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Technical Memorandum

March 17, 2025 Project# 27852

To: Jamie Stasny, Regional Transportation and Land Use Policy Coordinator
Clackamas County
150 Beavercreek Road
Oregon City, OR 97045

From: Marc Butorac, PE, PTOE, PMP, Krista Purser, PE, Russ Doubleday, and Poppy Yang, Ph.D.

CC: Ana Jovanovic, Jamey Dempster, Scott Richman - Jacobs

RE: Sunrise Gateway Corridor Tech Memo #4.4.3: SE 162nd Avenue Interim Concepts

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Executive Summary

This memorandum summarizes potential interim improvements at SE 162nd Avenue/OR 212 based on feedback provided through the ongoing Sunrise Corridor Visioning Project. TM #4.4.2 presented a split-diamond interchange with frontage roads between 162nd and 172nd. This memorandum describes potential interim near-/mid-term improvement options at SE 162nd Avenue and OR 212, presents the operational analysis for the options, and planning level cost estimates for the most promising options. The primary purpose of these interim near-/mid-term improvement options is to allow further development within the Rock Creek Employment Center area while preserving the long-term Sunrise Gateway Corridor Refinement Plan alternative.

More information on the background is available in TM #4.4.2.

Potential Near-term Improvements Option

Project partners identified several potential near-/mid-term improvement options allowing SE 162nd Avenue to connect to OR 212, including:

- A partial couplet that extends SE 162nd Avenue to meet OR 212, intersecting at a new one-way westbound road and a one-way eastbound road that uses the existing OR 212. These intersections would ultimately serve as the SE 162nd Avenue ramp terminals proposed under the Sunrise Gateway Corridor Refinement Plan alternative. The one-way segments of OR212 merge back into the existing OR 212 alignment approximately 1,000 feet to the east of SE 162nd Avenue.
- An extension of SE 162nd Avenue directly south to OR 212 with right-in/right-out access controlled by a raised median on OR 212.
- An extension of SE 162nd Avenue directly south to OR 212 with signalized access, including installation of an eastbound left-turn lane, southbound left and right turn lanes, and westbound right-turn lane.
- An extension of SE 162nd Avenue directly south to OR 212, meeting at a single-lane roundabout.

Operational Performance

This section describes performance thresholds and the operational performance of the four potential interim near-/mid-term options under existing (based on 2023 counts) and future year 2045 conditions.

Performance Thresholds

The Oregon Highway Plan (OHP – Reference 1) identifies operating standards for OR 212 for the weekday AM and PM peak hours. At unsignalized intersections (i.e. the right-in/right-out or roundabout options), the v/c ratio threshold of 0.99 applies to state highway approaches. At signalized intersections other than interchange ramp terminals (i.e., the partial couplet or signal options), the 0.99 v/c threshold applies to the overall intersection operation.

The ODOT Highway Design Manual (HDM - Table 1200-2, Reference 2) identifies 20-year design mobility standards for statewide National Highway System (NHS) freight routes, interstate highways, and statewide (NHS) expressways within the MPO are 0.75. If the volume/capacity ratios in Table 1200-1 cannot be met, a design exception may be considered by ODOT.

Concept Operational Analysis

Table 1 and Figure 1 show the traffic control devices and intersection operations for the interim options in 2023 and 2045. 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 3), an update to *NCHRP 255: Highway Traffic Data for Urbanized Area Project Planning and Design* (Reference 4). 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*) and the Metro 2045 Regional Transportation Plan (RTP) fiscally-constrained travel demand model results. Key findings include:

- The partial couplet and right-in/right-out operate acceptably in 2023, but are failing (over capacity) by 2045. These concepts could be used as an interim improvement until the Sunrise is in-place.
- The signal and roundabout are failing (over capacity) in both 2023 and 2045.

Table 1. Operations Comparison

Year		2023		2045	
Time Period		AM	PM	AM	PM
Partial Couplet	**WB**	0.88	0.68	1.17	0.88
	EB	0.84	0.64	1.09	0.83
Right-In/Right-Out		0.78	0.40	1.86	0.74
Signal		0.98	1.11	1.32	1.43
Roundabout		1.00	0.83	1.48	1.11

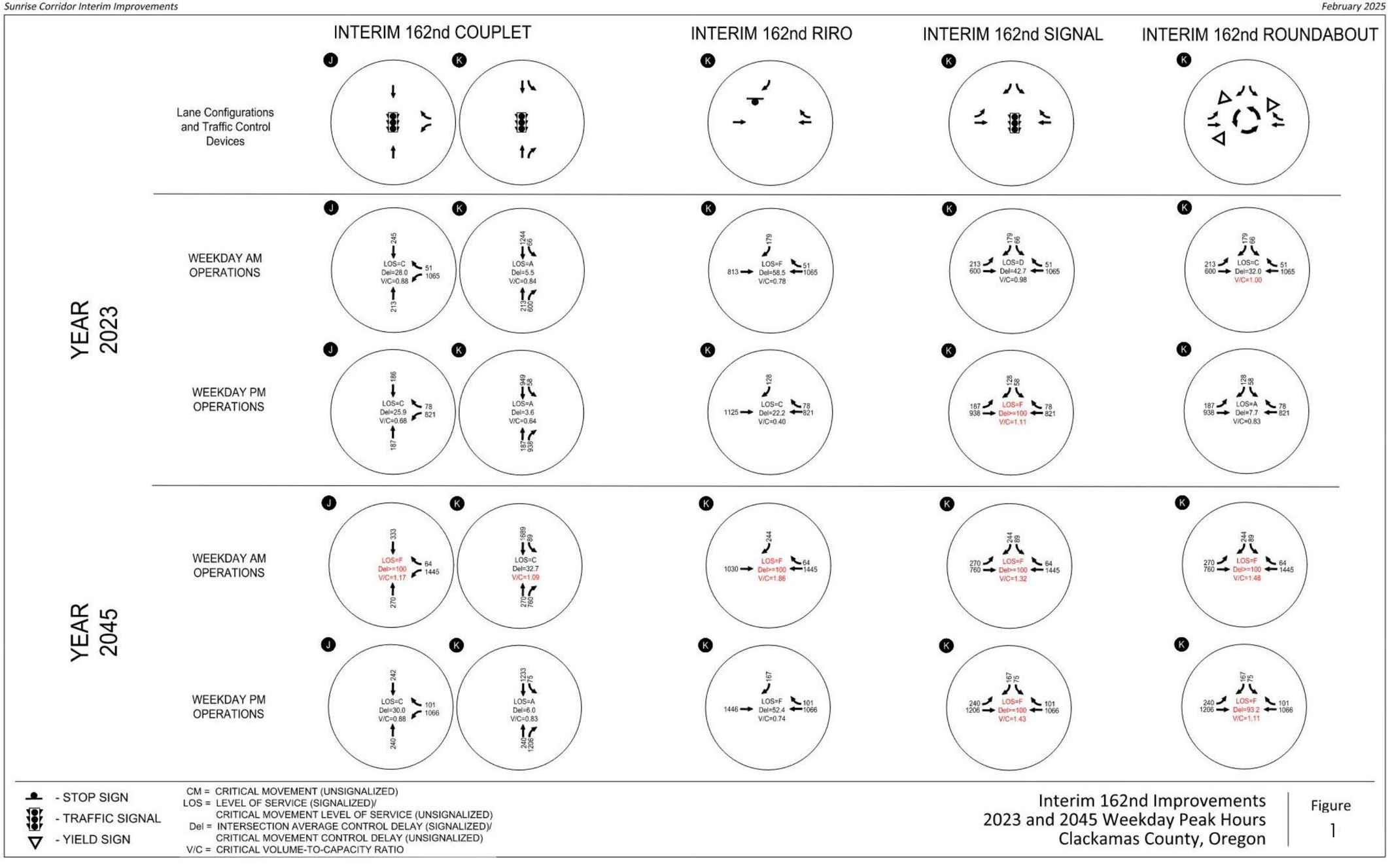
Using OHP operating standards (v/c not exceeding 0.99), the partial couplet option operates acceptably during the weekday AM peak hour through at least year 2033 and the right-in/right-out through 2028. These options should be explored further and discussed in the subsequent sections of this memorandum.

Using HDM mobility standards (as a Statewide (NHS) Freight Route within an MPO, the design-mobility standard is a v/c not to exceed 0.75), none of the options meet the standard in the AM 2023 scenario. Therefore, any option would need a design exception. In addition, in the PM 2023 scenario, both the signal and roundabout options also fail to meet the standard. However, for PM scenarios, the partial couplet option is projected to operate acceptably through at least 2031, while the right-in/right-out option remains viable through 2045.

Detailed operations results are available in Appendix A.

Figure 1. Proposed Interim Options Lane Configurations and Traffic Control Devices

Sunrise Corridor Interim Improvements *February 2025*



SE 162nd Avenue Partial Couplet Option

Exhibit 1 shows a partial couplet option that extends SE 162nd Avenue to meet OR 212, intersecting at new one-way westbound and eastbound signalize terminals. These intersections would ultimately serve as the SE 162nd Avenue ramp terminal to access the Sunrise Gateway Corridor Refinement Plan alternative. The one-way couplet merges back into the existing OR 212 alignment approximately 1,000 feet to the east of the SE 162nd Avenue. An eastbound u-turn pocket is provided to allow the driveways along the one-way eastbound segment to turn and head west. This option facilitates walking and biking connections between residential neighborhoods to the south of OR 212 and schools to the north and provides full vehicular access for existing and future land uses in the Rock Creek Employment Center area. Many elements of this interim option are forward-compatible with the split-diamond alternative. Only the one-way westbound segment transition segment would not be forward-compatible.

Also shown in Exhibit 1 are the right-of-way impacts of the concept. The purple property is already owned by ODOT. The blue shading shows property impacts and easements needed for this option, with the orange showing ultimate property impacts when the Sunrise Gateway facility is in-place.

SE 162nd Avenue Right-In/Right-Out Option

Exhibit 2 shows improvements to extend SE 162nd Avenue to provide a right-in/right-out access at OR 212. This option installs medians to prevent eastbound and southbound left-turns and serve as a refuge for pedestrian crossings. This option facilitates walking and biking connections between residential neighborhoods to the south of OR 212 and schools to the north via a rectangular rapid flash beacon, provides some vehicular access for existing and future land uses in the Rock Creek Employment Center area, and maintains acceptable mobility performance along OR 212. Improvements at the SE 162nd Avenue/Rock Creek Boulevard intersection would be forward-compatible; however, the remaining portion of the improvements would not be forward-compatible. Right-of-way impacts are relatively minor for this improvement.

Planning Level Cost Estimates

The planning cost estimates for the two most promising options include an itemized breakdown of major work items for the project, including earthwork, pavement structure, curb, sidewalk, signing, striping, street lighting, signals and other associated work. Groups of items (such as work zone traffic control, staging, and drainage) are presented as lump sum items, and the estimates are based on similar work from other recent projects.

The assumptions used in developing the planning level cost estimates are as follows:

- Roadway construction areas were primarily assumed to be full depth reconstruction with pavement sections varying based on the functional classification of the roadway.
- Private utilities in conflict with the project will relocate at their own cost.
- Public water and sanitary sewer improvements or relocations will not be included with this project.
- Retaining walls that would be part of the ultimate Sunrise construction are deferred to a future phase of the project.
- Traffic control and staging costs are lower impact and assumed at 5% of constructed items, each as most of the construction is off the mainline.

Table 2 includes a summary of the planning level project costs in both 2025 and 2030 dollars, including two different costs for if the full right-of-way needed for the Sunrise Gateway facility (shown in orange in Exhibit 1) is acquired at the time of a near-term improvement. It should be noted that portions of both options are improvements to SE 162nd Avenue, which is a local road and would need to be funded by the City of Happy Valley or developers. Detailed cost breakdowns are included in Appendix B.

Table 2. Potential Near-Term Interim Options Project Cost Summary

Cost Element	Right-In/ Right-Out	Partial Couplet	
		Without Additional Right-of-Way	With Additional Right-of-Way
Construction Costs	**$7,238,000**	**$14,592,000**	**-**
Right-of-Way Costs	**$2,843,000**	**$6,843,000**	**+7,900,000**
Engineering Support	**$1,885,000**	**$3,724,000**	**-**
30% Contingency	**$3,590,000**	**$7,550,000**	**+$2,370,000**
2025 Project Subtotals	**$15,556,000**	**$32,709,000**	**$42,979,000**
Price Escalation			
Annual Price Escalation (5 years at 3% per year)	**$2,480,000**	**$5,210,000**	**$6,845,000**
2030 Project Subtotals	**$18,036,000**	**$37,919,000**	**$49,824,000**

Recommendation

Given the operational performance, only the partial couplet or right-in/right-out options should be considered for near-term implementation. While the partial couplet option is more expensive, it provides acceptable operational performance longer (year 2033 versus 2028) than the right-in/right-out. Further, the partial couplet is forward-compatible with the Sunrise Gateway Refinement Plan Preferred Concept, preserves the long-term corridor from development, and reduces future improvement costs, with about 10% of its costs being throwaway. As the right-in/right-out is not forward-compatible, 80-90% of its costs would be throwaway ultimately.

Given the incremental $17 million dollar difference between the two most promising options and the inability for private development to acquire right-of-way and fund this magnitude of improvements, it is recommended that the project partners collaborate on a funding and implementation approach to develop the partial couplet in the near-term to allow continued development with the Rock Creek Employment Center area of Happy Valley.

References

1. Oregon Department of Transportation. *1999 Oregon Highway Plan*. 1999.
2. Oregon Department of Transportation. *Highway Design Manual*. January 2025.
3. Transportation Research Board. *National Cooperative Highway Research Plan 765: Analytical Travel Forecasting Approaches for Project-Level Planning and Design*. 2014.
4. Transportation Research Board. *National Cooperative Highway Research Plan 255: Highway Traffic Data for Urbanized Area Project Planning and Design*. 1982.

Appendices

A. Concept Operations Worksheets
B. Planning-Level Cost Estimates

Exhibit 1. SE 162nd Avenue Partial Couplet Option and Right-of-Way Impacts

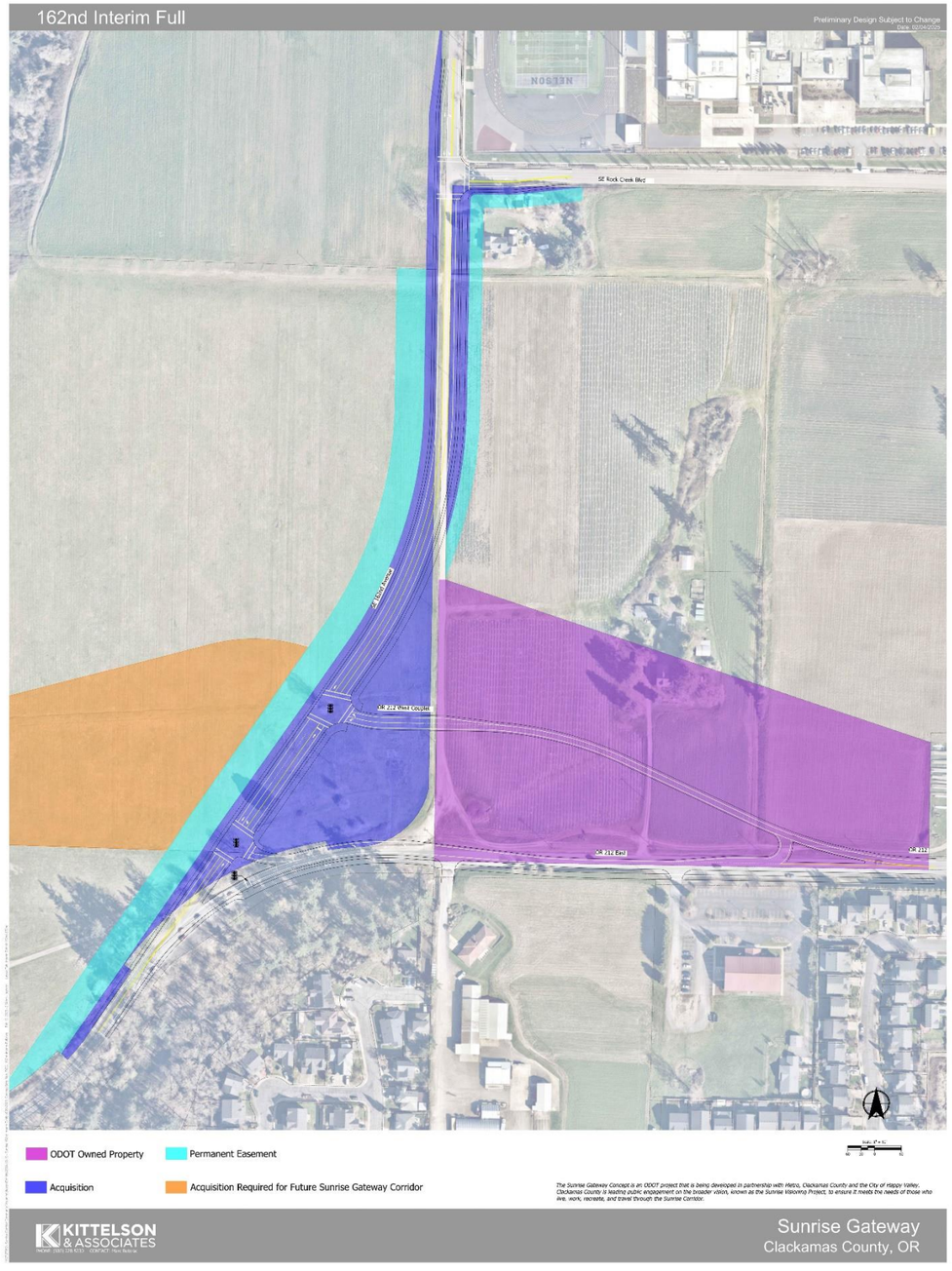
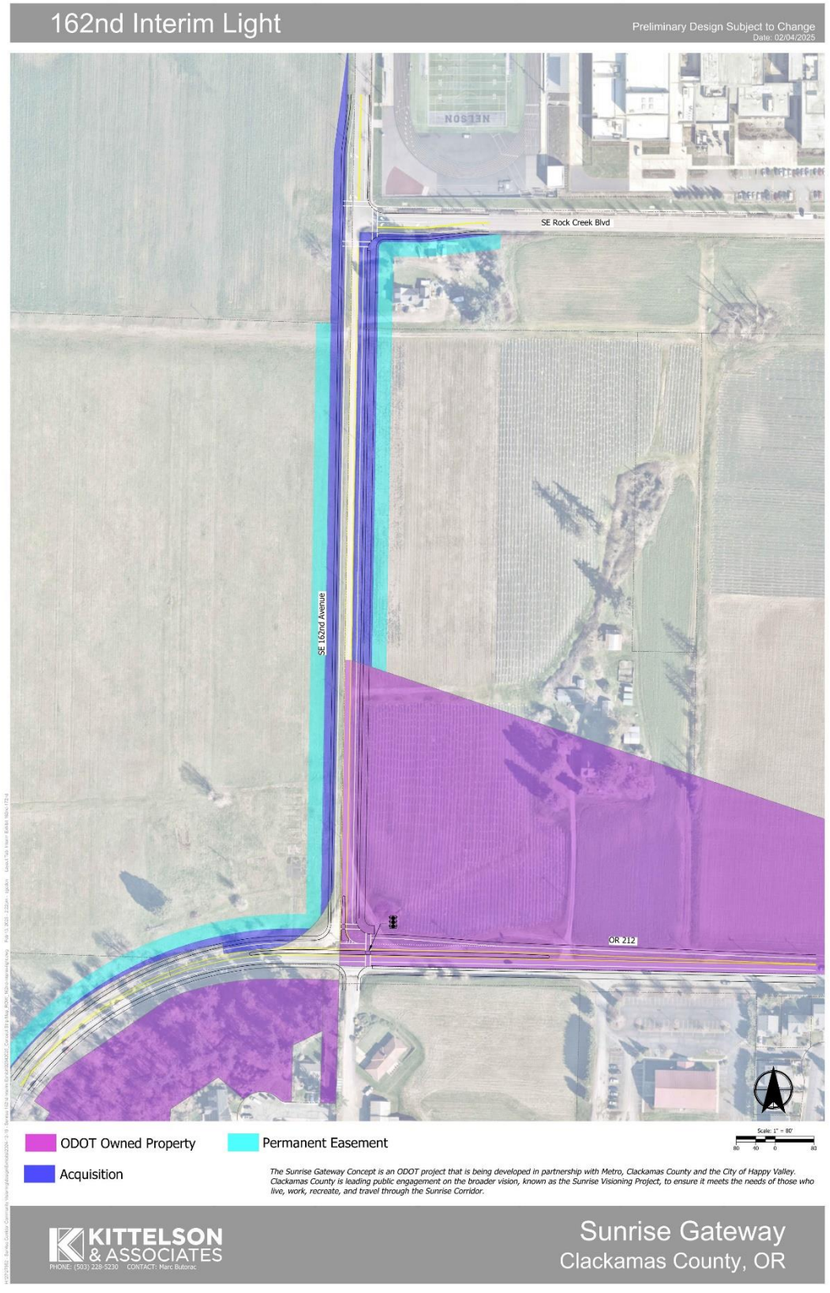


Exhibit 2. SE 162nd Avenue Right-In/Right-Out Option and Right-of-Way Impacts



Appendix A. Traffic Operations Worksheets

Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_AM_PreferredGateway_162ndInterim.vistro
Scenario 1 2023 162nd Interim Volumes

Report File: H:\...\2023_162nd_halflet_AM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
109	162nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	SB Thru	0.878	28.0	C
110	162nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	SB Left	0.844	5.5	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 109: 162nd Avenue/Sunrise Westbound

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):	0.878

Intersection Setup

Name			162nd Avenue			
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	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]	35.00		35.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		Yes		Yes	

Volumes

Name			162nd Avenue			
Base Volume Input [veh/h]	213	0	0	245	1065	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	0.00	6.00	6.00	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]	213	0	0	245	1065	51
Peak Hour Factor	0.9400	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	0	0	65	283	14
Total Analysis Volume [veh/h]	227	0	0	261	1133	54
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	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	18.0
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	0	0	6	8	8
Auxiliary Signal Groups						
Maximum Green [s]	20	0	0	20	90	90
Amber [s]	3.5	0.0	0.0	3.5	3.5	3.5
All red [s]	1.0	0.0	0.0	1.0	1.0	1.0
Walk [s]	7	0	0	7	7	7
Pedestrian Clearance [s]	11	0	0	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	0.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	2.5	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

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

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	R
C, Cycle Length [s]	92	92	92	92
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50
g_i, Effective Green Time [s]	20	20	63	63
g / C, Green / Cycle	0.22	0.22	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.13	0.14	0.66	0.04
s, saturation flow rate [veh/h]	1810	1810	1724	1538
c, Capacity [veh/h]	395	395	1179	1052
d1, Uniform Delay [s]	32.07	32.77	13.38	4.75
k, delay calibration	0.50	0.50	0.23	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.99	8.44	10.66	0.02
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	0.58	0.66	0.96	0.05
d, Delay for Lane Group [s/veh]	38.05	41.21	24.03	4.77
Lane Group LOS	D	D	C	A
Critical Lane Group	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	5.02	6.05	18.34	0.26
50th-Percentile Queue Length [ft/ln]	125.42	151.22	458.38	6.43
95th-Percentile Queue Length [veh/ln]	8.69	10.08	25.36	0.46
95th-Percentile Queue Length [ft/ln]	217.25	252.05	633.95	11.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	38.05	0.00	0.00	41.21	24.03	4.77
Movement LOS	D			D	C	A
d_A, Approach Delay [s/veh]	38.05		41.21		23.16	
Approach LOS	D		D		C	
d_I, Intersection Delay [s/veh]	27.99					
Intersection LOS	C					
Intersection V/C	0.878					

Emissions

Vehicle Miles Traveled [mph]	31.16	11.81	222.16	10.59
Stops [stops/h]	197.00	237.52	720.02	10.10
Fuel consumption [US gal/h]	4.43	4.43	22.11	0.54
CO [g/h]	309.47	309.33	1545.43	37.81
NOx [g/h]	60.21	60.18	300.68	7.36
VOC [g/h]	71.72	71.69	358.17	8.76

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	35.50	35.50
l_p,int, Pedestrian LOS Score for Intersectio	0.000	2.024	2.583
Crosswalk LOS	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	436	436	0
d_b, Bicycle Delay [s]	28.02	28.02	45.84
l_b,int, Bicycle LOS Score for Intersection	1.934	1.990	1.560
Bicycle LOS	A	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 110: 162nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	5.5
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.844

Intersection Setup

Name	162nd Avenue				EB Couplet	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	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]	35.00		35.00		0.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No			
Crosswalk	Yes		No		No	

Volumes

Name	162nd Avenue				EB Couplet	
Base Volume Input [veh/h]	213	600	66	1244	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	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]	213	600	66	1244	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	160	18	331	0	0
Total Analysis Volume [veh/h]	227	638	70	1323	0	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]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	20.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Unsignalized	Protected	Permissive	Permissive	Permissive
Signal Group	2	2	1	6	0	0
Auxiliary Signal Groups						
Maximum Green [s]	55	55	25	85	0	0
Amber [s]	3.5	3.5	3.5	3.5	0.0	0.0
All red [s]	1.0	1.0	1.0	1.0	0.0	0.0
Walk [s]	7	7	0	7	0	0
Pedestrian Clearance [s]	11	11	0	11	0	0
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	2.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.5	2.5	2.5	2.5	0.0	0.0
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]	30	30	30	30	0	0
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	5	5	5	5	0	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	0.0	0.0
Minimum Recall	No		No	No		
Maximum Recall	Yes		No	Yes		
Pedestrian Recall	Yes		No	Yes		

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	
C, Cycle Length [s]	90	90	90	
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]	76	5	85	
g / C, Green / Cycle	0.85	0.05	0.95	
(v / s)_i Volume / Saturation Flow Rate	0.13	0.04	0.73	
s, saturation flow rate [veh/h]	1810	1724	1810	
c, Capacity [veh/h]	1530	93	1719	
d1, Uniform Delay [s]	1.22	41.76	0.42	
k, delay calibration	0.50	0.11	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.20	11.62	3.39	
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	0.15	0.75	0.77	
d, Delay for Lane Group [s/veh]	1.42	53.38	3.81	
Lane Group LOS	A	D	A	
Critical Lane Group	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	0.27	1.79	1.62	
50th-Percentile Queue Length [ft/ln]	6.78	44.76	40.45	
95th-Percentile Queue Length [veh/ln]	0.49	3.22	2.91	
95th-Percentile Queue Length [ft/ln]	12.21	80.56	72.80	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.42	0.00	53.38	3.81	0.00	0.00
Movement LOS	A		D	A		
d_A, Approach Delay [s/veh]	0.39		6.30		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	5.47					
Intersection LOS	A					
Intersection V/C	0.844					

Emissions

Vehicle Miles Traveled [mph]	15.65	9.61	181.63	
Stops [stops/h]	10.92	72.01	65.07	
Fuel consumption [US gal/h]	0.74	1.67	8.44	
CO [g/h]	52.03	116.60	589.80	
NOx [g/h]	10.12	22.69	114.75	
VOC [g/h]	12.06	27.02	136.69	

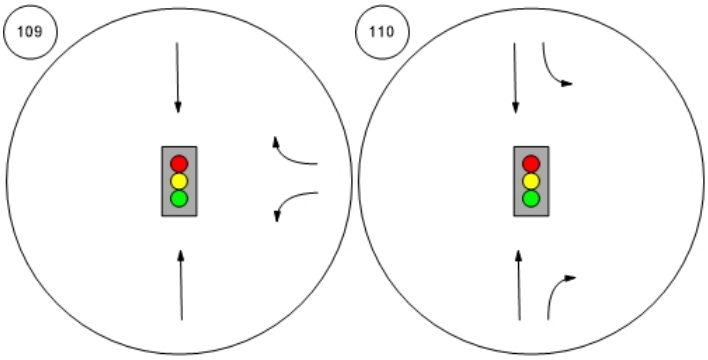
Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.75	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersectio	2.538	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]	1229	1899	0
d_b, Bicycle Delay [s]	6.65	0.11	44.75
l_b,int, Bicycle LOS Score for Intersection	1.934	3.858	4.132
Bicycle LOS	A	D	D

Sequence

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

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_PM_PreferredGateway_162ndInterim.vistro
Scenario 1 2023 162nd Interim Volumes

Report File: H:\...\2023_162nd_halflet_PM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
109	162nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	WB Left	0.677	25.9	C
110	162nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	SB Left	0.636	3.6	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 109: 162nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.677

Intersection Setup

Name	162nd Avenue		162nd Avenue		WB Couplet	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	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]	35.00		35.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		Yes		Yes	

Volumes

Name	162nd Avenue		162nd Avenue		WB Couplet	
Base Volume Input [veh/h]	187	0	0	186	821	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	0.00	6.00	6.00	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]	187	0	0	186	821	78
Peak Hour Factor	0.9400	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	0	0	49	218	21
Total Analysis Volume [veh/h]	199	0	0	198	873	83
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	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	10.0
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	6	0	0	2	8	0
Auxiliary Signal Groups						
Maximum Green [s]	11	0	0	11	5	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	6	0	0	10	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	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	15	0	0	15	75	0
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	5	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	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	C	L	R
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	34	48	48
g / C, Green / Cycle	0.38	0.38	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.51	0.05
s, saturation flow rate [veh/h]	1810	1810	1724	1538
c, Capacity [veh/h]	681	681	922	823
d1, Uniform Delay [s]	19.67	19.66	19.72	10.29
k, delay calibration	0.50	0.50	0.21	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.09	1.08	10.06	0.05
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	0.29	0.29	0.95	0.10
d, Delay for Lane Group [s/veh]	20.76	20.74	29.78	10.34
Lane Group LOS	C	C	C	B
Critical Lane Group	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.00	2.98	16.84	0.72
50th-Percentile Queue Length [ft/ln]	74.91	74.48	421.01	17.99
95th-Percentile Queue Length [veh/ln]	5.39	5.36	23.57	1.30
95th-Percentile Queue Length [ft/ln]	134.84	134.06	589.27	32.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.76	0.00	0.00	20.74	29.78	10.34
Movement LOS	C			C	C	B
d_A, Approach Delay [s/veh]	20.76		20.74		28.09	
Approach LOS	C		C		C	
d_I, Intersection Delay [s/veh]	25.94					
Intersection LOS	C					
Intersection V/C	0.677					

Emissions

Vehicle Miles Traveled [mph]	27.32	8.96	171.18	16.27
Stops [stops/h]	119.86	119.17	673.64	28.79
Fuel consumption [US gal/h]	2.78	2.07	19.53	1.09
CO [g/h]	194.57	144.94	1365.38	76.22
NOx [g/h]	37.86	28.20	265.65	14.83
VOC [g/h]	45.09	33.59	316.44	17.67

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	36.45	36.45
l_p,int, Pedestrian LOS Score for Intersectio	0.000	1.989	2.415
Crosswalk LOS	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	244	244	1578
d_b, Bicycle Delay [s]	34.67	34.67	2.01
l_b,int, Bicycle LOS Score for Intersection	1.888	1.886	1.560
Bicycle LOS	A	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 110: 162nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	3.6
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.636

Intersection Setup

Name	162nd Avenue		162nd Avenue		EB Couplet	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	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]	35.00		35.00		0.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No			
Crosswalk	Yes		No		No	

Volumes

Name	162nd Avenue		162nd Avenue		EB Couplet	
Base Volume Input [veh/h]	187	938	58	949	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	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]	187	938	58	949	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	249	15	252	0	0
Total Analysis Volume [veh/h]	199	998	62	1010	0	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]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	33.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Unsignalized	Protected	Permissive	Permissive	Permissive
Signal Group	2	2	1	6	0	0
Auxiliary Signal Groups						
Maximum Green [s]	27	27	27	59	0	0
Amber [s]	3.5	3.5	4.7	4.7	0.0	0.0
All red [s]	1.5	1.5	1.5	1.5	0.0	0.0
Walk [s]	7	7	0	7	0	0
Pedestrian Clearance [s]	11	11	0	11	0	0
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	2.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	4.2	4.2	0.0	0.0
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]	22	22	68	90	0	0
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	6	6	6	6	0	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	0.0	0.0
Minimum Recall	No		No	No		
Maximum Recall	Yes		No	Yes		
Pedestrian Recall	Yes		No	Yes		

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	
C, Cycle Length [s]	65	65	65	
L, Total Lost Time per Cycle [s]	5.00	6.20	6.20	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.00	4.20	4.20	
g_i, Effective Green Time [s]	50	4	59	
g / C, Green / Cycle	0.76	0.06	0.90	
(v / s)_i Volume / Saturation Flow Rate	0.11	0.04	0.56	
s, saturation flow rate [veh/h]	1810	1724	1810	
c, Capacity [veh/h]	1382	112	1638	
d1, Uniform Delay [s]	2.05	29.57	0.67	
k, delay calibration	0.50	0.11	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.22	4.23	1.75	
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	0.14	0.55	0.62	
d, Delay for Lane Group [s/veh]	2.27	33.80	2.42	
Lane Group LOS	A	C	A	
Critical Lane Group	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	0.34	1.02	0.80	
50th-Percentile Queue Length [ft/ln]	8.53	25.56	19.91	
95th-Percentile Queue Length [veh/ln]	0.61	1.84	1.43	
95th-Percentile Queue Length [ft/ln]	15.36	46.00	35.83	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.27	0.00	33.80	2.42	0.00	0.00
Movement LOS	A		C	A		
d_A, Approach Delay [s/veh]	0.40		4.23		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.63					
Intersection LOS	A					
Intersection V/C	0.636					

Emissions

Vehicle Miles Traveled [mph]	13.72	8.51	138.66	
Stops [stops/h]	18.85	56.44	43.97	
Fuel consumption [US gal/h]	0.76	1.18	6.11	
CO [g/h]	52.88	82.16	427.28	
NOx [g/h]	10.29	15.98	83.13	
VOC [g/h]	12.26	19.04	99.03	

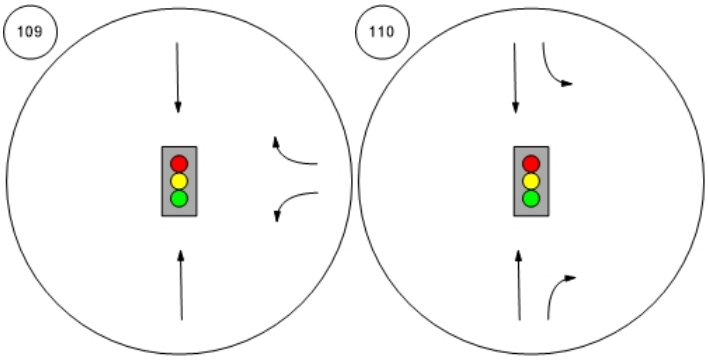
Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	32.60	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersectio	2.396	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]	521	2571	0
d_b, Bicycle Delay [s]	17.82	2.65	32.60
l_b,int, Bicycle LOS Score for Intersection	1.888	3.328	4.132
Bicycle LOS	A	C	D

Sequence

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

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_AM_PreferredGateway_162ndInterim.vistro
Scenario 3 2023 162nd RIRO Interim Volumes

Report File: H:\...\2023_162nd_RIRO_AM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Two-way stop	HCM 7th Edition	SB Right	0.784	58.5	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Two-way stop	Delay (sec / veh):	58.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

Intersection Setup

Name						
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	0	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	179	0	813	1065	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	6.00	2.00	6.00	6.00	6.00
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]	0	179	0	813	1065	51
Peak Hour Factor	1.0000	0.9400	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	48	0	216	283	14
Total Analysis Volume [veh/h]	0	190	0	865	1133	54
Pedestrian Volume [ped/h]	0		0		0	

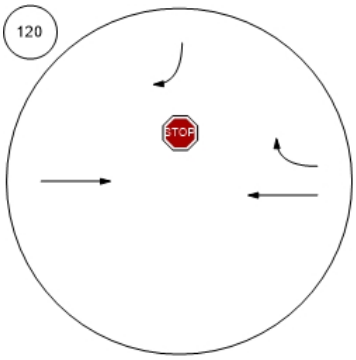
Intersection Settings

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	0.00	0.78	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	58.48	0.00	0.00	0.00	0.00
Movement LOS		F		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	5.78	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	144.58	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	58.48		0.00		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	4.96					
Intersection LOS	F					

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_PM_PreferredGateway_162ndInterim.vistro
Scenario 3 2023 162nd RIRO Interim Volumes

Report File: H:\...\2023_162nd_RIRO_PM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Two-way stop	HCM 7th Edition	SB Right	0.396	22.2	C

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 120: Highway 212 & SE 162nd Avenue

Control Type:	Two-way stop	Delay (sec / veh):	22.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.396

Intersection Setup

Name						
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	0	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	128	0	1125	821	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	6.00	2.00	6.00	6.00	6.00
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]	0	128	0	1125	821	78
Peak Hour Factor	1.0000	0.9400	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	34	0	299	218	21
Total Analysis Volume [veh/h]	0	136	0	1197	873	83
Pedestrian Volume [ped/h]	0		0		0	

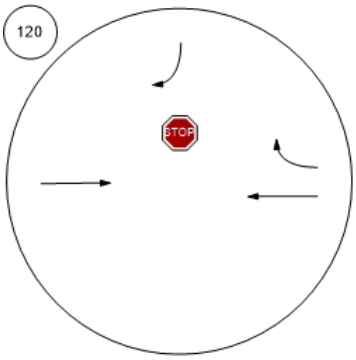
Intersection Settings

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	0.00	0.40	0.00	0.01	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	22.17	0.00	0.00	0.00	0.00
Movement LOS		C		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	1.83	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	45.87	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	22.17		0.00		0.00	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	1.32					
Intersection LOS	C					

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_AM_PreferredGateway_162ndInterim.vistro
Scenario 5 2023 162nd Signalized Interim Volumes

Report File: H:\...\2023_162nd_signal_AM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Signalized	HCM 7th Edition	EB Left	0.980	42.7	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Signalized	Delay (sec / veh):	42.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.980

Intersection Setup

Name						
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	1	0	1	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	66	179	213	600	1065	51
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	6.00	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]	66	179	213	600	1065	51
Peak Hour Factor	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
Total 15-Minute Volume [veh/h]	18	48	57	160	283	14
Total Analysis Volume [veh/h]	70	190	227	638	1133	54
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]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	8	0	1	6	2	0
Auxiliary Signal Groups						
Maximum Green [s]	17	0	15	95	76	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	10	0	0	10	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	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
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]	23	0	17	97	80	0
Lead / Lag	Lag	-	Lead	-	-	-
Minimum Green [s]	10	0	5	10	5	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Minimum Recall	No		No	No	No	
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	L	C	C	R
C, Cycle Length [s]	119	119	119	119	119	119
L, Total Lost Time per Cycle [s]	4.00	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	15	95	76	76
g / C, Green / Cycle	0.14	0.14	0.13	0.79	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.04	0.12	0.13	0.35	0.63	0.04
s, saturation flow rate [veh/h]	1724	1538	1724	1810	1810	1538
c, Capacity [veh/h]	239	214	217	1437	1148	976
d1, Uniform Delay [s]	46.05	50.41	52.08	3.91	21.28	8.25
k, delay calibration	0.11	0.32	0.44	0.11	0.47	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.67	27.99	69.93	0.22	22.61	0.02
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	0.29	0.89	1.05	0.44	0.99	0.06
d, Delay for Lane Group [s/veh]	46.72	78.40	122.01	4.12	43.88	8.27
Lane Group LOS	D	E	F	A	D	A
Critical Lane Group	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.90	7.16	10.50	3.29	33.04	0.48
50th-Percentile Queue Length [ft/ln]	47.39	179.03	262.61	82.14	825.91	12.09
95th-Percentile Queue Length [veh/ln]	3.41	11.55	16.14	5.91	42.46	0.87
95th-Percentile Queue Length [ft/ln]	85.31	288.75	403.41	147.86	1061.57	21.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.72	78.40	122.01	4.12	43.88	8.27
Movement LOS	D	E	F	A	D	A
d_A, Approach Delay [s/veh]	69.87		35.06		42.26	
Approach LOS	E		D		D	
d_I, Intersection Delay [s/veh]	42.67					
Intersection LOS	D					
Intersection V/C	0.980					

Emissions

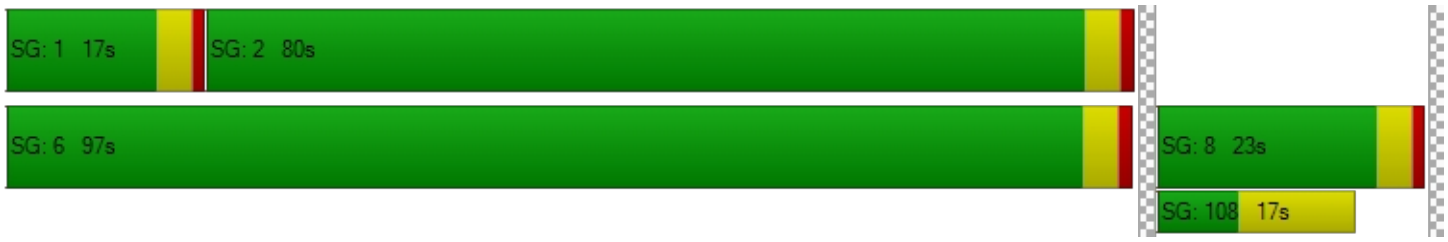
Vehicle Miles Traveled [mph]	5.76	15.62	23.84	67.00	93.20	4.44
Stops [stops/h]	57.32	216.53	317.62	99.35	998.90	14.62
Fuel consumption [US gal/h]	1.32	5.25	10.40	4.07	25.73	0.42
CO [g/h]	91.98	367.30	727.07	284.28	1798.67	29.70
NOx [g/h]	17.90	71.46	141.46	55.31	349.96	5.78
VOC [g/h]	21.32	85.13	168.51	65.88	416.86	6.88

Other Modes

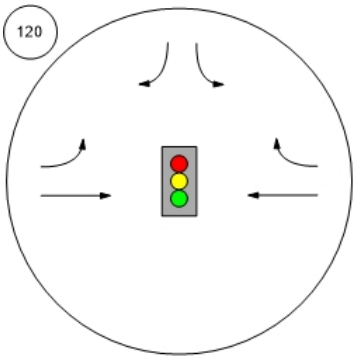
g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	49.04	49.04
l_p,int, Pedestrian LOS Score for Intersectio	0.000	3.020	2.877
Crosswalk LOS	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	319	1562	1277
d_b, Bicycle Delay [s]	42.05	2.85	7.79
l_b,int, Bicycle LOS Score for Intersection	1.560	2.987	3.518
Bicycle LOS	A	C	D

Sequence

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



Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_PM_PreferredGateway_162ndInterim.vistro
Scenario 5 2023 162nd Signalized Interim Volumes

Report File: H:\...\2023_162nd_signal_PM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Signalized	HCM 7th Edition	SB Left	1.108	120.9	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Signalized	Delay (sec / veh):	120.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.108

Intersection Setup

Name						
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	1	0	1	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	58	128	187	938	821	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	6.00	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]	58	128	187	938	821	78
Peak Hour Factor	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
Total 15-Minute Volume [veh/h]	15	34	50	249	218	21
Total Analysis Volume [veh/h]	62	136	199	998	873	83
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]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	2	0	1	6	8	0
Auxiliary Signal Groups						
Maximum Green [s]	17	0	15	95	76	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	10	0	0	10	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	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
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]	73	0	12	85	35	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	5	0	5	10	10	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Minimum Recall	No		No	No	No	
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	L	C	C	R
C, Cycle Length [s]	179	179	179	179	179	179
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	15	95	76	76
g / C, Green / Cycle	0.42	0.42	0.08	0.53	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.11	0.09	0.12	0.55	0.48	0.05
s, saturation flow rate [veh/h]	546	1538	1724	1810	1810	1538
c, Capacity [veh/h]	40	653	145	961	768	653
d1, Uniform Delay [s]	89.33	32.46	81.83	41.91	51.42	31.29
k, delay calibration	0.50	0.37	0.50	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	334.64	0.53	206.15	39.56	77.01	0.09
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	1.54	0.21	1.38	1.04	1.14	0.13
d, Delay for Lane Group [s/veh]	423.98	32.99	287.98	81.47	128.44	31.37
Lane Group LOS	F	C	F	F	F	C
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	5.62	3.90	14.91	50.99	49.82	2.21
50th-Percentile Queue Length [ft/ln]	140.58	97.43	372.82	1274.80	1245.62	55.28
95th-Percentile Queue Length [veh/ln]	10.12	7.02	23.59	64.79	67.46	3.98
95th-Percentile Queue Length [ft/ln]	253.04	175.38	589.83	1619.66	1686.62	99.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	423.98	32.99	287.98	81.47	128.44	31.37
Movement LOS	F	C	F	F	F	C
d_A, Approach Delay [s/veh]	155.42		115.81		120.01	
Approach LOS	F		F		F	
d_I, Intersection Delay [s/veh]	120.85					
Intersection LOS	F					
Intersection V/C	1.108					

Emissions

Vehicle Miles Traveled [mph]	5.13	11.25	15.90	79.74	58.56	5.57
Stops [stops/h]	113.20	78.45	300.20	1026.49	1002.99	44.51
Fuel consumption [US gal/h]	6.39	1.93	15.94	32.04	37.29	1.27
CO [g/h]	447.00	135.03	1114.01	2239.64	2606.65	89.06
NOx [g/h]	86.97	26.27	216.75	435.75	507.16	17.33
VOC [g/h]	103.60	31.29	258.18	519.06	604.12	20.64

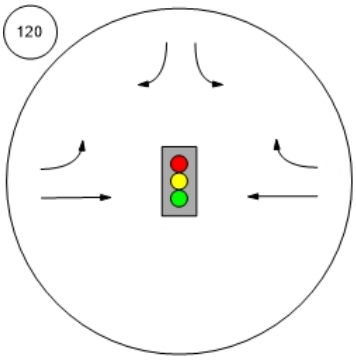
Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	78.76	78.76	78.76
l_p,int, Pedestrian LOS Score for Intersectio	2.155	3.048	3.044
Crosswalk LOS	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	772	906	347
d_b, Bicycle Delay [s]	33.73	26.76	61.10
l_b,int, Bicycle LOS Score for Intersection	1.560	3.535	3.137
Bicycle LOS	A	D	C

Sequence

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

Lane Configuration and Traffic Control



MOVEMENT SUMMARY

Site: 120 [Highway 212/SE 162nd Avenue_2023PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Highway 212															
5	T1	All MCs	873	6.0	873	6.0	0.814	8.6	LOS A	13.4	98.8	0.91	0.68	1.02	51.1
6	R2	All MCs	83	6.0	83	6.0	0.814	8.4	LOS A	13.4	98.8	0.91	0.68	1.02	50.8
Approach			956	6.0	956	6.0	0.814	8.6	LOS A	13.4	98.8	0.91	0.68	1.02	51.1
North: SE 162nd Avenue															
7	L2	All MCs	62	6.0	62	6.0	0.419	17.1	LOS B	3.3	24.5	0.97	0.84	1.05	47.3
9	R2	All MCs	136	6.0	136	6.0	0.419	12.3	LOS B	3.3	24.5	0.97	0.84	1.05	47.8
Approach			198	6.0	198	6.0	0.419	13.8	LOS B	3.3	24.5	0.97	0.84	1.05	47.6
West: Highway 212															
10	L2	All MCs	199	6.0	199	6.0	0.825	9.8	LOS A	17.1	125.9	0.71	0.46	0.71	50.8
11	T1	All MCs	998	6.0	998	6.0	0.825	5.1	LOS A	17.1	125.9	0.71	0.46	0.71	51.7
Approach			1197	6.0	1197	6.0	0.825	5.9	LOS A	17.1	125.9	0.71	0.46	0.71	51.5
All Vehicles			2351	6.0	2351	6.0	0.825	7.7	LOS A	17.1	125.9	0.81	0.58	0.86	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
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.

MOVEMENT SUMMARY

Site: 120 [Highway 212/SE 162nd Avenue_2023PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Highway 212															
5	T1	All MCs	873	6.0	873	6.0	0.814	8.6	LOS A	13.4	98.8	0.91	0.68	1.02	51.1
6	R2	All MCs	83	6.0	83	6.0	0.814	8.4	LOS A	13.4	98.8	0.91	0.68	1.02	50.8
Approach			956	6.0	956	6.0	0.814	8.6	LOS A	13.4	98.8	0.91	0.68	1.02	51.1
North: SE 162nd Avenue															
7	L2	All MCs	62	6.0	62	6.0	0.419	17.1	LOS B	3.3	24.5	0.97	0.84	1.05	47.3
9	R2	All MCs	136	6.0	136	6.0	0.419	12.3	LOS B	3.3	24.5	0.97	0.84	1.05	47.8
Approach			198	6.0	198	6.0	0.419	13.8	LOS B	3.3	24.5	0.97	0.84	1.05	47.6
West: Highway 212															
10	L2	All MCs	199	6.0	199	6.0	0.825	9.8	LOS A	17.1	125.9	0.71	0.46	0.71	50.8
11	T1	All MCs	998	6.0	998	6.0	0.825	5.1	LOS A	17.1	125.9	0.71	0.46	0.71	51.7
Approach			1197	6.0	1197	6.0	0.825	5.9	LOS A	17.1	125.9	0.71	0.46	0.71	51.5
All Vehicles			2351	6.0	2351	6.0	0.825	7.7	LOS A	17.1	125.9	0.81	0.58	0.86	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
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.

Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_AM_PreferredGateway_162ndInterim.vistro
Scenario 2 2045 162nd Interim Volumes

Report File: H:\...\2045_162nd_halflet_AM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
109	162nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	WB Left	1.166	106.6	F
110	162nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	SB Left	1.090	32.7	C

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 109: 162nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	106.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.166

Intersection Setup

Name			162nd Avenue			
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	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]	35.00		35.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		Yes		Yes	

Volumes

Name			162nd Avenue			
Base Volume Input [veh/h]	270	0	0	333	1445	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	0.00	6.00	6.00	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]	270	0	0	333	1445	64
Peak Hour Factor	0.9400	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	0	0	89	384	17
Total Analysis Volume [veh/h]	287	0	0	354	1537	68
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	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	18.0
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	0	0	6	8	8
Auxiliary Signal Groups						
Maximum Green [s]	22	0	0	22	87	87
Amber [s]	3.5	0.0	0.0	3.5	3.5	3.5
All red [s]	1.0	0.0	0.0	1.0	1.0	1.0
Walk [s]	7	0	0	7	7	7
Pedestrian Clearance [s]	11	0	0	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	0.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.5	0.0	0.0	2.5	2.5	2.5
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Free Running (No Pattern)

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

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	R
C, Cycle Length [s]	118	118	118	118
L, Total Lost Time per Cycle [s]	4.50	4.50	4.50	4.50
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.50	2.50	2.50	2.50
g_i, Effective Green Time [s]	22	22	87	87
g / C, Green / Cycle	0.19	0.19	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.16	0.20	0.89	0.04
s, saturation flow rate [veh/h]	1810	1810	1724	1538
c, Capacity [veh/h]	337	337	1271	1134
d1, Uniform Delay [s]	46.41	48.00	15.50	4.26
k, delay calibration	0.50	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.69	62.42	101.79	0.02
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	0.85	1.05	1.21	0.06
d, Delay for Lane Group [s/veh]	69.10	110.42	117.29	4.28
Lane Group LOS	E	F	F	A
Critical Lane Group	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	10.16	15.62	60.35	0.37
50th-Percentile Queue Length [ft/ln]	254.04	390.53	1508.66	9.15
95th-Percentile Queue Length [veh/ln]	15.39	22.67	85.70	0.66
95th-Percentile Queue Length [ft/ln]	384.74	566.74	2142.52	16.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	69.10	0.00	0.00	110.42	117.29	4.28
Movement LOS	E			F	F	A
d_A, Approach Delay [s/veh]	69.10		110.42		112.50	
Approach LOS	E		F		F	
d_I, Intersection Delay [s/veh]	106.63					
Intersection LOS	F					
Intersection V/C	1.166					

Emissions

Vehicle Miles Traveled [mph]	39.40	16.02	301.38	13.33
Stops [stops/h]	310.02	476.58	1841.07	11.16
Fuel consumption [US gal/h]	7.87	12.15	69.90	0.66
CO [g/h]	550.03	849.15	4886.12	45.79
NOx [g/h]	107.02	165.21	950.66	8.91
VOC [g/h]	127.47	196.80	1132.41	10.61

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	48.51	48.51
l_p,int, Pedestrian LOS Score for Intersectio	0.000	2.131	2.901
Crosswalk LOS	F	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	373	373	1475
d_b, Bicycle Delay [s]	39.05	39.05	4.07
l_b,int, Bicycle LOS Score for Intersection	2.033	2.144	1.560
Bicycle LOS	B	B	A

Sequence

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

Intersection Level Of Service Report
Intersection 110: 162nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	32.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.090

Intersection Setup

Name	162nd Avenue				EB Couplet	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	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]	35.00		35.00		0.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No			
Crosswalk	Yes		No		No	

Volumes

Name	162nd Avenue				EB Couplet	
Base Volume Input [veh/h]	270	760	89	1689	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	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]	270	760	89	1689	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	72	202	24	449	0	0
Total Analysis Volume [veh/h]	287	809	95	1797	0	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]	90
Active Pattern	Free Running (No Pattern)
Coordination Type	*Free Running*
Actuation Type	*Fully actuated*
Offset [s]	20.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Unsignalized	Protected	Permissive	Permissive	Permissive
Signal Group	2	2	1	6	0	0
Auxiliary Signal Groups						
Maximum Green [s]	55	55	25	85	0	0
Amber [s]	3.5	3.5	3.5	3.5	0.0	0.0
All red [s]	1.0	1.0	1.0	1.0	0.0	0.0
Walk [s]	7	7	0	7	0	0
Pedestrian Clearance [s]	11	11	0	11	0	0
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	2.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	2.5	2.5	2.5	2.5	0.0	0.0
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]	30	30	30	30	0	0
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	5	5	5	5	0	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	0.0	0.0
Minimum Recall	No		No	No		
Maximum Recall	Yes		No	Yes		
Pedestrian Recall	Yes		No	Yes		

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	
C, Cycle Length [s]	90	90	90	
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]	74	6	85	
g / C, Green / Cycle	0.83	0.07	0.95	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.06	0.99	
s, saturation flow rate [veh/h]	1810	1724	1810	
c, Capacity [veh/h]	1498	124	1719	
d1, Uniform Delay [s]	1.58	40.79	2.25	
k, delay calibration	0.50	0.11	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.28	9.39	34.65	
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	0.19	0.77	1.05	
d, Delay for Lane Group [s/veh]	1.87	50.18	36.90	
Lane Group LOS	A	D	F	
Critical Lane Group	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	0.52	2.33	16.55	
50th-Percentile Queue Length [ft/ln]	12.89	58.30	413.64	
95th-Percentile Queue Length [veh/ln]	0.93	4.20	24.17	
95th-Percentile Queue Length [ft/ln]	23.21	104.94	604.27	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.87	0.00	50.18	36.90	0.00	0.00
Movement LOS	A		D	F		
d_A, Approach Delay [s/veh]	0.51		37.57		0.00	
Approach LOS	A		D		A	
d_I, Intersection Delay [s/veh]	32.69					
Intersection LOS	C					
Intersection V/C	1.090					

Emissions

Vehicle Miles Traveled [mph]	19.78	13.04	246.70	
Stops [stops/h]	20.74	93.80	665.53	
Fuel consumption [US gal/h]	1.02	2.17	27.90	
CO [g/h]	71.24	151.86	1950.29	
NOx [g/h]	13.86	29.55	379.45	
VOC [g/h]	16.51	35.20	452.00	

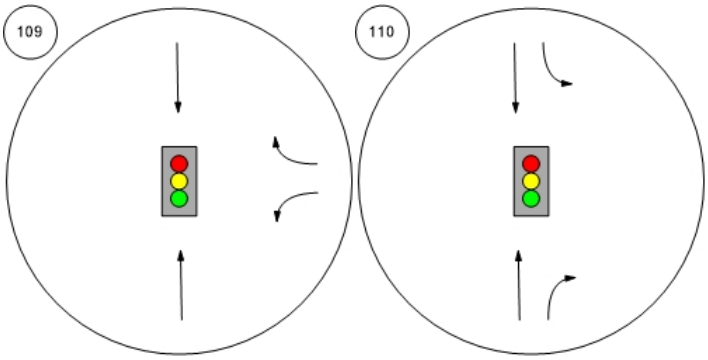
Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.75	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersectio	2.740	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]	1229	1899	0
d_b, Bicycle Delay [s]	6.65	0.11	44.75
l_b,int, Bicycle LOS Score for Intersection	2.033	4.681	4.132
Bicycle LOS	B	E	D

Sequence

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

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_PM_PreferredGateway_162ndInterim.vistro

Scenario 2 2045 162nd Interim Volumes

Report File: H:\...\2045_162nd_halflet_PM.pdf

2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
109	162nd Avenue/Sunrise Westbound	Signalized	HCM 7th Edition	SB Thru	0.878	30.0	C
110	162nd Avenue/Sunrise Eastbound	Signalized	HCM 7th Edition	SB Left	0.826	6.0	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 109: 162nd Avenue/Sunrise Westbound

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.878

Intersection Setup

Name	162nd Avenue		162nd Avenue		WB Couplet	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	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]	35.00		35.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		Yes		Yes	

Volumes

Name	162nd Avenue		162nd Avenue		WB Couplet	
Base Volume Input [veh/h]	240	0	0	242	1066	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	0.00	0.00	6.00	6.00	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]	240	0	0	242	1066	101
Peak Hour Factor	0.9400	1.0000	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	0	0	64	284	27
Total Analysis Volume [veh/h]	255	0	0	257	1134	107
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	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	10.0
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	6	0	0	2	8	0
Auxiliary Signal Groups						
Maximum Green [s]	11	0	0	11	5	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	6	0	0	10	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	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Phasing & Timing: Pattern 1

Split [s]	16	0	0	16	74	0
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	10	0	0	10	5	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	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	C	L	R
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	61	61
g / C, Green / Cycle	0.23	0.23	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.66	0.07
s, saturation flow rate [veh/h]	1810	1810	1724	1538
c, Capacity [veh/h]	415	415	1175	1049
d1, Uniform Delay [s]	31.09	31.13	13.33	4.90
k, delay calibration	0.50	0.50	0.36	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.63	6.76	15.44	0.04
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	0.61	0.62	0.97	0.10
d, Delay for Lane Group [s/veh]	37.73	37.90	28.77	4.95
Lane Group LOS	D	D	C	A
Critical Lane Group	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	5.55	5.61	19.66	0.52
50th-Percentile Queue Length [ft/ln]	138.85	140.32	491.60	12.99
95th-Percentile Queue Length [veh/ln]	9.42	9.50	26.94	0.94
95th-Percentile Queue Length [ft/ln]	235.48	237.45	673.41	23.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.73	0.00	0.00	37.90	28.77	4.95
Movement LOS	D			D	C	A
d_A, Approach Delay [s/veh]	37.73		37.90		26.72	
Approach LOS	D		D		C	
d_I, Intersection Delay [s/veh]	29.96					
Intersection LOS	C					
Intersection V/C	0.878					

Emissions

Vehicle Miles Traveled [mph]	35.01	11.63	222.36	20.98
Stops [stops/h]	222.17	224.52	786.58	20.79
Fuel consumption [US gal/h]	4.96	4.11	24.04	1.09
CO [g/h]	346.91	287.55	1680.47	75.87
NOx [g/h]	67.50	55.95	326.96	14.76
VOC [g/h]	80.40	66.64	389.46	17.58

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	36.45	36.45
l_p,int, Pedestrian LOS Score for Intersectio	0.000	2.068	2.624
Crosswalk LOS	F	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	267	1556
d_b, Bicycle Delay [s]	33.80	33.80	2.22
l_b,int, Bicycle LOS Score for Intersection	1.980	1.984	1.560
Bicycle LOS	A	A	A

Sequence

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

Intersection Level Of Service Report
Intersection 110: 162nd Avenue/Sunrise Eastbound

Control Type:	Signalized	Delay (sec / veh):	6.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.826

Intersection Setup

Name	162nd Avenue		162nd Avenue		EB Couplet	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	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]	35.00		35.00		0.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No			
Crosswalk	Yes		No		No	

Volumes

Name	162nd Avenue		162nd Avenue		EB Couplet	
Base Volume Input [veh/h]	240	1206	75	1233	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	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]	240	1206	75	1233	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	321	20	328	0	0
Total Analysis Volume [veh/h]	255	1283	80	1312	0	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]	90
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	33.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing (Basic)

Control Type	Permissive	Unsignalized	Protected	Permissive	Permissive	Permissive
Signal Group	2	2	1	6	0	0
Auxiliary Signal Groups						
Maximum Green [s]	27	27	27	59	0	0
Amber [s]	3.5	3.5	4.7	4.7	0.0	0.0
All red [s]	1.5	1.5	1.5	1.5	0.0	0.0
Walk [s]	7	7	0	7	0	0
Pedestrian Clearance [s]	11	11	0	11	0	0
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	2.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	3.0	3.0	4.2	4.2	0.0	0.0
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]	22	22	68	90	0	0
Lead / Lag	-	-	Lead	-	-	-
Minimum Green [s]	6	6	6	6	0	0
Vehicle Extension [s]	3.0	3.0	3.0	3.0	0.0	0.0
Minimum Recall	No		No	No		
Maximum Recall	Yes		No	Yes		
Pedestrian Recall	Yes		No	Yes		

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	
C, Cycle Length [s]	65	65	65	
L, Total Lost Time per Cycle [s]	5.00	6.20	6.20	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	3.00	4.20	4.20	
g_i, Effective Green Time [s]	49	5	59	
g / C, Green / Cycle	0.76	0.07	0.90	
(v / s)_i Volume / Saturation Flow Rate	0.14	0.05	0.72	
s, saturation flow rate [veh/h]	1810	1724	1810	
c, Capacity [veh/h]	1367	126	1638	
d1, Uniform Delay [s]	2.28	29.37	1.07	
k, delay calibration	0.50	0.11	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.30	5.18	4.23	
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	0.19	0.63	0.80	
d, Delay for Lane Group [s/veh]	2.58	34.55	5.30	
Lane Group LOS	A	C	A	
Critical Lane Group	No	No	Yes	
50th-Percentile Queue Length [veh/ln]	0.50	1.33	1.92	
50th-Percentile Queue Length [ft/ln]	12.52	33.27	48.06	
95th-Percentile Queue Length [veh/ln]	0.90	2.40	3.46	
95th-Percentile Queue Length [ft/ln]	22.53	59.89	86.52	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.58	0.00	34.55	5.30	0.00	0.00
Movement LOS	A		C	A		
d_A, Approach Delay [s/veh]	0.45		6.98		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	5.97					
Intersection LOS	A					
Intersection V/C	0.826					

Emissions

Vehicle Miles Traveled [mph]	17.58	10.98	180.12
Stops [stops/h]	27.64	73.49	106.15
Fuel consumption [US gal/h]	1.01	1.53	9.08
CO [g/h]	70.72	107.21	634.56
NOx [g/h]	13.76	20.86	123.46
VOC [g/h]	16.39	24.85	147.07

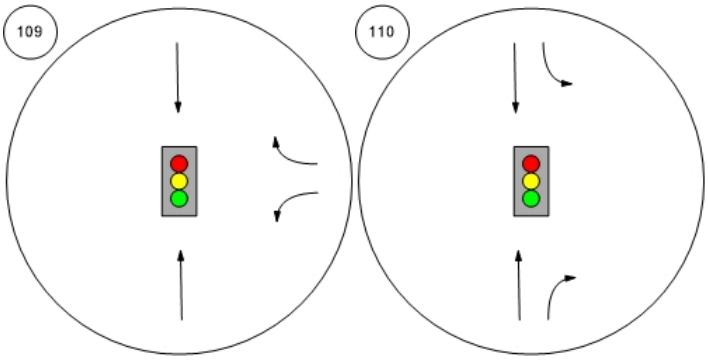
Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	32.60	0.00	0.00
l_p,int, Pedestrian LOS Score for Intersectio	2.531	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]	521	2571	0
d_b, Bicycle Delay [s]	17.82	2.65	32.60
l_b,int, Bicycle LOS Score for Intersection	1.980	3.856	4.132
Bicycle LOS	A	D	D

Sequence

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

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_AM_PreferredGateway_162ndInterim.vistro

Scenario 4 2045 162nd RIRO Interim Volumes

Report File: H:\...\2045_162nd_RIRO_AM.pdf

2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Two-way stop	HCM 7th Edition	SB Right	1.864	469.1	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Two-way stop	Delay (sec / veh):	469.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.864

Intersection Setup

Name						
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	0	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	244	0	1030	1445	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	6.00	2.00	6.00	6.00	6.00
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]	0	244	0	1030	1445	64
Peak Hour Factor	1.0000	0.9400	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	65	0	274	384	17
Total Analysis Volume [veh/h]	0	260	0	1096	1537	68
Pedestrian Volume [ped/h]	0		0		0	

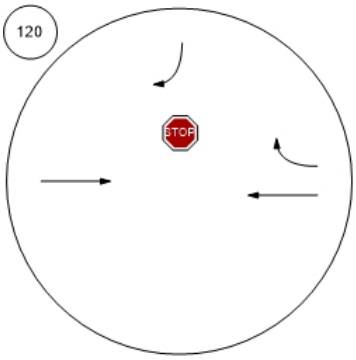
Intersection Settings

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	0.00	1.86	0.00	0.01	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	469.13	0.00	0.00	0.00	0.00
Movement LOS		F		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	19.95	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	498.83	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	469.13		0.00		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	41.19					
Intersection LOS	F					

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_PM_PreferredGateway_162ndInterim.vistro

Scenario 4 2045 162nd RIRO Interim Volumes

Report File: H:\...\2045_162nd_RIRO_PM.pdf

2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Two-way stop	HCM 7th Edition	SB Right	0.736	52.4	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Two-way stop	Delay (sec / veh):	52.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name						
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	0	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	0	167	0	1446	1066	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	6.00	2.00	6.00	6.00	6.00
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]	0	167	0	1446	1066	101
Peak Hour Factor	1.0000	0.9400	1.0000	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	44	0	385	284	27
Total Analysis Volume [veh/h]	0	178	0	1538	1134	107
Pedestrian Volume [ped/h]	0		0		0	

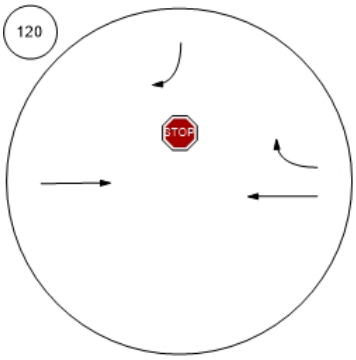
Intersection Settings

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	0.00	0.74	0.00	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	52.39	0.00	0.00	0.00	0.00
Movement LOS		F		A	A	A
95th-Percentile Queue Length [veh/ln]	0.00	5.10	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	127.45	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	52.39		0.00		0.00	
Approach LOS	F		A		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	F					

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_AM_PreferredGateway_162ndInterim.vistro

Scenario 6 2045 162nd Signalized Interim Volumes

Report File: H:\...\2045_162nd_signal_AM.pdf

2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Signalized	HCM 7th Edition	EB Left	1.316	130.7	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Signalized	Delay (sec / veh):	130.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.316

Intersection Setup

Name						
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	1	0	1	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	No		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	89	244	270	760	1445	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	6.00	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]	89	244	270	760	1445	64
Peak Hour Factor	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
Total 15-Minute Volume [veh/h]	24	65	72	202	384	17
Total Analysis Volume [veh/h]	95	260	287	809	1537	68
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]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	8	0	1	6	2	0
Auxiliary Signal Groups						
Maximum Green [s]	17	0	15	95	76	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	10	0	0	10	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	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
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]	21	0	19	99	80	0
Lead / Lag	Lag	-	Lead	-	-	-
Minimum Green [s]	10	0	5	10	5	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Minimum Recall	No		No	No	No	
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	L	C	C	R
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	15	95	76	76
g / C, Green / Cycle	0.14	0.14	0.13	0.79	0.63	0.63
(v / s)_i Volume / Saturation Flow Rate	0.06	0.17	0.17	0.45	0.85	0.04
s, saturation flow rate [veh/h]	1724	1538	1724	1810	1810	1538
c, Capacity [veh/h]	244	218	215	1433	1146	974
d1, Uniform Delay [s]	46.78	51.50	52.50	4.71	22.00	8.44
k, delay calibration	0.11	0.50	0.50	0.15	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.01	122.90	177.59	0.49	159.33	0.03
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	0.39	1.19	1.33	0.56	1.34	0.07
d, Delay for Lane Group [s/veh]	47.79	174.40	230.09	5.19	181.33	8.47
Lane Group LOS	D	F	F	A	F	A
Critical Lane Group	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	2.63	13.92	16.93	5.14	77.80	0.62
50th-Percentile Queue Length [ft/ln]	65.81	347.89	423.33	128.42	1944.90	15.60
95th-Percentile Queue Length [veh/ln]	4.74	21.61	26.48	8.85	114.60	1.12
95th-Percentile Queue Length [ft/ln]	118.46	540.32	661.92	221.35	2865.11	28.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.79	174.40	230.09	5.19	181.33	8.47
Movement LOS	D	F	F	A	F	A
d_A, Approach Delay [s/veh]	140.52		64.09		174.00	
Approach LOS	F		E		F	
d_I, Intersection Delay [s/veh]	130.69					
Intersection LOS	F					
Intersection V/C	1.316					

Emissions

Vehicle Miles Traveled [mph]	7.81	21.38	30.14	84.95	126.43	5.59
Stops [stops/h]	78.97	417.47	508.00	154.11	2333.88	18.72
Fuel consumption [US gal/h]	1.82	13.18	20.78	5.68	90.06	0.54
CO [g/h]	126.90	921.30	1452.84	397.27	6294.90	37.86
NOx [g/h]	24.69	179.25	282.67	77.29	1224.76	7.37
VOC [g/h]	29.41	213.52	336.71	92.07	1458.90	8.78

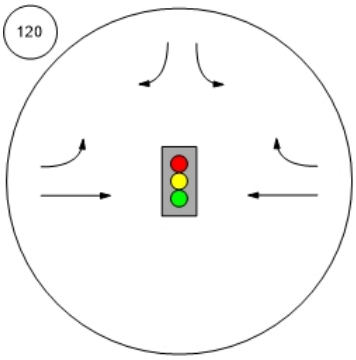
Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	49.50	49.50
l_p,int, Pedestrian LOS Score for Intersectio	0.000	3.364	3.177
Crosswalk LOS	F	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	283	1583	1267
d_b, Bicycle Delay [s]	44.20	2.60	8.07
l_b,int, Bicycle LOS Score for Intersection	1.560	3.368	4.208
Bicycle LOS	A	C	D

Sequence

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

Lane Configuration and Traffic Control



Sunrise Corridor Community Visioning

Vistro File: H:\...\Sunrise_PM_PreferredGateway_162ndInterim.vistro
Scenario 6 2045 162nd Signalized Interim Volumes

Report File: H:\...\2045_162nd_signal_PM.pdf
2/10/2025

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
120	Highway 212 & SE 162nd Avenue	Signalized	HCM 7th Edition	SB Left	1.431	243.6	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 120: Highway 212 & SE 162nd Avenue

Control Type:	Signalized	Delay (sec / veh):	243.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.431

Intersection Setup

Name						
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	1	0	1	0	0	1
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]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name						
Base Volume Input [veh/h]	75	167	240	1206	1066	101
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	6.00	6.00	6.00	6.00	6.00	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]	75	167	240	1206	1066	101
Peak Hour Factor	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
Total 15-Minute Volume [veh/h]	20	44	64	321	284	27
Total Analysis Volume [veh/h]	80	178	255	1283	1134	107
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]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing (Basic)

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	2	0	1	6	8	0
Auxiliary Signal Groups						
Maximum Green [s]	17	0	15	95	76	0
Amber [s]	3.0	0.0	3.0	3.0	3.0	0.0
All red [s]	1.0	0.0	1.0	1.0	1.0	0.0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	10	0	0	10	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	0.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	2.0	2.0	0.0
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]	74	0	12	86	34	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	5	0	5	10	10	0
Vehicle Extension [s]	3.0	0.0	3.0	3.0	3.0	0.0
Minimum Recall	No		No	No	No	
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	L	C	C	R
C, Cycle Length [s]	179	179	179	179	179	179
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	76	76	15	95	76	76
g / C, Green / Cycle	0.42	0.42	0.08	0.53	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.19	0.12	0.15	0.71	0.63	0.07
s, saturation flow rate [veh/h]	417	1538	1724	1810	1810	1538
c, Capacity [veh/h]	40	654	145	962	767	652
d1, Uniform Delay [s]	89.40	33.42	81.91	41.91	51.50	31.88
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	520.79	1.03	370.30	157.55	222.02	0.12
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	1.99	0.27	1.76	1.33	1.48	0.16
d, Delay for Lane Group [s/veh]	610.19	34.45	452.21	199.45	273.52	32.00
Lane Group LOS	F	C	F	F	F	C
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	7.70	5.31	21.50	82.58	80.69	2.90
50th-Percentile Queue Length [ft/ln]	192.52	132.85	537.40	2064.58	2017.29	72.54
95th-Percentile Queue Length [veh/ln]	13.86	9.09	34.12	119.56	120.71	5.22
95th-Percentile Queue Length [ft/ln]	346.54	227.37	852.93	2989.02	3017.65	130.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	610.19	34.45	452.21	199.45	273.52	32.00
Movement LOS	F	C	F	F	F	C
d_A, Approach Delay [s/veh]	212.97		241.36		252.70	
Approach LOS	F		F		F	
d_I, Intersection Delay [s/veh]	243.58					
Intersection LOS	F					
Intersection V/C	1.431					

Emissions

Vehicle Miles Traveled [mph]	6.62	14.72	20.37	102.51	76.07	7.18
Stops [stops/h]	154.96	106.93	432.55	1661.78	1623.72	58.38
Fuel consumption [US gal/h]	11.35	2.61	29.54	76.24	85.90	1.67
CO [g/h]	793.30	182.66	2064.64	5329.14	6004.50	116.64
NOx [g/h]	154.35	35.54	401.70	1036.86	1168.26	22.69
VOC [g/h]	183.85	42.33	478.50	1235.08	1391.60	27.03

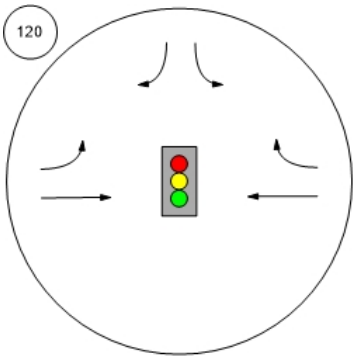
Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	78.79	78.79	78.79
l_p,int, Pedestrian LOS Score for Intersectio	2.208	3.362	3.356
Crosswalk LOS	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	783	917	335
d_b, Bicycle Delay [s]	33.15	26.24	61.97
l_b,int, Bicycle LOS Score for Intersection	1.560	4.097	3.607
Bicycle LOS	A	D	D

Sequence

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

Lane Configuration and Traffic Control



MOVEMENT SUMMARY

Site: 120 [Highway 212/SE 162nd Avenue_2045AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Highway 212															
5	T1	All MCs	1537	6.0	1537	6.0	1.477	439.8	LOS F	341.1	2510.5	1.00	8.00	14.40	7.4
6	R2	All MCs	68	6.0	68	6.0	1.477	439.6	LOS F	341.1	2510.5	1.00	8.00	14.40	7.4
Approach			1605	6.0	1605	6.0	1.477	439.8	LOS F	341.1	2510.5	1.00	8.00	14.40	7.4
North: SE 162nd Avenue															
7	L2	All MCs	95	6.0	95	6.0	1.084	146.7	LOS F	34.2	251.9	1.00	2.29	4.43	17.8
9	R2	All MCs	260	6.0	260	6.0	1.084	141.9	LOS F	34.2	251.9	1.00	2.29	4.43	17.8
Approach			354	6.0	354	6.0	1.084	143.2	LOS F	34.2	251.9	1.00	2.29	4.43	17.8
West: Highway 212															
10	L2	All MCs	287	6.0	287	6.0	0.794	10.0	LOS A	13.5	99.6	0.73	0.49	0.73	50.5
11	T1	All MCs	809	6.0	809	6.0	0.794	5.3	LOS A	13.5	99.6	0.73	0.49	0.73	51.4
Approach			1096	6.0	1096	6.0	0.794	6.5	LOS A	13.5	99.6	0.73	0.49	0.73	51.2
All Vehicles			3055	6.0	3055	6.0	1.477	250.0	LOS F	341.1	2510.5	0.90	4.64	8.35	11.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
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.

MOVEMENT SUMMARY

Site: 120 [Highway 212/SE 162nd Avenue_2045PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Highway 212															
5	T1	All MCs	1134	6.0	1134	6.0	1.114	116.9	LOS F	107.0	787.5	1.00	3.24	5.04	20.6
6	R2	All MCs	107	6.0	107	6.0	1.114	116.7	LOS F	107.0	787.5	1.00	3.24	5.04	20.5
Approach			1241	6.0	1241	6.0	1.114	116.8	LOS F	107.0	787.5	1.00	3.24	5.04	20.6
North: SE 162nd Avenue															
7	L2	All MCs	80	6.0	80	6.0	0.748	37.9	LOS D	8.5	62.6	1.00	1.17	1.62	37.4
9	R2	All MCs	178	6.0	178	6.0	0.748	33.1	LOS C	8.5	62.6	1.00	1.17	1.62	37.7
Approach			257	6.0	257	6.0	0.748	34.5	LOS C	8.5	62.6	1.00	1.17	1.62	37.6
West: Highway 212															
10	L2	All MCs	255	6.0	255	6.0	1.083	87.8	LOS F	126.9	934.1	1.00	1.69	2.34	25.1
11	T1	All MCs	1283	6.0	1283	6.0	1.083	83.1	LOS F	126.9	934.1	1.00	1.69	2.34	25.3
Approach			1538	6.0	1538	6.0	1.083	83.9	LOS F	126.9	934.1	1.00	1.69	2.34	25.2
All Vehicles			3037	6.0	3037	6.0	1.114	93.2	LOS F	126.9	934.1	1.00	2.28	3.38	23.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
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.

Appendix B. Planning-Level Cost Estimates

Sunrise Gateway Corridor
162nd Interim Design Alt1
Clackamas County, OR

Engineer's Conceptual Estimate

Prepared By: Caleb Cox, PE, Sam Godon		*Date: 02/05/2025*		
Reviewed By: Darren Hippenstiel, PE				
This Estimate has a Rating of:		**3C**	*(See rating scale guide below.)*	
ITEM	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
Mobilization	LS	ALL	$1,212,000.00	$1,212,000.00
Traffic Control	LS	ALL	$609,000.00	$609,000.00
Construction Staging	LS	ALL	$609,000.00	$609,000.00
Erosion Control	AC	4.9	$10,000.00	$49,000.00
Removal of Structures and Obstructions	LS	ALL	$262,000.00	$262,000.00
Clearing and Grubbing	LS	ALL	$233,000.00	$233,000.00
General Earthworks	CY	130,675	$25.00	$3,266,875.00
Asphalt Section - Full Depth - Highway	SF	111,095	$11.70	$1,299,811.50
Asphalt Section - Full Depth - Arterial	SF	75,241	$9.20	$692,217.20
Asphalt Roadway - Grind & Inlay (2" Depth)	SF	29,489	$3.30	$97,313.70
Subgrade Geotextile	SY	20,704	$1.50	$31,056.00
Concrete Curbs - Standard Curb & Gutter	LF	7,635	$54.90	$419,161.50
Raised Concrete Island	SF	4,941	$13.00	$64,233.00
Concrete Walks	SF	58,580	$11.00	$644,380.00
Detectable Warnings	EA	24	$500.00	$12,000.00
Extra for Pedestrian Ramps	EA	25	$1,500.00	$37,500.00
Retaining Walls, Wall No. 4	SF	0	$200.00	$0.00
Guardrail System, Complete	LF	500	$80.00	$40,000.00
Storm Water Conveyance System, Complete	LS	ALL	$1,970,000.00	$1,970,000.00
Regional Water Quality and Hydromodification System, Complete	SF	18,700	$28.00	$523,600.00
Permanent Landscaping	SF	25,192	$4.20	$105,806.40
Pavement Markings, Complete	LS	ALL	$132,000.00	$132,000.00
Signage, Complete	LS	ALL	$263,000.00	$263,000.00
Illumination System, Complete	LS	ALL	$919,100.00	$919,100.00
Traffic Signal System, Complete	EA	2	$550,000.00	$1,100,000.00
TOTAL CONSTRUCTION COST			**$**	**14,592,000**

Sunrise Gateway Corridor
162nd Interim Design Alt1
Clackamas County, OR

KITTELSON & ASSOCIATES

Engineer's Conceptual Estimate

Prepared By: Caleb Cox, PE, Sam Godon		*Date: 02/05/2025*		
Reviewed By: Darren Hippenstiel, PE				
This Estimate has a Rating of:		**3C**	*(See rating scale guide below.)*	
ITEM	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
RIGHT-OF-WAY COSTS				
Right-of-Way Acquisition; By Zone:				
--C2	SF	11,139	$45.00	$501,255.00
--IC	SF	19,657	$12.00	$235,884.00
--RC	SF	233,416	$18.00	$4,201,488.00
Permanent Easement; By Zone:				
--C2	SF	11,992	$22.50	$269,820.00
--IC	SF	19,223	$6.00	$115,338.00
--RC	SF	133,373	$9.00	$1,200,357.00
Temporary Easement; By Zone:				
--C2	SF	2,785	$11.25	$31,328.44
--IC	SF	4,914	$5.00	$24,571.25
--RC	SF	58,354	$4.50	$262,593.00
RIGHT-OF-WAY SUBTOTAL				**$ 6,843,000**
ENGINEERING SUPPORT				
Engineering	10.0%	ALL	$1,460,000.00	$1,460,000.00
Construction Management	15.0%	ALL	$2,189,000.00	$2,189,000.00
Right-of-Way Support	EA	5	$15,000.00	$75,000.00
ENGINEERING SUPPORT SUBTOTAL				**$ 3,724,000**
			TOTAL PROJECT SUBTOTAL	**$ 25,159,000**
			30% Contingency	**$ 7,550,000**
			2025 TOTAL ESTIMATED PROJECT COST	**$ 32,709,000**
PRICE ESCALATION				
Annual Price Escalation	YEARS	5	3%	$5,209,695.70
PRICE ESCALATION SUBTOTAL				**$ 5,210,000**
			2030 TOTAL ESTIMATED PROJECT COST	**$ 37,919,000**

Unit Costs Note:

The associated product and material costs are based upon the most recent available cost data. Due to the current volatility of the construction market, we

Scope Accuracy:

Level 1: Project scope well understood and well defined.

Level 2: Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Level A: Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

Level B: Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

Level C: No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 60% based on risk.

Sunrise Gateway Corridor
162nd Interim Design Alt1
Clackamas County, OR

Engineer's Conceptual Estimate

Prepared By: Caleb Cox, PE, Sam Godon		*Date: 02/05/2025*		
Reviewed By: Darren Hippenstiel, PE				
This Estimate has a Rating of:		**3C**	*(See rating scale guide below.)*	
ITEM	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
Mobilization	LS	ALL	$600,000.00	$600,000.00
Traffic Control	LS	ALL	$302,000.00	$302,000.00
Construction Staging	LS	ALL	$302,000.00	$302,000.00
Erosion Control	AC	3.7	$10,000.00	$37,000.00
Removal of Structures and Obstructions	LS	ALL	$130,000.00	$130,000.00
Clearing and Grubbing	LS	ALL	$116,000.00	$116,000.00
General Earthworks	CY	31,669	$25.00	$791,730.56
Asphalt Section - Full Depth - Highway	SF	57,816	$11.70	$676,447.20
Asphalt Section - Full Depth - Arterial	SF	88,178	$9.20	$811,237.60
Asphalt Roadway - Grind & Inlay (2" Depth)	SF	35,003	$3.30	$115,510.63
Subgrade Geotextile	SY	16,222	$1.50	$24,333.00
Concrete Curbs - Standard Curb & Gutter	LF	6,422	$54.90	$352,567.80
Raised Concrete Island	SF	5,427	$13.00	$70,551.00
Concrete Walks	SF	53,079	$11.00	$583,869.00
Detectable Warnings	EA	10	$500.00	$5,000.00
Extra for Pedestrian Ramps	EA	10	$1,500.00	$15,000.00
Retaining Walls, Wall No. 4	SF	0	$200.00	$0.00
Guardrail System, Complete	LF	500	$80.00	$40,000.00
Storm Water Conveyance System, Complete	LS	ALL	$1,034,000.00	$1,034,000.00
Regional Water Quality and Hydromodification System, Complete	SF	14,600	$28.00	$408,800.00
Permanent Landscaping	SF	13,755	$4.20	$57,771.00
Pavement Markings, Complete	LS	ALL	$69,000.00	$69,000.00
Signage, Complete	LS	ALL	$138,000.00	$138,000.00
Illumination System, Complete	LS	ALL	$482,500.00	$482,500.00
Traffic Signal System, RRFB	EA	1	$75,000.00	$75,000.00
		TOTAL CONSTRUCTION COST	**$**	**7,238,000**

Sunrise Gateway Corridor
162nd Interim Design Alt1
Clackamas County, OR

KITTELSON & ASSOCIATES

Engineer's Conceptual Estimate

Prepared By: Caleb Cox, PE, Sam Godon		*Date: 02/05/2025*		
Reviewed By: Darren Hippenstiel, PE				
This Estimate has a Rating of:		**3C**	*(See rating scale guide below.)*	
ITEM	**UNIT**	**TOTAL QUANTITY**	**UNIT PRICE**	**TOTAL COST**
RIGHT-OF-WAY COSTS				
Right-of-Way Acquisition; By Zone:				
--C2	SF	11,139	$45.00	$501,255.00
--IC	SF	27,824	$12.00	$333,888.00
--RC	SF	52,837	$18.00	$951,066.00
Permanent Easement; By Zone:				
--C2	SF	11,992	$22.50	$269,820.00
--IC	SF	21,092	$6.00	$126,552.00
--RC	SF	59,479	$9.00	$535,311.00
Temporary Easement; By Zone:				
--C2	SF	2,785	$11.25	$31,328.44
--IC	SF	6,956	$5.00	$34,780.00
--RC	SF	13,209	$4.50	$59,441.63
RIGHT-OF-WAY SUBTOTAL				**$ 2,843,000**
ENGINEERING SUPPORT				
Engineering	10.0%	ALL	$724,000.00	$724,000.00
Construction Management	15.0%	ALL	$1,086,000.00	$1,086,000.00
Right-of-Way Support	EA	5	$15,000.00	$75,000.00
ENGINEERING SUPPORT SUBTOTAL				**$ 1,885,000**
			TOTAL PROJECT SUBTOTAL	**$ 11,966,000**
			30% Contingency	**$ 3,590,000**
			2025 TOTAL ESTIMATED PROJECT COST	**$ 15,556,000**
PRICE ESCALATION				
Annual Price Escalation	YEARS	5	3%	$2,477,667.50
PRICE ESCALATION SUBTOTAL				**$ 2,480,000**
			2030 TOTAL ESTIMATED PROJECT COST	**$ 18,036,000**

Unit Costs Note:

The associated product and material costs are based upon the most recent available cost data. Due to the current volatility of the construction market, we

Scope Accuracy:

Level 1: Project scope well understood and well defined.

Level 2: Project scope conceptual. Scope lacks detail due to potential permit requirements; Unknown project conditions; limited knowledge of external impacts.

Level 3: Project scope is a "vision" with limited detail.

Engineering Effort:

Level A: Preliminary engineering performed. Technical information is available, engineering calculations have been performed; clear understanding of the materials size and quantities needed to execute job. Schedule understood; staff and permitting is fairly clear, (however this element may still need refining). Project Development & Construction Contingencies ranges between 10%-20%.

Level B: Conceptual engineering performed. Technical information is available, rough engineering calculations may have been performed, or similar information from previous similar work is compared and used. Project Development Contingencies ranges between 15% to 25% and Construction Contingencies ranges between 20% to 30%.

Level C: No engineering performed. Educated guesstimating. Limited technical information available and/or analysis performed. Project Development and Construction Contingencies should be selected appropriately by Project Manager. Contingency may range up to 60% based on risk.