

Technical Memorandum

March 18, 2025

Project# 27852

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RE: Sunrise Gateway Corridor Tech Memo #4.4: Future Transportation Conditions in the Study Area

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Executive Summary

This memorandum documents the future no-build and build transportation conditions within the Sunrise Corridor study area, including future walking, biking, and transit infrastructure, Metro travel demand model overview, and future intersection operations. The purpose of this memorandum is to understand if planned or potential improvements in the area meet the needs and goals of the Sunrise Corridor Community Visioning and other related planning efforts.

The 2045 future year analysis included modeling four scenarios:

1. 2045 no-build
2. 2045 two-lane Sunrise (one lane in each direction),
3. 2045 four-lane Sunrise (two lanes in each direction), and
4. 2045 six-lane Final Environmental Impact Statement (FEIS) Preferred Alternative (three lanes in each direction) with auxiliary lanes.

This executive summary includes key findings related to the no-build analysis and the additional key findings of the three build analyses. Figure 1 illustrates key future no-build findings followed by narrative summarizing the no-build and build scenarios. Table 1 shows the volume-to-capacity results for the 2045 scenarios, described in the subsequent sections.

Figure 1. Key Year 2045 No-Build Scenario Findings Summary

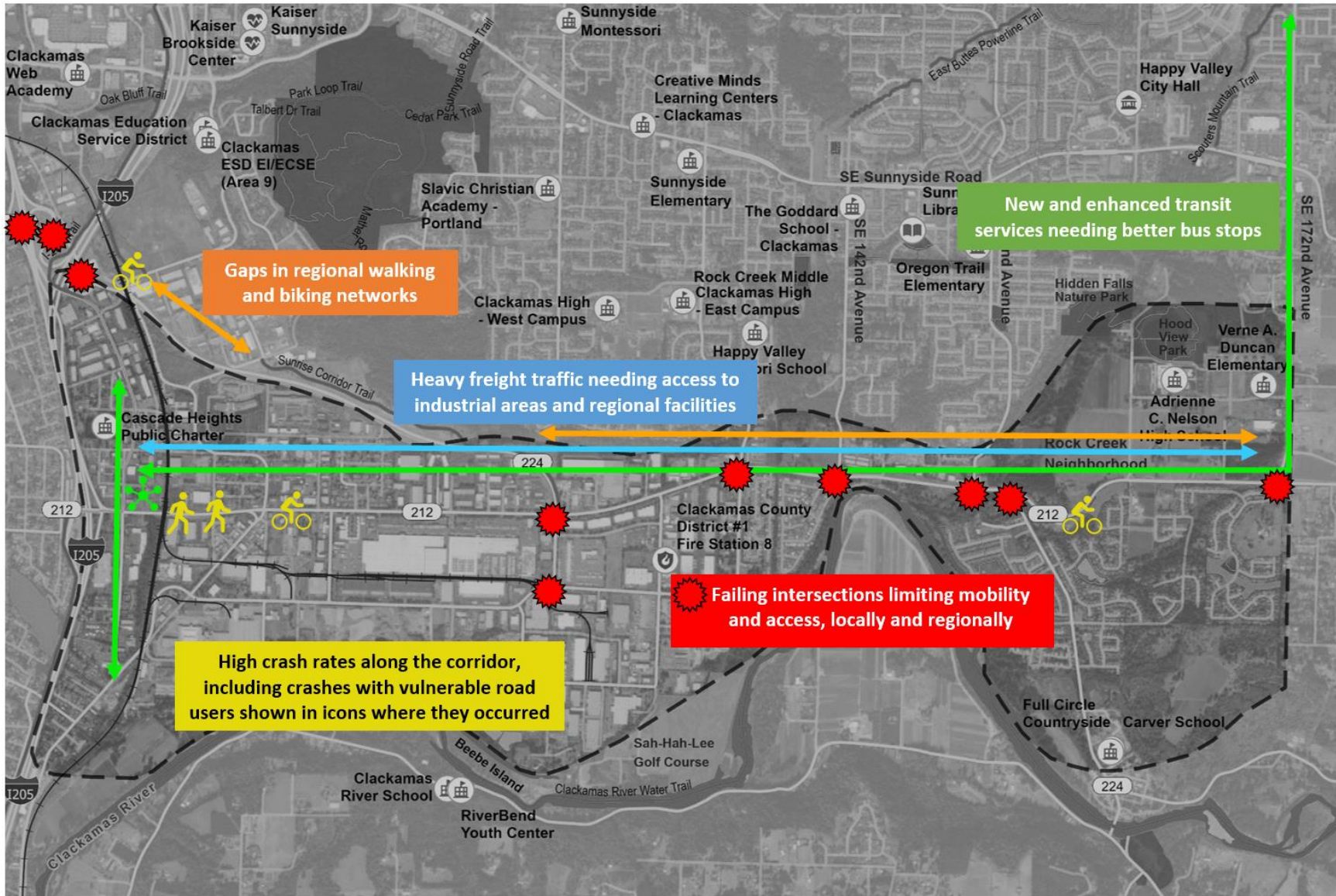
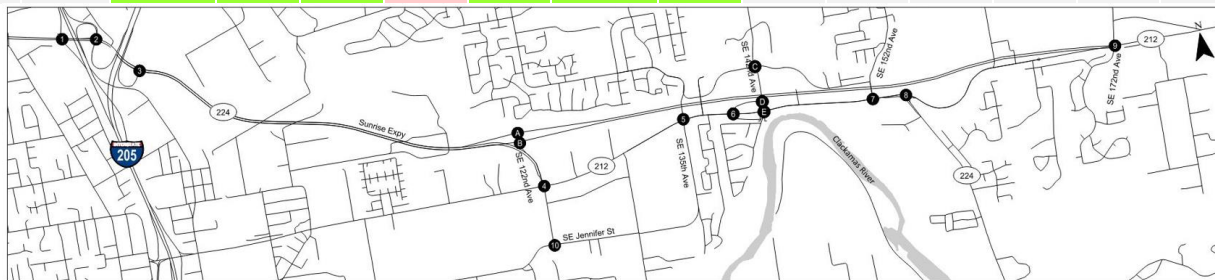


Table 1. Operations Comparison

2045 Scenario		Existing Intersections							Future Intersections								
		4	5	6	7	8	9	10	A	B	C	D	E	F	G	H	I
No-Build	AM	0.87	1.13	1.05	>2.0	0.82	0.62	0.31	-	-	-	-	-	-	-	-	-
	PM	0.69	1.09	0.95	>2.0	0.76	0.89	0.68	-	-	-	-	-	-	-	-	-
Two-Lane Sunrise	AM	0.87	0.74	N/A	N/A	0.76	0.84	0.17	0.88	0.77	0.24	0.62	0.68	-	-	-	-
	PM	0.74	0.66	N/A	N/A	0.58	0.83	0.17	0.62	0.79	0.98	0.74	0.88	-	-	-	-
Four-Lane Sunrise	AM	0.69	0.56	N/A	N/A	0.69	0.64	0.08	0.98	0.74	0.42	0.58	0.64	-	-	-	-
	PM	0.82	0.83	N/A	N/A	0.50	0.83	0.01	0.64	0.81	0.42	0.70	0.63	-	-	-	-
FEIS	AM	0.88	0.83	0.56	1.15	0.57	0.86	0.27	-	-	-	-	-	0.95	0.81	0.73	0.57
	PM	0.68	0.87	0.57	1.46	0.39	0.87	0.13	-	-	-	-	-	0.80	0.92	0.83	0.64



Key Findings: 2045 No-Build Scenario

In the no-build scenario, Highway 212/224 east of 122nd Avenue fails to meet current operational performance standards. Specifically:

- Three intersections along Highway 212/224 between 122nd Avenue and 172nd Avenue will have a volume-to-capacity (v/c) ratio projected to exceed 1.0:
 - Highway 212/224 at SE 135th Avenue, SE 142nd Avenue, and SE 152nd Avenue.
 - At SE 135th Avenue/Highway 212, the southbound right-turn and through queues exceed storage lane capacity, blocking the southbound left-turn lane.
- The County's SE 122nd Avenue/SE Jennifer Street intersection is projected to be Level of Service (LOS) F as it experiences high delays.
- Two of the three I-205 ramp terminal intersections do not meet ODOT's 0.85/0.90 v/c ratio threshold; however, the forecasted v/c ratios do not exceed 1.00 except for Hwy 213 NB access/I-205 SB off-ramp/Hwy 224 in the PM.

What is volume to capacity (v/c) ratio?

V/c ratio measures congestion on a roadway by dividing the amount of traffic by the roadway's available space.

- A v/c ratio of 0.90 suggests the roadway is fairly congested but not yet over capacity.
- A v/c ratio of 1.0 is at capacity.
- Over 1.0 is over capacity.

Having intersections with v/c ratios of greater than 1.0 (failing) along Highway 212/224 impacts not only the travel conditions for automobiles and freight, but also influences conditions for pedestrians and cyclists and impacts the opportunity to provide transit service through the area. In addition, this existing and future condition causes drivers of automobiles to choose different routes, moving more traffic onto roads such as Sunnyside Road and SE 142nd Avenue.

A sensitivity analysis indicates that the Rock Creek Junction can maintain acceptable operations through approximately year 2036 under the No-Build Scenario. The intersection could continue to meet mobility standards with the addition of a second eastbound right-turn lane. It should be noted that this interim improvement is not required under the Sunrise Gateway Concept Plan build scenarios.

Pedestrian-Bicycle Conditions

The draft *Walk Bike Clackamas Plan* outlines a strategic plan for active transportation in Clackamas County, with eight projects that impact the Sunrise Corridor Community Vision area and Highway 212:

- Five County projects to address bikeway and sidewalk gaps on SE Jennifer Street and SE 142nd Avenue, and
- Three ODOT projects including extending the Sunrise multi-use path to Rock Creek Junction and adding shoulders and/or bikeways on Highway 212 and Highway 224.

Under the no-build scenario, the multi-use path and other pedestrian and bikeway improvements associated with the Sunrise Corridor FEIS project or the Sunrise Gateway Concept Plan would not be constructed, leaving significant gaps in the active transportation system. In addition, the pedestrian and bikeway access across Highway 212 between Rock Creek Junction and 172nd Avenue, an area where high school students and others cross Highway 212, is not addressed by other projects within the Regional Transportation Plan, leaving no access from the residential areas south of Highway 212 to the high school and parks north of Highway 212. A lack of improvements to Highway 212/224 also leaves gaps between the City of Happy Valley's planned pedestrian and bicycle improvements.

Transit Conditions

For future transit services, TriMet's *Forward Together* plan recommends adding two bus routes on or adjacent to the Sunrise Corridor study area, as well as removing one existing bus route.

- Add Line 45 from Gladstone to Clackamas Town Center on Strawberry Lane, 82nd Drive, Sunnybrook Road, Minuteman Way, Evelyn Street and Jennifer Street.
- Increase frequency of Line 79 on SE 82nd Drive to every 15-30 minutes.
- A new hourly Line 150-Oatfield/ Thiessen/172nd from Milwaukie through Happy Valley on Highway 212, continuing north via 172nd Avenue to end in Gresham at Powell Blvd¹.
- Reduce service on SE 122nd/Mather and on SE 152nd between Sunnyside and Highway 212.

The *Clackamas County Transit Development Plan* identifies 20-year transit needs for the county and provides short-term, medium-term, and long-term recommendations for new and additional transit services.

- Medium-term recommendations include adding service in Happy Valley, in Damascus, and along Highway 212 between I-205 and US 26.
- Long-term recommendations include expanding Damascus and Highway 212 service, as well as monitoring demand for increased service on Highway 224 to Estacada.
- Recommendations include a transit hub near Highway 212 and SE 82nd Drive.

Any existing or new bus service along Highway 212 will experience significant delay in the no-build scenario. Since this corridor is not expected to have high-capacity transit with a protected space for transit, frequent and dependable bus service is reliant upon a roadway system that meets the v/c standards and does not have continual delay. While TriMet and the Clackamas County Industrial Shuttle plan to increase service in and through the area, this service is negatively impacted in the no-build scenario.

Key Findings: 2045 Two-Lane Sunrise

The two-lane analysis modeled the impacts of the Sunrise Gateway Concept Plan proposal with one lane in each direction on the new Sunrise facility. The existing Highway 212/224 is expected to maintain four lanes and SE 122nd Avenue serves as the junction between Highway 212 and 224 with Highway 212 continuing along the new Sunrise facility to SE 172nd Avenue.

Key findings include:

- All study intersections (outside of the I-205 ramp terminal intersections) meet ODOT and County operating standards.
- The intersection operation and queuing analysis identifies the need to integrate the following changes into the Sunrise Gateway Concept Plan developed in 2020 to meet mobility standards:
 - Adding second eastbound left-turn, westbound right-turn, and southbound right-turn lanes at the SE 122nd Avenue/Highway 212 intersection
 - Adding dual northbound right-turn lanes at the SE 135th Avenue/Highway 212 intersection
 - Including a channelized northbound right-turn and southbound right-turn at the reconfigured SE 142nd Avenue/Highway 212 eastbound and westbound terminals as free movements with receiving lanes added on Highway 212.
 - Including a channelized southbound right-turn at the reconfigured SE 152nd Avenue/Highway 212 westbound terminal as a free movement with a receiving lane added on Highway 212.
 - Adding second eastbound left-turn, southbound right-turn, and westbound through lanes at the SE 172nd Avenue/Highway 212 intersection.

¹ This route is outside the TriMet Service Area Boundary at the time of this report.

- Highway 213 southbound off-ramp/I-205 southbound on-ramp/Highway 224:
 - The southbound ramp terminal exceeds available storage capacity during the PM peak hour.
- Highway 213 northbound access/I-205 southbound off-ramp/Highway 224:
 - The westbound movement exceeds capacity during the AM peak hour.
 - The northbound, southbound, and westbound movements exceed capacity during the PM peak hour.
 - The westbound through movement obstructs the intersection with SE Ambler Road during the AM and PM peak hours.
 - The eastbound left-turn queue exceeds available storage during the weekday PM peak hour.
 - The northbound right-turn queue blocks the northbound left-turn lane and may reach southbound I-205 during the weekday PM peak hour.
- Highway 224/212 (Rock Creek Junction): The northbound and westbound queues remain within storage lane capacities during PM peak hours. The eastbound right-turn lane exceeds queue capacity still, though the queue length is substantially less than the existing and no-build scenarios.

Key Findings: 2045 Four-Lane Sunrise

The four-lane analysis modeled the impacts of the Sunrise Gateway Concept Plan proposal with two lanes in each direction on the new Sunrise facility. The existing Highway 212/224 is expected to maintain four lanes and SE 122nd Avenue serves as the junction between Highway 212 and 224 with Highway 212 continuing along the new Sunrise facility to SE 172nd Avenue.

Key findings include:

- All study intersections (outside of the I-205 ramp terminal intersections) meet ODOT and County operating standards.
- The intersection operation and queuing analysis identifies the need to integrate the following changes into the Sunrise Gateway Concept Plan developed in 2020 to meet mobility standards:
 - Adding second eastbound left-turn, westbound right-turn, and southbound right-turn lanes at the SE 122nd Avenue/Highway 212 intersection
 - Adding dual northbound right-turn lanes at the SE 135th Avenue/Highway 212 intersection
 - Including a channelized northbound right-turn and southbound right-turn at the reconfigured SE 142nd Avenue/Highway 212 eastbound and westbound terminals as free movements with receiving lanes added on Highway 212.
 - Including a channelized southbound right-turn at the reconfigured SE 152nd Avenue/Highway 212 westbound terminal as a free movement with a receiving lane added on Highway 212.
 - Adding second eastbound left-turn, southbound right-turn, and westbound through lanes at the SE 172nd Avenue/Highway 212 intersection.
- Highway 213 southbound off-ramp/I-205 southbound on-ramp/Highway 224:
 - The westbound movement exceeds capacity during the AM peak hour.
 - The southbound ramp terminal exceeds available storage capacity during the PM peak hour.
 - The northbound and eastbound movements exceed capacity during the PM peak hour.
- Highway 213 northbound access/I-205 southbound off-ramp/Highway 224:
 - The westbound movement exceeds capacity during the PM peak hour.
 - The westbound through movement obstructs the intersection with SE Ambler Road during the AM and PM peak hours.
 - The eastbound left-turn queue exceeds available storage during the weekday PM peak hour.
 - The northbound right-turn queue blocks the northbound left-turn lane and may reach southbound I-205 during the weekday PM peak hour.

- Highway 224/212 (Rock Creek Junction): The northbound and westbound queues remain within storage lane capacities during PM peak hours. The eastbound right-turn lane exceeds queue capacity still, though the queue length is substantially less than the existing and no-build scenarios.

Key Findings: Sunrise Gateway Scenarios vs. FEIS

- Sunrise Gateway Concept Future Build 4-lane Scenario meet the Sunrise FEIS Purpose and Need.
- The FEIS includes several interchanges that have not been included in the Sunrise Gateway two-lane and four-lane scenarios. These elements include direct access between Highway 213 and I-205 and a new interchange at the Rock Creek Junction intersection.
- The 2045 six-lane FEIS scenario includes projected deficiencies at the Highway 212/SE 152nd Avenue intersection. The intersection is projected to operate acceptably under the 2045 two-lane and four-lane Sunrise Gateway Concept scenarios.
- With a larger Sunrise facility in the six-lane FEIS, additional trips are attracted to the corridor which impact operations.

Future Walking and Biking Infrastructure

In April 2024, Clackamas County released a draft *Walk Bike Clackamas Plan* (Reference 1), which outlines a strategic plan for active transportation in Clackamas County. This plan delves into various aspects related to active transportation, public engagement, goals and objectives, project prioritization, program recommendations, and more. The plan places a strong emphasis on health equity, community engagement, and addressing the transportation needs of diverse populations. Through detailed analysis and strategic recommendations, the document sets the groundwork for fostering a more accessible and sustainable active transportation network in Clackamas County.

In the Sunrise Community Corridor study area, the *Walk Bike Clackamas Plan* identified the improvement projects shown in Table 2 and Figure 2.

Additionally, the Happy Valley Transportation System Plan (Reference 2) includes several walking and biking projects in and around the Sunrise Community Corridor study area. The pedestrian projects include sidewalk infill on SE 142nd Avenue, SE 152nd Avenue, OR 212, OR 224, and SE 162nd Avenue and SE Rock Creek Boulevard. None of these projects are on the city's financially-constrained project list. For bicycle projects, there is a financially-constrained project to add bike lanes on the SE 162nd Avenue extension between SE 157th Avenue and OR 212. Other projects include constructing the Clackamas River Trail, adding bike lanes on OR 212 to the east from Rock Creek Junction, extending the Sunrise multi-use path to the east, and constructing a shared-use path from Rock Creek Junction to the north following Rock Creek. The location of these improvements are shown in Figure 3 through Figure 5.

Table 2. Related Projects in Clackamas Town Center Area (Source: Walk Bike Clackamas Plan, Clackamas County, 2024)

Project ID	Type	Source	Name	Extent 1	Extent 2	Description	Miles	Tier
CC - 169	Linear	TSP	Scouters Mountain / Mt Scott Loop Trail	Loop trail through Happy Valley, Damascus, Clackamas County and Portland		Construct multi-use path in accordance with the Active Transportation Plan	27.63	1
CC - 129	Linear	TSP	SE 82nd Dr pedestrian facilities and bikeways	OR 212	I-205 Multi-Use Path	Fill in bikeways and pedestrian facilities gaps	0.8	1
CC - 144	Linear	TSP	SE Evelyn St pedestrian facilities and bikeway	OR 224	Jennifer St	Fill gaps in bikeways and pedestrian facilities	0.39	1
CC - 149	Linear	TSP	SE Jennifer St pedestrian facilities and bikeways	SE 82nd Dr	SE 135th Ave	Fill in pedestrian facility gaps and bikeway	2.38	2
CC - 172	Linear	TSP	SE 142nd Ave pedestrian facilities and bikeways	SE Sunnyside Rd	OR 212	Add bikeways and pedestrian facilities	1.03	1
ODOT - 11	Linear	TSP	Sunrise Multi-Use Path	SE 122nd Ave	OR 224	Construct multi-use path from 122nd to Rock Creek Junction parallel to the Sunrise project consistent with FEIS.	4.01	1
ODOT - 12	Linear	TSP	OR 224 bikeways	OR 212	SE Midway St	Add bikeways	1.22	1
ODOT - 34	Linear	TSP	OR 212 shoulder widening	OR 224	SE Sunnyside Road	Add pedestrian and bicycle facilities	2.49	3

Source: Walk Bike Clackamas Plan, Clackamas County, 2024

Figure 2. Linear and Spot Improvement Projects in Clackamas Town Center Area East (Source: Walk Bike Clackamas Plan, Clackamas County, 2024)

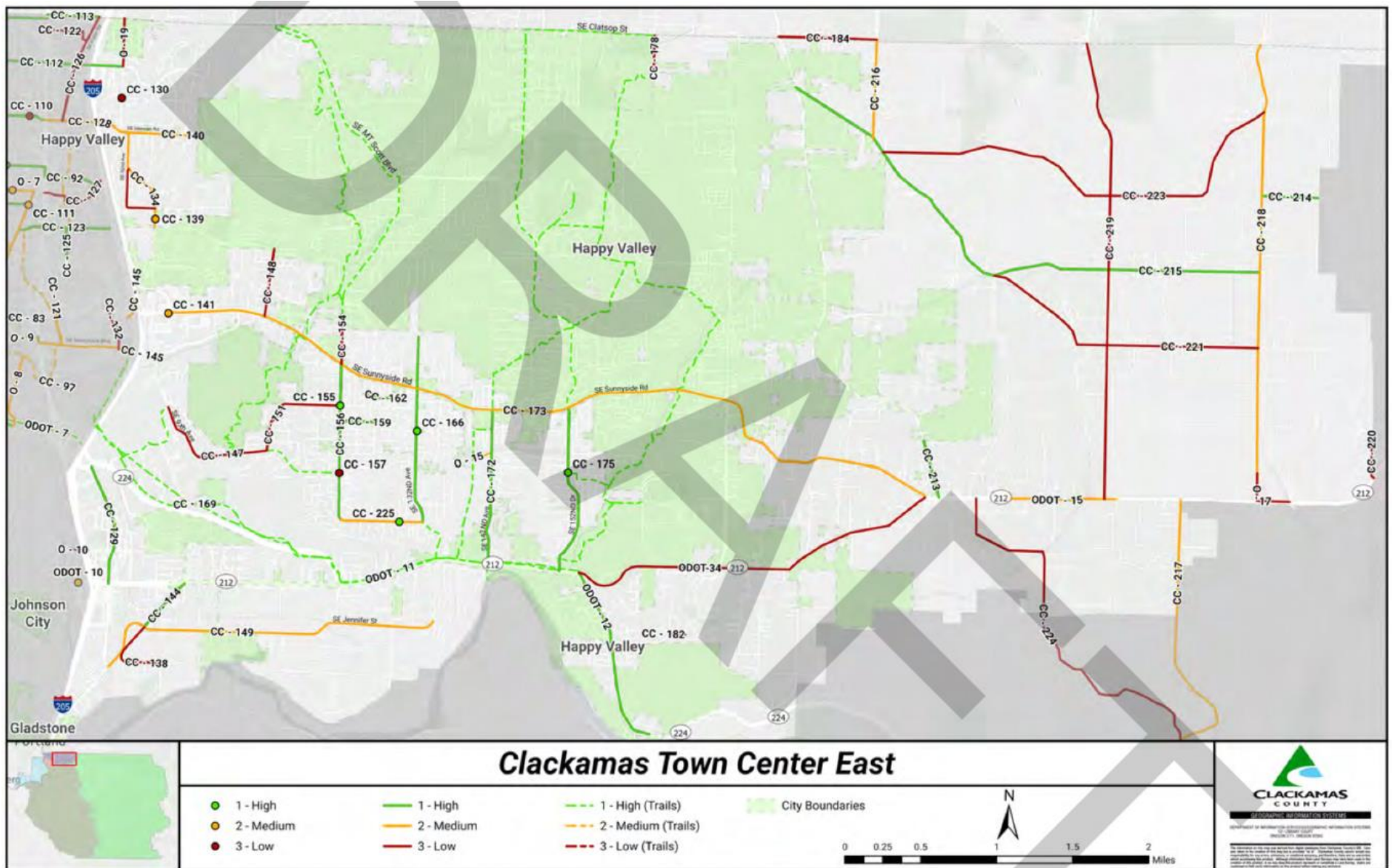


Figure 3. Happy Valley Pedestrian Master Plan in the Sunrise Area (1 of 2)

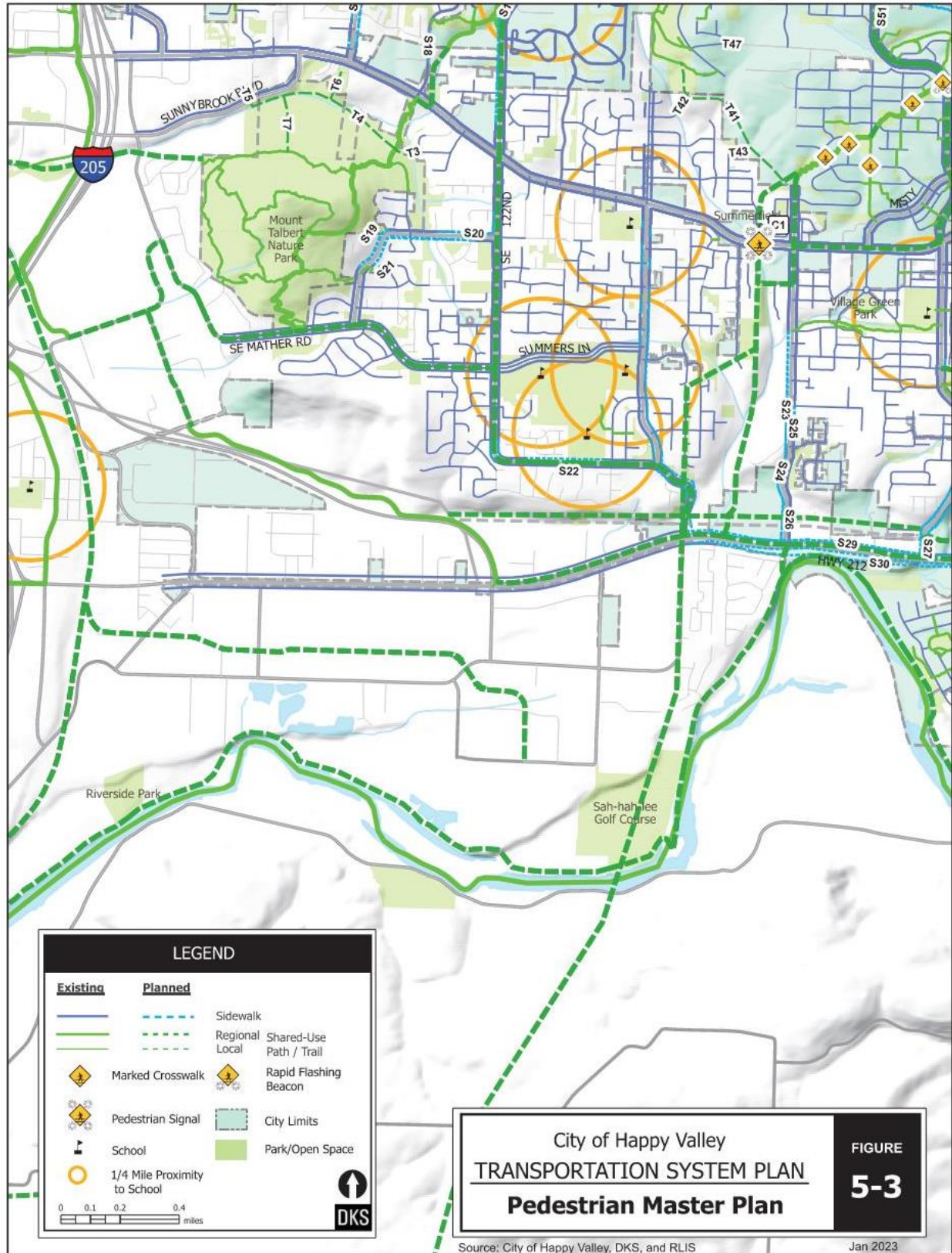


Figure 4. Happy Valley Pedestrian Master Plan in the Sunrise Area (2 of 2)

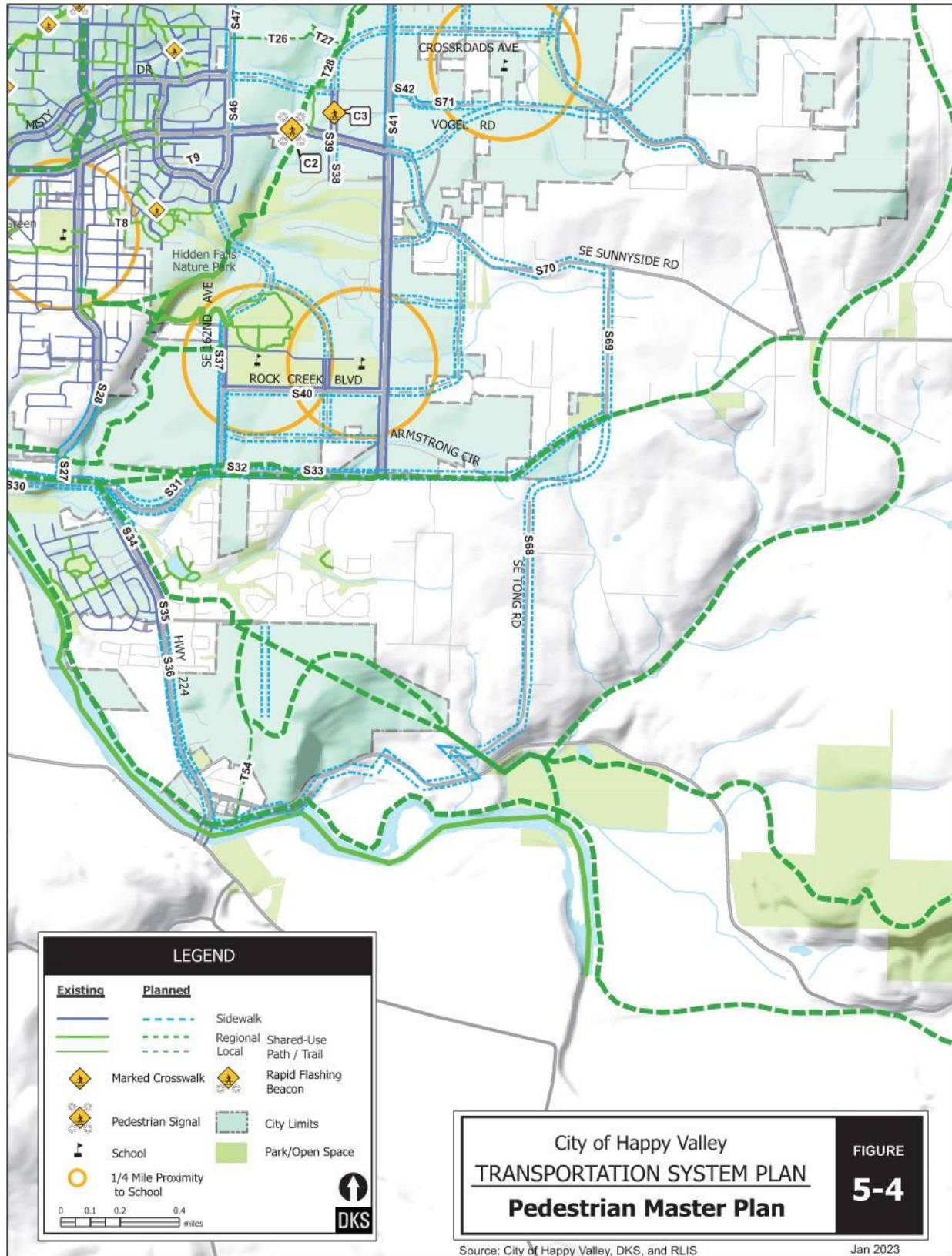
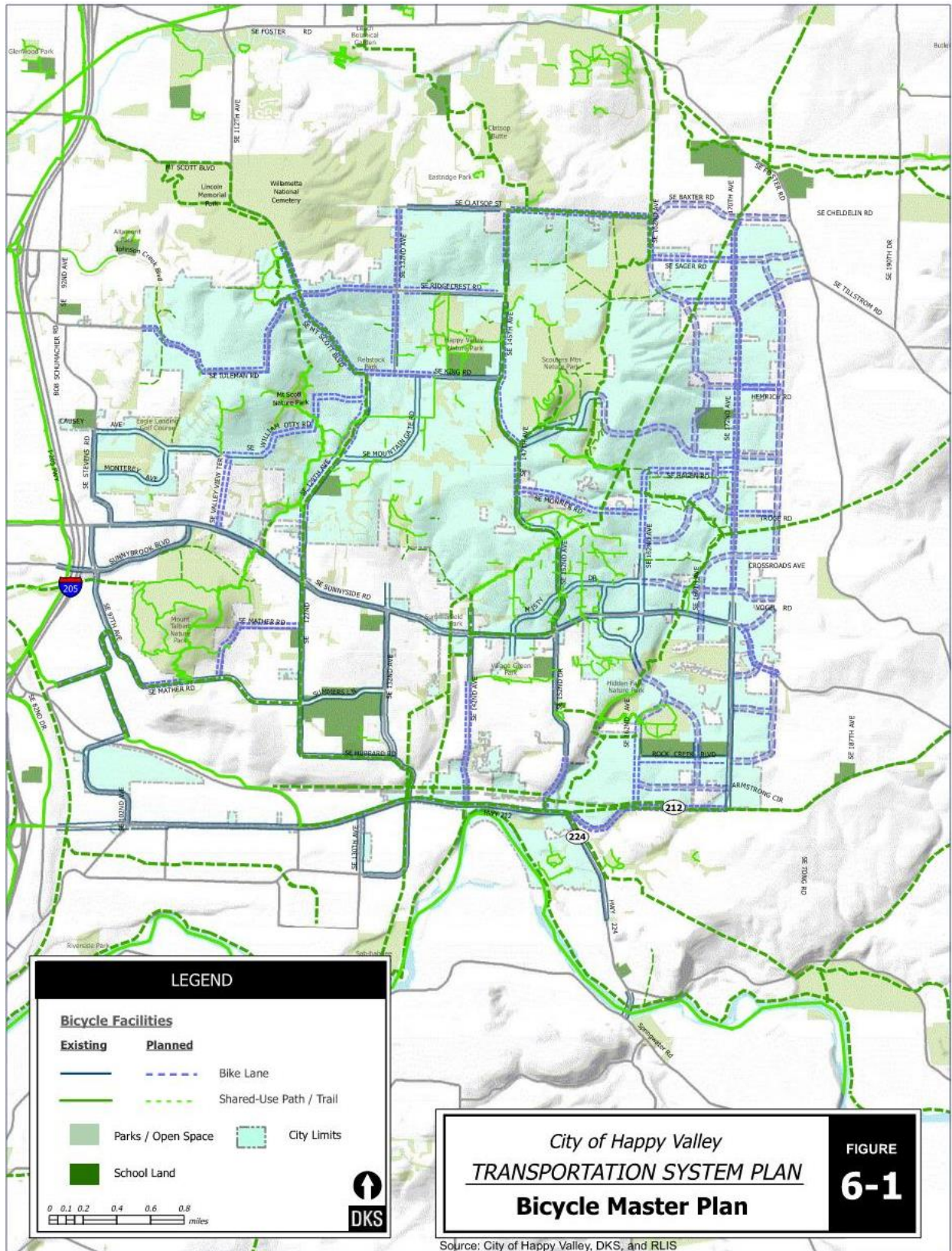


Figure 5. Happy Valley Bicycle Master Plan in the Sunrise Area



Future Transit Services

The *Clackamas County Transit Development Plan* (TDP – Reference 3) identifies 20-year transit needs for the county and provides short-term, medium-term, and long-term recommendations for new and additional transit services (Figure 6 through Figure 8). This includes the Clackamas Industrial Area Shuttle launched in 2021 with 15 runs per day. The TDP recommends gradually increasing service to 17 to 32 runs per day in the medium- and long-term, respectively. Recommendations relevant to the project area and its vicinity are shown in Table 3.

Table 3. Clackamas County TDP Recommendations

ID	Corridor or Area	Existing Runs per Day	Additional Transit Run Demand	Recommendation	District/ Provider	Vehicle Size	Status
MT-6	Happy Valley	16	19	Establish hourly service (about 10 runs per day)	TriMet	Larger	Established Need
MT-9	Damascus	0	19	Establish hourly service (about 10 runs per day)	TBD	Smaller	Established Need
MT-11	Highway 212: I-205 to US26	0	14	Establish hourly service (about 8 runs per day); triggers Mobility Hub in Boring	SAM	Larger	In Provider Plan
LT-6	Happy Valley	26	9	Evaluate service; consider increased service span and frequency to add about 10 runs per day	TriMet	Larger	Established Need
LT-8	Damascus	10	9	Evaluate service; consider increased service span and frequency to add about 10 runs per day	TBD	Smaller	Established Need
LT-10	Highway 212: I-205 to US26	8	6	Evaluate service; consider increased service span and frequency to add about 10 runs per day	SAM	Larger	In Provider Plan
N/A	Highway 224: Highway 212 to Estacada	Monitor potential increases to transit demand			N/A	N/A	N/A
	OR-212 Mobility Hub	N/A	N/A		TriMet	All	Established Need

Notes: MT = Medium-Term; LT = Long-Term; SAM = Sandy Area Metro

Source: Clackamas County TDP

TriMet's *Forward Together* plan (Reference 4) focuses service in areas with high ridership that serve lower-income people and their needs more equitably. By mapping ridership changes between 2019 and 2021, job locations and access to transit, and using a composite equity index, TriMet was able to create a new regional service concept. TriMet is continuing to refine this plan through evolutions such as their FX planning for frequent service lines and other programs.

Within the project area and the Clackamas Industrial Area, the *Forward Together* plan results in a net service increase. Figure 9 shows the revised transit concept for the project area and the Clackamas Industrial Area. The existing Route 79, running along 82nd Drive across Highway 224, would be elevated to a frequent service route (15-minute headways or better) in the long-term, an improvement over its 40-minute headways currently. Two new routes would serve different areas within the project area corridor:

- **Route 145** would run between Clackamas Town Center and Oregon City, with service on SE 102nd Avenue and SE Evelyn Street at Highway 224
- **Route 150** would run between Milwaukie and Powell Boulevard in Gresham, with services along SE Jennifer Street and on Highway 212 before turning north onto SE 172nd Avenue and the Clackamas to Columbia (C2C) corridor.
- The *Forward Together* plan proposes removing **Route 156**, which runs between Clackamas Town Center and Sunnyside Road, with service on Highway 212 between SE 135th Avenue and SE 152nd Avenue.

Figure 6. Clackamas County TDP Short-Term Recommendations (Source: Clackamas County TDP)

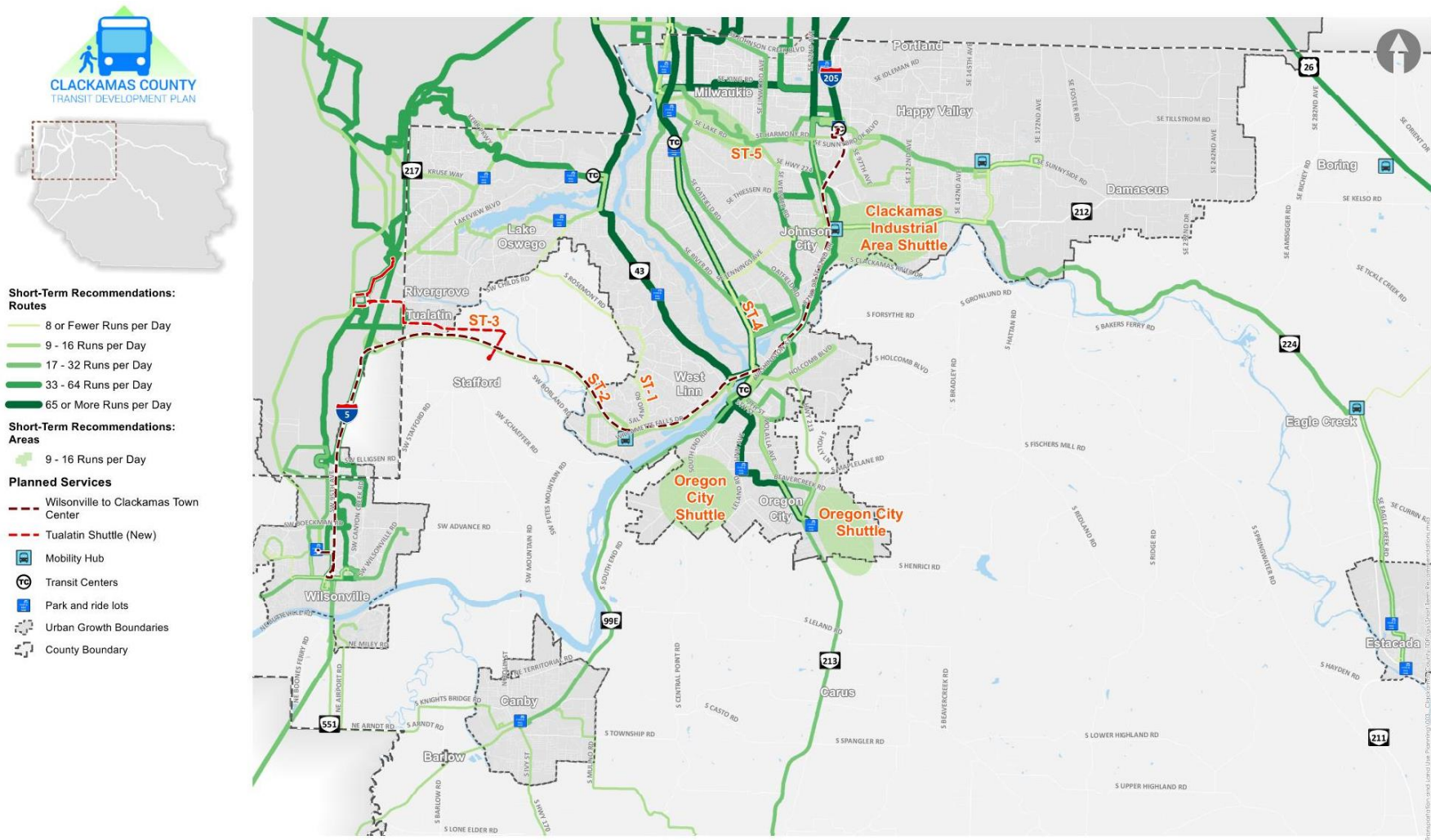


Figure 7. Clackamas County TDP Medium-Term Recommendations (Source: Clackamas County TDP)

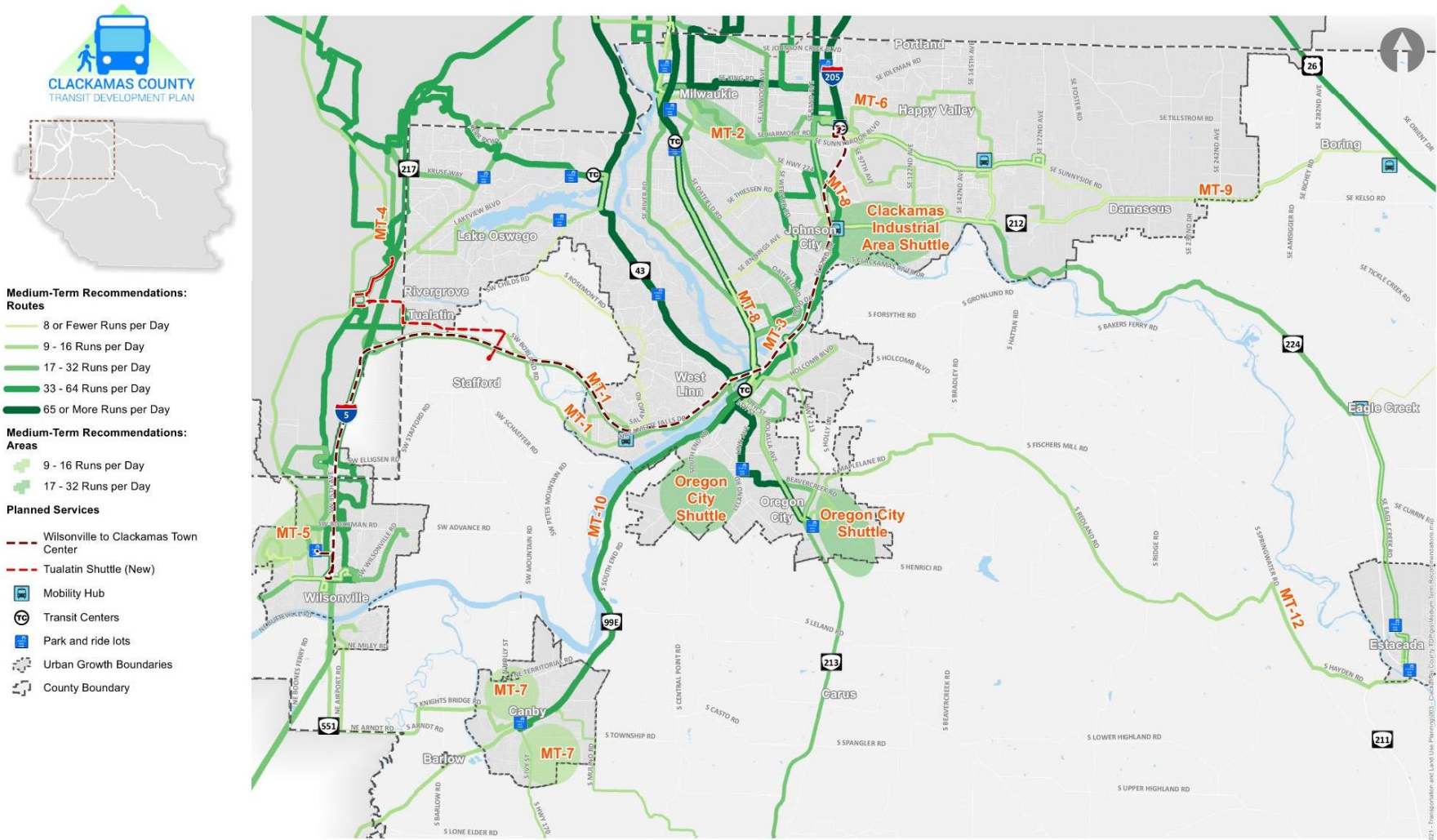


Figure 8. Clackamas County TDP Long-Term Recommendations (Source: Clackamas County TDP)

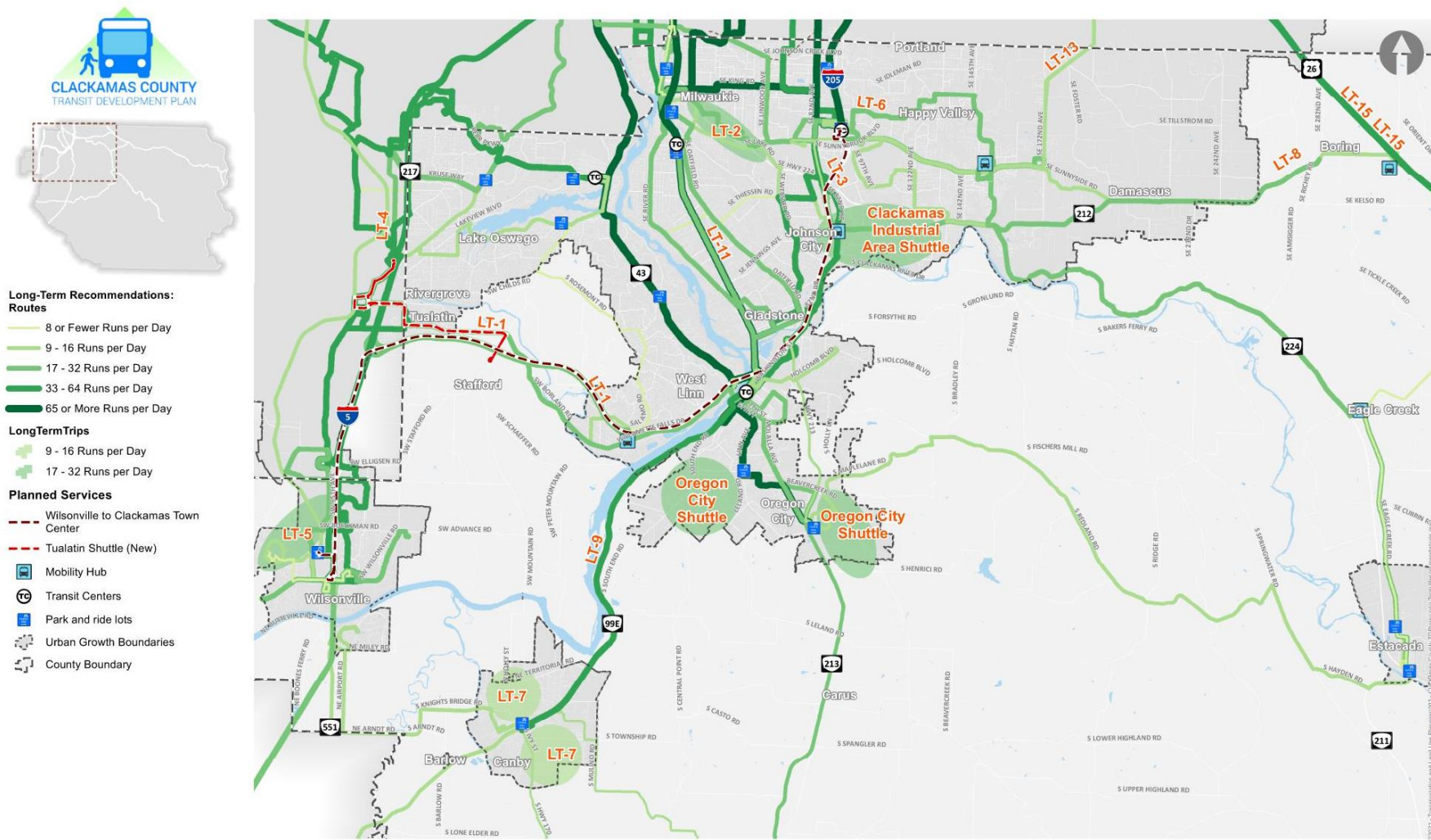
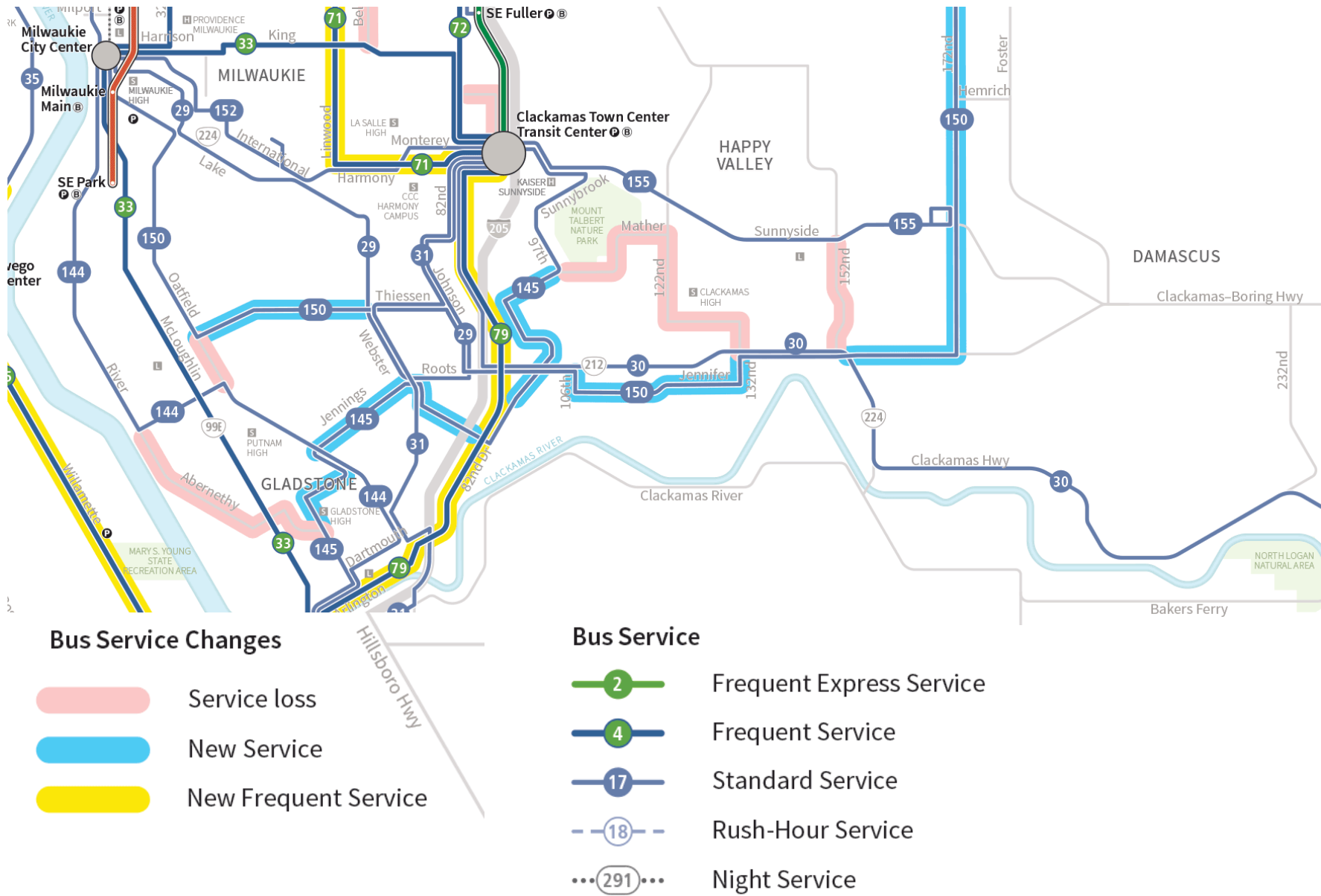


Figure 9. Forward Together Plan for the Sunrise Corridor Area (Source: TriMet's Forward Together Plan)



Metro Regional Travel Model

As part of the adoption of the 2023 Regional Transportation Plan (RTP – Reference 5), Metro updated their travel demand model to reflect the new list of projects in the RTP. This model has a base year of 2020 and a future year of 2045.

Consistent with the 2021 *Sunrise Gateway Corridor Concept Plan* (Reference 6), Metro ran four different 2045 future year scenarios:

- 2045 No-build: No Sunrise improvement (Gateway or FEIS) in the model
- 2045 Two-Lane Sunrise: A two-lane (one lane each direction) Sunrise Gateway Concept Plan from SE 122nd Avenue to SE 172nd Avenue
- 2045 Four-Lane Sunrise: A four-lane (two lanes each direction) Sunrise Gateway Concept Plan from SE 122nd Avenue to SE 172nd Avenue
- 2045 Six-Lane Sunrise based on the FEIS: A six-lane (three lanes in each direction) Sunrise from I-205 to SE 172nd Avenue, with interchanges at SE 122nd Avenue and Rock Creek Junction, while maintaining a signalized intersection at SE 172nd Avenue.

Sunrise Gateway Concept Plan Scenarios

Key components of the Sunrise Gateway Concept Plan build scenarios include:

- A one-way couplet intersection at SE 122nd Avenue with the new Sunrise Gateway alignment (to the north of the existing SE 122nd Avenue/Highway 212/224 intersection) which are forward compatible in serving as ramps to a future interchange (Sunrise crossing over SE 122nd Avenue).
- The new four-lane Sunrise Gateway alignment becomes the extension of Highway 212 east of SE 122nd Avenue and Highway 212/224 east of SE 122nd Avenue becomes Highway 224. SE 122nd Avenue replaces Rock Creek Junction as the interface between Highway 212 and 224.
- No other intersections or interchanges between SE 122nd Avenue and SE 172nd Avenue are planned along the at-grade Sunrise Gateway alignment, providing an access-controlled facility. The Rock Creek Junction interchange proposed in the 2011 FEIS was removed, given more-recent construction rendered this access infeasible without substantial property impacts.
- Connections in the area between SE 135th Avenue and SE 152nd Avenue and the existing Highway 212/224 alignment are maintained via a new grade-separated access at SE 142nd Avenue (servicing SE 135th Avenue, SE 142nd Avenue, and SE 152nd Avenue to the north) and Highway 212/224.
- The Sunrise Gateway alignment ties into the existing Highway 212 at SE 172nd Avenue.
- The portion of Highway 212 east of the Rock Creek Junction becomes SE 162nd Avenue and travels north to SE Rock Creek Boulevard.
- Both the FEIS and Sunrise Gateway concepts included safety improvements and enhanced walking and biking connections throughout the corridor.

Other general model updates included:

- Realigning Tong Road to SE 187th Avenue consistent with Happy Valley's Pleasant Valley/North Carver Comprehensive Plan
- Shifting the Clackamas-to-Columbia (C2C) connection between SE 172nd Avenue and SE 190th Drive further to the north, consistent with the 172nd – 190th Corridor Plan

Figure 10 shows the Sunrise Gateway Corridor Concept, and Figure 11 shows the key components from the model update.

Figure 10. Sunrise Gateway Corridor Concept

122nd Tie-In



The 122nd Tie-in is designed to preserve the long-term diamond interchange footprint and allow phased construction of the ultimate mainline expressway and bridge over the crossroad.

135th/142nd/152nd Tie-In



This tie-in allows the consolidation of left-turn access to/from OR 212/224 through the development of a grade-separated overcrossing of the highway and new Sunrise Gateway Corridor and provides a gateway to the industrial site.

Rock Creek Junction



Rock Creek Junction will be converted into multi-lane roundabout to improve safety and provide adequate capacity following the development of the Sunrise Gateway Corridor.

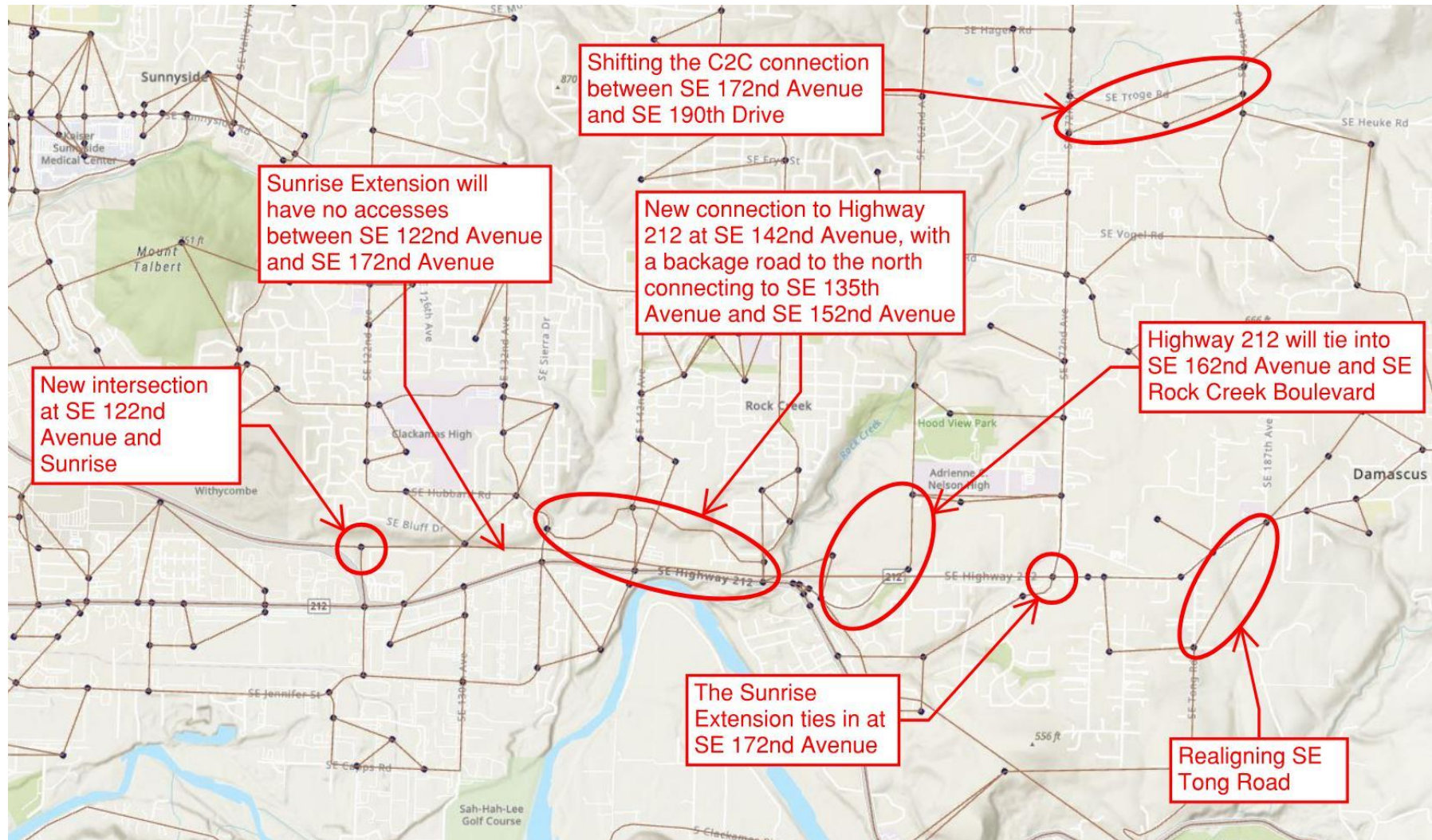
Rock Creek Junction/ 162nd to 172nd Tie-In



This improvement minimizes right-of-way impacts and provides access to the Rock Creek Employment area via OR212, OR224, and the Sunrise (at 172nd Avenue) corridor.



Figure 11. Key Components in Metro's 2045 Sunrise Future Build Models

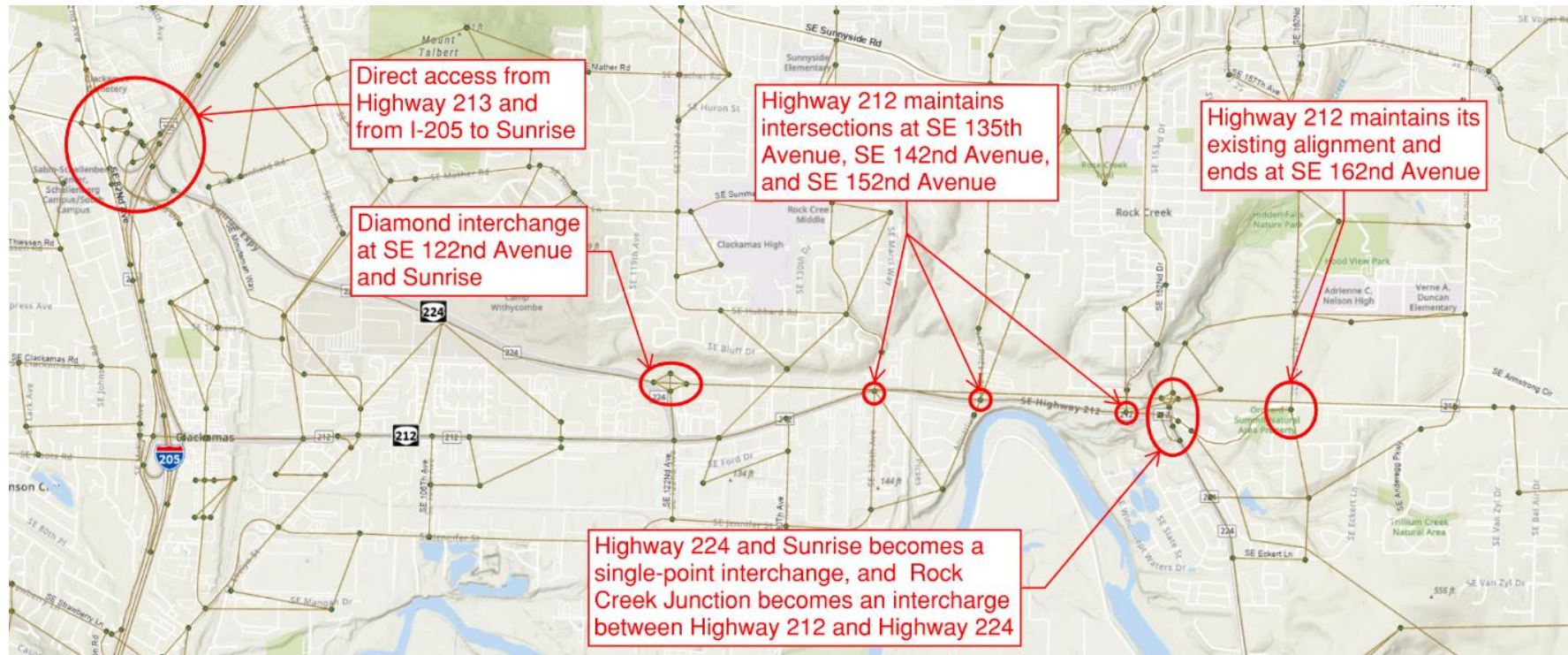


FEIS Preferred Alternative Scenario Update

The preferred alternative from the 2010 Final Environmental Impact Study (FEIS – Reference 7) includes the following elements that are not included in the *Sunrise Gateway Corridor Concept Plan* or the Metro model scenarios:

- Direct access from both Highway 213 and I-205 to the Sunrise Expressway.
- Highway 212 maintains existing intersections at SE 135th Avenue, SE 142nd Avenue, and SE 152nd Avenue.
- Highway 224 extends north to become a single-point interchange for the Sunrise Expressway, with plans to extend the highway to the north.
- The existing Rock Creek Junction intersection becomes an interchange between Highway 212 and Highway 224.
- Highway 212 maintains its current right-of-way at SE 162nd Avenue and does not turn to the north.

Figure 12. Key Components in Metro's 2045 FEIS Future Build Model

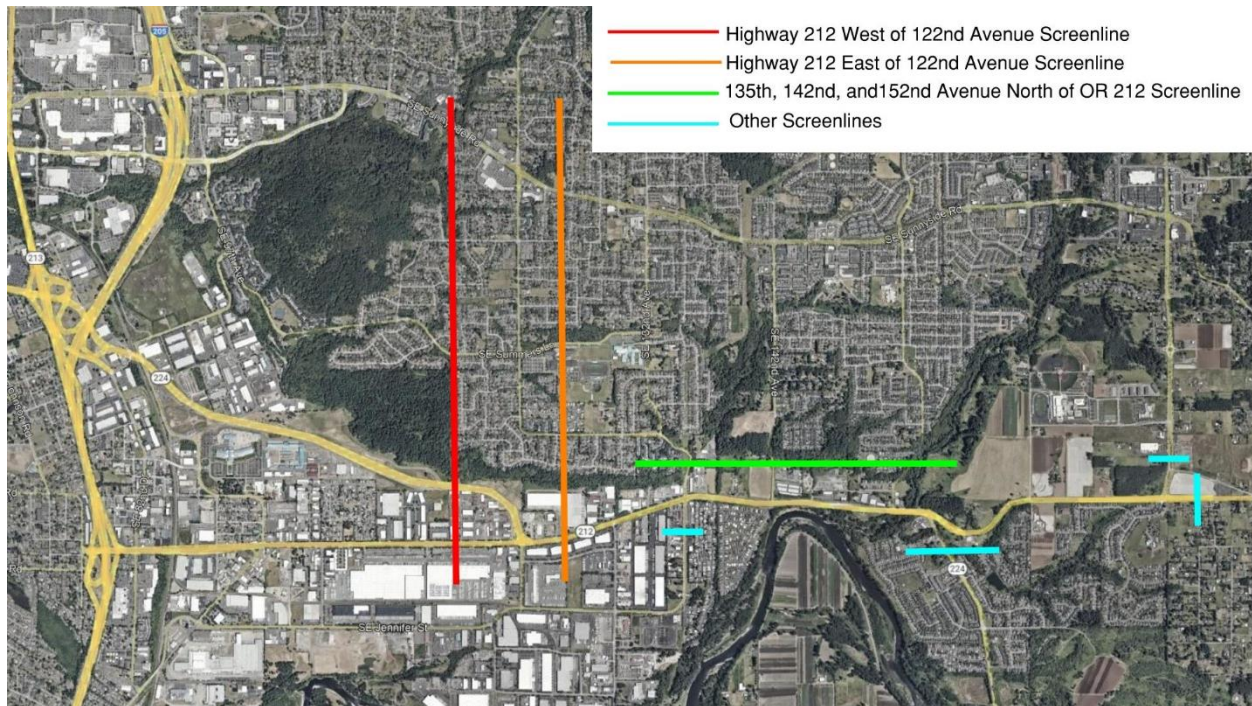


Sunrise Gateway Concept Plan Scenario Model Volume Comparison

To verify the reasonableness of the Metro model, traffic volumes near SE 122nd Avenue, SE 152nd Avenue, Rock Creek Junction, and SE 172nd Avenue were reviewed to understand how they compare to existing turning movement counts (2019 and 2023) and across the 2045 RTP model scenarios.

- Screenline traffic volumes on Highway 212 and Highway 224 west of SE 122nd Avenue are higher under the build scenarios. This is consistent with the added highway capacity created by extending the Sunrise Corridor to the east.
- Screenline volumes on Highway 212 and the planned Sunrise Corridor at SE 152nd Avenue are higher overall compared with existing volumes and the no-build scenario, with lower volumes on Highway 212 as traffic shifts to the Sunrise extension.
- Screenline volumes south of Rock Creek Junction and east of SE 172nd Avenue show higher volumes at each of these areas outside of the Sunrise Corridor study area, consistent with the added capacity through the corridor study area.

Figure 13. Screenline Locations



SE 122nd Avenue

The first two screenlines, shown in Figure 14 through Figure 17, taken to the west and east of SE 122nd Avenue, include Highway 224 (Sunrise Expressway), Highway 212, and SE Sunnyside Road. The screenlines captured both westbound and eastbound motor vehicles during the weekday AM and PM peak hours. Weekday AM peak hour counts were not collected along Sunnyside Road in 2019. The 2023 volumes are lower than the 2019 volumes, with slightly lower volumes on Highway 212/Sunnyside Rd in 2023 compared to 2019, which may reflect traffic patterns in a post-COVID environment. The 2045 no-build scenario includes an increase in volumes on Highway 224 and Sunnyside Road, as well as a minor decrease in volumes on Highway 212.

The two-lane and four-lane build scenarios show a significant increase for both Highway 212 and Highway 224 volumes, with higher volumes on Highway 224 that indicate an extended Sunrise Corridor to the east. All of these trends are reasonable and indicate modeling efforts were sensitive to changes in the network.

Figure 14. Weekday AM Volumes at Highway 212, Highway 224, and Sunnyside West of SE 122nd Avenue

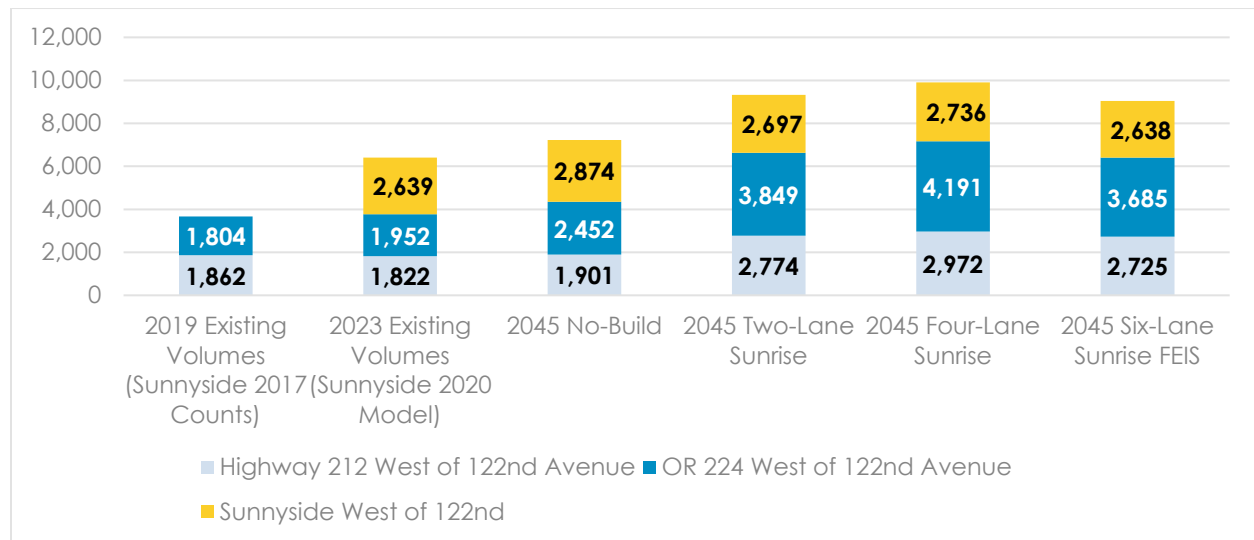


Figure 15. Weekday PM Volumes at Highway 212, Highway 224, and Sunnyside West of SE 122nd Avenue

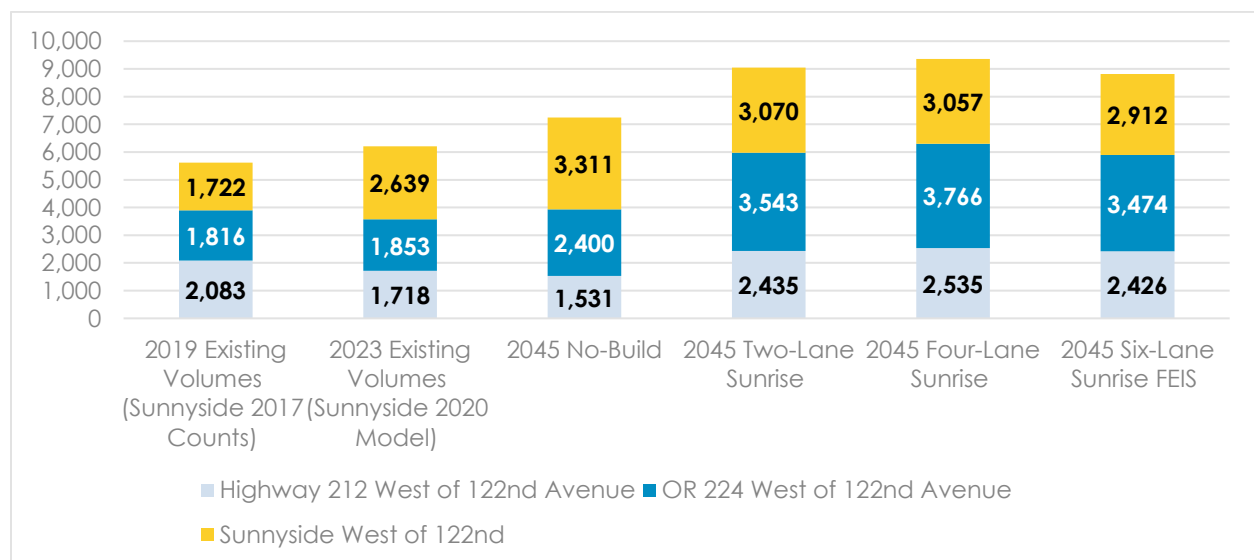


Figure 16. Weekday AM Volumes at Highway 212-224, Sunrise, and Sunnyside East of SE 122nd Avenue

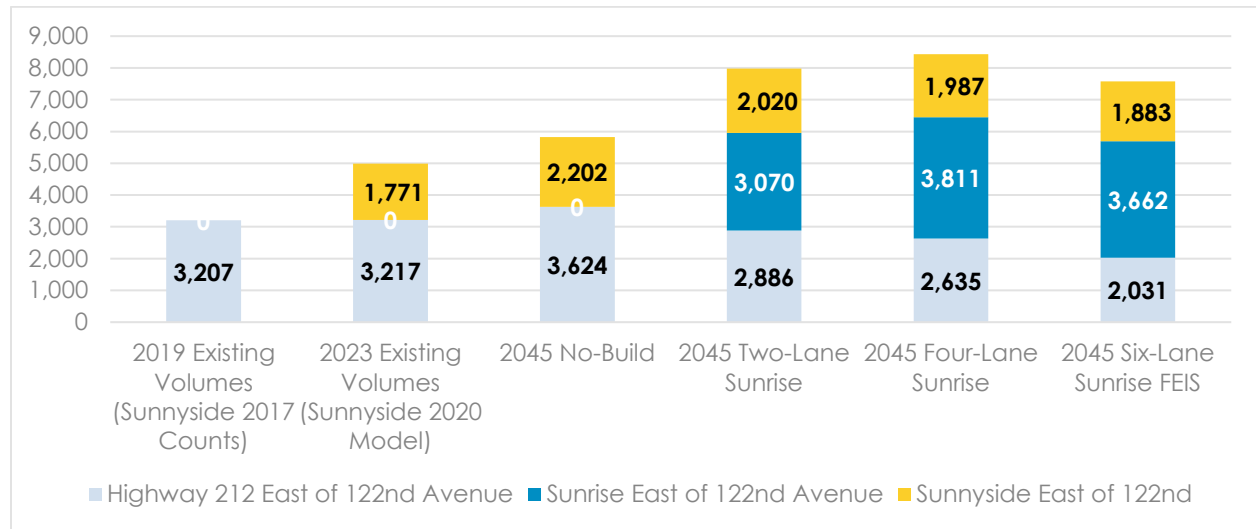
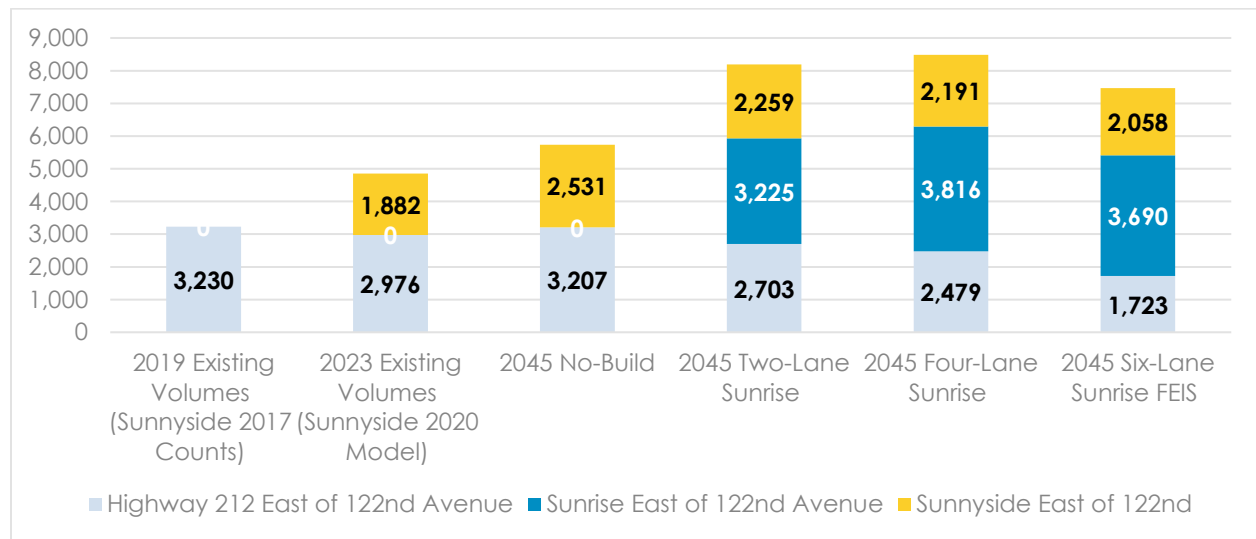


Figure 17. Weekday PM Volumes at Highway 212-224, Sunrise, and Sunnyside East of SE 122nd Avenue



SE 135th Avenue to SE 152nd Avenue

The third screenline, shown in Figure 18 and Figure 19, was taken between SE 135th Avenue and SE 152nd Avenue on the north of Highway 212. This screenline captured both southbound and northbound motor vehicles during the weekday AM and PM peak hour. The 2019 analysis did not include traffic counts at these intersections. Similar to the screenline volumes around SE 122nd Avenue, the 2023 volumes are slightly lower than the 2019 volumes, which may reflect traffic patterns in a post-COVID environment. The 2045 no-build scenario includes a modest increase in volumes.

Under the two-lane and four-lane Sunrise scenarios, the north leg of SE 135th Avenue is removed. The figure below shows nearly identical volumes when the volumes for 142nd Avenue and 152nd Avenue are combined. Under the two-lane Sunrise scenario, the volumes are slightly higher at both 142nd and 152nd Avenue. Comparatively, there is a decrease in total volume in two-lane and four-lane scenarios, potentially due to Sunnyside becoming a more attractive route, especially as the Sunrise connection at 172nd requires Highway 212 traffic to reroute through the Rock Creek area, and traffic may be using corridors like Sunnyside Road instead.

Figure 18. Weekday AM Volumes at 135th, 142nd, and 152nd Avenue North of OR 212

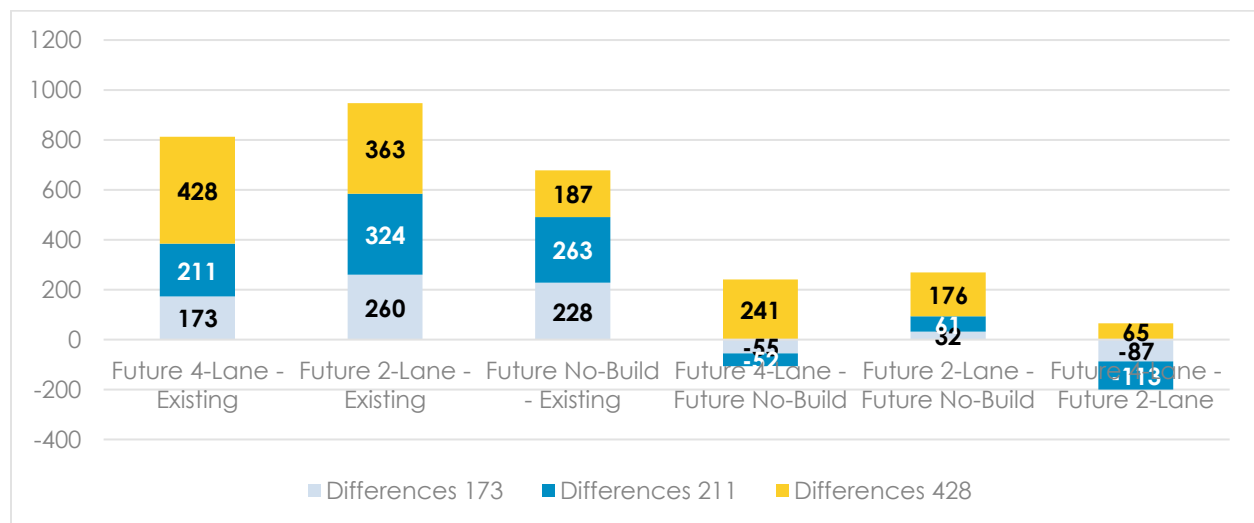
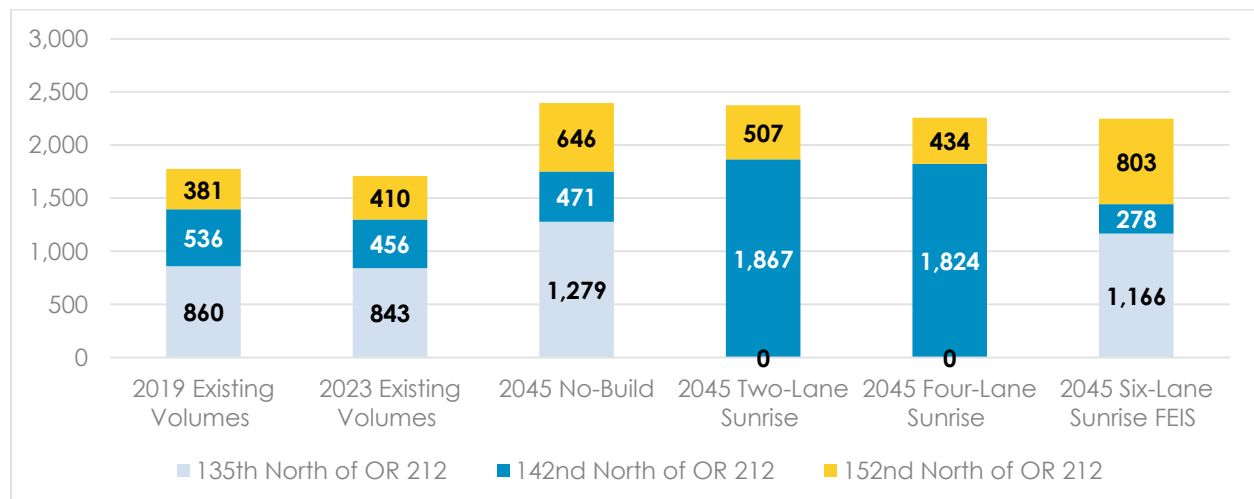


Figure 19. Weekday PM Volumes at 135th, 142nd, and 152nd Avenue North of OR 212



Other screens were taken to capture volumes at key locations, shown in Figure 20 and Figure 21. All of these trends are reasonable and indicate modeling efforts were sensitive to changes in the network.

Figure 20. Weekday AM Volumes at Other Locations

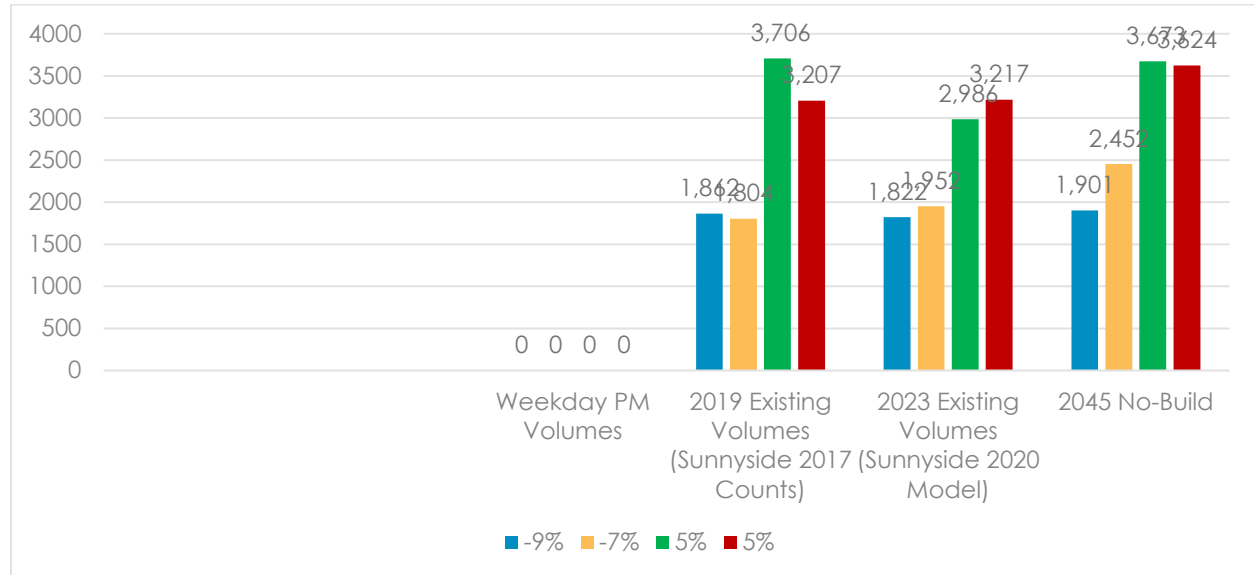
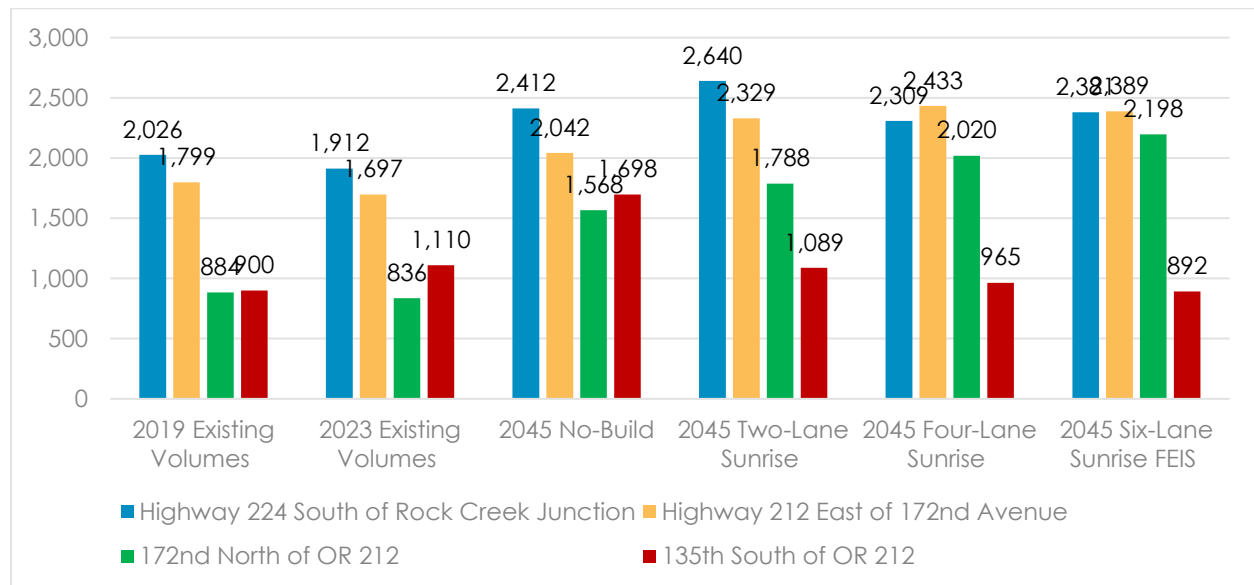


Figure 21. Weekday PM Volumes at Other Locations



Future Conditions Scenarios

The future year 2045 forecasted volumes were refined using recommended procedures for producing travel forecasts from *NCHRP 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design* (Reference 8), and the update to *NCHRP 255: Highway Traffic Data for Urbanized Area Project Planning and Design* (Reference 9). The inputs into the travel forecasts include the traffic volumes from the existing conditions analysis (see *Sunrise Corridor Community Visioning Tech Memo #4.3: Existing Transportation Conditions in the Study Area*).

When this project kicked off in 2023, ODOT was studying the impact of tolling on I-205. In March 2024, Governor Kotek paused work on the I-205 tolling program. As a result, tolling is not expected to have an impact on projected travel demands on the Sunrise Corridor Community project, especially as an alternative east-west corridor to deviate onto is not available. Appendix F includes more discussion on this topic.

Future Intersection Operations

The model volumes described above were analyzed using Synchro 11 and SIDRA transportation software, applying methods from the 6th Edition and 2000 Highway Capacity Manual. The model volumes were then balanced between the Highway 213 southbound off-ramp/I-205 southbound on-ramp/Highway 224 and SE 122nd Avenue/Highway 224/Highway 212 intersections, as well as between the SE 152nd Avenue/Highway 212 and Highway 224/212 intersections, where access points between intersections are limited.

Performance Thresholds

The *Oregon Highway Plan* (OHP – Reference 10) identifies operating standards for I-205, Highway 212, and Highway 224 for the weekday PM peak hour. At unsignalized intersections, the v/c ratio threshold of 0.99 applies to state highway approaches. At signalized intersections other than interchange ramp terminals, the 0.99 v/c threshold applies to the overall intersection. At signalized interchange ramp terminals, a v/c threshold of 0.85 applies to the overall intersection or up to 0.90 if ramp vehicle queues would not extend onto the mainline per OHP guidelines.

Clackamas County sets a threshold of 0.99 (1-hr or 2-hr) PM peak v/c ratio for county intersections on corridors (i.e. Highway 212/SE 142nd Avenue) by Metro Urban Design Type. The county also uses level of service (LOS) for its operating standards, setting a threshold of LOS E for unsignalized intersections (i.e., SE 122nd Avenue/SE Jennifer Street).

Performance thresholds are summarized in Table 4.

Table 4. Performance Thresholds Summary

Agency	Ramp Terminal Thresholds	Signalized Intersection Thresholds	Unsignalized Ramp Terminal Thresholds
ODOT (<i>Oregon Highway Plan</i>)	0.99 v/c unsignalized 0.85 or 0.90 v/c signalized	0.99 v/c	0.85 v/c
Clackamas County (<i>TSP</i>)	N/A	0.99 v/c	LOS E
Happy Valley (<i>TSP</i>)	N/A	LOS D and 0.90 v/c	Two-Way Stop Control: LOS E All-Way Stop Control: LOS D

Traffic Operations Results

The figures below show lane configurations and traffic control devices, along with intersection operations, at each of the study area intersections under the three 2045 scenarios. The following summarizes key operations results:

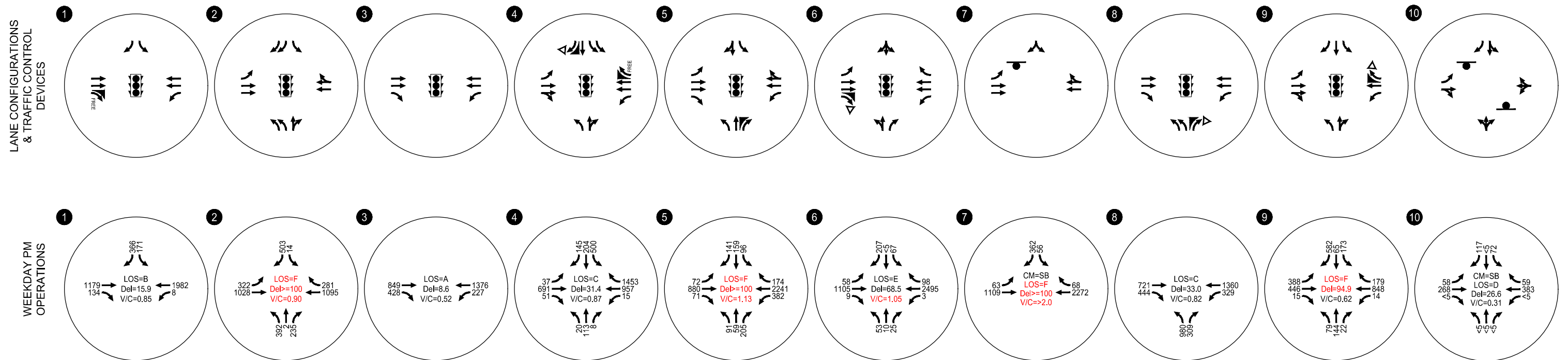
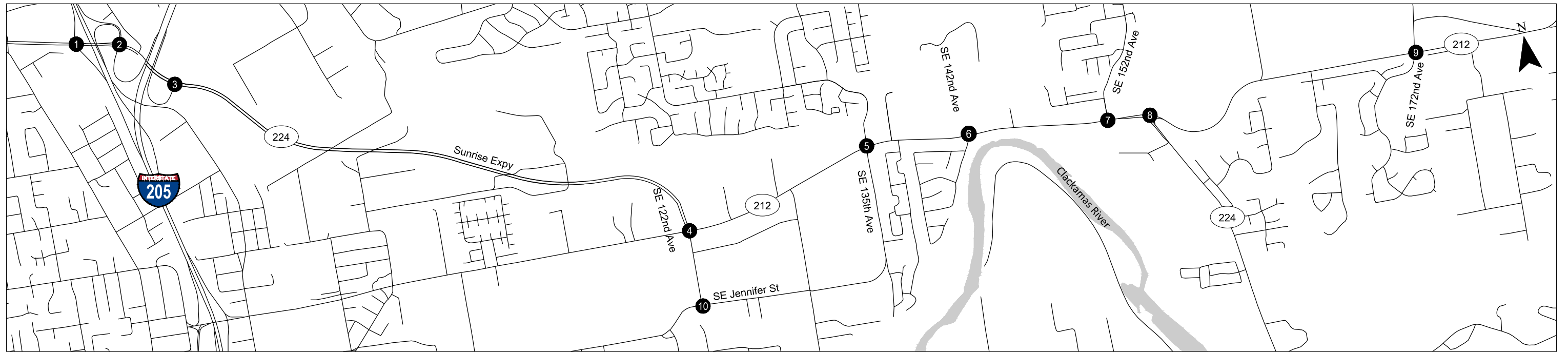
- One of the three I-205 intersection ramp terminal intersections do not meet the 0.85/0.90 v/c ratio threshold under at least one peak period in all 2045 future conditions scenarios.

- The 2045 no-build scenario has a v/c ratio that is projected to exceed 1.0 on Highway 212 at SE 135th Avenue, SE 142nd Avenue, and SE 152nd Avenue.
- The 2045 no-build scenario is projected to be LOS F at SE 122nd Avenue and SE Jennifer Street, a county intersection.
- The 2045 FEIS scenario is projected to have a v/c greater than 1.0 at the SE 152nd Avenue/Highway 212 intersection.

Initial analysis of the two-lane and four-lane Sunrise Gateway Concept Plan scenarios developed in 2020 showed several intersections not meeting their performance standards due to traffic pattern changes between then and now (2023 traffic counts). The following refinements were made under the two-lane and four-lane Sunrise Gateway Concept Plan scenarios to address the congestion:

- Assumed three east/west through-lanes near the I-205 interchange to be comparable to the FEIS.
- Added second eastbound left-turn, westbound right-turn, and southbound right-turn lanes at the SE 122nd Avenue/Highway 212 intersection
- Added dual northbound right-turn lanes at the SE 135th Avenue/Highway 212 intersection
- Channelized the northbound right-turn and southbound right-turn at the reconfigured SE 142nd Avenue/Highway 212 eastbound and westbound terminals as free movements with receiving lanes added on Highway 212.
- Channelized the southbound right-turn at the reconfigured SE 152nd Avenue/Highway 212 westbound terminal as a free movement with a receiving lane added on Highway 212.
- Added second eastbound left-turn, southbound right-turn, and westbound through lanes at the SE 172nd Avenue/Highway 212 intersection (also needed for the FEIS).

With these mitigations, all study intersections outside of the I-205 ramp terminal intersections meet the ODOT and County operating standards for the two-lane and four-lane Sunrise scenarios. These improvements were also applied to the FEIS.

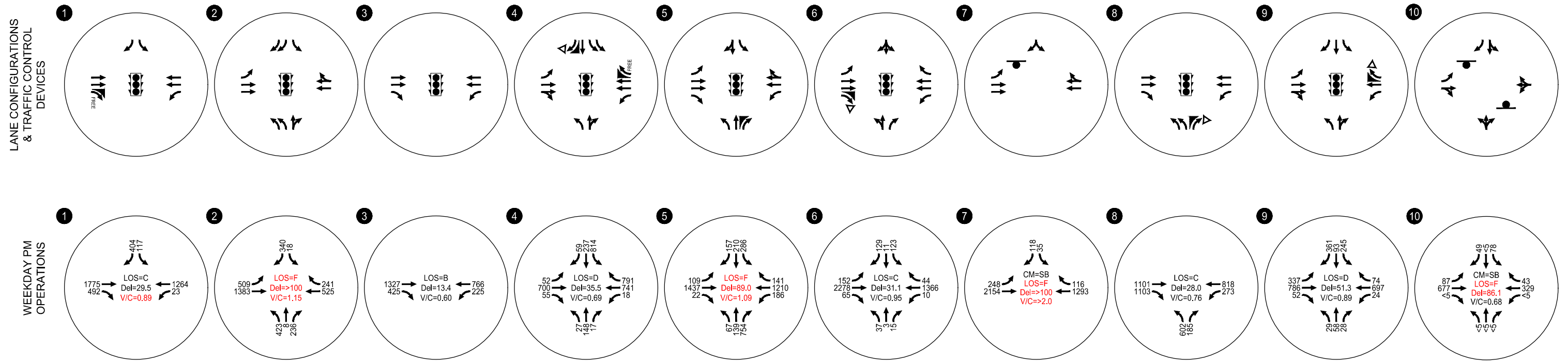
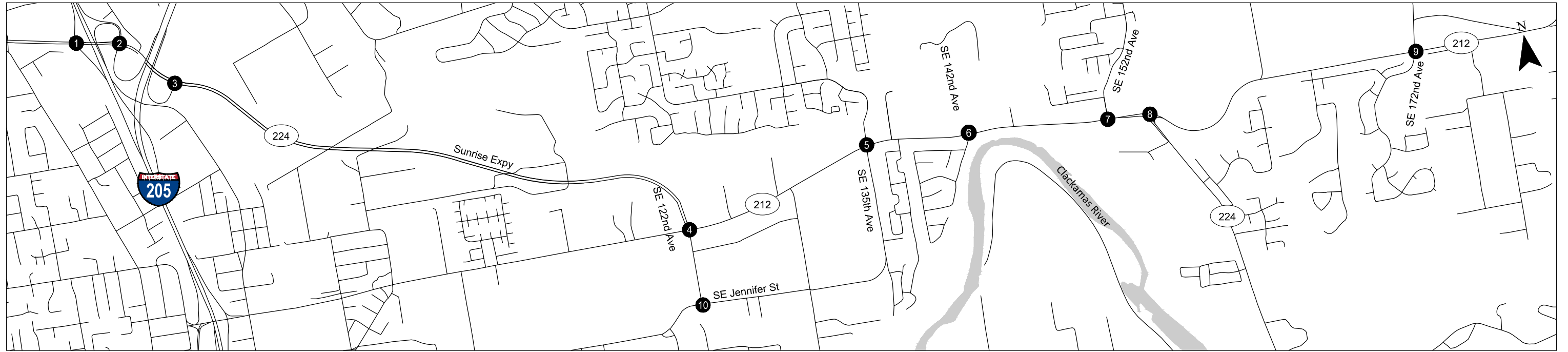


- STOP SIGN
- TRAFFIC SIGNAL
- YIELD SIGN

- CM = CRITICAL MOVEMENT (UNSIGNALIZED)
- LOS = LEVEL OF SERVICE (SIGNALIZED)/
CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
- Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
- V/C = CRITICAL VOLUME-TO-CAPACITY

Existing Lane Configurations, Traffic Control Devices and Operations
2045 No-Build Scenario - Weekday AM Peak Hour
Clackamas County, Oregon

Figure
22

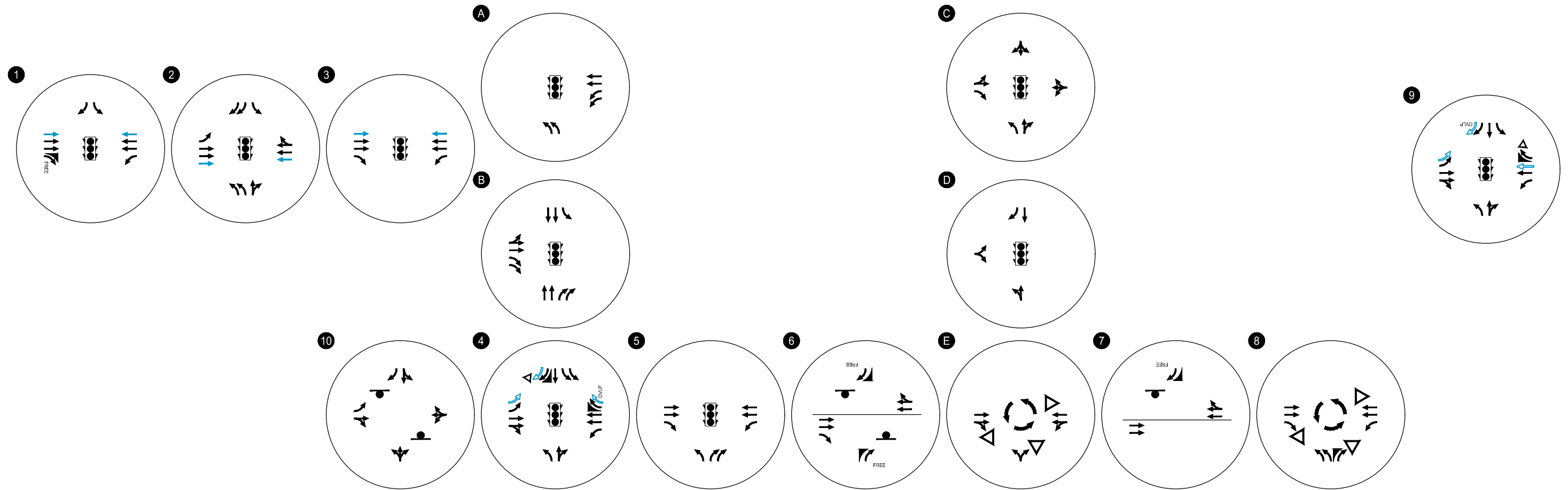
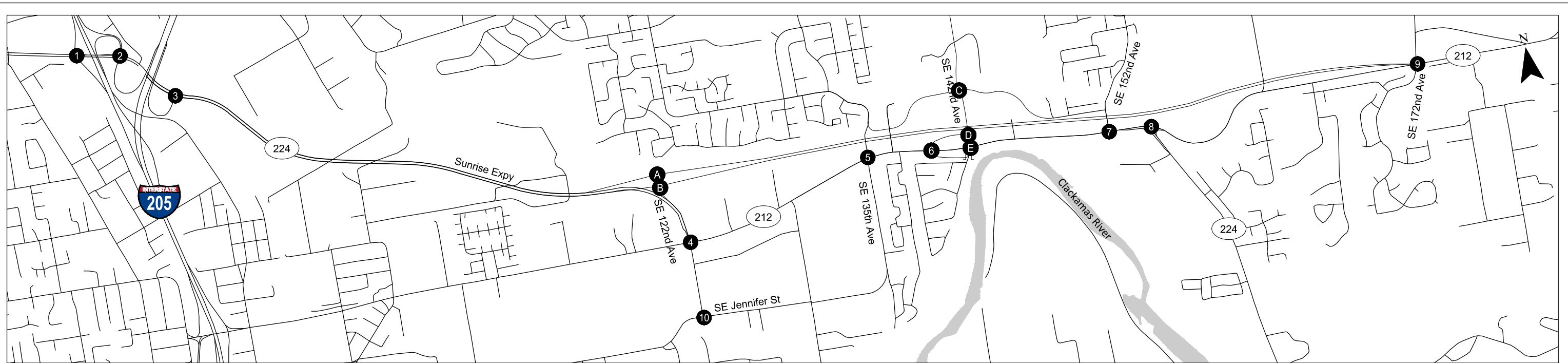


- STOP SIGN
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Existing Lane Configurations, Traffic Control Devices and Operations
 2045 No-Build Scenario - Weekday PM Peak Hour
 Clackamas County, Oregon

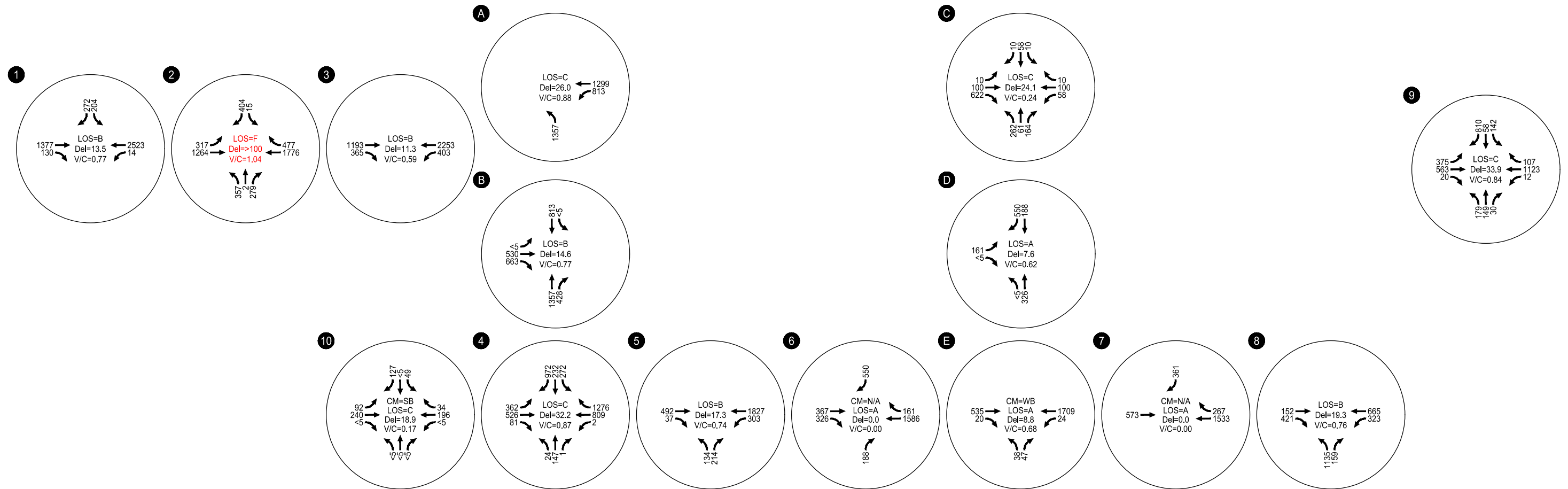
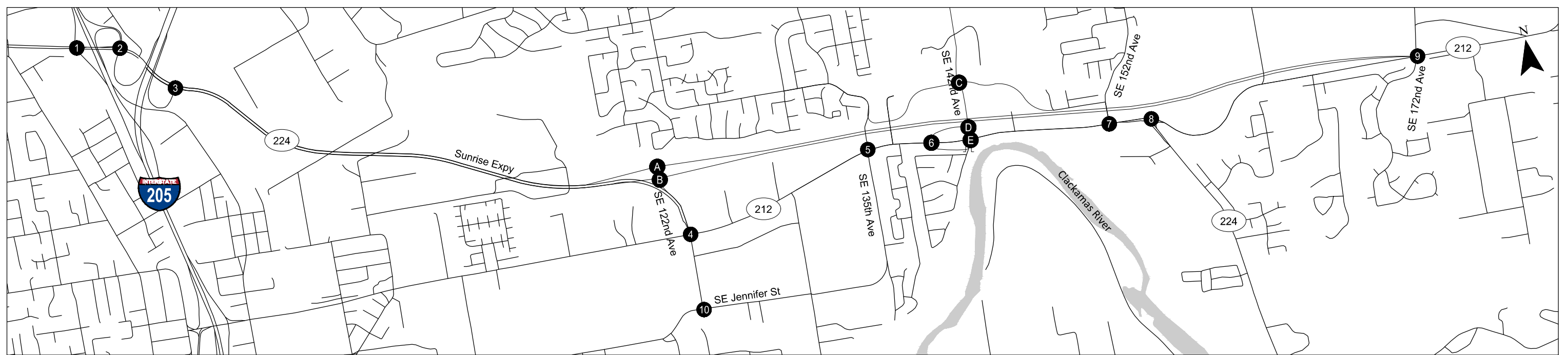
Figure
 23



-  - STOP SIGN
-  - TRAFFIC SIGNAL
-  - YIELD SIGN
-  - ROUNDABOUT
-  - NEW LANE

Proposed Lane Configurations and Traffic Control Devices
 2045 Two-Lane Sunrise Scenario
 Clackamas County, Oregon

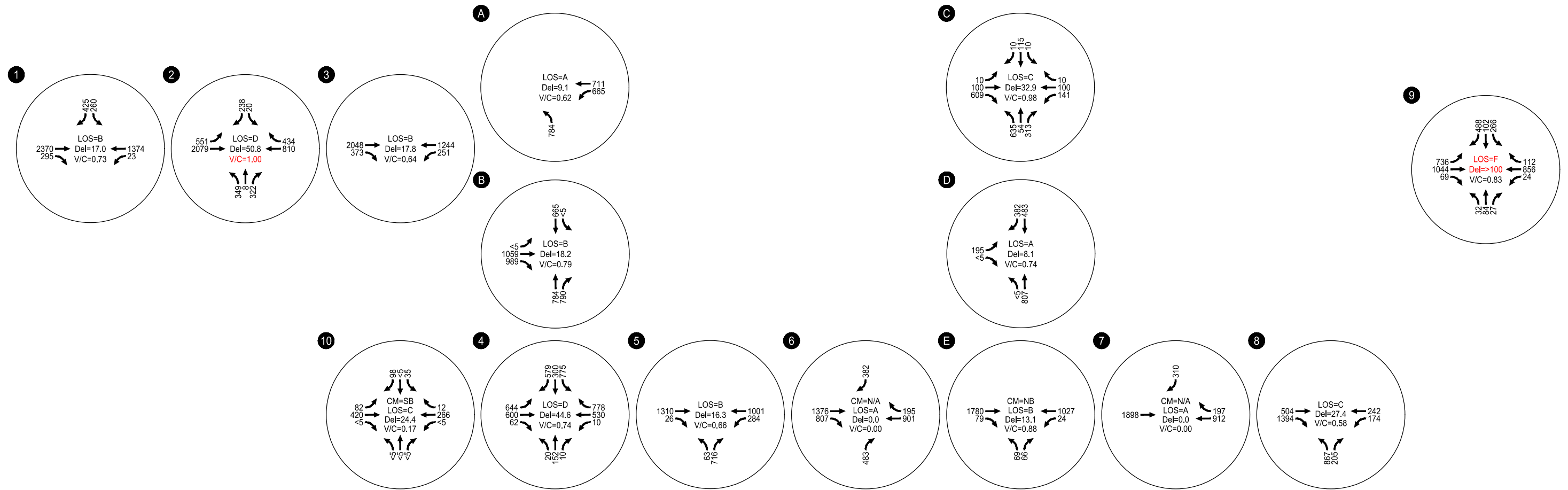
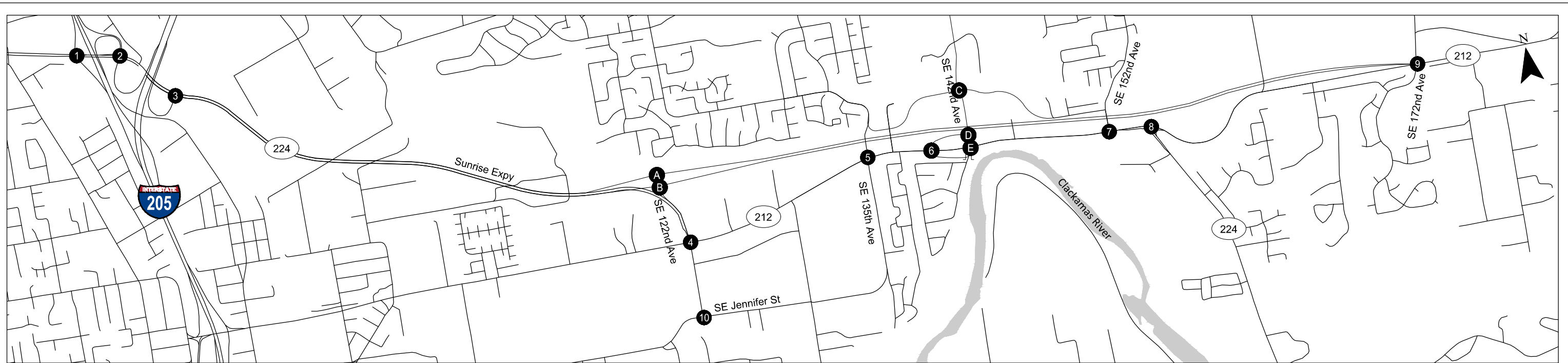
Figure
 24



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 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)
 CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Future Traffic Operations
 2045 Two-Lane Sunrise Scenario - Weekday AM Peak Hour
 Clackamas County, Oregon

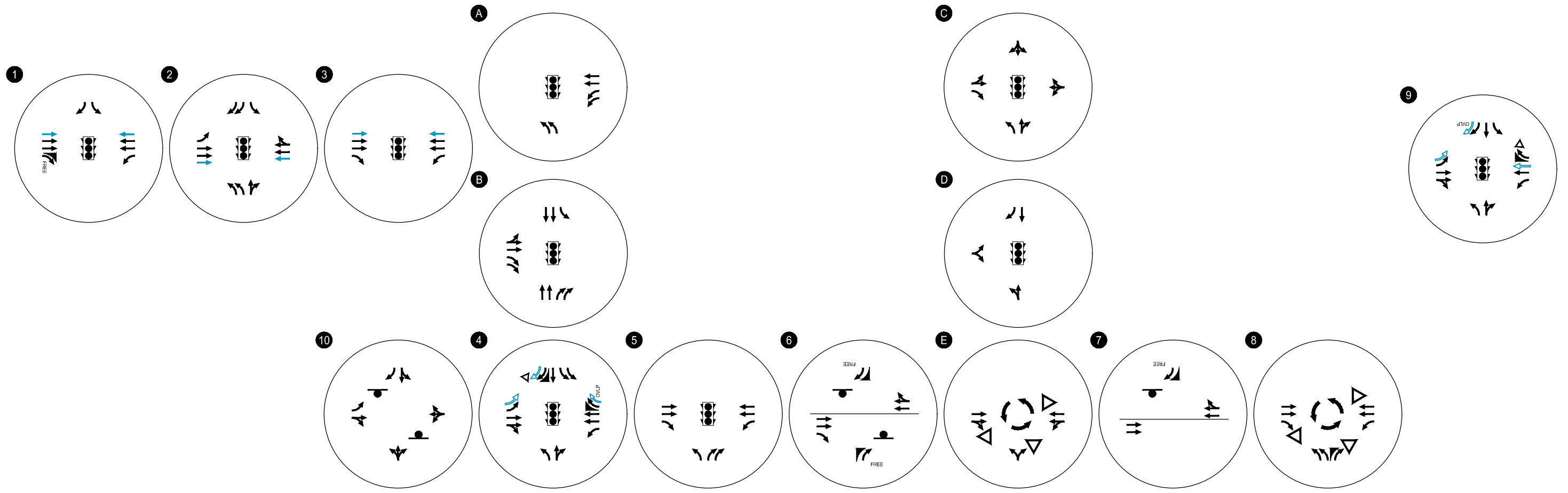
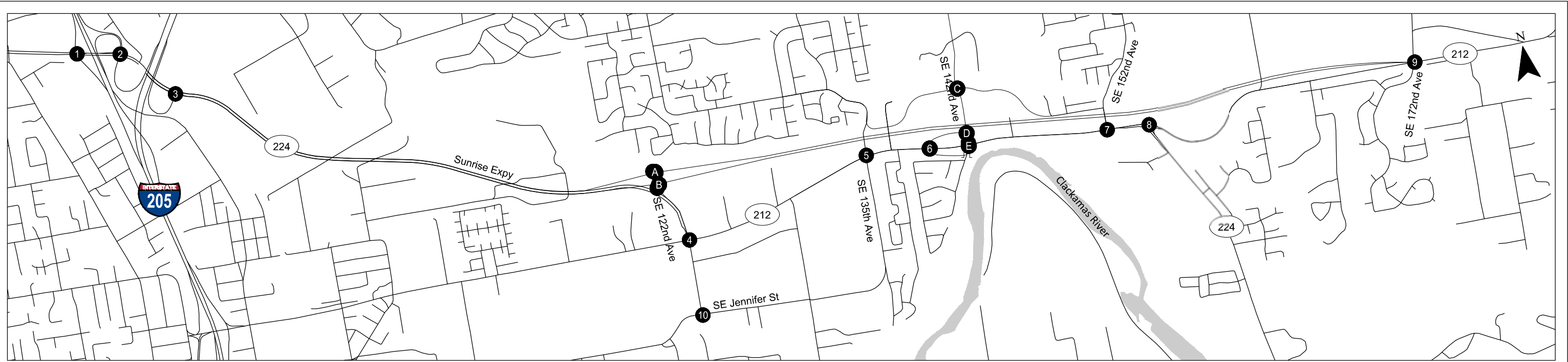
Figure
 25



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 CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
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Future Traffic Operations
 2045 Two-Lane Sunrise Scenario - Weekday PM Peak Hour
 Clackamas County, Oregon

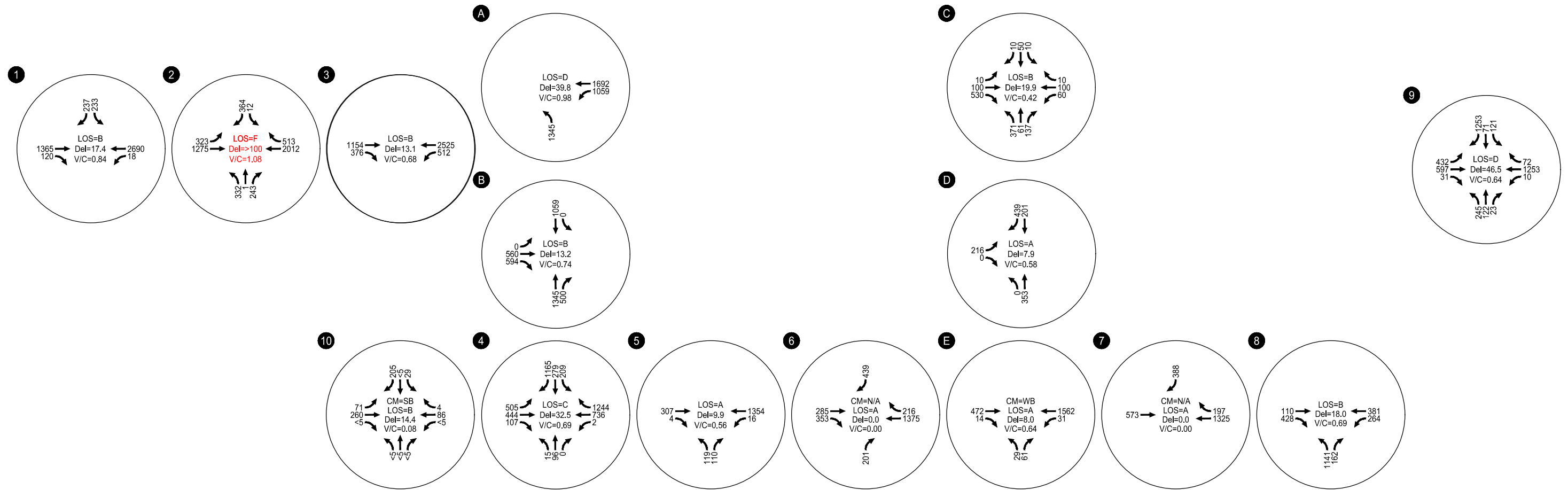
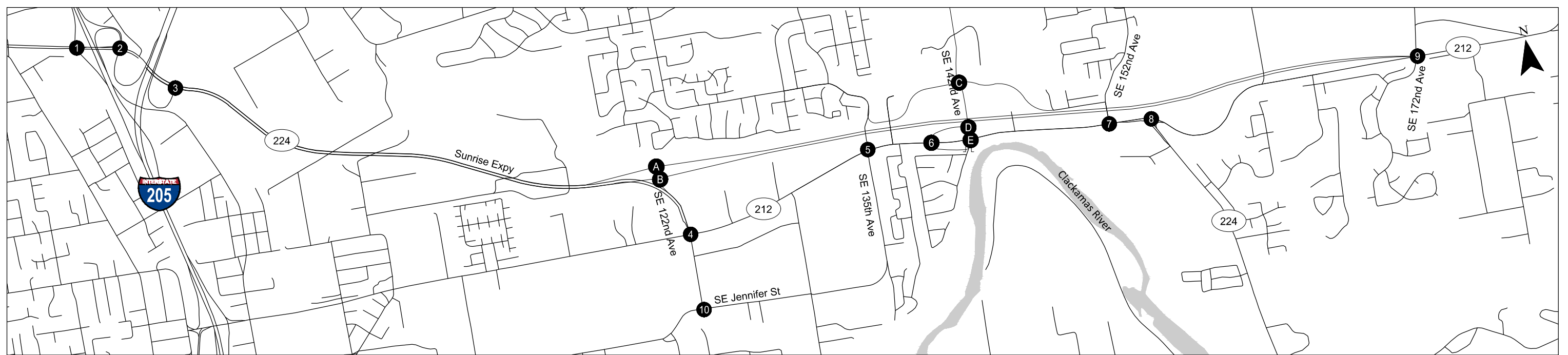
Figure
 26



-  - STOP SIGN
-  - TRAFFIC SIGNAL
-  - YIELD SIGN
-  - ROUNDABOUT
-  - NEW LANE

Proposed Lane Configurations and Traffic Control Devices
 2045 Four-Lane Sunrise Scenario
 Clackamas County, Oregon

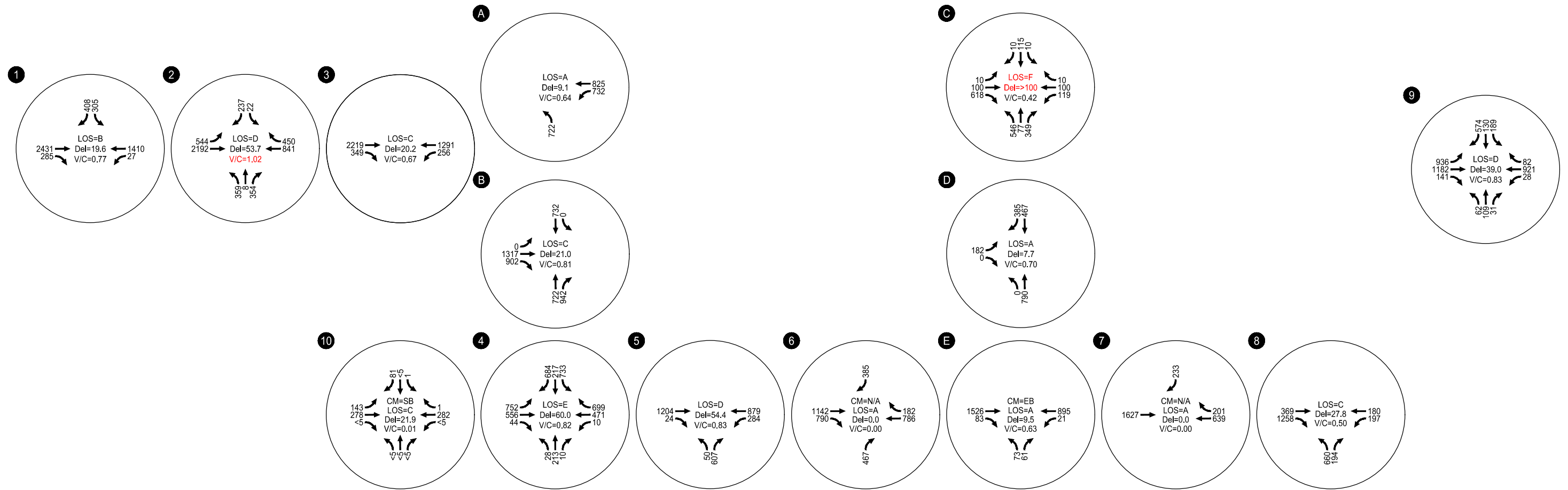
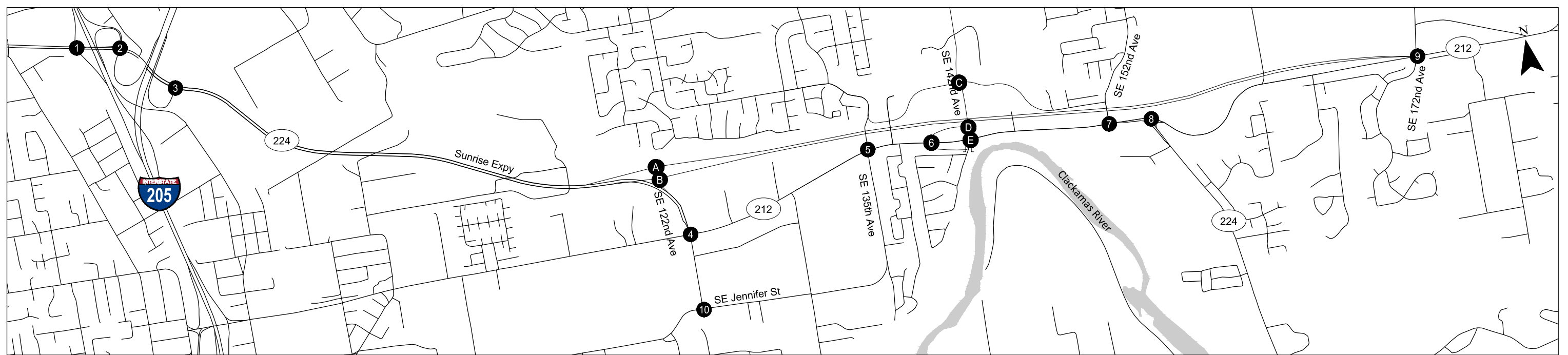
Figure
 27



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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Future Traffic Operations
 2045 Four-Lane Sunrise Scenario - Weekday AM Peak Hour
 Clackamas County, Oregon

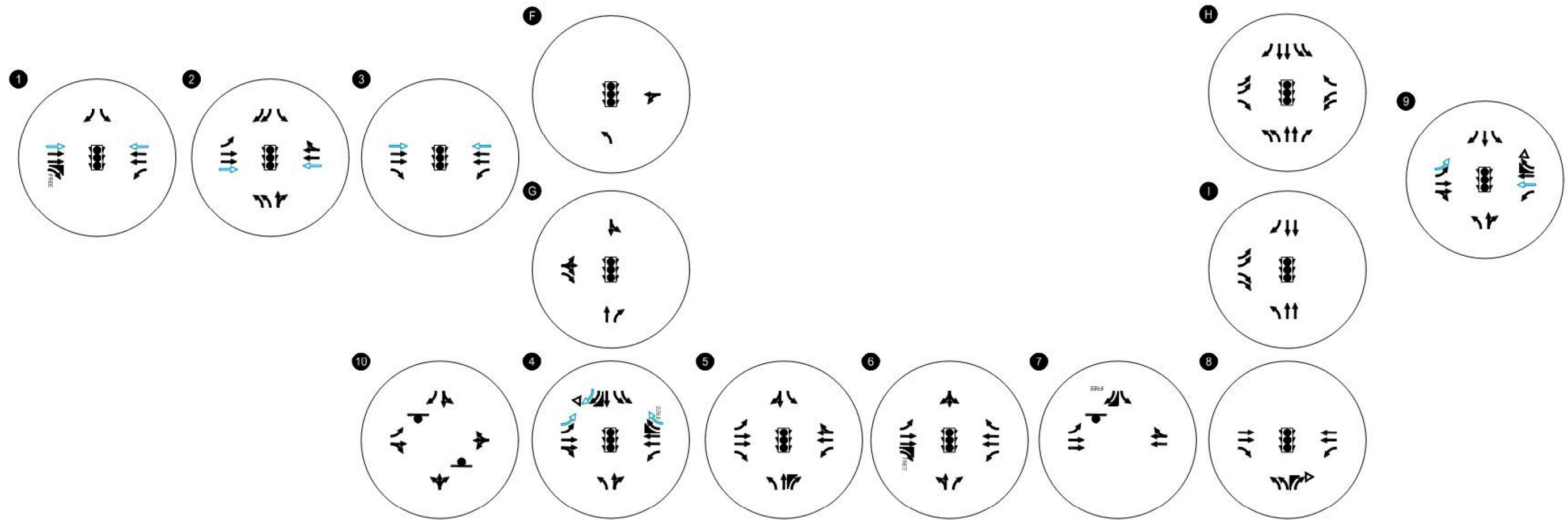
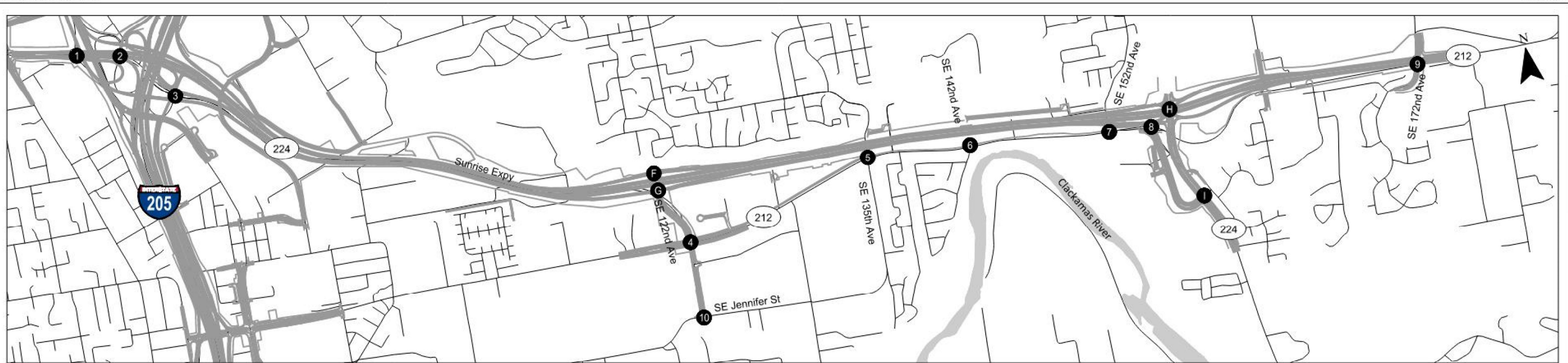
Figure
 28







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Future Traffic Operations
 2045 Four-Lane Sunrise Scenario - Weekday PM Peak Hour
 Clackamas County, Oregon

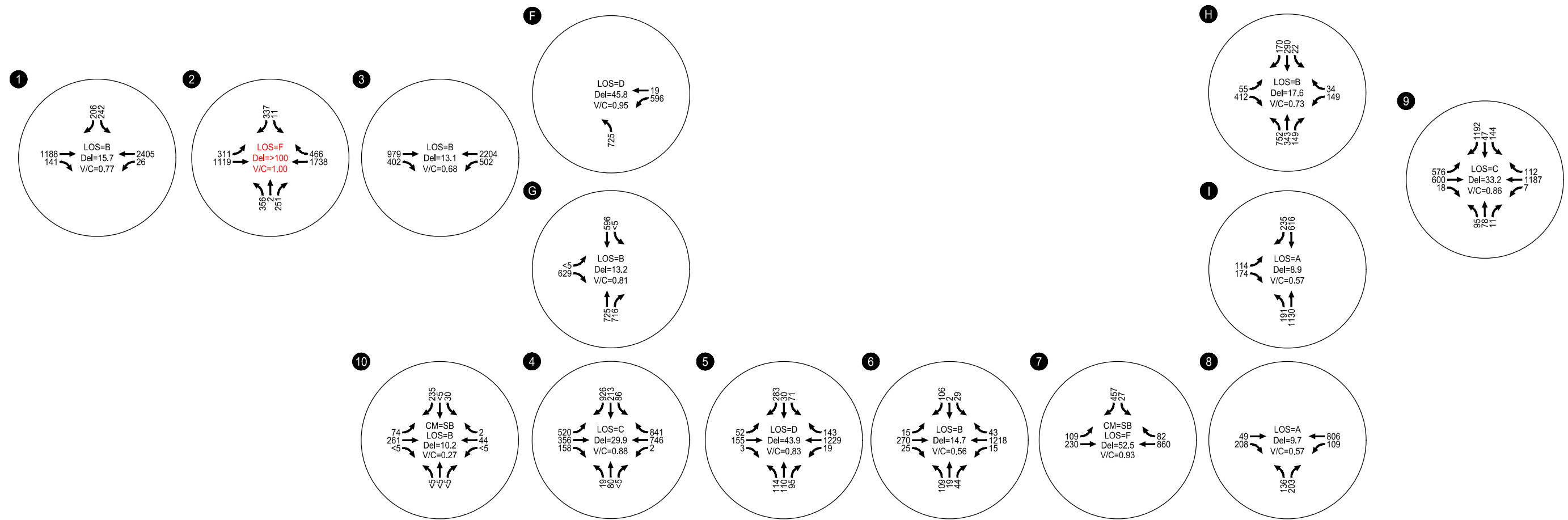
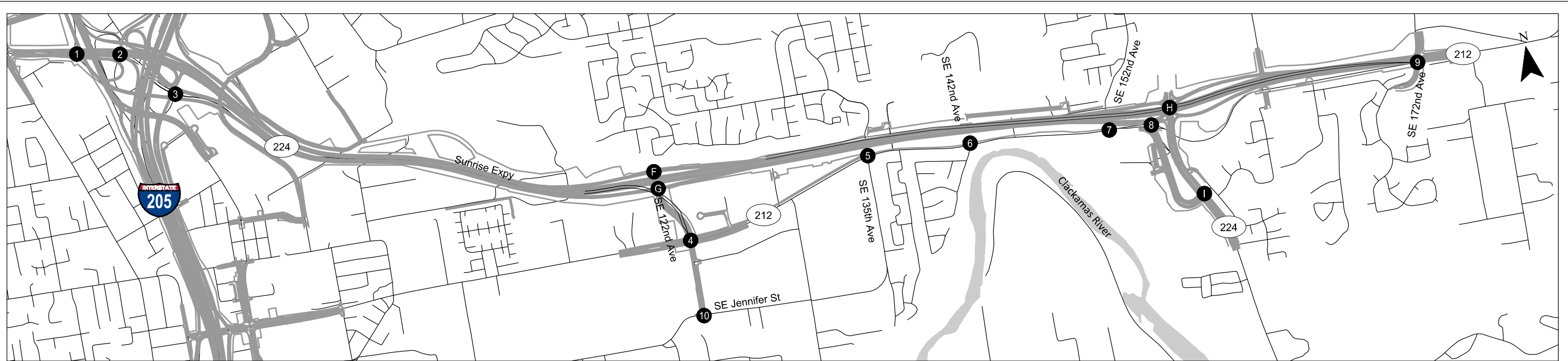
Figure
 29



-  - STOP SIGN
-  - TRAFFIC SIGNAL
-  - YIELD SIGN
-  - NEW LANE

Proposed Lane Configurations and Traffic Control Devices
 2045 FEIS 6 Lanes Scenario
 Clackamas County, Oregon

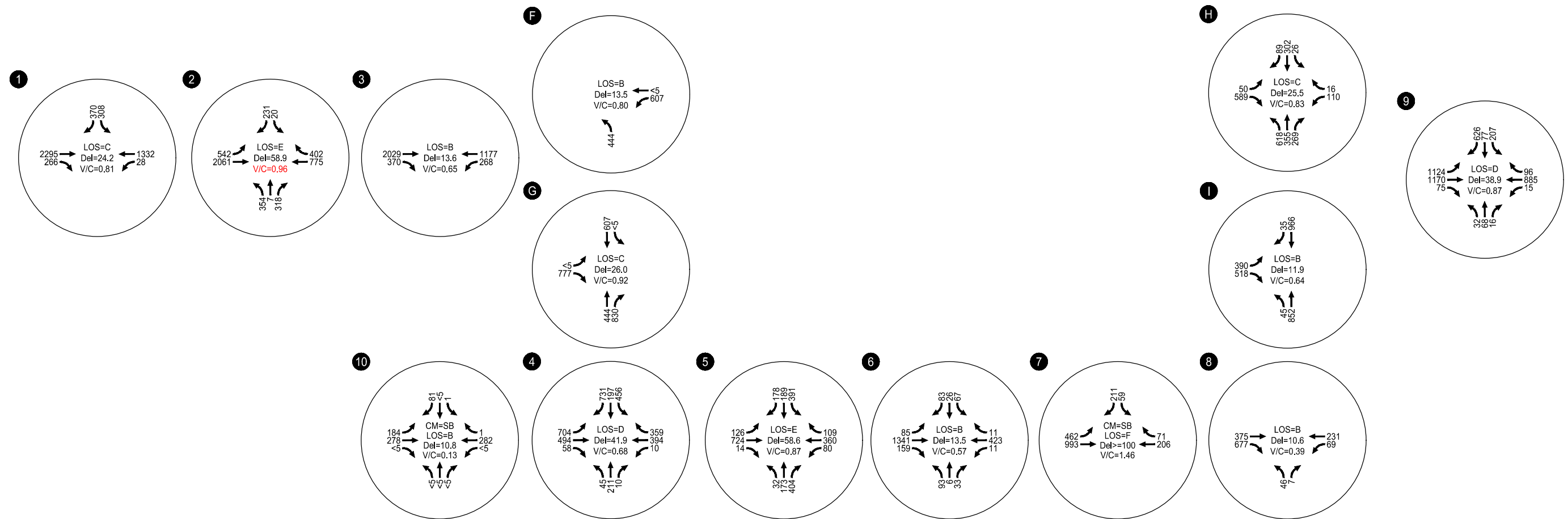
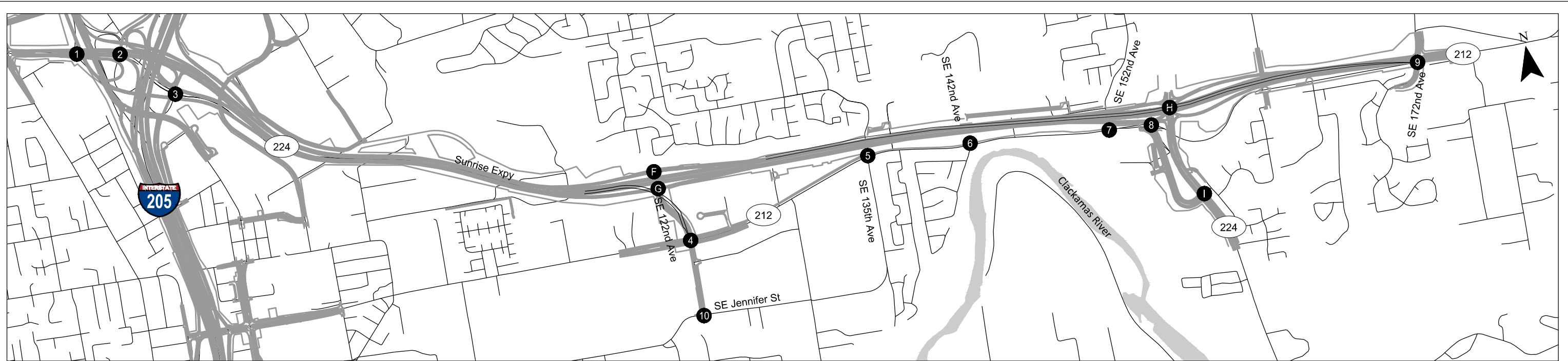
Figure
 30



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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Future Traffic Operations
 2045 FEIS 6 Lanes Scenario - Weekday AM Peak Hour
 Clackamas County, Oregon

Figure
 31



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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Future Traffic Operations
 2045 FEIS 6 Lanes Scenario - Weekday PM Peak Hour
 Clackamas County, Oregon

Figure
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Comparison to the FEIS

Table 5 summarizes the future intersection operations results from FEIS published in 2010, as well as the three future conditions scenarios from this study.

Table 5. 2045 Study Intersection Operations Results

Intersection	2030 FEIS Operations	2045 No-Build Sunrise	2045 Two-Lane Sunrise	2045 Four-Lane Sunrise	2045 FEIS Six-Lane Sunrise	2030 FEIS Operations	2045 No-Build Sunrise	2045 Two-Lane Sunrise	2045 Four-Lane Sunrise	2045 FEIS Six-Lane Sunrise
	Weekday AM Peak Hour					Weekday PM Peak Hour				
I-205 SB On-Ramp/Sunrise	--	v/c = 0.85 LOS B 15.9 sec	v/c = 0.77 LOS B 13.5 sec	v/c = 0.84 LOS B 17.4 sec	v/c = 0.77 LOS B 15.7 sec	--	v/c = 0.89 LOS C 29.5 sec	v/c = 0.73 LOS B 17.0 sec	v/c = 0.77 LOS B 19.6 sec	v/c = 0.81 LOS C 24.2 sec
I-205 SB Off-Ramp/OR 213 NB/Sunrise	LOS C	v/c = 0.90 LOS F >200 sec	v/c = 1.04 LOS F >200 sec	v/c = 1.08 LOS F >200 sec	v/c = 1.00 LOS F >200 sec	LOS A	v/c = 1.15 LOS F >100 sec	v/c = 1.00 LOS D 50.8 sec	v/c = 1.01 LOS D 53.7 sec	v/c = 0.96 LOS E 58.9 sec
I-205 NB On-Ramp/Sunrise*	LOS B	v/c = 0.52 LOS A 8.6 sec	v/c = 0.59 LOS B 11.3 sec	v/c = 0.68 LOS B 13.1 sec	v/c = 0.68 LOS B 13.1 sec	LOS B	v/c = 0.59 LOS B 13.4 sec	v/c = 0.64 LOS B 17.8 sec	v/c = 0.67 LOS C 20.2 sec	v/c = 0.65 LOS B 13.6 sec
Sunrise WB/ 122 nd Avenue	LOS B	--	v/c = 0.88 LOS C 26.0 sec	v/c = 0.98 LOS D 39.8 sec	v/c = 0.81 LOS B 13.2 sec	LOS A	--	v/c = 0.62 LOS A 9.1 sec	v/c = 0.64 LOS A 9.1 sec	v/c = 0.92 LOS C 26.0 sec
Sunrise EB/ 122 nd Avenue	LOS A	--	v/c = 0.77 LOS B 14.6 sec	v/c = 0.74 LOS B 13.2 sec	v/c = 0.95 LOS D 45.8 sec	LOS B	--	v/c = 0.79 LOS B 18.2 sec	v/c = 0.81 LOS C 21.0 sec	v/c = 0.80 LOS B 13.5 sec
Highway 212/ 122 nd Avenue	LOS C	v/c = 0.87 LOS C 31.4 sec	v/c = 0.87 LOS C 32.2 sec	v/c = 0.69 LOS C 32.5 sec	v/c = 0.88 LOS C 29.9 sec	LOS D	v/c = 0.69 LOS D 35.5 sec	v/c = 0.74 LOS D 44.6 sec	v/c = 0.83 LOS D 54.4 sec	v/c = 0.68 LOS D 41.9 sec
Jennifer Street/ 122 nd Avenue	v/c = 0.44 for WB traffic	CM = SB v/c = 0.32 LOS D 26.6 sec	CM = SB v/c = 0.17 LOS B 18.9 sec	CM = SB v/c = 0.08 LOS B 14.4 sec	CM = SB v/c = 0.08 LOS B 13.8 sec	v/c = 0.50 for WB traffic	CM = SB v/c = 0.70 LOS F 86.1 sec	CM = SB v/c = 0.17 LOS C 24.4 sec	CM = SB v/c = 0.01 LOS C 21.9 sec	CM = SB v/c = 0.01 LOS D 25.3 sec
Highway 212/ 135 th Avenue	LOS F	v/c = 1.12 LOS F > 100 sec	v/c = 0.74 LOS B 17.3 sec	v/c = 0.56 LOS A 9.9 sec	v/c = 0.83 LOS D > 43.9 sec	LOS E	v/c = 1.09 LOS F 89.0 sec	v/c = 0.66 LOS B 16.3 sec	v/c = 0.83 LOS D 39.0 sec	v/c = 0.87 LOS E 58.6 sec
142 nd Avenue/ Backage Road	--	--	v/c = 0.24 LOS C 24.1 sec	v/c = 0.69 LOS B 18.0 sec	--	--	--	v/c = 0.98 LOS C 32.9 sec	v/c = 0.42 LOS F >200 sec	--
142 nd Avenue/ Highway 212 Accesses	--	--	v/c = 0.62 LOS A 7.6 sec	v/c = 0.42 LOS B 19.9 sec	--	--	--	v/c = 0.74 LOS A 8.1 sec	v/c = 0.70 LOS A 7.7 sec	--
Highway 212/ 142 nd Avenue	LOS F	v/c = 1.05 LOS E 68.5 sec	--	--	v/c = 0.56 LOS B 14.7 sec	LOS D	v/c = 0.95 LOS C 31.1 sec	--	--	v/c = 0.57 LOS B 13.5 sec
WB OR212/142 nd terminal and EB OR212/142 nd terminal	--	--	CM = SB v/c = 0 LOS A 0 sec	CM = SB v/c = 0 LOS A 0 sec	--	--	--	CM = SB v/c = 0 LOS A 0 sec	CM = SB v/c = 0 LOS A 0 sec	--
Highway 212/ Riverbend Access	--	--	v/c = 0.68 LOS A 8.8 sec	v/c = 0.64 LOS A 8.0 sec	--	--	--	v/c = 0.88 LOS B 13.1 sec	v/c = 0.63 LOS A 9.5 sec	--
Highway 212/ 152 nd Avenue	LOS F	CM = SB v/c > 2.0 LOS F >100 sec	CM = SB v/c = 0 LOS A 0 sec	CM = SB v/c = 0 LOS A 0 sec	CM = SB v/c = 0.93 LOS F 52.5 sec	LOS C	CM = SB v/c > 2.0 LOS F >100 sec	CM = SB v/c = 0 LOS A 0 sec	CM = SB v/c = 0 LOS A 0 sec	CM = SB v/c = 1.21 LOS F >200 sec
Highway 212/ Highway 224 (Rock Creek Junction)	LOS F	v/c = 0.82 LOS C 33.0 sec	v/c = 0.76 LOS B 19.3 sec	v/c = 0.69 LOS B 18.0 sec	v/c = 0.57 LOS A 9.7 sec	LOS B	v/c = 0.76 LOS D 51.3 sec	v/c = 0.58 LOS C 27.4 sec	v/c = 0.50 LOS C 27.8 sec	v/c = 0.39 LOS B 10.6 sec
Rock Creek Junction Interchange	--	--	--	--	v/c = 0.73 LOS B 17.6 sec	--	--	--	--	v/c = 0.83 LOS C 25.5 sec
Rock Creek Junction Jughandle	--	--	--	--	v/c = 0.57 LOS A 8.9 sec	--	--	--	--	v/c = 0.64 LOS B 11.9 sec

Intersection	2030 FEIS Operations	2045 No-Build Sunrise	2045 Two-Lane Sunrise	2045 Four-Lane Sunrise	2045 FEIS Six-Lane Sunrise	2030 FEIS Operations	2045 No-Build Sunrise	2045 Two-Lane Sunrise	2045 Four-Lane Sunrise	2045 FEIS Six-Lane Sunrise
	Weekday AM Peak Hour					Weekday PM Peak Hour				
Highway 212/ 172 nd Avenue	LOS B v/c = 1.03 for SB traffic	v/c = 0.62 LOS F 94.9 sec	v/c = 0.84 LOS C 33.9 sec	v/c = 0.64 LOS D 46.5 sec	v/c = 0.86 LOS C 33.2	LOS B v/c = 1.03 for SB traffic	v/c = 0.90 LOS D 51.3 sec	v/c = 0.83 LOS F 108.1 sec	v/c = 0.83 LOS D 54.4 sec	v/c = 0.87 LOS D 38.9

Values **in red** show where the intersection operations are projected to exceed their v/c ratio or LOS target.

All signalized intersection v/c ratios utilize HCM 2000.

* Synchro does not produce HCM 6th Edition results for this intersection phasing and configuration. LOS and delay results shown are HCM 2000.

CM = Critical Movement; v/c = Volume-to-Capacity Ratio; LOS = Level of Service

Intersection Queuing

Intersection queues were analyzed to determine if there is adequate queue storage for lane groups across all study intersections. The 95th percentile queue represents a common figure for measuring peak queue lengths, where queues are less than this distance 95% of the time during the peak hour. Table 6 identifies the 95th percentile queues during PM peak hours, available storage or distance to next intersection, and whether storage adequately handles queues in existing, 2045 no-build, 2045 two-lane, and 2045 four-lane scenarios. Queues exceeding storage are shown in **red**.

- At the Highway 213 southbound off-ramp/I-205 southbound on-ramp/Highway 224 intersection, the southbound ramp terminal exceeds available storage capacity during the AM and PM peak hours. In 2045, the southbound left-turn movement exceeds capacity in all build scenarios, while the southbound right-turn queue surpasses capacity in all scenarios, potentially impacting the left-turn movement. Additionally, the eastbound movement exceeds capacity in both two-lane and four-lane scenarios for 2045. Eastbound and westbound through movements also back-up to adjacent intersections, with the exception of the six-lane FEIS which provides additional capacity at this intersection.
- At the Highway 213 northbound access/I-205 southbound off-ramp/Highway 224 intersection, the westbound through movement obstructs the intersection with SE Ambler Road during both peak hours in 2045 under all scenarios. The eastbound left-turn queue exceeds available storage both today and in several future scenarios during the PM peak hour. The northbound right-turn queue blocks the northbound left-turn lane and may reach southbound I-205 in 2045 under the build scenarios, six-lane FEIS in the both peak hours and the two-lane and four-lane in the PM peak hour.
- At the SE 135th Avenue/Highway 212 intersection, the southbound right-turn and through queues exceed storage lane capacity during both peak hours, blocking the southbound left-turn lane, under any scenario where it still exists. The southbound leg is removed in 2045 under both two-lane and four-lane scenarios. The westbound through queue is notably shorter in 2045 for both two-lane and four-lane scenarios. The westbound left-turn queue is longer, though the storage lane could be easily extended using the existing two-way left-turn lane.
- At the Highway 224/212 (Rock Creek Junction) intersection, the northbound and westbound queues remain within storage lane capacities during PM peak hours under 2045 two-lane and four-lane scenarios, given the roundabout would effectively extend the left-turn storage, and the six-lane FEIS given less traffic volume on Highway 212. The eastbound right-turn lane still exceeds capacity in the 2045 PM peak hour, though the queue length is significantly shorter than existing and future no-build conditions and in the case of the four-lane Gateway, the spillback extending in the through-lanes would not impact upstream intersections along Highway 212.

Table 6. 2045 95th Percentile Queue Lengths

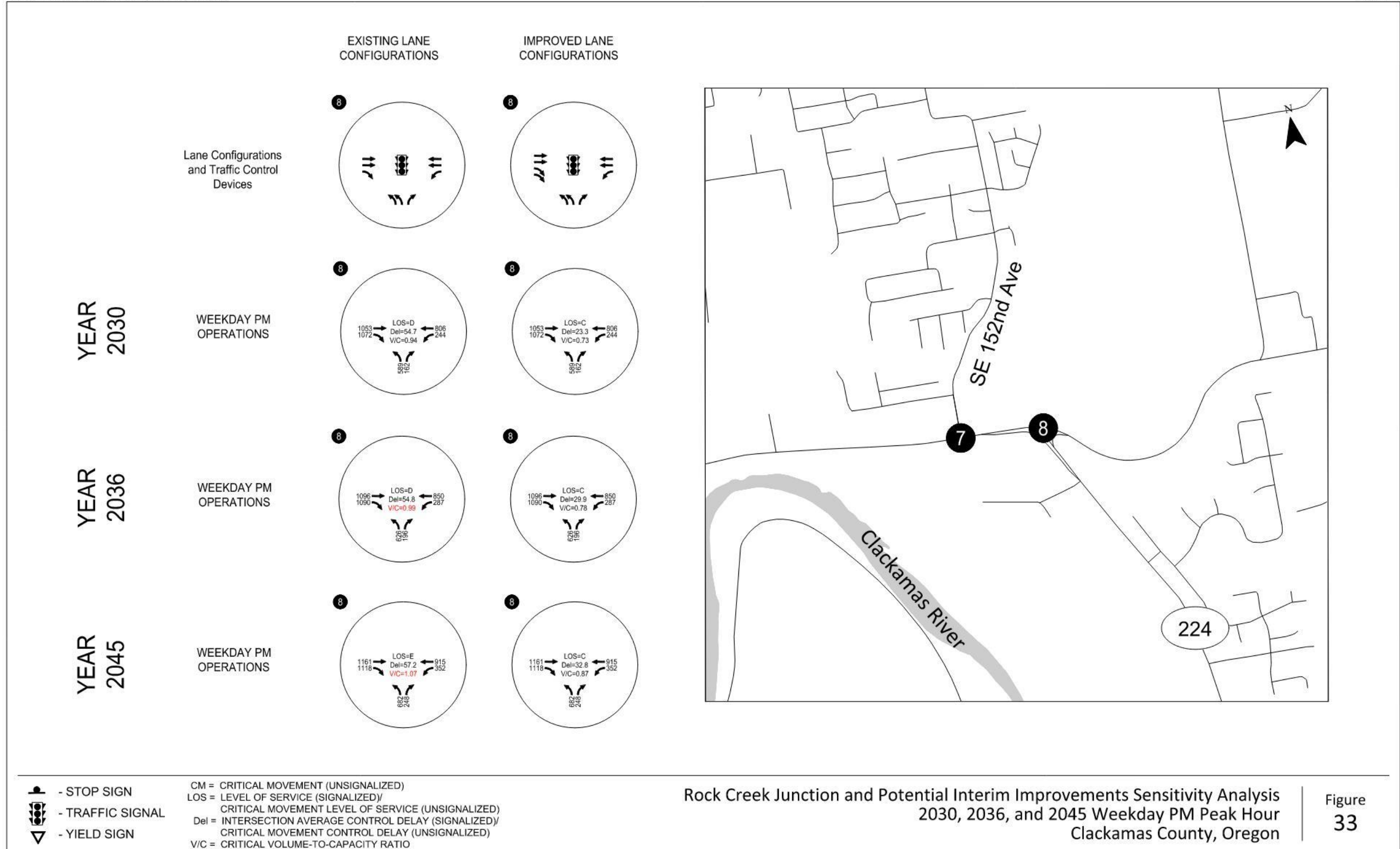
ID	Intersection	Movement	Storage Length (ft)	2023 Existing 95 th Percentile Queue (ft)	2045 No-Build 95 th Percentile Queue (ft)	2045 Two-Lane 95 th Percentile Queue (ft)	2045 Four-Lane 95 th Percentile Queue (ft)	2045 Six-Lane FEIS 95 th Percentile Queue (ft)	2023 Existing 95 th Percentile Queue (ft)	2045 No-Build 95 th Percentile Queue (ft)	2045 Two-Lane 95 th Percentile Queue (ft)	2045 Four-Lane 95 th Percentile Queue (ft)	2045 Six-Lane FEIS 95 th Percentile Queue (ft)
				Weekday AM Peak Hour					Weekday PM Peak Hour				
1	Highway 213 southbound off-ramp/I-205 southbound on-ramp/Highway 224	EBT	1,075	275	325	400	400	700	600	975	2,275	2,475	700
		WBL	75	25	25	25	50	50	50	25	50	50	50
		WBT	700	50	25	475	825	25	25	25	25	25	25
		SBL	250	125	150	275	325	400	125	175	325	400	400
		SBR	250	400	925	500	375	575	450	950	800	725	575
2	Highway 213 northbound access/I-205 southbound off-ramp/Highway 224	EBL	375	250	350	350	350	575	450	625	575	525	575
		EBT	600	25	25	25	25	25	25	25	25	25	25
		WBT	300	375	825	2,800	3,550	525	450	625	1,125	1,225	525
		NBL	800	425	250	225	225	250	350	250	250	250	250
		NBR	800	1,125	475	675	500	1,000	750	550	1,000	1,175	1,000
SBL	175	50	25	25	25	50	50	25	50	50	50		
5	SE 135th Avenue/Highway 212	EBL	425	100	125	0	0	125	100	150	0	0	125
		EBT	725	25	350	125	125	275	50	775	550	600	275
		EBR	75	25	50	25	25	25	0	25	25	25	25
		WBL	225	275	1,175	650	75	150	275	375	450	450	150
		WBT	350	125	1,950	275	300	350	750	975	275	225	350
		NBL	250	175	175	200	175	75	125	125	100	75	75
		NBTR	N/A	100	100	150	175	275	200	250	800	550	275
		SBL	325	150	875	0	0	1,300	525	925	0	0	1,300
		SBTR	325	700	250	0	0	600	150	1,350	0	0	600
8	Highway 224/212 (Rock Creek Junction)	EBT	650	250	300	25	25	25	575	750	75	50	200
		EBR	150	300	400	50	50	50	2,100	2,425	1,175	750	1,225
		WBL	225	200	1,150	1,325	200	75	225	450	50	50	75
		WBT	5,000	300	500	1,350	200	50	175	250	50	50	25
		NBL	200	350	550	150	125	25	375	425	200	100	50

Numbers in red show where 95th percentile queues are projected to exceed the storage capacity.

Potential Rock Creek Junction Interim Improvement Sensitivity Analysis

A sensitivity analysis under the No-build scenario was conducted at the Rock Creek Junction (212/224) intersection to determine when the intersection will fail under its current configuration and whether the addition of an eastbound right-turn lane would allow the intersection to meet mobility standards through 2045.

As illustrated in the figure below, Rock Creek Junction will function effectively under the current lane configurations until the year 2036. In 2036, the v/c ratio is projected to reach 0.99, at which point the operational performance will fall below ODOT standards. Adding an additional eastbound right turn lane will extend the junction's functionality until 2045, achieving a projected v/c ratio of 0.87.



References

1. Clackamas County. *Walk Bike Clackamas Plan Draft*. April 2024.
2. Happy Valley. *Happy Valley Transportation System Plan*. August 2023.
3. Clackamas County. *Transit Development Plan*. April 2021.
4. TriMet. *Forward Together*. December 2022.
5. Metro. *2023 Regional Transportation Plan*. November 2023.
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7. Federal Highway Administration. *Sunrise Project, I-205 to Rock Creek Junction Final Environmental Impact Statement*. December 2010.
8. Transportation Research Board. *National Cooperative Highway Research Plan 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design*. 2014.
9. Transportation Research Board. *National Cooperative Highway Research Plan 255: Highway Traffic Data for Urbanized Area Project Planning and Design*. 1982.
10. Oregon Department of Transportation. *Oregon Highway Plan*. 1999.

Appendices

- A. NCHRP 255 Model Volume Worksheets
- B. 2045 No-Build Synchro Operations Worksheets
- C. 2045 Two-Lane Synchro Operations Worksheets
- D. 2045 Four-Lane Synchro Operations Worksheets
- E. FEIS Preferred Alternative Figures and Operations Worksheets
- F. Sunrise Tolling Memo

Appendix A. NCHRP 255 Model Volume Worksheets

Future Year 2045 Four-Lane Scenario

Project #:
 Project Name: Future Year 2045 Four-Lane Scenario
 Date: 4/30/2024
 Scenario: N-3727523 - Some Consider Comoros/Vandervall/Nickel/Col PM-dm
 Future Year: 2045
 Future Year 2045 Four-Lane Scenario
 Future Year 2045 Four-Lane Scenario
 Future Year 2045 Four-Lane Scenario
 Future Year 2045 Four-Lane Scenario

Intersection Name	Leg	Movement	Left	Thru	Right	Existing Link		Base Model		Future Model		Growth Factor	Adjusted Base Model	Base Model	Ratio Method	Difference Method (E-C)	Average of Ratio & Difference	Selected 2045	Growth Factor (From Year)	New Link Test	Removed Link Test	Check Summary	Volume Overview																																																																																																																																																					
						Link Volume	Link Volume	Link Volume	Volume	Volume	Volume												Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume																																																																																																																																												
CH-3727523 CH-3727523	West	Out	31	1	0	629	238	430	0	730	1	347	274	310	310	49%	310	310	Chk	Chk	Chk	Chk	<table border="1"> <thead> <tr> <th colspan="5">First Iteration - Row</th> <th colspan="5">Future 2045 In</th> <th colspan="5">Future 2045 Out</th> <th colspan="5">Final Iteration - Column</th> </tr> <tr> <th>West</th><th>West</th><th>West</th><th>West</th><th>West</th> <th>West</th><th>West</th><th>West</th><th>West</th><th>West</th> <th>West</th><th>West</th><th>West</th><th>West</th><th>West</th> <th>West</th><th>West</th><th>West</th><th>West</th><th>West</th> <th>West</th><th>West</th><th>West</th><th>West</th><th>West</th> </tr> </thead> <tbody> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> </tbody> </table>					First Iteration - Row					Future 2045 In					Future 2045 Out					Final Iteration - Column					West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	West	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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Appendix B. 2045 No-Build Synchro Operations Worksheets

Future Traffic Conditions - No Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (vph)	0	1179	134	8	1982	0	0	0	0	171	0	366
Future Volume (vph)	0	1179	134	8	1982	0	0	0	0	171	0	366
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3343	1392	1228	3343					1687		1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3343	1392	1228	3343					1687		1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1282	146	9	2154	0	0	0	0	186	0	398
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	1282	102	9	2154	0	0	0	0	186	0	346
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2							4		4
Actuated Green, G (s)		81.5	81.5	1.5	87.0					21.5		21.5
Effective Green, g (s)		83.5	83.5	1.5	89.0					23.0		23.0
Actuated g/C Ratio		0.70	0.70	0.01	0.74					0.19		0.19
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5		5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3		2.3
Lane Grp Cap (vph)		2326	968	15	2479					323		289
v/s Ratio Prot		0.38		0.01	c0.64					0.11		
v/s Ratio Perm			0.07									c0.23
v/c Ratio		0.55	0.10	0.60	0.87					0.58		1.20
Uniform Delay, d1		9.0	6.0	59.0	11.3					44.1		48.5
Progression Factor		1.00	1.00	1.14	1.61					1.00		1.00
Incremental Delay, d2		0.9	0.2	18.7	1.9					1.8		117.7
Delay (s)		10.0	6.2	85.6	20.1					45.9		166.2
Level of Service		A	A	F	C					D		F
Approach Delay (s)		9.6			20.3			0.0			127.9	
Approach LOS		A			C			A			F	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - No Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (veh/h)	0	1179	134	8	1982	0	0	0	0	171	0	366
Future Volume (veh/h)	0	1179	134	8	1982	0	0	0	0	171	0	366
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	0	1796
Adj Flow Rate, veh/h	0	1282	0	9	2154	0				186	0	398
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	2368		10	2510	0				328	0	292
Arrive On Green	0.00	0.70	0.00	0.02	1.00	0.00				0.19	0.00	0.19
Sat Flow, veh/h	0	3474	1409	1146	3474	0				1711	0	1522
Grp Volume(v), veh/h	0	1282	0	9	2154	0				186	0	398
Grp Sat Flow(s),veh/h/ln	0	1692	1409	1146	1692	0				1711	0	1522
Q Serve(g_s), s	0.0	22.0	0.0	0.9	0.0	0.0				11.8	0.0	23.0
Cycle Q Clear(g_c), s	0.0	22.0	0.0	0.9	0.0	0.0				11.8	0.0	23.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2368		10	2510	0				328	0	292
V/C Ratio(X)	0.00	0.54		0.91	0.86	0.00				0.57	0.00	1.36
Avail Cap(c_a), veh/h	0	2368		201	2510	0				328	0	292
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.17	0.17	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	8.7	0.0	58.9	0.0	0.0				44.0	0.0	48.5
Incr Delay (d2), s/veh	0.0	0.9	0.0	25.2	0.7	0.0				1.8	0.0	184.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	12.2	0.0	0.6	0.5	0.0				8.9	0.0	36.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	9.6	0.0	84.1	0.7	0.0				45.8	0.0	232.9
LnGrp LOS	A	A		F	A	A				D	A	F
Approach Vol, veh/h		1282			2163						584	
Approach Delay, s/veh		9.6			1.1						173.3	
Approach LOS		A			A						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.0	88.0		27.0		93.0						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	21.0	62.0		21.5		87.0						
Max Q Clear Time (g_c+I1), s	2.9	24.0		25.0		2.0						
Green Ext Time (p_c), s	0.0	3.0		0.0		7.2						
Intersection Summary												
HCM 6th Ctrl Delay				28.8								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

Future Traffic Conditions - No Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↘↘
Traffic Volume (vph)	322	1028	0	0	1095	281	392	2	235	14	0	503
Future Volume (vph)	322	1028	0	0	1095	281	392	2	235	14	0	503
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0		4.0
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00		1.00		0.88
Frb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Frt	1.00	1.00			0.97		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1703	3343			3265		3242	1372		1467		2608
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1703	3343			3265		3242	1372		1467		2608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	350	1117	0	0	1190	305	426	2	255	15	0	547
RTOR Reduction (vph)	0	0	0	0	16	0	0	204	0	0	0	90
Lane Group Flow (vph)	350	1117	0	0	1479	0	426	53	0	15	0	457
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	25.9	73.9			44.0		23.5	22.5		6.6		35.5
Effective Green, g (s)	25.9	75.9			46.0		25.0	24.0		8.1		34.5
Actuated g/C Ratio	0.22	0.63			0.38		0.21	0.20		0.07		0.29
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	367	2114			1251		675	274		99		749
v/s Ratio Prot	c0.21	0.33			c0.45		c0.13	0.04		0.01		c0.18
v/s Ratio Perm												
v/c Ratio	0.95	0.53			1.18		0.63	0.19		0.15		0.61
Uniform Delay, d1	46.5	12.2			37.0		43.3	39.9		52.7		36.9
Progression Factor	0.88	0.97			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	33.2	0.8			90.5		1.6	0.2		0.4		1.1
Delay (s)	74.1	12.7			127.5		44.9	40.1		53.1		38.0
Level of Service	E	B			F		D	D		D		D
Approach Delay (s)		27.3			127.5			43.1			38.4	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			67.0									E
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			120.0							16.0		
Intersection Capacity Utilization			84.9%									E
ICU Level of Service												
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - No Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↘↘
Traffic Volume (veh/h)	322	1028	0	0	1095	281	392	2	235	14	0	503
Future Volume (veh/h)	322	1028	0	0	1095	281	392	2	235	14	0	503
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	350	1117	0	0	1190	305	426	2	255	15	0	547
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	372	2452	0	0	1227	311	688	2	240	38	0	0
Arrive On Green	0.43	1.00	0.00	0.00	0.46	0.44	0.21	0.15	0.14	0.03	0.00	0.01
Sat Flow, veh/h	1725	3474	0	0	2764	677	3291	13	1600	1485	15	
Grp Volume(v), veh/h	350	1117	0	0	747	748	426	0	257	15	61.6	
Grp Sat Flow(s),veh/h/ln	1725	1692	0	0	1692	1660	1646	0	1612	1485	E	
Q Serve(g_s), s	23.3	0.0	0.0	0.0	51.4	53.3	14.1	0.0	18.0	1.2		
Cycle Q Clear(g_c), s	23.3	0.0	0.0	0.0	51.4	53.3	14.1	0.0	18.0	1.2		
Prop In Lane	1.00		0.00	0.00		0.41	1.00		0.99	1.00		
Lane Grp Cap(c), veh/h	372	2452	0	0	776	761	688	0	242	38		
V/C Ratio(X)	0.94	0.46	0.00	0.00	0.96	0.98	0.62	0.00	1.06	0.39		
Avail Cap(c_a), veh/h	532	2452	0	0	776	761	713	0	242	223		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.83	0.83	0.00	0.00	0.92	0.92	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	33.4	0.0	0.0	0.0	31.5	32.4	43.1	0.0	51.7	57.5		
Incr Delay (d2), s/veh	16.2	0.5	0.0	0.0	22.4	26.8	1.3	0.0	75.4	4.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	14.0	0.3	0.0	0.0	33.0	34.5	9.8	0.0	18.7	0.9		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	0.5	0.0	0.0	53.9	59.2	44.4	0.0	127.2	61.6		
LnGrp LOS	D	A	A	A	D	E	D	A	F	E		
Approach Vol, veh/h		1467			1495			683				
Approach Delay, s/veh		12.2			56.6			75.6				
Approach LOS		B			E			E				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		90.9	29.1		31.9	59.1	7.1	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		70.0	24.5		37.0	* 29	16.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	16.1		25.3	55.3	3.2	20.0				
Green Ext Time (p_c), s		21.9	0.7		0.6	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			42.4									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - No Sunrise
3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/02/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑		
Traffic Volume (vph)	849	428	227	1376	0	0
Future Volume (vph)	849	428	227	1376	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3223	1509	1517	3505		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3223	1509	1517	3505		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	866	437	232	1404	0	0
RTOR Reduction (vph)	0	177	0	0	0	0
Lane Group Flow (vph)	866	260	232	1404	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	29.6	29.6	14.2	54.8		
Effective Green, g (s)	32.6	32.6	14.2	54.8		
Actuated g/C Ratio	0.59	0.59	0.26	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	1917	897	393	3505		
v/s Ratio Prot	c0.27		c0.15	0.40		
v/s Ratio Perm		0.17				
v/c Ratio	0.45	0.29	0.59	0.40		
Uniform Delay, d1	6.1	5.4	17.8	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.3	0.3	1.8	0.1		
Delay (s)	6.5	5.8	19.6	0.1		
Level of Service	A	A	B	A		
Approach Delay (s)	6.2			2.9	0.0	
Approach LOS	A			A	A	

Intersection Summary

HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	54.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - No Sunrise
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↗	↖	↗		↗	↗	↗
Traffic Volume (vph)	37	691	51	15	957	1453	20	113	8	500	204	145
Future Volume (vph)	37	691	51	15	957	1453	20	113	8	500	204	145
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1388	3110		1543	3343	1568	1203	1287		3242	1597	1417
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.67	1.00	1.00
Satd. Flow (perm)	1388	3110		1543	3343	1568	1203	1287		2302	1597	1417
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	39	735	54	16	1018	1546	21	120	9	532	217	154
RTOR Reduction (vph)	0	3	0	0	0	330	0	2	0	0	0	122
Lane Group Flow (vph)	39	786	0	16	1018	1216	21	127	0	532	217	32
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6				4		4
Actuated Green, G (s)	8.6	77.4		2.9	71.7	71.7	5.1	16.1		27.2	26.4	26.4
Effective Green, g (s)	8.6	78.8		2.9	73.1	73.1	5.1	16.9		27.2	27.2	27.2
Actuated g/C Ratio	0.07	0.61		0.02	0.56	0.56	0.04	0.13		0.21	0.21	0.21
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6	4.6	2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	91	1885		34	1879	881	47	167		593	334	296
v/s Ratio Prot	0.03	c0.25		0.01	0.30		0.02	c0.10		c0.11	0.14	
v/s Ratio Perm						c0.78				c0.08		0.02
v/c Ratio	0.43	0.42		0.47	0.54	1.38	0.45	0.76		0.90	0.65	0.11
Uniform Delay, d1	58.3	13.5		62.8	17.9	28.5	61.1	54.6		48.4	47.0	41.6
Progression Factor	1.00	1.00		1.29	0.89	1.70	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.7		0.3	0.1	171.8	3.9	17.3		16.0	3.6	0.1
Delay (s)	59.5	14.2		81.0	16.0	220.2	65.0	71.9		64.4	50.6	41.7
Level of Service	E	B		F	B	F	E	E		E	D	D
Approach Delay (s)		16.3			138.8			70.9			57.2	
Approach LOS		B			F			E			E	

Intersection Summary		
HCM 2000 Control Delay	97.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.18	F
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	109.7%	16.0
Analysis Period (min)	15	ICU Level of Service
		H

c Critical Lane Group

Future Traffic Conditions - No Sunrise
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗	↖	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	37	691	51	15	957	1453	20	113	8	500	204	145
Future Volume (veh/h)	37	691	51	15	957	1453	20	113	8	500	204	145
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	39	735	54	16	1018	0	21	120	9	532	217	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	275	1774	130	21	1314		19	142	11	584	424	
Arrive On Green	0.20	0.58	0.57	0.01	0.39	0.00	0.02	0.13	0.12	0.14	0.26	0.00
Sat Flow, veh/h	1386	3037	223	1570	3385	1572	1104	1092	82	3291	1618	1434
Grp Volume(v), veh/h	39	389	400	16	1018	0	21	0	129	532	217	0
Grp Sat Flow(s),veh/h/ln	1386	1608	1652	1570	1692	1572	1104	0	1174	1646	1618	1434
Q Serve(g_s), s	3.0	17.2	17.3	1.3	34.2	0.0	2.3	0.0	14.0	16.2	14.9	0.0
Cycle Q Clear(g_c), s	3.0	17.2	17.3	1.3	34.2	0.0	2.3	0.0	14.0	16.2	14.9	0.0
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	275	939	965	21	1314		19	0	152	584	424	
V/C Ratio(X)	0.14	0.41	0.41	0.75	0.77		1.08	0.00	0.85	0.91	0.51	
Avail Cap(c_a), veh/h	275	939	965	133	1640		119	0	172	644	424	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.00	1.00	0.00	1.00	0.79	0.79	0.00
Uniform Delay (d), s/veh	42.9	14.8	14.9	63.9	34.8	0.0	63.9	0.0	55.3	52.9	40.9	0.0
Incr Delay (d2), s/veh	0.1	1.3	1.3	1.9	0.4	0.0	98.8	0.0	26.8	13.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	10.8	11.1	0.9	15.9	0.0	2.1	0.0	9.0	14.1	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	16.2	16.2	65.8	35.2	0.0	162.7	0.0	82.2	65.9	41.5	0.0
LnGrp LOS	D	B	B	E	D		F	A	F	E	D	
Approach Vol, veh/h		828			1034			150			749	
Approach Delay, s/veh		17.5			35.7			93.4			58.8	
Approach LOS		B			D			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	79.9	6.3	38.0	31.2	54.5	23.4	20.9				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.8	* 5.4	* 5.4	4.8	* 4.8				
Max Green Setting (Gmax), s	11.0	* 62	14.0	25.2	* 11	* 62	21.0	* 18				
Max Q Clear Time (g_c+I1), s	3.3	19.3	4.3	16.9	5.0	36.2	18.2	16.0				
Green Ext Time (p_c), s	0.0	10.9	0.0	0.6	0.0	12.9	0.5	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			39.6									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Future Traffic Conditions - No Sunrise
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	880	71	382	2241	174	91	59	205	96	159	141
Future Volume (vph)	72	880	71	382	2241	174	91	59	205	96	159	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.1	4.4	5.4	3.1	4.4		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3167	1346	1671	3305		1671	1727	1396	1736	1679	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1626	3167	1346	1671	3305		1671	1727	1396	1736	1679	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	76	926	75	402	2359	183	96	62	216	101	167	148
RTOR Reduction (vph)	0	0	38	0	4	0	0	0	199	0	25	0
Lane Group Flow (vph)	76	926	37	402	2538	0	96	62	17	101	290	0
Confl. Peds. (#/hr)	1		2	2		1	1		2	2		1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	11%	14%	17%	8%	8%	6%	8%	10%	14%	4%	4%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	9.0	64.6	64.6	20.3	75.9		11.7	10.3	10.3	16.9	15.5	
Effective Green, g (s)	9.9	65.6	64.6	21.2	76.9		11.7	10.3	10.3	16.9	15.5	
Actuated g/C Ratio	0.08	0.50	0.50	0.16	0.59		0.09	0.08	0.08	0.13	0.12	
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	2.3	4.5	4.5	2.3	4.5		2.3	3.0	3.0	2.3	3.0	
Lane Grp Cap (vph)	123	1598	668	272	1955		150	136	110	225	200	
v/s Ratio Prot	0.05	0.29		c0.24	c0.77		c0.06	0.04		0.06	c0.17	
v/s Ratio Perm			0.03						0.01			
v/c Ratio	0.62	0.58	0.06	1.48	1.30		0.64	0.46	0.16	0.45	1.45	
Uniform Delay, d1	58.2	22.5	16.9	54.4	26.5		57.1	57.2	55.8	52.2	57.2	
Progression Factor	1.06	0.98	2.07	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.2	1.3	0.1	233.9	138.1		7.5	2.4	0.7	0.8	228.9	
Delay (s)	68.0	23.4	35.2	288.3	164.6		64.6	59.6	56.5	53.1	286.2	
Level of Service	E	C	D	F	F		E	E	E	D	F	
Approach Delay (s)		27.4			181.5			59.1			229.6	
Approach LOS		C			F			E			F	

Intersection Summary		
HCM 2000 Control Delay	141.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.31	F
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	108.0%	16.0
Analysis Period (min)	15	ICU Level of Service
c Critical Lane Group		G

Future Traffic Conditions - No Sunrise
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	880	71	382	2241	174	91	59	205	96	159	141
Future Volume (veh/h)	72	880	71	382	2241	174	91	59	205	96	159	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1693	1648	1781	1781	1811	1781	1752	1693	1841	1841	1826
Adj Flow Rate, veh/h	76	926	75	402	2359	183	96	62	0	101	167	148
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	11	14	17	8	8	6	8	10	14	4	4	5
Cap, veh/h	105	1771	757	234	1987	152	118	98		233	106	94
Arrive On Green	0.06	0.55	0.54	0.14	0.62	0.62	0.07	0.06	0.00	0.13	0.12	0.12
Sat Flow, veh/h	1654	3216	1394	1697	3180	243	1697	1752	1434	1753	891	790
Grp Volume(v), veh/h	76	926	75	402	1238	1304	96	62	0	101	0	315
Grp Sat Flow(s),veh/h/ln	1654	1608	1394	1697	1692	1731	1697	1752	1434	1753	0	1681
Q Serve(g_s), s	5.9	23.6	2.3	17.9	81.2	81.2	7.3	4.5	0.0	6.9	0.0	15.5
Cycle Q Clear(g_c), s	5.9	23.6	2.3	17.9	81.2	81.2	7.3	4.5	0.0	6.9	0.0	15.5
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	105	1771	757	234	1057	1081	118	98		233	0	200
V/C Ratio(X)	0.72	0.52	0.10	1.72	1.17	1.21	0.82	0.63		0.43	0.00	1.57
Avail Cap(c_a), veh/h	126	1771	757	234	1057	1081	196	209		233	0	200
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	59.7	18.4	6.8	56.1	24.4	24.5	59.7	60.1	0.0	51.9	0.0	57.3
Incr Delay (d2), s/veh	9.8	0.8	0.2	341.8	87.4	101.4	8.1	6.6	0.0	0.8	0.0	280.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.9	13.2	2.0	46.8	77.3	85.9	6.1	3.9	0.0	5.6	0.0	34.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	19.3	7.0	397.9	111.8	125.9	67.8	66.7	0.0	52.6	0.0	337.3
LnGrp LOS	E	B	A	F	F	F	E	E		D	A	F
Approach Vol, veh/h		1077			2944			158			416	
Approach Delay, s/veh		22.0			157.1			67.3			268.2	
Approach LOS		C			F			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.0	76.0	13.0	20.0	11.4	85.6	21.3	11.8				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.5	4.0	* 5.4	4.0	4.5				
Max Green Setting (Gmax), s	17.0	* 65	15.0	15.5	9.0	* 73	15.0	15.5				
Max Q Clear Time (g_c+I1), s	19.9	25.6	9.3	17.5	7.9	83.2	8.9	6.5				
Green Ext Time (p_c), s	0.0	14.5	0.1	0.0	0.0	0.0	0.1	0.1				

Intersection Summary

HCM 6th Ctrl Delay	132.4
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - No Sunrise
6: 142nd Ave & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	1105	9	3	2495	98	53	10	25	67	0	207
Future Volume (vph)	58	1105	9	3	2495	98	53	10	25	67	0	207
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.4	4.8	4.0	5.4	5.4		4.8	4.8		4.8	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.99	
Satd. Flow (prot)	1597	3195	1396	1805	3343	1533		1793	1347		1627	
Flt Permitted	0.06	1.00	1.00	0.19	1.00	1.00		0.34	1.00		0.90	
Satd. Flow (perm)	93	3195	1396	368	3343	1533		629	1347		1476	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	60	1151	9	3	2599	102	55	10	26	70	0	216
RTOR Reduction (vph)	0	0	8	0	0	25	0	0	22	0	108	0
Lane Group Flow (vph)	60	1151	1	3	2599	77	0	65	4	0	178	0
Confl. Peds. (#/hr)			1	1					4	4		
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	13%	13%	13%	0%	8%	3%	2%	0%	18%	5%	0%	3%
Turn Type	pm+pt	NA	custom	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		4	6		6	8		8	4		
Actuated Green, G (s)	80.5	79.1	17.7	72.3	72.3	72.3		17.7	17.7		17.7	
Effective Green, g (s)	80.5	79.1	17.7	72.3	72.3	72.3		17.7	17.7		17.7	
Actuated g/C Ratio	0.72	0.71	0.16	0.65	0.65	0.65		0.16	0.16		0.16	
Clearance Time (s)	4.0	5.4	4.8	4.0	5.4	5.4		4.8	4.8		4.8	
Vehicle Extension (s)	2.0	4.6	2.3	2.0	4.6	4.6		2.3	2.3		2.3	
Lane Grp Cap (vph)	171	2256	220	250	2158	989		99	212		233	
v/s Ratio Prot	0.02	c0.36		0.00	c0.78							
v/s Ratio Perm	0.23		0.00	0.01		0.05		0.10	0.00		c0.12	
v/c Ratio	0.35	0.51	0.01	0.01	1.20	0.08		0.66	0.02		0.76	
Uniform Delay, d1	45.8	7.6	39.7	8.1	19.9	7.4		44.3	39.8		45.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.5	0.8	0.0	0.0	96.6	0.2		12.4	0.0		13.0	
Delay (s)	46.2	8.4	39.7	8.1	116.5	7.6		56.7	39.8		58.2	
Level of Service	D	A	D	A	F	A		E	D		E	
Approach Delay (s)		10.5			112.3			51.9			58.2	
Approach LOS		B			F			D			E	

Intersection Summary

HCM 2000 Control Delay	78.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - No Sunrise
6: 142nd Ave & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘		↖	↗		↕	
Traffic Volume (veh/h)	58	1105	9	3	2495	98	53	10	25	67	0	207
Future Volume (veh/h)	58	1105	9	3	2495	98	53	10	25	67	0	207
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1900	1781	1856	1870	1900	1633	1826	1900	1856
Adj Flow Rate, veh/h	60	1151	0	3	2599	102	55	10	26	70	0	216
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	13	13	13	0	8	3	2	0	18	5	0	3
Cap, veh/h	204	2092		227	1862	844	174	27	310	93	15	211
Arrive On Green	0.09	0.65	0.00	0.00	0.55	0.55	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1626	3244	1447	1810	3385	1535	509	120	1377	236	68	937
Grp Volume(v), veh/h	60	1151	0	3	2599	102	65	0	26	286	0	0
Grp Sat Flow(s),veh/h/ln	1626	1622	1447	1810	1692	1535	629	0	1377	1240	0	0
Q Serve(g_s), s	0.0	21.9	0.0	0.1	61.6	3.6	0.0	0.0	1.7	15.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	21.9	0.0	0.1	61.6	3.6	9.5	0.0	1.7	25.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.85		1.00	0.24		0.76
Lane Grp Cap(c), veh/h	204	2092		227	1862	844	201	0	310	319	0	0
V/C Ratio(X)	0.29	0.55		0.01	1.40	0.12	0.32	0.00	0.08	0.90	0.00	0.00
Avail Cap(c_a), veh/h	224	2092		399	1862	844	201	0	310	319	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.8	10.9	0.0	14.8	25.2	12.1	37.0	0.0	34.3	45.0	0.0	0.0
Incr Delay (d2), s/veh	0.3	1.0	0.0	0.0	181.6	0.3	0.6	0.0	0.1	25.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.8	12.1	0.0	0.1	104.8	2.3	2.8	0.0	1.0	15.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.1	12.0	0.0	14.8	206.8	12.4	37.6	0.0	34.4	70.8	0.0	0.0
LnGrp LOS	D	B		B	F	B	D	A	C	E	A	A
Approach Vol, veh/h		1211			2704			91				286
Approach Delay, s/veh		13.7			199.2			36.7				70.8
Approach LOS		B			F			D				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	77.6		30.0	15.0	67.0		30.0				
Change Period (Y+Rc), s	4.0	* 5.4		4.8	* 5.4	* 5.4		4.8				
Max Green Setting (Gmax), s	11.0	* 62		25.2	* 11	* 62		18.2				
Max Q Clear Time (g_c+I1), s	2.1	23.9		27.2	2.0	63.6		11.5				
Green Ext Time (p_c), s	0.0	18.5		0.0	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	134.9
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	168.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	63	1109	2272	68	56	362
Future Vol, veh/h	63	1109	2272	68	56	362
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	220	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	66	1167	2392	72	59	381

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2465	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.24	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.27	-	-
Pot Cap-1 Maneuver	171	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	171	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	\$ 1576.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	171	-	-	-	102
HCM Lane V/C Ratio	0.388	-	-	-	4.314
HCM Control Delay (s)	38.8	-	-	-	\$ 1576.1
HCM Lane LOS	E	-	-	-	F
HCM 95th %tile Q(veh)	1.7	-	-	-	45.8

Notes
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Future Traffic Conditions - No Sunrise
8: Highway 224 & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	721	444	329	1360	980	309
Future Volume (vph)	721	444	329	1360	980	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3223	1404	1752	3343	3273	1495
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3223	1404	1752	3343	3273	1495
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	759	467	346	1432	1032	325
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	759	467	346	1432	1032	325
Heavy Vehicles (%)	12%	15%	3%	8%	7%	8%
Turn Type	NA	pm+ov	Prot	NA	Prot	Free
Protected Phases	2	8	1	6	8	
Permitted Phases		2				Free
Actuated Green, G (s)	48.8	90.1	11.5	64.3	41.3	117.0
Effective Green, g (s)	50.8	92.9	11.5	66.3	42.7	117.0
Actuated g/C Ratio	0.43	0.79	0.10	0.57	0.36	1.00
Clearance Time (s)	6.0	5.4	4.0	6.0	5.4	
Vehicle Extension (s)	4.8	2.5	3.5	4.8	2.5	
Lane Grp Cap (vph)	1399	1114	172	1894	1194	1495
v/s Ratio Prot	0.24	0.15	c0.20	c0.43	c0.32	
v/s Ratio Perm		0.18				0.22
v/c Ratio	0.54	0.42	2.01	0.76	0.86	0.22
Uniform Delay, d1	24.5	3.7	52.8	19.2	34.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	475.2	2.1	6.7	0.3
Delay (s)	25.2	3.9	527.9	21.3	41.1	0.3
Level of Service	C	A	F	C	D	A
Approach Delay (s)	17.1			119.9	31.3	
Approach LOS	B			F	C	

Intersection Summary			
HCM 2000 Control Delay	63.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	117.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - No Sunrise
8: Highway 224 & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘↘	↘
Traffic Volume (veh/h)	721	444	329	1360	980	309
Future Volume (veh/h)	721	444	329	1360	980	309
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1678	1856	1781	1796	1781
Adj Flow Rate, veh/h	759	467	346	1432	1032	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	15	3	8	7	8
Cap, veh/h	1498	1138	164	1979	1154	
Arrive On Green	0.46	0.45	0.09	0.58	0.35	0.00
Sat Flow, veh/h	3358	1422	1767	3474	3319	1510
Grp Volume(v), veh/h	759	467	346	1432	1032	0
Grp Sat Flow(s),veh/h/ln	1636	1422	1767	1692	1659	1510
Q Serve(g_s), s	19.4	11.5	11.0	36.0	34.8	0.0
Cycle Q Clear(g_c), s	19.4	11.5	11.0	36.0	34.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1498	1138	164	1979	1154	
V/C Ratio(X)	0.51	0.41	2.10	0.72	0.89	
Avail Cap(c_a), veh/h	1498	1138	164	2520	1460	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.6	3.5	53.6	17.7	36.5	0.0
Incr Delay (d2), s/veh	0.5	0.5	516.9	1.2	5.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	12.0	16.0	45.1	19.8	21.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.2	4.0	570.5	18.9	42.4	0.0
LnGrp LOS	C	A	F	B	D	
Approach Vol, veh/h	1226			1778	1032	
Approach Delay, s/veh	15.9			126.2	42.4	
Approach LOS	B			F	D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	15.0	58.1			73.1	45.1
Change Period (Y+Rc), s	4.0	6.0			6.0	5.4
Max Green Setting (Gmax), s	11.0	46.0			86.0	50.6
Max Q Clear Time (g_c+I1), s	13.0	21.4			38.0	36.8
Green Ext Time (p_c), s	0.0	13.7			29.1	2.9

Intersection Summary

HCM 6th Ctrl Delay			71.3			
HCM 6th LOS			E			

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - No Sunrise
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	388	446	15	14	848	179	79	144	22	173	65	582
Future Volume (vph)	388	446	15	14	848	179	79	144	22	173	65	582
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	3153		1626	1759	1429	1794	1812		1700	1827	1522
Flt Permitted	0.06	1.00		0.46	1.00	1.00	0.71	1.00		0.50	1.00	1.00
Satd. Flow (perm)	103	3153		792	1759	1429	1341	1812		897	1827	1522
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	431	496	17	16	942	199	88	160	24	192	72	647
RTOR Reduction (vph)	0	1	0	0	0	96	0	5	0	0	0	42
Lane Group Flow (vph)	431	512	0	16	942	103	88	179	0	192	72	605
Confl. Peds. (#/hr)							5		1	1		5
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	2			6		6	8			4		4
Actuated Green, G (s)	87.5	80.8		65.1	62.9	62.9	29.9	29.9		28.7	28.7	48.8
Effective Green, g (s)	87.5	80.8		65.1	62.9	62.9	29.9	29.9		28.7	28.7	48.8
Actuated g/C Ratio	0.68	0.63		0.51	0.49	0.49	0.23	0.23		0.22	0.22	0.38
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.3
Lane Grp Cap (vph)	312	1976		414	858	697	311	420		199	406	576
v/s Ratio Prot	c0.22	0.16		0.00	0.54			0.10			0.04	c0.16
v/s Ratio Perm	c0.72			0.02		0.07	0.07			0.21		0.23
v/c Ratio	1.38	0.26		0.04	1.10	0.15	0.28	0.43		0.96	0.18	1.05
Uniform Delay, d1	45.1	10.7		15.9	33.0	18.2	40.7	42.2		49.6	40.5	40.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	190.5	0.2		0.0	61.0	0.2	0.4	0.5		53.2	0.2	51.3
Delay (s)	235.6	10.9		16.0	94.0	18.4	41.1	42.7		102.8	40.7	91.3
Level of Service	F	B		B	F	B	D	D		F	D	F
Approach Delay (s)		113.5			80.0			42.2			89.7	
Approach LOS		F			E			D			F	

Intersection Summary		
HCM 2000 Control Delay	89.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.33	F
Actuated Cycle Length (s)	128.9	Sum of lost time (s)
Intersection Capacity Utilization	103.7%	17.2
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Future Traffic Conditions - No Sunrise
 9: 172nd Ave & Highway 212

Weekday AM Peak Hour
 08/02/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕	↖	↖	↕		↖	↕	↖
Traffic Volume (veh/h)	388	446	15	14	848	179	79	144	22	173	65	582
Future Volume (veh/h)	388	446	15	14	848	179	79	144	22	173	65	582
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	431	496	17	16	942	0	88	160	24	192	72	647
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	309	1877	64	451	809		229	420	63	265	487	641
Arrive On Green	0.15	0.59	0.59	0.01	0.45	0.00	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1682	3172	109	1654	1781	1447	743	1587	238	1155	1841	1539
Grp Volume(v), veh/h	431	251	262	16	942	0	88	0	184	192	72	647
Grp Sat Flow(s),veh/h/ln	1682	1608	1673	1654	1781	1447	743	0	1825	1155	1841	1539
Q Serve(g_s), s	20.0	10.0	10.0	0.7	60.0	0.0	13.6	0.0	10.9	21.5	4.0	35.0
Cycle Q Clear(g_c), s	20.0	10.0	10.0	0.7	60.0	0.0	17.5	0.0	10.9	32.4	4.0	35.0
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	309	951	990	451	809		229	0	483	265	487	641
V/C Ratio(X)	1.39	0.26	0.26	0.04	1.17		0.38	0.00	0.38	0.72	0.15	1.01
Avail Cap(c_a), veh/h	309	951	990	616	809		229	0	483	265	487	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	13.1	13.1	18.9	36.1	0.0	43.9	0.0	39.7	53.0	37.2	38.6
Incr Delay (d2), s/veh	196.3	0.4	0.4	0.0	87.6	0.0	0.8	0.0	0.4	8.9	0.1	37.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	40.4	6.7	6.9	0.5	62.7	0.0	4.6	0.0	8.6	11.2	3.3	35.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	241.8	13.4	13.4	19.0	123.7	0.0	44.7	0.0	40.1	62.0	37.3	76.3
LnGrp LOS	F	B	B	B	F		D	A	D	E	D	F
Approach Vol, veh/h		944			958			272			911	
Approach Delay, s/veh		117.7			122.0			41.6			70.2	
Approach LOS		F			F			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	84.7		41.2	24.5	66.5		41.2				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	15.0	60.0		35.0	20.0	60.0		* 35				
Max Q Clear Time (g_c+I1), s	2.7	12.0		37.0	22.0	62.0		19.5				
Green Ext Time (p_c), s	0.0	8.1		0.0	0.0	0.0		1.2				

Intersection Summary

HCM 6th Ctrl Delay	98.3
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	268	0	0	383	59	0	0	0	72	0	117
Future Vol, veh/h	58	268	0	0	383	59	0	0	0	72	0	117
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	63	291	0	0	416	64	0	0	0	78	0	127

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	480	0	0	291	0	0	929	897	291	865	865	448
Stage 1	-	-	-	-	-	-	417	417	-	448	448	-
Stage 2	-	-	-	-	-	-	512	480	-	417	417	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	835	-	-	869	-	-	250	281	753	263	294	553
Stage 1	-	-	-	-	-	-	617	595	-	571	576	-
Stage 2	-	-	-	-	-	-	548	558	-	594	595	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	835	-	-	869	-	-	182	260	753	248	272	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	260	-	248	272	-
Stage 1	-	-	-	-	-	-	571	550	-	528	576	-
Stage 2	-	-	-	-	-	-	422	558	-	549	550	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	0	18.2
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	835	-	-	869	-	-	248	553
HCM Lane V/C Ratio	-	0.076	-	-	-	-	-	0.316	0.23
HCM Control Delay (s)	0	9.7	-	-	0	-	-	26.1	13.4
HCM Lane LOS	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	1.3	0.9

Future Traffic Conditions - No Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (vph)	0	1960	366	14	1195	0	0	0	0	143	1	500
Future Volume (vph)	0	1960	366	14	1195	0	0	0	0	143	1	500
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	2.5	4.0					3.5	5.5	3.5
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3438	1538	1597	3471					1736	0	1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3438	1538	1597	3471					1736	0	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	2021	377	14	1232	0	0	0	0	147	1	515
RTOR Reduction (vph)	0	0	148	0	0	0	0	0	0	0	0	66
Lane Group Flow (vph)	0	2021	229	14	1232	0	0	0	0	147	1	449
Heavy Vehicles (%)	0%	5%	5%	13%	4%	0%	0%	0%	0%	4%	0%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		77.1	77.1	2.9	84.0					34.5	34.5	34.5
Effective Green, g (s)		79.1	79.1	4.4	86.0					36.5	34.5	36.5
Actuated g/C Ratio		0.61	0.61	0.03	0.66					0.28	0.27	0.28
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5	5.5	5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3	2.3	2.3
Lane Grp Cap (vph)		2091	935	54	2296					487	0	444
v/s Ratio Prot		c0.59		0.01	c0.35					0.08		
v/s Ratio Perm			0.15									c0.28
v/c Ratio		0.97	0.25	0.26	0.54					0.30	no cap	1.01
Uniform Delay, d1		24.2	11.7	61.2	11.5					36.7	Error	46.8
Progression Factor		1.00	1.00	1.25	0.43					1.00		1.00
Incremental Delay, d2		13.2	0.6	1.2	0.7					0.2	Error	45.5
Delay (s)		37.4	12.3	77.8	5.7					36.9	Error	92.2
Level of Service		D	B	E	A					D	F	F
Approach Delay (s)		33.5			6.5			0.0			Error	
Approach LOS		C			A			A			F	

Intersection Summary		
HCM 2000 Control Delay	Error	HCM 2000 Level of Service F
HCM 2000 Volume to Capacity ratio	0.98	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	Err%	ICU Level of Service H
Analysis Period (min)	15	
c Critical Lane Group		

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_AM_NoBuild.vistro

Scenario 1 2045 AM No-Build

Report File: H:\...\2045_NoBuildAM.pdf

3/17/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.851	15.9	B
2	OR 213 NE Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Right	0.895	244.9	F
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.519	8.6	A
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	NB Left	0.872	31.4	C
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	EB Left	1.125	105.1	F
6	142nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Thru	1.052	68.5	E
7	152nd Avenue/OR 212	Two-way stop	HCM 7th Edition	SB Left	11.419	6,533.3	F
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.816	33.0	C
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	EB Left	0.622	94.9	F
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.320	26.6	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	15.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.851

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	171	0	366	0	1179	134	8	1982	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	7.00	0.00	7.00	0.00	8.00	16.00	47.00	8.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	183	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	171	0	183	0	1179	134	8	1982	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	46	0	50	0	320	36	2	539	0
Total Analysis Volume [veh/h]	0	0	0	186	0	199	0	1282	146	9	2154	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	14.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	29	0	29	0	72	72	4	80	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	6.0	6.0	20.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	34	0	34	0	78	78	8	86	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		120	120	120	120	120	120
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		18	18	85	85	1	91
g / C, Green / Cycle		0.15	0.15	0.71	0.71	0.01	0.75
(v / s)_i Volume / Saturation Flow Rate		0.11	0.13	0.38	0.10	0.01	0.64
s, saturation flow rate [veh/h]		1709	1526	3389	1411	1138	3389
c, Capacity [veh/h]		257	229	2412	1004	10	2555
d1, Uniform Delay [s]		48.63	49.84	8.02	5.56	59.40	9.96
k, delay calibration		0.07	0.07	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.39	6.20	0.84	0.30	71.65	3.60
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.72	0.87	0.53	0.15	0.88	0.84
d, Delay for Lane Group [s/veh]		51.02	56.04	8.87	5.87	131.05	13.56
Lane Group LOS		D	E	A	A	F	B
Critical Lane Group		No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		5.48	6.22	7.20	1.18	0.48	16.96
50th-Percentile Queue Length [ft/ln]		137.08	155.51	180.03	29.45	11.95	423.88
95th-Percentile Queue Length [veh/ln]		9.32	10.31	11.60	2.12	0.86	23.71
95th-Percentile Queue Length [ft/ln]		233.08	257.76	290.05	53.00	21.51	592.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	51.02	0.00	56.04	0.00	8.87	5.87	131.05	13.56	0.00
Movement LOS				D		E		A	A	F	B	
d_A, Approach Delay [s/veh]	0.00			53.61			8.56			14.05		
Approach LOS	A			D			A			B		
d_I, Intersection Delay [s/veh]	15.91											
Intersection LOS	B											
Intersection V/C	0.851											

Emissions

Vehicle Miles Traveled [mph]		35.99	38.51	406.11	46.25	1.42	339.63
Stops [stops/h]		164.49	186.60	432.05	35.33	14.34	1017.27
Fuel consumption [US gal/h]		4.32	4.89	21.42	2.27	0.38	25.55
CO [g/h]		302.06	341.49	1497.18	158.92	26.40	1785.72
NOx [g/h]		58.77	66.44	291.30	30.92	5.14	347.44
VOC [g/h]		70.00	79.14	346.99	36.83	6.12	413.86

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	475	1200	1333
d_b, Bicycle Delay [s]	60.00	34.89	9.60	6.67
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	2.738	3.344
Bicycle LOS	D	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NE Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	244.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.895

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	392	2	235	14	0	503	322	1028	0	0	1095	281
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	2.00	18.00	23.00	0.00	9.00	6.00	8.00	0.00	0.00	8.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	0	0	0	117
Total Hourly Volume [veh/h]	392	2	234	14	0	503	322	1028	0	0	1095	164
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	1.0000	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	107	1	64	4	0	137	88	279	0	0	298	45
Total Analysis Volume [veh/h]	426	2	254	15	0	547	350	1117	0	0	1190	178
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	22	31	31	18	0	27	30	54	0	0	20	20
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	20.0	20.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	27	37	37	24	0	33	34	60	0	0	26	26
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	18	21	14	65	44	68	20	20
g / C, Green / Cycle	0.15	0.18	0.12	0.54	0.36	0.56	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.13	0.16	0.01	0.21	0.20	0.33	0.38	0.40
s, saturation flow rate [veh/h]	3292	1591	1481	2655	1724	3389	1780	1702
c, Capacity [veh/h]	496	282	176	1437	624	1905	297	284
d1, Uniform Delay [s]	49.72	48.38	47.06	15.92	30.64	17.16	50.00	50.00
k, delay calibration	0.07	0.11	0.07	0.07	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.80	10.91	0.13	0.10	3.62	1.33	598.10	645.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.91	0.09	0.38	0.56	0.59	2.31	2.41
d, Delay for Lane Group [s/veh]	52.53	59.29	47.19	16.02	34.26	18.50	648.10	695.89
Lane Group LOS	D	E	D	B	C	B	F	F
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	6.41	8.34	0.41	4.30	8.69	10.10	58.15	59.36
50th-Percentile Queue Length [ft/ln]	160.36	208.54	10.19	107.40	217.32	252.45	1453.69	1483.98
95th-Percentile Queue Length [veh/ln]	10.57	13.08	0.73	7.70	13.53	15.31	90.81	92.88
95th-Percentile Queue Length [ft/ln]	264.20	326.95	18.35	192.38	338.20	382.74	2270.15	2321.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.53	59.29	59.29	47.19	0.00	16.02	34.26	18.50	0.00	0.00	668.42	695.89
Movement LOS	D	E	E	D		B	C	B			F	F
d_A, Approach Delay [s/veh]	55.06			16.85			22.26			671.99		
Approach LOS	E			B			C			F		
d_I, Intersection Delay [s/veh]	244.90											
Intersection LOS	F											
Intersection V/C	0.895											

Emissions

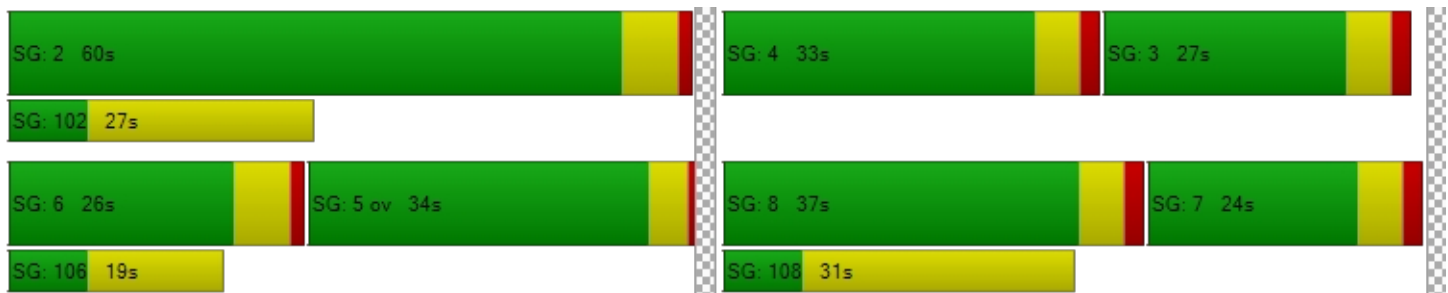
Vehicle Miles Traveled [mph]	89.24	53.63	2.14	78.05	55.19	176.12	181.01	181.01
Stops [stops/h]	384.87	250.24	12.23	257.76	260.78	605.89	1744.42	1780.78
Fuel consumption [US gal/h]	10.35	6.68	0.30	6.42	6.15	14.80	107.28	114.13
CO [g/h]	723.67	466.83	20.95	448.78	430.04	1034.66	7498.78	7977.64
NOx [g/h]	140.80	90.83	4.08	87.32	83.67	201.31	1458.99	1552.16
VOC [g/h]	167.72	108.19	4.86	104.01	99.67	239.79	1737.92	1848.90

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	0.00	49.50
l_p,int, Pedestrian LOS Score for Intersectio	2.177	2.440	0.000	3.054
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	525	308	900	333
d_b, Bicycle Delay [s]	32.63	42.93	18.15	41.67
l_b,int, Bicycle LOS Score for Intersection	2.687	1.560	2.770	2.785
Bicycle LOS	B	A	C	C

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	8.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.519

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	0	0	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	227	1376	849	428
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	19.00	3.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	227	1376	849	428
Peak Hour Factor	1.0000	1.0000	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	58	351	217	109
Total Analysis Volume [veh/h]	0	0	232	1404	866	437
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	101
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	32.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	24	60	32	32
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	0	30	30	30	30
Lead / Lag	-	-	Lag	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	51	51	51	51
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	10	37	23	23
g / C, Green / Cycle	0.20	0.72	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.15	0.40	0.26	0.29
s, saturation flow rate [veh/h]	1538	3532	3275	1526
c, Capacity [veh/h]	303	2559	1469	685
d1, Uniform Delay [s]	19.32	3.21	10.52	10.85
k, delay calibration	0.07	0.20	0.20	0.20
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.48	0.34	0.71	1.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.55	0.59	0.64
d, Delay for Lane Group [s/veh]	21.80	3.55	11.23	12.69
Lane Group LOS	C	A	B	B
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.52	1.30	3.03	3.36
50th-Percentile Queue Length [ft/ln]	62.93	32.43	75.83	83.93
95th-Percentile Queue Length [veh/ln]	4.53	2.34	5.46	6.04
95th-Percentile Queue Length [ft/ln]	113.28	58.38	136.50	151.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	21.80	3.55	11.23	12.69
Movement LOS			C	A	B	B
d_A, Approach Delay [s/veh]	0.00		6.14		11.72	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	8.61					
Intersection LOS	A					
Intersection V/C	0.519					

Emissions

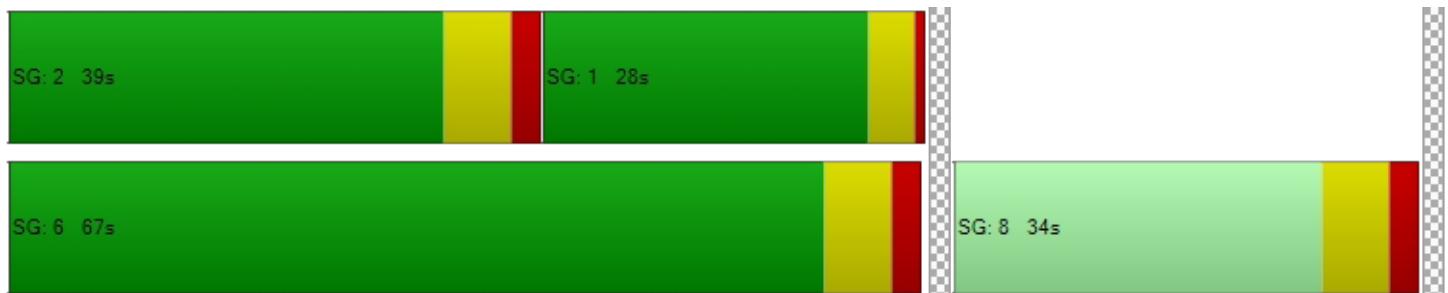
Vehicle Miles Traveled [mph]		327.79	1983.67	229.17	115.64
Stops [stops/h]		178.27	183.74	429.63	237.77
Fuel consumption [US gal/h]		15.51	83.69	13.79	7.20
CO [g/h]		1084.02	5849.93	963.69	503.52
NOx [g/h]		210.91	1138.18	187.50	97.97
VOC [g/h]		251.23	1355.78	223.35	116.70

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	2361	1259
d_b, Bicycle Delay [s]	25.42	0.83	3.49
I_b,int, Bicycle LOS Score for Intersection	4.132	2.909	2.635
Bicycle LOS	D	C	B

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	31.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.872

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐⇐⇐			⇐⇐⇐			⇐⇐⇐⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	20	113	8	500	204	145	37	691	51	15	957	1453
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	50.00	48.00	20.00	8.00	19.00	14.00	30.00	14.00	27.00	17.00	8.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	8	0	0	0	0	0	51	0	0	727
Total Hourly Volume [veh/h]	20	113	0	500	204	145	37	691	0	15	957	726
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	30	0	133	54	39	10	184	0	4	255	193
Total Analysis Volume [veh/h]	21	120	0	532	217	154	39	735	0	16	1018	772
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	18.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	8	35	35	4	31	31	4	67	67	6	69	69
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	12	40	40	8	36	36	8	72	72	10	74	74
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.40	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	0.00	2.80	2.80	2.00	3.40	3.40	2.00	3.40	3.40
g_i, Effective Green Time [s]	2	15	31	31	31	4	77	77	2	75	75
g / C, Green / Cycle	0.02	0.12	0.24	0.23	0.23	0.03	0.59	0.59	0.01	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.02	0.10	0.17	0.13	0.11	0.03	0.22	0.22	0.01	0.30	0.49
s, saturation flow rate [veh/h]	1095	1180	3092	1615	1436	1381	1690	1690	1567	3389	1577
c, Capacity [veh/h]	20	136	629	379	337	42	1003	1003	21	1954	909
d1, Uniform Delay [s]	63.82	56.63	47.22	44.01	42.67	62.84	13.70	13.70	63.90	16.65	22.83
k, delay calibration	0.07	0.07	0.07	0.07	0.07	0.14	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	88.66	10.85	2.01	0.84	0.59	54.71	1.03	1.03	17.84	1.00	9.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.06	0.88	0.85	0.57	0.46	0.92	0.37	0.37	0.75	0.52	0.85
d, Delay for Lane Group [s/veh]	152.48	67.48	49.23	44.85	43.27	117.55	14.74	14.74	81.74	17.65	32.57
Lane Group LOS	F	E	D	D	D	F	B	B	F	B	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.15	4.29	7.95	6.29	4.32	1.93	5.83	5.83	0.63	9.31	21.24
50th-Percentile Queue Length [ft/ln]	28.77	107.31	198.87	157.27	108.08	48.36	145.69	145.69	15.86	232.64	531.11
95th-Percentile Queue Length [veh/ln]	2.07	7.69	12.58	10.40	7.73	3.48	9.79	9.79	1.14	14.31	28.80
95th-Percentile Queue Length [ft/ln]	51.78	192.26	314.51	260.10	193.33	87.06	244.67	244.67	28.55	357.71	720.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	152.48	67.48	67.48	49.23	44.85	43.27	117.55	14.74	14.74	81.74	17.65	32.57
Movement LOS	F	E	E	D	D	D	F	B	B	F	B	C
d_A, Approach Delay [s/veh]	80.14			47.16			19.92			24.60		
Approach LOS	F			D			B			C		
d_I, Intersection Delay [s/veh]	31.38											
Intersection LOS	C											
Intersection V/C	0.872											

Emissions

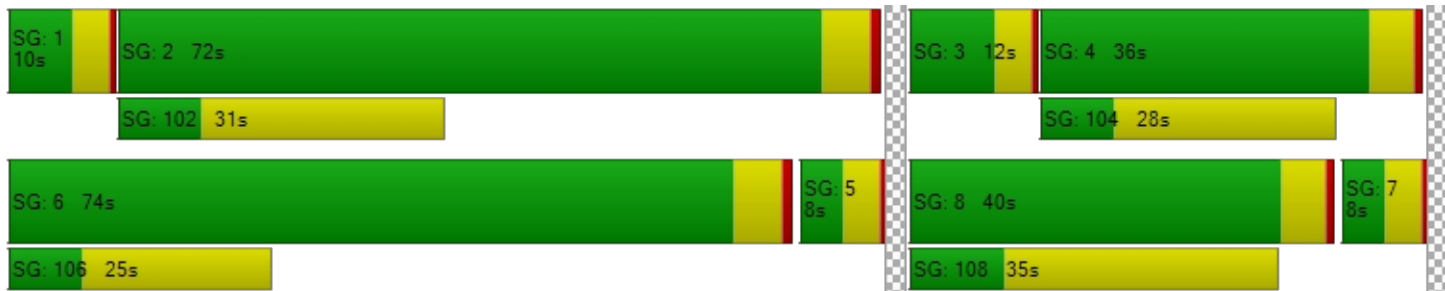
Vehicle Miles Traveled [mph]	4.73	27.04	122.83	50.10	35.56	35.05	330.32	330.32	10.55	671.18	508.99
Stops [stops/h]	31.86	118.87	440.58	174.20	119.72	53.57	161.38	161.38	17.57	515.38	588.31
Fuel consumption [US gal/h]	1.02	3.42	12.82	5.01	3.48	2.67	15.59	15.59	0.80	34.13	29.32
CO [g/h]	71.46	238.89	896.13	349.88	243.32	186.76	1089.86	1089.86	55.74	2385.98	2049.50
NOx [g/h]	13.90	46.48	174.36	68.07	47.34	36.34	212.05	212.05	10.85	464.22	398.76
VOC [g/h]	16.56	55.36	207.69	81.09	56.39	43.28	252.59	252.59	12.92	552.97	474.99

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		11.0		13.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.55		54.47		54.47		52.65	
I_p,int, Pedestrian LOS Score for Intersectio	2.109		2.887		2.784		4.201	
Crosswalk LOS	B		C		C		D	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	542		480		1025		1055	
d_b, Bicycle Delay [s]	34.57		37.54		15.46		14.50	
I_b,int, Bicycle LOS Score for Intersection	1.805		3.050		2.240		3.649	
Bicycle LOS	A		C		B		D	

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	105.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.125

Intersection Setup

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	300.00	100.00	60.00	320.00	100.00	100.00	415.00	100.00	60.00	200.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	91	59	205	96	159	141	72	880	71	382	2241	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	10.00	14.00	4.00	4.00	5.00	11.00	14.00	17.00	8.00	8.00	6.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	103	0	0	51	0	0	36	0	0	0
Total Hourly Volume [veh/h]	91	59	102	96	159	90	72	880	35	382	2241	174
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	16	27	25	42	24	19	232	9	101	590	46
Total Analysis Volume [veh/h]	96	62	107	101	167	95	76	926	37	402	2359	183
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			1			0		
v_di, Inbound Pedestrian Volume crossing m	1			0			1			1		
v_co, Outbound Pedestrian Volume crossing	1			0			1			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			1			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	50.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	5	32	32	8	35	35	4	42	42	30	68	68
Amber [s]	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	8	8	0	10	10	0	8	8	0	7	7
Pedestrian Clearance [s]	0	22	22	0	25	25	0	18	18	0	14	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.5	2.5	2.0	2.5	2.5	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	37	37	12	40	40	8	48	48	34	74	74
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	3.0	3.0	2.3	3.0	3.0	2.3	4.5	4.5	2.3	4.5	4.5
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.50	4.50	4.00	4.50	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.50	2.50	2.00	2.50	2.00	3.40	3.40	2.00	3.40	3.40
g_i, Effective Green Time [s]	9	13	13	19	22	4	51	51	30	77	77
g / C, Green / Cycle	0.07	0.10	0.10	0.14	0.17	0.03	0.39	0.39	0.23	0.59	0.59
(v / s)_i Volume / Saturation Flow Rate	0.06	0.04	0.07	0.06	0.15	0.05	0.29	0.03	0.24	0.71	0.73
s, saturation flow rate [veh/h]	1695	1750	1436	1752	1728	1652	3217	1395	1695	1780	1736
c, Capacity [veh/h]	117	169	139	249	294	51	1263	548	391	1055	1029
d1, Uniform Delay [s]	59.75	54.98	57.30	50.76	52.77	63.00	33.66	24.63	50.00	26.48	26.48
k, delay calibration	0.07	0.11	0.11	0.07	0.12	0.50	0.50	0.50	0.47	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.58	1.32	8.66	0.65	10.20	301.29	3.79	0.24	51.28	101.31	114.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.37	0.77	0.41	0.89	1.49	0.73	0.07	1.03	1.20	1.24
d, Delay for Lane Group [s/veh]	68.33	56.30	65.96	51.41	62.96	364.29	37.45	24.86	101.28	127.79	141.01
Lane Group LOS	E	E	E	D	E	F	D	C	F	F	F
Critical Lane Group	Yes	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.40	1.97	3.77	3.05	9.20	5.94	13.06	0.76	18.23	60.34	62.62
50th-Percentile Queue Length [ft/ln]	85.12	49.36	94.33	76.33	229.95	148.49	326.39	19.01	455.81	1508.59	1565.42
95th-Percentile Queue Length [veh/ln]	6.13	3.55	6.79	5.50	14.17	10.69	18.98	1.37	25.64	84.61	88.97
95th-Percentile Queue Length [ft/ln]	153.21	88.84	169.79	137.39	354.30	267.27	474.53	34.23	641.08	2115.32	2224.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	68.33	56.30	65.96	51.41	62.96	62.96	364.29	37.45	24.86	101.28	133.88	141.01
Movement LOS	E	E	E	D	E	E	F	D	C	F	F	F
d_A, Approach Delay [s/veh]	64.56			59.75			60.91			129.87		
Approach LOS	E			E			E			F		
d_I, Intersection Delay [s/veh]	105.06											
Intersection LOS	F											
Intersection V/C	1.125											

Emissions

Vehicle Miles Traveled [mph]	18.78	12.13	20.94	5.05	13.11	50.11	610.53	24.39	119.73	378.56	378.56
Stops [stops/h]	94.29	54.67	104.49	84.55	254.72	164.48	723.08	21.06	504.90	1671.06	1734.01
Fuel consumption [US gal/h]	2.63	1.51	2.88	1.73	5.30	8.60	36.19	1.31	16.00	57.86	61.63
CO [g/h]	183.77	105.67	200.98	121.05	370.73	601.44	2529.36	91.42	1118.60	4044.57	4307.79
NOx [g/h]	35.75	20.56	39.10	23.55	72.13	117.02	492.12	17.79	217.64	786.93	838.14
VOC [g/h]	42.59	24.49	46.58	28.05	85.92	139.39	586.20	21.19	259.25	937.37	998.37

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0			11.0			14.0			12.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	53.55			54.47			51.75			53.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.541			2.269			3.117			3.132		
Crosswalk LOS	B			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	500			546			655			1055		
d_b, Bicycle Delay [s]	36.56			34.35			29.38			14.50		
I_b,int, Bicycle LOS Score for Intersection	2.167			2.243			2.446			3.988		
Bicycle LOS	B			B			B			D		

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: 142nd Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	68.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.052

Intersection Setup

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	20.00	100.00	100.00	100.00	225.00	100.00	165.00	220.00	100.00	70.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	53	10	25	67	0	207	58	1105	9	3	2495	98
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	18.00	5.00	0.00	3.00	13.00	13.00	13.00	2.00	8.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	13	0	0	8	0	0	5	0	0	49
Total Hourly Volume [veh/h]	53	10	12	67	0	199	58	1105	4	3	2495	49
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	3	3	17	0	52	15	288	1	1	650	13
Total Analysis Volume [veh/h]	55	10	13	70	0	207	60	1151	4	3	2599	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			0			0			2		
v_di, Inbound Pedestrian Volume crossing m	2			0			0			2		
v_co, Outbound Pedestrian Volume crossing	1			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	112
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	30.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Protecte	ProtPer	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	4	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	33	33	33	33	33	33	7	60	33	5	58	58
Amber [s]	4.3	4.3	4.3	4.3	4.3	4.3	3.5	4.7	4.3	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.7	0.7
Walk [s]	7	7	7	0	0	0	0	8	0	0	7	7
Pedestrian Clearance [s]	26	26	26	0	0	0	0	26	0	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.8	2.8	2.8	2.8	2.8	2.8	2.0	3.4	2.8	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	38	38	38	38	38	38	11	66	38	9	64	64
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	6	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	2.3	2.0	4.6	4.6
Minimum Recall		No			No		No	Yes	No	No	Yes	
Maximum Recall		No			No		No	No	No	No	No	
Pedestrian Recall		No			No		No	No	No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	L	C	R	L	C	R
C, Cycle Length [s]	112	112	112	112	112	112	112	112	112
L, Total Lost Time per Cycle [s]	4.80	4.80	4.80	4.70	5.40	4.80	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.80	2.80	2.80	0.00	3.40	2.80	0.00	3.40	3.40
g_i, Effective Green Time [s]	21	21	21	78	77	21	74	74	74
g / C, Green / Cycle	0.19	0.19	0.19	0.70	0.68	0.19	0.66	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.09	0.01	0.17	0.27	0.35	0.00	0.01	0.77	0.03
s, saturation flow rate [veh/h]	708	1376	1645	225	3246	1449	530	3389	1577
c, Capacity [veh/h]	191	255	345	192	2221	269	356	2228	1037
d1, Uniform Delay [s]	40.63	37.51	44.43	45.71	8.65	37.26	8.45	19.19	6.79
k, delay calibration	0.07	0.07	0.09	0.50	0.50	0.07	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.64	0.05	3.53	4.20	0.87	0.01	0.00	80.26	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.05	0.80	0.31	0.52	0.01	0.01	1.17	0.05
d, Delay for Lane Group [s/veh]	41.28	37.56	47.96	49.92	9.51	37.28	8.46	99.44	6.88
Lane Group LOS	D	D	D	D	A	D	A	F	A
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.64	0.30	7.80	0.63	6.44	0.09	0.02	50.07	0.43
50th-Percentile Queue Length [ft/ln]	41.00	7.46	195.01	15.78	161.00	2.28	0.59	1251.66	10.87
95th-Percentile Queue Length [veh/ln]	2.95	0.54	12.38	1.14	10.60	0.16	0.04	70.02	0.78
95th-Percentile Queue Length [ft/ln]	73.80	13.43	309.52	28.41	265.05	4.10	1.06	1750.47	19.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.28	41.28	37.56	47.96	47.96	47.96	49.92	9.51	37.28	8.46	99.44	6.88
Movement LOS	D	D	D	D	D	D	D	A	D	A	F	A
d_A, Approach Delay [s/veh]	40.66			47.96			11.60			97.56		
Approach LOS	D			D			B			F		
d_I, Intersection Delay [s/veh]	68.52											
Intersection LOS	E											
Intersection V/C	1.052											

Emissions

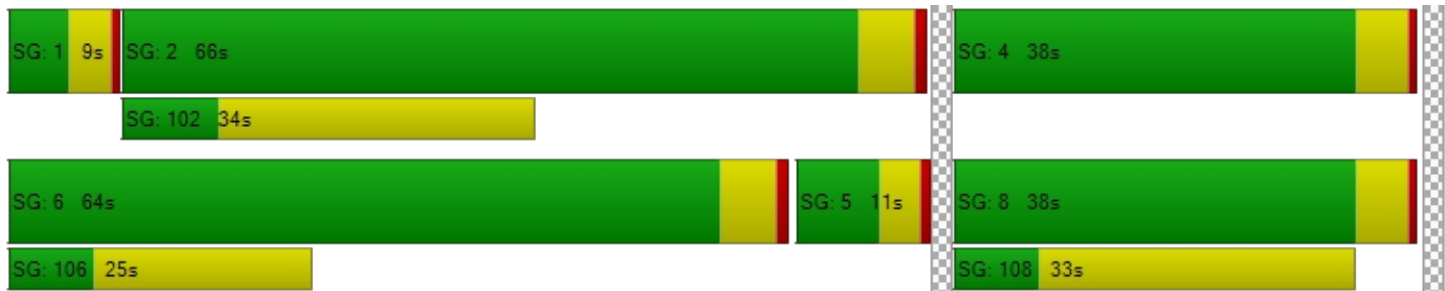
Vehicle Miles Traveled [mph]	6.76	1.35	27.03	9.45	181.34	0.63	0.45	388.73	7.63
Stops [stops/h]	52.71	9.59	250.73	20.29	414.00	2.93	0.76	3218.52	13.98
Fuel consumption [US gal/h]	1.12	0.21	5.20	1.11	11.98	0.07	0.03	86.37	0.46
CO [g/h]	77.98	14.54	363.56	77.63	837.50	5.07	1.95	6037.33	32.34
NOx [g/h]	15.17	2.83	70.74	15.10	162.95	0.99	0.38	1174.65	6.29
VOC [g/h]	18.07	3.37	84.26	17.99	194.10	1.17	0.45	1399.21	7.50

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.64	45.54	0.00	45.54
I_p,int, Pedestrian LOS Score for Intersectio	2.005	2.036	0.000	3.274
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	593	593	1082	1046
d_b, Bicycle Delay [s]	27.72	27.72	11.79	12.73
I_b,int, Bicycle LOS Score for Intersection	1.710	2.030	2.566	3.789
Bicycle LOS	A	B	B	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: 152nd Avenue/OR 212

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 6,533.3
 Level Of Service: F
 Volume to Capacity (v/c): 11.419

Intersection Setup

Name	152nd Ave		Highway 212		Highway 212	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	220.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	152nd Ave		Highway 212		Highway 212	
Base Volume Input [veh/h]	56	362	63	1109	2272	68
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	3.00	7.00	11.00	5.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	362	63	1109	2272	68
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	95	17	292	598	18
Total Analysis Volume [veh/h]	59	381	66	1167	2392	72
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	11.42	2.28	0.38	0.01	0.02	0.00
d_M, Delay for Movement [s/veh]	6533.35	5858.09	38.53	0.00	0.00	0.00
Movement LOS	F	F	E	A	A	A
95th-Percentile Queue Length [veh/ln]	54.04	54.04	1.67	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1350.94	1350.94	41.63	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	5948.63		2.06		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	633.30					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	33.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	1	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	980	309	721	444	329	1360
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	8.00	12.00	15.00	3.00	8.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	980	309	721	444	329	1360
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	258	81	190	117	87	358
Total Analysis Volume [veh/h]	1032	325	759	467	346	1432
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	148
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	42.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	54	0	41	41	38	83
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	30	30	30	30
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		No	No	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	127	127	127	127	127	127
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	5.40	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	46	46	38	90	27	70
g / C, Green / Cycle	0.36	0.36	0.30	0.71	0.22	0.55
(v / s)_i Volume / Saturation Flow Rate	0.31	0.21	0.23	0.33	0.20	0.42
s, saturation flow rate [veh/h]	3320	1513	3275	1424	1767	3389
c, Capacity [veh/h]	1199	546	987	1010	382	1861
d1, Uniform Delay [s]	37.56	32.96	40.30	7.95	48.44	22.33
k, delay calibration	0.08	0.08	0.21	0.46	0.22	0.21
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.46	0.77	2.50	1.39	14.78	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.59	0.77	0.46	0.91	0.77
d, Delay for Lane Group [s/veh]	39.01	33.74	42.80	9.34	63.22	23.68
Lane Group LOS	D	C	D	A	E	C
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	14.92	8.23	11.06	5.48	12.20	16.44
50th-Percentile Queue Length [ft/ln]	372.95	205.75	276.48	137.04	304.90	411.12
95th-Percentile Queue Length [veh/ln]	21.25	12.93	16.51	9.32	17.92	23.10
95th-Percentile Queue Length [ft/ln]	531.31	323.36	412.83	233.03	448.08	577.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	39.01	33.74	42.80	9.34	63.22	23.68
Movement LOS	D	C	D	A	E	C
d_A, Approach Delay [s/veh]	37.75		30.06		31.37	
Approach LOS	D		C		C	
d_I, Intersection Delay [s/veh]	32.99					
Intersection LOS	C					
Intersection V/C	0.816					

Emissions

Vehicle Miles Traveled [mph]	337.55	106.30	110.20	67.80	21.94	90.79
Stops [stops/h]	848.00	233.91	628.67	155.80	346.64	934.79
Fuel consumption [US gal/h]	26.77	7.90	14.62	4.54	7.27	15.80
CO [g/h]	1871.48	552.17	1021.97	317.34	508.13	1104.61
NOx [g/h]	364.12	107.43	198.84	61.74	98.86	214.92
VOC [g/h]	433.73	127.97	236.85	73.55	117.76	256.00

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	52.81	0.00	51.90
I_p,int, Pedestrian LOS Score for Intersectio	2.676	0.000	2.874
Crosswalk LOS	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	853	647	1311
d_b, Bicycle Delay [s]	20.84	28.97	7.53
I_b,int, Bicycle LOS Score for Intersection	1.560	2.571	3.026
Bicycle LOS	A	B	C

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	94.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	79	144	22	173	65	582	388	446	15	14	848	179
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	6.00	6.00	4.00	5.00	9.00	14.00	12.00	11.00	8.00	13.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	22	0	0	291	0	0	15	0	0	90
Total Hourly Volume [veh/h]	79	144	0	173	65	291	388	446	0	14	848	89
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	40	0	48	18	81	108	124	0	4	236	25
Total Analysis Volume [veh/h]	88	160	0	192	72	323	431	496	0	16	942	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	132
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	8.5
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	35	35	35	34	34	34	22	77	77	4	60	60
Amber [s]	3.5	3.5	3.5	4.7	4.7	4.7	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	9	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	21	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	4.2	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No	No		No		No	No	
Maximum Recall		No			No	No		No		No	No	
Pedestrian Recall		No			No	No		No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	132	132	132	132	132	132	132	132	132	132	132
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	4.50	6.50	6.50	6.50	6.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.20	4.20	0.00	0.00	4.50	4.50	0.00	4.50	4.50
g_i, Effective Green Time [s]	35	35	34	34	61	79	79	79	85	60	60
g / C, Green / Cycle	0.27	0.27	0.26	0.26	0.46	0.60	0.60	0.60	0.65	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.07	0.09	0.16	0.04	0.21	0.54	0.15	0.15	0.02	0.53	0.07
s, saturation flow rate [veh/h]	1322	1870	1187	1840	1548	802	1690	1690	659	1780	1449
c, Capacity [veh/h]	347	498	260	474	716	304	1010	1010	466	809	658
d1, Uniform Delay [s]	42.94	38.86	53.85	37.90	24.10	50.77	12.52	12.52	9.32	36.04	21.11
k, delay calibration	0.08	0.08	0.13	0.08	0.27	0.44	0.28	0.28	0.07	0.50	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.27	4.87	0.11	1.10	204.79	0.33	0.33	0.02	87.59	0.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.25	0.32	0.74	0.15	0.45	1.42	0.25	0.25	0.03	1.17	0.15
d, Delay for Lane Group [s/veh]	43.23	39.13	58.73	38.01	25.20	255.56	12.85	12.85	9.34	123.63	21.38
Lane Group LOS	D	D	E	D	C	F	B	B	A	F	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.45	4.24	6.64	1.84	7.09	21.68	3.54	3.54	0.17	45.05	1.87
50th-Percentile Queue Length [ft/ln]	61.23	106.00	165.93	45.97	177.17	541.93	88.41	88.41	4.13	1126.25	46.75
95th-Percentile Queue Length [veh/ln]	4.41	7.62	10.86	3.31	11.45	36.32	6.37	6.37	0.30	62.65	3.37
95th-Percentile Queue Length [ft/ln]	110.21	190.43	271.55	82.75	286.32	908.09	159.14	159.14	7.44	1566.34	84.15

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.23	39.13	39.13	58.73	38.01	25.20	255.56	12.85	12.85	9.34	123.63	21.38
Movement LOS	D	D	D	E	D	C	F	B	B	A	F	C
d_A, Approach Delay [s/veh]	40.58			37.74			125.69			112.33		
Approach LOS	D			D			F			F		
d_I, Intersection Delay [s/veh]	94.88											
Intersection LOS	F											
Intersection V/C	0.622											

Emissions

Vehicle Miles Traveled [mph]	10.35	18.82	24.97	9.37	42.01	50.77	29.21	29.21	7.49	441.12	46.36
Stops [stops/h]	66.77	115.60	180.95	50.14	193.21	591.00	96.42	96.42	4.51	1228.23	50.98
Fuel consumption [US gal/h]	1.57	2.69	4.32	1.22	4.45	27.76	2.38	2.38	0.36	48.64	2.62
CO [g/h]	109.68	187.85	302.11	85.24	311.28	1940.74	166.62	166.62	25.43	3400.01	183.20
NOx [g/h]	21.34	36.55	58.78	16.58	60.56	377.60	32.42	32.42	4.95	661.52	35.64
VOC [g/h]	25.42	43.54	70.02	19.75	72.14	449.79	38.61	38.61	5.89	787.98	42.46

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			12.0			13.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	55.48			54.57			53.66			0.00		
I_p,int, Pedestrian LOS Score for Intersectio	2.125			3.343			2.968			0.000		
Crosswalk LOS	B			C			C			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	530			515			1166			909		
d_b, Bicycle Delay [s]	35.66			36.40			11.47			19.65		
I_b,int, Bicycle LOS Score for Intersection	2.005			3.008			2.337			3.452		
Bicycle LOS	B			C			B			C		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street

Control Type:	Two-way stop	Delay (sec / veh):	26.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.320

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⊕			⊕			⊕			⊕		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	72	0	117	58	268	0	0	383	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	12.00	0.00	32.00	61.00	12.00	0.00	0.00	14.00	12.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	72	0	117	58	268	0	0	383	59
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	20	0	32	16	73	0	0	104	16
Total Analysis Volume [veh/h]	0	0	0	78	0	127	63	291	0	0	416	64
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.32	0.00	0.23	0.08	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	25.21	18.83	9.78	26.62	25.08	13.45	9.66	0.00	0.00	7.81	0.00	0.00
Movement LOS	D	C	A	D	D	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	1.33	1.33	0.88	0.24	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	33.24	33.24	22.01	6.11	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	17.94			18.46			1.72			0.00		
Approach LOS	C			C			A			A		
d_I, Intersection Delay [s/veh]	4.23											
Intersection LOS	D											

Study Intersections



Future Traffic Conditions - No Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (veh/h)	0	1960	366	14	1195	0	0	0	0	143	1	500
Future Volume (veh/h)	0	1960	366	14	1195	0	0	0	0	143	1	500
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1826	1826	1707	1841	0				1841	1900	1870
Adj Flow Rate, veh/h	0	2021	0	14	1232	0				147	1	515
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	5	5	13	4	0				4	0	2
Cap, veh/h	0	2146		39	2314	0				492	0	445
Arrive On Green	0.00	0.62	0.00	0.05	1.00	0.00				0.28	0.27	0.28
Sat Flow, veh/h	0	3561	1547	1626	3589	0				1753	0	1585
Grp Volume(v), veh/h	0	2021	0	14	1232	0				147	0	515
Grp Sat Flow(s),veh/h/ln	0	1735	1547	1626	1749	0				1753	0	1585
Q Serve(g_s), s	0.0	69.2	0.0	1.1	0.0	0.0				8.6	0.0	36.5
Cycle Q Clear(g_c), s	0.0	69.2	0.0	1.1	0.0	0.0				8.6	0.0	36.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2146		39	2314	0				492	0	445
V/C Ratio(X)	0.00	0.94		0.36	0.53	0.00				0.30	0.00	1.16
Avail Cap(c_a), veh/h	0	2146		219	2314	0				492	0	445
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.64	0.64	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.7	0.0	61.0	0.0	0.0				36.7	0.0	46.8
Incr Delay (d2), s/veh	0.0	9.9	0.0	2.2	0.6	0.0				0.2	0.0	93.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	38.2	0.0	0.8	0.3	0.0				6.7	0.0	37.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	32.5	0.0	63.2	0.6	0.0				36.9	0.0	140.1
LnGrp LOS	A	C		E	A	A				D	A	F
Approach Vol, veh/h		2021			1246						662	
Approach Delay, s/veh		32.5			1.3						117.2	
Approach LOS		C			A						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.6	84.4		40.0		90.0						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	16.0	64.0		34.5		84.0						
Max Q Clear Time (g_c+I1), s	3.1	71.2		38.5		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		2.8						

Intersection Summary

HCM 6th Ctrl Delay	36.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - No Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↘↘
Traffic Volume (vph)	582	1521	0	0	589	299	355	7	216	15	0	265
Future Volume (vph)	582	1521	0	0	589	299	355	7	216	15	0	265
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0			4.0		4.5	4.5		4.5		4.5
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00		1.00		0.88
Frt	1.00	1.00			0.95		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1770	3406			3317		3335	1390		1641		2707
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1770	3406			3317		3335	1390		1641		2707
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	626	1635	0	0	633	322	382	8	232	16	0	285
RTOR Reduction (vph)	0	0	0	0	47	0	0	154	0	0	0	87
Lane Group Flow (vph)	626	1635	0	0	908	0	382	86	0	16	0	198
Heavy Vehicles (%)	2%	6%	0%	0%	4%	2%	5%	12%	17%	10%	0%	5%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	41.1	85.8			40.7		22.7	22.5		4.7		49.6
Effective Green, g (s)	42.1	87.8			42.7		23.7	23.5		5.7		47.6
Actuated g/C Ratio	0.32	0.68			0.33		0.18	0.18		0.04		0.37
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	573	2300			1089		607	251		71		991
v/s Ratio Prot	c0.35	0.48			c0.27		c0.11	c0.06		0.01		0.07
v/s Ratio Perm												
v/c Ratio	1.09	0.71			0.83		0.63	0.34		0.23		0.20
Uniform Delay, d1	44.0	13.2			40.4		49.1	46.5		60.0		28.2
Progression Factor	0.75	0.14			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	55.2	0.9			6.0		1.7	0.5		0.9		0.1
Delay (s)	88.1	2.8			46.4		50.7	47.0		61.0		28.2
Level of Service	F	A			D		D	D		E		C
Approach Delay (s)		26.4			46.4			49.3			30.0	
Approach LOS		C			D			D			C	

Intersection Summary		
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.87	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	85.3%	ICU Level of Service E
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - No Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↗↗
Traffic Volume (veh/h)	582	1521	0	0	589	299	355	7	216	15	0	265
Future Volume (veh/h)	582	1521	0	0	589	299	355	7	216	15	0	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	0	0	1841	1870	1826	1722	1648	1752	0	1826
Adj Flow Rate, veh/h	626	1635	0	0	633	322	382	8	232	16	0	285
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	6	0	0	4	2	5	12	17	10	0	5
Cap, veh/h	575	2561	0	0	858	437	642	7	191	35	0	0
Arrive On Green	0.65	1.00	0.00	0.00	0.13	0.12	0.19	0.13	0.13	0.02	0.00	0.01
Sat Flow, veh/h	1781	3532	0	0	2335	1141	3374	49	1418	1668	16	
Grp Volume(v), veh/h	626	1635	0	0	493	462	382	0	240	16	68.3	
Grp Sat Flow(s),veh/h/ln	1781	1721	0	0	1749	1635	1687	0	1467	1668	E	
Q Serve(g_s), s	42.0	0.0	0.0	0.0	35.3	35.4	13.4	0.0	17.5	1.2		
Cycle Q Clear(g_c), s	42.0	0.0	0.0	0.0	35.3	35.4	13.4	0.0	17.5	1.2		
Prop In Lane	1.00		0.00	0.00		0.70	1.00		0.97	1.00		
Lane Grp Cap(c), veh/h	575	2561	0	0	669	626	642	0	197	35		
V/C Ratio(X)	1.09	0.64	0.00	0.00	0.74	0.74	0.59	0.00	1.22	0.45		
Avail Cap(c_a), veh/h	575	2561	0	0	669	626	740	0	197	212		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.32	0.32	0.00	0.00	0.97	0.97	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	23.0	0.0	0.0	0.0	50.5	50.7	48.0	0.0	56.7	62.9		
Incr Delay (d2), s/veh	49.4	0.4	0.0	0.0	4.8	5.1	0.7	0.0	134.1	5.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	24.8	0.3	0.0	0.0	24.3	23.1	9.7	0.0	21.6	1.0		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.4	0.4	0.0	0.0	55.3	55.8	48.7	0.0	190.8	68.3		
LnGrp LOS	F	A	A	A	E	E	D	A	F	E		
Approach Vol, veh/h		2261			955			622				
Approach Delay, s/veh		20.3			55.5			103.5				
Approach LOS		C			E			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		100.7	29.3		47.0	53.7	7.3	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		81.0	27.5		41.0	* 36	15.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	15.4		44.0	37.4	3.2	19.5				
Green Ext Time (p_c), s		44.5	0.8		0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	42.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Future Traffic Conditions - No Sunrise
3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑		
Traffic Volume (vph)	1327	425	185	888	0	0
Future Volume (vph)	1327	425	185	888	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	1.0	4.0		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frpb, ped/bikes	1.00	0.98	1.00	1.00		
Flpb, ped/bikes	1.00	1.00	1.00	1.00		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3374	1521	1703	3574		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3374	1521	1703	3574		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1427	457	199	955	0	0
RTOR Reduction (vph)	0	63	0	0	0	0
Lane Group Flow (vph)	1427	394	199	955	0	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	7%	4%	6%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	98.9	98.9	20.1	130.0		
Effective Green, g (s)	101.9	101.9	23.1	130.0		
Actuated g/C Ratio	0.78	0.78	0.18	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	2644	1192	302	3574		
v/s Ratio Prot	c0.42		c0.12	0.27		
v/s Ratio Perm		0.26				
v/c Ratio	0.54	0.33	0.66	0.27		
Uniform Delay, d1	5.3	4.1	49.8	0.0		
Progression Factor	0.94	1.27	1.00	1.00		
Incremental Delay, d2	0.6	0.5	4.3	0.2		
Delay (s)	5.5	5.8	54.1	0.2		
Level of Service	A	A	D	A		
Approach Delay (s)	5.6			9.5	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - No Sunrise
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	613	48	17	721	868	24	152	15	973	282	72
Future Volume (vph)	53	613	48	17	721	868	24	152	15	973	282	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.97	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1703	3376		1719	3343	1562	1687	1784		3364	1681	1547
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.44	1.00	1.00
Satd. Flow (perm)	1703	3376		1719	3343	1562	1687	1784		1556	1681	1547
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	55	632	49	18	743	895	25	157	15	1003	291	74
RTOR Reduction (vph)	0	5	0	0	0	505	0	3	0	0	0	43
Lane Group Flow (vph)	55	676	0	18	743	390	25	169	0	1003	291	31
Confl. Peds. (#/hr)	1					1	8		2	2		8
Heavy Vehicles (%)	6%	5%	16%	5%	8%	2%	7%	5%	5%	4%	13%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6				4		4
Actuated Green, G (s)	9.2	46.6		2.9	40.3	40.3	7.8	16.9		54.5	54.5	54.5
Effective Green, g (s)	9.2	46.6		2.9	40.3	40.3	7.8	16.9		54.5	54.5	54.5
Actuated g/C Ratio	0.07	0.36		0.02	0.31	0.31	0.06	0.13		0.42	0.42	0.42
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6	4.6	2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	120	1210		38	1036	484	101	231		1283	704	648
v/s Ratio Prot	0.03	c0.20		0.01	0.22		0.01	c0.09		c0.27	0.17	
v/s Ratio Perm						c0.25				c0.05		0.02
v/c Ratio	0.46	0.56		0.47	0.72	0.81	0.25	0.73		0.78	0.41	0.05
Uniform Delay, d1	58.0	33.4		62.8	39.8	41.2	58.3	54.4		31.4	26.5	22.4
Progression Factor	1.00	1.00		1.40	0.80	1.42	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	1.9		1.0	1.3	4.4	0.7	10.4		3.0	0.2	0.0
Delay (s)	59.0	35.3		88.9	33.0	63.0	59.0	64.8		34.4	26.8	22.4
Level of Service	E	D		F	C	E	E	E		C	C	C
Approach Delay (s)		37.1			49.8			64.1			32.1	
Approach LOS		D			D			E			C	
Intersection Summary												
HCM 2000 Control Delay			42.0									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			130.0									Sum of lost time (s) 18.2
Intersection Capacity Utilization			79.3%									ICU Level of Service D
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - No Sunrise
4: 122nd Avenue & Highway 212
























Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕	↖	↖	↖		↖	↕	↖
Traffic Volume (veh/h)	53	613	48	17	721	868	24	152	15	973	282	72
Future Volume (veh/h)	53	613	48	17	721	868	24	152	15	973	282	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1826	1663	1826	1781	1870	1796	1826	1826	1841	1707	1870
Adj Flow Rate, veh/h	55	632	49	18	743	0	25	157	15	1003	291	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	6	5	16	5	8	2	7	5	5	4	13	2
Cap, veh/h	375	1615	125	26	952		259	183	17	922	329	
Arrive On Green	0.22	0.50	0.50	0.01	0.28	0.00	0.15	0.11	0.11	0.24	0.19	0.00
Sat Flow, veh/h	1725	3262	253	1739	3385	1585	1711	1637	156	3401	1707	1585
Grp Volume(v), veh/h	55	336	345	18	743	0	25	0	172	1003	291	0
Grp Sat Flow(s),veh/h/ln	1725	1735	1780	1739	1692	1585	1711	0	1794	1700	1707	1585
Q Serve(g_s), s	3.4	15.8	15.8	1.3	26.3	0.0	1.6	0.0	12.2	31.0	21.6	0.0
Cycle Q Clear(g_c), s	3.4	15.8	15.8	1.3	26.3	0.0	1.6	0.0	12.2	31.0	21.6	0.0
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	375	859	881	26	952		259	0	201	922	329	
V/C Ratio(X)	0.15	0.39	0.39	0.70	0.78		0.10	0.00	0.86	1.09	0.88	
Avail Cap(c_a), veh/h	375	859	881	147	1291		259	0	210	922	370	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	41.1	20.6	20.6	63.8	43.0	0.0	47.5	0.0	56.7	51.3	51.0	0.0
Incr Delay (d2), s/veh	0.1	1.3	1.3	1.2	0.6	0.0	0.1	0.0	26.4	56.6	19.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.6	11.0	11.2	1.0	12.7	0.0	1.3	0.0	11.4	31.9	16.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	21.9	21.9	65.0	43.6	0.0	47.6	0.0	83.1	107.8	70.1	0.0
LnGrp LOS	D	C	C	E	D		D	A	F	F	E	
Approach Vol, veh/h		736			761			197			1294	
Approach Delay, s/veh		23.3			44.1			78.6			99.3	
Approach LOS		C			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	69.8	24.5	29.9	33.7	42.0	35.0	19.3				
Change Period (Y+Rc), s	4.0	* 5.4	4.8	* 4.8	* 5.4	* 5.4	4.0	4.8				
Max Green Setting (Gmax), s	11.0	* 55	18.0	* 28	* 16	* 50	31.0	15.2				
Max Q Clear Time (g_c+I1), s	3.3	17.8	3.6	23.6	5.4	28.3	33.0	14.2				
Green Ext Time (p_c), s	0.0	8.6	0.0	0.5	0.0	8.3	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			65.2									
HCM 6th LOS			E									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Future Traffic Conditions - No Sunrise
5: 135th Ave & Highway 212

Weekday PM Peak Hour
08/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	1521	20	203	1276	161	70	157	907	339	341	174
Future Volume (vph)	107	1521	20	203	1276	161	70	157	907	339	341	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4	5.4	4.0	4.4		4.0	3.6	3.6	4.0	3.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3406	1507	1752	3318		1671	1881	1510	1752	1737	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3406	1507	1752	3318		1671	1881	1510	1752	1737	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	110	1568	21	209	1315	166	72	162	935	349	352	179
RTOR Reduction (vph)	0	0	12	0	8	0	0	0	179	0	13	0
Lane Group Flow (vph)	110	1568	9	209	1473	0	72	162	756	349	518	0
Confl. Peds. (#/hr)	4		4	4		4	3		3	3		3
Confl. Bikes (#/hr)						2			2			
Heavy Vehicles (%)	1%	6%	4%	3%	7%	3%	8%	1%	5%	3%	3%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	16.0	53.8	53.8	16.0	53.8		9.1	25.5	25.5	16.8	33.2	
Effective Green, g (s)	16.0	54.8	53.8	16.0	54.8		9.1	26.4	26.4	16.8	34.1	
Actuated g/C Ratio	0.12	0.42	0.41	0.12	0.42		0.07	0.20	0.20	0.13	0.26	
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	2.3	4.5	4.5	2.3	4.5		2.3	3.0	3.0	2.3	3.0	
Lane Grp Cap (vph)	219	1435	623	215	1398		116	381	306	226	455	
v/s Ratio Prot	0.06	c0.46		0.12	c0.44		0.04	0.09		c0.20	0.30	
v/s Ratio Perm			0.01						c0.50			
v/c Ratio	0.50	1.09	0.01	0.97	1.05		0.62	0.43	2.47	1.54	1.14	
Uniform Delay, d1	53.3	37.6	22.5	56.8	37.6		58.8	45.2	51.8	56.6	48.0	
Progression Factor	1.17	1.21	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	51.1	0.0	53.0	39.7		8.1	0.8	671.1	265.7	85.7	
Delay (s)	63.3	96.7	22.5	109.8	77.3		66.8	45.9	722.9	322.3	133.6	
Level of Service	E	F	C	F	E		E	D	F	F	F	
Approach Delay (s)		93.6			81.3			588.6			208.5	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM 2000 Control Delay			214.8			HCM 2000 Level of Service			F			
HCM 2000 Volume to Capacity ratio			1.48									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			127.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - No Sunrise
5: 135th Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	107	1521	20	203	1276	161	70	157	907	339	341	174
Future Volume (veh/h)	107	1521	20	203	1276	161	70	157	907	339	341	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1811	1841	1856	1796	1856	1781	1885	1826	1856	1856	1841
Adj Flow Rate, veh/h	110	1568	21	209	1315	166	72	162	0	349	352	179
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	6	4	3	7	3	8	1	5	3	3	4
Cap, veh/h	327	1711	761	217	1300	163	91	225		235	235	120
Arrive On Green	0.18	0.50	0.49	0.12	0.43	0.42	0.05	0.12	0.00	0.13	0.20	0.20
Sat Flow, veh/h	1795	3441	1554	1767	3041	381	1697	1885	1547	1767	1158	589
Grp Volume(v), veh/h	110	1568	21	209	734	747	72	162	0	349	0	531
Grp Sat Flow(s),veh/h/ln	1795	1721	1554	1767	1706	1715	1697	1885	1547	1767	0	1746
Q Serve(g_s), s	6.9	54.7	0.9	15.3	55.6	55.6	5.5	10.8	0.0	17.3	0.0	26.4
Cycle Q Clear(g_c), s	6.9	54.7	0.9	15.3	55.6	55.6	5.5	10.8	0.0	17.3	0.0	26.4
Prop In Lane	1.00		1.00	1.00		0.22	1.00		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	327	1711	761	217	730	734	91	225		235	0	355
V/C Ratio(X)	0.34	0.92	0.03	0.96	1.01	1.02	0.79	0.72		1.48	0.00	1.50
Avail Cap(c_a), veh/h	327	1711	761	217	730	734	209	383		235	0	355
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.3	30.2	17.2	56.7	37.2	37.3	60.8	55.1	0.0	56.4	0.0	52.0
Incr Delay (d2), s/veh	0.3	6.8	0.0	49.6	34.7	37.9	9.2	4.3	0.0	239.2	0.0	238.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	5.6	30.3	0.6	15.0	38.8	40.1	4.7	9.2	0.0	36.3	0.0	53.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	37.0	17.2	106.3	71.9	75.2	70.0	59.4	0.0	295.6	0.0	290.1
LnGrp LOS	D	D	B	F	F	F	E	E		F	A	F
Approach Vol, veh/h		1699			1690			234			880	
Approach Delay, s/veh		37.4			77.6			62.6			292.3	
Approach LOS		D			E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.0	69.1	10.9	30.0	29.1	60.0	21.8	19.1				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.5	* 5.4	* 5.4	4.5	* 4.5				
Max Green Setting (Gmax), s	16.0	* 55	16.0	25.5	* 16	* 55	16.0	* 26				
Max Q Clear Time (g_c+I1), s	17.3	56.7	7.5	28.4	8.9	57.6	19.3	12.8				
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay	103.6
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - No Sunrise
6: 142nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	2546	82	10	1443	39	44	3	15	110	12	138
Future Volume (vph)	169	2546	82	10	1443	39	44	3	15	110	12	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	5.4	4.0	4.2	5.4		3.0	3.0		3.8	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00	0.99		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1787	3406	1551	1805	3374	1550		1765	1327		1679	
Flt Permitted	0.12	1.00	1.00	0.05	1.00	1.00		0.55	1.00		0.84	
Satd. Flow (perm)	224	3406	1551	89	3374	1550		1019	1327		1442	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	174	2625	85	10	1488	40	45	3	15	113	12	142
RTOR Reduction (vph)	0	0	14	0	0	14	0	0	12	0	31	0
Lane Group Flow (vph)	174	2625	71	10	1488	26	0	48	3	0	236	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	6%	2%	0%	7%	2%	3%	0%	20%	3%	9%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	100.8	93.4	93.4	87.4	85.4	85.4		21.2	21.2		20.4	
Effective Green, g (s)	100.8	94.6	93.4	87.4	86.6	85.4		22.2	22.2		21.4	
Actuated g/C Ratio	0.78	0.73	0.72	0.67	0.67	0.66		0.17	0.17		0.16	
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0		4.8	
Vehicle Extension (s)	2.3	4.5	4.5	2.3	4.5	4.5		2.5	2.5		2.5	
Lane Grp Cap (vph)	293	2478	1114	86	2247	1018		174	226		237	
v/s Ratio Prot	c0.05	c0.77		0.00	0.44							
v/s Ratio Perm	0.41		0.05	0.08		0.02		0.05	0.00		c0.16	
v/c Ratio	0.59	1.06	0.06	0.12	0.66	0.03		0.28	0.01		1.00	
Uniform Delay, d1	27.2	17.7	5.4	59.5	13.0	7.8		46.9	44.8		54.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	2.5	36.2	0.1	0.4	1.6	0.0		0.6	0.0		57.0	
Delay (s)	29.7	53.9	5.5	59.8	14.5	7.8		47.5	44.8		111.3	
Level of Service	C	D	A	E	B	A		D	D		F	
Approach Delay (s)		51.1			14.6			46.9			111.3	
Approach LOS		D			B			D			F	

Intersection Summary		
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.05	
Actuated Cycle Length (s)	130.0	Sum of lost time (s)
Intersection Capacity Utilization	105.7%	ICU Level of Service
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - No Sunrise
6: 142nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘		↖	↗		↖	↗
Traffic Volume (veh/h)	169	2546	82	10	1443	39	44	3	15	110	12	138
Future Volume (veh/h)	169	2546	82	10	1443	39	44	3	15	110	12	138
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1811	1870	1900	1796	1870	1856	1900	1604	1856	1767	1870
Adj Flow Rate, veh/h	174	2625	0	10	1488	40	45	3	15	113	12	142
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	6	2	0	7	2	3	0	20	3	9	2
Cap, veh/h	345	2377		195	2358	1057	171	10	189	93	7	69
Arrive On Green	0.08	0.69	0.00	0.08	0.69	0.68	0.13	0.14	0.14	0.13	0.14	0.13
Sat Flow, veh/h	1795	3441	1585	1810	3413	1552	836	70	1353	384	47	489
Grp Volume(v), veh/h	174	2625	0	10	1488	40	48	0	15	267	0	0
Grp Sat Flow(s),veh/h/ln	1795	1721	1585	1810	1706	1552	906	0	1353	920	0	0
Q Serve(g_s), s	0.0	89.8	0.0	0.0	31.1	1.1	0.0	0.0	1.3	11.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	89.8	0.0	0.0	31.1	1.1	6.2	0.0	1.3	17.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.94		1.00	0.42		0.53
Lane Grp Cap(c), veh/h	345	2377		195	2358	1057	174	0	189	161	0	0
V/C Ratio(X)	0.50	1.10		0.05	0.63	0.04	0.28	0.00	0.08	1.66	0.00	0.00
Avail Cap(c_a), veh/h	345	2377		195	2358	1057	181	0	198	161	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.3	20.1	0.0	55.4	11.0	6.8	51.1	0.0	48.6	60.3	0.0	0.0
Incr Delay (d2), s/veh	0.7	53.9	0.0	0.1	1.3	0.1	0.6	0.0	0.1	321.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.9	66.7	0.0	0.6	16.9	0.7	2.7	0.0	0.8	32.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	74.0	0.0	55.5	12.3	6.8	51.7	0.0	48.7	381.6	0.0	0.0
LnGrp LOS	C	F		E	B	A	D	A	D	F	A	A
Approach Vol, veh/h		2799			1538			63				267
Approach Delay, s/veh		71.4			12.5			51.0				381.6
Approach LOS		E			B			D				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	94.0		22.0	14.0	94.0		22.0				
Change Period (Y+Rc), s	* 4	5.4		4.8	* 4	5.4		* 4.8				
Max Green Setting (Gmax), s	* 10	88.6		17.2	* 10	88.6		* 18				
Max Q Clear Time (g_c+I1), s	2.0	91.8		19.2	2.0	33.1		8.2				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.2	31.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay	69.4
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	37.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	353	2323	1381	157	30	106
Future Vol, veh/h	353	2323	1381	157	30	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	220	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	5	4	4	0	5
Mvmt Flow	368	2420	1439	164	31	110

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1603	0	-	0	3467 802
Stage 1	-	-	-	-	1521 -
Stage 2	-	-	-	-	1946 -
Critical Hdwy	4.14	-	-	-	6.8 7
Critical Hdwy Stg 1	-	-	-	-	5.8 -
Critical Hdwy Stg 2	-	-	-	-	5.8 -
Follow-up Hdwy	2.22	-	-	-	3.5 3.35
Pot Cap-1 Maneuver	404	-	-	-	~5 321
Stage 1	-	-	-	-	170 -
Stage 2	-	-	-	-	100 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	404	-	-	-	0 321
Mov Cap-2 Maneuver	-	-	-	-	~12 -
Stage 1	-	-	-	-	~15 -
Stage 2	-	-	-	-	100 -

Approach	EB	WB	SB
HCM Control Delay, s	7.6	0	\$ 1059.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	404	-	-	-	48
HCM Lane V/C Ratio	0.91	-	-	-	2.951
HCM Control Delay (s)	57.4	-	-	-	\$ 1059.8
HCM Lane LOS	F	-	-	-	F
HCM 95th %tile Q(veh)	9.7	-	-	-	15.2

Notes
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Future Traffic Conditions - No Sunrise
8: Highway 224 & Highway 212

Weekday PM Peak Hour
08/01/2024



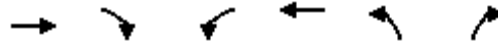
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵↵	↵
Traffic Volume (vph)	1198	1155	352	881	657	248
Future Volume (vph)	1198	1155	352	881	657	248
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.4	2.6	4.6	4.4	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3406	1505	1719	3374	3335	1538
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3406	1505	1719	3374	3335	1538
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1261	1216	371	927	692	261
RTOR Reduction (vph)	0	32	0	0	0	0
Lane Group Flow (vph)	1261	1184	371	927	692	261
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	6%	6%	5%	7%	5%	5%
Turn Type	NA	pm+ov	Prot	NA	Prot	Free
Protected Phases	2	8	1	6	8	
Permitted Phases		2				Free
Actuated Green, G (s)	49.0	88.6	26.0	79.0	39.6	130.0
Effective Green, g (s)	50.0	90.6	27.4	80.4	40.6	130.0
Actuated g/C Ratio	0.38	0.70	0.21	0.62	0.31	1.00
Clearance Time (s)	6.0	5.4	4.0	6.0	5.4	
Vehicle Extension (s)	4.8	2.5	3.5	4.8	2.5	
Lane Grp Cap (vph)	1310	1099	362	2086	1041	1538
v/s Ratio Prot	0.37	c0.34	c0.22	0.27	0.21	
v/s Ratio Perm		0.45				0.17
v/c Ratio	0.96	1.08	1.02	0.44	0.66	0.17
Uniform Delay, d1	39.1	19.7	51.3	13.0	38.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.4	50.5	53.8	0.7	1.5	0.2
Delay (s)	56.5	70.2	105.1	13.7	40.2	0.2
Level of Service	E	E	F	B	D	A
Approach Delay (s)	63.2			39.9	29.3	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - No Sunrise
8: Highway 224 & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵↵	↵
Traffic Volume (veh/h)	1198	1155	352	881	657	248
Future Volume (veh/h)	1198	1155	352	881	657	248
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1811	1811	1826	1796	1826	1826
Adj Flow Rate, veh/h	1261	1216	371	927	692	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	5	7	5	5
Cap, veh/h	1323	936	476	2378	789	
Arrive On Green	0.38	0.38	0.27	0.70	0.23	0.00
Sat Flow, veh/h	3532	1500	1739	3503	3374	1547
Grp Volume(v), veh/h	1261	1216	371	927	692	0
Grp Sat Flow(s),veh/h/ln	1721	1500	1739	1706	1687	1547
Q Serve(g_s), s	46.3	50.0	25.6	14.7	25.7	0.0
Cycle Q Clear(g_c), s	46.3	50.0	25.6	14.7	25.7	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1323	936	476	2378	789	
V/C Ratio(X)	0.95	1.30	0.78	0.39	0.88	
Avail Cap(c_a), veh/h	1323	936	476	2378	1054	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	38.9	19.0	43.6	8.2	48.0	0.0
Incr Delay (d2), s/veh	15.8	142.6	8.3	0.5	6.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	29.8	96.8	17.8	9.1	17.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.6	161.6	51.9	8.7	54.2	0.0
LnGrp LOS	D	F	D	A	D	
Approach Vol, veh/h	2477			1298	692	
Approach Delay, s/veh	107.1			21.0	54.2	
Approach LOS	F			C	D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	40.2	55.0			95.2	34.8
Change Period (Y+Rc), s	6.0	* 6			6.0	5.4
Max Green Setting (Gmax), s	26.0	* 49			79.0	39.6
Max Q Clear Time (g_c+I1), s	27.6	52.0			16.7	27.7
Green Ext Time (p_c), s	0.0	0.0			17.0	1.7

Intersection Summary

HCM 6th Ctrl Delay	73.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - No Sunrise
9: 172nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	455	775	51	32	726	123	27	91	35	351	134	414
Future Volume (vph)	455	775	51	32	726	123	27	91	35	351	134	414
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.3		3.5	4.3	5.5	4.0	3.0		5.2	4.2	5.2
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3294		1805	1792	1482	1624	1753		1787	1810	1487
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.59	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1719	3294		1805	1792	1482	1013	1753		1100	1810	1487
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	484	824	54	34	772	131	29	97	37	373	143	440
RTOR Reduction (vph)	0	3	0	0	0	71	0	10	0	0	0	239
Lane Group Flow (vph)	484	875	0	34	772	60	29	124	0	373	143	201
Confl. Peds. (#/hr)							6					6
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	9%	2%	0%	6%	9%	10%	3%	4%	1%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	20.5	75.8		5.0	60.3	60.3	36.0	36.0		34.8	34.8	34.8
Effective Green, g (s)	21.5	78.0		6.0	62.5	61.3	37.0	38.0		35.8	36.8	35.8
Actuated g/C Ratio	0.16	0.59		0.05	0.47	0.46	0.28	0.29		0.27	0.28	0.27
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	6.2
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	278	1934		81	843	684	282	501		296	501	400
v/s Ratio Prot	c0.28	0.27		0.02	c0.43			0.07			0.08	
v/s Ratio Perm						0.04	0.03			c0.34		0.14
v/c Ratio	1.74	0.45		0.42	0.92	0.09	0.10	0.25		1.26	0.29	0.50
Uniform Delay, d1	55.7	15.4		61.7	32.7	20.1	35.6	36.4		48.5	37.7	41.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	348.0	0.4		2.0	15.3	0.1	0.1	0.2		141.4	0.2	0.7
Delay (s)	403.7	15.8		63.7	48.0	20.2	35.7	36.6		189.9	37.9	41.7
Level of Service	F	B		E	D	C	D	D		F	D	D
Approach Delay (s)		153.6			44.7			36.4			99.0	
Approach LOS		F			D			D			F	

Intersection Summary		
HCM 2000 Control Delay	102.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.16	F
Actuated Cycle Length (s)	132.8	Sum of lost time (s)
Intersection Capacity Utilization	104.4%	12.0
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Future Traffic Conditions - No Sunrise
9: 172nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	455	775	51	32	726	123	27	91	35	351	134	414
Future Volume (veh/h)	455	775	51	32	726	123	27	91	35	351	134	414
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1767	1870	1900	1811	1767	1752	1856	1841	1885	1826	1826
Adj Flow Rate, veh/h	484	824	54	34	772	0	29	97	37	373	143	440
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	5	9	2	0	6	9	10	3	4	1	5	5
Cap, veh/h	285	1905	125	57	839		220	356	136	323	513	418
Arrive On Green	0.16	0.60	0.58	0.03	0.46	0.00	0.27	0.28	0.27	0.27	0.28	0.27
Sat Flow, veh/h	1739	3198	210	1810	1811	1497	776	1266	483	1256	1826	1530
Grp Volume(v), veh/h	484	432	446	34	772	0	29	0	134	373	143	440
Grp Sat Flow(s),veh/h/ln	1739	1678	1729	1810	1811	1497	776	0	1749	1256	1826	1530
Q Serve(g_s), s	21.5	18.4	18.5	2.4	52.2	0.0	4.0	0.0	7.8	28.0	8.0	35.8
Cycle Q Clear(g_c), s	21.5	18.4	18.5	2.4	52.2	0.0	12.0	0.0	7.8	35.8	8.0	35.8
Prop In Lane	1.00		0.12	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	285	1000	1030	57	839		220	0	492	323	513	418
V/C Ratio(X)	1.70	0.43	0.43	0.59	0.92		0.13	0.00	0.27	1.15	0.28	1.05
Avail Cap(c_a), veh/h	285	1000	1030	228	867		221	0	494	323	513	418
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.7	14.4	14.5	62.6	32.9	0.0	42.2	0.0	36.9	53.9	36.7	47.6
Incr Delay (d2), s/veh	327.6	0.8	0.8	5.8	15.6	0.0	0.2	0.0	0.2	98.9	0.2	58.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	55.0	11.5	11.8	2.2	34.4	0.0	1.4	0.0	6.2	29.3	6.6	28.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	382.3	15.2	15.3	68.4	48.5	0.0	42.4	0.0	37.1	152.8	36.9	105.8
LnGrp LOS	F	B	B	E	D		D	A	D	F	D	F
Approach Vol, veh/h		1362			806			163				956
Approach Delay, s/veh		145.7			49.3			38.1				113.8
Approach LOS		F			D			D				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	82.3		41.0	25.0	65.0		41.0				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	15.5	60.5		34.8	20.5	60.5		* 35				
Max Q Clear Time (g_c+I1), s	4.4	20.5		37.8	23.5	54.2		14.0				
Green Ext Time (p_c), s	0.0	15.4		0.0	0.0	4.2		0.7				

Intersection Summary

HCM 6th Ctrl Delay	107.5
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	22.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕			↕			↖	↗
Traffic Vol, veh/h	83	903	0	0	351	46	0	0	0	104	0	46
Future Vol, veh/h	83	903	0	0	351	46	0	0	0	104	0	46
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	12	5	0	0	4	5	0	50	0	12	0	13
Mvmt Flow	89	971	0	0	377	49	0	0	0	112	0	49

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	426	0	0	972	0	0	1577	1576	972	1551	1552	403
Stage 1	-	-	-	-	-	-	1150	1150	-	402	402	-
Stage 2	-	-	-	-	-	-	427	426	-	1149	1150	-
Critical Hdwy	4.22	-	-	4.1	-	-	7.1	7	6.2	7.22	6.5	6.33
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6	-	6.22	5.5	-
Follow-up Hdwy	2.308	-	-	2.2	-	-	3.5	4.45	3.3	3.608	4	3.417
Pot Cap-1 Maneuver	1082	-	-	717	-	-	90	86	309	~ 88	115	624
Stage 1	-	-	-	-	-	-	243	223	-	605	604	-
Stage 2	-	-	-	-	-	-	610	512	-	231	275	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1082	-	-	716	-	-	77	79	309	~ 82	105	623
Mov Cap-2 Maneuver	-	-	-	-	-	-	77	79	-	~ 82	105	-
Stage 1	-	-	-	-	-	-	223	204	-	555	604	-
Stage 2	-	-	-	-	-	-	561	512	-	212	252	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0	0	221.3
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1082	-	-	716	-	-	82	623
HCM Lane V/C Ratio	-	0.082	-	-	-	-	-	1.364	0.079
HCM Control Delay (s)	0	8.6	-	-	0	-	-	\$ 314.2	11.3
HCM Lane LOS		A	A	-	-	A	-	F	B
HCM 95th %tile Q(veh)	-	0.3	-	-	0	-	-	8.6	0.3

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_PM_NoBuild.vistro

Scenario 1 VistroScenario

Report File: H:\...\2045_NoBuildPM.pdf

3/17/2025

Intersection Analysis Summary




ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	SB Right	0.885	29.5	C
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	EB Thru	1.153	108.6	F
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.595	13.4	B
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	EB Left	0.686	35.5	D
5	135th Avneue/OR 212	Signalized	HCM 7th Edition	EB Left	1.090	89.0	F
6	142nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.953	31.1	C
7	152nd Avenue/OR 212	Two-way stop	HCM 7th Edition	SB Left	8.428	4,557.4	F
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.760	28.0	C
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Thru	0.894	51.3	D
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.697	86.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	29.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	117	1	404	0	1775	492	23	1264	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	4.00	2.00	2.00	0.00	5.00	5.00	13.00	4.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	117	1	404	0	1775	492	23	1264	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700	1.0000	0.9700	0.9700	0.9700	0.9700	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	30	0	104	0	457	127	6	326	0
Total Analysis Volume [veh/h]	0	0	0	121	1	416	0	1830	507	24	1303	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	128.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	32	0	32	0	74	74	9	87	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	6.0	6.0	20.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	37	0	37	0	80	80	13	93	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		130	130	130	130	130	130
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		32	32	81	81	2	87
g / C, Green / Cycle		0.24	0.24	0.62	0.62	0.02	0.67
(v / s)_i Volume / Saturation Flow Rate		0.07	0.26	0.53	0.33	0.01	0.37
s, saturation flow rate [veh/h]		1752	1589	3475	1551	1624	3503
c, Capacity [veh/h]		425	385	2154	961	30	2344
d1, Uniform Delay [s]		40.08	49.25	19.85	13.96	63.54	11.33
k, delay calibration		0.07	0.46	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.22	67.28	4.44	2.07	23.92	0.96
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.28	1.08	0.85	0.53	0.79	0.56
d, Delay for Lane Group [s/veh]		40.30	116.53	24.29	16.03	87.46	12.28
Lane Group LOS		D	F	C	B	F	B
Critical Lane Group		No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]		3.21	19.64	22.26	8.71	0.99	9.71
50th-Percentile Queue Length [ft/ln]		80.19	491.10	556.61	217.75	24.86	242.77
95th-Percentile Queue Length [veh/ln]		5.77	28.14	30.00	13.55	1.79	14.82
95th-Percentile Queue Length [ft/ln]		144.34	703.52	750.07	338.76	44.75	370.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	40.30	0.00	116.53	0.00	24.29	16.03	87.46	12.28	0.00
Movement LOS				D		F		C	B	F	B	
d_A, Approach Delay [s/veh]	0.00			99.35			22.50			13.64		
Approach LOS	A			F			C			B		
d_I, Intersection Delay [s/veh]	29.52											
Intersection LOS	C											
Intersection V/C	0.885											

Emissions

Vehicle Miles Traveled [mph]		23.42	80.50	579.70	160.61	3.78	205.45
Stops [stops/h]		88.82	543.97	1233.06	241.20	27.54	537.81
Fuel consumption [US gal/h]		2.45	16.18	39.72	9.60	0.74	14.69
CO [g/h]		171.05	1131.16	2776.59	670.90	51.38	1026.55
NOx [g/h]		33.28	220.08	540.22	130.53	10.00	199.73
VOC [g/h]		39.64	262.16	643.50	155.49	11.91	237.91

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	485	1138	1338
d_b, Bicycle Delay [s]	65.00	37.32	12.06	7.11
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	3.488	2.654
Bicycle LOS	D	A	C	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	108.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.153

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	423	8	236	18	0	340	509	1383	0	0	525	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	12.00	17.00	10.00	0.00	5.00	2.00	6.00	0.00	0.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	0	0	0	55
Total Hourly Volume [veh/h]	423	8	235	18	0	340	509	1383	0	0	525	186
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	114	2	63	5	0	91	137	372	0	0	141	50
Total Analysis Volume [veh/h]	455	9	253	19	0	366	547	1487	0	0	565	200
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	20.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Split	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	21	31	31	8	0	18	44	75	0	0	27	27
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	20.0	6.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	26	37	37	13	0	23	48	81	0	0	33	33
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	20	25	7	66	50	81	27	27
g / C, Green / Cycle	0.15	0.19	0.05	0.51	0.38	0.62	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.13	0.18	0.01	0.13	0.31	0.82	0.21	0.23
s, saturation flow rate [veh/h]	3375	1469	1667	2746	1781	1810	1840	1685
c, Capacity [veh/h]	515	284	92	1398	681	1124	382	350
d1, Uniform Delay [s]	53.97	51.49	58.72	18.08	35.78	24.64	51.52	51.52
k, delay calibration	0.07	0.21	0.07	0.07	0.50	0.50	0.42	0.47
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.29	19.89	0.67	0.06	9.70	151.68	42.56	74.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.92	0.21	0.26	0.80	1.32	1.00	1.09
d, Delay for Lane Group [s/veh]	57.26	71.39	59.40	18.14	45.48	176.33	94.08	125.74
Lane Group LOS	E	E	E	B	D	F	F	F
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.52	9.94	0.62	3.15	17.15	79.32	16.92	18.57
50th-Percentile Queue Length [ft/ln]	188.10	248.57	15.45	78.68	428.67	1983.06	423.09	464.26
95th-Percentile Queue Length [veh/ln]	12.02	15.11	1.11	5.67	23.94	115.73	23.69	26.91
95th-Percentile Queue Length [ft/ln]	300.57	377.86	27.81	141.63	598.45	2893.34	592.16	672.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	57.26	71.39	71.39	59.40	0.00	18.14	45.48	176.33	0.00	0.00	104.30	125.74
Movement LOS	E	E	E	E		B	D	F			F	F
d_A, Approach Delay [s/veh]	62.42			20.18			141.14			109.91		
Approach LOS	E			C			F			F		
d_I, Intersection Delay [s/veh]	108.61											
Intersection LOS	F											
Intersection V/C	1.153											

Emissions

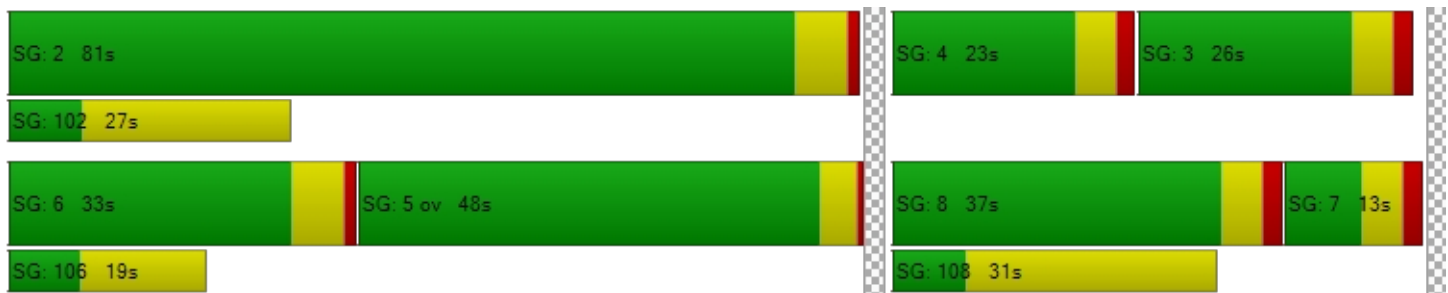
Vehicle Miles Traveled [mph]	95.31	54.88	3.51	67.68	86.25	234.46	95.83	95.83
Stops [stops/h]	416.67	275.31	17.11	174.29	474.78	2196.36	468.60	514.20
Fuel consumption [US gal/h]	11.53	7.59	0.47	5.10	11.24	75.13	13.86	16.57
CO [g/h]	805.72	530.26	32.77	356.50	785.36	5251.85	968.50	1158.34
NOx [g/h]	156.76	103.17	6.38	69.36	152.80	1021.82	188.44	225.37
VOC [g/h]	186.73	122.89	7.59	82.62	182.01	1217.17	224.46	268.46

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		0.0		11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	54.47		54.47		0.00		54.47
I_p,int, Pedestrian LOS Score for Intersectio	2.193		2.440		0.000		2.875
Crosswalk LOS	B		B		F		C
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	485		115		1154		415
d_b, Bicycle Delay [s]	37.32		57.72		11.64		40.81
I_b,int, Bicycle LOS Score for Intersection	2.744		1.560		4.916		2.236
Bicycle LOS	B		A		E		B

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.595

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	0	0	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	225	766	1327	425
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	6.00	1.00	7.00	4.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	225	766	1327	425
Peak Hour Factor	1.0000	1.0000	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	60	206	357	114
Total Analysis Volume [veh/h]	0	0	242	824	1427	457
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	22	89	63	63
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	20.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	26	96	70	70
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	20	116	92	92
g / C, Green / Cycle	0.15	0.89	0.71	0.71
(v / s)_i Volume / Saturation Flow Rate	0.14	0.23	0.42	0.29
s, saturation flow rate [veh/h]	1724	3589	3418	1564
c, Capacity [veh/h]	266	3200	2414	1105
d1, Uniform Delay [s]	54.08	0.99	9.62	7.91
k, delay calibration	0.29	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.79	0.20	1.07	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.91	0.26	0.59	0.41
d, Delay for Lane Group [s/veh]	78.88	1.19	10.69	9.06
Lane Group LOS	E	A	B	A
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.62	0.63	9.79	5.32
50th-Percentile Queue Length [ft/ln]	240.43	15.79	244.83	133.09
95th-Percentile Queue Length [veh/ln]	14.70	1.14	14.93	9.11
95th-Percentile Queue Length [ft/ln]	367.58	28.43	373.14	227.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	78.88	1.19	10.69	9.06
Movement LOS			E	A	B	A
d_A, Approach Delay [s/veh]	0.00		18.82		10.29	
Approach LOS	A		B		B	
d_I, Intersection Delay [s/veh]	13.38					
Intersection LOS	B					
Intersection V/C	0.595					

Emissions

Vehicle Miles Traveled [mph]		335.38	1141.95	357.51	114.49
Stops [stops/h]		266.33	34.99	542.40	147.42
Fuel consumption [US gal/h]		19.16	47.40	20.82	6.37
CO [g/h]		1339.40	3313.43	1455.17	445.27
NOx [g/h]		260.60	644.67	283.12	86.63
VOC [g/h]		310.42	767.92	337.25	103.20

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1369	969
d_b, Bicycle Delay [s]	65.00	6.47	17.27
I_b,int, Bicycle LOS Score for Intersection	4.132	2.439	3.114
Bicycle LOS	D	B	C

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐⇐⇐			⇐⇐⇐			⇐⇐⇐⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	27	148	17	814	237	59	52	700	55	18	741	791
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	5.00	5.00	4.00	13.00	2.00	6.00	5.00	16.00	5.00	8.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	17	0	0	59	0	0	55	0	0	396
Total Hourly Volume [veh/h]	27	148	0	814	237	0	52	700	0	18	741	395
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	38	0	210	61	0	13	180	0	5	191	102
Total Analysis Volume [veh/h]	28	153	0	839	244	0	54	722	0	19	764	407
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			1			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			1		
v_co, Outbound Pedestrian Volume crossing	1			4			4			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			4			4			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	34.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	6	35	35	26	55	55	5	46	46	5	46	46
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	10	40	40	30	60	60	9	51	51	9	51	51
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.80	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	0.00	2.80	2.80	2.00	3.40	3.40	2.00	3.40	3.40
g_i, Effective Green Time [s]	7	14	33	33	33	5	70	70	2	67	67
g / C, Green / Cycle	0.05	0.10	0.25	0.25	0.25	0.04	0.54	0.54	0.02	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.02	0.08	0.26	0.14	0.00	0.03	0.20	0.20	0.01	0.23	0.26
s, saturation flow rate [veh/h]	1709	1825	3252	1705	1589	1724	1825	1825	1738	3389	1589
c, Capacity [veh/h]	91	192	844	429	400	66	984	984	27	1750	821
d1, Uniform Delay [s]	59.20	56.80	48.64	42.47	0.00	62.04	17.20	17.20	63.70	19.63	20.44
k, delay calibration	0.07	0.07	0.07	0.07	0.07	0.12	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.14	4.62	9.95	0.73	0.00	21.81	1.06	1.06	11.91	0.79	2.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.80	0.99	0.57	0.00	0.81	0.37	0.37	0.71	0.44	0.50
d, Delay for Lane Group [s/veh]	60.35	61.42	58.59	43.20	0.00	83.85	18.25	18.25	75.61	20.43	22.58
Lane Group LOS	E	E	E	D	A	F	B	B	E	C	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.92	5.16	14.62	6.97	0.00	2.18	6.47	6.47	0.72	7.38	8.46
50th-Percentile Queue Length [ft/ln]	22.99	129.08	365.40	174.14	0.00	54.41	161.73	161.73	17.91	184.45	211.44
95th-Percentile Queue Length [veh/ln]	1.66	8.89	20.89	11.29	0.00	3.92	10.64	10.64	1.29	11.83	13.23
95th-Percentile Queue Length [ft/ln]	41.39	222.24	522.15	282.35	0.00	97.94	266.02	266.02	32.24	295.82	330.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	60.35	61.42	61.42	58.59	43.20	0.00	83.85	18.25	18.25	75.61	20.43	22.58
Movement LOS	E	E	E	E	D	A	F	B	B	E	C	C
d_A, Approach Delay [s/veh]	61.26			55.12			22.82			22.04		
Approach LOS	E			E			C			C		
d_I, Intersection Delay [s/veh]	35.52											
Intersection LOS	D											
Intersection V/C	0.686											

Emissions

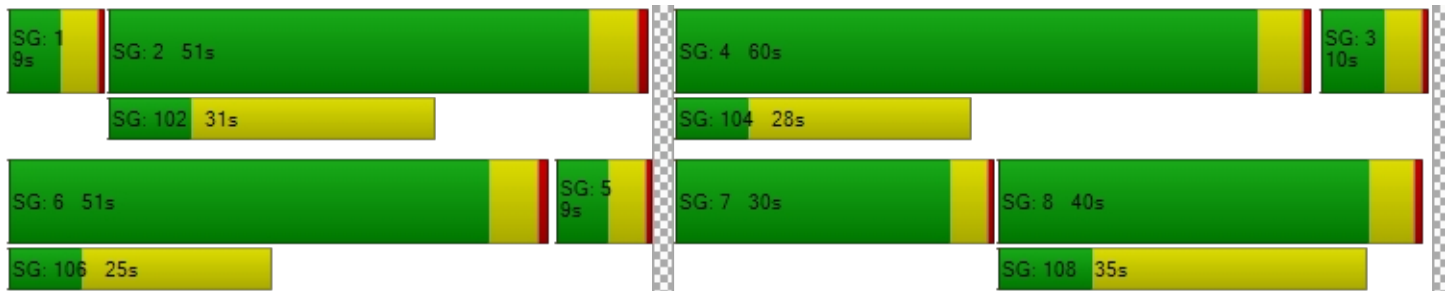
Vehicle Miles Traveled [mph]	6.31	34.48	193.72	56.34	0.00	48.54	324.48	324.48	12.53	503.72	268.34
Stops [stops/h]	25.47	142.98	809.50	192.89	0.00	60.27	179.15	179.15	19.84	408.63	234.21
Fuel consumption [US gal/h]	0.74	4.12	22.45	5.53	0.00	3.25	15.69	15.69	0.92	26.17	14.21
CO [g/h]	52.02	288.09	1569.18	386.53	0.00	227.34	1096.60	1096.60	64.14	1829.25	993.31
NOx [g/h]	10.12	56.05	305.31	75.20	0.00	44.23	213.36	213.36	12.48	355.91	193.26
VOC [g/h]	12.06	66.77	363.67	89.58	0.00	52.69	254.15	254.15	14.87	423.95	230.21

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		11.0		13.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.55		54.47		54.47		52.65	
I_p,int, Pedestrian LOS Score for Intersectio	2.149		2.904		2.724		3.623	
Crosswalk LOS	B		C		B		D	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	542		849		702		702	
d_b, Bicycle Delay [s]	34.57		21.52		27.40		27.40	
I_b,int, Bicycle LOS Score for Intersection	1.886		3.444		2.245		2.868	
Bicycle LOS	A		C		B		C	

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	89.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.090

Intersection Setup

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	300.00	100.00	60.00	320.00	100.00	100.00	415.00	100.00	60.00	200.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	67	139	754	286	210	157	109	1437	22	186	1210	141
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	1.00	5.00	3.00	3.00	4.00	1.00	6.00	4.00	3.00	7.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	377	0	0	52	0	0	11	0	0	141
Total Hourly Volume [veh/h]	67	139	377	286	210	105	109	1437	11	186	1210	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	36	97	74	54	27	28	370	3	48	312	0
Total Analysis Volume [veh/h]	69	143	389	295	216	108	112	1481	11	192	1247	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			2			2			2		
v_di, Inbound Pedestrian Volume crossing m	2			2			2			2		
v_co, Outbound Pedestrian Volume crossing	1			1			2			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			2			1			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	98.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	8	45	45	14	51	51	6	45	45	9	48	48
Amber [s]	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	8	8	0	10	10	0	8	8	0	7	7
Pedestrian Clearance [s]	0	22	22	0	25	25	0	18	18	0	14	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.5	2.5	2.0	2.5	2.5	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	10	35	35	24	49	49	11	54	54	17	60	60
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	3.0	3.0	2.3	3.0	3.0	2.3	4.5	4.5	2.3	4.5	4.5
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.50	4.50	4.00	4.50	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.50	2.50	2.00	2.50	2.00	3.40	3.40	2.00	3.40	3.40
g_i, Effective Green Time [s]	6	31	31	20	44	7	49	49	13	55	55
g / C, Green / Cycle	0.05	0.23	0.23	0.15	0.34	0.05	0.37	0.37	0.10	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.25	0.17	0.19	0.06	0.43	0.01	0.11	0.35	0.35
s, saturation flow rate [veh/h]	1695	1885	1551	1767	1750	1795	3446	1556	1767	1795	1795
c, Capacity [veh/h]	78	442	364	269	597	97	1293	584	177	756	756
d1, Uniform Delay [s]	61.65	41.20	49.75	55.09	34.64	61.50	40.62	25.56	58.50	33.36	33.36
k, delay calibration	0.09	0.11	0.25	0.49	0.11	0.41	0.50	0.50	0.45	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.13	0.42	53.48	81.92	0.77	132.23	75.10	0.06	89.29	9.94	9.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.32	1.07	1.09	0.54	1.16	1.15	0.02	1.09	0.82	0.82
d, Delay for Lane Group [s/veh]	83.78	41.62	103.23	137.01	35.41	193.73	115.72	25.62	147.79	43.30	43.30
Lane Group LOS	F	D	F	F	D	F	F	C	F	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.75	3.88	17.18	14.94	8.43	6.75	33.86	0.23	10.19	19.32	19.32
50th-Percentile Queue Length [ft/ln]	68.78	97.05	429.54	373.46	210.84	168.66	846.61	5.70	254.86	482.97	482.97
95th-Percentile Queue Length [veh/ln]	4.95	6.99	24.90	22.22	13.20	11.48	47.59	0.41	15.94	26.53	26.53
95th-Percentile Queue Length [ft/ln]	123.80	174.69	622.56	555.38	329.91	286.97	1189.73	10.25	398.61	663.18	663.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	83.78	41.62	103.23	137.01	35.41	35.41	193.73	115.72	25.62	147.79	43.30	43.30
Movement LOS	F	D	F	F	D	D	F	F	C	F	D	D
d_A, Approach Delay [s/veh]	86.34			83.83			120.55			57.24		
Approach LOS	F			F			F			E		
d_I, Intersection Delay [s/veh]	89.02											
Intersection LOS	F											
Intersection V/C	1.090											

Emissions

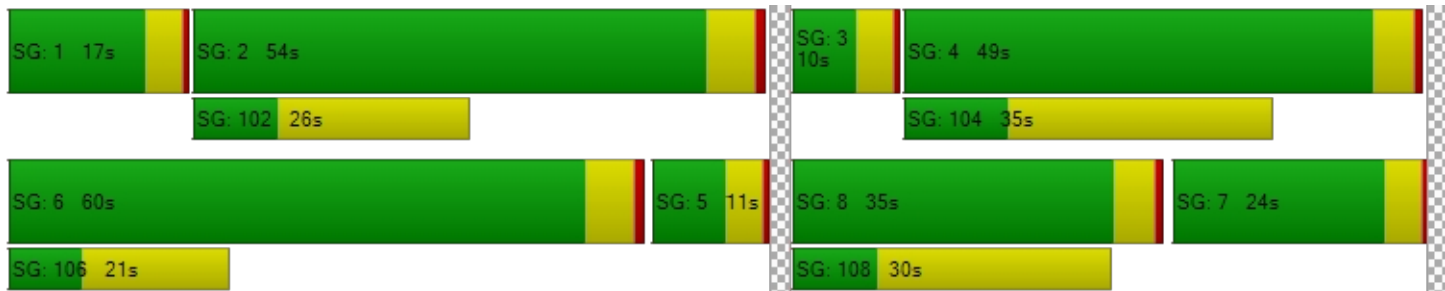
Vehicle Miles Traveled [mph]	13.50	27.98	76.12	36.54	40.14	73.84	976.44	7.25	67.79	220.14	220.14
Stops [stops/h]	76.18	107.50	475.80	413.68	233.55	186.82	1875.56	6.31	282.30	534.98	534.98
Fuel consumption [US gal/h]	2.15	2.96	13.93	12.01	5.28	8.49	85.43	0.39	10.12	17.51	17.51
CO [g/h]	150.49	206.68	973.90	839.74	368.86	593.21	5971.45	27.31	707.65	1224.03	1224.03
NOx [g/h]	29.28	40.21	189.48	163.38	71.77	115.42	1161.83	5.31	137.68	238.15	238.15
VOC [g/h]	34.88	47.90	225.71	194.62	85.49	137.48	1383.94	6.33	164.00	283.68	283.68

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0			11.0			14.0			12.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	53.55			54.47			51.75			53.55		
I_p,int, Pedestrian LOS Score for Intersectio	3.028			2.379			2.986			3.321		
Crosswalk LOS	C			B			C			C		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	469			685			748			840		
d_b, Bicycle Delay [s]	38.08			28.12			25.48			21.87		
I_b,int, Bicycle LOS Score for Intersection	3.173			2.667			2.892			2.863		
Bicycle LOS	C			B			C			C		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: 142nd Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.953

Intersection Setup

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	20.00	100.00	100.00	100.00	225.00	100.00	165.00	220.00	100.00	70.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	37	3	15	123	11	129	152	2278	65	10	1366	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	20.00	3.00	9.00	2.00	1.00	6.00	2.00	2.00	7.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	8	0	0	2	0	0	33	0	0	22
Total Hourly Volume [veh/h]	37	3	7	123	11	127	152	2278	32	10	1366	22
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	1	2	32	3	33	39	587	8	3	352	6
Total Analysis Volume [veh/h]	38	3	7	127	11	131	157	2348	33	10	1408	23
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			1		
v_di, Inbound Pedestrian Volume crossing m	1			0			0			1		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	121.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	33	33	33	32	32	32	11	78	78	6	72	72
Amber [s]	3.5	3.5	3.5	4.3	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	7	7	7	0	0	0	0	8	8	0	7	7
Pedestrian Clearance [s]	26	26	26	0	0	0	0	26	26	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.8	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	37	37	37	37	37	37	15	84	84	10	78	78
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.3	4.5	4.5	2.3	4.5	4.5
Minimum Recall		No			No		No	Yes		No	No	
Maximum Recall		No			No		No	No		No	Yes	
Pedestrian Recall		No			No		No	No		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.00	4.80	4.70	5.40	5.40	4.70	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.80	0.00	3.40	3.40	0.00	3.40	3.40
g_i, Effective Green Time [s]	26	26	26	96	89	89	96	86	86
g / C, Green / Cycle	0.20	0.20	0.20	0.73	0.68	0.68	0.73	0.66	0.66
(v / s)_i Volume / Saturation Flow Rate	0.04	0.01	0.18	0.29	0.68	0.02	0.03	0.41	0.01
s, saturation flow rate [veh/h]	1030	1356	1470	547	3446	1589	296	3418	1589
c, Capacity [veh/h]	236	277	332	332	2354	1086	146	2261	1052
d1, Uniform Delay [s]	42.14	41.39	50.82	30.69	20.47	6.66	56.64	12.65	7.55
k, delay calibration	0.08	0.08	0.13	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	0.03	5.51	4.78	17.91	0.05	0.90	1.30	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	0.03	0.81	0.47	1.00	0.03	0.07	0.62	0.02
d, Delay for Lane Group [s/veh]	42.40	41.42	56.33	35.47	38.38	6.71	57.54	13.96	7.59
Lane Group LOS	D	D	E	D	D	A	E	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.10	0.18	9.08	1.59	37.32	0.30	0.10	11.56	0.23
50th-Percentile Queue Length [ft/ln]	27.56	4.60	227.10	39.82	932.99	7.59	2.60	289.00	5.71
95th-Percentile Queue Length [veh/ln]	1.98	0.33	14.03	2.87	47.34	0.55	0.19	17.14	0.41
95th-Percentile Queue Length [ft/ln]	49.60	8.28	350.68	71.67	1183.46	13.66	4.68	428.40	10.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.40	42.40	41.42	56.33	56.33	56.33	35.47	38.38	6.71	57.54	13.96	7.59
Movement LOS	D	D	D	E	E	E	D	D	A	E	B	A
d_A, Approach Delay [s/veh]	42.25			56.33			37.79			14.16		
Approach LOS	D			E			D			B		
d_I, Intersection Delay [s/veh]	31.07											
Intersection LOS	C											
Intersection V/C	0.953											

Emissions

Vehicle Miles Traveled [mph]	5.04	0.86	36.51	52.49	785.05	11.03	4.80	675.89	11.04
Stops [stops/h]	30.53	5.10	251.56	44.10	2066.91	8.40	2.88	640.24	6.33
Fuel consumption [US gal/h]	0.73	0.12	5.98	3.54	62.08	0.55	0.33	35.36	0.52
CO [g/h]	51.01	8.57	417.74	247.27	4339.13	38.15	23.11	2471.66	36.70
NOx [g/h]	9.92	1.67	81.28	48.11	844.24	7.42	4.50	480.89	7.14
VOC [g/h]	11.82	1.99	96.81	57.31	1005.64	8.84	5.36	572.83	8.50

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.55	54.47	0.00	54.47
I_p,int, Pedestrian LOS Score for Intersectio	2.028	2.171	0.000	3.325
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	508	495	1209	1117
d_b, Bicycle Delay [s]	36.19	36.79	10.16	12.67
I_b,int, Bicycle LOS Score for Intersection	1.652	2.007	3.681	2.767
Bicycle LOS	A	B	D	C

Sequence

Ring 1	2	1	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: 152nd Avenue/OR 212

Control Type:	Two-way stop	Delay (sec / veh):	4,557.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	8.428

Intersection Setup

Name	152nd Ave		Highway 212		Highway 212	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	220.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	152nd Ave		Highway 212		Highway 212	
Base Volume Input [veh/h]	35	118	248	2154	1293	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	5.00	2.00	5.00	4.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	118	248	2154	1293	116
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	31	65	561	337	30
Total Analysis Volume [veh/h]	36	123	258	2244	1347	121
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	8.43	0.35	0.57	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	4557.37	3724.68	22.72	0.00	0.00	0.00
Movement LOS	F	F	C	A	A	A
95th-Percentile Queue Length [veh/ln]	20.52	20.52	3.44	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	512.90	512.90	85.95	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	3913.21		2.34		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	152.11					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	1	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	602	185	1101	1103	273	818
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	5.00	6.00	6.00	5.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	93	0	552	0	0
Total Hourly Volume [veh/h]	602	92	1101	551	273	818
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	158	24	290	145	72	215
Total Analysis Volume [veh/h]	634	97	1159	580	287	861
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	78.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	48	0	42	42	25	71
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	34	0	56	56	40	96
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		Yes	Yes	No	Yes
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	28	28	63	96	24	91
g / C, Green / Cycle	0.21	0.21	0.49	0.74	0.18	0.70
(v / s)_i Volume / Saturation Flow Rate	0.19	0.06	0.34	0.38	0.17	0.25
s, saturation flow rate [veh/h]	3375	1551	3446	1538	1738	3418
c, Capacity [veh/h]	716	329	1674	1137	319	2393
d1, Uniform Delay [s]	49.69	43.04	25.91	7.09	51.87	7.81
k, delay calibration	0.08	0.08	0.50	0.50	0.18	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.95	0.37	2.38	1.63	13.70	0.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.29	0.69	0.51	0.90	0.36
d, Delay for Lane Group [s/veh]	52.64	43.41	28.29	8.72	65.58	8.23
Lane Group LOS	D	D	C	A	E	A
Critical Lane Group	No	No	Yes	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	10.28	2.68	14.24	6.60	10.36	4.70
50th-Percentile Queue Length [ft/ln]	256.96	67.01	356.02	164.89	258.93	117.57
95th-Percentile Queue Length [veh/ln]	15.54	4.82	20.43	10.81	15.63	8.26
95th-Percentile Queue Length [ft/ln]	388.40	120.62	510.74	270.18	390.87	206.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.64	43.41	28.29	8.72	65.58	8.23
Movement LOS	D	D	C	A	E	A
d_A, Approach Delay [s/veh]	51.41		21.76		22.57	
Approach LOS	D		C		C	
d_I, Intersection Delay [s/veh]	28.01					
Intersection LOS	C					
Intersection V/C	0.760					

Emissions

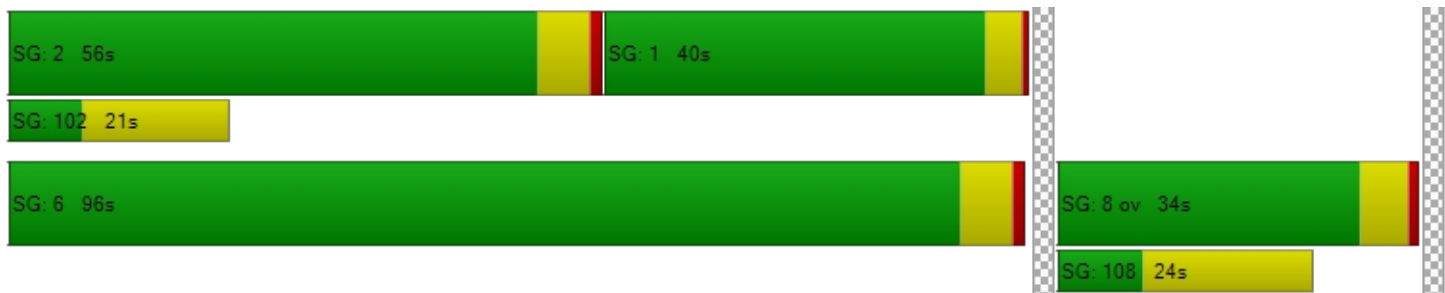
Vehicle Miles Traveled [mph]	207.37	31.73	168.27	84.21	18.27	54.81
Stops [stops/h]	569.26	74.23	788.70	182.64	286.81	260.47
Fuel consumption [US gal/h]	18.47	2.57	17.96	5.51	6.17	5.14
CO [g/h]	1291.21	179.85	1255.14	384.84	431.02	359.12
NOx [g/h]	251.22	34.99	244.20	74.88	83.86	69.87
VOC [g/h]	299.25	41.68	290.89	89.19	99.89	83.23

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	0.00	53.55
I_p,int, Pedestrian LOS Score for Intersectio	2.828	0.000	2.804
Crosswalk LOS	C	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	440	769	1385
d_b, Bicycle Delay [s]	39.55	24.62	6.15
I_b,int, Bicycle LOS Score for Intersection	1.560	3.450	2.507
Bicycle LOS	A	C	B

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	51.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.894

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	29	58	28	245	93	361	337	786	52	24	697	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	10.00	3.00	4.00	1.00	5.00	5.00	5.00	9.00	2.00	2.00	6.00	9.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	16	0	0	181	0	0	52	0	0	37
Total Hourly Volume [veh/h]	29	58	12	245	93	180	337	786	0	24	697	37
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	15	3	65	25	48	90	209	0	6	185	10
Total Analysis Volume [veh/h]	31	62	13	261	99	191	359	836	0	26	741	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			3			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			3			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	133
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	10.7
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	37	37	37	36	36	36	30	74	74	6	51	51
Amber [s]	3.5	3.5	3.5	4.7	4.7	4.7	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	9	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	21	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	4.2	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	6.20	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	4.20	4.20	4.20	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	35	35	33	33	33	29	77	77	2	51	51
g / C, Green / Cycle	0.27	0.27	0.26	0.26	0.26	0.22	0.59	0.59	0.02	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.02	0.04	0.20	0.05	0.12	0.21	0.24	0.24	0.01	0.41	0.03
s, saturation flow rate [veh/h]	1255	1800	1335	1825	1533	1738	1765	1765	1781	1810	1500
c, Capacity [veh/h]	293	477	335	466	392	383	1046	1046	35	709	588
d1, Uniform Delay [s]	41.88	36.70	50.51	38.13	41.13	49.85	14.15	14.15	63.47	39.58	24.71
k, delay calibration	0.08	0.08	0.19	0.08	0.08	0.35	0.28	0.28	0.07	0.48	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	0.11	6.76	0.17	0.70	25.68	0.65	0.65	17.12	45.50	0.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.11	0.16	0.78	0.21	0.49	0.94	0.40	0.40	0.74	1.04	0.07
d, Delay for Lane Group [s/veh]	41.99	36.82	57.27	38.30	41.82	75.53	14.80	14.80	80.59	85.08	24.84
Lane Group LOS	D	D	E	D	D	E	B	B	F	F	C
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.76	1.87	8.96	2.54	5.31	14.19	6.68	6.68	1.03	31.25	0.79
50th-Percentile Queue Length [ft/ln]	18.94	46.70	223.92	63.38	132.65	354.82	167.01	167.01	25.65	781.25	19.63
95th-Percentile Queue Length [veh/ln]	1.36	3.36	13.86	4.56	9.08	20.37	10.92	10.92	1.85	41.75	1.41
95th-Percentile Queue Length [ft/ln]	34.08	84.06	346.62	114.08	227.10	509.27	272.98	272.98	46.17	1043.69	35.34

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.99	36.82	36.82	57.27	38.30	41.82	75.53	14.80	14.80	80.59	85.08	24.84
Movement LOS	D	D	D	E	D	D	E	B	B	F	F	C
d_A, Approach Delay [s/veh]	38.33			48.51			33.04			82.02		
Approach LOS	D			D			C			F		
d_I, Intersection Delay [s/veh]	51.31											
Intersection LOS	D											
Intersection V/C	0.894											

Emissions

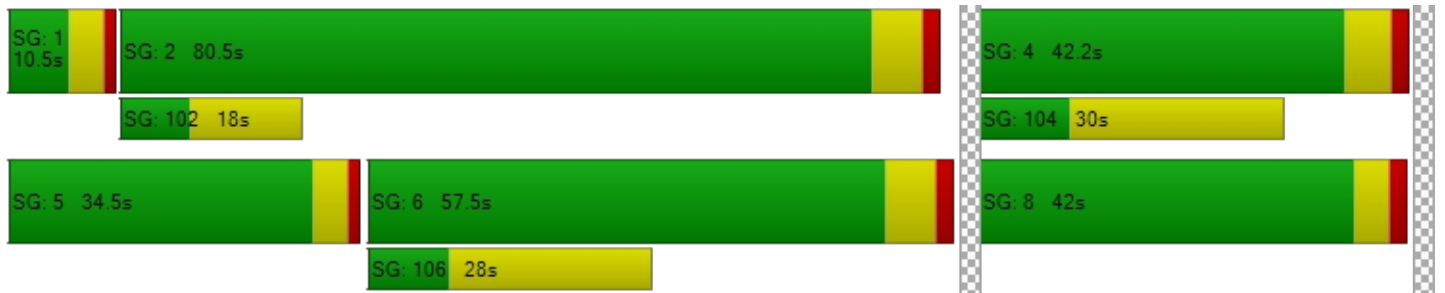
Vehicle Miles Traveled [mph]	3.65	8.82	33.95	12.88	24.84	42.29	49.24	49.24	12.18	346.99	18.26
Stops [stops/h]	20.94	51.66	247.68	70.10	146.73	392.47	184.74	184.74	28.37	864.16	21.72
Fuel consumption [US gal/h]	0.53	1.21	5.81	1.69	3.46	9.43	4.31	4.31	1.08	31.89	1.07
CO [g/h]	37.10	84.61	405.92	118.05	241.78	658.92	301.03	301.03	75.79	2228.89	74.72
NOx [g/h]	7.22	16.46	78.98	22.97	47.04	128.20	58.57	58.57	14.75	433.66	14.54
VOC [g/h]	8.60	19.61	94.08	27.36	56.03	152.71	69.77	69.77	17.57	516.57	17.32

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		12.0		13.0		0.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	54.56		53.65		52.74		0.00	
I_p,int, Pedestrian LOS Score for Intersectio	2.078		2.705		2.847		0.000	
Crosswalk LOS	B		B		C		F	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	568		553		1137		784	
d_b, Bicycle Delay [s]	33.35		34.07		12.12		24.08	
I_b,int, Bicycle LOS Score for Intersection	1.761		2.767		2.588		2.951	
Bicycle LOS	A		C		B		C	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street

Control Type:	Two-way stop	Delay (sec / veh):	86.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.697

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⊕			⊕			⊕			⊕		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	1	1	1	78	1	49	87	677	0	0	329	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	12.00	0.00	13.00	12.00	5.00	0.00	0.00	4.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	1	1	78	1	49	87	677	0	0	329	43
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	21	0	13	23	182	0	0	88	12
Total Analysis Volume [veh/h]	1	1	1	84	1	53	94	728	0	0	354	46
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

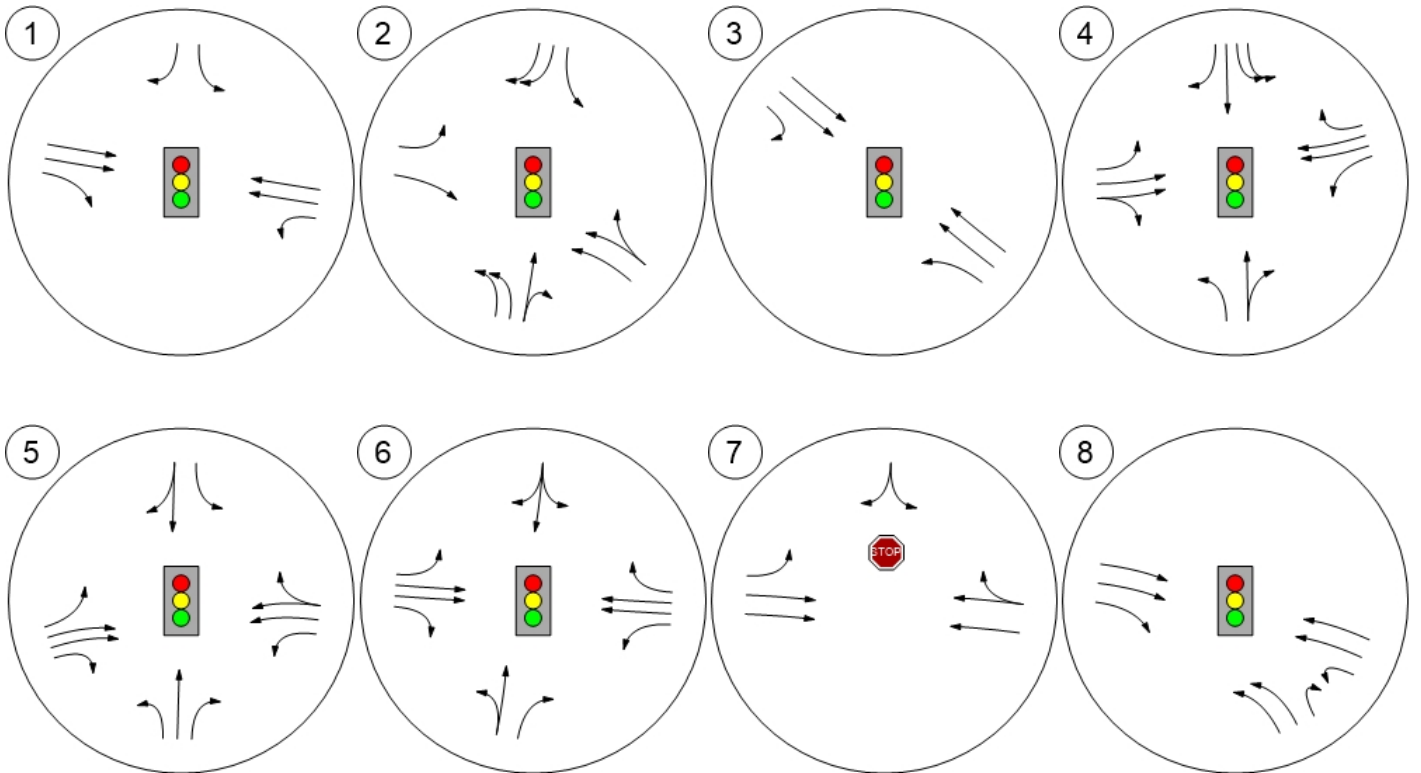
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.70	0.01	0.08	0.08	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	37.32	30.14	13.84	86.08	80.16	11.07	8.56	0.00	0.00	9.07	0.00	0.00
Movement LOS	E	D	B	F	F	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.06	0.06	0.06	3.84	3.84	0.27	0.28	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	1.38	1.38	1.38	95.93	95.93	6.68	6.95	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	27.10			57.23			0.98			0.00		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	6.44											
Intersection LOS	F											

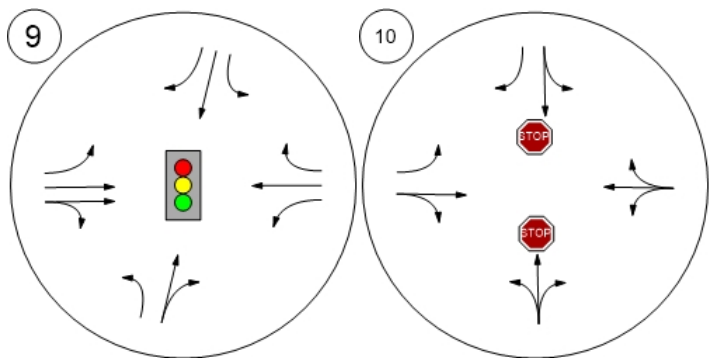
Study Intersections



Lane Configuration and Traffic Control



Lane Configuration and Traffic Control



Appendix C. 2045 Two-Lane Synchro Operations Worksheets

Future Traffic Conditions - Two-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖		↗
Traffic Volume (vph)	0	1377	130	14	2523	0	0	0	0	204	0	272
Future Volume (vph)	0	1377	130	14	2523	0	0	0	0	204	0	272
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3343	1392	1228	3343					1687		1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3343	1392	1228	3343					1687		1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1497	141	15	2742	0	0	0	0	222	0	296
RTOR Reduction (vph)	0	0	44	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	1497	97	15	2742	0	0	0	0	222	0	244
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2							4		4
Actuated Green, G (s)		80.9	80.9	3.2	88.1					20.4		20.4
Effective Green, g (s)		82.9	82.9	3.2	90.1					21.9		21.9
Actuated g/C Ratio		0.69	0.69	0.03	0.75					0.18		0.18
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5		5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3		2.3
Lane Grp Cap (vph)		2309	961	32	2510					307		275
v/s Ratio Prot		0.45		0.01	c0.82					0.13		
v/s Ratio Perm			0.07									c0.16
v/c Ratio		0.65	0.10	0.47	1.09					0.72		0.89
Uniform Delay, d1		10.4	6.2	57.6	15.0					46.2		47.8
Progression Factor		1.00	1.00	1.12	1.79					1.00		1.00
Incremental Delay, d2		1.4	0.2	0.6	42.3					7.4		26.7
Delay (s)		11.8	6.4	65.1	69.1					53.6		74.5
Level of Service		B	A	E	E					D		E
Approach Delay (s)		11.3			69.1			0.0			65.5	
Approach LOS		B			E			A			E	
Intersection Summary												
HCM 2000 Control Delay			49.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.09									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			93.3%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Two-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (veh/h)	0	1377	130	14	2523	0	0	0	0	204	0	272
Future Volume (veh/h)	0	1377	130	14	2523	0	0	0	0	204	0	272
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	0	1796
Adj Flow Rate, veh/h	0	1497	0	15	2742	0				222	0	296
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	2353		15	2510	0				328	0	292
Arrive On Green	0.00	0.70	0.00	0.03	1.00	0.00				0.19	0.00	0.19
Sat Flow, veh/h	0	3474	1409	1146	3474	0				1711	0	1522
Grp Volume(v), veh/h	0	1497	0	15	2742	0				222	0	296
Grp Sat Flow(s),veh/h/ln	0	1692	1409	1146	1692	0				1711	0	1522
Q Serve(g_s), s	0.0	29.0	0.0	1.6	0.0	0.0				14.5	0.0	23.0
Cycle Q Clear(g_c), s	0.0	29.0	0.0	1.6	0.0	0.0				14.5	0.0	23.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2353		15	2510	0				328	0	292
V/C Ratio(X)	0.00	0.64		1.00	1.09	0.00				0.68	0.00	1.01
Avail Cap(c_a), veh/h	0	2353		201	2510	0				328	0	292
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.0	0.0	58.4	0.0	0.0				45.1	0.0	48.5
Incr Delay (d2), s/veh	0.0	1.3	0.0	24.8	42.3	0.0				4.9	0.0	56.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	15.4	0.0	0.9	18.1	0.0				10.8	0.0	19.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.3	0.0	83.2	42.3	0.0				49.9	0.0	104.9
LnGrp LOS	A	B		F	F	A				D	A	F
Approach Vol, veh/h		1497			2757						518	
Approach Delay, s/veh		11.3			42.5						81.4	
Approach LOS		B			D						F	
Timer - Assigned Phs	1	2		4	6							
Phs Duration (G+Y+Rc), s	5.6	87.4		27.0	93.0							
Change Period (Y+Rc), s	4.0	6.0		5.5	6.0							
Max Green Setting (Gmax), s	21.0	62.0		21.5	87.0							
Max Q Clear Time (g_c+I1), s	3.6	31.0		25.0	2.0							
Green Ext Time (p_c), s	0.0	3.7		0.0	13.3							

Intersection Summary

HCM 6th Ctrl Delay	36.9
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Two-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↘		↘		↘↘
Traffic Volume (vph)	317	1264	0	0	1776	477	357	2	279	15	0	404
Future Volume (vph)	317	1264	0	0	1776	477	357	2	279	15	0	404
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0		4.0
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00		1.00		0.88
Frb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Frt	1.00	1.00			0.97		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1703	3343			3262		3242	1372		1467		2608
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1703	3343			3262		3242	1372		1467		2608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	345	1374	0	0	1930	518	388	2	303	16	0	439
RTOR Reduction (vph)	0	0	0	0	16	0	0	187	0	0	0	91
Lane Group Flow (vph)	345	1374	0	0	2432	0	388	118	0	16	0	348
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	25.5	75.4			45.9		22.3	23.2		4.4		34.8
Effective Green, g (s)	25.5	77.4			47.9		23.8	24.7		5.9		33.8
Actuated g/C Ratio	0.21	0.65			0.40		0.20	0.21		0.05		0.28
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	361	2156			1302		642	282		72		734
v/s Ratio Prot	c0.20	0.41			c0.75		c0.12	c0.09		0.01		0.13
v/s Ratio Perm												
v/c Ratio	0.96	0.64			1.87		0.60	0.42		0.22		0.47
Uniform Delay, d1	46.7	12.8			36.0		43.8	41.4		54.8		35.7
Progression Factor	0.98	1.20			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	31.8	1.1			393.4		1.3	0.6		0.9		0.3
Delay (s)	77.5	16.5			429.5		45.1	42.0		55.8		36.0
Level of Service	E	B			F		D	D		E		D
Approach Delay (s)		28.8			429.5			43.7			36.7	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			216.0									F
HCM 2000 Volume to Capacity ratio			1.27									
Actuated Cycle Length (s)			120.0							16.0		
Intersection Capacity Utilization			109.3%									H
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - Two-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↗↗
Traffic Volume (veh/h)	317	1264	0	0	1776	477	357	2	279	15	0	404
Future Volume (veh/h)	317	1264	0	0	1776	477	357	2	279	15	0	404
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	345	1374	0	0	1930	518	388	2	303	16	0	439
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	367	2450	0	0	1229	315	690	2	240	39	0	0
Arrive On Green	0.43	1.00	0.00	0.00	0.46	0.44	0.21	0.15	0.14	0.03	0.00	0.01
Sat Flow, veh/h	1725	3474	0	0	2755	684	3291	11	1601	1485	16	
Grp Volume(v), veh/h	345	1374	0	0	1193	1255	388	0	305	16	61.7	
Grp Sat Flow(s),veh/h/ln	1725	1692	0	0	1692	1658	1646	0	1612	1485	E	
Q Serve(g_s), s	23.0	0.0	0.0	0.0	55.3	55.3	12.7	0.0	18.0	1.3		
Cycle Q Clear(g_c), s	23.0	0.0	0.0	0.0	55.3	55.3	12.7	0.0	18.0	1.3		
Prop In Lane	1.00		0.00	0.00		0.41	1.00		0.99	1.00		
Lane Grp Cap(c), veh/h	367	2450	0	0	780	764	690	0	242	39		
V/C Ratio(X)	0.94	0.56	0.00	0.00	1.53	1.64	0.56	0.00	1.26	0.41		
Avail Cap(c_a), veh/h	532	2450	0	0	780	764	713	0	242	223		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.72	0.72	0.00	0.00	0.71	0.71	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	33.7	0.0	0.0	0.0	32.3	32.8	42.5	0.0	51.7	57.5		
Incr Delay (d2), s/veh	14.2	0.7	0.0	0.0	242.6	293.3	0.7	0.0	146.5	4.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	13.3	0.4	0.0	0.0	111.7	127.7	9.0	0.0	26.4	0.9		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	0.7	0.0	0.0	275.0	326.0	43.2	0.0	198.3	61.7		
LnGrp LOS	D	A	A	A	F	F	D	A	F	E		
Approach Vol, veh/h		1719			2448			693				
Approach Delay, s/veh		10.2			301.2			111.4				
Approach LOS		B			F			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		90.8	29.2		31.5	59.3	7.2	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		70.0	24.5		37.0	* 29	16.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	14.7		25.0	57.3	3.3	20.0				
Green Ext Time (p_c), s		31.1	0.7		0.6	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			170.8									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - Two-Lane Sunrise
 3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
 08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑		
Traffic Volume (vph)	1193	365	403	2253	0	0
Future Volume (vph)	1193	365	403	2253	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3223	1509	1517	3505		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3223	1509	1517	3505		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1217	372	411	2299	0	0
RTOR Reduction (vph)	0	143	0	0	0	0
Lane Group Flow (vph)	1217	229	411	2299	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	41.9	41.9	26.3	79.2		
Effective Green, g (s)	44.9	44.9	26.3	79.2		
Actuated g/C Ratio	0.57	0.57	0.33	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	1827	855	503	3505		
v/s Ratio Prot	0.38		c0.27	c0.66		
v/s Ratio Perm		0.15				
v/c Ratio	0.67	0.27	0.82	0.66		
Uniform Delay, d1	11.9	8.8	24.2	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.2	0.3	9.6	0.6		
Delay (s)	13.1	9.1	33.8	0.6		
Level of Service	B	A	C	A		
Approach Delay (s)	12.2			5.6	0.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - Two-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	362	526	81	2	809	1276	24	147	1	272	232	972
Future Volume (vph)	362	526	81	2	809	1276	24	147	1	272	232	972
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	0.88	1.00	1.00		0.97	1.00	0.88
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2694	3057		1543	3343	2760	1203	1284		3242	1597	2493
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.66	1.00	1.00
Satd. Flow (perm)	2694	3057		1543	3343	2760	1203	1284		2244	1597	2493
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	385	560	86	2	861	1357	26	156	1	289	247	1034
RTOR Reduction (vph)	0	8	0	0	0	612	0	0	0	0	0	433
Lane Group Flow (vph)	385	638	0	2	861	745	26	157	0	289	247	601
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6				4		4
Actuated Green, G (s)	19.2	69.9		1.1	51.8	51.8	5.5	17.4		36.1	35.3	35.3
Effective Green, g (s)	19.2	71.3		1.1	53.2	53.2	5.5	18.2		36.1	36.1	36.1
Actuated g/C Ratio	0.15	0.55		0.01	0.41	0.41	0.04	0.14		0.28	0.28	0.28
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6	4.6	2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	397	1676		13	1368	1129	50	179		802	443	692
v/s Ratio Prot	c0.14	0.21		0.00	0.26		0.02	c0.12		0.06	0.15	
v/s Ratio Perm						c0.27				0.04		c0.24
v/c Ratio	0.97	0.38		0.15	0.63	0.66	0.52	0.88		0.36	0.56	0.87
Uniform Delay, d1	55.1	16.7		64.0	30.6	31.1	61.0	54.8		38.6	40.1	44.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	36.6	0.7		2.0	2.2	3.0	6.1	34.4		0.2	1.1	11.0
Delay (s)	91.7	17.4		66.0	32.8	34.1	67.1	89.2		38.7	41.2	55.6
Level of Service	F	B		E	C	C	E	F		D	D	E
Approach Delay (s)		45.1			33.6			86.1			50.3	
Approach LOS		D			C			F			D	

Intersection Summary		
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.81	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	72.8%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Two-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕		↖	↕↕	↖↗	↖	↕		↖↗	↕	↖↗
Traffic Volume (veh/h)	362	526	81	2	809	1276	24	147	1	272	232	972
Future Volume (veh/h)	362	526	81	2	809	1276	24	147	1	272	232	972
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	385	560	86	2	861	0	26	156	1	289	247	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	810	1818	278	3	1153		26	172	1	348	325	
Arrive On Green	0.30	0.65	0.64	0.00	0.34	0.00	0.02	0.15	0.14	0.07	0.20	0.00
Sat Flow, veh/h	2689	2795	428	1570	3385	2768	1104	1180	8	3291	1618	2524
Grp Volume(v), veh/h	385	321	325	2	861	0	26	0	157	289	247	0
Grp Sat Flow(s),veh/h/ln	1345	1608	1615	1570	1692	1384	1104	0	1187	1646	1618	1262
Q Serve(g_s), s	15.2	11.4	11.5	0.2	29.2	0.0	3.1	0.0	16.9	6.8	18.7	0.0
Cycle Q Clear(g_c), s	15.2	11.4	11.5	0.2	29.2	0.0	3.1	0.0	16.9	6.8	18.7	0.0
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	810	1046	1051	3	1153		26	0	174	348	325	
V/C Ratio(X)	0.48	0.31	0.31	0.59	0.75		0.99	0.00	0.90	0.83	0.76	
Avail Cap(c_a), veh/h	810	1046	1051	133	1640		119	0	174	642	325	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.00	1.00	0.00	1.00	0.83	0.83	0.00
Uniform Delay (d), s/veh	37.0	9.9	10.0	64.8	37.9	0.0	63.4	0.0	54.6	57.8	49.0	0.0
Incr Delay (d2), s/veh	0.2	0.8	0.8	33.5	2.8	0.0	61.6	0.0	41.7	2.7	8.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.7	7.4	7.6	0.2	17.2	0.0	2.4	0.0	11.4	8.1	12.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	10.7	10.8	98.3	40.7	0.0	125.0	0.0	96.3	60.5	57.0	0.0
LnGrp LOS	D	B	B	F	D		F	A	F	E	E	
Approach Vol, veh/h		1031			863			183			536	
Approach Delay, s/veh		20.6			40.9			100.4			58.9	
Approach LOS		C			D			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	88.6	7.1	30.1	44.6	48.3	14.2	23.0				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.8	* 5.4	* 5.4	4.8	* 4.8				
Max Green Setting (Gmax), s	11.0	* 62	14.0	25.2	* 11	* 62	21.0	* 18				
Max Q Clear Time (g_c+I1), s	2.2	13.5	5.1	20.7	17.2	31.2	8.8	18.9				
Green Ext Time (p_c), s	0.0	8.6	0.0	0.4	0.0	11.6	0.5	0.0				

Intersection Summary

HCM 6th Ctrl Delay	40.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
 Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Two-Lane Sunrise
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



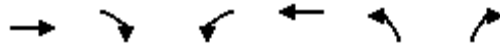
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵↵
Traffic Volume (vph)	492	37	303	1827	134	214
Future Volume (vph)	492	37	303	1827	134	214
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.88
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3167	1347	1671	3343	1671	2434
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3167	1347	1671	3343	1671	2434
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	518	39	319	1923	141	225
RTOR Reduction (vph)	0	20	0	0	0	198
Lane Group Flow (vph)	518	19	319	1923	141	27
Confl. Peds. (#/hr)		2	2		1	2
Heavy Vehicles (%)	14%	17%	8%	8%	8%	14%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	53.1	53.1	31.3	88.4	13.2	12.7
Effective Green, g (s)	54.5	54.5	31.3	89.8	13.2	13.2
Actuated g/C Ratio	0.49	0.49	0.28	0.81	0.12	0.12
Clearance Time (s)	5.4	5.4	4.0	5.4	4.0	4.5
Vehicle Extension (s)	4.5	4.5	2.3	4.5	2.3	3.0
Lane Grp Cap (vph)	1554	661	471	2704	198	289
v/s Ratio Prot	0.16		0.19	c0.58	c0.08	
v/s Ratio Perm		0.01				0.01
v/c Ratio	0.33	0.03	0.68	0.71	0.71	0.09
Uniform Delay, d1	17.2	14.6	35.4	4.8	47.1	43.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	3.3	1.6	10.3	0.1
Delay (s)	17.8	14.7	38.7	6.4	57.4	43.7
Level of Service	B	B	D	A	E	D
Approach Delay (s)	17.6			11.0	49.0	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Two-Lane Sunrise
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙	↑↑	↙	↗↗
Traffic Volume (veh/h)	492	37	303	1827	134	214
Future Volume (veh/h)	492	37	303	1827	134	214
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1693	1648	1781	1781	1781	1693
Adj Flow Rate, veh/h	518	39	319	1923	141	225
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	14	17	8	8	8	14
Cap, veh/h	2029	880	260	2776	183	284
Arrive On Green	0.63	0.63	0.15	0.82	0.11	0.11
Sat Flow, veh/h	3300	1394	1697	3474	1697	2524
Grp Volume(v), veh/h	518	39	319	1923	141	225
Grp Sat Flow(s),veh/h/ln	1608	1394	1697	1692	1697	1262
Q Serve(g_s), s	7.9	1.2	17.0	26.3	9.0	9.6
Cycle Q Clear(g_c), s	7.9	1.2	17.0	26.3	9.0	9.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2029	880	260	2776	183	284
V/C Ratio(X)	0.26	0.04	1.23	0.69	0.77	0.79
Avail Cap(c_a), veh/h	2029	880	260	2776	229	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	7.8	47.0	4.2	48.2	48.0
Incr Delay (d2), s/veh	0.3	0.1	131.5	1.4	10.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.9	0.6	25.5	10.7	7.7	6.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.3	7.9	178.5	5.6	58.2	56.3
LnGrp LOS	A	A	F	A	E	E
Approach Vol, veh/h	557			2242	366	
Approach Delay, s/veh	9.2			30.2	57.0	
Approach LOS	A			C	E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	21.0	74.0			95.0	16.0
Change Period (Y+Rc), s	4.0	* 5.4			* 5.4	4.0
Max Green Setting (Gmax), s	17.0	* 65			* 73	15.0
Max Q Clear Time (g_c+I1), s	19.0	9.9			28.3	11.6
Green Ext Time (p_c), s	0.0	7.3			35.9	0.3

Intersection Summary

HCM 6th Ctrl Delay			29.6			
HCM 6th LOS			C			

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	573	1533	267	0	361
Future Vol, veh/h	0	573	1533	267	0	361
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	0	603	1614	281	0	380

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

MOVEMENT SUMMARY

Site: 106 [Highway 212/Riverbend_2LaneAM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Two-Lane Sunrise
 Site Category: (None)
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]			mph	
			veh/h		veh/h					veh	ft				
South: Riverbend															
3	L2	All MCs	39	5.0	39	5.0	0.148	5.6	LOS A	0.4	11.5	0.54	0.47	0.54	18.5
18	R2	All MCs	48	28.0	48	28.0	0.148	10.1	LOS B	0.4	11.5	0.54	0.47	0.54	18.5
Approach			88	17.7	88	17.7	0.148	7.9	LOS A	0.4	11.5	0.54	0.47	0.54	18.5
East: Highway 212															
1	L2	All MCs	25	0.0	25	0.0	0.679	9.8	LOS A	7.3	187.1	0.34	0.11	0.34	33.1
6	T1	All MCs	1762	4.0	1762	4.0	0.679	10.1	LOS B	7.3	187.1	0.34	0.11	0.34	33.3
Approach			1787	3.9	1787	3.9	0.679	10.1	LOS B	7.3	187.1	0.34	0.11	0.34	33.3
West: Highway 212															
2	T1	All MCs	552	20.0	552	20.0	0.247	5.0	LOS A	1.0	30.2	0.12	0.03	0.12	34.0
12	R2	All MCs	21	10.0	21	10.0	0.247	4.4	LOS A	1.0	30.2	0.12	0.03	0.12	34.8
Approach			572	19.6	572	19.6	0.247	5.0	LOS A	1.0	30.2	0.12	0.03	0.12	34.0
All Vehicles			2446	8.1	2446	8.1	0.679	8.8	LOS A	7.3	187.1	0.30	0.10	0.30	32.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stoptime Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: H:\27\27852 - Sunrise Corridor Community Visioning\synchro\27852_RoundaboutsAnalysis.sjp9

Future Traffic Conditions - Two-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↔		↔	↕	↕↕
Traffic Volume (vph)	375	563	20	12	1123	107	179	149	30	142	58	810
Future Volume (vph)	375	563	20	12	1123	107	179	149	30	142	58	810
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	3152		1626	3343	1429	1795	1798		1701	1827	2661
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.72	1.00		0.46	1.00	1.00
Satd. Flow (perm)	3213	3152		1626	3343	1429	1352	1798		832	1827	2661
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	417	626	22	13	1248	119	199	166	33	158	64	900
RTOR Reduction (vph)	0	1	0	0	0	59	0	5	0	0	0	34
Lane Group Flow (vph)	417	647	0	13	1248	60	199	194	0	158	64	866
Confl. Peds. (#/hr)							5		1	1		5
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	18.5	72.1		2.5	56.1	56.1	25.9	25.9		24.7	24.7	43.2
Effective Green, g (s)	19.0	74.6		3.0	58.6	58.6	26.9	26.9		26.9	26.9	44.2
Actuated g/C Ratio	0.16	0.64		0.03	0.50	0.50	0.23	0.23		0.23	0.23	0.38
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.3
Lane Grp Cap (vph)	524	2018		41	1681	718	312	415		192	421	1009
v/s Ratio Prot	0.13	0.21		0.01	c0.37			0.11			0.04	c0.14
v/s Ratio Perm						0.04	0.15			c0.19		0.19
v/c Ratio	0.80	0.32		0.32	0.74	0.08	0.64	0.47		0.82	0.15	0.86
Uniform Delay, d1	46.9	9.5		55.7	23.0	15.0	40.4	38.6		42.5	35.7	33.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.8	0.2		2.6	2.3	0.1	3.7	0.6		23.4	0.1	7.2
Delay (s)	54.7	9.7		58.3	25.2	15.1	44.1	39.2		66.0	35.8	40.5
Level of Service	D	A		E	C	B	D	D		E	D	D
Approach Delay (s)		27.3			24.7			41.7			43.8	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	116.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Two-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↔		↔	↕	↕↕
Traffic Volume (veh/h)	375	563	20	12	1123	107	179	149	30	142	58	810
Future Volume (veh/h)	375	563	20	12	1123	107	179	149	30	142	58	810
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	417	626	22	13	1248	0	199	166	33	158	64	900
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	481	1884	66	26	1566		211	432	86	293	543	1161
Arrive On Green	0.15	0.59	0.57	0.02	0.46	0.00	0.29	0.29	0.28	0.29	0.29	0.28
Sat Flow, veh/h	3264	3169	111	1654	3385	1447	591	1512	301	1140	1841	2699
Grp Volume(v), veh/h	417	317	331	13	1248	0	199	0	199	158	64	900
Grp Sat Flow(s),veh/h/ln	1632	1608	1672	1654	1692	1447	591	0	1813	1140	1841	1350
Q Serve(g_s), s	15.8	12.6	12.6	1.0	39.6	0.0	32.8	0.0	11.1	16.1	3.2	35.5
Cycle Q Clear(g_c), s	15.8	12.6	12.6	1.0	39.6	0.0	36.0	0.0	11.1	27.2	3.2	35.5
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	481	956	994	26	1566		211	0	517	293	543	1161
V/C Ratio(X)	0.87	0.33	0.33	0.50	0.80		0.94	0.00	0.38	0.54	0.12	0.78
Avail Cap(c_a), veh/h	543	956	994	210	1690		211	0	517	293	543	1161
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	12.9	13.0	61.6	28.9	0.0	50.4	0.0	36.3	46.1	32.5	30.9
Incr Delay (d2), s/veh	12.1	0.5	0.5	9.0	3.4	0.0	46.1	0.0	0.3	1.6	0.1	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.7	8.1	8.4	0.9	23.1	0.0	14.0	0.0	8.7	8.3	2.6	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.7	13.5	13.5	70.7	32.2	0.0	96.6	0.0	36.6	47.7	32.6	34.1
LnGrp LOS	E	B	B	E	C		F	A	D	D	C	C
Approach Vol, veh/h		1065			1261			398			1122	
Approach Delay, s/veh		33.5			32.6			66.6			35.9	
Approach LOS		C			C			E			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	79.0		41.2	22.6	62.4		41.2				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	15.5	60.5		34.8	20.5	60.5		* 35				
Max Q Clear Time (g_c+I1), s	3.0	14.6		37.5	17.8	41.6		38.0				
Green Ext Time (p_c), s	0.0	10.8		0.0	0.3	14.3		0.0				

Intersection Summary

HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Two-Lane Sunrise
10: 122nd Avenue & Jennifer Street

Weekday AM Peak Hour
08/01/2024

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	92	240	0	0	196	34	0	0	0	49	0	127
Future Vol, veh/h	92	240	0	0	196	34	0	0	0	49	0	127
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	100	261	0	0	213	37	0	0	0	53	0	138

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	250	0	0	261	0	0	762	711	261	693	693	232
Stage 1	-	-	-	-	-	-	461	461	-	232	232	-
Stage 2	-	-	-	-	-	-	301	250	-	461	461	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	1037	-	-	896	-	-	324	361	783	345	369	738
Stage 1	-	-	-	-	-	-	584	569	-	749	716	-
Stage 2	-	-	-	-	-	-	712	704	-	562	569	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1037	-	-	896	-	-	244	326	783	319	334	738
Mov Cap-2 Maneuver	-	-	-	-	-	-	244	326	-	319	334	-
Stage 1	-	-	-	-	-	-	528	514	-	677	716	-
Stage 2	-	-	-	-	-	-	579	704	-	508	514	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0	0	13.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1037	-	-	896	-	-	319	738
HCM Lane V/C Ratio	-	0.096	-	-	-	-	-	0.167	0.187
HCM Control Delay (s)		0	8.8	-	0	-	-	18.5	11
HCM Lane LOS		A	A	-	A	-	-	C	B
HCM 95th %tile Q(veh)	-	0.3	-	-	0	-	-	0.6	0.7

Future Traffic Conditions - Two-Lane Sunrise
101: 122nd Avenue & Sunrise WB

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (vph)	0	0	813	1299	1357	0
Future Volume (vph)	0	0	813	1299	1357	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			0.97	0.95	0.97	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			3502	3539	3433	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			3502	3539	3433	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	874	1397	1459	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	874	1397	1459	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Turn Type			Prot	NA	Prot	
Protected Phases			3	8	2	
Permitted Phases						
Actuated Green, G (s)			49.8	49.8	52.3	
Effective Green, g (s)			50.3	50.3	52.8	
Actuated g/C Ratio			0.45	0.45	0.48	
Clearance Time (s)			4.5	4.5	4.5	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			1585	1602	1631	
v/s Ratio Prot			0.25	0.39	0.42	
v/s Ratio Perm						
v/c Ratio			0.55	0.87	0.89	
Uniform Delay, d1			22.2	27.5	26.6	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.4	5.5	6.8	
Delay (s)			22.6	33.0	33.4	
Level of Service			C	C	C	
Approach Delay (s)	0.0			29.0	33.4	
Approach LOS	A			C	C	
Intersection Summary						
HCM 2000 Control Delay			30.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			111.1		Sum of lost time (s)	8.0
Intersection Capacity Utilization			106.6%		ICU Level of Service	G
Analysis Period (min)			15			
c Critical Lane Group						

Future Traffic Conditions - Two-Lane Sunrise
101: 122nd Avenue & Sunrise WB



















Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (veh/h)	0	0	813	1299	1357	0
Future Volume (veh/h)	0	0	813	1299	1357	0
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00		1.00	1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1900	1870	1870	0
Adj Flow Rate, veh/h			874	1397	1459	0
Peak Hour Factor			0.93	0.93	0.93	0.93
Percent Heavy Veh, %			0	2	2	0
Cap, veh/h			0	2985	0	0
Arrive On Green			0.84	0.84	0.02	0.00
Sat Flow, veh/h			0	3647	0	
Grp Volume(v), veh/h			0	1397	0.0	
Grp Sat Flow(s),veh/h/ln			0	1777		
Q Serve(g_s), s			0.0	2.6		
Cycle Q Clear(g_c), s			0.0	2.6		
Prop In Lane			0.00			
Lane Grp Cap(c), veh/h			0	2985		
V/C Ratio(X)			0.00	0.47		
Avail Cap(c_a), veh/h			0	7676		
HCM Platoon Ratio			1.00	1.00		
Upstream Filter(I)			0.00	1.00		
Uniform Delay (d), s/veh			0.0	0.5		
Incr Delay (d2), s/veh			0.0	0.1		
Initial Q Delay(d3),s/veh			0.0	0.0		
%ile BackOfQ(95%),veh/ln			0.0	0.1		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			0.0	0.6		
LnGrp LOS			A	A		
Approach Vol, veh/h				1397		
Approach Delay, s/veh				0.6		
Approach LOS				A		
Timer - Assigned Phs						8
Phs Duration (G+Y+Rc), s						25.0
Change Period (Y+Rc), s						* 4.5
Max Green Setting (Gmax), s						* 54
Max Q Clear Time (g_c+I1), s						4.6
Green Ext Time (p_c), s						15.9
Intersection Summary						
HCM 6th Ctrl Delay			0.6			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Future Traffic Conditions - Two-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday AM Peak Hour
08/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	530	663	0	0	0	0	1357	428	0	813	0
Future Volume (vph)	0	530	663	0	0	0	0	1357	428	0	813	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor		0.95	0.88					0.95	0.88		0.95	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		3610	2682					3438	2656		3610	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		3610	2682					3438	2656		3610	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	570	713	0	0	0	0	1459	460	0	874	0
RTOR Reduction (vph)	0	0	201	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	570	512	0	0	0	0	1459	386	0	874	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	5%	7%	0%	0%	0%
Turn Type		NA	Perm					NA	Perm	Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		28.8	28.8					57.3	57.3		57.3	
Effective Green, g (s)		29.3	29.3					57.8	57.8		57.8	
Actuated g/C Ratio		0.31	0.31					0.61	0.61		0.61	
Clearance Time (s)		4.5	4.5					4.5	4.5		4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		1112	826					2089	1614		2194	
v/s Ratio Prot		0.16						0.42			0.24	
v/s Ratio Perm			0.19						0.15			
v/c Ratio		0.51	0.62					0.70	0.24		0.40	
Uniform Delay, d1		27.0	28.1					12.7	8.6		9.7	
Progression Factor		1.00	1.00					1.00	1.00		1.00	
Incremental Delay, d2		0.4	1.4					1.0	0.1		0.1	
Delay (s)		27.4	29.5					13.7	8.6		9.8	
Level of Service		C	C					B	A		A	
Approach Delay (s)		28.6			0.0			12.5			9.8	
Approach LOS		C			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			17.0									B
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			95.1								8.0	
Intersection Capacity Utilization			89.9%									E
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Two-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday AM Peak Hour
08/01/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	530	663	0	0	0	0	1357	428	0	813	0
Future Volume (veh/h)	0	530	663	0	0	0	0	1357	428	0	813	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811				0	1826	1796	1900	1900	0
Adj Flow Rate, veh/h	0	570	713				0	1459	460	0	874	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6				0	5	7	0	0	0
Cap, veh/h	0	1220	913				0	1983	1531	81	2064	0
Arrive On Green	0.00	0.34	0.34				0.00	0.57	0.57	0.00	0.57	0.00
Sat Flow, veh/h	0	3705	2701				0	3561	2679	237	3705	0
Grp Volume(v), veh/h	0	570	713				0	1459	460	0	874	0
Grp Sat Flow(s),veh/h/ln	0	1805	1351				0	1735	1340	237	1805	0
Q Serve(g_s), s	0.0	11.0	21.0				0.0	27.5	7.9	0.0	12.1	0.0
Cycle Q Clear(g_c), s	0.0	11.0	21.0				0.0	27.5	7.9	0.0	12.1	0.0
Prop In Lane	0.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1220	913				0	1983	1531	81	2064	0
V/C Ratio(X)	0.00	0.47	0.78				0.00	0.74	0.30	0.00	0.42	0.00
Avail Cap(c_a), veh/h	0	1590	1190				0	2860	2209	141	2976	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00				0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	23.0	26.4				0.0	14.0	9.8	0.0	10.7	0.0
Incr Delay (d2), s/veh	0.0	0.3	2.5				0.0	0.6	0.1	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	8.1	11.1				0.0	14.9	3.9	0.0	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.3	28.9				0.0	14.6	9.9	0.0	10.9	0.0
LnGrp LOS	A	C	C				A	B	A	A	B	A
Approach Vol, veh/h		1283						1919			874	
Approach Delay, s/veh		26.4						13.5			10.9	
Approach LOS		C						B			B	
Timer - Assigned Phs		2		4				6				
Phs Duration (G+Y+Rc), s		54.6		33.9				54.6				
Change Period (Y+Rc), s		4.5		4.5				4.5				
Max Green Setting (Gmax), s		72.5		38.5				72.5				
Max Q Clear Time (g_c+I1), s		29.5		23.0				14.1				
Green Ext Time (p_c), s		20.6		6.4				7.8				
Intersection Summary												
HCM 6th Ctrl Delay			17.0									
HCM 6th LOS			B									

Future Traffic Conditions - Two-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↖			↕	
Traffic Volume (vph)	10	100	622	58	100	10	262	61	164	10	58	10
Future Volume (vph)	10	100	622	58	100	10	262	61	164	10	58	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Frt		1.00	0.85		0.99		1.00	0.89			0.98	
Flt Protected		1.00	1.00		0.98		0.95	1.00			0.99	
Satd. Flow (prot)		1891	1568		1853		1752	1644			1763	
Flt Permitted		0.97	1.00		0.87		0.70	1.00			0.95	
Satd. Flow (perm)		1842	1568		1641		1295	1644			1694	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	109	676	63	109	11	285	66	178	11	63	11
RTOR Reduction (vph)	0	0	427	0	4	0	0	106	0	0	7	0
Lane Group Flow (vph)	0	120	249	0	179	0	285	138	0	0	78	0
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	3%	0%	4%	0%	7%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		6			
Actuated Green, G (s)		12.5	12.5		12.5		13.8	13.8			13.8	
Effective Green, g (s)		13.0	13.0		13.0		14.3	14.3			14.3	
Actuated g/C Ratio		0.37	0.37		0.37		0.41	0.41			0.41	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		678	577		604		524	665			686	
v/s Ratio Prot								0.08				
v/s Ratio Perm		0.07	c0.16		0.11		c0.22				0.05	
v/c Ratio		0.18	0.43		0.30		0.54	0.21			0.11	
Uniform Delay, d1		7.5	8.4		7.9		8.0	6.8			6.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.1	0.5		0.3		1.2	0.2			0.1	
Delay (s)		7.7	8.9		8.2		9.2	7.0			6.6	
Level of Service		A	A		A		A	A			A	
Approach Delay (s)		8.7			8.2		8.2				6.6	
Approach LOS		A			A		A				A	
Intersection Summary												
HCM 2000 Control Delay			8.4									A
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			35.3						8.0			
Intersection Capacity Utilization			61.8%									B
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Two-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕			↕	↖
Traffic Volume (veh/h)	10	100	622	58	100	10	262	61	164	10	58	10
Future Volume (veh/h)	10	100	622	58	100	10	262	61	164	10	58	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1856	1900	1900	1900	1856	1900	1841	1900	1796	1900
Adj Flow Rate, veh/h	11	109	676	63	109	11	285	66	178	11	63	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	3	0	0	0	3	0	4	0	7	0
Cap, veh/h	128	922	805	350	569	51	579	135	365	121	418	66
Arrive On Green	0.50	0.51	0.51	0.50	0.51	0.50	0.30	0.30	0.29	0.29	0.30	0.29
Sat Flow, veh/h	67	1802	1572	459	1112	101	1315	454	1225	79	1405	221
Grp Volume(v), veh/h	120	0	676	183	0	0	285	0	244	85	0	0
Grp Sat Flow(s),veh/h/ln	1869	0	1572	1672	0	0	1315	0	1679	1705	0	0
Q Serve(g_s), s	0.0	0.0	15.4	0.0	0.0	0.0	6.0	0.0	5.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	15.4	2.2	0.0	0.0	7.5	0.0	5.0	1.5	0.0	0.0
Prop In Lane	0.09		1.00	0.34		0.06	1.00		0.73	0.13		0.13
Lane Grp Cap(c), veh/h	1027	0	805	951	0	0	579	0	500	584	0	0
V/C Ratio(X)	0.12	0.00	0.84	0.19	0.00	0.00	0.49	0.00	0.49	0.15	0.00	0.00
Avail Cap(c_a), veh/h	1789	0	1462	1631	0	0	1223	0	1321	1378	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.4	0.0	8.8	5.6	0.0	0.0	12.8	0.0	12.3	10.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	2.5	0.1	0.0	0.0	0.6	0.0	0.7	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	0.0	7.0	1.1	0.0	0.0	3.6	0.0	2.9	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.4	0.0	11.2	5.7	0.0	0.0	13.5	0.0	13.0	11.0	0.0	0.0
LnGrp LOS	A	A	B	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		796			183			529				85
Approach Delay, s/veh		10.4			5.7			13.2				11.0
Approach LOS		B			A			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.5		25.5		16.5		25.5				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		38.5		32.5		38.5				
Max Q Clear Time (g_c+I1), s		9.5		17.4		3.5		4.2				
Green Ext Time (p_c), s		2.5		3.5		0.4		1.1				
Intersection Summary												
HCM 6th Ctrl Delay				10.8								
HCM 6th LOS				B								

Future Traffic Conditions - Two-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	161	0	0	326	188	550
Future Volume (vph)	161	0	0	326	188	550
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1752			1845	1792	1568
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1752			1845	1792	1568
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	166	0	0	336	194	567
RTOR Reduction (vph)	0	0	0	0	0	303
Lane Group Flow (vph)	166	0	0	336	194	264
Heavy Vehicles (%)	3%	0%	0%	3%	6%	3%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Actuated Green, G (s)	6.5			12.5	12.5	12.5
Effective Green, g (s)	7.5			13.5	13.5	13.5
Actuated g/C Ratio	0.26			0.47	0.47	0.47
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	453			858	834	729
v/s Ratio Prot	c0.09			c0.18	0.11	
v/s Ratio Perm						0.17
v/c Ratio	0.37			0.39	0.23	0.36
Uniform Delay, d1	8.8			5.1	4.6	5.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.5			0.3	0.1	0.3
Delay (s)	9.3			5.4	4.8	5.3
Level of Service	A			A	A	A
Approach Delay (s)	9.3			5.4	5.2	
Approach LOS	A			A	A	

Intersection Summary

HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	29.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - Two-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	161	0	0	326	188	550
Future Volume (veh/h)	161	0	0	326	188	550
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1900	1900	1856	1811	1856
Adj Flow Rate, veh/h	336	1	0	336	194	567
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	0	0	3	6	3
Cap, veh/h	9999	9999	0	910	889	772
Arrive On Green	0.26	0.23	0.00	0.49	0.49	0.49
Sat Flow, veh/h	1882671938535	153088	0	1856	1811	1572
Grp Volume(v), veh/h	336	1	0	336	194	567
Grp Sat Flow(s),veh/h/ln	1767	1610	0	1856	1811	1572
Q Serve(g_s), s	0.0	0.0	0.0	3.7	2.0	9.4
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.7	2.0	9.4
Prop In Lane	1.00	1.00	0.00			1.00
Lane Grp Cap(c), veh/h	497434230547	6249088	0	910	889	772
V/C Ratio(X)	0.00	0.00	0.00	0.37	0.22	0.73
Avail Cap(c_a), veh/h	12691028042955	0905344	0	2843	2775	2409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.2	4.7	6.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.2	0.1	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	0.0	1.4	0.7	3.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	5.4	4.9	8.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	337			336	761	
Approach Delay, s/veh	0.0			5.4	7.2	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		20.0		12.6		20.0
Change Period (Y+Rc), s		5.0		5.0		5.0
Max Green Setting (Gmax), s		49.0		21.0		49.0
Max Q Clear Time (g_c+I1), s		5.7		2.0		11.4
Green Ext Time (p_c), s		2.2		1.2		3.7
Intersection Summary						
HCM 6th Ctrl Delay			5.1			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑				↑			↑
Traffic Vol, veh/h	0	367	326	0	1586	161	0	0	188	0	0	550
Future Vol, veh/h	0	367	326	0	1586	161	0	0	188	0	0	550
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	165	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	27	3	0	4	3	0	0	6	0	0	3
Mvmt Flow	0	378	336	0	1635	166	0	0	194	0	0	567

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	0	0	0	0
Stage 1	0	-	-	0	-	-	0	0	0	0	0	0
Stage 2	0	-	-	0	-	-	0	0	0	0	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	-	0
HCM Lane LOS	A	-	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	-	-

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_AM_2LaneGateway.vistro

Scenario: Base Scenario

Report File: H:\...\2045_2LaneAM.pdf

3/17/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.773	13.5	B
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Right	1.038	427.8	F
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	NWB Left	0.591	11.3	B
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	WB Left	0.873	32.2	C
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.736	17.3	B
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.759	19.3	B
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.839	33.9	C
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.170	18.9	C
101	122nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	WB Thru	0.884	26.0	C
102	122nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	EB Right	0.769	14.6	B
103	142nd Avenue/Backage Road	Signalized	HCM 7th Edition	EB Right	0.243	24.1	C
104	142nd Avenue/Highway 212 Access	Signalized	HCM 7th Edition	EB Left	0.619	7.6	A
105	142nd Avenue/OR 212	Two-way stop	HCM 7th Edition	SB Right	2.030	505.4	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	13.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.773

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	204	0	272	0	1377	130	14	2523	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	7.00	0.00	7.00	0.00	8.00	16.00	47.00	8.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	136	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	204	0	136	0	1377	130	14	2523	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	55	0	37	0	374	35	4	686	0
Total Analysis Volume [veh/h]	0	0	0	222	0	148	0	1497	141	15	2742	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	23.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	17	0	17	0	81	81	7	92	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	22	0	22	0	87	87	11	98	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		120	120	120	120	120	120
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		17	17	86	86	2	92
g / C, Green / Cycle		0.14	0.14	0.72	0.72	0.01	0.77
(v / s)_i Volume / Saturation Flow Rate		0.13	0.10	0.31	0.10	0.01	0.57
s, saturation flow rate [veh/h]		1709	1526	4849	1411	1138	4849
c, Capacity [veh/h]		235	210	3485	1014	17	3717
d1, Uniform Delay [s]		51.29	49.42	6.87	5.28	59.06	7.53
k, delay calibration		0.29	0.12	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		32.69	4.93	0.39	0.29	58.52	1.35
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.94	0.70	0.43	0.14	0.91	0.74
d, Delay for Lane Group [s/veh]		83.98	54.36	7.26	5.56	117.58	8.87
Lane Group LOS		F	D	A	A	F	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.74	4.53	4.79	1.09	0.72	10.76
50th-Percentile Queue Length [ft/ln]		218.39	113.18	119.86	27.35	18.12	269.07
95th-Percentile Queue Length [veh/ln]		13.58	8.02	8.39	1.97	1.30	16.14
95th-Percentile Queue Length [ft/ln]		339.57	200.41	209.63	49.23	32.61	403.58

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	83.98	0.00	54.36	0.00	7.26	5.56	117.58	8.87	0.00
Movement LOS				F		D		A	A	F	A	
d_A, Approach Delay [s/veh]	0.00			72.13			7.11			9.46		
Approach LOS	A			E			A			A		
d_I, Intersection Delay [s/veh]	13.52											
Intersection LOS	B											
Intersection V/C	0.773											

Emissions

Vehicle Miles Traveled [mph]		42.96	28.64	474.22	44.67	2.37	432.34
Stops [stops/h]		262.05	135.80	431.46	32.81	21.74	968.60
Fuel consumption [US gal/h]		7.01	3.57	24.12	2.18	0.58	28.10
CO [g/h]		489.99	249.28	1685.76	152.36	40.28	1964.28
NOx [g/h]		95.33	48.50	327.99	29.64	7.84	382.18
VOC [g/h]		113.56	57.77	390.69	35.31	9.34	455.24

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	275	1350	1533
d_b, Bicycle Delay [s]	60.00	44.64	6.34	3.27
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	2.461	3.076
Bicycle LOS	D	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	427.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.038

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	357	2	279	15	0	404	317	1264	0	0	1776	477
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	2.00	18.00	23.00	0.00	9.00	6.00	8.00	0.00	0.00	8.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	0	0	0	40
Total Hourly Volume [veh/h]	357	2	278	15	0	404	317	1264	0	0	1776	437
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	1.0000	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	1	76	4	0	110	86	343	0	0	483	119
Total Analysis Volume [veh/h]	388	2	302	16	0	439	345	1374	0	0	1930	475
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Split	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	20	31	31	18	0	29	30	54	0	0	20	20
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	26	37	37	24	0	34	34	60	0	0	26	26
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	17	25	5	66	49	73	20	20
g / C, Green / Cycle	0.14	0.21	0.05	0.55	0.41	0.61	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.12	0.19	0.01	0.17	0.20	0.28	0.47	0.50
s, saturation flow rate [veh/h]	3292	1591	1481	2655	1724	4849	3389	1611
c, Capacity [veh/h]	458	329	68	1467	698	2934	565	269
d1, Uniform Delay [s]	50.41	46.65	55.18	14.39	26.54	13.05	50.00	50.00
k, delay calibration	0.07	0.20	0.07	0.07	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.76	17.50	1.06	0.07	2.49	0.54	832.27	903.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.92	0.23	0.30	0.49	0.47	2.84	2.98
d, Delay for Lane Group [s/veh]	53.17	64.14	56.24	14.46	29.03	13.59	882.27	953.19
Lane Group LOS	D	E	E	B	C	B	F	F
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.85	10.45	0.49	3.18	7.78	6.70	73.73	75.40
50th-Percentile Queue Length [ft/ln]	146.31	261.28	12.20	79.44	194.55	167.53	1843.17	1885.08
95th-Percentile Queue Length [veh/ln]	9.82	15.75	0.88	5.72	12.36	10.95	114.69	117.32
95th-Percentile Queue Length [ft/ln]	245.50	393.83	21.96	143.00	308.92	273.67	2867.20	2932.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.17	64.14	64.14	56.24	0.00	14.46	29.03	13.59	0.00	0.00	894.27	953.19
Movement LOS	D	E	E	E		B	C	B			F	F
d_A, Approach Delay [s/veh]	57.99			15.93			16.69			905.91		
Approach LOS	E			B			B			F		
d_I, Intersection Delay [s/veh]	427.77											
Intersection LOS	F											
Intersection V/C	1.038											

Emissions

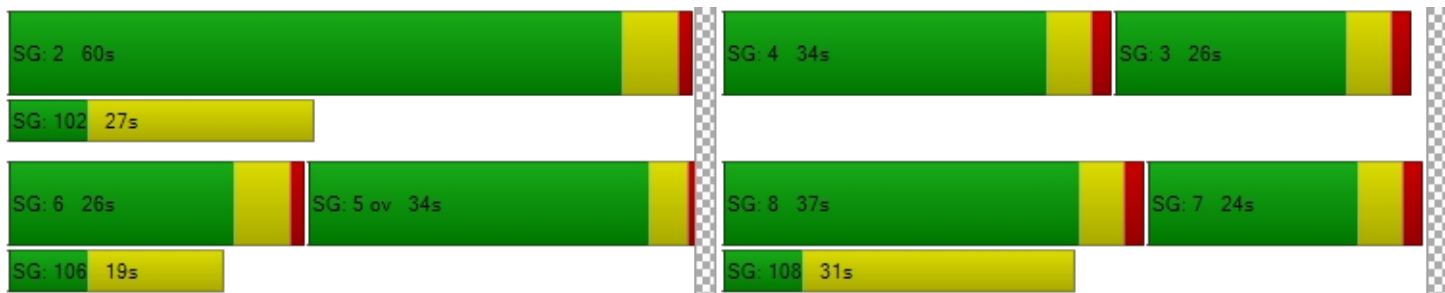
Vehicle Miles Traveled [mph]	81.28	63.68	2.14	58.83	54.40	216.64	401.68	200.84
Stops [stops/h]	351.15	313.54	14.64	190.67	233.46	603.11	4423.60	2262.10
Fuel consumption [US gal/h]	9.48	8.32	0.35	4.77	5.57	16.05	328.77	176.23
CO [g/h]	662.92	581.67	24.62	333.24	389.14	1121.93	22980.92	12318.34
NOx [g/h]	128.98	113.17	4.79	64.84	75.71	218.29	4471.25	2396.70
VOC [g/h]	153.64	134.81	5.71	77.23	90.19	260.02	5326.05	2854.89

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	0.00	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.181	2.466	0.000	3.241
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	525	308	900	333
d_b, Bicycle Delay [s]	32.63	42.93	18.15	41.67
I_b,int, Bicycle LOS Score for Intersection	2.703	1.560	2.505	2.904
Bicycle LOS	B	A	B	C

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Northwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	0	0	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	403	2253	1193	365
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	19.00	3.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	403	2253	1193	365
Peak Hour Factor	1.0000	1.0000	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	103	575	304	93
Total Analysis Volume [veh/h]	0	0	411	2299	1217	372
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	101
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	32.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	24	60	32	32
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	0	30	30	30	30
Lead / Lag	-	-	Lag	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	74	74	74	74
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	28	60	28	28
g / C, Green / Cycle	0.38	0.81	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.27	0.45	0.26	0.24
s, saturation flow rate [veh/h]	1538	5053	4685	1526
c, Capacity [veh/h]	582	4091	1767	576
d1, Uniform Delay [s]	19.54	2.46	19.41	19.00
k, delay calibration	0.29	0.20	0.20	0.20
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.22	0.23	0.90	2.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.56	0.69	0.65
d, Delay for Lane Group [s/veh]	23.76	2.69	20.31	21.28
Lane Group LOS	C	A	C	C
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	6.23	1.52	5.59	5.25
50th-Percentile Queue Length [ft/ln]	155.68	37.98	139.76	131.22
95th-Percentile Queue Length [veh/ln]	10.32	2.73	9.47	9.01
95th-Percentile Queue Length [ft/ln]	258.00	68.37	236.70	225.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	23.76	2.69	20.31	21.28
Movement LOS			C	A	C	C
d_A, Approach Delay [s/veh]	0.00		5.89		20.54	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	11.30					
Intersection LOS	B					
Intersection V/C	0.591					

Emissions

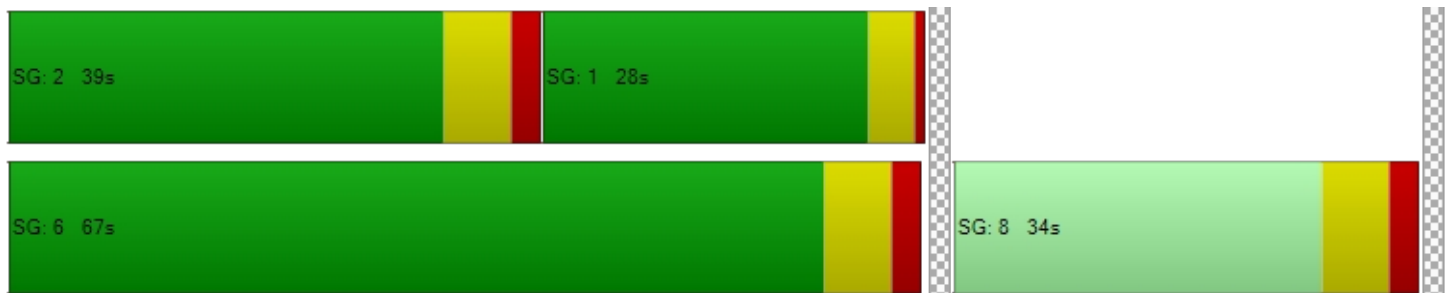
Vehicle Miles Traveled [mph]		569.59	3186.09	304.89	93.20
Stops [stops/h]		302.74	221.59	815.29	255.17
Fuel consumption [US gal/h]		27.11	133.64	22.09	6.86
CO [g/h]		1894.83	9341.63	1543.90	479.31
NOx [g/h]		368.67	1817.54	300.39	93.26
VOC [g/h]		439.15	2165.01	357.81	111.08

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1620	864
d_b, Bicycle Delay [s]	37.03	1.33	11.94
I_b,int, Bicycle LOS Score for Intersection	4.132	3.050	2.434
Bicycle LOS	D	C	B

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	32.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T T			T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	2
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	24	147	1	272	232	972	362	526	81	2	809	1276
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	50.00	48.00	20.00	8.00	19.00	14.00	30.00	14.00	27.00	17.00	8.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	27	0	0	638
Total Hourly Volume [veh/h]	24	147	0	272	232	972	362	526	54	2	809	638
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	39	0	72	62	259	96	140	14	1	215	170
Total Analysis Volume [veh/h]	26	156	0	289	247	1034	385	560	57	2	861	679
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	18.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						6,7
Maximum Green [s]	5	35	35	6	36	36	22	67	67	4	49	49
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	40	40	10	41	41	26	72	72	8	54	54
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No	No	No	Yes		No	Yes	Yes
Maximum Recall	No	No		No	No	No	No	No		No	No	No
Pedestrian Recall	No	No		No	No	No	No	No		No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.40	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	0.00	2.80	0.00	2.00	3.40	3.40	2.00	3.40	0.00
g_i, Effective Green Time [s]	3	19	29	29	61	21	80	80	0	59	76
g / C, Green / Cycle	0.03	0.15	0.23	0.22	0.47	0.16	0.61	0.61	0.00	0.45	0.58
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.10	0.15	0.41	0.14	0.19	0.19	0.00	0.25	0.24
s, saturation flow rate [veh/h]	335	1180	2956	1615	2542	2681	1690	1636	1567	3389	2791
c, Capacity [veh/h]	59	173	501	353	1192	436	1036	1003	3	1534	1623
d1, Uniform Delay [s]	64.89	54.56	48.25	46.83	30.90	53.23	11.95	11.95	64.80	26.11	15.03
k, delay calibration	0.50	0.07	0.07	0.07	0.20	0.04	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	21.94	10.31	0.64	1.54	3.68	2.40	0.75	0.78	46.51	1.49	0.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.90	0.58	0.70	0.87	0.88	0.30	0.30	0.58	0.56	0.42
d, Delay for Lane Group [s/veh]	86.84	64.87	48.89	48.37	34.58	55.63	12.71	12.73	111.31	27.60	15.83
Lane Group LOS	F	E	D	D	C	E	B	B	F	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	1.28	5.52	4.02	7.53	14.80	6.29	4.49	4.35	0.11	10.07	5.66
50th-Percentile Queue Length [ft/ln]	31.89	137.93	100.44	188.24	369.97	157.36	112.24	108.81	2.77	251.66	141.55
95th-Percentile Queue Length [veh/ln]	2.30	9.37	7.23	12.03	21.11	10.41	7.96	7.77	0.20	15.27	9.56
95th-Percentile Queue Length [ft/ln]	57.40	234.23	180.79	300.74	527.70	260.22	199.11	194.35	4.99	381.74	239.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	86.84	64.87	64.87	48.89	48.37	34.58	55.63	12.72	12.73	111.31	27.60	15.83
Movement LOS	F	E	E	D	D	C	E	B	B	F	C	B
d_A, Approach Delay [s/veh]	68.01			39.38			29.20			22.52		
Approach LOS	E			D			C			C		
d_I, Intersection Delay [s/veh]	32.17											
Intersection LOS	C											
Intersection V/C	0.873											

Emissions

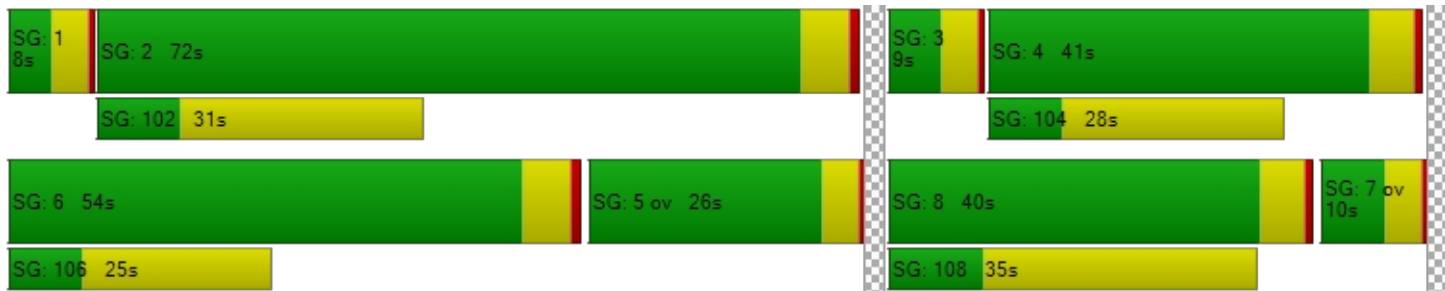
Vehicle Miles Traveled [mph]	5.86	35.16	66.73	57.03	238.74	346.05	281.80	272.77	1.32	567.67	447.67
Stops [stops/h]	35.32	152.78	222.51	208.51	819.63	348.61	124.33	120.53	3.07	557.52	313.60
Fuel consumption [US gal/h]	0.90	4.35	6.85	5.93	21.63	20.53	13.10	12.68	0.12	31.28	22.35
CO [g/h]	62.61	304.09	478.92	414.57	1512.09	1434.99	915.58	886.42	8.15	2186.79	1562.17
NOx [g/h]	12.18	59.16	93.18	80.66	294.20	279.20	178.14	172.46	1.59	425.47	303.94
VOC [g/h]	14.51	70.48	110.99	96.08	350.44	332.57	212.19	205.44	1.89	506.81	362.05

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.55	54.47	54.47	52.65
I_p,int, Pedestrian LOS Score for Intersectio	2.126	3.089	3.025	4.019
Crosswalk LOS	B	C	C	D
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	542	557	1025	748
d_b, Bicycle Delay [s]	34.57	33.84	15.46	25.48
I_b,int, Bicycle LOS Score for Intersection	1.862	4.150	2.409	3.358
Bicycle LOS	A	D	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	17.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name	135th Ave		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↔↔↔		↑↑		↔↔	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	1	0
Entry Pocket Length [ft]	300.00	100.00	100.00	60.00	200.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	135th Ave		Highway 212		Highway 212	
Base Volume Input [veh/h]	134	214	492	37	303	1827
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	14.00	14.00	17.00	8.00	8.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	134	214	492	37	303	1827
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	56	129	10	80	481
Total Analysis Volume [veh/h]	141	225	518	39	319	1923
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1		0		1	
v_di, Inbound Pedestrian Volume crossing m	1		0		1	
v_co, Outbound Pedestrian Volume crossing	1		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	1		1		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	52.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Protected	Permissive	Permissive	Protected	Permissive
Signal Group	3	3	2	2	1	6
Auxiliary Signal Groups						
Maximum Green [s]	17	17	45	45	35	84
Amber [s]	3.5	3.5	4.7	4.7	3.5	4.7
All red [s]	0.5	0.5	0.7	0.7	0.5	0.7
Walk [s]	0	0	8	8	0	7
Pedestrian Clearance [s]	0	0	18	18	0	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	3.4	3.4	2.0	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	21	21	50	50	39	89
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	4	4	10	10	4	10
Vehicle Extension [s]	2.3	2.3	4.5	4.5	2.3	4.5
Minimum Recall	No	No	Yes		No	Yes
Maximum Recall	No	No	No		No	No
Pedestrian Recall	No	No	No		No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	5.40	5.40	4.00	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	3.40	3.40	2.00	3.40
g_i, Effective Green Time [s]	12	12	62	62	23	89
g / C, Green / Cycle	0.11	0.11	0.56	0.56	0.21	0.81
(v / s)_i Volume / Saturation Flow Rate	0.08	0.09	0.16	0.03	0.19	0.57
s, saturation flow rate [veh/h]	1695	2542	3217	1396	1695	3389
c, Capacity [veh/h]	184	277	1809	785	351	2731
d1, Uniform Delay [s]	47.64	47.92	12.56	10.84	42.59	4.80
k, delay calibration	0.07	0.07	0.50	0.50	0.12	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.02	3.58	0.40	0.12	9.70	1.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.81	0.29	0.05	0.91	0.70
d, Delay for Lane Group [s/veh]	51.67	51.51	12.96	10.96	52.29	6.35
Lane Group LOS	D	D	B	B	D	A
Critical Lane Group	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.95	3.14	3.33	0.45	9.34	7.36
50th-Percentile Queue Length [ft/ln]	98.79	78.59	83.37	11.16	233.38	183.96
95th-Percentile Queue Length [veh/ln]	7.11	5.66	6.00	0.80	14.35	11.81
95th-Percentile Queue Length [ft/ln]	177.81	141.45	150.07	20.09	358.66	295.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.67	51.51	12.96	10.96	52.29	6.35
Movement LOS	D	D	B	B	D	A
d_A, Approach Delay [s/veh]	51.57		12.82		12.89	
Approach LOS	D		B		B	
d_I, Intersection Delay [s/veh]	17.35					
Intersection LOS	B					
Intersection V/C	0.736					

Emissions

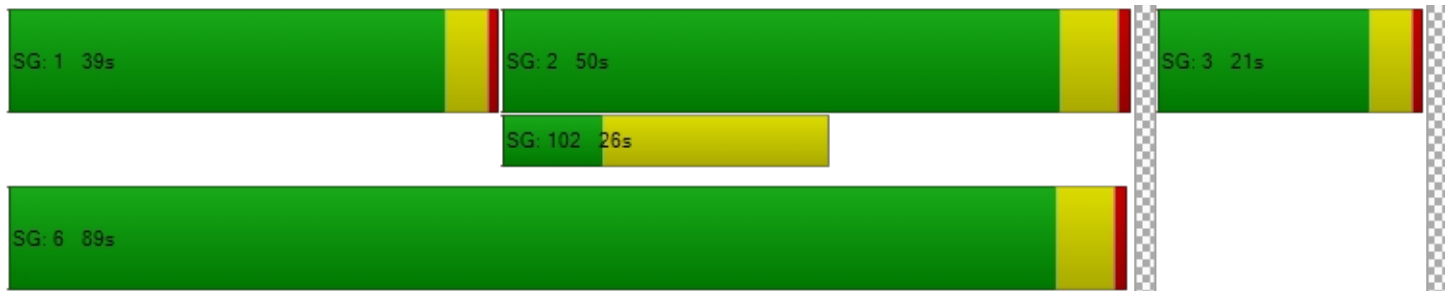
Vehicle Miles Traveled [mph]	27.59	44.03	341.52	25.71	95.01	572.75
Stops [stops/h]	129.32	205.75	218.28	14.61	305.51	481.63
Fuel consumption [US gal/h]	3.33	5.31	16.63	1.23	8.99	28.72
CO [g/h]	232.94	370.97	1162.56	85.72	628.64	2007.86
NOx [g/h]	45.32	72.18	226.19	16.68	122.31	390.66
VOC [g/h]	53.99	85.98	269.43	19.87	145.69	465.34

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		0.0		17.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	43.66		0.00		39.32	
I_p,int, Pedestrian LOS Score for Intersectio	2.316		0.000		2.886	
Crosswalk LOS	B		F		C	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	309		811		1520	
d_b, Bicycle Delay [s]	39.32		19.44		3.17	
I_b,int, Bicycle LOS Score for Intersection	1.560		2.019		3.409	
Bicycle LOS	A		B		C	

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.759

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	2	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	1135	159	152	421	323	665
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	8.00	12.00	15.00	3.00	8.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1135	159	152	421	323	665
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	299	42	40	111	85	175
Total Analysis Volume [veh/h]	1195	167	160	443	340	700
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	148
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	46.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	68	0	23	23	42	69
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	30	30	30	30
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		No	No	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	79	79	79	79	79	79
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	5.40	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	36	36	10	52	18	32
g / C, Green / Cycle	0.45	0.45	0.13	0.66	0.22	0.40
(v / s)_i Volume / Saturation Flow Rate	0.36	0.11	0.05	0.18	0.19	0.21
s, saturation flow rate [veh/h]	3320	1513	3275	2520	1767	3389
c, Capacity [veh/h]	1509	688	413	1654	398	1361
d1, Uniform Delay [s]	18.43	13.26	31.84	5.68	29.48	17.89
k, delay calibration	0.08	0.08	0.21	0.21	0.13	0.21
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.72	0.13	1.16	0.17	6.33	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.24	0.39	0.27	0.85	0.51
d, Delay for Lane Group [s/veh]	19.15	13.40	32.99	5.85	35.82	18.48
Lane Group LOS	B	B	C	A	D	B
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	8.66	1.74	1.44	1.29	6.66	4.64
50th-Percentile Queue Length [ft/ln]	216.54	43.42	35.99	32.35	166.56	116.06
95th-Percentile Queue Length [veh/ln]	13.49	3.13	2.59	2.33	10.90	8.18
95th-Percentile Queue Length [ft/ln]	337.21	78.16	64.79	58.23	272.39	204.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.15	13.40	32.99	5.85	35.82	18.48
Movement LOS	B	B	C	A	D	B
d_A, Approach Delay [s/veh]	18.45		13.05		24.15	
Approach LOS	B		B		C	
d_I, Intersection Delay [s/veh]	19.34					
Intersection LOS	B					
Intersection V/C	0.759					

Emissions

Vehicle Miles Traveled [mph]	390.86	54.62	23.23	64.32	21.64	44.56
Stops [stops/h]	787.77	78.99	130.94	117.69	302.97	422.23
Fuel consumption [US gal/h]	25.10	3.14	2.75	3.83	5.04	6.80
CO [g/h]	1754.56	219.51	192.50	267.40	352.49	475.27
NOx [g/h]	341.37	42.71	37.45	52.03	68.58	92.47
VOC [g/h]	406.64	50.87	44.61	61.97	81.69	110.15

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		0.0		12.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	29.35		0.00		28.49	
I_p,int, Pedestrian LOS Score for Intersectio	2.711		0.000		2.558	
Crosswalk LOS	B		F		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	1718		581		1743	
d_b, Bicycle Delay [s]	0.79		19.92		0.65	
I_b,int, Bicycle LOS Score for Intersection	1.560		2.057		2.418	
Bicycle LOS	A		B		B	

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.839

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	179	149	30	142	58	810	375	563	20	12	1123	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	6.00	6.00	4.00	5.00	9.00	14.00	12.00	11.00	8.00	13.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	179	149	30	142	58	810	375	563	20	12	1123	107
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	41	8	39	16	225	104	156	6	3	312	30
Total Analysis Volume [veh/h]	199	166	33	158	64	900	417	626	22	13	1248	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	133
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	8.5
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	8	8	8	4	4	5	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	36	36	36	35	35	23	23	77	77	4	59	59
Amber [s]	3.5	3.5	3.5	4.7	4.7	3.5	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	0	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	0	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	2.5	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	4	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.3	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	132	132	132	132	132	132	132	132	132	132	132
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	4.50	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.20	4.20	0.00	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	36	36	35	35	64	23	78	78	2	56	56
g / C, Green / Cycle	0.27	0.27	0.27	0.27	0.49	0.17	0.59	0.59	0.01	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.15	0.11	0.14	0.03	0.33	0.13	0.19	0.19	0.01	0.37	0.08
s, saturation flow rate [veh/h]	1332	1817	1145	1840	2737	3264	1690	1670	1652	3389	1449
c, Capacity [veh/h]	365	499	239	489	1334	570	999	987	21	1454	622
d1, Uniform Delay [s]	45.55	38.88	53.75	36.78	25.73	51.43	13.65	13.65	64.70	33.98	23.39
k, delay calibration	0.08	0.08	0.08	0.08	0.12	0.07	0.28	0.28	0.07	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.99	0.38	2.31	0.09	0.69	1.12	0.49	0.50	16.72	4.00	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.40	0.66	0.13	0.67	0.73	0.33	0.33	0.62	0.86	0.19
d, Delay for Lane Group [s/veh]	46.54	39.27	56.07	36.87	26.42	52.55	14.15	14.15	81.42	37.98	23.78
Lane Group LOS	D	D	E	D	C	D	B	B	F	D	C
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.99	5.33	5.25	1.60	10.73	6.61	5.00	4.95	0.53	18.59	2.40
50th-Percentile Queue Length [ft/ln]	149.63	133.28	131.13	40.01	268.32	165.25	125.10	123.67	13.32	464.63	60.01
95th-Percentile Queue Length [veh/ln]	10.00	9.12	9.00	2.88	16.11	10.83	8.67	8.59	0.96	25.66	4.32
95th-Percentile Queue Length [ft/ln]	249.94	227.95	225.03	72.01	402.64	270.66	216.81	214.85	23.98	641.38	108.02

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.54	39.27	39.27	56.07	36.87	26.42	52.55	14.15	14.15	81.42	37.98	23.78
Movement LOS	D	D	D	E	D	C	D	B	B	F	D	C
d_A, Approach Delay [s/veh]	42.90			31.19			29.19			37.16		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	33.91											
Intersection LOS	C											
Intersection V/C	0.839											

Emissions

Vehicle Miles Traveled [mph]	23.41	23.41	20.55	8.32	117.07	49.12	38.39	37.94	6.09	584.41	55.72
Stops [stops/h]	163.74	145.85	143.50	43.78	587.24	361.66	136.89	135.33	14.58	1016.88	65.67
Fuel consumption [US gal/h]	3.75	3.36	3.44	1.06	12.90	8.48	3.28	3.24	0.55	39.32	3.23
CO [g/h]	262.33	234.83	240.55	74.42	901.93	592.71	228.93	226.27	38.20	2748.55	225.96
NOx [g/h]	51.04	45.69	46.80	14.48	175.48	115.32	44.54	44.02	7.43	534.77	43.96
VOC [g/h]	60.80	54.42	55.75	17.25	209.03	137.37	53.06	52.44	8.85	637.00	52.37

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		12.0		13.0		0.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	55.26		54.34		53.44		0.00	
I_p,int, Pedestrian LOS Score for Intersectio	2.120		2.767		3.307		0.000	
Crosswalk LOS	B		C		C		F	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	547		532		1170		897	
d_b, Bicycle Delay [s]	34.72		35.45		11.32		20.02	
I_b,int, Bicycle LOS Score for Intersection	2.216		3.411		2.438		2.698	
Bicycle LOS	B		C		B		B	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street**

Control Type:	Two-way stop	Delay (sec / veh):	18.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.170

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+r			+r			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	49	0	127	92	240	0	0	196	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	12.00	0.00	32.00	61.00	12.00	0.00	0.00	14.00	12.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	49	0	127	92	240	0	0	196	34
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	13	0	35	25	65	0	0	53	9
Total Analysis Volume [veh/h]	0	0	0	53	0	138	100	261	0	0	213	37
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.17	0.00	0.19	0.10	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	20.11	16.05	9.60	18.90	18.13	10.99	8.84	0.00	0.00	7.74	0.00	0.00
Movement LOS	C	C	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.60	0.60	0.68	0.32	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	15.08	15.08	17.07	7.98	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	15.25			13.18			2.45			0.00		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	4.24											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 101: 122nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	26.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.884

Intersection Setup

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↵↵				↵↵↵↵	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	2	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	300.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No				No	
Crosswalk	No		No		Yes	

Volumes

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Base Volume Input [veh/h]	1357	0	0	0	813	1299
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1357	0	0	0	813	1299
Peak Hour Factor	0.9300	1.0000	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	365	0	0	0	219	349
Total Analysis Volume [veh/h]	1459	0	0	0	874	1397
Presence of On-Street Parking	No	No			No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal Group	2	0	0	0	3	8
Auxiliary Signal Groups						
Maximum Green [s]	58	0	0	0	54	54
Amber [s]	3.5	0.0	0.0	0.0	3.5	3.5
All red [s]	1.0	0.0	0.0	0.0	1.0	1.0
Walk [s]	7	0	0	0	0	7
Pedestrian Clearance [s]	11	0	0	0	0	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No					No
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	0.0	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	0.0	0.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	0	0	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	5	0	0	0	5	5
Vehicle Extension [s]	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No				No	No
Maximum Recall	No				No	No
Pedestrian Recall	No				No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	L	C
C, Cycle Length [s]	102	102	102
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50
g_i, Effective Green Time [s]	48	45	45
g / C, Green / Cycle	0.47	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.42	0.25	0.39
s, saturation flow rate [veh/h]	3459	3459	3560
c, Capacity [veh/h]	1623	1530	1575
d1, Uniform Delay [s]	24.82	21.20	26.07
k, delay calibration	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	2.04	0.34	1.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.90	0.57	0.89
d, Delay for Lane Group [s/veh]	26.86	21.54	27.94
Lane Group LOS	C	C	C
Critical Lane Group	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	15.75	7.60	15.21
50th-Percentile Queue Length [ft/ln]	393.76	190.04	380.26
95th-Percentile Queue Length [veh/ln]	22.26	12.12	21.61
95th-Percentile Queue Length [ft/ln]	556.48	303.08	540.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.86	0.00	0.00	0.00	21.54	27.94
Movement LOS	C				C	C
d_A, Approach Delay [s/veh]	26.86		0.00		25.47	
Approach LOS	C		A		C	
d_I, Intersection Delay [s/veh]	26.02					
Intersection LOS	C					
Intersection V/C	0.884					

Emissions

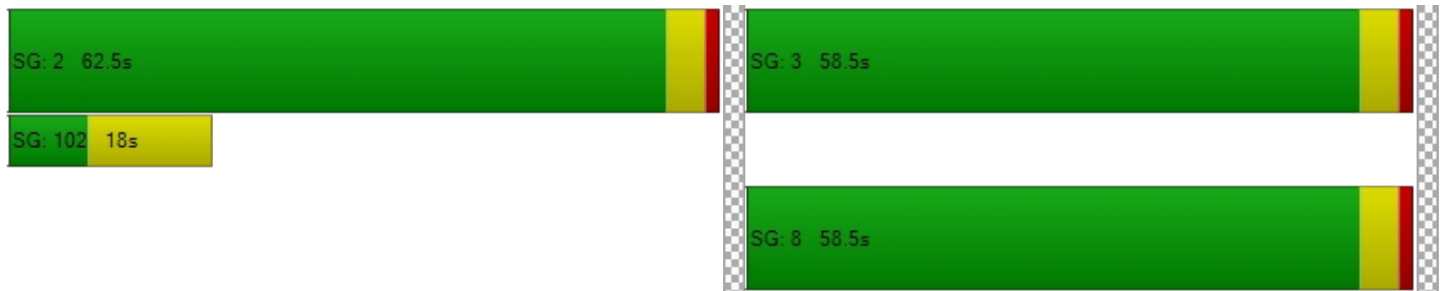
Vehicle Miles Traveled [mph]	121.55		115.83	185.14
Stops [stops/h]	1114.56		537.92	1076.35
Fuel consumption [US gal/h]	19.14		11.57	21.51
CO [g/h]	1337.73		808.79	1503.61
NOx [g/h]	260.27		157.36	292.55
VOC [g/h]	310.03		187.45	348.48

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	40.47
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	2.690
Crosswalk LOS	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1140	0	1061
d_b, Bicycle Delay [s]	9.40	50.87	11.20
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132	3.433
Bicycle LOS	A	D	C

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 102: 122nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.769

Intersection Setup

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	0	0	0	0	2	0	0	0
Entry Pocket Length [ft]	100.00	100.00	200.00	50.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			No			Yes			No		

Volumes

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Base Volume Input [veh/h]	0	1357	428	0	813	0	0	530	663	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	7.00	0.00	2.00	0.00	0.00	2.00	6.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1357	428	0	813	0	0	530	663	0	0	0
Peak Hour Factor	1.0000	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	365	115	0	219	0	0	142	178	0	0	0
Total Analysis Volume [veh/h]	0	1459	460	0	874	0	0	570	713	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss
Signal Group	0	2	2	6	6	0	4	4	4	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	73	73	73	73	0	39	39	39	0	0	0
Amber [s]	0.0	3.5	3.5	3.5	3.5	0.0	3.5	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
Walk [s]	0	7	7	7	7	0	7	7	7	0	0	0
Pedestrian Clearance [s]	0	11	11	11	11	0	11	11	11	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	2.5	2.5	2.5	0.0	2.5	2.5	2.5	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	6.0	20.0	20.0	0.0	6.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	30	30	30	30	0	30	30	30	0	0	0
Lead / Lag	-	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	0	5	5	5	5	0	5	5	5	0	0	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0
Minimum Recall		No			No			No				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	70	70	70	70	70	70	70	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	38	38	38	38	23	23	23	
g / C, Green / Cycle	0.55	0.55	0.55	0.55	0.33	0.33	0.33	
(v / s)_i Volume / Saturation Flow Rate	0.42	0.17	0.00	0.25	0.15	0.15	0.26	
s, saturation flow rate [veh/h]	3475	2700	237	3560	1870	1870	2723	
c, Capacity [veh/h]	1895	1473	147	1942	611	611	889	
d1, Uniform Delay [s]	12.52	8.75	0.00	9.62	18.81	18.81	21.59	
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.68	0.12	0.00	0.16	0.56	0.56	1.74	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.77	0.31	0.00	0.45	0.47	0.47	0.80	
d, Delay for Lane Group [s/veh]	13.20	8.87	0.00	9.79	19.36	19.36	23.33	
Lane Group LOS	B	A	A	A	B	B	C	
Critical Lane Group	Yes	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	7.69	1.68	0.00	3.50	3.54	3.54	5.16	
50th-Percentile Queue Length [ft/ln]	192.30	42.02	0.00	87.60	88.45	88.45	129.01	
95th-Percentile Queue Length [veh/ln]	12.24	3.03	0.00	6.31	6.37	6.37	8.89	
95th-Percentile Queue Length [ft/ln]	306.01	75.63	0.00	157.68	159.20	159.20	222.15	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	13.20	8.87	0.00	9.79	0.00	19.36	19.36	23.33	0.00	0.00	0.00
Movement LOS		B	A	A	A		B	B	C			
d_A, Approach Delay [s/veh]	12.16			9.79			21.57			0.00		
Approach LOS	B			A			C			A		
d_I, Intersection Delay [s/veh]	14.61											
Intersection LOS	B											
Intersection V/C	0.769											

Emissions

Vehicle Miles Traveled [mph]	336.87	106.21	0.00	72.81	34.11	34.11	85.34
Stops [stops/h]	789.58	172.52	0.00	359.70	181.58	181.58	529.73
Fuel consumption [US gal/h]	22.15	6.16	0.00	6.73	3.53	3.53	9.83
CO [g/h]	1548.25	430.31	0.00	470.12	246.78	246.78	686.77
NOx [g/h]	301.23	83.72	0.00	91.47	48.01	48.01	133.62
VOC [g/h]	358.82	99.73	0.00	108.96	57.19	57.19	159.17

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	24.93	0.00	24.93	0.00
l_p,int, Pedestrian LOS Score for Intersectio	3.009	0.000	2.430	0.000
Crosswalk LOS	C	F	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	2082	2082	1112	0
d_b, Bicycle Delay [s]	0.06	0.06	6.91	35.07
l_b,int, Bicycle LOS Score for Intersection	3.143	2.281	2.618	4.132
Bicycle LOS	C	B	B	D

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 103: 142nd Avenue/Backage Road

Control Type:	Signalized	Delay (sec / veh):	24.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.243

Intersection Setup

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Base Volume Input [veh/h]	262	61	164	10	58	10	10	100	622	58	100	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	4.00	2.00	7.00	2.00	2.00	2.00	3.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	262	61	164	10	58	10	10	100	622	58	100	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	17	45	3	16	3	3	27	169	16	27	3
Total Analysis Volume [veh/h]	285	66	178	11	63	11	11	109	676	63	109	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	30.7
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	4	8	8	8
Auxiliary Signal Groups									1,4			
Maximum Green [s]	32	32	32	26	62	62	18	18	18	18	18	18
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	7	7	7	0	7	7	7	7	7	7	7	7
Pedestrian Clearance [s]	11	11	11	0	11	11	11	11	11	11	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	5	5	5	5	5	5	5	5	5	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall		No		No	No			No	No		No	
Maximum Recall		No		No	No			No	No		No	
Pedestrian Recall		No		No	No			No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	59	59	59	59	59	59	59
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	0.00	2.50
g_i, Effective Green Time [s]	23	23	4	32	18	26	18
g / C, Green / Cycle	0.40	0.40	0.07	0.54	0.31	0.45	0.31
(v / s)_i Volume / Saturation Flow Rate	0.22	0.15	0.01	0.04	0.07	0.43	0.15
s, saturation flow rate [veh/h]	1315	1657	1781	1749	1842	1577	1236
c, Capacity [veh/h]	571	658	121	947	630	710	460
d1, Uniform Delay [s]	16.31	12.55	25.73	6.47	15.15	15.57	15.94
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.41	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.68	0.35	0.32	0.03	0.15	21.02	0.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.50	0.37	0.09	0.08	0.19	0.95	0.40
d, Delay for Lane Group [s/veh]	16.99	12.90	26.05	6.50	15.30	36.60	16.49
Lane Group LOS	B	B	C	A	B	D	B
Critical Lane Group	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.97	2.05	0.15	0.37	1.11	11.37	1.79
50th-Percentile Queue Length [ft/ln]	74.26	51.35	3.69	9.15	27.71	284.25	44.66
95th-Percentile Queue Length [veh/ln]	5.35	3.70	0.27	0.66	2.00	16.90	3.22
95th-Percentile Queue Length [ft/ln]	133.67	92.44	6.64	16.46	49.88	422.49	80.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.99	12.90	12.90	26.05	6.50	6.50	15.30	15.30	36.60	16.49	16.49	16.49
Movement LOS	B	B	B	C	A	A	B	B	D	B	B	B
d_A, Approach Delay [s/veh]	15.10			9.03			33.39			16.49		
Approach LOS	B			A			C			B		
d_I, Intersection Delay [s/veh]	24.07											
Intersection LOS	C											
Intersection V/C	0.243											

Emissions

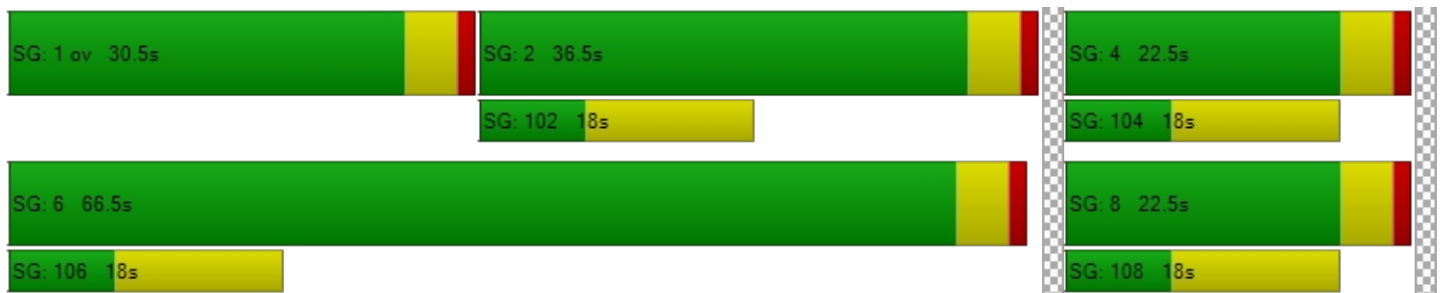
Vehicle Miles Traveled [mph]	53.96	46.20	2.02	13.62	28.90	162.83	44.53
Stops [stops/h]	181.90	125.79	9.04	22.40	67.88	696.24	109.39
Fuel consumption [US gal/h]	4.21	3.24	0.19	0.78	1.94	15.58	3.05
CO [g/h]	294.40	226.29	13.39	54.68	135.50	1089.36	213.33
NOx [g/h]	57.28	44.03	2.61	10.64	26.36	211.95	41.51
VOC [g/h]	68.23	52.45	3.10	12.67	31.40	252.47	49.44

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	19.42	19.42	19.42	19.42
l_p,int, Pedestrian LOS Score for Intersectio	2.521	1.988	2.712	1.926
Crosswalk LOS	B	A	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1089	2109	612	612
d_b, Bicycle Delay [s]	6.10	0.09	14.15	14.15
l_b,int, Bicycle LOS Score for Intersection	2.432	1.700	2.873	1.862
Bicycle LOS	B	A	C	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 104: 142nd Avenue/Highway 212 Access

Control Type:	Signalized	Delay (sec / veh):	7.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

Intersection Setup

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↶		↷		↶	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

Volumes

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Base Volume Input [veh/h]	0	326	188	550	161	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	3.00	6.00	3.00	3.00	0.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	326	188	550	161	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	84	48	142	41	0
Total Analysis Volume [veh/h]	0	336	194	567	166	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	2	2	6	6	4	4
Auxiliary Signal Groups						
Maximum Green [s]	49	49	49	49	21	21
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	3.0	3.0	3.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	8	5	5	8	8
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C
C, Cycle Length [s]	30	30	30	30
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	14	14	14	6
g / C, Green / Cycle	0.46	0.46	0.46	0.20
(v / s)_i Volume / Saturation Flow Rate	0.18	0.11	0.36	0.09
s, saturation flow rate [veh/h]	1855	1810	1577	1810
c, Capacity [veh/h]	973	830	723	368
d1, Uniform Delay [s]	5.30	4.86	6.77	10.34
k, delay calibration	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	0.14	1.91	0.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.23	0.78	0.45
d, Delay for Lane Group [s/veh]	5.51	5.00	8.68	11.21
Lane Group LOS	A	A	A	B
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.70	0.37	1.76	0.76
50th-Percentile Queue Length [ft/ln]	17.40	9.28	44.08	18.88
95th-Percentile Queue Length [veh/ln]	1.25	0.67	3.17	1.36
95th-Percentile Queue Length [ft/ln]	31.33	16.71	79.35	33.98

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.51	5.51	5.00	8.68	11.21	11.21
Movement LOS	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	5.51		7.74		11.21	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	7.60					
Intersection LOS	A					
Intersection V/C	0.619					

Emissions

Vehicle Miles Traveled [mph]	78.38	36.73	107.36	38.53
Stops [stops/h]	84.93	45.31	215.14	92.13
Fuel consumption [US gal/h]	4.07	1.96	6.61	2.47
CO [g/h]	284.68	137.00	462.05	172.91
NOx [g/h]	55.39	26.65	89.90	33.64
VOC [g/h]	65.98	31.75	107.08	40.07

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3321	3321	1423
d_b, Bicycle Delay [s]	6.44	6.44	1.23
I_b,int, Bicycle LOS Score for Intersection	2.114	2.815	1.834
Bicycle LOS	B	C	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 105: 142nd Avenue/OR 212**

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 505.4
 Level Of Service: F
 Volume to Capacity (v/c): 2.030

Intersection Setup

Name	142nd Ave			142nd Ave			EB OR 212			WB OR 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↶			↷			↶↷			↶↷		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	165.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Ave			142nd Ave			EB OR 212			WB OR 212		
Base Volume Input [veh/h]	0	0	188	0	0	550	0	367	326	0	1586	161
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	6.00	0.00	0.00	3.00	0.00	27.00	3.00	0.00	4.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	188	0	0	550	0	367	326	0	1586	161
Peak Hour Factor	1.0000	1.0000	0.9700	1.0000	1.0000	0.9700	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	48	0	0	142	0	95	84	0	409	41
Total Analysis Volume [veh/h]	0	0	194	0	0	567	0	378	336	0	1635	166
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

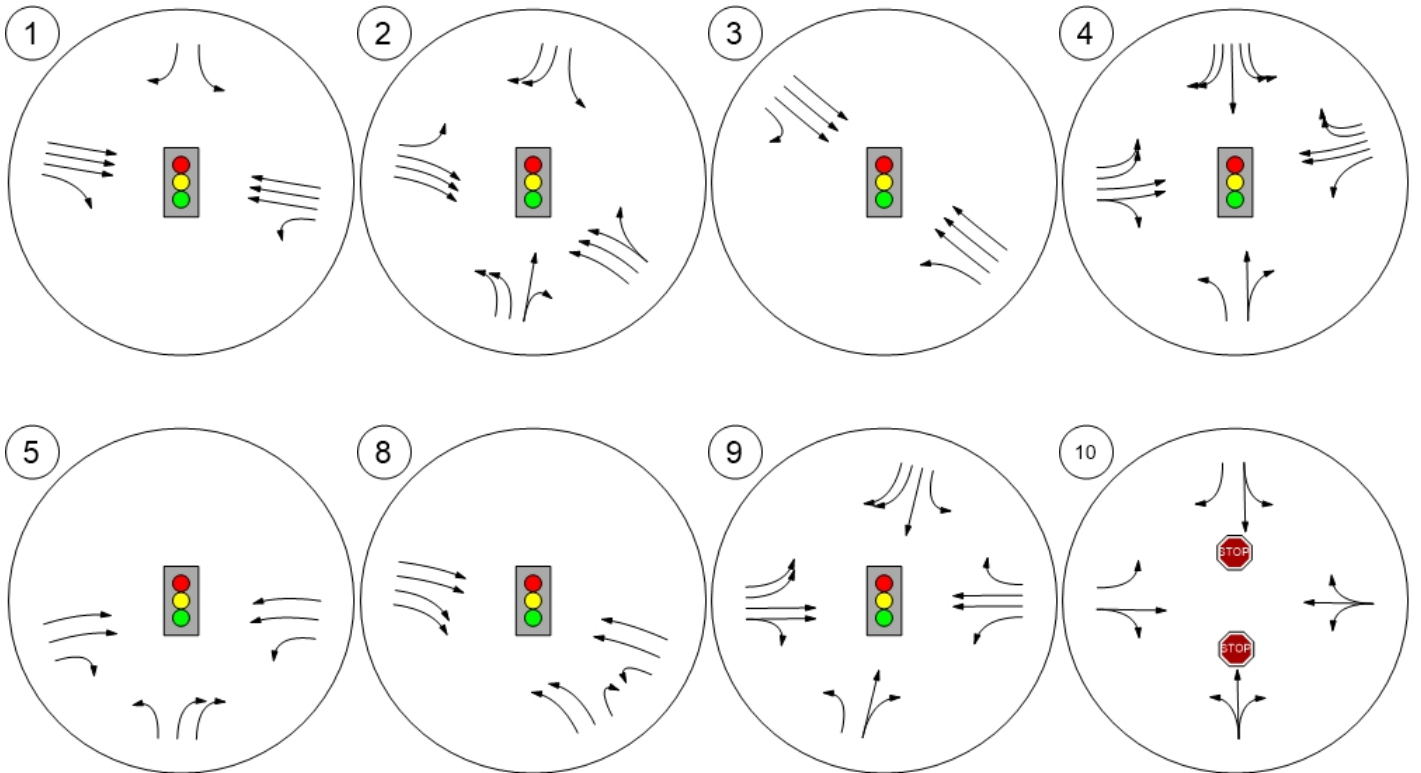
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.24	0.00	0.00	2.03	0.00	0.00	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	10.85	0.00	0.00	505.38	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			F		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.94	0.00	0.00	41.13	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	23.40	0.00	0.00	1028.14	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.85				505.38		0.00		0.00			
Approach LOS	B				F		A		A			
d_I, Intersection Delay [s/veh]	88.11											
Intersection LOS	F											

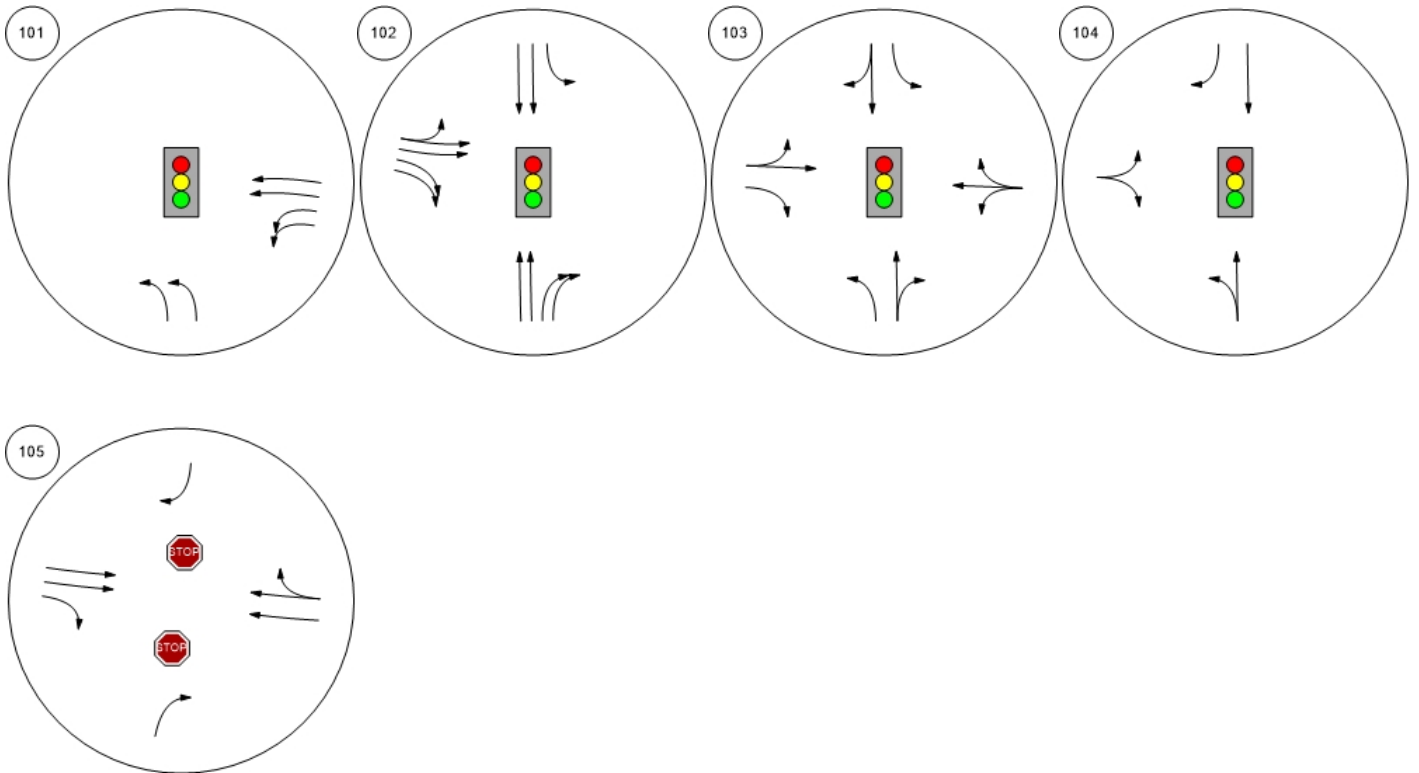
Study Intersections



Lane Configuration and Traffic Control















Lane Configuration and Traffic Control



Future Traffic Conditions - Two-Lane Sunrise
 1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (vph)	0	2370	295	23	1374	0	0	0	0	260	1	425
Future Volume (vph)	0	2370	295	23	1374	0	0	0	0	260	1	425
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	5.5	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3343	1392	1228	3343					1687	0	1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3343	1392	1228	3343					1687	0	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2576	321	25	1493	0	0	0	0	283	1	462
RTOR Reduction (vph)	0	0	132	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	2576	189	25	1493	0	0	0	0	283	1	419
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		74.6	74.6	5.4	84.0					34.5	34.5	34.5
Effective Green, g (s)		76.6	76.6	5.4	86.0					36.0	34.5	36.0
Actuated g/C Ratio		0.59	0.59	0.04	0.66					0.28	0.27	0.28
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5	5.5	5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3	2.3	2.3
Lane Grp Cap (vph)		1969	820	51	2211					467	0	417
v/s Ratio Prot		c0.77		0.02	c0.45							
v/s Ratio Perm			0.14							0.17		c0.28
v/c Ratio		1.31	0.23	0.49	0.68					0.61	no cap	1.01
Uniform Delay, d1		26.7	12.7	61.0	13.5					40.8	Error	47.0
Progression Factor		1.00	1.00	1.24	0.39					1.00		1.00
Incremental Delay, d2		142.5	0.7	2.2	0.9					1.7	Error	45.5
Delay (s)		169.2	13.3	77.6	6.2					42.6	Error	92.5
Level of Service		F	B	E	A					D	F	F
Approach Delay (s)		151.9			7.4			0.0			Error	
Approach LOS		F			A			A			F	
Intersection Summary												
HCM 2000 Control Delay			Error		HCM 2000 Level of Service					F		
HCM 2000 Volume to Capacity ratio			1.21									
Actuated Cycle Length (s)			130.0		Sum of lost time (s)					13.5		
Intersection Capacity Utilization			Err%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Two-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (veh/h)	0	2370	295	23	1374	0	0	0	0	260	1	425
Future Volume (veh/h)	0	2370	295	23	1374	0	0	0	0	260	1	425
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	1900	1796
Adj Flow Rate, veh/h	0	2576	0	25	1493	0				283	1	462
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	2060		25	2239	0				474	0	422
Arrive On Green	0.00	0.61	0.00	0.04	1.00	0.00				0.28	0.27	0.28
Sat Flow, veh/h	0	3474	1409	1146	3474	0				1711	0	1522
Grp Volume(v), veh/h	0	2576	0	25	1493	0				283	0	462
Grp Sat Flow(s),veh/h/ln	0	1692	1409	1146	1692	0				1711	0	1522
Q Serve(g_s), s	0.0	79.1	0.0	2.8	0.0	0.0				18.6	0.0	36.0
Cycle Q Clear(g_c), s	0.0	79.1	0.0	2.8	0.0	0.0				18.6	0.0	36.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2060		25	2239	0				474	0	422
V/C Ratio(X)	0.00	1.25		0.98	0.67	0.00				0.60	0.00	1.10
Avail Cap(c_a), veh/h	0	2060		141	2239	0				474	0	422
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.21	0.21	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.4	0.0	62.1	0.0	0.0				40.7	0.0	47.0
Incr Delay (d2), s/veh	0.0	116.9	0.0	26.1	0.3	0.0				1.7	0.0	72.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	90.3	0.0	1.7	0.2	0.0				12.8	0.0	31.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	142.4	0.0	88.2	0.3	0.0				42.4	0.0	119.3
LnGrp LOS	A	F		F	A	A				D	A	F
Approach Vol, veh/h		2576			1518						745	
Approach Delay, s/veh		142.4			1.8						90.1	
Approach LOS		F			A						F	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.9	83.1		40.0		90.0						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	16.0	64.0		34.5		84.0						
Max Q Clear Time (g_c+I1), s	4.8	81.1		38.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		3.7						

Intersection Summary

HCM 6th Ctrl Delay	90.2
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Two-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	551	2079	0	0	810	434	349	8	322	20	0	238	
Future Volume (vph)	551	2079	0	0	810	434	349	8	322	20	0	238	
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0		4.0	
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00		1.00		0.88	
Frb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00	
Frt	1.00	1.00			0.95		1.00	0.85		1.00		0.85	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00	
Satd. Flow (prot)	1703	3343			3209		3242	1380		1467		2608	
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00	
Satd. Flow (perm)	1703	3343			3209		3242	1380		1467		2608	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	599	2260	0	0	880	472	379	9	350	22	0	259	
RTOR Reduction (vph)	0	0	0	0	50	0	0	131	0	0	0	75	
Lane Group Flow (vph)	599	2260	0	0	1302	0	379	228	0	22	0	184	
Confl. Peds. (#/hr)			1	1									
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%	
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov	
Protected Phases	5	2			6		3	8		7		4 5	
Permitted Phases													
Actuated Green, G (s)	38.8	86.5			43.7		22.0	20.4		6.1		47.3	
Effective Green, g (s)	38.8	88.5			45.7		23.5	21.9		7.6		46.3	
Actuated g/C Ratio	0.30	0.68			0.35		0.18	0.17		0.06		0.36	
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5			
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3			
Lane Grp Cap (vph)	508	2275			1128		586	232		85		928	
v/s Ratio Prot	c0.35	0.68			c0.41		c0.12	c0.16		0.01		0.07	
v/s Ratio Perm													
v/c Ratio	1.18	0.99			1.15		0.65	0.98		0.26		0.20	
Uniform Delay, d1	45.6	20.5			42.1		49.4	53.8		58.5		29.0	
Progression Factor	0.72	0.31			1.00		1.00	1.00		1.00		1.00	
Incremental Delay, d2	82.7	4.4			79.4		2.0	53.4		0.9		0.1	
Delay (s)	115.4	10.6			121.6		51.4	107.3		59.5		29.0	
Level of Service	F	B			F		D	F		E		C	
Approach Delay (s)		32.6			121.6			78.6			31.4		
Approach LOS		C			F			E			C		
Intersection Summary													
HCM 2000 Control Delay			62.0		HCM 2000 Level of Service					E			
HCM 2000 Volume to Capacity ratio			1.11										
Actuated Cycle Length (s)			130.0		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			97.2%		ICU Level of Service					F			
Analysis Period (min)			15										

c Critical Lane Group

Future Traffic Conditions - Two-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖		↖	↗		↖		↖
Traffic Volume (veh/h)	551	2079	0	0	810	434	349	8	322	20	0	238
Future Volume (veh/h)	551	2079	0	0	810	434	349	8	322	20	0	238
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	599	2260	0	0	880	472	379	9	350	22	0	259
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	544	2507	0	0	811	429	651	6	218	42	0	0
Arrive On Green	0.63	1.00	0.00	0.00	0.13	0.12	0.20	0.14	0.13	0.03	0.00	0.01
Sat Flow, veh/h	1725	3474	0	0	2228	1131	3291	41	1576	1485	22	
Grp Volume(v), veh/h	599	2260	0	0	694	658	379	0	359	22	68.3	
Grp Sat Flow(s),veh/h/ln	1725	1692	0	0	1692	1578	1646	0	1616	1485	E	
Q Serve(g_s), s	41.0	0.0	0.0	0.0	49.3	49.3	13.6	0.0	18.0	1.9		
Cycle Q Clear(g_c), s	41.0	0.0	0.0	0.0	49.3	49.3	13.6	0.0	18.0	1.9		
Prop In Lane	1.00		0.00	0.00		0.72	1.00		0.97	1.00		
Lane Grp Cap(c), veh/h	544	2507	0	0	642	598	651	0	224	42		
V/C Ratio(X)	1.10	0.90	0.00	0.00	1.08	1.10	0.58	0.00	1.60	0.52		
Avail Cap(c_a), veh/h	544	2507	0	0	642	598	734	0	224	194		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.94	0.94	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	24.0	0.0	0.0	0.0	56.9	57.1	47.3	0.0	56.7	62.3		
Incr Delay (d2), s/veh	48.5	0.6	0.0	0.0	58.3	66.1	0.6	0.0	291.7	6.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	22.1	0.4	0.0	0.0	44.4	43.8	9.5	0.0	39.9	1.4		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.5	0.6	0.0	0.0	115.2	123.2	47.9	0.0	348.5	68.3		
LnGrp LOS	F	A	A	A	F	F	D	A	F	E		
Approach Vol, veh/h		2859			1352			738				
Approach Delay, s/veh		15.7			119.1			194.1				
Approach LOS		B			F			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		100.3	29.7		47.0	53.3	7.7	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		81.0	27.5		41.0	* 36	15.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	15.6		43.0	51.3	3.9	20.0				
Green Ext Time (p_c), s		67.9	0.8		0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	70.5
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Future Traffic Conditions - Two-Lane Sunrise
 3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑		
Traffic Volume (vph)	2048	373	251	1244	0	0
Future Volume (vph)	2048	373	251	1244	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3223	1509	1517	3505		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3223	1509	1517	3505		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2090	381	256	1269	0	0
RTOR Reduction (vph)	0	45	0	0	0	0
Lane Group Flow (vph)	2090	336	256	1269	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	91.9	91.9	27.1	130.0		
Effective Green, g (s)	94.9	94.9	27.1	130.0		
Actuated g/C Ratio	0.73	0.73	0.21	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	2352	1101	316	3505		
v/s Ratio Prot	c0.65		c0.17	0.36		
v/s Ratio Perm		0.22				
v/c Ratio	0.89	0.31	0.81	0.36		
Uniform Delay, d1	13.5	6.1	49.0	0.0		
Progression Factor	0.83	1.38	1.00	1.00		
Incremental Delay, d2	1.7	0.2	14.0	0.3		
Delay (s)	13.0	8.6	63.0	0.3		
Level of Service	B	A	E	A		
Approach Delay (s)	12.3			10.8	0.0	
Approach LOS	B			B	A	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - Two-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↕↗		↖	↕↕	↖↗	↖	↕		↖↗	↕	↖↗
Traffic Volume (vph)	644	600	62	10	530	778	20	152	10	775	300	579
Future Volume (vph)	644	600	62	10	530	778	20	152	10	775	300	579
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	0.88	1.00	1.00		0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2694	3089		1543	3343	2760	1203	1287		3242	1597	2493
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.38	1.00	1.00
Satd. Flow (perm)	2694	3089		1543	3343	2760	1203	1287		1302	1597	2493
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	685	638	66	11	564	828	21	162	11	824	319	616
RTOR Reduction (vph)	0	5	0	0	0	381	0	2	0	0	0	471
Lane Group Flow (vph)	685	699	0	11	564	447	21	171	0	824	319	145
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6	6 7	3	8		7	4	
Permitted Phases										4		4
Actuated Green, G (s)	40.7	77.2		1.6	38.1	42.1	3.1	29.0		29.9	29.9	29.9
Effective Green, g (s)	40.7	78.6		1.6	39.5	44.9	3.1	29.8		29.9	30.7	30.7
Actuated g/C Ratio	0.31	0.60		0.01	0.30	0.35	0.02	0.23		0.23	0.24	0.24
Clearance Time (s)	4.0	5.4		4.0	5.4		4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6		2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	843	1867		18	1015	953	28	295		359	377	588
v/s Ratio Prot	c0.25	0.23		0.01	c0.17	0.16	0.02	c0.13		c0.07	0.20	
v/s Ratio Perm										c0.46		0.06
v/c Ratio	0.81	0.37		0.61	0.56	0.47	0.75	0.58		2.30	0.85	0.25
Uniform Delay, d1	41.1	13.1		63.9	37.9	33.2	63.1	44.5		51.7	47.4	40.3
Progression Factor	1.00	1.00		0.98	1.05	1.74	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.7	0.6		35.2	2.1	0.2	67.9	2.0		591.6	15.5	0.1
Delay (s)	46.8	13.7		98.1	41.8	58.0	130.9	46.6		643.4	62.9	40.4
Level of Service	D	B		F	D	E	F	D		F	E	D
Approach Delay (s)		30.0			51.8			55.7			326.9	
Approach LOS		C			D			E			F	

Intersection Summary		
HCM 2000 Control Delay	147.6	HCM 2000 Level of Service F
HCM 2000 Volume to Capacity ratio	1.09	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	77.1%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Two-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	644	600	62	10	530	778	20	152	10	775	300	579
Future Volume (veh/h)	644	600	62	10	530	778	20	152	10	775	300	579
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	685	638	66	11	564	828	21	162	11	824	319	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	772	1834	189	16	1136	1044	19	234	16	249	356	
Arrive On Green	0.29	0.62	0.61	0.01	0.34	0.34	0.02	0.21	0.21	0.03	0.22	0.00
Sat Flow, veh/h	2689	2942	304	1570	3385	2768	1104	1100	75	3291	1618	2524
Grp Volume(v), veh/h	685	348	356	11	564	828	21	0	173	824	319	0
Grp Sat Flow(s),veh/h/ln	1345	1608	1638	1570	1692	1384	1104	0	1175	1646	1618	1262
Q Serve(g_s), s	31.7	13.5	13.6	0.9	17.3	25.2	2.3	0.0	17.7	4.0	24.9	0.0
Cycle Q Clear(g_c), s	31.7	13.5	13.6	0.9	17.3	25.2	2.3	0.0	17.7	4.0	24.9	0.0
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.06	1.00		1.00
Lane Grp Cap(c), veh/h	772	1002	1021	16	1136	1044	19	0	250	249	356	
V/C Ratio(X)	0.89	0.35	0.35	0.69	0.50	0.79	1.09	0.00	0.69	3.31	0.90	
Avail Cap(c_a), veh/h	772	1002	1021	48	1463	1311	34	0	324	249	446	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	0.00	1.00	0.74	0.74	0.00
Uniform Delay (d), s/veh	44.3	11.8	11.9	64.1	34.4	23.9	63.9	0.0	47.3	55.2	49.3	0.0
Incr Delay (d2), s/veh	11.8	1.0	0.9	17.2	1.4	5.8	146.1	0.0	3.0	1048.8	12.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	17.4	8.7	8.9	0.8	11.7	13.5	2.6	0.0	9.2	55.5	16.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.2	12.7	12.8	81.3	35.9	29.7	210.0	0.0	50.3	1103.9	62.1	0.0
LnGrp LOS	E	B	B	F	D	C	F	A	D	F	E	
Approach Vol, veh/h		1389			1403			194			1143	
Approach Delay, s/veh		34.2			32.6			67.6			813.2	
Approach LOS		C			C			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	85.0	7.1	32.6	42.7	47.6	8.0	31.7				
Change Period (Y+Rc), s	4.0	* 5.4	4.8	* 4.8	* 5.4	* 5.4	4.0	4.8				
Max Green Setting (Gmax), s	4.0	* 69	4.0	* 35	* 18	* 55	4.0	35.0				
Max Q Clear Time (g_c+I1), s	2.9	15.6	4.3	26.9	33.7	27.2	6.0	19.7				
Green Ext Time (p_c), s	0.0	9.8	0.0	0.9	0.0	15.1	0.0	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			250.8									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Future Traffic Conditions - Two-Lane Sunrise
5: 135th Ave & Highway 212/OR 212

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵↵
Traffic Volume (vph)	1310	26	284	1001	63	716
Future Volume (vph)	1310	26	284	1001	63	716
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.88
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3167	1346	1671	3343	1671	2433
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3167	1346	1671	3343	1671	2433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1379	27	299	1054	66	754
RTOR Reduction (vph)	0	3	0	0	0	545
Lane Group Flow (vph)	1379	24	299	1054	66	209
Confl. Peds. (#/hr)		2	2		1	2
Heavy Vehicles (%)	14%	17%	8%	8%	8%	14%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	73.0	73.0	27.0	104.0	16.6	16.1
Effective Green, g (s)	74.4	74.4	27.0	105.4	16.6	16.6
Actuated g/C Ratio	0.57	0.57	0.21	0.81	0.13	0.13
Clearance Time (s)	5.4	5.4	4.0	5.4	4.0	4.5
Vehicle Extension (s)	4.5	4.5	2.3	4.5	2.3	3.0
Lane Grp Cap (vph)	1812	770	347	2710	213	310
v/s Ratio Prot	c0.44		c0.18	0.32	0.04	
v/s Ratio Perm		0.02				c0.09
v/c Ratio	0.76	0.03	0.86	0.39	0.31	0.67
Uniform Delay, d1	21.1	12.1	49.7	3.4	51.5	54.1
Progression Factor	0.87	0.98	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	18.8	0.4	0.5	5.7
Delay (s)	18.7	11.8	68.5	3.8	52.0	59.8
Level of Service	B	B	E	A	D	E
Approach Delay (s)	18.5			18.1	59.2	
Approach LOS	B			B	E	

Intersection Summary

HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Two-Lane Sunrise
5: 135th Ave & Highway 212/OR 212

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵↵
Traffic Volume (veh/h)	1310	26	284	1001	63	716
Future Volume (veh/h)	1310	26	284	1001	63	716
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1693	1648	1781	1781	1781	1693
Adj Flow Rate, veh/h	1379	27	299	1054	66	754
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	14	17	8	8	8	14
Cap, veh/h	1554	673	322	2382	398	602
Arrive On Green	0.48	0.48	0.19	0.70	0.23	0.24
Sat Flow, veh/h	3300	1394	1697	3474	1697	2524
Grp Volume(v), veh/h	1379	27	299	1054	66	754
Grp Sat Flow(s),veh/h/ln	1608	1394	1697	1692	1697	1262
Q Serve(g_s), s	50.4	1.3	22.5	17.4	4.0	31.0
Cycle Q Clear(g_c), s	50.4	1.3	22.5	17.4	4.0	31.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1554	673	322	2382	398	602
V/C Ratio(X)	0.89	0.04	0.93	0.44	0.17	1.25
Avail Cap(c_a), veh/h	1554	673	352	2382	398	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	17.7	51.8	8.3	39.6	49.5
Incr Delay (d2), s/veh	0.8	0.0	28.3	0.6	0.1	126.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	21.4	0.8	17.8	10.3	3.1	31.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.2	17.7	80.1	8.9	39.7	176.4
LnGrp LOS	C	B	F	A	D	F
Approach Vol, veh/h	1406			1353	820	
Approach Delay, s/veh	31.0			24.6	165.4	
Approach LOS	C			C	F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	28.7	66.8			95.5	34.5
Change Period (Y+Rc), s	4.0	* 5.4			* 5.4	4.0
Max Green Setting (Gmax), s	27.0	* 59			* 90	30.5
Max Q Clear Time (g_c+I1), s	24.5	52.4			19.4	33.0
Green Ext Time (p_c), s	0.2	5.6			19.4	0.0

Intersection Summary

HCM 6th Ctrl Delay	59.4
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	1898	912	197	0	310
Future Vol, veh/h	0	1898	912	197	0	310
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	0	1998	960	207	0	326

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

MOVEMENT SUMMARY

Site: 106 [Highway 212/Riverbend_2LanePM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Two-Lane Sunrise
 Site Category: (None)
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]			mph	
			veh/h		veh/h					veh	ft				
South: Riverbend															
3	L2	All MCs	71	3.0	71	3.0	0.881	84.1	LOS F	3.1	84.3	0.97	1.64	2.48	10.7
18	R2	All MCs	68	20.0	68	20.0	0.881	115.8	LOS F	3.1	84.3	0.97	1.64	2.48	10.7
Approach			139	11.3	139	11.3	0.881	97.4	LOS F	3.1	84.3	0.97	1.64	2.48	10.7
East: Highway 212															
1	L2	All MCs	25	0.0	25	0.0	0.437	6.5	LOS A	2.6	69.6	0.28	0.11	0.28	34.6
6	T1	All MCs	1059	7.0	1059	7.0	0.437	7.1	LOS A	2.6	69.6	0.28	0.11	0.28	34.4
Approach			1084	6.8	1084	6.8	0.437	7.1	LOS A	2.6	69.6	0.28	0.11	0.28	34.5
West: Highway 212															
2	T1	All MCs	1835	6.0	1835	6.0	0.731	10.2	LOS B	9.3	243.3	0.31	0.08	0.31	33.1
12	R2	All MCs	81	3.0	81	3.0	0.731	9.9	LOS A	9.3	243.3	0.31	0.08	0.31	33.1
Approach			1916	5.9	1916	5.9	0.731	10.2	LOS B	9.3	243.3	0.31	0.08	0.31	33.1
All Vehicles			3139	6.4	3139	6.4	0.881	13.1	LOS B	9.3	243.3	0.33	0.16	0.40	30.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stoptime Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: H:\27\27852 - Sunrise Corridor Community Visioning\synchro\27852_RoundaboutsAnalysis.sip9

Future Traffic Conditions - Two-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	736	1044	69	24	856	112	32	84	27	266	102	488	
Future Volume (vph)	736	1044	69	24	856	112	32	84	27	266	102	488	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88	
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3213	3141		1626	3343	1429	1805	1769		1703	1827	2660	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3213	3141		1626	3343	1429	1805	1769		1703	1827	2660	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	775	1099	73	25	901	118	34	88	28	280	107	514	
RTOR Reduction (vph)	0	3	0	0	0	71	0	11	0	0	0	206	
Lane Group Flow (vph)	775	1169	0	25	901	47	34	105	0	280	107	308	
Confl. Peds. (#/hr)							5		1	1		5	
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	
Protected Phases	5	2		1	6		3	8		7	4	5	
Permitted Phases						6						4	
Actuated Green, G (s)	14.1	49.6		1.4	36.9	36.9	4.3	14.4		14.0	22.9	37.0	
Effective Green, g (s)	14.6	52.1		1.9	39.4	39.4	4.8	15.4		14.5	25.1	38.0	
Actuated g/C Ratio	0.15	0.52		0.02	0.39	0.39	0.05	0.15		0.15	0.25	0.38	
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	4.5	5.0		4.5	6.2	4.5	
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.3	2.5		2.3	2.5	2.3	
Lane Grp Cap (vph)	469	1638		30	1318	563	86	272		247	459	1011	
v/s Ratio Prot	c0.24	c0.37		0.02	0.27		0.02	c0.06		c0.16	0.06	0.04	
v/s Ratio Perm						0.03						0.07	
v/c Ratio	1.65	0.71		0.83	0.68	0.08	0.40	0.39		1.13	0.23	0.30	
Uniform Delay, d1	42.7	18.2		48.8	25.1	18.9	46.1	38.0		42.7	29.7	21.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	303.0	2.0		94.0	2.0	0.2	1.7	0.7		98.0	0.2	0.1	
Delay (s)	345.7	20.2		142.8	27.1	19.1	47.9	38.7		140.7	29.9	21.8	
Level of Service	F	C		F	C	B	D	D		F	C	C	
Approach Delay (s)		149.7			29.0			40.8			59.7		
Approach LOS		F			C			D			E		
Intersection Summary													
HCM 2000 Control Delay			94.4		HCM 2000 Level of Service					F			
HCM 2000 Volume to Capacity ratio			0.91										
Actuated Cycle Length (s)			99.9		Sum of lost time (s)					16.0			
Intersection Capacity Utilization			76.6%		ICU Level of Service					D			
Analysis Period (min)			15										

c Critical Lane Group

Future Traffic Conditions - Two-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕		↔	↕↕	↔	↔	↕		↔	↕	↕↕
Traffic Volume (veh/h)	736	1044	69	24	856	112	32	84	27	266	102	488
Future Volume (veh/h)	736	1044	69	24	856	112	32	84	27	266	102	488
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	775	1099	73	25	901	0	34	88	28	280	107	514
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	506	1550	103	43	1277		55	174	55	266	488	1087
Arrive On Green	0.16	0.51	0.48	0.03	0.38	0.00	0.03	0.13	0.12	0.15	0.26	0.25
Sat Flow, veh/h	3264	3061	203	1654	3385	1447	1810	1352	430	1725	1841	2696
Grp Volume(v), veh/h	775	577	595	25	901	0	34	0	116	280	107	514
Grp Sat Flow(s),veh/h/ln	1632	1608	1656	1654	1692	1447	1810	0	1782	1725	1841	1348
Q Serve(g_s), s	14.4	25.7	25.8	1.4	21.0	0.0	1.7	0.0	5.6	14.3	4.2	13.1
Cycle Q Clear(g_c), s	14.4	25.7	25.8	1.4	21.0	0.0	1.7	0.0	5.6	14.3	4.2	13.1
Prop In Lane	1.00		0.12	1.00		1.00	1.00		0.24	1.00		1.00
Lane Grp Cap(c), veh/h	506	814	839	43	1277		55	0	229	266	488	1087
V/C Ratio(X)	1.53	0.71	0.71	0.58	0.71		0.62	0.00	0.51	1.05	0.22	0.47
Avail Cap(c_a), veh/h	506	885	911	80	1501		238	0	654	266	717	1423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	17.7	17.8	44.7	24.5	0.0	44.5	0.0	37.8	39.3	26.6	20.5
Incr Delay (d2), s/veh	249.1	3.7	3.6	7.5	2.2	0.0	6.6	0.0	1.3	70.3	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	36.6	14.8	15.2	1.2	13.3	0.0	1.6	0.0	4.5	17.0	3.3	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	288.3	21.3	21.4	52.3	26.7	0.0	51.1	0.0	39.1	109.6	26.8	20.8
LnGrp LOS	F	C	C	D	C		D	A	D	F	C	C
Approach Vol, veh/h		1947			926			150				901
Approach Delay, s/veh		127.6			27.4			41.8				49.1
Approach LOS		F			C			D				D
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	51.0	6.8	28.6	18.4	39.0	18.3	17.2				
Change Period (Y+Rc), s	4.5	6.5	4.5	6.2	4.5	6.5	4.5	* 6.2				
Max Green Setting (Gmax), s	4.0	48.6	11.7	34.0	13.9	38.7	13.8	* 33				
Max Q Clear Time (g_c+I1), s	3.4	27.8	3.7	15.1	16.4	23.0	16.3	7.6				
Green Ext Time (p_c), s	0.0	14.4	0.0	2.1	0.0	9.6	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	82.7
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Two-Lane Sunrise
10: 122nd Avenue & Jennifer Street

Weekday PM Peak Hour
08/01/2024

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	82	420	0	0	266	12	0	0	0	35	0	98
Future Vol, veh/h	82	420	0	0	266	12	0	0	0	35	0	98
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	89	457	0	0	289	13	0	0	0	38	0	107

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	302	0	0	457	0	0	984	937	457	931	931	296
Stage 1	-	-	-	-	-	-	635	635	-	296	296	-
Stage 2	-	-	-	-	-	-	349	302	-	635	635	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	988	-	-	735	-	-	229	267	608	237	269	678
Stage 1	-	-	-	-	-	-	470	476	-	691	672	-
Stage 2	-	-	-	-	-	-	671	668	-	450	476	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	988	-	-	735	-	-	180	243	608	221	245	678
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	243	-	221	245	-
Stage 1	-	-	-	-	-	-	428	433	-	629	672	-
Stage 2	-	-	-	-	-	-	566	668	-	409	433	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	0	0	14.8
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	988	-	-	735	-	-	221	678
HCM Lane V/C Ratio	-	0.09	-	-	-	-	-	0.172	0.157
HCM Control Delay (s)	0	9	-	-	0	-	-	24.6	11.3
HCM Lane LOS		A	A	-	A	-	-	C	B
HCM 95th %tile Q(veh)	-	0.3	-	-	0	-	-	0.6	0.6

Future Traffic Conditions - Two-Lane Sunrise
101: 122nd Avenue & Sunrise WB

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (vph)	0	0	665	711	784	0
Future Volume (vph)	0	0	665	711	784	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			0.97	0.95	0.97	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			3502	3539	3433	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			3502	3539	3433	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	715	765	843	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	715	765	843	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Turn Type			Prot	NA	Prot	
Protected Phases			3	8	2	
Permitted Phases						
Actuated Green, G (s)			18.8	18.8	19.5	
Effective Green, g (s)			19.3	19.3	20.0	
Actuated g/C Ratio			0.41	0.41	0.42	
Clearance Time (s)			4.5	4.5	4.5	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			1428	1444	1451	
v/s Ratio Prot			0.20	c0.22	c0.25	
v/s Ratio Perm						
v/c Ratio			0.50	0.53	0.58	
Uniform Delay, d1			10.4	10.6	10.4	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.3	0.4	0.6	
Delay (s)			10.7	10.9	11.0	
Level of Service			B	B	B	
Approach Delay (s)	0.0			10.8	11.0	
Approach LOS	A			B	B	
Intersection Summary						
HCM 2000 Control Delay			10.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			47.3		Sum of lost time (s)	8.0
Intersection Capacity Utilization			71.1%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Future Traffic Conditions - Two-Lane Sunrise
101: 122nd Avenue & Sunrise WB



















Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (veh/h)	0	0	665	711	784	0
Future Volume (veh/h)	0	0	665	711	784	0
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00		1.00	1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1900	1870	1870	0
Adj Flow Rate, veh/h			715	765	843	0
Peak Hour Factor			0.93	0.93	0.93	0.93
Percent Heavy Veh, %			0	2	2	0
Cap, veh/h			0	2540	0	0
Arrive On Green			0.71	0.71	0.04	0.00
Sat Flow, veh/h			0	3647	0	
Grp Volume(v), veh/h			0	765	0.0	
Grp Sat Flow(s),veh/h/ln			0	1777		
Q Serve(g_s), s			0.0	1.1		
Cycle Q Clear(g_c), s			0.0	1.1		
Prop In Lane			0.00			
Lane Grp Cap(c), veh/h			0	2540		
V/C Ratio(X)			0.00	0.30		
Avail Cap(c_a), veh/h			0	13177		
HCM Platoon Ratio			1.00	1.00		
Upstream Filter(I)			0.00	1.00		
Uniform Delay (d), s/veh			0.0	0.7		
Incr Delay (d2), s/veh			0.0	0.1		
Initial Q Delay(d3),s/veh			0.0	0.0		
%ile BackOfQ(95%),veh/ln			0.0	0.0		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			0.0	0.8		
LnGrp LOS			A	A		
Approach Vol, veh/h				765		
Approach Delay, s/veh				0.8		
Approach LOS				A		
Timer - Assigned Phs						8
Phs Duration (G+Y+Rc), s						14.0
Change Period (Y+Rc), s						* 4.5
Max Green Setting (Gmax), s						* 52
Max Q Clear Time (g_c+I1), s						3.1
Green Ext Time (p_c), s						6.5
Intersection Summary						
HCM 6th Ctrl Delay			0.8			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Future Traffic Conditions - Two-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday PM Peak Hour
08/01/2024

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	1059	989	0	0	0	0	784	790	0	665	0	
Future Volume (vph)	0	1059	989	0	0	0	0	784	790	0	665	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0		
Lane Util. Factor		0.95	0.88					0.95	0.88		0.95		
Frt		1.00	0.85					1.00	0.85		1.00		
Flt Protected		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (prot)		3610	2682					3438	2656		3610		
Flt Permitted		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (perm)		3610	2682					3438	2656		3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	1139	1063	0	0	0	0	843	849	0	715	0	
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	53	0	0	0	
Lane Group Flow (vph)	0	1139	956	0	0	0	0	843	796	0	715	0	
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	5%	7%	0%	0%	0%	
Turn Type		NA	Perm					NA	Perm	Perm	NA		
Protected Phases		4						2			6		
Permitted Phases	4		4						2	6			
Actuated Green, G (s)		54.9	54.9					45.1	45.1		45.1		
Effective Green, g (s)		55.4	55.4					45.6	45.6		45.6		
Actuated g/C Ratio		0.51	0.51					0.42	0.42		0.42		
Clearance Time (s)		4.5	4.5					4.5	4.5		4.5		
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		1834	1363					1438	1111		1510		
v/s Ratio Prot		0.32						0.25			0.20		
v/s Ratio Perm			c0.36						c0.30				
v/c Ratio		0.62	0.70					0.59	0.72		0.47		
Uniform Delay, d1		19.3	20.5					24.4	26.3		23.0		
Progression Factor		1.00	1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.7	1.7					0.6	2.2		0.2		
Delay (s)		19.9	22.1					25.0	28.6		23.2		
Level of Service		B	C					C	C		C		
Approach Delay (s)		21.0			0.0			26.8			23.2		
Approach LOS		C			A			C			C		
Intersection Summary													
HCM 2000 Control Delay			23.5									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.71										
Actuated Cycle Length (s)			109.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			71.1%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

Future Traffic Conditions - Two-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗↗					↕↕	↗↗	↘	↕↕	
Traffic Volume (veh/h)	0	1059	989	0	0	0	0	784	790	0	665	0
Future Volume (veh/h)	0	1059	989	0	0	0	0	784	790	0	665	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811				0	1826	1796	1900	1900	0
Adj Flow Rate, veh/h	0	1139	1063				0	843	849	0	715	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6				0	5	7	0	0	0
Cap, veh/h	0	1836	1374				0	1422	1098	73	1480	0
Arrive On Green	0.00	0.51	0.51				0.00	0.41	0.41	0.00	0.41	0.00
Sat Flow, veh/h	0	3705	2701				0	3561	2679	295	3705	0
Grp Volume(v), veh/h	0	1139	1063				0	843	849	0	715	0
Grp Sat Flow(s),veh/h/ln	0	1805	1351				0	1735	1340	295	1805	0
Q Serve(g_s), s	0.0	22.3	31.3				0.0	18.6	26.9	0.0	14.3	0.0
Cycle Q Clear(g_c), s	0.0	22.3	31.3				0.0	18.6	26.9	0.0	14.3	0.0
Prop In Lane	0.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1836	1374				0	1422	1098	73	1480	0
V/C Ratio(X)	0.00	0.62	0.77				0.00	0.59	0.77	0.00	0.48	0.00
Avail Cap(c_a), veh/h	0	2205	1650				0	1836	1418	109	1911	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00				0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	17.3	19.6				0.0	22.6	25.0	0.0	21.3	0.0
Incr Delay (d2), s/veh	0.0	0.4	1.9				0.0	0.4	2.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	13.7	14.7				0.0	11.9	13.3	0.0	9.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.7	21.5				0.0	23.0	27.1	0.0	21.6	0.0
LnGrp LOS	A	B	C				A	C	C	A	C	A
Approach Vol, veh/h		2202						1692			715	
Approach Delay, s/veh		19.5						25.0			21.6	
Approach LOS		B						C			C	
Timer - Assigned Phs		2		4				6				
Phs Duration (G+Y+Rc), s		44.3		54.0				44.3				
Change Period (Y+Rc), s		4.5		4.5				4.5				
Max Green Setting (Gmax), s		51.5		59.5				51.5				
Max Q Clear Time (g_c+I1), s		28.9		33.3				16.3				
Green Ext Time (p_c), s		10.9		16.2				5.7				
Intersection Summary												
HCM 6th Ctrl Delay			21.9									
HCM 6th LOS			C									

Future Traffic Conditions - Two-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↖			↕	
Traffic Volume (vph)	10	100	609	141	100	10	635	54	313	10	115	10
Future Volume (vph)	10	100	609	141	100	10	635	54	313	10	115	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Frt		1.00	0.85		0.99		1.00	0.87			0.99	
Flt Protected		1.00	1.00		0.97		0.95	1.00			1.00	
Satd. Flow (prot)		1891	1568		1838		1752	1616			1769	
Flt Permitted		0.97	1.00		0.75		0.95	1.00			0.95	
Satd. Flow (perm)		1843	1568		1413		1752	1616			1690	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	109	662	153	109	11	690	59	340	11	125	11
RTOR Reduction (vph)	0	0	165	0	2	0	0	115	0	0	3	0
Lane Group Flow (vph)	0	120	497	0	271	0	690	284	0	0	144	0
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	3%	0%	3%	0%	7%	0%
Turn Type	Perm	NA	pm+ov	Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4	5		8		5	2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)		18.4	53.6		18.4		35.2	51.8			12.1	
Effective Green, g (s)		18.9	54.6		18.9		35.7	52.3			12.6	
Actuated g/C Ratio		0.24	0.69		0.24		0.45	0.66			0.16	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		439	1160		337		789	1067			268	
v/s Ratio Prot			0.19				c0.39	0.18				
v/s Ratio Perm		0.07	0.12		c0.19						c0.08	
v/c Ratio		0.27	0.43		0.81		0.87	0.27			0.54	
Uniform Delay, d1		24.6	5.4		28.4		19.7	5.5			30.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.3	0.3		13.1		10.6	0.1			2.1	
Delay (s)		24.9	5.7		41.5		30.3	5.7			32.7	
Level of Service		C	A		D		C	A			C	
Approach Delay (s)		8.6			41.5		21.3				32.7	
Approach LOS		A			D		C				C	

Intersection Summary		
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.79	
Actuated Cycle Length (s)	79.2	Sum of lost time (s) 12.0
Intersection Capacity Utilization	72.7%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Two-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↖			↕	
Traffic Volume (veh/h)	10	100	609	141	100	10	635	54	313	10	115	10
Future Volume (veh/h)	10	100	609	141	100	10	635	54	313	10	115	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1856	1900	1900	1900	1856	1900	1856	1900	1796	1900
Adj Flow Rate, veh/h	11	109	662	153	109	11	690	59	340	11	125	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	3	0	0	0	3	0	3	0	7	0
Cap, veh/h	73	494	1105	202	123	10	760	149	860	64	190	16
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.43	0.61	0.61	0.12	0.13	0.12
Sat Flow, veh/h	62	1813	1572	445	452	38	1767	244	1404	65	1522	128
Grp Volume(v), veh/h	120	0	662	273	0	0	690	0	399	147	0	0
Grp Sat Flow(s),veh/h/ln	1875	0	1572	935	0	0	1767	0	1647	1715	0	0
Q Serve(g_s), s	0.0	0.0	15.1	15.1	0.0	0.0	25.4	0.0	8.7	1.7	0.0	0.0
Cycle Q Clear(g_c), s	3.4	0.0	15.1	18.5	0.0	0.0	25.4	0.0	8.7	5.7	0.0	0.0
Prop In Lane	0.09		1.00	0.56		0.04	1.00		0.85	0.07		0.07
Lane Grp Cap(c), veh/h	554	0	1105	329	0	0	760	0	1009	258	0	0
V/C Ratio(X)	0.22	0.00	0.60	0.83	0.00	0.00	0.91	0.00	0.40	0.57	0.00	0.00
Avail Cap(c_a), veh/h	554	0	1105	329	0	0	989	0	1490	527	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	19.7	0.0	5.3	26.3	0.0	0.0	18.6	0.0	7.0	29.1	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.9	16.2	0.0	0.0	9.9	0.0	0.3	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.7	0.0	6.4	9.9	0.0	0.0	16.9	0.0	4.6	4.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	0.0	6.2	42.5	0.0	0.0	28.5	0.0	7.3	31.1	0.0	0.0
LnGrp LOS	B	A	A	D	A	A	C	A	A	C	A	A
Approach Vol, veh/h		782			273			1089				147
Approach Delay, s/veh		8.3			42.5			20.7				31.1
Approach LOS		A			D			C				C
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		46.7		23.0	34.0	12.7		23.0				
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s		62.5		18.5	38.5	19.5		18.5				
Max Q Clear Time (g_c+I1), s		10.7		17.1	27.4	7.7		20.5				
Green Ext Time (p_c), s		3.1		0.6	2.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				19.7								
HCM 6th LOS				B								

Future Traffic Conditions - Two-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↑	↑
Traffic Volume (vph)	195	0	0	807	483	382
Future Volume (vph)	195	0	0	807	483	382
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1752			1863	1792	1583
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1752			1863	1792	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	201	0	0	832	498	394
RTOR Reduction (vph)	0	0	0	0	0	156
Lane Group Flow (vph)	201	0	0	832	498	238
Heavy Vehicles (%)	3%	0%	0%	2%	6%	2%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Actuated Green, G (s)	12.4			31.7	31.7	31.7
Effective Green, g (s)	13.4			32.7	32.7	32.7
Actuated g/C Ratio	0.25			0.60	0.60	0.60
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	433			1126	1083	956
v/s Ratio Prot	c0.11			c0.45	0.28	
v/s Ratio Perm						0.15
v/c Ratio	0.46			0.74	0.46	0.25
Uniform Delay, d1	17.3			7.6	5.9	5.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.8			2.6	0.3	0.1
Delay (s)	18.1			10.2	6.2	5.1
Level of Service	B			B	A	A
Approach Delay (s)	18.1			10.2	5.7	
Approach LOS	B			B	A	

Intersection Summary

HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	54.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - Two-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	195	0	0	807	483	382
Future Volume (veh/h)	195	0	0	807	483	382
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1900	1900	1870	1811	1870
Adj Flow Rate, veh/h	832	1	0	832	498	394
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	0	0	2	6	2
Cap, veh/h	9999	9999	0	1104	1069	936
Arrive On Green	0.22	0.19	0.00	0.59	0.59	0.59
Sat Flow, veh/h	1882671939532	18816640	0	1870	1811	1585
Grp Volume(v), veh/h	832	1	0	832	498	394
Grp Sat Flow(s),veh/h/ln	1767	1610	0	1870	1811	1585
Q Serve(g_s), s	0.0	0.0	0.0	13.6	6.4	5.6
Cycle Q Clear(g_c), s	0.0	0.0	0.0	13.6	6.4	5.6
Prop In Lane	1.00	1.00	0.00			1.00
Lane Grp Cap(c), veh/h	408286103654	28816640	0	1104	1069	936
V/C Ratio(X)	0.00	0.00	0.00	0.75	0.47	0.42
Avail Cap(c_a), veh/h	907356862382	1220224	0	2794	2706	2368
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.3	4.8	4.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	0.0	5.5	2.4	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	7.3	5.1	4.9
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	833			832	892	
Approach Delay, s/veh	0.0			7.3	5.0	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		28.5		13.0		28.5
Change Period (Y+Rc), s		5.0		5.0		5.0
Max Green Setting (Gmax), s		61.0		19.0		61.0
Max Q Clear Time (g_c+I1), s		15.6		2.0		8.4
Green Ext Time (p_c), s		7.9		3.2		5.4
Intersection Summary						
HCM 6th Ctrl Delay			4.1			
HCM 6th LOS			A			

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑				↑			↑
Traffic Vol, veh/h	0	1376	807	0	901	195	0	0	483	0	0	382
Future Vol, veh/h	0	1376	807	0	901	195	0	0	483	0	0	382
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	165	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	18	2	0	4	3	0	0	6	0	0	2
Mvmt Flow	0	1419	832	0	929	201	0	0	498	0	0	394

Major/Minor	Major1		Major2		Minor1		Minor2	
Conflicting Flow All	-	0	0	-	-	0	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0
Stage 1	0	-	-	0	-	-	0	0
Stage 2	0	-	-	0	-	-	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	-	0
HCM Lane LOS	A	-	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	-	-

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_PM_2LaneGateway.vistro

Scenario: Base Scenario

Report File: H:\...\2045_2LanePM.pdf

3/17/2025

Intersection Analysis Summary




ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.726	17.0	B
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	EB Left	1.000	50.8	D
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.642	17.8	B
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	SB Left	0.743	44.6	D
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.657	16.3	B
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.584	27.4	C
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	SB Left	0.829	108.1	F
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.170	24.4	C
101	122nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	WB Thru	0.615	9.1	A
102	122nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	NB Right	0.786	18.2	B
103	142nd Avenue/Backage Road	Signalized	HCM 7th Edition	WB Left	0.980	32.9	C
104	142nd Avenue/Highway 212 Access	Signalized	HCM 7th Edition	EB Left	0.742	8.1	A
105	142nd Avenue/OR 212	Two-way stop	HCM 7th Edition	NB Right	1.356	206.2	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	17.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	260	1	425	0	2370	295	23	1374	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	4.00	2.00	2.00	0.00	5.00	5.00	13.00	4.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	213	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	260	1	212	0	2370	295	23	1374	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700	1.0000	0.9700	0.9700	0.9700	0.9700	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	67	0	55	0	611	76	6	354	0
Total Analysis Volume [veh/h]	0	0	0	268	1	219	0	2443	304	24	1416	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	6.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	24	0	24	0	82	82	9	95	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	29	0	29	0	88	88	13	101	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		130	130	130	130	130	130
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		22	22	90	90	2	97
g / C, Green / Cycle		0.17	0.17	0.69	0.69	0.02	0.74
(v / s)_i Volume / Saturation Flow Rate		0.15	0.14	0.49	0.20	0.01	0.28
s, saturation flow rate [veh/h]		1752	1589	4971	1551	1624	5012
c, Capacity [veh/h]		294	267	3451	1077	30	3727
d1, Uniform Delay [s]		53.14	52.21	11.95	7.56	63.54	5.95
k, delay calibration		0.26	0.20	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		21.27	10.77	1.25	0.66	23.92	0.30
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.91	0.82	0.71	0.28	0.79	0.38
d, Delay for Lane Group [s/veh]		74.41	62.97	13.20	8.21	87.46	6.25
Lane Group LOS		E	E	B	A	F	A
Critical Lane Group		Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]		10.33	7.70	13.43	3.27	0.99	4.29
50th-Percentile Queue Length [ft/ln]		258.34	192.47	335.81	81.84	24.86	107.30
95th-Percentile Queue Length [veh/ln]		15.61	12.25	19.44	5.89	1.79	7.69
95th-Percentile Queue Length [ft/ln]		390.14	306.23	486.08	147.31	44.75	192.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	74.41	0.00	62.97	0.00	13.20	8.21	87.46	6.25	0.00
Movement LOS				E		E		B	A	F	A	
d_A, Approach Delay [s/veh]	0.00			69.27			12.65			7.60		
Approach LOS	A			E			B			A		
d_I, Intersection Delay [s/veh]	16.99											
Intersection LOS	B											
Intersection V/C	0.726											

Emissions

Vehicle Miles Traveled [mph]		51.86	42.38	773.89	96.30	3.78	223.27
Stops [stops/h]		286.15	213.19	1115.89	90.65	27.54	356.56
Fuel consumption [US gal/h]		7.77	5.73	44.58	4.97	0.74	12.96
CO [g/h]		543.37	400.42	3116.49	347.63	51.38	906.01
NOx [g/h]		105.72	77.91	606.36	67.64	10.00	176.28
VOC [g/h]		125.93	92.80	722.28	80.57	11.91	209.98

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	362	1262	1461
d_b, Bicycle Delay [s]	65.00	43.63	8.86	4.71
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	3.070	2.352
Bicycle LOS	D	A	C	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	50.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.000

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	349	8	322	20	0	238	551	2079	0	0	810	434
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	12.00	17.00	10.00	0.00	5.00	2.00	6.00	0.00	0.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	0	0	0	12
Total Hourly Volume [veh/h]	349	8	321	20	0	238	551	2079	0	0	810	422
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	94	2	86	5	0	64	148	559	0	0	218	113
Total Analysis Volume [veh/h]	375	9	345	22	0	256	592	2235	0	0	871	454
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	11.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	21	31	31	8	0	18	35	75	0	0	36	36
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	26	37	37	13	0	24	39	81	0	0	42	42
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	31	2	54	39	79	36	36
g / C, Green / Cycle	0.18	0.24	0.02	0.41	0.30	0.61	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.11	0.24	0.01	0.09	0.33	0.45	0.25	0.29
s, saturation flow rate [veh/h]	3375	1467	1667	2746	1781	4930	3503	1564
c, Capacity [veh/h]	609	355	29	1131	537	3005	970	433
d1, Uniform Delay [s]	49.12	49.20	63.58	24.80	45.39	18.14	45.24	47.01
k, delay calibration	0.07	0.41	0.07	0.07	0.50	0.50	0.19	0.47
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.62	42.22	20.68	0.06	69.52	1.71	5.62	54.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	1.00	0.75	0.23	1.10	0.74	0.90	1.05
d, Delay for Lane Group [s/veh]	49.74	91.42	84.26	24.86	114.90	19.85	50.86	101.98
Lane Group LOS	D	F	F	C	F	B	D	F
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.69	15.59	0.90	2.60	27.56	15.75	14.22	20.52
50th-Percentile Queue Length [ft/ln]	142.16	389.74	22.38	65.03	689.03	393.80	355.51	513.10
95th-Percentile Queue Length [veh/ln]	9.60	22.06	1.61	4.68	38.47	22.26	20.41	28.79
95th-Percentile Queue Length [ft/ln]	239.93	551.62	40.28	117.05	961.85	556.52	510.13	719.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.74	91.42	91.42	84.26	0.00	24.86	114.90	19.85	0.00	0.00	50.86	101.98
Movement LOS	D	F	F	F		C	F	B			D	F
d_A, Approach Delay [s/veh]	69.98			29.56			39.76			68.37		
Approach LOS	E			C			D			E		
d_I, Intersection Delay [s/veh]	50.83											
Intersection LOS	D											
Intersection V/C	1.000											

Emissions

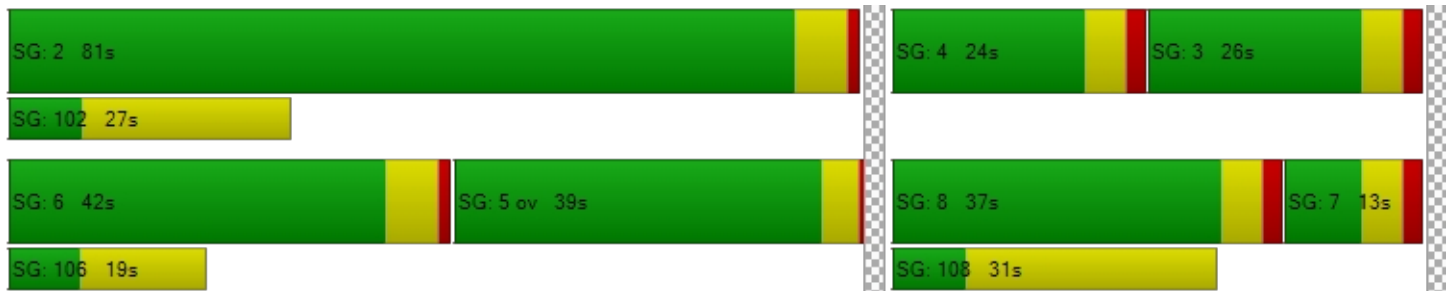
Vehicle Miles Traveled [mph]	78.55	74.15	2.76	32.11	93.34	352.40	218.21	113.74
Stops [stops/h]	314.93	431.68	24.79	144.05	763.19	1308.54	787.55	568.32
Fuel consumption [US gal/h]	8.77	12.02	0.63	3.41	21.90	30.77	22.35	17.24
CO [g/h]	612.97	840.35	43.88	238.54	1530.77	2150.51	1562.10	1205.26
NOx [g/h]	119.26	163.50	8.54	46.41	297.83	418.41	303.93	234.50
VOC [g/h]	142.06	194.76	10.17	55.28	354.77	498.40	362.03	279.33

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		0.0		11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	54.47		54.47		0.00		54.47
I_p,int, Pedestrian LOS Score for Intersectio	2.196		2.477		0.000		3.128
Crosswalk LOS	B		B		F		C
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	485		115		1154		554
d_b, Bicycle Delay [s]	37.32		57.72		11.64		33.99
I_b,int, Bicycle LOS Score for Intersection	2.764		1.560		3.114		2.295
Bicycle LOS	C		A		C		B

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	17.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	1	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	251	1244	2048	373
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	6.00	1.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	251	1244	2048	373
Peak Hour Factor	1.0000	1.0000	0.9300	0.9300	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	67	334	522	95
Total Analysis Volume [veh/h]	0	0	270	1338	2090	381
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	1		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	17	89	68	68
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	21	96	75	75
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	17	116	95	95
g / C, Green / Cycle	0.13	0.89	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.16	0.26	0.45	0.25
s, saturation flow rate [veh/h]	1724	5135	4685	1526
c, Capacity [veh/h]	225	4578	3420	1114
d1, Uniform Delay [s]	56.50	1.03	8.56	6.32
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	123.78	0.16	0.82	0.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.20	0.29	0.61	0.34
d, Delay for Lane Group [s/veh]	180.28	1.20	9.38	7.16
Lane Group LOS	F	A	A	A
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	15.14	0.68	8.88	3.74
50th-Percentile Queue Length [ft/ln]	378.56	17.09	221.99	93.48
95th-Percentile Queue Length [veh/ln]	23.23	1.23	13.77	6.73
95th-Percentile Queue Length [ft/ln]	580.81	30.76	344.17	168.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	180.28	1.20	9.38	7.16
Movement LOS			F	A	A	A
d_A, Approach Delay [s/veh]	0.00		31.27		9.04	
Approach LOS	A		C		A	
d_I, Intersection Delay [s/veh]	17.80					
Intersection LOS	B					
Intersection V/C	0.642					

Emissions

Vehicle Miles Traveled [mph]		374.18	1854.28	523.61	95.45
Stops [stops/h]		419.33	56.80	737.71	103.55
Fuel consumption [US gal/h]		27.62	76.97	29.62	5.06
CO [g/h]		1930.92	5380.47	2070.51	353.44
NOx [g/h]		375.69	1046.84	402.85	68.77
VOC [g/h]		447.51	1246.98	479.86	81.91

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1369	1046
d_b, Bicycle Delay [s]	65.00	6.47	14.78
I_b,int, Bicycle LOS Score for Intersection	4.132	2.444	2.919
Bicycle LOS	D	B	C

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	44.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T			T T T T			T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	2
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	20	152	10	775	300	579	644	600	62	10	530	778
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	5.00	5.00	4.00	13.00	2.00	6.00	5.00	16.00	5.00	8.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	290	0	0	0	0	0	389
Total Hourly Volume [veh/h]	20	152	10	775	300	289	644	600	62	10	530	389
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	39	3	200	77	74	166	155	16	3	137	100
Total Analysis Volume [veh/h]	21	157	10	799	309	298	664	619	64	10	546	401
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	41.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						6,7
Maximum Green [s]	6	35	35	20	49	49	30	53	53	4	27	27
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	10	40	40	24	54	54	34	58	58	8	32	32
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No	No	No	Yes		No	Yes	Yes
Maximum Recall	No	No		No	No	No	No	No		No	No	No
Pedestrian Recall	No	No		No	No	No	No	No		No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.80	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	0.00	2.80	0.00	2.00	3.40	3.40	2.00	3.40	0.00
g_i, Effective Green Time [s]	7	14	29	29	61	28	75	75	1	48	93
g / C, Green / Cycle	0.05	0.11	0.22	0.22	0.47	0.22	0.57	0.57	0.01	0.37	0.71
(v / s)_i Volume / Saturation Flow Rate	0.01	0.09	0.25	0.18	0.11	0.20	0.19	0.19	0.01	0.16	0.14
s, saturation flow rate [veh/h]	1709	1806	3217	1705	2813	3348	1825	1766	1738	3389	2782
c, Capacity [veh/h]	92	195	736	380	1320	721	1047	1013	16	1247	1983
d1, Uniform Delay [s]	58.92	57.02	50.51	47.94	20.50	49.92	14.56	14.58	64.16	30.96	6.27
k, delay calibration	0.07	0.07	0.07	0.07	0.07	0.04	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.76	6.68	42.37	2.64	0.05	2.20	0.85	0.88	13.13	1.12	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.86	1.09	0.81	0.23	0.92	0.33	0.33	0.61	0.44	0.20
d, Delay for Lane Group [s/veh]	59.68	63.70	92.88	50.58	20.55	52.12	15.41	15.46	77.28	32.07	6.50
Lane Group LOS	E	E	F	D	C	D	B	B	E	C	A
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.68	5.76	16.14	9.77	2.72	10.76	5.59	5.45	0.39	6.68	1.82
50th-Percentile Queue Length [ft/ln]	17.12	144.00	403.48	244.33	68.03	269.00	139.76	136.24	9.75	167.10	45.45
95th-Percentile Queue Length [veh/ln]	1.23	9.70	23.78	14.90	4.90	16.14	9.47	9.28	0.70	10.92	3.27
95th-Percentile Queue Length [ft/ln]	30.82	242.40	594.43	372.51	122.45	403.49	236.71	231.95	17.56	273.10	81.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.68	63.70	63.70	92.88	50.58	20.55	52.12	15.43	15.46	77.28	32.07	6.50
Movement LOS	E	E	E	F	D	C	D	B	B	E	C	A
d_A, Approach Delay [s/veh]	63.25			68.25			33.52			21.83		
Approach LOS	E			E			C			C		
d_I, Intersection Delay [s/veh]	44.61											
Intersection LOS	D											
Intersection V/C	0.743											

Emissions

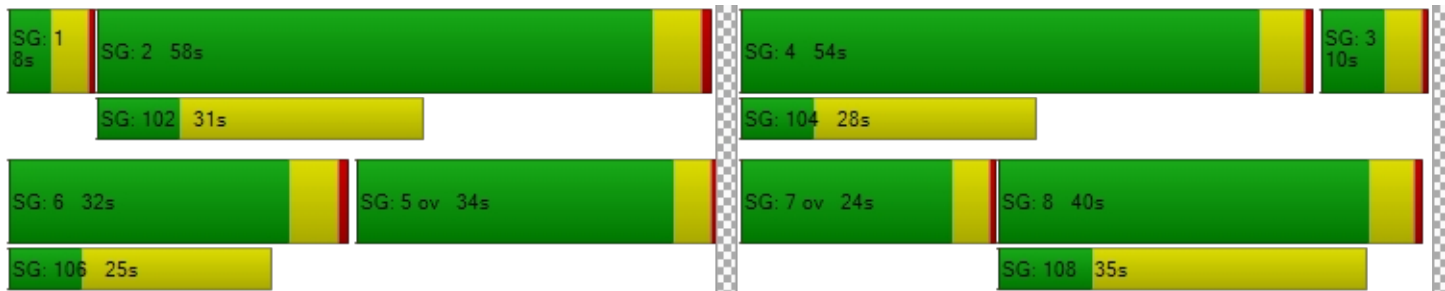
Vehicle Miles Traveled [mph]	4.73	37.63	184.48	71.35	68.81	596.82	311.27	302.62	6.59	359.99	264.39
Stops [stops/h]	18.97	159.51	893.87	270.64	150.71	595.94	154.82	150.91	10.80	370.19	100.69
Fuel consumption [US gal/h]	0.55	4.60	27.63	7.61	4.91	34.90	14.76	14.35	0.49	20.43	11.97
CO [g/h]	38.77	321.20	1931.53	532.11	343.29	2439.71	1031.40	1003.13	34.14	1427.93	836.76
NOx [g/h]	7.54	62.49	375.80	103.53	66.79	474.68	200.67	195.17	6.64	277.82	162.80
VOC [g/h]	8.99	74.44	447.65	123.32	79.56	565.43	239.04	232.49	7.91	330.94	193.93

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		11.0		13.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	53.55		54.47		54.47		52.65
I_p,int, Pedestrian LOS Score for Intersectio	2.143		3.485		2.877		3.720
Crosswalk LOS	B		C		C		D
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	542		757		809		409
d_b, Bicycle Delay [s]	34.57		25.11		23.04		41.14
I_b,int, Bicycle LOS Score for Intersection	1.870		4.358		2.671		2.670
Bicycle LOS	A		E		B		B

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	16.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

Intersection Setup

Name	135th Ave		Highway 212		OR 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↔↔↔		↑↔		↔↑↑	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	1	0
Entry Pocket Length [ft]	300.00	100.00	100.00	60.00	200.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	135th Ave		Highway 212		OR 212	
Base Volume Input [veh/h]	63	716	1310	26	284	1001
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	5.00	6.00	4.00	3.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	358	0	13	0	0
Total Hourly Volume [veh/h]	63	358	1310	13	284	1001
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	92	338	3	73	258
Total Analysis Volume [veh/h]	65	369	1351	13	293	1032
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1		0		1	
v_di, Inbound Pedestrian Volume crossing m	1		0		1	
v_co, Outbound Pedestrian Volume crossing	1		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	1		1		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		0		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	75.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Protected	Permissive	Permissive	Protected	Permissive
Signal Group	3	8	2	2	1	6
Auxiliary Signal Groups						
Maximum Green [s]	25	5	70	70	22	96
Amber [s]	3.5	3.0	4.7	4.7	3.5	4.7
All red [s]	0.5	1.0	0.7	0.7	0.5	0.7
Walk [s]	0	0	8	8	0	7
Pedestrian Clearance [s]	0	0	18	18	0	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	3.4	3.4	2.0	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	29	9	75	75	26	101
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	4	5	10	10	4	10
Vehicle Extension [s]	2.3	3.0	4.5	4.5	2.3	4.5
Minimum Recall	No	No	Yes		No	Yes
Maximum Recall	No	No	No		No	No
Pedestrian Recall	No	No	No		No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	0.00	5.40	5.40	4.00	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	3.40	3.40	2.00	3.40
g_i, Effective Green Time [s]	6	0	88	88	22	114
g / C, Green / Cycle	0.05	0.00	0.68	0.68	0.17	0.88
(v / s)_i Volume / Saturation Flow Rate	0.04	0.13	0.39	0.01	0.17	0.30
s, saturation flow rate [veh/h]	1695	2746	3446	1562	1767	3418
c, Capacity [veh/h]	84	0	2337	1059	299	3001
d1, Uniform Delay [s]	61.05	0.00	11.08	6.79	53.78	1.38
k, delay calibration	0.07	0.50	0.50	0.50	0.41	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.85	0.00	1.05	0.02	42.49	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	10000.00	0.58	0.01	0.98	0.34
d, Delay for Lane Group [s/veh]	69.90	0.00	12.13	6.81	96.27	1.70
Lane Group LOS	E	F	B	A	F	A
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.33	0.00	10.03	0.12	13.05	1.24
50th-Percentile Queue Length [ft/ln]	58.32	0.00	250.85	3.01	326.34	31.03
95th-Percentile Queue Length [veh/ln]	4.20	0.00	15.23	0.22	18.98	2.23
95th-Percentile Queue Length [ft/ln]	104.97	0.00	380.73	5.43	474.47	55.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	69.90	0.00	12.13	6.81	96.27	1.70
Movement LOS	E	A	B	A	F	A
d_A, Approach Delay [s/veh]	10.47		12.08		22.61	
Approach LOS	B		B		C	
d_I, Intersection Delay [s/veh]	16.32					
Intersection LOS	B					
Intersection V/C	0.657					

Emissions

Vehicle Miles Traveled [mph]	12.72	72.20	890.73	8.57	87.27	307.37
Stops [stops/h]	64.59	0.00	555.73	3.34	361.48	68.74
Fuel consumption [US gal/h]	1.80	2.97	43.07	0.39	11.33	13.39
CO [g/h]	126.17	207.77	3010.84	27.21	791.91	935.95
NOx [g/h]	24.55	40.42	585.80	5.29	154.08	182.10
VOC [g/h]	29.24	48.15	697.79	6.31	183.53	216.92

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		0.0		25.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.55		0.00		42.40	
I_p,int, Pedestrian LOS Score for Intersectio	2.928		0.000		2.971	
Crosswalk LOS	C		F		C	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	385		1071		1471	
d_b, Bicycle Delay [s]	42.47		14.03		4.56	
I_b,int, Bicycle LOS Score for Intersection	1.560		2.696		2.653	
Bicycle LOS	A		B		B	

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	27.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.584

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	2	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	867	205	504	1394	174	242
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	5.00	6.00	6.00	5.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	103	0	697	0	0
Total Hourly Volume [veh/h]	867	102	504	697	174	242
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	228	27	133	183	46	64
Total Analysis Volume [veh/h]	913	107	531	734	183	255
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		4		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	82.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	46	0	46	46	23	73
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	51	0	52	52	27	79
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		Yes	Yes	No	Yes
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	41	41	57	104	16	77
g / C, Green / Cycle	0.32	0.32	0.44	0.80	0.12	0.59
(v / s)_i Volume / Saturation Flow Rate	0.27	0.07	0.15	0.27	0.11	0.07
s, saturation flow rate [veh/h]	3375	1529	3446	2689	1738	3418
c, Capacity [veh/h]	1074	487	1521	2155	212	2030
d1, Uniform Delay [s]	41.41	32.45	23.99	3.52	56.01	11.58
k, delay calibration	0.08	0.08	0.50	0.50	0.17	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.49	0.17	0.63	0.43	14.39	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.22	0.35	0.34	0.86	0.13
d, Delay for Lane Group [s/veh]	42.89	32.61	24.62	3.95	70.41	11.71
Lane Group LOS	D	C	C	A	E	B
Critical Lane Group	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	13.83	2.52	5.55	2.28	6.75	1.66
50th-Percentile Queue Length [ft/ln]	345.67	63.03	138.83	56.96	168.67	41.44
95th-Percentile Queue Length [veh/ln]	19.92	4.54	9.42	4.10	11.01	2.98
95th-Percentile Queue Length [ft/ln]	498.12	113.45	235.44	102.54	275.17	74.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.89	32.61	24.62	3.95	70.41	11.71
Movement LOS	D	C	C	A	E	B
d_A, Approach Delay [s/veh]	41.82		12.63		36.23	
Approach LOS	D		B		D	
d_I, Intersection Delay [s/veh]	27.36					
Intersection LOS	C					
Intersection V/C	0.584					

Emissions

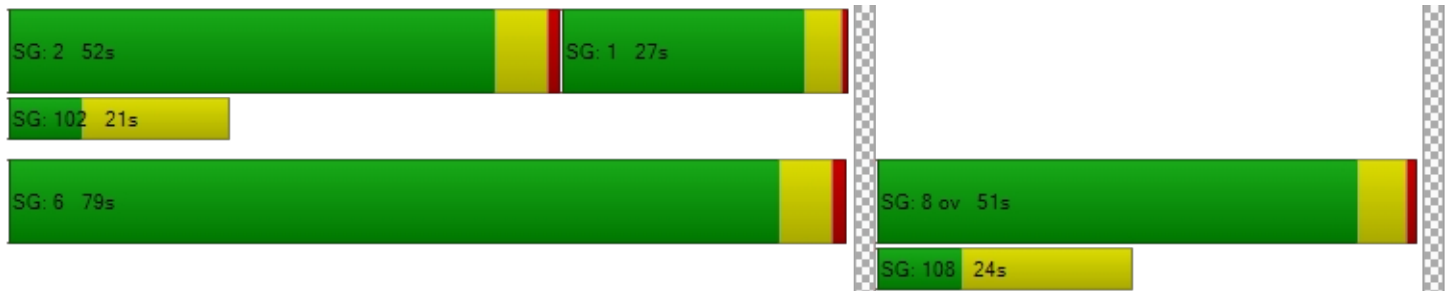
Vehicle Miles Traveled [mph]	298.62	35.00	77.09	106.57	11.65	16.23
Stops [stops/h]	765.75	69.81	307.54	126.19	186.83	91.80
Fuel consumption [US gal/h]	24.49	2.54	7.53	5.67	4.13	1.78
CO [g/h]	1712.05	177.30	526.60	396.64	288.92	124.63
NOx [g/h]	333.10	34.50	102.46	77.17	56.21	24.25
VOC [g/h]	396.79	41.09	122.04	91.93	66.96	28.88

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	0.00	53.56
I_p,int, Pedestrian LOS Score for Intersectio	2.998	0.000	2.547
Crosswalk LOS	C	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	702	708	1123
d_b, Bicycle Delay [s]	27.44	27.20	12.50
I_b,int, Bicycle LOS Score for Intersection	1.560	3.178	1.921
Bicycle LOS	A	C	A

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	108.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.829

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	32	84	27	266	102	488	736	1044	69	24	856	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	10.00	3.00	4.00	1.00	5.00	5.00	5.00	9.00	2.00	0.00	6.00	9.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	84	27	266	102	488	736	1044	69	24	856	112
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	22	7	71	27	130	196	278	18	6	228	30
Total Analysis Volume [veh/h]	34	89	29	283	109	519	783	1111	73	26	911	119
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	104
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	9.7
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	5	35	35	5	34	34	17	47	47	5	36	36
Amber [s]	3.0	3.5	3.5	3.0	4.7	4.7	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.0	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	0	9	9	0	9	9	0	7	7	0	8	8
Pedestrian Clearance [s]	0	22	22	0	21	21	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	3.0	3.0	2.0	4.2	4.2	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	30	30	9	30	30	30	30	30	30	30	30
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	6	6	5	6	6	4	10	10	4	10	10
Vehicle Extension [s]	3.0	2.5	2.5	3.0	2.5	2.5	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	76	76	76	76	76	76	76	76	76	76	76
L, Total Lost Time per Cycle [s]	0.00	5.00	0.00	6.20	4.50	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	3.00	0.00	4.20	0.00	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	0	15	0	14	37	17	43	43	2	28	28
g / C, Green / Cycle	0.00	0.20	0.00	0.18	0.49	0.22	0.57	0.57	0.02	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.35	0.07	1.61	0.06	0.19	0.29	0.34	0.34	0.02	0.26	0.08
s, saturation flow rate [veh/h]	98	1767	176	1825	2739	2686	1765	1727	1440	3446	1500
c, Capacity [veh/h]	94	348	94	330	1329	623	1007	986	95	1276	555
d1, Uniform Delay [s]	38.11	26.35	38.11	27.18	12.44	30.03	10.57	10.68	37.12	20.55	16.42
k, delay calibration	0.50	0.08	0.50	0.08	0.08	0.13	0.28	0.29	0.07	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.35	0.43	925.99	0.43	0.14	119.07	1.43	1.56	0.95	1.96	0.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.34	3.00	0.33	0.39	1.26	0.59	0.60	0.27	0.71	0.21
d, Delay for Lane Group [s/veh]	48.46	26.77	964.10	27.61	12.58	149.09	12.00	12.24	38.07	22.51	16.92
Lane Group LOS	D	C	F	C	B	F	B	B	D	C	B
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.99	1.82	26.29	1.71	2.58	15.80	5.91	5.99	0.50	6.81	1.43
50th-Percentile Queue Length [ft/ln]	24.75	45.61	657.30	42.82	64.57	394.98	147.65	149.83	12.40	170.14	35.63
95th-Percentile Queue Length [veh/ln]	1.78	3.28	34.70	3.08	4.65	24.93	9.89	10.01	0.89	11.08	2.57
95th-Percentile Queue Length [ft/ln]	44.55	82.09	867.54	77.08	116.23	623.33	247.29	250.21	22.32	277.10	64.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.46	26.77	26.77	964.10	27.61	12.58	149.09	12.11	12.24	38.07	22.51	16.92
Movement LOS	D	C	C	F	C	B	F	B	B	D	C	B
d_A, Approach Delay [s/veh]	31.62			309.97			66.64			22.26		
Approach LOS	C			F			E			C		
d_I, Intersection Delay [s/veh]	108.12											
Intersection LOS	F											
Intersection V/C	0.829											

Emissions

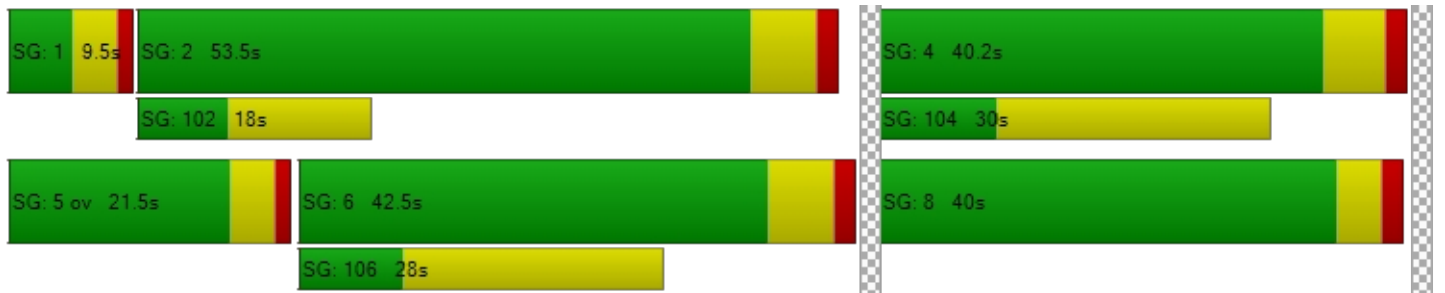
Vehicle Miles Traveled [mph]	4.00	13.88	36.81	14.18	67.51	92.23	69.73	69.73	12.18	426.60	55.72
Stops [stops/h]	46.84	86.32	1244.07	81.05	244.42	1495.14	279.46	283.59	23.47	644.05	67.43
Fuel consumption [US gal/h]	0.76	1.69	63.90	1.64	5.46	35.81	5.86	5.91	0.83	25.29	3.08
CO [g/h]	53.04	118.21	4466.50	114.91	381.55	2503.14	409.62	413.27	58.18	1767.98	215.03
NOx [g/h]	10.32	23.00	869.02	22.36	74.24	487.02	79.70	80.41	11.32	343.98	41.84
VOC [g/h]	12.29	27.40	1035.15	26.63	88.43	580.13	94.93	95.78	13.48	409.75	49.83

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		12.0		13.0		0.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	27.84		26.99		26.15		0.00	
I_p,int, Pedestrian LOS Score for Intersectio	2.085		3.865		3.047		0.000	
Crosswalk LOS	B		D		C		F	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	920		894		1235		946	
d_b, Bicycle Delay [s]	11.10		11.64		5.56		10.56	
I_b,int, Bicycle LOS Score for Intersection	1.810		3.063		3.182		2.431	
Bicycle LOS	A		C		C		B	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street

Control Type:	Two-way stop	Delay (sec / veh):	24.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.170

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+r			r+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	35	0	98	82	420	0	0	266	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	50.00	0.00	12.00	0.00	13.00	12.00	5.00	0.00	0.00	4.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	35	0	98	82	420	0	0	266	12
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	9	0	26	22	113	0	0	72	3
Total Analysis Volume [veh/h]	0	0	0	38	0	105	88	452	0	0	286	13
Pedestrian Volume [ped/h]	1			0			1			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.17	0.00	0.15	0.07	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	24.57	22.37	10.90	24.37	22.54	10.85	8.22	0.00	0.00	8.22	0.00	0.00
Movement LOS	C	C	B	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.60	0.60	0.51	0.24	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	14.97	14.97	12.72	5.89	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	19.28			14.45			1.34			0.00		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	2.84											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 101: 122nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↵↵				↵↵	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	2	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	300.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No				No	
Crosswalk	No		No		Yes	

Volumes

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Base Volume Input [veh/h]	784	0	0	0	665	711
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	784	0	0	0	665	711
Peak Hour Factor	0.9300	1.0000	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	211	0	0	0	179	191
Total Analysis Volume [veh/h]	843	0	0	0	715	765
Presence of On-Street Parking	No	No			No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal Group	2	0	0	0	3	8
Auxiliary Signal Groups						
Maximum Green [s]	60	0	0	0	52	52
Amber [s]	3.5	0.0	0.0	0.0	3.5	3.5
All red [s]	1.0	0.0	0.0	0.0	1.0	1.0
Walk [s]	7	0	0	0	0	7
Pedestrian Clearance [s]	11	0	0	0	0	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No					No
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	0.0	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	0.0	0.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	0	0	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	5	0	0	0	5	5
Vehicle Extension [s]	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No				No	No
Maximum Recall	No				No	No
Pedestrian Recall	No				No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	L	C
C, Cycle Length [s]	31	31	31
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50
g_i, Effective Green Time [s]	12	10	10
g / C, Green / Cycle	0.38	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.24	0.21	0.21
s, saturation flow rate [veh/h]	3459	3459	3560
c, Capacity [veh/h]	1319	1154	1188
d1, Uniform Delay [s]	7.99	8.83	8.93
k, delay calibration	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	0.52	0.55	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.64	0.62	0.64
d, Delay for Lane Group [s/veh]	8.51	9.38	9.52
Lane Group LOS	A	A	A
Critical Lane Group	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	1.50	1.41	1.53
50th-Percentile Queue Length [ft/ln]	37.46	35.24	38.16
95th-Percentile Queue Length [veh/ln]	2.70	2.54	2.75
95th-Percentile Queue Length [ft/ln]	67.43	63.44	68.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.51	0.00	0.00	0.00	9.38	9.52
Movement LOS	A				A	A
d_A, Approach Delay [s/veh]	8.51		0.00		9.45	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	9.11					
Intersection LOS	A					
Intersection V/C	0.615					

Emissions

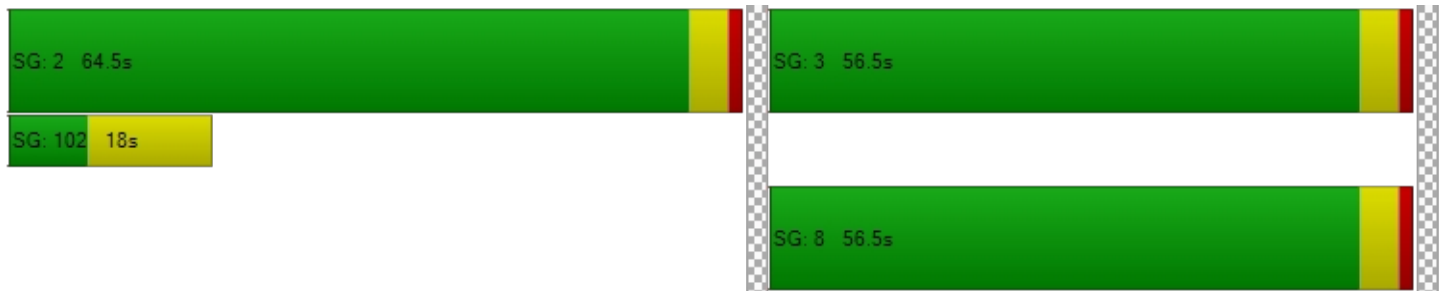
Vehicle Miles Traveled [mph]	70.23		94.76	101.39
Stops [stops/h]	343.72		323.37	350.15
Fuel consumption [US gal/h]	6.25		7.05	7.59
CO [g/h]	436.88		493.00	530.55
NOx [g/h]	85.00		95.92	103.23
VOC [g/h]	101.25		114.26	122.96

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	6.62
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	2.425
Crosswalk LOS	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3823	0	3313
d_b, Bicycle Delay [s]	13.04	15.69	6.77
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132	2.781
Bicycle LOS	A	D	C

Sequence




Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 102: 122nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	18.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.786

Intersection Setup

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	0	0	0	0	2	0	0	0
Entry Pocket Length [ft]	100.00	100.00	200.00	50.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			No			Yes			No		

Volumes

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Base Volume Input [veh/h]	0	784	790	0	665	0	0	1059	989	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	7.00	0.00	2.00	0.00	0.00	2.00	6.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	784	790	0	665	0	0	1059	989	0	0	0
Peak Hour Factor	1.0000	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	211	212	0	179	0	0	285	266	0	0	0
Total Analysis Volume [veh/h]	0	843	849	0	715	0	0	1139	1063	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss
Signal Group	0	2	2	6	6	0	4	4	4	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	52	52	52	52	0	60	60	60	0	0	0
Amber [s]	0.0	3.5	3.5	3.5	3.5	0.0	3.5	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
Walk [s]	0	7	7	7	7	0	7	7	7	0	0	0
Pedestrian Clearance [s]	0	11	11	11	11	0	11	11	11	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	2.5	2.5	2.5	0.0	2.5	2.5	2.5	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	6.0	20.0	20.0	0.0	6.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	30	30	30	30	0	30	30	30	0	0	0
Lead / Lag	-	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	0	5	5	5	5	0	5	5	5	0	0	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0
Minimum Recall		No			No			No				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R
C, Cycle Length [s]	77	77	77	77	77	77	77
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50
g_i, Effective Green Time [s]	30	30	30	30	38	38	38
g / C, Green / Cycle	0.39	0.39	0.39	0.39	0.49	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.24	0.31	0.00	0.20	0.30	0.30	0.39
s, saturation flow rate [veh/h]	3475	2700	295	3560	1870	1870	2723
c, Capacity [veh/h]	1369	1064	145	1403	915	915	1333
d1, Uniform Delay [s]	18.72	20.68	0.00	17.74	14.47	14.47	16.51
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.45	1.42	0.00	0.29	0.70	0.70	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.80	0.00	0.51	0.62	0.62	0.80
d, Delay for Lane Group [s/veh]	19.18	22.10	0.00	18.03	15.17	15.17	17.64
Lane Group LOS	B	C	A	B	B	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.70	6.46	0.00	4.57	6.77	6.77	7.22
50th-Percentile Queue Length [ft/ln]	142.56	161.46	0.00	114.26	169.15	169.15	180.62
95th-Percentile Queue Length [veh/ln]	9.62	10.63	0.00	8.08	11.03	11.03	11.63
95th-Percentile Queue Length [ft/ln]	240.47	265.66	0.00	201.91	275.79	275.79	290.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	19.18	22.10	0.00	18.03	0.00	15.17	15.17	17.64	0.00	0.00	0.00
Movement LOS		B	C	A	B		B	B	B			
d_A, Approach Delay [s/veh]	20.65			18.03			16.36			0.00		
Approach LOS	C			B			B			A		
d_I, Intersection Delay [s/veh]	18.19											
Intersection LOS	B											
Intersection V/C	0.786											

Emissions

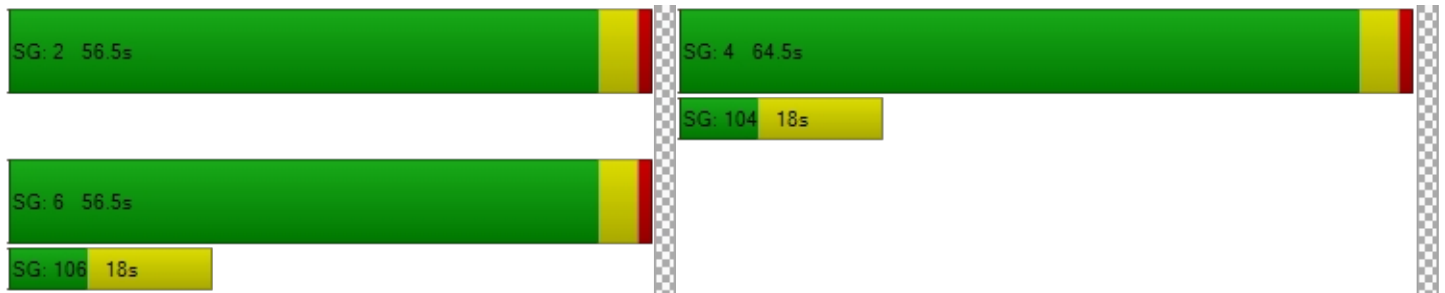
Vehicle Miles Traveled [mph]	194.64	196.03	0.00	59.57	68.16	68.16	127.23
Stops [stops/h]	532.80	603.43	0.00	427.03	316.07	316.07	675.03
Fuel consumption [US gal/h]	14.25	15.22	0.00	7.44	6.31	6.31	12.78
CO [g/h]	995.82	1064.08	0.00	519.71	441.07	441.07	893.55
NOx [g/h]	193.75	207.03	0.00	101.12	85.82	85.82	173.85
VOC [g/h]	230.79	246.61	0.00	120.45	102.22	102.22	207.09

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	28.32	0.00	28.32	0.00
I_p,int, Pedestrian LOS Score for Intersectio	3.008	0.000	2.659	0.000
Crosswalk LOS	C	F	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1350	1350	1557	0
d_b, Bicycle Delay [s]	4.08	4.08	1.89	38.53
I_b,int, Bicycle LOS Score for Intersection	2.956	2.149	3.376	4.132
Bicycle LOS	C	B	C	D

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 103: 142nd Avenue/Backage Road

Control Type:	Signalized	Delay (sec / veh):	32.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.980

Intersection Setup

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Base Volume Input [veh/h]	635	54	313	10	115	10	10	100	609	141	100	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	2.00	3.00	2.00	7.00	2.00	2.00	2.00	3.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	3	0	0	10	0	0	6	0	0	10
Total Hourly Volume [veh/h]	635	54	310	10	115	0	10	100	603	141	100	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	173	15	84	3	31	0	3	27	164	38	27	0
Total Analysis Volume [veh/h]	690	59	337	11	125	0	11	109	655	153	109	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	48.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal Group	5	2	2	1	6	6	4	4	1	8	8	8
Auxiliary Signal Groups									1,4			
Maximum Green [s]	44	36	36	27	20	20	23	23	27	23	23	23
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	0	7	7	0	7	7	7	7	0	7	7	7
Pedestrian Clearance [s]	0	11	11	0	11	11	11	11	0	11	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	5	5	5	5	5	5	5	5	5	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	75	75	75	75	75	75	75
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	0.00	2.50
g_i, Effective Green Time [s]	32	33	6	7	23	33	23
g / C, Green / Cycle	0.43	0.44	0.08	0.09	0.30	0.44	0.30
(v / s)_i Volume / Saturation Flow Rate	0.39	0.24	0.01	0.07	0.07	0.42	0.31
s, saturation flow rate [veh/h]	1767	1626	1781	1795	1832	1577	832
c, Capacity [veh/h]	752	717	135	163	610	694	329
d1, Uniform Delay [s]	20.42	15.61	32.44	33.55	19.51	20.25	27.53
k, delay calibration	0.21	0.11	0.11	0.11	0.11	0.50	0.45
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.08	0.67	0.25	7.35	0.16	22.89	16.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.55	0.08	0.77	0.20	0.94	0.80
d, Delay for Lane Group [s/veh]	29.51	16.28	32.70	40.90	19.67	43.14	43.80
Lane Group LOS	C	B	C	D	B	D	D
Critical Lane Group	Yes	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	12.26	4.76	0.19	2.50	1.52	14.32	6.00
50th-Percentile Queue Length [ft/ln]	306.48	118.99	4.80	62.62	38.09	357.96	149.92
95th-Percentile Queue Length [veh/ln]	18.00	8.34	0.35	4.51	2.74	20.52	10.01
95th-Percentile Queue Length [ft/ln]	450.03	208.44	8.64	112.71	68.55	513.11	250.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.51	16.28	16.28	32.70	40.90	40.90	19.67	19.67	43.14	43.80	43.80	43.80
Movement LOS	C	B	B	C	D	D	B	B	D	D	D	D
d_A, Approach Delay [s/veh]	24.68			40.23			39.50			43.80		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	32.92											
Intersection LOS	C											
Intersection V/C	0.980											

Emissions

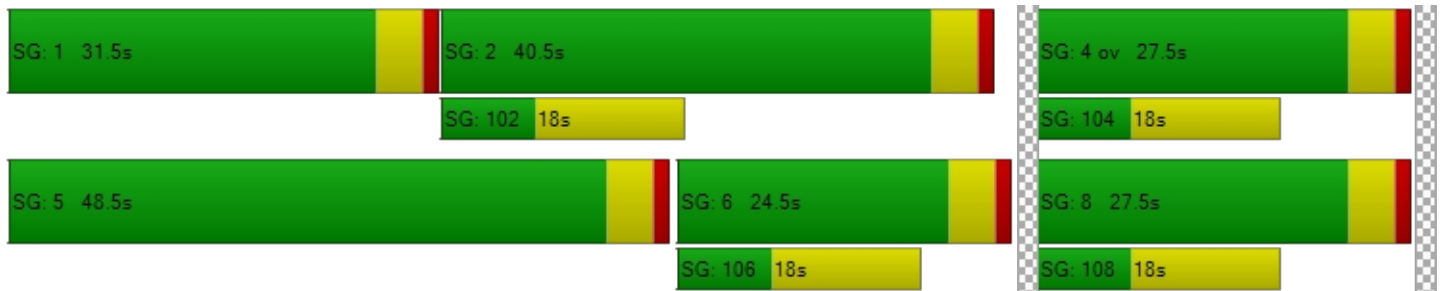
Vehicle Miles Traveled [mph]	130.65	74.98	2.02	23.00	28.90	157.77	63.76
Stops [stops/h]	585.24	227.22	9.16	119.57	72.73	683.55	286.28
Fuel consumption [US gal/h]	12.76	5.65	0.21	2.65	2.07	16.02	6.54
CO [g/h]	891.58	395.23	14.48	185.09	144.83	1119.88	457.25
NOx [g/h]	173.47	76.90	2.82	36.01	28.18	217.89	88.96
VOC [g/h]	206.63	91.60	3.36	42.90	33.57	259.54	105.97

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	27.51	27.51	27.51	27.51
I_p,int, Pedestrian LOS Score for Intersectio	2.838	2.034	2.456	2.076
Crosswalk LOS	C	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	955	530	610	610
d_b, Bicycle Delay [s]	10.30	20.36	18.21	18.21
I_b,int, Bicycle LOS Score for Intersection	3.356	1.801	2.848	2.008
Bicycle LOS	C	A	C	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 104: 142nd Avenue/Highway 212 Access

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↶		↷		↵	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

Volumes

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Base Volume Input [veh/h]	0	807	483	382	195	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	0.00	0.00	0.00	0.00	6.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	807	483	382	195	0
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	217	130	103	52	0
Total Analysis Volume [veh/h]	0	868	519	411	210	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	2	2	6	6	4	4
Auxiliary Signal Groups						
Maximum Green [s]	56	56	56	56	24	24
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	3.0	3.0	3.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	8	5	5	8	8
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C
C, Cycle Length [s]	36	36	36	36
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	19	19	19	7
g / C, Green / Cycle	0.53	0.53	0.53	0.19
(v / s)_i Volume / Saturation Flow Rate	0.46	0.27	0.25	0.12
s, saturation flow rate [veh/h]	1900	1900	1615	1724
c, Capacity [veh/h]	1108	1009	857	335
d1, Uniform Delay [s]	7.38	5.51	5.37	13.45
k, delay calibration	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.26	0.41	0.42	1.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.51	0.48	0.63
d, Delay for Lane Group [s/veh]	8.63	5.92	5.79	15.37
Lane Group LOS	A	A	A	B
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.35	1.44	1.12	1.43
50th-Percentile Queue Length [ft/ln]	83.79	35.98	28.05	35.83
95th-Percentile Queue Length [veh/ln]	6.03	2.59	2.02	2.58
95th-Percentile Queue Length [ft/ln]	150.82	64.76	50.50	64.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.63	8.63	5.92	5.79	15.37	15.37
Movement LOS	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	8.63		5.86		15.37	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	8.06					
Intersection LOS	A					
Intersection V/C	0.742					

Emissions

Vehicle Miles Traveled [mph]	202.49	98.27	77.82	48.74
Stops [stops/h]	332.13	142.62	111.21	142.04
Fuel consumption [US gal/h]	11.70	5.46	4.30	3.45
CO [g/h]	817.55	381.57	300.74	241.04
NOx [g/h]	159.07	74.24	58.51	46.90
VOC [g/h]	189.48	88.43	69.70	55.86

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3083	3083	1321
d_b, Bicycle Delay [s]	5.33	5.33	2.09
I_b,int, Bicycle LOS Score for Intersection	2.992	3.094	1.906
Bicycle LOS	C	C	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 105: 142nd Avenue/OR 212**

Control Type:	Two-way stop	Delay (sec / veh):	206.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.356

Intersection Setup

Name	142nd Ave			142nd Ave			EB OR212			WB OR212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↶			↷			↶↷			↶↷		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	165.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Ave			142nd Ave			EB OR212			WB OR212		
Base Volume Input [veh/h]	0	0	483	0	0	382	0	1376	807	0	901	195
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	6.00	0.00	0.00	2.00	0.00	18.00	2.00	0.00	4.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	483	0	0	382	0	1376	807	0	901	195
Peak Hour Factor	1.0000	1.0000	0.9700	1.0000	1.0000	0.9700	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	124	0	0	98	0	355	208	0	232	50
Total Analysis Volume [veh/h]	0	0	498	0	0	394	0	1419	832	0	929	201
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

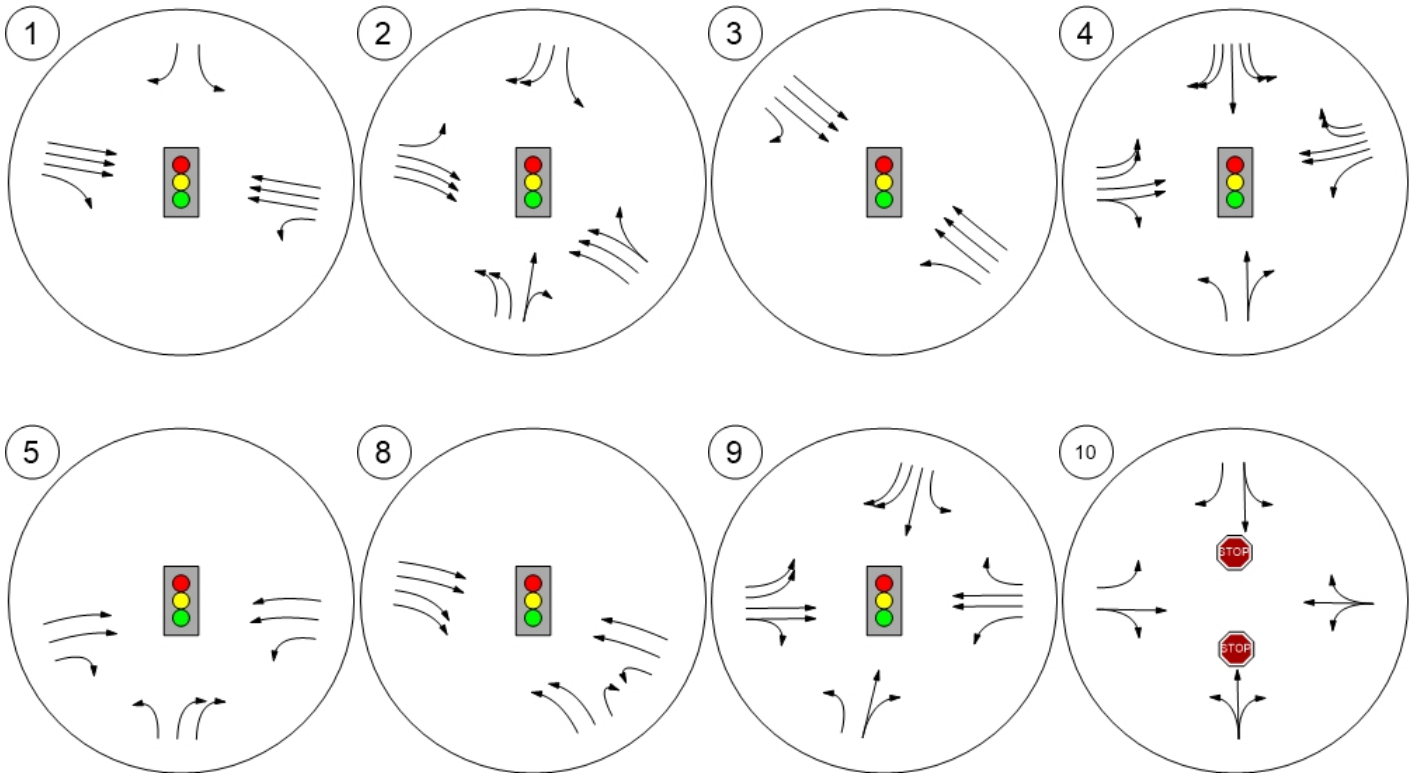
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	1.36	0.00	0.00	0.84	0.00	0.01	0.01	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	206.21	0.00	0.00	41.73	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			F			E		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	24.09	0.00	0.00	8.37	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	602.30	0.00	0.00	209.37	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	206.21			41.73			0.00			0.00		
Approach LOS	F			E			A			A		
d_I, Intersection Delay [s/veh]	27.88											
Intersection LOS	F											

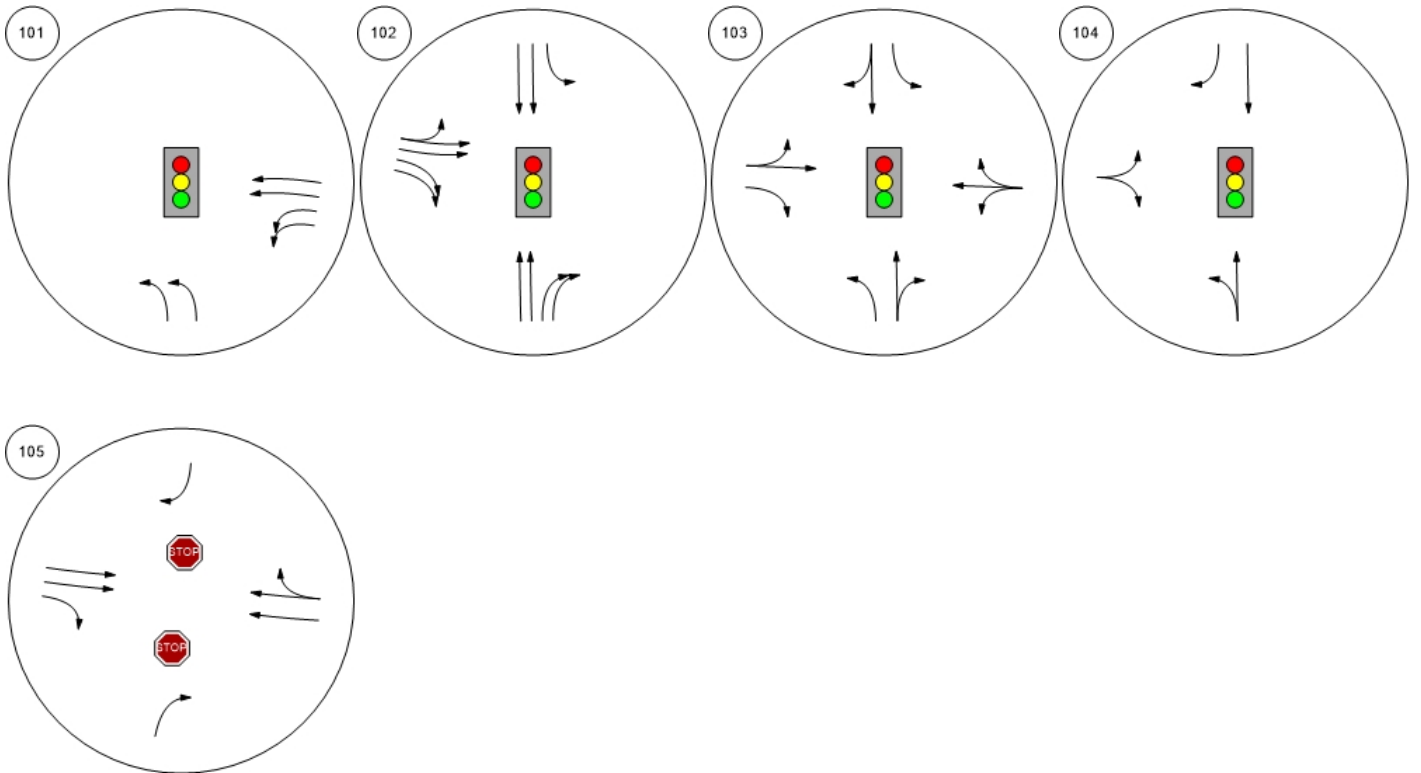
Study Intersections



Lane Configuration and Traffic Control















Lane Configuration and Traffic Control



Appendix D. 2045 Four-Lane Synchro Operations Worksheets

Future Traffic Conditions - Four-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↖		↗
Traffic Volume (vph)	0	1365	120	18	2690	0	0	0	0	233	0	237
Future Volume (vph)	0	1365	120	18	2690	0	0	0	0	233	0	237
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		3343	1392	1228	3343					1687		1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		3343	1392	1228	3343					1687		1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1484	130	20	2924	0	0	0	0	253	0	258
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	0	0	0	53
Lane Group Flow (vph)	0	1484	90	20	2924	0	0	0	0	253	0	205
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2							4		4
Actuated Green, G (s)		81.0	81.0	3.5	88.5					20.0		20.0
Effective Green, g (s)		83.0	83.0	3.5	90.5					21.5		21.5
Actuated g/C Ratio		0.69	0.69	0.03	0.75					0.18		0.18
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5		5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3		2.3
Lane Grp Cap (vph)		2312	962	35	2521					302		270
v/s Ratio Prot		0.44		0.02	0.87					0.15		
v/s Ratio Perm			0.06									0.14
v/c Ratio		0.64	0.09	0.57	1.16					0.84		0.76
Uniform Delay, d1		10.3	6.1	57.5	14.8					47.6		46.8
Progression Factor		1.00	1.00	1.07	1.91					1.00		1.00
Incremental Delay, d2		1.4	0.2	1.5	72.4					17.5		11.2
Delay (s)		11.6	6.3	62.8	100.5					65.1		58.0
Level of Service		B	A	E	F					E		E
Approach Delay (s)		11.2			100.3			0.0			61.5	
Approach LOS		B			F			A			E	
Intersection Summary												
HCM 2000 Control Delay			68.0		HCM 2000 Level of Service					E		
HCM 2000 Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			95.7%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Four-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (veh/h)	0	1365	120	18	2690	0	0	0	0	233	0	237
Future Volume (veh/h)	0	1365	120	18	2690	0	0	0	0	233	0	237
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	0	1796
Adj Flow Rate, veh/h	0	1484	0	20	2924	0				253	0	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	2343		19	2510	0				328	0	292
Arrive On Green	0.00	0.69	0.00	0.03	1.00	0.00				0.19	0.00	0.19
Sat Flow, veh/h	0	3474	1409	1146	3474	0				1711	0	1522
Grp Volume(v), veh/h	0	1484	0	20	2924	0				253	0	258
Grp Sat Flow(s),veh/h/ln	0	1692	1409	1146	1692	0				1711	0	1522
Q Serve(g_s), s	0.0	28.8	0.0	1.9	0.0	0.0				16.8	0.0	19.8
Cycle Q Clear(g_c), s	0.0	28.8	0.0	1.9	0.0	0.0				16.8	0.0	19.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2343		19	2510	0				328	0	292
V/C Ratio(X)	0.00	0.63		1.08	1.16	0.00				0.77	0.00	0.88
Avail Cap(c_a), veh/h	0	2343		201	2510	0				328	0	292
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.1	0.0	58.1	0.0	0.0				46.0	0.0	47.2
Incr Delay (d2), s/veh	0.0	1.3	0.0	46.2	74.6	0.0				10.2	0.0	25.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	15.4	0.0	1.3	33.0	0.0				12.7	0.0	14.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.4	0.0	104.2	74.6	0.0				56.2	0.0	72.5
LnGrp LOS	A	B		F	F	A				E	A	E
Approach Vol, veh/h		1484			2944							511
Approach Delay, s/veh		11.4			74.8							64.4
Approach LOS		B			E							E
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.9	87.1		27.0		93.0						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	21.0	62.0		21.5		87.0						
Max Q Clear Time (g_c+I1), s	3.9	30.8		21.8		2.0						
Green Ext Time (p_c), s	0.0	3.6		0.0		16.3						

Intersection Summary

HCM 6th Ctrl Delay	54.7
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Four-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	1275	0	0	2012	513	332	1	243	12	0	364
Future Volume (vph)	323	1275	0	0	2012	513	332	1	243	12	0	364
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0		4.0
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00		1.00		0.88
Frb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Frt	1.00	1.00			0.97		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1703	3343			3265		3242	1370		1467		2608
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1703	3343			3265		3242	1370		1467		2608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	351	1386	0	0	2187	558	361	1	264	13	0	396
RTOR Reduction (vph)	0	0	0	0	15	0	0	194	0	0	0	91
Lane Group Flow (vph)	351	1386	0	0	2730	0	361	71	0	13	0	305
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	25.9	76.5			46.6		21.3	21.3		5.2		35.1
Effective Green, g (s)	25.9	78.5			48.6		22.8	22.8		6.7		34.1
Actuated g/C Ratio	0.22	0.65			0.41		0.19	0.19		0.06		0.28
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	367	2186			1322		615	260		81		741
v/s Ratio Prot	c0.21	0.41			c0.84		c0.11	0.05		0.01		c0.12
v/s Ratio Perm												
v/c Ratio	0.96	0.63			2.07		0.59	0.27		0.16		0.41
Uniform Delay, d1	46.5	12.3			35.7		44.3	41.5		54.0		34.8
Progression Factor	0.98	1.20			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	31.4	1.1			481.9		1.1	0.3		0.5		0.2
Delay (s)	76.9	15.8			517.6		45.4	41.9		54.5		35.0
Level of Service	E	B			F		D	D		D		D
Approach Delay (s)		28.1			517.6			43.9			35.7	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			274.0									F
HCM 2000 Volume to Capacity ratio			1.36									
Actuated Cycle Length (s)			120.0							16.0		
Intersection Capacity Utilization			116.0%									H
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↗↗
Traffic Volume (veh/h)	323	1275	0	0	2012	513	332	1	243	12	0	364
Future Volume (veh/h)	323	1275	0	0	2012	513	332	1	243	12	0	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	351	1386	0	0	2187	558	361	1	264	13	0	396
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	373	2457	0	0	1239	303	683	1	241	36	0	0
Arrive On Green	0.43	1.00	0.00	0.00	0.46	0.44	0.21	0.15	0.14	0.02	0.00	0.01
Sat Flow, veh/h	1725	3474	0	0	2785	659	3291	6	1605	1485	13	
Grp Volume(v), veh/h	351	1386	0	0	1337	1408	361	0	265	13	61.3	
Grp Sat Flow(s),veh/h/ln	1725	1692	0	0	1692	1663	1646	0	1611	1485	E	
Q Serve(g_s), s	23.4	0.0	0.0	0.0	55.2	55.2	11.7	0.0	18.0	1.0		
Cycle Q Clear(g_c), s	23.4	0.0	0.0	0.0	55.2	55.2	11.7	0.0	18.0	1.0		
Prop In Lane	1.00		0.00	0.00		0.40	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	373	2457	0	0	778	764	683	0	242	36		
V/C Ratio(X)	0.94	0.56	0.00	0.00	1.72	1.84	0.53	0.00	1.10	0.36		
Avail Cap(c_a), veh/h	532	2457	0	0	778	764	713	0	242	223		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.71	0.71	0.00	0.00	0.60	0.60	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	33.3	0.0	0.0	0.0	32.4	32.8	42.3	0.0	51.7	57.6		
Incr Delay (d2), s/veh	14.6	0.7	0.0	0.0	326.9	381.9	0.4	0.0	86.1	3.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	13.5	0.4	0.0	0.0	141.5	158.6	8.4	0.0	19.8	0.8		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	0.7	0.0	0.0	359.3	414.7	42.7	0.0	137.9	61.3		
LnGrp LOS	D	A	A	A	F	F	D	A	F	E		
Approach Vol, veh/h		1737			2745			626				
Approach Delay, s/veh		10.2			387.7			83.0				
Approach LOS		B			F			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		91.1	28.9		31.9	59.2	6.9	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		70.0	24.5		37.0	* 29	16.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	13.7		25.4	57.2	3.0	20.0				
Green Ext Time (p_c), s		31.5	0.7		0.6	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			221.6									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - Four-Lane Sunrise
3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑		
Traffic Volume (vph)	1154	376	512	2525	0	0
Future Volume (vph)	1154	376	512	2525	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3223	1509	1517	3505		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3223	1509	1517	3505		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	1178	384	522	2577	0	0
RTOR Reduction (vph)	0	127	0	0	0	0
Lane Group Flow (vph)	1178	257	522	2577	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	42.8	42.8	29.0	82.8		
Effective Green, g (s)	45.8	45.8	29.0	82.8		
Actuated g/C Ratio	0.55	0.55	0.35	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	1782	834	531	3505		
v/s Ratio Prot	0.37		c0.34	c0.74		
v/s Ratio Perm		0.17				
v/c Ratio	0.66	0.31	0.98	0.74		
Uniform Delay, d1	13.0	10.0	26.7	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.2	0.4	34.4	1.0		
Delay (s)	14.2	10.4	61.1	1.0		
Level of Service	B	B	E	A		
Approach Delay (s)	13.3			11.1	0.0	
Approach LOS	B			B	A	

Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	82.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - Four-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕		↔	↕↕	↔↔	↔	↕		↔↔	↕	↔↔
Traffic Volume (vph)	505	444	107	2	736	1244	15	96	0	209	279	1165
Future Volume (vph)	505	444	107	2	736	1244	15	96	0	209	279	1165
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	0.88	1.00	1.00		0.97	1.00	0.88
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2694	3008		1543	3343	2760	1203	1284		3242	1597	2493
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.69	1.00	1.00
Satd. Flow (perm)	2694	3008		1543	3343	2760	1203	1284		2359	1597	2493
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	537	472	114	2	783	1323	16	102	0	222	297	1239
RTOR Reduction (vph)	0	15	0	0	0	699	0	0	0	0	0	463
Lane Group Flow (vph)	537	571	0	2	783	624	16	102	0	222	297	776
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6				4		4
Actuated Green, G (s)	21.8	69.1		1.1	48.4	48.4	3.4	14.2		39.0	38.2	38.2
Effective Green, g (s)	21.8	70.5		1.1	49.8	49.8	3.4	15.0		39.0	39.0	39.0
Actuated g/C Ratio	0.17	0.54		0.01	0.38	0.38	0.03	0.12		0.30	0.30	0.30
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6	4.6	2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	451	1631		13	1280	1057	31	148		893	479	747
v/s Ratio Prot	c0.20	0.19		0.00	c0.23		0.01	c0.08		0.05	0.19	
v/s Ratio Perm						0.23				0.02		c0.31
v/c Ratio	1.19	0.35		0.15	0.61	0.59	0.52	0.69		0.25	0.62	1.04
Uniform Delay, d1	54.1	16.8		64.0	32.3	32.0	62.5	55.3		35.2	39.1	45.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	106.0	0.6		2.0	2.2	2.4	8.6	11.0		0.1	2.0	43.3
Delay (s)	160.1	17.4		66.0	34.5	34.4	71.1	66.3		35.2	41.1	88.8
Level of Service	F	B		E	C	C	E	E		D	D	F
Approach Delay (s)		85.6			34.5			66.9			74.0	
Approach LOS		F			C			E			E	

Intersection Summary		
HCM 2000 Control Delay	60.1	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.88	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	74.4%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Four-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔↔	↔	↔		↔↔	↕	↔↔
Traffic Volume (veh/h)	505	444	107	2	736	1244	15	96	0	209	279	1165
Future Volume (veh/h)	505	444	107	2	736	1244	15	96	0	209	279	1165
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	537	472	114	2	783	0	16	102	0	222	297	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	909	1701	408	3	1065		15	127	0	445	324	
Arrive On Green	0.34	0.66	0.65	0.00	0.31	0.00	0.01	0.11	0.00	0.10	0.20	0.00
Sat Flow, veh/h	2689	2572	617	1570	3385	2768	1104	1189	0	3291	1618	2524
Grp Volume(v), veh/h	537	294	292	2	783	0	16	102	0	222	297	0
Grp Sat Flow(s),veh/h/ln	1345	1608	1581	1570	1692	1384	1104	1189	0	1646	1618	1262
Q Serve(g_s), s	21.5	9.8	10.1	0.2	26.8	0.0	1.8	10.9	0.0	3.7	23.4	0.0
Cycle Q Clear(g_c), s	21.5	9.8	10.1	0.2	26.8	0.0	1.8	10.9	0.0	3.7	23.4	0.0
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	909	1063	1046	3	1065		15	127	0	445	324	
V/C Ratio(X)	0.59	0.28	0.28	0.59	0.74		1.07	0.81	0.00	0.50	0.92	
Avail Cap(c_a), veh/h	909	1063	1046	133	1640		119	174	0	645	324	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.00	1.00	1.00	0.00	0.79	0.79	0.00
Uniform Delay (d), s/veh	35.6	9.1	9.3	64.8	39.7	0.0	64.1	56.8	0.0	53.3	50.9	0.0
Incr Delay (d2), s/veh	0.7	0.6	0.7	35.8	3.1	0.0	105.8	14.4	0.0	0.4	25.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.5	6.4	6.5	0.2	16.2	0.0	1.7	6.8	0.0	6.1	16.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	9.8	9.9	100.6	42.8	0.0	169.9	71.1	0.0	53.7	76.0	0.0
LnGrp LOS	D	A	A	F	D		F	E		A	D	E
Approach Vol, veh/h		1123			785			118				519
Approach Delay, s/veh		22.5			43.0			84.5				66.4
Approach LOS		C			D			F				E
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	90.0	5.8	30.0	49.3	44.9	17.9	17.8				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.8	* 5.4	* 5.4	4.8	* 4.8				
Max Green Setting (Gmax), s	11.0	* 62	14.0	25.2	* 11	* 62	21.0	* 18				
Max Q Clear Time (g_c+I1), s	2.2	12.1	3.8	25.4	23.5	28.8	5.7	12.9				
Green Ext Time (p_c), s	0.0	7.7	0.0	0.0	0.0	10.7	0.4	0.1				

Intersection Summary

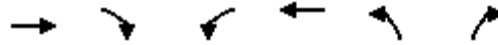
HCM 6th Ctrl Delay	40.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
 Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Four-Lane Sunrise
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵	↵↵
Traffic Volume (vph)	401	4	47	1744	119	227
Future Volume (vph)	401	4	47	1744	119	227
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.88
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3167	1347	1671	3343	1671	2434
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3167	1347	1671	3343	1671	2434
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	422	4	49	1836	125	239
RTOR Reduction (vph)	0	1	0	0	0	211
Lane Group Flow (vph)	422	3	49	1836	125	28
Confl. Peds. (#/hr)		2	2		1	2
Heavy Vehicles (%)	14%	17%	8%	8%	8%	14%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	77.5	77.5	7.0	88.5	13.1	12.6
Effective Green, g (s)	78.9	78.9	7.0	89.9	13.1	13.1
Actuated g/C Ratio	0.71	0.71	0.06	0.81	0.12	0.12
Clearance Time (s)	5.4	5.4	4.0	5.4	4.0	4.5
Vehicle Extension (s)	4.5	4.5	2.3	4.5	2.3	3.0
Lane Grp Cap (vph)	2251	957	105	2707	197	287
v/s Ratio Prot	0.13		0.03	c0.55	c0.07	
v/s Ratio Perm		0.00				0.01
v/c Ratio	0.19	0.00	0.47	0.68	0.63	0.10
Uniform Delay, d1	5.4	4.7	50.2	4.4	46.7	43.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	1.9	1.4	5.4	0.2
Delay (s)	5.5	4.7	52.1	5.8	52.0	43.8
Level of Service	A	A	D	A	D	D
Approach Delay (s)	5.5			7.0	46.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑↑
Traffic Volume (veh/h)	401	4	47	1744	119	227
Future Volume (veh/h)	401	4	47	1744	119	227
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1693	1648	1781	1781	1781	1693
Adj Flow Rate, veh/h	422	4	49	1836	125	239
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	14	17	8	8	8	14
Cap, veh/h	2387	1035	62	2759	191	296
Arrive On Green	0.74	0.74	0.04	0.82	0.11	0.12
Sat Flow, veh/h	3300	1395	1697	3474	1697	2524
Grp Volume(v), veh/h	422	4	49	1836	125	239
Grp Sat Flow(s),veh/h/ln	1608	1395	1697	1692	1697	1262
Q Serve(g_s), s	4.3	0.1	3.2	24.3	7.8	10.2
Cycle Q Clear(g_c), s	4.3	0.1	3.2	24.3	7.8	10.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2387	1035	62	2759	191	296
V/C Ratio(X)	0.18	0.00	0.79	0.67	0.65	0.81
Avail Cap(c_a), veh/h	2387	1035	260	2759	229	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	4.2	3.7	53.0	4.1	47.2	47.8
Incr Delay (d2), s/veh	0.2	0.0	12.6	1.3	3.6	10.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	0.0	2.8	10.2	6.3	6.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.4	3.7	65.6	5.4	50.8	57.8
LnGrp LOS	A	A	E	A	D	E
Approach Vol, veh/h	426			1885	364	
Approach Delay, s/veh	4.4			7.0	55.4	
Approach LOS	A			A	E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.1	86.4			94.5	16.5
Change Period (Y+Rc), s	4.0	* 5.4			* 5.4	4.0
Max Green Setting (Gmax), s	17.0	* 65			* 73	15.0
Max Q Clear Time (g_c+I1), s	5.2	6.3			26.3	12.2
Green Ext Time (p_c), s	0.0	5.5			35.6	0.3

Intersection Summary

HCM 6th Ctrl Delay	13.2
HCM 6th LOS	B

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	573	1325	197	0	388
Future Vol, veh/h	0	573	1325	197	0	388
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	0	603	1395	207	0	408

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

MOVEMENT SUMMARY

Site: 8 [Highway 212/Highway 224_4LaneAM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-Lane Sunrise
 Site Category: (None)
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]			mph	
			veh/h		veh/h					veh	ft				
South: Highway 224															
3	L2	All MCs	1201	7.0	1201	7.0	0.599	10.3	LOS B	4.4	115.1	0.48	0.23	0.48	30.2
18	R2	All MCs	171	8.0	171	8.0	0.599	10.2	LOS B	4.2	112.3	0.47	0.22	0.47	30.7
Approach			1372	7.1	1372	7.1	0.599	10.3	LOS B	4.4	115.1	0.48	0.23	0.48	30.2
East: Highway 212															
1	L2	All MCs	278	3.0	278	3.0	0.911	54.3	LOS F	8.0	207.5	0.96	1.43	2.81	19.4
6	T1	All MCs	401	8.0	401	8.0	0.911	62.3	LOS F	8.0	207.5	0.96	1.42	2.77	18.8
Approach			679	6.0	679	6.0	0.911	59.0	LOS F	8.0	207.5	0.96	1.42	2.79	19.0
West: Highway 212															
2	T1	All MCs	116	12.0	116	12.0	0.123	5.0	LOS A	0.4	12.0	0.39	0.25	0.39	35.0
12	R2	All MCs	451	15.0	451	15.0	0.357	8.5	LOS A	1.5	42.9	0.46	0.30	0.46	32.8
Approach			566	14.4	566	14.4	0.357	7.8	LOS A	1.5	42.9	0.45	0.29	0.45	33.2
All Vehicles			2617	8.4	2617	8.4	0.911	22.4	LOS C	8.0	207.5	0.59	0.55	1.07	26.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: H:\27\27852 - Sunrise Corridor Community Visioning\synchro\27852_RoundaboutsAnalysis.sjp9

Future Traffic Conditions - Four-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	432	597	31	10	1253	72	245	122	23	121	71	1253
Future Volume (vph)	432	597	31	10	1253	72	245	122	23	121	71	1253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	3146		1626	3343	1429	1796	1801		1700	1827	2667
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.71	1.00		0.56	1.00	1.00
Satd. Flow (perm)	3213	3146		1626	3343	1429	1339	1801		998	1827	2667
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	455	628	33	11	1319	76	258	128	24	127	75	1319
RTOR Reduction (vph)	0	2	0	0	0	42	0	6	0	0	0	18
Lane Group Flow (vph)	455	659	0	11	1319	34	258	146	0	127	75	1301
Confl. Peds. (#/hr)							5		1	1		5
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	24.0	72.0		0.7	48.7	48.7	25.2	25.2		24.0	24.0	48.0
Effective Green, g (s)	24.5	74.5		1.2	51.2	51.2	26.2	26.2		26.2	26.2	49.0
Actuated g/C Ratio	0.22	0.65		0.01	0.45	0.45	0.23	0.23		0.23	0.23	0.43
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.3
Lane Grp Cap (vph)	691	2057		17	1502	642	308	414		229	420	1147
v/s Ratio Prot	0.14	0.21		0.01	c0.39			0.08			0.04	c0.24
v/s Ratio Perm						0.02	0.19			0.13		0.24
v/c Ratio	0.66	0.32		0.65	0.88	0.05	0.84	0.35		0.55	0.18	1.13
Uniform Delay, d1	40.9	8.6		56.1	28.5	17.7	41.8	36.7		38.7	35.2	32.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.2		53.4	6.8	0.1	17.4	0.4		2.3	0.1	71.5
Delay (s)	42.8	8.8		109.6	35.3	17.8	59.2	37.1		41.0	35.4	104.0
Level of Service	D	A		F	D	B	E	D		D	D	F
Approach Delay (s)		22.7			34.9			51.0			95.3	
Approach LOS		C			C			D			F	

Intersection Summary		
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.99	
Actuated Cycle Length (s)	113.9	Sum of lost time (s) 12.0
Intersection Capacity Utilization	102.6%	ICU Level of Service G
Analysis Period (min)	15	

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↔		↔	↕	↕↔
Traffic Volume (veh/h)	432	597	31	10	1253	72	245	122	23	121	71	1253
Future Volume (veh/h)	432	597	31	10	1253	72	245	122	23	121	71	1253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	455	628	33	11	1319	0	258	128	24	127	75	1319
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	532	1735	91	24	1387		174	479	90	372	595	1278
Arrive On Green	0.16	0.56	0.54	0.01	0.41	0.00	0.31	0.31	0.30	0.32	0.32	0.31
Sat Flow, veh/h	3264	3108	163	1654	3385	1447	393	1529	287	1190	1841	2701
Grp Volume(v), veh/h	455	325	336	11	1319	0	258	0	152	127	75	1319
Grp Sat Flow(s),veh/h/ln	1632	1608	1663	1654	1692	1447	393	0	1816	1190	1841	1351
Q Serve(g_s), s	15.7	12.9	13.0	0.8	43.6	0.0	32.9	0.0	7.3	10.2	3.3	35.7
Cycle Q Clear(g_c), s	15.7	12.9	13.0	0.8	43.6	0.0	36.2	0.0	7.3	17.5	3.3	35.7
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	532	898	928	24	1387		174	0	568	372	595	1278
V/C Ratio(X)	0.85	0.36	0.36	0.45	0.95		1.48	0.00	0.27	0.34	0.13	1.03
Avail Cap(c_a), veh/h	689	936	968	64	1387		174	0	568	372	595	1278
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	14.1	14.2	56.5	33.0	0.0	47.3	0.0	29.9	35.4	27.6	30.6
Incr Delay (d2), s/veh	7.4	0.6	0.6	7.9	14.5	0.0	245.2	0.0	0.2	0.4	0.1	33.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.2	8.3	8.6	0.7	27.5	0.0	28.5	0.0	5.8	5.4	2.7	31.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	14.8	14.8	64.5	47.5	0.0	292.5	0.0	30.0	35.8	27.7	64.4
LnGrp LOS	D	B	B	E	D		F	A	C	D	C	F
Approach Vol, veh/h		1116			1330			410			1521	
Approach Delay, s/veh		31.0			47.7			195.2			60.2	
Approach LOS		C			D			F			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	68.6		41.4	22.9	51.4		41.4				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	4.0	64.8		34.0	23.9	44.9		* 35				
Max Q Clear Time (g_c+I1), s	2.8	15.0		37.7	17.7	45.6		38.2				
Green Ext Time (p_c), s	0.0	11.3		0.0	0.7	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	61.6
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Four-Lane Sunrise
10: 122nd Avenue & Jennifer Street

Weekday AM Peak Hour
08/01/2024

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	71	260	0	0	86	4	0	0	0	29	0	205
Future Vol, veh/h	71	260	0	0	86	4	0	0	0	29	0	205
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	77	283	0	0	93	4	0	0	0	32	0	223

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	97	0	0	283	0	0	644	534	283	532	532	95
Stage 1	-	-	-	-	-	-	437	437	-	95	95	-
Stage 2	-	-	-	-	-	-	207	97	-	437	437	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	1197	-	-	876	-	-	389	455	761	443	456	885
Stage 1	-	-	-	-	-	-	602	583	-	888	820	-
Stage 2	-	-	-	-	-	-	800	819	-	579	583	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1197	-	-	876	-	-	277	426	761	421	427	885
Mov Cap-2 Maneuver	-	-	-	-	-	-	277	426	-	421	427	-
Stage 1	-	-	-	-	-	-	563	546	-	831	820	-
Stage 2	-	-	-	-	-	-	599	819	-	542	546	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0	0	10.9
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1197	-	-	876	-	-	421	885
HCM Lane V/C Ratio	-	0.064	-	-	-	-	-	0.075	0.252
HCM Control Delay (s)	0	8.2	-	-	0	-	-	14.2	10.4
HCM Lane LOS	A	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.2	1

Future Traffic Conditions - Four-Lane Sunrise
101: 122nd Avenue & Sunrise WB

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (vph)	0	0	1059	1692	1345	0
Future Volume (vph)	0	0	1059	1692	1345	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			0.97	0.95	0.97	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			3502	3574	3433	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			3502	3574	3433	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	1139	1819	1446	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	1139	1819	1446	0
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%
Turn Type			Prot	NA	Prot	
Protected Phases			3	8	2	
Permitted Phases						
Actuated Green, G (s)			71.5	71.5	59.5	
Effective Green, g (s)			72.0	72.0	60.0	
Actuated g/C Ratio			0.51	0.51	0.43	
Clearance Time (s)			4.5	4.5	4.5	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			1801	1838	1471	
v/s Ratio Prot			0.33	c0.51	c0.42	
v/s Ratio Perm						
v/c Ratio			0.63	0.99	0.98	
Uniform Delay, d1			24.5	33.6	39.5	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.7	18.4	19.4	
Delay (s)			25.2	52.0	58.9	
Level of Service			C	D	E	
Approach Delay (s)	0.0			41.7	58.9	
Approach LOS	A			D	E	
Intersection Summary						
HCM 2000 Control Delay			47.3		HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.99			
Actuated Cycle Length (s)			140.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			114.7%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

Future Traffic Conditions - Four-Lane Sunrise
101: 122nd Avenue & Sunrise WB

Weekday AM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (veh/h)	0	0	1059	1692	1345	0
Future Volume (veh/h)	0	0	1059	1692	1345	0
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00		1.00	1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1900	1885	1870	0
Adj Flow Rate, veh/h			1139	1819	1446	0
Peak Hour Factor			0.93	0.93	0.93	0.93
Percent Heavy Veh, %			0	1	2	0
Cap, veh/h			0	3213	0	0
Arrive On Green			0.90	0.90	0.01	0.00
Sat Flow, veh/h			0	3676	0	
Grp Volume(v), veh/h			0	1819	0.0	
Grp Sat Flow(s),veh/h/ln			0	1791		
Q Serve(g_s), s			0.0	4.1		
Cycle Q Clear(g_c), s			0.0	4.1		
Prop In Lane			0.00			
Lane Grp Cap(c), veh/h			0	3213		
V/C Ratio(X)			0.00	0.57		
Avail Cap(c_a), veh/h			0	6646		
HCM Platoon Ratio			1.00	1.00		
Upstream Filter(I)			0.00	1.00		
Uniform Delay (d), s/veh			0.0	0.4		
Incr Delay (d2), s/veh			0.0	0.2		
Initial Q Delay(d3),s/veh			0.0	0.0		
%ile BackOfQ(95%),veh/ln			0.0	0.1		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			0.0	0.6		
LnGrp LOS			A	A		
Approach Vol, veh/h				1819		
Approach Delay, s/veh				0.6		
Approach LOS				A		
Timer - Assigned Phs						8
Phs Duration (G+Y+Rc), s						38.8
Change Period (Y+Rc), s						* 4.5
Max Green Setting (Gmax), s						* 72
Max Q Clear Time (g_c+I1), s						6.1
Green Ext Time (p_c), s						28.2
Intersection Summary						
HCM 6th Ctrl Delay			0.6			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						



















Future Traffic Conditions - Four-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday AM Peak Hour
08/01/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	560	594	0	0	0	0	1345	500	0	1059	0	
Future Volume (vph)	0	560	594	0	0	0	0	1345	500	0	1059	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0		
Lane Util. Factor		0.95	0.88					0.95	0.88		0.95		
Frt		1.00	0.85					1.00	0.85		1.00		
Flt Protected		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (prot)		3610	2682					3438	2682		3610		
Flt Permitted		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (perm)		3610	2682					3438	2682		3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	602	639	0	0	0	0	1446	538	0	1139	0	
RTOR Reduction (vph)	0	0	111	0	0	0	0	0	64	0	0	0	
Lane Group Flow (vph)	0	602	528	0	0	0	0	1446	474	0	1139	0	
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	5%	6%	0%	0%	0%	
Turn Type		NA	Perm					NA	Perm	Perm	NA		
Protected Phases		4						2			6		
Permitted Phases	4		4						2	6			
Actuated Green, G (s)		29.4	29.4					58.6	58.6		58.6		
Effective Green, g (s)		29.9	29.9					59.1	59.1		59.1		
Actuated g/C Ratio		0.31	0.31					0.61	0.61		0.61		
Clearance Time (s)		4.5	4.5					4.5	4.5		4.5		
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		1112	826					2094	1634		2199		
v/s Ratio Prot		0.17						0.42			0.32		
v/s Ratio Perm			0.20						0.18				
v/c Ratio		0.54	0.64					0.69	0.29		0.52		
Uniform Delay, d1		27.9	28.9					12.8	9.0		10.8		
Progression Factor		1.00	1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.5	1.6					1.0	0.1		0.2		
Delay (s)		28.4	30.5					13.8	9.1		11.0		
Level of Service		C	C					B	A		B		
Approach Delay (s)		29.5			0.0			12.5			11.0		
Approach LOS		C			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			17.0									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.67										
Actuated Cycle Length (s)			97.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			98.1%									ICU Level of Service	F
Analysis Period (min)			15										
c Critical Lane Group													

Future Traffic Conditions - Four-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday AM Peak Hour
08/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	560	594	0	0	0	0	1345	500	0	1059	0
Future Volume (veh/h)	0	560	594	0	0	0	0	1345	500	0	1059	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811				0	1826	1811	1900	1900	0
Adj Flow Rate, veh/h	0	602	639				0	1446	538	0	1139	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6				0	5	6	0	0	0
Cap, veh/h	0	1161	868				0	2025	1577	85	2107	0
Arrive On Green	0.00	0.32	0.32				0.00	0.58	0.58	0.00	0.58	0.00
Sat Flow, veh/h	0	3705	2701				0	3561	2701	222	3705	0
Grp Volume(v), veh/h	0	602	639				0	1446	538	0	1139	0
Grp Sat Flow(s),veh/h/ln	0	1805	1351				0	1735	1351	222	1805	0
Q Serve(g_s), s	0.0	11.5	17.7				0.0	25.1	8.7	0.0	16.2	0.0
Cycle Q Clear(g_c), s	0.0	11.5	17.7				0.0	25.1	8.7	0.0	16.2	0.0
Prop In Lane	0.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1161	868				0	2025	1577	85	2107	0
V/C Ratio(X)	0.00	0.52	0.74				0.00	0.71	0.34	0.00	0.54	0.00
Avail Cap(c_a), veh/h	0	1670	1249				0	3003	2338	148	3125	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00				0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	23.3	25.4				0.0	12.5	9.1	0.0	10.7	0.0
Incr Delay (d2), s/veh	0.0	0.4	1.3				0.0	0.5	0.1	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	8.3	9.5				0.0	13.5	4.2	0.0	9.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.7	26.8				0.0	13.0	9.3	0.0	10.9	0.0
LnGrp LOS	A	C	C				A	B	A	A	B	A
Approach Vol, veh/h		1241						1984			1139	
Approach Delay, s/veh		25.3						12.0			10.9	
Approach LOS		C						B			B	
Timer - Assigned Phs		2	4			6						
Phs Duration (G+Y+Rc), s		53.2	31.1			53.2						
Change Period (Y+Rc), s		4.5	4.5			4.5						
Max Green Setting (Gmax), s		72.5	38.5			72.5						
Max Q Clear Time (g_c+I1), s		27.1	19.7			18.2						
Green Ext Time (p_c), s		21.6	6.9			11.5						
Intersection Summary												
HCM 6th Ctrl Delay			15.5									
HCM 6th LOS			B									

Future Traffic Conditions - Four-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕			↕	
Traffic Volume (vph)	10	100	530	60	100	10	371	61	137	10	50	10
Future Volume (vph)	10	100	530	60	100	10	371	61	137	10	50	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Frt		1.00	0.85		0.99		1.00	0.90			0.98	
Flt Protected		1.00	1.00		0.98		0.95	1.00			0.99	
Satd. Flow (prot)		1891	1553		1852		1770	1636			1750	
Flt Permitted		0.97	1.00		0.86		0.71	1.00			0.96	
Satd. Flow (perm)		1837	1553		1619		1318	1636			1691	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	109	576	65	109	11	403	66	149	11	54	11
RTOR Reduction (vph)	0	0	400	0	3	0	0	75	0	0	6	0
Lane Group Flow (vph)	0	120	176	0	182	0	403	140	0	0	70	0
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	2%	5%	0%	8%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		11.6	11.6		11.6		19.1	19.1			19.1	
Effective Green, g (s)		12.1	12.1		12.1		19.6	19.6			19.6	
Actuated g/C Ratio		0.30	0.30		0.30		0.49	0.49			0.49	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		559	473		493		650	807			834	
v/s Ratio Prot								0.09				
v/s Ratio Perm		0.07	0.11		0.11		0.31				0.04	
v/c Ratio		0.21	0.37		0.37		0.62	0.17			0.08	
Uniform Delay, d1		10.3	10.8		10.8		7.3	5.6			5.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.2	0.5		0.5		1.8	0.1			0.0	
Delay (s)		10.5	11.3		11.3		9.1	5.7			5.4	
Level of Service		B	B		B		A	A			A	
Approach Delay (s)		11.2			11.3			7.9			5.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.6									A
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			39.7								8.0	
Intersection Capacity Utilization			56.2%									B
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Four-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday AM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕			↕	
Traffic Volume (veh/h)	10	100	530	60	100	10	371	61	137	10	50	10
Future Volume (veh/h)	10	100	530	60	100	10	371	61	137	10	50	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1900	1900	1870	1870	1826	1900	1781	1900
Adj Flow Rate, veh/h	11	109	576	65	109	11	403	66	149	11	54	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	0	0	0	2	2	5	0	8	0
Cap, veh/h	117	797	687	314	490	44	681	192	434	135	498	91
Arrive On Green	0.43	0.44	0.44	0.43	0.44	0.43	0.38	0.38	0.37	0.37	0.38	0.37
Sat Flow, veh/h	62	1808	1560	460	1113	99	1337	510	1152	110	1320	242
Grp Volume(v), veh/h	120	0	576	185	0	0	403	0	215	76	0	0
Grp Sat Flow(s),veh/h/ln	1871	0	1560	1672	0	0	1337	0	1663	1672	0	0
Q Serve(g_s), s	0.0	0.0	14.4	0.0	0.0	0.0	9.9	0.0	4.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	14.4	2.7	0.0	0.0	11.2	0.0	4.1	1.3	0.0	0.0
Prop In Lane	0.09		1.00	0.35		0.06	1.00		0.69	0.14		0.14
Lane Grp Cap(c), veh/h	893	0	687	829	0	0	681	0	627	705	0	0
V/C Ratio(X)	0.13	0.00	0.84	0.22	0.00	0.00	0.59	0.00	0.34	0.11	0.00	0.00
Avail Cap(c_a), veh/h	1294	0	1031	1187	0	0	1487	0	1630	1671	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.3	0.0	10.9	7.7	0.0	0.0	11.8	0.0	9.9	9.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	3.9	0.1	0.0	0.0	0.8	0.0	0.3	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.0	0.0	7.8	1.6	0.0	0.0	5.1	0.0	2.2	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	0.0	14.8	7.8	0.0	0.0	12.7	0.0	10.2	9.0	0.0	0.0
LnGrp LOS	A	A	B	A	A	A	B	A	B	A	A	A
Approach Vol, veh/h		696			185			618				76
Approach Delay, s/veh		13.5			7.8			11.8				9.0
Approach LOS		B			A			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.5		23.3		20.5		23.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		42.5		28.5		42.5		28.5				
Max Q Clear Time (g_c+I1), s		13.2		16.4		3.3		4.7				
Green Ext Time (p_c), s		2.8		2.5		0.4		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			12.0									
HCM 6th LOS			B									

Future Traffic Conditions - Four-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	216	0	0	353	201	439
Future Volume (vph)	216	0	0	353	201	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1752			1845	1810	1568
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1752			1845	1810	1568
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	223	0	0	364	207	453
RTOR Reduction (vph)	0	0	0	0	0	242
Lane Group Flow (vph)	223	0	0	364	207	212
Heavy Vehicles (%)	3%	0%	0%	3%	5%	3%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Actuated Green, G (s)	7.1			13.1	13.1	13.1
Effective Green, g (s)	8.1			14.1	14.1	14.1
Actuated g/C Ratio	0.27			0.47	0.47	0.47
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	469			861	845	732
v/s Ratio Prot	c0.13			c0.20	0.11	
v/s Ratio Perm						0.13
v/c Ratio	0.48			0.42	0.24	0.29
Uniform Delay, d1	9.3			5.3	4.8	5.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.8			0.3	0.2	0.2
Delay (s)	10.0			5.7	5.0	5.2
Level of Service	B			A	A	A
Approach Delay (s)	10.0			5.7	5.1	
Approach LOS	B			A	A	

Intersection Summary

HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	30.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday AM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	216	0	0	353	201	439
Future Volume (veh/h)	216	0	0	353	201	439
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1900	1900	1856	1826	1856
Adj Flow Rate, veh/h	364	1	0	364	207	453
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	0	0	3	5	3
Cap, veh/h	9999	9999	0	808	795	685
Arrive On Green	0.29	0.26	0.00	0.44	0.44	0.44
Sat Flow, veh/h	1882671938534	5796096	0	1856	1826	1572
Grp Volume(v), veh/h	364	1	0	364	207	453
Grp Sat Flow(s),veh/h/ln	1767	1610	0	1856	1826	1572
Q Serve(g_s), s	0.0	0.0	0.0	4.0	2.1	6.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	4.0	2.1	6.7
Prop In Lane	1.00	1.00	0.00			1.00
Lane Grp Cap(c), veh/h	550383190084	1505792	0	808	795	685
V/C Ratio(X)	0.00	0.00	0.00	0.45	0.26	0.66
Avail Cap(c_a), veh/h	1088744194995	7168128	0	3472	3416	2942
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	5.8	5.3	6.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.2	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	0.0	1.6	0.8	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	6.2	5.5	7.7
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	365			364	660	
Approach Delay, s/veh	0.0			6.2	7.0	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		16.8		12.6		16.8
Change Period (Y+Rc), s		5.0		5.0		5.0
Max Green Setting (Gmax), s		54.0		16.0		54.0
Max Q Clear Time (g_c+I1), s		6.0		2.0		8.7
Green Ext Time (p_c), s		2.5		1.2		3.1
Intersection Summary						
HCM 6th Ctrl Delay			4.9			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑				↑			↑
Traffic Vol, veh/h	0	285	353	0	1375	216	0	0	201	0	0	439
Future Vol, veh/h	0	285	353	0	1375	216	0	0	201	0	0	439
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	165	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	13	13	13	0	8	3	2	0	18	5	0	3
Mvmt Flow	0	297	368	0	1432	225	0	0	209	0	0	457

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	0	0	0	0
Stage 1	0	-	-	0	-	-	0	0	0	0	0	0
Stage 2	0	-	-	0	-	-	0	0	0	0	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	-	0
HCM Lane LOS	A	-	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	-	-

MOVEMENT SUMMARY

Site: 106 [Highway 212/Riverbend_4LaneAM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Four-Lane Sunrise
 Site Category: (None)
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. Dist]				mph	
			veh/h		veh/h					veh	ft				
South: Riverbend															
3	L2	All MCs	30	2.0	30	2.0	0.129	4.8	LOS A	0.4	10.7	0.50	0.41	0.50	18.8
18	R2	All MCs	63	18.0	63	18.0	0.129	7.2	LOS A	0.4	10.7	0.50	0.41	0.50	18.8
Approach			93	12.8	93	12.8	0.129	6.4	LOS A	0.4	10.7	0.50	0.41	0.50	18.8
East: Highway 212															
1	L2	All MCs	32	0.0	32	0.0	0.642	8.6	LOS A	6.1	161.5	0.27	0.07	0.27	33.5
6	T1	All MCs	1610	8.0	1610	8.0	0.642	9.2	LOS A	6.1	161.5	0.27	0.07	0.27	33.3
Approach			1642	7.8	1642	7.8	0.642	9.2	LOS A	6.1	161.5	0.27	0.07	0.27	33.3
West: Highway 212															
2	T1	All MCs	487	13.0	487	13.0	0.206	4.5	LOS A	0.9	24.1	0.13	0.04	0.13	35.1
12	R2	All MCs	14	13.0	14	13.0	0.206	4.5	LOS A	0.9	24.1	0.13	0.04	0.13	34.6
Approach			501	13.0	501	13.0	0.206	4.5	LOS A	0.9	24.1	0.13	0.04	0.13	35.1
All Vehicles			2236	9.2	2236	9.2	0.642	8.0	LOS A	6.1	161.5	0.24	0.08	0.24	32.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stopline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: H:\27\27852 - Sunrise Corridor Community Visioning\synchro\27852_RoundaboutsAnalysis.sjp9

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_AM_4LaneGateway.vistro

Scenario: Base Scenario

Report File: H:\...\2045_4LaneAM.pdf

3/17/2025

Intersection Analysis Summary




ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	SB Left	0.835	17.4	B
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Right	1.077	538.2	F
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.680	13.1	B
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	WB Left	0.694	32.5	C
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.555	9.9	A
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.685	18.0	B
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.643	46.5	D
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.077	14.4	B
101	122nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	NB Left	0.981	39.8	D
102	122nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	EB Right	0.742	13.2	B
103	142nd Avenue/Backage Road	Signalized	HCM 7th Edition	SB Left	0.421	19.9	B
104	142nd Avenue/Highway 212 Access	Signalized	HCM 7th Edition	EB Left	0.581	7.9	A
105	142nd Avenue/OR 212	Two-way stop	HCM 7th Edition	SB Right	1.633	329.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	17.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.835

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	233	0	237	0	1365	120	18	2690	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	7.00	0.00	7.00	0.00	8.00	16.00	47.00	8.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	119	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	233	0	118	0	1365	120	18	2690	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	63	0	32	0	371	33	5	731	0
Total Analysis Volume [veh/h]	0	0	0	253	0	128	0	1484	130	20	2924	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	24.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	16	0	16	0	82	82	7	93	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	21	0	21	0	88	88	11	99	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		120	120	120	120	120	120
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		16	16	87	87	2	93
g / C, Green / Cycle		0.13	0.13	0.72	0.72	0.02	0.77
(v / s)_i Volume / Saturation Flow Rate		0.15	0.08	0.31	0.09	0.02	0.60
s, saturation flow rate [veh/h]		1709	1526	4849	1411	1138	4849
c, Capacity [veh/h]		221	197	3509	1021	20	3757
d1, Uniform Delay [s]		52.25	49.66	6.60	5.05	58.91	7.66
k, delay calibration		0.42	0.08	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		100.47	2.66	0.38	0.26	67.36	1.65
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		1.14	0.65	0.42	0.13	0.98	0.78
d, Delay for Lane Group [s/veh]		152.72	52.32	6.98	5.31	126.27	9.31
Lane Group LOS		F	D	A	A	F	A
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		12.80	3.80	4.62	0.98	0.99	11.92
50th-Percentile Queue Length [ft/ln]		320.07	94.96	115.43	24.40	24.75	297.88
95th-Percentile Queue Length [veh/ln]		19.78	6.84	8.14	1.76	1.78	17.58
95th-Percentile Queue Length [ft/ln]		494.46	170.94	203.53	43.91	44.55	439.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	152.72	0.00	52.32	0.00	6.98	5.31	126.27	9.31	0.00
Movement LOS				F		D		A	A	F	A	
d_A, Approach Delay [s/veh]	0.00			118.99			6.85			10.11		
Approach LOS	A			F			A			B		
d_I, Intersection Delay [s/veh]	17.44											
Intersection LOS	B											
Intersection V/C	0.835											

Emissions

Vehicle Miles Traveled [mph]		48.96	24.77	470.10	41.18	3.15	461.04
Stops [stops/h]		384.06	113.95	415.52	29.27	29.70	1072.28
Fuel consumption [US gal/h]		12.00	3.01	23.76	2.00	0.81	30.45
CO [g/h]		838.70	210.54	1660.56	139.62	56.46	2128.22
NOx [g/h]		163.18	40.96	323.08	27.16	10.98	414.08
VOC [g/h]		194.38	48.79	384.85	32.36	13.08	493.24

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	258	1367	1550
d_b, Bicycle Delay [s]	60.00	45.50	6.02	3.04
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	2.447	3.179
Bicycle LOS	D	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	538.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.077

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	332	1	243	12	0	364	323	1275	0	0	2012	513
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	0.00	18.00	23.00	0.00	9.00	6.00	8.00	0.00	0.00	8.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	38
Total Hourly Volume [veh/h]	332	1	243	12	0	364	323	1275	0	0	2012	475
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	1.0000	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	0	66	3	0	99	88	346	0	0	547	129
Total Analysis Volume [veh/h]	361	1	264	13	0	396	351	1386	0	0	2187	516
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Split	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	19	31	31	18	0	30	30	54	0	0	20	20
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	25	37	37	24	0	35	34	60	0	0	26	26
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	16	22	6	67	51	75	20	20
g / C, Green / Cycle	0.13	0.18	0.05	0.56	0.43	0.63	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.11	0.16	0.01	0.15	0.20	0.29	0.53	0.56
s, saturation flow rate [veh/h]	3292	1616	1481	2655	1724	4849	3389	1617
c, Capacity [veh/h]	430	292	77	1489	734	3034	565	269
d1, Uniform Delay [s]	50.92	48.20	54.40	13.59	24.84	11.76	50.00	50.00
k, delay calibration	0.07	0.12	0.07	0.07	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.77	11.49	0.63	0.06	2.23	0.50	990.28	1064.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.91	0.17	0.27	0.48	0.46	3.19	3.34
d, Delay for Lane Group [s/veh]	53.69	59.69	55.02	13.65	27.07	12.26	1040.28	1114.32
Lane Group LOS	D	E	E	B	C	B	F	F
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.46	8.68	0.39	2.75	7.61	6.33	86.12	87.70
50th-Percentile Queue Length [ft/ln]	136.38	216.92	9.76	68.66	190.21	158.21	2153.05	2192.56
95th-Percentile Queue Length [veh/ln]	9.29	13.51	0.70	4.94	12.13	10.45	133.15	135.56
95th-Percentile Queue Length [ft/ln]	232.13	337.69	17.56	123.59	303.30	261.35	3328.80	3389.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.69	59.69	59.69	55.02	0.00	13.65	27.07	12.26	0.00	0.00	1053.31	1114.32
Movement LOS	D	E	E	E		B	C	B			F	F
d_A, Approach Delay [s/veh]	56.23			14.97			15.25			1064.96		
Approach LOS	E			B			B			F		
d_I, Intersection Delay [s/veh]	538.16											
Intersection LOS	F											
Intersection V/C	1.077											

Emissions

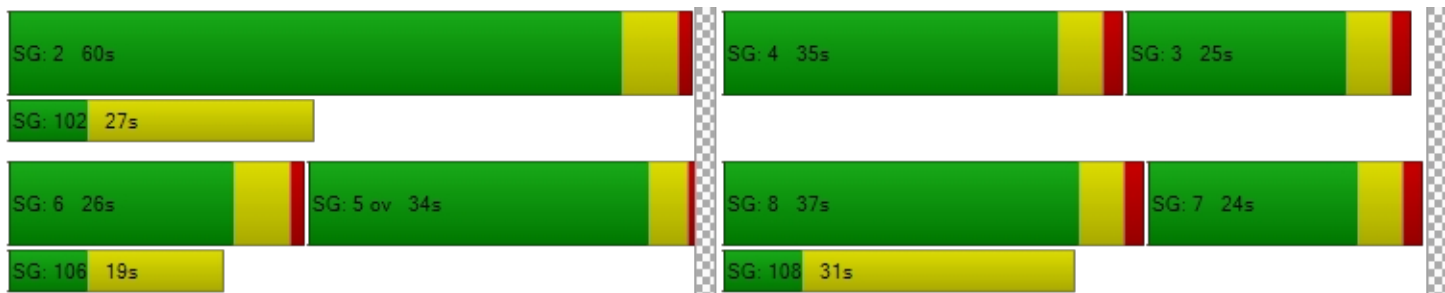
Vehicle Miles Traveled [mph]	75.62	55.51	1.95	59.46	55.34	218.54	451.45	225.73
Stops [stops/h]	327.30	260.30	11.71	164.78	228.25	569.56	5167.32	2631.07
Fuel consumption [US gal/h]	8.86	6.94	0.29	4.46	5.47	15.60	428.51	228.09
CO [g/h]	619.66	485.25	20.31	311.65	382.54	1090.57	29953.03	15943.53
NOx [g/h]	120.56	94.41	3.95	60.63	74.43	212.19	5827.77	3102.03
VOC [g/h]	143.61	112.46	4.71	72.23	88.66	252.75	6941.90	3695.07

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	0.00	49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.157	2.465	0.000	3.236
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	525	308	900	333
d_b, Bicycle Delay [s]	32.63	42.93	18.15	41.67
I_b,int, Bicycle LOS Score for Intersection	2.593	1.560	2.515	3.067
Bicycle LOS	B	A	B	C

Sequence



Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.680

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	1	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	512	2525	1207	378
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	19.00	3.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	512	2525	1207	378
Peak Hour Factor	1.0000	1.0000	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	131	644	308	96
Total Analysis Volume [veh/h]	0	0	522	2577	1232	386
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	101
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	30.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	26	60	30	30
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	0	30	30	30	30
Lead / Lag	-	-	Lag	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	70	70	70	70
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	25	56	27	27
g / C, Green / Cycle	0.36	0.80	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.34	0.51	0.26	0.25
s, saturation flow rate [veh/h]	1538	5053	4685	1526
c, Capacity [veh/h]	555	4038	1786	582
d1, Uniform Delay [s]	21.60	2.87	18.12	17.88
k, delay calibration	0.37	0.20	0.20	0.20
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	21.18	0.32	0.90	2.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.94	0.64	0.69	0.66
d, Delay for Lane Group [s/veh]	42.78	3.19	19.02	20.33
Lane Group LOS	D	A	B	C
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	10.77	1.88	5.22	5.10
50th-Percentile Queue Length [ft/ln]	269.28	47.07	130.39	127.39
95th-Percentile Queue Length [veh/ln]	16.15	3.39	8.96	8.80
95th-Percentile Queue Length [ft/ln]	403.84	84.73	224.02	219.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	42.78	3.19	19.02	20.33
Movement LOS			D	A	B	C
d_A, Approach Delay [s/veh]	0.00		9.86		19.33	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	13.11					
Intersection LOS	B					
Intersection V/C	0.680					

Emissions

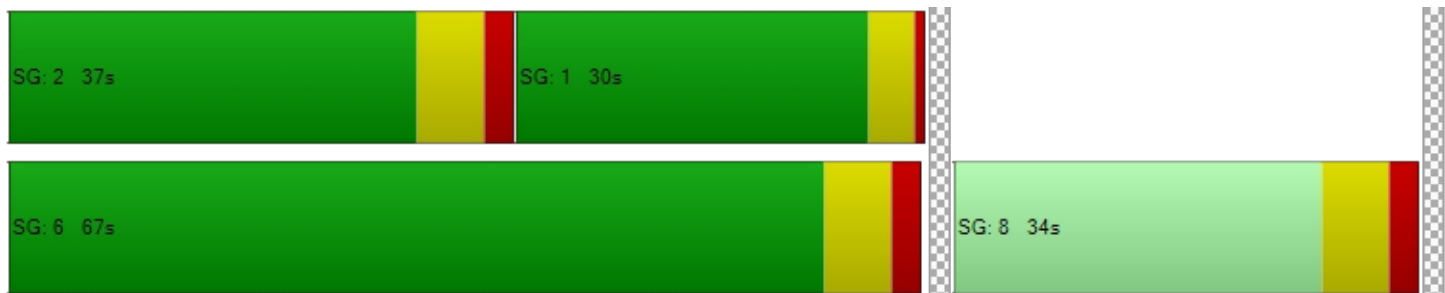
Vehicle Miles Traveled [mph]		723.42	3571.36	308.65	96.70
Stops [stops/h]		556.27	291.70	808.06	263.16
Fuel consumption [US gal/h]		37.40	150.30	21.94	7.03
CO [g/h]		2614.10	10506.20	1533.53	491.54
NOx [g/h]		508.61	2044.13	298.37	95.64
VOC [g/h]		605.84	2434.91	355.41	113.92

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1721	861
d_b, Bicycle Delay [s]	34.85	0.68	11.31
I_b,int, Bicycle LOS Score for Intersection	4.132	3.264	2.450
Bicycle LOS	D	C	B

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	32.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T			T T T T			T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	2
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	15	96	0	209	279	1165	505	444	107	2	736	1244
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	50.00	48.00	20.00	8.00	19.00	14.00	30.00	14.00	27.00	17.00	8.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	96	0	209	279	1165	505	444	107	2	736	1244
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	26	0	56	74	310	134	118	28	1	196	331
Total Analysis Volume [veh/h]	16	102	0	222	297	1239	537	472	114	2	783	1323
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			1			1			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	17.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	ProtPer	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						6,7
Maximum Green [s]	4	38	38	4	38	38	28	66	66	4	42	42
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	8	43	43	8	43	43	32	71	71	8	47	47
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No	No	No	Yes		No	Yes	Yes
Maximum Recall	No	No		No	No	No	No	No		No	No	No
Pedestrian Recall	No	No		No	No	No	No	No		No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.40	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	0.00	2.80	0.00	2.00	3.40	3.40	2.00	3.40	0.00
g_i, Effective Green Time [s]	2	13	40	39	77	28	71	71	0	43	75
g / C, Green / Cycle	0.01	0.10	0.31	0.30	0.59	0.21	0.54	0.54	0.00	0.33	0.58
(v / s)_i Volume / Saturation Flow Rate	0.06	0.09	0.07	0.18	0.49	0.20	0.18	0.18	0.00	0.23	0.48
s, saturation flow rate [veh/h]	276	1180	3176	1615	2514	2681	1690	1563	1567	3389	2756
c, Capacity [veh/h]	55	117	887	486	1486	575	918	849	3	1121	1591
d1, Uniform Delay [s]	65.00	57.72	35.09	38.89	21.23	50.16	16.54	16.58	64.80	37.86	22.10
k, delay calibration	0.50	0.07	0.07	0.11	0.28	0.04	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.68	11.43	0.09	1.29	3.21	3.22	0.96	1.06	46.51	3.62	5.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.29	0.87	0.25	0.61	0.83	0.93	0.33	0.33	0.58	0.70	0.83
d, Delay for Lane Group [s/veh]	77.68	69.15	35.18	40.19	24.44	53.38	17.51	17.64	111.31	41.48	27.32
Lane Group LOS	E	E	D	D	C	D	B	B	F	D	C
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.76	3.68	2.64	8.30	15.02	8.81	5.27	4.96	0.11	11.41	16.73
50th-Percentile Queue Length [ft/ln]	18.99	92.05	66.08	207.60	375.53	220.33	131.85	124.08	2.77	285.13	418.23
95th-Percentile Queue Length [veh/ln]	1.37	6.63	4.76	13.03	21.38	13.68	9.04	8.62	0.20	16.94	23.44
95th-Percentile Queue Length [ft/ln]	34.18	165.68	118.95	325.75	534.43	342.05	226.01	215.42	4.99	423.59	585.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	77.68	69.15	69.15	35.18	40.19	24.44	53.38	17.55	17.64	111.31	41.48	27.32
Movement LOS	E	E	E	D	D	C	D	B	B	F	D	C
d_A, Approach Delay [s/veh]	70.31			28.46			34.69			32.66		
Approach LOS	E			C			C			C		
d_I, Intersection Delay [s/veh]	32.53											
Intersection LOS	C											
Intersection V/C	0.694											

Emissions

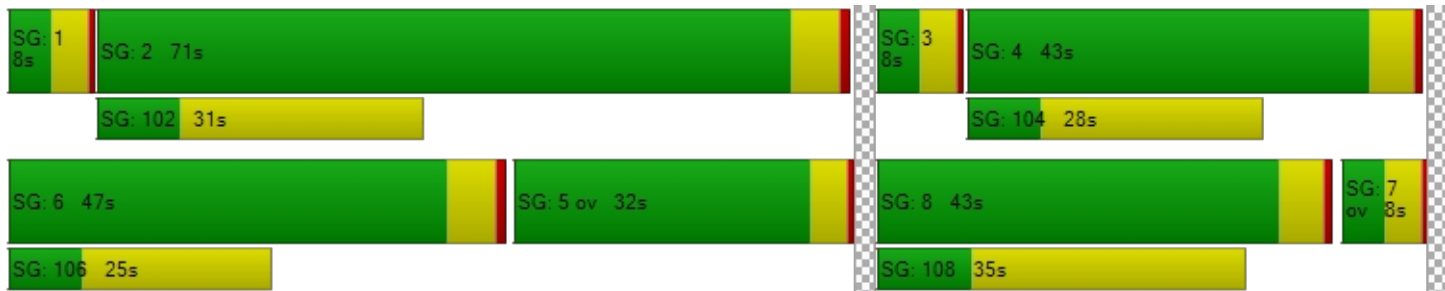
Vehicle Miles Traveled [mph]	3.61	22.99	51.26	68.58	286.08	482.67	272.18	254.53	1.32	516.24	872.27
Stops [stops/h]	21.03	101.96	146.39	229.96	831.94	488.12	146.05	137.44	3.07	631.67	926.55
Fuel consumption [US gal/h]	0.52	2.94	4.51	6.52	22.54	28.40	13.09	12.25	0.12	31.35	48.38
CO [g/h]	36.18	205.84	315.11	455.90	1575.22	1985.12	915.02	856.55	8.15	2191.44	3381.94
NOx [g/h]	7.04	40.05	61.31	88.70	306.48	386.23	178.03	166.65	1.59	426.37	658.00
VOC [g/h]	8.38	47.71	73.03	105.66	365.07	460.07	212.06	198.51	1.89	507.89	783.80

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		11.0		13.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.55		54.47		54.47		52.65	
I_p,int, Pedestrian LOS Score for Intersectio	2.130		3.130		3.007		3.080	
Crosswalk LOS	B		C		C		C	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	588		588		1009		640	
d_b, Bicycle Delay [s]	32.41		32.43		15.96		30.07	
I_b,int, Bicycle LOS Score for Intersection	1.754		4.460		2.486		3.299	
Bicycle LOS	A		E		B		C	

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.555

Intersection Setup

Name	135th Ave		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↔↔↔		↑↑		↔↔	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	1	0
Entry Pocket Length [ft]	300.00	100.00	100.00	60.00	200.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		No	

Volumes

Name	135th Ave		Highway 212		Highway 212	
Base Volume Input [veh/h]	119	110	307	4	16	1354
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	14.00	14.00	17.00	8.00	8.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	119	110	307	4	16	1354
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	29	81	1	4	356
Total Analysis Volume [veh/h]	125	116	323	4	17	1425
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	1		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	1		1		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		4	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	79.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal Group	3	3	2	2	1	6
Auxiliary Signal Groups						
Maximum Green [s]	18	18	72	72	7	83
Amber [s]	3.5	3.5	4.7	4.7	3.5	4.7
All red [s]	0.5	0.5	0.7	0.7	0.5	0.7
Walk [s]	0	0	8	8	0	7
Pedestrian Clearance [s]	0	0	18	18	0	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	3.4	3.4	2.0	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	22	22	77	77	11	88
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	4	4	10	10	4	10
Vehicle Extension [s]	2.3	2.3	4.5	4.5	2.3	4.5
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	5.40	5.40	4.00	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	3.40	3.40	2.00	3.40
g_i, Effective Green Time [s]	10	10	85	85	2	90
g / C, Green / Cycle	0.09	0.09	0.77	0.77	0.02	0.82
(v / s)_i Volume / Saturation Flow Rate	0.07	0.05	0.10	0.00	0.01	0.42
s, saturation flow rate [veh/h]	1695	2542	3217	1396	1695	3389
c, Capacity [veh/h]	159	238	2474	1074	26	2782
d1, Uniform Delay [s]	48.78	47.34	3.26	2.94	53.85	3.04
k, delay calibration	0.07	0.07	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.25	0.94	0.11	0.01	15.13	0.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.49	0.13	0.00	0.65	0.51
d, Delay for Lane Group [s/veh]	54.03	48.29	3.37	2.95	68.98	3.72
Lane Group LOS	D	D	A	A	E	A
Critical Lane Group	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	3.58	1.54	0.78	0.02	0.58	3.43
50th-Percentile Queue Length [ft/ln]	89.53	38.49	19.57	0.46	14.44	85.77
95th-Percentile Queue Length [veh/ln]	6.45	2.77	1.41	0.03	1.04	6.18
95th-Percentile Queue Length [ft/ln]	161.15	69.29	35.22	0.83	26.00	154.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.03	48.29	3.37	2.95	68.98	3.72
Movement LOS	D	D	A	A	E	A
d_A, Approach Delay [s/veh]	51.26		3.37		4.49	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	9.92					
Intersection LOS	A					
Intersection V/C	0.555					

Emissions

Vehicle Miles Traveled [mph]	24.46	22.70	212.96	2.64	5.06	424.42
Stops [stops/h]	117.20	100.78	51.23	0.61	18.91	224.56
Fuel consumption [US gal/h]	3.03	2.63	9.27	0.11	0.55	19.79
CO [g/h]	211.70	183.90	648.07	7.99	38.55	1383.48
NOx [g/h]	41.19	35.78	126.09	1.55	7.50	269.17
VOC [g/h]	49.06	42.62	150.20	1.85	8.93	320.63

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	43.66	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.204	0.000	0.000
Crosswalk LOS	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	327	1302	1502
d_b, Bicycle Delay [s]	38.47	6.70	3.42
I_b,int, Bicycle LOS Score for Intersection	1.560	1.829	2.749
Bicycle LOS	A	A	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	2	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	1141	162	110	428	264	381
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	8.00	12.00	15.00	3.00	8.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	81	0	214	0	0
Total Hourly Volume [veh/h]	1141	81	110	214	264	381
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	300	21	29	56	69	100
Total Analysis Volume [veh/h]	1201	85	116	225	278	401
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	148
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	41.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	72	0	24	24	37	65
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	30	30	30	30
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		No	No	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	69	69	69	69	69	69
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	5.40	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	31	31	10	47	13	27
g / C, Green / Cycle	0.44	0.44	0.14	0.67	0.19	0.39
(v / s)_i Volume / Saturation Flow Rate	0.36	0.06	0.04	0.09	0.16	0.12
s, saturation flow rate [veh/h]	3320	1492	3275	2520	1767	3389
c, Capacity [veh/h]	1468	660	470	1693	341	1335
d1, Uniform Delay [s]	16.96	11.47	26.43	4.11	26.88	14.48
k, delay calibration	0.08	0.08	0.21	0.21	0.13	0.21
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.88	0.06	0.53	0.07	5.73	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.82	0.13	0.25	0.13	0.82	0.30
d, Delay for Lane Group [s/veh]	17.83	11.53	26.96	4.17	32.61	14.73
Lane Group LOS	B	B	C	A	C	B
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	7.59	0.72	0.85	0.44	4.73	2.05
50th-Percentile Queue Length [ft/ln]	189.72	18.03	21.32	11.01	118.13	51.13
95th-Percentile Queue Length [veh/ln]	12.11	1.30	1.54	0.79	8.29	3.68
95th-Percentile Queue Length [ft/ln]	302.67	32.45	38.38	19.82	207.25	92.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	17.83	11.53	26.96	4.17	32.61	14.73
Movement LOS	B	B	C	A	C	B
d_A, Approach Delay [s/veh]	17.42		11.93		22.05	
Approach LOS	B		B		C	
d_I, Intersection Delay [s/veh]	17.97					
Intersection LOS	B					
Intersection V/C	0.685					

Emissions

Vehicle Miles Traveled [mph]	392.82	27.80	16.84	32.67	17.70	25.53
Stops [stops/h]	787.56	37.42	88.52	45.71	245.18	212.23
Fuel consumption [US gal/h]	24.88	1.55	1.82	1.79	3.93	3.43
CO [g/h]	1739.18	108.39	127.13	125.02	274.57	239.42
NOx [g/h]	338.38	21.09	24.74	24.32	53.42	46.58
VOC [g/h]	403.07	25.12	29.46	28.97	63.63	55.49

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		0.0		12.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	24.56		0.00		23.73	
I_p,int, Pedestrian LOS Score for Intersectio	2.807		0.000		2.472	
Crosswalk LOS	C		F		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	2076		692		1874	
d_b, Bicycle Delay [s]	0.05		14.84		0.14	
I_b,int, Bicycle LOS Score for Intersection	1.560		2.017		2.120	
Bicycle LOS	A		B		B	

Sequence



Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	46.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.643

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	245	122	23	121	71	1253	432	597	31	10	1253	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	6.00	6.00	4.00	5.00	9.00	14.00	12.00	11.00	8.00	13.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	245	122	23	121	71	1253	432	597	31	10	1253	72
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	34	6	34	20	348	120	166	9	3	348	20
Total Analysis Volume [veh/h]	272	136	26	134	79	1392	480	663	34	11	1392	80
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	8.5
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	8	8	8	4	4	5	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	36	36	36	35	35	19	19	64	64	4	50	50
Amber [s]	3.5	3.5	3.5	4.7	4.7	3.5	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	0	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	0	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	2.5	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	4	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.3	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	121	121	121	121	121	121	121	121	121	121	121
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	4.50	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.20	4.20	0.00	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	36	36	35	35	60	19	68	68	1	50	50
g / C, Green / Cycle	0.30	0.30	0.29	0.29	0.50	0.16	0.56	0.56	0.01	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.20	0.09	0.11	0.04	0.51	0.15	0.21	0.21	0.01	0.41	0.06
s, saturation flow rate [veh/h]	1335	1818	1184	1840	2737	3264	1690	1661	1652	3389	1449
c, Capacity [veh/h]	394	543	301	531	1359	512	944	927	18	1398	598
d1, Uniform Delay [s]	42.78	32.72	43.31	32.03	30.40	50.52	14.92	14.92	59.68	35.49	22.14
k, delay calibration	0.19	0.08	0.08	0.08	0.32	0.07	0.28	0.28	0.07	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.82	0.23	0.77	0.09	25.98	5.81	0.64	0.65	18.55	17.11	0.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	0.30	0.45	0.15	1.02	0.94	0.37	0.37	0.61	1.00	0.13
d, Delay for Lane Group [s/veh]	46.60	32.95	44.08	32.12	56.37	56.33	15.56	15.58	78.23	52.60	22.40
Lane Group LOS	D	C	D	C	F	E	B	B	E	D	C
Critical Lane Group	No	No	No	No	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.05	3.72	3.68	1.75	23.82	7.40	5.18	5.10	0.42	22.47	1.42
50th-Percentile Queue Length [ft/ln]	201.36	93.00	91.96	43.81	595.55	184.95	129.40	127.39	10.56	561.81	35.41
95th-Percentile Queue Length [veh/ln]	12.71	6.70	6.62	3.15	32.43	11.86	8.91	8.80	0.76	30.25	2.55
95th-Percentile Queue Length [ft/ln]	317.72	167.41	165.53	78.86	810.78	296.46	222.68	219.94	19.01	756.17	63.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.60	32.95	32.95	44.08	32.12	56.37	56.33	15.57	15.58	78.23	52.60	22.40
Movement LOS	D	C	C	D	C	F	E	B	B	E	D	C
d_A, Approach Delay [s/veh]	41.50			54.15			32.19			51.16		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	46.54											
Intersection LOS	D											
Intersection V/C	0.643											

Emissions

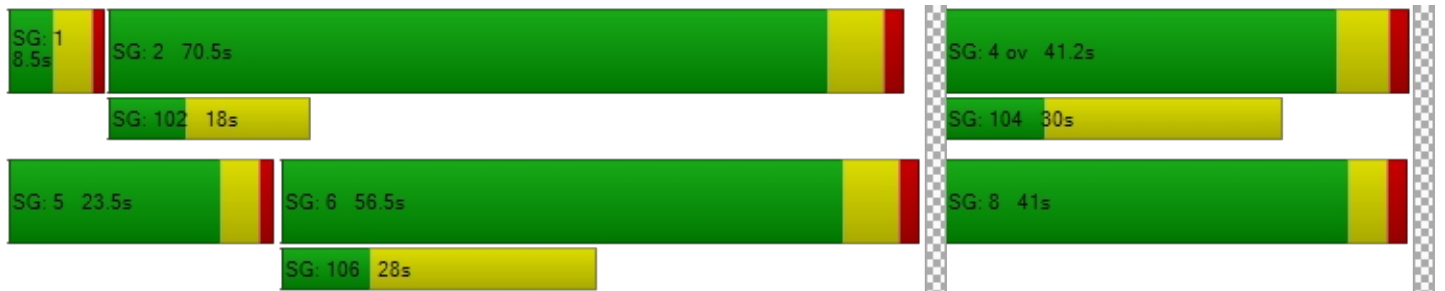
Vehicle Miles Traveled [mph]	32.00	19.06	17.43	10.28	181.06	56.54	41.39	40.71	5.15	651.84	37.46
Stops [stops/h]	239.24	110.50	109.26	52.05	1415.18	439.48	153.75	151.35	12.55	1335.00	42.07
Fuel consumption [US gal/h]	5.22	2.48	2.52	1.23	31.24	12.90	4.44	4.37	0.51	53.84	2.17
CO [g/h]	364.75	173.43	176.37	85.77	2183.63	902.00	310.56	305.67	35.49	3763.57	151.81
NOx [g/h]	70.97	33.74	34.31	16.69	424.86	175.50	60.42	59.47	6.90	732.25	29.54
VOC [g/h]	84.53	40.19	40.87	19.88	506.08	209.05	71.98	70.84	8.22	872.24	35.18

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0			12.0			13.0			0.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	50.10			49.19			48.30			0.00		
I_p,int, Pedestrian LOS Score for Intersectio	2.136			2.840			3.884			0.000		
Crosswalk LOS	B			C			D			F		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	594			578			1056			825		
d_b, Bicycle Delay [s]	29.95			30.65			13.50			20.91		
I_b,int, Bicycle LOS Score for Intersection	2.276			4.208			2.531			2.783		
Bicycle LOS	B			D			B			C		

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street

Control Type:	Two-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.077

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+r			r+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	29	0	205	71	260	0	0	86	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	12.00	0.00	32.00	61.00	12.00	0.00	100.00	14.00	12.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	29	0	205	71	260	0	0	86	4
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	8	0	56	19	71	0	0	23	1
Total Analysis Volume [veh/h]	0	0	0	32	0	223	77	283	0	0	93	4
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.08	0.00	0.25	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.22	13.46	9.73	14.41	14.16	10.43	8.21	0.00	0.00	9.11	0.00	0.00
Movement LOS	C	B	A	B	B	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.25	0.25	1.00	0.21	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	6.24	6.24	24.95	5.15	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.80			10.93			1.76			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	4.80											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 101: 122nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	39.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.981

Intersection Setup

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↵↵				↵↵	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	2	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	300.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No				No	
Crosswalk	No		No		Yes	

Volumes

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Base Volume Input [veh/h]	1345	0	0	0	1059	1692
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	0.00	0.00	0.00	2.00	1.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1345	0	0	0	1059	1692
Peak Hour Factor	0.9300	1.0000	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	362	0	0	0	285	455
Total Analysis Volume [veh/h]	1446	0	0	0	1139	1819
Presence of On-Street Parking	No	No			No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal Group	2	0	0	0	3	8
Auxiliary Signal Groups						
Maximum Green [s]	60	0	0	0	72	72
Amber [s]	3.5	0.0	0.0	0.0	3.5	3.5
All red [s]	1.0	0.0	0.0	0.0	1.0	1.0
Walk [s]	7	0	0	0	0	7
Pedestrian Clearance [s]	11	0	0	0	0	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No					No
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	0.0	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	0.0	0.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	0	0	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	5	0	0	0	5	5
Vehicle Extension [s]	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No				No	No
Maximum Recall	No				No	No
Pedestrian Recall	No				No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	L	C
C, Cycle Length [s]	141	141	141
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50
g_i, Effective Green Time [s]	60	72	72
g / C, Green / Cycle	0.43	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.42	0.33	0.51
s, saturation flow rate [veh/h]	3459	3459	3589
c, Capacity [veh/h]	1472	1766	1833
d1, Uniform Delay [s]	39.98	25.17	34.23
k, delay calibration	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	7.57	0.40	8.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.98	0.64	0.99
d, Delay for Lane Group [s/veh]	47.55	25.57	42.43
Lane Group LOS	D	C	D
Critical Lane Group	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	25.92	13.92	32.11
50th-Percentile Queue Length [ft/ln]	647.97	348.10	802.86
95th-Percentile Queue Length [veh/ln]	34.27	20.04	41.41
95th-Percentile Queue Length [ft/ln]	856.71	501.09	1035.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.55	0.00	0.00	0.00	25.57	42.43
Movement LOS	D				C	D
d_A, Approach Delay [s/veh]	47.55		0.00		35.94	
Approach LOS	D		A		D	
d_I, Intersection Delay [s/veh]	39.75					
Intersection LOS	D					
Intersection V/C	0.981					

Emissions

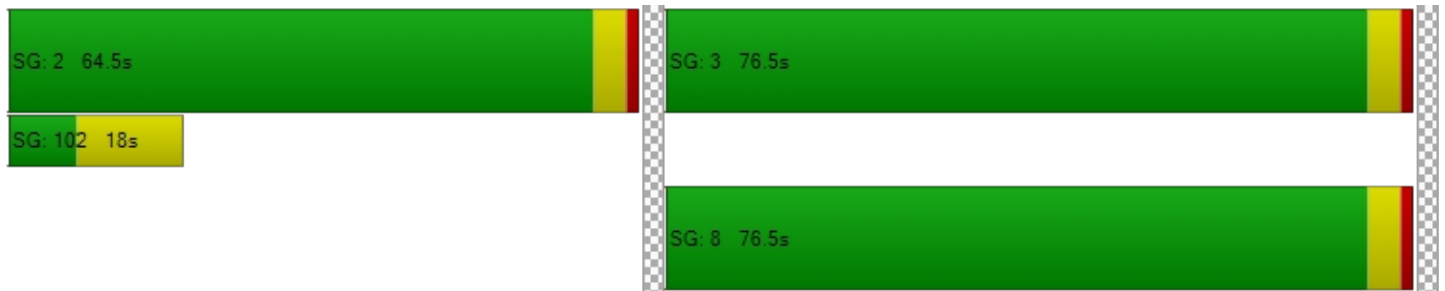
Vehicle Miles Traveled [mph]	120.46		150.95	241.07
Stops [stops/h]	1323.52		711.02	1639.89
Fuel consumption [US gal/h]	26.26		16.07	34.69
CO [g/h]	1835.75		1123.26	2424.83
NOx [g/h]	357.17		218.55	471.78
VOC [g/h]	425.45		260.33	561.98

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	59.93
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	2.874
Crosswalk LOS	F	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	851	0	1021
d_b, Bicycle Delay [s]	23.27	70.50	16.88
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132	4.000
Bicycle LOS	A	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 102: 122nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	0	0	0	0	2	0	0	0
Entry Pocket Length [ft]	100.00	100.00	200.00	50.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			No			Yes			No		

Volumes

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Base Volume Input [veh/h]	0	1345	500	0	1059	0	0	560	594	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	6.00	0.00	2.00	0.00	0.00	2.00	6.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1345	500	0	1059	0	0	560	594	0	0	0
Peak Hour Factor	1.0000	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	362	134	0	285	0	0	151	160	0	0	0
Total Analysis Volume [veh/h]	0	1446	538	0	1139	0	0	602	639	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss
Signal Group	0	2	2	6	6	0	4	4	4	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	73	73	73	73	0	39	39	39	0	0	0
Amber [s]	0.0	3.5	3.5	3.5	3.5	0.0	3.5	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
Walk [s]	0	7	7	7	7	0	7	7	7	0	0	0
Pedestrian Clearance [s]	0	11	11	11	11	0	11	11	11	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	2.5	2.5	2.5	0.0	2.5	2.5	2.5	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	6.0	20.0	20.0	0.0	6.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	30	30	30	30	0	30	30	30	0	0	0
Lead / Lag	-	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	0	5	5	5	5	0	5	5	5	0	0	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0
Minimum Recall		No			No			No				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R	
C, Cycle Length [s]	65	65	65	65	65	65	65	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	36	36	36	36	20	20	20	
g / C, Green / Cycle	0.56	0.56	0.56	0.56	0.30	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.42	0.20	0.00	0.32	0.16	0.16	0.23	
s, saturation flow rate [veh/h]	3475	2723	222	3560	1870	1870	2723	
c, Capacity [veh/h]	1934	1516	158	1982	570	570	829	
d1, Uniform Delay [s]	10.92	7.95	0.00	9.38	18.70	18.70	20.51	
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.59	0.14	0.00	0.26	0.76	0.76	1.55	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.75	0.35	0.00	0.57	0.53	0.53	0.77	
d, Delay for Lane Group [s/veh]	11.51	8.09	0.00	9.64	19.47	19.47	22.06	
Lane Group LOS	B	A	A	A	B	B	C	
Critical Lane Group	Yes	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	6.47	1.74	0.00	4.34	3.58	3.58	4.20	
50th-Percentile Queue Length [ft/ln]	161.70	43.44	0.00	108.48	89.42	89.42	105.01	
95th-Percentile Queue Length [veh/ln]	10.64	3.13	0.00	7.76	6.44	6.44	7.56	
95th-Percentile Queue Length [ft/ln]	265.97	78.19	0.00	193.88	160.95	160.95	189.01	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	11.51	8.09	0.00	9.64	0.00	19.47	19.47	22.06	0.00	0.00	0.00
Movement LOS		B	A	A	A		B	B	C			
d_A, Approach Delay [s/veh]	10.59			9.64			20.80			0.00		
Approach LOS	B			A			C			A		
d_I, Intersection Delay [s/veh]	13.24											
Intersection LOS	B											
Intersection V/C	0.742											

Emissions

Vehicle Miles Traveled [mph]	333.87	124.22	0.00	94.89	36.03	36.03	76.48
Stops [stops/h]	718.80	193.10	0.00	482.21	198.74	198.74	466.78
Fuel consumption [US gal/h]	21.10	7.07	0.00	8.81	3.77	3.77	8.60
CO [g/h]	1475.19	493.93	0.00	615.50	263.77	263.77	600.82
NOx [g/h]	287.02	96.10	0.00	119.75	51.32	51.32	116.90
VOC [g/h]	341.89	114.47	0.00	142.65	61.13	61.13	139.25

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	22.33	0.00	22.33	0.00
I_p,int, Pedestrian LOS Score for Intersectio	3.046	0.000	2.415	0.000
Crosswalk LOS	C	F	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	2253	2253	1204	0
d_b, Bicycle Delay [s]	0.52	0.52	5.13	32.39
I_b,int, Bicycle LOS Score for Intersection	3.196	2.499	2.583	4.132
Bicycle LOS	C	B	B	D

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 103: 142nd Avenue/Backage Road

Control Type:	Signalized	Delay (sec / veh):	19.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

Intersection Setup

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Base Volume Input [veh/h]	371	61	137	10	50	10	10	100	530	60	100	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	5.00	2.00	8.00	2.00	2.00	2.00	4.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	371	61	137	10	50	10	10	100	530	60	100	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	101	17	37	3	14	3	3	27	144	16	27	3
Total Analysis Volume [veh/h]	403	66	149	11	54	11	11	109	576	65	109	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	23.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal Group	2	2	2	1	6	6	4	4	1	8	8	8
Auxiliary Signal Groups									1,4			
Maximum Green [s]	40	40	40	19	63	63	18	18	19	18	18	18
Amber [s]	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	7	7	7	0	7	7	7	7	0	7	7	7
Pedestrian Clearance [s]	11	11	11	0	11	11	11	11	0	11	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	5	5	5	5	5	5	5	5	5	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall		No		No	No			No	No		No	
Maximum Recall		No		No	No			No	No		No	
Pedestrian Recall		No		No	No			No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	59	59	59	59	59	59	59
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	0.00	2.50
g_i, Effective Green Time [s]	24	24	3	28	18	26	18
g / C, Green / Cycle	0.41	0.41	0.06	0.47	0.30	0.44	0.30
(v / s)_i Volume / Saturation Flow Rate	0.30	0.13	0.01	0.04	0.07	0.37	0.15
s, saturation flow rate [veh/h]	1336	1666	1781	1728	1842	1564	1271
c, Capacity [veh/h]	590	680	104	821	628	687	470
d1, Uniform Delay [s]	17.85	11.87	26.34	8.45	15.25	14.69	16.11
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.50	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.41	0.26	0.44	0.04	0.15	11.69	0.54
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.32	0.11	0.08	0.19	0.84	0.39
d, Delay for Lane Group [s/veh]	19.26	12.14	26.78	8.50	15.40	26.37	16.64
Lane Group LOS	B	B	C	A	B	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.72	1.74	0.15	0.40	1.12	7.97	1.82
50th-Percentile Queue Length [ft/ln]	118.06	43.42	3.79	9.90	27.92	199.20	45.48
95th-Percentile Queue Length [veh/ln]	8.29	3.13	0.27	0.71	2.01	12.60	3.27
95th-Percentile Queue Length [ft/ln]	207.16	78.15	6.82	17.82	50.25	314.93	81.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.26	12.14	12.14	26.78	8.50	8.50	15.40	15.40	26.37	16.64	16.64	16.64
Movement LOS	B	B	B	C	A	A	B	B	C	B	B	B
d_A, Approach Delay [s/veh]	16.78			11.14			24.48			16.64		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	19.90											
Intersection LOS	B											
Intersection V/C	0.421											

Emissions

Vehicle Miles Traveled [mph]	76.31	40.71	2.02	11.96	28.90	138.74	45.02
Stops [stops/h]	288.06	105.94	9.25	24.16	68.12	486.03	110.97
Fuel consumption [US gal/h]	6.31	2.79	0.19	0.74	1.94	11.49	3.09
CO [g/h]	441.24	195.18	13.59	51.61	135.76	803.03	216.20
NOx [g/h]	85.85	37.98	2.64	10.04	26.41	156.24	42.06
VOC [g/h]	102.26	45.24	3.15	11.96	31.46	186.11	50.11

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	19.53	19.53	19.53	19.53
I_p,int, Pedestrian LOS Score for Intersectio	2.520	1.986	2.886	1.913
Crosswalk LOS	B	A	C	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1356	2135	610	610
d_b, Bicycle Delay [s]	3.06	0.13	14.25	14.25
I_b,int, Bicycle LOS Score for Intersection	2.579	1.685	2.708	1.865
Bicycle LOS	B	A	B	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 104: 142nd Avenue/Highway 212 Access

Control Type:	Signalized	Delay (sec / veh):	7.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.581

Intersection Setup

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↶		↷		↶	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

Volumes

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Base Volume Input [veh/h]	0	353	201	439	216	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	3.00	5.00	3.00	3.00	0.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	353	201	439	216	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	91	52	113	56	0
Total Analysis Volume [veh/h]	0	364	207	453	223	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	2	2	6	6	4	4
Auxiliary Signal Groups						
Maximum Green [s]	54	54	54	54	16	16
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	3.0	3.0	3.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	8	5	5	8	8
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C
C, Cycle Length [s]	27	27	27	27
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	11	11	11	7
g / C, Green / Cycle	0.39	0.39	0.39	0.24
(v / s)_i Volume / Saturation Flow Rate	0.20	0.11	0.29	0.12
s, saturation flow rate [veh/h]	1855	1825	1577	1810
c, Capacity [veh/h]	862	719	621	437
d1, Uniform Delay [s]	6.27	5.68	7.07	9.00
k, delay calibration	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.22	1.66	0.92
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.29	0.73	0.51
d, Delay for Lane Group [s/veh]	6.60	5.90	8.73	9.92
Lane Group LOS	A	A	A	A
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.86	0.45	1.38	0.84
50th-Percentile Queue Length [ft/ln]	21.46	11.14	34.52	21.07
95th-Percentile Queue Length [veh/ln]	1.54	0.80	2.49	1.52
95th-Percentile Queue Length [ft/ln]	38.62	20.05	62.14	37.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.60	6.60	5.90	8.73	9.92	9.92
Movement LOS	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	6.60		7.84		9.92	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.85					
Intersection LOS	A					
Intersection V/C	0.581					

Emissions

Vehicle Miles Traveled [mph]	84.92	39.19	85.77	51.76
Stops [stops/h]	113.16	58.74	182.09	111.13
Fuel consumption [US gal/h]	4.61	2.19	5.34	3.20
CO [g/h]	322.21	152.84	373.41	223.34
NOx [g/h]	62.69	29.74	72.65	43.45
VOC [g/h]	74.67	35.42	86.54	51.76

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3956	3956	1172
d_b, Bicycle Delay [s]	13.05	13.05	2.34
I_b,int, Bicycle LOS Score for Intersection	2.160	2.649	1.928
Bicycle LOS	B	B	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 105: 142nd Avenue/OR 212**

Control Type:	Two-way stop	Delay (sec / veh):	329.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.633

Intersection Setup

Name	142nd Ave			142nd Ave			EB OR 212			WB OR 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↶			↷			↶			↷		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	165.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Ave			142nd Ave			EB OR 212			WB OR 212		
Base Volume Input [veh/h]	0	0	279	0	0	482	0	445	333	0	1400	209
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	18.00	0.00	0.00	3.00	0.00	13.00	13.00	0.00	8.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	279	0	0	482	0	445	333	0	1400	209
Peak Hour Factor	1.0000	1.0000	0.9600	1.0000	1.0000	0.9600	1.0000	0.9600	0.9600	1.0000	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	73	0	0	126	0	116	87	0	365	54
Total Analysis Volume [veh/h]	0	0	291	0	0	502	0	464	347	0	1458	218
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

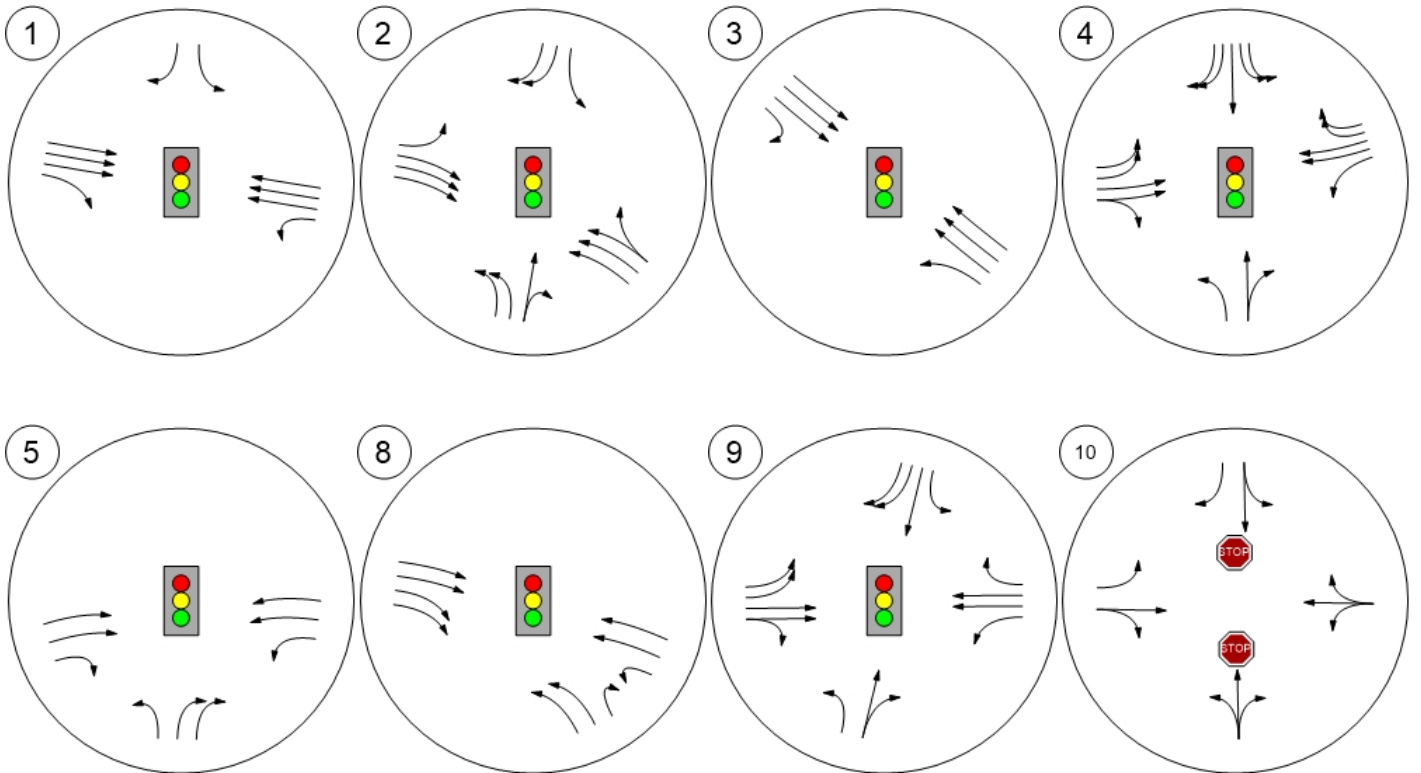
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.40	0.00	0.00	1.63	0.00	0.00	0.00	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.29	0.00	0.00	329.06	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			B			F		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	1.95	0.00	0.00	30.49	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	48.73	0.00	0.00	762.36	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.29				329.06		0.00		0.00			
Approach LOS	B				F		A		A			
d_I, Intersection Delay [s/veh]	51.54											
Intersection LOS	F											

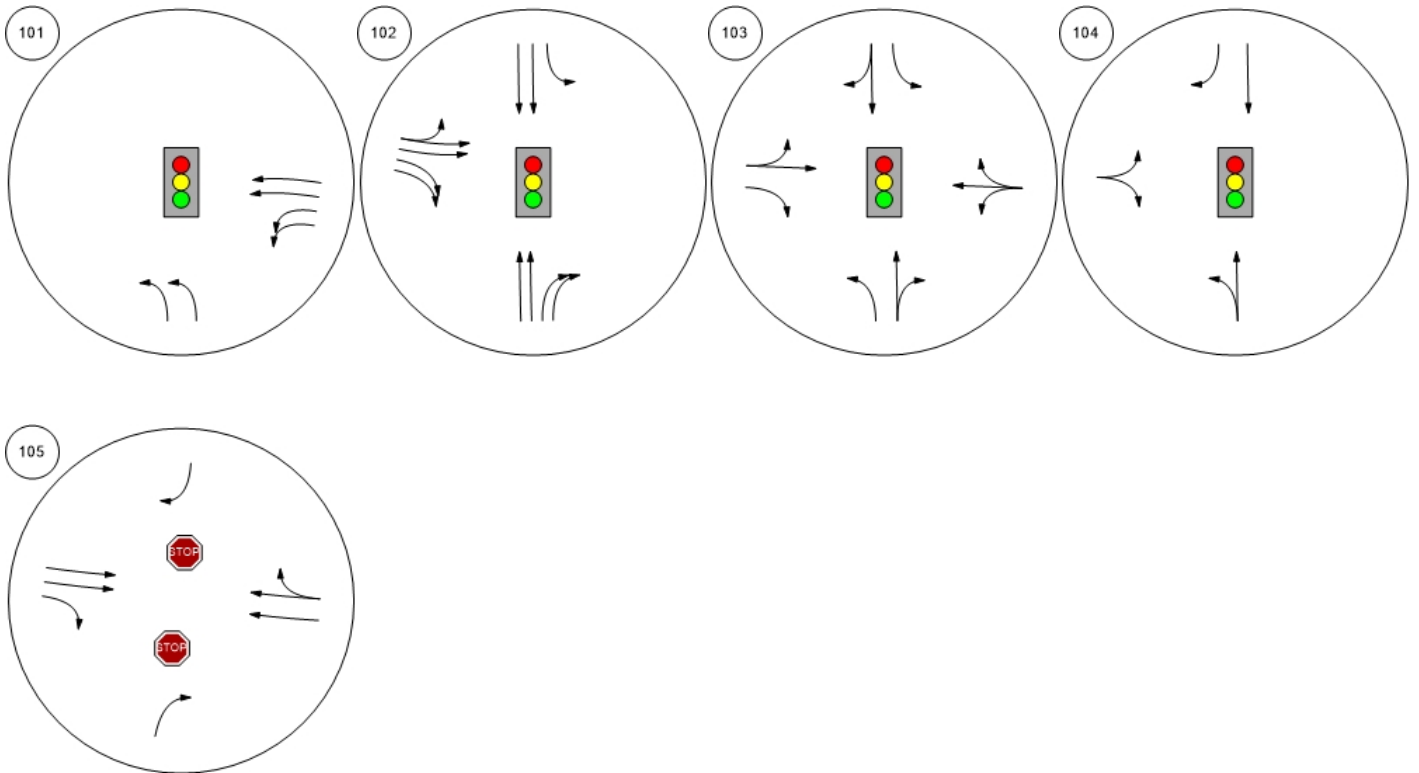
Study Intersections



Lane Configuration and Traffic Control



Lane Configuration and Traffic Control



Future Traffic Conditions - Four-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (vph)	0	2431	285	27	1410	0	0	0	0	305	1	408
Future Volume (vph)	0	2431	285	27	1410	0	0	0	0	305	1	408
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	5.5	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3343	1392	1228	3343					1687	0	1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3343	1392	1228	3343					1687	0	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2642	310	29	1533	0	0	0	0	332	1	443
RTOR Reduction (vph)	0	0	127	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	2642	183	29	1533	0	0	0	0	332	1	400
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Perm	NA	Perm
Protected Phases		2		1	6						4	
Permitted Phases			2							4		4
Actuated Green, G (s)		74.6	74.6	5.7	84.3					34.2	34.2	34.2
Effective Green, g (s)		76.6	76.6	5.7	86.3					35.7	34.2	35.7
Actuated g/C Ratio		0.59	0.59	0.04	0.66					0.27	0.26	0.27
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5	5.5	5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3	2.3	2.3
Lane Grp Cap (vph)		1969	820	53	2219					463	0	414
v/s Ratio Prot		c0.79		0.02	c0.46							
v/s Ratio Perm			0.13							0.20		c0.27
v/c Ratio		1.34	0.22	0.55	0.69					0.72	no cap	0.97
Uniform Delay, d1		26.7	12.6	60.9	13.6					42.6	Error	46.6
Progression Factor		1.00	1.00	1.23	0.38					1.00		1.00
Incremental Delay, d2		157.3	0.6	3.6	0.8					4.7	Error	35.2
Delay (s)		184.0	13.3	78.7	6.0					47.3	Error	81.7
Level of Service		F	B	E	A					D	F	F
Approach Delay (s)		166.1			7.4			0.0			Error	
Approach LOS		F			A			A			F	
Intersection Summary												
HCM 2000 Control Delay			Error		HCM 2000 Level of Service					F		
HCM 2000 Volume to Capacity ratio			1.22									
Actuated Cycle Length (s)			130.0		Sum of lost time (s)					13.5		
Intersection Capacity Utilization			Err%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Four-Lane Sunrise
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗	↖	↑↑					↘		↗
Traffic Volume (veh/h)	0	2431	285	27	1410	0	0	0	0	305	1	408
Future Volume (veh/h)	0	2431	285	27	1410	0	0	0	0	305	1	408
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	1900	1796
Adj Flow Rate, veh/h	0	2642	0	29	1533	0				332	1	443
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	2045		30	2239	0				474	0	422
Arrive On Green	0.00	0.60	0.00	0.05	1.00	0.00				0.28	0.27	0.28
Sat Flow, veh/h	0	3474	1409	1146	3474	0				1711	0	1522
Grp Volume(v), veh/h	0	2642	0	29	1533	0				332	0	443
Grp Sat Flow(s),veh/h/ln	0	1692	1409	1146	1692	0				1711	0	1522
Q Serve(g_s), s	0.0	78.6	0.0	3.3	0.0	0.0				22.6	0.0	36.0
Cycle Q Clear(g_c), s	0.0	78.6	0.0	3.3	0.0	0.0				22.6	0.0	36.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2045		30	2239	0				474	0	422
V/C Ratio(X)	0.00	1.29		0.96	0.68	0.00				0.70	0.00	1.05
Avail Cap(c_a), veh/h	0	2045		141	2239	0				474	0	422
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.12	0.12	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.7	0.0	61.5	0.0	0.0				42.2	0.0	47.0
Incr Delay (d2), s/veh	0.0	135.0	0.0	12.6	0.2	0.0				4.1	0.0	57.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	98.5	0.0	1.6	0.1	0.0				15.3	0.0	28.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	160.7	0.0	74.1	0.2	0.0				46.3	0.0	104.8
LnGrp LOS	A	F		E	A	A				D	A	F
Approach Vol, veh/h		2642			1562						775	
Approach Delay, s/veh		160.7			1.6						79.8	
Approach LOS		F			A						E	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.4	82.6		40.0		90.0						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	16.0	64.0		34.5		84.0						
Max Q Clear Time (g_c+I1), s	5.3	80.6		38.0		2.0						
Green Ext Time (p_c), s	0.0	0.0		0.0		3.9						

Intersection Summary

HCM 6th Ctrl Delay	98.2
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Four-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↘		↘		↘↘
Traffic Volume (vph)	544	2192	0	0	841	450	359	8	354	22	0	237
Future Volume (vph)	544	2192	0	0	841	450	359	8	354	22	0	237
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0		4.0
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00		1.00		0.88
Frb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Frt	1.00	1.00			0.95		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1703	3343			3209		3242	1379		1467		2608
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1703	3343			3209		3242	1379		1467		2608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	591	2383	0	0	914	489	390	9	385	24	0	258
RTOR Reduction (vph)	0	0	0	0	50	0	0	127	0	0	0	75
Lane Group Flow (vph)	591	2383	0	0	1353	0	390	267	0	24	0	183
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	38.8	86.1			43.3		22.4	20.5		6.4		47.3
Effective Green, g (s)	38.8	88.1			45.3		23.9	22.0		7.9		46.3
Actuated g/C Ratio	0.30	0.68			0.35		0.18	0.17		0.06		0.36
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	508	2265			1118		596	233		89		928
v/s Ratio Prot	c0.35	0.71			c0.42		c0.12	c0.19		0.02		0.07
v/s Ratio Perm												
v/c Ratio	1.16	1.05			1.21		0.65	1.15		0.27		0.20
Uniform Delay, d1	45.6	21.0			42.4		49.2	54.0		58.3		29.0
Progression Factor	0.74	0.39			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	75.7	24.8			102.7		2.2	103.8		1.0		0.1
Delay (s)	109.5	32.9			145.0		51.4	157.8		59.2		29.0
Level of Service	F	C			F		D	F		E		C
Approach Delay (s)		48.1			145.0			104.9			31.6	
Approach LOS		D			F			F			C	
Intersection Summary												
HCM 2000 Control Delay			80.4									F
HCM 2000 Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			130.0							16.0		
Intersection Capacity Utilization			100.1%									G
ICU Level of Service												
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑			↑↑		↘↘	↑		↘		↘↘
Traffic Volume (veh/h)	544	2192	0	0	841	450	359	8	354	22	0	237
Future Volume (veh/h)	544	2192	0	0	841	450	359	8	354	22	0	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	591	2383	0	0	914	489	390	9	385	24	0	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	544	2503	0	0	810	426	655	5	219	44	0	0
Arrive On Green	0.63	1.00	0.00	0.00	0.12	0.12	0.20	0.14	0.13	0.03	0.00	0.01
Sat Flow, veh/h	1725	3474	0	0	2233	1127	3291	37	1579	1485	24	
Grp Volume(v), veh/h	591	2383	0	0	718	685	390	0	394	24	68.4	
Grp Sat Flow(s),veh/h/ln	1725	1692	0	0	1692	1579	1646	0	1616	1485	E	
Q Serve(g_s), s	41.0	0.0	0.0	0.0	49.1	49.1	14.0	0.0	18.0	2.1		
Cycle Q Clear(g_c), s	41.0	0.0	0.0	0.0	49.1	49.1	14.0	0.0	18.0	2.1		
Prop In Lane	1.00		0.00	0.00		0.71	1.00		0.98	1.00		
Lane Grp Cap(c), veh/h	544	2503	0	0	640	597	655	0	224	44		
V/C Ratio(X)	1.09	0.95	0.00	0.00	1.12	1.15	0.60	0.00	1.76	0.54		
Avail Cap(c_a), veh/h	544	2503	0	0	640	597	734	0	224	194		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.93	0.93	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	24.0	0.0	0.0	0.0	56.9	57.1	47.3	0.0	56.7	62.2		
Incr Delay (d2), s/veh	42.3	1.2	0.0	0.0	73.2	83.9	0.7	0.0	360.2	6.2		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	20.9	0.7	0.0	0.0	48.6	48.5	9.8	0.0	46.7	1.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.3	1.2	0.0	0.0	130.1	141.1	48.1	0.0	416.9	68.4		
LnGrp LOS	F	A	A	A	F	F	D	A	F	E		
Approach Vol, veh/h		2974			1403			784				
Approach Delay, s/veh		14.2			135.5			233.4				
Approach LOS		B			F			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		100.1	29.9		47.0	53.1	7.9	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		81.0	27.5		41.0	* 36	15.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	16.0		43.0	51.1	4.1	20.0				
Green Ext Time (p_c), s		70.7	0.8		0.0	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			80.4									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - Four-Lane Sunrise
3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑		
Traffic Volume (vph)	2219	349	256	1291	0	0
Future Volume (vph)	2219	349	256	1291	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.95	1.00	1.00	0.95		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	3223	1509	1517	3505		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	3223	1509	1517	3505		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2264	356	261	1317	0	0
RTOR Reduction (vph)	0	39	0	0	0	0
Lane Group Flow (vph)	2264	317	261	1317	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	91.5	91.5	27.5	130.0		
Effective Green, g (s)	94.5	94.5	27.5	130.0		
Actuated g/C Ratio	0.73	0.73	0.21	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	2342	1096	320	3505		
v/s Ratio Prot	c0.70		c0.17	0.38		
v/s Ratio Perm		0.21				
v/c Ratio	0.97	0.29	0.82	0.38		
Uniform Delay, d1	16.3	6.1	48.8	0.0		
Progression Factor	0.83	1.38	1.00	1.00		
Incremental Delay, d2	1.8	0.1	14.2	0.3		
Delay (s)	15.3	8.5	63.1	0.3		
Level of Service	B	A	E	A		
Approach Delay (s)	14.3			10.7	0.0	
Approach LOS	B			B	A	

Intersection Summary

HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - Four-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	752	556	44	10	471	699	28	213	10	733	217	684
Future Volume (vph)	752	556	44	10	471	699	28	213	10	733	217	684
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	0.88	1.00	1.00		0.97	1.00	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2694	3106		1543	3343	2760	1203	1286		3242	1597	2493
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.77	1.00	1.00
Satd. Flow (perm)	2694	3106		1543	3343	2760	1203	1286		2625	1597	2493
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	800	591	47	11	501	744	30	227	11	780	231	728
RTOR Reduction (vph)	0	4	0	0	0	44	0	2	0	0	0	521
Lane Group Flow (vph)	800	634	0	11	501	700	30	236	0	780	231	207
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	pt+ov	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6	6 7	3	8		7	4	
Permitted Phases										4		4
Actuated Green, G (s)	36.1	61.3		2.7	27.9	58.9	11.6	16.8		36.2	36.2	36.2
Effective Green, g (s)	36.1	62.7		2.7	29.3	61.7	11.6	17.6		36.2	37.0	37.0
Actuated g/C Ratio	0.28	0.48		0.02	0.23	0.47	0.09	0.14		0.28	0.28	0.28
Clearance Time (s)	4.0	5.4		4.0	5.4		4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6		2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	748	1498		32	753	1309	107	174		878	454	709
v/s Ratio Prot	c0.30	0.20		0.01	c0.15	0.25	0.02	c0.18		c0.21	0.14	
v/s Ratio Perm										0.04		0.08
v/c Ratio	1.07	0.42		0.34	0.67	0.53	0.28	1.36		0.89	0.51	0.29
Uniform Delay, d1	47.0	21.9		62.8	45.9	24.0	55.3	56.2		44.6	38.9	36.3
Progression Factor	1.00	1.00		0.98	1.02	0.96	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	53.1	0.9		2.3	4.5	0.3	0.8	193.7		10.7	0.5	0.1
Delay (s)	100.0	22.8		63.9	51.1	23.3	56.1	249.9		55.3	39.4	36.4
Level of Service	F	C		E	D	C	E	F		E	D	D
Approach Delay (s)		65.8			34.7			228.2			45.3	
Approach LOS		E			C			F			D	

Intersection Summary		
HCM 2000 Control Delay	59.2	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.97	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	80.5%	ICU Level of Service D
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Four-Lane Sunrise
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	752	556	44	10	471	699	28	213	10	733	217	684
Future Volume (veh/h)	752	556	44	10	471	699	28	213	10	733	217	684
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	800	591	47	11	501	744	30	227	11	780	231	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	651	1525	121	16	888	1416	210	138	7	896	267	
Arrive On Green	0.24	0.51	0.49	0.01	0.26	0.26	0.19	0.12	0.12	0.24	0.17	0.00
Sat Flow, veh/h	2689	3018	240	1570	3385	2768	1104	1124	54	3291	1618	2524
Grp Volume(v), veh/h	800	314	324	11	501	744	30	0	238	780	231	0
Grp Sat Flow(s),veh/h/ln	1345	1608	1649	1570	1692	1384	1104	0	1179	1646	1618	1262
Q Serve(g_s), s	31.5	15.6	15.7	0.9	16.7	6.8	2.9	0.0	16.0	30.7	18.1	0.0
Cycle Q Clear(g_c), s	31.5	15.6	15.7	0.9	16.7	6.8	2.9	0.0	16.0	30.7	18.1	0.0
Prop In Lane	1.00		0.15	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	651	812	833	16	888	1416	210	0	145	896	267	
V/C Ratio(X)	1.23	0.39	0.39	0.69	0.56	0.53	0.14	0.00	1.64	0.87	0.86	
Avail Cap(c_a), veh/h	651	812	833	133	1328	1776	210	0	145	896	361	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	1.00	0.77	0.77	0.00
Uniform Delay (d), s/veh	49.3	19.8	19.9	64.1	41.5	8.4	43.8	0.0	57.0	49.3	52.9	0.0
Incr Delay (d2), s/veh	116.1	1.4	1.4	17.5	2.5	1.3	0.2	0.0	317.1	7.2	10.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	31.8	10.3	10.5	0.8	11.6	6.8	1.5	0.0	28.6	18.7	12.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	165.3	21.2	21.2	81.6	44.0	9.8	44.0	0.0	374.1	56.5	63.4	0.0
LnGrp LOS	F	C	C	F	D	A	D	A	F	E	E	
Approach Vol, veh/h		1438			1256			268			1011	
Approach Delay, s/veh		101.4			24.0			337.1			58.1	
Approach LOS		F			C			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	69.7	29.5	25.5	36.9	38.1	35.0	20.0				
Change Period (Y+Rc), s	4.0	* 5.4	4.8	* 4.8	* 5.4	* 5.4	4.0	4.8				
Max Green Setting (Gmax), s	11.0	* 55	18.0	* 28	* 16	* 50	31.0	15.2				
Max Q Clear Time (g_c+I1), s	2.9	17.7	4.9	20.1	33.5	18.7	32.7	18.0				
Green Ext Time (p_c), s	0.0	8.0	0.0	0.6	0.0	14.1	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			81.8									
HCM 6th LOS			F									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

Future Traffic Conditions - Four-Lane Sunrise
5: 135th Ave & Highway 212/OR 212

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑↑
Traffic Volume (vph)	1204	24	284	879	50	607
Future Volume (vph)	1204	24	284	879	50	607
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	0.88
Frbp, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3167	1346	1671	3343	1671	2433
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3167	1346	1671	3343	1671	2433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1267	25	299	925	53	639
RTOR Reduction (vph)	0	2	0	0	0	576
Lane Group Flow (vph)	1267	23	299	925	53	63
Confl. Peds. (#/hr)		2	2		1	2
Heavy Vehicles (%)	14%	17%	8%	8%	8%	14%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				8
Actuated Green, G (s)	77.0	77.0	26.8	108.0	12.8	12.3
Effective Green, g (s)	78.4	78.4	26.8	109.2	12.8	12.8
Actuated g/C Ratio	0.60	0.60	0.21	0.84	0.10	0.10
Clearance Time (s)	5.4	5.4	4.0	5.2	4.0	4.5
Vehicle Extension (s)	4.5	4.5	2.3	4.5	2.3	3.0
Lane Grp Cap (vph)	1909	811	344	2808	164	239
v/s Ratio Prot	c0.40		c0.18	0.28	c0.03	
v/s Ratio Perm		0.02				0.03
v/c Ratio	0.66	0.03	0.87	0.33	0.32	0.26
Uniform Delay, d1	17.1	10.4	49.9	2.3	54.6	54.2
Progression Factor	1.20	1.22	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	0.0	19.8	0.3	0.7	0.6
Delay (s)	21.8	12.7	69.7	2.6	55.2	54.8
Level of Service	C	B	E	A	E	D
Approach Delay (s)	21.7			19.0	54.9	
Approach LOS	C			B	D	

Intersection Summary			
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
5: 135th Ave & Highway 212/OR 212

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓↓
Traffic Volume (veh/h)	1204	24	284	879	50	607
Future Volume (veh/h)	1204	24	284	879	50	607
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1693	1648	1781	1781	1781	1693
Adj Flow Rate, veh/h	1267	25	299	925	53	639
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	14	17	8	8	8	14
Cap, veh/h	1552	673	323	2377	398	602
Arrive On Green	0.48	0.48	0.19	0.70	0.23	0.24
Sat Flow, veh/h	3300	1394	1697	3474	1697	2524
Grp Volume(v), veh/h	1267	25	299	925	53	639
Grp Sat Flow(s),veh/h/ln	1608	1394	1697	1692	1697	1262
Q Serve(g_s), s	43.7	1.2	22.5	14.6	3.2	31.0
Cycle Q Clear(g_c), s	43.7	1.2	22.5	14.6	3.2	31.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1552	673	323	2377	398	602
V/C Ratio(X)	0.82	0.04	0.92	0.39	0.13	1.06
Avail Cap(c_a), veh/h	1552	673	378	2382	398	602
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	17.7	51.7	7.9	39.3	49.5
Incr Delay (d2), s/veh	3.6	0.1	25.0	0.5	0.1	54.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	23.1	0.7	17.5	8.9	2.5	21.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	32.3	17.8	76.7	8.4	39.4	103.6
LnGrp LOS	C	B	E	A	D	F
Approach Vol, veh/h	1292			1224	692	
Approach Delay, s/veh	32.1			25.1	98.7	
Approach LOS	C			C	F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	28.8	66.7			95.5	34.5
Change Period (Y+Rc), s	4.0	* 5.4			* 5.4	4.0
Max Green Setting (Gmax), s	29.0	* 57			* 90	30.5
Max Q Clear Time (g_c+I1), s	24.5	45.7			16.6	33.0
Green Ext Time (p_c), s	0.3	8.6			15.8	0.0

Intersection Summary

HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	1627	639	201	0	233
Future Vol, veh/h	0	1627	639	201	0	233
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	0	1713	673	212	0	245

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	-
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

MOVEMENT SUMMARY

Site: 8 [Highway 212/Highway 224_4LanePM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Four-Lane Sunrise
 Site Category: (None)
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]			mph	
			veh/h		veh/h					veh	ft				
South: Highway 224															
3	L2	All MCs	695	5.0	695	5.0	0.502	10.5	LOS B	3.4	87.8	0.63	0.55	0.84	30.4
18	R2	All MCs	204	5.0	204	5.0	0.502	10.2	LOS B	3.3	86.6	0.62	0.53	0.82	31.5
Approach			899	5.0	899	5.0	0.502	10.4	LOS B	3.4	87.8	0.63	0.54	0.83	30.7
East: Highway 212															
1	L2	All MCs	207	5.0	207	5.0	0.306	9.0	LOS A	1.1	29.8	0.62	0.56	0.65	30.7
6	T1	All MCs	189	7.0	189	7.0	0.306	10.0	LOS A	1.1	29.8	0.64	0.59	0.69	33.0
Approach			397	6.0	397	6.0	0.306	9.5	LOS A	1.1	30.2	0.63	0.58	0.67	31.8
West: Highway 212															
2	T1	All MCs	388	6.0	388	6.0	0.359	6.9	LOS A	1.8	46.6	0.43	0.25	0.43	34.7
12	R2	All MCs	1324	6.0	1324	6.0	0.882	22.5	LOS C	29.6	774.6	0.84	0.89	1.58	28.5
Approach			1713	6.0	1713	6.0	0.882	19.0	LOS C	29.6	774.6	0.75	0.75	1.32	29.8
All Vehicles			3008	5.7	3008	5.7	0.882	15.2	LOS C	29.6	774.6	0.70	0.66	1.09	30.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stoptime Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: H:\27\27852 - Sunrise Corridor Community Visioning\synchro\27852_RoundaboutsAnalysis.sip9

Future Traffic Conditions - Four-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	936	1182	141	28	921	82	62	109	31	189	130	574
Future Volume (vph)	936	1182	141	28	921	82	62	109	31	189	130	574
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	3122		1626	3343	1429	1797	1776		1701	1827	2668
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.60	1.00		0.58	1.00	1.00
Satd. Flow (perm)	3213	3122		1626	3343	1429	1144	1776		1045	1827	2668
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	985	1244	148	29	969	86	65	115	33	199	137	604
RTOR Reduction (vph)	0	7	0	0	0	50	0	9	0	0	0	43
Lane Group Flow (vph)	985	1385	0	29	969	36	65	139	0	199	137	561
Confl. Peds. (#/hr)							5		1	1		5
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	23.0	62.2		1.9	41.1	41.1	24.9	24.9		23.7	23.7	46.7
Effective Green, g (s)	23.5	64.7		2.4	43.6	43.6	25.9	25.9		25.9	25.9	47.7
Actuated g/C Ratio	0.22	0.62		0.02	0.42	0.42	0.25	0.25		0.25	0.25	0.45
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.3
Lane Grp Cap (vph)	719	1923		37	1388	593	282	438		257	450	1212
v/s Ratio Prot	c0.31	c0.44		0.02	0.29			0.08			0.07	0.10
v/s Ratio Perm						0.02	0.06			c0.19		0.11
v/c Ratio	1.37	0.72		0.78	0.70	0.06	0.23	0.32		0.77	0.30	0.46
Uniform Delay, d1	40.8	13.9		51.0	25.3	18.4	31.6	32.3		36.8	32.2	19.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	175.3	1.8		65.1	2.1	0.1	0.3	0.3		13.0	0.3	0.2
Delay (s)	216.0	15.7		116.2	27.4	18.5	31.9	32.6		49.9	32.5	20.0
Level of Service	F	B		F	C	B	C	C		D	C	B
Approach Delay (s)		98.7			29.1			32.4			28.1	
Approach LOS		F			C			C			C	

Intersection Summary		
HCM 2000 Control Delay	64.9	HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio	0.92	
Actuated Cycle Length (s)	105.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	84.2%	ICU Level of Service E
Analysis Period (min)	15	

c Critical Lane Group

Future Traffic Conditions - Four-Lane Sunrise
9: 172nd Ave & Highway 212

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↕		↔	↕	↕↕
Traffic Volume (veh/h)	936	1182	141	28	921	82	62	109	31	189	130	574
Future Volume (veh/h)	936	1182	141	28	921	82	62	109	31	189	130	574
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	985	1244	148	29	969	0	65	115	33	199	137	604
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	697	1675	199	42	1322		224	381	109	328	524	1307
Arrive On Green	0.21	0.58	0.56	0.03	0.39	0.00	0.27	0.27	0.26	0.28	0.28	0.27
Sat Flow, veh/h	3264	2895	343	1654	3385	1447	728	1394	400	1193	1841	2698
Grp Volume(v), veh/h	985	689	703	29	969	0	65	0	148	199	137	604
Grp Sat Flow(s),veh/h/ln	1632	1608	1631	1654	1692	1447	728	0	1794	1193	1841	1349
Q Serve(g_s), s	23.0	34.0	34.6	1.9	26.3	0.0	8.3	0.0	7.1	16.8	6.2	16.1
Cycle Q Clear(g_c), s	23.0	34.0	34.6	1.9	26.3	0.0	14.5	0.0	7.1	23.9	6.2	16.1
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	697	930	943	42	1322		224	0	491	328	524	1307
V/C Ratio(X)	1.41	0.74	0.75	0.69	0.73		0.29	0.00	0.30	0.61	0.26	0.46
Avail Cap(c_a), veh/h	697	1012	1027	61	1534		270	0	603	390	619	1446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	16.7	17.1	52.1	28.0	0.0	36.4	0.0	31.1	39.4	29.8	18.6
Incr Delay (d2), s/veh	194.4	3.9	3.9	11.5	2.5	0.0	0.5	0.0	0.3	1.5	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	43.0	18.6	19.1	1.6	16.3	0.0	2.7	0.0	5.6	8.7	5.0	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.7	20.6	21.0	63.5	30.5	0.0	36.9	0.0	31.3	40.9	30.0	18.8
LnGrp LOS	F	C	C	E	C		D	A	C	D	C	B
Approach Vol, veh/h		2377			998			213				940
Approach Delay, s/veh		110.3			31.5			33.0				25.1
Approach LOS		F			C			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	66.3		34.7	27.0	46.1		34.7				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	3.5	65.3		34.0	22.5	46.3		* 35				
Max Q Clear Time (g_c+I1), s	3.9	36.6		25.9	25.0	28.3		16.5				
Green Ext Time (p_c), s	0.0	21.6		2.3	0.0	11.2		1.0				

Intersection Summary

HCM 6th Ctrl Delay	71.6
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	143	278	0	0	282	1	0	0	0	1	0	81
Future Vol, veh/h	143	278	0	0	282	1	0	0	0	1	0	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	155	302	0	0	307	1	0	0	0	1	0	88

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	308	0	0	302	0	0	964	920	302	920	920	308
Stage 1	-	-	-	-	-	-	612	612	-	308	308	-
Stage 2	-	-	-	-	-	-	352	308	-	612	612	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	982	-	-	860	-	-	237	273	742	241	273	667
Stage 1	-	-	-	-	-	-	484	487	-	681	664	-
Stage 2	-	-	-	-	-	-	669	664	-	464	487	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	982	-	-	860	-	-	181	230	742	212	230	667
Mov Cap-2 Maneuver	-	-	-	-	-	-	181	230	-	212	230	-
Stage 1	-	-	-	-	-	-	408	410	-	573	664	-
Stage 2	-	-	-	-	-	-	581	664	-	391	410	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0	0	11.3
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	982	-	-	860	-	-	212	667
HCM Lane V/C Ratio	-	0.158	-	-	-	-	-	0.005	0.132
HCM Control Delay (s)	0	9.4	-	-	0	-	-	22.1	11.2
HCM Lane LOS	A	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	-	0.6	-	-	0	-	-	0	0.5

Future Traffic Conditions - Four-Lane Sunrise
101: 122nd Avenue & Sunrise WB

Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (vph)	0	0	732	825	722	0
Future Volume (vph)	0	0	732	825	722	0
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.0	4.0	
Lane Util. Factor			0.97	0.95	0.97	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			3502	3574	3433	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			3502	3574	3433	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	787	887	776	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	787	887	776	0
Heavy Vehicles (%)	0%	0%	0%	1%	2%	0%
Turn Type			Prot	NA	Prot	
Protected Phases			3	8	2	
Permitted Phases						
Actuated Green, G (s)			21.9	21.9	18.7	
Effective Green, g (s)			22.4	22.4	19.2	
Actuated g/C Ratio			0.45	0.45	0.39	
Clearance Time (s)			4.5	4.5	4.5	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			1581	1614	1328	
v/s Ratio Prot			0.22	c0.25	c0.23	
v/s Ratio Perm						
v/c Ratio			0.50	0.55	0.58	
Uniform Delay, d1			9.6	9.9	12.0	
Progression Factor			1.00	1.00	1.00	
Incremental Delay, d2			0.2	0.4	0.7	
Delay (s)			9.9	10.3	12.7	
Level of Service			A	B	B	
Approach Delay (s)	0.0			10.1	12.7	
Approach LOS	A			B	B	
Intersection Summary						
HCM 2000 Control Delay			10.9		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			49.6		Sum of lost time (s)	8.0
Intersection Capacity Utilization			102.2%		ICU Level of Service	G
Analysis Period (min)			15			
c Critical Lane Group						

Future Traffic Conditions - Four-Lane Sunrise
101: 122nd Avenue & Sunrise WB



















Weekday PM Peak Hour
08/01/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations			↔↔	↕↕	↔↔	
Traffic Volume (veh/h)	0	0	732	825	722	0
Future Volume (veh/h)	0	0	732	825	722	0
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00		1.00	1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1900	1885	1870	0
Adj Flow Rate, veh/h			787	887	776	0
Peak Hour Factor			0.93	0.93	0.93	0.93
Percent Heavy Veh, %			0	1	2	0
Cap, veh/h			0	2672	0	0
Arrive On Green			0.75	0.75	0.03	0.00
Sat Flow, veh/h			0	3676	0	
Grp Volume(v), veh/h			0	887	0.0	
Grp Sat Flow(s),veh/h/ln			0	1791		
Q Serve(g_s), s			0.0	1.3		
Cycle Q Clear(g_c), s			0.0	1.3		
Prop In Lane			0.00			
Lane Grp Cap(c), veh/h			0	2672		
V/C Ratio(X)			0.00	0.33		
Avail Cap(c_a), veh/h			0	13191		
HCM Platoon Ratio			1.00	1.00		
Upstream Filter(I)			0.00	1.00		
Uniform Delay (d), s/veh			0.0	0.7		
Incr Delay (d2), s/veh			0.0	0.1		
Initial Q Delay(d3),s/veh			0.0	0.0		
%ile BackOfQ(95%),veh/ln			0.0	0.0		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			0.0	0.7		
LnGrp LOS			A	A		
Approach Vol, veh/h				887		
Approach Delay, s/veh				0.7		
Approach LOS				A		
Timer - Assigned Phs						8
Phs Duration (G+Y+Rc), s						15.7
Change Period (Y+Rc), s						* 4.5
Max Green Setting (Gmax), s						* 58
Max Q Clear Time (g_c+I1), s						3.3
Green Ext Time (p_c), s						7.9
Intersection Summary						
HCM 6th Ctrl Delay			0.7			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						



















Future Traffic Conditions - Four-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday PM Peak Hour
08/01/2024

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	1317	902	0	0	0	0	722	942	0	732	0	
Future Volume (vph)	0	1317	902	0	0	0	0	722	942	0	732	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0		
Lane Util. Factor		0.95	0.88					0.95	0.88		0.95		
Frt		1.00	0.85					1.00	0.85		1.00		
Flt Protected		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (prot)		3610	2682					3438	2682		3610		
Flt Permitted		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (perm)		3610	2682					3438	2682		3610		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	1416	970	0	0	0	0	776	1013	0	787	0	
RTOR Reduction (vph)	0	0	107	0	0	0	0	0	17	0	0	0	
Lane Group Flow (vph)	0	1416	863	0	0	0	0	776	996	0	787	0	
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	5%	6%	0%	0%	0%	
Turn Type		NA	Perm					NA	Perm	Perm	NA		
Protected Phases		4						2			6		
Permitted Phases	4		4						2	6			
Actuated Green, G (s)		55.5	55.5					52.5	52.5		52.5		
Effective Green, g (s)		56.0	56.0					53.0	53.0		53.0		
Actuated g/C Ratio		0.48	0.48					0.45	0.45		0.45		
Clearance Time (s)		4.5	4.5					4.5	4.5		4.5		
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		1727	1283					1557	1214		1635		
v/s Ratio Prot		c0.39						0.23			0.22		
v/s Ratio Perm			0.32						c0.37				
v/c Ratio		0.82	0.67					0.50	0.82		0.48		
Uniform Delay, d1		26.2	23.4					22.6	27.9		22.4		
Progression Factor		1.00	1.00					1.00	1.00		1.00		
Incremental Delay, d2		3.2	1.4					0.3	4.6		0.2		
Delay (s)		29.4	24.8					22.9	32.4		22.6		
Level of Service		C	C					C	C		C		
Approach Delay (s)		27.5			0.0			28.3			22.6		
Approach LOS		C			A			C			C		
Intersection Summary													
HCM 2000 Control Delay			27.0									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.82										
Actuated Cycle Length (s)			117.0									Sum of lost time (s)	8.0
Intersection Capacity Utilization			85.5%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Future Traffic Conditions - Four-Lane Sunrise
102: 122nd Avenue & Sunrise EB

Weekday PM Peak Hour
08/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1317	902	0	0	0	0	722	942	0	732	0
Future Volume (veh/h)	0	1317	902	0	0	0	0	722	942	0	732	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1811				0	1826	1811	1900	1900	0
Adj Flow Rate, veh/h	0	1416	970				0	776	1013	0	787	0
Peak Hour Factor	0.93	0.93	0.93				0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	6				0	5	6	0	0	0
Cap, veh/h	0	1734	1298				0	1546	1204	66	1609	0
Arrive On Green	0.00	0.48	0.48				0.00	0.45	0.45	0.00	0.45	0.00
Sat Flow, veh/h	0	3705	2701				0	3561	2701	269	3705	0
Grp Volume(v), veh/h	0	1416	970				0	776	1013	0	787	0
Grp Sat Flow(s),veh/h/ln	0	1805	1351				0	1735	1351	269	1805	0
Q Serve(g_s), s	0.0	36.3	31.5				0.0	17.3	36.0	0.0	16.7	0.0
Cycle Q Clear(g_c), s	0.0	36.3	31.5				0.0	17.3	36.0	0.0	16.7	0.0
Prop In Lane	0.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	0	1734	1298				0	1546	1204	66	1609	0
V/C Ratio(X)	0.00	0.82	0.75				0.00	0.50	0.84	0.00	0.49	0.00
Avail Cap(c_a), veh/h	0	1866	1396				0	1793	1396	86	1866	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00				0.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	24.1	22.8				0.0	21.4	26.6	0.0	21.3	0.0
Incr Delay (d2), s/veh	0.0	2.8	2.1				0.0	0.3	4.3	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	22.0	15.2				0.0	11.3	17.6	0.0	11.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	26.8	24.9				0.0	21.7	30.9	0.0	21.5	0.0
LnGrp LOS	A	C	C				A	C	C	A	C	A
Approach Vol, veh/h		2386						1789			787	
Approach Delay, s/veh		26.1						26.9			21.5	
Approach LOS		C						C			C	
Timer - Assigned Phs		2		4				6				
Phs Duration (G+Y+Rc), s		52.3		56.1				52.3				
Change Period (Y+Rc), s		4.5		4.5				4.5				
Max Green Setting (Gmax), s		55.5		55.5				55.5				
Max Q Clear Time (g_c+I1), s		38.0		38.3				18.7				
Green Ext Time (p_c), s		9.8		13.2				6.5				
Intersection Summary												
HCM 6th Ctrl Delay			25.6									
HCM 6th LOS			C									

Future Traffic Conditions - Four-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↕			↕	
Traffic Volume (vph)	10	100	618	119	100	10	546	77	349	10	115	10
Future Volume (vph)	10	100	618	119	100	10	546	77	349	10	115	10
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Frt		1.00	0.85		0.99		1.00	0.88			0.99	
Flt Protected		1.00	1.00		0.97		0.95	1.00			1.00	
Satd. Flow (prot)		1891	1553		1841		1770	1608			1754	
Flt Permitted		0.96	1.00		0.77		0.66	1.00			0.97	
Satd. Flow (perm)		1831	1553		1463		1236	1608			1705	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	109	672	129	109	11	593	84	379	11	125	11
RTOR Reduction (vph)	0	0	488	0	2	0	0	160	0	0	4	0
Lane Group Flow (vph)	0	120	184	0	247	0	593	303	0	0	143	0
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	2%	4%	0%	8%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2		6			
Actuated Green, G (s)		14.4	14.4		14.4		30.9	30.9			30.9	
Effective Green, g (s)		14.9	14.9		14.9		31.4	31.4			31.4	
Actuated g/C Ratio		0.27	0.27		0.27		0.58	0.58			0.58	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)		502	426		401		714	929			985	
v/s Ratio Prot								0.19				
v/s Ratio Perm		0.07	0.12		0.17		0.48				0.08	
v/c Ratio		0.24	0.43		0.62		0.83	0.33			0.14	
Uniform Delay, d1		15.3	16.2		17.2		9.3	6.0			5.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2		0.2	0.7		2.8		8.1	0.2			0.1	
Delay (s)		15.5	16.9		20.0		17.4	6.2			5.3	
Level of Service		B	B		B		B	A			A	
Approach Delay (s)		16.7			20.0			12.5			5.3	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			14.3									B
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			54.3								8.0	
Intersection Capacity Utilization			67.9%									C
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Four-Lane Sunrise
103: 142nd Avenue & Backage Road

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↔			↕	
Traffic Volume (veh/h)	10	100	618	119	100	10	546	77	349	10	115	10
Future Volume (veh/h)	10	100	618	119	100	10	546	77	349	10	115	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1841	1900	1900	1900	1870	1870	1841	1900	1781	1900
Adj Flow Rate, veh/h	11	109	672	129	109	11	593	84	379	11	125	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	4	0	0	0	2	2	4	0	8	0
Cap, veh/h	88	613	529	338	265	24	803	155	700	94	800	67
Arrive On Green	0.33	0.34	0.34	0.33	0.34	0.33	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	64	1806	1560	722	782	70	1253	296	1334	53	1523	128
Grp Volume(v), veh/h	120	0	672	249	0	0	593	0	463	147	0	0
Grp Sat Flow(s),veh/h/ln	1870	0	1560	1574	0	0	1253	0	1630	1704	0	0
Q Serve(g_s), s	0.0	0.0	20.0	4.3	0.0	0.0	20.5	0.0	11.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.6	0.0	20.0	6.9	0.0	0.0	23.1	0.0	11.2	2.6	0.0	0.0
Prop In Lane	0.09		1.00	0.52		0.04	1.00		0.82	0.07		0.07
Lane Grp Cap(c), veh/h	685	0	529	614	0	0	803	0	856	946	0	0
V/C Ratio(X)	0.18	0.00	1.27	0.41	0.00	0.00	0.74	0.00	0.54	0.16	0.00	0.00
Avail Cap(c_a), veh/h	685	0	529	614	0	0	1038	0	1162	1253	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.7	0.0	19.5	15.1	0.0	0.0	11.7	0.0	9.5	7.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	135.5	0.4	0.0	0.0	2.0	0.0	0.5	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	1.9	0.0	39.9	4.4	0.0	0.0	9.5	0.0	6.0	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	0.0	155.0	15.6	0.0	0.0	13.8	0.0	10.0	7.4	0.0	0.0
LnGrp LOS	B	A	F	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		792			249			1056			147	
Approach Delay, s/veh		133.6			15.6			12.1			7.4	
Approach LOS		F			B			B			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		34.9		24.0		34.9		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		41.5		19.5		41.5		19.5				
Max Q Clear Time (g_c+I1), s		25.1		22.0		4.6		8.9				
Green Ext Time (p_c), s		5.3		0.0		0.9		1.0				
Intersection Summary												
HCM 6th Ctrl Delay			55.1									
HCM 6th LOS			E									

Future Traffic Conditions - Four-Lane Sunrise
104: 142nd Avenue & Highway 212 Accesses

Weekday PM Peak Hour
08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	182	0	0	790	467	385
Future Volume (vph)	182	0	0	790	467	385
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	0.95			1.00	1.00	1.00
Satd. Flow (prot)	1752			1863	1792	1568
Flt Permitted	0.95			1.00	1.00	1.00
Satd. Flow (perm)	1752			1863	1792	1568
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	188	0	0	814	481	397
RTOR Reduction (vph)	0	0	0	0	0	143
Lane Group Flow (vph)	188	0	0	814	481	254
Heavy Vehicles (%)	3%	0%	0%	2%	6%	3%
Turn Type	Prot			NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases			2			6
Actuated Green, G (s)	8.2			29.6	29.6	29.6
Effective Green, g (s)	9.2			30.6	30.6	30.6
Actuated g/C Ratio	0.19			0.64	0.64	0.64
Clearance Time (s)	5.0			5.0	5.0	5.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	337			1192	1147	1003
v/s Ratio Prot	c0.11			c0.44	0.27	
v/s Ratio Perm						0.16
v/c Ratio	0.56			0.68	0.42	0.25
Uniform Delay, d1	17.5			5.5	4.2	3.7
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	2.0			1.6	0.2	0.1
Delay (s)	19.5			7.1	4.5	3.8
Level of Service	B			A	A	A
Approach Delay (s)	19.5			7.1	4.2	
Approach LOS	B			A	A	

Intersection Summary

HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	47.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - Four-Lane Sunrise
 104: 142nd Avenue & Highway 212 Accesses

Weekday PM Peak Hour
 08/01/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	182	0	0	790	467	385
Future Volume (veh/h)	182	0	0	790	467	385
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1900	1900	1870	1811	1856
Adj Flow Rate, veh/h	814	1	0	814	481	397
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	0	0	2	6	3
Cap, veh/h	9999	9999	0	1078	1044	906
Arrive On Green	0.22	0.20	0.00	0.58	0.58	0.58
Sat Flow, veh/h	18826719395385	173632	0	1870	1811	1572
Grp Volume(v), veh/h	814	1	0	814	481	397
Grp Sat Flow(s),veh/h/ln	1767	1610	0	1870	1811	1572
Q Serve(g_s), s	0.0	0.0	0.0	13.1	6.1	5.7
Cycle Q Clear(g_c), s	0.0	0.0	0.0	13.1	6.1	5.7
Prop In Lane	1.00	1.00	0.00			1.00
Lane Grp Cap(c), veh/h	422217744320	2571264	0	1078	1044	906
V/C Ratio(X)	0.00	0.00	0.00	0.76	0.46	0.44
Avail Cap(c_a), veh/h	750685026478	4887808	0	2144	2076	1803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	6.4	4.9	4.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	0.0	0.0	5.3	2.3	1.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	0.0	0.0	7.5	5.2	5.2
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	815			814	878	
Approach Delay, s/veh	0.0			7.5	5.2	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		27.1		13.0		27.1
Change Period (Y+Rc), s		5.0		5.0		5.0
Max Green Setting (Gmax), s		45.0		15.0		45.0
Max Q Clear Time (g_c+I1), s		15.1		2.0		8.1
Green Ext Time (p_c), s		7.0		2.8		5.2
Intersection Summary						
HCM 6th Ctrl Delay			4.2			
HCM 6th LOS			A			

Notes

User approved volume balancing among the lanes for turning movement.

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑				↑			↑
Traffic Vol, veh/h	0	1142	790	0	786	182	0	0	467	0	0	385
Future Vol, veh/h	0	1142	790	0	786	182	0	0	467	0	0	385
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	4	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	165	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	13	13	13	0	8	3	2	0	18	5	0	3
Mvmt Flow	0	1190	823	0	819	190	0	0	486	0	0	401

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	0	0	0	0
Stage 1	0	-	-	0	-	-	0	0	0	0	0	0
Stage 2	0	-	-	0	-	-	0	0	0	0	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			0			0		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	-	0
HCM Lane LOS	A	-	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-	-	-

MOVEMENT SUMMARY

Site: 106 [Highway 212/Riverbend_4LanePM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Four-Lane Sunrise
 Site Category: (None)
 Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed	
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]			mph	
			veh/h		veh/h					veh	ft				
South: Riverbend															
3	L2	All MCs	75	3.0	75	3.0	0.622	34.1	LOS D	1.9	50.3	0.89	1.19	1.54	14.5
18	R2	All MCs	63	20.0	63	20.0	0.622	54.5	LOS F	1.9	50.3	0.89	1.19	1.54	14.5
Approach			138	10.7	138	10.7	0.622	42.2	LOS E	1.9	50.3	0.89	1.19	1.54	14.5
East: Highway 212															
1	L2	All MCs	22	0.0	22	0.0	0.383	5.9	LOS A	2.1	55.9	0.27	0.11	0.27	34.9
6	T1	All MCs	923	7.0	923	7.0	0.383	6.4	LOS A	2.1	55.9	0.27	0.11	0.27	34.8
Approach			944	6.8	944	6.8	0.383	6.4	LOS A	2.1	55.9	0.27	0.11	0.27	34.8
West: Highway 212															
2	T1	All MCs	1573	6.0	1573	6.0	0.630	8.4	LOS A	6.0	156.9	0.21	0.05	0.21	34.0
12	R2	All MCs	86	2.0	86	2.0	0.630	8.1	LOS A	6.0	156.9	0.21	0.05	0.21	34.1
Approach			1659	5.8	1659	5.8	0.630	8.4	LOS A	6.0	156.9	0.21	0.05	0.21	34.0
All Vehicles			2741	6.4	2741	6.4	0.630	9.5	LOS A	6.0	156.9	0.27	0.13	0.30	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Stoptline Delay: Geometric Delay is not included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Siegloch M1 implied by US HCM 6 Roundabout Capacity Model.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: H:\27\27852 - Sunrise Corridor Community Visioning\synchro\27852_RoundaboutsAnalysis.sjp9

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_PM_4LaneGateway.vistro

Scenario: Base Scenario

Report File: H:\...\2045_4LanePM.pdf

3/17/2025

Intersection Analysis Summary




ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	SB Left	0.772	19.6	B
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	EB Left	1.016	53.7	D
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.667	20.2	C
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	SB Left	0.826	60.0	E
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	NB Right	0.832	54.4	D
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.497	27.8	C
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.825	39.0	D
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.005	21.9	C
101	122nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	WB Thru	0.635	9.1	A
102	122nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	NB Right	0.810	21.0	C
103	142nd Avenue/Backage Road	Signalized	HCM 7th Edition	NB Left	0.421	416.5	F
104	142nd Avenue/Highway 212 Access	Signalized	HCM 7th Edition	EB Left	0.701	7.7	A
105	142nd Avenue/OR 212	Two-way stop	HCM 7th Edition	NB Right	1.065	90.9	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.772

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	305	1	408	0	2431	285	27	1410	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	4.00	2.00	2.00	0.00	5.00	5.00	13.00	4.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	204	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	305	1	204	0	2431	285	27	1410	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700	1.0000	0.9700	0.9700	0.9700	0.9700	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	79	0	53	0	627	73	7	363	0
Total Analysis Volume [veh/h]	0	0	0	314	1	210	0	2506	294	28	1454	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	11.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	24	0	24	0	87	87	4	95	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	29	0	29	0	93	93	8	101	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		130	130	130	130	130	130
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		24	24	88	88	3	95
g / C, Green / Cycle		0.18	0.18	0.68	0.68	0.02	0.73
(v / s)_i Volume / Saturation Flow Rate		0.18	0.13	0.50	0.19	0.02	0.29
s, saturation flow rate [veh/h]		1752	1589	4971	1551	1624	5012
c, Capacity [veh/h]		317	288	3369	1051	36	3661
d1, Uniform Delay [s]		53.12	50.24	13.62	8.33	63.30	6.66
k, delay calibration		0.37	0.17	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		40.69	5.61	1.53	0.66	20.21	0.32
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.99	0.73	0.74	0.28	0.79	0.40
d, Delay for Lane Group [s/veh]		93.81	55.85	15.15	9.00	83.51	6.98
Lane Group LOS		F	E	B	A	F	A
Critical Lane Group		Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]		13.80	6.91	15.18	3.36	1.13	4.78
50th-Percentile Queue Length [ft/ln]		345.05	172.73	379.51	84.00	28.13	119.60
95th-Percentile Queue Length [veh/ln]		19.89	11.22	21.57	6.05	2.03	8.37
95th-Percentile Queue Length [ft/ln]		497.37	280.51	539.26	151.20	50.63	209.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	93.81	0.00	55.85	0.00	15.15	9.00	83.51	6.98	0.00
Movement LOS				F		E		B	A	F	A	
d_A, Approach Delay [s/veh]	0.00			78.60			14.51			8.43		
Approach LOS	A			E			B			A		
d_I, Intersection Delay [s/veh]	19.62											
Intersection LOS	B											
Intersection V/C	0.772											

Emissions

Vehicle Miles Traveled [mph]		60.76	40.64	793.84	93.13	4.41	229.26
Stops [stops/h]		382.12	191.29	1260.84	93.02	31.15	397.35
Fuel consumption [US gal/h]		10.61	5.12	47.37	4.89	0.83	13.70
CO [g/h]		741.38	357.64	3311.39	341.55	57.99	957.56
NOx [g/h]		144.25	69.58	644.28	66.45	11.28	186.31
VOC [g/h]		171.82	82.89	767.45	79.16	13.44	221.92

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	361	1338	1461
d_b, Bicycle Delay [s]	65.02	43.64	7.12	4.72
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	3.100	2.375
Bicycle LOS	D	A	C	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	53.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.016

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	2
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	359	8	354	22	0	237	544	2192	0	0	841	450
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	12.00	17.00	10.00	0.00	5.00	2.00	6.00	0.00	0.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	53
Total Hourly Volume [veh/h]	359	8	354	22	0	237	544	2192	0	0	841	397
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	2	95	6	0	64	146	589	0	0	226	107
Total Analysis Volume [veh/h]	386	9	381	24	0	255	585	2357	0	0	904	427
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	12.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Split	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	17	31	31	3	0	17	36	80	0	0	40	40
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	22	37	37	8	0	23	40	86	0	0	46	46
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	3	4	4	3	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	23	31	2	50	36	79	39	39
g / C, Green / Cycle	0.18	0.24	0.02	0.39	0.28	0.61	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.11	0.27	0.01	0.09	0.33	0.48	0.25	0.28
s, saturation flow rate [veh/h]	3375	1467	1667	2746	1781	4930	3503	1573
c, Capacity [veh/h]	601	355	29	1066	491	3006	1061	477
d1, Uniform Delay [s]	49.60	49.27	63.68	26.82	47.07	18.98	42.30	44.00
k, delay calibration	0.07	0.49	0.07	0.07	0.50	0.50	0.19	0.40
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.71	76.23	28.43	0.07	104.43	2.13	3.20	23.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.64	1.10	0.83	0.24	1.19	0.78	0.84	0.93
d, Delay for Lane Group [s/veh]	50.31	125.51	92.11	26.89	151.50	21.10	45.50	67.22
Lane Group LOS	D	F	F	C	F	C	D	E
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.90	19.00	1.02	2.71	30.05	17.47	13.72	16.85
50th-Percentile Queue Length [ft/ln]	147.39	474.91	25.59	67.82	751.17	436.75	342.92	421.23
95th-Percentile Queue Length [veh/ln]	9.88	27.57	1.84	4.88	43.24	24.32	19.79	23.58
95th-Percentile Queue Length [ft/ln]	246.94	689.37	46.06	122.07	1080.97	608.12	494.76	589.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.31	125.51	125.51	92.11	0.00	26.89	151.50	21.10	0.00	0.00	45.90	67.22
Movement LOS	D	F	F	F		C	F	C			D	E
d_A, Approach Delay [s/veh]	88.10			32.50			47.03			52.74		
Approach LOS	F			C			D			D		
d_I, Intersection Delay [s/veh]	53.68											
Intersection LOS	D											
Intersection V/C	1.016											

Emissions

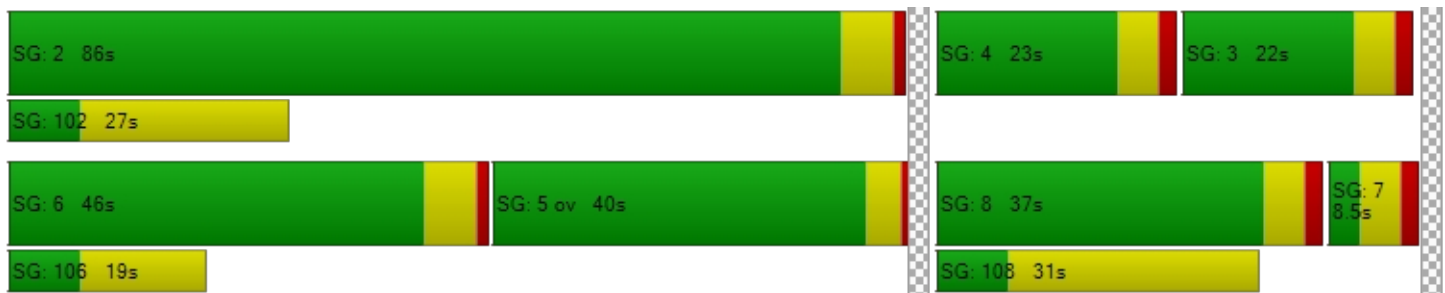
Vehicle Miles Traveled [mph]	80.86	81.70	3.77	40.06	92.24	371.64	222.30	111.15
Stops [stops/h]	326.48	525.99	28.34	150.23	831.97	1451.18	759.60	466.54
Fuel consumption [US gal/h]	9.08	16.23	0.76	3.87	26.43	33.44	21.56	13.22
CO [g/h]	634.94	1134.36	53.24	270.83	1847.21	2337.43	1507.32	924.16
NOx [g/h]	123.54	220.70	10.36	52.69	359.40	454.78	293.27	179.81
VOC [g/h]	147.15	262.90	12.34	62.77	428.11	541.72	349.34	214.18

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	54.47	0.00	54.47
l_p,int, Pedestrian LOS Score for Intersectio	2.210	2.478	0.000	3.220
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	485	46	1231	615
d_b, Bicycle Delay [s]	37.32	62.04	9.62	31.16
l_b,int, Bicycle LOS Score for Intersection	2.840	1.560	3.178	2.321
Bicycle LOS	C	A	C	B

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	20.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	1	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	256	1291	2140	350
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	6.00	1.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	256	1291	2140	350
Peak Hour Factor	1.0000	1.0000	0.9300	0.9300	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	69	347	546	89
Total Analysis Volume [veh/h]	0	0	275	1388	2184	357
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	1		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	16	89	69	69
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	20	96	76	76
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	16	116	96	96
g / C, Green / Cycle	0.12	0.89	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.16	0.27	0.47	0.23
s, saturation flow rate [veh/h]	1724	5135	4685	1526
c, Capacity [veh/h]	212	4578	3456	1125
d1, Uniform Delay [s]	57.00	1.05	8.38	5.84
k, delay calibration	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	163.56	0.17	0.89	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.30	0.30	0.63	0.32
d, Delay for Lane Group [s/veh]	220.56	1.22	9.27	6.58
Lane Group LOS	F	A	A	A
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	16.60	0.72	9.25	3.30
50th-Percentile Queue Length [ft/ln]	415.06	17.97	231.28	82.40
95th-Percentile Queue Length [veh/ln]	25.80	1.29	14.24	5.93
95th-Percentile Queue Length [ft/ln]	644.91	32.35	355.98	148.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	220.56	1.22	9.27	6.58
Movement LOS			F	A	A	A
d_A, Approach Delay [s/veh]	0.00		37.49		8.89	
Approach LOS	A		D		A	
d_I, Intersection Delay [s/veh]	20.21					
Intersection LOS	C					
Intersection V/C	0.667					

Emissions

Vehicle Miles Traveled [mph]		381.11	1923.57	547.16	89.44
Stops [stops/h]		459.75	59.72	768.55	91.27
Fuel consumption [US gal/h]		30.57	79.86	30.89	4.66
CO [g/h]		2136.81	5582.28	2159.29	326.04
NOx [g/h]		415.75	1086.11	420.12	63.44
VOC [g/h]		495.23	1293.75	500.44	75.56

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1369	1062
d_b, Bicycle Delay [s]	65.00	6.47	14.31
I_b,int, Bicycle LOS Score for Intersection	4.132	2.474	2.957
Bicycle LOS	D	B	C

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	60.0
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.826

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T			T T T T			T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	2
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	28	213	10	733	217	684	752	556	44	10	471	699
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	5.00	5.00	4.00	13.00	2.00	6.00	5.00	16.00	5.00	8.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	213	10	733	217	684	752	556	44	10	471	699
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	55	3	189	56	176	194	143	11	3	121	180
Total Analysis Volume [veh/h]	29	220	10	756	224	705	775	573	45	10	486	721
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	36.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						6,7
Maximum Green [s]	6	35	35	25	54	54	26	48	48	4	26	26
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	10	40	40	29	59	59	30	53	53	8	31	31
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No	No	No	Yes		No	Yes	Yes
Maximum Recall	No	No		No	No	No	No	No		No	No	No
Pedestrian Recall	No	No		No	No	No	No	No		No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.00	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	2.00	2.80	0.00	2.00	3.40	3.40	2.00	3.40	0.00
g_i, Effective Green Time [s]	16	19	25	28	58	26	67	67	1	42	95
g / C, Green / Cycle	0.12	0.14	0.19	0.21	0.45	0.20	0.52	0.52	0.01	0.33	0.73
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.22	0.13	0.25	0.23	0.17	0.17	0.01	0.14	0.26
s, saturation flow rate [veh/h]	1709	1811	3403	1705	2813	3348	1825	1779	1738	3389	2786
c, Capacity [veh/h]	206	259	654	366	1254	669	940	916	17	1100	2029
d1, Uniform Delay [s]	51.14	54.68	52.50	46.14	26.66	52.00	18.45	18.47	64.12	34.61	6.48
k, delay calibration	0.07	0.07	0.10	0.07	0.07	0.07	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	6.42	73.59	1.02	0.24	73.75	0.95	0.98	11.89	1.29	0.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.89	1.16	0.61	0.56	1.16	0.33	0.33	0.60	0.44	0.36
d, Delay for Lane Group [s/veh]	51.33	61.10	126.09	47.15	26.90	125.75	19.40	19.45	76.01	35.90	6.97
Lane Group LOS	D	E	F	D	C	F	B	B	E	D	A
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.86	7.86	17.34	6.67	8.11	17.74	5.75	5.64	0.39	6.29	3.51
50th-Percentile Queue Length [ft/ln]	21.57	196.49	433.41	166.83	202.65	443.48	143.77	141.10	9.65	157.32	87.65
95th-Percentile Queue Length [veh/ln]	1.55	12.46	25.98	10.91	12.78	26.55	9.68	9.54	0.70	10.41	6.31
95th-Percentile Queue Length [ft/ln]	38.83	311.43	649.48	272.75	319.39	663.79	242.10	238.51	17.38	260.17	157.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.33	61.10	61.10	126.09	47.15	26.90	125.75	19.42	19.45	76.01	35.90	6.97
Movement LOS	D	E	E	F	D	C	F	B	B	E	D	A
d_A, Approach Delay [s/veh]	60.01			74.10			78.58			19.09		
Approach LOS	E			E			E			B		
d_I, Intersection Delay [s/veh]	59.97											
Intersection LOS	E											
Intersection V/C	0.826											

Emissions

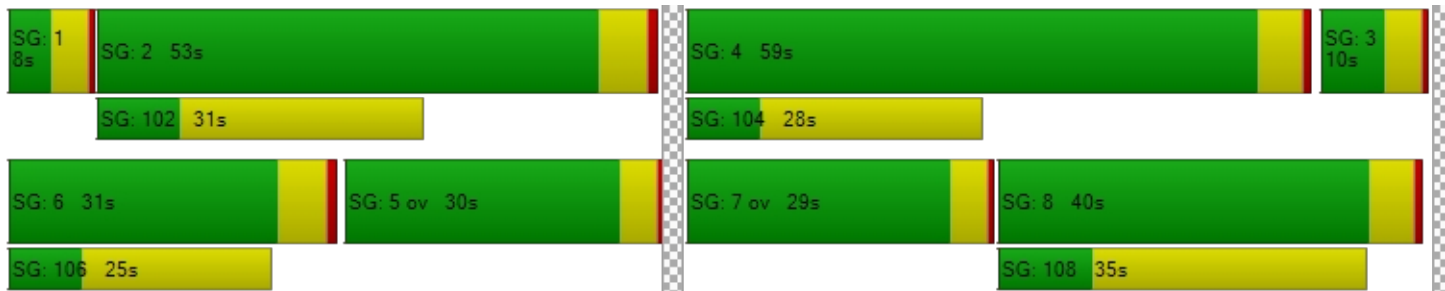
Vehicle Miles Traveled [mph]	6.54	51.83	174.55	51.72	162.78	696.59	280.64	274.83	6.59	320.43	475.37
Stops [stops/h]	23.89	217.64	960.15	184.80	448.95	982.46	159.25	156.30	10.69	348.52	194.18
Fuel consumption [US gal/h]	0.70	6.20	31.89	5.30	13.04	53.93	13.67	13.39	0.49	18.67	21.66
CO [g/h]	49.20	433.07	2228.82	370.42	911.59	3769.94	955.21	935.79	33.91	1304.80	1514.35
NOx [g/h]	9.57	84.26	433.65	72.07	177.36	733.49	185.85	182.07	6.60	253.87	294.64
VOC [g/h]	11.40	100.37	516.55	85.85	211.27	873.72	221.38	216.88	7.86	302.40	350.97

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	11.0	11.0	13.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.55	54.47	54.47	52.65
I_p,int, Pedestrian LOS Score for Intersectio	2.132	3.085	2.895	2.966
Crosswalk LOS	B	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	542	834	732	394
d_b, Bicycle Delay [s]	34.57	22.10	26.12	41.94
I_b,int, Bicycle LOS Score for Intersection	1.987	4.340	2.709	2.564
Bicycle LOS	A	E	B	B

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212

Control Type:	Signalized	Delay (sec / veh):	54.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.832

Intersection Setup

Name	135th Ave		Highway 212		OR 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↔↔↔		↕↕		↔↔	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	1	0
Entry Pocket Length [ft]	300.00	100.00	100.00	60.00	200.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		No	

Volumes

Name	135th Ave		Highway 212		OR 212	
Base Volume Input [veh/h]	50	607	1204	24	284	879
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	4.00	5.00	4.00	3.00	6.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	607	1204	24	284	879
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	156	310	6	73	227
Total Analysis Volume [veh/h]	52	626	1241	25	293	906
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	1		1		0	
v_ci, Inbound Pedestrian Volume crossing mi	1		1		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		0		3	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	75.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal Group	3	3	2	2	1	6
Auxiliary Signal Groups						
Maximum Green [s]	24	24	70	70	23	97
Amber [s]	3.5	3.5	4.7	4.7	3.5	4.7
All red [s]	0.5	0.5	0.7	0.7	0.5	0.5
Walk [s]	0	0	8	8	0	7
Pedestrian Clearance [s]	0	0	18	18	0	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	3.4	3.4	2.0	3.2
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	28	28	75	75	27	102
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	4	4	10	10	4	10
Vehicle Extension [s]	2.3	2.3	4.5	4.5	2.3	4.5
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.00	5.40	5.40	4.00	5.20
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	3.40	3.40	2.00	3.20
g_i, Effective Green Time [s]	24	24	70	70	23	97
g / C, Green / Cycle	0.18	0.18	0.54	0.54	0.18	0.74
(v / s)_i Volume / Saturation Flow Rate	0.03	0.23	0.36	0.02	0.17	0.26
s, saturation flow rate [veh/h]	1695	2696	3475	1561	1767	3446
c, Capacity [veh/h]	313	497	1862	836	312	2567
d1, Uniform Delay [s]	44.63	52.74	21.81	14.25	52.85	5.75
k, delay calibration	0.07	0.14	0.50	0.50	0.38	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.15	120.99	1.91	0.07	31.34	0.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.17	1.26	0.67	0.03	0.94	0.35
d, Delay for Lane Group [s/veh]	44.78	173.73	23.72	14.31	84.19	6.13
Lane Group LOS	D	F	C	B	F	A
Critical Lane Group	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.44	16.41	13.90	0.37	12.15	4.03
50th-Percentile Queue Length [ft/ln]	35.97	410.35	347.61	9.21	303.78	100.78
95th-Percentile Queue Length [veh/ln]	2.59	25.62	20.02	0.66	17.87	7.26
95th-Percentile Queue Length [ft/ln]	64.74	640.56	500.49	16.58	446.69	181.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.78	173.73	23.72	14.31	84.19	6.13
Movement LOS	D	F	C	B	F	A
d_A, Approach Delay [s/veh]	163.84		23.53		25.20	
Approach LOS	F		C		C	
d_I, Intersection Delay [s/veh]	54.44					
Intersection LOS	D					
Intersection V/C	0.832					

Emissions

Vehicle Miles Traveled [mph]	10.18	122.49	818.21	16.48	87.27	269.84
Stops [stops/h]	39.83	908.73	769.79	10.20	336.36	223.19
Fuel consumption [US gal/h]	1.11	32.19	43.93	0.81	10.47	13.47
CO [g/h]	77.78	2250.10	3070.42	56.46	731.85	941.68
NOx [g/h]	15.13	437.79	597.39	10.98	142.39	183.22
VOC [g/h]	18.03	521.48	711.60	13.08	169.61	218.24

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.58	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.391	0.000	0.000
Crosswalk LOS	B	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	369	1070	1489
d_b, Bicycle Delay [s]	43.30	14.05	4.26
I_b,int, Bicycle LOS Score for Intersection	1.560	2.604	2.549
Bicycle LOS	A	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.497

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	2	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	660	194	369	1258	197	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	5.00	6.00	6.00	5.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	97	0	629	0	0
Total Hourly Volume [veh/h]	660	97	369	629	197	180
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	174	26	97	166	52	47
Total Analysis Volume [veh/h]	695	102	388	662	207	189
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		4		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	83.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	40	0	47	47	28	79
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	45	0	53	53	32	85
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		Yes	Yes	No	Yes
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	33	33	64	102	18	85
g / C, Green / Cycle	0.26	0.26	0.49	0.79	0.14	0.66
(v / s)_i Volume / Saturation Flow Rate	0.21	0.07	0.11	0.25	0.12	0.06
s, saturation flow rate [veh/h]	3375	1529	3446	2685	1738	3418
c, Capacity [veh/h]	862	391	1688	2114	237	2245
d1, Uniform Delay [s]	45.37	38.57	19.06	3.90	55.06	8.10
k, delay calibration	0.08	0.08	0.50	0.50	0.14	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.37	0.26	0.32	0.39	12.39	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.26	0.23	0.31	0.87	0.08
d, Delay for Lane Group [s/veh]	46.74	38.83	19.38	4.29	67.46	8.18
Lane Group LOS	D	D	B	A	E	A
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	10.67	2.65	3.47	2.21	7.47	0.97
50th-Percentile Queue Length [ft/ln]	266.74	66.24	86.68	55.32	186.75	24.34
95th-Percentile Queue Length [veh/ln]	16.03	4.77	6.24	3.98	11.95	1.75
95th-Percentile Queue Length [ft/ln]	400.67	119.22	156.03	99.57	298.80	43.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.74	38.83	19.38	4.29	67.46	8.18
Movement LOS	D	D	B	A	E	A
d_A, Approach Delay [s/veh]	45.73		9.86		39.16	
Approach LOS	D		A		D	
d_I, Intersection Delay [s/veh]	27.78					
Intersection LOS	C					
Intersection V/C	0.497					

Emissions

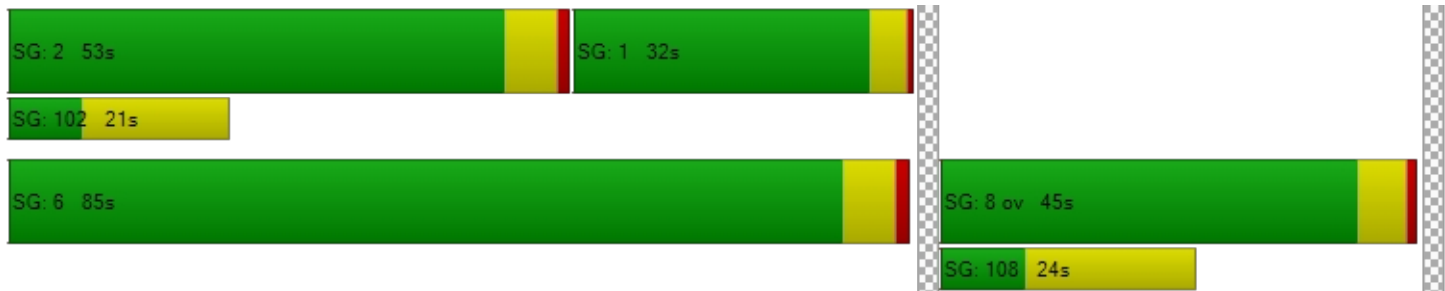
Vehicle Miles Traveled [mph]	227.32	33.36	56.33	96.11	13.18	12.03
Stops [stops/h]	590.92	73.37	192.03	122.55	206.85	53.92
Fuel consumption [US gal/h]	19.23	2.58	4.91	5.21	4.53	1.11
CO [g/h]	1344.40	180.67	343.21	364.28	316.40	77.43
NOx [g/h]	261.57	35.15	66.78	70.87	61.56	15.06
VOC [g/h]	311.58	41.87	79.54	84.42	73.33	17.94

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	0.00	53.56
I_p,int, Pedestrian LOS Score for Intersectio	2.922	0.000	2.508
Crosswalk LOS	C	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	609	723	1215
d_b, Bicycle Delay [s]	31.48	26.55	10.00
I_b,int, Bicycle LOS Score for Intersection	1.560	2.945	1.886
Bicycle LOS	A	C	A

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	39.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.825

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	62	109	31	189	130	574	936	1182	141	28	921	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	10.00	3.00	4.00	1.00	5.00	5.00	5.00	9.00	2.00	0.00	6.00	9.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	62	109	31	189	130	574	936	1182	141	28	921	82
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	29	8	50	35	153	249	314	38	7	245	22
Total Analysis Volume [veh/h]	66	116	33	201	138	611	996	1257	150	30	980	87
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	10.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	35	35	35	34	34	34	33	63	63	6	36	36
Amber [s]	3.5	3.5	3.5	4.7	4.7	4.7	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	9	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	21	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	4.2	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	117	117	117	117	117	117	117	117	117	117	117
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	4.50	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.20	4.20	0.00	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	33	33	31	31	71	33	66	66	2	36	36
g / C, Green / Cycle	0.28	0.28	0.27	0.27	0.60	0.28	0.56	0.56	0.02	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.06	0.08	0.16	0.08	0.22	0.30	0.40	0.41	0.02	0.28	0.06
s, saturation flow rate [veh/h]	1166	1775	1248	1825	2740	3375	1765	1701	1810	3446	1500
c, Capacity [veh/h]	294	492	290	487	1649	951	997	960	39	1048	456
d1, Uniform Delay [s]	39.78	33.37	46.59	34.02	11.93	42.03	18.45	18.92	57.00	39.61	30.09
k, delay calibration	0.08	0.08	0.08	0.08	0.08	0.07	0.37	0.38	0.07	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.25	2.22	0.23	0.10	25.65	3.10	3.76	18.00	10.34	0.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.30	0.69	0.28	0.37	1.05	0.71	0.73	0.78	0.94	0.19
d, Delay for Lane Group [s/veh]	40.07	33.63	48.81	34.25	12.03	67.69	21.55	22.68	75.00	49.94	30.61
Lane Group LOS	D	C	D	C	B	F	C	C	E	D	C
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.64	3.39	5.86	3.16	3.98	16.96	14.07	14.55	1.08	15.04	1.89
50th-Percentile Queue Length [ft/ln]	41.08	84.72	146.38	78.99	99.46	424.11	351.66	363.69	26.92	375.93	47.30
95th-Percentile Queue Length [veh/ln]	2.96	6.10	9.82	5.69	7.16	24.39	20.22	20.80	1.94	21.40	3.41
95th-Percentile Queue Length [ft/ln]	73.95	152.49	245.59	142.19	179.03	609.84	505.43	520.07	48.46	534.92	85.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.07	33.63	33.63	48.81	34.25	12.03	67.69	22.05	22.68	75.00	49.94	30.61
Movement LOS	D	C	C	D	C	B	F	C	C	E	D	C
d_A, Approach Delay [s/veh]	35.60			23.04			41.00			49.10		
Approach LOS	D			C			D			D		
d_I, Intersection Delay [s/veh]	39.00											
Intersection LOS	D											
Intersection V/C	0.825											

Emissions

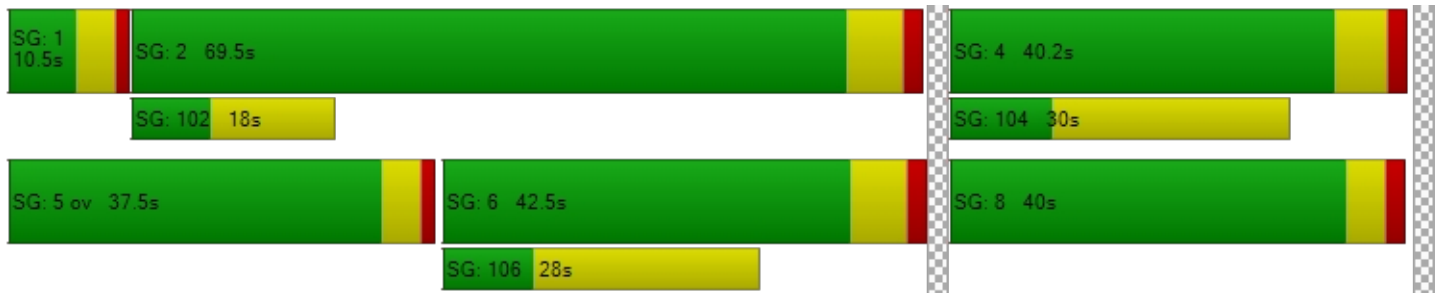
Vehicle Miles Traveled [mph]	7.76	17.53	26.14	17.95	79.47	117.32	82.87	82.87	14.05	458.91	40.74
Stops [stops/h]	50.50	104.13	179.93	97.10	244.51	1042.63	432.26	447.05	33.09	924.19	58.14
Fuel consumption [US gal/h]	1.14	2.32	4.07	2.24	6.12	24.31	8.88	9.13	1.22	33.96	2.54
CO [g/h]	79.46	161.91	284.27	156.38	427.72	1699.11	621.04	638.02	85.21	2373.59	177.57
NOx [g/h]	15.46	31.50	55.31	30.43	83.22	330.59	120.83	124.13	16.58	461.81	34.55
VOC [g/h]	18.41	37.53	65.88	36.24	99.13	393.79	143.93	147.87	19.75	550.10	41.15

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		12.0		13.0		0.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	48.09		47.19		46.30		0.00	
I_p,int, Pedestrian LOS Score for Intersectio	2.126		2.814		3.218		0.000	
Crosswalk LOS	B		C		C		F	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	598		580		1076		615	
d_b, Bicycle Delay [s]	28.82		29.51		12.51		28.11	
I_b,int, Bicycle LOS Score for Intersection	1.914		3.127		3.542		2.465	
Bicycle LOS	A		C		D		B	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street

Control Type:	Two-way stop	Delay (sec / veh):	21.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+r			r+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	1	0	81	143	278	0	0	282	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	50.00	0.00	12.00	0.00	13.00	12.00	5.00	0.00	0.00	4.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	1	0	81	143	278	0	0	282	1
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	22	38	75	0	0	76	0
Total Analysis Volume [veh/h]	0	0	0	1	0	87	154	299	0	0	303	1
Pedestrian Volume [ped/h]	1			0			1			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.12	0.13	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	24.67	23.05	9.84	21.93	20.05	10.78	8.43	0.00	0.00	7.83	0.00	0.00
Movement LOS	C	C	A	C	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.01	0.01	0.42	0.44	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.35	0.35	10.43	10.98	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	19.19			10.91			2.87			0.00		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	2.67											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 101: 122nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	9.1
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↵↵				↵↵↵↵	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	2	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	300.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No				No	
Crosswalk	No		No		Yes	

Volumes

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Base Volume Input [veh/h]	722	0	0	0	732	825
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	0.00	0.00	0.00	0.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	722	0	0	0	732	825
Peak Hour Factor	0.9300	1.0000	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	194	0	0	0	197	222
Total Analysis Volume [veh/h]	776	0	0	0	787	887
Presence of On-Street Parking	No	No			No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal Group	2	0	0	0	3	8
Auxiliary Signal Groups						
Maximum Green [s]	54	0	0	0	58	58
Amber [s]	3.5	0.0	0.0	0.0	3.5	3.5
All red [s]	1.0	0.0	0.0	0.0	1.0	1.0
Walk [s]	7	0	0	0	0	7
Pedestrian Clearance [s]	11	0	0	0	0	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No					No
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	0.0	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	0.0	0.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	0	0	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	5	0	0	0	5	5
Vehicle Extension [s]	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No				No	No
Maximum Recall	No				No	No
Pedestrian Recall	No				No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	L	C
C, Cycle Length [s]	32	32	32
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50
g_i, Effective Green Time [s]	11	12	12
g / C, Green / Cycle	0.36	0.36	0.36
(v / s)_i Volume / Saturation Flow Rate	0.23	0.22	0.25
s, saturation flow rate [veh/h]	3403	3514	3560
c, Capacity [veh/h]	1211	1283	1300
d1, Uniform Delay [s]	8.67	8.38	8.66
k, delay calibration	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00
d2, Incremental Delay [s]	0.57	0.48	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.64	0.61	0.68
d, Delay for Lane Group [s/veh]	9.24	8.86	9.30
Lane Group LOS	A	A	A
Critical Lane Group	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	1.54	1.50	1.76
50th-Percentile Queue Length [ft/ln]	38.47	37.47	44.04
95th-Percentile Queue Length [veh/ln]	2.77	2.70	3.17
95th-Percentile Queue Length [ft/ln]	69.25	67.45	79.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.24	0.00	0.00	0.00	8.86	9.30
Movement LOS	A				A	A
d_A, Approach Delay [s/veh]	9.24		0.00		9.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	9.14					
Intersection LOS	A					
Intersection V/C	0.635					

Emissions

Vehicle Miles Traveled [mph]	64.65		104.30	117.55
Stops [stops/h]	344.79		335.80	394.73
Fuel consumption [US gal/h]	6.03		7.57	8.70
CO [g/h]	421.23		528.97	608.02
NOx [g/h]	81.96		102.92	118.30
VOC [g/h]	97.62		122.59	140.91

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	6.95
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	2.474
Crosswalk LOS	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3361	0	3610
d_b, Bicycle Delay [s]	7.44	16.07	10.41
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132	2.941
Bicycle LOS	A	D	C

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 102: 122nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.810

Intersection Setup

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	1	0	0	0	0	2	0	0	0
Entry Pocket Length [ft]	100.00	100.00	200.00	50.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			No			Yes			No		

Volumes

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Base Volume Input [veh/h]	0	722	942	0	732	0	0	1317	902	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	3.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	722	942	0	732	0	0	1317	902	0	0	0
Peak Hour Factor	1.0000	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	194	253	0	197	0	0	354	242	0	0	0
Total Analysis Volume [veh/h]	0	776	1013	0	787	0	0	1416	970	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss
Signal Group	0	2	2	6	6	0	4	4	4	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	56	56	56	56	0	56	56	56	0	0	0
Amber [s]	0.0	3.5	3.5	3.5	3.5	0.0	3.5	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
Walk [s]	0	7	7	7	7	0	7	7	7	0	0	0
Pedestrian Clearance [s]	0	11	11	11	11	0	11	11	11	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	2.5	2.5	2.5	0.0	2.5	2.5	2.5	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	6.0	20.0	20.0	0.0	6.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	30	30	30	30	0	30	30	30	0	0	0
Lead / Lag	-	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	0	5	5	5	5	0	5	5	5	0	0	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0
Minimum Recall		No			No			No				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	C	C	R
C, Cycle Length [s]	87	87	87	87	87	87	87
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	2.50	2.50
g_i, Effective Green Time [s]	38	38	38	38	40	40	40
g / C, Green / Cycle	0.43	0.43	0.43	0.43	0.46	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.22	0.36	0.00	0.22	0.37	0.37	0.36
s, saturation flow rate [veh/h]	3475	2791	269	3618	1900	1900	2723
c, Capacity [veh/h]	1511	1214	150	1573	878	878	1259
d1, Uniform Delay [s]	17.98	21.92	0.00	17.85	20.15	20.15	19.64
k, delay calibration	0.11	0.11	0.11	0.11	0.15	0.15	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	1.58	0.00	0.25	2.53	2.53	1.03
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.51	0.83	0.00	0.50	0.81	0.81	0.77
d, Delay for Lane Group [s/veh]	18.25	23.51	0.00	18.09	22.68	22.68	20.67
Lane Group LOS	B	C	A	B	C	C	C
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.46	8.87	0.00	5.50	12.08	12.08	7.83
50th-Percentile Queue Length [ft/ln]	136.57	221.77	0.00	137.40	301.93	301.93	195.75
95th-Percentile Queue Length [veh/ln]	9.30	13.76	0.00	9.34	17.78	17.78	12.42
95th-Percentile Queue Length [ft/ln]	232.39	343.88	0.00	233.51	444.42	444.42	310.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	18.25	23.51	0.00	18.09	0.00	22.68	22.68	20.67	0.00	0.00	0.00
Movement LOS		B	C	A	B		C	C	C			
d_A, Approach Delay [s/veh]	21.23			18.09			21.86			0.00		
Approach LOS	C			B			C			A		
d_I, Intersection Delay [s/veh]	21.04											
Intersection LOS	C											
Intersection V/C	0.810											

Emissions

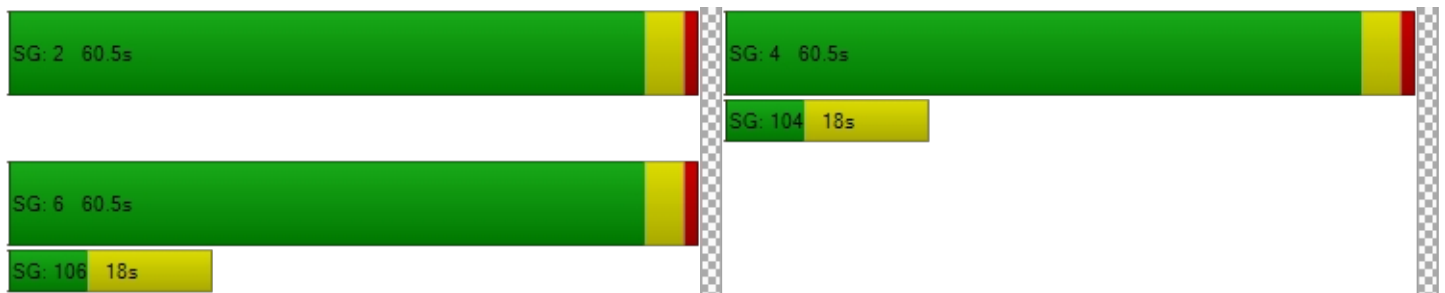
Vehicle Miles Traveled [mph]	179.17	233.89	0.00	65.56	84.74	84.74	116.10
Stops [stops/h]	450.64	731.79	0.00	453.37	498.15	498.15	645.94
Fuel consumption [US gal/h]	12.75	18.52	0.00	8.10	9.51	9.51	12.43
CO [g/h]	891.08	1294.38	0.00	566.32	664.67	664.67	868.71
NOx [g/h]	173.37	251.84	0.00	110.19	129.32	129.32	169.02
VOC [g/h]	206.52	299.98	0.00	131.25	154.04	154.04	201.33

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		0.0		11.0		0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	33.33		0.00		33.33		0.00
I_p,int, Pedestrian LOS Score for Intersectio	3.027		0.000		2.711		0.000
Crosswalk LOS	C		F		B		F
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	1283		1283		1283		0
d_b, Bicycle Delay [s]	5.60		5.60		5.60		43.64
I_b,int, Bicycle LOS Score for Intersection	3.036		2.209		3.528		4.132
Bicycle LOS	C		B		D		D

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 103: 142nd Avenue/Backage Road

Control Type:	Signalized	Delay (sec / veh):	416.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

Intersection Setup

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Avenue			142nd Avenue			Backage Road			Backage Road		
Base Volume Input [veh/h]	546	77	349	10	115	10	10	100	618	119	100	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.00	2.00	0.00	3.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	546	77	349	10	115	10	10	100	618	119	100	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	148	21	95	3	31	3	3	27	168	32	27	3
Total Analysis Volume [veh/h]	593	84	379	11	125	11	11	109	672	129	109	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	80
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	13.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal Group	5	2	2	1	6	6	4	4	1	8	8	8
Auxiliary Signal Groups									1,4			
Maximum Green [s]	5	40	40	9	53	53	18	18	9	18	18	18
Amber [s]	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	0	7	7	0	7	7	7	7	0	7	7	7
Pedestrian Clearance [s]	0	11	11	0	11	11	11	11	0	11	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	9	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	5	5	5	5	5	5	5	5	5	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall	No	No		No	No			No	No		No	
Maximum Recall	No	No		No	No			No	No		No	
Pedestrian Recall	No	No		No	No			No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	52	52	52	52	52	52	52
L, Total Lost Time per Cycle [s]	0.00	4.50	4.50	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	0.00	2.50	2.50	2.50	2.50	0.00	2.50
g_i, Effective Green Time [s]	0	17	3	25	18	26	18
g / C, Green / Cycle	0.00	0.33	0.06	0.48	0.35	0.49	0.35
(v / s)_i Volume / Saturation Flow Rate	0.58	0.28	0.01	0.07	0.06	0.43	0.26
s, saturation flow rate [veh/h]	1017	1647	1810	1829	1884	1577	958
c, Capacity [veh/h]	138	548	112	880	727	780	436
d1, Uniform Delay [s]	26.02	16.12	23.03	7.57	11.89	11.59	15.10
k, delay calibration	0.50	0.11	0.11	0.11	0.11	0.50	0.23
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1495.64	3.68	0.38	0.08	0.11	12.08	2.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	4.29	0.85	0.10	0.15	0.17	0.86	0.57
d, Delay for Lane Group [s/veh]	1521.66	19.80	23.41	7.65	11.99	23.67	17.63
Lane Group LOS	F	B	C	A	B	C	B
Critical Lane Group	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	59.33	4.91	0.13	0.70	0.86	7.78	2.55
50th-Percentile Queue Length [ft/ln]	1483.16	122.75	3.24	17.45	21.51	194.56	63.81
95th-Percentile Queue Length [veh/ln]	71.96	8.54	0.23	1.26	1.55	12.36	4.59
95th-Percentile Queue Length [ft/ln]	1798.95	213.59	5.84	31.41	38.72	308.93	114.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1521.66	19.80	19.80	23.41	7.65	7.65	11.99	11.99	23.67	17.63	17.63	17.63
Movement LOS	F	B	B	C	A	A	B	B	C	B	B	B
d_A, Approach Delay [s/veh]	863.17			8.83			21.90			17.63		
Approach LOS	F			A			C			B		
d_I, Intersection Delay [s/veh]	416.46											
Intersection LOS	F											
Intersection V/C	0.421											

Emissions

Vehicle Miles Traveled [mph]	112.28	87.67	2.02	25.03	28.90	161.87	60.59
Stops [stops/h]	4109.92	340.14	8.99	48.35	59.61	539.13	176.84
Fuel consumption [US gal/h]	210.91	7.35	0.19	1.51	1.81	12.88	4.36
CO [g/h]	14742.79	514.02	12.96	105.49	126.67	900.25	305.09
NOx [g/h]	2868.41	100.01	2.52	20.52	24.64	175.16	59.36
VOC [g/h]	3416.78	119.13	3.00	24.45	29.36	208.64	70.71

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	16.15	16.15	16.15	16.15
I_p,int, Pedestrian LOS Score for Intersectio	2.767	2.007	3.242	2.048
Crosswalk LOS	C	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1539	2040	693	693
d_b, Bicycle Delay [s]	1.38	0.01	11.10	11.10
I_b,int, Bicycle LOS Score for Intersection	3.302	1.802	2.866	1.970
Bicycle LOS	C	A	C	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 104: 142nd Avenue/Highway 212 Access

Control Type:	Signalized	Delay (sec / veh):	7.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.701

Intersection Setup

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	↵		↱↲		↵	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		No	

Volumes

Name	142nd Avenue		142nd Avenue		Highway 212 Accesses	
Base Volume Input [veh/h]	0	790	467	385	182	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.00	2.00	4.00	3.00	0.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	790	467	385	182	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	204	120	99	47	0
Total Analysis Volume [veh/h]	0	814	481	397	188	0
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	70
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	2	2	6	6	4	4
Auxiliary Signal Groups						
Maximum Green [s]	43	43	43	43	17	17
Amber [s]	4.0	4.0	4.0	4.0	4.0	4.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	3.0	3.0	3.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	8	5	5	8	8
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	R	C
C, Cycle Length [s]	34	34	34	34
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00
g_i, Effective Green Time [s]	17	17	17	7
g / C, Green / Cycle	0.51	0.51	0.51	0.20
(v / s)_i Volume / Saturation Flow Rate	0.43	0.26	0.25	0.10
s, saturation flow rate [veh/h]	1885	1870	1564	1810
c, Capacity [veh/h]	1067	954	798	356
d1, Uniform Delay [s]	7.21	5.51	5.49	12.28
k, delay calibration	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.16	0.41	0.48	1.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.50	0.50	0.53
d, Delay for Lane Group [s/veh]	8.36	5.93	5.97	13.50
Lane Group LOS	A	A	A	B
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.85	1.24	1.04	1.11
50th-Percentile Queue Length [ft/ln]	71.29	31.08	25.95	27.68
95th-Percentile Queue Length [veh/ln]	5.13	2.24	1.87	1.99
95th-Percentile Queue Length [ft/ln]	128.32	55.95	46.72	49.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.36	8.36	5.93	5.97	13.50	13.50
Movement LOS	A	A	A	A	B	B
d_A, Approach Delay [s/veh]	8.36		5.94		13.50	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	7.75					
Intersection LOS	A					
Intersection V/C	0.701					

Emissions

Vehicle Miles Traveled [mph]	189.90	91.08	75.17	43.63
Stops [stops/h]	301.88	131.62	109.90	117.21
Fuel consumption [US gal/h]	10.87	5.06	4.18	2.96
CO [g/h]	759.88	353.45	292.46	206.93
NOx [g/h]	147.85	68.77	56.90	40.26
VOC [g/h]	176.11	81.92	67.78	47.96

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	2529	2529	1000
d_b, Bicycle Delay [s]	1.19	1.19	4.25
I_b,int, Bicycle LOS Score for Intersection	2.903	3.008	1.870
Bicycle LOS	C	C	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 105: 142nd Avenue/OR 212**

Control Type:	Two-way stop	Delay (sec / veh):	90.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.065

Intersection Setup

Name	142nd Ave			142nd Ave			EB OR212			WB OR212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↶			↷			↶↷			↶↷		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	165.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	142nd Ave			142nd Ave			EB OR212			WB OR212		
Base Volume Input [veh/h]	0	0	467	0	0	385	0	1142	790	0	786	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.00	0.00	0.00	4.00	0.00	8.00	1.00	0.00	7.00	3.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	467	0	0	385	0	1142	790	0	786	182
Peak Hour Factor	1.0000	1.0000	0.9700	1.0000	1.0000	0.9700	1.0000	0.9700	0.9700	1.0000	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	120	0	0	99	0	294	204	0	203	47
Total Analysis Volume [veh/h]	0	0	481	0	0	397	0	1177	814	0	810	188
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

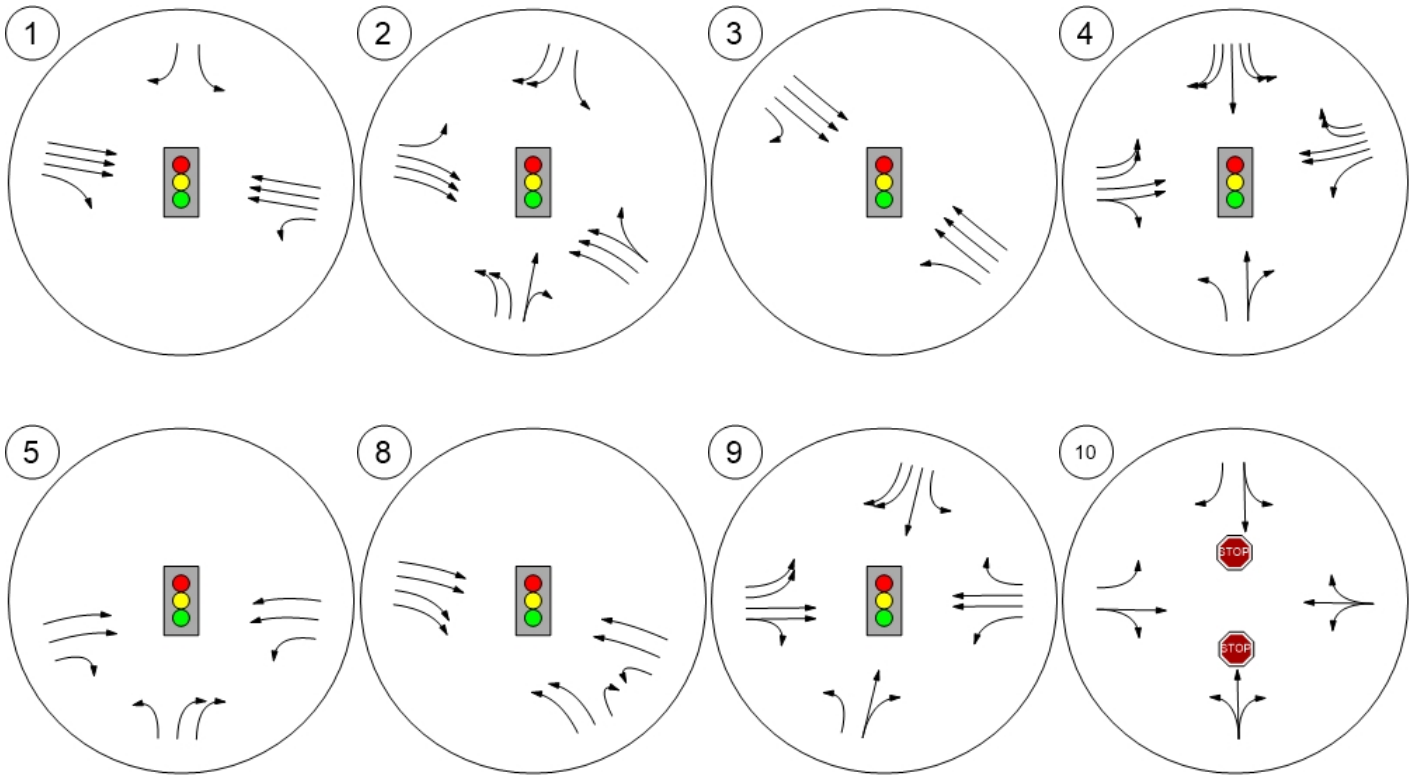
Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	1.06	0.00	0.00	0.78	0.00	0.01	0.01	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	90.94	0.00	0.00	32.31	0.00	0.00	0.00	0.00	0.00	0.00
Movement LOS			F			D		A	A		A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	15.38	0.00	0.00	6.98	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	384.38	0.00	0.00	174.55	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	90.94			32.31			0.00			0.00		
Approach LOS	F			D			A			A		
d_I, Intersection Delay [s/veh]	14.63											
Intersection LOS	F											

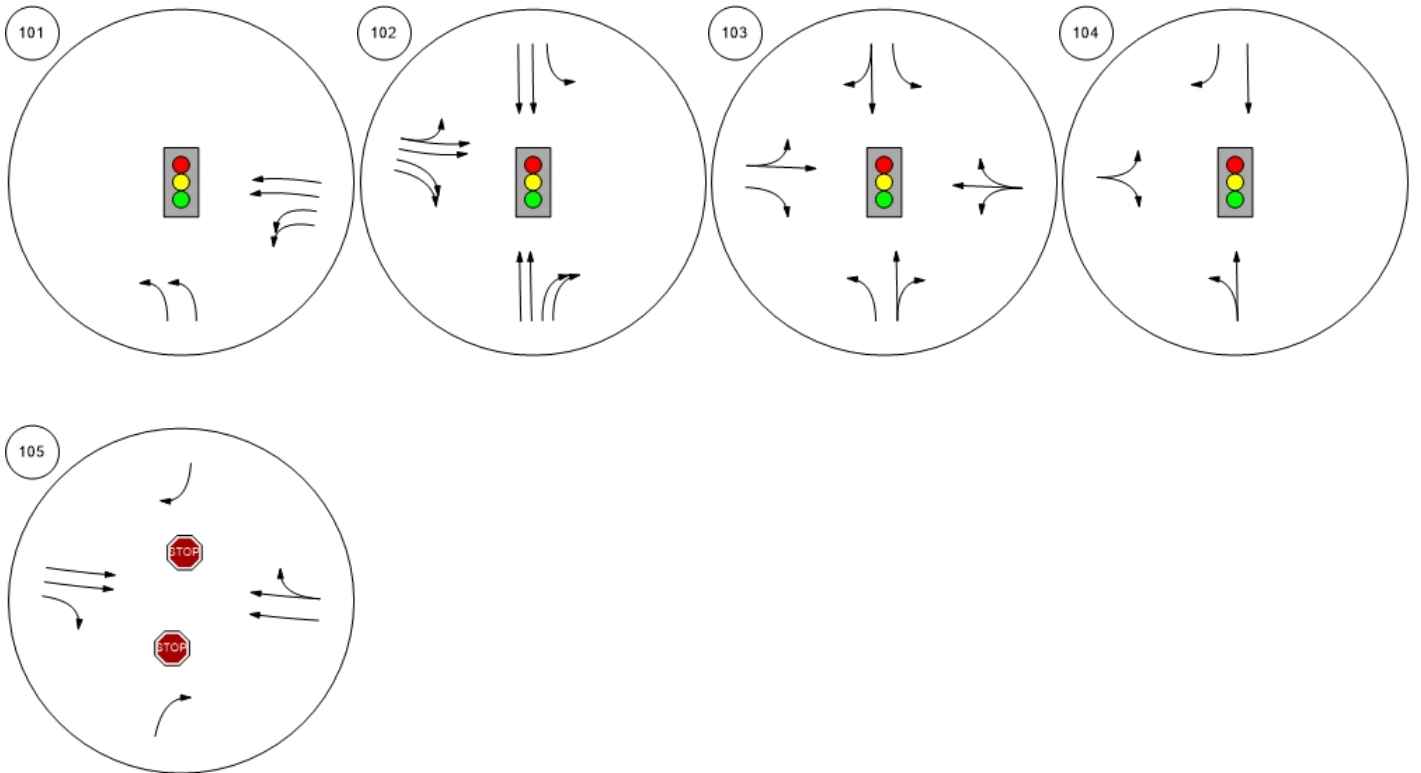
Study Intersections



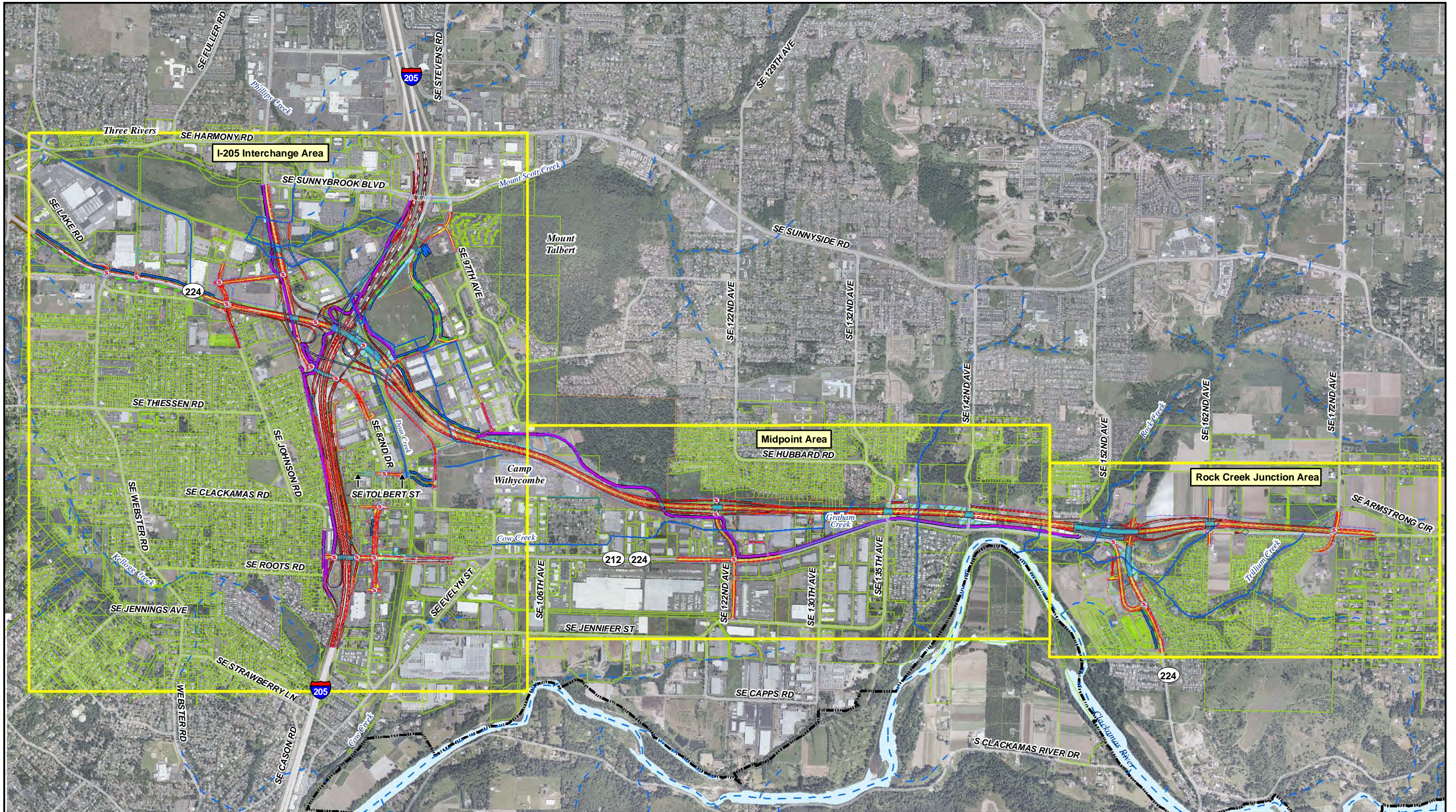
Lane Configuration and Traffic Control





Lane Configuration and Traffic Control




Appendix E. FEIS Preferred Alternative Figures

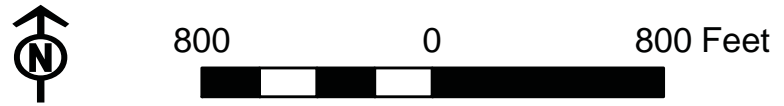
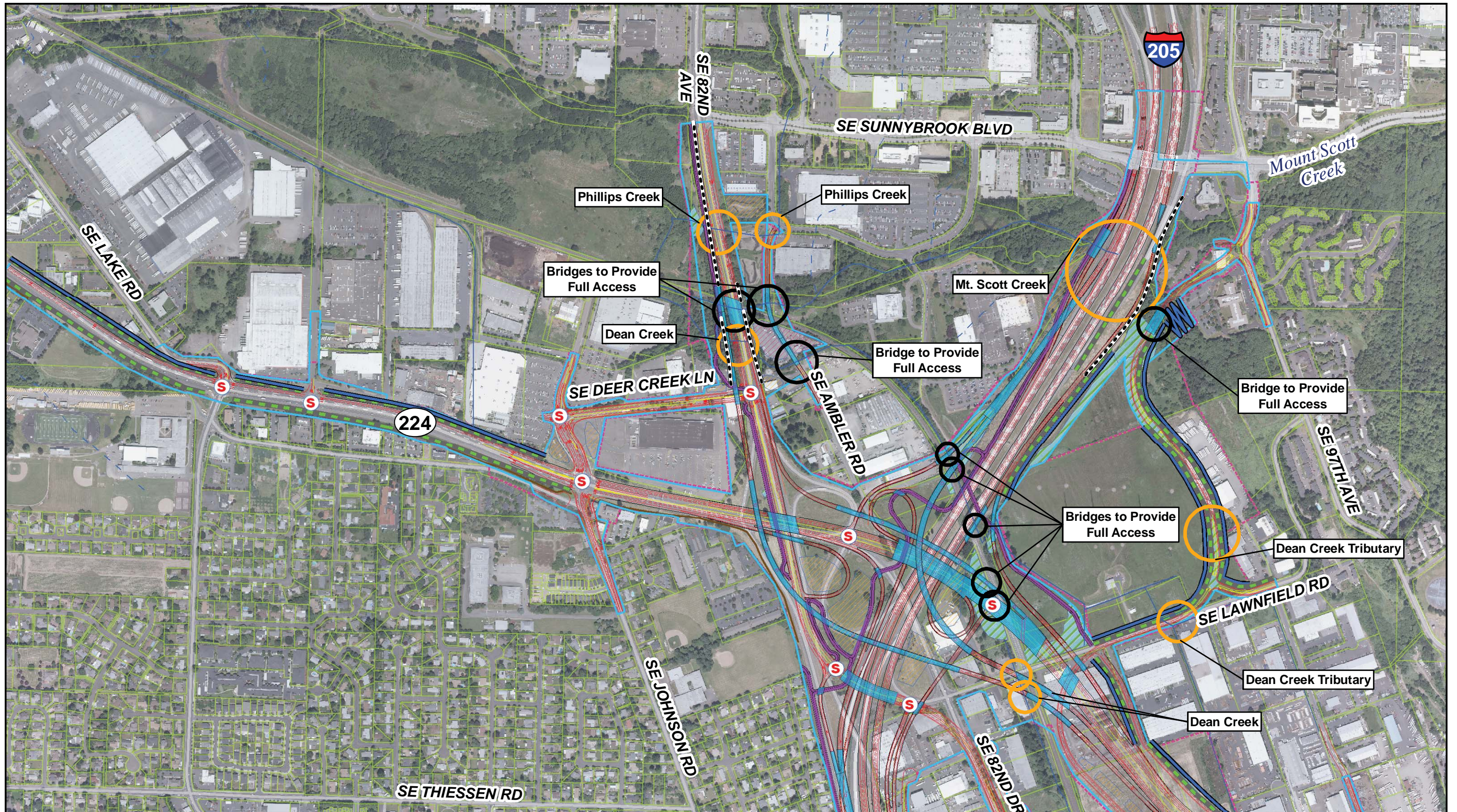



 2,000 0 2,000 Feet


Sources:
 ODOT and Metro, Portland OR (2008-09)

Legend	
Access Closure	Lane Line
Bridge Structure	Lane Striping
Bridge Footing	Median
Construction Impact Line	Multi-Use Path
Edge of Pavement (with curb)	Proposed Right-of-Way Line
Edge of Pavement (with no curb)	Retaining Wall
Traffic Signal	Storm Water Treatment/Detention
Taxlots	Flood Plain Mitigation Site
Urban Growth Boundary (UGB)	Bioslope
Swale	ODOT Verified Wetlands
	Streams
	Metro Non-Verified
	ODOT Verified

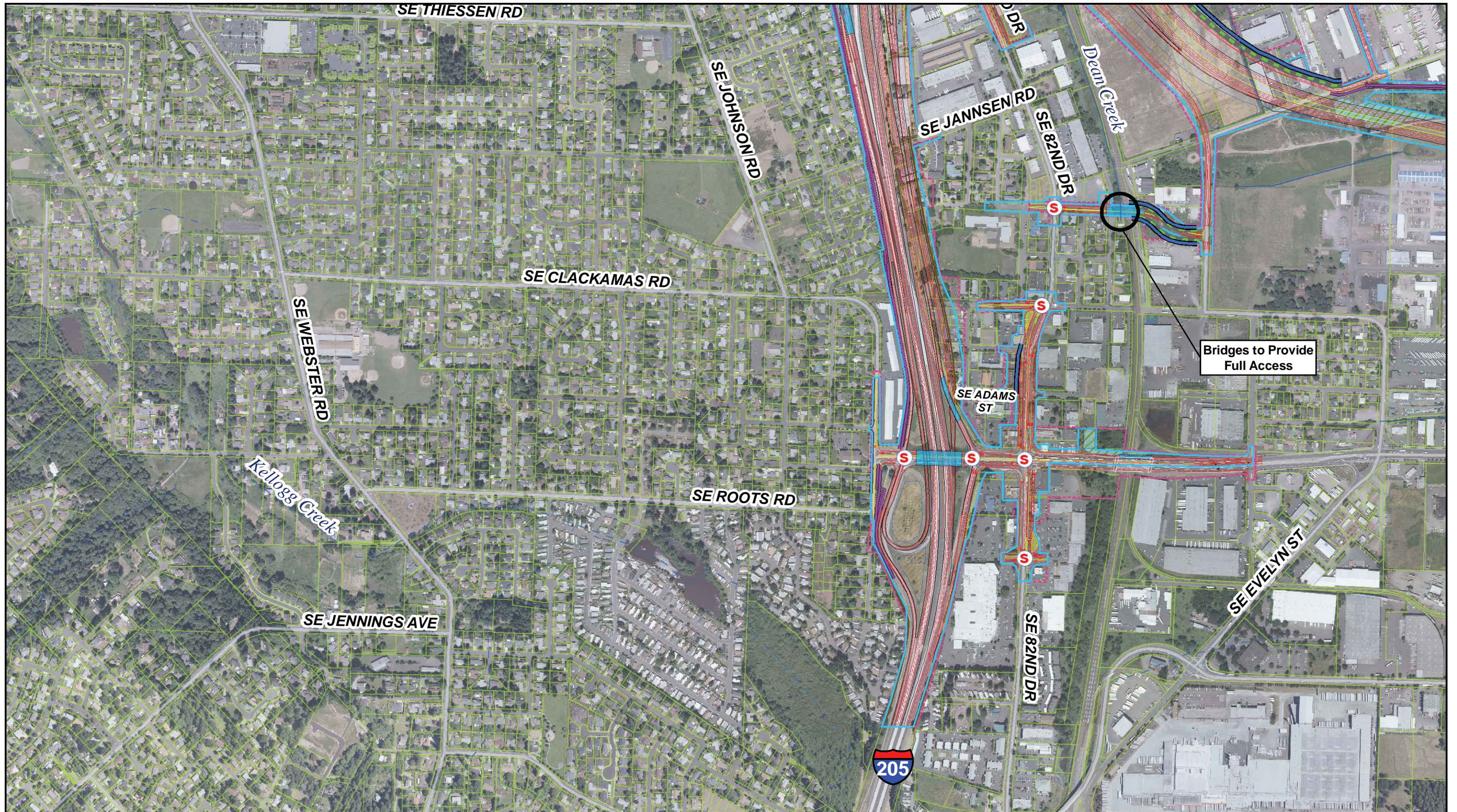
Figure PA-1
Project Area
 Sunrise Project, I-205 to Rock Creek Junction



Legend	
Access Closure	Lane Line
Bridge Structure	Lane Striping
Bridge Footing	Median
Construction Impact Line	Multi-Use Path
Edge of Pavement (with curb)	Proposed Right-of-Way Line
Edge of Pavement (with no curb)	Retaining Wall
Taxlots	Sound Wall
Urban Growth Boundary (UGB)	Traffic Signal
Exclusionary Fencing	Storm Water Treatment/Detention
Flood Plain Mitigation Site	ODOT Verified Wetlands
ODOT Verified Wetlands	Bioslope
Bioslope	Swale
Swale	Streams - Metro Non-Verified
Streams - Metro Non-Verified	Streams - ODOT Verified
Streams - ODOT Verified	Future Bridges & Culverts/Wildlife Passages
Future Bridges & Culverts/Wildlife Passages	Medium
Medium	Full Access
Full Access	

Figure PA-2
I-205 Interchange Area - North
 Sunrise Project, I-205 to Rock Creek Junction


Sources: ODOT and Metro, Portland OR (2008-09)
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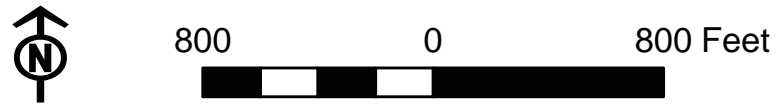
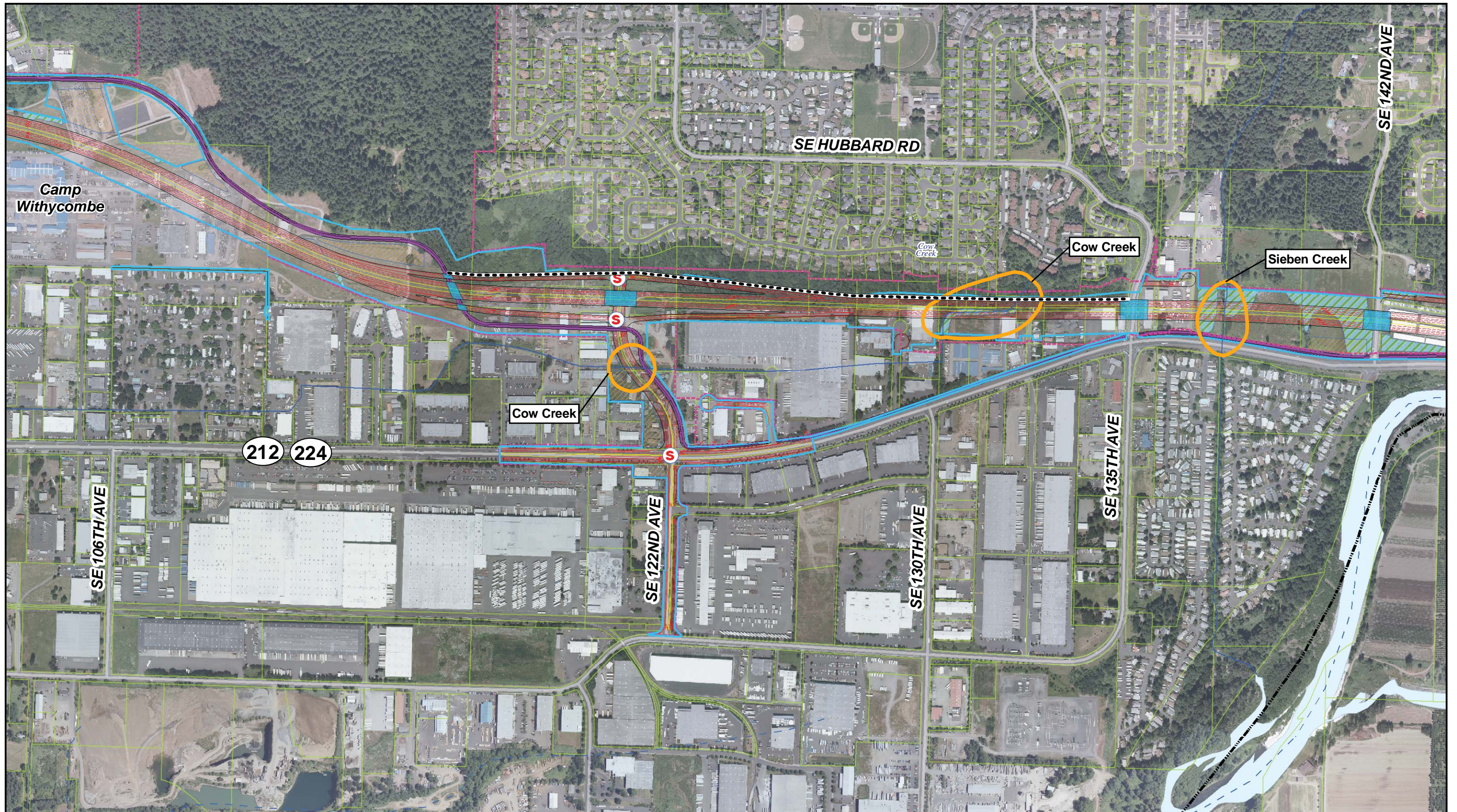

800
0
800 Feet



Legend	
Access Closure	Lane Line
Bridge Structure	Lane Striping
Bridge Footing	Median
Construction Impact Line	Multi-Use Path
Edge of Pavement (with curb)	Proposed Right-of-Way Line
Edge of Pavement (with no curb)	Retaining Wall
Access Closure	Sound Wall
Traffic Signal	Storm Water Treatment/Detention
Taxlots	Flood Plain Mitigation Site
Urban Growth Boundary (UGB)	ODOT Verified Wetlands
Bioslope	Streams
Swale	Metro Non-Verified
	ODOT Verified
	Future Bridges & Culverts/Wildlife Passages
	Full Access

Figure PA-3
I-205 Interchange Area - South
 Sunrise Project, I-205 to Rock Creek Junction

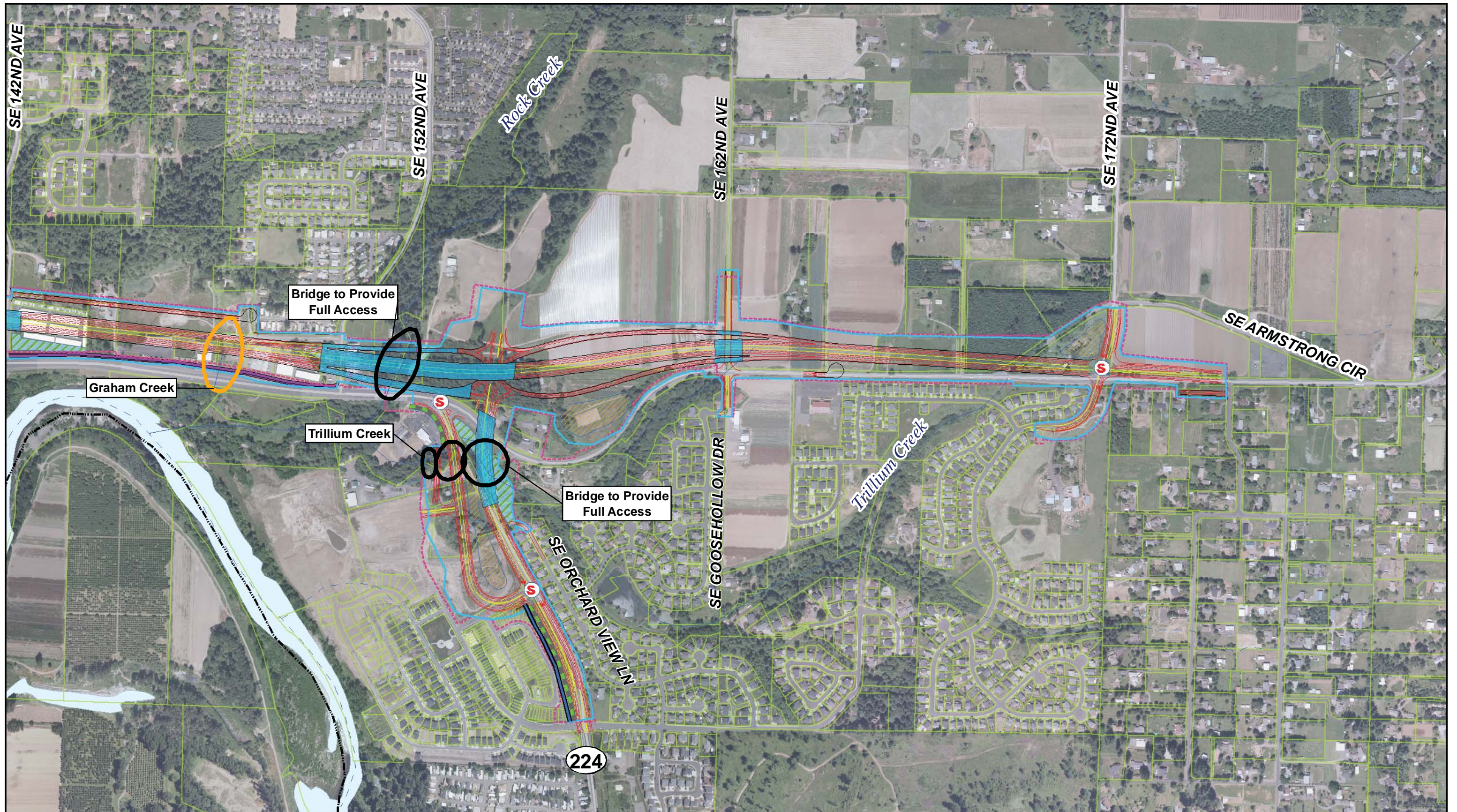
Sources: ODOT and Metro, Portland OR (2008-09)
 Printing Date: File: P:\O\ODOT\00000648\0600\INFO\GIS\arcmap\FEIS_Preliminary_Design\PA-3_Preliminary_Design_Paneled_10192010.mxd



Legend	
Access Closure	Lane Line
Bridge Structure	Lane Striping
Bridge Footing	Median
Construction Impact Line	Multi-Use Path
Edge of Pavement (with curb)	Proposed Right-of-Way Line
Edge of Pavement (with no curb)	Retaining Wall
Exclusionary Fencing	Sound Wall
Traffic Signal	Storm Water Treatment/Detention
Taxlots	Flood Plain Mitigation Site
Urban Growth Boundary (UGB)	ODOT Verified Wetlands
Exclusionary Fencing	Bioslope
Streams	Swale
Metro Non-Verified	
ODOT Verified	
Future Bridges & Culverts/ Wildlife Passages	
Medium	

Figure PA-4
Midpoint Area
 Sunrise Project, I-205 to Rock Creek Junction

Sources:
 ODOT and Metro, Portland OR (2008-09)
 Printing Date:
 File: P:\O\ODOT\00000648\0600\INFO\GIS\arcmap\FEIS_Preliminary_Design\PA-4_Preliminary_Design_Paneled_10192010.mxd















Legend	
Access Closure	Lane Line
Bridge Structure	Lane Striping
Bridge Footing	Median
Construction Impact Line	Multi-Use Path
Edge of Pavement (with curb)	Proposed Right-of-Way Line
Edge of Pavement (with no curb)	Retaining Wall
Urban Growth Boundary (UGB)	Sound Wall
Traffic Signal	Storm Water Treatment/Detention
Taxlots	Flood Plain Mitigation Site
Urban Growth Boundary (UGB)	ODOT Verified Wetlands
Metro Non-Verified	Bioslope
ODOT Verified	Swale
Future Bridges & Culverts/Wildlife Passages	Medium
Medium	Full Access
Full Access	

Figure PA-5
Rock Creek Junction Area
 Sunrise Project, I-205 to Rock Creek Junction

Future Traffic Conditions - Six-Lane FEIS
 1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
 08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑↑					↖		↗
Traffic Volume (vph)	0	1188	141	26	2405	0	0	0	0	242	0	206
Future Volume (vph)	0	1188	141	26	2405	0	0	0	0	242	0	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Lane Util. Factor		0.91	1.00	1.00	0.91					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		4803	1392	1228	4803					1687		1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		4803	1392	1228	4803					1687		1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1291	153	28	2614	0	0	0	0	263	0	224
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	1291	101	28	2614	0	0	0	0	263	0	172
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2							4		4
Actuated Green, G (s)		77.1	77.1	5.5	86.6					21.9		21.9
Effective Green, g (s)		79.1	79.1	5.5	88.6					23.4		23.4
Actuated g/C Ratio		0.66	0.66	0.05	0.74					0.19		0.19
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5		5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3		2.3
Lane Grp Cap (vph)		3165	917	56	3546					328		294
v/s Ratio Prot		0.27		0.02	0.54					0.16		
v/s Ratio Perm			0.07									0.11
v/c Ratio		0.41	0.11	0.50	0.74					0.80		0.59
Uniform Delay, d1		9.5	7.5	55.9	9.0					46.1		43.9
Progression Factor		1.00	1.00	1.17	1.01					1.00		1.00
Incremental Delay, d2		0.4	0.2	0.4	0.1					12.7		2.3
Delay (s)		9.9	7.8	65.7	9.2					58.8		46.2
Level of Service		A	A	E	A					E		D
Approach Delay (s)		9.7			9.8			0.0			53.0	
Approach LOS		A			A			A			D	
Intersection Summary												
HCM 2000 Control Delay			14.4		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			66.5%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Six-Lane FEIS
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑↑					↘		↗
Traffic Volume (veh/h)	0	1188	141	26	2405	0	0	0	0	242	0	206
Future Volume (veh/h)	0	1188	141	26	2405	0	0	0	0	242	0	206
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	0	1796
Adj Flow Rate, veh/h	0	1291	0	28	2614	0				263	0	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	3380		29	3663	0				308	0	274
Arrive On Green	0.00	0.69	0.00	0.05	1.00	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	5024	1409	1146	5024	0				1711	0	1522
Grp Volume(v), veh/h	0	1291	0	28	2614	0				263	0	224
Grp Sat Flow(s),veh/h/ln	0	1621	1409	1146	1621	0				1711	0	1522
Q Serve(g_s), s	0.0	13.2	0.0	2.9	0.0	0.0				17.9	0.0	17.0
Cycle Q Clear(g_c), s	0.0	13.2	0.0	2.9	0.0	0.0				17.9	0.0	17.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3380		29	3663	0				308	0	274
V/C Ratio(X)	0.00	0.38		0.98	0.71	0.00				0.85	0.00	0.82
Avail Cap(c_a), veh/h	0	3380		201	3663	0				328	0	292
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.6	0.0	57.0	0.0	0.0				47.7	0.0	47.3
Incr Delay (d2), s/veh	0.0	0.3	0.0	13.5	0.1	0.0				17.7	0.0	14.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	7.8	0.0	1.4	0.1	0.0				14.0	0.0	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	7.9	0.0	70.5	0.1	0.0				65.3	0.0	62.1
LnGrp LOS	A	A		E	A	A				E	A	E
Approach Vol, veh/h		1291			2642						487	
Approach Delay, s/veh		7.9			0.9						63.9	
Approach LOS		A			A						E	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.0	87.4		25.6		94.4						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	21.0	62.0		21.5		87.0						
Max Q Clear Time (g_c+I1), s	4.9	15.2		19.9		2.0						
Green Ext Time (p_c), s	0.0	3.0		0.2		10.1						

Intersection Summary

HCM 6th Ctrl Delay			9.9									
HCM 6th LOS			A									

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑			↑↑↑		↘↘	↘		↘		↘↘
Traffic Volume (vph)	311	1119	0	0	1738	466	356	2	251	11	0	337
Future Volume (vph)	311	1119	0	0	1738	466	356	2	251	11	0	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0		4.0
Lane Util. Factor	1.00	0.91			0.91		0.97	1.00		1.00		0.88
Frb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Frt	1.00	1.00			0.97		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1703	4803			4687		3242	1372		1467		2608
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1703	4803			4687		3242	1372		1467		2608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	338	1216	0	0	1889	507	387	2	273	12	0	366
RTOR Reduction (vph)	0	0	0	0	32	0	0	210	0	0	0	92
Lane Group Flow (vph)	338	1216	0	0	2364	0	387	65	0	12	0	274
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	25.2	75.6			46.4		22.2	21.6		5.8		34.4
Effective Green, g (s)	25.2	77.6			48.4		23.7	23.1		7.3		33.4
Actuated g/C Ratio	0.21	0.65			0.40		0.20	0.19		0.06		0.28
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	357	3105			1890		640	264		89		725
v/s Ratio Prot	c0.20	0.25			c0.50		c0.12	0.05		0.01		c0.11
v/s Ratio Perm												
v/c Ratio	0.95	0.39			1.25		0.60	0.25		0.13		0.38
Uniform Delay, d1	46.7	10.0			35.8		43.9	41.1		53.4		34.9
Progression Factor	0.86	0.84			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	33.7	0.3			117.4		1.3	0.3		0.4		0.2
Delay (s)	73.9	8.7			153.2		45.1	41.4		53.8		35.1
Level of Service	E	A			F		D	D		D		D
Approach Delay (s)		22.9			153.2			43.6			35.7	
Approach LOS		C			F			D			D	
Intersection Summary												
HCM 2000 Control Delay			89.2									F
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			120.0							16.0		
Intersection Capacity Utilization			88.0%									E
ICU Level of Service												
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - Six-Lane FEIS
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday AM Peak Hour
 08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑↑			↑↑↑		↖↖	↖		↖		↖↖
Traffic Volume (veh/h)	311	1119	0	0	1738	466	356	2	251	11	0	337
Future Volume (veh/h)	311	1119	0	0	1738	466	356	2	251	11	0	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	338	1216	0	0	1889	507	387	2	273	12	0	366
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	360	3533	0	0	1799	466	681	2	240	35	0	0
Arrive On Green	0.42	1.00	0.00	0.00	0.47	0.45	0.21	0.15	0.14	0.02	0.00	0.01
Sat Flow, veh/h	1725	5024	0	0	4008	997	3291	12	1600	1485	12	
Grp Volume(v), veh/h	338	1216	0	0	1581	815	387	0	275	12	61.2	
Grp Sat Flow(s),veh/h/ln	1725	1621	0	0	1621	1602	1646	0	1612	1485	E	
Q Serve(g_s), s	22.5	0.0	0.0	0.0	56.1	56.1	12.7	0.0	18.0	1.0		
Cycle Q Clear(g_c), s	22.5	0.0	0.0	0.0	56.1	56.1	12.7	0.0	18.0	1.0		
Prop In Lane	1.00		0.00	0.00		0.62	1.00		0.99	1.00		
Lane Grp Cap(c), veh/h	360	3533	0	0	1516	749	681	0	242	35		
V/C Ratio(X)	0.94	0.34	0.00	0.00	1.04	1.09	0.57	0.00	1.14	0.34		
Avail Cap(c_a), veh/h	532	3533	0	0	1516	749	713	0	242	223		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.88	0.88	0.00	0.00	0.90	0.90	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	34.2	0.0	0.0	0.0	31.9	32.6	42.8	0.0	51.7	57.7		
Incr Delay (d2), s/veh	15.7	0.2	0.0	0.0	34.0	57.8	0.7	0.0	99.9	3.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	13.8	0.1	0.0	0.0	37.8	44.8	9.0	0.0	21.4	0.7		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	0.2	0.0	0.0	65.9	90.4	43.5	0.0	151.7	61.2		
LnGrp LOS	D	A	A	A	F	F	D	A	F	E		
Approach Vol, veh/h		1554			2396			662				
Approach Delay, s/veh		11.0			74.2			88.4				
Approach LOS		B			E			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		91.2	28.8		31.1	60.1	6.8	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		70.0	24.5		37.0	* 29	16.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	14.7		24.5	58.1	3.0	20.0				
Green Ext Time (p_c), s		23.8	0.7		0.5	0.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			55.0									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - Six-Lane FEIS
 3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday AM Peak Hour
 08/06/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑↑		
Traffic Volume (vph)	979	402	502	2204	0	0
Future Volume (vph)	979	402	502	2204	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		
Lane Util. Factor	0.91	1.00	1.00	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	4631	1509	1517	5036		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	4631	1509	1517	5036		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	999	410	512	2249	0	0
RTOR Reduction (vph)	0	153	0	0	0	0
Lane Group Flow (vph)	999	257	512	2249	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	28.2	28.2	27.5	66.7		
Effective Green, g (s)	31.2	31.2	27.5	66.7		
Actuated g/C Ratio	0.47	0.47	0.41	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	2166	705	625	5036		
v/s Ratio Prot	0.22		c0.34	c0.45		
v/s Ratio Perm		0.17				
v/c Ratio	0.46	0.36	0.82	0.45		
Uniform Delay, d1	12.0	11.4	17.4	0.0		
Progression Factor	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.3	0.6	8.0	0.1		
Delay (s)	12.3	12.0	25.4	0.1		
Level of Service	B	B	C	A		
Approach Delay (s)	12.2			4.8	0.0	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	66.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - Six-Lane FEIS
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	520	356	158	2	746	841	19	80	0	86	213	926
Future Volume (vph)	520	356	158	2	746	841	19	80	0	86	213	926
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	0.88	1.00	1.00		0.97	1.00	0.88
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2694	2919		1543	3343	2760	1203	1284		3242	1597	2493
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.70	1.00	1.00
Satd. Flow (perm)	2694	2919		1543	3343	2760	1203	1284		2395	1597	2493
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	553	379	168	2	794	895	20	85	0	91	227	985
RTOR Reduction (vph)	0	30	0	0	0	547	0	0	0	0	0	494
Lane Group Flow (vph)	553	517	0	2	794	348	20	85	0	91	227	491
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6				4		4
Actuated Green, G (s)	29.2	77.3		1.1	49.2	49.2	3.7	13.0		30.5	29.7	29.7
Effective Green, g (s)	29.2	78.7		1.1	50.6	50.6	3.7	13.8		30.5	30.5	30.5
Actuated g/C Ratio	0.22	0.61		0.01	0.39	0.39	0.03	0.11		0.23	0.23	0.23
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6	4.6	2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	605	1767		13	1301	1074	34	136		694	374	584
v/s Ratio Prot	c0.21	0.18		0.00	c0.24		0.02	c0.07		0.02	0.14	
v/s Ratio Perm						0.13				0.01		c0.20
v/c Ratio	0.91	0.29		0.15	0.61	0.32	0.59	0.62		0.13	0.61	0.84
Uniform Delay, d1	49.2	12.3		64.0	31.8	27.8	62.4	55.6		39.6	44.4	47.4
Progression Factor	1.00	1.00		1.30	0.80	1.21	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.1	0.4		1.3	1.4	0.5	18.1	7.0		0.1	2.2	10.3
Delay (s)	67.2	12.7		84.5	26.7	34.2	80.5	62.7		39.6	46.6	57.8
Level of Service	E	B		F	C	C	F	E		D	D	E
Approach Delay (s)		40.1			30.7			66.0			54.6	
Approach LOS		D			C			E			D	

Intersection Summary		
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.76	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	66.3%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Six-Lane FEIS
4: 122nd Avenue & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔↔	↔	↔		↔↔	↕	↔↔
Traffic Volume (veh/h)	520	356	158	2	746	841	19	80	0	86	213	926
Future Volume (veh/h)	520	356	158	2	746	841	19	80	0	86	213	926
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	553	379	168	2	794	0	20	85	0	91	227	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	994	1517	663	3	1078		18	110	0	374	262	
Arrive On Green	0.37	0.70	0.69	0.00	0.32	0.00	0.02	0.09	0.00	0.08	0.16	0.00
Sat Flow, veh/h	2689	2178	951	1570	3385	2768	1104	1189	0	3291	1618	2524
Grp Volume(v), veh/h	553	278	269	2	794	0	20	85	0	91	227	0
Grp Sat Flow(s),veh/h/ln	1345	1608	1521	1570	1692	1384	1104	1189	0	1646	1618	1262
Q Serve(g_s), s	21.2	8.3	8.6	0.2	27.2	0.0	2.1	9.1	0.0	0.0	17.8	0.0
Cycle Q Clear(g_c), s	21.2	8.3	8.6	0.2	27.2	0.0	2.1	9.1	0.0	0.0	17.8	0.0
Prop In Lane	1.00		0.63	1.00		1.00	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	994	1120	1060	3	1078		18	110	0	374	262	
V/C Ratio(X)	0.56	0.25	0.25	0.59	0.74		1.11	0.77	0.00	0.24	0.87	
Avail Cap(c_a), veh/h	994	1120	1060	133	1640		119	174	0	645	324	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.60	0.60	0.00	1.00	1.00	0.00	0.79	0.79	0.00
Uniform Delay (d), s/veh	32.5	7.2	7.4	64.8	39.5	0.0	63.9	57.7	0.0	55.1	53.1	0.0
Incr Delay (d2), s/veh	0.4	0.5	0.6	32.1	2.7	0.0	108.7	6.9	0.0	0.2	13.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	11.3	5.2	5.2	0.2	16.0	0.0	2.1	5.3	0.0	2.5	12.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	7.8	8.0	96.9	42.2	0.0	172.6	64.6	0.0	55.3	67.1	0.0
LnGrp LOS	C	A	A	F	D		F	E	A	E	E	
Approach Vol, veh/h		1100			796			105			318	
Approach Delay, s/veh		20.5			42.3			85.1			63.7	
Approach LOS		C			D			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.3	94.6	6.1	25.0	53.5	45.4	15.1	16.0				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.8	* 5.4	* 5.4	4.8	* 4.8				
Max Green Setting (Gmax), s	11.0	* 62	14.0	25.2	* 11	* 62	21.0	* 18				
Max Q Clear Time (g_c+I1), s	2.2	10.6	4.1	19.8	23.2	29.2	2.0	11.1				
Green Ext Time (p_c), s	0.0	7.2	0.0	0.4	0.0	10.8	0.2	0.1				

Intersection Summary

HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	155	3	19	1229	143	114	110	95	71	30	283
Future Volume (vph)	52	155	3	19	1229	143	114	110	95	71	30	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.1	4.4	5.4	3.1	4.4		4.0	4.5	4.5	4.0	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3167	1346	1671	3288		1671	1727	1396	1736	1545	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1626	3167	1346	1671	3288		1671	1727	1396	1736	1545	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	55	163	3	20	1294	151	120	116	100	75	32	298
RTOR Reduction (vph)	0	0	1	0	7	0	0	0	87	0	165	0
Lane Group Flow (vph)	55	163	2	20	1438	0	120	116	13	75	165	0
Confl. Peds. (#/hr)	1		2	2		1	1		2	2		1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	11%	14%	17%	8%	8%	6%	8%	10%	14%	4%	4%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	6.9	77.2	77.2	4.4	74.7		13.7	16.4	16.4	14.1	16.8	
Effective Green, g (s)	7.8	78.2	77.2	5.3	75.7		13.7	16.4	16.4	14.1	16.8	
Actuated g/C Ratio	0.06	0.60	0.59	0.04	0.58		0.11	0.13	0.13	0.11	0.13	
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	2.3	4.5	4.5	2.3	4.5		2.3	3.0	3.0	2.3	3.0	
Lane Grp Cap (vph)	97	1905	799	68	1914		176	217	176	188	199	
v/s Ratio Prot	c0.03	0.05		0.01	c0.44		c0.07	0.07		0.04	c0.11	
v/s Ratio Perm			0.00						0.01			
v/c Ratio	0.57	0.09	0.00	0.29	0.75		0.68	0.53	0.07	0.40	0.83	
Uniform Delay, d1	59.5	10.9	10.7	60.5	20.2		56.0	53.2	50.1	54.0	55.2	
Progression Factor	1.07	0.78	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	0.1	0.0	1.4	2.8		9.1	2.5	0.2	0.8	24.5	
Delay (s)	69.2	8.5	10.7	61.9	22.9		65.1	55.7	50.3	54.8	79.7	
Level of Service	E	A	B	E	C		E	E	D	D	E	
Approach Delay (s)		23.7			23.5			57.5			75.1	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM 2000 Control Delay			36.8			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			79.8%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Six-Lane FEIS
5: 135th Ave & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	155	3	19	1229	143	114	110	95	71	30	283
Future Volume (veh/h)	52	155	3	19	1229	143	114	110	95	71	30	283
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1693	1648	1781	1781	1811	1781	1752	1693	1841	1841	1826
Adj Flow Rate, veh/h	55	163	3	20	1294	151	120	116	0	75	32	298
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	11	14	17	8	8	6	8	10	14	4	4	5
Cap, veh/h	80	2092	896	39	1903	221	143	148		209	18	168
Arrive On Green	0.05	0.65	0.64	0.02	0.62	0.62	0.08	0.08	0.00	0.12	0.12	0.12
Sat Flow, veh/h	1654	3216	1394	1697	3047	354	1697	1752	1434	1753	151	1405
Grp Volume(v), veh/h	55	163	3	20	716	729	120	116	0	75	0	330
Grp Sat Flow(s),veh/h/ln	1654	1608	1394	1697	1692	1708	1697	1752	1434	1753	0	1556
Q Serve(g_s), s	4.3	2.4	0.1	1.5	35.7	36.4	9.1	8.4	0.0	5.1	0.0	15.5
Cycle Q Clear(g_c), s	4.3	2.4	0.1	1.5	35.7	36.4	9.1	8.4	0.0	5.1	0.0	15.5
Prop In Lane	1.00		1.00	1.00		0.21	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	80	2092	896	39	1057	1067	143	148		209	0	186
V/C Ratio(X)	0.69	0.08	0.00	0.52	0.68	0.68	0.84	0.78		0.36	0.00	1.78
Avail Cap(c_a), veh/h	126	2092	896	234	1057	1067	196	209		209	0	186
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	60.9	8.4	2.6	62.8	15.9	16.1	58.6	58.3	0.0	52.7	0.0	57.3
Incr Delay (d2), s/veh	6.0	0.1	0.0	6.4	3.5	3.6	17.2	11.9	0.0	0.6	0.0	371.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	1.5	0.1	1.3	20.4	21.0	8.1	7.6	0.0	4.1	0.0	40.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	8.4	2.6	69.2	19.3	19.6	75.9	70.2	0.0	53.3	0.0	428.6
LnGrp LOS	E	A	A	E	B	B	E	E		D	A	F
Approach Vol, veh/h		221			1465			236			405	
Approach Delay, s/veh		22.9			20.2			73.1			359.1	
Approach LOS		C			C			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	89.0	15.0	20.0	9.4	85.6	19.5	15.5				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.5	4.0	* 5.4	4.0	4.5				
Max Green Setting (Gmax), s	17.0	* 65	15.0	15.5	9.0	* 73	15.0	15.5				
Max Q Clear Time (g_c+I1), s	3.5	4.4	11.1	17.5	6.3	38.4	7.1	10.4				
Green Ext Time (p_c), s	0.0	2.0	0.1	0.0	0.0	21.9	0.1	0.2				

Intersection Summary

HCM 6th Ctrl Delay	84.8
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
6: 142nd Ave & Highway 212

Weekday AM Peak Hour
08/06/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	270	25	15	1218	43	109	19	44	29	2	106
Future Volume (vph)	15	270	25	15	1218	43	109	19	44	29	2	106
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.4	4.8	4.0	5.4	5.4		4.8	4.8		4.8	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.99	
Satd. Flow (prot)	1597	3195	1396	1804	3343	1533		1792	1347		1627	
Flt Permitted	0.19	1.00	1.00	0.55	1.00	1.00		0.55	1.00		0.91	
Satd. Flow (perm)	324	3195	1396	1041	3343	1533		1027	1347		1497	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	16	281	26	16	1269	45	114	20	46	30	2	110
RTOR Reduction (vph)	0	0	22	0	0	14	0	0	38	0	91	0
Lane Group Flow (vph)	16	281	4	16	1269	31	0	134	8	0	51	0
Confl. Peds. (#/hr)			1	1					4	4		
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	13%	13%	13%	0%	8%	3%	2%	0%	18%	5%	0%	3%
Turn Type	pm+pt	NA	custom	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		4	6		6	8		8	4		
Actuated Green, G (s)	78.0	76.6	19.0	76.8	76.8	76.8		19.0	19.0		19.0	
Effective Green, g (s)	78.0	76.6	19.0	76.8	76.8	76.8		19.0	19.0		19.0	
Actuated g/C Ratio	0.70	0.68	0.17	0.69	0.69	0.69		0.17	0.17		0.17	
Clearance Time (s)	4.0	5.4	4.8	4.0	5.4	5.4		4.8	4.8		4.8	
Vehicle Extension (s)	2.0	4.6	2.3	2.0	4.6	4.6		2.3	2.3		2.3	
Lane Grp Cap (vph)	248	2185	236	728	2292	1051		174	228		253	
v/s Ratio Prot	0.00	c0.09		0.00	c0.38							
v/s Ratio Perm	0.04		0.00	0.01		0.02		c0.13	0.01		0.03	
v/c Ratio	0.06	0.13	0.02	0.02	0.55	0.03		0.77	0.03		0.20	
Uniform Delay, d1	8.7	6.1	38.7	5.7	8.9	5.6		44.4	38.8		40.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.1	0.0	0.0	1.0	0.1		17.7	0.0		0.2	
Delay (s)	8.7	6.3	38.8	5.7	9.9	5.7		62.1	38.9		40.2	
Level of Service	A	A	D	A	A	A		E	D		D	
Approach Delay (s)		9.0			9.7			56.2			40.2	
Approach LOS		A			A			E			D	
Intersection Summary												
HCM 2000 Control Delay			16.0		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			112.0		Sum of lost time (s)			14.2				
Intersection Capacity Utilization			57.6%		ICU Level of Service			B				
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Six-Lane FEIS
6: 142nd Ave & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘
Traffic Volume (veh/h)	15	270	25	15	1218	43	109	19	44	29	2	106
Future Volume (veh/h)	15	270	25	15	1218	43	109	19	44	29	2	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1900	1781	1856	1870	1900	1633	1826	1900	1856
Adj Flow Rate, veh/h	16	281	0	16	1269	45	114	20	46	30	2	110
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	13	13	13	0	8	3	2	0	18	5	0	3
Cap, veh/h	380	2057		526	1609	730	165	24	310	39	24	81
Arrive On Green	0.16	0.63	0.00	0.01	0.48	0.48	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1626	3244	1447	1810	3385	1535	469	109	1377	0	105	362
Grp Volume(v), veh/h	16	281	0	16	1269	45	134	0	46	142	0	0
Grp Sat Flow(s),veh/h/ln	1626	1622	1447	1810	1692	1535	577	0	1377	467	0	0
Q Serve(g_s), s	0.0	3.9	0.0	0.5	35.2	1.8	0.0	0.0	3.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.9	0.0	0.5	35.2	1.8	25.2	0.0	3.0	25.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.85		1.00	0.21		0.77
Lane Grp Cap(c), veh/h	380	2057		526	1609	730	189	0	310	144	0	0
V/C Ratio(X)	0.04	0.14		0.03	0.79	0.06	0.71	0.00	0.15	0.99	0.00	0.00
Avail Cap(c_a), veh/h	380	2057		678	1862	844	189	0	310	144	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.4	8.2	0.0	16.8	24.7	15.9	43.4	0.0	34.8	40.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	4.0	0.2	10.5	0.0	0.1	70.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	2.4	0.0	0.4	20.8	1.2	7.6	0.0	1.8	11.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	8.3	0.0	16.8	28.7	16.0	53.9	0.0	34.9	110.3	0.0	0.0
LnGrp LOS	C	A		B	C	B	D	A	C	F	A	A
Approach Vol, veh/h		297			1330			180				142
Approach Delay, s/veh		9.4			28.1			49.0				110.3
Approach LOS		A			C			D				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	76.4		30.0	23.4	58.6		30.0				
Change Period (Y+Rc), s	4.0	* 5.4		4.8	* 5.4	* 5.4		4.8				
Max Green Setting (Gmax), s	11.0	* 62		25.2	* 11	* 62		18.2				
Max Q Clear Time (g_c+I1), s	2.5	5.9		27.2	2.0	37.2		27.2				
Green Ext Time (p_c), s	0.0	3.6		0.0	0.0	16.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	33.2
HCM 6th LOS	C

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	109	230	860	82	27	457
Future Vol, veh/h	109	230	860	82	27	457
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	220	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	115	242	905	86	28	481

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	992	0	0 1300
Stage 1	-	-	- 949
Stage 2	-	-	- 351
Critical Hdwy	4.24	-	- 6.8
Critical Hdwy Stg 1	-	-	- 5.8
Critical Hdwy Stg 2	-	-	- 5.8
Follow-up Hdwy	2.27	-	- 3.5
Pot Cap-1 Maneuver	663	-	- 155 0
Stage 1	-	-	- 341 0
Stage 2	-	-	- 690 0
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	662	-	- 128
Mov Cap-2 Maneuver	-	-	- 227
Stage 1	-	-	- 281
Stage 2	-	-	- 689

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	23.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	662	-	-	-	227	-
HCM Lane V/C Ratio	0.173	-	-	-	0.125	-
HCM Control Delay (s)	11.6	-	-	-	23.1	0
HCM Lane LOS	B	-	-	-	C	A
HCM 95th %tile Q(veh)	0.6	-	-	-	0.4	-

Future Traffic Conditions - Six-Lane FEIS
8: Highway 224 & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓↓	↓
Traffic Volume (vph)	49	208	109	806	136	203
Future Volume (vph)	49	208	109	806	136	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3223	1404	1752	3343	3273	1495
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3223	1404	1752	3343	3273	1495
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	219	115	848	143	214
RTOR Reduction (vph)	0	95	0	0	0	0
Lane Group Flow (vph)	52	124	115	848	143	214
Heavy Vehicles (%)	12%	15%	3%	8%	7%	8%
Turn Type	NA	pm+ov	Prot	NA	Prot	Free
Protected Phases	2	8	1	6	8	
Permitted Phases		2				Free
Actuated Green, G (s)	3.6	11.8	16.9	24.5	8.2	44.1
Effective Green, g (s)	5.6	14.6	16.9	26.5	9.6	44.1
Actuated g/C Ratio	0.13	0.33	0.38	0.60	0.22	1.00
Clearance Time (s)	6.0	5.4	4.0	6.0	5.4	
Vehicle Extension (s)	4.8	2.5	3.5	4.8	2.5	
Lane Grp Cap (vph)	409	464	671	2008	712	1495
v/s Ratio Prot	0.02	c0.06	0.07	c0.25	0.04	
v/s Ratio Perm		0.03				0.14
v/c Ratio	0.13	0.27	0.17	0.42	0.20	0.14
Uniform Delay, d1	17.1	10.8	9.0	4.7	14.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.1	0.3	0.1	0.2
Delay (s)	17.4	11.1	9.1	5.0	14.2	0.2
Level of Service	B	B	A	A	B	A
Approach Delay (s)	12.3			5.5	5.8	
Approach LOS	B			A	A	

Intersection Summary

HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	44.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - Six-Lane FEIS
8: Highway 224 & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↓
Traffic Volume (veh/h)	49	208	109	806	136	203
Future Volume (veh/h)	49	208	109	806	136	203
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1678	1856	1781	1796	1781
Adj Flow Rate, veh/h	52	219	115	848	143	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	15	3	8	7	8
Cap, veh/h	1393	858	150	2063	640	
Arrive On Green	0.43	0.41	0.08	0.61	0.19	0.00
Sat Flow, veh/h	3358	1422	1767	3474	3319	1510
Grp Volume(v), veh/h	52	219	115	848	143	0
Grp Sat Flow(s),veh/h/ln	1636	1422	1767	1692	1659	1510
Q Serve(g_s), s	0.4	2.9	2.6	5.3	1.5	0.0
Cycle Q Clear(g_c), s	0.4	2.9	2.6	5.3	1.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1393	858	150	2063	640	
V/C Ratio(X)	0.04	0.26	0.77	0.41	0.22	
Avail Cap(c_a), veh/h	3882	1940	480	7362	4266	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.8	3.8	18.1	4.1	13.8	0.0
Incr Delay (d2), s/veh	0.0	0.3	9.4	0.3	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.2	1.9	2.3	1.7	0.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.8	4.1	27.5	4.4	13.9	0.0
LnGrp LOS	A	A	C	A	B	
Approach Vol, veh/h	271			963	143	
Approach Delay, s/veh	4.6			7.1	13.9	
Approach LOS	A			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	7.4	21.2			28.7	11.8
Change Period (Y+Rc), s	4.0	6.0			6.0	5.4
Max Green Setting (Gmax), s	11.0	46.0			86.0	50.6
Max Q Clear Time (g_c+I1), s	4.6	4.9			7.3	3.5
Green Ext Time (p_c), s	0.2	2.4			15.4	0.4

Intersection Summary

HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↔		↔	↕	↕↕
Traffic Volume (vph)	576	600	18	7	1187	112	95	78	11	144	47	1192
Future Volume (vph)	576	600	18	7	1187	112	95	78	11	144	47	1192
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	3154		1626	3343	1429	1789	1815		1700	1827	2668
Flt Permitted	0.09	1.00		0.39	1.00	1.00	0.72	1.00		0.68	1.00	1.00
Satd. Flow (perm)	319	3154		668	3343	1429	1362	1815		1210	1827	2668
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	640	667	20	8	1319	124	106	87	12	160	52	1324
RTOR Reduction (vph)	0	1	0	0	0	62	0	4	0	0	0	24
Lane Group Flow (vph)	640	686	0	8	1319	62	106	95	0	160	52	1300
Confl. Peds. (#/hr)							5		1	1		5
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases	2			6		6	8			4		4
Actuated Green, G (s)	82.6	77.2		58.6	57.7	57.7	21.0	21.0		19.8	19.8	40.2
Effective Green, g (s)	82.6	77.2		58.6	57.7	57.7	21.0	21.0		19.8	19.8	40.2
Actuated g/C Ratio	0.72	0.67		0.51	0.50	0.50	0.18	0.18		0.17	0.17	0.35
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.3
Lane Grp Cap (vph)	741	2115		347	1675	716	248	331		208	314	931
v/s Ratio Prot	0.15	0.22		0.00	0.39			0.05			0.03	c0.25
v/s Ratio Perm	c0.47			0.01		0.04	0.08			0.13		0.24
v/c Ratio	0.86	0.32		0.02	0.79	0.09	0.43	0.29		0.77	0.17	1.40
Uniform Delay, d1	30.8	8.0		13.9	23.6	15.0	41.7	40.6		45.5	40.6	37.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.1	0.2		0.0	3.0	0.1	0.9	0.3		15.0	0.2	184.9
Delay (s)	40.9	8.2		14.0	26.7	15.1	42.6	40.9		60.5	40.8	222.3
Level of Service	D	A		B	C	B	D	D		E	D	F
Approach Delay (s)		23.9			25.6			41.8			199.3	
Approach LOS		C			C			D			F	

Intersection Summary

HCM 2000 Control Delay	84.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	115.1	Sum of lost time (s)	17.2
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Six-Lane FEIS
9: 172nd Ave & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↔		↔	↕	↕↕
Traffic Volume (veh/h)	576	600	18	7	1187	112	95	78	11	144	47	1192
Future Volume (veh/h)	576	600	18	7	1187	112	95	78	11	144	47	1192
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	640	667	20	8	1319	0	106	87	12	160	52	1324
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	681	1885	56	381	1509		154	432	60	338	495	1143
Arrive On Green	0.15	0.59	0.59	0.01	0.45	0.00	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	3264	3188	96	1654	3385	1447	400	1606	222	1246	1841	2698
Grp Volume(v), veh/h	640	336	351	8	1319	0	106	0	99	160	52	1324
Grp Sat Flow(s),veh/h/ln	1632	1608	1675	1654	1692	1447	400	0	1828	1246	1841	1349
Q Serve(g_s), s	17.9	14.1	14.1	0.3	46.1	0.0	32.2	0.0	5.4	14.8	2.8	35.0
Cycle Q Clear(g_c), s	17.9	14.1	14.1	0.3	46.1	0.0	35.0	0.0	5.4	20.3	2.8	35.0
Prop In Lane	1.00		0.06	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	681	951	990	381	1509		154	0	492	338	495	1143
V/C Ratio(X)	0.94	0.35	0.35	0.02	0.87		0.69	0.00	0.20	0.47	0.11	1.16
Avail Cap(c_a), veh/h	682	951	990	559	1560		154	0	492	338	495	1143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	13.8	13.8	19.5	32.8	0.0	50.0	0.0	36.8	44.6	35.8	37.7
Incr Delay (d2), s/veh	20.9	0.6	0.6	0.0	6.4	0.0	11.2	0.0	0.1	0.8	0.1	81.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	17.9	9.0	9.3	0.2	27.2	0.0	7.2	0.0	4.5	8.2	2.3	43.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	14.3	14.3	19.5	39.2	0.0	61.2	0.0	36.9	45.4	35.9	119.1
LnGrp LOS	E	B	B	B	D		E	A	D	D	D	F
Approach Vol, veh/h		1327			1327			205				1536
Approach Delay, s/veh		35.3			39.1			49.5				108.6
Approach LOS		D			D			D				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	83.5		41.2	24.4	64.5		41.2				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	15.0	60.0		35.0	20.0	60.0		* 35				
Max Q Clear Time (g_c+I1), s	2.3	16.1		37.0	19.9	48.1		37.0				
Green Ext Time (p_c), s	0.0	11.5		0.0	0.0	10.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	62.7
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	261	0	0	44	2	0	0	0	30	0	235
Future Vol, veh/h	74	261	0	0	44	2	0	0	0	30	0	235
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	80	284	0	0	48	2	0	0	0	33	0	255

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	50	0	0	284	0	0	621	494	284	493	493	49
Stage 1	-	-	-	-	-	-	444	444	-	49	49	-
Stage 2	-	-	-	-	-	-	177	50	-	444	444	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	1250	-	-	875	-	-	403	479	760	470	480	941
Stage 1	-	-	-	-	-	-	597	579	-	939	858	-
Stage 2	-	-	-	-	-	-	829	857	-	574	579	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1250	-	-	875	-	-	279	448	760	447	449	941
Mov Cap-2 Maneuver	-	-	-	-	-	-	279	448	-	447	449	-
Stage 1	-	-	-	-	-	-	559	542	-	879	858	-
Stage 2	-	-	-	-	-	-	604	857	-	537	542	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0	0	10.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1250	-	-	875	-	-	447	941
HCM Lane V/C Ratio	-	0.064	-	-	-	-	-	0.073	0.271
HCM Control Delay (s)	0	8.1	-	-	0	-	-	13.7	10.2
HCM Lane LOS		A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.2	1.1




















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕	↕	
Traffic Volume (vph)	0	0	596	19	725	0
Future Volume (vph)	0	0	596	19	725	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				1.00	1.00	
Frt				1.00	1.00	
Flt Protected				0.95	0.95	
Satd. Flow (prot)				1756	1736	
Flt Permitted				0.95	0.95	
Satd. Flow (perm)				1756	1736	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	641	20	780	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	661	780	0
Heavy Vehicles (%)	0%	0%	0%	105%	4%	0%
Turn Type			Prot	NA	Prot	
Protected Phases			3	8	2	
Permitted Phases						
Actuated Green, G (s)				60.5	50.5	
Effective Green, g (s)				61.0	51.0	
Actuated g/C Ratio				0.51	0.42	
Clearance Time (s)				4.5	4.5	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				892	737	
v/s Ratio Prot					0.45	
v/s Ratio Perm				0.38		
v/c Ratio				0.74	1.06	
Uniform Delay, d1				23.3	34.5	
Progression Factor				1.00	1.00	
Incremental Delay, d2				3.3	49.7	
Delay (s)				26.6	84.2	
Level of Service				C	F	
Approach Delay (s)	0.0			26.6	84.2	
Approach LOS	A			C	F	
Intersection Summary						
HCM 2000 Control Delay			57.8		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			114.3%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕	↕	
Traffic Volume (veh/h)	0	0	596	19	725	0
Future Volume (veh/h)	0	0	596	19	725	0
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00		1.00	1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1900	344	1841	0
Adj Flow Rate, veh/h			641	20	780	0
Peak Hour Factor			0.93	0.93	0.93	0.93
Percent Heavy Veh, %			0	105	4	0
Cap, veh/h			0	181	0	0
Arrive On Green			0.53	0.53	0.06	0.00
Sat Flow, veh/h			0	344	0	
Grp Volume(v), veh/h			0	20	0.0	
Grp Sat Flow(s),veh/h/ln			0	344		
Q Serve(g_s), s			0.0	0.2		
Cycle Q Clear(g_c), s			0.0	0.2		
Prop In Lane			0.00			
Lane Grp Cap(c), veh/h			0	181		
V/C Ratio(X)			0.00	0.11		
Avail Cap(c_a), veh/h			0	2486		
HCM Platoon Ratio			1.00	1.00		
Upstream Filter(I)			0.00	1.00		
Uniform Delay (d), s/veh			0.0	1.0		
Incr Delay (d2), s/veh			0.0	0.3		
Initial Q Delay(d3),s/veh			0.0	0.0		
%ile BackOfQ(95%),veh/ln			0.0	0.0		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			0.0	1.3		
LnGrp LOS			A	A		
Approach Vol, veh/h				20		
Approach Delay, s/veh				1.3		
Approach LOS				A		
Timer - Assigned Phs						8
Phs Duration (G+Y+Rc), s						8.4
Change Period (Y+Rc), s						* 4.5
Max Green Setting (Gmax), s						* 61
Max Q Clear Time (g_c+I1), s						2.2
Green Ext Time (p_c), s						0.1
Intersection Summary						
HCM 6th Ctrl Delay			1.3			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Future Traffic Conditions - Six-Lane FEIS
 102: 122nd Avenue & Sunrise EB

Weekday AM Peak Hour
 08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	31	629	0	0	0	0	725	716	0	596	0
Future Volume (vph)	0	31	629	0	0	0	0	725	716	0	596	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0	
Lane Util. Factor		0.95	0.95					1.00	1.00		1.00	
Frt		0.86	0.85					1.00	0.85		1.00	
Flt Protected		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		1479	1447					1810	1553		1900	
Flt Permitted		1.00	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		1479	1447					1810	1553		1900	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	33	676	0	0	0	0	780	770	0	641	0
RTOR Reduction (vph)	0	216	216	0	0	0	0	0	236	0	0	0
Lane Group Flow (vph)	0	141	136	0	0	0	0	780	534	0	641	0
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	5%	4%	0%	0%	0%
Turn Type		NA	Perm					NA	Perm		NA	
Protected Phases		4						2			6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)		13.4	13.4					40.7	40.7		40.7	
Effective Green, g (s)		13.9	13.9					41.2	41.2		41.2	
Actuated g/C Ratio		0.22	0.22					0.65	0.65		0.65	
Clearance Time (s)		4.5	4.5					4.5	4.5		4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0	
Lane Grp Cap (vph)		325	318					1181	1014		1240	
v/s Ratio Prot		c0.10						c0.43			0.34	
v/s Ratio Perm			0.09						0.34			
v/c Ratio		0.43	0.43					0.66	0.53		0.52	
Uniform Delay, d1		21.2	21.2					6.7	5.8		5.7	
Progression Factor		1.00	1.00					1.00	1.00		1.00	
Incremental Delay, d2		0.9	0.9					1.4	0.5		0.4	
Delay (s)		22.1	22.1					8.1	6.3		6.1	
Level of Service		C	C					A	A		A	
Approach Delay (s)		22.1			0.0			7.2			6.1	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			10.6									B
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			63.1								8.0	
Intersection Capacity Utilization			97.6%									F
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Edition methodology does not support turning movements with shared & exclusive lanes.
































Future Traffic Conditions - Six-Lane FEIS
107: Rock Creek Blvd & Sunrise

Weekday AM Peak Hour
08/06/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	0	412	149	0	34	752	343	149	22	290	170
Future Volume (vph)	55	0	412	149	0	34	752	343	149	22	290	170
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	0.97		1.00	0.97		1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00		0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502		1524	3335		1615	3335	3610	1538	3502	3610	1615
Flt Permitted	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502		1524	3335		1615	3335	3610	1538	3502	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	0	434	157	0	36	792	361	157	23	305	179
RTOR Reduction (vph)	0	0	374	0	0	31	0	0	29	0	0	75
Lane Group Flow (vph)	58	0	60	157	0	5	792	361	128	23	305	104
Heavy Vehicles (%)	0%	6%	6%	5%	7%	0%	5%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	Prot		Perm	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3			7			5	2	2 7	1	6	6 3
Permitted Phases			3			7						
Actuated Green, G (s)	7.7		7.7	7.7		7.7	18.3	32.6	45.7	0.9	15.2	28.3
Effective Green, g (s)	7.7		7.7	7.7		7.7	18.3	32.6	45.7	0.9	15.2	28.3
Actuated g/C Ratio	0.14		0.14	0.14		0.14	0.33	0.58	0.82	0.02	0.27	0.51
Clearance Time (s)	4.0		4.0	4.0		4.0	5.4	5.4		5.4	5.4	
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	481		209	458		222	1089	2101	1255	56	979	816
v/s Ratio Prot	0.02			c0.05			c0.24	0.10	0.08	0.01	c0.08	0.06
v/s Ratio Perm			0.04			0.00						
v/c Ratio	0.12		0.29	0.34		0.02	0.73	0.17	0.10	0.41	0.31	0.13
Uniform Delay, d1	21.2		21.7	21.9		20.9	16.6	5.4	1.0	27.3	16.2	7.3
Progression Factor	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		0.8	0.5		0.0	2.5	0.0	0.0	4.8	0.2	0.1
Delay (s)	21.3		22.4	22.3		20.9	19.1	5.5	1.1	32.1	16.4	7.4
Level of Service	C		C	C		C	B	A	A	C	B	A
Approach Delay (s)		22.3			22.1			13.2			13.9	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.8									B
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			56.0							14.8		
Intersection Capacity Utilization			48.9%									A
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Six-Lane FEIS
107: Rock Creek Blvd & Sunrise

Weekday AM Peak Hour
08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 		 	 	 	 	 	 	
Traffic Volume (veh/h)	55	0	412	149	0	34	752	343	149	22	290	170
Future Volume (veh/h)	55	0	412	149	0	34	752	343	149	22	290	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	0	1811	1826	0	1900	1826	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	58	0	434	157	0	36	792	361	157	23	305	179
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	6	5	0	0	5	0	5	0	0	0
Cap, veh/h	208	0	0	346	0	0	1130	1817	937	99	709	411
Arrive On Green	0.06	0.00	0.00	0.10	0.00	0.00	0.34	0.50	0.50	0.03	0.20	0.20
Sat Flow, veh/h	3510	58		3374	157		3374	3610	1547	3510	3610	1610
Grp Volume(v), veh/h	58	18.9		157	18.0		792	361	157	23	305	179
Grp Sat Flow(s),veh/h/ln	1755	B		1687	B		1687	1805	1547	1755	1805	1610
Q Serve(g_s), s	0.6			1.8			8.2	2.2	1.8	0.3	3.0	3.8
Cycle Q Clear(g_c), s	0.6			1.8			8.2	2.2	1.8	0.3	3.0	3.8
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	208			346			1130	1817	937	99	709	411
V/C Ratio(X)	0.28			0.45			0.70	0.20	0.17	0.23	0.43	0.44
Avail Cap(c_a), veh/h	695			668			3973	5519	2524	469	1751	876
HCM Platoon Ratio	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2			17.1			11.7	5.5	3.5	19.2	14.3	12.6
Incr Delay (d2), s/veh	0.7			0.9			0.8	0.1	0.1	1.2	0.4	0.7
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.4			1.1			4.5	1.0	0.5	0.2	1.9	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.9			18.0			12.5	5.6	3.6	20.4	14.7	13.3
LnGrp LOS	B			B			B	A	A	C	B	B
Approach Vol, veh/h								1310			507	
Approach Delay, s/veh								9.5			14.5	
Approach LOS								A			B	
Timer - Assigned Phs	1	2	3		5	6	7					
Phs Duration (G+Y+Rc), s	6.5	25.7	6.4		18.9	13.3	8.1					
Change Period (Y+Rc), s	* 5.4	* 5.4	4.0		* 5.4	* 5.4	4.0					
Max Green Setting (Gmax), s	* 5.4	* 62	8.0		* 48	* 20	8.0					
Max Q Clear Time (g_c+I1), s	2.3	4.2	2.6		10.2	5.8	3.8					
Green Ext Time (p_c), s	0.0	3.2	0.0		3.3	2.2	0.2					
Intersection Summary												
HCM 6th Ctrl Delay				11.7								
HCM 6th LOS				B								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - Six-Lane FEIS
108: Rock Creek Blvd & Highway 212

Weekday AM Peak Hour
08/06/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	114	174	191	1130	616	235
Future Volume (vph)	114	174	191	1130	616	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	4.0	5.4	5.4	5.4
Lane Util. Factor	0.97	0.88	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	2682	1719	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3502	2682	1719	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	120	183	201	1189	648	247
RTOR Reduction (vph)	0	102	0	0	0	160
Lane Group Flow (vph)	120	81	201	1189	648	87
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Turn Type	Prot	pt+ov	Prot	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases						6
Actuated Green, G (s)	7.2	20.7	8.1	28.6	16.5	16.5
Effective Green, g (s)	7.2	20.7	8.1	28.6	16.5	16.5
Actuated g/C Ratio	0.15	0.44	0.17	0.61	0.35	0.35
Clearance Time (s)	5.4		4.0	5.4	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	541	1191	298	2215	1278	571
v/s Ratio Prot	c0.03	0.03	c0.12	c0.33	0.18	
v/s Ratio Perm						0.05
v/c Ratio	0.22	0.07	0.67	0.54	0.51	0.15
Uniform Delay, d1	17.2	7.4	18.0	5.2	11.8	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	5.9	0.3	0.3	0.1
Delay (s)	17.5	7.4	23.9	5.4	12.2	10.4
Level of Service	B	A	C	A	B	B
Approach Delay (s)	11.4			8.1	11.7	
Approach LOS	B			A	B	

Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	46.6	Sum of lost time (s)	14.8
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Six-Lane FEIS
 108: Rock Creek Blvd & Highway 212













Weekday AM Peak Hour
 08/06/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↖	↖↖	↖	↕↕	↕↕	↖
Traffic Volume (veh/h)	114	174	191	1130	616	235
Future Volume (veh/h)	114	174	191	1130	616	235
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1811	1826	1900	1900	1900
Adj Flow Rate, veh/h	120	183	201	1189	648	247
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	6	5	0	0	0
Cap, veh/h	441	735	255	2160	1262	563
Arrive On Green	0.13	0.13	0.15	0.60	0.35	0.35
Sat Flow, veh/h	3510	2701	1739	3705	3705	1610
Grp Volume(v), veh/h	120	183	201	1189	648	247
Grp Sat Flow(s),veh/h/ln	1755	1351	1739	1805	1805	1610
Q Serve(g_s), s	1.2	2.1	4.4	7.7	5.6	4.6
Cycle Q Clear(g_c), s	1.2	2.1	4.4	7.7	5.6	4.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	441	735	255	2160	1262	563
V/C Ratio(X)	0.27	0.25	0.79	0.55	0.51	0.44
Avail Cap(c_a), veh/h	2027	1955	355	5221	4114	1835
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.5	11.1	16.1	4.7	10.1	9.8
Incr Delay (d2), s/veh	0.3	0.2	7.8	0.2	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	0.0	3.6	2.5	3.1	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.8	11.3	23.9	4.9	10.4	10.3
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	303			1390	895	
Approach Delay, s/veh	13.1			7.7	10.4	
Approach LOS	B			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		28.8		10.3	9.7	19.1
Change Period (Y+Rc), s		* 5.4		* 5.4	4.0	* 5.4
Max Green Setting (Gmax), s		* 57		* 23	8.0	* 45
Max Q Clear Time (g_c+I1), s		9.7		4.1	6.4	7.6
Green Ext Time (p_c), s		12.1		1.0	0.1	6.1
Intersection Summary						
HCM 6th Ctrl Delay			9.2			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Future Traffic Conditions - Six-Lane FEIS
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↖	↑↑↑					↖		↗
Traffic Volume (vph)	0	2295	266	28	1332	0	0	0	0	308	1	370
Future Volume (vph)	0	2295	266	28	1332	0	0	0	0	308	1	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	2.5	4.0					3.5	5.5	3.5
Lane Util. Factor		0.91	1.00	1.00	0.91					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4803	1392	1228	4803					1687	0	1509
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		4803	1392	1228	4803					1687	0	1509
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2495	289	30	1448	0	0	0	0	335	1	402
RTOR Reduction (vph)	0	0	114	0	0	0	0	0	0	0	0	43
Lane Group Flow (vph)	0	2495	175	30	1448	0	0	0	0	335	1	359
Heavy Vehicles (%)	0%	8%	16%	47%	8%	0%	0%	0%	0%	7%	0%	7%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		76.5	76.5	5.8	86.3					32.2	32.2	32.2
Effective Green, g (s)		78.5	78.5	7.3	88.3					34.2	32.2	34.2
Actuated g/C Ratio		0.60	0.60	0.06	0.68					0.26	0.25	0.26
Clearance Time (s)		6.0	6.0	4.0	6.0					5.5	5.5	5.5
Vehicle Extension (s)		0.5	0.5	2.3	0.5					2.3	2.3	2.3
Lane Grp Cap (vph)		2900	840	68	3262					443	0	396
v/s Ratio Prot		c0.52		0.02	c0.30					0.20		
v/s Ratio Perm			0.13									c0.24
v/c Ratio		0.86	0.21	0.44	0.44					0.76	no cap	0.91
Uniform Delay, d1		21.2	11.7	59.4	9.6					44.1	Error	46.3
Progression Factor		1.00	1.00	1.29	0.40					1.00		1.00
Incremental Delay, d2		3.6	0.6	2.0	0.3					6.7	Error	23.4
Delay (s)		24.8	12.2	78.7	4.2					50.8	Error	69.7
Level of Service		C	B	E	A					D	F	E
Approach Delay (s)		23.5			5.7			0.0			Error	
Approach LOS		C			A			A			F	
Intersection Summary												
HCM 2000 Control Delay			Error		HCM 2000 Level of Service					F		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			130.0		Sum of lost time (s)					12.0		
Intersection Capacity Utilization			Err%		ICU Level of Service					H		
Analysis Period (min)			15									
c Critical Lane Group												

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_AM_FEIS.vistro

Scenario: Base Scenario

Report File: H:\...\2045_FEISAM.pdf

3/17/2025

Intersection Analysis Summary




ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.770	15.7	B
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Right	0.995	430.3	F
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	SEB Right	0.675	13.1	B
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	WB Left	0.881	29.9	C
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	EB Left	0.830	43.9	D
6	142nd Avenue/OR 212	Signalized	HCM 7th Edition	NB Left	0.563	14.7	B
7	152nd Avenue/OR 212	Two-way stop	HCM 7th Edition	SB Right	0.930	52.5	F
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.570	9.7	A
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.855	33.2	C
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.075	13.8	B
101	Sunrise Expy/122nd Avenue EB Ramps	Signalized	HCM 7th Edition	WB Left	0.951	45.8	D
102	Sunrise Expy/122nd Avenue WB Ramps	Signalized	HCM 7th Edition	EB Right	0.814	13.2	B
107	Sunrise Expy/OR 224	Signalized	HCM 7th Edition	SB Left	0.731	17.6	B
108	Sunrise Expy/OR 224 Jughandle	Signalized	HCM 7th Edition	NB Left	0.571	8.9	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	15.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.770

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	242	0	206	0	1188	141	26	2405	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	7.00	0.00	7.00	0.00	8.00	16.00	47.00	8.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	242	0	206	0	1188	141	26	2405	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9200	1.0000	0.9200	1.0000	0.9200	0.9200	0.9200	0.9200	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	66	0	56	0	323	38	7	654	0
Total Analysis Volume [veh/h]	0	0	0	263	0	224	0	1291	153	28	2614	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	30	0	30	0	67	67	8	79	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	6.0	6.0	20.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	35	0	35	0	73	73	12	85	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		120	120	120	120	120	120
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		21	21	81	81	3	88
g / C, Green / Cycle		0.17	0.17	0.67	0.67	0.03	0.73
(v / s)_i Volume / Saturation Flow Rate		0.15	0.15	0.27	0.11	0.02	0.54
s, saturation flow rate [veh/h]		1709	1526	4849	1411	1138	4849
c, Capacity [veh/h]		297	265	3255	947	29	3541
d1, Uniform Delay [s]		48.39	47.99	8.84	7.27	58.40	9.47
k, delay calibration		0.11	0.09	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		8.76	5.99	0.36	0.37	50.73	1.42
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.88	0.84	0.40	0.16	0.96	0.74
d, Delay for Lane Group [s/veh]		57.15	53.98	9.20	7.64	109.13	10.89
Lane Group LOS		E	D	A	A	F	B
Critical Lane Group		Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]		8.39	6.92	4.83	1.48	1.26	12.00
50th-Percentile Queue Length [ft/ln]		209.72	172.90	120.87	36.97	31.53	299.94
95th-Percentile Queue Length [veh/ln]		13.14	11.23	8.44	2.66	2.27	17.68
95th-Percentile Queue Length [ft/ln]		328.47	280.73	211.02	66.55	56.76	441.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	57.15	0.00	53.98	0.00	9.20	7.64	109.13	10.89	0.00
Movement LOS				E		D		A	A	F	B	
d_A, Approach Delay [s/veh]	0.00			55.70			9.04			11.93		
Approach LOS	A			E			A			B		
d_I, Intersection Delay [s/veh]	15.68											
Intersection LOS	B											
Intersection V/C	0.770											

Emissions

Vehicle Miles Traveled [mph]		50.89	43.35	408.96	48.47	4.41	412.16
Stops [stops/h]		251.65	207.48	435.10	44.36	37.84	1079.76
Fuel consumption [US gal/h]		6.54	5.39	21.66	2.48	1.01	28.73
CO [g/h]		457.43	376.85	1513.82	173.23	70.78	2008.01
NOx [g/h]		89.00	73.32	294.53	33.70	13.77	390.69
VOC [g/h]		106.01	87.34	350.84	40.15	16.40	465.38

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	492	1117	1317
d_b, Bicycle Delay [s]	60.00	34.13	11.71	7.01
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	2.354	3.013
Bicycle LOS	D	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	430.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.995

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	356	2	251	11	0	337	311	1119	0	0	1738	466
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	2.00	18.00	23.00	0.00	9.00	6.00	8.00	0.00	0.00	8.00	4.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	0	0	0	41
Total Hourly Volume [veh/h]	356	2	250	11	0	337	311	1119	0	0	1738	425
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	0.9200	0.9200	1.0000	1.0000	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	1	68	3	0	92	85	304	0	0	472	115
Total Analysis Volume [veh/h]	387	2	272	12	0	366	338	1216	0	0	1889	462
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	81.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	20	31	31	18	0	29	30	54	0	0	20	20
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	20.0	6.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	26	37	37	24	0	34	34	60	0	0	26	26
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	17	23	5	66	51	75	20	20
g / C, Green / Cycle	0.14	0.19	0.05	0.55	0.42	0.62	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.12	0.17	0.01	0.14	0.20	0.25	0.46	0.49
s, saturation flow rate [veh/h]	3292	1591	1481	2655	1724	4849	3389	1612
c, Capacity [veh/h]	457	300	68	1468	730	3024	565	269
d1, Uniform Delay [s]	50.41	47.73	55.05	13.92	24.78	11.34	50.00	50.00
k, delay calibration	0.07	0.14	0.07	0.07	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.75	13.55	0.74	0.05	2.10	0.40	803.65	872.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.85	0.91	0.18	0.25	0.46	0.40	2.77	2.92
d, Delay for Lane Group [s/veh]	53.16	61.28	55.79	13.98	26.89	11.74	853.65	922.51
Lane Group LOS	D	E	E	B	C	B	F	F
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.84	9.13	0.36	2.56	7.28	5.32	71.48	73.15
50th-Percentile Queue Length [ft/ln]	145.90	228.22	9.10	64.08	182.02	133.12	1787.03	1828.74
95th-Percentile Queue Length [veh/ln]	9.80	14.08	0.66	4.61	11.71	9.11	111.32	113.95
95th-Percentile Queue Length [ft/ln]	244.95	352.09	16.39	115.34	292.65	227.72	2782.90	2848.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.16	61.28	61.28	55.79	0.00	13.98	26.89	11.74	0.00	0.00	865.38	922.51
Movement LOS	D	E	E	E		B	C	B			F	F
d_A, Approach Delay [s/veh]	56.53			15.30			15.03			876.60		
Approach LOS	E			B			B			F		
d_I, Intersection Delay [s/veh]	430.30											
Intersection LOS	F											
Intersection V/C	0.995											

Emissions

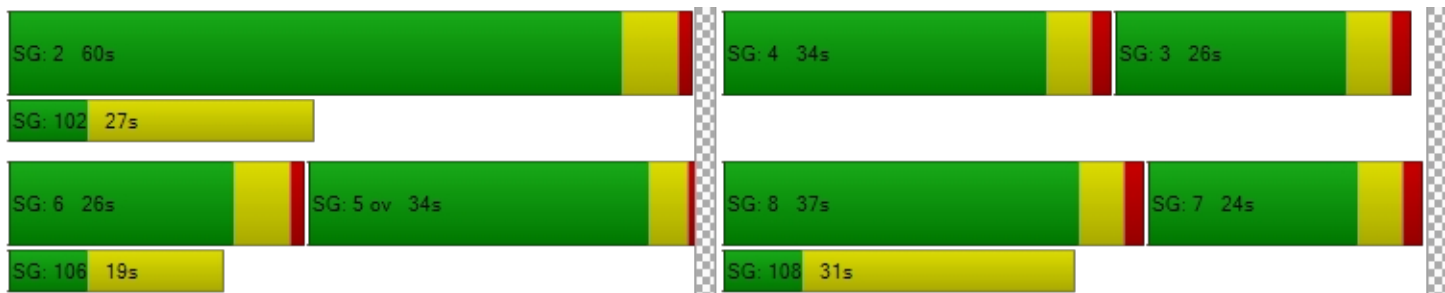
Vehicle Miles Traveled [mph]	81.07	57.40	1.76	53.77	53.29	191.73	392.66	196.33
Stops [stops/h]	350.16	273.86	10.92	153.79	218.42	479.22	4288.88	2194.49
Fuel consumption [US gal/h]	9.46	7.29	0.27	4.10	5.25	13.44	312.06	167.29
CO [g/h]	661.11	509.74	18.81	286.88	366.97	939.80	21813.34	11693.41
NOx [g/h]	128.63	99.18	3.66	55.82	71.40	182.85	4244.08	2275.11
VOC [g/h]	153.22	118.14	4.36	66.49	85.05	217.81	5055.45	2710.06

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		11.0		0.0		11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	49.50		49.50		0.00		49.50
I_p,int, Pedestrian LOS Score for Intersectio	2.171		2.442		0.000		3.131
Crosswalk LOS	B		B		F		C
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	525		308		900		333
d_b, Bicycle Delay [s]	32.63		42.93		18.15		41.67
I_b,int, Bicycle LOS Score for Intersection	2.652		1.560		2.414		2.875
Bicycle LOS	B		A		B		C

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	0	0	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	502	2204	979	402
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	19.00	3.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	502	2204	979	402
Peak Hour Factor	1.0000	1.0000	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	128	562	250	103
Total Analysis Volume [veh/h]	0	0	512	2249	999	410
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	101
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	24.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	32	60	24	24
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	0	30	30	30	30
Lead / Lag	-	-	Lag	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	74	74	74	74
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	33	60	23	23
g / C, Green / Cycle	0.44	0.81	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.33	0.45	0.21	0.27
s, saturation flow rate [veh/h]	1538	5053	4685	1526
c, Capacity [veh/h]	679	4091	1473	480
d1, Uniform Delay [s]	17.34	2.42	22.14	23.82
k, delay calibration	0.26	0.20	0.20	0.31
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.11	0.22	1.03	11.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.55	0.68	0.85
d, Delay for Lane Group [s/veh]	21.45	2.64	23.17	35.54
Lane Group LOS	C	A	C	D
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	7.37	1.46	4.89	7.85
50th-Percentile Queue Length [ft/ln]	184.32	36.48	122.25	196.32
95th-Percentile Queue Length [veh/ln]	11.83	2.63	8.52	12.45
95th-Percentile Queue Length [ft/ln]	295.65	65.66	212.91	311.22

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	21.45	2.64	23.17	35.54
Movement LOS			C	A	C	D
d_A, Approach Delay [s/veh]	0.00		6.13		26.77	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	13.10					
Intersection LOS	B					
Intersection V/C	0.675					

Emissions

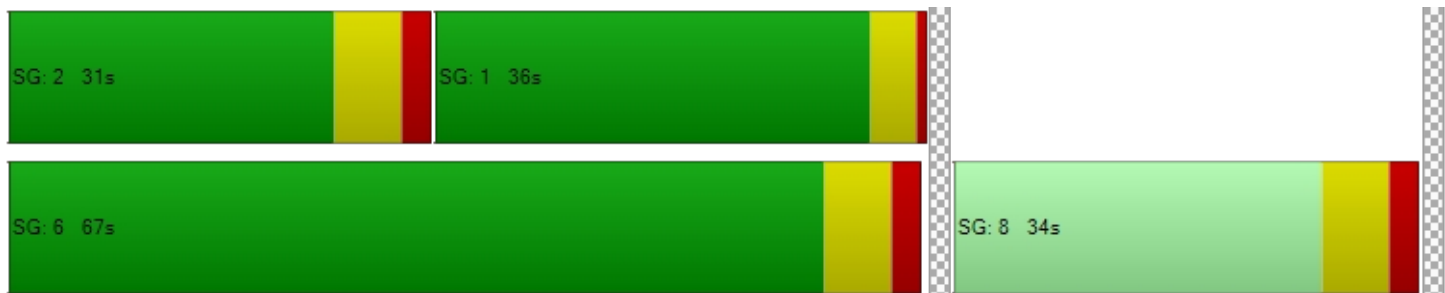
Vehicle Miles Traveled [mph]		709.56	3116.80	250.28	102.72
Stops [stops/h]		358.42	212.79	713.16	381.76
Fuel consumption [US gal/h]		33.43	130.69	18.95	9.30
CO [g/h]		2336.46	9135.18	1324.83	650.25
NOx [g/h]		454.59	1777.37	257.76	126.51
VOC [g/h]		541.50	2117.17	307.04	150.70

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1620	648
d_b, Bicycle Delay [s]	37.03	1.33	16.92
I_b,int, Bicycle LOS Score for Intersection	4.132	3.078	2.335
Bicycle LOS	D	C	B

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.881

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T			T			T			T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	2
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	19	80	0	86	213	926	520	356	158	2	746	841
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	50.00	48.00	0.00	8.00	19.00	14.00	30.00	14.00	27.00	17.00	8.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	80	0	86	213	926	520	356	158	2	746	841
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	21	0	23	57	246	138	95	42	1	198	224
Total Analysis Volume [veh/h]	20	85	0	91	227	985	553	379	168	2	794	895
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	19.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						6,7
Maximum Green [s]	5	35	35	5	35	35	33	68	68	4	39	39
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	9	40	40	9	40	40	37	73	73	8	44	44
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No	No	No	Yes		No	Yes	Yes
Maximum Recall	No	No		No	No	No	No	No		No	No	No
Pedestrian Recall	No	No		No	No	No	No	No		No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.00	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	2.00	2.80	0.00	2.00	3.40	3.40	2.00	3.40	0.00
g_i, Effective Green Time [s]	2	11	17	25	66	30	84	84	0	54	75
g / C, Green / Cycle	0.02	0.08	0.13	0.19	0.51	0.23	0.64	0.64	0.00	0.42	0.58
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.03	0.14	0.39	0.21	0.17	0.17	0.00	0.23	0.32
s, saturation flow rate [veh/h]	351	1180	3292	1615	2542	2681	1690	1516	1567	3389	2791
c, Capacity [veh/h]	57	99	426	314	1289	621	1088	976	4	1405	1605
d1, Uniform Delay [s]	64.97	58.75	50.66	49.11	25.81	48.35	9.93	9.94	64.78	29.08	17.29
k, delay calibration	0.50	0.07	0.07	0.07	0.17	0.04	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.96	11.98	0.15	1.95	1.55	1.83	0.59	0.66	38.45	1.65	1.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.86	0.21	0.72	0.76	0.89	0.26	0.27	0.54	0.56	0.56
d, Delay for Lane Group [s/veh]	80.93	70.73	50.81	51.06	27.36	50.18	10.53	10.60	103.22	30.73	18.69
Lane Group LOS	F	E	D	D	C	D	B	B	F	C	B
Critical Lane Group	No	Yes	No	No	Yes	No	No	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.96	3.10	1.35	7.09	12.30	8.82	3.63	3.29	0.11	9.77	8.51
50th-Percentile Queue Length [ft/ln]	23.88	77.43	33.63	177.31	307.41	220.48	90.85	82.15	2.65	244.31	212.81
95th-Percentile Queue Length [veh/ln]	1.72	5.57	2.42	11.46	18.05	13.69	6.54	5.92	0.19	14.90	13.30
95th-Percentile Queue Length [ft/ln]	42.98	139.37	60.54	286.50	451.18	342.23	163.53	147.88	4.77	372.48	332.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	80.93	70.73	70.73	50.81	51.06	27.36	50.18	10.55	10.60	103.22	30.73	18.69
Movement LOS	F	E	E	D	D	C	D	B	B	F	C	B
d_A, Approach Delay [s/veh]	72.67			33.13			30.48			24.44		
Approach LOS	E			C			C			C		
d_I, Intersection Delay [s/veh]	29.93											
Intersection LOS	C											
Intersection V/C	0.881											

Emissions

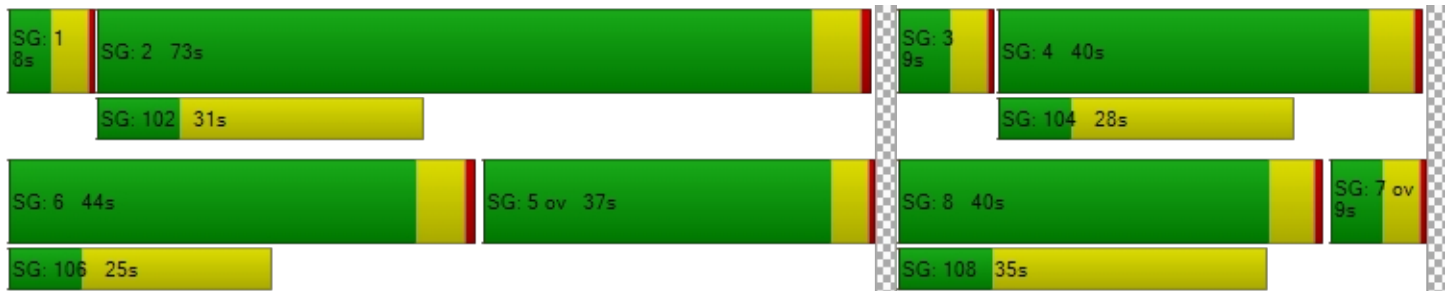
Vehicle Miles Traveled [mph]	4.51	19.15	21.01	52.41	227.43	497.05	258.93	232.73	1.32	523.50	590.09
Stops [stops/h]	26.45	85.77	74.50	196.41	681.03	488.44	100.64	91.00	2.93	541.24	471.45
Fuel consumption [US gal/h]	0.66	2.49	2.22	5.60	18.61	28.81	11.83	10.64	0.11	29.51	30.30
CO [g/h]	46.21	173.75	154.99	391.53	1300.83	2013.58	827.07	743.89	7.86	2062.43	2118.00
NOx [g/h]	8.99	33.81	30.16	76.18	253.09	391.77	160.92	144.73	1.53	401.27	412.09
VOC [g/h]	10.71	40.27	35.92	90.74	301.48	466.67	191.68	172.40	1.82	477.99	490.87

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		11.0		13.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.55		54.47		54.47		52.65	
I_p,int, Pedestrian LOS Score for Intersectio	2.120		2.931		2.970		2.911	
Crosswalk LOS	B		C		C		C	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	542		542		1040		594	
d_b, Bicycle Delay [s]	34.57		34.57		14.98		32.13	
I_b,int, Bicycle LOS Score for Intersection	1.733		3.710		2.467		2.955	
Bicycle LOS	A		D		B		C	

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	43.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.830

Intersection Setup

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	300.00	100.00	60.00	320.00	100.00	100.00	415.00	100.00	60.00	200.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	114	110	95	71	30	283	52	155	3	19	1229	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	10.00	14.00	4.00	4.00	5.00	11.00	14.00	17.00	8.00	8.00	6.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	110	95	71	30	283	52	155	3	19	1229	143
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	29	25	19	8	74	14	41	1	5	323	38
Total Analysis Volume [veh/h]	120	116	100	75	32	298	55	163	3	20	1294	151
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			1			0		
v_di, Inbound Pedestrian Volume crossing m	1			0			1			1		
v_co, Outbound Pedestrian Volume crossing	1			0			1			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			1			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	67.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	11	34	34	12	35	35	5	60	60	6	61	61
Amber [s]	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	8	8	0	10	10	0	8	8	0	7	7
Pedestrian Clearance [s]	0	22	22	0	25	25	0	18	18	0	14	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.5	2.5	2.0	2.5	2.5	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	15	39	39	16	40	40	9	65	65	10	66	66
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	3.0	3.0	2.3	3.0	3.0	2.3	4.5	4.5	2.3	4.5	4.5
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.50	4.50	4.00	4.50	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.50	2.50	2.00	2.50	2.00	3.40	3.40	2.00	3.40	3.40
g_i, Effective Green Time [s]	11	12	12	28	29	5	70	70	2	67	67
g / C, Green / Cycle	0.08	0.09	0.09	0.22	0.22	0.04	0.54	0.54	0.02	0.51	0.51
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.07	0.04	0.21	0.03	0.05	0.00	0.01	0.41	0.42
s, saturation flow rate [veh/h]	1695	1750	1436	1752	1585	1652	3217	1396	1695	1780	1715
c, Capacity [veh/h]	144	163	134	379	356	64	1728	749	27	916	883
d1, Uniform Delay [s]	58.61	57.23	57.44	41.74	49.35	62.17	14.68	13.97	63.68	26.03	26.20
k, delay calibration	0.07	0.11	0.11	0.07	0.27	0.17	0.50	0.50	0.07	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.65	5.61	7.99	0.15	21.32	37.81	0.11	0.01	20.59	7.26	7.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.71	0.75	0.20	0.93	0.87	0.09	0.00	0.73	0.80	0.81
d, Delay for Lane Group [s/veh]	66.26	62.85	65.42	41.89	70.67	99.98	14.79	13.98	84.27	33.29	34.04
Lane Group LOS	E	E	E	D	E	F	B	B	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	4.20	3.97	3.51	2.01	12.58	2.48	1.21	0.04	0.82	20.07	19.77
50th-Percentile Queue Length [ft/ln]	105.03	99.15	87.70	50.18	314.41	61.97	30.34	1.09	20.41	501.85	494.33
95th-Percentile Queue Length [veh/ln]	7.56	7.14	6.31	3.61	18.39	4.46	2.18	0.08	1.47	27.42	27.07
95th-Percentile Queue Length [ft/ln]	189.05	178.46	157.86	90.33	459.80	111.55	54.61	1.96	36.74	685.54	676.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	66.26	62.85	65.42	41.89	70.67	70.67	99.98	14.79	13.98	84.27	33.62	34.04
Movement LOS	E	E	E	D	E	E	F	B	B	F	C	C
d_A, Approach Delay [s/veh]	64.83			65.34			35.98			34.35		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	43.89											
Intersection LOS	D											
Intersection V/C	0.830											

Emissions

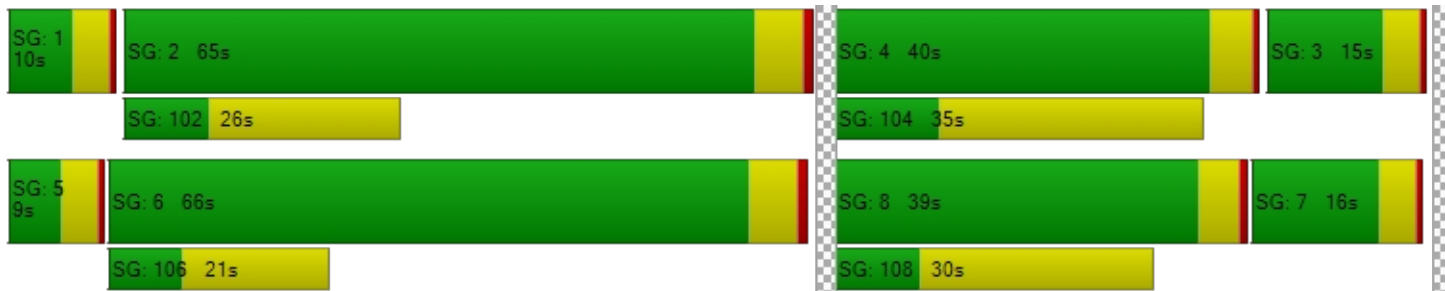
Vehicle Miles Traveled [mph]	23.48	22.70	19.57	9.29	40.88	36.26	107.47	1.98	7.06	258.60	251.59
Stops [stops/h]	116.34	109.82	97.15	55.59	348.27	68.65	67.21	1.21	22.61	555.89	547.57
Fuel consumption [US gal/h]	3.23	3.02	2.67	1.33	8.35	2.99	5.29	0.10	0.76	18.68	18.32
CO [g/h]	225.58	211.41	186.87	92.89	583.83	209.06	369.49	6.75	53.02	1305.62	1280.46
NOx [g/h]	43.89	41.13	36.36	18.07	113.59	40.68	71.89	1.31	10.32	254.03	249.13
VOC [g/h]	52.28	49.00	43.31	21.53	135.31	48.45	85.63	1.57	12.29	302.59	296.76

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0			11.0			14.0			12.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	53.55			54.47			51.75			53.55		
I_p,int, Pedestrian LOS Score for Intersectio	2.243			2.194			2.783			2.668		
Crosswalk LOS	B			B			C			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	531			546			917			932		
d_b, Bicycle Delay [s]	35.08			34.35			19.06			18.52		
I_b,int, Bicycle LOS Score for Intersection	2.114			2.228			1.742			2.768		
Bicycle LOS	B			B			A			C		

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 6: 142nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	14.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

Intersection Setup

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	20.00	100.00	100.00	100.00	225.00	100.00	165.00	220.00	100.00	70.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	109	19	44	29	2	106	15	270	25	15	1218	43
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	18.00	5.00	2.00	3.00	13.00	13.00	13.00	2.00	8.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	19	44	29	2	106	15	270	25	15	1218	43
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	5	11	8	1	28	4	70	7	4	317	11
Total Analysis Volume [veh/h]	114	20	46	30	2	110	16	281	26	16	1269	45
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			0			0			2		
v_di, Inbound Pedestrian Volume crossing m	2			0			0			2		
v_co, Outbound Pedestrian Volume crossing	1			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	112
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	30.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Protecte	ProtPer	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	4	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	33	33	33	33	33	33	7	60	33	5	58	58
Amber [s]	4.3	4.3	4.3	4.3	4.3	4.3	3.5	4.7	4.3	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.5	0.7	0.7
Walk [s]	7	7	7	0	0	0	0	8	0	0	7	7
Pedestrian Clearance [s]	26	26	26	0	0	0	0	26	0	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.8	2.8	2.8	2.8	2.8	2.8	2.0	3.4	2.8	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	38	38	38	38	38	38	11	66	38	9	64	64
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	6	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	2.3	2.0	4.6	4.6
Minimum Recall		No			No		No	Yes	No	No	Yes	
Maximum Recall		No			No		No	No	No	No	No	
Pedestrian Recall		No			No		No	No	No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	L	C	R	L	C	R
C, Cycle Length [s]	112	112	112	112	112	112	112	112	112
L, Total Lost Time per Cycle [s]	4.80	4.80	4.80	4.70	5.40	4.80	5.40	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.80	2.80	2.80	0.00	3.40	2.80	0.00	3.40	3.40
g_i, Effective Green Time [s]	18	18	18	80	78	18	78	78	78
g / C, Green / Cycle	0.16	0.16	0.16	0.71	0.70	0.16	0.70	0.70	0.70
(v / s)_i Volume / Saturation Flow Rate	0.13	0.03	0.09	0.03	0.09	0.02	0.01	0.37	0.03
s, saturation flow rate [veh/h]	1050	1375	1637	521	3246	1449	1129	3389	1577
c, Capacity [veh/h]	228	220	301	333	2268	232	857	2368	1102
d1, Uniform Delay [s]	46.17	40.84	43.21	13.54	5.56	40.20	5.16	8.12	5.23
k, delay calibration	0.07	0.07	0.07	0.50	0.50	0.07	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.48	0.28	0.70	0.27	0.11	0.13	0.00	0.87	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.59	0.21	0.47	0.05	0.12	0.11	0.02	0.54	0.04
d, Delay for Lane Group [s/veh]	47.65	41.12	43.91	13.81	5.67	40.33	5.17	9.00	5.30
Lane Group LOS	D	D	D	B	A	D	A	A	A
Critical Lane Group	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.71	1.12	3.67	0.12	1.04	0.62	0.11	6.88	0.32
50th-Percentile Queue Length [ft/ln]	92.82	28.06	91.71	3.10	25.88	15.58	2.64	172.03	8.06
95th-Percentile Queue Length [veh/ln]	6.68	2.02	6.60	0.22	1.86	1.12	0.19	11.18	0.58
95th-Percentile Queue Length [ft/ln]	167.07	50.51	165.07	5.58	46.58	28.04	4.76	279.58	14.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.65	47.65	41.12	43.91	43.91	43.91	13.81	5.67	40.33	5.17	9.00	5.30
Movement LOS	D	D	D	D	D	D	B	A	D	A	A	A
d_A, Approach Delay [s/veh]	45.98			43.91			8.87			8.83		
Approach LOS	D			D			A			A		
d_I, Intersection Delay [s/veh]	14.74											
Intersection LOS	B											
Intersection V/C	0.563											

Emissions

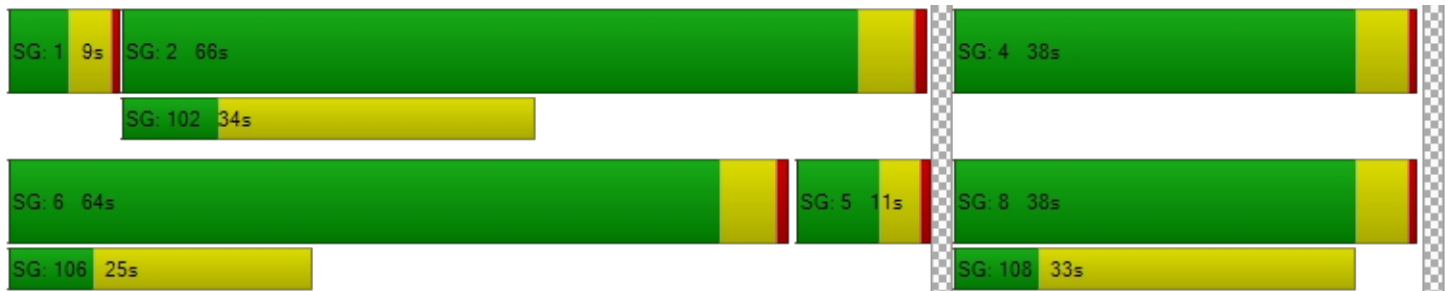
Vehicle Miles Traveled [mph]	16.46	5.65	19.27	5.35	93.95	8.69	7.68	609.16	21.60
Stops [stops/h]	119.33	36.08	117.91	3.99	66.54	20.03	3.40	442.35	10.36
Fuel consumption [US gal/h]	2.64	0.82	2.71	0.29	4.56	0.68	0.35	29.84	1.00
CO [g/h]	184.28	57.10	189.68	20.08	318.73	47.67	24.59	2086.13	69.55
NOx [g/h]	35.85	11.11	36.91	3.91	62.01	9.27	4.78	405.89	13.53
VOC [g/h]	42.71	13.23	43.96	4.65	73.87	11.05	5.70	483.48	16.12

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.64	45.54	0.00	45.54
I_p,int, Pedestrian LOS Score for Intersectio	2.038	1.855	0.000	2.780
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	593	593	1082	1046
d_b, Bicycle Delay [s]	27.72	27.72	11.79	12.73
I_b,int, Bicycle LOS Score for Intersection	1.857	1.794	1.826	2.657
Bicycle LOS	A	A	A	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 7: 152nd Avenue/OR 212**

Control Type: Two-way stop
 Analysis Method: HCM 7th Edition
 Analysis Period: 15 minutes

Delay (sec / veh): 52.5
 Level Of Service: F
 Volume to Capacity (v/c): 0.930

Intersection Setup

Name	152nd Ave		Highway 212		Highway 212	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	220.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	152nd Ave		Highway 212		Highway 212	
Base Volume Input [veh/h]	27	457	109	230	860	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	3.00	7.00	11.00	5.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	457	109	230	860	82
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	120	29	61	226	22
Total Analysis Volume [veh/h]	28	481	115	242	905	86
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.93	0.17	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	41.35	52.49	11.56	0.00	0.00	0.00
Movement LOS	E	F	B	A	A	A
95th-Percentile Queue Length [veh/ln]	0.80	11.36	0.62	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	20.01	284.10	15.58	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	51.87		3.72		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	14.93					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	9.7
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.570

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	1	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	136	203	49	208	109	806
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	8.00	12.00	15.00	3.00	8.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	136	203	49	208	109	806
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	53	13	55	29	212
Total Analysis Volume [veh/h]	143	214	52	219	115	848
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	148
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	41.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	41	0	55	55	37	96
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	30	30	30	30
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		No	No	No	No
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	38	38	38	38	38	38
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	5.40	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	9	9	10	25	3	18
g / C, Green / Cycle	0.24	0.24	0.27	0.66	0.09	0.46
(v / s)_i Volume / Saturation Flow Rate	0.04	0.14	0.02	0.15	0.07	0.25
s, saturation flow rate [veh/h]	3320	1513	3275	1424	1767	3389
c, Capacity [veh/h]	807	368	868	946	161	1560
d1, Uniform Delay [s]	11.51	12.82	10.54	2.56	16.98	7.46
k, delay calibration	0.08	0.08	0.21	0.21	0.13	0.21
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.08	1.09	0.06	0.24	6.92	0.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.58	0.06	0.23	0.71	0.54
d, Delay for Lane Group [s/veh]	11.58	13.91	10.60	2.80	23.90	8.04
Lane Group LOS	B	B	B	A	C	A
Critical Lane Group	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.40	1.40	0.14	0.24	1.15	1.74
50th-Percentile Queue Length [ft/ln]	9.88	35.03	3.43	6.04	28.63	43.59
95th-Percentile Queue Length [veh/ln]	0.71	2.52	0.25	0.43	2.06	3.14
95th-Percentile Queue Length [ft/ln]	17.79	63.05	6.17	10.87	51.53	78.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.58	13.91	10.60	2.80	23.90	8.04
Movement LOS	B	B	B	A	C	A
d_A, Approach Delay [s/veh]	12.98		4.30		9.93	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	9.66					
Intersection LOS	A					
Intersection V/C	0.570					

Emissions

Vehicle Miles Traveled [mph]	46.77	69.99	7.55	31.80	7.32	53.98
Stops [stops/h]	74.32	131.69	25.77	22.71	107.63	327.74
Fuel consumption [US gal/h]	2.67	4.21	0.57	1.56	1.46	5.42
CO [g/h]	186.86	294.63	39.52	108.99	101.72	378.91
NOx [g/h]	36.36	57.32	7.69	21.21	19.79	73.72
VOC [g/h]	43.31	68.28	9.16	25.26	23.58	87.82

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	9.73	0.00	9.03
I_p,int, Pedestrian LOS Score for Intersectio	2.248	0.000	2.485
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	2141	2872	5013
d_b, Bicycle Delay [s]	0.10	3.64	43.46
I_b,int, Bicycle LOS Score for Intersection	1.560	1.783	2.354
Bicycle LOS	A	A	B

Sequence




Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	33.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.855

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	95	78	11	144	47	1192	576	600	18	7	1187	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	6.00	6.00	4.00	5.00	9.00	14.00	12.00	11.00	8.00	13.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	11	0	0	596	0	0	18	0	0	56
Total Hourly Volume [veh/h]	95	78	0	144	47	596	576	600	0	7	1187	56
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	22	0	40	13	166	160	167	0	2	330	16
Total Analysis Volume [veh/h]	106	87	0	160	52	662	640	667	0	8	1319	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	132
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	8.5
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	8	8	8	4	4	5	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	35	35	35	34	34	28	28	77	77	4	54	54
Amber [s]	3.5	3.5	3.5	4.7	4.7	3.5	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	0	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	0	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	2.5	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	4	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.3	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	123	123	123	123	123	123	123	123	123	123	123
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	4.50	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.20	4.20	0.00	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	27	27	26	26	59	27	79	79	1	53	53
g / C, Green / Cycle	0.22	0.22	0.21	0.21	0.48	0.22	0.64	0.64	0.01	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.14	0.05	0.13	0.03	0.24	0.20	0.20	0.20	0.00	0.39	0.04
s, saturation flow rate [veh/h]	734	1870	1268	1840	2738	3264	1690	1690	1652	3389	1449
c, Capacity [veh/h]	192	414	257	389	1311	707	1082	1082	13	1463	625
d1, Uniform Delay [s]	48.11	39.04	50.00	39.27	21.98	46.86	9.89	9.89	60.75	32.48	20.73
k, delay calibration	0.08	0.08	0.08	0.08	0.08	0.07	0.28	0.28	0.07	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.85	0.19	1.83	0.11	0.22	2.98	0.42	0.42	26.21	5.67	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.55	0.21	0.62	0.13	0.50	0.90	0.31	0.31	0.62	0.90	0.10
d, Delay for Lane Group [s/veh]	49.95	39.23	51.83	39.39	22.20	49.84	10.31	10.31	86.96	38.15	20.91
Lane Group LOS	D	D	D	D	C	D	B	B	F	D	C
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.20	2.18	4.87	1.30	6.54	9.79	4.03	4.03	0.34	19.00	1.10
50th-Percentile Queue Length [ft/ln]	80.06	54.56	121.83	32.44	163.47	244.71	100.74	100.74	8.57	474.92	27.54
95th-Percentile Queue Length [veh/ln]	5.76	3.93	8.49	2.34	10.73	14.92	7.25	7.25	0.62	26.14	1.98
95th-Percentile Queue Length [ft/ln]	144.11	98.21	212.33	58.39	268.31	372.98	181.33	181.33	15.43	653.62	49.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.95	39.23	39.23	51.83	39.39	22.20	49.84	10.31	10.31	86.96	38.15	20.91
Movement LOS	D	D	D	D	D	C	D	B	B	F	D	C
d_A, Approach Delay [s/veh]	45.12			28.65			29.66			37.66		
Approach LOS	D			C			C			D		
d_I, Intersection Delay [s/veh]	33.17											
Intersection LOS	C											
Intersection V/C	0.855											

Emissions

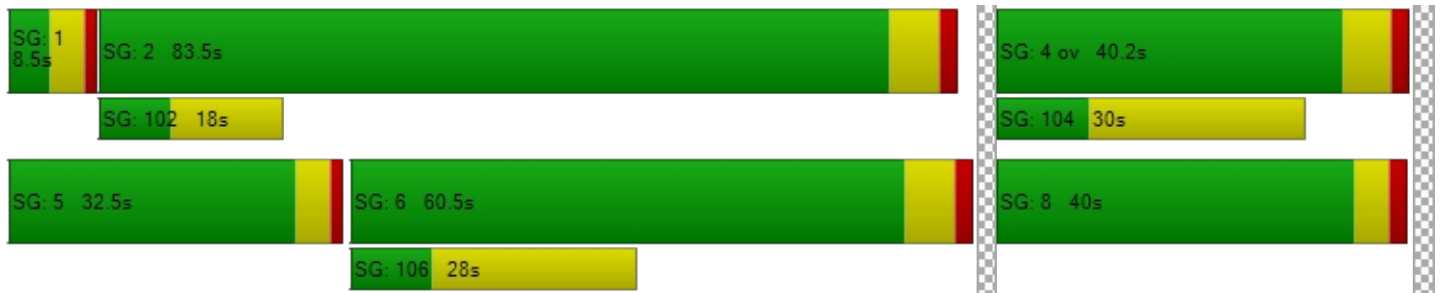
Vehicle Miles Traveled [mph]	12.47	10.23	20.81	6.76	86.11	75.39	39.28	39.28	3.75	617.66	29.03
Stops [stops/h]	93.81	63.93	142.75	38.01	383.07	573.46	118.04	118.04	10.04	1112.95	32.27
Fuel consumption [US gal/h]	2.11	1.47	3.33	0.91	8.65	12.76	2.97	2.97	0.35	41.82	1.64
CO [g/h]	147.42	102.68	232.97	63.27	604.77	892.09	207.52	207.52	24.55	2922.93	114.44
NOx [g/h]	28.68	19.98	45.33	12.31	117.67	173.57	40.38	40.38	4.78	568.70	22.27
VOC [g/h]	34.17	23.80	53.99	14.66	140.16	206.75	48.09	48.09	5.69	677.42	26.52

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		12.0		13.0		0.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	50.94		50.03		49.14		0.00	
I_p,int, Pedestrian LOS Score for Intersectio	2.062		3.691		3.271		0.000	
Crosswalk LOS	B		D		C		F	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	570		553		1253		879	
d_b, Bicycle Delay [s]	31.43		32.15		8.57		19.31	
I_b,int, Bicycle LOS Score for Intersection	1.896		3.985		2.653		2.752	
Bicycle LOS	A		D		B		C	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.075

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+r			r+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	30	0	235	74	261	0	0	44	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	12.00	0.00	32.00	61.00	12.00	0.00	0.00	14.00	12.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	30	0	235	74	261	0	0	44	2
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	8	0	64	20	71	0	0	12	1
Total Analysis Volume [veh/h]	0	0	0	33	0	255	80	284	0	0	48	2
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.07	0.00	0.27	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	18.10	13.02	9.74	13.84	13.67	10.24	8.08	0.00	0.00	7.79	0.00	0.00
Movement LOS	C	B	A	B	B	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.24	0.24	1.10	0.20	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	6.05	6.05	27.54	5.12	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.62			10.66			1.78			0.00		
Approach LOS	B			B			A			A		
d_I, Intersection Delay [s/veh]	5.29											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 101: Sunrise Expy/122nd Avenue EB Ramps

Control Type:	Signalized	Delay (sec / veh):	45.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.951

Intersection Setup

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↶				↷	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No				No	
Crosswalk	No		No		Yes	

Volumes

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Base Volume Input [veh/h]	725	0	0	0	596	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	0.00	0.00	0.00	2.00	0.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	725	0	0	0	596	19
Peak Hour Factor	0.9300	1.0000	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	195	0	0	0	160	5
Total Analysis Volume [veh/h]	780	0	0	0	641	20
Presence of On-Street Parking	No	No			No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal Group	2	0	0	0	8	8
Auxiliary Signal Groups						
Maximum Green [s]	93	0	0	0	18	18
Amber [s]	3.5	0.0	0.0	0.0	3.5	3.5
All red [s]	1.0	0.0	0.0	0.0	1.0	1.0
Walk [s]	7	0	0	0	7	7
Pedestrian Clearance [s]	11	0	0	0	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No					No
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	0.0	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	0	0	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	5	0	0	0	5	5
Vehicle Extension [s]	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No					No
Maximum Recall	No					No
Pedestrian Recall	No					No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C
C, Cycle Length [s]	54	54
L, Total Lost Time per Cycle [s]	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50
g_i, Effective Green Time [s]	27	18
g / C, Green / Cycle	0.50	0.33
(v / s)_i Volume / Saturation Flow Rate	0.45	0.36
s, saturation flow rate [veh/h]	1752	1812
c, Capacity [veh/h]	875	605
d1, Uniform Delay [s]	12.18	17.98
k, delay calibration	0.11	0.47
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	3.40	63.60
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	1.09
d, Delay for Lane Group [s/veh]	15.57	81.58
Lane Group LOS	B	F
Critical Lane Group	Yes	Yes
50th-Percentile Queue Length [veh/ln]	7.31	17.11
50th-Percentile Queue Length [ft/ln]	182.86	427.71
95th-Percentile Queue Length [veh/ln]	11.75	25.26
95th-Percentile Queue Length [ft/ln]	293.74	631.58

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.57	0.00	0.00	0.00	81.58	81.58
Movement LOS	B				F	F
d_A, Approach Delay [s/veh]	15.57		0.00		81.58	
Approach LOS	B		A		F	
d_I, Intersection Delay [s/veh]	45.85					
Intersection LOS	D					
Intersection V/C	0.951					

Emissions

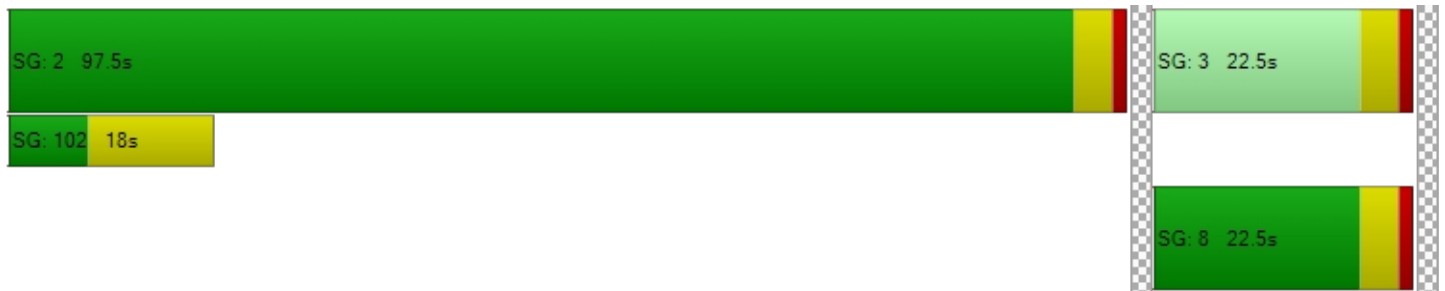
Vehicle Miles Traveled [mph]	64.98		87.60
Stops [stops/h]	488.62		1142.91
Fuel consumption [US gal/h]	7.85		20.89
CO [g/h]	548.47		1460.45
NOx [g/h]	106.71		284.15
VOC [g/h]	127.11		338.47

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	17.07
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	2.039
Crosswalk LOS	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	3452	0	668
d_b, Bicycle Delay [s]	14.19	26.94	11.95
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132	2.650
Bicycle LOS	A	D	B

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 102: Sunrise Expy/122nd Avenue WB Ramps

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.814

Intersection Setup

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑ ↑			↑			↑ + ↑					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			No			Yes			No		

Volumes

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Base Volume Input [veh/h]	0	725	716	0	596	0	0	31	629	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	725	716	0	596	0	0	31	629	0	0	0
Peak Hour Factor	1.0000	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	195	192	0	160	0	0	8	169	0	0	0
Total Analysis Volume [veh/h]	0	780	770	0	641	0	0	33	676	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss
Signal Group	0	2	2	6	6	0	4	4	4	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	79	79	79	79	0	33	33	33	0	0	0
Amber [s]	0.0	3.5	3.5	3.5	3.5	0.0	3.5	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
Walk [s]	0	7	7	7	7	0	7	7	7	0	0	0
Pedestrian Clearance [s]	0	11	11	11	11	0	11	11	11	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	2.5	2.5	2.5	0.0	2.5	2.5	2.5	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	30	30	30	30	0	30	30	30	0	0	0
Lead / Lag	-	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	0	5	5	5	5	0	5	5	5	0	0	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0
Minimum Recall		No			No			No				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	C	R	
C, Cycle Length [s]	55	55	55	55	55	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	30	30	30	15	15	
g / C, Green / Cycle	0.56	0.56	0.56	0.28	0.28	
(v / s)_i Volume / Saturation Flow Rate	0.41	0.48	0.34	0.22	0.22	
s, saturation flow rate [veh/h]	1900	1615	1900	1638	1615	
c, Capacity [veh/h]	1058	899	1124	457	450	
d1, Uniform Delay [s]	9.12	10.28	8.12	18.21	18.22	
k, delay calibration	0.11	0.11	0.11	0.11	0.11	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.02	2.48	0.46	2.94	3.02	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.74	0.86	0.57	0.78	0.78	
d, Delay for Lane Group [s/veh]	10.15	12.76	8.58	21.15	21.24	
Lane Group LOS	B	B	A	C	C	
Critical Lane Group	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	5.39	6.28	3.86	4.05	4.01	
50th-Percentile Queue Length [ft/ln]	134.65	156.89	96.52	101.17	100.30	
95th-Percentile Queue Length [veh/ln]	9.19	10.38	6.95	7.28	7.22	
95th-Percentile Queue Length [ft/ln]	229.80	259.60	173.74	182.11	180.53	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	10.15	12.76	8.58	8.58	0.00	21.15	21.15	21.20	0.00	0.00	0.00
Movement LOS		B	B	A	A		C	C	C			
d_A, Approach Delay [s/veh]	11.44			8.58			21.19			0.00		
Approach LOS	B			A			C			A		
d_I, Intersection Delay [s/veh]	13.19											
Intersection LOS	B											
Intersection V/C	0.814											

Emissions

Vehicle Miles Traveled [mph]	180.10	177.79	53.40	42.67	42.19	
Stops [stops/h]	354.99	413.62	254.47	266.73	264.42	
Fuel consumption [US gal/h]	10.99	11.60	4.72	4.76	4.72	
CO [g/h]	767.92	811.10	330.14	333.06	330.00	
NOx [g/h]	149.41	157.81	64.23	64.80	64.21	
VOC [g/h]	177.97	187.98	76.51	77.19	76.48	

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	17.42	0.00	17.42	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.802	0.000	2.032	0.000
Crosswalk LOS	C	F	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	2893	2893	1208	0
d_b, Bicycle Delay [s]	5.44	5.44	4.28	27.31
I_b,int, Bicycle LOS Score for Intersection	4.117	2.617	2.729	4.132
Bicycle LOS	D	B	B	D

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 107: Sunrise Expy/OR 224**

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	Rock Creek Blvd			Rock Creek Blvd			Sunrise			Sunrise		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Rock Creek Blvd			Rock Creek Blvd			Sunrise			Sunrise		
Base Volume Input [veh/h]	752	343	149	22	290	170	55	0	412	149	0	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	752	343	149	22	290	170	55	0	412	149	0	34
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	198	90	39	6	76	45	14	0	108	39	0	9
Total Analysis Volume [veh/h]	792	361	157	23	305	179	58	0	434	157	0	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	35.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	2	1	6	3	3	0	3	7	0	2
Auxiliary Signal Groups			2,7			3,6						
Maximum Green [s]	30	45	45	5	21	25	25	0	25	25	0	45
Amber [s]	4.7	4.7	4.7	4.7	4.7	3.5	3.5	0.0	3.5	3.5	0.0	4.7
All red [s]	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.0	0.5	0.5	0.0	0.7
Walk [s]	0	7	7	0	7	0	0	0	0	0	0	7
Pedestrian Clearance [s]	0	11	11	0	11	0	0	0	0	0	0	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No		No			No		
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	3.4	3.4	3.4	3.4	3.4	2.0	2.0	0.0	2.0	2.0	0.0	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	0.0	20.0	20.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	0	30	30	0	30
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	5	5	5	5	5	0	5	5	0	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0
Minimum Recall	No	Yes	Yes	No	Yes	No	No			No		
Maximum Recall	No	No	No	No	No	No	No			No		
Pedestrian Recall	No	No	No	No	No	No	No			No		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
C, Cycle Length [s]	57	57	57	57	57	57	57	57	57	57
L, Total Lost Time per Cycle [s]	5.40	5.40	4.00	5.40	5.40	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	0.00	3.40	3.40	0.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	23	46	2	8	31	18	18	18	18
g / C, Green / Cycle	0.29	0.40	0.81	0.03	0.13	0.54	0.32	0.32	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.23	0.10	0.10	0.01	0.08	0.11	0.02	0.27	0.08	0.02
s, saturation flow rate [veh/h]	3514	3618	1615	3514	3618	1615	2707	1615	1883	1615
c, Capacity [veh/h]	1028	1446	1308	95	485	879	895	511	661	511
d1, Uniform Delay [s]	18.60	11.53	1.15	27.44	23.58	6.73	15.07	18.41	16.08	13.77
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.17	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.25	0.09	0.04	1.30	1.35	0.11	0.03	6.05	0.18	0.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.25	0.12	0.24	0.63	0.20	0.06	0.85	0.24	0.07
d, Delay for Lane Group [s/veh]	19.86	11.62	1.20	28.75	24.93	6.84	15.10	24.46	16.27	13.83
Lane Group LOS	B	B	A	C	C	A	B	C	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.48	1.36	0.04	0.16	1.91	0.91	0.26	5.62	0.75	0.30
50th-Percentile Queue Length [ft/ln]	111.88	34.02	1.05	4.09	47.77	22.78	6.42	140.55	18.70	7.59
95th-Percentile Queue Length [veh/ln]	7.94	2.45	0.08	0.29	3.44	1.64	0.46	9.51	1.35	0.55
95th-Percentile Queue Length [ft/ln]	198.61	61.23	1.89	7.36	85.99	41.01	11.55	237.77	33.65	13.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	19.86	11.62	1.20	28.75	24.93	6.84	15.10	0.00	24.46	16.27	0.00	13.83
Movement LOS	B	B	A	C	C	A	B		C	B		B
d_A, Approach Delay [s/veh]	15.35			18.72			23.35			15.81		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	17.64											
Intersection LOS	B											
Intersection V/C	0.731											

Emissions

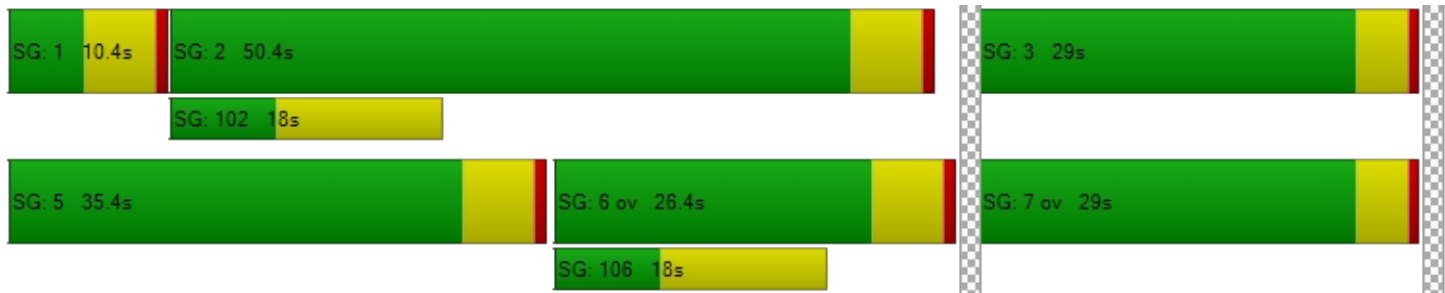
Vehicle Miles Traveled [mph]	59.98	27.34	11.89	1.73	22.98	13.49	6.21	46.43	17.30	3.97
Stops [stops/h]	561.11	170.62	2.64	20.50	239.60	57.13	32.18	352.45	93.76	19.04
Fuel consumption [US gal/h]	8.77	2.92	0.54	0.32	3.82	1.12	0.61	6.02	1.75	0.37
CO [g/h]	613.02	204.23	37.90	22.31	266.82	78.30	42.74	420.71	122.34	25.85
NOx [g/h]	119.27	39.74	7.37	4.34	51.91	15.24	8.32	81.85	23.80	5.03
VOC [g/h]	142.07	47.33	8.78	5.17	61.84	18.15	9.91	97.50	28.35	5.99

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			18.77			18.77		
I_p,int, Pedestrian LOS Score for Intersectio	0.000			0.000			2.560			2.347		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1567			731			871			871		
d_b, Bicycle Delay [s]	1.34			11.55			9.15			9.15		
I_b,int, Bicycle LOS Score for Intersection	2.640			1.978			1.560			1.560		
Bicycle LOS	B			A			A			A		

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 108: Sunrise Expy/OR 224 Jughandle

Control Type:	Signalized	Delay (sec / veh):	8.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

Intersection Setup

Name	Rock Creek Blvd		Rock Creek Blvd		Highway 212	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	⇐		⇐		⇐⇐⇐⇐⇐	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		Yes	

Volumes

Name	Rock Creek Blvd		Rock Creek Blvd		Highway 212	
Base Volume Input [veh/h]	191	1130	616	235	114	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	1130	616	235	114	174
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	297	162	62	30	46
Total Analysis Volume [veh/h]	201	1189	648	247	120	183
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	29.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protected	Permissive	Permissive	Permissive	Split	Overlap
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						4,5
Maximum Green [s]	25	60	31	31	20	20
Amber [s]	3.5	4.7	4.7	4.7	4.7	4.7
All red [s]	0.5	0.7	0.7	0.7	0.7	0.7
Walk [s]	0	7	7	7	7	7
Pedestrian Clearance [s]	0	11	11	11	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	3.4	3.4	3.4	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall	No	Yes	Yes		No	No
Maximum Recall	No	No	No		No	No
Pedestrian Recall	No	No	No		No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	36	36	36	36	36	36
L, Total Lost Time per Cycle [s]	4.00	5.40	5.40	5.40	5.40	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.40	3.40	3.40	3.40	0.00
g_i, Effective Green Time [s]	6	20	10	10	5	16
g / C, Green / Cycle	0.17	0.56	0.28	0.28	0.13	0.45
(v / s)_i Volume / Saturation Flow Rate	0.11	0.33	0.18	0.15	0.03	0.06
s, saturation flow rate [veh/h]	1810	3618	3618	1615	3514	2859
c, Capacity [veh/h]	302	2037	1028	459	470	1292
d1, Uniform Delay [s]	13.91	5.06	11.12	10.78	13.84	5.71
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.53	0.27	0.64	0.98	0.28	0.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.67	0.58	0.63	0.54	0.26	0.14
d, Delay for Lane Group [s/veh]	16.44	5.33	11.77	11.76	14.12	5.76
Lane Group LOS	B	A	B	B	B	A
Critical Lane Group	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.42	1.35	1.75	1.35	0.37	0.26
50th-Percentile Queue Length [ft/ln]	35.54	33.71	43.64	33.68	9.27	6.40
95th-Percentile Queue Length [veh/ln]	2.56	2.43	3.14	2.43	0.67	0.46
95th-Percentile Queue Length [ft/ln]	63.97	60.68	78.56	60.63	16.68	11.52

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.44	5.33	11.77	11.76	14.12	5.76
Movement LOS	B	A	B	B	B	A
d_A, Approach Delay [s/veh]	6.94		11.77		9.07	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	8.86					
Intersection LOS	A					
Intersection V/C	0.571					

Emissions

Vehicle Miles Traveled [mph]	14.61	86.45	49.08	18.71	11.03	16.83
Stops [stops/h]	143.94	273.06	353.53	136.42	75.08	51.86
Fuel consumption [US gal/h]	2.07	6.36	5.53	2.12	1.21	1.19
CO [g/h]	144.65	444.40	386.23	147.85	84.86	83.45
NOx [g/h]	28.14	86.46	75.15	28.77	16.51	16.24
VOC [g/h]	33.52	102.99	89.51	34.27	19.67	19.34

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0		0.0		11.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	0.00		0.00		8.48	
I_p,int, Pedestrian LOS Score for Intersectio	0.000		0.000		2.389	
Crosswalk LOS	F		F		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	3375		1744		1125	
d_b, Bicycle Delay [s]	8.40		0.29		3.40	
I_b,int, Bicycle LOS Score for Intersection	2.706		2.298		1.560	
Bicycle LOS	B		B		A	

Sequence

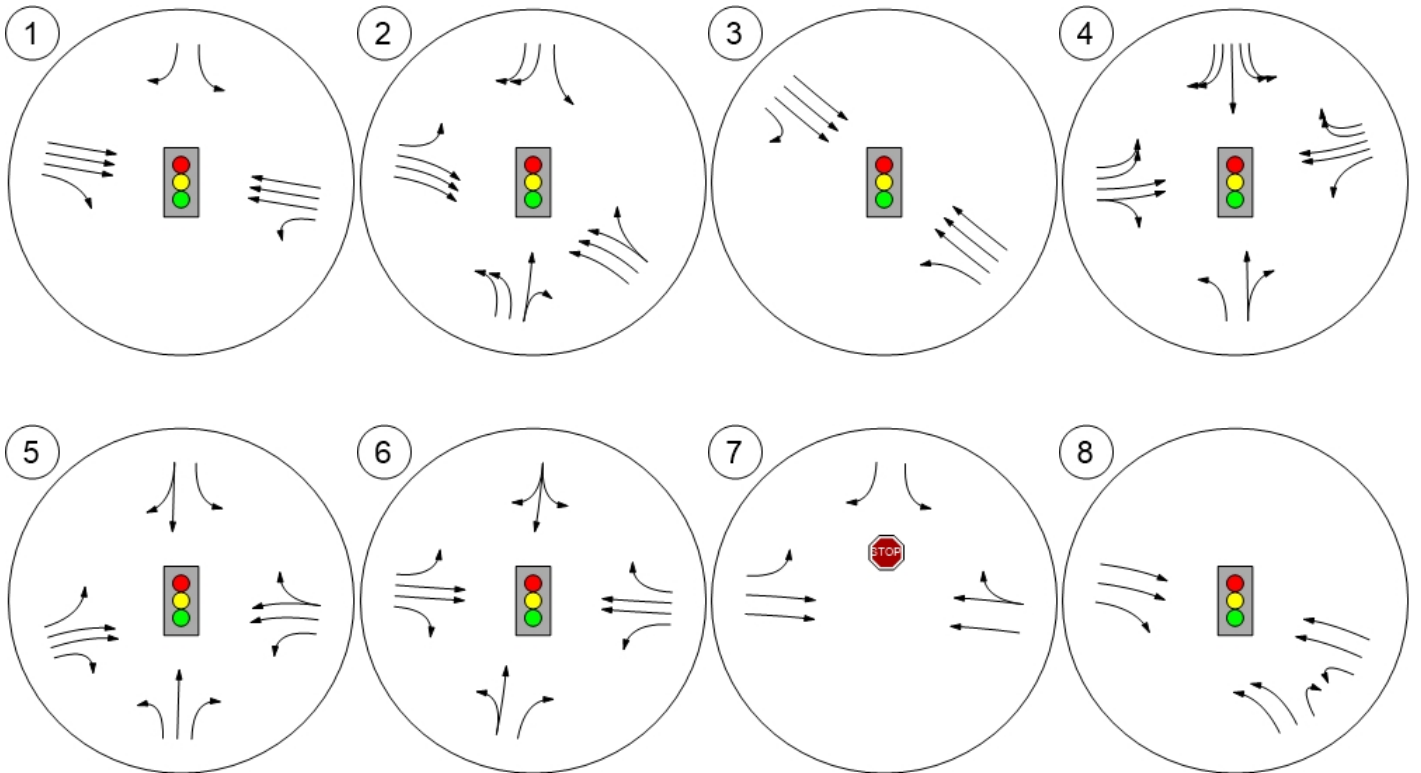
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Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



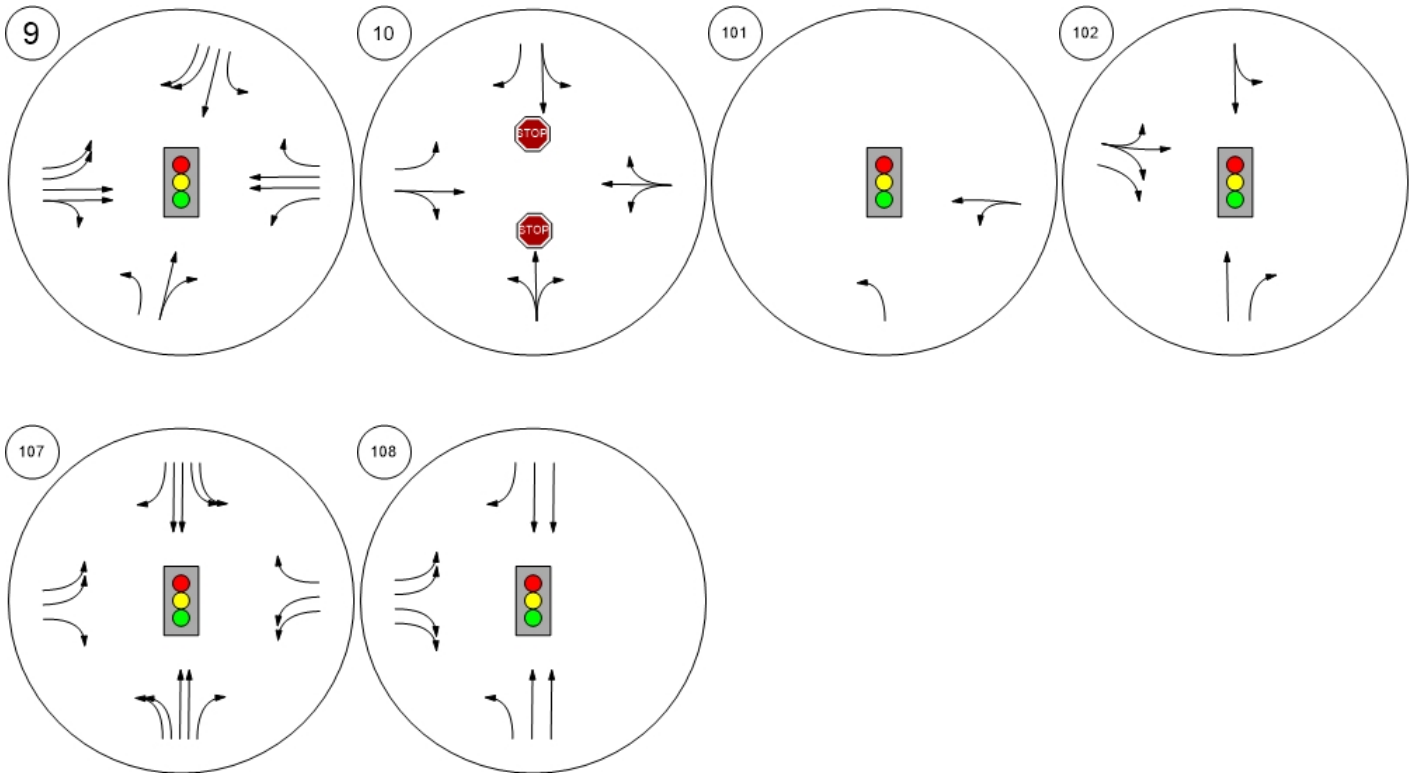
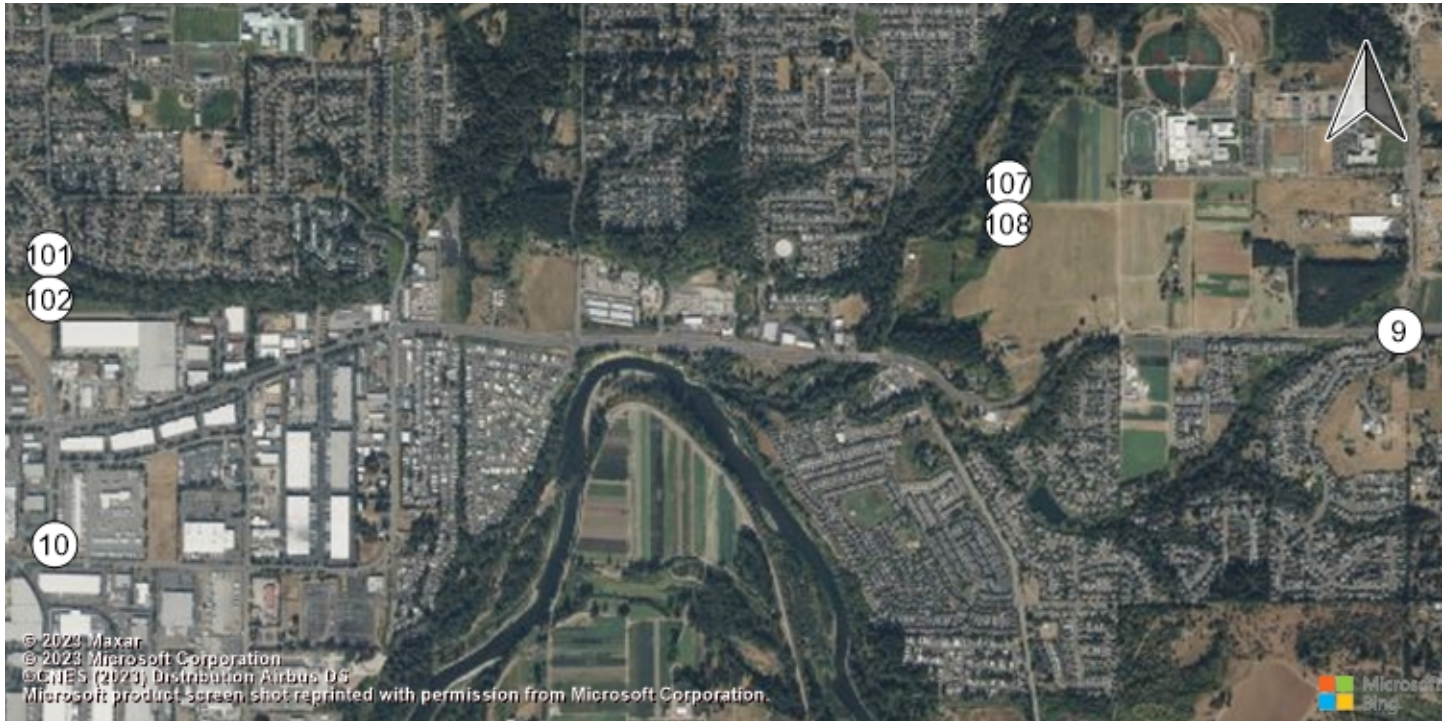
Study Intersections



Lane Configuration and Traffic Control



Lane Configuration and Traffic Control



Future Traffic Conditions - Six-Lane FEIS
1: I-205 SB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗	↘	↑↑↑					↘		↗
Traffic Volume (veh/h)	0	2295	266	28	1332	0	0	0	0	308	1	370
Future Volume (veh/h)	0	2295	266	28	1332	0	0	0	0	308	1	370
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1663	1203	1781	0				1796	1900	1796
Adj Flow Rate, veh/h	0	2495	0	30	1448	0				335	1	402
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	8	16	47	8	0				7	0	7
Cap, veh/h	0	2936		44	3217	0				480	0	427
Arrive On Green	0.00	0.60	0.00	0.08	1.00	0.00				0.28	0.27	0.28
Sat Flow, veh/h	0	5024	1409	1146	5024	0				1711	0	1522
Grp Volume(v), veh/h	0	2495	0	30	1448	0				335	0	402
Grp Sat Flow(s),veh/h/ln	0	1621	1409	1146	1621	0				1711	0	1522
Q Serve(g_s), s	0.0	54.3	0.0	3.3	0.0	0.0				22.8	0.0	33.6
Cycle Q Clear(g_c), s	0.0	54.3	0.0	3.3	0.0	0.0				22.8	0.0	33.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2936		44	3217	0				480	0	427
V/C Ratio(X)	0.00	0.85		0.68	0.45	0.00				0.70	0.00	0.94
Avail Cap(c_a), veh/h	0	2936		154	3217	0				480	0	427
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.62	0.62	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.0	0.0	59.2	0.0	0.0				41.8	0.0	45.7
Incr Delay (d2), s/veh	0.0	3.3	0.0	6.7	0.3	0.0				4.0	0.0	28.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	27.9	0.0	1.8	0.2	0.0				15.4	0.0	22.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.3	0.0	65.8	0.3	0.0				45.8	0.0	74.5
LnGrp LOS	A	C		E	A	A				D	A	E
Approach Vol, veh/h		2495			1478						737	
Approach Delay, s/veh		24.3			1.6						61.4	
Approach LOS		C			A						E	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.5	82.5		40.0		90.0						
Change Period (Y+Rc), s	4.0	6.0		5.5		6.0						
Max Green Setting (Gmax), s	16.0	64.0		34.5		84.0						
Max Q Clear Time (g_c+I1), s	5.3	56.3		35.6		2.0						
Green Ext Time (p_c), s	0.0	4.6		0.0		3.5						

Intersection Summary

HCM 6th Ctrl Delay	23.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑			↑↑↑		↘↘	↘		↘		↘↘
Traffic Volume (vph)	542	2061	0	0	775	402	354	7	318	20	0	231
Future Volume (vph)	542	2061	0	0	775	402	354	7	318	20	0	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0			4.0		4.5	4.5		4.5		4.5
Lane Util. Factor	1.00	0.91			0.91		0.97	1.00		1.00		0.88
Frbp, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00		1.00
Frt	1.00	1.00			0.95		1.00	0.85		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1703	4803			4615		3242	1379		1467		2608
Flt Permitted	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	1703	4803			4615		3242	1379		1467		2608
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	589	2240	0	0	842	437	385	8	346	22	0	251
RTOR Reduction (vph)	0	0	0	0	69	0	0	131	0	0	0	73
Lane Group Flow (vph)	589	2240	0	0	1210	0	385	223	0	22	0	178
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	6%	8%	0%	0%	8%	4%	8%	0%	18%	23%	0%	9%
Turn Type	Prot	NA			NA		Prot	NA		Prot		pt+ov
Protected Phases	5	2			6		3	8		7		4 5
Permitted Phases												
Actuated Green, G (s)	42.1	86.3			40.2		22.2	20.4		6.3		50.6
Effective Green, g (s)	43.1	88.3			42.2		23.2	21.4		7.3		48.6
Actuated g/C Ratio	0.33	0.68			0.32		0.18	0.16		0.06		0.37
Clearance Time (s)	4.0	6.0			6.0		5.5	5.5		5.5		
Vehicle Extension (s)	2.3	4.6			4.6		2.3	2.3		2.3		
Lane Grp Cap (vph)	564	3262			1498		578	227		82		974
v/s Ratio Prot	c0.35	0.47			c0.26		c0.12	c0.16		0.01		0.07
v/s Ratio Perm												
v/c Ratio	1.04	0.69			0.81		0.67	0.98		0.27		0.18
Uniform Delay, d1	43.5	12.5			40.2		49.8	54.1		58.8		27.4
Progression Factor	0.83	0.37			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2	40.0	0.6			3.7		2.5	54.2		1.0		0.1
Delay (s)	76.1	5.3			43.8		52.3	108.3		59.8		27.4
Level of Service	E	A			D		D	F		E		C
Approach Delay (s)		20.0			43.8			79.1			30.0	
Approach LOS		C			D			E			C	
Intersection Summary												
HCM 2000 Control Delay			35.0				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			84.5%				ICU Level of Service		E			
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - Six-Lane FEIS
 2: I-205 SB Off-Ramp/OR 213 NB & Sunrise Pkwy

Weekday PM Peak Hour
 08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑↑			↑↑↑		↘↘	↘		↘		↘↘
Traffic Volume (veh/h)	542	2061	0	0	775	402	354	7	318	20	0	231
Future Volume (veh/h)	542	2061	0	0	775	402	354	7	318	20	0	231
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1781	0	0	1781	1841	1781	1900	1633	1559	0	1767
Adj Flow Rate, veh/h	589	2240	0	0	842	437	385	8	346	22	0	251
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	8	0	0	8	4	8	0	18	23	0	9
Cap, veh/h	557	3603	0	0	1230	573	638	5	213	36	0	0
Arrive On Green	0.65	1.00	0.00	0.00	0.13	0.12	0.19	0.13	0.13	0.02	0.00	0.01
Sat Flow, veh/h	1725	5024	0	0	3403	1510	3291	37	1579	1485	22	
Grp Volume(v), veh/h	589	2240	0	0	842	437	385	0	354	22	72.2	
Grp Sat Flow(s),veh/h/ln	1725	1621	0	0	1621	1510	1646	0	1616	1485	E	
Q Serve(g_s), s	42.0	0.0	0.0	0.0	32.3	36.5	13.9	0.0	17.5	1.9		
Cycle Q Clear(g_c), s	42.0	0.0	0.0	0.0	32.3	36.5	13.9	0.0	17.5	1.9		
Prop In Lane	1.00		0.00	0.00		1.00	1.00		0.98	1.00		
Lane Grp Cap(c), veh/h	557	3603	0	0	1230	573	638	0	218	36		
V/C Ratio(X)	1.06	0.62	0.00	0.00	0.68	0.76	0.60	0.00	1.63	0.60		
Avail Cap(c_a), veh/h	557	3603	0	0	1230	573	722	0	218	188		
HCM Platoon Ratio	2.00	2.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00		
Upstream Filter(I)	0.44	0.44	0.00	0.00	0.98	0.98	1.00	0.00	1.00	1.00		
Uniform Delay (d), s/veh	23.0	0.0	0.0	0.0	49.4	51.5	47.8	0.0	56.7	62.8		
Incr Delay (d2), s/veh	41.8	0.4	0.0	0.0	1.9	6.6	0.8	0.0	302.4	9.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	22.9	0.2	0.0	0.0	20.6	22.4	9.7	0.0	39.9	1.5		
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.8	0.4	0.0	0.0	51.3	58.2	48.7	0.0	359.2	72.2		
LnGrp LOS	F	A	A	A	D	E	D	A	F	E		
Approach Vol, veh/h		2829			1279			739				
Approach Delay, s/veh		13.8			53.7			197.4				
Approach LOS		B			D			F				
Timer - Assigned Phs		2	3		5	6	7	8				
Phs Duration (G+Y+Rc), s		100.3	29.7		47.0	53.3	7.7	22.0				
Change Period (Y+Rc), s		6.0	5.5		6.0	* 6	5.5	5.5				
Max Green Setting (Gmax), s		81.0	27.5		41.0	* 36	15.5	16.5				
Max Q Clear Time (g_c+I1), s		2.0	15.9		44.0	38.5	3.9	19.5				
Green Ext Time (p_c), s		63.2	0.8		0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Future Traffic Conditions - Six-Lane FEIS
 3: I-205 NB On-Ramp & Sunrise Pkwy

Weekday PM Peak Hour
 08/06/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑		
Traffic Volume (vph)	2029	370	268	1177	0	0
Future Volume (vph)	2029	370	268	1177	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	1.0	4.0		
Lane Util. Factor	0.91	1.00	1.00	0.91		
Frt	1.00	0.85	1.00	1.00		
Flt Protected	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	4631	1509	1517	5036		
Flt Permitted	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	4631	1509	1517	5036		
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	2070	378	273	1201	0	0
RTOR Reduction (vph)	0	67	0	0	0	0
Lane Group Flow (vph)	2070	311	273	1201	0	0
Heavy Vehicles (%)	12%	7%	19%	3%	0%	0%
Turn Type	NA	Perm	Prot	NA		
Protected Phases	2		1	6		
Permitted Phases		2				
Actuated Green, G (s)	90.5	90.5	28.5	130.0		
Effective Green, g (s)	93.5	93.5	31.5	130.0		
Actuated g/C Ratio	0.72	0.72	0.24	1.00		
Clearance Time (s)	7.0	7.0	4.0	7.0		
Vehicle Extension (s)	4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)	3330	1085	367	5036		
v/s Ratio Prot	c0.45		c0.18	0.24		
v/s Ratio Perm		0.21				
v/c Ratio	0.62	0.29	0.74	0.24		
Uniform Delay, d1	9.3	6.5	45.5	0.0		
Progression Factor	0.76	1.02	1.00	1.00		
Incremental Delay, d2	0.6	0.5	7.3	0.1		
Delay (s)	7.7	7.0	52.8	0.1		
Level of Service	A	A	D	A		
Approach Delay (s)	7.6			9.9	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Future Traffic Conditions - Six-Lane FEIS
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	704	494	58	10	394	359	45	211	10	456	197	731
Future Volume (vph)	704	494	58	10	394	359	45	211	10	456	197	731
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Lane Util. Factor	0.97	0.95		1.00	0.95	0.88	1.00	1.00		0.97	1.00	0.88
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2694	3080		1543	3343	2760	1203	1286		3242	1597	2493
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.75	1.00	1.00
Satd. Flow (perm)	2694	3080		1543	3343	2760	1203	1286		2576	1597	2493
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	749	526	62	11	419	382	48	224	11	485	210	778
RTOR Reduction (vph)	0	6	0	0	0	317	0	2	0	0	0	602
Lane Group Flow (vph)	749	582	0	11	419	65	48	233	0	485	210	176
Heavy Vehicles (%)	30%	14%	27%	17%	8%	3%	50%	48%	20%	8%	19%	14%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6				4		4
Actuated Green, G (s)	42.7	62.1		2.7	22.1	22.1	17.6	22.9		29.4	29.4	29.4
Effective Green, g (s)	42.7	62.1		2.7	22.1	22.1	17.6	22.9		29.4	29.4	29.4
Actuated g/C Ratio	0.33	0.48		0.02	0.17	0.17	0.14	0.18		0.23	0.23	0.23
Clearance Time (s)	4.0	5.4		4.0	5.4	5.4	4.0	4.8		4.0	4.8	4.8
Vehicle Extension (s)	2.0	4.6		2.0	4.6	4.6	2.3	2.3		2.3	2.3	2.3
Lane Grp Cap (vph)	884	1471		32	568	469	162	226		706	361	563
v/s Ratio Prot	c0.28	0.19		0.01	c0.13		0.04	c0.18		c0.13	0.13	
v/s Ratio Perm						0.02				0.03		0.07
v/c Ratio	0.85	0.40		0.34	0.74	0.14	0.30	1.03		0.69	0.58	0.31
Uniform Delay, d1	40.6	21.9		62.8	51.2	45.9	50.6	53.5		45.8	44.8	41.9
Progression Factor	1.00	1.00		1.25	0.64	0.35	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.3	0.8		2.3	8.1	0.6	0.6	68.6		2.4	1.8	0.2
Delay (s)	47.9	22.7		81.0	40.6	16.6	51.2	122.1		48.2	46.6	42.1
Level of Service	D	C		F	D	B	D	F		D	D	D
Approach Delay (s)		36.8			29.9			110.1			44.7	
Approach LOS		D			C			F			D	

Intersection Summary		
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.84	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 18.2
Intersection Capacity Utilization	70.9%	ICU Level of Service C
Analysis Period (min)	15	
c Critical Lane Group		

Future Traffic Conditions - Six-Lane FEIS
4: 122nd Avenue & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔↔	↔	↔		↔↔	↕	↔↔
Traffic Volume (veh/h)	704	494	58	10	394	359	45	211	10	456	197	731
Future Volume (veh/h)	704	494	58	10	394	359	45	211	10	456	197	731
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1455	1693	1500	1648	1781	1856	1159	1189	1604	1781	1618	1693
Adj Flow Rate, veh/h	749	526	62	11	419	0	48	224	11	485	210	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	30	14	27	17	8	3	50	48	20	8	19	14
Cap, veh/h	1060	1642	193	16	581		144	131	6	659	238	
Arrive On Green	0.39	0.57	0.57	0.01	0.17	0.00	0.13	0.12	0.12	0.17	0.15	0.00
Sat Flow, veh/h	2689	2899	341	1570	3385	2768	1104	1124	55	3291	1618	2524
Grp Volume(v), veh/h	749	291	297	11	419	0	48	0	235	485	210	0
Grp Sat Flow(s),veh/h/ln	1345	1608	1631	1570	1692	1384	1104	0	1179	1646	1618	1262
Q Serve(g_s), s	30.4	12.5	12.5	0.9	15.2	0.0	5.1	0.0	15.2	18.7	16.5	0.0
Cycle Q Clear(g_c), s	30.4	12.5	12.5	0.9	15.2	0.0	5.1	0.0	15.2	18.7	16.5	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.05	1.00		1.00
Lane Grp Cap(c), veh/h	1060	911	924	16	581		144	0	138	659	238	
V/C Ratio(X)	0.71	0.32	0.32	0.69	0.72		0.33	0.00	1.71	0.74	0.88	
Avail Cap(c_a), veh/h	1060	911	924	133	1291		153	0	138	896	351	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.67	0.67	0.00	1.00	0.00	1.00	0.67	0.67	0.00
Uniform Delay (d), s/veh	33.1	14.9	14.9	64.1	50.9	0.0	51.4	0.0	57.4	52.9	54.3	0.0
Incr Delay (d2), s/veh	1.9	0.9	0.9	12.7	5.2	0.0	0.8	0.0	346.3	1.0	9.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	15.4	8.4	8.5	0.8	10.4	0.0	2.6	0.0	29.2	11.6	11.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	15.8	15.9	76.9	56.1	0.0	52.2	0.0	403.7	53.9	64.1	0.0
LnGrp LOS	C	B	B	E	E		D	A	F	D	E	
Approach Vol, veh/h		1337			430			283			695	
Approach Delay, s/veh		26.5			56.6			344.0			57.0	
Approach LOS		C			E			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.3	79.0	21.7	23.9	56.6	27.7	25.7	20.0				
Change Period (Y+Rc), s	4.0	* 5.4	4.8	* 4.8	* 5.4	* 5.4	4.0	4.8				
Max Green Setting (Gmax), s	11.0	* 55	18.0	* 28	* 16	* 50	31.0	15.2				
Max Q Clear Time (g_c+I1), s	2.9	14.5	7.1	18.5	32.4	17.2	20.7	17.2				
Green Ext Time (p_c), s	0.0	7.4	0.0	0.6	0.0	5.1	1.0	0.0				

Intersection Summary























HCM 6th Ctrl Delay	71.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
 * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
 Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
5: 135th Ave & Highway 212

Weekday PM Peak Hour
08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	724	14	80	360	109	32	173	404	391	189	178
Future Volume (vph)	126	724	14	80	360	109	32	173	404	391	189	178
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.4	5.4	4.0	4.4		4.0	3.6	3.6	4.0	3.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1626	3167	1346	1671	3218		1671	1727	1396	1736	1675	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1626	3167	1346	1671	3218		1671	1727	1396	1736	1675	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	133	762	15	84	379	115	34	182	425	412	199	187
RTOR Reduction (vph)	0	0	10	0	31	0	0	0	224	0	19	0
Lane Group Flow (vph)	133	762	5	84	463	0	34	182	201	412	367	0
Confl. Peds. (#/hr)	1		2	2		1	1		2	2		1
Confl. Bikes (#/hr)						3						1
Heavy Vehicles (%)	11%	14%	17%	8%	8%	6%	8%	10%	14%	4%	4%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	28.7	41.9	41.9	11.2	24.4		5.3	23.6	23.6	35.4	53.7	
Effective Green, g (s)	28.7	42.9	41.9	11.2	25.4		5.3	24.5	24.5	35.4	54.6	
Actuated g/C Ratio	0.22	0.33	0.32	0.09	0.20		0.04	0.19	0.19	0.27	0.42	
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4		4.0	4.5	4.5	4.0	4.5	
Vehicle Extension (s)	2.3	4.5	4.5	2.3	4.5		2.3	3.0	3.0	2.3	3.0	
Lane Grp Cap (vph)	358	1045	433	143	628		68	325	263	472	703	
v/s Ratio Prot	0.08	c0.24		0.05	c0.14		0.02	0.11		c0.24	0.22	
v/s Ratio Perm			0.00						c0.14			
v/c Ratio	0.37	0.73	0.01	0.59	0.74		0.50	0.56	0.76	0.87	0.52	
Uniform Delay, d1	43.0	38.4	30.0	57.2	49.2		61.1	47.9	50.0	45.2	28.0	
Progression Factor	0.98	0.96	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	4.0	0.0	4.6	7.6		3.3	2.2	12.4	15.9	0.7	
Delay (s)	42.4	41.1	30.0	61.8	56.8		64.4	50.1	62.4	61.1	28.7	
Level of Service	D	D	C	E	E		E	D	E	E	C	
Approach Delay (s)		41.1			57.5			59.0			45.4	
Approach LOS		D			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			49.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)		16.0				
Intersection Capacity Utilization			78.9%			ICU Level of Service		D				
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Six-Lane FEIS
5: 135th Ave & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑		↘	↑	↗	↘	↗	
Traffic Volume (veh/h)	126	724	14	80	360	109	32	173	404	391	189	178
Future Volume (veh/h)	126	724	14	80	360	109	32	173	404	391	189	178
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1693	1648	1781	1781	1811	1781	1752	1693	1841	1841	1826
Adj Flow Rate, veh/h	133	762	15	84	379	115	34	182	0	412	199	187
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	11	14	17	8	8	6	8	10	14	4	4	5
Cap, veh/h	658	1786	763	105	530	158	43	233		216	203	191
Arrive On Green	0.40	0.56	0.55	0.06	0.21	0.20	0.03	0.13	0.00	0.12	0.23	0.23
Sat Flow, veh/h	1654	3216	1394	1697	2547	761	1697	1752	1434	1753	866	813
Grp Volume(v), veh/h	133	762	15	84	250	244	34	182	0	412	0	386
Grp Sat Flow(s),veh/h/ln	1654	1608	1394	1697	1692	1616	1697	1752	1434	1753	0	1679
Q Serve(g_s), s	6.8	18.0	0.6	6.4	17.8	18.3	2.6	13.1	0.0	16.0	0.0	29.7
Cycle Q Clear(g_c), s	6.8	18.0	0.6	6.4	17.8	18.3	2.6	13.1	0.0	16.0	0.0	29.7
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	658	1786	763	105	352	336	43	233		216	0	395
V/C Ratio(X)	0.20	0.43	0.02	0.80	0.71	0.73	0.80	0.78		1.91	0.00	0.98
Avail Cap(c_a), veh/h	658	1786	763	209	724	691	209	356		216	0	395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.6	16.9	13.5	60.2	47.8	48.3	63.0	54.5	0.0	57.0	0.0	49.6
Incr Delay (d2), s/veh	0.1	0.6	0.0	8.5	11.5	12.9	18.4	6.0	0.0	426.1	0.0	39.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	4.9	10.7	0.4	5.4	13.5	13.4	2.4	10.2	0.0	51.2	0.0	23.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	17.5	13.5	68.7	59.3	61.1	81.5	60.6	0.0	483.1	0.0	89.0
LnGrp LOS	C	B	B	E	E	E	F	E		F	A	F
Approach Vol, veh/h		910			578			216			798	
Approach Delay, s/veh		18.6			61.4			63.8			292.5	
Approach LOS		B			E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	76.6	7.3	34.1	57.1	31.4	20.5	20.9				
Change Period (Y+Rc), s	4.0	* 5.4	4.0	4.5	* 5.4	* 5.4	4.5	* 4.5				
Max Green Setting (Gmax), s	16.0	* 55	16.0	25.5	* 16	* 55	16.0	* 26				
Max Q Clear Time (g_c+I1), s	8.4	20.0	4.6	31.7	8.8	20.3	18.0	15.1				
Green Ext Time (p_c), s	0.1	10.4	0.0	0.0	0.1	5.7	0.0	0.6				

Intersection Summary

HCM 6th Ctrl Delay	119.8
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
6: 142nd Ave & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1341	159	11	423	11	93	6	33	67	26	83
Future Volume (vph)	85	1341	159	11	423	11	93	6	33	67	26	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	5.4	4.0	4.2	5.4		3.0	3.0		3.8	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1597	3195	1398	1805	3343	1533		1781	1346		1687	
Flt Permitted	0.48	1.00	1.00	0.13	1.00	1.00		0.50	1.00		0.72	
Satd. Flow (perm)	814	3195	1398	255	3343	1533		930	1346		1240	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	89	1397	166	11	441	11	97	6	34	70	27	86
RTOR Reduction (vph)	0	0	51	0	0	4	0	0	28	0	24	0
Lane Group Flow (vph)	89	1397	115	11	441	7	0	103	6	0	159	0
Confl. Peds. (#/hr)			1	1					4	4		
Confl. Bikes (#/hr)						4						
Heavy Vehicles (%)	13%	13%	13%	0%	8%	3%	2%	0%	18%	5%	0%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	94.2	85.1	85.1	96.4	86.2	86.2		21.3	21.3		20.5	
Effective Green, g (s)	94.2	86.3	85.1	96.4	87.4	86.2		22.3	22.3		21.5	
Actuated g/C Ratio	0.72	0.66	0.65	0.74	0.67	0.66		0.17	0.17		0.17	
Clearance Time (s)	4.0	5.4	5.4	4.0	5.4	5.4		4.0	4.0		4.8	
Vehicle Extension (s)	2.3	4.5	4.5	2.3	4.5	4.5		2.5	2.5		2.5	
Lane Grp Cap (vph)	644	2120	915	310	2247	1016		159	230		205	
v/s Ratio Prot	c0.01	c0.44		0.00	0.13							
v/s Ratio Perm	0.09		0.08	0.02		0.00		0.11	0.00		c0.13	
v/c Ratio	0.14	0.66	0.13	0.04	0.20	0.01		0.65	0.03		0.77	
Uniform Delay, d1	6.2	13.1	8.4	14.1	8.0	7.4		50.2	44.8		51.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	0.1	1.6	0.3	0.0	0.2	0.0		7.8	0.0		16.0	
Delay (s)	6.2	14.7	8.7	14.1	8.2	7.4		58.0	44.8		67.9	
Level of Service	A	B	A	B	A	A		E	D		E	
Approach Delay (s)		13.6			8.4			54.7			67.9	
Approach LOS		B			A			D			E	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - Six-Lane FEIS
6: 142nd Ave & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗		↘	↗		↕	
Traffic Volume (veh/h)	85	1341	159	11	423	11	93	6	33	67	26	83
Future Volume (veh/h)	85	1341	159	11	423	11	93	6	33	67	26	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1707	1707	1707	1900	1781	1856	1870	1900	1633	1826	1900	1856
Adj Flow Rate, veh/h	89	1397	0	11	441	11	97	6	34	70	27	86
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	13	13	13	0	8	3	2	0	18	5	0	3
Cap, veh/h	598	1793		509	2338	1047	167	8	199	48	18	24
Arrive On Green	0.07	0.55	0.00	0.21	0.69	0.68	0.14	0.15	0.15	0.14	0.15	0.14
Sat Flow, veh/h	1626	3244	1447	1810	3385	1536	778	53	1373	67	121	166
Grp Volume(v), veh/h	89	1397	0	11	441	11	103	0	34	183	0	0
Grp Sat Flow(s),veh/h/ln	1626	1622	1447	1810	1692	1536	831	0	1373	354	0	0
Q Serve(g_s), s	0.0	44.0	0.0	0.0	6.0	0.3	0.0	0.0	2.8	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	44.0	0.0	0.0	6.0	0.3	15.9	0.0	2.8	17.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.94		1.00	0.38		0.47
Lane Grp Cap(c), veh/h	598	1793		509	2338	1047	168	0	199	87	0	0
V/C Ratio(X)	0.15	0.78		0.02	0.19	0.01	0.61	0.00	0.17	2.10	0.00	0.00
Avail Cap(c_a), veh/h	606	2241		509	2338	1047	169	0	201	87	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.5	22.8	0.0	24.1	7.1	6.6	54.7	0.0	48.7	59.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	3.4	0.0	0.0	0.2	0.0	5.6	0.0	0.3	533.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	2.3	23.9	0.0	0.4	3.9	0.2	6.5	0.0	1.8	27.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	26.3	0.0	24.1	7.3	6.7	60.3	0.0	49.0	592.7	0.0	0.0
LnGrp LOS	B	C		C	A	A	E	A	D	F	A	A
Approach Vol, veh/h		1486			463			137				183
Approach Delay, s/veh		25.5			7.7			57.5				592.7
Approach LOS		C			A			E				F
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.3	76.1		22.7	13.3	94.0		22.7				
Change Period (Y+Rc), s	* 4	5.4		4.8	* 4	5.4		* 4.8				
Max Green Setting (Gmax), s	* 10	88.6		17.2	* 10	88.6		* 18				
Max Q Clear Time (g_c+I1), s	2.0	46.0		19.9	2.0	8.0		17.9				
Green Ext Time (p_c), s	0.0	24.7		0.0	0.1	5.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	69.5
HCM 6th LOS	E

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	462	993	206	71	59	211
Future Vol, veh/h	462	993	206	71	59	211
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Free
Storage Length	220	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	7	11	5	4	0	3
Mvmt Flow	486	1045	217	75	62	222

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	293	0	-	0	1751
Stage 1	-	-	-	-	256
Stage 2	-	-	-	-	1495
Critical Hdwy	4.24	-	-	-	6.8
Critical Hdwy Stg 1	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	5.8
Follow-up Hdwy	2.27	-	-	-	3.5
Pot Cap-1 Maneuver	1230	-	-	-	78
Stage 1	-	-	-	-	769
Stage 2	-	-	-	-	175
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1229	-	-	-	~ 47
Mov Cap-2 Maneuver	-	-	-	-	132
Stage 1	-	-	-	-	464
Stage 2	-	-	-	-	175

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	54.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1229	-	-	-	132
HCM Lane V/C Ratio	0.396	-	-	-	0.47
HCM Control Delay (s)	9.8	-	-	-	54.4
HCM Lane LOS	A	-	-	-	F
HCM 95th %tile Q(veh)	1.9	-	-	-	2.1

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Future Traffic Conditions - Six-Lane FEIS
8: Highway 224 & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵↵	↵
Traffic Volume (vph)	375	677	69	231	46	7
Future Volume (vph)	375	677	69	231	46	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	4.4	2.6	4.6	4.4	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3223	1404	1752	3343	3273	1495
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3223	1404	1752	3343	3273	1495
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	395	713	73	243	48	7
RTOR Reduction (vph)	0	126	0	0	0	0
Lane Group Flow (vph)	395	587	73	243	48	7
Heavy Vehicles (%)	12%	15%	3%	8%	7%	8%
Turn Type	NA	pm+ov	Prot	NA	Prot	Free
Protected Phases	2	8	1	6	8	
Permitted Phases		2				Free
Actuated Green, G (s)	93.3	104.7	9.9	107.2	11.4	130.0
Effective Green, g (s)	94.3	106.7	11.3	108.6	12.4	130.0
Actuated g/C Ratio	0.73	0.82	0.09	0.84	0.10	1.00
Clearance Time (s)	6.0	5.4	4.0	6.0	5.4	
Vehicle Extension (s)	4.8	2.5	3.5	4.8	2.5	
Lane Grp Cap (vph)	2337	1199	152	2792	312	1495
v/s Ratio Prot	0.12	c0.05	c0.04	0.07	0.01	
v/s Ratio Perm		0.37				0.00
v/c Ratio	0.17	0.49	0.48	0.09	0.15	0.00
Uniform Delay, d1	5.6	3.5	56.6	1.9	54.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.2	2.8	0.1	0.2	0.0
Delay (s)	5.7	3.7	59.4	2.0	54.2	0.0
Level of Service	A	A	E	A	D	A
Approach Delay (s)	4.4			15.2	47.3	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Future Traffic Conditions - Six-Lane FEIS
8: Highway 224 & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↵	↑↑	↵↵	↵
Traffic Volume (veh/h)	375	677	69	231	46	7
Future Volume (veh/h)	375	677	69	231	46	7
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1722	1678	1856	1781	1796	1781
Adj Flow Rate, veh/h	395	713	73	243	48	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	12	15	3	8	7	8
Cap, veh/h	1259	630	794	2953	194	
Arrive On Green	0.38	0.38	0.45	0.87	0.06	0.00
Sat Flow, veh/h	3358	1422	1767	3474	3319	1510
Grp Volume(v), veh/h	395	713	73	243	48	0
Grp Sat Flow(s),veh/h/ln	1636	1422	1767	1692	1659	1510
Q Serve(g_s), s	11.0	50.0	3.1	1.3	1.8	0.0
Cycle Q Clear(g_c), s	11.0	50.0	3.1	1.3	1.8	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1259	630	794	2953	194	
V/C Ratio(X)	0.31	1.13	0.09	0.08	0.25	
Avail Cap(c_a), veh/h	1259	630	794	2953	1036	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.0	34.1	20.6	1.1	58.5	0.0
Incr Delay (d2), s/veh	0.7	78.1	0.1	0.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	7.9	48.2	2.4	0.4	1.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.6	112.2	20.6	1.2	59.0	0.0
LnGrp LOS	C	F	C	A	E	
Approach Vol, veh/h	1108			316	48	
Approach Delay, s/veh	82.4			5.7	59.0	
Approach LOS	F			A	E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	63.0	55.0			118.0	12.0
Change Period (Y+Rc), s	6.0	* 6			6.0	5.4
Max Green Setting (Gmax), s	26.0	* 49			79.0	39.6
Max Q Clear Time (g_c+I1), s	5.1	52.0			3.3	3.8
Green Ext Time (p_c), s	0.2	0.0			3.3	0.1

Intersection Summary























HCM 6th Ctrl Delay	65.2
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Future Traffic Conditions - Six-Lane FEIS
 9: 172nd Ave & Highway 212

Weekday PM Peak Hour
 08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1124	1170	75	15	885	96	32	68	16	207	77	626
Future Volume (vph)	1124	1170	75	15	885	96	32	68	16	207	77	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.3		3.5	4.3	5.5	4.0	3.0		5.2	4.2	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	3141		1626	3343	1429	1790	1788		1700	1827	2664
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.70	1.00		0.66	1.00	1.00
Satd. Flow (perm)	3213	3141		1626	3343	1429	1321	1788		1175	1827	2664
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1249	1300	83	17	983	107	36	76	18	230	86	696
RTOR Reduction (vph)	0	3	0	0	0	61	0	7	0	0	0	67
Lane Group Flow (vph)	1249	1380	0	17	983	46	36	87	0	230	86	629
Confl. Peds. (#/hr)							5		1	1		5
Heavy Vehicles (%)	9%	14%	12%	11%	8%	13%	0%	2%	6%	6%	4%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	21.2	65.3		2.6	46.7	46.7	26.7	26.7		25.5	25.5	46.7
Effective Green, g (s)	22.2	67.5		3.6	48.9	47.7	27.7	28.7		26.5	27.5	48.7
Actuated g/C Ratio	0.20	0.61		0.03	0.44	0.43	0.25	0.26		0.24	0.25	0.44
Clearance Time (s)	4.5	6.5		4.5	6.5	6.5	5.0	5.0		6.2	6.2	4.5
Vehicle Extension (s)	2.3	5.4		2.3	5.4	5.4	2.5	2.5		2.5	2.5	2.3
Lane Grp Cap (vph)	644	1916		52	1478	616	330	463		281	454	1173
v/s Ratio Prot	c0.39	c0.44		0.01	0.29			0.05			0.05	0.11
v/s Ratio Perm						0.03	0.03			c0.20		0.13
v/c Ratio	1.94	0.72		0.33	0.67	0.07	0.11	0.19		0.82	0.19	0.54
Uniform Delay, d1	44.2	15.0		52.3	24.4	18.5	31.9	31.9		39.8	32.8	22.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	428.4	1.8		2.1	1.6	0.1	0.1	0.1		16.3	0.1	0.3
Delay (s)	472.6	16.8		54.5	26.0	18.6	32.0	32.0		56.1	32.9	23.0
Level of Service	F	B		D	C	B	C	C		E	C	C
Approach Delay (s)		233.1			25.7			32.0			31.4	
Approach LOS		F			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			138.9	HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			110.6	Sum of lost time (s)				12.0				
Intersection Capacity Utilization			86.1%	ICU Level of Service				E				
Analysis Period (min)			15									

c Critical Lane Group

Future Traffic Conditions - Six-Lane FEIS
 9: 172nd Ave & Highway 212

Weekday PM Peak Hour
 08/06/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↔		↔	↕↕	↔	↔	↔		↔	↕	↕↕
Traffic Volume (veh/h)	1124	1170	75	15	885	96	32	68	16	207	77	626
Future Volume (veh/h)	1124	1170	75	15	885	96	32	68	16	207	77	626
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1693	1722	1737	1781	1707	1900	1870	1811	1811	1841	1826
Adj Flow Rate, veh/h	1249	1300	83	17	983	0	36	76	18	230	86	696
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	9	14	12	11	8	13	0	2	6	6	4	5
Cap, veh/h	631	1821	116	39	1434		226	402	95	348	507	1245
Arrive On Green	0.19	0.59	0.57	0.02	0.42	0.00	0.27	0.28	0.26	0.27	0.28	0.27
Sat Flow, veh/h	3264	3070	196	1654	3385	1447	700	1459	345	1251	1841	2698
Grp Volume(v), veh/h	1249	680	703	17	983	0	36	0	94	230	86	696
Grp Sat Flow(s),veh/h/ln	1632	1608	1657	1654	1692	1447	700	0	1804	1251	1841	1349
Q Serve(g_s), s	21.5	33.1	33.5	1.1	26.2	0.0	4.6	0.0	4.4	19.4	4.0	20.9
Cycle Q Clear(g_c), s	21.5	33.1	33.5	1.1	26.2	0.0	8.6	0.0	4.4	23.8	4.0	20.9
Prop In Lane	1.00		0.12	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	631	954	983	39	1434		226	0	497	348	507	1245
V/C Ratio(X)	1.98	0.71	0.72	0.43	0.69		0.16	0.00	0.19	0.66	0.17	0.56
Avail Cap(c_a), veh/h	631	954	983	245	1908		266	0	600	417	609	1395
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	15.9	16.1	53.6	26.0	0.0	34.7	0.0	31.0	40.8	30.6	21.9
Incr Delay (d2), s/veh	446.6	3.4	3.4	4.6	1.6	0.0	0.2	0.0	0.1	2.4	0.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	75.2	18.1	18.7	0.9	16.0	0.0	1.5	0.0	3.5	10.2	3.2	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	491.5	19.4	19.5	58.1	27.6	0.0	34.9	0.0	31.1	43.2	30.8	22.2
LnGrp LOS	F	B	B	E	C		C	A	C	D	C	C
Approach Vol, veh/h		2632			1000			130			1012	
Approach Delay, s/veh		243.4			28.1			32.2			27.7	
Approach LOS		F			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	70.3		34.8	25.0	51.4		34.8				
Change Period (Y+Rc), s	4.5	6.5		6.2	4.5	6.5		* 6.2				
Max Green Setting (Gmax), s	15.5	60.5		34.8	20.5	60.5		* 35				
Max Q Clear Time (g_c+I1), s	3.1	35.5		25.8	23.5	28.2		10.6				
Green Ext Time (p_c), s	0.0	19.2		2.6	0.0	16.7		0.6				

Intersection Summary

HCM 6th Ctrl Delay	146.8
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- * HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	184	278	0	0	282	1	0	0	0	1	0	81
Future Vol, veh/h	184	278	0	0	282	1	0	0	0	1	0	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	61	12	0	100	14	12	0	0	0	12	0	32
Mvmt Flow	200	302	0	0	307	1	0	0	0	1	0	88

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	308	0	0	302	0	0	1054	1010	302	1010	1010	308
Stage 1	-	-	-	-	-	-	702	702	-	308	308	-
Stage 2	-	-	-	-	-	-	352	308	-	702	702	-
Critical Hdwy	4.71	-	-	5.1	-	-	7.1	6.5	6.2	7.22	6.5	6.52
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.22	5.5	-
Follow-up Hdwy	2.749	-	-	3.1	-	-	3.5	4	3.3	3.608	4	3.588
Pot Cap-1 Maneuver	982	-	-	860	-	-	206	242	742	209	242	667
Stage 1	-	-	-	-	-	-	432	443	-	681	664	-
Stage 2	-	-	-	-	-	-	669	664	-	413	443	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	982	-	-	860	-	-	151	193	742	176	193	667
Mov Cap-2 Maneuver	-	-	-	-	-	-	151	193	-	176	193	-
Stage 1	-	-	-	-	-	-	344	353	-	542	664	-
Stage 2	-	-	-	-	-	-	581	664	-	329	353	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.8	0	0	11.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	982	-	-	860	-	-	176	667
HCM Lane V/C Ratio	-	0.204	-	-	-	-	-	0.006	0.132
HCM Control Delay (s)	0	9.6	-	-	0	-	-	25.6	11.2
HCM Lane LOS	A	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	-	0.8	-	-	0	-	-	0	0.5




















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕	↕	
Traffic Volume (vph)	0	0	607	0	444	0
Future Volume (vph)	0	0	607	0	444	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0	
Lane Util. Factor				1.00	1.00	
Frt				1.00	1.00	
Flt Protected				0.95	0.95	
Satd. Flow (prot)				1805	1736	
Flt Permitted				0.95	0.95	
Satd. Flow (perm)				1805	1736	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	653	0	477	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	653	477	0
Heavy Vehicles (%)	0%	0%	0%	105%	4%	0%
Turn Type			Prot	NA	Prot	
Protected Phases			3	8	2	
Permitted Phases						
Actuated Green, G (s)				57.9	31.8	
Effective Green, g (s)				58.4	32.3	
Actuated g/C Ratio				0.59	0.33	
Clearance Time (s)				4.5	4.5	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				1068	568	
v/s Ratio Prot					0.27	
v/s Ratio Perm				0.36		
v/c Ratio				0.61	0.84	
Uniform Delay, d1				12.9	30.8	
Progression Factor				1.00	1.00	
Incremental Delay, d2				1.0	10.5	
Delay (s)				13.9	41.3	
Level of Service				B	D	
Approach Delay (s)	0.0			13.9	41.3	
Approach LOS	A			B	D	
Intersection Summary						
HCM 2000 Control Delay			25.5	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio			0.69			
Actuated Cycle Length (s)			98.7	Sum of lost time (s)		8.0
Intersection Capacity Utilization			127.1%	ICU Level of Service		H
Analysis Period (min)			15			
c Critical Lane Group						



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↕	↕	
Traffic Volume (veh/h)	0	0	607	0	444	0
Future Volume (veh/h)	0	0	607	0	444	0
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00		1.00	1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1900	344	1841	0
Adj Flow Rate, veh/h			653	0	477	0
Peak Hour Factor			0.93	0.93	0.93	0.93
Percent Heavy Veh, %			0	105	4	0
Cap, veh/h			0	9999	0	0
Arrive On Green			0.00	0.00	1.00	0.00
Sat Flow, veh/h			0	344	0	
Grp Volume(v), veh/h			0	0	0.0	
Grp Sat Flow(s),veh/h/ln			0	344		
Q Serve(g_s), s			0.0	0.0		
Cycle Q Clear(g_c), s			0.0	0.0		
Prop In Lane			0.00			
Lane Grp Cap(c), veh/h			9529	2856	32	
V/C Ratio(X)			0.00	0.00		
Avail Cap(c_a), veh/h			552698	53757	44	
HCM Platoon Ratio			1.00	1.00		
Upstream Filter(I)			0.00	0.00		
Uniform Delay (d), s/veh			0.0	0.0		
Incr Delay (d2), s/veh			0.0	0.0		
Initial Q Delay(d3),s/veh			0.0	0.0		
%ile BackOfQ(95%),veh/ln			0.0	0.0		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			0.0	0.0		
LnGrp LOS			A	A		
Approach Vol, veh/h				0		
Approach Delay, s/veh				0.0		
Approach LOS						
Timer - Assigned Phs						8
Phs Duration (G+Y+Rc), s						0.0
Change Period (Y+Rc), s						* 4.5
Max Green Setting (Gmax), s						* 58
Max Q Clear Time (g_c+I1), s						0.0
Green Ext Time (p_c), s						0.0
Intersection Summary						
HCM 6th Ctrl Delay			0.0			
HCM 6th LOS			A			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Future Traffic Conditions - Six-Lane FEIS
 102: 122nd Avenue & Sunrise EB

































Weekday PM Peak Hour
 08/06/2024

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	777	0	0	0	0	444	830	0	607	0	
Future Volume (vph)	0	0	777	0	0	0	0	444	830	0	607	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0		
Lane Util. Factor		0.95	0.95					1.00	1.00		1.00		
Frt		0.85	0.85					1.00	0.85		1.00		
Flt Protected		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (prot)		1447	1447					1810	1553		1900		
Flt Permitted		1.00	1.00					1.00	1.00		1.00		
Satd. Flow (perm)		1447	1447					1810	1553		1900		
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	0	0	835	0	0	0	0	477	892	0	653	0	
RTOR Reduction (vph)	0	109	109	0	0	0	0	0	448	0	0	0	
Lane Group Flow (vph)	0	309	308	0	0	0	0	477	444	0	653	0	
Heavy Vehicles (%)	0%	0%	6%	0%	0%	0%	0%	5%	4%	0%	0%	0%	
Turn Type		NA	Perm					NA	Perm		NA		
Protected Phases		4						2			6		
Permitted Phases	4		4						2	6			
Actuated Green, G (s)		22.3	22.3					30.0	30.0		30.0		
Effective Green, g (s)		22.8	22.8					30.5	30.5		30.5		
Actuated g/C Ratio		0.37	0.37					0.50	0.50		0.50		
Clearance Time (s)		4.5	4.5					4.5	4.5		4.5		
Vehicle Extension (s)		3.0	3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		538	538					900	772		945		
v/s Ratio Prot		c0.21						0.26			c0.34		
v/s Ratio Perm			0.21						0.29				
v/c Ratio		0.57	0.57					0.53	0.57		0.69		
Uniform Delay, d1		15.4	15.4					10.5	10.8		11.8		
Progression Factor		1.00	1.00					1.00	1.00		1.00		
Incremental Delay, d2		1.5	1.5					0.6	1.0		2.2		
Delay (s)		16.9	16.8					11.1	11.9		14.0		
Level of Service		B	B					B	B		B		
Approach Delay (s)		16.8			0.0			11.6			14.0		
Approach LOS		B			A			B			B		
Intersection Summary													
HCM 2000 Control Delay			13.7									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			61.3									Sum of lost time (s)	8.0
Intersection Capacity Utilization			110.4%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

HCM 6th Edition methodology does not support turning movements with shared & exclusive lanes.

































Future Traffic Conditions - Six-Lane FEIS
107: Rock Creek Blvd & Sunrise

Weekday PM Peak Hour
08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 		 	 	 	 	 	 	 
Traffic Volume (vph)	50	0	589	110	0	16	618	355	269	26	302	89
Future Volume (vph)	50	0	589	110	0	16	618	355	269	26	302	89
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0		4.0	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	0.97		1.00	0.97		1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00		0.85	1.00		0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3502		1524	3335		1615	3335	3610	1538	3502	3610	1615
Flt Permitted	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3502		1524	3335		1615	3335	3610	1538	3502	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	0	620	116	0	17	651	374	283	27	318	94
RTOR Reduction (vph)	0	0	525	0	0	14	0	0	55	0	0	44
Lane Group Flow (vph)	53	0	95	116	0	3	651	374	228	27	318	50
Heavy Vehicles (%)	0%	6%	6%	5%	7%	0%	5%	0%	5%	0%	0%	0%
Turn Type	Prot		Perm	Prot		Perm	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	3			7			5	2	2 7	1	6	6 3
Permitted Phases			3			7						
Actuated Green, G (s)	8.1		8.1	8.1		8.1	15.3	29.1	42.6	0.9	14.7	28.2
Effective Green, g (s)	8.1		8.1	8.1		8.1	15.3	29.1	42.6	0.9	14.7	28.2
Actuated g/C Ratio	0.15		0.15	0.15		0.15	0.29	0.55	0.81	0.02	0.28	0.53
Clearance Time (s)	4.0		4.0	4.0		4.0	5.4	5.4		5.4	5.4	
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	536		233	510		247	964	1985	1238	59	1003	860
v/s Ratio Prot	0.02			0.03			c0.20	0.10	0.15	0.01	c0.09	0.03
v/s Ratio Perm			c0.06			0.00						
v/c Ratio	0.10		0.41	0.23		0.01	0.68	0.19	0.18	0.46	0.32	0.06
Uniform Delay, d1	19.3		20.2	19.7		19.0	16.6	6.0	1.2	25.8	15.1	6.0
Progression Factor	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		1.2	0.2		0.0	1.9	0.0	0.1	5.5	0.2	0.0
Delay (s)	19.3		21.4	19.9		19.0	18.5	6.0	1.2	31.3	15.3	6.0
Level of Service	B		C	B		B	B	A	A	C	B	A
Approach Delay (s)		21.2			19.8			11.2			14.3	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.8									B
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			52.9						14.8			
Intersection Capacity Utilization			59.3%									B
Analysis Period (min)			15									
c Critical Lane Group												

Future Traffic Conditions - Six-Lane FEIS
107: Rock Creek Blvd & Sunrise

Weekday PM Peak Hour
08/06/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 		 	 	 	 	 	 	 
Traffic Volume (veh/h)	50	0	589	110	0	16	618	355	269	26	302	89
Future Volume (veh/h)	50	0	589	110	0	16	618	355	269	26	302	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	0	1811	1826	0	1900	1826	1900	1826	1900	1900	1900
Adj Flow Rate, veh/h	53	0	620	116	0	17	651	374	283	27	318	94
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	6	5	0	0	5	0	5	0	0	0
Cap, veh/h	201	0	0	323	0	0	1002	1644	853	116	690	400
Arrive On Green	0.06	0.00	0.00	0.10	0.00	0.00	0.30	0.46	0.46	0.03	0.19	0.19
Sat Flow, veh/h	3510	53		3374	116		3374	3610	1547	3510	3610	1610
Grp Volume(v), veh/h	53	16.7		116	15.7		651	374	283	27	318	94
Grp Sat Flow(s),veh/h/ln	1755	B		1687	B		1687	1805	1547	1755	1805	1610
Q Serve(g_s), s	0.5			1.1			6.0	2.2	3.6	0.3	2.8	1.7
Cycle Q Clear(g_c), s	0.5			1.1			6.0	2.2	3.6	0.3	2.8	1.7
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	201			323			1002	1644	853	116	690	400
V/C Ratio(X)	0.26			0.36			0.65	0.23	0.33	0.23	0.46	0.23
Avail Cap(c_a), veh/h	789			758			4512	6269	2835	533	1988	979
HCM Platoon Ratio	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1			15.1			10.9	5.9	4.4	16.8	12.8	10.7
Incr Delay (d2), s/veh	0.7			0.7			0.7	0.1	0.2	1.0	0.5	0.3
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.3			0.7			3.1	1.0	1.0	0.2	1.7	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7			15.7			11.6	6.0	4.6	17.8	13.2	11.0
LnGrp LOS	B			B			B	A	A	B	B	B
Approach Vol, veh/h								1308			439	
Approach Delay, s/veh								8.5			13.0	
Approach LOS								A			B	
Timer - Assigned Phs	1	2	3		5	6	7					
Phs Duration (G+Y+Rc), s	6.6	21.6	6.0		16.0	12.2	7.4					
Change Period (Y+Rc), s	* 5.4	* 5.4	4.0		* 5.4	* 5.4	4.0					
Max Green Setting (Gmax), s	* 5.4	* 62	8.0		* 48	* 20	8.0					
Max Q Clear Time (g_c+I1), s	2.3	5.6	2.5		8.0	4.8	3.1					
Green Ext Time (p_c), s	0.0	3.8	0.0		2.6	2.0	0.1					
Intersection Summary												
HCM 6th Ctrl Delay			10.2									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Future Traffic Conditions - Six-Lane FEIS
108: Rock Creek Blvd & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	390	518	45	852	966	35
Future Volume (vph)	390	518	45	852	966	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	4.0	5.4	5.4	5.4
Lane Util. Factor	0.97	0.88	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3502	2682	1719	3610	3610	1615
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3502	2682	1719	3610	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	411	545	47	897	1017	37
RTOR Reduction (vph)	0	71	0	0	0	21
Lane Group Flow (vph)	411	474	47	897	1017	16
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%
Turn Type	Prot	pt+ov	Prot	NA	NA	Perm
Protected Phases	4	4 5	5	2	6	
Permitted Phases						6
Actuated Green, G (s)	14.6	27.3	7.3	38.6	27.3	27.3
Effective Green, g (s)	14.6	27.3	7.3	38.6	27.3	27.3
Actuated g/C Ratio	0.23	0.43	0.11	0.60	0.43	0.43
Clearance Time (s)	5.4		4.0	5.4	5.4	5.4
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	798	1144	196	2177	1539	688
v/s Ratio Prot	c0.12	c0.18	0.03	0.25	c0.28	
v/s Ratio Perm						0.01
v/c Ratio	0.52	0.41	0.24	0.41	0.66	0.02
Uniform Delay, d1	21.6	12.8	25.8	6.7	14.7	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.6	0.1	1.1	0.0
Delay (s)	22.2	13.0	26.5	6.8	15.7	10.6
Level of Service	C	B	C	A	B	B
Approach Delay (s)	17.0			7.8	15.6	
Approach LOS	B			A	B	

Intersection Summary

HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Future Traffic Conditions - Six-Lane FEIS
108: Rock Creek Blvd & Highway 212

Weekday PM Peak Hour
08/06/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	390	518	45	852	966	35
Future Volume (veh/h)	390	518	45	852	966	35
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1900	1811	1826	1900	1900	1900
Adj Flow Rate, veh/h	411	545	47	897	1017	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	6	5	0	0	0
Cap, veh/h	932	843	81	1950	1522	679
Arrive On Green	0.27	0.27	0.05	0.54	0.42	0.42
Sat Flow, veh/h	3510	2701	1739	3705	3705	1610
Grp Volume(v), veh/h	411	545	47	897	1017	37
Grp Sat Flow(s),veh/h/ln	1755	1351	1739	1805	1805	1610
Q Serve(g_s), s	5.4	9.7	1.5	8.5	12.6	0.8
Cycle Q Clear(g_c), s	5.4	9.7	1.5	8.5	12.6	0.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	932	843	81	1950	1522	679
V/C Ratio(X)	0.44	0.65	0.58	0.46	0.67	0.05
Avail Cap(c_a), veh/h	1428	1224	250	3677	2897	1292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	16.5	26.0	7.8	12.9	9.5
Incr Delay (d2), s/veh	0.3	0.8	6.5	0.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.6	11.6	1.3	4.6	7.8	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.3	17.3	32.5	8.0	13.4	9.5
LnGrp LOS	B	B	C	A	B	A
Approach Vol, veh/h	956			944	1054	
Approach Delay, s/veh	17.3			9.2	13.3	
Approach LOS	B			A	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		35.4		20.2	6.6	28.8
Change Period (Y+Rc), s		* 5.4		* 5.4	4.0	* 5.4
Max Green Setting (Gmax), s		* 57		* 23	8.0	* 45
Max Q Clear Time (g_c+I1), s		10.5		11.7	3.5	14.6
Green Ext Time (p_c), s		7.9		3.1	0.0	8.8

Intersection Summary

HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Sunrise Refinement Plan

Vistro File: H:\...\Sunrise_PM_FEIS.vistro

Scenario: Base Scenario

Report File: H:\...\2045_FEISPM.pdf

3/17/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	OR 213 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.808	24.2	C
2	OR 213 NB Ramps/I-205 SB Ramps/OR 224	Signalized	HCM 7th Edition	WB Right	0.964	58.9	E
3	I-205 NB Ramps/OR 224	Signalized	HCM 7th Edition	WB Left	0.649	13.6	B
4	122nd Avenue/OR 224/OR 212	Signalized	HCM 7th Edition	WB Left	0.678	41.9	D
5	135th Avenue/OR 212	Signalized	HCM 7th Edition	NB Right	0.870	58.6	E
6	142nd Avenue/OR 212	Signalized	HCM 7th Edition	SB Right	0.573	13.5	B
7	152nd Avenue/OR 212	Two-way stop	HCM 7th Edition	SB Left	1.215	335.6	F
8	OR 212/OR 224 (Rock Creek Junction)	Signalized	HCM 7th Edition	WB Left	0.389	10.6	B
9	172nd Avenue/OR 212	Signalized	HCM 7th Edition	WB Left	0.873	38.9	D
10	122nd Avenue/Jennifer Street	Two-way stop	HCM 7th Edition	SB Left	0.006	25.3	D
101	Sunrise Expy/122nd Avenue EB Ramps	Signalized	HCM 7th Edition	NB Left	0.802	13.5	B
102	Sunrise Expy/122nd Avenue WB Ramps	Signalized	HCM 7th Edition	EB Right	0.918	26.0	C
107	Sunrise Expy/OR 224	Signalized	HCM 7th Edition	EB Right	0.831	25.5	C
108	Sunrise Expy/OR 224 Jughandle	Signalized	HCM 7th Edition	NB Left	0.644	11.9	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report
Intersection 1: OR 213 SB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	24.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.808

Intersection Setup

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1000.00	75.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present				No			No			No		
Crosswalk	No			No			No			No		

Volumes

Name	I-205 SB On-Ramp			I-205 SB On-Ramp			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	0	0	0	308	1	370	0	2295	266	28	1332	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	4.00	2.00	2.00	0.00	5.00	5.00	13.00	4.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	308	1	370	0	2295	266	28	1332	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9700	1.0000	0.9700	1.0000	0.9700	0.9700	0.9700	0.9700	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	79	0	95	0	591	69	7	343	0
Total Analysis Volume [veh/h]	0	0	0	318	1	381	0	2366	274	29	1373	0
Presence of On-Street Parking				No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	125.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	0	0	4	0	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Maximum Green [s]	0	0	0	35	0	35	0	71	71	9	84	0
Amber [s]	0.0	0.0	0.0	4.0	0.0	4.0	0.0	5.0	5.0	3.5	5.0	0.0
All red [s]	0.0	0.0	0.0	1.5	0.0	1.5	0.0	1.0	1.0	0.5	1.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No				No			No	
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	3.5	0.0	3.5	0.0	4.0	4.0	2.0	4.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	20.0	0.0	20.0	0.0	6.0	6.0	20.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	0	40	0	40	0	77	77	13	90	0
Lead / Lag	-	-	-	Lag	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	6	0	6	0	10	10	4	10	0
Vehicle Extension [s]	0.0	0.0	0.0	2.3	0.0	2.3	0.0	0.5	0.5	2.3	0.5	0.0
Minimum Recall				No				Yes		No	Yes	
Maximum Recall				No				No		No	No	
Pedestrian Recall				No				No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group		L	R	C	R	L	C
C, Cycle Length [s]		130	130	130	130	130	130
L, Total Lost Time per Cycle [s]		5.50	5.50	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		3.50	3.50	4.00	4.00	2.00	4.00
g_i, Effective Green Time [s]		33	33	79	79	3	85
g / C, Green / Cycle		0.25	0.25	0.60	0.60	0.02	0.66
(v / s)_i Volume / Saturation Flow Rate		0.18	0.24	0.48	0.18	0.02	0.27
s, saturation flow rate [veh/h]		1752	1589	4971	1551	1624	5012
c, Capacity [veh/h]		445	404	3001	937	37	3295
d1, Uniform Delay [s]		44.19	47.58	19.48	12.40	63.18	10.50
k, delay calibration		0.16	0.33	0.50	0.50	0.07	0.50
l, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.23	25.07	2.18	0.79	18.70	0.39
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.71	0.94	0.79	0.29	0.78	0.42
d, Delay for Lane Group [s/veh]		47.42	72.65	21.66	13.19	81.88	10.89
Lane Group LOS		D	E	C	B	F	B
Critical Lane Group		No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]		9.75	14.87	17.76	4.00	1.15	6.10
50th-Percentile Queue Length [ft/ln]		243.65	371.71	443.97	99.98	28.78	152.39
95th-Percentile Queue Length [veh/ln]		14.87	21.19	24.67	7.20	2.07	10.14
95th-Percentile Queue Length [ft/ln]		371.65	529.80	616.75	179.96	51.81	253.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	47.42	0.00	72.65	0.00	21.66	13.19	81.88	10.89	0.00
Movement LOS				D		E		C	B	F	B	
d_A, Approach Delay [s/veh]	0.00			61.17			20.78			12.36		
Approach LOS	A			E			C			B		
d_I, Intersection Delay [s/veh]	24.25											
Intersection LOS	C											
Intersection V/C	0.808											

Emissions

Vehicle Miles Traveled [mph]		61.54	73.73	749.50	86.80	4.57	216.49
Stops [stops/h]		269.88	411.71	1475.26	110.74	31.88	506.38
Fuel consumption [US gal/h]		7.09	10.94	49.43	4.92	0.85	14.75
CO [g/h]		495.79	764.83	3455.48	343.94	59.24	1031.27
NOx [g/h]		96.46	148.81	672.31	66.92	11.53	200.65
VOC [g/h]		114.91	177.26	800.84	79.71	13.73	239.01

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	531	1092	1292
d_b, Bicycle Delay [s]	65.00	35.08	13.39	8.14
I_b,int, Bicycle LOS Score for Intersection	4.132	1.560	3.012	2.331
Bicycle LOS	D	A	C	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: OR 213 NB Ramps/I-205 SB Ramps/OR 224

Control Type:	Signalized	Delay (sec / veh):	58.9
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.964

Intersection Setup

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐			⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	415.00	100.00	100.00	160.00	100.00	405.00	365.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	I-205 SB Off-Ramp			OR 213 NB			Sunrise Pkwy			Sunrise Pkwy		
Base Volume Input [veh/h]	354	7	318	20	0	231	542	2061	0	0	775	402
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	12.00	17.00	10.00	0.00	5.00	2.00	6.00	0.00	0.00	4.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	1	0	0	0	0	0	0	0	0	13
Total Hourly Volume [veh/h]	354	7	317	20	0	231	542	2061	0	0	775	389
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	2	85	5	0	62	146	554	0	0	208	105
Total Analysis Volume [veh/h]	381	8	341	22	0	248	583	2216	0	0	833	418
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			1			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	19.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	3	8	8	7	0	4	5	2	0	0	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	21	31	31	8	0	18	43	75	0	0	28	28
Amber [s]	4.0	4.0	4.0	4.0	0.0	4.0	3.5	5.0	0.0	0.0	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	0.0	1.5	0.5	1.0	0.0	0.0	1.0	1.0
Walk [s]	7	7	7	0	0	0	0	7	0	0	7	7
Pedestrian Clearance [s]	12	24	24	0	0	0	0	20	0	0	12	12
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No		No				No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	3.5	3.5	3.5	3.5	0.0	3.5	2.0	4.0	0.0	0.0	4.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	0.0	0.0	20.0	6.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	26	37	37	13	0	23	47	81	0	0	34	34
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	6	4	4	4	0	4	4	6	0	0	6	6
Vehicle Extension [s]	2.3	2.3	2.3	2.3	0.0	2.3	2.3	4.6	0.0	0.0	4.6	4.6
Minimum Recall	No	No		No		No	Yes	Yes			No	
Maximum Recall	No	No		No		No	No	No			No	
Pedestrian Recall	No	No		No		No	No	No			No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	R	L	C	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.50	5.50	5.50	5.50	4.00	6.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.50	3.50	3.50	0.00	2.00	4.00	4.00	4.00
g_i, Effective Green Time [s]	24	31	2	61	47	79	28	28
g / C, Green / Cycle	0.19	0.24	0.02	0.47	0.36	0.61	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.11	0.24	0.01	0.09	0.33	0.45	0.24	0.27
s, saturation flow rate [veh/h]	3375	1467	1667	2746	1781	4930	3503	1564
c, Capacity [veh/h]	634	355	29	1279	647	3005	754	337
d1, Uniform Delay [s]	48.32	48.98	63.58	20.38	39.17	18.01	51.01	51.01
k, delay calibration	0.07	0.40	0.07	0.07	0.50	0.50	0.19	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.56	38.46	20.68	0.04	18.02	1.66	55.15	131.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.98	0.75	0.19	0.90	0.74	1.10	1.24
d, Delay for Lane Group [s/veh]	48.89	87.45	84.26	20.43	57.20	19.67	106.16	182.22
Lane Group LOS	D	F	F	C	E	B	F	F
Critical Lane Group	No	Yes	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.73	15.01	0.90	2.24	20.66	15.50	18.01	23.20
50th-Percentile Queue Length [ft/ln]	143.16	375.18	22.38	56.11	516.47	387.52	450.37	580.04
95th-Percentile Queue Length [veh/ln]	9.65	21.36	1.61	4.04	28.11	21.96	26.35	34.71
95th-Percentile Queue Length [ft/ln]	241.28	534.00	40.28	101.00	702.82	548.95	658.85	867.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.89	87.45	87.45	84.26	0.00	20.43	57.20	19.67	0.00	0.00	106.16	182.22
Movement LOS	D	F	F	F		C	E	B			F	F
d_A, Approach Delay [s/veh]	67.32			25.63			27.49			131.57		
Approach LOS	E			C			C			F		
d_I, Intersection Delay [s/veh]	58.93											
Intersection LOS	E											
Intersection V/C	0.964											

Emissions

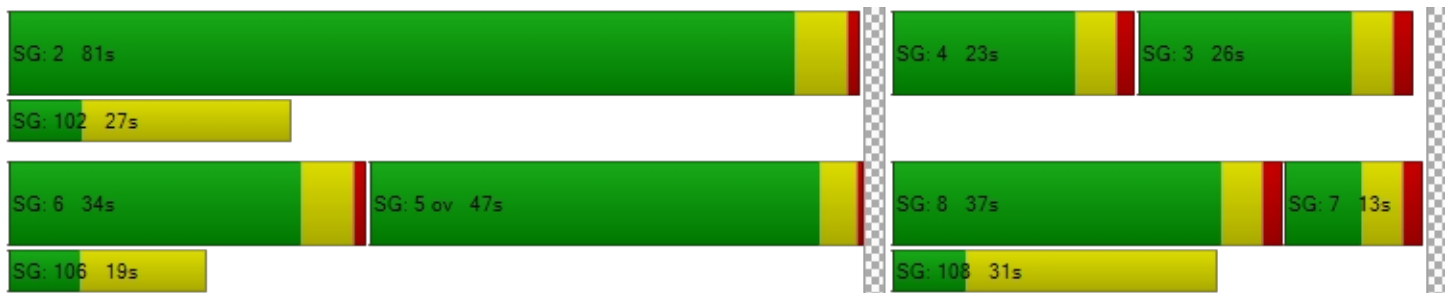
Vehicle Miles Traveled [mph]	79.81	73.11	3.15	35.55	91.92	349.41	208.69	104.72
Stops [stops/h]	317.14	415.55	24.79	124.30	572.05	1287.69	997.69	642.47
Fuel consumption [US gal/h]	8.83	11.52	0.64	3.18	13.73	30.37	32.10	23.36
CO [g/h]	617.04	804.90	45.01	222.35	959.71	2122.76	2243.44	1632.71
NOx [g/h]	120.05	156.61	8.76	43.26	186.73	413.01	436.49	317.67
VOC [g/h]	143.01	186.54	10.43	51.53	222.42	491.97	519.94	378.40

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	54.47	0.00	54.47
I_p,int, Pedestrian LOS Score for Intersectio	2.197	2.464	0.000	3.086
Crosswalk LOS	B	B	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	485	115	1154	431
d_b, Bicycle Delay [s]	37.32	57.72	11.64	40.02
I_b,int, Bicycle LOS Score for Intersection	2.766	1.560	3.099	2.255
Bicycle LOS	C	A	C	B

Sequence

Ring 1	-	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 3: I-205 NB Ramps/OR 224**

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.649

Intersection Setup

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Approach	Eastbound		Westbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	2	0	0	2
Entry Pocket Length [ft]	100.00	100.00	630.00	100.00	100.00	220.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	0.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present			No		No	
Crosswalk	No		No		No	

Volumes

Name	I-205 NB On-Ramp		Sunrise Pkwy		Sunrise Pkwy	
Base Volume Input [veh/h]	0	0	268	1177	2029	370
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	6.00	1.00	12.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	268	1177	2029	370
Peak Hour Factor	1.0000	1.0000	0.9300	0.9300	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	72	316	518	94
Total Analysis Volume [veh/h]	0	0	288	1266	2070	378
Presence of On-Street Parking			No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	1		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Semi-actuated
Offset [s]	50.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	0	0	1	6	2	2
Auxiliary Signal Groups						
Maximum Green [s]	0	0	26	89	59	59
Amber [s]	0.0	0.0	3.5	5.0	5.0	5.0
All red [s]	0.0	0.0	0.5	2.0	2.0	2.0
Walk [s]	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	0	17	17
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk				No	No	
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	5.0	5.0	5.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	20.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	0	0	30	96	66	66
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	0	0	4	10	10	10
Vehicle Extension [s]	0.0	0.0	2.3	4.7	4.7	4.7
Minimum Recall			No	Yes	Yes	
Maximum Recall			No	No	No	
Pedestrian Recall			No	No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R
C, Cycle Length [s]	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	7.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	5.00	5.00	5.00
g_i, Effective Green Time [s]	24	116	88	88
g / C, Green / Cycle	0.18	0.89	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.17	0.25	0.44	0.25
s, saturation flow rate [veh/h]	1724	5135	4685	1526
c, Capacity [veh/h]	312	4578	3185	1037
d1, Uniform Delay [s]	52.35	1.02	11.94	8.86
k, delay calibration	0.31	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	24.73	0.15	1.04	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.28	0.65	0.36
d, Delay for Lane Group [s/veh]	77.08	1.17	12.98	9.85
Lane Group LOS	E	A	B	A
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	11.37	0.63	11.02	4.64
50th-Percentile Queue Length [ft/ln]	284.30	15.87	275.46	115.99
95th-Percentile Queue Length [veh/ln]	16.90	1.14	16.46	8.17
95th-Percentile Queue Length [ft/ln]	422.56	28.56	411.55	204.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	77.08	1.17	12.98	9.85
Movement LOS			E	A	B	A
d_A, Approach Delay [s/veh]	0.00		15.23		12.50	
Approach LOS	A		B		B	
d_I, Intersection Delay [s/veh]	13.56					
Intersection LOS	B					
Intersection V/C	0.649					

Emissions

Vehicle Miles Traveled [mph]		399.13	1754.50	518.60	94.70
Stops [stops/h]		314.92	52.72	915.37	128.48
Fuel consumption [US gal/h]		22.69	72.82	31.88	5.37
CO [g/h]		1585.84	5089.98	2228.11	375.10
NOx [g/h]		308.55	990.32	433.51	72.98
VOC [g/h]		367.53	1179.65	516.39	86.93

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	0.000
Crosswalk LOS	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	0	1369	908
d_b, Bicycle Delay [s]	65.00	6.47	19.39
I_b,int, Bicycle LOS Score for Intersection	4.132	2.414	2.906
Bicycle LOS	D	B	C

Sequence

Ring 1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: 122nd Avenue/OR 224/OR 212

Control Type:	Signalized	Delay (sec / veh):	41.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

Intersection Setup

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T			T T T T			T T T			T T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	2
Entry Pocket Length [ft]	135.00	100.00	100.00	525.00	100.00	350.00	220.00	100.00	100.00	255.00	100.00	410.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Highway 212			Highway 212		
Base Volume Input [veh/h]	45	211	10	456	197	731	704	494	58	10	394	359
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	5.00	5.00	4.00	13.00	2.00	6.00	5.00	16.00	5.00	8.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	10	0	0	366	0	0	37	0	0	359
Total Hourly Volume [veh/h]	45	211	0	456	197	365	704	494	21	10	394	0
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	54	0	118	51	94	181	127	5	3	102	0
Total Analysis Volume [veh/h]	46	218	0	470	203	376	726	509	22	10	406	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			1		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	42.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						6,7
Maximum Green [s]	9	35	35	19	45	45	31	54	54	4	27	27
Amber [s]	3.5	4.3	4.3	3.5	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	9	9	0	7	7	0	8	8	0	7	7
Pedestrian Clearance [s]	0	26	26	0	21	21	0	23	23	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.8	2.8	2.0	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	13	40	40	23	50	50	35	59	59	8	32	32
Lead / Lag	Lag	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	2.3	2.3	2.3	2.3	2.3	2.0	4.6	4.6	2.0	4.6	4.6
Minimum Recall	No	No		No	No	No	No	Yes		No	Yes	Yes
Maximum Recall	No	No		No	No	No	No	No		No	No	No
Pedestrian Recall	No	No		No	No	No	No	No		No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.80	4.00	4.80	4.80	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.80	2.00	2.80	0.00	2.00	3.40	3.40	2.00	3.40	0.00
g_i, Effective Green Time [s]	19	18	20	18	52	30	73	73	1	44	90
g / C, Green / Cycle	0.15	0.13	0.15	0.14	0.40	0.23	0.56	0.56	0.01	0.34	0.70
(v / s)_i Volume / Saturation Flow Rate	0.03	0.12	0.14	0.12	0.13	0.22	0.15	0.15	0.01	0.12	0.00
s, saturation flow rate [veh/h]	1709	1825	3403	1705	2813	3348	1825	1798	1738	3389	2813
c, Capacity [veh/h]	251	247	515	238	1131	776	1029	1014	17	1158	1958
d1, Uniform Delay [s]	48.60	55.21	54.31	54.63	26.81	48.97	14.48	14.48	64.14	32.02	0.00
k, delay calibration	0.07	0.07	0.07	0.07	0.07	0.04	0.50	0.50	0.04	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	6.52	4.31	5.37	0.10	2.48	0.61	0.62	12.57	0.84	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.88	0.91	0.85	0.33	0.94	0.26	0.26	0.61	0.35	0.00
d, Delay for Lane Group [s/veh]	48.81	61.73	58.62	60.00	26.92	51.45	15.09	15.11	76.71	32.85	0.00
Lane Group LOS	D	E	E	E	C	D	B	B	E	C	A
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.33	7.47	7.88	6.85	4.08	11.79	4.20	4.15	0.39	4.95	0.00
50th-Percentile Queue Length [ft/ln]	33.35	186.66	196.91	171.33	101.95	294.70	105.01	103.70	9.71	123.80	0.00
95th-Percentile Queue Length [veh/ln]	2.40	11.95	12.48	11.15	7.34	17.42	7.56	7.47	0.70	8.60	0.00
95th-Percentile Queue Length [ft/ln]	60.04	298.70	311.98	278.67	183.51	435.47	189.02	186.66	17.48	215.04	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.81	61.73	61.73	58.62	60.00	26.92	51.45	15.10	15.11	76.71	32.85	0.00
Movement LOS	D	E	E	E	E	C	D	B	B	E	C	A
d_A, Approach Delay [s/veh]	59.48			47.52			36.10			33.91		
Approach LOS	E			D			D			C		
d_I, Intersection Delay [s/veh]	41.87											
Intersection LOS	D											
Intersection V/C	0.678											

Emissions

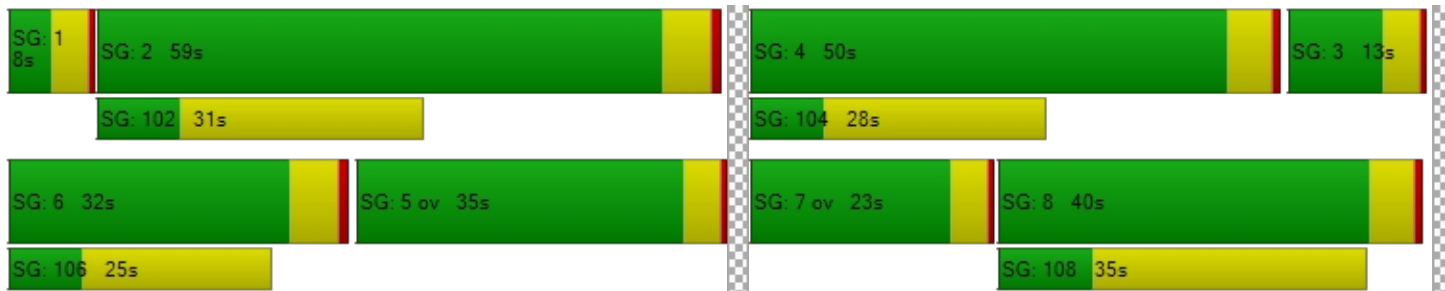
Vehicle Miles Traveled [mph]	10.37	49.13	108.52	46.87	86.82	652.55	240.23	237.04	6.59	267.68	0.00
Stops [stops/h]	36.95	206.76	436.23	189.78	225.85	652.87	116.32	114.87	10.76	274.26	0.00
Fuel consumption [US gal/h]	1.09	5.90	12.48	5.46	6.88	38.07	11.35	11.20	0.49	15.25	0.00
CO [g/h]	76.03	412.63	872.59	381.41	481.00	2661.15	793.58	783.12	34.04	1065.90	0.00
NOx [g/h]	14.79	80.28	169.77	74.21	93.59	517.76	154.40	152.37	6.62	207.39	0.00
VOC [g/h]	17.62	95.63	202.23	88.39	111.48	616.75	183.92	181.50	7.89	247.03	0.00

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		11.0		13.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00
d_p, Pedestrian Delay [s]	53.55		54.47		54.47		52.65
I_p,int, Pedestrian LOS Score for Intersectio	2.149		3.433		2.927		3.367
Crosswalk LOS	B		C		C		C
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000
c_b, Capacity of the bicycle lane [bicycles/h]	542		695		825		409
d_b, Bicycle Delay [s]	34.57		27.66		22.45		41.14
I_b,int, Bicycle LOS Score for Intersection	2.012		3.894		2.627		2.199
Bicycle LOS	B		D		B		B

Sequence

Ring 1	1	2	4	3	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	7	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 5: 135th Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	58.6
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.870

Intersection Setup

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	300.00	100.00	60.00	320.00	100.00	100.00	415.00	100.00	60.00	200.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	135th Ave			135th Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	32	173	404	391	189	178	126	724	14	80	360	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	8.00	1.00	5.00	3.00	3.00	4.00	1.00	6.00	4.00	3.00	7.00	3.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	173	404	391	189	178	126	724	14	80	360	109
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	45	104	101	49	46	32	187	4	21	93	28
Total Analysis Volume [veh/h]	33	178	416	403	195	184	130	746	14	82	371	112
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	1			1			1			0		
v_di, Inbound Pedestrian Volume crossing m	1			0			1			1		
v_co, Outbound Pedestrian Volume crossing	1			0			1			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			1			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			1			0			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	89.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	7	31	31	37	61	61	13	36	36	9	32	32
Amber [s]	3.5	4.0	4.0	3.5	4.0	4.0	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	0	8	8	0	10	10	0	8	8	0	7	7
Pedestrian Clearance [s]	0	22	22	0	25	25	0	18	18	0	14	14
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.5	2.5	2.0	2.5	2.5	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	11	35	35	41	65	65	17	41	41	13	37	37
Lead / Lag	Lead	-	-	Lag	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	6	6	4	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.3	3.0	3.0	2.3	3.0	3.0	2.3	4.5	4.5	2.3	4.5	4.5
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.50	4.50	4.00	4.50	4.00	5.40	5.40	4.00	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.50	2.50	2.00	2.50	2.00	3.40	3.40	2.00	3.40	3.40
g_i, Effective Green Time [s]	3	32	32	32	61	11	41	41	8	37	37
g / C, Green / Cycle	0.02	0.25	0.25	0.24	0.47	0.09	0.31	0.31	0.06	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.09	0.27	0.23	0.22	0.07	0.22	0.01	0.05	0.14	0.14
s, saturation flow rate [veh/h]	1695	1885	1528	1767	1697	1795	3446	1559	1767	1795	1632
c, Capacity [veh/h]	42	466	378	429	790	155	1082	489	103	513	467
d1, Uniform Delay [s]	63.07	40.69	48.71	48.26	23.92	58.50	39.05	30.88	60.46	38.51	38.68
k, delay calibration	0.07	0.11	0.50	0.29	0.11	0.18	0.50	0.50	0.11	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.90	0.52	76.54	20.98	0.45	17.25	3.60	0.11	12.96	3.28	3.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.38	1.10	0.94	0.48	0.84	0.69	0.03	0.80	0.49	0.50
d, Delay for Lane Group [s/veh]	80.97	41.21	125.25	69.24	24.37	75.75	42.66	30.98	73.41	41.79	42.48
Lane Group LOS	F	D	F	E	C	E	D	C	E	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.30	4.84	20.15	15.27	8.10	4.96	10.97	0.32	3.05	7.11	6.73
50th-Percentile Queue Length [ft/ln]	32.41	121.00	503.81	381.79	202.51	124.08	274.26	8.10	76.18	177.83	168.31
95th-Percentile Queue Length [veh/ln]	2.33	8.45	29.09	21.68	12.77	8.62	16.40	0.58	5.49	11.49	10.99
95th-Percentile Queue Length [ft/ln]	58.34	211.20	727.32	542.01	319.20	215.42	410.05	14.59	137.13	287.19	274.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	80.97	41.21	125.25	69.24	24.37	24.37	75.75	42.66	30.98	73.41	42.01	42.48
Movement LOS	F	D	F	E	C	C	E	D	C	E	D	D
d_A, Approach Delay [s/veh]	99.06			47.49			47.31			46.66		
Approach LOS	F			D			D			D		
d_I, Intersection Delay [s/veh]	58.56											
Intersection LOS	E											
Intersection V/C	0.870											

Emissions

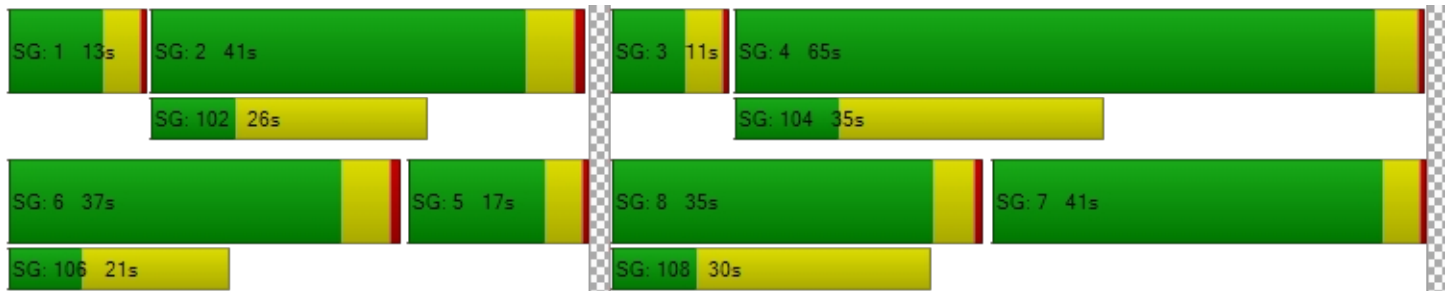
Vehicle Miles Traveled [mph]	6.46	34.83	81.40	49.92	46.95	85.71	491.85	9.23	28.95	88.14	82.39
Stops [stops/h]	35.90	134.03	558.04	422.88	224.30	137.43	607.55	8.98	84.38	196.98	186.42
Fuel consumption [US gal/h]	1.01	3.67	17.04	10.07	5.05	6.29	30.08	0.52	2.88	6.84	6.44
CO [g/h]	70.45	256.31	1190.76	703.85	353.10	439.77	2102.57	36.20	201.51	478.08	450.07
NOx [g/h]	13.71	49.87	231.68	136.94	68.70	85.56	409.08	7.04	39.21	93.02	87.57
VOC [g/h]	16.33	59.40	275.97	163.12	81.83	101.92	487.29	8.39	46.70	110.80	104.31

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0		11.0		14.0		12.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.56		54.47		51.76		53.56	
I_p,int, Pedestrian LOS Score for Intersectio	2.372		2.348		2.709		2.732	
Crosswalk LOS	B		B		B		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	469		931		548		486	
d_b, Bicycle Delay [s]	38.14		18.59		34.28		37.30	
I_b,int, Bicycle LOS Score for Intersection	2.594		2.850		2.294		2.026	
Bicycle LOS	B		C		B		B	

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	8	7	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 6: 142nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	13.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	20.00	100.00	100.00	100.00	225.00	100.00	165.00	220.00	100.00	70.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	142nd Ave			142nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	93	6	33	67	26	83	85	1341	159	11	423	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.00	0.00	20.00	3.00	9.00	2.00	1.00	6.00	2.00	0.00	7.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	93	6	33	67	26	83	85	1341	159	11	423	11
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	2	9	17	7	21	22	346	41	3	109	3
Total Analysis Volume [veh/h]	96	6	34	69	27	86	88	1382	164	11	436	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	2			0			0			2		
v_di, Inbound Pedestrian Volume crossing m	2			0			0			2		
v_co, Outbound Pedestrian Volume crossing	1			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			1			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			1			2		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	118.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	8	8	8	4	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Maximum Green [s]	35	35	35	34	34	34	6	76	76	6	76	76
Amber [s]	3.5	3.5	3.5	4.3	4.3	4.3	3.5	4.7	4.7	3.5	4.7	4.7
All red [s]	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.7	0.7
Walk [s]	7	7	7	0	0	0	0	8	8	0	7	7
Pedestrian Clearance [s]	26	26	26	0	0	0	0	26	26	0	18	18
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	2.8	2.8	2.8	2.0	3.4	3.4	2.0	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	6.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	39	39	39	39	39	39	10	81	81	10	81	81
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	6	6	6	6	6	6	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.5	2.3	4.5	4.5	2.3	4.5	4.5
Minimum Recall		No			No		No	Yes		No	No	
Maximum Recall		No			No		No	No		No	Yes	
Pedestrian Recall		No			No		No	No		No	Yes	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	L	C	R	L	C	R
C, Cycle Length [s]	130	130	130	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	4.00	4.00	4.80	4.70	5.40	5.40	4.70	5.40	5.40
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.80	0.00	3.40	3.40	0.00	3.40	3.40
g_i, Effective Green Time [s]	18	18	17	104	97	97	104	95	95
g / C, Green / Cycle	0.14	0.14	0.13	0.80	0.75	0.75	0.80	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.10	0.03	0.12	0.08	0.40	0.11	0.02	0.13	0.01
s, saturation flow rate [veh/h]	1032	1348	1530	1042	3446	1557	464	3418	1556
c, Capacity [veh/h]	171	189	244	800	2570	1161	330	2484	1131
d1, Uniform Delay [s]	50.89	49.27	55.05	5.03	7.01	4.68	10.92	5.56	4.89
k, delay calibration	0.08	0.08	0.08	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.47	0.33	3.40	0.28	0.81	0.25	0.19	0.15	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.18	0.75	0.11	0.54	0.14	0.03	0.18	0.01
d, Delay for Lane Group [s/veh]	53.36	49.60	58.46	5.31	7.82	4.93	11.11	5.72	4.90
Lane Group LOS	D	D	E	A	A	A	B	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.16	1.00	6.09	0.47	7.52	1.23	0.07	1.79	0.08
50th-Percentile Queue Length [ft/ln]	79.05	25.00	152.14	11.71	187.98	30.70	1.65	44.82	2.05
95th-Percentile Queue Length [veh/ln]	5.69	1.80	10.13	0.84	12.02	2.21	0.12	3.23	0.15
95th-Percentile Queue Length [ft/ln]	142.30	45.00	253.29	21.07	300.41	55.27	2.96	80.68	3.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.36	53.36	49.60	58.46	58.46	58.46	5.31	7.82	4.93	11.11	5.72	4.90
Movement LOS	D	D	D	E	E	E	A	A	A	B	A	A
d_A, Approach Delay [s/veh]	52.42			58.46			7.39			5.83		
Approach LOS	D			E			A			A		
d_I, Intersection Delay [s/veh]	13.49											
Intersection LOS	B											
Intersection V/C	0.573											

Emissions

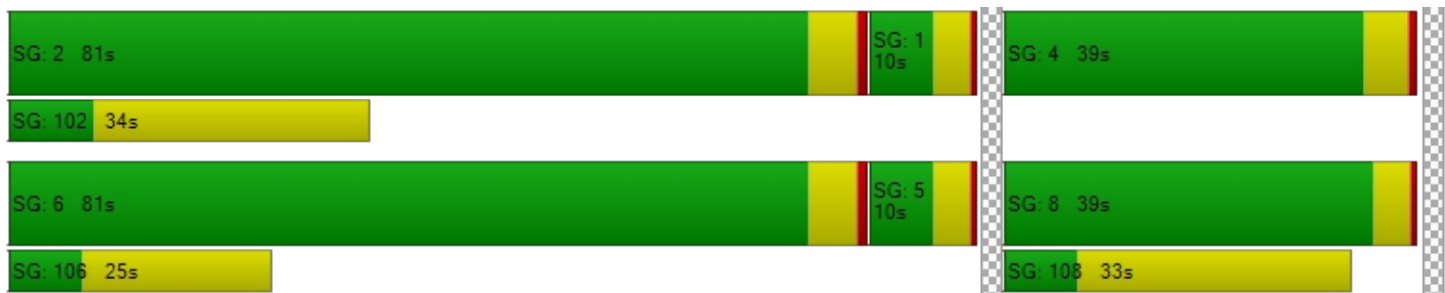
Vehicle Miles Traveled [mph]	12.53	4.18	24.70	29.42	462.07	54.83	5.28	209.29	5.28
Stops [stops/h]	87.57	27.69	168.52	12.97	416.45	34.01	1.82	99.29	2.27
Fuel consumption [US gal/h]	2.11	0.67	4.11	1.38	23.52	2.61	0.25	9.67	0.24
CO [g/h]	147.29	46.70	287.48	96.31	1644.17	182.43	17.64	676.05	16.84
NOx [g/h]	28.66	9.09	55.93	18.74	319.90	35.49	3.43	131.53	3.28
VOC [g/h]	34.14	10.82	66.63	22.32	381.05	42.28	4.09	156.68	3.90

Other Modes

g_Walk,mi, Effective Walk Time [s]	12.0	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.56	54.47	0.00	54.47
I_p,int, Pedestrian LOS Score for Intersectio	2.082	1.987	0.000	2.884
Crosswalk LOS	B	A	F	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	538	526	1163	1163
d_b, Bicycle Delay [s]	34.71	35.30	11.39	11.39
I_b,int, Bicycle LOS Score for Intersection	1.784	1.860	2.908	1.937
Bicycle LOS	A	A	C	A

Sequence

Ring 1	2	1	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	5	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 7: 152nd Avenue/OR 212**

Control Type:	Two-way stop	Delay (sec / veh):	335.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.215

Intersection Setup

Name	152nd Ave		Highway 212		Highway 212	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	220.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	152nd Ave		Highway 212		Highway 212	
Base Volume Input [veh/h]	59	211	462	993	206	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	2.00	5.00	4.00	4.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	211	462	993	206	71
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	55	120	259	54	18
Total Analysis Volume [veh/h]	61	220	481	1034	215	74
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.21	0.25	0.38	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	335.56	268.01	9.55	0.00	0.00	0.00
Movement LOS	F	F	A	A	A	A
95th-Percentile Queue Length [veh/ln]	17.30	17.30	1.80	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	432.45	432.45	44.92	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	282.68		3.03		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	40.30					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: OR 212/OR 224 (Rock Creek Junction)

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.389

Intersection Setup

Name	Highway 224		Highway 212		Highway 212	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	⇐⇐⇐		⇐⇐		⇐⇐	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	1	0	1	1	0
Entry Pocket Length [ft]	155.00	70.00	100.00	125.00	230.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Highway 224		Highway 212		Highway 212	
Base Volume Input [veh/h]	46	7	375	677	69	231
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	5.00	6.00	6.00	5.00	7.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	46	7	375	677	69	231
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	99	178	18	61
Total Analysis Volume [veh/h]	48	7	395	713	73	243
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		4		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	130
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	65.0
Offset Reference	End of Lagging Red
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Overlap	Protected	Permissive
Signal Group	8	0	2	2	1	6
Auxiliary Signal Groups				2,8		
Maximum Green [s]	67	0	29	29	19	52
Amber [s]	4.7	0.0	5.0	5.0	3.5	5.0
All red [s]	0.7	0.0	1.0	1.0	0.5	1.0
Walk [s]	8	0	7	7	7	0
Pedestrian Clearance [s]	16	0	14	14	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No		No			No
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.4	0.0	4.0	4.0	2.0	4.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	6.0	6.0	20.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	72	0	35	35	23	58
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	8	0	10	10	4	10
Vehicle Extension [s]	2.5	0.0	4.8	4.8	3.5	4.8
Minimum Recall	No		Yes	Yes	No	Yes
Maximum Recall	No		No	No	No	No
Pedestrian Recall	No		No	No	No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	R	C	R	L	C
C, Cycle Length [s]	130	130	130	130	130	130
L, Total Lost Time per Cycle [s]	5.40	5.40	6.00	6.00	4.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	4.00	0.00	2.00	4.00
g_i, Effective Green Time [s]	24	24	83	113	7	94
g / C, Green / Cycle	0.19	0.19	0.64	0.87	0.05	0.73
(v / s)_i Volume / Saturation Flow Rate	0.01	0.00	0.11	0.47	0.04	0.07
s, saturation flow rate [veh/h]	3375	1527	3446	1513	1738	3418
c, Capacity [veh/h]	630	285	2209	1316	93	2480
d1, Uniform Delay [s]	43.61	43.18	9.46	2.07	60.75	5.27
k, delay calibration	0.08	0.08	0.50	0.50	0.13	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.04	0.03	0.18	1.61	15.46	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.08	0.02	0.18	0.54	0.78	0.10
d, Delay for Lane Group [s/veh]	43.64	43.21	9.64	3.68	76.20	5.35
Lane Group LOS	D	D	A	A	E	A
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.65	0.19	2.30	3.03	2.79	0.94
50th-Percentile Queue Length [ft/ln]	16.21	4.71	57.48	75.63	69.64	23.60
95th-Percentile Queue Length [veh/ln]	1.17	0.34	4.14	5.45	5.01	1.70
95th-Percentile Queue Length [ft/ln]	29.18	8.48	103.46	136.14	125.35	42.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.64	43.21	9.64	3.68	76.20	5.35
Movement LOS	D	D	A	A	E	A
d_A, Approach Delay [s/veh]	43.59		5.80		21.72	
Approach LOS	D		A		C	
d_I, Intersection Delay [s/veh]	10.61					
Intersection LOS	B					
Intersection V/C	0.389					

Emissions

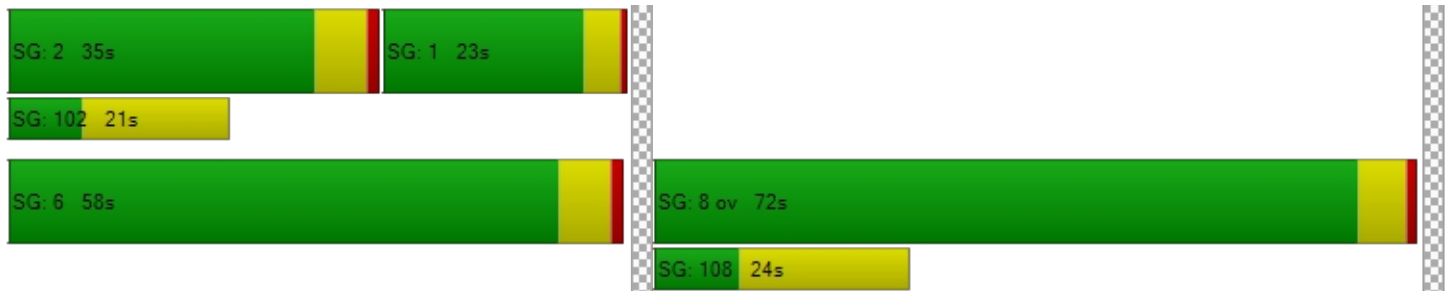
Vehicle Miles Traveled [mph]	15.70	2.29	57.35	103.52	4.65	15.47
Stops [stops/h]	35.91	5.22	127.34	83.78	77.14	52.29
Fuel consumption [US gal/h]	1.27	0.18	3.84	5.26	1.75	1.19
CO [g/h]	88.84	12.90	268.38	367.51	122.28	83.20
NOx [g/h]	17.29	2.51	52.22	71.50	23.79	16.19
VOC [g/h]	20.59	2.99	62.20	85.17	28.34	19.28

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	12.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	54.47	0.00	53.55
I_p,int, Pedestrian LOS Score for Intersectio	2.354	0.000	2.457
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1025	446	800
d_b, Bicycle Delay [s]	15.48	39.31	23.40
I_b,int, Bicycle LOS Score for Intersection	1.560	2.474	1.820
Bicycle LOS	A	B	A

Sequence

Ring 1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 9: 172nd Avenue/OR 212**

Control Type:	Signalized	Delay (sec / veh):	38.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.873

Intersection Setup

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐⇐⇐			⇐⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	2	2	0	0	1	0	1
Entry Pocket Length [ft]	110.00	100.00	100.00	235.00	100.00	290.00	550.00	100.00	100.00	395.00	100.00	420.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	172nd Ave			172nd Ave			Highway 212			Highway 212		
Base Volume Input [veh/h]	32	68	16	207	77	626	1124	1170	75	15	885	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	10.00	3.00	4.00	1.00	5.00	5.00	5.00	9.00	2.00	0.00	6.00	9.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	16	0	0	313	0	0	75	0	0	48
Total Hourly Volume [veh/h]	32	68	0	207	77	313	1124	1170	0	15	885	48
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	18	0	55	20	83	299	311	0	4	235	13
Total Analysis Volume [veh/h]	34	72	0	220	82	333	1196	1245	0	16	941	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			2			3			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			3			2			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	1			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	133
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	9.9
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	8	8	8	4	4	5	5	2	2	1	6	6
Auxiliary Signal Groups						4,5						
Maximum Green [s]	35	35	35	34	34	46	46	76	76	5	36	36
Amber [s]	3.5	3.5	3.5	4.7	4.7	3.5	3.5	5.0	5.0	3.5	5.0	5.0
All red [s]	1.5	1.5	1.5	1.5	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Walk [s]	9	9	9	9	9	0	0	7	7	0	8	8
Pedestrian Clearance [s]	22	22	22	21	21	0	0	11	11	0	20	20
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	3.0	3.0	3.0	4.2	4.2	2.5	2.5	4.5	4.5	2.5	4.5	4.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	6.0	6.0	20.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	30	30	30	30	30
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	4	4	10	10	4	10	10
Vehicle Extension [s]	2.5	2.5	2.5	2.5	2.5	2.3	2.3	5.4	5.4	2.3	5.4	5.4
Minimum Recall		No			No	No	No	No		No	No	
Maximum Recall		No			No	No	No	No		No	No	
Pedestrian Recall		No			No	No	No	No		No	No	

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	129	129	129	129	129	129	129	129	129	129	129
L, Total Lost Time per Cycle [s]	5.00	5.00	6.20	6.20	4.50	4.50	6.50	6.50	4.50	6.50	6.50
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	3.00	4.20	4.20	0.00	2.50	4.50	4.50	2.50	4.50	4.50
g_i, Effective Green Time [s]	31	31	30	30	82	46	80	80	2	36	36
g / C, Green / Cycle	0.24	0.24	0.23	0.23	0.64	0.36	0.62	0.62	0.01	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.16	0.04	0.12	0.35	0.35	0.35	0.01	0.27	0.03
s, saturation flow rate [veh/h]	1221	1855	1339	1825	2741	3375	1765	1765	1810	3446	1500
c, Capacity [veh/h]	283	443	300	419	1740	1206	1100	1100	25	963	419
d1, Uniform Delay [s]	43.87	38.80	51.52	40.01	9.76	41.19	14.12	14.12	63.20	45.96	34.59
k, delay calibration	0.08	0.08	0.13	0.08	0.08	0.07	0.31	0.31	0.07	0.28	0.28
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	0.13	4.01	0.17	0.04	7.72	1.32	1.32	16.40	16.93	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	0.16	0.73	0.20	0.19	0.99	0.57	0.57	0.65	0.98	0.12
d, Delay for Lane Group [s/veh]	44.01	38.93	55.53	40.18	9.80	48.92	15.43	15.43	79.60	62.90	34.92
Lane Group LOS	D	D	E	D	A	D	B	B	E	E	C
Critical Lane Group	No	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.93	1.84	7.28	2.14	1.94	19.93	10.60	10.60	0.64	17.09	1.25
50th-Percentile Queue Length [ft/ln]	23.21	45.97	181.88	53.44	48.42	498.28	265.11	265.11	15.88	427.21	31.21
95th-Percentile Queue Length [veh/ln]	1.67	3.31	11.70	3.85	3.49	27.25	15.95	15.95	1.14	23.87	2.25
95th-Percentile Queue Length [ft/ln]	41.77	82.74	292.47	96.20	87.15	681.33	398.63	398.63	28.58	596.70	56.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.01	38.93	38.93	55.53	40.18	9.80	48.92	15.43	15.43	79.60	62.90	34.92
Movement LOS	D	D	D	E	D	A	D	B	B	E	E	C
d_A, Approach Delay [s/veh]	40.56			29.57			31.84			61.75		
Approach LOS	D			C			C			E		
d_I, Intersection Delay [s/veh]	38.91											
Intersection LOS	D											
Intersection V/C	0.873											

Emissions

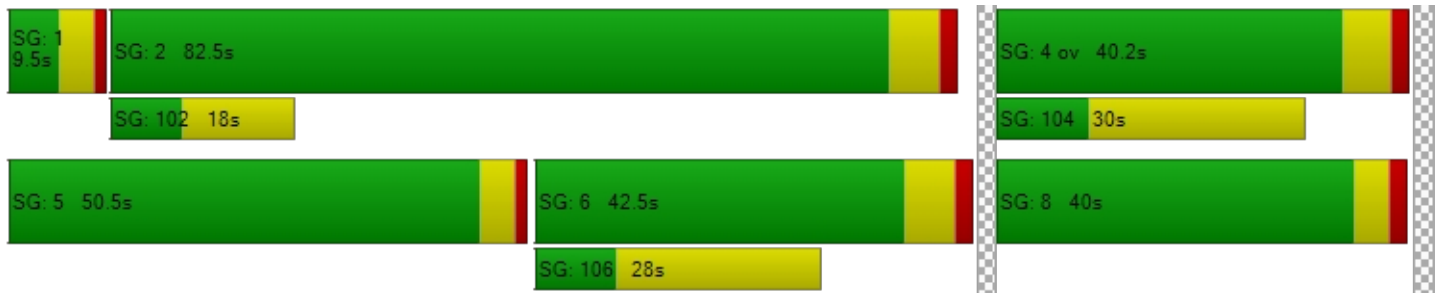
Vehicle Miles Traveled [mph]	4.00	8.47	28.62	10.67	43.31	140.88	73.33	73.33	7.49	440.65	23.88
Stops [stops/h]	25.94	51.38	203.30	59.74	108.24	1113.93	296.33	296.33	17.75	955.04	34.88
Fuel consumption [US gal/h]	0.61	1.20	4.79	1.44	3.05	23.86	6.61	6.61	0.67	35.46	1.54
CO [g/h]	42.81	84.08	334.62	100.62	212.87	1667.69	462.10	462.10	46.53	2478.59	107.53
NOx [g/h]	8.33	16.36	65.10	19.58	41.42	324.47	89.91	89.91	9.05	482.24	20.92
VOC [g/h]	9.92	19.49	77.55	23.32	49.33	386.50	107.10	107.10	10.78	574.44	24.92

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0		12.0		13.0		0.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	53.88		52.97		52.07		0.00	
I_p,int, Pedestrian LOS Score for Intersectio	2.076		3.291		3.277		0.000	
Crosswalk LOS	B		C		C		F	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	543		528		1180		559	
d_b, Bicycle Delay [s]	34.19		34.90		10.83		33.44	
I_b,int, Bicycle LOS Score for Intersection	1.761		3.124		3.635		2.431	
Bicycle LOS	A		C		D		B	

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 10: 122nd Avenue/Jennifer Street**

Control Type:	Two-way stop	Delay (sec / veh):	25.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	+			+r			r+			+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	1	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	150.00	75.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	122nd Avenue			122nd Avenue			Jennifer Street			Jennifer Street		
Base Volume Input [veh/h]	0	0	0	1	0	81	184	278	0	0	282	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	50.00	0.00	12.00	0.00	13.00	12.00	5.00	0.00	0.00	4.00	5.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	1	0	81	184	278	0	0	282	1
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	0	0	22	49	75	0	0	76	0
Total Analysis Volume [veh/h]	0	0	0	1	0	87	198	299	0	0	303	1
Pedestrian Volume [ped/h]	1			0			1			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane	No			
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No	No		
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.01	0.00	0.12	0.16	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	28.56	26.39	9.84	25.34	22.71	10.78	8.58	0.00	0.00	7.83	0.00	0.00
Movement LOS	D	D	A	D	C	B	A	A	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.02	0.02	0.42	0.59	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.42	0.42	10.43	14.72	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	21.60			10.95			3.42			0.00		
Approach LOS	C			B			A			A		
d_I, Intersection Delay [s/veh]	3.00											
Intersection LOS	D											

Intersection Level Of Service Report
Intersection 101: Sunrise Expy/122nd Avenue EB Ramps

Control Type:	Signalized	Delay (sec / veh):	13.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.802

Intersection Setup

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↶				↷	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No				No	
Crosswalk	No		No		Yes	

Volumes

Name	122nd Avenue		Sunrise WB		Sunrise WB	
Base Volume Input [veh/h]	444	0	0	0	607	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	7.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	444	0	0	0	607	0
Peak Hour Factor	0.9300	1.0000	1.0000	1.0000	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	119	0	0	0	163	0
Total Analysis Volume [veh/h]	477	0	0	0	653	0
Presence of On-Street Parking	No	No			No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal Group	2	0	0	0	8	8
Auxiliary Signal Groups						
Maximum Green [s]	38	0	0	0	74	74
Amber [s]	3.5	0.0	0.0	0.0	3.5	3.5
All red [s]	1.0	0.0	0.0	0.0	1.0	1.0
Walk [s]	7	0	0	0	7	7
Pedestrian Clearance [s]	11	0	0	0	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No					No
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	0.0	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	0.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	0	0	0	30	30
Lead / Lag	Lag	-	-	-	Lag	-
Minimum Green [s]	5	0	0	0	5	5
Vehicle Extension [s]	3.0	0.0	0.0	0.0	3.0	3.0
Minimum Recall	No					No
Maximum Recall	No					No
Pedestrian Recall	No					No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C
C, Cycle Length [s]	40	40
L, Total Lost Time per Cycle [s]	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50
g_i, Effective Green Time [s]	14	17
g / C, Green / Cycle	0.34	0.43
(v / s)_i Volume / Saturation Flow Rate	0.28	0.36
s, saturation flow rate [veh/h]	1709	1810
c, Capacity [veh/h]	590	774
d1, Uniform Delay [s]	11.79	10.16
k, delay calibration	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00
d2, Incremental Delay [s]	2.69	2.61
d3, Initial Queue Delay [s]	0.00	0.00
Rp, platoon ratio	1.00	1.00
PF, progression factor	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.84
d, Delay for Lane Group [s/veh]	14.48	12.77
Lane Group LOS	B	B
Critical Lane Group	Yes	Yes
50th-Percentile Queue Length [veh/ln]	3.29	4.04
50th-Percentile Queue Length [ft/ln]	82.25	100.91
95th-Percentile Queue Length [veh/ln]	5.92	7.27
95th-Percentile Queue Length [ft/ln]	148.05	181.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.48	0.00	0.00	0.00	12.77	12.77
Movement LOS	B				B	B
d_A, Approach Delay [s/veh]	14.48		0.00		12.77	
Approach LOS	B		A		B	
d_I, Intersection Delay [s/veh]	13.49					
Intersection LOS	B					
Intersection V/C	0.802					

Emissions

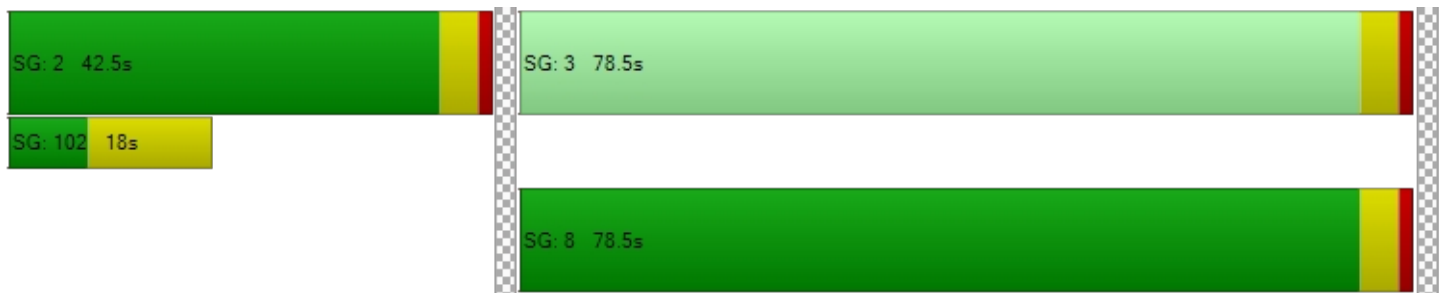
Vehicle Miles Traveled [mph]	39.74		86.54
Stops [stops/h]	299.77		367.77
Fuel consumption [US gal/h]	4.70		7.29
CO [g/h]	328.39		509.71
NOx [g/h]	63.89		99.17
VOC [g/h]	76.11		118.13

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	11.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	10.29
I_p,int, Pedestrian LOS Score for Intersectio	0.000	0.000	2.011
Crosswalk LOS	F	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1924	0	3746
d_b, Bicycle Delay [s]	0.03	19.76	15.05
I_b,int, Bicycle LOS Score for Intersection	1.560	4.132	2.637
Bicycle LOS	A	D	B

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 102: Sunrise Expy/122nd Avenue WB Ramps

Control Type:	Signalized	Delay (sec / veh):	26.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.918

Intersection Setup

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↑ ↑ ↑			↑ ↑ ↑			↑ ↑ ↑					
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	200.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	Yes			No			Yes			No		

Volumes

Name	122nd Avenue			122nd Avenue			Sunrise EB			Sunrise EB		
Base Volume Input [veh/h]	0	444	830	0	607	0	0	0	777	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	5.00	4.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	444	830	0	607	0	0	0	777	0	0	0
Peak Hour Factor	1.0000	0.9300	0.9300	0.9300	0.9300	1.0000	0.9300	0.9300	0.9300	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	119	223	0	163	0	0	0	209	0	0	0
Total Analysis Volume [veh/h]	0	477	892	0	653	0	0	0	835	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No			
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss
Signal Group	0	2	2	6	6	0	4	4	4	0	0	0
Auxiliary Signal Groups												
Maximum Green [s]	0	73	73	73	73	0	39	39	39	0	0	0
Amber [s]	0.0	3.5	3.5	3.5	3.5	0.0	3.5	3.5	3.5	0.0	0.0	0.0
All red [s]	0.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0
Walk [s]	0	7	7	7	7	0	7	7	7	0	0	0
Pedestrian Clearance [s]	0	11	11	11	11	0	11	11	11	0	0	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No				
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.5	2.5	2.5	2.5	0.0	2.5	2.5	2.5	0.0	0.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	0	30	30	30	30	0	30	30	30	0	0	0
Lead / Lag	-	-	-	Lag	-	-	Lag	-	-	-	-	-
Minimum Green [s]	0	5	5	5	5	0	5	5	5	0	0	0
Vehicle Extension [s]	0.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0
Minimum Recall		No			No			No				
Maximum Recall		No			No			No				
Pedestrian Recall		No			No			No				

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	C	C	R	
C, Cycle Length [s]	96	96	96	96	96	
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50	4.50	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	2.00	0.00	0.00	
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50	2.50	
g_i, Effective Green Time [s]	58	58	58	29	29	
g / C, Green / Cycle	0.60	0.60	0.60	0.30	0.30	
(v / s)_i Volume / Saturation Flow Rate	0.26	0.57	0.34	0.26	0.27	
s, saturation flow rate [veh/h]	1825	1564	1900	1615	1538	
c, Capacity [veh/h]	1099	942	1182	492	468	
d1, Uniform Delay [s]	10.34	17.78	11.64	31.51	32.07	
k, delay calibration	0.11	0.29	0.11	0.19	0.21	
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.27	12.78	0.41	7.01	10.89	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.43	0.95	0.55	0.85	0.89	
d, Delay for Lane Group [s/veh]	10.61	30.56	12.04	38.52	42.96	
Lane Group LOS	B	C	B	D	D	
Critical Lane Group	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	5.10	19.48	7.87	9.83	10.44	
50th-Percentile Queue Length [ft/ln]	127.57	487.10	196.68	245.71	261.11	
95th-Percentile Queue Length [veh/ln]	8.81	26.72	12.47	14.97	15.74	
95th-Percentile Queue Length [ft/ln]	220.19	668.07	311.68	374.25	393.62	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	10.61	30.56	12.04	12.04	0.00	38.52	38.52	40.74	0.00	0.00	0.00
Movement LOS		B	C	B	B		D	D	D			
d_A, Approach Delay [s/veh]	23.61		12.04			40.74			0.00			
Approach LOS	C		B			D			A			
d_I, Intersection Delay [s/veh]	25.97											
Intersection LOS	C											
Intersection V/C	0.918											

Emissions

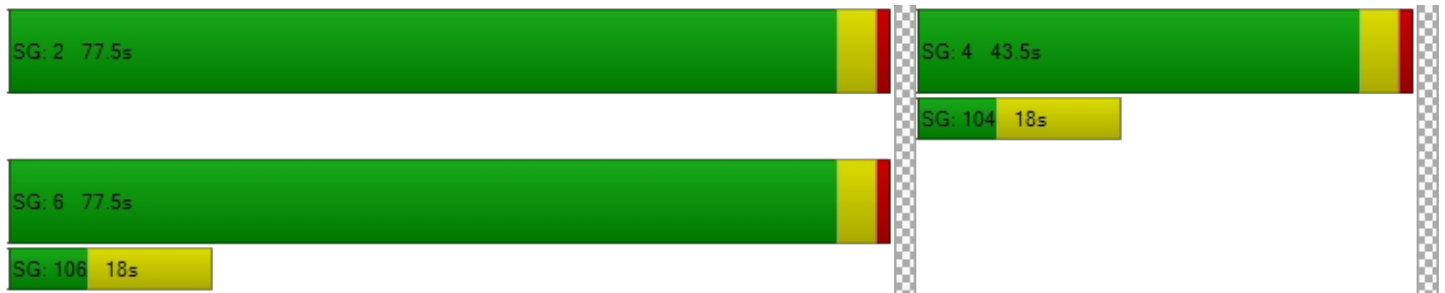
Vehicle Miles Traveled [mph]	110.14	205.96	54.40	49.97	49.97
Stops [stops/h]	190.42	727.09	293.59	366.78	389.76
Fuel consumption [US gal/h]	6.62	18.04	5.46	7.36	7.86
CO [g/h]	462.46	1261.20	381.79	514.20	549.41
NOx [g/h]	89.98	245.38	74.28	100.04	106.89
VOC [g/h]	107.18	292.29	88.48	119.17	127.33

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.86	0.00	37.86	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.831	0.000	2.125	0.000
Crosswalk LOS	C	F	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1513	1513	809	0
d_b, Bicycle Delay [s]	2.85	2.85	17.12	48.23
I_b,int, Bicycle LOS Score for Intersection	3.818	2.637	2.937	4.132
Bicycle LOS	D	B	C	D

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report
Intersection 107: Sunrise Expy/OR 224**

Control Type:	Signalized	Delay (sec / veh):	25.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.831

Intersection Setup

Name	Rock Creek Blvd			Rock Creek Blvd			Sunrise			Sunrise		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	[Diagram]			[Diagram]			[Diagram]			[Diagram]		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Rock Creek Blvd			Rock Creek Blvd			Sunrise			Sunrise		
Base Volume Input [veh/h]	618	355	269	26	302	89	50	0	589	110	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	6.00	5.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	618	355	269	26	302	89	50	0	589	110	0	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	1.0000	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	163	93	71	7	79	23	13	0	155	29	0	4
Total Analysis Volume [veh/h]	651	374	283	27	318	94	53	0	620	116	0	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	3			0			4			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	30.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	2	1	6	3	3	0	3	7	0	2
Auxiliary Signal Groups			2,7			3,6						
Maximum Green [s]	25	39	39	5	20	31	31	0	31	31	0	39
Amber [s]	4.7	4.7	4.7	4.7	4.7	3.5	3.5	0.0	3.5	3.5	0.0	4.7
All red [s]	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.0	0.5	0.5	0.0	0.7
Walk [s]	0	7	7	0	7	0	0	0	0	0	0	7
Pedestrian Clearance [s]	0	11	11	0	11	0	0	0	0	0	0	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No		No			No		
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0
I2, Clearance Lost Time [s]	3.4	3.4	3.4	3.4	3.4	2.0	2.0	0.0	2.0	2.0	0.0	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	20.0	6.0	6.0	20.0	0.0	20.0	20.0	0.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30	30	0	30	30	0	30
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	5	5	5	5	5	0	5	5	0	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0
Minimum Recall	No	Yes	Yes	No	Yes	No	No			No		
Maximum Recall	No	No	No	No	No	No	No			No		
Pedestrian Recall	No	No	No	No	No	No	No			No		

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	R	L	R	L	R
C, Cycle Length [s]	70	70	70	70	70	70	70	70	70	70
L, Total Lost Time per Cycle [s]	5.40	5.40	4.00	5.40	5.40	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	3.40	3.40	0.00	3.40	3.40	0.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	24	59	2	9	44	30	30	30	30
g / C, Green / Cycle	0.24	0.33	0.84	0.03	0.12	0.63	0.43	0.43	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.19	0.10	0.18	0.01	0.09	0.06	0.02	0.41	0.08	0.01
s, saturation flow rate [veh/h]	3375	3618	1542	3514	3618	1615	2754	1517	1523	1615
c, Capacity [veh/h]	806	1210	1291	103	452	1014	1203	647	711	689
d1, Uniform Delay [s]	25.32	17.43	1.14	33.49	29.61	5.19	12.95	19.44	13.75	11.73
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.40	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.98	0.14	0.08	1.33	2.01	0.04	0.01	23.11	0.11	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.31	0.22	0.26	0.70	0.09	0.04	0.96	0.16	0.02
d, Delay for Lane Group [s/veh]	27.30	17.57	1.23	34.82	31.62	5.22	12.97	42.55	13.86	11.75
Lane Group LOS	C	B	A	C	C	A	B	D	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.06	2.14	0.13	0.24	2.61	0.45	0.24	12.81	0.57	0.15
50th-Percentile Queue Length [ft/ln]	126.55	53.44	3.36	5.95	65.15	11.24	6.04	320.17	14.16	3.65
95th-Percentile Queue Length [veh/ln]	8.75	3.85	0.24	0.43	4.69	0.81	0.44	18.68	1.02	0.26
95th-Percentile Queue Length [ft/ln]	218.79	96.19	6.04	10.71	117.27	20.23	10.88	466.90	25.48	6.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.30	17.57	1.23	34.82	31.62	5.22	12.97	0.00	42.55	13.86	0.00	11.75
Movement LOS	C	B	A	C	C	A	B		D	B		B
d_A, Approach Delay [s/veh]	18.88			26.16			40.22			13.59		
Approach LOS	B			C			D			B		
d_I, Intersection Delay [s/veh]	25.48											
Intersection LOS	C											
Intersection V/C	0.831											

Emissions

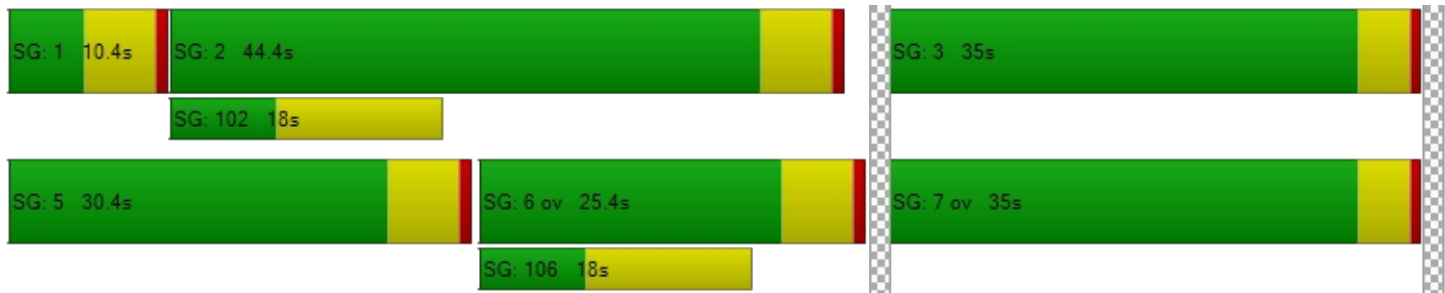
Vehicle Miles Traveled [mph]	49.30	28.32	21.43	2.03	23.96	7.08	5.67	66.33	12.79	1.87
Stops [stops/h]	517.77	218.65	6.86	24.35	266.57	22.99	24.72	655.00	57.93	7.46
Fuel consumption [US gal/h]	8.51	3.71	0.99	0.41	4.51	0.52	0.51	11.72	1.17	0.16
CO [g/h]	594.65	259.42	69.26	28.63	314.91	36.25	35.64	819.07	82.03	11.11
NOx [g/h]	115.70	50.47	13.47	5.57	61.27	7.05	6.93	159.36	15.96	2.16
VOC [g/h]	137.82	60.12	16.05	6.64	72.98	8.40	8.26	189.83	19.01	2.58

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0			0.0			11.0			11.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	0.00			0.00			25.05			25.05		
I_p,int, Pedestrian LOS Score for Intersectio	0.000			0.000			2.563			2.373		
Crosswalk LOS	F			F			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	1108			568			881			881		
d_b, Bicycle Delay [s]	7.01			18.04			11.04			11.02		
I_b,int, Bicycle LOS Score for Intersection	2.639			1.922			1.560			1.560		
Bicycle LOS	B			A			A			A		

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 108: Sunrise Expy/OR 224 Jughandle

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name	Rock Creek Blvd		Rock Creek Blvd		Highway 212	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	⇐		⇐		⇐⇐⇐⇐	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		No		Yes	

Volumes

Name	Rock Creek Blvd		Rock Creek Blvd		Highway 212	
Base Volume Input [veh/h]	45	852	966	35	390	518
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	5.00	0.00	0.00	0.00	0.00	6.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	852	966	35	390	518
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	224	254	9	103	136
Total Analysis Volume [veh/h]	47	897	1017	37	411	545
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	3		0		4	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	<i>Free Running</i>
Actuation Type	<i>Fully actuated</i>
Offset [s]	12.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Protected	Permissive	Permissive	Permissive	Split	Overlap
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						4,5
Maximum Green [s]	8	57	45	45	23	23
Amber [s]	3.5	4.7	4.7	4.7	4.7	4.7
All red [s]	0.5	0.7	0.7	0.7	0.7	0.7
Walk [s]	0	7	7	7	7	7
Pedestrian Clearance [s]	0	11	11	11	11	11
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	3.4	3.4	3.4	3.4	3.4
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	6.0	6.0	6.0	20.0	20.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

Split [s]	30	30	30	30	30	30
Lead / Lag	Lead	-	-	-	Lag	-
Minimum Green [s]	5	5	5	5	5	5
Vehicle Extension [s]	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Recall	No	Yes	Yes		No	No
Maximum Recall	No	No	No		No	No
Pedestrian Recall	No	No	No		No	No

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R	L	R
C, Cycle Length [s]	49	49	49	49	49	49
L, Total Lost Time per Cycle [s]	4.00	5.40	5.40	5.40	5.40	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.40	3.40	3.40	3.40	0.00
g_i, Effective Green Time [s]	4	26	18	18	12	22
g / C, Green / Cycle	0.09	0.53	0.37	0.37	0.25	0.44
(v / s)_i Volume / Saturation Flow Rate	0.03	0.25	0.28	0.02	0.12	0.20
s, saturation flow rate [veh/h]	1738	3618	3618	1615	3514	2678
c, Capacity [veh/h]	150	1931	1325	592	870	1185
d1, Uniform Delay [s]	21.18	7.14	13.80	10.15	15.84	9.57
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.17	0.17	0.96	0.04	0.40	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.31	0.46	0.77	0.06	0.47	0.46
d, Delay for Lane Group [s/veh]	22.35	7.31	14.76	10.20	16.24	9.84
Lane Group LOS	C	A	B	B	B	A
Critical Lane Group	Yes	No	Yes	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.51	2.14	4.28	0.23	1.77	1.66
50th-Percentile Queue Length [ft/ln]	12.85	53.42	106.91	5.67	44.37	41.51
95th-Percentile Queue Length [veh/ln]	0.93	3.85	7.67	0.41	3.19	2.99
95th-Percentile Queue Length [ft/ln]	23.13	96.16	191.70	10.20	79.87	74.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.35	7.31	14.76	10.20	16.24	9.84
Movement LOS	C	A	B	B	B	A
d_A, Approach Delay [s/veh]	8.06		14.60		12.59	
Approach LOS	A		B		B	
d_I, Intersection Delay [s/veh]	11.86					
Intersection LOS	B					
Intersection V/C	0.644					

Emissions

Vehicle Miles Traveled [mph]	3.42	65.22	77.02	2.80	37.79	50.11
Stops [stops/h]	37.54	312.13	624.66	16.56	259.25	242.54
Fuel consumption [US gal/h]	0.56	5.74	9.68	0.28	4.35	4.49
CO [g/h]	39.27	401.51	676.39	19.82	303.80	314.19
NOx [g/h]	7.64	78.12	131.60	3.86	59.11	61.13
VOC [g/h]	9.10	93.05	156.76	4.59	70.41	72.82

Other Modes

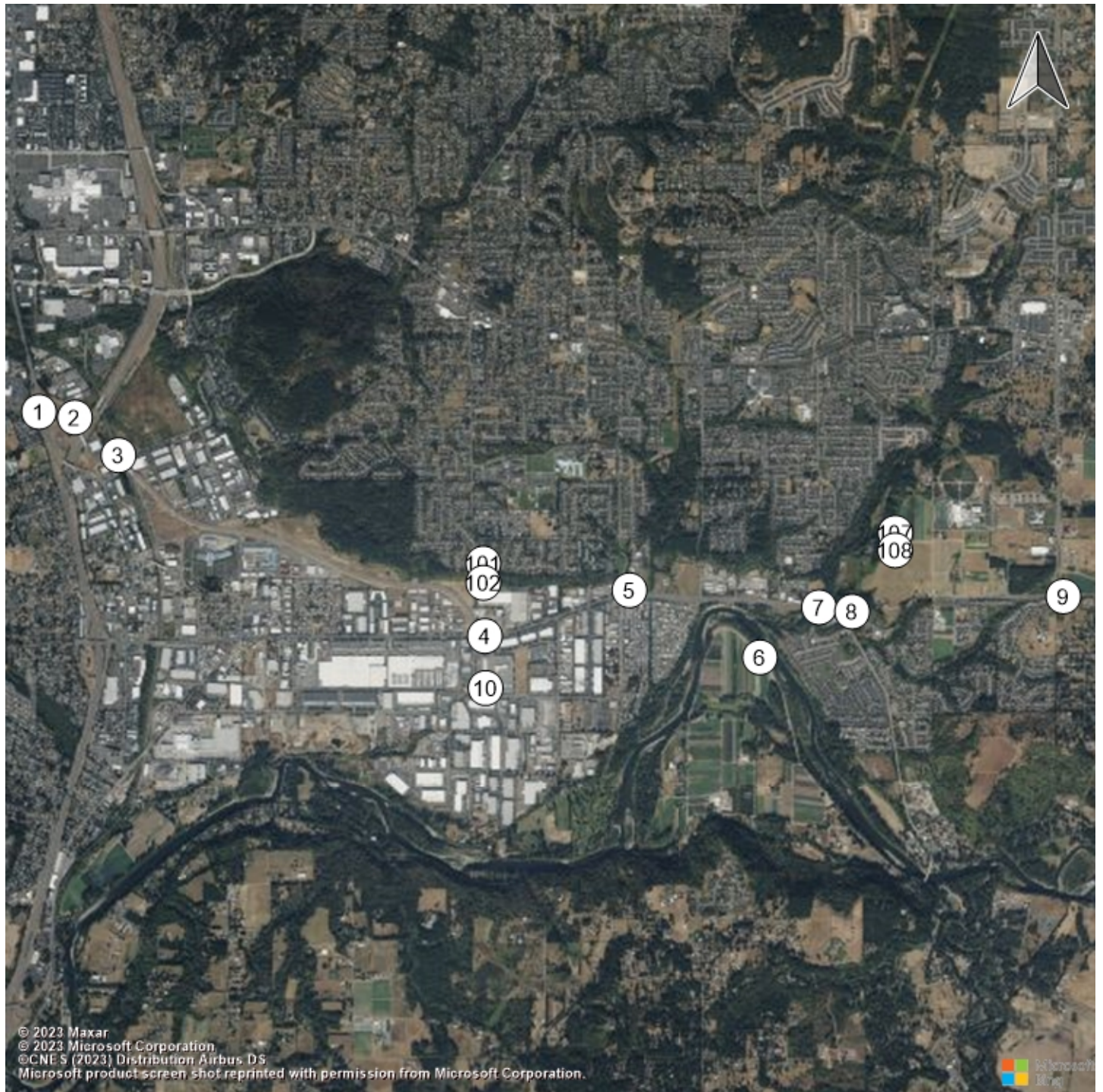
g_Walk,mi, Effective Walk Time [s]	0.0		0.0		11.0	
M_corner, Corner Circulation Area [ft ² /ped]	0.00		0.00		0.00	
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00		0.00		0.00	
d_p, Pedestrian Delay [s]	0.00		0.00		14.87	
I_p,int, Pedestrian LOS Score for Intersectio	0.000		0.000		2.468	
Crosswalk LOS	F		F		B	
s_b, Saturation Flow Rate of the bicycle lane	2000		2000		2000	
c_b, Capacity of the bicycle lane [bicycles/h]	2313		1826		933	
d_b, Bicycle Delay [s]	0.60		0.19		7.03	
I_b,int, Bicycle LOS Score for Intersection	2.338		2.429		1.560	
Bicycle LOS	B		B		A	

Sequence

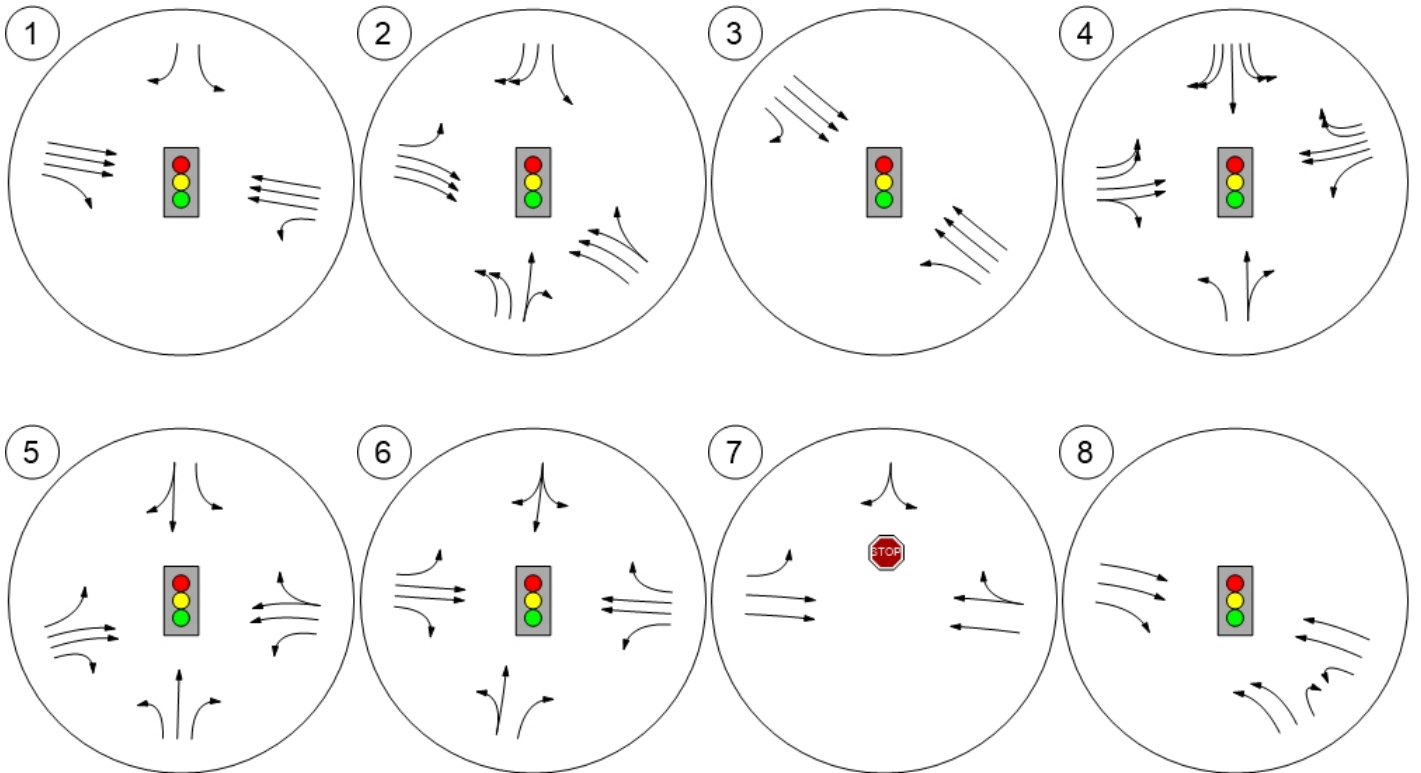
Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



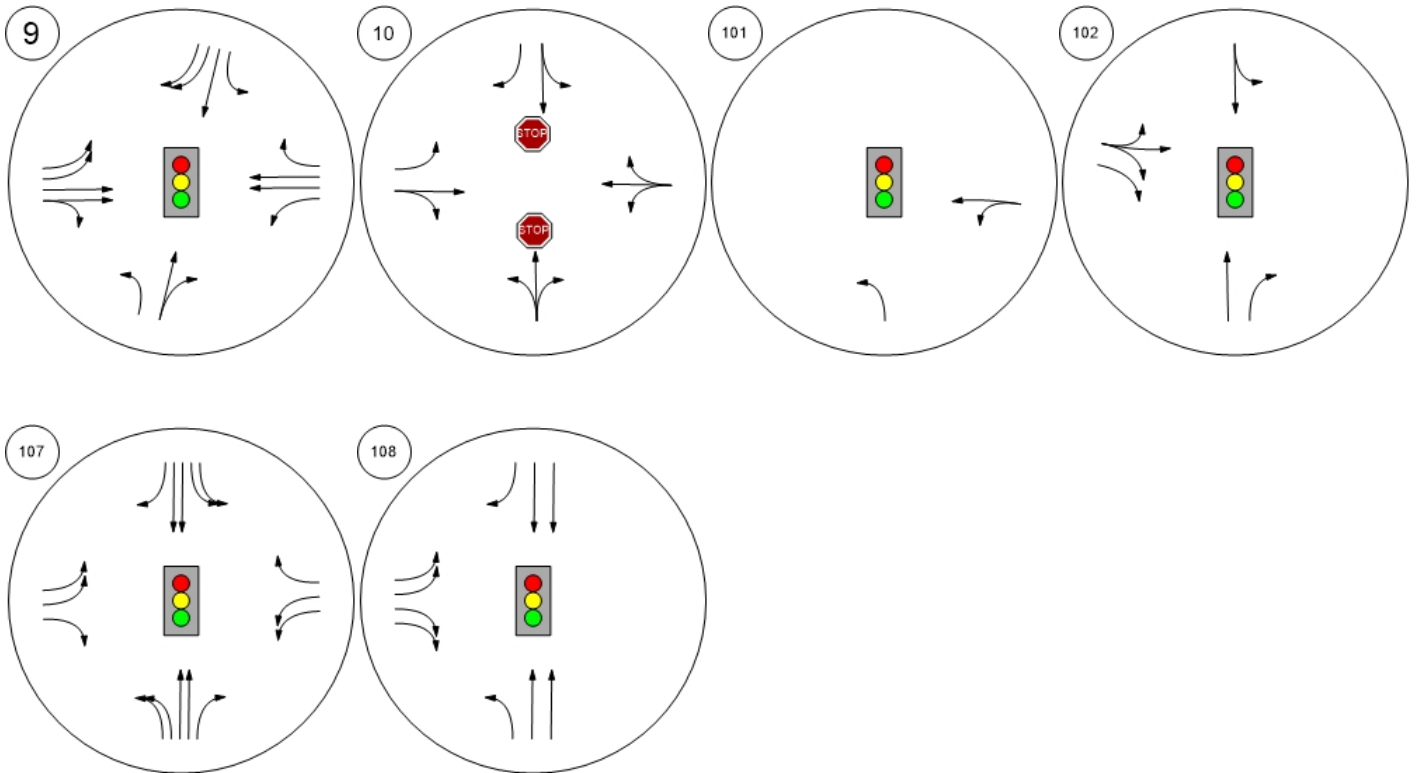
Study Intersections



Lane Configuration and Traffic Control



Lane Configuration and Traffic Control



Appendix F. Sunrise Tolling Memo

Tolling Memorandum

February 1, 2024

Project# 27852

To: Jamie Stasny, Regional Transportation and Land Use Policy Coordinator
From: Marc Butorac, PE, Julia Kuhn, PE and Krista Purser
CC: Karen Buehrig, Clackamas County
RE: Sunrise Community Visioning

This memo presents a brief summary of the tolling options under consideration by the Oregon Department of Transportation (ODOT) and their potential effect on the future travel on the Sunrise Corridor (OR 212). More detailed information will be available from ODOT in the summer and fall of 2024 and can supplement the information presented herein.

The remainder of this memo provides an overview of the status of the various tolling options under consideration, the available information regarding the origins and destinations of people traveling on I-205 that can help to inform potential diversion routes, how ODOT defines the Area of Potential Impact (API) associated with the tolling, information the potential diversion to 82nd Avenue and how that may inform diversion to the Sunrise Corridor, the effect of the I-205 Toll Gantry locations on the Sunrise Corridor, and potential next steps.

Status of Tolling Options

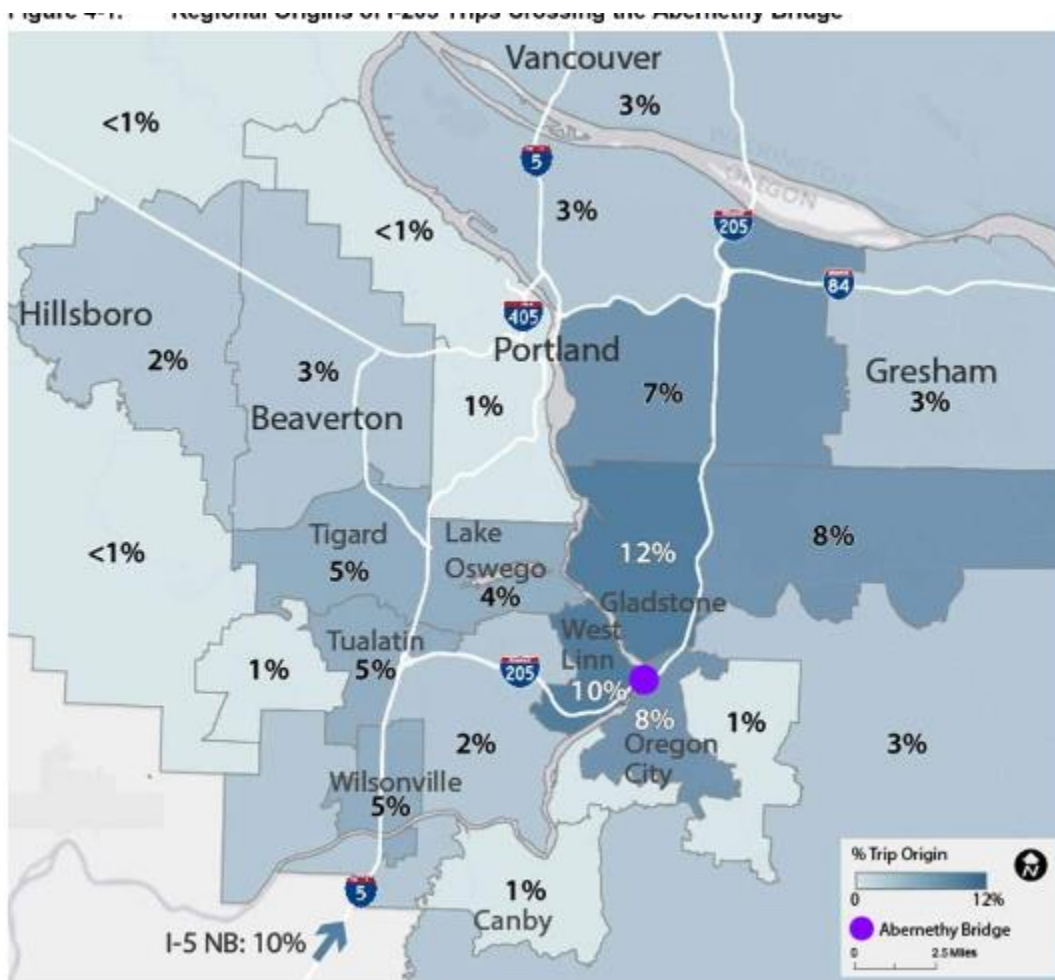
During the past two years, Clackamas County and its partner cities have been actively reviewing the documentation issued by ODOT for both the I-205 Toll Project as well as the Regional Mobility Pricing Project (RMPP). As of the writing of this memo, the I-205 Toll Project has been revised to only include a toll gantry on the Abernethy Bridge whereas previously both the Abernethy Bridge and Tualatin River Bridge were anticipated to be tolled. More detailed information on the option that only includes the Abernethy Bridge tolling will be available from ODOT later this spring. All of the detailed environmental analyses of potential impacts that are available from ODOT include both bridges being tolled and as such this memo summarizes the pertinent information about potential impacts on the Sunrise Corridor based information available at this time.

The Regional Mobility Pricing Project (RMPP) will include tolls on both I-5 and I-205 but ODOT is still soliciting feedback from its partner agencies on the specific location of the toll gantries and how the tolls will be collected. No information about the environmental impacts of the tolling of both freeways is available at this time.

Available Origin-Destination (O-D) Information related to the Sunrise Corridor

Exhibit 1 illustrates the where people using I-205 across the Abernethy Bridge begin their travel today. As shown, less than 10 percent of these travelers start their travel east of I-205 and north of Gladstone. Given the limited number of crossings of the Clackamas River, the potential of travel to divert from I-205 south of the Abernethy Bridge to access the Sunrise Corridor, combined with the O-D information suggests that a limited number of travelers using the Sunrise Corridor would be affected by the Abernethy Bridge Toll Project.

Exhibit 1. Regional Origins of I-205 Trips Crossing the Abernethy Bridge (Source: I-205 Toll Project; Appendix C – Transportation Technical Report, February 2023)



Area of Potential Impact (API)

For the purposes of the environmental review, ODOT has established the following criteria for the I-205 Tolling Project. This same API criteria is being used to assess the effects of only tolling the Abernethy Bridge Project. From a vehicular standpoint, the criteria includes roadways that meet one of the following criteria as a result of the diversion impacts associated with the tolling:

- The AM or PM peak hour volumes are anticipated to increase by more than 10 percent as a result of diversion from I-205 tolling;
- The AM or PM peak hour volumes are anticipated to increase by 100 vehicles per hour as a result of diversion from I-205 tolling;
- The diversion from the tolling results in an intersection volume-to-capacity ratio greater than 0.70.

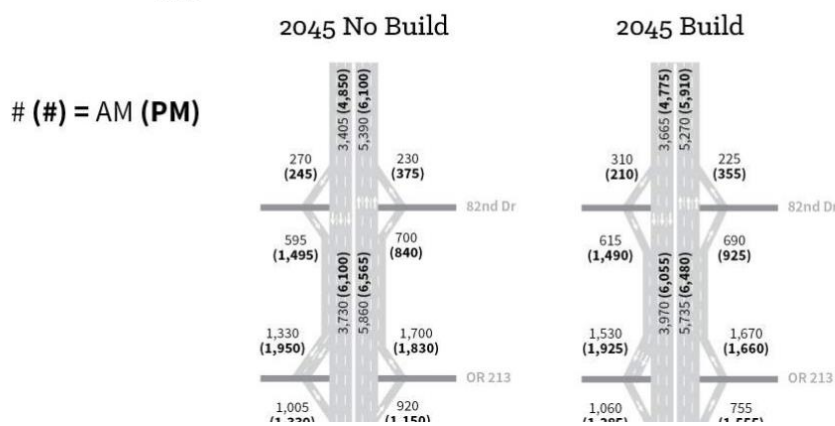
Neither the I-205 ramps for the Sunrise Corridor nor any of the intersections along the Sunrise Corridor met any of the above criteria. Again, this is likely due to both the origin-destination information about people crossing the Abernethy Bridge on I-205 as well as the lack of crossing options of the Clackamas River that would provide an alternative route to access the Sunrise Corridor.

SE 82nd Avenue Diversion Considerations

An analysis of the potential diversion on the SE 82nd Avenue I-205 ramps can help further confirm that the impacts to the Sunrise Corridor would be minimal as a result of the tolling.

For reference purposes, Exhibit 2 shows the change in peak hour volumes in the year 2045 at the I-205 interchange. As shown, the volume differences on the SE 82nd Avenue ramps with and without tolling are minimal. This would also be expected at the OR 212 Interchange based on the information provided by ODOT to date.

Exhibit 2. Change in Year 2045 Volumes at the SE 82nd Avenue Interchange (Source: I-205 Toll Project; Appendix C – Transportation Technical Report, February 2023)



Effect of Gantry Locations

As noted above, the I-205 Toll Project has been revised to only consider tolling of the Abernethy Bridge and not the Tualatin River Bridge. Under this revised scenario, the potential for diversion to the Sunrise Corridor is likely to be even less than with both bridges tolled.

No information from ODOT is available yet on the RMPP tolling options under consideration and the potential for route diversion. Once this information is available, we can review the potential impacts on the Sunrise Corridor.

Next Steps

Based on the available information to-date from ODOT, it appears that the I-205 Toll Project will have little change on the projected travel demands on the Sunrise Corridor project. We would recommend that the County and its partner cities continue to review and provide comments on the forthcoming information from ODOT on both the I-205 Tolling Project as well as the RMPP.