

# Threewind Master Plan

Transportation Impact Study  
Sisters, OR

**Date:**

March 18, 2019

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RENEWS: 12/31/2020



**LANCASTER**  
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## ***Executive Summary***

1. The proposed Threewind Master Plan in Sisters, Oregon will include construction of 50 units of multi-family housing and 28,000 square feet of commercial space across several buildings.
2. The trip generation calculations show that the proposed development is projected to generate 36 trips during the morning peak hour and 80 during the evening peak hour.
3. The intersection of W McKinney Butte Drive at N Arrowleaf Trail is projected to operate with a higher v/c ratio than the maximum allowable by the City of Sisters under year 2021 background conditions and year 2021 background plus site conditions. For reasons detailed in this report, no mitigations are recommended.
4. All other study intersections are projected to operate acceptably through the year 2021, with or without site trips generated by the proposed development.
5. Left-turn lane and traffic signal warrants are not projected to be met at any of the study intersections where they would be applicable, and no turn lanes or traffic signals are recommended.
6. Adequate sight distance is available at the proposed site access intersection on W Hood Avenue.
7. Turning movement restrictions to the existing Three Wind Shopping Center access to W Hood Avenue are not necessary or recommended in conjunction with the proposed Master Plan.
8. It is recommended that the back-to-back left-turn lane striping on W Hood Avenue south of the existing Three Wind Shopping Center access be removed and replaced with standard two-way left-turn lane striping to accommodate the new public street intersection along the south property line of the street.
9. With development of the vacant residential-zoned property south of the site (known as the Patterson property), traffic volumes at the public street/private street intersection internal to the site and near the south property line will operate well within capacity as a two-way stop-controlled intersection. No higher-order intersection configuration is needed based on intersection capacity.



## ***Introduction***

The property located at 915 W McKinney Butte Road in Sisters, Oregon is proposed for Master Plan approval to allow construction of a mixed-use development. The project site consists of Parcel 3 of tax lot 7200, which comprises 5.91 acres. The proposed development includes 50 units of multi-family housing and 28,000 square feet of commercial space (in approximately four buildings), as well as open space.

This report examines the impacts of the proposed development on the transportation system in the vicinity of the project site. The purpose of this report is to ensure safe and efficient performance of the transportation facilities that will be impacted by the proposed development.

All supporting data and calculations are provided in the appendix to this report.

## ***Location Description***

The project site is located southeast of W McKinney Butte Road and west of W Hood Avenue in Sisters, Oregon. The site is bordered by undeveloped, residentially-zoned land to the south, single-family residential development to the west, W McKinney Butte Road to the northwest, commercial development to the north and northeast, and W Hood Avenue to the east. The adjacent commercial development to the northeast (Three Wind Shopping Center) is bordered by US Highway 20 to the northeast. The site is currently undeveloped. The project site is shown in Figure 1.



**Figure 1 – Project Location**



Based on the location of the subject property, preliminary calculations of trip generation, and a confirmation of the scope of work with both the City of Sisters and the Oregon Department of Transportation (ODOT) the following intersections were identified for analysis:

- W McKinney Butte Road at proposed site access
- W McKinney Butte Road at N Arrowleaf Trail
- W Hood Avenue at existing Threewind Shopping Center access
- W Hood Avenue at proposed site access
- US Highway 20 at W Hood Avenue
- US Highway 20 at W McKinney Butte Road/W Barclay Drive
- McKenzie Highway at W Hood Avenue

### *Site Access*

Access to the site will be provided via an existing driveway on W McKinney Butte Road, west of N Arrowleaf Trail, as well as an existing shopping center driveway and a proposed driveway on W Hood Avenue. After construction of the proposed driveway on W Hood Avenue, the existing driveway on W Hood Avenue could be restricted to allow only right turns in and out of the site if the intersection's close proximity to Highway 20 creates operational problems. This report examines the intersection with both full access and with turning movements restricted to right turns in and out.

A shared-use pedestrian and bicycle path will be provided behind the Bi-Mart store, connecting the residential use on the site to McKinney Butte Road.

### *Vicinity Streets*

Characteristics of the study roadways are summarized in Table 1



Table 1 – Characteristics of Study Roadways<sup>1,2</sup>

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed (mph)	Sidewalks?	Bike Lanes?
US Highway 20 (Santiam Highway)	ODOT	Statewide Highway	2-3 lanes	35 posted	Yes	Partial
OR Highway 242 (McKenzie Highway)	ODOT	District Highway (W of Hood St), Statewide Highway (E of Hood St)	2 lanes	40 posted	Partial	None
W Hood Avenue (between US 20 and OR 242)	ODOT	District Highway	3 lanes	30 posted	West side	Yes
W Hood Avenue (south of OR 242)	City of Sisters	Collector	2-3 lanes	20 posted	Yes	None
W McKinney Butte Road	City of Sisters	Collector	2 Lanes	25 posted	Yes	None
N Arrowleaf Trail	City of Sisters	Local Road	2 Lanes	20 posted	Yes	None

### Study Intersections

Site trips generated by the proposed development are primarily expected to impact the seven intersections listed in the Location Description section. Characteristics of these intersections are summarized in Table 2. A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2 on page 6.

<sup>1</sup> Oregon Department of Transportation, *1999 Oregon Highway Plan: Including amendments November 1999 through May 2015*, 1999.

<sup>2</sup> *Sisters Transportation System Plan*, 2010.

[https://www.oregon.gov/ODOT/Planning/TPOD/tsp/city/city\\_of\\_sisters\\_tsp\\_2010.pdf](https://www.oregon.gov/ODOT/Planning/TPOD/tsp/city/city_of_sisters_tsp_2010.pdf).



Table 2 – Characteristics of Study Intersections

Number	Name	Geometry	Traffic Control	Stopped Approaches
1	W McKinney Butte Road at Proposed Access	Three-legged	Stop Control	NW-bound
2	W McKinney Butte Road at N Arrowleaf Trail	Four-legged	Stop Control	NW- and SE-bound
3	US Highway 20 at W McKinney Butte Road	Four-legged	Roundabout	N/A
4	US Highway 20 at W Hood Avenue	Three-legged	Stop Control	NE-bound
5	W Hood Avenue at Existing Access	Three-legged	Stop Control	SE-bound
6	W Hood Avenue at Proposed Access	Three-legged	Stop Control	SE-bound
7	McKenzie Highway at W Hood Avenue	Four-legged	Stop Control	All approaches

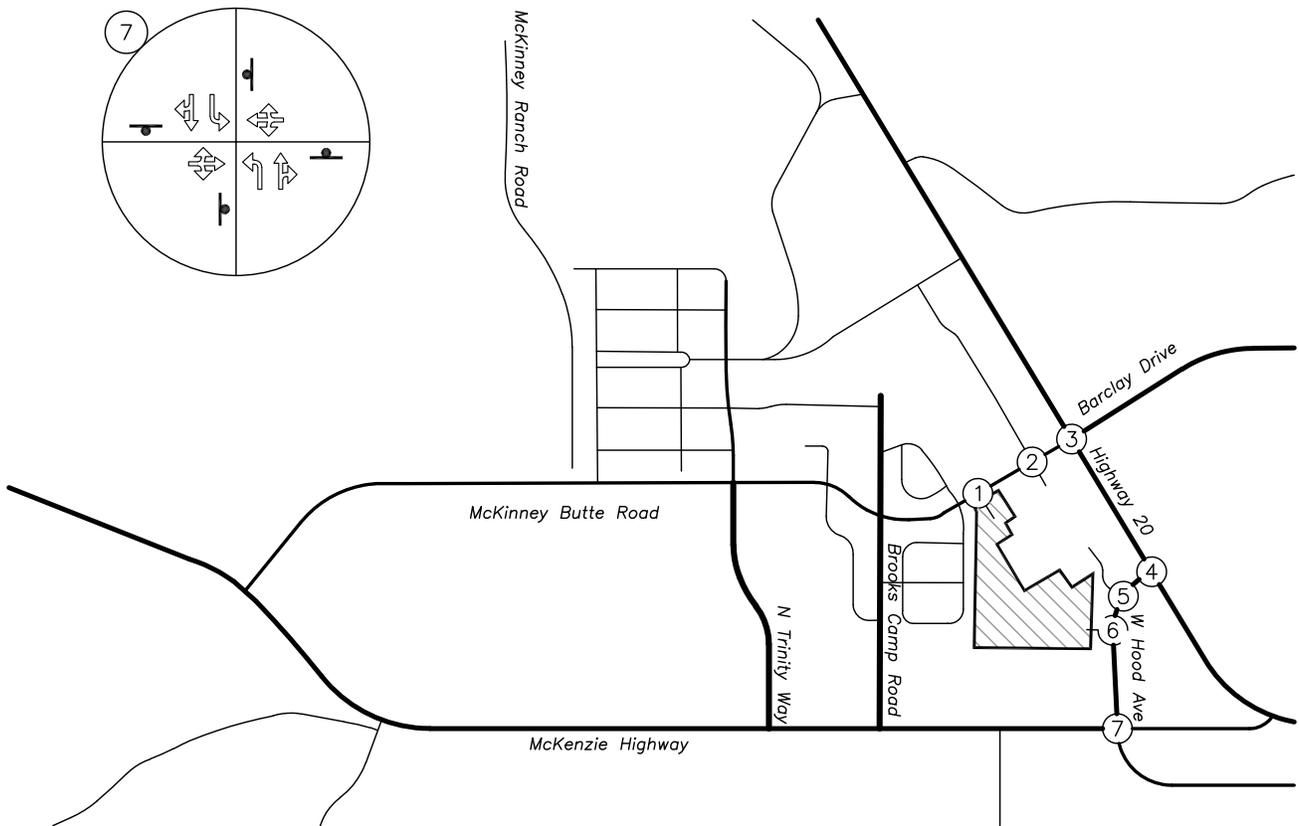
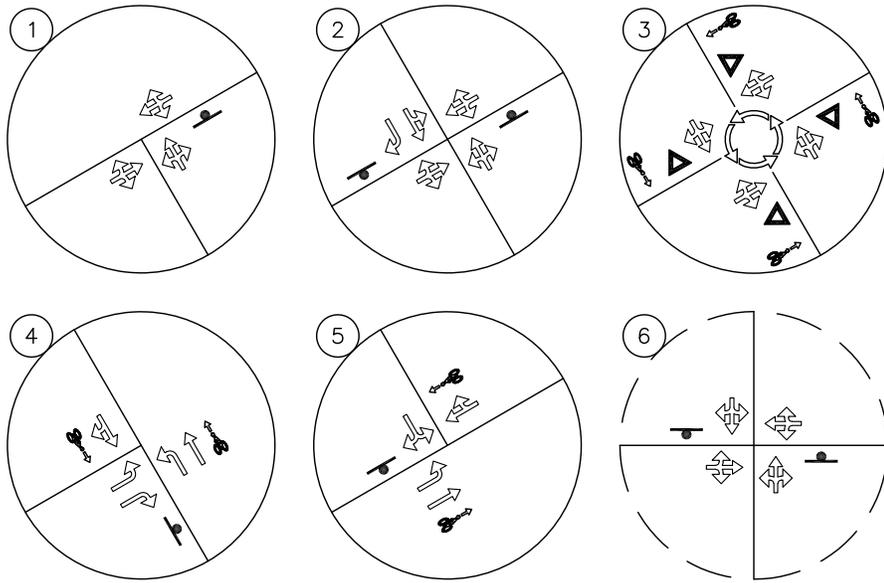
### **Traffic Counts**

After consulting with the City of Sisters, it was decided that only the evening peak hour would be analyzed for this study. Traffic counts were conducted at the study intersections on December 12, 2018, from 2:00 p.m. to 6:00 p.m. School was in session and under a normal schedule on the day of the counts. Turning movement volumes corresponding to the system peak hour were used for analysis.

Existing traffic counts at the study intersections are shown in Figure 3 on page 7.

**LEGEND**

-  STUDY INTERSECTION (EXISTING)
-  STUDY INTERSECTION (PROPOSED)
-  STOP SIGN
-  YIELD SIGN
-  ROUNDABOUT
-  BIKE LANE
-  PROJECT SITE
-  ARTERIAL ROADWAY
-  COLLECTOR ROADWAY
-  LOCAL ROADWAY

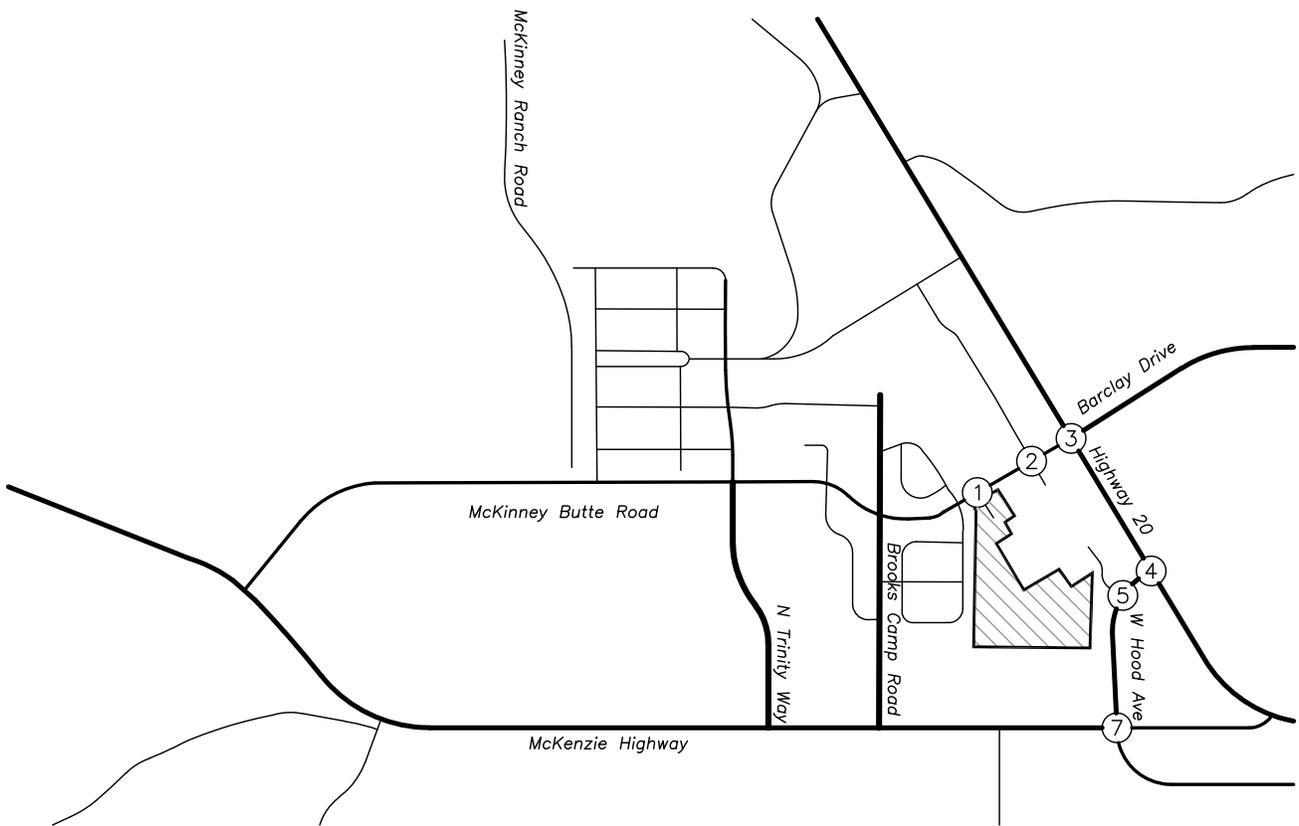
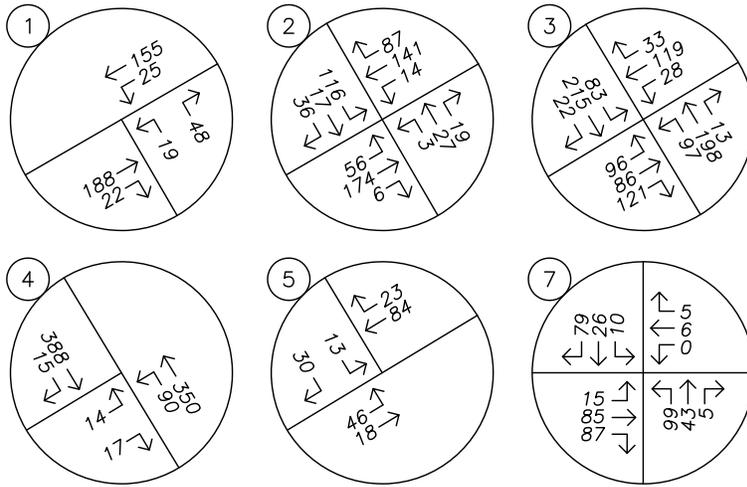


**Study Intersection Configurations**



**FIGURE 2**

**PAGE 6**



TRAFFIC VOLUMES  
Existing Conditions – Seasonally Adjusted  
PM Peak Hour



FIGURE  
3

PAGE  
7



## Site Trips

This section describes the characteristics of the traffic that is expected to be generated by development within the proposed Master Plan.

### Trip Generation

The proposed development includes 50 units of multi-family housing and 28,000 square feet of commercial space. To estimate the number of trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual*<sup>3</sup> were used. Data for land use codes 221 – *Multifamily Housing (Mid-Rise)* and 820 – *Shopping Center* were used to estimate the proposed development’s trip generation based on the number of housing units and the square footage of the commercial space.

Since both commercial and residential land uses are proposed for the Threewind Master Plan, some trips generated are likely to be shared, or captured internally within the development and will not impact the study intersections or roadways. Using the *National Cooperative Highway Research Project’s* (NCHRP) Report 684, internal capture rates of 0 percent for the morning peak hour and 13 percent for the evening peak hour were calculated and used in trip generation calculations. The trip generation calculations show that, accounting for internalization and pass-by trips, the proposed development is expected to generate 36 trips during the morning peak hour, 80 during the evening peak hour, and a total of 853 on a typical weekday. The trip generation calculation results are summarized in Table 3, and detailed calculation worksheets are provided in the appendix.

Table 3 – Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday
			In	Out	Total	In	Out	Total	Total
Multi-Family Housing	221	50 Units	5	13	18	13	9	22	272
<i>Internalization (0% AM, 12% PM)</i>			0	0	0	2	1	3	33
Shopping Center	820	28,000 s.f.	16	10	26	51	56	107	1,058
<i>Internalization (0% AM, 12% PM)</i>			0	0	0	7	7	14	127
<i>Pass-by (34%)</i>			4	4	8	16	16	32	317
<b>Net Primary Trips</b>			<b>17</b>	<b>19</b>	<b>36</b>	<b>39</b>	<b>41</b>	<b>80</b>	<b>853</b>

<sup>3</sup> Institute of Transportation Engineers, *Trip Generation Manual*, 10<sup>th</sup> Edition, 2017.



### *Trip Distribution*

The directional distribution of site trips to and from the proposed development was estimated based on locations of likely trip origins and destinations and locations of major transportation facilities in the site vicinity. The following trip distribution was estimated and used for analysis:

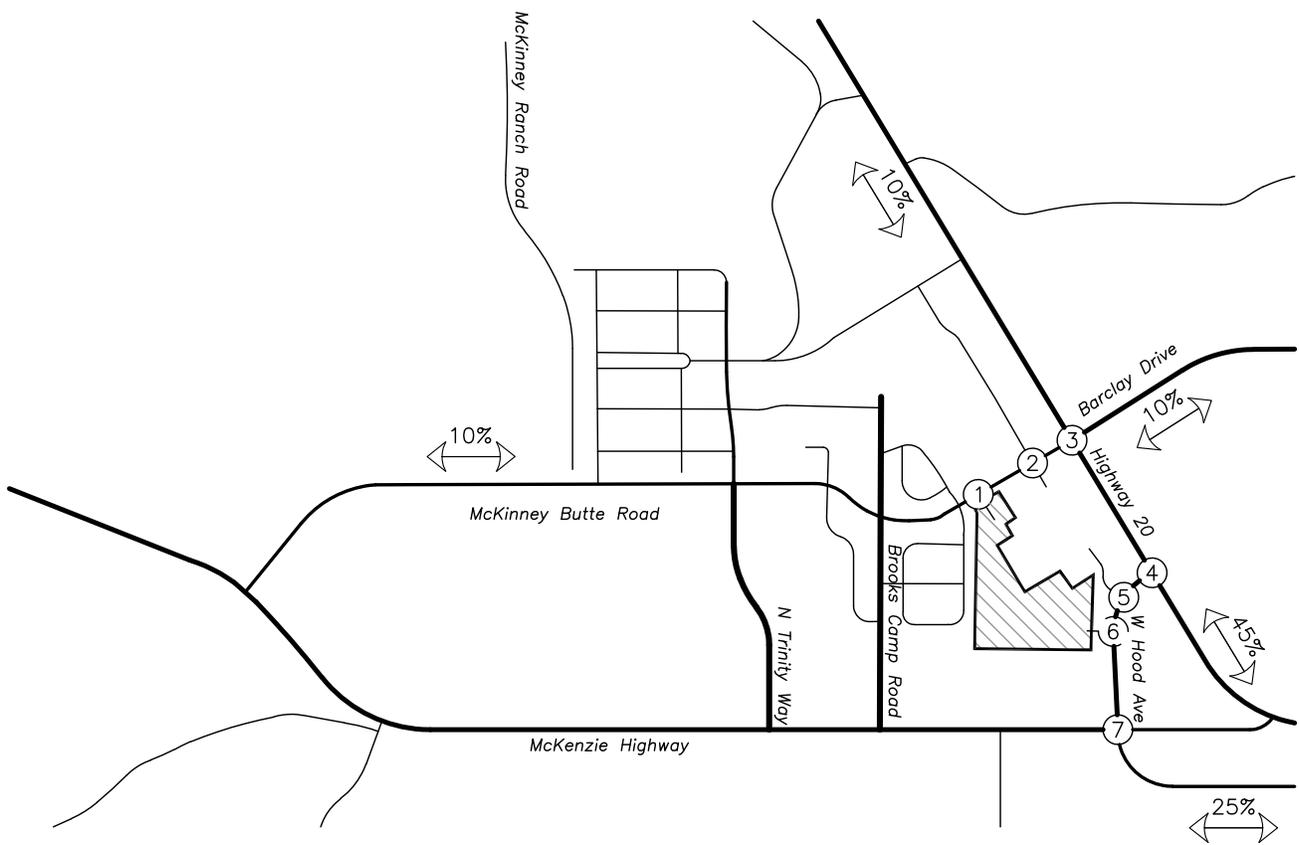
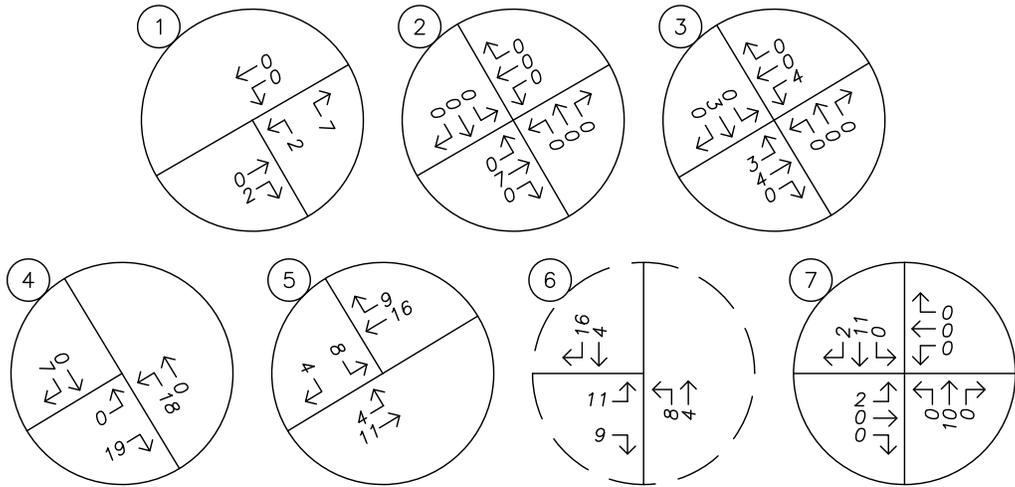
- Approximately 45 percent of site trips will travel to/from the east on US Highway 20
- Approximately 25 percent of site trips will travel to/from the south on W Hood Avenue
- Approximately 10 percent of site trips will travel to/from the west on McKinney Butte Road
- Approximately 10 percent of site trips will travel to/from the east on W Barclay Drive
- Approximately 10 percent of site trips will travel to/from the west on US Highway 20

The site trip distribution and assignment for primary trips are shown in Figure 4 on page 10 and in Figure 5 on page 11 for two full-access driveways on W Hood Avenue and for a restricted existing access on W Hood Avenue, respectively. The site trip distribution and assignment for pass-by trips are shown in Figure 6 on page 12 and in Figure 7 on page 13 for two full-access driveways on W Hood Avenue and for a restricted existing access on W Hood Avenue, respectively.

LEGEND

XX% PERCENT OF PRIMARY TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	17	19	36
PM	39	41	80



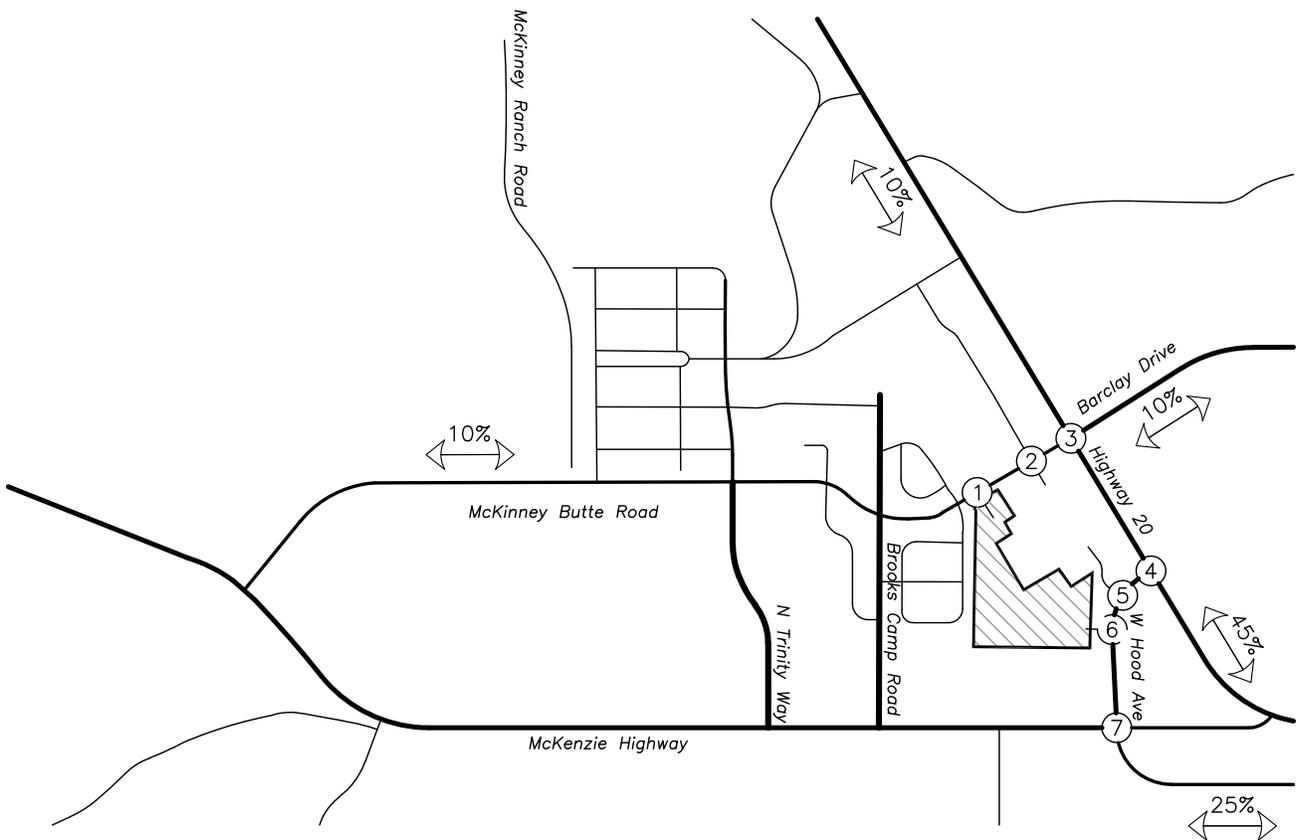
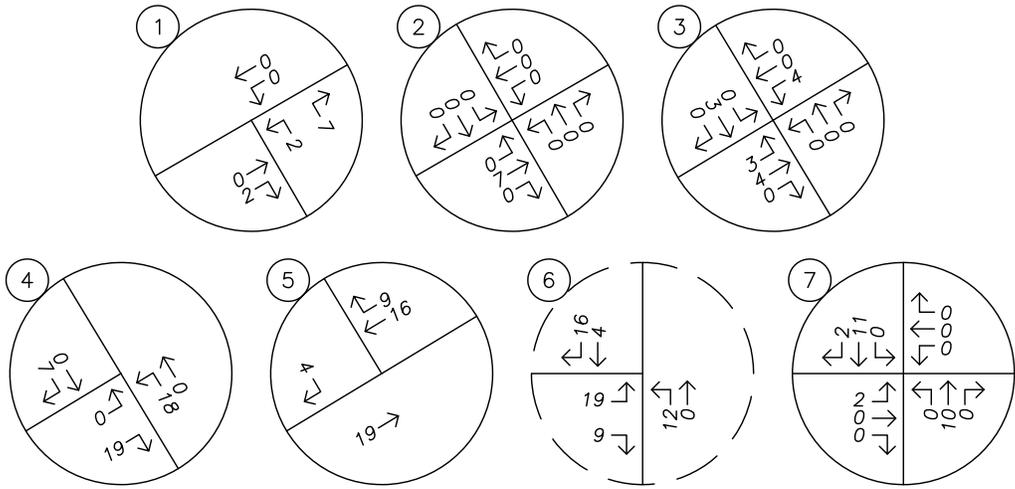
TRIP DISTRIBUTION & ASSIGNMENT  
 Primary External Trips – Full Access at Intersection 5  
 PM Peak Hour



LEGEND

XX% PERCENT OF PRIMARY TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	17	19	36
PM	39	41	80



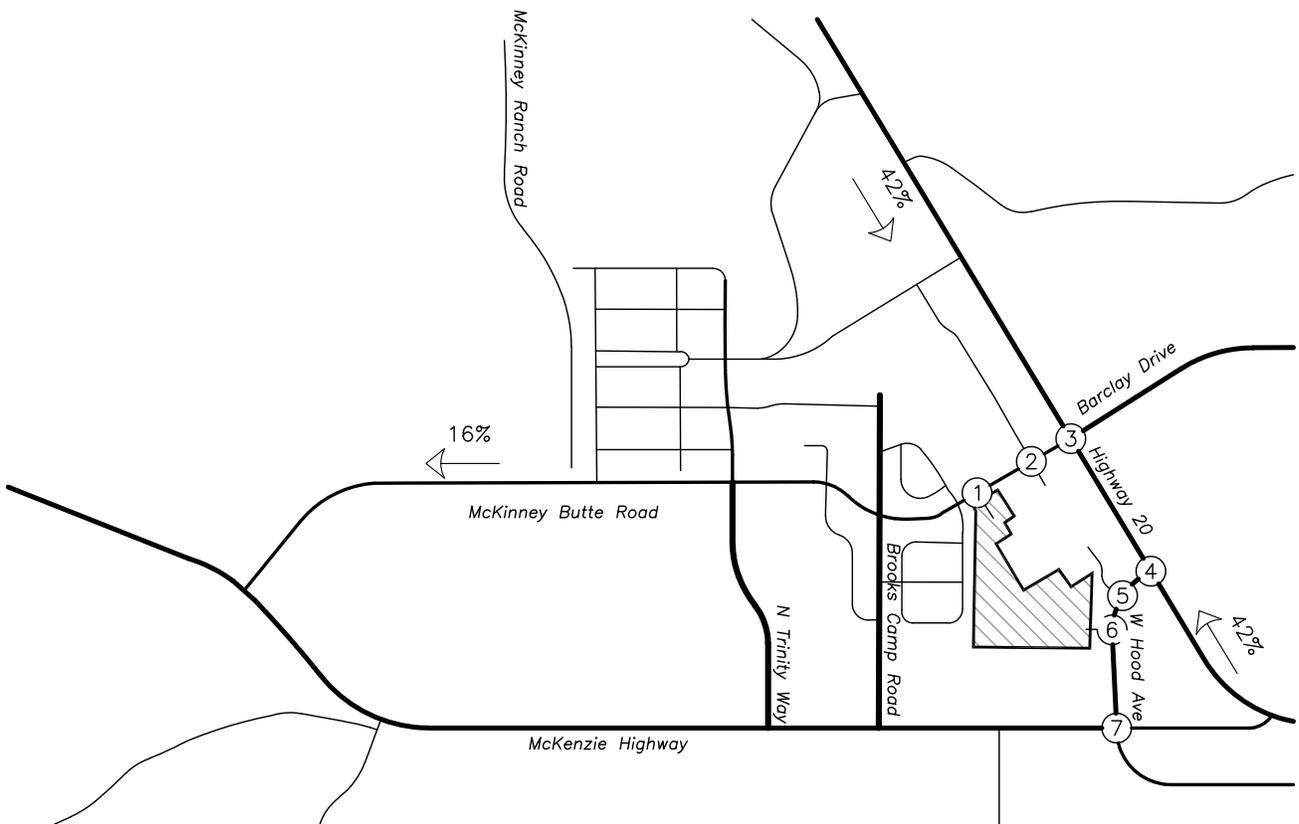
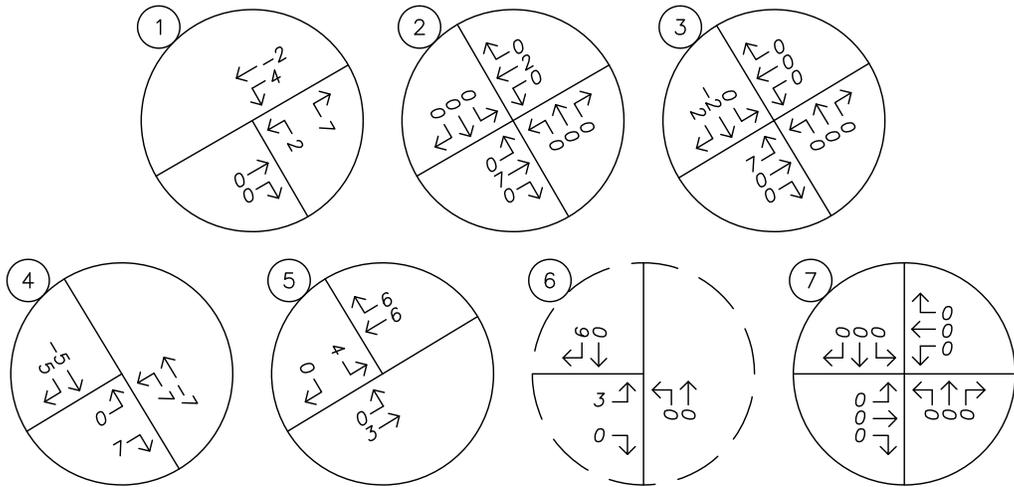
TRIP DISTRIBUTION & ASSIGNMENT  
 Primary External Trips – Right-In/Right-Out at Intersection 5  
 PM Peak Hour



LEGEND

XX%  
 PERCENT OF PASS-BY TRIPS

PASS-BY TRIP GENERATION			
	IN	OUT	TOTAL
AM	4	4	8
PM	16	16	32



TRIP DISTRIBUTION & ASSIGNMENT  
 Pass-By Trips – Full Access at Intersection 5  
 PM Peak Hour



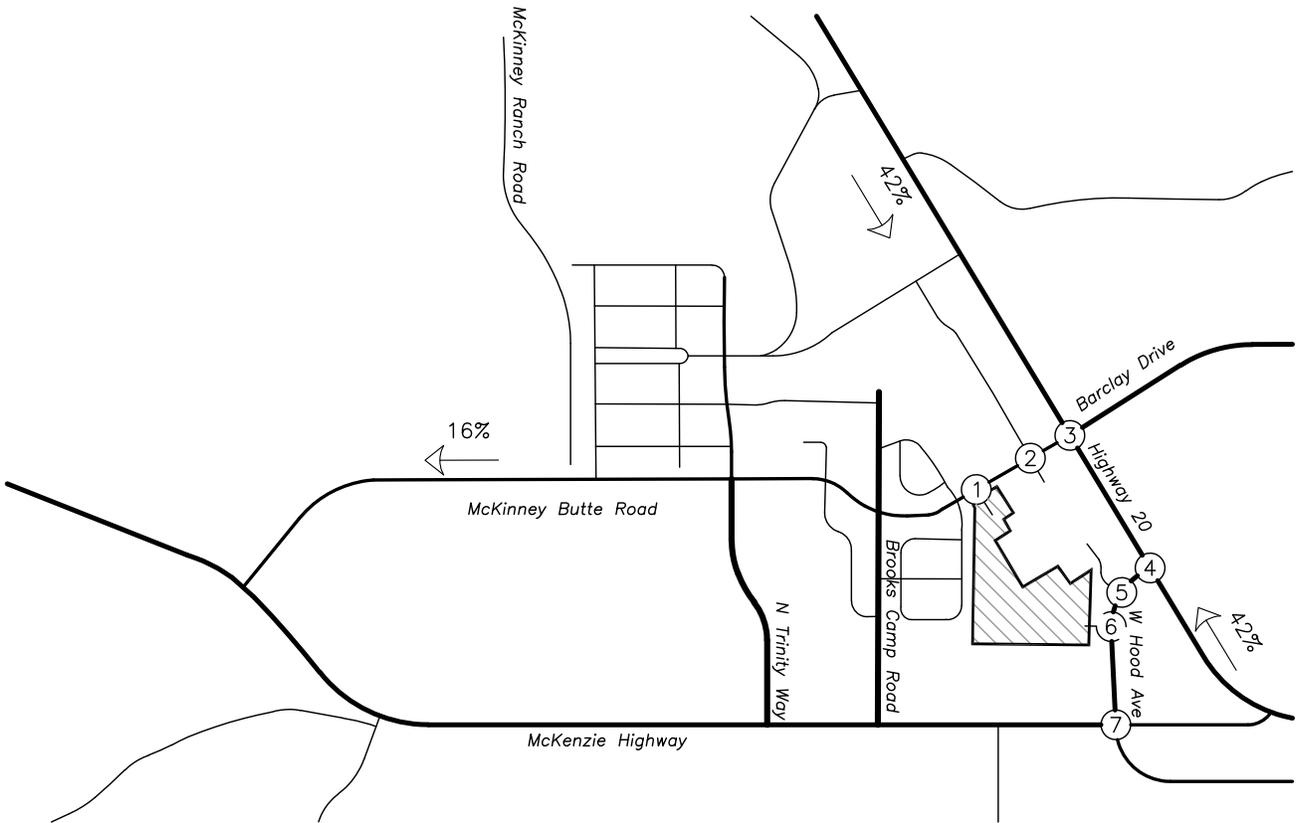
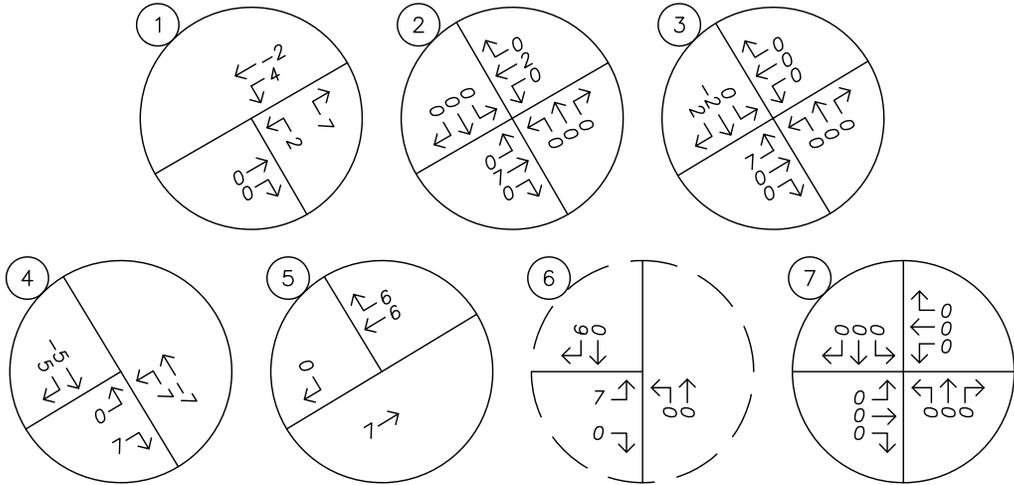
FIGURE  
6

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12

**LEGEND**

XX%  
 PERCENT OF PASS-BY TRIPS

PASS-BY TRIP GENERATION			
	IN	OUT	TOTAL
AM	4	4	8
PM	16	16	32



**TRIP DISTRIBUTION & ASSIGNMENT**  
 Pass-By Trips – Right-In/Right-Out at Intersection 5  
 PM Peak Hour



**FIGURE 7**

**PAGE 13**



## **Future Traffic Volumes**

To provide analysis of the impact of the proposed development, an estimate of future traffic volumes is required. A growth rate must be applied to recorded traffic volumes to calculate future volumes.

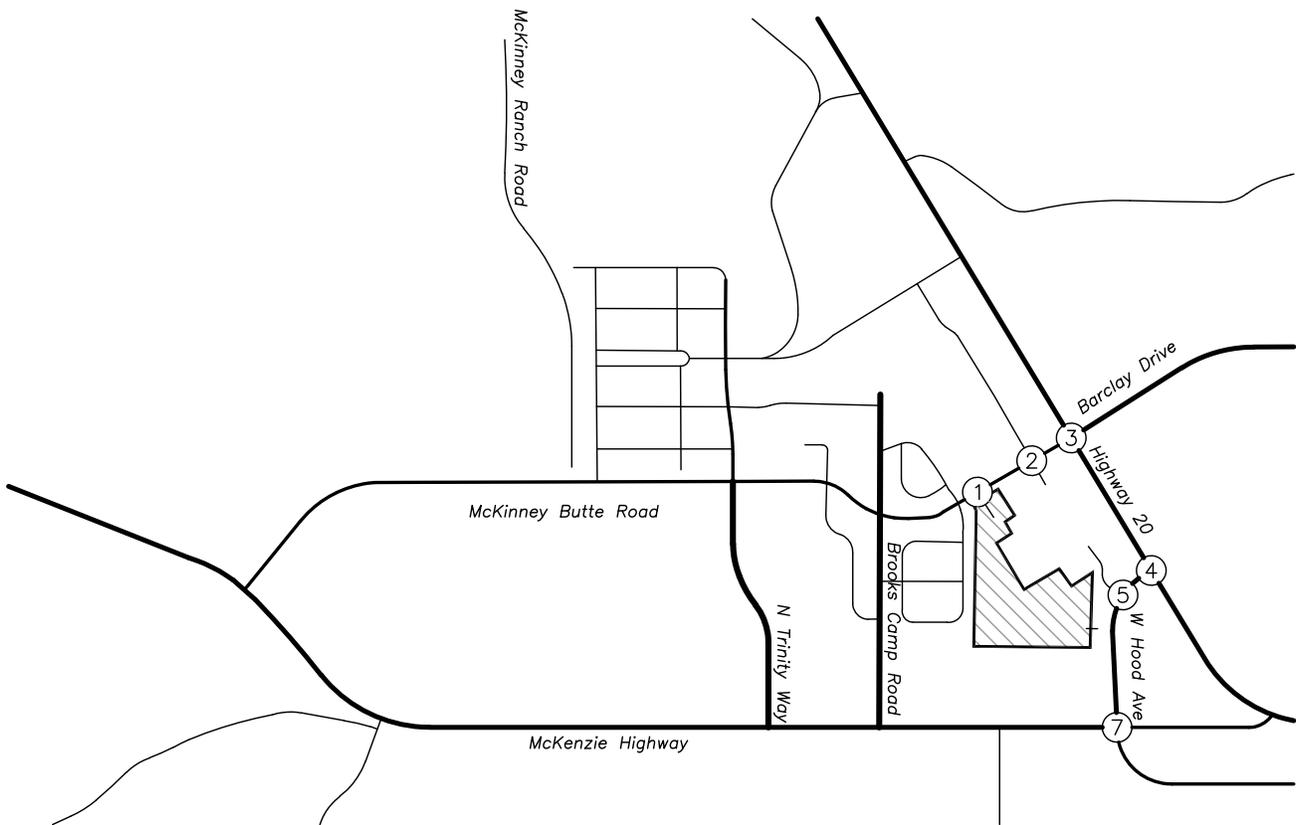
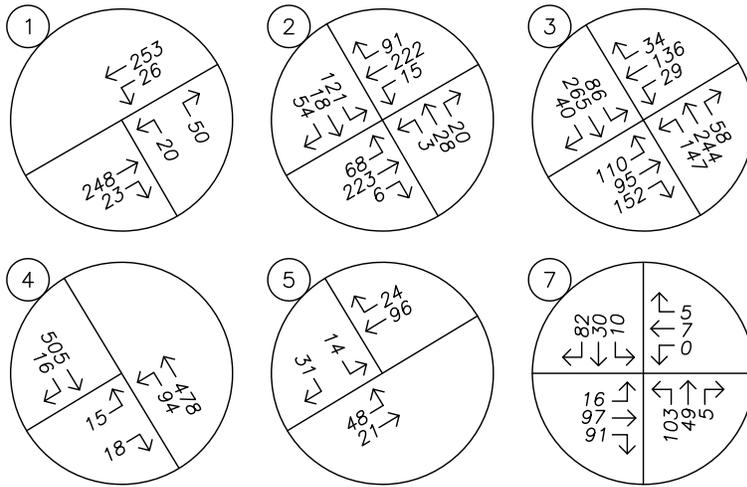
Since US Highway 20 and OR Highway 242 are under the jurisdiction of the Oregon Department of Transportation (ODOT), procedures described in ODOT's *Analysis Procedures Manual* were used to estimate future volumes. Traffic volumes were seasonally adjusted to reflect the 30<sup>th</sup>-highest hour in a typical year. Using a map of seasonal trends, this portion of US Highway 20 was determined to show a summer trend.

Growth rates for through traffic on US Highway 20 and OR Highway 242 were derived using ODOT's 2037 Future Volume Table. Using data corresponding to milepost 100.05 of ODOT highway number 016 and milepost 91.96 of ODOT highway number 015, linear growth rates of 1.09 and 1.01 were calculated for US Highway 20 and OR Highway 242, respectively. The growth rates and seasonal adjustment factor were applied to the appropriate ODOT highway through volumes over a 2-year period to determine year 2021 traffic volumes.

For non-ODOT facilities, a compounded growth rate of two percent per year was applied to the existing traffic volumes over a two-year period to determine year 2021 background volumes.

In addition to the expected background traffic growth in the site vicinity, the nearby McKenzie Meadows subdivision will impact future volumes at the study intersections. This development is proposed for the site west of McKinney Ranch Road and east of Sisters High School, on the north side of W McKinney Butte Road, and will include 150 single-family homes and 55 units of low-rise multi-family housing. Since this development will likely be contributing trips to the transportation system by 2021, the site trips it is projected to generate were included in 2021 background traffic volumes. A figure showing the site trips generated by this development that are expected to impact the study intersections is provided in the appendix.

Figure 8 on page 15 shows the projected year 2021 background traffic volumes during the evening peak hour. Figure 9 on page 16 and Figure 10 on page 17 show year 2021 background traffic volumes plus net trips generated by the proposed development, with full access and restricted access at the intersection of W Hood Avenue at the existing site access, respectively.

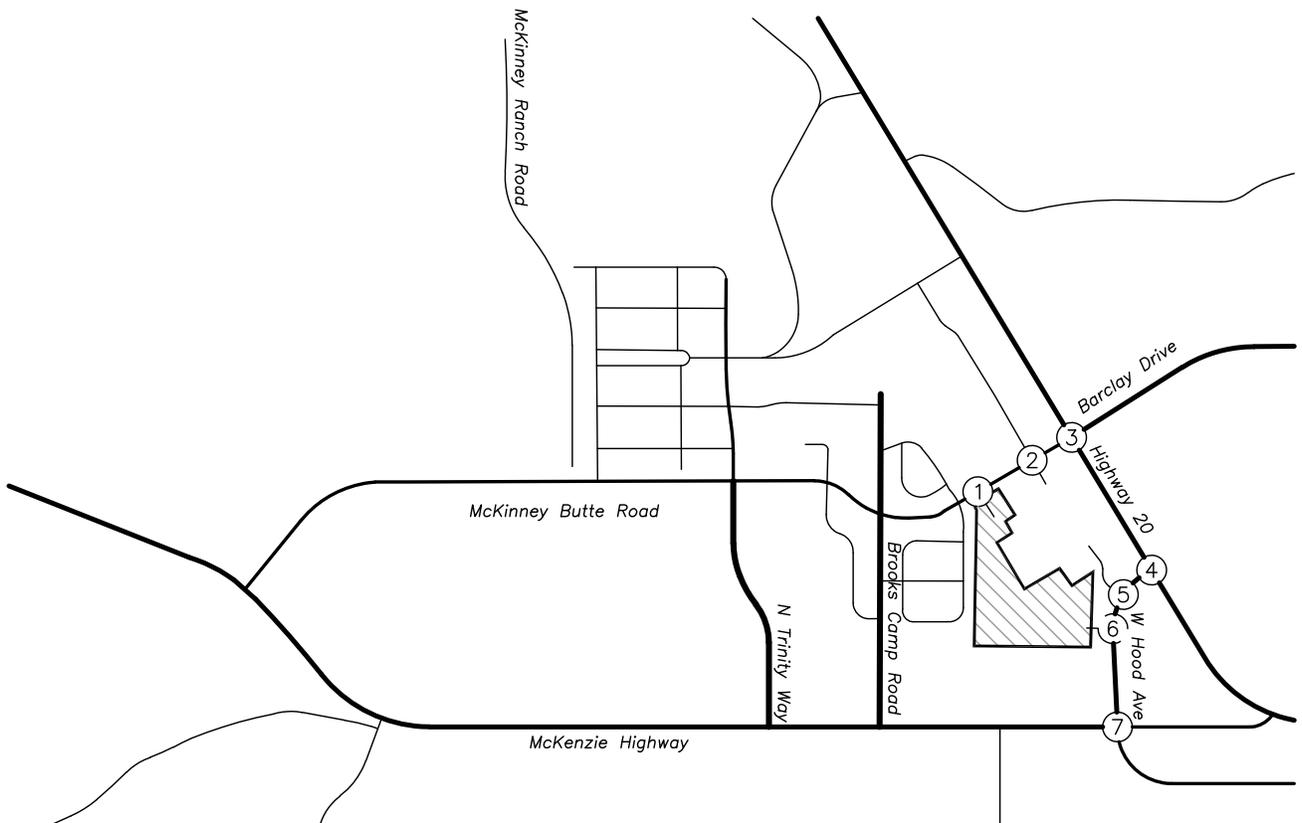
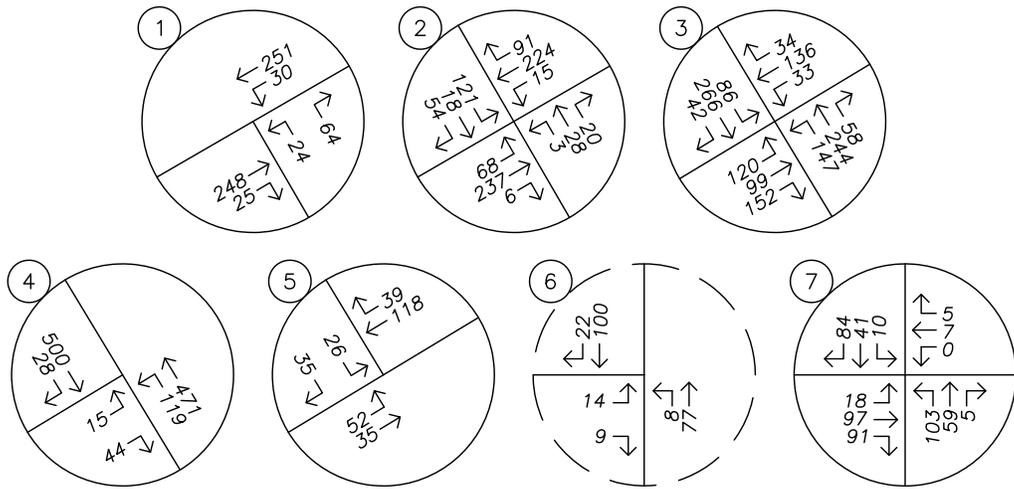


TRAFFIC VOLUMES  
 2021 Background Conditions  
 PM Peak Hour



FIGURE  
 8

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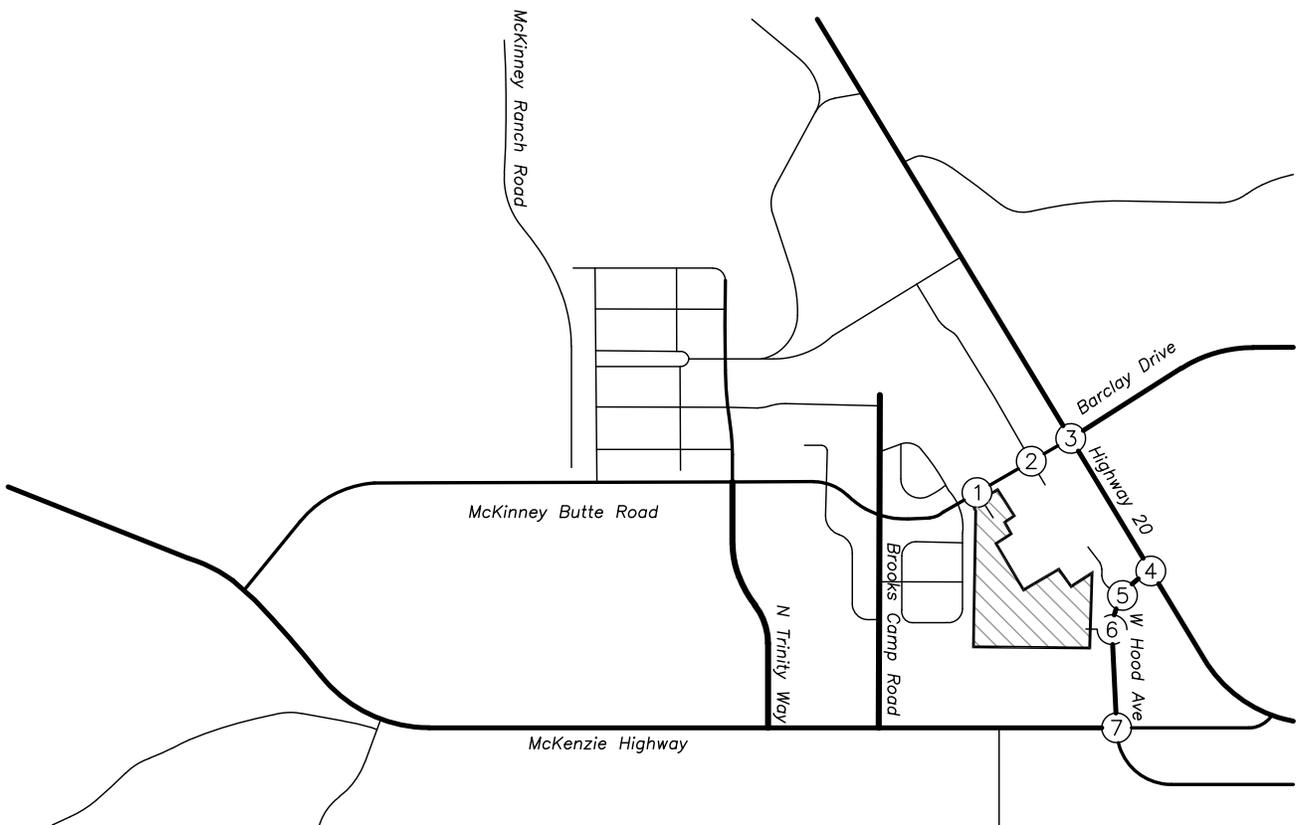
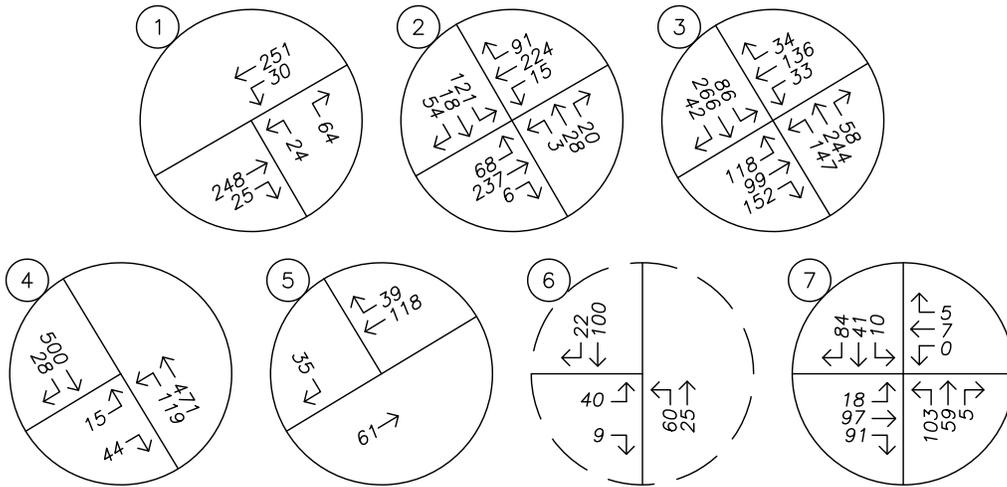


TRAFFIC VOLUMES  
 2021 Background + Site - Full Access at Intersection 5  
 PM Peak Hour



FIGURE  
 9

PAGE  
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TRAFFIC VOLUMES  
 2021 Background + Site - Right-In/Right-Out at Intersection 5  
 PM Peak Hour



FIGURE  
 10  
 PAGE  
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## ***Operational Analysis***

To determine the performance of the study intersections, a capacity analysis was conducted for the evening peak hour of 2:45 p.m. to 3:45 p.m. The analysis was conducted according to the intersection analysis methodology given in the *Highway Capacity Manual* (HCM).<sup>4</sup> The v/c ratio compares the actual traffic demand at an intersection to the potential capacity of the intersection to determine the proposed that is utilized by traffic.

Most of the study intersections are under the jurisdiction of ODOT. The applicable minimum operation standards for these facilities are established under the Oregon Highway Plan<sup>1</sup> and are based on the v/c ratio of the intersection. According to the Oregon Highway Plan, US Highway 20 is a freight route on a statewide highway, and has a maximum allowable v/c ratio of 0.85. The intersections of US Highway 20 at W McKinney Butte Road/W Barclay Drive and US Highway 20 at W Hood Avenue were analyzed according to this standard. OR Highway 242 is a district highway, and has a maximum allowable v/c ratio of 0.9. Since W Hood Avenue is under the jurisdiction of ODOT as part of OR Highway 242, the intersection of W Hood Avenue at the existing access, W Hood Avenue at the proposed access, and OR Highway 242 at W Hood Avenue were analyzed according to this standard.

The intersections of W McKinney Butte Road at the site access and W McKinney Butte Road at N Arrowleaf Trail, both two-way stop-controlled intersections, are under the jurisdiction of the City of Sisters. The City of Sisters 2018 Transportation Plan Refinement states that two-way stop-controlled intersections should have a v/c ratio no greater than 0.90.<sup>5</sup>

The results of the capacity analysis are shown in Table 4.

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<sup>4</sup> Transportation Research Board, *Highway Capacity Manual*, 6<sup>th</sup> Edition, 2016.

<sup>5</sup> *Sisters Transportation System Plan Refinement*, June 2018.

[https://www.ci.sisters.or.us/sites/default/files/fileattachments/public\\_works/page/2281/final\\_sisters\\_tsp\\_refinement.pdf](https://www.ci.sisters.or.us/sites/default/files/fileattachments/public_works/page/2281/final_sisters_tsp_refinement.pdf).



**Table 4 – Intersection Capacity Analysis Summary**

	Evening Peak Hour		
	LOS	Delay (s)	v/c
<b>W McKinney Butte Road at Site Access</b>			
2019 Existing Conditions	B	12	0.16
2021 Background Conditions	B	14	0.21
2021 Background Plus Site Conditions	B	15	0.27
<b>W McKinney Butte Road at N Arrowleaf Trail</b>			
2019 Existing Conditions	D	33	0.60
2021 Background Conditions	F	91	0.91
2021 Background Plus Site Conditions	F	103	0.96
<b>US Highway 20 at W McKinney Butte Road/W Barclay Dr</b>			
2019 Existing Conditions	A	8	0.38
2021 Background Conditions	B	11	0.55
2021 Background Plus Site Conditions	B	12	0.55
<b>US Highway 20 at W Hood Avenue</b>			
2019 Existing Conditions	C	22	0.09
2021 Background Conditions	D	31	0.11
2021 Background Plus Site Conditions	D	35	0.12
<b>W Hood Avenue at Existing Access</b>			
2019 Existing Conditions	A	10	0.07
2021 Background Conditions	A	10	0.08
2021 Background Conditions – Full Access	B	11	0.12
2021 Background Conditions – Restricted Access	A	10	0.06
<b>W Hood Avenue at Proposed Access</b>			
2021 Background Conditions – Full Access at Existing Access	A	10	0.04
2021 Background Conditions – Restricted Access at Existing Access	B	11	0.11
<b>OR Highway 242 at W Hood Avenue</b>			
2019 Existing Conditions	B	11	0.35
2021 Background Conditions	B	11	0.39
2021 Background Plus Site Conditions	B	11	0.38

*LOS, Delay, and v/c ratio were reported for each intersection's worst-operating approach*

As seen in Table 4 above, all intersections except the intersection of W McKinney Butte Road at N Arrowleaf Trail are projected to operate acceptably through the 2021 build-out year, with or without the addition of site trips from the proposed development. The intersection of W McKinney Butte Road at N Arrowleaf Trail is projected to exceed the City's maximum v/c ratio of 0.90 under 2021 background conditions. This is due primarily to a relatively high southbound left-turn volume from N Arrowleaf Trail onto W McKinney Butte Road to reach the roundabout. No planned projects or improvements to this intersection are listed in the City's TSP. The intersection operates acceptably for existing conditions, but delays increase in future years, regardless of development of the Threewind Master Plan. No mitigations are recommended at this intersection for the following reasons:



1. The close proximity of the roundabout serves to meter traffic arriving from the east. The standard calculation methodology for delay may not accurately model this operation and delays will likely be lower than what is calculated for future conditions.
2. This intersection serves as convenient access to the commercial areas to the north and the south. If turning movements are restricted, there would be significant out-of-direction travel.
3. Long delays will occur primarily during the peak hours and turn restrictions would force inefficient out-of-direction travel even during off-peak times when such a restriction is not necessary.
4. During peak hours when delays are long, drivers will self-select how they exit the commercial center. Highway traffic will likely choose to travel north on Arrowleaf Trail to Railway Avenue to make a right-turn onto Highway 20. Local traffic may choose a number of other routes to avoid Highway 20 and utilize the local street system.

## ***Safety Analysis***

The following sections comprise a traffic safety analysis for the proposed development, which includes warrant analysis and crash data analysis.

### ***Warrant Analysis***

Left-turn lane warrants and preliminary traffic signal warrants were examined for the study intersections where such treatments would be applicable.

#### ***Left-Turn Lane Warrants***

Left-turn lane warrants were examined for the study intersections where such treatments would be applicable.

A left-turn refuge land is primarily a safety consideration for the major street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants were examined using methodologies provided in the National Cooperative Highway Research Program's (NCHRP) *Report 457*. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles, number of turning vehicles, travel speed, and the number of through lanes.

Left-turn lane warrants are not projected to be met under any analysis scenario for any of the following two-way stop-controlled intersections:

- W McKinney Butte Road at Site Access
- W McKinney Butte Road at N Arrowleaf Trail
- W Hood Avenue at Proposed Access

The two-way stop-controlled intersections on US Highway 20 in the study area already have left-turn lanes. No new left-turn lanes are necessary or recommended.



## *Signal Warrants*

Preliminary traffic signal warrants were examined for all study intersections except the intersection of US Highway 20 at W McKinney Butte Road/W Barclay Drive. Due to insufficient traffic volumes, traffic signal warrants are not projected to be met at the unsignalized study intersections under any of the analysis scenarios.

## *Crash Data Analysis*

Using data obtained from ODOT's Online Crash Data System, a review was performed of the most recent five years of available crash data (January 2012 through December 2016) at the existing study intersections. The crash data were analyzed based on the type and severity of crashes. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

1. PDO – property damage only
2. Injury C – possible injury or complain of pain
3. Injury B – non-incapacitating injury
4. Injury A – incapacitating injury (i.e. bleeding or broken bones)
5. Fatality

Crash rates were calculated under the common assumption that traffic counted during the evening peak hour represents ten percent of annual average daily traffic (AADT) at each intersection. Crash rates for each intersection are reported as crashes per million entering vehicles (CMEV). A crash rate higher than one to two CMEV may be indicative of design deficiencies or the need for mitigation. Detailed crash data is provided in the appendix to this report.

The crash data is summarized in Table 5. It should be noted that all of the crashes in the analysis period occurred before construction of the existing roundabout at the intersection of US Highway 20 at W McKinney Butte Road/W Barclay Drive. Two of the crashes at this intersection resulted in incapacitating injuries. One involved a car and a motorcycle. Both of the two people on the motorcycle suffered the incapacitating injuries. The second crash involving incapacitating injuries occurred when a northbound vehicle did not yield right-of-way to a westbound vehicle and struck the westbound vehicle. All three occupants of the westbound vehicle suffered incapacitating injuries. The crash involving a bicycle occurred when a southbound vehicle struck an eastbound cyclist. The cyclist suffered a non-incapacitating injury.

No crashes at any of the other study intersections resulted in incapacitating injuries or involved pedestrians or cyclists.

Based on the analysis of crash data, there are no apparent safety hazards or design deficiencies at the study intersections. No safety mitigation is recommended.



Table 5 – Crash Data Summary

Intersection*	By Severity			By Modes Involved			Total Crashes	Crash Rate (CMEV)
	PDO†	Injury	Fatal	Ped	Bike	Car Only		
W McKinney Butte Road at Site Access	0	0	0	0	0	0	0	0
W McKinney Butte Road at N Arrowleaf Trail	1	1	0	0	0	2	2	0.16
US Highway 20 at W McKinney Butte	6	10	0	0	1	15	16	0.79
US Highway 20 at W Hood Avenue	1	1	0	0	0	2	2	0.13
W Hood Avenue at Existing Access	0	0	0	0	0	0	0	0
OR Highway 242 at W Hood Avenue	2	0	0	0	0	2	2	0.24

†“Property damage only,” i.e. a crash in which no injury occurred

### Sight Distance Analysis

Intersection sight distance was measured for the proposed site access intersection on W Hood Avenue. Sight distance was measured and evaluated in accordance with standards established in *A Policy on Geometric Design of Highways and Streets*.<sup>6</sup> According to AASHTO, the driver’s eye is assumed to be 15 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver’s eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

Based on the posted speed of 30 mph, the minimum recommended intersection sight distance is 335 feet. Sight distance to the north was measured to be approximately 365 feet, to the intersection of US Highway 20 at W Hood Avenue, as shown in Figure 11. Sight distance to the south was measured to be approximately 523 feet, to the intersection of OR Highway 242 at W Hood Avenue, as shown in Figure 12.

<sup>6</sup> American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6<sup>th</sup> Edition, 2011.



Figure 11 – Sight Distance at Proposed Access, Looking North



Figure 12 – Sight Distance at Proposed Access, Looking South

### ***W Hood Avenue Access Management***

The proposed access to the site on W Hood Avenue is approximately 200 feet south of the existing Three Wind Shopping Center access. The ODOT spacing standard for district highways with an annual average daily traffic of 5,000 vehicles or less and a posted speed of 30 mph is 250 feet.<sup>1</sup> Because of the horizontal curve in the roadway, it is possible that vehicles would be traveling at speeds less than 30 mph. Traffic volumes on W Hood Avenue and at both of the driveways are relatively low.

The proposed driveway is across the street and offset from the existing driveway to the East Portal access. This East Portal site is currently for sale and owned by the Forest Service. Redevelopment potential of the property is limited since it is currently zoned Open Space. No redevelopment of the site was assumed for the purposes of this report.



As shown in Figure 13 below, there are currently back-to-back left-turn lanes striped on W Hood Avenue between the existing Three Wind Shopping Center access and the East Portal Access. The new street intersection along the southern property line of the subject site will access W Hood Avenue where there is currently a southbound left-turn lane for the East Portal driveway. Given the spacing of intersections after development of the Threewind Master Plan site, it is recommended that the existing left-turn lane striping on W Hood Avenue be removed and replaced with standard two-way left-turn lane striping.



**Figure 13 – Existing (left) and Proposed (right) Striping on W Hood Avenue**

Based on the operational analysis of the intersection of US Highway 20 at W Hood Avenue, the projected 95<sup>th</sup> percentile queue length on the W Hood Avenue approach to US Highway 20 is only one vehicle, which is not enough to block the existing access to the site on W Hood Avenue. No operational issues are expected



at the existing site access on W Hood Avenue due to its proximity to US Highway 20, with or without the proposed development. As such, no turning movement restrictions are recommended at this time.

If operation at the existing access becomes a problem in the future, access restrictions can be reevaluated at that time, but no restriction is needed as a result of the Master Plan. If restriction of turning movements is entertained in the future, consideration should be given to allowing left turns into the driveway in order to minimize out-of-direction travel.

### *Internal Public/Private Street Intersection*

The property to the south of the subject site, the Patterson Property, is zoned for residential development and could develop in the future. A preliminary trip generation and distribution analysis was completed for the Patterson Property. It was assumed that when the property develops, 7 single-family homes will be constructed per gross acre of site area, for a total of 91 dwellings on 13.1 acres. The site will likely have three access points: one on Brooks Camp Road, one on OR Highway 242, and one at the north property line that will connect at the four-legged intersection in the southern portion of the Threewind Master Plan development. The public street connection within Threewind will provide access to W Hood Avenue.

Using the *Trip Generation Manual*,<sup>3</sup> it was determined that during the evening peak hour, the Patterson Property could generate up to 57 entering trips and 33 exiting trips. Using the same trip distribution described in the Trip Distribution section of this report, it was estimated that a total of 41 of these trips would travel through the intersection on the Threewind Master Plan site during the evening peak hour. This volume, combined with the trips from the Threewind site, are still quite low. A standard two-way stop-controlled intersection will be sufficient to manage traffic at this intersection.



## **Conclusions**

The intersection of W McKinney Butte Drive at N Arrowleaf Trail is projected to operate with a higher v/c ratio than the maximum allowable by the City of Sisters under year 2021 background conditions and year 2021 background plus site conditions. Because future delays will likely be less than what the model predicts for future conditions, mitigation would likely result in turning movement restrictions and out-of-direction travel, and local traffic may self-select other routes, no mitigation at this intersection is recommended. All other study intersections are projected to operate acceptably through the year 2021, with or without site trips generated by the proposed development.

Left-turn lane warrants are not projected to be met at any of the study intersections where they would be applicable.

Traffic signal warrants are not projected to be met at the unsignalized study intersections under any of the analysis scenarios due to insufficient traffic volumes.

Adequate sight distance is available at the location of the proposed site access intersection on W Hood Avenue.

Turning movement restriction at the existing site access on W Hood Avenue is not necessary or recommended in conjunction with the proposed Master Plan.

If and when the Patterson Property develops, two-way stop control would be sufficient to control the intersection between that property and the subject property.



*Appendix*



**VICINITY MAP**

NTS

LEGEND	
	EXISTING CABLE
	EXISTING GAS
	EXISTING IRRIGATION
	EXISTING OVERHEAD LINES
	EXISTING POWER
	EXISTING SANITARY SEWER
	EXISTING STORM DRAIN
	EXISTING TELECOMMUNICATIONS
	EXISTING WATER
	NEW CABLE
	NEW GAS
	NEW IRRIGATION
	NEW POWER
	NEW SANITARY SEWER
	NEW STORM DRAIN
	NEW TELECOMMUNICATIONS
	NEW WATER
	FENCE
	EXISTING RIGHT-OF-WAY
	EXISTING EDGE OF GRAVEL
	EXISTING EDGE OF PAVEMENT
	EXISTING CURB
	NEW RIGHT-OF-WAY
	NEW EDGE OF GRAVEL
	NEW EDGE OF PAVEMENT
	NEW CURB
	EXISTING SANITARY MANHOLE
	EXISTING STORM DRAIN MANHOLE, DRYWELL
	PROPOSED SANITARY MANHOLE
	PROPOSED STORM DRAIN MANHOLE, DRYWELL
	PROPOSED WATER VALVE, GAS VALVE
	PROPOSED AIR RELEASE VALVE
	PROPOSED BACKFLOW PREVENTER
	PROPOSED WATER METER, GAS METER
	PROPOSED FIRE HYDRANT
	PROPOSED CATCH BASIN/CURB INLET
	PROPOSED CLEAN OUT
	PROPOSED RAIN DRAIN
	PROPOSED STREET LIGHT, PARKING LOT LIGHT
	PROPOSED UTILITY POLE, GUY ANCHOR
	PROPOSED UTILITY VAULT
	PROPOSED ELECTRICAL PEDESTAL
	PROPOSED CABLE PEDESTAL
	PROPOSED TELECOMMUNICATIONS PEDESTAL
	PROPOSED IRON ROD, IRON PIPE
	TREES
	SIGN
	MAILBOX

**OWNER**  
THREEWIND PARTNERS LLC  
1825 HAPPY LN  
EUGENE, OR 97401

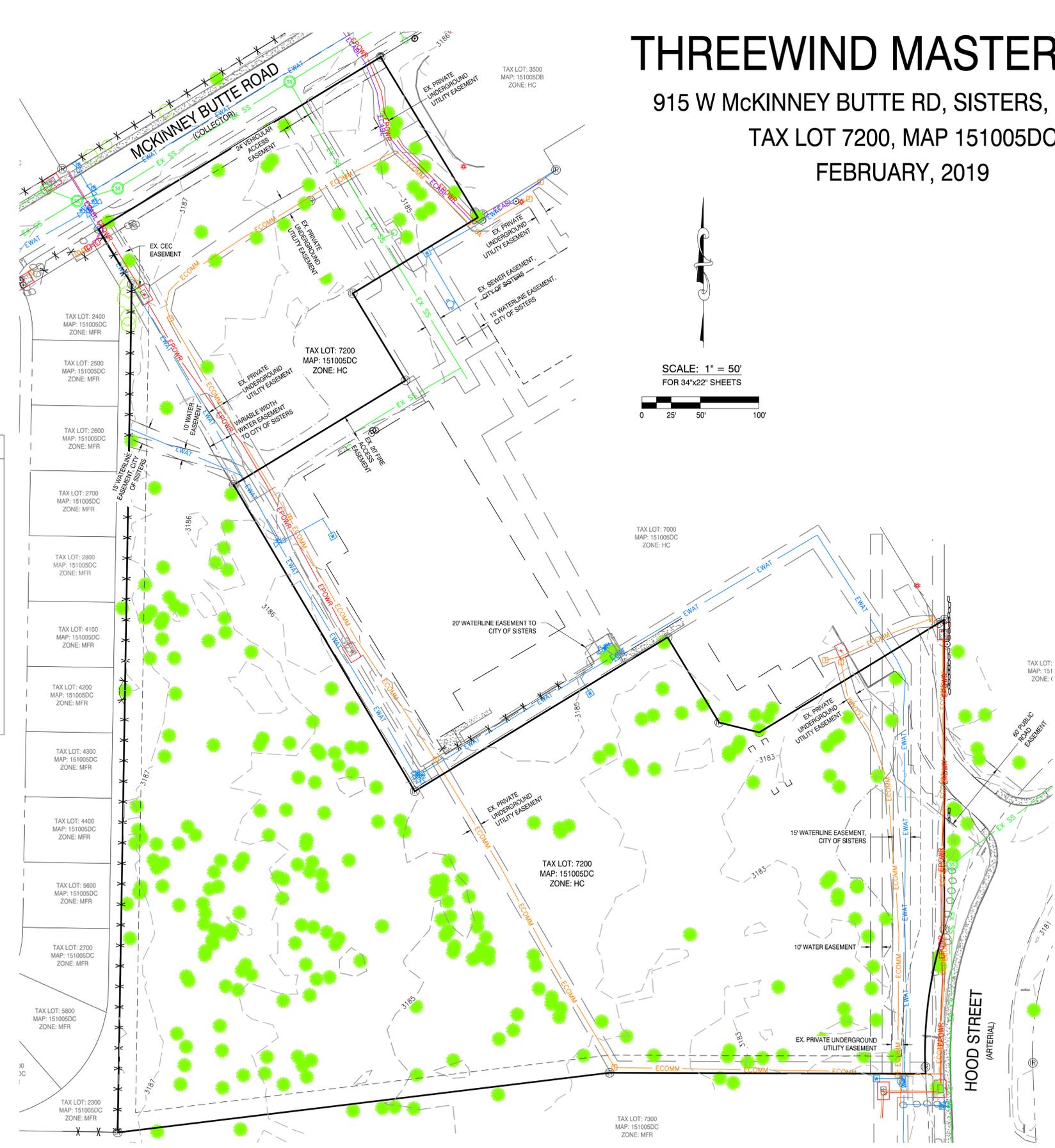
**CIVIL ENGINEER & LAND SURVEYOR**  
H.A. M'COY ENGINEERING & SURVEYING  
CONTACT: HAYES M'COY  
1180 SW LAKE ROAD  
SUITE 201  
REDMOND, OR 97756  
PH: 541-923-7554

**SITE INFORMATION**  
TAX ASSESSORS MAP: TAX LOT #7200, MAP 151005DC  
LEGAL DESCRIPTION: PARCEL 1, PARTITION PLAT 2014-26  
PROPERTY SIZE: 7.48 ACRES  
ZONING: HC

**SHEET INDEX**  
P1.0 COVER SHEET AND EX. CONDITIONS  
P1.1 PRELIMINARY PLAT  
P1.2 PRELIMINARY STREET SECTIONS AND DEVELOPMENT PLAN

**VERTICAL DATUM**  
ELEVATIONS ARE BASED OFF OF DESCHUTES COUNTY BENCHMARK GIS 015, A 3 1/2" ALUMINUM CAP IN A MASS OF CONCRETE AT GROUND LEVEL, 26 FEET SOUTH OF THE CENTERLINE OF HWY. 242, 20 FEET NORTH OF WOOD POLE FENCE AND 140 FEET WEST OF TRINITY WAY.

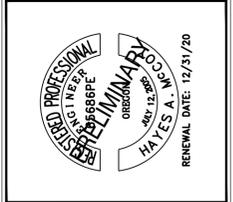
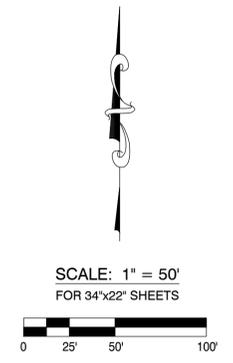
**LOCATE TICKETS = 18101846, 18101856, & 18101879**  
ALL UTILITY LOCATES WERE TIED DURING COURSE OF THIS SURVEY. H.A. M'COY ENGINEERING & SURVEYING, LLC MAKES NO GUARANTEE OF THE ACCURACY OF SAID MARKS.



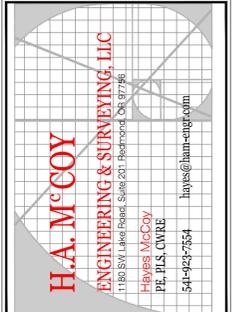
**EXISTING CONDITIONS**

# THREEWIND MASTER PLAN

915 W MCKINNEY BUTTE RD, SISTERS, OR 97759  
TAX LOT 7200, MAP 151005DC  
FEBRUARY, 2019



DRAWING STATUS:	DATE:	REVISION:	No.	DATE:
1ST PRE-APP.	11/06/18	△		
2ND PRE-APP.	12/04/18	△		
FINAL PRE-APP.	02/12/19	△		
SUBMITTAL	03/22/19	△		



**PROJECT:** THREEWIND MASTERPLAN

**PROJECT LOCATION:** SISTERS, OR

**CLIENT:** MAYES ARCHITECTURE

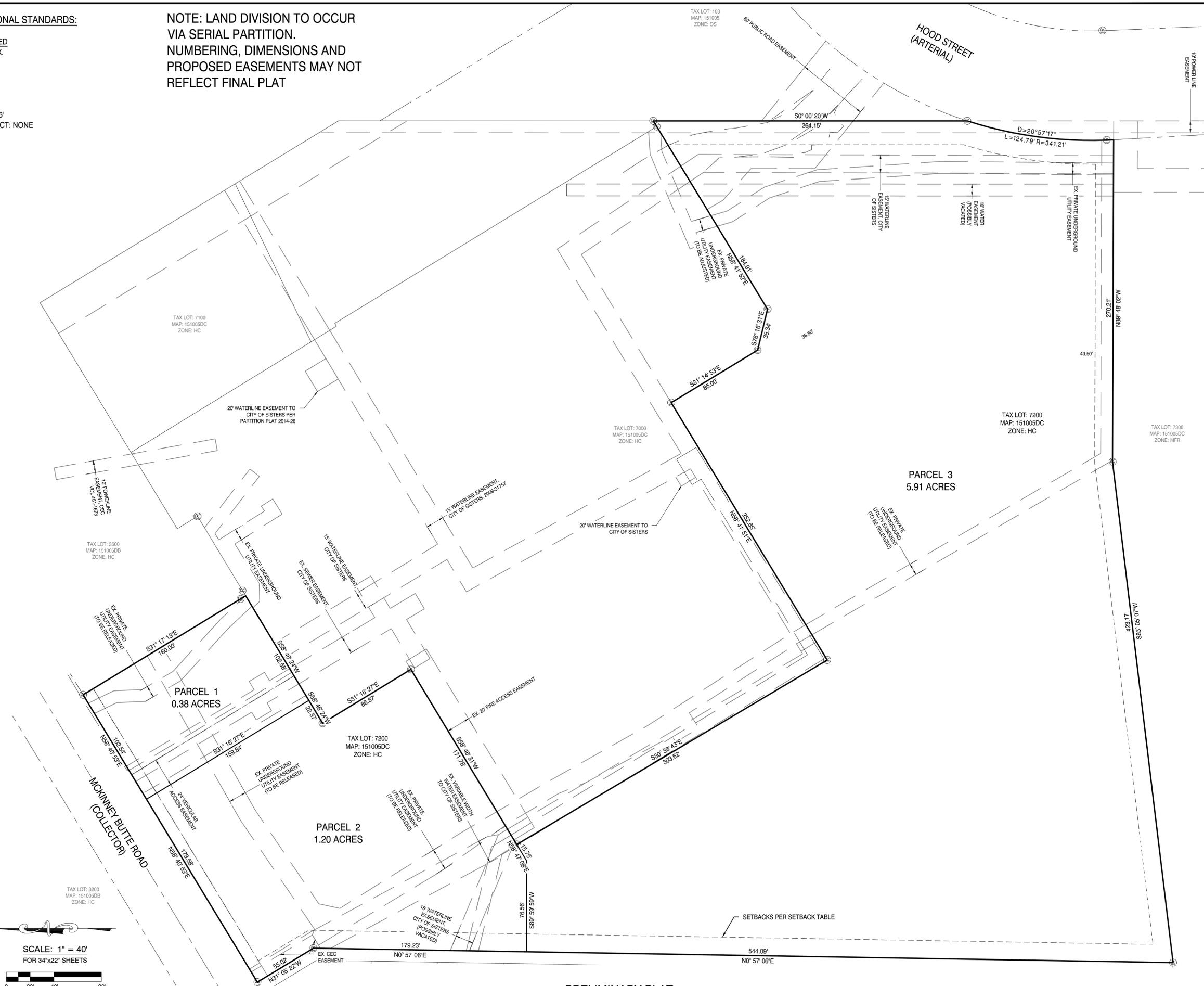
**SHEET TITLE:** COVER SHEET AND EX. CONDITIONS

**JOB NO.** 18-056  
**DRAWN BY:** SCW  
**DRAWING:** P1.0

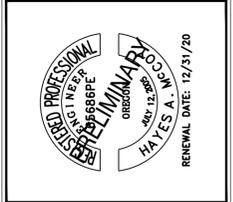
**HC ZONE MINIMUM DIMENSIONAL STANDARDS:**

STANDARD	REQUIRED
BUILDING HEIGHT:	35' MAX.
<b>MINIMUM BUILDING SETBACKS</b>	
ABUTTING HIGHWAY:	50'
ABUTTING ARTERIAL:	20'
ABUTTING LOCAL STREET:	10'
ABUTTING RESIDENTIAL DISTRICT:	15'
ABUTTING NON-RESIDENTIAL DISTRICT:	NONE

**NOTE: LAND DIVISION TO OCCUR VIA SERIAL PARTITION. NUMBERING, DIMENSIONS AND PROPOSED EASEMENTS MAY NOT REFLECT FINAL PLAT**



**PRELIMINARY PLAT**



DRAWING STATUS:	DATE:	REVISION:	DATE:
<input type="checkbox"/> 1ST PRE-APP.	11/06/18	No.	
<input type="checkbox"/> 2ND PRE-APP.	12/04/18		
<input type="checkbox"/> FINAL PRE-APP.	02/12/19		
<input checked="" type="checkbox"/> SUBMITTAL	03/22/19		

**H.A. MCCOY**  
**ENGINEERING & SURVEYING, LLC**  
 1180 S.W. Lakehead, Suite 201, Warrenton, OR 97146  
 P.E. H.A. MCCOY, PLS. C.V. R.E.  
 541-424-7354  
 hmc@hmc-engineer.com

PROJECT: THREWIND MASTERPLAN  
 PROJECT LOCATION: SISTERS, OR  
 CLIENT: MAYES ARCHITECTURE

SHEET TITLE: PRELIMINARY PLAT

JOB NO. 18-056  
 DRAWN BY: SCW  
 DRAWING: P1.1

FILE: \\yreenas\MS\HAM\_Eng\18-056\_Threwind Master Plan\Planning\190311-18056-PLAT.dwg 3/12/2019 9:59 AM - Owner

**HC ZONE MINIMUM DIMENSIONAL STANDARDS:**

STANDARD	REQUIRED
BUILDING HEIGHT:	35' MAX.

**MINIMUM BUILDING SETBACKS**

- ABUTTING HIGHWAY: 50'
- ABUTTING ARTERIAL: 20'
- ABUTTING LOCAL STREET: 10'
- ABUTTING RESIDENTIAL DISTRICT: 15'
- ABUTTING NON-RESIDENTIAL DISTRICT: NONE

**MASTERPLAN MINIMUM DIMENSIONAL STANDARDS:**

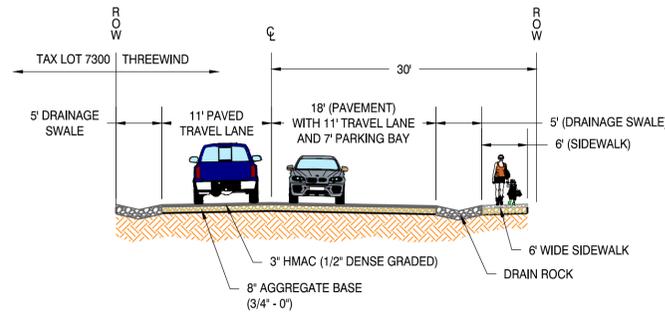
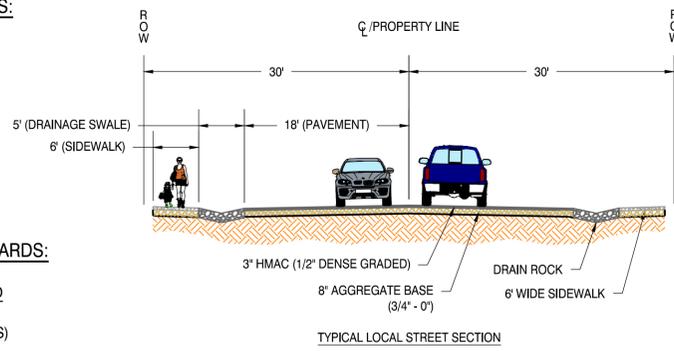
STANDARD	REQUIRED	PROVIDED
OPEN SPACE & LANDSCAPING	15%	15%*
	(1.1 ACRES)	(1.1 ACRES)

GROUND FLOOR COMMERCIAL AREA:	50% MIN. (30,650 SF)	50%** (30,650 SF)
-------------------------------	-------------------------	----------------------

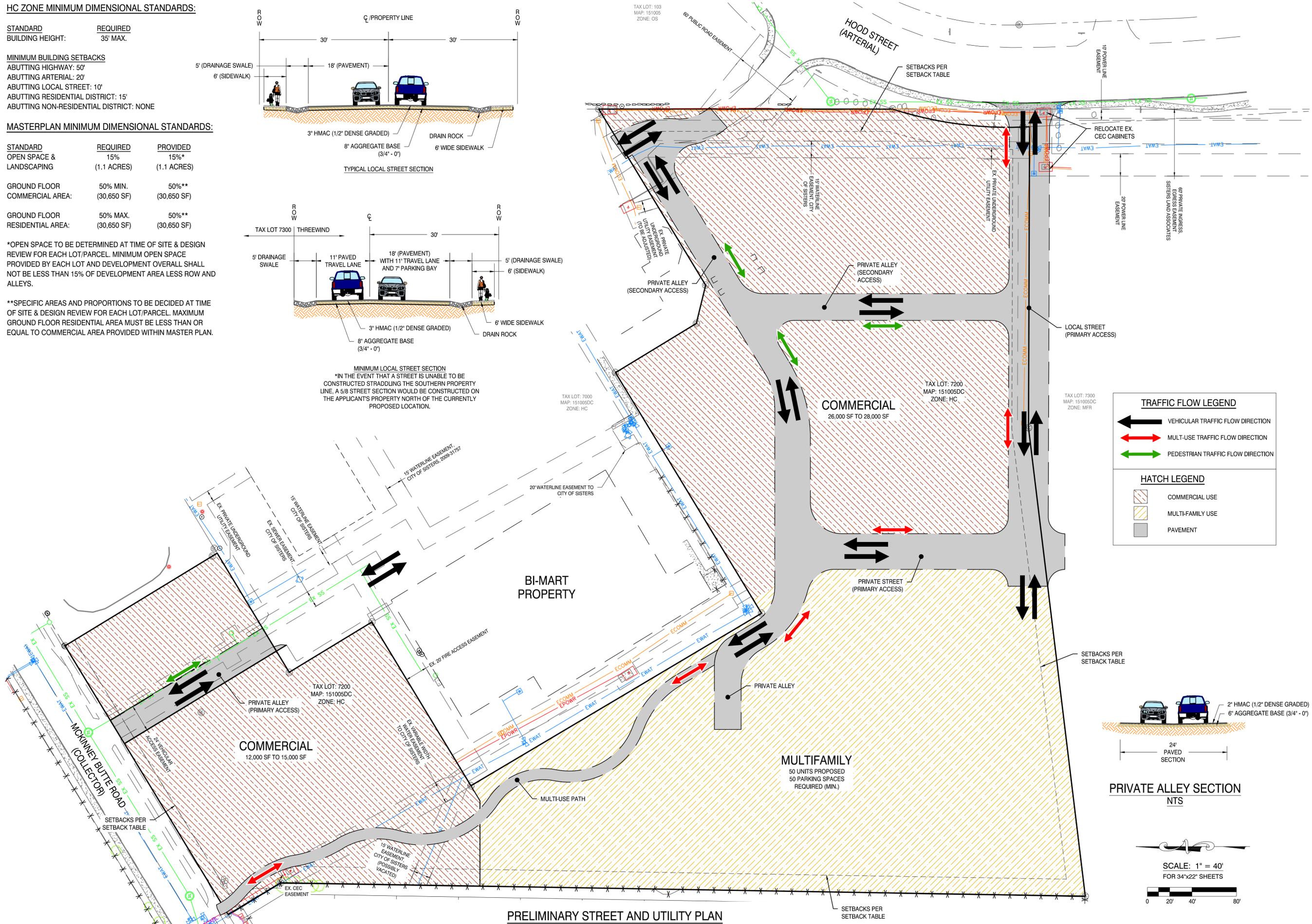
GROUND FLOOR RESIDENTIAL AREA:	50% MAX. (30,650 SF)	50%** (30,650 SF)
--------------------------------	-------------------------	----------------------

\*OPEN SPACE TO BE DETERMINED AT TIME OF SITE & DESIGN REVIEW FOR EACH LOT/PARCEL. MINIMUM OPEN SPACE PROVIDED BY EACH LOT AND DEVELOPMENT OVERALL SHALL NOT BE LESS THAN 15% OF DEVELOPMENT AREA LESS ROW AND ALLEYS.

\*\*SPECIFIC AREAS AND PROPORTIONS TO BE DETERMINED AT TIME OF SITE & DESIGN REVIEW FOR EACH LOT/PARCEL. MAXIMUM GROUND FLOOR RESIDENTIAL AREA MUST BE LESS THAN OR EQUAL TO COMMERCIAL AREA PROVIDED WITHIN MASTER PLAN.



**MINIMUM LOCAL STREET SECTION**  
 \*IN THE EVENT THAT A STREET IS UNABLE TO BE CONSTRUCTED STRADDLING THE SOUTHERN PROPERTY LINE, A 5/8 STREET SECTION WOULD BE CONSTRUCTED ON THE APPLICANT'S PROPERTY NORTH OF THE CURRENTLY PROPOSED LOCATION.

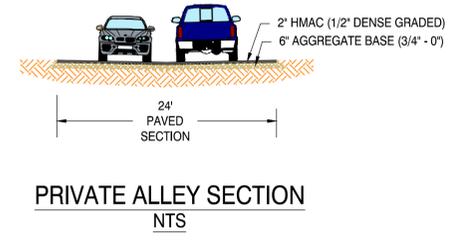


**TRAFFIC FLOW LEGEND**

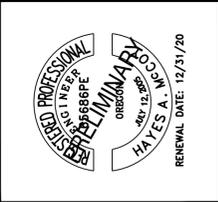
- VEHICULAR TRAFFIC FLOW DIRECTION (black arrow)
- MULT-USE TRAFFIC FLOW DIRECTION (red arrow)
- PEDESTRIAN TRAFFIC FLOW DIRECTION (green arrow)

**HATCH LEGEND**

- COMMERCIAL USE (diagonal lines)
- MULTI-FAMILY USE (cross-hatch)
- PAVEMENT (grey)



SCALE: 1" = 40'  
 FOR 34"x22" SHEETS



DRAWING STATUS:	DATE:	REVISION:	No.
<input type="checkbox"/> 1ST PRE-APP.	11/06/18		
<input type="checkbox"/> 2ND PRE-APP.	12/04/18		
<input type="checkbox"/> FINAL PRE-APP.	02/12/19		
<input checked="" type="checkbox"/> SUBMITTAL	03/22/19		

**H.A. MCCOY**  
 ENGINEERING & SURVEYING, LLC  
 1180 SW Lake Road, Suite 201, Beaufort, OR 97766  
 HAYES@hmc-engineer.com  
 541-443-7554

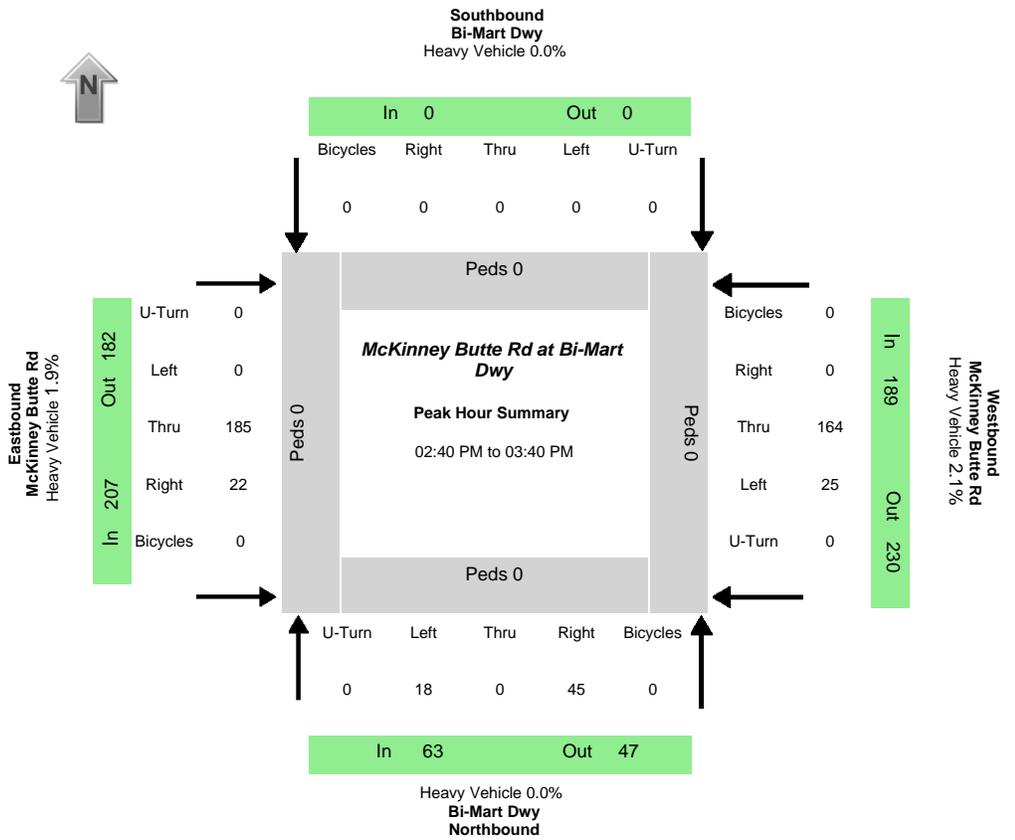
PROJECT: THREEWIND MASTERPLAN  
 PROJECT LOCATION: SISTERS, OR  
 CLIENT: MAYES ARCHITECTURE

SHEET TITLE: PRELIMINARY STREET SECTIONS AND DEVELOPMENT PLAN

JOB NO. 18-056  
 DRAWN BY: SCW  
 DRAWING: P1.2

Data Provided by K-D-N.com 503-594-4224

N/S street	<b>Bi-Mart Dwy</b>
E/W street	<b>McKinney Butte Rd</b>
City, State	Sisters OR
Site Notes	
Location	44.295102 - -121.561009
Start Date	Wednesday, December 12, 2018
Start Time	02:00:00 PM
Weather	
Study ID #	
<b>Peak Hour Start</b>	<b>02:40:00 PM</b>
<b>Peak 15 Min Start</b>	<b>03:10:00 PM</b>
<b>PHF (15-Min Int)</b>	<b>0.66</b>



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
18	0	45	0	0	0	0	0	0	185	22	0	25	164	0	0	63	0	207	189	47	0	182	230
Percent Heavy Vehicles																							
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	0.0%	0.0%	4.0%	1.8%	0.0%	0.0%	0.0%	0.0%	1.9%	2.1%	2.1%	0.0%	1.6%	1.7%

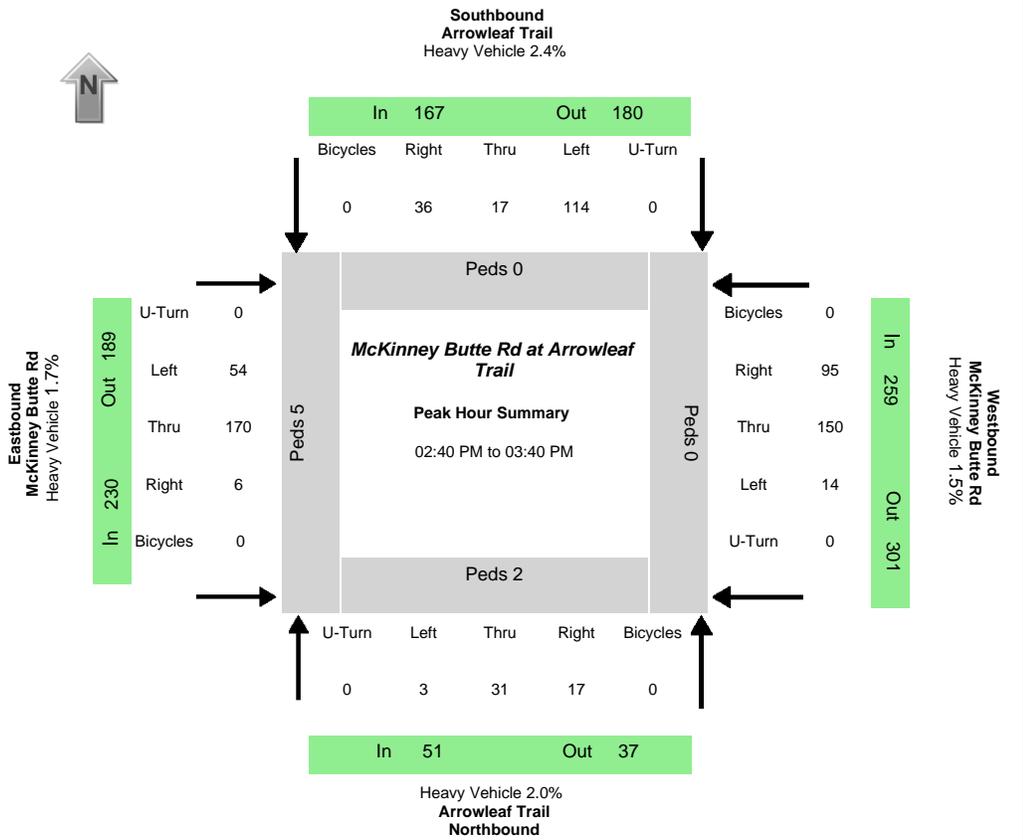
PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk				Sum	
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Time	Northbound Bi-Mart Dwy				Southbound Bi-Mart Dwy				Eastbound McKinney Butte Rd				Westbound McKinney Butte Rd				15 Min Sum	1 HR Sum	
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn			
02:00:00 PM	0	0	5	0	0	0	0	0	0	3	2	0	0	3	5	0	0		
02:05:00 PM	0	0	2	0	0	0	0	0	0	0	12	0	0	1	3	0	0		
02:10:00 PM	2	0	3	0	0	0	0	0	0	5	2	0	0	1	1	0	0	50	
02:15:00 PM	0	0	5	0	0	0	0	0	0	10	1	0	0	3	3	0	0	54	
02:20:00 PM	0	0	0	0	0	0	0	0	0	7	2	0	0	1	7	0	0	53	
02:25:00 PM	0	0	2	0	0	0	0	0	0	2	0	0	0	4	6	0	0	53	
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02:35:00 PM	1	0	2	0	0	0	0	0	0	6	0	0	0	5	8	0	0	61	
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03:25:00 PM	3	0	2	0	0	0	0	0	0	14	1	0	0	2	7	0	0	152	453
03:30:00 PM	1	0	3	0	0	0	0	0	0	11	2	0	0	2	8	0	0	103	455
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03:40:00 PM	2	0	6	0	0	0	0	0	0	9	0	0	0	0	4	0	0	74	457
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04:05:00 PM	0	0	3	0	0	0	0	0	0	0	7	0	0	3	8	0	0	56	381
04:10:00 PM	3	0	5	0	0	0	0	0	0	0	9	1	0	3	7	0	0	67	359
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05:00:00 PM	1	0	1	0	0	0	0	0	0	0	3	0	0	1	4	0	0	52	266
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05:10:00 PM	1	0	8	0	0	0	0	0	0	0	11	1	0	1	9	0	0	61	268
05:15:00 PM	1	0	3	0	0	0	0	0	0	0	4	1	0	1	9	0	0	70	269
05:20:00 PM	2	0	4	0	0	0	0	0	0	0	4	0	0	3	0	0	0	63	260
05:25:00 PM	1	0	3	0	0	0	0	0	0	0	6	1	0	1	6	0	0	50	254
05:30:00 PM	1	0	2	0	0	0	0	0	0	0	5	0	0	0	8	0	0	47	243
05:35:00 PM	1	0	3	0	0	0	0	0	0	0	1	2	0	1	6	0	0	48	230
05:40:00 PM	2	0	2	0	0	0	0	0	0	0	14	1	0	2	8	0	0	59	230
05:45:00 PM	0	0	3	0	0	0	0	0	0	0	10	0	0	0	5	0	0	61	230
05:50:00 PM	1	0	1	0	0	0	0	0	0	0	8	0	0	2	5	0	0	64	226
05:55:00 PM	0	0	1	0	0	0	0	0	0	0	12	1	0	0	7	0	0	56	226

Data Provided by K-D-N.com 503-594-4224

N/S street	<b>Arrowleaf Trail</b>
E/W street	<b>McKinney Butte Rd</b>
City, State	Sisters OR
Site Notes	
Location	44.295359 - -121.560495
Start Date	Wednesday, December 12, 2018
Start Time	02:00:00 PM
Weather	
Study ID #	
<b>Peak Hour Start</b>	<b>02:40:00 PM</b>
<b>Peak 15 Min Start</b>	<b>03:10:00 PM</b>
<b>PHF (15-Min Int)</b>	<b>0.75</b>



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
3	31	17	0	114	17	36	0	54	170	6	0	14	150	95	0	51	167	230	259	37	180	189	301
Percent Heavy Vehicles																							
0.0%	3.2%	0.0%	0.0%	2.6%	0.0%	2.8%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	2.0%	1.1%	0.0%	2.0%	2.4%	1.7%	1.5%	0.0%	1.1%	2.1%	2.3%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5	0	7

All Vehicle Volumes																		
Time	Northbound Arrowleaf Trail				Southbound Arrowleaf Trail				Eastbound McKinney Butte Rd				Westbound McKinney Butte Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
02:00:00 PM	0	1	1	0	13	2	5	0	4	4	0	0	1	3	6	0		
02:05:00 PM	1	0	2	0	13	0	1	0	1	12	1	0	0	2	5	0		
02:10:00 PM	0	1	1	0	12	0	0	0	2	6	0	0	0	2	6	0	108	
02:15:00 PM	0	0	2	0	2	0	1	0	4	11	0	0	3	5	5	0	101	
02:20:00 PM	1	1	1	0	12	3	0	0	2	5	0	0	1	7	8	0	104	
02:25:00 PM	0	1	1	0	6	0	4	0	1	3	0	0	0	6	5	0	101	
02:30:00 PM	0	4	2	0	11	2	3	0	2	7	0	0	2	12	6	0	119	
02:35:00 PM	0	0	1	0	8	1	2	0	1	7	0	0	1	11	6	0	116	
02:40:00 PM	0	4	0	0	6	0	1	0	1	7	1	0	2	12	11	0	134	
02:45:00 PM	0	4	1	0	8	1	5	0	2	6	0	0	3	10	7	0	130	
02:50:00 PM	1	1	3	0	10	1	3	0	6	6	0	0	2	19	9	0	153	
02:55:00 PM	1	3	2	0	8	1	3	0	3	4	1	0	1	22	7	0	164	507
03:00:00 PM	0	1	3	0	11	1	2	0	3	7	0	0	0	18	9	0	172	522
03:05:00 PM	0	2	0	0	10	0	1	0	4	12	2	0	0	25	2	0	169	542
03:10:00 PM	0	7	1	0	6	4	2	0	5	27	1	0	0	13	8	0	187	586
03:15:00 PM	0	3	1	0	10	0	6	0	14	44	1	0	0	6	7	0	224	645
03:20:00 PM	0	1	2	0	15	5	4	0	7	26	0	0	1	5	5	0	237	675
03:25:00 PM	0	0	1	0	11	2	5	0	6	10	0	0	2	4	11	0	215	700
03:30:00 PM	0	3	2	0	7	1	1	0	1	13	0	0	1	9	11	0	172	698
03:35:00 PM	1	2	1	0	12	1	3	0	2	8	0	0	2	7	8	0	148	707
03:40:00 PM	0	0	2	0	8	0	1	0	3	11	1	0	2	3	3	0	130	696
03:45:00 PM	1	1	2	0	16	3	3	0	6	6	0	0	1	3	8	0	131	699
03:50:00 PM	0	1	3	0	9	3	4	0	5	8	0	0	0	7	6	0	130	684
03:55:00 PM	1	0	2	0	8	1	0	0	2	7	1	0	2	2	5	0	127	659

04:00:00 PM	0	0	0	0	13	0	2	0	2	9	1	0	1	2	7	0	114	641
04:05:00 PM	0	1	1	0	12	2	3	0	5	4	1	0	1	8	12	0	118	633
04:10:00 PM	0	5	1	0	13	1	3	0	3	11	0	0	0	7	10	0	141	613
04:15:00 PM	1	1	0	0	14	3	3	0	8	4	0	0	0	1	6	0	145	562
04:20:00 PM	0	0	1	0	14	0	1	0	3	6	1	0	1	8	8	0	138	534
04:25:00 PM	0	0	1	0	15	1	3	0	3	10	1	0	1	6	7	0	132	530
04:30:00 PM	0	1	0	0	12	2	4	0	4	10	0	0	0	5	9	0	138	528
04:35:00 PM	0	2	1	0	7	2	5	0	4	9	1	0	1	6	6	0	139	525
04:40:00 PM	0	0	0	0	7	1	2	0	2	15	0	0	0	9	4	0	131	531
04:45:00 PM	0	3	1	0	8	0	1	0	1	11	0	0	1	4	5	0	119	516
04:50:00 PM	0	0	1	0	11	1	2	0	3	8	0	0	2	6	7	0	116	511
04:55:00 PM	0	1	2	0	10	1	3	0	3	5	0	0	1	8	2	0	112	516
05:00:00 PM	0	0	3	0	7	3	1	0	3	1	0	0	1	4	11	0	111	513
05:05:00 PM	0	1	2	0	8	3	2	0	3	3	0	0	1	8	12	0	113	506
05:10:00 PM	0	1	0	0	10	1	2	0	4	13	2	0	0	8	8	0	126	501
05:15:00 PM	1	1	2	0	11	1	4	0	3	4	0	0	0	5	6	0	130	498
05:20:00 PM	0	0	0	0	5	1	2	0	3	5	0	0	0	1	5	0	109	477
05:25:00 PM	0	0	0	0	13	2	2	0	5	4	0	0	0	5	9	0	100	469
05:30:00 PM	0	0	0	0	8	0	2	0	4	3	0	0	0	6	6	0	91	451
05:35:00 PM	0	1	1	0	10	0	3	0	1	3	0	0	4	4	3	0	99	437
05:40:00 PM	0	1	1	0	3	0	1	0	4	12	0	0	0	9	6	0	96	434
05:45:00 PM	0	3	2	0	11	1	2	0	4	8	1	0	1	3	3	0	106	438
05:50:00 PM	0	0	2	0	6	0	2	0	1	8	0	0	1	5	5	0	106	427
05:55:00 PM	0	3	2	0	6	0	4	0	3	8	2	0	0	3	3	0	103	425

**Study Name Hwy 20 at McKinney Butte or W Barclay Dr**

**Start Date 12/12/2018**

**Start Time 2:00 PM**

**Site Code**

**Location 44.295756**

**-121.559593**

Start Time	W US 20 Northbound				W US 20 Southbound				W McKinney Butte Rd Eastbound				W Barclay Dr Westbound			
	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn
2:00 PM	11	54	0	0	19	43	3	0	24	8	31	0	7	10	13	0
2:15 PM	18	47	0	0	14	47	4	0	16	10	13	0	3	18	7	0
2:30 PM	24	57	0	0	10	59	1	0	15	10	24	0	6	34	14	0
2:45 PM	33	38	3	0	17	50	3	0	18	12	18	0	7	42	7	0
3:00 PM	32	51	3	0	20	72	9	0	21	23	31	0	5	34	7	0
3:15 PM	15	52	5	0	28	53	5	0	34	43	39	0	7	19	9	0
3:30 PM	17	57	2	0	18	40	5	0	23	8	33	0	9	24	10	0
3:45 PM	14	48	2	0	15	63	4	0	19	16	26	0	7	17	11	0
4:00 PM	21	63	2	0	14	55	5	0	19	6	33	0	8	21	10	0
4:15 PM	10	44	4	0	15	45	5	0	25	8	28	0	9	22	4	0
4:30 PM	13	41	6	0	17	55	6	0	20	9	29	0	7	17	8	0
4:45 PM	18	30	1	0	14	60	4	0	25	9	24	0	5	14	6	0
5:00 PM	24	39	4	0	5	57	6	0	16	11	18	0	6	23	8	0
5:15 PM	18	28	2	0	6	46	2	0	15	4	25	0	3	10	8	0
5:30 PM	21	32	1	0	5	46	2	0	9	9	22	0	1	17	13	0
5:45 PM	9	28	1	0	12	37	1	0	21	11	19	0	3	12	5	0

**Study Name Hwy 20 at McKinney Butte or W Barclay Dr**  
**Start Date 12/12/2018**  
**Start Time 2:00 PM**  
**Site Code**

**Location 44.295756**

**-121.559593**

Start Time	W US 20 Northbound				W US 20 Southbound				W McKinney Butte Rd Eastbound				W Barclay Dr Westbound			
	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn
2:00 PM	0	4	0	0	1	4	0	1	0	0	1	0	0	0	0	0
2:15 PM	0	6	0	0	1	3	0	0	2	0	1	0	0	0	0	0
2:30 PM	1	7	0	0	0	2	0	0	2	0	0	0	0	1	1	0
2:45 PM	1	6	0	0	1	7	0	0	1	0	0	0	2	2	0	0
3:00 PM	0	5	1	0	0	6	0	1	0	0	0	0	3	1	3	0
3:15 PM	0	6	0	0	2	5	1	0	2	2	1	0	1	0	1	0
3:30 PM	0	4	0	0	0	7	0	1	1	0	1	0	1	0	0	0
3:45 PM	0	3	0	0	0	7	0	1	1	0	1	0	0	0	1	0
4:00 PM	1	1	0	0	0	4	0	0	2	0	3	0	1	0	0	0
4:15 PM	0	7	0	0	0	1	1	0	1	0	1	0	0	0	0	0
4:30 PM	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	4	0	0	1	0	0	0	0	0	1	0
5:00 PM	0	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0
5:15 PM	0	3	0	0	0	3	0	0	0	0	0	0	1	0	1	0
5:30 PM	0	3	0	0	0	5	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	5	0	0	0	5	0	0	0	0	1	0	0	1	0	0



**Study Name Hwy 20 at McKinney Butte or W Barclay Dr**  
**Start Date 12/12/2018**  
**Start Time 2:00 PM**  
**Site Code**

**Location 44.295756**

**-121.559593**

Start Time	W US 20 Northbound		W US 20 Southbound		W McKinney Butte Rd Eastbound		W Barclay Dr Westbound	
	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW	Peds CCW	Peds CW
2:00 PM	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0
2:30 PM	0	0	1	0	0	0	1	0
2:45 PM	0	0	0	0	0	0	0	0
3:00 PM	0	0	1	0	0	0	0	0
3:15 PM	2	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0
3:45 PM	0	0	1	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	1

**Study Name** Hwy 20 at McKinney Butte or W Barclay Dr  
**Start Date** 12/12/2018  
**Start Time** 2:00 PM  
**Site Code**

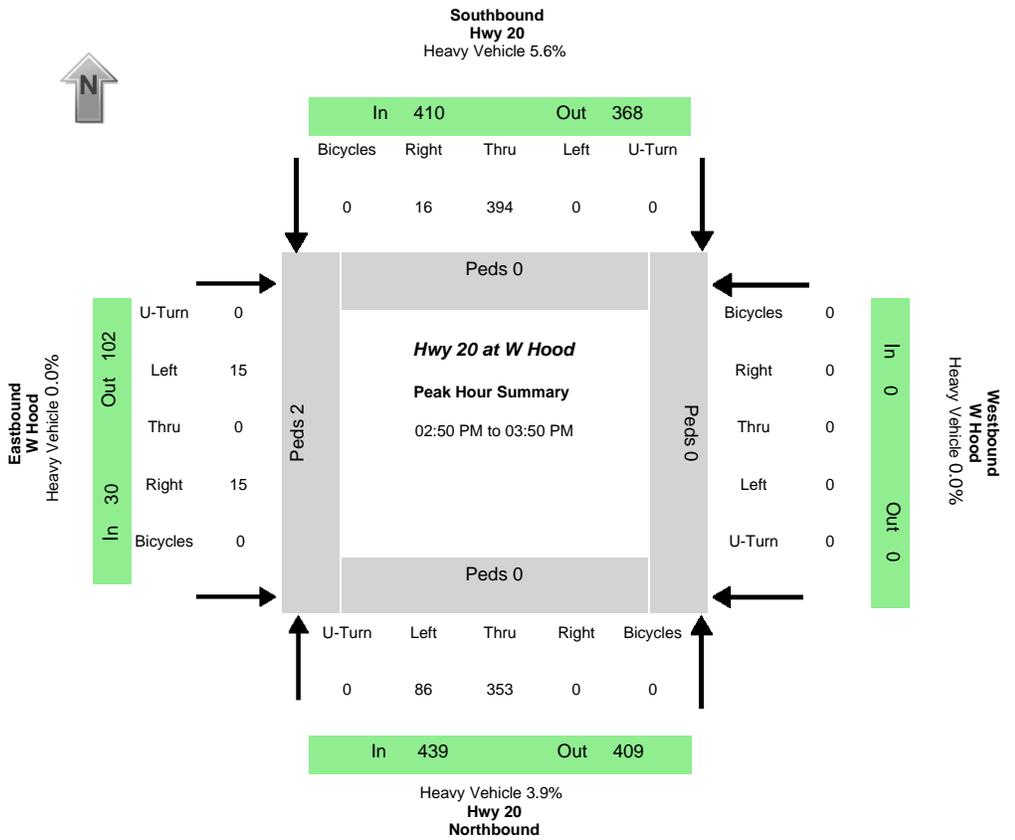
**Location** 44.295756

**-121.559593**

Start Time	W US 20 Northbound				W US 20 Southbound				W McKinney Butte Rd Eastbound				W Barclay Dr Westbound				Hour sums	15-min sums
	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn		
2:00 PM	11	58	0	0	20	47	3	1	24	8	32	0	7	10	13	0	980	234
2:15 PM	18	53	0	0	15	50	4	0	18	10	14	0	3	18	7	0	1074	210
2:30 PM	25	64	0	0	10	61	1	0	17	10	24	0	6	35	15	0	1194	268
2:45 PM	34	44	3	0	18	57	3	0	19	12	18	0	9	44	7	0	1187	268
3:00 PM	32	56	4	0	20	78	9	1	21	23	31	0	8	35	10	0	1175	328
3:15 PM	15	58	5	0	30	58	6	0	36	45	40	0	8	19	10	0	1116	330
3:30 PM	17	61	2	0	18	47	5	1	24	8	34	0	10	24	10	0	1016	261
3:45 PM	14	51	2	0	15	70	4	1	20	16	27	0	7	17	12	0	989	256
4:00 PM	22	64	2	0	14	59	5	0	21	6	36	0	9	21	10	0	950	269
4:15 PM	10	51	4	0	15	46	6	0	26	8	29	0	9	22	4	0	903	230
4:30 PM	13	41	6	0	17	60	7	0	20	9	29	0	7	17	8	0	848	234
4:45 PM	18	31	1	0	14	64	4	0	26	9	24	0	5	14	7	0	800	217
5:00 PM	24	42	4	1	5	57	6	1	16	11	18	0	6	23	8	0	755	222
5:15 PM	18	31	2	0	6	49	2	0	15	4	25	0	4	10	9	0		175
5:30 PM	21	35	1	0	5	51	2	0	9	9	22	0	1	17	13	0		186
5:45 PM	10	33	1	0	12	42	1	0	21	11	20	0	3	13	5	0		172

Data Provided by K-D-N.com 503-594-4224

N/S street	Hwy 20
E/W street	W Hood
City, State	Sisters OR
Site Notes	
Location	44.293625 - -121.557933
Start Date	Wednesday, December 12, 2018
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	02:50:00 PM
Peak 15 Min Start	03:05:00 PM
PHF (15-Min Int)	0.89



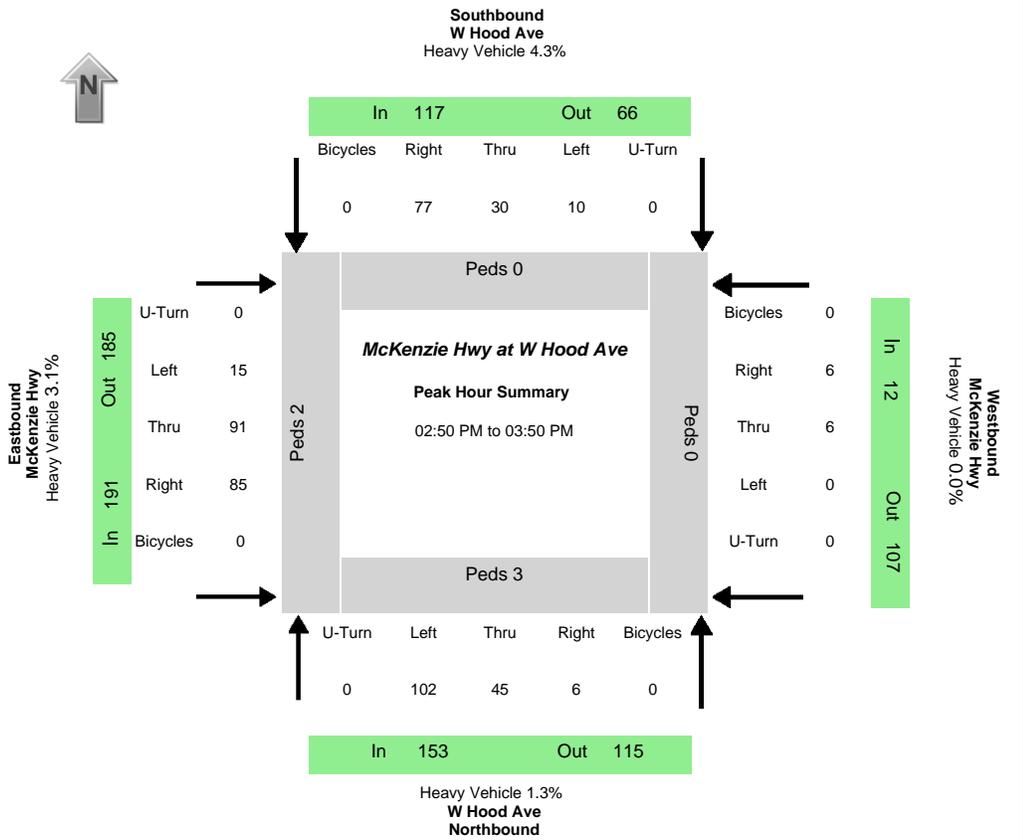
Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
86	353	0	0	0	394	16	0	15	0	15	0	0	0	0	0	439	410	30	0	409	368	102	0
Percent Heavy Vehicles																							
1.2%	4.5%	0.0%	0.0%	0.0%	4.8%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%	5.6%	0.0%	0.0%	4.6%	4.3%	4.9%	0.0%

PHV - Bicycles												PHV - Pedestrians									
Northbound				Southbound				Eastbound				Westbound				Sum	in Crosswalk				Sum
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		NB	SB	EB	WB	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2

Time	Northbound Hwy 20				Southbound Hwy 20				Eastbound W Hood				Westbound W Hood				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
02:00:00 PM	1	25	0	0	0	29	0	0	3	0	1	0	0	0	0	0		
02:05:00 PM	4	17	0	0	0	26	1	0	1	0	2	0	0	0	0	0		
02:10:00 PM	6	26	0	0	0	24	3	0	4	0	1	0	0	0	0	0	174	
02:15:00 PM	7	22	0	0	0	20	0	0	1	0	4	0	0	0	0	0	169	
02:20:00 PM	2	27	0	0	0	42	0	0	1	0	2	0	0	0	0	0	192	
02:25:00 PM	3	30	0	0	0	10	0	0	0	0	2	0	0	0	0	0	173	
02:30:00 PM	2	28	0	0	0	26	2	0	1	0	2	0	0	0	0	0	180	
02:35:00 PM	2	35	0	0	0	37	1	0	2	0	1	0	0	0	0	0	184	
02:40:00 PM	4	27	0	0	0	31	1	0	1	0	3	0	0	0	0	0	206	
02:45:00 PM	6	20	0	0	0	30	0	0	0	0	2	0	0	0	0	0	203	
02:50:00 PM	12	34	0	0	0	27	2	0	2	0	2	0	0	0	0	0	204	
02:55:00 PM	15	40	0	0	0	23	6	0	0	0	4	0	0	0	0	0	225	778
03:00:00 PM	5	22	0	0	0	24	1	0	0	0	1	0	0	0	0	0	220	772
03:05:00 PM	6	29	0	0	0	39	0	0	2	0	1	0	0	0	0	0	218	798
03:10:00 PM	9	36	0	0	0	48	1	0	5	0	0	0	0	0	0	0	229	833
03:15:00 PM	7	27	0	0	0	33	0	0	0	0	3	0	0	0	0	0	246	849
03:20:00 PM	5	25	0	0	0	36	1	0	2	0	0	0	0	0	0	0	238	844
03:25:00 PM	5	32	0	0	0	32	0	0	0	0	1	0	0	0	0	0	209	869
03:30:00 PM	6	26	0	0	0	22	2	0	1	0	0	0	0	0	0	0	196	865
03:35:00 PM	4	31	0	0	0	38	1	0	1	0	2	0	0	0	0	0	204	864
03:40:00 PM	10	28	0	0	0	36	1	0	1	0	1	0	0	0	0	0	211	874
03:45:00 PM	2	23	0	0	0	36	1	0	1	0	0	0	0	0	0	0	217	879
03:50:00 PM	3	15	0	0	0	33	0	0	4	0	4	0	0	0	0	0	199	859
03:55:00 PM	1	28	0	0	0	32	0	0	0	0	2	0	0	0	0	0	185	834

04:00:00 PM	6	31	0	0	0	28	1	0	1	0	3	0	0	0	0	0	192	851
04:05:00 PM	4	35	0	0	0	42	2	0	2	0	0	0	0	0	0	0	218	859
04:10:00 PM	4	20	0	0	0	31	2	0	1	0	3	0	0	0	0	0	216	821
04:15:00 PM	3	24	0	0	0	23	2	0	3	0	2	0	0	0	0	0	203	808
04:20:00 PM	6	23	0	0	0	30	0	0	1	0	2	0	0	0	0	0	180	801
04:25:00 PM	2	19	0	0	0	33	1	0	0	0	1	0	0	0	0	0	175	787
04:30:00 PM	7	24	0	0	0	28	2	0	3	0	3	0	0	0	0	0	185	797
04:35:00 PM	1	18	0	0	0	31	2	0	0	0	4	0	0	0	0	0	179	776
04:40:00 PM	5	17	0	0	0	39	0	0	0	0	0	0	0	0	0	0	184	760
04:45:00 PM	3	15	0	0	0	25	4	0	1	0	2	0	0	0	0	0	167	747
04:50:00 PM	4	20	0	0	0	30	0	0	0	0	2	0	0	0	0	0	167	744
04:55:00 PM	2	23	0	0	0	40	0	0	0	0	0	0	0	0	0	0	171	746
05:00:00 PM	7	27	0	0	0	33	0	0	4	0	1	0	0	0	0	0	193	748
05:05:00 PM	2	15	0	0	0	20	1	0	0	0	0	0	0	0	0	0	175	701
05:10:00 PM	1	25	0	0	0	21	3	0	1	0	0	0	0	0	0	0	161	691
05:15:00 PM	1	26	0	0	0	36	2	0	2	0	2	0	0	0	0	0	158	703
05:20:00 PM	6	11	0	0	0	31	1	0	0	0	1	0	0	0	0	0	170	691
05:25:00 PM	3	14	0	0	0	14	0	0	0	0	2	0	0	0	0	0	152	668
05:30:00 PM	4	14	0	0	0	27	1	0	1	0	0	0	0	0	0	0	130	648
05:35:00 PM	5	24	0	0	0	25	2	0	0	0	3	0	0	0	0	0	139	651
05:40:00 PM	2	26	0	0	0	22	0	0	0	0	0	0	0	0	0	0	156	640
05:45:00 PM	3	17	0	0	0	17	0	0	1	0	4	0	0	0	0	0	151	632
05:50:00 PM	4	12	0	0	0	25	0	0	1	0	4	0	0	0	0	0	138	622
05:55:00 PM	5	19	0	0	0	24	0	0	0	0	1	0	0	0	0	0	137	606

Data Provided by K-D-N.com 503-594-4224	
N/S street	W Hood Ave
E/W street	McKenzie Hwy
City, State	Sisters OR
Site Notes	
Location	44.291311 - -121.558599
Start Date	Wednesday, December 12, 2018
Start Time	02:00:00 PM
Weather	
Study ID #	
Peak Hour Start	02:50:00 PM
Peak 15 Min Start	03:05:00 PM
PHF (15-Min Int)	0.69



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
102	45	6	0	10	30	77	0	15	91	85	0	0	6	6	0	153	117	191	12	115	66	185	107
Percent Heavy Vehicles																							
2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	0.0%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	4.3%	3.1%	0.0%	5.2%	0.0%	3.8%	0.0%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	0	5

Time	Northbound W Hood Ave				Southbound W Hood Ave				Eastbound McKenzie Hwy				Westbound McKenzie Hwy				15 Min Sum	1 HR Sum	
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn			
02:00:00 PM	5	4	1	0	0	2	0	0	0	3	2	0	0	0	0	1	0		
02:05:00 PM	5	1	1	0	0	2	2	0	1	5	3	0	0	0	0	0	0		
02:10:00 PM	7	8	0	0	0	3	3	0	0	4	5	0	0	0	1	0	69		
02:15:00 PM	7	4	0	0	2	1	2	0	0	2	3	0	1	0	0	0	73		
02:20:00 PM	4	5	0	0	1	4	1	0	1	5	4	0	0	0	0	0	78		
02:25:00 PM	6	3	0	0	1	3	3	0	0	9	3	0	0	0	0	0	75		
02:30:00 PM	6	4	0	0	0	0	2	0	1	2	3	0	0	0	0	0	71		
02:35:00 PM	3	4	0	0	1	4	3	0	0	5	4	0	0	0	1	0	71		
02:40:00 PM	5	5	0	0	2	2	5	0	0	5	1	0	0	0	1	0	69		
02:45:00 PM	4	2	0	0	1	0	5	0	1	2	2	0	0	1	0	0	69		
02:50:00 PM	10	4	1	0	2	1	16	0	1	6	5	0	0	0	2	0	92		
02:55:00 PM	9	8	0	0	1	3	8	0	0	4	6	0	0	1	0	0	106	319	
03:00:00 PM	12	4	1	0	0	1	15	0	1	5	3	0	0	0	1	0	131	344	
03:05:00 PM	20	3	1	0	1	3	1	0	4	18	10	0	0	0	0	0	144	385	
03:10:00 PM	10	10	0	0	1	4	8	0	4	7	12	0	0	1	0	0	161	411	
03:15:00 PM	3	4	1	0	1	1	7	0	2	13	22	0	0	0	0	0	172	443	
03:20:00 PM	7	1	0	0	0	4	6	0	0	8	8	0	0	0	1	0	146	453	
03:25:00 PM	8	0	0	0	0	2	3	0	0	11	7	0	0	0	0	0	120	456	
03:30:00 PM	4	2	1	0	0	5	3	0	1	5	2	0	0	1	0	0	90	462	
03:35:00 PM	6	4	0	0	3	1	3	0	0	4	7	0	0	0	1	0	84	466	
03:40:00 PM	6	1	0	0	0	1	4	0	1	2	3	0	0	2	0	0	73	460	
03:45:00 PM	7	4	1	0	1	4	3	0	1	8	0	0	0	1	1	0	80	473	
03:50:00 PM	12	11	1	0	1	1	1	0	0	6	5	0	0	1	0	0	90	464	
03:55:00 PM	6	8	1	0	0	3	1	0	2	3	2	0	0	1	1	0	98	452	

04:00:00 PM	9	1	0	0	1	0	4	0	0	5	2	0	0	0	1	0	90	432
04:05:00 PM	3	7	0	0	1	3	3	0	0	6	2	0	0	0	0	0	76	396
04:10:00 PM	6	4	0	0	0	5	4	0	1	8	4	0	0	1	0	0	81	372
04:15:00 PM	4	4	2	0	2	4	2	0	1	1	4	0	0	1	1	0	84	344
04:20:00 PM	6	1	1	0	1	0	3	0	0	2	1	0	1	0	2	0	77	327
04:25:00 PM	3	2	0	0	1	1	4	0	0	5	1	0	0	0	0	0	61	313
04:30:00 PM	7	5	1	0	0	5	3	0	0	3	3	0	0	0	1	0	63	317
04:35:00 PM	6	6	0	0	0	3	2	0	0	3	4	0	0	1	0	0	70	313
04:40:00 PM	6	1	1	0	0	0	4	0	0	4	7	0	0	0	0	0	76	316
04:45:00 PM	4	5	0	0	2	5	2	0	0	8	8	0	0	0	1	0	83	320
04:50:00 PM	4	1	0	0	1	0	4	0	0	2	4	0	0	0	1	0	75	298
04:55:00 PM	9	2	0	0	0	4	0	0	0	3	4	0	0	0	0	0	74	292
05:00:00 PM	6	5	0	0	3	3	3	0	0	3	3	0	0	0	2	0	67	297
05:05:00 PM	6	4	0	0	0	4	5	0	1	1	5	0	0	1	0	0	77	299
05:10:00 PM	3	1	0	0	0	3	2	0	1	2	6	0	0	0	0	0	73	284
05:15:00 PM	4	4	0	0	0	3	1	0	1	6	1	0	0	0	0	0	65	278
05:20:00 PM	9	3	0	0	1	3	6	0	0	1	1	0	0	1	0	0	63	285
05:25:00 PM	6	0	0	0	0	5	1	0	3	2	2	0	0	0	0	0	64	287
05:30:00 PM	3	3	0	0	0	2	4	0	1	1	4	0	0	0	0	0	62	277
05:35:00 PM	12	1	0	0	0	3	3	0	0	3	2	0	0	0	0	0	61	276
05:40:00 PM	2	2	0	0	0	4	1	0	0	1	2	0	0	0	0	0	54	265
05:45:00 PM	7	2	0	0	0	0	3	0	2	12	4	0	0	2	0	0	68	262
05:50:00 PM	7	1	0	0	0	0	3	0	4	8	2	0	0	0	0	0	69	270
05:55:00 PM	3	3	0	0	0	2	3	0	1	7	7	0	0	0	0	0	83	274



## TRIP GENERATION CALCULATIONS

*Land Use:* Multifamily Housing (Mid-Rise)

*Land Use Code:* 221

*Setting/Location:* General Urban/Suburban

*Variable:* Dwelling Units

*Variable Value:* 50

### AM PEAK HOUR

*Trip Rate:* 0.36

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	<b>5</b>	<b>13</b>	<b>18</b>

### PM PEAK HOUR

*Trip Rate:* 0.44

	Enter	Exit	Total
Directional Distribution	61%	39%	
Trip Ends	<b>13</b>	<b>9</b>	<b>22</b>

### WEEKDAY

*Trip Rate:* 5.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	<b>136</b>	<b>136</b>	<b>272</b>

### SATURDAY

*Trip Rate:* 4.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	<b>123</b>	<b>123</b>	<b>246</b>



## TRIP GENERATION CALCULATIONS

*Land Use:* Shopping Center  
*Land Use Code:* 820  
*Setting/Location:* General Urban/Suburban  
*Variable:* 1,000 Sq. Ft. GFA  
*Variable Value:* 20

### AM PEAK HOUR

*Trip Rate:* 0.94

	Enter	Exit	Total
Directional Distribution	62%	38%	
Trip Ends	12	7	19

### PM PEAK HOUR

*Trip Rate:* 3.81

	Enter	Exit	Total
Directional Distribution	48%	52%	
Trip Ends	36	40	76

### WEEKDAY

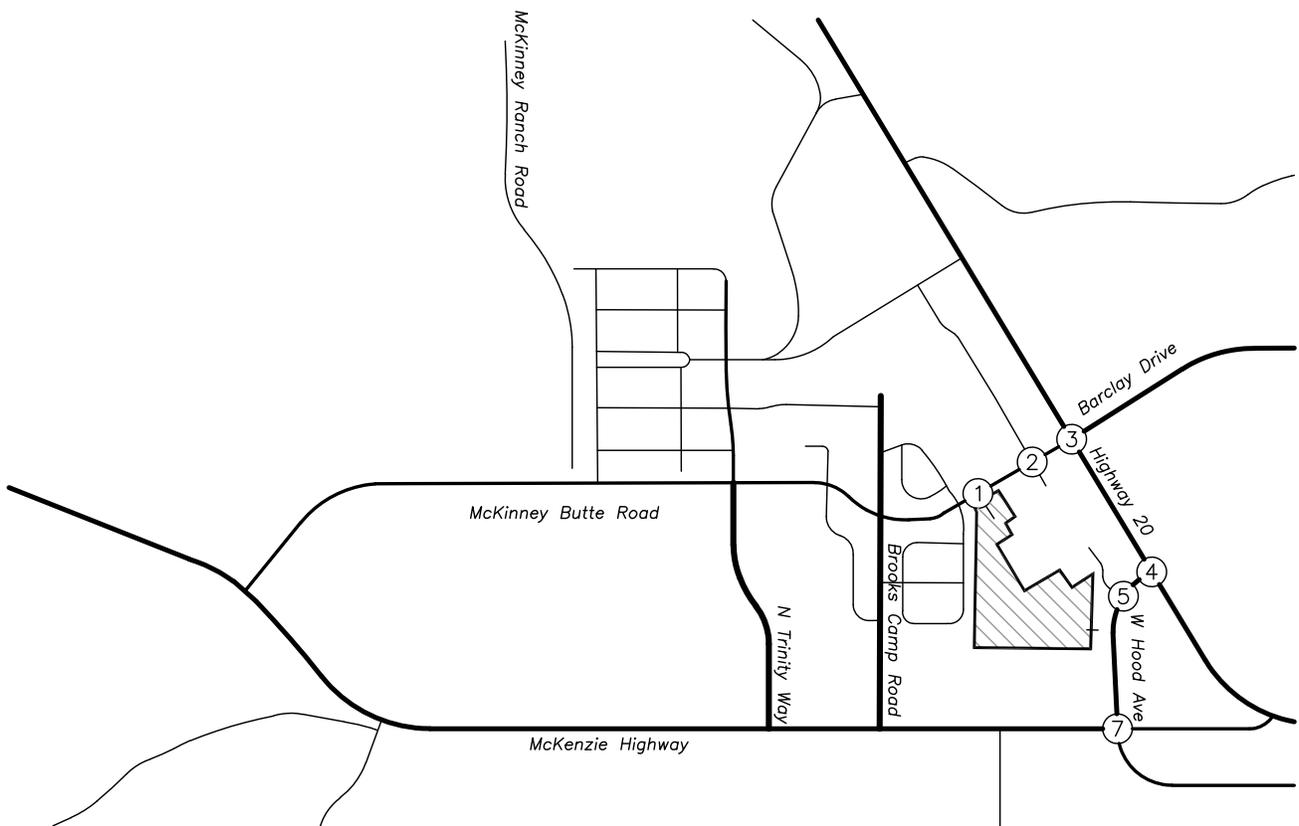
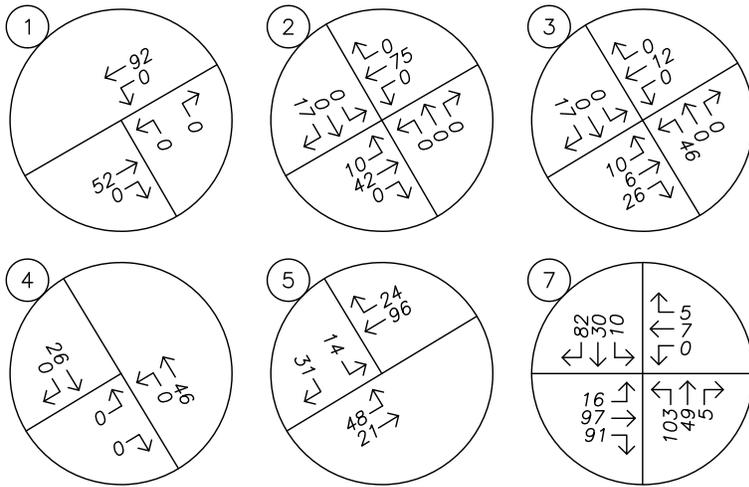
*Trip Rate:* 37.75

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	378	378	756

### SATURDAY

*Trip Rate:* 46.12

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	461	461	922



TRAFFIC VOLUMES  
In-Process Trips  
PM Peak Hour





## LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

*Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

*Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

*Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

*Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

*Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

*Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.



*LEVEL OF SERVICE CRITERIA  
FOR SIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

*LEVEL OF SERVICE CRITERIA  
FOR UNSIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	188	22	25	155	19	48
Future Vol, veh/h	188	22	25	155	19	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	285	33	38	235	29	73

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	318	0	613	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	311	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1242	-	456	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	743	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1242	-	440	738
Mov Cap-2 Maneuver	-	-	-	-	440	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	619	-	-	1242	-
HCM Lane V/C Ratio	0.164	-	-	0.03	-
HCM Control Delay (s)	12	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Intersection												
Int Delay, s/veh	8.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Traffic Vol, veh/h	56	174	6	14	141	87	3	27	19	116	17	36
Future Vol, veh/h	56	174	6	14	141	87	3	27	19	116	17	36
Conflicting Peds, #/hr	0	0	2	2	0	0	5	0	0	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	75	232	8	19	188	116	4	36	25	155	23	48

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	304	0	0	242	0	0	713	730	238	701	676	251
Stage 1	-	-	-	-	-	-	388	388	-	284	284	-
Stage 2	-	-	-	-	-	-	325	342	-	417	392	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1257	-	-	1324	-	-	347	349	801	353	375	788
Stage 1	-	-	-	-	-	-	636	609	-	723	676	-
Stage 2	-	-	-	-	-	-	687	638	-	613	606	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1257	-	-	1321	-	-	287	318	799	292	342	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	287	318	-	292	342	-
Stage 1	-	-	-	-	-	-	591	566	-	673	664	-
Stage 2	-	-	-	-	-	-	609	627	-	517	563	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	1.9		0.4		15.4		28.4	
HCM LOS					C		D	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	411	1257	-	-	1321	-	-	298	784
HCM Lane V/C Ratio	0.159	0.059	-	-	0.014	-	-	0.595	0.061
HCM Control Delay (s)	15.4	8	0	-	7.8	0	-	33.4	9.9
HCM Lane LOS	C	A	A	-	A	A	-	D	A
HCM 95th %tile Q(veh)	0.6	0.2	-	-	0	-	-	3.6	0.2

Intersection				
Intersection Delay, s/veh	7.9			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	337	200	342	355
Demand Flow Rate, veh/h	347	214	366	387
Vehicles Circulating, veh/h	394	461	309	290
Vehicles Exiting, veh/h	283	214	432	385
Ped Vol Crossing Leg, #/h	2	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.3	7.2	7.8	8.0
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	347	214	366	387
Cap Entry Lane, veh/h	923	862	1007	1027
Entry HV Adj Factor	0.972	0.934	0.933	0.918
Flow Entry, veh/h	337	200	342	355
Cap Entry, veh/h	897	805	940	943
V/C Ratio	0.376	0.248	0.364	0.377
Control Delay, s/veh	8.3	7.2	7.8	8.0
LOS	A	A	A	A
95th %tile Queue, veh	2	1	2	2

Intersection						
Int Delay, s/veh	1.5					
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations	↘	↑	↗		↘	↗
Traffic Vol, veh/h	90	350	388	15	14	17
Future Vol, veh/h	90	350	388	15	14	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	275	-	-	-	52	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	101	393	436	17	16	19

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	453	0	-	0	1040 445
Stage 1	-	-	-	-	445 -
Stage 2	-	-	-	-	595 -
Critical Hdwy	4.14	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.236	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1097	-	-	-	255 613
Stage 1	-	-	-	-	646 -
Stage 2	-	-	-	-	551 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1097	-	-	-	232 613
Mov Cap-2 Maneuver	-	-	-	-	232 -
Stage 1	-	-	-	-	587 -
Stage 2	-	-	-	-	551 -

Approach	NB	SB	NE
HCM Control Delay, s	1.8	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	232	613	1097	-	-	-
HCM Lane V/C Ratio	0.068	0.031	0.092	-	-	-
HCM Control Delay (s)	21.6	11.1	8.6	-	-	-
HCM Lane LOS	C	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.1	0.3	-	-	-

Intersection						
Int Delay, s/veh	3.6					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	13	30	46	18	84	23
Future Vol, veh/h	13	30	46	18	84	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	18	42	65	25	118	32

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	289	134	150	0	-	0
Stage 1	134	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	702	915	1431	-	-	-
Stage 1	892	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	670	915	1431	-	-	-
Mov Cap-2 Maneuver	670	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.7	5.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET	SELn1	SWT	SWR
Capacity (veh/h)	1431	-	824	-	-
HCM Lane V/C Ratio	0.045	-	0.073	-	-
HCM Control Delay (s)	7.6	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

<b>Intersection</b>												
Intersection Delay, s/veh	9.8											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	15	85	87	0	6	5	99	43	5	10	26	79
Future Vol, veh/h	15	85	87	0	6	5	99	43	5	10	26	79
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	4	4	4
Mvmt Flow	22	123	126	0	9	7	143	62	7	14	38	114
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.2	8.2	9.9	9.1
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	8%	0%	100%	0%
Vol Thru, %	0%	90%	45%	55%	0%	25%
Vol Right, %	0%	10%	47%	45%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	48	187	11	10	105
LT Vol	99	0	15	0	10	0
Through Vol	0	43	85	6	0	26
RT Vol	0	5	87	5	0	79
Lane Flow Rate	143	70	271	16	14	152
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.235	0.103	0.351	0.022	0.024	0.21
Departure Headway (Hd)	5.893	5.315	4.658	4.977	6.009	4.973
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	605	670	770	712	592	715
Service Time	3.663	3.085	2.705	3.057	3.783	2.745
HCM Lane V/C Ratio	0.236	0.104	0.352	0.022	0.024	0.213
HCM Control Delay	10.5	8.7	10.2	8.2	8.9	9.1
HCM Lane LOS	B	A	B	A	A	A
HCM 95th-tile Q	0.9	0.3	1.6	0.1	0.1	0.8

Intersection						
Int Delay, s/veh	2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	248	23	26	253	20	50
Future Vol, veh/h	248	23	26	253	20	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	376	35	39	383	30	76

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	411	0	855	394
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1148	-	329	655
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1148	-	315	655
Mov Cap-2 Maneuver	-	-	-	-	315	-
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	501	-	-	1148	-
HCM Lane V/C Ratio	0.212	-	-	0.034	-
HCM Control Delay (s)	14.1	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.8	-	-	0.1	-

Intersection												
Int Delay, s/veh	17.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Traffic Vol, veh/h	68	223	6	15	222	91	3	28	20	121	18	54
Future Vol, veh/h	68	223	6	15	222	91	3	28	20	121	18	54
Conflicting Peds, #/hr	0	0	2	2	0	0	5	0	0	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	297	8	20	296	121	4	37	27	161	24	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	417	0	0	307	0	0	935	942	303	912	886	362
Stage 1	-	-	-	-	-	-	485	485	-	397	397	-
Stage 2	-	-	-	-	-	-	450	457	-	515	489	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1142	-	-	1254	-	-	246	263	737	255	284	683
Stage 1	-	-	-	-	-	-	563	552	-	629	603	-
Stage 2	-	-	-	-	-	-	589	568	-	543	549	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1142	-	-	1252	-	-	185	232	736	197	251	680
Mov Cap-2 Maneuver	-	-	-	-	-	-	185	232	-	197	251	-
Stage 1	-	-	-	-	-	-	508	498	-	569	590	-
Stage 2	-	-	-	-	-	-	492	556	-	438	495	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.9			0.4			19.8			68.4		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	311	1142	-	-	1252	-	-	203	680
HCM Lane V/C Ratio	0.219	0.079	-	-	0.016	-	-	0.913	0.106
HCM Control Delay (s)	19.8	8.4	0	-	7.9	0	-	90.7	10.9
HCM Lane LOS	C	A	A	-	A	A	-	F	B
HCM 95th %tile Q(veh)	0.8	0.3	-	-	0	-	-	7.3	0.4

Intersection				
Intersection Delay, s/veh	10.6			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	397	221	498	434
Demand Flow Rate, veh/h	409	237	532	473
Vehicles Circulating, veh/h	459	590	340	370
Vehicles Exiting, veh/h	384	282	528	457
Ped Vol Crossing Leg, #/h	2	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.5	9.0	11.3	10.7
Approach LOS	B	A	B	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	409	237	532	473
Cap Entry Lane, veh/h	864	756	976	946
Entry HV Adj Factor	0.970	0.934	0.936	0.917
Flow Entry, veh/h	397	221	498	434
Cap Entry, veh/h	838	706	913	867
V/C Ratio	0.473	0.314	0.545	0.500
Control Delay, s/veh	10.5	9.0	11.3	10.7
LOS	B	A	B	B
95th %tile Queue, veh	3	1	3	3

Intersection						
Int Delay, s/veh	1.4					
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations	↘	↑	↗		↘	↗
Traffic Vol, veh/h	94	478	505	16	15	18
Future Vol, veh/h	94	478	505	16	15	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	275	-	-	-	52	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	106	537	567	18	17	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	585	0	-	0	1325 576
Stage 1	-	-	-	-	576 -
Stage 2	-	-	-	-	749 -
Critical Hdwy	4.14	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.236	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	980	-	-	-	172 517
Stage 1	-	-	-	-	562 -
Stage 2	-	-	-	-	467 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	980	-	-	-	153 517
Mov Cap-2 Maneuver	-	-	-	-	153 -
Stage 1	-	-	-	-	501 -
Stage 2	-	-	-	-	467 -

Approach	NB	SB	NE
HCM Control Delay, s	1.5	0	20.9
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	153	517	980	-	-	-
HCM Lane V/C Ratio	0.11	0.039	0.108	-	-	-
HCM Control Delay (s)	31.4	12.2	9.1	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.1	0.4	-	-	-

Intersection						
Int Delay, s/veh	3.5					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	14	31	48	21	96	24
Future Vol, veh/h	14	31	48	21	96	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	20	44	68	30	135	34

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	318	152	169	0	0
Stage 1	152	-	-	-	-
Stage 2	166	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	675	894	1409	-	-
Stage 1	876	-	-	-	-
Stage 2	863	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	643	894	1409	-	-
Mov Cap-2 Maneuver	643	-	-	-	-
Stage 1	834	-	-	-	-
Stage 2	863	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	9.9	5.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NEL	NET SELn1	SWT	SWR
Capacity (veh/h)	1409	-	797	-
HCM Lane V/C Ratio	0.048	-	0.08	-
HCM Control Delay (s)	7.7	-	9.9	-
HCM Lane LOS	A	-	A	-
HCM 95th %tile Q(veh)	0.2	-	0.3	-

Intersection												
Intersection Delay, s/veh	10.2											
Intersection LOS	B											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	16	97	91	0	7	5	103	49	5	10	30	82
Future Vol, veh/h	16	97	91	0	7	5	103	49	5	10	30	82
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles, %	3	3	3	2	2	2	2	2	2	4	4	4
Mvmt Flow	23	141	132	0	10	7	149	71	7	14	43	119
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.8	8.3	10.1	9.4
HCM LOS	B	A	B	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	8%	0%	100%	0%
Vol Thru, %	0%	91%	48%	58%	0%	27%
Vol Right, %	0%	9%	45%	42%	0%	73%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	54	204	12	10	112
LT Vol	103	0	16	0	10	0
Through Vol	0	49	97	7	0	30
RT Vol	0	5	91	5	0	82
Lane Flow Rate	149	78	296	17	14	162
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.248	0.118	0.389	0.025	0.025	0.229
Departure Headway (Hd)	5.981	5.41	4.736	5.11	6.106	5.083
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	656	754	691	581	698
Service Time	3.768	3.197	2.794	3.209	3.895	2.871
HCM Lane V/C Ratio	0.25	0.119	0.393	0.025	0.024	0.232
HCM Control Delay	10.8	8.9	10.8	8.3	9.1	9.4
HCM Lane LOS	B	A	B	A	A	A
HCM 95th-tile Q	1	0.4	1.9	0.1	0.1	0.9

Intersection						
Int Delay, s/veh	2.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	248	25	30	251	24	64
Future Vol, veh/h	248	25	30	251	24	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	376	38	45	380	36	97

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	414	0	865	395
Stage 1	-	-	-	-	395	-
Stage 2	-	-	-	-	470	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1145	-	324	654
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1145	-	308	654
Mov Cap-2 Maneuver	-	-	-	-	308	-
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	629	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	501	-	-	1145	-
HCM Lane V/C Ratio	0.266	-	-	0.04	-
HCM Control Delay (s)	14.8	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0.1	-

Intersection												
Int Delay, s/veh	18.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↕
Traffic Vol, veh/h	68	237	6	15	224	91	3	28	20	121	18	54
Future Vol, veh/h	68	237	6	15	224	91	3	28	20	121	18	54
Conflicting Peds, #/hr	0	0	2	2	0	0	5	0	0	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	91	316	8	20	299	121	4	37	27	161	24	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	420	0	0	326	0	0	957	964	322	934	908	365
Stage 1	-	-	-	-	-	-	504	504	-	400	400	-
Stage 2	-	-	-	-	-	-	453	460	-	534	508	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
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	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1139	-	-	1234	-	-	237	255	719	246	275	680
Stage 1	-	-	-	-	-	-	550	541	-	626	602	-
Stage 2	-	-	-	-	-	-	586	566	-	530	539	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1139	-	-	1232	-	-	177	224	718	188	242	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	177	224	-	188	242	-
Stage 1	-	-	-	-	-	-	495	487	-	565	589	-
Stage 2	-	-	-	-	-	-	489	554	-	425	485	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			0.4			20.5			77.5		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	300	1139	-	-	1232	-	-	194	677
HCM Lane V/C Ratio	0.227	0.08	-	-	0.016	-	-	0.955	0.106
HCM Control Delay (s)	20.5	8.4	0	-	8	0	-	103.4	10.9
HCM Lane LOS	C	A	A	-	A	A	-	F	B
HCM 95th %tile Q(veh)	0.9	0.3	-	-	0	-	-	7.8	0.4

Intersection				
Intersection Delay, s/veh	10.9			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	412	226	498	439
Demand Flow Rate, veh/h	424	243	532	479
Vehicles Circulating, veh/h	468	601	355	376
Vehicles Exiting, veh/h	387	286	537	468
Ped Vol Crossing Leg, #/h	2	2	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	11.0	9.3	11.6	11.0
Approach LOS	B	A	B	B
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	424	243	532	479
Cap Entry Lane, veh/h	856	748	961	940
Entry HV Adj Factor	0.971	0.932	0.936	0.917
Flow Entry, veh/h	412	226	498	439
Cap Entry, veh/h	831	696	899	862
V/C Ratio	0.495	0.325	0.554	0.509
Control Delay, s/veh	11.0	9.3	11.6	11.0
LOS	B	A	B	B
95th %tile Queue, veh	3	1	3	3

Intersection						
Int Delay, s/veh	1.9					
Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations	↘	↑	↗		↘	↗
Traffic Vol, veh/h	119	471	500	28	15	44
Future Vol, veh/h	119	471	500	28	15	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	275	-	-	-	52	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	4	4	6	6	2	2
Mvmt Flow	134	529	562	31	17	49

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	593	0	-	0	1375 578
Stage 1	-	-	-	-	578 -
Stage 2	-	-	-	-	797 -
Critical Hdwy	4.14	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.236	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	973	-	-	-	160 516
Stage 1	-	-	-	-	561 -
Stage 2	-	-	-	-	444 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	973	-	-	-	138 516
Mov Cap-2 Maneuver	-	-	-	-	138 -
Stage 1	-	-	-	-	484 -
Stage 2	-	-	-	-	444 -

Approach	NB	SB	NE
HCM Control Delay, s	1.9	0	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NELn1	NELn2	NBL	NBT	SBT	SBR
Capacity (veh/h)	138	516	973	-	-	-
HCM Lane V/C Ratio	0.122	0.096	0.137	-	-	-
HCM Control Delay (s)	34.7	12.7	9.3	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.3	0.5	-	-	-

Intersection						
Int Delay, s/veh	3.5					
Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Traffic Vol, veh/h	26	35	52	35	118	39
Future Vol, veh/h	26	35	52	35	118	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	37	49	73	49	166	55

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	389	194	221	0	0
Stage 1	194	-	-	-	-
Stage 2	195	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	615	847	1348	-	-
Stage 1	839	-	-	-	-
Stage 2	838	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	582	847	1348	-	-
Mov Cap-2 Maneuver	582	-	-	-	-
Stage 1	794	-	-	-	-
Stage 2	838	-	-	-	-

Approach	SE	NE	SW
HCM Control Delay, s	10.8	4.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NEL	NET SELn1	SWT	SWR
Capacity (veh/h)	1348	- 709	-	-
HCM Lane V/C Ratio	0.054	- 0.121	-	-
HCM Control Delay (s)	7.8	- 10.8	-	-
HCM Lane LOS	A	- B	-	-
HCM 95th %tile Q(veh)	0.2	- 0.4	-	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	9	8	77	100	22
Future Vol, veh/h	14	9	8	77	100	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	20	13	11	108	141	31

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	287	157	172	0	-	0
Stage 1	157	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	703	889	1405	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	896	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	697	889	1405	-	-	-
Mov Cap-2 Maneuver	697	-	-	-	-	-
Stage 1	864	-	-	-	-	-
Stage 2	896	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	761	-	-
HCM Lane V/C Ratio	0.008	-	0.043	-	-
HCM Control Delay (s)	7.6	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	18	97	91	0	7	5	103	59	5	10	41	84
Future Vol, veh/h	18	97	91	0	7	5	103	59	5	10	41	84
Peak Hour Factor	0.92	0.69	0.69	0.69	0.69	0.92	0.69	0.92	0.69	0.92	0.92	0.92
Heavy Vehicles, %	2	3	3	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	141	132	0	10	5	149	64	7	11	45	91
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.5	8.2	10	9
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	9%	0%	100%	0%
Vol Thru, %	0%	92%	47%	58%	0%	33%
Vol Right, %	0%	8%	44%	42%	0%	67%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	64	206	12	10	125
LT Vol	103	0	18	0	10	0
Through Vol	0	59	97	7	0	41
RT Vol	0	5	91	5	0	84
Lane Flow Rate	149	71	292	16	11	136
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.246	0.106	0.376	0.022	0.018	0.191
Departure Headway (Hd)	5.922	5.362	4.636	5.002	6.036	5.056
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	603	663	774	708	589	704
Service Time	3.696	3.136	2.685	3.086	3.815	2.833
HCM Lane V/C Ratio	0.247	0.107	0.377	0.023	0.019	0.193
HCM Control Delay	10.6	8.8	10.5	8.2	8.9	9
HCM Lane LOS	B	A	B	A	A	A
HCM 95th-tile Q	1	0.4	1.8	0.1	0.1	0.7

**Intersection**

Int Delay, s/veh 1.3

**Movement** SEL SER NEL NET SWT SWR

Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	35	0	61	118	39
Future Vol, veh/h	0	35	0	61	118	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	0	49	0	86	166	55

**Major/Minor** Minor2 Major1 Major2

Conflicting Flow All	-	194	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	847	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	847	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

**Approach** SE NE SW

HCM Control Delay, s	9.5	0	0
HCM LOS	A		

**Minor Lane/Major Mvmt** NET SELn1 SWT SWR

Capacity (veh/h)	-	847	-	-
HCM Lane V/C Ratio	-	0.058	-	-
HCM Control Delay (s)	-	9.5	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

HCM 6th TWSC  
6: W Hood Ave & Proposed Access

Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	9	60	25	100	22
Future Vol, veh/h	40	9	60	25	100	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	5	5
Mvmt Flow	56	13	85	35	141	31

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	362	157	172	0	-	0
Stage 1	157	-	-	-	-	-
Stage 2	205	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	637	889	1405	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	598	889	1405	-	-	-
Mov Cap-2 Maneuver	598	-	-	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	829	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	5.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	636	-	-
HCM Lane V/C Ratio	0.06	-	0.109	-	-
HCM Control Delay (s)	7.7	0	11.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	-	-

## Left-Turn Lane Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Intersection: W McKinney Butte Road at Site Access  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

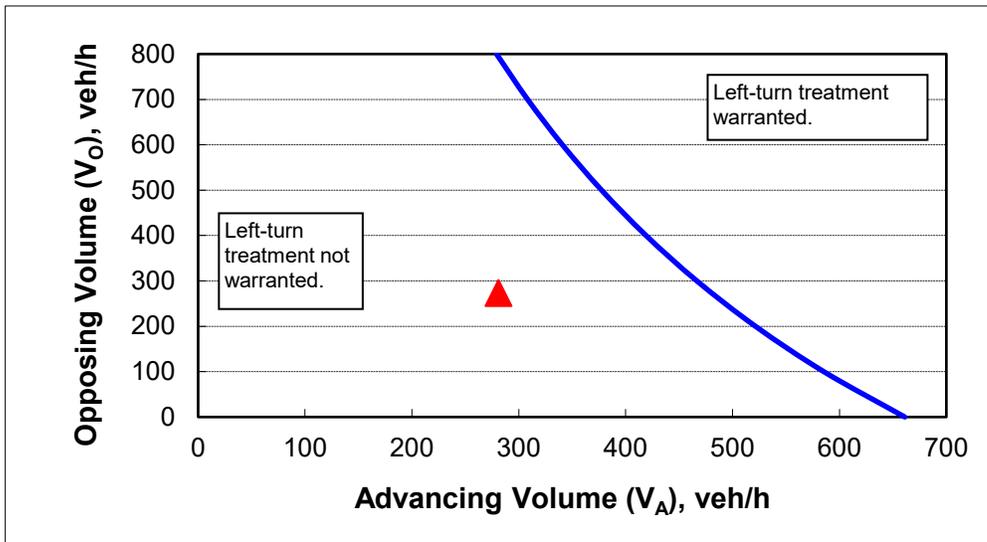
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Left-turns in advancing volume ( $V_A$ ), veh/hr:	30
Advancing volume ( $V_A$ ), veh/h:	281
Opposing volume ( $V_O$ ), veh/h:	273

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	481
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Intersection: EB W McKinney Butte Road at N Arrowleaf Trail  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

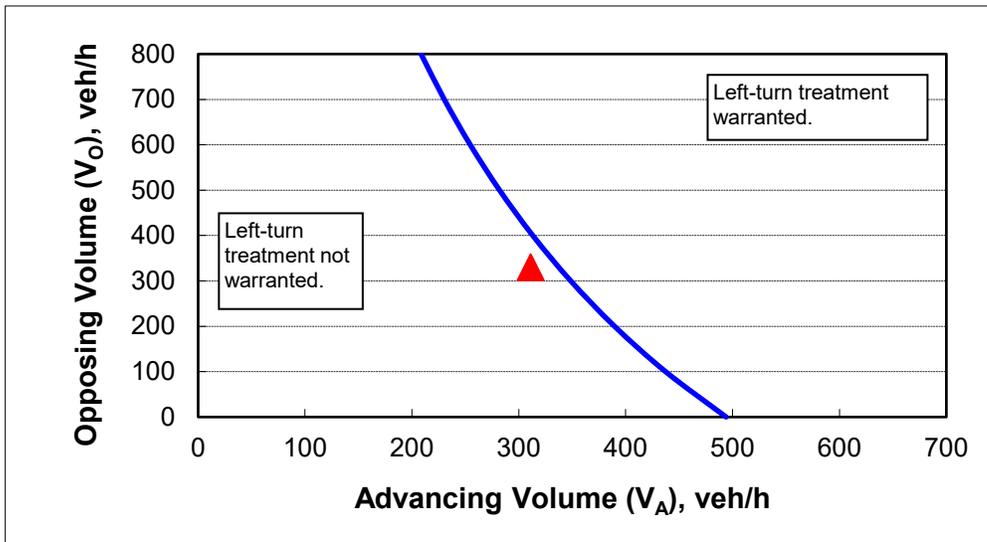
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Left-turns in advancing volume ( $V_A$ ), veh/hr:	68
Advancing volume ( $V_A$ ), veh/h:	311
Opposing volume ( $V_O$ ), veh/h:	330

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	337
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Intersection: W Hood Avenue at Proposed Access - Non-Restricted Existing Access  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

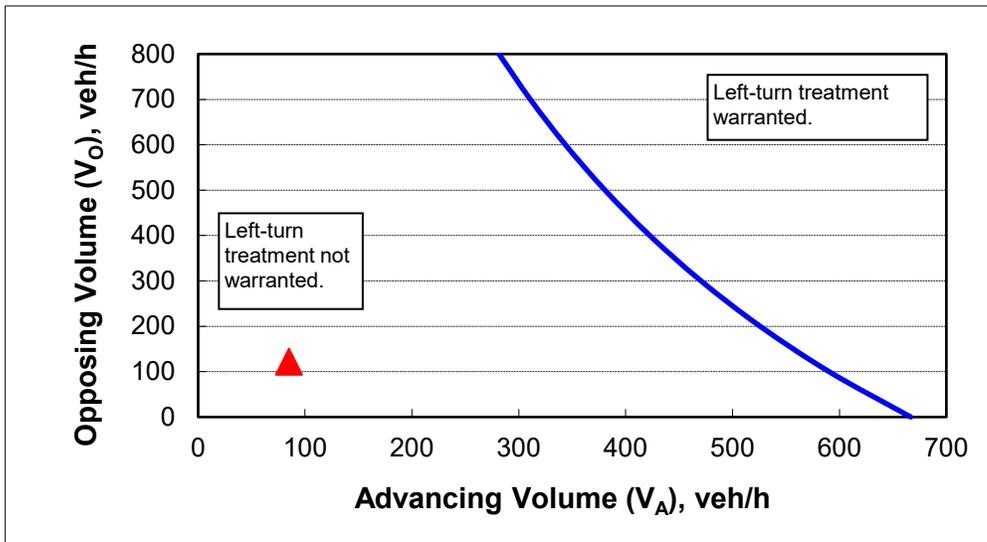
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	30
Left-turns in advancing volume ( $V_A$ ), veh/hr:	8
Advancing volume ( $V_A$ ), veh/h:	85
Opposing volume ( $V_O$ ), veh/h:	122

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	575
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Intersection: W Hood Avenue at Proposed Access - Restricted Existing Access  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

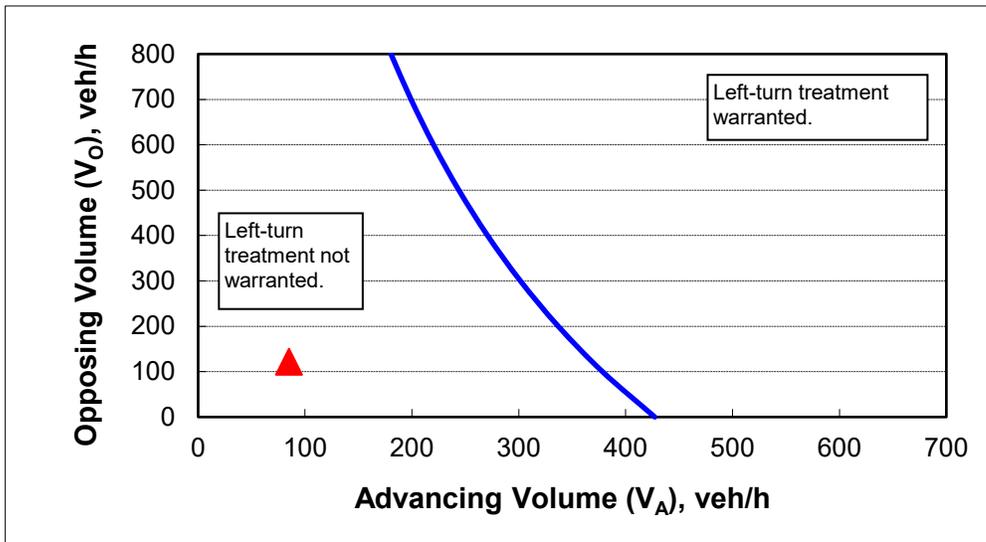
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	30
Left-turns in advancing volume ( $V_A$ ), veh/hr:	60
Advancing volume ( $V_A$ ), veh/h:	85
Opposing volume ( $V_O$ ), veh/h:	122

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	369
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

Major Street:	W McKinney Butte Drive	Minor Street:	Site Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	554	PM Peak Hour Volumes:	72

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess  
 \_\_\_\_\_ of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	5,540	6,200	
Minor Street*	720	1,850	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	5,540	9,300	
Minor Street*	720	950	<b>No</b>
<i>Combination Warrant</i>			
Major Street	5,540	7,440	
Minor Street*	720	1,480	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

Major Street:	W McKinney Butte Drive	Minor Street:	N Arrowleaf Trail
Number of Lanes:	1	Number of Lanes:	2
PM Peak Hour Volumes:	641	PM Peak Hour Volumes:	180

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess  
 \_\_\_\_\_ of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	6,410	6,200	
Minor Street*	1,800	2,500	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,410	9,300	
Minor Street*	1,800	1,250	<b>No</b>
<i>Combination Warrant</i>			
Major Street	6,410	7,440	
Minor Street*	1,800	2,000	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

Major Street:	US Highway 20	Minor Street:	W Hood Ave
Number of Lanes:	1	Number of Lanes:	2
PM Peak Hour Volumes:	1118	PM Peak Hour Volumes:	48

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess  
 \_\_\_\_\_ of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	11,180	6,200	
Minor Street*	480	2,500	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	11,180	9,300	
Minor Street*	480	1,250	<b>No</b>
<i>Combination Warrant</i>			
Major Street	11,180	7,440	
Minor Street*	480	2,000	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions - Non-Restricted Existing Access

Major Street:	W Hood Ave	Minor Street:	Existing Access
Number of Lanes:	2	Number of Lanes:	1
PM Peak Hour Volumes:	244	PM Peak Hour Volumes:	52

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)		
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
<b>WARRANT 1, CONDITION A</b>					
		100%	70%	100%	70%
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	2,440	7,400	
Minor Street*	520	1,850	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	2,440	11,100	
Minor Street*	520	950	<b>No</b>
<i>Combination Warrant</i>			
Major Street	2,440	8,880	
Minor Street*	520	1,480	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions - Restricted Existing Access

Major Street:	W Hood Ave	Minor Street:	Existing Access
Number of Lanes:	2	Number of Lanes:	1
PM Peak Hour Volumes:	218	PM Peak Hour Volumes:	26

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)		
<u>WARRANT 1, CONDITION A</u>		100%	70%	100%	70%
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<u>WARRANT 1, CONDITION B</u>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	2,180	7,400	
Minor Street*	260	1,850	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	2,180	11,100	
Minor Street*	260	950	<b>No</b>
<i>Combination Warrant</i>			
Major Street	2,180	8,880	
Minor Street*	260	1,480	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions - Non-Restricted Existing Access

Major Street:	W Hood Ave	Minor Street:	Proposed Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	207	PM Peak Hour Volumes:	21

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	2,070	6,200	
Minor Street*	210	1,850	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	2,070	9,300	
Minor Street*	210	950	<b>No</b>
<i>Combination Warrant</i>			
Major Street	2,070	7,440	
Minor Street*	210	1,480	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions - Restricted Existing Access

Major Street:	W Hood Ave	Minor Street:	Proposed Access
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	207	PM Peak Hour Volumes:	47

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)	ADT on Minor St. (higher-volume approach)		
<u>WARRANT 1, CONDITION A</u>		100%	70%	100%	70%
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<u>WARRANT 1, CONDITION B</u>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	2,070	6,200	
Minor Street*	470	1,850	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	2,070	9,300	
Minor Street*	470	950	<b>No</b>
<i>Combination Warrant</i>			
Major Street	2,070	7,440	
Minor Street*	470	1,480	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

# Traffic Signal Warrant Analysis



Project: 18187 - Threewind Master Plan  
 Date: 3/18/2019  
 Scenario: 2021 Background Plus Site Conditions

Major Street:	W Hood Ave	Minor Street:	OR Highway 242
Number of Lanes:	2	Number of Lanes:	1
PM Peak Hour Volumes:	302	PM Peak Hour Volumes:	183

**Warrant Used:**

\_\_\_\_\_ 100 percent of standard warrants used  
      X       70 percent of standard warrants used due to 85th percentile speed in excess  
 \_\_\_\_\_ of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	3,020	7,400	
Minor Street*	1,830	1,850	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	3,020	11,100	
Minor Street*	1,830	950	<b>No</b>
<i>Combination Warrant</i>			
Major Street	3,020	8,880	
Minor Street*	1,830	1,480	<b>No</b>

\* Minor street right-turning traffic volumes reduced by 25%

## ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNE ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUIING OR ATTEMPTING TO STOP ANOTHER VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF-ROAD
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED)
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS--RAG	DISREGARDED R-A-G TRAFFIC SIGNAL.
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST CLOTHING NOT VISIBLE
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1TURN	FROM OPPOSITE DIRECTION - ONE TURN, ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

## DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

## DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

## ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	FAILED TO DIM LIGHTS (UNTIL 4/1/97) / INATTENTION (AFTER 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY (DELIBERATELY TRAVELING ON WRONG SIDE)
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAYON RD	STANDING OR LYING IN ROADWAY
073	ELUDING	ELUDING
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVERCORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

## EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	PED INV	PEDESTRIAN INVOLVED (NON-PEDESTRIAN ACCIDENT)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	BIKE INV	TRICYCLE-BICYCLE INVOLVED
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE (OCCUPANTS ONLY)
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSH	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BARS OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING (ON BRIDGE AND APPROACH)
047	BR ABUT	BRIDGE ABUTMENT (APPROACH ENDS)
048	BR COLMN	BRIDGE PILLAR OR COLUMN (EVEN THOUGH STRUCK PROTECTIVE GUARD RAIL FIRST)
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

## EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, ROCKS OFF OR ON ROAD, FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	SPEED BUMP, OTHER BUMP, POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	HOLE	CHUCKHOLE IN ROAD, LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ F MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY OTHER MOVING OR FLYING OBJECT
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTH ACDT	ACCIDENT RELATED TO ANOTHER SEPARATE ACCIDENT
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE (ON PAR OR REPORT)
093	CELL-POL	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL-WTN	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	UNKNOWN TYPE OF FIXED OBJECT
101	OTHER OBJ	OTHER OR UNKNOWN OBJECT, NOT FIXED
104	OUTSIDE V	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS AND/OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS AND/OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR/TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE
125	SHLDR	SHOULDER GAVE WAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

**MOVEMENT TYPE CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

**PARTICIPANT TYPE CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYANCE
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OBJECT
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN OBJECT
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

**PEDESTRIAN LOCATION CODE TRANSLATION LIST**

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
18	OTHER, NOT IN ROADWAY
99	UNKNOWN LOCATION

**TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILLUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

**ROAD CHARACTER CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

095 BUS STPSGN BUS STOP SIGN AND RED LIGHTS  
099 UNKNOWN UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
01	PSNGR CAR	PASSENGER CAR, PICKUP, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, MOTOR SCOOTER, OR MOTOR BICYCLE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH















OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CONTINUOUS SYSTEM CRASH LISTING

016: SANTIAM

Highway 016 ALL ROAD TYPES, MP 99.9 to 100 01/01/2012 to 12/31/2016, Both Add and Non-Add mileage

11 - 14 of 14 Crash records shown.

SER#	P	R	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	SPCL USE	TRLR	QTY	MOVE	A	S	G	E	LICNS	PED	ERROR	ACT	EVENT	CAUSE				
INVEST	E	A	U	C	O	DAY	CITY	COMPNT	FIRST STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	OWNER	FROM	PRTC	INJ	E	X	RES	LOC						
RD DPT	E	L	G	H	R	TIME	URBAN AREA	MLG	TYP	SECOND STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL													
UNLOC?	D	C	S	L	K	LAT	LONG	MILEPNT	LRS		(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC				
																01	NONE	0	STRGHT										
																	PRVTE		SW-NE								000	00	
																	PSNGR	CAR	03	PSNG	INJC	00	F				000	000	00
																	01	NONE	0	STRGHT									
																	PRVTE		SW-NE								000	00	
																	PSNGR	CAR	04	PSNG	INJC	69	F				000	000	00
																	02	NONE	0	STRGHT									
																	PRVTE		SE-NW								000	00	
																	PSNGR	CAR	01	DRVR	INJC	33	M	OR-Y			000	000	00
01738	N	N	N	N	N	12/07/2013	DESCHUTES	1	02	INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE	0	STRGHT									02	
CITY					SA		SISTERS	MN	0	BARCLAY WAY	CN			ICE	ANGL		PRVTE		SW-NE								000	00	
N					11A			99.94		SANTIAM HY	04			DAY	PDO		PSNGR	CAR									028	000	02
N					44 17		-121 33			001600100S00																			
					44.7192239		34.7473079																						
																	02	NONE	0	STRGHT									
																	PRVTE		SE-NW									000	00
																	PSNGR	CAR	01	DRVR	NONE	60	M	OR-Y			000	000	00
01331	N	N	N	N	N	09/13/2015	DESCHUTES	1	02	STRGHT		N	N	CLR	S-1STOP	01	NONE	0	STRGHT									07	
STATE					SU		SISTERS	MN	0	SANTIAM HY	SE	(NONE)	UNKNOWN	DRY	REAR		PRVTE		NW-SE								000	00	
N					4P			99.96		MCKINNEY BUTTE RD	03			DAY	INJ		PSNGR	CAR									026	000	07
N					44 17 43.86		-121 33 34.02			001600100S00																			
																	01	NONE	0	STRGHT									
																	PRVTE		NW-SE									000	00
																	PSNGR	CAR	02	PSNG	INJC	68	F				000	000	00
																	02	NONE	0	STOP									
																	PRVTE		NW-SE									011	00
																	PSNGR	CAR	01	DRVR	NONE	57	M	OR-Y			000	000	00
																	02	NONE	0	STOP									
																	PRVTE		NW-SE									011	00
																	PSNGR	CAR	02	PSNG	INJC	11	F				000	000	00
00473	N	N	N	N	N	04/13/2015	DESCHUTES	1	02	STRGHT		Y	N	CLR	O-STRGHT	01	NONE	0	STRGHT									02	
COUNTY					MO		SISTERS	MN	0	SANTIAM HY	SE	(NONE)	L-TURN REF	DRY	HEAD		PRVTE		SE-NW								000	00	
N					8P			99.97		MCKINNEY BUTTE RD	08			DARK	INJ		PSNGR	CAR									000	000	00
N					44 17 43.45		-121 33 33.66			001600100S00																			
																	02	NONE	0	STRGHT									
																	PRVTE		NW-SE									000	00
																	PSNGR	CAR	01	DRVR	NONE	64	F	OTH-Y			028,015,007	000	02

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.









CITY OF SISTERS, DESCHUTES COUNTY

**SANTIAM HY at MCKINNEY BUTTE RD, City of Sisters, Deschutes County, 01/01/2012 to 12/31/2016**

4 - 4 of 4 Crash records shown.

SER#	P	R S W DATE	CLASS	CITY STREET	INT-TYPE	SPCL USE																
INVEST	E A U C O DAY	DIST	FIRST STREET	RD CHAR	(MEDIAN) INT-REL	OFFRD WTHR CRASH	TRLR QTY	MOVE	A S													
RD DPT	E L G H R TIME	FROM	SECOND STREET	DIRECT	LEGS TRAF-	RNDBT SURF COLL	OWNER	FROM	PRTC	INJ	G E LICNS	PED										
UNLOC?	D C S L K LAT	LONG	LRS	LOCTN	(#LANES) CONTL	DRVWY LIGHT SVRTY	V# TYPE	TO	P# TYPE	SVRTY	E X RES	LOC	ERROR	ACT	EVENT	CAUSE						
							02 NONE 0	STRGHT														
							PRVTE	SE-NW									000	00				
							PSNGR CAR		01 DRVR	INJC	33 M	OR-Y	000	000			00					
																	OR<25					

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015: MCKENZIE Highway 015 ALL ROAD TYPES, MP 92.02 to 92.04 01/01/2012 to 12/31/2016, Both Add and Non-Add mileage

1 - 1 of 1 Crash records shown.

SER#	P	R	S	W	DATE	COUNTY	RD#	FC	CONN#	RD CHAR	INT-TYPE	SPCL USE	TRLR	QTY	MOVE	A	S	G	E	LICNS	PED	ACT	EVENT	CAUSE						
INVEST	E	A	U	C	O	DAY	CITY	COMPNT	FIRST STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	OWNER	FROM	PRTC	INJ	SVR	TY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
RD DPT	E	L	G	H	R	TIME	URBAN AREA	MLG TYP	SECOND STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	SVR	TY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
UNLOC?	D	C	S	L	K	LAT	LONG	MILEPNT	LRS	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVR	TY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
01392	N	N	N	N	N	08/19/2016	DESCHUTES	1	02	STRGHT	N		N	CLR	S-1STOP	01	NONE	0										013	29,27	
COUNTY						FR	SISTERS	MN	Z	SANTIAM HY	SE	(NONE)	UNKNOWN	N	DRY	REAR	PRVTE										000	00		
N						1P		92.04	W	HOOD AVE	03			N	DAY	INJ	PSNGR	CAR								026,016	000	29,27		
N						44 17 36.79	-121 33 27.94			0015001Z2S00	(02)																			
																02	NONE	0										011	013	00
																PRVTE												000	000	00
																PSNGR	CAR													00
																03	NONE	0										022	00	
																PRVTE												000	000	00
																PSNGR	CAR													00

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CITY OF SISTERS, DESCHUTES COUNTY

MCKENZIE HY at CASCADE AVE, City of Sisters, Deschutes County, 01/01/2012 to 12/31/2016

SER#	P	R	S	W	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	SPCL USE	TRLR QTY	MOVE	A	S	RD DPT	E	L	G	H	R	TIME	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED	UNLOC?	D	C	S	L	K	LAT	LONG	LRS	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
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