Appendix D

TRAFFIC ANALYSIS

CADMAN MATERIALS INC.

Canby Pit – Phase 4 Expansion

March 4, 2019

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Traffic Analysis

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EXECUTIVE SUMMARY

Cadman Materials Inc. (Cadman) is requesting a comprehensive plan amendment and related application of the MAO overlay zone designation to properties west of South Barlow Road in Canby, Oregon. The requested plan amendment and zone change are to allow for the future extraction of aggregate. This report summarizes the traffic impact analysis necessary to satisfy the requirements of Oregon Administrative Rule (OAR) 660-12-0060 (the Transportation Planning Rule or "TPR") for the proposed zone change and comprehensive plan amendment and OAR 660-23-180(4) (b) (B) (the Goal 5 implementing rule or the "Goal 5 Rule") for the mining operation.

FINDINGS

This analysis includes the following findings:

- Highway 99E at South Barlow Road currently does not meet the adopted mobility standard which is expected to continue through Clackamas County's Transportation System Plan planning horizon. Oregon Highway Plan Action 1F.5 defines the mobility standard as no further degradation for this intersection. Since the application requests authorization of a minable inventory of aggregate resource to replace depleted resources at the facility, traffic associated with the application of the MAO overlay from the proposed aggregate extraction operation does not modify the volume-to-capacity ratios beyond existing background conditions, meeting ODOT mobility targets as defined in the Oregon Highway Plan.
- The existing site driveway will meet the mobility standard for the year of opening and through the end of Clackamas County Transportation System Plan planning horizon with the comprehensive plan amendment.
- The existing horizontal alignment of all roadways can accommodate truck traffic consistent with applicable standards under Goal 5.
- The application was found to meet all applicable traffic analysis code criteria.
- TPR has been demonstrated to be met for the proposed zone change and comprehensive plan amendment.

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1.0 BACKGROUND

Cadman Materials Inc. (Cadman) is proposing the inclusion of 99 acres adjacent to their existing aggregate operation southwest of Canby, Oregon. The site is located on the west side of South Barlow Road south of Highway 99E. The applicant is a requesting a comprehensive plan amendment to include the site on the County's inventory of significant aggregate resource sites and the application of the Mineral Aggregate Overlay (MAO) to support the proposed aggregate extraction. The inclusion of the 99 acres, which is currently zoned Exclusive Farm Use (EFU) into the existing operations will allow Cadman to continue its current extraction and processing activities at this location by providing a source of new aggregate as the resources on the existing site are depleted. Cadman does not propose to increase production of aggregate over the currently allowed 3 million tons/year, or the associated number of truck trips. Additionally, the existing conveyor tunnel currently used to transfer aggregate from the west side to the east side of South Barlow Road will continue to operate as Cadman moves into this area which eliminates the need for any additional truck traffic.

1.1 PROPOSED SITE INFORMATION

Cadman is proposing to incorporate eight adjacent tax lots to their existing aggregate facility along South Barlow Road south of Highway 99. The existing facility is comprised of the following tax lots:

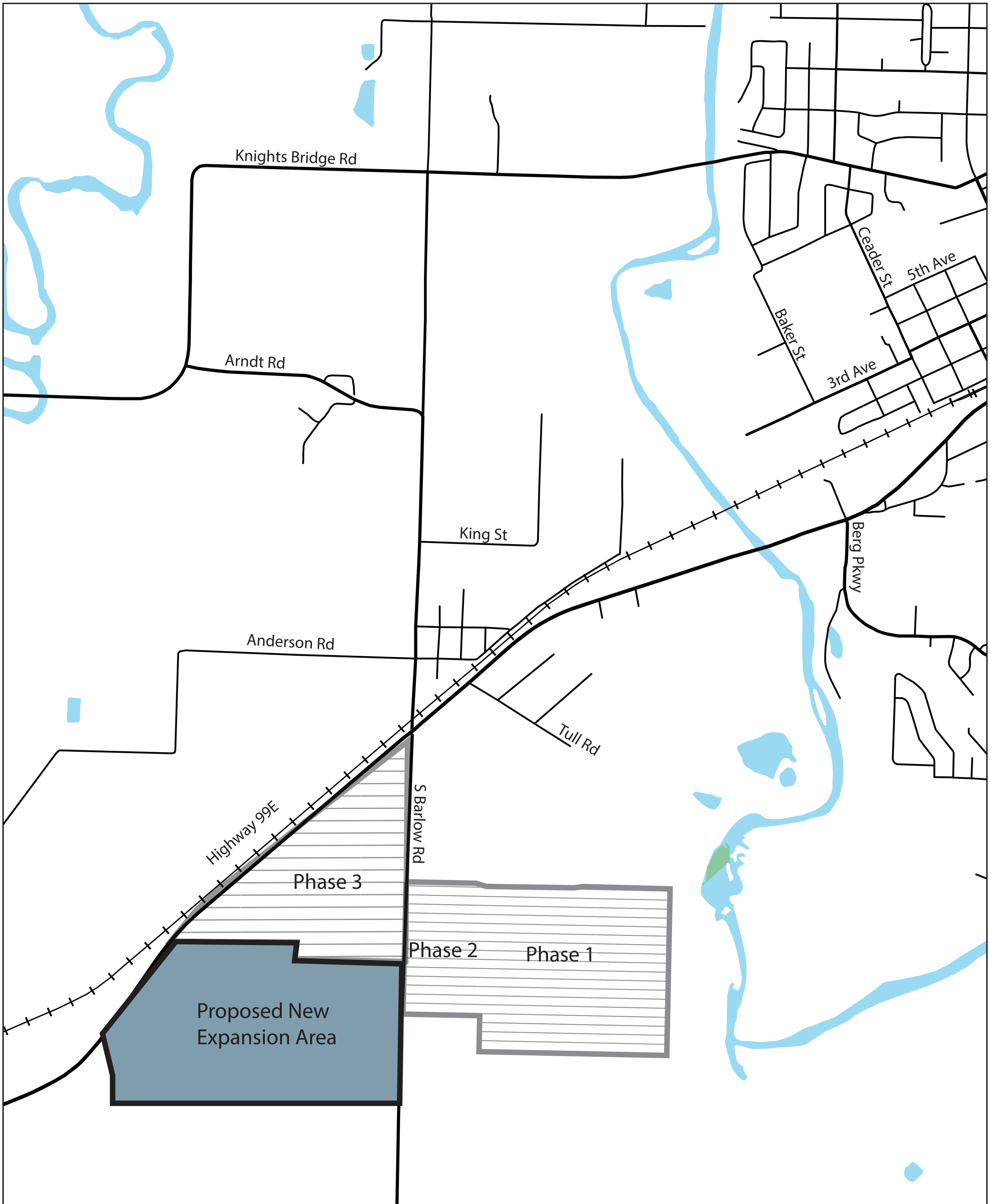
- 41E06- 1900
- 41E07- 100, 300, 190, 400, 390
- 41E08- 1000, 800, 700

The proposal is to add the tax lots illustrated in Table 1 within the existing operations. Figure 1 provides a vicinity map of the site. Appendix A contains more detail of the tax lots.

TABLE 1: PROPOSED TAX LOTS

Tax Lot	Acres	Zoning
41E07- 1003	17.0	EFU
41E07- 1004	17.2	EFU
41E07- 1002	7.3	EFU
41E07- 500	11.3	EFU
41E07- 600	27.7	EFU
41E07- 800	14.38	EFU
41E07- 801	1.4	EFU
41E07- 700	3.93	EFU

The proposed tax lots are currently zoned Exclusive Farm Use (EFU).



Cadman, Canby, Oregon

Figure 1: Site Location and Vicinity Map

1.2 OPERATIONAL BACKGROUND APPROVALS AND PHASING

Phase 1: The original aggregate operation was approved in 1999 and was contained within the tax lots located on the east side of South Barlow Road. In 2000, the site was approved for an increase in production to 3 million tons/year. With the approval, Clackamas County placed a trip cap on the property of no more than 154 AM peak hour and 120 PM peak hour trips.

Phase 2: In 2007, the operation incorporated tax lot 1000 on the east side of South Barlow Road, known as the "Rodrigues" property. The incorporation of this tax lot allowed the current/approved operations to be maintained within the 3 million tons/year limit. As the sand and gravel were depleted in the existing site, operations at the "Rodrigues" site were added to maintain production. All processing, internal roadways, and site access remained as originally permitted in Phase 1. There was no increase in production or increase in vehicle trips to the site from the inclusion of this tax lot.

A traffic impact evaluation was prepared for this phase. The evaluation determined that the Transportation Planning Rule (TPR) was met.

Phase 3: In 2012, Phase 3 was approved by the County to extend the MAO overlay designation to several tax lots on the west side of South Barlow Road. The inclusion of these lots in the MAO overlay allowed the continued operation at the existing location, subject to the permitted capacity of up to 3 million tons/year and continuation of the trip cap of 154 AM and 120 PM peak hour trips.

With this phase, a conveyor tunnel was built under South Barlow Road. All aggregate material extracted from the tax lots on the west side is transferred to the east side via the conveyor tunnel. All truck traffic uses the existing phase 1 and phase 2 driveway onto the east side of South Barlow Road.

1.3 SITE OPERATION

As the existing lands designated MAO are depleted of aggregate, Cadman is proposing the application of the MAO overlay designation to additional tax lots to allow mining within this additional area upon depletion of the current MAO area. Approval of this area for mining will allow the existing operation to be maintained in its current location.

The existing aggregate facility is allowed to produce up to 3 million tons/year, subject to a trip cap of 154 AM peak hours trips and 120 PM peak hour trips; this will not change with the proposed expansion. There will be no additional vehicle trips beyond what is already generated from the existing operations at Phases 1 - 3.

Additionally, the conveyor tunnel will continue to be used for the same purpose. All material will be transferred from the west side to the east side. Access to the tax lots on the west side of

South Barlow Road will be limited to the occasional equipment and employee trips with all trucks utilizing only the existing access to tax lot 1000.

1.4 EVALUATION CRITERIA

The applicant is requesting a comprehensive plan amendment to (1) include the Site on the Significant Inventory and (2) add a Mineral Aggregate Overlay (MAO) designation to support the proposed aggregate extraction operation. Impacts to the surrounding transportation system from the proposed zone change and mining operation are analyzed and evaluated under the following criteria:

- Oregon Administrative Ruling (OAR 660-23-180 (5)(b)(B)), Goal 5, for the mining operation
- OAR 660-12-0060, Goal 12, Transportation Planning Rule (TPR) for the Comprehensive Plan Amendment

Goal 5 (specifically, OAR 660-23-180(5)(b)) requires that local governments determine existing and approved land uses within the impact area that will be adversely affected by proposed mining operations and specify the predicted conflicts. For determination of traffic conflicts from proposed mining of a significant aggregate site, the local government shall limit its consideration to the following:

> "(B) Potential conflicts to local roads used for access and egress to the mining site within one mile of the entrance of the mining site unless a greater distance is necessary in order to include the intersection with the nearest arterial identified in the local transportation plan. Conflicts shall be determined based on clear and objective standards regarding sight distances, road capacity, cross-section elements, horizontal and vertical alignment, and similar items in the transportation plan and implementing ordinances. Such standards for trucks associated with the mining operation shall be equivalent to standards for other trucks of equivalent size, weight, and capacity that haul other materials;" OAR 660-23-180(5)(b)(B).

Goal 12 (specifically OAR 660-12-0060 (1)) requires that a local government ensures that an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) does not significantly affect an existing or planned transportation facility. A plan or land use amendment significantly affects a transportation facility if it would:

"(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);

(b) Change standards implementing a functional classification system; or

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan." OAR 660-12-0060(1)

1.5 SCOPE OF ANALYSIS

The applicant is planning to maintain the existing access connection and usage on South Barlow Road. South Barlow Road is classified as a major arterial within Clackamas Country Transportation System Plan[1].

[1] Scope of work is based on phone conversations with ODOT and Clackamas County. The evaluation is consistent with our understanding that TPR was the main issue to address for this application.

Goal 5 Criteria:

Goal 5 requires an analysis of potential transportation impacts to ***local roads*** used for access and egress to the mine site within one mile of the entrance or to the nearest arterial if a greater distance is necessary. Vehicle traffic generated by the subject Tax Lots will have direct access to South Barlow Road which is considered a “major arterial” by the Clackamas County Transportation System Plan.

The nearest major intersection is Highway 99E at South Barlow Road. This is the only intersection within one (1) mile that will receive regular turning truck traffic; all other intersections have minimal additional through traveling trucks.

This transportation analysis evaluates conflicts from truck traffic generated by the site from the driveway to the intersection of Highway 99E and South Barlow Road. This analysis includes the following:

- Estimation of the number of trucks expected to be generated by the site during the peak traffic demand period and over a whole day for normal operating conditions.
- Evaluation of the Site Driveway for truck access on South Barlow Road for existing conditions and the planning horizon of the Clackamas County TSP.
- Evaluation of intersection operations for the existing year (Year 2019), and at the end of the planning horizon as per Clackamas County’s Transportation System Plan (Year 2033). The analysis compares conditions with and without additional trips, if any, associated with the proposed aggregate extraction operations and compares the intersection operations to ODOT’s mobility standards, for the PM peak hour.
- Evaluation of roadway geometry/cross-sectional elements along South Barlow Road from the site driveway to the intersection of Highway 99E and South Barlow Road to determine if there are any horizontal or vertical alignment issues.
- Evaluation of sight distance at the site entrance.
- Evaluation of crash data at the site entrance and the intersection of Highway 99E and South Barlow Road.

Transportation Planning Rule (TPR) Criteria:

Compliance with TPR analysis requirements includes:

- Determining the number of trips to the site under the existing zoning and proposed zoning using a “reasonable worst-case” development potential.

2.0 PROPOSED SITE USAGE AND OPERATIONS

2.1 TRUCK USAGE

Cadman's aggregate operation at the Canby Pit has been permitted in prior approval of adjacent operations to allow no more than 3 million tons/year and no more than 154 AM peak hour trips and 120 PM peak hour trips. The proposed expansion to include the additional tax lots will allow Cadman to continue the existing operations at this location upon depletion of minable resources at the existing site, without an increase to production over what is currently allowed.

2.2 ACCESS

All aggregate from this site will be conveyed to the existing processing facility located on the east side of South Barlow Road for processing. All trucks entering and leaving the overall site will access the operations using the existing access on the east side of South Barlow Road. No vehicular traffic will use the access on the west side of South Barlow Road.

Figure 2 provides the site configuration.

3.0 EXISTING CONDITIONS

3.1 STREET NETWORK

Highway 99E

Highway 99E, is under the jurisdiction of the ODOT and is classified a Regional Highway. Highway 99E is a five-lane highway with an average width of 90 feet. Lane widths along Highway 99E are 12 feet with a 17-foot two-way left-turn lane (TWLTL) and 10 to 11-foot shoulders. The posted speed is 55 MPH.

South Barlow Road

South Barlow Road is classified as a Major Arterial. It is a two-lane, two-way road. South Barlow Road has an average width of 24 feet. Lane widths in this segment average 12 feet with gravel shoulders. The road is striped with a centerline and fog lines. South Barlow Road enters the Barlow Urban Growth Boundary north of Highway 99E and otherwise is outside of the Urban Growth Boundary. South Barlow Road is under Clackamas County Jurisdiction and has a posted speed of 55 MPH.

3.2 INTERSECTION CONFIGURATION

The signalized intersection of Highway 99E at South Barlow Road is evaluated for performance. Figure 4 shows the existing lane configurations and traffic control for the studied area.

Cadman, Canby, Oregon	Figure 2: Site Access

3.3 CRASH ANALYSIS

Pursuant to OAR 660-023-160 (5)(B) crash investigation was performed for the study area intersection and site access. The analysis investigates crashes that have been reported to the state for the most recent 5 years, January 1, 2013 to December 31, 2017, following procedures set forth in ODOT's Analysis Procedures Manual (APM). The study area is not large enough to use the HCM Critical Rate methodology for intersections or roadway segments. Therefore, the intersection and segment crash rate were used. The segment crash rate determines a crash rate in crashes per million vehicle miles of travel on the roadway segment. The crash rate is compared to the statewide average crash rate for roads of the same functional classifications. If the calculated crash rate exceeds the crash rate for that functional classification or there is a high percentage of a certain crash type, the location is investigated for further mitigation measures. Crash data was provided by ODOT and is included in Appendix B. The results of the segment crash analysis are provided in Table 2.

TABLE 2: SEGMENT CRASH RATE – SOUTH BARLOW ROAD (1.0 MILES SOUTH OF SITE DRIVEWAY TO HIGHWAY 99)

Collision Type	Year					Total
	2013	**2014**	**2015**	**2016**	**2017**	
Angle	0	0	0	0	0	0
Fixed/Other Object	0	0	0	0	0	0
Head-On	0	0	0	0	0	0
Rear-End	0	0	0	0	0	0
Sideswipe-Overtaking	0	0	1	1	1	3
Turning Movement	0	0	0	0	0	0
Other	1	0	1	0	0	2
Total	**1**	**0**	**2**	**1**	**1**	**5**
ADT	5268	5417	5560	5716	5865	
Crash Rate*	**0.27**	**0.00**	**0.51**	**0.25**	**0.24**	**0.25**
Statewide Crash Rate	2013	204	2015	2016	2017	
Rural Area – Other Minor Arterials	1.15	1.22	1.24	1.35	**	1.14

***crashes/million vehicle miles (normalized over one mile)**

**** Rates not provided by ODOT as of the date of the report**

As illustrated in Table 2, the studied segment of South Barlow Road has an average crash rate of 0.25 which is lower than the average State Highway Crash Rate, 1.14, for minor arterials in rural areas over the last 5 reported years.

Additionally, an intersection crash analysis was completed for the intersection of Highway 99E and South Barlow Road considering only crashes which occurred within the intersection influence area. The intersection crash rate is evaluated in terms of crashes per million entering vehicles at the intersection. The crash rate is compared to the statewide 90th percentile intersection crash rate in Exhibit 4-1 in the APM. The result of the intersection crash analysis is provided in Table 3.

TABLE 3: INTERSECTION CRASH RATE-SOUTH BARLOW AT HIGHWAY 99

Location	Number of Crashes	Types of Crashes						ADT	Crash Rate*	Statewide 90th Percentile Crash Rate
		Head	Rear	Side	Turn	Other	Pedestrian/ Bike			
Highway 99E at S Barlow Rd	41	0	14	5	16	6	0	40,000	0.56	0.579
S Barlow Road at Site Driveway	0	0	0	0	0	0	0	5865	0.00	0.475

***(crashes/million entering vehicles)**

As illustrated in Table 3, the intersection of Highway 99E and South Barlow Road has a crash rate of 0.56 which is lower than the statewide 90th percentile intersection crash rate, 0.579, for rural 4-leg signalized intersections. The Site Driveway at South Barlow Road has a crash rate of 0.00 which is lower than the 90th percentile intersection crash rate, 0.475, for rural 3-leg minor stop-controlled intersections.

3.4 EXISTING TRAFFIC VOLUMES

INTERSECTION COUNTS

As part of the analysis, PM peak hour turning movement counts were collected at the intersection of Highway 99E and South Barlow Road. The traffic count was performed for the weekday peak periods of 3:30 PM to 6:00 PM.

The turning movement counts illustrate that the weekday PM peak hour occurs from 4:15-5:15 PM. The traffic volumes are included in Appendix C.

SEASONAL ADJUSTMENT

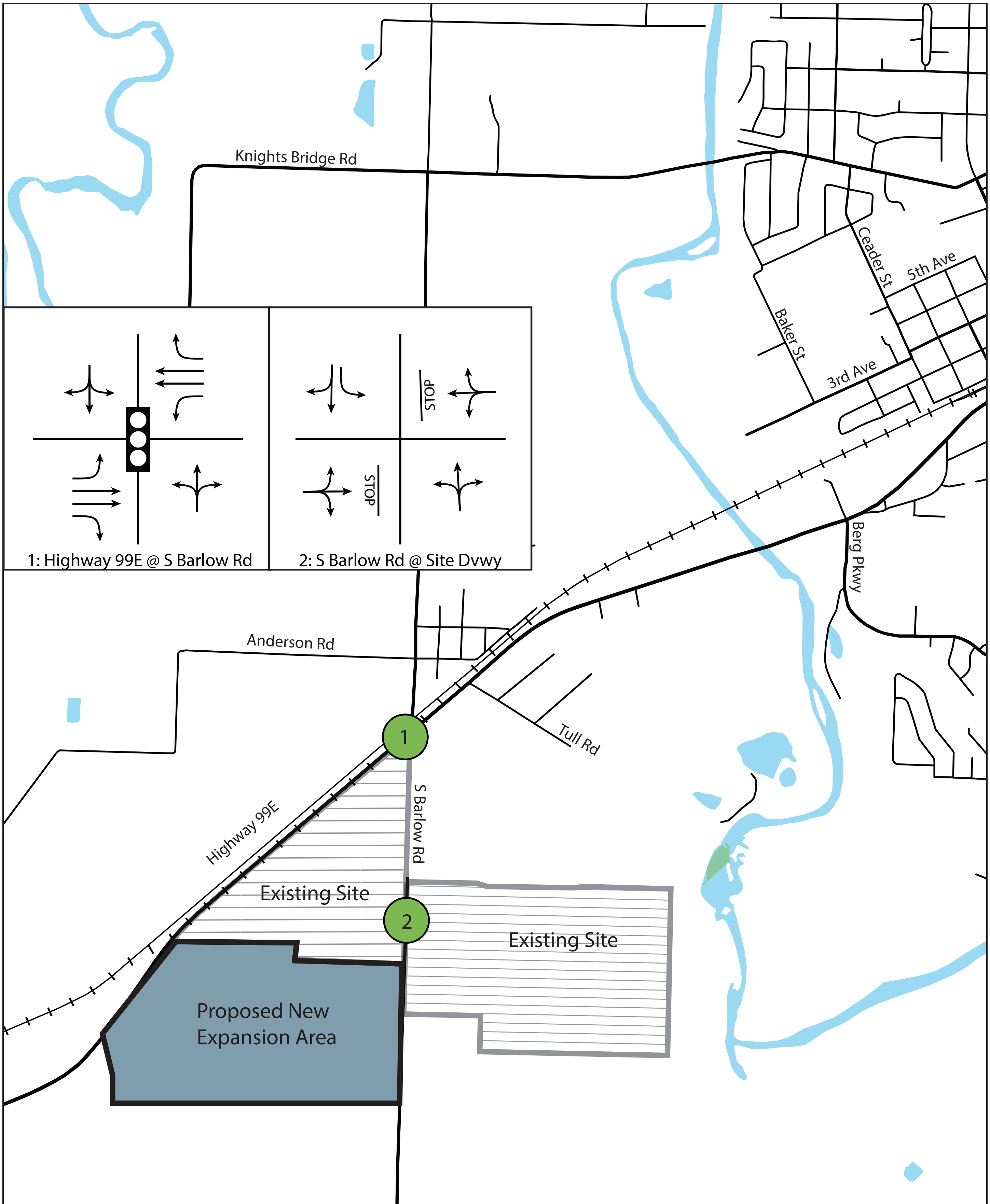
Application of seasonal adjustment factors account for the fact that through volumes along State Highways and recreational routes tend to fluctuate from month to month due to changes in recreational behavior, etc. Monthly volume variations for routes with recreational traffic show much higher seasonal peaking than for traffic with predominantly intercity traffic. The design hour traffic volumes are adjusted to reflect traffic conditions on roadways during the peak month of the year using the seasonal adjustment factor.

There are no Automatic Traffic Recorders (ATR) in the vicinity located on Highway 99E. Therefore, following methodology outlined by ODOT's *Analysis Procedures Manual (APM)*, the

Seasonal Trend Table was used to seasonally adjust traffic counts taken in September to the peak month of the year, August. Specifically, the commuter trend was determined to be most appropriate. The seasonal adjustment factor was determined to be 1.026. The seasonal adjustment calculation is included in Appendix C.

DESIGN HOUR VOLUMES

The existing traffic volumes were adjusted according to the methodology described above. Appendix C provides the traffic volume calculations.



Cadman, Canby, Oregon

Figure 3: Lane Configuration and Intersection Control

4.0 INTERSECTION EVALUATION

Goal 5 requires an evaluation of traffic operations at intersections that will be impacted by the proposed mining operation.

The intersections of Highway 99E at South Barlow Road and the Site Access at South Barlow Road were evaluated to determine if the proposed zone change and development will significantly affect these intersections as defined in Goal 5.

4.1 PERFORMANCE MEASURES

Intersections within this study were evaluated for volume-to-capacity ratios (V/C) and Level of Service (LOS). The volume-to-capacity ratio describes the capability of an intersection to meet volume demand based upon the maximum number of vehicles that could be served in an hour. Level of Service quantifies the degree of comfort a driver experiences as they travel through an intersection or roadway, measured in a delay in second per vehicle.

V/C is the threshold for which ODOT evaluates the operation of intersections, as defined by the *1999 Oregon Highway Plan*. V/C thresholds are defined based on roadway classification and speed. Since Highway 99E is a Regional Highway, the maximum v/c threshold for this facility type is 0.75.

Level of Service is the performance measure for rural roadway segments and unsignalized intersections within Clackamas County. LOS E is the standard for these facility types.

For this study, volume-to capacity intersection analysis was completed according to the *Highway Capacity Manual* (HCM) method implemented in SYNCHRO Version 9.

4.2 BASE TRAFFIC VOLUMES

The existing year base traffic volumes were collected and seasonally adjusted as per the methodology described in Section 3.4.

4.3 FUTURE YEAR BACKGROUND VOLUMES

Consistent with the traffic impact analysis criteria the intersections were evaluated for the existing condition, year 2019, and the planning horizon as per the Clackamas County Transportation System Plan (TSP), year 2033. The growth rate was calculated using existing and future condition traffic volumes from the Clackamas County TSP. The growth rate was calculated by approach with rates ranging from 1% for Highway 99 and 2.5% for South Barlow Road.

The growth rate calculations are included in Appendix C. Figure 4 illustrates the year 2019 and 2033 background traffic volumes.

4.5 SITE GENERATED TRIPS

Cadman has been permitted to allow up to but not more than 120 PM peak hour trips associated with its operations at this location. The evaluation considered operations up to the trip cap.

4.6 SITE TRIP DISTRIBUTION AND ASSIGNMENT

The truck trips are assumed to follow the following splits:

- 40% to/from the east on Highway 99E
- 45% to/from the north on South Barlow Road
- 5% to/from the west on Highway 99E
- 10% to/from the south on South Barlow Road

The PM peak hour trips were distributed along the haul route as illustrated in Figure 5.

4.7 INTERSECTION VOLUMES WITH SITE TRIPS

The proposed site trips were added to the year 2033 base traffic volumes to represent volumes with the site traffic added to it. Figures 6 illustrates traffic volumes for the year 2033 within the site operation.

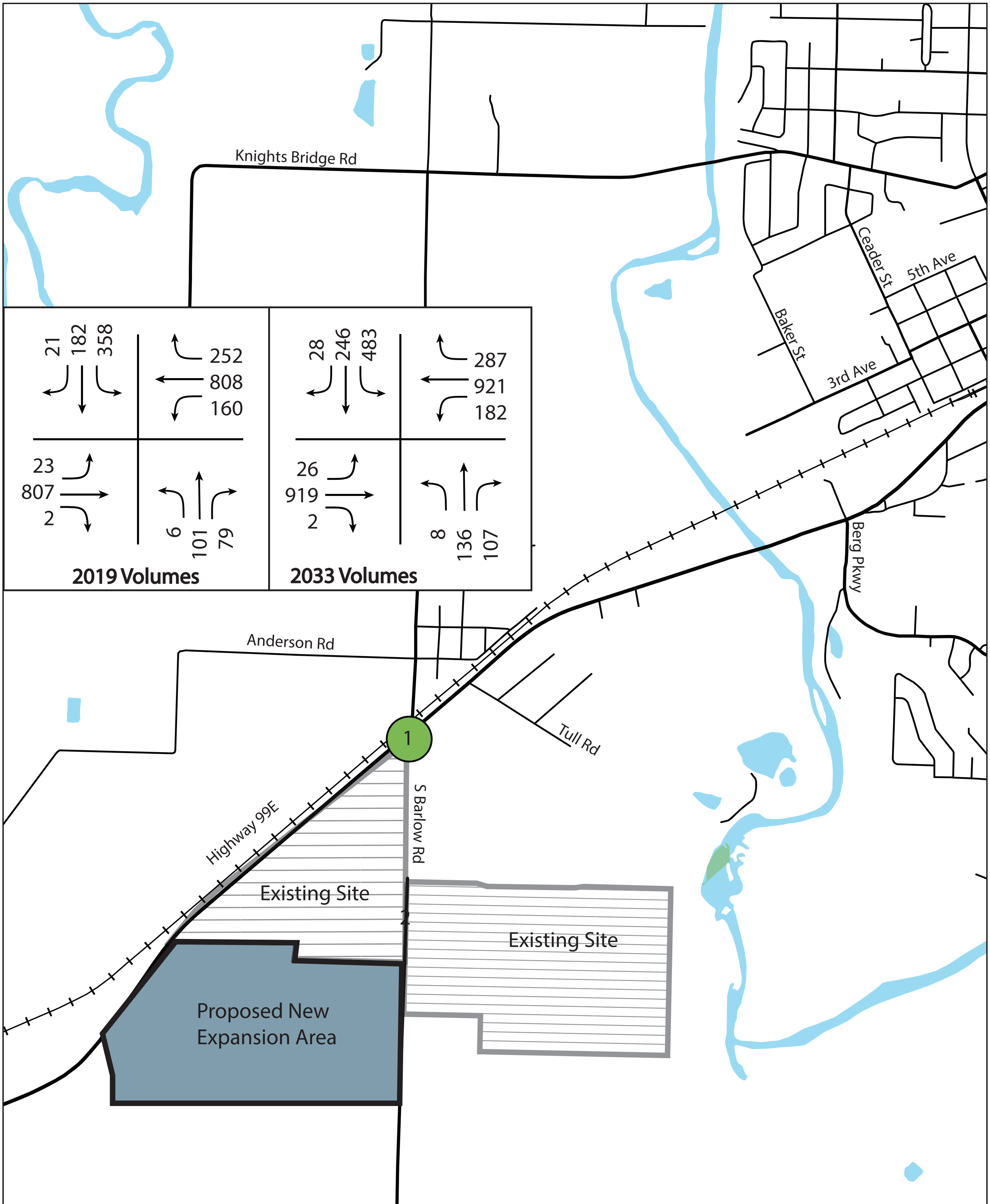


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Figure 4: PM Peak Hour Background Traffic Volumes

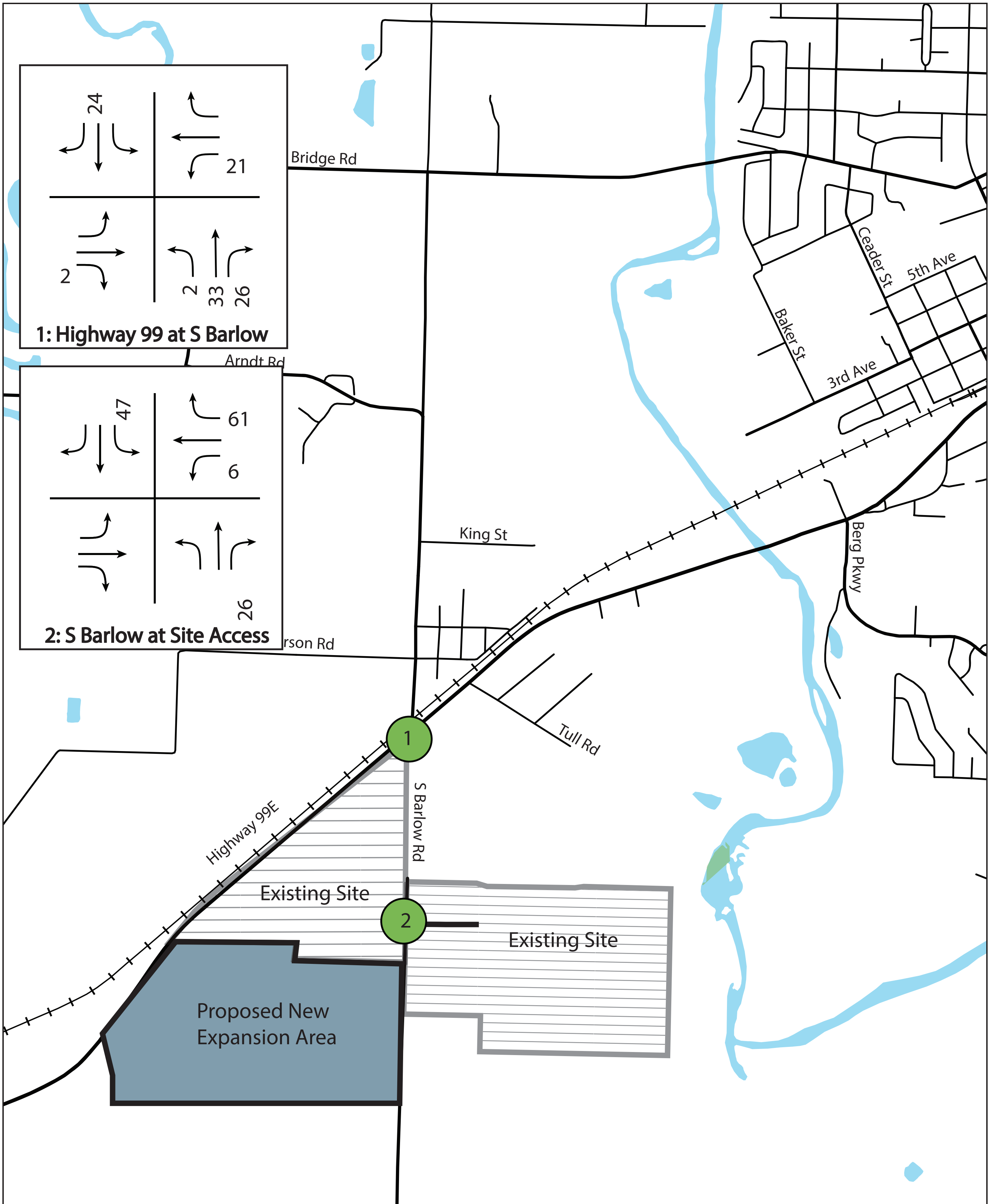

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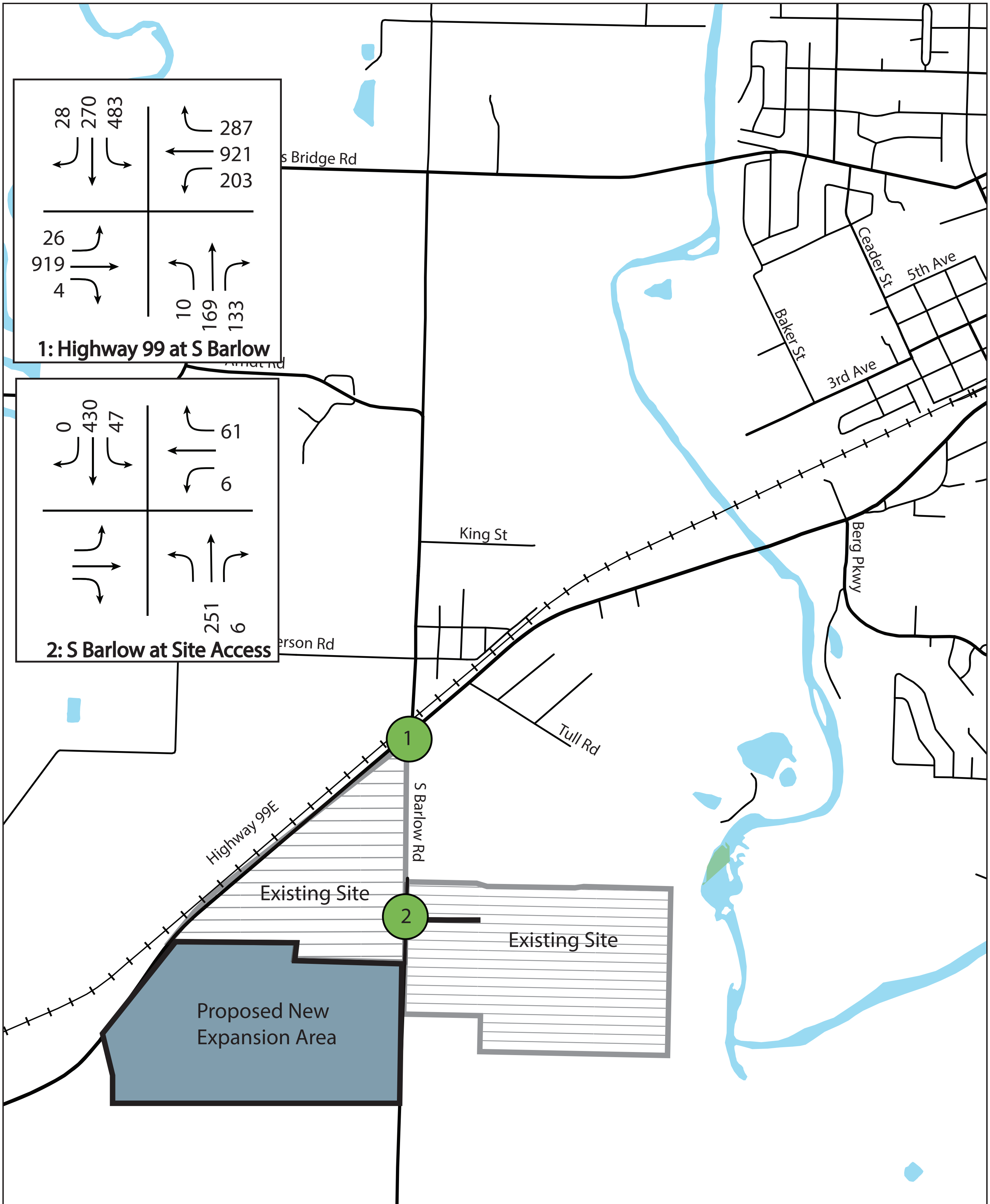
Figure 5: PM Peak Hour Site Trips



Cadman, Canby, Oregon

Figure 6: 2033 PM Peak Hour with Site Operation

4.8 INTERSECTION ANALYSIS RESULTS

A performance analysis was conducted for the studied intersections for the year 2019 existing conditions for the PM peak hour, and year 2033 conditions with and without the site operations. The analysis included mitigations provided on Clackamas County's TSP list of financially constrained projects. Specifically, at the intersection of Highway 99E at South Barlow Road, the financially constrained project list includes the construction of two southbound left turn lanes which were considered in this analysis. The results of the analysis are presented in Table 4. The SYNCHRO outputs are provided in Appendix D.

TABLE 4: INTERSECTION PERFORMANCE: YEAR WEEKDAY PM PEAK HOUR

Intersection	Mobility Standard	2019 Existing	2033 No-Build*	2033 Build*
Highway 99E at S Barlow Rd	V/C 0.75	1.00	0.89	0.89
South Barlow Road @ at Site Driveway	LOS E	N/A	B	B

*Includes the intersection improvements

As shown above, the intersection of Highway 99E at South Barlow Road exceeds the accepted mobility standard in the existing year and 2033 background condition. The continuation of the Cadman operations does not worsen the operation of the intersection. The site driveway continues to operate within the mobility standard under the full trip cap of 120 PM peak hour trips.

The Oregon Highway Plan Action 1F.5 states that for the purpose of evaluating amendments to a comprehensive plan, in situations where the volume to capacity ratio is currently above the mobility targets or is projected to be above the mobility targets at the planning horizon, the mobility target is to avoid further degradation. As shown, in Table 4, the proposed aggregate expansion (Canby Phase 4) and associated comprehensive plan amendment does not worsen the v/c ratio beyond the background conditions which meets the criteria of the Oregon Highway Plan, thus meeting the applicable mobility standards.

As shown in Table 4, the v/c is projected to be 0.89 in the year 2033 for Highway 99E at South Barlow Road. This is better than the 1.00 in the current year 2019. As stated above, Clackamas County's capital improvement list has identified this intersection for improvements. The identified improvement of dual southbound left turn lanes will improve the v/c to 0.89 by the end of the planning horizon.

5.0 GOAL 5 EVALUATION

As per Goal 5, local roads within one (1) mile of the site entrance that are used for access and egress from the site are to be evaluated for road capacity, cross section elements, and horizontal and vertical alignment. The site access is on South Barlow Road which is a major arterial. Regular truck traffic will be to the north to Highway 99E, a state facility. To the south on South Barlow Road, the 1 mile is reached just before the intersection of South Lone Elder Road, a minor arterial.

It is assumed that trucks accessing the site will be a mix of single unit dump trucks and dump trucks with a pup trailer. The evaluation takes into consideration both types of trucks.

5.1 SIGHT DISTANCE

Sight distances are classified by the stopping sight distance (SSD) for the major roadway and departure/intersection sight distance (ISD) for the minor street (controlled) approach. The stopping sight distance is the length of roadway needed for a vehicle traveling at the design speed to safely stop for a stationary object in the roadway. The required sight distance allows a driver to perceive and react to an object two (2) feet high on the roadway visible from a driver's eye height of 3.5 feet above the ground. The departure sight distance (ISD) is a measure of length of visibility of the roadway given to a stopped driver on a minor road approach. The distance provides time to perceive and react to gaps in traffic. For this calculation it is assumed that the driver's eye is 3.5 feet above the ground and that the object to be seen is 3.5 feet above the ground of the intersecting road.

Intersections and driveways should, at a minimum, meet the SSD requirements; however, it is desirable to achieve the ISD whenever possible.

The standards for evaluating SSD and ISD follow the methodology in AASHTO's *A Policy on Geometric Design of Highways and Streets* (2011).

The site driveway on South Barlow Road was evaluated to determine if sight distances were met.

Based on a posted speed of 55 MPH and a grade near the intersection of less than 3%, the recommended SSD from the 2011 AASHTO manual is 495 feet for vehicles in both the northbound and southbound directions. The ISD calculation was based on Case B1 of the 2011 AASHTO manual. The design vehicle used was a combination truck with a base time gap of 11.5 seconds. Based on these assumptions the recommended ISD is 930 feet for a left turn and 850 feet for a right turn.

- The available stopping sight distance for northbound vehicles on South Barlow Road as they approach the driveway is over 1,000 feet. This extends beyond the recommended 495 foot stopping sight distance.

- The available stopping sight distance for southbound vehicles on South Barlow Road as they approach the driveway is over 1,000 feet. This exceeds the recommended 495-foot stopping sight distance.

- The available intersection sight distance for a truck making a right turn from the driveway onto South Barlow Road extends beyond 1,000 feet to the north. This meets the minimum of 850 feet for the right turn from the minor road (Case B-2, AASHTO).

- The available intersection sight distance for a truck making a left turn from the site driveway onto South Barlow Road is more than 1,000 feet to the north and south. The minimum intersection sight distance is recommended to be 930 feet for a truck making a left turn from the minor road (Case B-1, AASHTO). The available intersection sight distance meets the requirement.

The sight distance standards for dump trucks are met for this intersection.

5.2 TURNING MOVEMENTS

The site driveway was evaluated for the ability of a gravel truck to make the necessary turns. The evaluation looked at movements made by a single unit dump truck and dump truck with a pup trailer. The results illustrate that the site driveway, as currently constructed, can accommodate the necessary truck movements.

5.3 ROAD CAPACITY

The roadways along the haul route were evaluated to determine if there is enough capacity to handle the trips associated with the area proposed for rezoning, which will be consistent with existing background trips from the Cadman operations traffic from this site resulting from this approval.

The estimated capacity of a roadway is based on the *Highway Capacity Manual* where the theoretical maximum number of vehicles that can travel on roadway section per lane per hour is adjusted per physical characteristics of the roadway such as lane width, grade, speed, the presence of stop signs or traffic signals, and horizontal alignment. A typical level roadway at free-flow speeds can handle 3,200 cars per hour per lane as per the *Highway Capacity Manual*; however, based on regional characteristics, the recommended practice to use 1,750 vehicles per hour per lane and make the necessary adjustments as per roadway characteristics.

South Barlow Road has a through volume of 315 for the northbound direction and 477 for southbound direction for the year 2033 with the proposed aggregate extraction operation. The volume to capacity ratio (as calculated from SYNCHRO) for South Barlow Road is 0.01 for the northbound and 0.28 for the southbound direction. This means that 1% and 28% of the capacity is used, respectively. Therefore, the roadways have sufficient capacity to handle the traffic from the proposed operation.

5.4 HORIZONTAL ALIGNMENT

South Barlow Road along the haul route was evaluated for roadway alignment to identify any significant safety or operational concerns that could be created or perpetuated by the added truck traffic.

Specifically, the roadway was evaluated to ensure adequate lane widths for trucks, paying significant attention to the off-tracking of a truck with a pup trailer. The existing lane widths are sufficient to handle the truck traffic along South Barlow Road.

6.0 TPR ANALYSIS (GOAL 12 EVALUATION)

The subject site is currently zoned Exclusive Farm Use (EFU). The applicant is requesting a zone map amendment to add a Mineral Aggregate Overlay (MAO) to support the proposed aggregate extraction of this site. The Transportation Planning Rule requires that the zone map amendment results in no significant effect on the adjacent transportation system.

The reasonable worst-case trip generation allowed under the current EFU zone designation is based upon the type and intensity of uses allowed in this street under the County zoning and development ordinance was determined using zoning types that are allowed within Clackamas County code. Table 5 depicts specifically allowed use and associated trip generation under current EFU zoning.

TABLE 5: EFU ZONING POTENTIAL TRIP GENERATION-PM PEAK HOUR

Allowed EFU Uses	ITE Lane Use Category	Size	Trip Generation Rate	PM Peak Hour Trips
Winery with Restaurant	931-Quality Restaurant	9,000 sf	7.8 trips/ksf	70
Golf Driving Range	432-Golf Driving Range	39 tees	1.25 trips/tee	49
Day Care Center	565 Day Care Center	2,000 sf	11.12 trips/ksf	22
Total				141

The proposed MAO zone amendment is anticipated to include the current production of not more than 3 million tons per year with no more than 120 trips in the PM peak hour.

The proposed zone map amendment will generate fewer trips than the worst-case trip generation associated with other EFU uses allowed under County code. Therefore, the TPR requirement of "no significant offset" under 660-12-0060 is met.

7.0 CODE COMPLIANCE

As per the analysis included within the report, the application can be found to meet all applicable traffic analysis code criteria as described in the following:

GOAL 5 (OAR 660-23-180(5)(b)(B))

Goal 5 (OAR 660-23-180(5)(b)) "(B) Potential conflicts to local roads used for access and egress to the mining site within one mile of the entrance of the mining site unless a greater distance is necessary in order to include the intersection with the nearest arterial identified in the local transportation plan. Conflicts shall be determined based on clear and objective standards regarding sight distances, road capacity, cross-section elements, horizontal and vertical alignment, and similar items in the transportation plan and implementing ordinances. Such standards for trucks associated with the mining operation shall be equivalent to standards for other trucks of equivalent size, weight, and capacity that haul other materials;" OAR 660-23-180(5)(b)(B)

The analysis evaluated the sight distance, intersection geometry, road capacity, and horizontal elements. All elements meet applicable standard either by existing conditions or by proposed mitigation to improve existing conditions.

GOAL 12, TPR (OAR 660-12-0060)

Goal 12, TPR (OAR 660-12-0060 (1)) requires that a local government ensures that an amendment to a functional plan, an acknowledged comprehensive plan, or a land use regulation (including a zoning map) does not significantly affect an existing or planned transportation facility. A plan or land use amendment significantly affects a transportation facility if it would:

"(a) Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);

The traffic from the proposed plan amendment and use will not change the functional classification of any existing or planned transportation facilities.

(b) Change standards implementing a functional classification system; or

The traffic from the proposed plan amendment will not change the standard implementing a functional classification system.

(c) Result in any of the effects listed in paragraphs (A) through (C) of this subsection based on projected conditions measured at the end of the planning period identified in the adopted TSP. As part of evaluating projected conditions, the amount of traffic projected to be generated within the area of the amendment may be reduced if the amendment includes an enforceable, ongoing requirement that would demonstrably limit traffic generation, including, but not limited to, transportation demand management. This reduction may diminish or completely eliminate the significant effect of the amendment.

(A) Types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;

The traffic from the proposed plan amendment and use will not result in levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility.

(B) Degrade the performance of an existing or planned transportation facility such that it would not meet the performance standards identified in the TSP or comprehensive plan; or

The traffic from the proposed plan amendment and use will not degrade the performance of any existing or planned transportation facility to below mobility standards.

(C) Degrade the performance of an existing or planned transportation facility that is otherwise projected to not meet the performance standards identified in the TSP or comprehensive plan." OAR 660-12-0060(1)

This criterion is not applicable as none of the studied intersections have been identified to not meet the mobility standards.

8.0 CONCLUSION

This analysis includes the following findings:

- Highway 99E at South Barlow Road currently does not meet the adopted mobility standard which is expected to continue through Clackamas County's Transportation System Plan planning horizon. Oregon Highway Plan Action 1F.5 defines the mobility standard as no further degradation for this intersection. Since the application requests authorization of a minable inventory of aggregate resource to replace depleted resources at the facility, traffic associated with the application of the MAO overlay from the proposed aggregate extraction operation does not modify the volume-to-capacity ratios beyond existing background conditions, thereby meeting ODOT mobility targets as defined in the Oregon Highway Plan.

- The existing site driveway will meet the mobility standard for the year of opening and through the end of Clackamas County Transportation System Plan planning horizon with the comprehensive plan amendment.
- The existing horizontal alignment of all roadways can accommodate truck traffic consistent with applicable standards under Goal 5.
- The application was found to meet all applicable traffic analysis code criteria.
- TPR has been demonstrated to be met for the proposed zone change and comprehensive plan amendment.

APPENDIX A: SITE PLAN

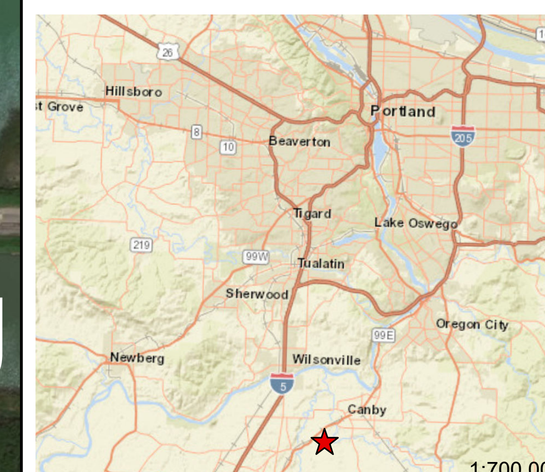
Cadman

PROPERTY MAP

CANBY
CLACKAMAS COUNTY, OREGON

Canby Property Boundary
Pit Boundary
Subject Parcels
Cha
Lapp
Blumenkron
Lee
VanPelt
Yoder
Cadastral

Note:



Scale:
200 100 0 200 400 600 800 ft

N W E S

DESIGNED:

DRAWN: DS

CHECKED:

LOCATION: CLACKAMAS COUNTY

REGION: CANADA

FLIGHT DATE: 2016- 07- 14

PRINT DATE:

DATE: 2018- 10- 22

Map No.
1

SUSTAINABLE RESOURCE
DEVELOPMENT REGION CANADA
8955 SHAUGHNESSY STREET
VANCOUVER, BC, V6P 3Y7

Service Layer Credits: World Imagery: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
World Boundaries and Places: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
World Street Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

APPENDIX B: CRASH DATA

Cadman

CRASH DATA SUMMARY

HWY 99E @ Barlow Rd

YEAR	PDO	INJURY	FATAL	HEAD	REAR	SIDE	TURN	ANGLE	OTHER	PED	BIKE	TOTAL	CHECK
2013	5	3	1		1	3	4		1			9	OK
2014	2	3					4	1				5	OK
2015	3	5			3	1	3	1				8	OK
2016	2	8			7	1	1	1				10	OK
2017	3	6			3		4	1	1			9	OK
TOTALS:	15	25	1	0	14	5	16	4	2	0	0	41	

P.M. PEAK HOUR	Number of Years	ADT	AVG. ANNUAL MILES (MILLIONS)	AVG. YEARLY CRASHES	CRASH RATE/ MILLION MILES
4,443	5	40,000	14,600,000	8,200,000	0.56

Barlow Segment

YEAR	PDO	INJURY	FATAL	HEAD	REAR	SIDE	TURN	OTHER	PED	BIKE	TOTAL	CHECK
2013	1					0		1	0	0	1	OK
2014									0	0	0	OK
2015		2				1			1	0	2	OK
2016		1				1			0	0	1	OK
2017	1					1			0	0	1	OK
TOTALS:	2	3	0	0	0	3	0	1	1	0	5	

Number of Years, n	ADT	AVG. ANNUAL MILES (MILLIONS)	AVG. YEARLY CRASHES	CRASH RATE/ MILLION MILES	CRASH RATE NORMALIZED OVER ONE MILE
1	5268	1922893.000	1000000.0	0.52	0.27
1	5417	1977314.500	0.0	0.00	0.00
1	5566	2031736.000	2000000.0	0.98	0.51
1	5716	2086157.500	1000000.0	0.48	0.25
1	5865	2140579.000	1000000.0	0.47	0.24
			Average	**0.49**	**0.25**

02/06/2019 TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

CLACKAMAS COUNTY

S BARLOW RD, MP 0 to .5, 01/01/2013 to 12/31/2017

1 - 4 of 5 Crash records shown.

SER# INVEST RD DPT UNLOC?	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY TIME LAT	MILEPNT DIST FROM INTERSECT LONG	COUNTY ROADS FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
06129	Y	N	N	N	N	12/28/2016	0.00	S BARLOW RD	INTER	3-LEG	N	N	SLT	PRKD MV	01	NONE 0	STRGHT										005,058,124	01
CITY						WE			N		NONE	N	ICE	SS-O		PRVTE	S -N									000	058,124	00
N						6A			05	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		047	000		01
N						45 14 22.29	-122 41																OR<25					
							9.09																					
																	-											
																	STRGHT	01	PED	INJC	32	M		SHLDR	000	000	005	00
																	S N											
																	-											
																	STRGHT	02	PED	INJB	30	M		SHLDR	000	000	005	00
																	S N											
															02	NONE 0	PRKD-P											
																PRVTE	S -N									008		00
																PSNGR CAR												
01602	N	N	N	N	N	04/28/2017	0.01	S BARLOW RD	STRGHT		N	N	CLR	S-STRGHT	01	NONE 9	STRGHT											02
COUNTY						FR			UN	(NONE)	UNKNOWN	N	DRY	SS-O		N/A	S -N									052		00
N						2P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 14 59.68	-122 43			(02)													UNK					
							21.85																					
															02	NONE 9	STRGHT											
																N/A	S -N									000		00
																PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																							UNK					
02033	N	N	N			05/29/2013	0.10	S BARLOW RD	STRGHT		N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT										029,079,062	25
NONE						WE			UN	(NONE)	UNKNOWN	N	DRY	FIX		PRVTE	N -S									000	029,079,062	25
Y						6P			01			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	20	F	OR-Y		080	000		00
N						45 15	-122 43			(02)													OR<25					
						3.780108	21.6762599																					
03538	N	N	N	N	N	08/30/2015	0.19	S BARLOW RD	STRGHT		N	N	CLD	O-STRGHT	01	NONE 0	STRGHT										093,121	27,05
COUNTY						SU			UN	(NONE)	UNKNOWN	N	WET	SS-M		PRVTE	S -N									000	121	00
Y						12P			05			N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	17	F	OR-Y		016,080	038	093	27,05
N						45 14 48.46	-122 43			(02)													OR<25					
							21.88																					
															02	NONE 1	STRGHT											
																PRVTE	N -S									007		00
																PSNGR CAR		01	DRVR	INJC	33	M	OTH-Y		000	000		00
																							N-RES					
															02	NONE 1	STRGHT											
																PRVTE	N -S									007		00
																PSNGR CAR		02	PSNG	INJC	32	F			000	000		00

SER# / INVEST / RD DPT / UNLOC?	S P E E D / D A L C / R U G S / S C H L / W O R K	DATE / DAY / TIME / LAT	MILEPNT / DIST FROM / INTERSECT / LONG	COUNTY ROADS / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
05545	N N N	12/21/2015	0.35	S BARLOW RD	STRGHT		N	N	RAIN	PED	01	NONE 0	STRGHT										18,19
COUNTY		MO			UN	(NONE)	UNKNOWN	N	WET	PED		PRVTE	S -N									000	00
N		2A			03			N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		000	000	00
N		45 15 17.3	-122 43 21.49			(02)													OR<25				
													- STRGHT	01	PED	INJB	42	M		SHLDR	061	046	18,19
													S N										

081: PACIFIC HIGHWAY EAST **Highway 081 ALL ROAD TYPES, MP 22.7 to 23.1 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage**

1 - 4 of 47 Crash records shown.

SER# INVEST RD DPT UNLOC?	S D P R S W E A U C O E L G H R D C S L K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03056	N N N	07/27/2017	CLACKAMAS	1 16		STRGHT		N	N	CLR	S-STRGHT	01 NONE 9	STRGHT									29
NO RPT		TH		MN 0		UN	(NONE)	UNKNOWN	N	DRY	REAR	N/A	N -S								000	00
N		11P	CANBY UA	22.71		04			N	DARK	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
N		45 15 4.59	-122 43 12.04		008100100S00		(04)											UNK				
												02 NONE 9	STOP									
												N/A	N -S								011	00
												SEMI TOW		01 DRVR	NONE	00	Unk	UNK		000	000	00
																		UNK				
00722	N N N N N	02/14/2016	CLACKAMAS	1 16		STRGHT		N	N	CLD	S-STRGHT	01 NONE 0	STRGHT									13
STATE		SU		MN 0		UN	(NONE)	UNKNOWN	N	WET	SS-O	PRVTE	S -N								000	00
N		6P	CANBY UA	22.74		06			N	DARK	INJ	PSNGR CAR		01 DRVR	NONE	63	M	SUSP		045	000	13
N		45 15 3.51	-122 43 13.67		008100100S00		(04)											OR<25				
												02 NONE 0	STRGHT									
												PRVTE	S -N								000	00
												PSNGR CAR		01 DRVR	NONE	28	M	OR-Y		000	000	00
																		OR<25				
												02 NONE 0	STRGHT									
												PRVTE	S -N								000	00
												PSNGR CAR		02 PSNG	INJC	33	F			000	000	00
												02 NONE 0	STRGHT									
												PRVTE	S -N								000	00
												PSNGR CAR		03 PSNG	NO<5	03	F			000	000	00
												03 NONE 0	STRGHT									
												PRVTE	S -N								000	00
												PSNGR CAR		01 DRVR	INJC	51	F	OR-Y		000	000	00
																		OR<25				
												03 NONE 0	STRGHT									
												PRVTE	S -N								000	00
												PSNGR CAR		02 PSNG	INJC	12	M			000	000	00
03832	N N N N N	09/17/2017	CLACKAMAS	1 16		STRGHT		N	N	CLR	S-1TURN	01 NONE 0	STRGHT									08
STATE		SU		MN 0		UN	(NONE)	UNKNOWN	N	DRY	TURN	PRVTE	N -S								000	00
N		12A	CANBY UA	22.75		03			N	DARK	INJ	PSNGR CAR		01 DRVR	INJC	30	M	OR-Y		000	000	00
N		45 15 3.16	-122 43 14.22		008100100S00		(04)											OR<25				
												02 NONE 0	U-TURN									
												PRVTE	N -N								000	00
												TRUCK		01 DRVR	NONE	28	M	OR-Y		008	000	08
																		OR<25				
02244	N N N N N	06/09/2015	CLACKAMAS	1 16		STRGHT		N	N	CLR	S-1STOP	01 NONE 0	STRGHT									29,22
STATE		TU		MN 0		UN	(NONE)	UNKNOWN	N	DRY	REAR	PRVTE	N -S								000	22
N		5P	CANBY UA	22.84		04			N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	35	M	OTH-Y		026	000	29
N		45 15 .03	-122 43 19.12		008100100S00		(04)											N-RES				
												02 NONE 0	STOP									
												PRVTE	N -S								011	00
												PSNGR CAR		01 DRVR	INJC	43	F	OR-Y		000	000	00
																		OR<25				

Highway 081 ALL ROAD TYPES, MP 22.7 to 23.1 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

5 - 9 of 47 Crash records shown.

SER# INVEST RD DPT UNLOC?	S D P R S W E A U C O E L G H R D C S L K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03599	N N N	09/02/2015	CLACKAMAS	1 16		STRGHT		N	N	CLR	S-1STOP	01	NONE 0	STRGHT										29
NONE		WE		MN 0		UN	(NONE)	UNKNOWN	N	DRY	REAR		UNKN	NE-SW									000	00
N		4P	CANBY UA	22.84		04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		026	000	29
N		45 15 .03	-122 43 19.12		008100100S00		(04)													OR<25				
												02	NONE 0	STOP										
													PRVTE	NE-SW									011	00
													PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		000	000	00
																				OR<25				
00710	Y N N N N	03/01/2013	CLACKAMAS	1 06		STRGHT		N	N	CLD	S-STRGHT	01	NONE 0	STRGHT										13
NONE		FR	BARLOW	MN 0	PACIFIC HY 99E	NE	(NONE)	UNKNOWN	N	DRY	SS-O		PRVTE	NE-SW									000	00
N		5A		22.84	TULL AVE	08			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		045	000	31
N		45 15 .184032	-122 43 18.8870879		008100100S00		(04)													OR<25				
												02	NONE 0	STRGHT										
													PRVTE	NE-SW									000	00
													TRUCK		01	DRVR	NONE	43	F	OR-Y		000	000	00
																				OR<25				
00766	N N N	02/17/2016	CLACKAMAS	1 16		STRGHT		N	N	RAIN	S-STRGHT	01	NONE 9	STRGHT										29
NONE		WE		MN 0		UN	(NONE)	UNKNOWN	N	WET	SS-O		N/A	NE-SW									000	00
N		6P	CANBY UA	22.85		03			N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N		45 14 59.69	-122 43 19.67		008100100S00		(04)													UNK				
												02	NONE 9	STRGHT										
													N/A	NE-SW									000	00
													PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																				UNK				
03027	N N N	07/07/2016	CLACKAMAS	1 16		STRGHT		N	N	RAIN	S-1STOP	01	NONE 0	STRGHT										27,29
NONE		TH		MN 0		UN	(NONE)	UNKNOWN	N	WET	REAR		PRVTE	NE-SW									000	00
N		6P	CANBY UA	22.86		04			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		016,026	000	27,29
N		45 14 59.34	-122 43 20.21		008100100S00		(04)													OR<25				
												02	NONE 0	STOP										
													PRVTE	NE-SW									011	00
													PSNGR CAR		01	DRVR	INJC	41	F	OR-Y		000	000	00
																				OR<25				
04200	N N N N N	10/12/2015	CLACKAMAS	1 16		STRGHT		N	N	CLR	S-STRGHT	01	NONE 0	STRGHT										13
STATE		MO		MN 0		UN	(NONE)	UNKNOWN	N	DRY	SS-O		PRVTE	N -S									000	00
N		5P	CANBY UA	22.87		04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y		045	000	13
N		45 14 58.99	-122 43 20.75		008100100S00		(04)													OR<25				
												02	NONE 0	STRGHT										
													PRVTE	N -S									000	00
													PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		000	000	00
																				OR<25				
												03	NONE 0	STRGHT										
													PRVTE	N -S									000	00
													PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		000	000	00
																				N-RES				

SER# INVEST RD DPT UNLOC?	S D P R S W E A U C O E L G H R D C S L K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
03170	N N N	08/05/2015	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										29
NONE		WE		MN 0		UN		TRF SIGNAL	N	UNK	REAR	PRVTE	UN-UN								000		00
N		1P	CANBY UA	22.89		06	2		N	DAY	PDO	UNKNOWN		01 DRVR	NONE	00	F	UNK		026	000		29
N		45 14 58.28	-122 43 21.83		008100100S00													OR<25					
												02 NONE 0	STOP										
												PRVTE	UN-UN								011		00
												PSNGR CAR		01 DRVR	NONE	82	M	OR-Y		000	000		00
																		OR<25					
06187	Y N N	12/05/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	S-1STOP	01 NONE 0	STRGHT									124	01,29
NONE		MO		MN 0		UN		TRF SIGNAL	N	WET	REAR	PRVTE	N -S								000	124	00
N		12P	CANBY UA	22.89		06	2		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	28	M	OR-Y		047,026	000		01,29
N		45 14 58.28	-122 43 21.83		008100100S00													OR<25					
												02 NONE 0	STOP										
												PRVTE	N -S								012		00
												PSNGR CAR		01 DRVR	INJC	53	F	OR-Y		000	000		00
																		OR<25					
												02 NONE 0	STOP										
												PRVTE	N -S								012		00
												PSNGR CAR		02 PSNG	INJC	31	F			000	000		00
												02 NONE 0	STOP										
												PRVTE	N -S								012		00
												PSNGR CAR		03 PSNG	NO<5	03	F			000	000		00
01558	N N N N N	05/06/2013	CLACKAMAS	1 06		INTER	CROSS	N	Y	CLR	FIX OBJ	01 NONE 0	STRGHT									055	26
COUNTY		MO		MN 0		N		TRF SIGNAL	N	DRY	FIX	PRVTE	NE-SW								007	055	00
N		11A		22.89		05	2		N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	61	M	OR-Y		081	000		26
N		45 14 58.2806759	-122 43 21.826092		008100100S00													OR<25					
												01 NONE 0	STRGHT										
												PRVTE	NE-SW								007	055	00
												PSNGR CAR		02 PSNG	INJC	16	M			000	000		00
03903	N N N	08/26/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT									013	29
NO RPT		FR		MN 0		N		TRF SIGNAL	N	DRY	REAR	PRVTE	NE-SW								000		00
N		9A	CANBY UA	22.89		06	2		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	29	M	OR-Y		026	000		29
N		45 14 58.28	-122 43 21.83		008100100S00													OR>25					
												02 NONE 0	STOP										
												PRVTE	NE-SW								011	013	00
												PSNGR CAR		01 DRVR	NONE	41	M	OR-Y		000	000		00
																		OR<25					
												03 NONE 0	STOP										
												PRVTE	NE-SW								022		00
												PSNGR CAR		01 DRVR	INJC	34	F	OR-Y		000	000		00
																		OR<25					
												03 NONE 0	STOP										
												PRVTE	NE-SW								022		00
												PSNGR CAR		02 PSNG	NO<5	02	M			000	000		00

SER# INVEST RD DPT UNLOC?	S P E E D / R A L C S / S U G S L / W C O H R K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V# SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
01943	N N N	04/29/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT										29
NONE		FR		MN 0		N		TRF SIGNAL	N	DRY	REAR	PRVTE	N -S								000		00
N		7A	CANBY UA	22.89		06	0		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	24	M	OR-Y		026	000		29
N		45 14 58.28	-122 43 21.83		008100100S00													OR-?					
												02 NONE 0	STOP										
												PRVTE	N -S								011		00
												PSNGR CAR		01 DRVR	INJC	32	M	OTH-Y		000	000		00
																		N-RES					
00446	N N N	02/04/2015	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	O-OTHER	01 NONE 0	TURN-L										08
NONE		WE		MN 0		NE		TRF SIGNAL	N	WET	TURN	PRVTE	N -NE								000		00
N		6P	CANBY UA	22.89		05	2		N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	68	F	OR-Y		007	000		08
N		45 14 58.28	-122 43 21.83		008100100S00													OR<25					
												01 NONE 0	TURN-L										
												PRVTE	N -NE								000		00
												PSNGR CAR		02 PSNG	NO<5	04	M			000	000		00
												02 NONE 0	TURN-R										
												PRVTE	S -NE								000		00
												PSNGR CAR		01 DRVR	INJC	25	F	OR-Y		000	000		00
																		OR<25					
												02 NONE 0	TURN-R										
												PRVTE	S -NE								000		00
												PSNGR CAR		02 PSNG	INJC	27	M			000	000		00
												02 NONE 0	TURN-R										
												PRVTE	S -NE								000		00
												PSNGR CAR		03 PSNG	INJC	56	F			000	000		00
05266	Y N N N N	10/26/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	ANGL-STP	01 NONE 0	TURN-L									124	08,01
STATE		WE		MN 0		NE		TRF SIGNAL	N	WET	TURN	PRVTE	N -NE								000	124	00
N		3P	CANBY UA	22.89		06	2		N	DAY	INJ	PSNGR CAR		01 DRVR	NONE	47	F	OR-Y		047,002	017		01,08
N		45 14 58.28	-122 43 21.83		008100100S00													OR<25					
												02 NONE 1	STOP										
												PRVTE	NE-SW								012		00
												SEMI TOW		01 DRVR	INJC	47	M	OR-Y		000	000		00
																		OR<25					
03818	N N N N N	09/17/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	S-1STOP	01 NONE 0	STRGHT										29
STATE		SU		MN 0		NE		TRF SIGNAL	N	WET	REAR	PRVTE	NE-SW								000		00
N		9P	CANBY UA	22.89		06	2		N	DLIT	INJ	PSNGR CAR		01 DRVR	NONE	16	M	NONE		026	000		29
N		45 14 58.29	-122 43 21.83		008100100S00													OR<25					
												02 NONE 0	STOP										
												PRVTE	NE-SW								011		00
												PSNGR CAR		01 DRVR	INJC	36	F	OR-Y		000	000		00
																		OR<25					
02958	Y N N	08/12/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	CLD	ANGL-OTH	01 NONE 0	STRGHT										01,02,32
NONE		MO		MN 0		NE		YIELD	N	DRY	TURN	PRVTE	S -N								000		00
N		9A		22.89		09	2		N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	43	M	OR-Y		047,052	000		01,32
N		45 14 58.2806759	-122 43 21.826092		008100100S00													OR<25					

Highway 081 ALL ROAD TYPES, MP 22.7 to 23.1 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

SER# INVEST RD DPT UNLOC?	S D / P R S W / E A U C O / E L G H R / D C S L K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
												02	NONE 1	TURN-R											
													PRVTE	SE-N									000		00
													SEMI TOW		01	DRVR	NONE	59	M	OR-Y		028	000		02
																				OR<25					
04133	N N N	10/28/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 1	TURN-R											02
NONE		MO		MN 0		NE		YIELD	N	DRY	TURN		PRVTE	SE-N									000		00
N		4A		22.89		09	2		N	DLIT	PDO		SEMI TOW		01	DRVR	NONE	34	M	OR-Y		028	000		02
N		45 14 58.2806759	-122 43 21.826092		008100100S00															OR<25					
												02	NONE 0	STRGHT											
													PRVTE	S -N									000		00
													PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		000	000		00
																				OR<25					
01476	N N N N N	04/17/2014	CLACKAMAS	1 06		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-R											02
COUNTY		TH		MN 0		NE		YIELD	N	WET	TURN		PRVTE	E -N									000		00
N		9A		22.89		09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		028	000		02
N		45 14 58.2806759	-122 43 21.8261279		008100100S00															OR<25					
												02	NONE 0	STRGHT											
													PRVTE	S -N									000		00
													TRUCK		01	DRVR	NONE	22	M	OR-Y		000	000		00
																				OR>25					
04593	N N N	10/06/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	UNK	S-1STOP	01	NONE 0	STRGHT											29
NONE		TH		MN 0		NE		UNKNOWN	N	WET	REAR		PRVTE	E -W									000		00
N		7P	CANBY UA	22.89		09	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	82	M	OR-Y		026	000		29
N		45 14 58.28	-122 43 21.83		008100100S00															OR<25					
												02	NONE 0	STOP											
													PRVTE	E -W									011		00
													PSNGR CAR		01	DRVR	NONE	49	M	OR-Y		000	000		00
																				OR<25					
												02	NONE 0	STOP											
													PRVTE	E -W									011		00
													PSNGR CAR		02	PSNG	INJC	16	F			000	000		00
01534	N N N	04/04/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE		MO		MN 0		NE		UNKNOWN	N	DRY	REAR		N/A	E -W									000		00
N		6P	CANBY UA	22.89		09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 14 58.28	-122 43 21.83		008100100S00															UNK					
												02	NONE 9	STOP											
													N/A	E -W									011		00
													PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																				UNK					
01922	N N Y N N	05/17/2017	CLACKAMAS	1 16		INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 9	STRGHT										015,117	17,08,32
STATE		WE		MN 0		NE		WW W/ GATE	N	DRY	FIX		N/A	E -W									000		00
N		3P	CANBY UA	22.89		09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 14 58.28	-122 43 21.83		008100100S00															UNK					
04793	N N N N N	11/14/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	TURN-R											29
COUNTY		TU		MN 0		S		YIELD	N	DRY	REAR		PRVTE	W -S									000		00
N		1P	CANBY UA	22.89		09	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		026	000		29
N		45 14 58.28	-122 43 21.83		008100100S00															OR<25					

SER# INVEST RD DPT UNLOC?	S D P R S W E A U C O E L G H R D C S L K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	SPCL USE TRLR QTY OWNER V# TYPE	MOVE FROM TO	PRTC P# TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
												02 NONE 0	STOP									
												PRVTE	W -S								011	00
												PSNGR CAR		01 DRVR	INJC	48	M	OR-Y		000	000	00
																		OR<25				
												02 NONE 0	STOP									
												PRVTE	W -S								011	00
												PSNGR CAR		02 PSNG	INJC	46	F			000	000	00
01232	N N N	03/08/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT									07
NONE		FR		MN 0		SW		TRF SIGNAL	N	DRY	REAR	UNKN	SW-NE								000	00
N		3P		22.89		06	0		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	36	M	OR-Y		026	000	07
N		45 14 58.2806759	-122 43 21.826092		008100100S00													UNK				
												02 NONE 0	STOP									
												PRVTE	SW-NE								011	00
												PSNGR CAR		01 DRVR	NONE	57	M	OR-Y		000	000	00
																		OR<25				
00568	N N N N N	02/02/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT									29
STATE		TU		MN 0		SW		TRF SIGNAL	N	DRY	REAR	PRVTE	SW-NE								000	00
N		12P	CANBY UA	22.89		06	2		N	DAY	INJ	PSNGR CAR		01 DRVR	INJC	54	M	OR-Y		026	000	29
N		45 14 58.28	-122 43 21.83		008100100S00													OR<25				
												02 NONE 0	STOP									
												PRVTE	SW-NE								011	00
												PSNGR CAR		01 DRVR	INJC	23	F	OR-Y		000	000	00
																		OR<25				
												02 NONE 0	STOP									
												PRVTE	SW-NE								011	00
												PSNGR CAR		02 PSNG	INJC	26	M			000	000	00
03721	N N N	09/11/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	S-1STOP	01 NONE 0	STRGHT								013	29
NO RPT		MO		MN 0		SW		TRF SIGNAL	N	DRY	REAR	PRVTE	NE-SW								000	00
N		3P	CANBY UA	22.89		06	2		N	DAY	INJ	TRUCK		01 DRVR	NONE	59	M	OTH-Y		026	000	29
N		45 14 58.3	-122 43 21.83		008100100S00													OR>25				
												02 NONE 0	STOP									
												PRVTE	NE-SW								011 013	00
												PSNGR CAR		01 DRVR	INJC	29	F	OR-Y		000	000	00
																		OR<25				
												02 NONE 0	STOP									
												PRVTE	NE-SW								011 013	00
												PSNGR CAR		02 PSNG	INJC	04	F			000	000	00
												02 NONE 0	STOP									
												PRVTE	NE-SW								011 013	00
												PSNGR CAR		03 PSNG	NO<5	02	M			000	000	00
												02 NONE 0	STOP									
												PRVTE	NE-SW								011 013	00
												PSNGR CAR		04 PSNG	NO<5	04	M			000	000	00

081: PACIFIC HIGHWAY EAST **Highway 081 ALL ROAD TYPES, MP 22.7 to 23.1 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage**

27 - 31 of 47 Crash records shown.

SER# INVEST RD DPT UNLOC?	SPEED ALC DRUGS SCHL WORK	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF-CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V# SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P# PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
												03 NONE 0	STOP									
												PRVTE	NE-SW								022 013	00
												PSNGR CAR		01 DRVR	INJC	67	M	OR-Y		000	000	00
																		OR<25				
												04 NONE 0	STOP									
												PRVTE	NE-SW								022	00
												PSNGR CAR		01 DRVR	NONE	36	M	OR-Y		000	000	00
																		OR<25				
03227	N N N	08/10/2014	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE 0	STRGHT									04
NONE		SU		MN 0		CN		TRF SIGNAL	N	DRY	ANGL	PRVTE	UN-UN								000	00
N		4P		22.89		00	2		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	M	UNK		000	000	00
N		45 14 58.28	-122 43 21.83		008100100S00													OR<25				
												02 NONE 0	STRGHT									
												PRVTE	NE-SW								000	00
												PSNGR CAR		01 DRVR	NONE	19	M	OR-Y		020	000	04
																		OR<25				
02478	N N N	07/10/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	ANGL-OTH	01 NONE 0	STRGHT									04
NO RPT		WE		MN 0		CN		TRF SIGNAL	N	DRY	TURN	PRVTE	NE-SW								000	00
N		8P		22.89		01	2		N	DUSK	PDO	PSNGR CAR		01 DRVR	NONE	24	F	OR-Y		097	000	00
N		45 14 58.2806759	-122 43 21.826092		008100100S00													OR<25				
												02 NONE 0	TURN-L									
												PRVTE	N -NE								000	00
												PSNGR CAR		01 DRVR	NONE	23	M	OR-Y		097	000	00
																		OR<25				
05241	N N N N N	12/08/2015	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	ANGL-OTH	01 NONE 0	STRGHT									02
COUNTY		TU		MN 0		CN		TRF SIGNAL	N	WET	TURN	PRVTE	NE-SW								000	00
N		7P	CANBY UA	22.89		01	2		N	DARK	INJ	PSNGR CAR		01 DRVR	NONE	62	M	OR-Y		028	000	02
N		45 14 58.28	-122 43 21.83		008100100S00													OR>25				
												02 NONE 0	TURN-L									
												PRVTE	N -NE								015	00
												PSNGR CAR		01 DRVR	NONE	58	M	OR-Y		000	000	00
																		OR<25				
												02 NONE 0	TURN-L									
												PRVTE	N -NE								015	00
												PSNGR CAR		02 PSNG	INJC	67	F			000	000	00
05225	N N N	12/08/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	O-1 L-TURN	01 NONE 9	STRGHT									02,08
NO RPT		FR		MN 0		CN		TRF SIGNAL	N	DRY	TURN	N/A	N -S								000	00
N		12P	CANBY UA	22.89		01	2		N	DAY	PDO	PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
N		45 14 58.28	-122 43 21.83		008100100S00													UNK				
												02 NONE 9	TURN-L									
												N/A	S -W								000	00
												PSNGR CAR		01 DRVR	NONE	00	Unk	UNK		000	000	00
																		UNK				
00295	N N N N N	01/25/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01 NONE 0	STRGHT								013	04
STATE		FR		MN 0		CN		TRF SIGNAL	N	WET	TURN	PRVTE	NE-SW								000	00
N		7A		22.89		02	2		N	DAWN	INJ	PSNGR CAR		01 DRVR	NONE	66	M	OR-Y		020	000	04
N		45 14 58.2806759	-122 43 21.826092		008100100S00													OR<25				

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

081: PACIFIC HIGHWAY EAST

Highway 081 ALL ROAD TYPES, MP 22.7 to 23.1 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

32 - 36 of 47 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S D / P R S W / E A U C O / E L G H R / D C S L K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	AGE	SEX	LICNS / RES	PED / LOC	ERROR	ACT	EVENT	CAUSE
												02	NONE 0	TURN-L											
													PRVTE	SW-N									000	013	00
													PSNGR CAR		01	DRVR	INJC	32	M	OR-Y		000	000		00
																				OR<25					
												03	NONE 0	STOP											
													PRVTE	N -S									022		00
													PSNGR CAR		01	DRVR	NONE	53	F	OR-Y		000	000		00
																				OR<25					
02022	N N N	05/28/2015	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013	04
NO RPT		TH		MN 0		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	NE-SW									000		00
N		9A	CANBY UA	22.89		02	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	85	F	OR-Y		020	000		04
N		45 14 58.28	-122 43 21.83		008100100S00															OR<25					
												02	NONE 0	STRGHT											
													PRVTE	S -N									000		00
													PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		000	000		00
																				OR<25					
												03	NONE 0	STOP											
													PRVTE	N -S									011	013	00
													PSNGR CAR		01	DRVR	INJC	25	M	OR-Y		000	000		00
																				OR<25					
01162	N N N	03/12/2016	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	O-1 L-TURN	01	NONE 0	STRGHT											04
CITY		SA		MN 0		CN		TRF SIGNAL	N	WET	TURN		PRVTE	SW-NE									000		00
N		8P	CANBY UA	22.89		03	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	26	M	OR-Y		020	000		04
N		45 14 58.28	-122 43 21.83		008100100S00															OR<25					
												02	NONE 0	TURN-L											
													PRVTE	NE-S									000		00
													PSNGR CAR		01	DRVR	INJC	48	F	OR-Y		000	000		00
																				OR<25					
												02	NONE 0	TURN-L											
													PRVTE	NE-S									000		00
													PSNGR CAR		02	PSNG	INJC	50	M			000	000		00
01577	N N N	05/07/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
NONE		TU		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000		00
N		5P		22.89		04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		000	000		00
N		45 14 58.2806759	-122 43 21.826092		008100100S00															OR<25					
												02	NONE 0	TURN-L											
													PRVTE	N -E									000		00
													PSNGR CAR		01	DRVR	INJC	29	F	OR-Y		028,004	000		02
																				OR<25					
02341	N N N N N	07/01/2013	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT											02
COUNTY		MO		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000		00
N		8A		22.89		04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	30	F	OR-Y		000	000		00
N		45 14 58.2806759	-122 43 21.826092		008100100S00															OR<25					
												02	NONE 0	TURN-L											
													PRVTE	N -E									000		00
													PSNGR CAR		01	DRVR	NONE	69	F	OR-Y		028,004	000		02
																				OR<25					

SER# / INVEST / RD DPT / UNLOC?	S D / P R S W / E A U C O / E L G H R / D C S L K	DATE / DAY / TIME / LAT	COUNTY / CITY / URBAN AREA / LONG	RD# FC / COMPNT / MLG TYP / MILEPNT	CONN# / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE / (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
00179	N N N N N	01/14/2014	CLACKAMAS	1 06		INTER	CROSS	N	N	FOG	O-1 L-TURN	01	NONE 0	STRGHT										02
STATE		TU		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N		7A		22.89		04	2		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	49	M	OR-Y		000	000	00
N		45 14	-122 43		008100100S00															OR<25				
		58.2806759	21.8261279																					
												02	NONE 0	TURN-L										
													PRVTE	N -NE									000	00
													PSNGR CAR		01	DRVR	INJC	16	M	OR-Y		028,004	000	02
																				OR<25				
02004	N N N	05/27/2014	CLACKAMAS	1 06		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
NONE		TU		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N		5P		22.89		04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		000	000	00
N		45 14 58.28	-122 43 21.83		008100100S00															OR<25				
												01	NONE 0	STRGHT										
													PRVTE	S -N									000	00
													PSNGR CAR		02	PSNG	INJC	21	F			000	000	00
												02	NONE 0	TURN-L										
													PRVTE	N -E									000	00
													PSNGR CAR		01	DRVR	NONE	00	M	UNK		028,004	000	02
																				UNK				
02333	N N N N N	06/14/2015	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
STATE		SU		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N		4P	CANBY UA	22.89		04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	24	M	OR-Y		000	000	00
N		45 14 58.28	-122 43 21.83		008100100S00															OR<25				
												01	NONE 0	STRGHT										
													PRVTE	S -N									000	00
													PSNGR CAR		02	PSNG	INJB	18	M			000	000	00
												02	NONE 0	TURN-L										
													PRVTE	N -E									000	00
													PSNGR CAR		01	DRVR	INJC	54	F	OR-Y		028,004	000	02
																				OR<25				
02768	N N N	07/11/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	O-1 L-TURN	01	NONE 0	STRGHT										02
NO RPT		TU		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000	00
N		2P	CANBY UA	22.89		04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	29	M	OR-Y		000	000	00
N		45 14 58.3	-122 43 21.82		008100100S00															OR>25				
												02	NONE 0	TURN-L										
													PRVTE	N -NE									000	00
													PSNGR CAR		01	DRVR	NONE	82	M	OR-Y		028,004	000	02
																				OR<25				
03146	N N N N N	08/03/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
STATE		TH		MN 0		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SW-NE									000	00
N		10P	CANBY UA	22.89		04	2		N	DARK	INJ		PSNGR CAR		01	DRVR	INJC	29	F	OR-Y		000	000	00
N		45 14 58.31	-122 43 21.86		008100100S00															OR<25				
												02	NONE 0	STRGHT										
													PRVTE	S -N									000	00
													PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		028	000	02
																				OR<25				

Highway 081 ALL ROAD TYPES, MP 22.7 to 23.1 01/01/2013 to 12/31/2017, Both Add and Non-Add mileage

42 - 46 of 47 Crash records shown.

SER# INVEST RD DPT UNLOC?	S D P R S W E A U C O E L G H R D C S L K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
04197	N N N N N	10/09/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	CLD	O-1 L-TURN	01	NONE 0	STRGHT											27,02,08
STATE		MO		MN 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S -N									000		00
N		7A	CANBY UA	22.89		04	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	39	M	OR-Y		000	000		00
N		45 14 58.29	-122 43 21.83		008100100S00															OR<25					
												02	NONE 0	TURN-L											
													PRVTE	N -E									000		00
													PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		028,004	000		27,02,08
																				OR<25					
04238	N N N	10/12/2017	CLACKAMAS	1 16		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 9	STRGHT											04
NONE		TH		MN 0		CN		TRF SIGNAL	N	WET	ANGL		N/A	S -N									000		00
N		5A	CANBY UA	22.89		04	2		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N		45 14 58.31	-122 43 21.87		008100100S00															UNK					
												02	NONE 9	STRGHT											
													N/A	SW-NE									000		00
													PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																				UNK					
00990	N N N	03/22/2013	CLACKAMAS	1 06		STRGHT		Y	N	CLR	O-1STOP	01	NONE 0	BACK											10
NONE		FR		MN 0		UN	(NONE)	TRF SIGNAL	N	DRY	BACK		PRVTE	NE-SW									000		00
N		8A		22.91		06			N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		011	000		10
N		45 14 57.7464359	-122 43 22.7816759		008100100S00		(04)													OR>25					
												02	NONE 0	STOP											
													PRVTE	SW-NE									011		00
													PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																				OR<25					
03205	N N N	08/29/2013	CLACKAMAS	1 06		STRGHT		N	N	UNK	S-STRGHT	01	NONE 0	STRGHT											13
NONE		TH		MN 0		UN	(NONE)	UNKNOWN	N	WET	SS-O		PRVTE	N -S									000		00
N		7A		22.95		03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		045	000		13
N		45 14 56.439492	-122 43 24.8829599		008100100S00		(04)													UNK					
												02	NONE 0	STRGHT											
													PRVTE	N -S									000		00
													PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		000	000		00
																				OR<25					
02759	N N N N N	08/10/2013	CLACKAMAS	1 06		STRGHT		N	N	CLR	O-STRGHT	01	NONE 0	STRGHT										079,010	05
STATE		SA		MN 0		UN	(NONE)	UNKNOWN	N	DRY	SS-M		PRVTE	S -N									022	079,010	00
Y		8P		23.00		04			N	DAY	FAT		PSNGR CAR		01	DRVR	KILL	21	M	OR-Y		080	000		05
N		45 14 54.715668	-122 43 27.5973599		008100100S00		(04)													OR<25					
												02	NONE 1	STRGHT											
													PRVTE	N -S									000		00
													PSNGR CAR		01	DRVR	NONE	54	M	OTH-Y		000	000		00
																				N-RES					
												03	NONE 0	STRGHT											
													PRVTE	N -S									022		00
													PSNGR CAR		01	DRVR	INJC	57	M	OR-Y		000	000		00
																				OR<25					

SER# INVEST RD DPT UNLOC?	S P E E D	A L C	D R U G S	S C H L	W O R K	DATE DAY TIME LAT	COUNTY CITY URBAN AREA LONG	RD# FC COMPNT MLG TYP MILEPNT	CONN# FIRST STREET SECOND STREET LRS	RD CHAR DIRECT LOCTN	INT-TYPE (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CONTL	OFFRD RNDBT DRVWY	WTHR SURF LIGHT	CRASH COLL SVRTY	V#	SPCL USE TRLR QTY OWNER TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT	EVENT	CAUSE
00653	N	N	N			02/09/2016	CLACKAMAS	1 06		STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT											29
NONE						TU		MN 0		UN	(NONE)	UNKNOWN	N	DRY	REAR		N/A	S -N									000		00
N						2P		23.09		04			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 14 51.48	-122 43 32.69		008100100S00		(04)													UNK					
																02	NONE 9	STOP											
																	N/A	S -N									011		00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
																								UNK					

APPENDIX C: TRAFFIC VOLUMES

Cadman

Intersection: **1: S Barlow Rd @ Pacific HWY 99E** City: **Canby, Or**

Counter: **Sandow Engineering** Date: **Sept 12,2017**

Total of All Vehicles

Time Period		Southbound Right	Southbound Thru	Southbound Left	Southbound Approach Total	Westbound Right	Westbound Thru	Westbound Left	Westbound Approach Total	Northbound Right	Northbound Thru	Northbound Left	Northbound Approach Total	Eastbound Right	Eastbound Thru	Eastbound Left	Eastbound Approach Total	15 Minute Volume	Hourly Volume	Pedestrians SB	Pedestrians WB	Pedestrians NB	Pedestrians EB
15:30	15:45	12	46	102	160	67	144	50	261	24	16	5	45	2	159	9	170	636		0	0	0	0
15:45	16:00	6	48	78	132	61	175	39	275	32	20	4	56	0	171	5	176	639		0	0	0	0
16:00	16:15	6	27	80	113	54	190	49	293	30	20	1	51	7	150	3	160	617		0	0	0	0
16:15	16:30	5	40	79	124	66	212	44	322	22	28	1	51	2	163	7	172	669	2561	0	0	0	0
16:30	16:45	11	45	95	151	64	208	41	313	22	21	1	44	0	193	6	199	707	2632	0	0	0	0
16:45	17:00	2	41	82	125	54	194	37	285	18	23	1	42	0	233	3	236	688	2681	0	0	0	0
17:00	17:15	2	51	93	146	62	174	34	270	15	26	3	44	0	197	6	203	663	2727	0	0	0	0
17:15	17:30	1	45	75	121	52	185	44	281	23	22	1	46	3	169	8	180	628	2686	0	0	0	0
17:30	17:45	2	59	100	161	54	168	41	263	21	24	0	45	0	160	7	167	636	2615	0	0	0	0
17:45	18:00	2	38	82	122	34	149	30	213	18	24	2	44	1	149	7	157	536	2463	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1800	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1172	0	0	0	0
Count Period Total		**49**	**440**	**866**		**568**	**1799**	**409**		**225**	**224**	**19**		**15**	**1744**	**61**		**6419**		**0**	**0**	**0**	**0**

PM Peak Hour Count Summary

	Southbound Right	Southbound Thru	Southbound Left	Southbound Approach	Westbound Right	Westbound Thru	Westbound Left	Westbound Approach	Northbound Right	Northbound Thru	Northbound Left	Northbound Approach	Eastbound Right	Eastbound Thru	Eastbound Left	Eastbound Approach			Pedestrians SB	Pedestrians WB	Pedestrians NB	Pedestrians EB
Peak Volumes	**20**	**177**	**349**	**546**	**246**	**788**	**156**	**1190**	**77**	**98**	**6**	**181**	**2**	**786**	**22**	**810**	**2727**		**0**	**0**	**0**	**0**
PHF	0.45	0.87	0.92	0.90	0.93	0.93	0.89	0.92	0.88	0.88	0.50	0.89	0.25	0.84	0.79	0.86	0.96					
Trucks	1	4	0		1	10	2		1	1	0		0	12	3							
% Trucks	5%	2%	0%		0%	1%	1%		1%	1%	0%		0%	2%	14%							

Seasonally Adjusted Peak Hour

1: S Barlow Rd @ Pacific HWY 99E

Southbound

20%	937		13%
561	↓	↑	376
63.81%	32.44%	3.74%	%
R	T	L	PED
21	182	358	0

Eastbound

30%	835	%	Ped	0	
1666	← →	0.24%	L	23	
		96.99%	T	806	
30%	831	2.77%	R	2	

Westbound

252	R	13.11%	1220	44%	
808	T	66.23%	← →	2463	
160	L	20.66%			
0	Ped	%	1243	44%	

Northbound

0	6	101	79
Ped	L	T	R
%	42.5%	54.3%	3.2%
344	↓	↑	186
12%	530		7%

1

2798

Seasonal Adjustment Factor

1.026

1: S Barlow Rd @ Pacific HWY 99E

Pedestrians and Cars

Time Period	Southbound				Westbound				Northbound				Eastbound				15 Minute	Hourly
	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Volume	Volume
3:30 PM		12	46	95		65	142	47		24	16	5		1	144	6	603	
3:45 PM		5	44	77		59	171	38		29	19	4		0	161	5	612	
4:00 PM		6	26	77		52	185	46		29	20	1		7	140	2	591	
4:15 PM		5	38	78		65	205	42		21	26	1		2	159	5	647	2453
4:30 PM		10	45	92		61	200	38		20	19	0		0	184	6	675	2525
4:45 PM		2	41	81		54	189	35		17	23	1		0	227	2	672	2585
5:00 PM		1	51	92		61	167	34		15	26	3		0	193	5	648	2642
5:15 PM		1	45	74		49	180	43		22	22	1		3	166	8	614	2609
5:30 PM		1	57	100		54	162	39		20	23	0		0	155	7	618	2552
5:45 PM		2	36	82		33	145	30		18	24	2		1	142	4	519	2399
6:00 PM																	0	1751
6:15 PM																	0	1137
Total	0	45	429	848	0	553	1746	392	0	215	218	18	0	14	1671	50		
Peak Hour	**0**	**3**	**93**	**182**	**0**	**87**	**307**	**69**	**0**	**38**	**47**	**2**	**0**	**1**	**297**	**11**	**1137**	

Trucks

Time Period	Southbound			Westbound			Northbound			Eastbound			15 Minute	Hourly
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Volume	Volume
3:30 PM	0	0	7	2	2	3	0	0	0	1	15	3	33	
3:45 PM	1	4	1	2	4	1	3	1	0	0	10	0	27	
4:00 PM	0	1	3	2	5	3	1	0	0	0	10	1	26	
4:15 PM	0	2	1	1	7	2	1	2	0	0	4	2	22	108
4:30 PM	1	0	3	3	8	3	2	2	1	0	9	0	32	107
4:45 PM	0	0	1	0	5	2	1	0	0	0	6	1	16	96
5:00 PM	1	0	1	1	7	0	0	0	0	0	4	1	15	85
5:15 PM	0	0	1	3	5	1	1	0	0	0	3	0	14	77
5:30 PM	1	2	0	0	6	2	1	1	0	0	5	0	18	63
5:45 PM	0	2	0	1	4	0	0	0	0	0	7	3	17	64
6:00 PM													0	49
6:15 PM													0	35
Total	4	11	18	15	53	17	10	6	1	1	73	11		
Peak Hour	**1**	**4**	**0**	**1**	**10**	**2**	**1**	**1**	**0**	**0**	**12**	**3**	**35**	

Bikes

Time Period	Southbound			Westbound			Northbound			Eastbound			SB	WB	NB	EB
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left				
3:30 PM													0	0	0	0
3:45 PM													0	0	0	0
4:00 PM													0	0	0	0
4:15 PM													0	0	0	0
4:30 PM													0	0	0	0
4:45 PM													0	0	0	0
5:00 PM													0	0	0	0
5:15 PM													0	0	0	0
5:30 PM													0	0	0	0
5:45 PM													0	0	0	0
6:00 PM													0	0	0	0
6:15 PM													0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0				
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				

Pedestrians

Time Period	NE			NW			SW			SE			SB	WB	NB	EB
	Left	Right	Total	Left	Right	Total	Left	Right	Total	Left	Right	Total				
3:30 PM													0	0	0	0
3:45 PM													0	0	0	0
4:00 PM													0	0	0	0
4:15 PM													0	0	0	0
4:30 PM													0	0	0	0
4:45 PM													0	0	0	0
5:00 PM													0	0	0	0
5:15 PM													0	0	0	0
5:30 PM													0	0	0	0
5:45 PM													0	0	0	0
6:00 PM													0	0	0	0
6:15 PM													0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**				

Existing 2019 PM Volumes

			561		376				
			R	T	L	PED			
		1	21	182	358	0			
	Ped	0	1: S Barlow Rd @ Pacific HWY 99E				252	R	1220
835	L	23					808	T	
	T	806					160	L	1243
831	R	2					0	Ped	
			0	6	101	79			
			Ped	L	T	R			
				344		186			

EDIT Highlighted	
Base Year	2019
Target Year	2025
Years of Growth	6
Barlow Growth rate	0.025
Growth Factor	1.15
Hwy 99 Growth rate	0.01
Growth Factor	1.06

			R	T	L	PED			
		1	0	343	0	0			
	Ped	0	2: S Barlow Rd @ Site Driveway				0	R	0
0	L	0					0	T	
	T	0					0	L	0
0	R	0					0	Ped	
			0	0	182	0			
			Ped	L	T	R			
				343		182			

2033 Background volumes

			757		450				
			R	T	L	PED			
		1	28	246	483	0			
	Ped	0	1: S Barlow Rd @ Pacific HWY 99E				287	R	1390.8
958	L	26					921	T	
	T	919					182	L	1508.79
947	R	2					0	Ped	
			0	8	136	107			
			Ped	L	T	R			
				430		251			

EDIT Highlighted	
Base Year	2019
Target Year	2033
Years of Growth	14
Barlow Growth rate	0.025
Growth Factor	1.35
Hwy 99 Growth rate	0.01
Growth Factor	1.14

			430		251				
			R	T	L	PED			
		1	0	430	0	0			
	Ped	0	2: S Barlow Rd @ Site Driveway				0	R	0
0	L	0					0	T	
	T	0					0	L	0
0	R	0					0	Ped	
			0	0	251	0			
			Ped	L	T	R			
				430		251			

2025 **Existing Splits**

			561		376				
			R	T	L	PED			
		1	21	182	358	0			
	Ped	0	1: S Barlow Rd @ Pacific HWY 99E				252	R	1220
835	L	23					808	T	
	T	806					160	L	1243
831	R	2					0	Ped	
			0	6	101	79			
			Ped	L	T	R			
				344		186			

			0		0				
			R	T	L	PED			
		1	0	0	0	0			
	Ped	0	2: S Barlow Rd @ Site Driveway				0	R	0
0	L	0					0	T	
	T	0					0	L	0
0	R	0					0	Ped	
			0	0	0	0			
			Ped	L	T	R			
				0		0			

Development Trips:

Development trips

			24		33				
			R	T	L	PED			
		1	0	24	0	0			
	Ped	0	1: S Barlow Rd @ Pacific HWY 99E				0	R	21
2	L	0					0	T	
	T	0					21	L	26
2	R	2					0	Ped	
			0	2	33	26			
			Ped	L	T	R			
				47		61			

			1		1				
			R	T	L	PED			
		1	0	53%	0	0			
	Ped	0	0				0	R	0.47
0.03	L	0					0	T	
	T	0					47%	L	0.42
0.01	R	1%					0	Ped	
			0	3%	54%	42%			
			Ped	L	T	R			
				1		1			

			47		61				
			R	T	L	PED			
		1		0	47	0			
	Ped	0	2: S Barlow Rd @ Site Driveway				61	R	67
0	L						0	T	
	T	0					6	L	53
0	R						0	Ped	
			0		0	6			
			Ped	L	T	R			
				6		6			

47

2033 Build Volumes

			781		483				
			R	T	L	PED			
		1	28	270	483	0			
	Ped	0	1: S Barlow Rd @ Pacific HWY 99E				287	R	1412
959.5	L	26					921	T	
	T	919					203	L	1535
949.3	R	4					0	Ped	
			0	10	169	133			
			Ped	L	T	R			
				477		312			

			477		312				
			R	T	L	PED			
		1	0	430	47	0			
	Ped	0	2: S Barlow Rd @ Site Driveway				61	R	67
0	L	0					0	T	
	T	0					6	L	53
0	R	0					0	Ped	
			0	0	251	6			
			Ped	L	T	R			
				436		257			

APPENDIX D: SYNCHRO ANALYSIS

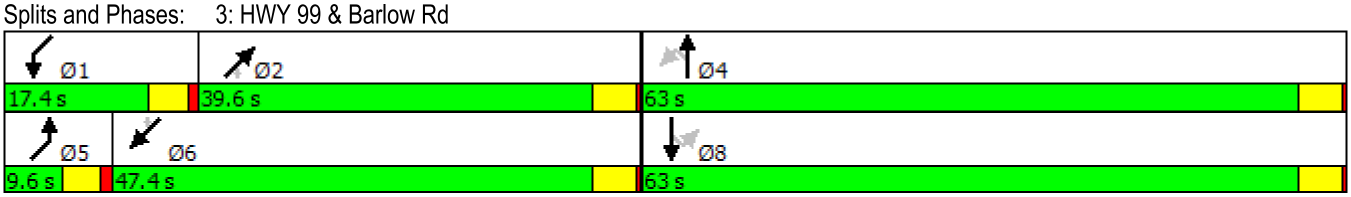
Cadman

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	6	101	79	358	182	21	23	806	2	160	808	252
Future Volume (vph)	6	101	79	358	182	21	23	806	2	160	808	252
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	275		115	285		230
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.943			0.995				0.850			0.850
Flt Protected		0.998			0.969		0.950			0.950		
Satd. Flow (prot)	0	1631	0	0	1665	0	1662	2969	1444	1630	3023	1473
Flt Permitted		0.985			0.668		0.950			0.950		
Satd. Flow (perm)	0	1610	0	0	1148	0	1662	2969	1444	1630	3023	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		44			2				95			263
Link Speed (mph)		55			35			55			55	
Link Distance (ft)		1272			1716			3436			1917	
Travel Time (s)		15.8			33.4			42.6			23.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	4%	1%	0%	12%	3%	2%	10%	1%
Adj. Flow (vph)	6	105	82	373	190	22	24	840	2	167	842	263
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	193	0	0	585	0	24	840	2	167	842	263
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	37.5	37.5		23.0	23.0		9.5	23.0	23.0	9.5	23.0	23.0
Total Split (s)	63.0	63.0		63.0	63.0		9.6	39.6	39.6	17.4	47.4	47.4
Total Split (%)	52.5%	52.5%		52.5%	52.5%		8.0%	33.0%	33.0%	14.5%	39.5%	39.5%
Maximum Green (s)	58.5	58.5		58.5	58.5		5.1	35.1	35.1	12.9	42.9	42.9
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	4.0	4.0	3.5	4.0	4.0
All-Red Time (s)	0.5	0.5		0.5	0.5		1.0	0.5	0.5	1.0	0.5	0.5
Lost Time Adjust (s)		-0.5			0.0		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Total Lost Time (s)		4.0			4.5		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)	26.0	26.0		0.0	0.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)		59.0			58.5		5.6	35.6	35.6	13.4	47.2	47.2
Actuated g/C Ratio		0.49			0.49		0.05	0.30	0.30	0.11	0.39	0.39
v/c Ratio		0.24			1.04		0.31	0.95	0.00	0.92	0.71	0.36
Control Delay		14.2			81.3		66.2	62.9	0.0	101.3	35.5	4.6
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		14.2			81.3		66.2	62.9	0.0	101.3	35.5	4.6
LOS		B			F		E	E	A	F	D	A
Approach Delay		14.2			81.3			62.9			37.7	
Approach LOS		B			F			E			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 52.4	Intersection LOS: D
Intersection Capacity Utilization 92.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: HWY 99 & Barlow Rd



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	6	101	79	358	182	21	23	806	2	160	808	252
Future Volume (vph)	6	101	79	358	182	21	23	806	2	160	808	252
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.94			0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1631			1665		1662	2969	1444	1630	3023	1473
Flt Permitted		0.98			0.67		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1609			1148		1662	2969	1444	1630	3023	1473
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	6	105	82	373	190	22	24	840	2	167	842	262
RTOR Reduction (vph)	0	23	0	0	1	0	0	0	1	0	0	161
Lane Group Flow (vph)	0	170	0	0	584	0	24	840	1	167	842	102
Heavy Vehicles (%)	0%	1%	1%	0%	4%	1%	0%	12%	3%	2%	10%	1%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		58.5			58.5		3.1	36.9	36.9	12.9	46.7	46.7
Effective Green, g (s)		59.0			58.5		3.6	37.4	37.4	13.4	47.2	47.2
Actuated g/C Ratio		0.48			0.48		0.03	0.31	0.31	0.11	0.39	0.39
Clearance Time (s)		4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)		3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		779			551		49	911	443	179	1171	570
v/s Ratio Prot							0.01	c0.28		c0.10	0.28	
v/s Ratio Perm		0.11			c0.51				0.00			0.07
v/c Ratio		0.22			1.06		0.49	0.92	0.00	0.93	0.72	0.18
Uniform Delay, d1		18.1			31.6		58.2	40.8	29.3	53.8	31.7	24.5
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1			55.2		7.5	16.0	0.0	48.0	3.8	0.7
Delay (s)		18.2			86.8		65.7	56.8	29.3	101.7	35.5	25.2
Level of Service		B			F		E	E	C	F	D	C
Approach Delay (s)		18.2			86.8			57.0			42.1	
Approach LOS		B			F			E			D	

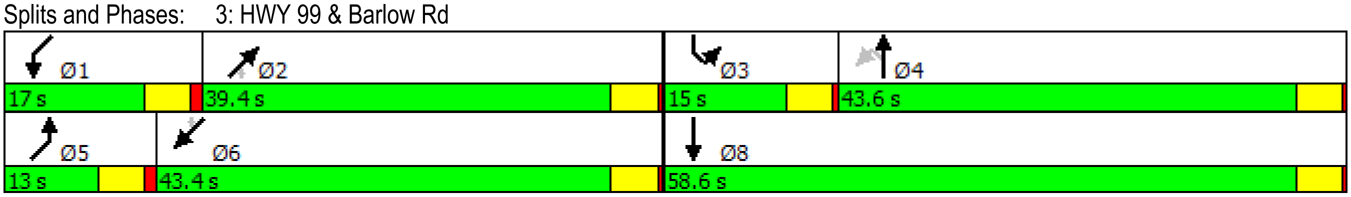
Intersection Summary			
HCM 2000 Control Delay	53.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	121.8	Sum of lost time (s)	12.5
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	8	136	107	483	246	28	26	919	2	182	921	287
Future Volume (vph)	8	136	107	483	246	28	26	919	2	182	921	287
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	275		115	285		230
Storage Lanes	0		0	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.943			0.985				0.850			0.850
Flt Protected		0.998		0.950			0.950			0.950		
Satd. Flow (prot)	0	1631	0	3225	1662	0	1614	2969	1488	1630	3023	1473
Flt Permitted		0.987		0.950			0.950			0.950		
Satd. Flow (perm)	0	1613	0	3225	1662	0	1614	2969	1488	1630	3023	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			7				104			288
Link Speed (mph)		55			35			55			55	
Link Distance (ft)		1272			1716			3436			1917	
Travel Time (s)		15.8			33.4			42.6			23.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	4%	1%	3%	12%	0%	2%	10%	1%
Adj. Flow (vph)	8	142	111	503	256	29	27	957	2	190	959	299
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	261	0	503	285	0	27	957	2	190	959	299
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		5	2		1	6	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4								2			6
Detector Phase	4	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		8.5	5.0		8.0	5.0	5.0	8.0	5.0	5.0
Minimum Split (s)	37.5	37.5		13.0	23.0		13.0	23.0	23.0	13.0	23.0	23.0
Total Split (s)	43.6	43.6		15.0	58.6		13.0	39.4	39.4	17.0	43.4	43.4
Total Split (%)	37.9%	37.9%		13.0%	51.0%		11.3%	34.3%	34.3%	14.8%	37.7%	37.7%
Maximum Green (s)	39.1	39.1		10.5	54.1		8.0	34.9	34.9	12.0	38.9	38.9
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5		0.5	0.5		1.0	0.5	0.5	1.0	0.5	0.5
Lost Time Adjust (s)		-0.5		-0.5	-0.5		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Total Lost Time (s)		4.0		4.0	4.0		4.5	4.0	4.0	4.5	4.0	4.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	7.0
Flash Dont Walk (s)	26.0	26.0						11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0						0	0		0	0
Act Effct Green (s)		19.1		11.0	34.1		8.5	35.5	35.5	12.5	47.6	47.6
Actuated g/C Ratio		0.20		0.12	0.36		0.09	0.37	0.37	0.13	0.50	0.50
v/c Ratio		0.74		1.34	0.47		0.19	0.86	0.00	0.88	0.63	0.34
Control Delay		43.5		205.2	25.3		45.5	37.7	0.0	80.6	22.3	4.1
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		43.5		205.2	25.3		45.5	37.7	0.0	80.6	22.3	4.1
LOS		D		F	C		D	D	A	F	C	A
Approach Delay		43.5			140.2			37.9			26.2	
Approach LOS		D			F			D			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 115	
Actuated Cycle Length: 94.7	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.34	
Intersection Signal Delay: 56.6	Intersection LOS: E
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: HWY 99 & Barlow Rd



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	8	136	107	483	246	28	26	919	2	182	921	287
Future Volume (vph)	8	136	107	483	246	28	26	919	2	182	921	287
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0		4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor		1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.94		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1631		3225	1662		1614	2969	1488	1630	3023	1473
Flt Permitted		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1613		3225	1662		1614	2969	1488	1630	3023	1473
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	8	142	111	503	256	29	27	957	2	190	959	299
RTOR Reduction (vph)	0	28	0	0	5	0	0	0	1	0	0	148
Lane Group Flow (vph)	0	233	0	503	280	0	27	957	1	190	959	151
Heavy Vehicles (%)	0%	1%	1%	0%	4%	1%	3%	12%	0%	2%	10%	1%
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4								2			6
Actuated Green, G (s)		18.6		10.5	33.6		3.0	38.2	38.2	12.0	47.2	47.2
Effective Green, g (s)		19.1		11.0	34.1		3.5	38.7	38.7	12.5	47.7	47.7
Actuated g/C Ratio		0.20		0.11	0.35		0.04	0.40	0.40	0.13	0.49	0.49
Clearance Time (s)		4.5		4.5	4.5		5.0	4.5	4.5	5.0	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		315		362	579		57	1174	588	208	1474	718
v/s Ratio Prot				c0.16	0.17		0.02	c0.32		c0.12	0.32	
v/s Ratio Perm		c0.14							0.00			0.10
v/c Ratio		0.74		1.39	0.48		0.47	0.82	0.00	0.91	0.65	0.21
Uniform Delay, d1		37.0		43.4	25.0		46.2	26.4	17.9	42.1	18.8	14.3
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		8.8		191.5	0.6		6.1	6.3	0.0	39.0	2.2	0.7
Delay (s)		45.8		234.9	25.6		52.3	32.6	17.9	81.2	21.0	15.0
Level of Service		D		F	C		D	C	B	F	C	B
Approach Delay (s)		45.8			159.2			33.2			27.7	
Approach LOS		D			F			C			C	

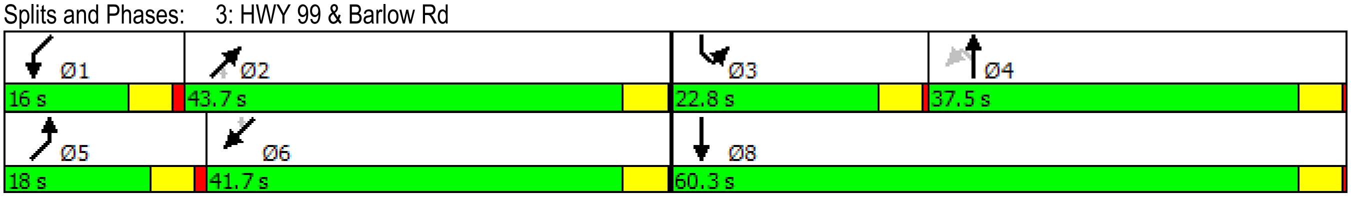
Intersection Summary			
HCM 2000 Control Delay	60.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	9	150	120	483	258	28	26	919	4	193	921	287
Future Volume (vph)	9	150	120	483	258	28	26	919	4	193	921	287
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	275		115	285		230
Storage Lanes	0		0	2		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.942			0.985				0.850			0.850
Flt Protected		0.998		0.950			0.950			0.950		
Satd. Flow (prot)	0	1629	0	3225	1662	0	1614	2969	1488	1630	3023	1473
Flt Permitted		0.987		0.950			0.950			0.950		
Satd. Flow (perm)	0	1611	0	3225	1662	0	1614	2969	1488	1630	3023	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			6				100			264
Link Speed (mph)		55			35			55			55	
Link Distance (ft)		1272			1716			3436			1917	
Travel Time (s)		15.8			33.4			42.6			23.8	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	1%	0%	4%	1%	3%	12%	0%	2%	10%	1%
Adj. Flow (vph)	9	156	125	503	269	29	27	957	4	201	959	299
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	290	0	503	298	0	27	957	4	201	959	299
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		5	2		1	6	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4								2			6
Detector Phase	4	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		13.0	5.0		13.0	5.0	5.0	8.0	5.0	5.0
Minimum Split (s)	37.5	37.5		17.5	23.0		18.0	23.0	23.0	13.0	23.0	23.0
Total Split (s)	37.5	37.5		22.8	60.3		18.0	43.7	43.7	16.0	41.7	41.7
Total Split (%)	31.3%	31.3%		19.0%	50.3%		15.0%	36.4%	36.4%	13.3%	34.8%	34.8%
Maximum Green (s)	33.0	33.0		18.3	55.8		13.0	39.2	39.2	11.0	37.2	37.2
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.5	0.5		0.5	0.5		1.0	0.5	0.5	1.0	0.5	0.5
Lost Time Adjust (s)		-0.5		-0.5	-0.5		-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Total Lost Time (s)		4.0		4.0	4.0		4.5	4.0	4.0	4.5	4.0	4.0
Lead/Lag	Lag	Lag		Lead			Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)	7.0	7.0						7.0	7.0		7.0	7.0
Flash Dont Walk (s)	26.0	26.0						11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0						0	0		0	0
Act Effct Green (s)		23.4		18.9	46.3		13.5	39.8	39.8	11.5	45.5	45.5
Actuated g/C Ratio		0.21		0.17	0.42		0.12	0.36	0.36	0.10	0.41	0.41
v/c Ratio		0.79		0.91	0.43		0.14	0.89	0.01	1.18	0.77	0.39
Control Delay		52.1		67.9	23.8		47.7	45.8	0.0	170.1	36.3	7.1
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		52.1		67.9	23.8		47.7	45.8	0.0	170.1	36.3	7.1
LOS		D		E	C		D	D	A	F	D	A
Approach Delay		52.1			51.5			45.7			48.7	
Approach LOS		D			D			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 110.2	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 48.8	Intersection LOS: D
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: HWY 99 & Barlow Rd



Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	9	150	120	483	258	28	26	919	4	193	921	287
Future Volume (vph)	9	150	120	483	258	28	26	919	4	193	921	287
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0		4.5	4.0	4.0	4.5	4.0	4.0
Lane Util. Factor		1.00		0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.94		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1630		3225	1663		1614	2969	1488	1630	3023	1473
Flt Permitted		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1610		3225	1663		1614	2969	1488	1630	3023	1473
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	9	156	125	503	269	29	27	957	4	201	959	299
RTOR Reduction (vph)	0	25	0	0	4	0	0	0	3	0	0	157
Lane Group Flow (vph)	0	265	0	503	294	0	27	957	1	201	959	142
Heavy Vehicles (%)	0%	1%	1%	0%	4%	1%	3%	12%	0%	2%	10%	1%
Turn Type	Perm	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4								2			6
Actuated Green, G (s)		22.9		18.4	45.8		7.5	41.5	41.5	11.0	45.0	45.0
Effective Green, g (s)		23.4		18.9	46.3		8.0	42.0	42.0	11.5	45.5	45.5
Actuated g/C Ratio		0.21		0.17	0.41		0.07	0.37	0.37	0.10	0.41	0.41
Clearance Time (s)		4.5		4.5	4.5		5.0	4.5	4.5	5.0	4.5	4.5
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		335		542	685		114	1110	556	166	1224	596
v/s Ratio Prot				c0.16	0.18		0.02	c0.32		c0.12	c0.32	
v/s Ratio Perm		c0.16							0.00			0.10
v/c Ratio		0.79		0.93	0.43		0.24	0.86	0.00	1.21	0.78	0.24
Uniform Delay, d1		42.1		46.0	23.6		49.3	32.5	22.0	50.4	29.1	22.0
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		12.0		22.2	0.4		1.1	8.9	0.0	137.8	5.1	0.9
Delay (s)		54.1		68.2	24.0		50.3	41.3	22.0	188.2	34.2	22.9
Level of Service		D		E	C		D	D	C	F	C	C
Approach Delay (s)		54.1			51.8			41.5			53.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	16.5
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	6	0	61	0	251	6	47	430	0
Future Volume (vph)	0	0	0	6	0	61	0	251	6	47	430	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	0		0	150		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.878			0.997				
Flt Protected					0.995					0.950		
Satd. Flow (prot)	0	1716	0	0	1499	0	0	1711	0	1630	1716	0
Flt Permitted					0.995					0.950		
Satd. Flow (perm)	0	1716	0	0	1499	0	0	1711	0	1630	1716	0
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		492			522			308			790	
Travel Time (s)		11.2			11.9			3.8			9.8	
Peak Hour Factor	0.85	0.92	0.85	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	7	0	66	0	282	7	52	478	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	73	0	0	289	0	52	478	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 53.5%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	6	0	61	0	251	6	47	430	0
Future Vol, veh/h	0	0	0	6	0	61	0	251	6	47	430	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	92	85	92	92	92	89	89	89	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	7	0	66	0	282	7	52	478	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	901	871	478	868	868	286	478	0	0	289	0	0
Stage 1	582	582	-	286	286	-	-	-	-	-	-	-
Stage 2	319	289	-	582	582	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	259	289	587	273	290	753	1084	-	-	1273	-	-
Stage 1	499	499	-	721	675	-	-	-	-	-	-	-
Stage 2	693	673	-	499	499	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	229	277	587	265	278	753	1084	-	-	1273	-	-
Mov Cap-2 Maneuver	229	277	-	265	278	-	-	-	-	-	-	-
Stage 1	499	479	-	721	675	-	-	-	-	-	-	-
Stage 2	632	673	-	479	479	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	11.3	0	0.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1084	-	-	-	646	1273	-	-
HCM Lane V/C Ratio	-	-	-	-	0.113	0.041	-	-
HCM Control Delay (s)	0	-	-	0	11.3	7.9	-	-
HCM Lane LOS	A	-	-	A	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0.1	-	-

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