



MEMORANDUM

DATE: June 2, 2023

TO: Jon Holland, PE, Brown and Caldwell

FROM: Dana Beckwith, PE, PTOE
Richard Martin, EIT

EXPIRES: DEC. 31, 2023

SUBJECT: Bull Run Filtration Facility – Construction Traffic Impact Analysis P18-035-000

This memorandum summarizes the analysis conducted to identify impacts from construction-related traffic for the Portland Water Bureau's (PWB) Bull Run Filtration Facility (the Filtration Facility) located within Multnomah County and adjacent to Clackamas County, Oregon. The study analyzes impacts to study intersections and roadways related to construction of the Filtration Facility and its associated pipelines (together, the Project).

The study uses projections of trips associated with construction and assumptions of how these trips will be distributed over time and over the surrounding road network. These projections and assumptions were made through collaboration with the construction managers/general contractors (CM/GCs) for both the Filtration Facility and pipelines. This study evaluates trips expected to be generated by trucks used for construction activities as well as "Commuter" trips (including site worker, staff, client and craft labor trips). The study concludes that the collective construction traffic will have minimal impacts on intersection and roadway operations, including during needed roadway closures for pipeline construction. Truck traffic causes no impact to intersection operations, and impacts from Commuter trips can be effectively mitigated through use of travel demand management (TDM) strategies. This analysis is based on the standards established by Multnomah County and Clackamas County for each jurisdiction's roadways. The following intersections were evaluated in this analysis:

1. SE Oxbow Drive / SE Altman Road (Multnomah County)
2. SE Oxbow Drive / SE Hosner Road (Multnomah County)
3. SE Lusted Road / SE Altman Road (Multnomah County)
4. SE Lusted Road / SE Cottrell Road (Multnomah County)
5. SE Dodge Park Boulevard / SE Altman Road (Multnomah County)
6. SE Dodge Park Boulevard / SE Cottrell Road (Multnomah County)
7. SE Carpenter Lane / SE Altman Road (Multnomah County)
8. SE Carpenter Lane / SE Cottrell Road (Multnomah County)
9. SE Bluff Road / SE Altman Road (Clackamas County)
10. SE Bluff Road / SE Cottrell Road (Clackamas County)
11. SE Bluff Road / SE Proctor Road (Clackamas County)
12. SE Dodge Park Boulevard / SE Lusted Road (Clackamas County)
13. SE Lusted Road / SE Hudson Road (Clackamas County)
14. SE Lusted Road / SE 302nd Avenue (Multnomah County)
15. SE Bluff Road / SE Orient Drive (Multnomah County)
 - A. SE Carpenter Lane at Site Access A
 - B. SE Bluff Road at Site Access B

These intersections were chosen for the construction traffic study either (1) because Global Transportation Engineering determined them to be the most likely to be impacted by Project-generated

traffic or (2) because Multnomah County Transportation requested the analysis of additional intersections. Project-generated traffic has been categorized in this analysis either as “Commuter” traffic (including site worker, staff, client, and craft labor trips) or as “Truck” traffic (including materials import/export, concrete, and miscellaneous deliveries). For the Filtration Facility site, the analysis assumes one access onto SE Carpenter Lane (Site Access A) and one onto SE Bluff Road (Site Access B). An additional analysis scenario was modeled where all traffic travels to Site Access A in the case Site Access B is not available. The analysis was modeled for conservative traffic scenarios, meaning that all peak hour construction traffic was assumed to travel through the study intersections. Realistically, some traffic will disperse through other area roadways. This traffic impact analysis includes the following elements:

- Project Description
- Inventory and Existing Conditions Analysis
 - Safety Analysis of Physical Condition of Roadways and Intersections
- Traffic Data Evaluation
 - 2022 Existing Traffic Volumes
 - Background Growth Rate
 - Project-Generated Trips
- Traffic Impact Analysis
 - Intersection Performance
 - Pipeline Construction Lane and Roadway Closure Impacts
 - Full Closures
 - Pedestrian and Bicycle Accommodations
 - Mitigation Analysis
 - Agricultural Business Access
 - Haul Routes
 - Emergency Vehicles and Bus Routes
 - Schools
- Results

PROJECT DESCRIPTION

The Filtration Facility site is located on the property bounded by SE Carpenter Lane to the north, SE Dodge Park Boulevard to the northeast, private property in Clackamas County to the south, and private property to the west. The site is located within Multnomah County with access from Carpenter Lane in Multnomah County and Bluff Road in Clackamas County. The associated pipelines are located within Multnomah County.

Construction of the Filtration Facility is projected to begin in the third quarter (Q3) of 2023 and finish in 2028. Construction of the raw and finished water pipelines is projected to begin in Q1 of 2024 and finish in 2028. The Filtration Facility is scheduled to be operational by September 30, 2027.

Construction traffic is divided into two categories: construction commuter vehicles and trucks. Construction commuter vehicles are expected to travel to and from the Filtration Facility site and pipeline work areas during the AM and PM peak periods, while truck traffic is spread throughout the workday. Construction of the pipelines, located in the right of way, will involve partial and full roadway closures and local detours.

INVENTORY AND EXISTING CONDITIONS ANALYSIS

Roadway functional classification and existing transportation facilities were reviewed along all study roadways listed on Table 1 within the Project area in the vicinity of study intersections. All modes of travel including pedestrians, bicycles, transit, and motor vehicles were evaluated. The inventory and existing conditions collected are summarized in Table 1.

Table 1 shows that no available sidewalks, bike lanes, on-street parking, or transit routes are identified within the study area. SE Dodge Park Boulevard, Cottrell Road, Bluff Road, and Altman Road have been designated as freight routes with no restrictions on size of trucks in the Multnomah County Transportation System Plan. Study area roadways do not have a freight route designation within Clackamas County based on the Clackamas County Transportation System Plan.

Table 1: Existing Conditions Within Study Area

Roadway	Functional Classification	Posted Speed Limit	Sidewalks	Bike Lanes	Lane Geometry	On-Street Parking	Transit Route	Truck Route ⁴
SE Oxbow Drive	Collector ¹	55 mph ³	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes
SE Hosner Road	Local ¹	55 mph ³	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes
SE Lusted Road	Collector ¹	45 mph	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes
SE Pleasant Home Road	Local ¹	25 mph	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes
SE Carpenter Lane	Local ¹	25 mph	None	None	16-20 ft. cross-section	None	None	No
SE Dodge Park Boulevard	Collector ¹	55 mph ³	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes
SE Altman Road	Local ¹	55 mph ³	None	None	~ 18 ft. cross-section north of SE Bluff Rd; one 11 ft. travel lane in each direction south of SE Bluff Rd	None	None	Yes
SE Cottrell Road	Local ¹	55 mph ³	None	None	~ 24 ft. cross-section	None	None	Yes
SE Bluff Road	Collector ¹ / Minor Arterial ²	45 mph	None	None	One 11 ft. travel lane in each direction	None	None	Yes
SE Proctor Road	Minor Arterial ²	55 mph ³	None	None	~ 20 ft. cross-section with one travel lane in each direction	None	None	No
SE Hudson Road	Collector ²	55 mph ³	None	None	~ 20 ft. cross-section with one travel lane in each direction	None	None	No

SE 302 nd Avenue	Collector ¹	45 mph	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes
SE Orient Drive	Arterial ¹	35 mph	None	None	One 11-13 ft. travel lane in each direction	None	None	Yes

¹ Based on Multnomah County Transportation System Plan

² Based on Clackamas County Road Functional Classification Map

³ No posted speed limit along the roadway. 55 mph is assumed based on statutory speed limits established by ODOT for open rural highways. However, roadway is subject to the “Basic Speed Rule” in ORS 811.100 *et seq.*

⁴Based on Multnomah County Comp Plan Figure 17B and Clackamas County Comp Plan Map 5-9b.

Safety Analysis of the Physical Condition of Roadways and Intersections

A safety analysis was conducted on March 10, 2023 to examine existing conditions and evaluate any safety concerns along study roadways listed in Table 1. Most of the roadways and intersections showed an acceptable existing physical condition, regarding pavement conditions, lane and shoulder widths, and sight lines to adequately serve construction traffic. Areas of potential concern found within the study area are listed below, along with the needed mitigation, where applicable. This mitigation is incorporated into the Project.

Multnomah County maintains a Pavement Condition Index (PCI) score from 1-100 with 100 being the best for County roadways in the Master Road List under their Pavement Management Program. Multnomah County’s goal is to maintain pavement conditions at 70 or above but the County accepts a score of 50 and above for rural roadways. All roadways listed in Table 1 are considered rural roadways by the County. The Master Road List assigns roadway segments different grades based on condition. The County provided a map on May 31, 2023 showing current PCI scores for roads in and near the Project. This map is included in Appendix A and the scores for areas of potential safety concern, along with observations made on March 10, 2023, are listed in the below documentation.

SE Lusted Road: SE Lusted Road shows fair-to-poor pavement conditions in the roadway curves east of SE Cottrell Road. The PCI score for this segment is 61.08. This section of roadway is not planned to be utilized as a route for construction traffic associated with the Filtration Facility and pipelines. For this reason, no mitigation is recommended for this section of roadway. SE Lusted Road between SE Cottrell Road and SE Altman Road has a PCI score of 28.44. This roadway segment is identified as a potential haul route and detour route during pipeline construction.

SE Altman Road: The PCI score for SE Altman Road is 43.59 north of SE Lusted Road and 20.06 south of SE Lusted Road. SE Altman Road is narrow with unpaved shoulders and no pavement markings in the study area. The southbound stop-controlled approach to the intersection of SE Altman Road at SE Bluff Road has a steep incline grade that meets the superelevation of SE Bluff Road. This can create slow acceleration for large construction vehicles. SE Altman Road is not planned as a haul route between SE Dodge Park Boulevard and SE Bluff Road, so no mitigations are recommended for this segment. Segments north of Dodge Park can accommodate construction traffic within the posted speeds from an operational perspective.

SE Carpenter Lane: SE Carpenter Lane is narrow and unmarked between SE Altman Road and the proposed Access A. The pavement is in poor condition with cracking and potholes. The PCI grade for Carpenter Lane between Altman Road and “End of Pavement” is 22.48.

The segment between SE Altman Road and SE Cottrell Road is not planned for construction traffic. Therefore, no mitigation is recommended for that segment of SE Carpenter Road. Construction traffic

will travel across the segment of SE Carpenter Lane between SE Cottrell Road and Access A at the northwest corner of the Filtration Facility. Therefore, pavement improvements to that segment of SE Carpenter Lane are recommended as mitigation to correct this condition and will be made as part of the Project prior to commencing construction truck traffic for materials import/export.

SE Cottrell Road: The PCI grade for SE Cottrell Road is 55.46 north of SE Dodge Park Boulevard and 65.03 south of SE Dodge Park Boulevard. These roadway segments showed fair pavement conditions that can accommodate construction traffic. The segment between SE Dodge Park Boulevard and SE Carpenter Lane is part of the primary route to Access A and will therefore be improved as part of the Project prior to commencing construction truck traffic for materials import/export.

SE Hosner Road: The PCI grade for SE Hosner Road is 40.53 between SE Oxbow Drive and SE Lusted Road. This roadway segment showed fair pavement conditions that can accommodate construction traffic.

Based on the information available at the time of this report, with the incorporation into the Project of the recommended improvements to Carpenter Lane and Cottrell Road noted above, there are no concerns with the physical condition of study roadways and intersections being able to safely serve both construction traffic and existing background traffic during construction. In addition, the Portland Water Bureau is committed to maintaining in serviceable condition throughout project construction the following roadway segments expected to be used for primary haul routes and detours:

- SE Altman Road – between SE Oxbow Drive and Dodge Park Road
- SE Cottrell Road – between SE Lusted Road and SE Dodge Park Road
- SE Lusted Road – between SE Altman Road and SE Cottrell Road
- SE Hosner Road – between SE Lusted Road and SE Oxbow Drive

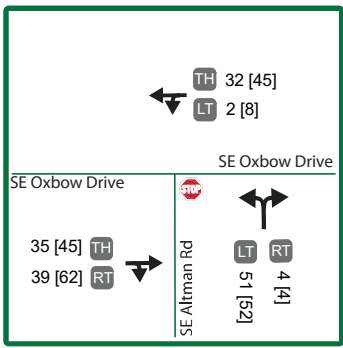
TRAFFIC DATA EVALUATION

2022 Existing Traffic Volumes

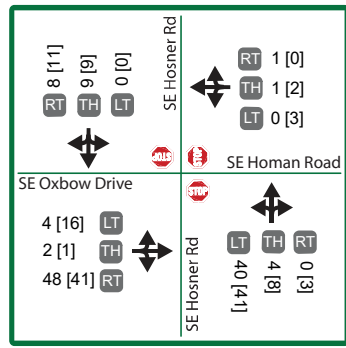
Turning movement count data was collected at study intersections during a typical weekday for the AM peak period of 7:00 AM to 9:00 AM and the PM peak period of 4:00 PM to 6:00 PM¹. Figure 1 shows the existing traffic volumes, traffic operations, and lane configurations within the study area.

Historic count data from 2019 was available for 7 of the 15 study intersections. The count data collected in 2022 was compared to this historic data to determine if the COVID-19 pandemic had significantly changed traffic patterns in the area, and whether the 2022 count data should be adjusted to reflect the impacts of the pandemic on traffic patterns. Some of the intersections showed a drop of up to 10% in the total number of vehicles moving through the intersection between 2019 and 2022. The count comparison, however, showed that many of the main arterial and collector level roadway commuter route volumes remained relatively consistent for both count periods, and some intersection volumes increased between 2019 and 2022.

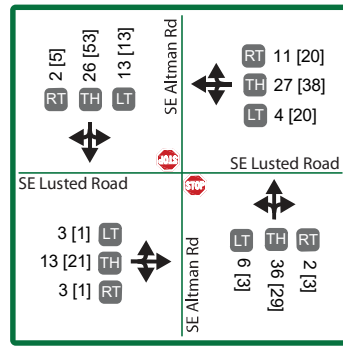
¹ Intersection turn movement counts were conducted by Quality Counts on Thursday, February 28, 2022 and Wednesday, March 15, 2023.



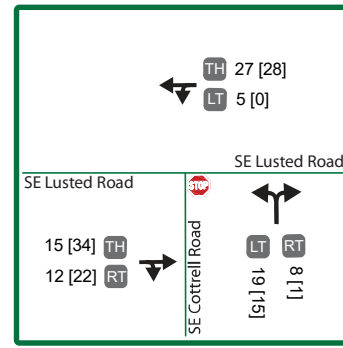
① SE Altman Road at SE Oxbow Drive



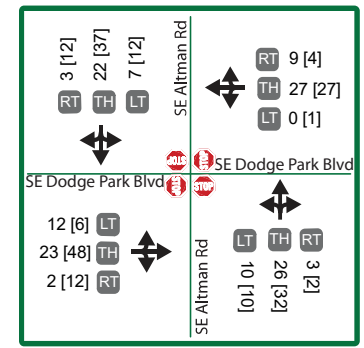
② SE Hosner Road at SE Oxbow Dr / SE Homan Road



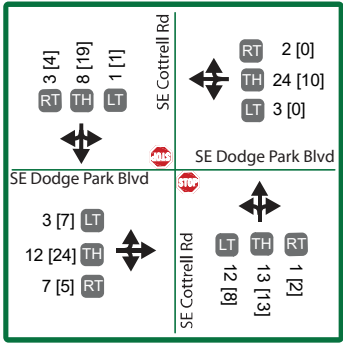
③ SE Altman Road at SE Lusted Road



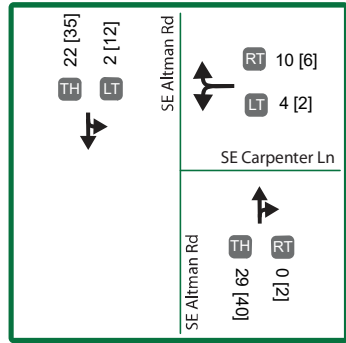
④ SE Cottrell Road at SE Lusted Road



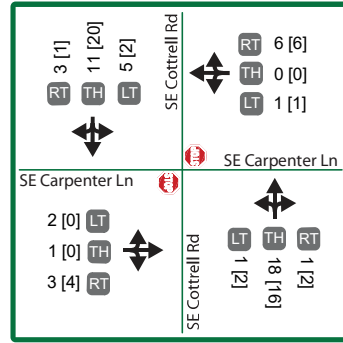
⑤ SE Altman Road at SE Dodge Park Boulevard



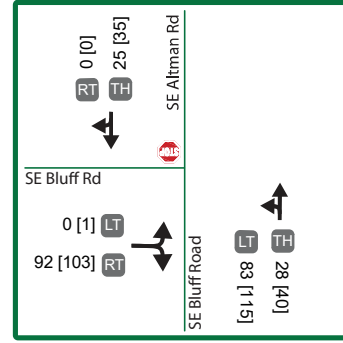
⑥ SE Cottrell Road at SE Dodge Park Boulevard



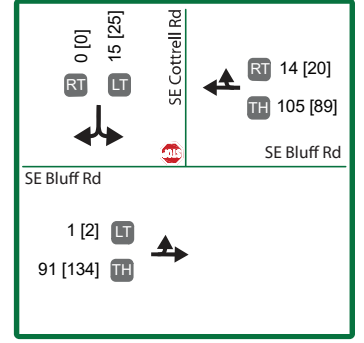
⑦ SE Altman Road at SE Carpenter Lane



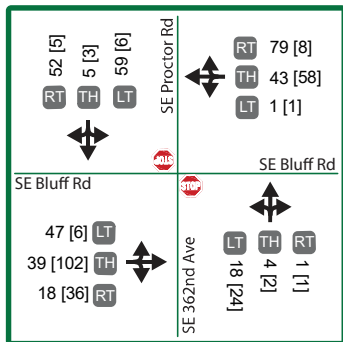
⑧ SE Cottrell Road at SE Carpenter Lane



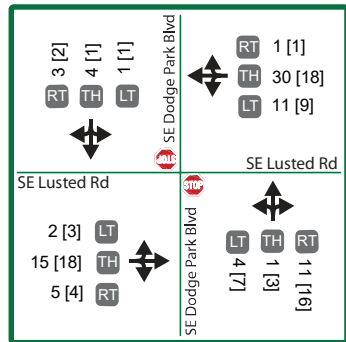
⑨ SE Altman Road at SE Bluff Road



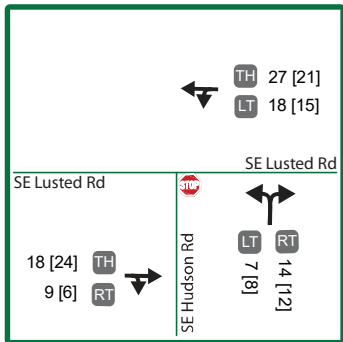
⑩ SE Cottrell Road at SE Bluff Road



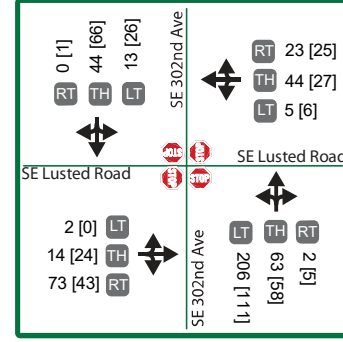
⑪ SE Bluff Road at SE Proctor Road



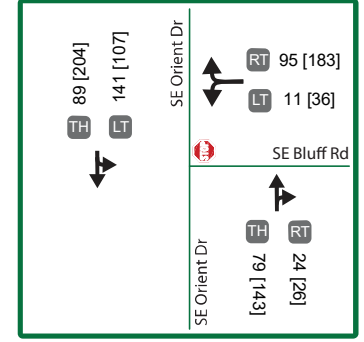
⑫ SE Dodge Park Boulevard at SE Lusted Road



⑬ SE Lusted Road at SE Hudson Road



⑭ SE 302nd Avenue at SE Lusted Road



⑮ SE Orient Drive at SE Bluff Road



⊗ = Study Intersection ↶ = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

Figure 1: Traffic Volumes 2022 Existing Conditions

Because the data did not indicate that the COVID-19 pandemic had either a consistent or significant effect on traffic patterns in the area, changes in volumes between the two count periods will present negligible differences in the capacity analysis and for the sake of a consistent time frame across the study intersections, the 2022 volumes were used in the existing conditions analysis, unaltered. Historical and 2022 traffic count data are included in Appendix A.

Background Growth Rate

A 2% annual background traffic growth rate was assumed in this analysis and applied to existing traffic volumes.² This growth rate was used to develop future traffic volumes at the study intersections for all future scenarios.

Project-Generated Trips

Construction of the Filtration Facility and the associated pipelines will add new vehicle traffic to the local transportation network. Trips generated by the Project are expected to utilize various routes to and from the Filtration Facility and the associated pipeline work sites. Roadways including SE Dodge Park Boulevard, SE Oxbow Drive and SE Bluff Road are considered to be primary routes out of the project area since these roadways have wider lane widths; are classified as collectors; provide connections to the Portland, Gresham, Fairview, and Troutdale area via US 26 and other roadways; and are County-designated truck routes. SE Bluff Road also provides direct access to the City of Sandy. Although considered primary routes in modeling impacts, actual trips will be distributed across a greater number of routes than these depending on pipeline construction locations and actual trip origins.

This section evaluates conditions when all roadways are open. During roadway closures for pipelines construction, other routes will be utilized. Roadway detour analyses are evaluated in the Detours section later in the report.

For this evaluation, construction traffic is divided into “Commuter” vehicles and “Truck” vehicles that haul materials to and from the Project. Commuter vehicles include site worker, staff, clients, and craft labor trips. Trucks include material import/export, concrete, and miscellaneous deliveries.

For a conservative estimate, Commuter vehicles are modeled to travel to and from the Filtration Facility site during the AM and PM peak periods, while Truck traffic is distributed across the typical workday hours of 7:00 AM to 6:00 PM. All Project traffic is modeled as traveling to and from the Filtration Facility, again for a conservative analysis, as this assumption will have the potential for the greatest concentration of impact and potential to trigger intersection performance issues. Realistically, trips traveling to the Filtration Facility will be lower than that assumed in this study, as much of the construction traffic traveling to and from the pipeline construction locations will travel directly to those locations and not actually travel to the Filtration Facility.

Coordination on the preliminary project schedule with the design and construction teams forecast that Project-related construction traffic will peak in 2025. Table 2 shows the number of vehicles associated with the construction of the Filtration Facility and pipelines, broken out into average daily construction

² This was based on Clackamas County Roadway Standards Chapter 295.12 and confirmed by Clackamas County staff. To provide consistency, this same growth rate was applied to Multnomah County intersections.

traffic and peak daily construction traffic. Detailed trip generation tables are provided in Appendix B.

Table 2: Project Construction Traffic Daily Vehicles

Category	Average Daily Vehicles (A)	Average Daily Trips (A*2)	Peak Daily Vehicles (B)	Peak Daily Trips (B*2)
Filtration Facility Construction				
Commuters	270	540	445	890
Trucks	148	296	295	590
Pipelines Construction				
Commuters	85	170	130	260
Trucks	122	244	276	552

Truck trips will occur throughout the day, with a percentage of the total trips shown in Table 2 occurring during the peak hours. Bi-directional 24-hour volume counts were collected on SE Dodge Park Boulevard and SE Bluff Road to identify the percentages of daily traffic traveling along each roadway during the peak hour analysis periods. Based on this information and a minimum construction workday of 9 hours, a conservative value of 15% was selected for Trucks assumed to travel to and from the Project during the AM peak hour and 15% during the PM peak hour. Tables 3 and 4 show the Project trip generation for the average and peak construction traffic scenarios.

Table 3: Average Construction Traffic Trip Generation Summary

Description	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Commuters						
Filtration Facility	270	0	270	0	270	270
Pipelines	85	0	85	0	85	85
Subtotal	355	0	355	0	355	355
Trucks						
Filtration Facility	23	23	46	23	23	46
Pipelines	19	19	38	19	19	38
Subtotal	42	42	84	42	42	84
Total						
Total	397	42	439	42	397	439

Table 4: Peak Construction Traffic Trip Generation Summary

Description	AM Peak Hour			PM Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Commuters						
Filtration Facility	445	0	445	0	445	445
Pipelines	130	0	130	0	130	130
Subtotal	575	0	535	0	575	535
Trucks						
Filtration Facility	45	45	90	45	45	90
Pipelines	42	42	84	42	42	84
Subtotal	87	87	174	87	87	174
Total						
Total	662	87	749	87	662	749

Trip distributions were developed for the peak daily Project traffic based on information provided by the CM/GCs. These distributions evaluate use of the two proposed accesses to the Filtration Facility site -

one to Carpenter Lane and the other to Bluff Road. Four trip distribution routes were modeled to make conservative assumptions of potential travel patterns. These are based on Commuter travel patterns as well as Truck trips to and from likely material disposal and import routes. Routes include the following:

- Site Access A via Dodge Park Boulevard (Route 1)
- Site Access A via Dodge Park Boulevard, Altman Road, and Oxbow Drive (Route 2)
- Site Access B via Orient Drive and Bluff Road (Route 3)
- Site Access B via Bluff Road (Route 4)

As there may be multiple actual material disposal and import sites over the construction period, traffic along the routes is likely to disperse more than these conservative estimates, resulting in fewer trips through study intersections.

For the Commuter trips, one distribution scenario was created based on population hubs, shortest-distance travel routes to/from the Filtration Facility site from various origins, and the collected turning movement count data. The distribution along each route is as follows:

- 55% of commuter trips were modeled on Route 1
- 15% on Route 2
- 15% on Route 3
- 15% on Route 4

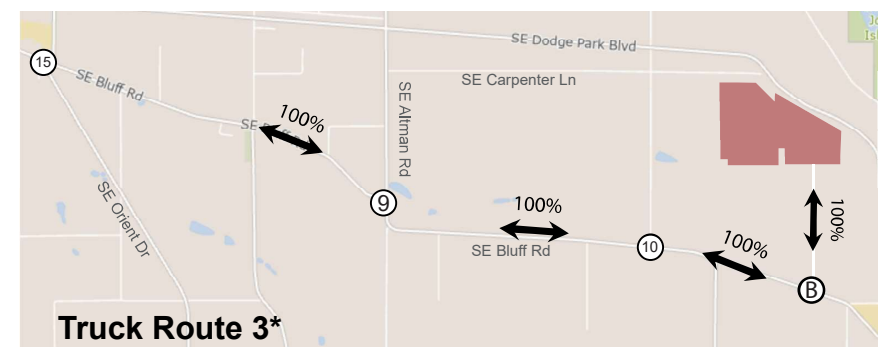
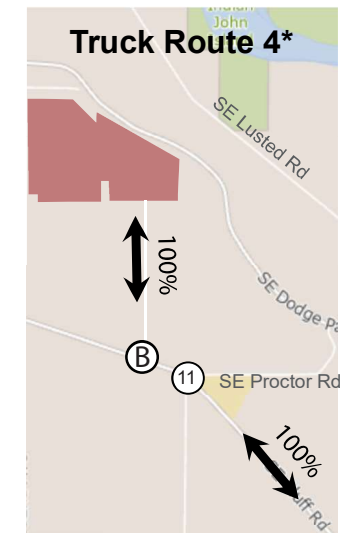
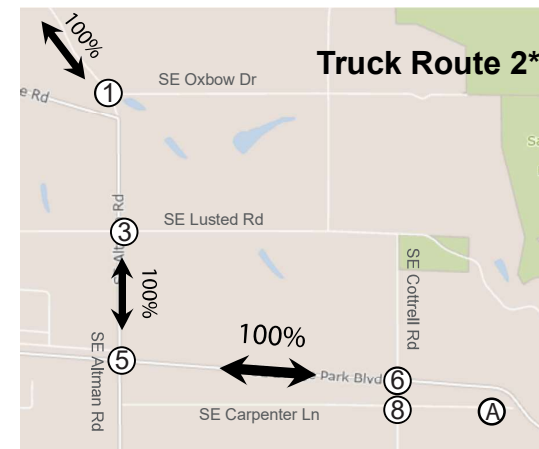
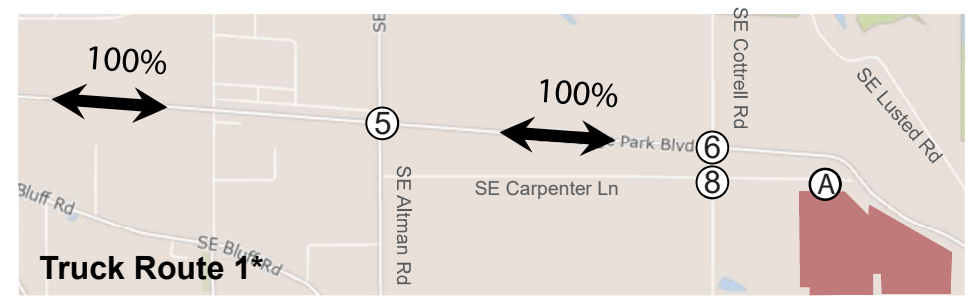
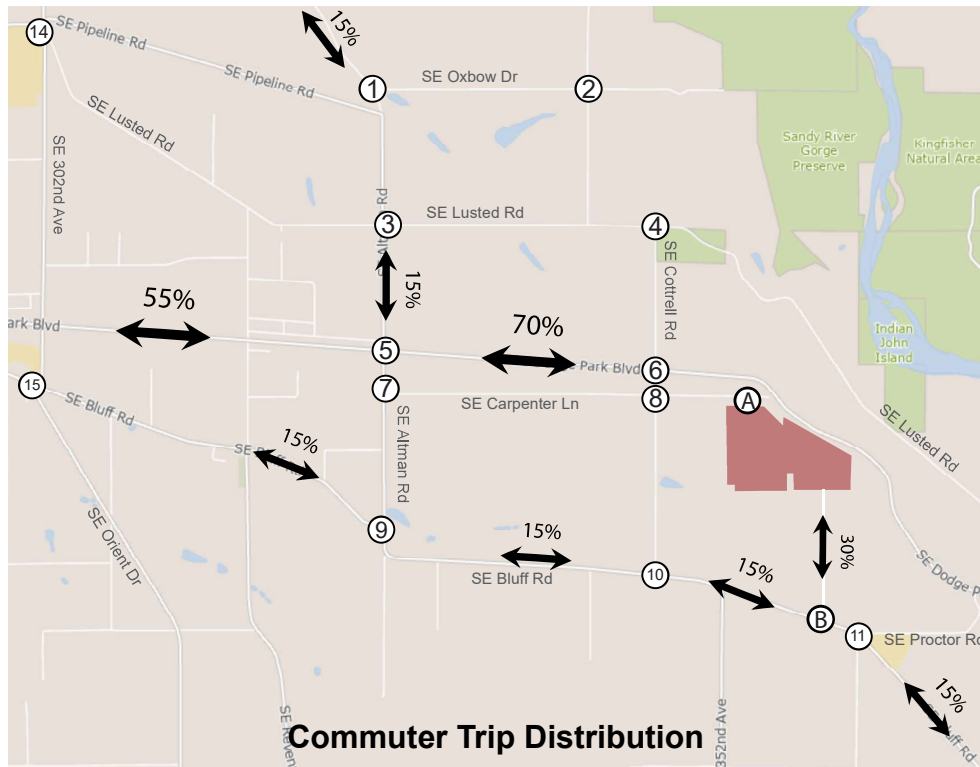
For the Truck trips, four scenarios were developed where 100% of Trucks were distributed along each route for a conservative analysis. Realistically, there are many import/export destinations in different directions from the Project work sites, and truck trips will likely disperse along various routes including County-designated freight routes not included in this analysis. These analyses show a worst-case scenario where all truck trips move along the same route to the same destinations. Figures for trip distributions for the Commuter traffic scenario and for the four Truck traffic scenarios are shown in Figure 2. Trip assignment for all scenarios is provided in Appendix B.

Total Project trip distribution estimates were developed for four scenarios by combining the Commuter traffic distribution scenario with the four Truck traffic scenarios:

- 2025 Peak Construction Traffic Distribution Scenario 1 (100% of Trucks on Route 1)
- 2025 Peak Construction Traffic Distribution Scenario 2 (100% of Trucks on Route 2)
- 2025 Peak Construction Traffic Distribution Scenario 3 (100% of Trucks on Route 3)
- 2025 Peak Construction Traffic Distribution Scenario 4 (100% of Trucks on Route 4)

The trip assignment figures provided in Appendix B include only intersections where site trip traffic was distributed. Other study intersections that were not modeled as receiving site trip distribution were omitted from these figures.

During roadway closures for pipeline construction, trip distribution routes will change as Commuters and Trucks are detoured. This is further discussed in the Pipeline Construction Lane and Roadway Closures section.



(X) = Study Intersection ↔ = Percentage of Vehicles Traveling Along Route

*Truck percentages represent worst-case scenarios used for conservative evaluations. Actual trips will disperse across multiple routes.

Figure 2: Trip Distribution Peak Construction Traffic Commuter and Truck Routes

TRAFFIC IMPACT ANALYSIS

Intersection Performance

An intersection performance analysis was conducted for study intersections to determine the expected traffic impacts of the construction process for existing conditions and peak construction traffic conditions. The peak periods analyzed for this evaluation include the AM peak period (7:00 AM to 9:00 AM) and the PM peak period (4:00 PM to 6:00 PM). The intersection Level of Service (LOS) was analyzed based on procedures described in the Highway Capacity Manual 2000 (HCM). The analysis was performed for all study intersections.

Multnomah County Design Standards specify that facilities shall accommodate an LOS C or better during the design hour in rural areas.³ Clackamas County Comprehensive Plan utilizes LOS E or better for unsignalized intersections in rural areas during AM and PM peak hours.

The study area intersections were evaluated for the following scenarios:

- 2022 Existing Conditions
- 2025 Peak Construction Traffic Conditions
 - Distribution Scenario 1
 - Distribution Scenario 2
 - Distribution Scenario 3
 - Distribution Scenario 4

Synchro software (Version 11) was used to determine the delay, level of service, and volume to capacity (v/c) ratio for each scenario considered. Delay is the average delay per vehicle in seconds and is reported for the approach with the highest stop-control delay for minor-street stop-controlled intersections and the average delay for all-way stop-controlled intersections.

The v/c ratio is a conventional level-of-service measure for roadways, comparing vehicle volumes on a roadway with the roadway's carrying capacity. Table 5 shows intersection performance for the 2022 existing conditions. Table 6 shows the intersection performance for the four peak construction distribution scenarios. The analyses shown in Tables 5 and 6 are for scenarios where all roadways are open. Roadway closure scenarios are detailed in a later section. Detailed analysis results are included in Appendix C.

As shown in Table 5, all study intersections perform at acceptable levels of service with minimal delay under existing conditions.

³ Multnomah County Design Standards, Section 1.1.5

Table 5: Existing Conditions Intersection Performance Summary

#	Intersection	Peak Hour	2022 Existing Traffic		
			Delay	LOS	V/C
1	SE Oxbow Drive / SE Altman Road	AM	9.5	A	0.08
		PM	9.5	A	0.07
2	SE Oxbow Drive / SE Hosner Road	AM	8.2	A	0.08
		PM	7.9	A	0.07
3	SE Lusted Road / SE Altman Road	AM	9.7	A	0.06
		PM	10.4	B	0.12
4	SE Lusted Road / SE Cottrell Road	AM	9.1	A	0.04
		PM	9.1	A	0.02
5	SE Dodge Park Boulevard / SE Altman Road	AM	7.5	A	0.05
		PM	7.6	A	0.09
6	SE Dodge Park Boulevard / SE Cottrell Road	AM	9.4	A	0.04
		PM	9.3	A	0.03
7	SE Carpenter Lane / SE Altman Road	AM	8.6	A	0.01
		PM	8.9	A	0.01
8	SE Carpenter Lane / SE Cottrell Road	AM	9.2	A	0.01
		PM	8.5	A	0.01
9	SE Bluff Road / SE Altman Road	AM	9.9	A	0.04
		PM	10.5	B	0.06
10	SE Bluff Road / SE Cottrell Road	AM	10.0	A	0.03
		PM	10.2	B	0.04
11	SE Bluff Road / SE Proctor Road	AM	11.3	B	0.16
		PM	10.3	B	0.04
12	SE Dodge Park Boulevard / SE Lusted Road	AM	9.2	A	0.01
		PM	8.9	A	0.04
13	SE Lusted Road / SE Hudson Road	AM	9.0	A	0.03
		PM	8.8	A	0.03
14	SE Lusted Road / SE 302 nd Avenue	AM	14.9	B	0.34
		PM	8.5	A	0.31
15	SE Bluff Road / SE Orient Drive	AM	9.9	A	0.14
		PM	13.1	B	0.37
A	SE Carpenter Lane / Site Access A	AM	-	-	-
		PM	-	-	-
B	SE Bluff Road / Site Access B	AM	-	-	-
		PM	-	-	-

Table 6: 2025 Peak Construction Conditions Intersection Performance Summary

#	Intersection	Peak Hour	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SE Oxbow Drive / SE Altman Road	AM	9.9	A	13.0	B	9.9	A	9.9	A
		PM	10.2	B	12.6	B	10.2	B	10.2	B
2	SE Oxbow Drive / SE Hosner Road	AM	8.2	A	8.2	A	8.2	A	8.2	A
		PM	7.9	A	7.9	A	7.9	A	7.9	A
3	SE Lusted Road / SE Altman Road	AM	10.4	B	12.3	B	10.4	B	10.4	B
		PM	11.2	B	14.2	B	11.2	B	11.2	B
4	SE Lusted Road / SE Cottrell Road	AM	9.1	A	9.1	A	9.1	A	9.1	A
		PM	9.1	A	9.1	A	9.1	A	9.1	A
5	SE Dodge Park Boulevard / SE Altman Road	AM	16.5	C	13.4	B	10.7	B	10.7	B
		PM	15.7	C	28.4	D	12.2	B	12.2	B
6	SE Dodge Park Boulevard / SE Cottrell Road	AM	16.0	C	16.0	C	12.3	B	12.3	B
		PM	22.9	C	22.9	C	14.2	B	14.2	B
7	SE Carpenter Lane / SE Altman Road	AM	8.7	A	8.7	A	8.7	A	8.7	A
		PM	9.0	A	9.0	A	9.0	A	9.0	A
8	SE Carpenter Lane / SE Cottrell Road	AM	51.9	F	51.9	F	26.2	D	26.2	D
		PM	13.3	B	13.3	B	11.2	B	11.2	B
9	SE Bluff Road / SE Altman Road	AM	10.7	B	10.7	B	12.6	B	10.7	B
		PM	11.5	B	11.5	B	13.8	B	11.5	B
10	SE Bluff Road / SE Cottrell Road	AM	10.7	B	10.7	B	12.6	B	10.7	B
		PM	11.2	B	11.2	B	13.1	B	11.2	B
11	SE Bluff Road / SE Proctor Road	AM	12.5	B	12.5	B	12.5	B	15.3	C
		PM	11.3	B	11.3	B	11.3	B	13.7	B
12	SE Dodge Park Boulevard / SE Lusted Road	AM	9.3	A	9.3	A	9.3	A	9.3	A
		PM	8.9	A	8.9	A	8.9	A	8.9	A
13	SE Lusted Road / SE Hudson Road	AM	9.0	A	9.0	A	9.0	A	9.0	A
		PM	8.8	A	8.8	A	8.8	A	8.8	A
14	SE Lusted Road / SE 302 nd Avenue	AM	10.6	B	10.6	B	10.6	B	10.6	B
		PM	8.6	A	8.6	A	8.6	A	8.6	A
15	SE Bluff Road / SE Orient Drive	AM	10.5	B	10.5	B	12.2	B	10.5	B
		PM	15.1	C	15.1	C	23.5	C	15.1	C
A	SE Dodge Park Boulevard / Site Access A	AM	10.9	B	10.9	B	0.0	A	0.0	A
		PM	14.4	B	14.4	B	11.3	B	11.3	B
B	SE Bluff Road / Site Access B	AM	3.8	A	3.8	A	9.7	A	19.3	C
		PM	10.6	B	10.6	B	13.7	B	14.3	B

Notes: **Bold** = Does not meet performance standard.

As shown in Table 6, all study intersections perform at acceptable levels of service with minimal delay except for SE Carpenter Lane / SE Cottrell Road for all scenarios and SE Dodge Park Boulevard / SE Altman Road for Scenario 2.

SE Carpenter Lane / SE Cottrell Road falls below standards due to delay created by the introduction of construction vehicles experienced by eastbound minor street vehicles during the AM peak hour, the approach for which is forecast to have less than five vehicles. These impacts are short term and without these vehicles, the intersection would operate at LOS B with a control delay of 10.8 seconds. The analysis is conservative for the worst-case trip distribution scenarios where all vehicles are modeled to travel to the Filtration Facility via the SE Carpenter Lane / Cottrell Road intersection. In reality, construction commuter and truck trips associated with the pipelines will travel directly to the

pipeline work area. This will allow the intersection to operate at an acceptable performance level rather than the level shown in Table 6. The TDM strategies for Commuter traffic recommended below in the Mitigation Analysis section will allow the intersection to operate at acceptable levels of service.

SE Dodge Park Boulevard / SE Altman Road meets performance standards for Scenarios 1, 3, and 4 that show Commuter traffic traveling through the intersection but falls below standards for Scenario 2 where 100 percent of the Truck traffic is added. A 15% reduction in truck traffic at the intersection will allow it to meet performance standards. Mitigation strategies outlined in the Mitigations Analysis section will also allow this intersection to meet performance standards.

With the TDM strategies described in the Mitigations Analysis section, all study intersections perform at acceptable levels of service with minimal delay even during peak construction conditions.

Pipeline Construction Lane and Roadway Closures

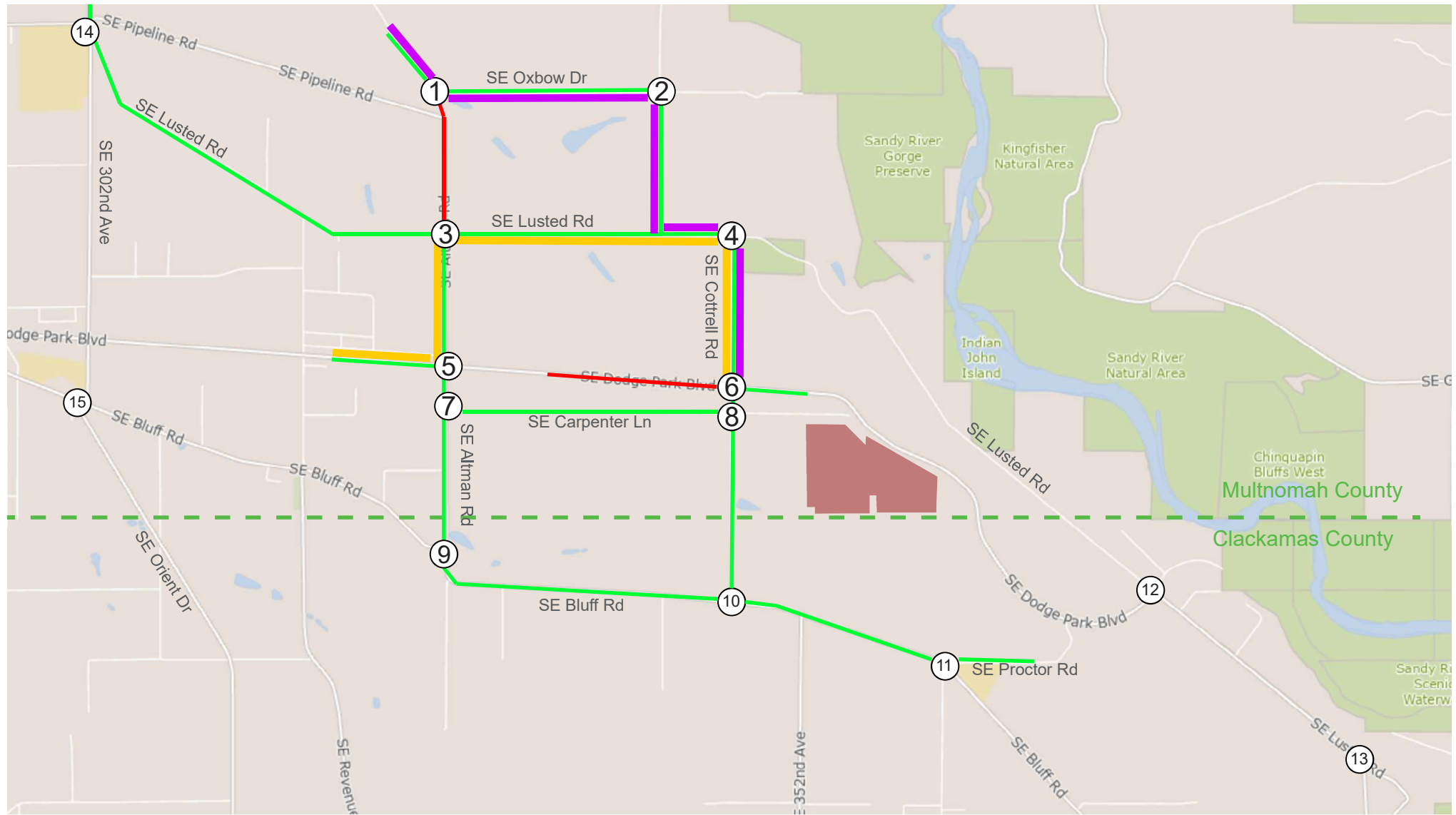
Partial and full roadway closures will be required to complete construction of the pipelines. Farm field access will be maintained and will incorporate seasonal constraints on closures to minimize impacts to agricultural operations. Flaggers will be utilized to facilitate traffic flow around work areas. Additionally, pedestrians and bicycles will be accommodated during these partial and full roadway closures. Lane and roadway closure locations and estimated durations are provided in Appendix D.

Full Closures

Full closures are anticipated to have a short-term impact on traffic as construction vehicles and non-local vehicles will need to be detoured. Traffic for local residences, local agricultural and other businesses, and emergency vehicles will still be allowed local access during full closures.

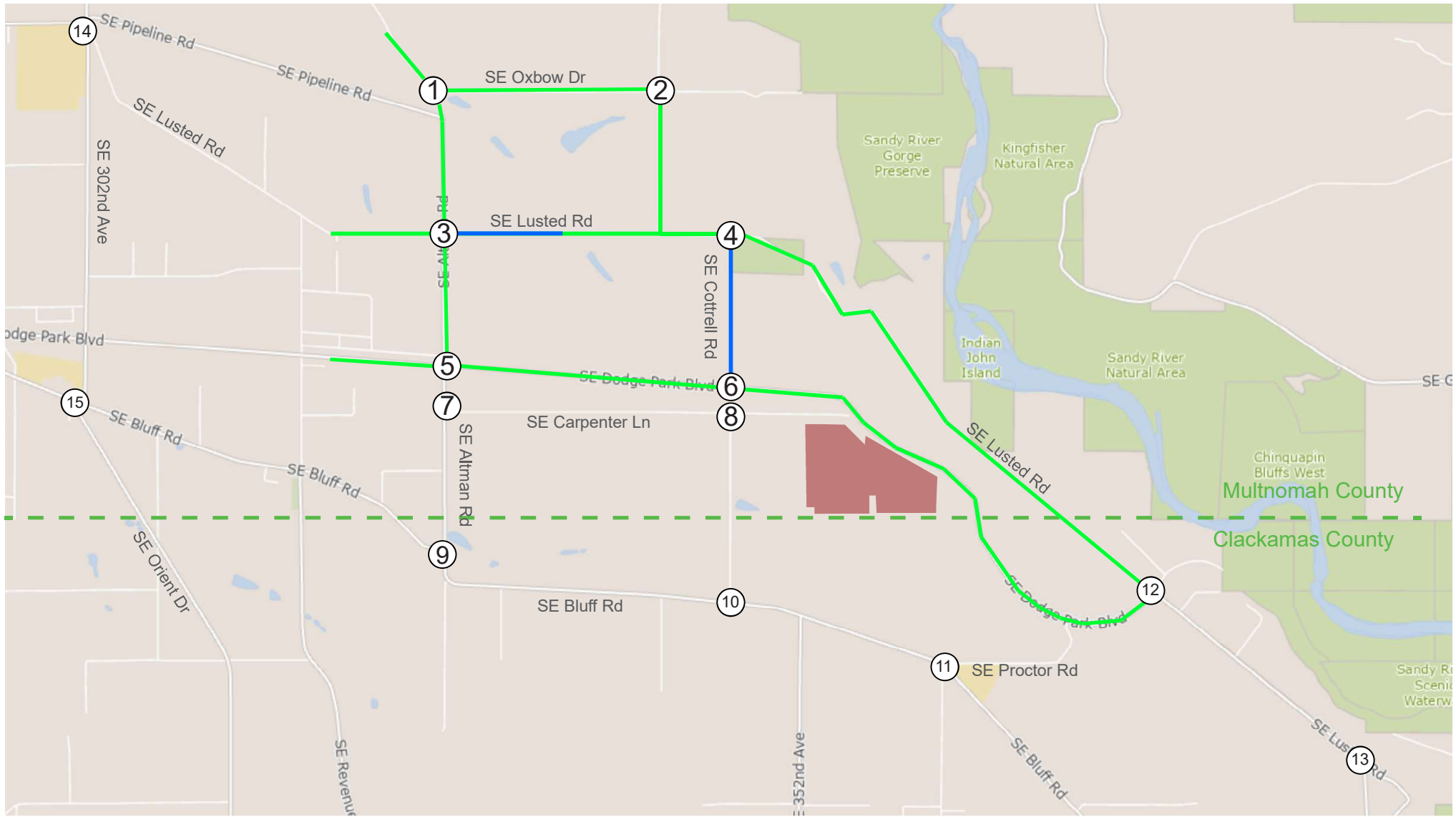
Two analyses were conducted to determine the operational impacts for paired full closures of SE Dodge Park Boulevard / SE Altman Road and SE Lusted Road / SE Cottrell Road, as these roadway closures have the greatest potential for impacts, compared to single and partial closures. All other roadways will be kept fully open during these paired full closures. As described below, the study area roadways are shown to perform at acceptable levels of service during the paired full closures with management of Commuter routes, so all other single and partial closures will similarly perform at acceptable levels of service.

For each analysis, the traffic volumes for the 2025 Peak Construction Traffic Conditions Distribution Scenario 2 (henceforth referred to as “Scenario 2 volumes”) were used, with all vehicles detouring around the closed roadway sections. The detours outlined in this section send all vehicles previously utilizing the closed roadways through the next closest study intersections to get them back to their original path for a conservative analysis. Scenario 2 volumes were chosen for this analysis because it represents the scenario where the greatest number of vehicles are traveling through study intersections impacted by the roadway closures. Figures 3 and 4 show detour routes and roadways for the two closure scenarios. Figures showing the areas of closure and the detoured volumes for the roadway closure scenarios are provided in Appendix D.



- ⊗ = Study Intersection
- = Dodge Park/Altman Closure
- = Local Traffic Detour Roadways During Closures
- = Route 1 Construction Vehicle Detours During Closures
- = Route 2 Construction Vehicle Detours During Closures

Figure 3: Dodge/Altman Full Roadway Closure Construction Detour Routes



(X) = Study Intersection — = Lusted/Cottrell Closure
 — = Local Traffic Detour Roadways During Closures

Figure 4: Lusted/Cottrell
 Full Roadway Closure
 Construction Detour Routes

Table 7 shows the intersection performance summaries for both paired closures. Detailed HCM reports for these results are provided in Appendix D. These capacity analyses reflect the worst-case scenarios for intersection operational and capacity impacts. As shown in Table 7, several study intersections operate below performance standards with the conservative detour routes. It is recommended that travel demand management strategies be implemented to reduce the demand for vehicles on Dodge Park Boulevard and Lusted Road. Alternative TDM measures are outlined in the Mitigations Analysis section.

Table 7: 2025 Peak Traffic Closure Scenarios Intersection Performance Summary (Without Mitigation by TDM Strategies)

#	Intersection	Peak Hour	Dodge / Altman Closures			Lusted / Cottrell Closures		
			Delay	LOS	V/C	Delay	LOS	V/C
1	SE Oxbow Drive / SE Altman Road	AM	0.0	A	0.19	15.7	C	0.39
		PM	0.0	A	0.12	16.7	C	0.42
2	SE Oxbow Drive / SE Hosner Road	AM	10.3	B	0.41	8.4	A	0.28
		PM	10.0	A	0.39	8.5	A	0.28
3	SE Lusted Road / SE Altman Road	AM	13.5	B	0.52	11.8	B	0.34
		PM	54.2	F	0.59	13.0	B	0.39
4	SE Lusted Road / SE Cottrell Road	AM	13.5	B	0.29	0.0	A	0.29
		PM	27.7	D	0.84	0.0	A	0.84
5	SE Dodge Park Boulevard / SE Altman Road	AM	11.7	B	0.45	14.1	B	0.56
		PM	15.1	C	0.39	28.4	D	0.53
6	SE Dodge Park Boulevard / SE Cottrell Road	AM	25.9	D	0.81	17.1	C	0.34
		PM	18.2	C	0.70	26.1	D	0.80
7	SE Carpenter Lane / SE Altman Road	AM	8.6	A	0.03	8.7	A	0.02
		PM	9.0	A	0.02	9.0	A	0.01
8	SE Carpenter Lane / SE Cottrell Road	AM	53.6	F	0.10	51.9	F	0.09
		PM	13.3	B	0.58	13.3	B	0.58
9	SE Bluff Road / SE Altman Road	AM	10.9	B	0.08	10.7	B	0.05
		PM	11.6	B	0.09	11.5	B	0.07
10	SE Bluff Road / SE Cottrell Road	AM	11.0	B	0.04	10.7	B	0.03
		PM	11.5	B	0.09	11.2	B	0.05
11	SE Bluff Road / SE Proctor Road	AM	12.8	B	0.05	11.7	B	0.20
		PM	11.4	B	0.05	11.3	B	0.05
12	SE Dodge Park Boulevard / SE Lusted Road	AM	9.3	A	0.01	9.4	A	0.01
		PM	8.9	A	0.04	9.0	A	0.07
13	SE Lusted Road / SE Hudson Road	AM	9.0	A	0.03	9.1	A	0.03
		PM	8.8	A	0.03	8.9	A	0.03
14	SE Lusted Road / SE 302 nd Avenue	AM	10.8	B	0.39	10.6	B	0.36
		PM	8.7	A	0.35	8.6	A	0.32
15	SE Bluff Road / SE Orient Drive	AM	10.5	B	0.16	10.5	B	0.16
		PM	15.1	C	0.51	15.1	C	0.51
A	SE Dodge Park Boulevard / Site Access A	AM	10.9	B	0.13	10.9	B	0.13
		PM	14.5	B	0.59	14.5	B	0.59
B	SE Bluff Road / Site Access B	AM	3.5	A	0.07	3.8	A	0.07
		PM	10.7	B	0.23	10.6	B	0.23

Notes: **Bold** = Does not meet performance standard

Pedestrian and Bicycle Accommodation During Construction

Pedestrians and bicycles will be accommodated through work zones during Project construction, equivalent to or exceeding the current accommodations. These accommodations will comply with all applicable Multnomah County and Clackamas County guidelines.

Currently, pedestrian access along study roadways is limited to the roadway and narrow gravel shoulders. SE Dodge Park Boulevard is the exception with typical 2-foot paved shoulders.

Through work zones where there are full roadway closures or one side of the road is closed, pedestrian access will remain open when there is ample room for passage around the work zone, with one exception described in the following paragraph. The typical approach to accommodating pedestrians and bicycles is to provide access on the side of the roadway opposite from the work zone. Pedestrian detour routes will be implemented such that pedestrians previously utilizing the closed side of the road will be detoured to the open side at either nearby intersections or at temporary crossings near the work zone. Striped shoulders and/or tubular markers will be used to provide temporary walkways for pedestrian access.

One work zone is proposed for a full roadway closure for Project-related activities where no vehicular, pedestrian or bike access will be provided through the work zone. This is a full closure of SE Altman Road between SE Pipeline Road and SE Oxbow Road for pipeline work. This is due to limited or no shoulder area, ditches along the west side of the road, and drop-offs along the east side of the road. No worn pedestrian paths are present in the area and there are no site access points along this segment of SE Altman Road, so no pedestrian traffic is anticipated. As an option, if pedestrian or bike access is deemed necessary by Multnomah County, a shuttle may be provided that can shuttle pedestrians and bikes around the work zone.

Bicycles currently share roadways with vehicle traffic along all study roadways. During lane closures, bicycles will continue to share the road in the same manor. If vehicle detours are present, bikes are anticipated to follow the same detour route. Temporary signs will be provided to warn drivers that bicycles will be sharing the roadway through work zones. Should it be necessary for bikes to share a pedestrian facility, the facility will be signed for bicyclists to walk their bikes through.

Mitigation Analysis

A mitigation analysis was conducted using the 2025 Peak Traffic Closure Scenarios volumes to determine if alternative Project trip distribution would allow for the intersections to perform at acceptable levels of service for peak construction conditions, including during the two paired-closure scenarios. As a first measure for mitigation, TDM strategies were explored. TDM measures that can be deployed to improve operations include:

- Direct half of the commuter traffic to use Access B, which will redirect traffic from Dodge Park Boulevard to Bluff Road at various intersections west of the Project sites. Because of the ample capacity on all study area roadways, detouring half of the construction commuter vehicles to SE Bluff Road will not create operational or capacity issues. The detailed analysis results and mitigations volumes figures are available in Appendix E.
- Provide a commuter shuttle.
- Offset commuter arrivals to the Filtration Facility.
- Develop a rideshare program.
- Develop an incentive program to encourage carpooling.

For this analysis, 190 peak hour commuter trips previously taking Route 1 from Dodge Park Boulevard to Site Access A were rerouted to Route 3 along Orient Drive and Bluff Road to Site Access B,

resulting in a new total trip allocation of 387 total peak hour trips (Commuter and Truck combined) utilizing Site Access A during both peak hours. Table 8 shows the results of the mitigation analysis.

Table 8: 2025 Peak Traffic Closure Scenarios Mitigation Analysis Intersection Performance Summary

#	Intersection	Peak Hour	Dodge / Altman Closures			Lusted / Cottrell Closures		
			Delay (sec)	LOS	V/C	Delay (sec)	LOS	V/C
1	SE Oxbow Drive / SE Altman Road	AM	0.0	A	0.19	15.7	C	0.39
		PM	0.0	A	0.12	16.7	C	0.42
2	SE Oxbow Drive / SE Hosner Road	AM	10.3	B	0.41	8.4	A	0.28
		PM	10.0	A	0.39	8.5	A	0.28
3	SE Lusted Road / SE Altman Road	AM	11.1	B	0.29	11.8	B	0.34
		PM	17.6	C	0.26	13.0	B	0.39
4	SE Lusted Road / SE Cottrell Road	AM	11.8	B	0.25	0.0	A	0.00
		PM	14.4	B	0.53	0.00	A	0.53
5	SE Dodge Park Boulevard / SE Altman Road	AM	8.7	A	0.34	11.2	B	0.46
		PM	9.8	A	0.28	13.4	B	0.43
6	SE Dodge Park Boulevard / SE Cottrell Road	AM	14.6	B	0.53	14.3	B	0.28
		PM	12.4	B	0.44	14.6	B	0.50
7	SE Carpenter Lane / SE Altman Road	AM	8.6	A	0.03	8.7	A	0.02
		PM	9.0	A	0.02	9.0	A	0.01
8	SE Carpenter Lane / SE Cottrell Road	AM	22.1	C	0.04	21.6	C	0.04
		PM	10.5	B	0.36	10.5	B	0.36
9	SE Bluff Road / SE Altman Road	AM	13.2	B	0.10	12.8	B	0.06
		PM	14.2	B	0.12	14.0	B	0.10
10	SE Bluff Road / SE Cottrell Road	AM	13.2	B	0.06	12.8	B	0.04
		PM	14.0	B	0.12	13.4	B	0.07
11	SE Bluff Road / SE Proctor Road	AM	12.8	B	0.05	12.5	B	0.05
		PM	11.4	B	0.05	11.3	B	0.05
12	SE Dodge Park Boulevard / SE Lusted Road	AM	9.3	A	0.01	9.4	A	0.01
		PM	8.9	A	0.04	9.0	A	0.07
13	SE Lusted Road / SE Hudson Road	AM	9.0	A	0.03	9.1	A	0.03
		PM	8.8	A	0.03	8.9	A	0.03
14	SE Lusted Road / SE 302 nd Avenue	AM	10.8	B	0.39	10.6	B	0.36
		PM	9.4	A	0.27	9.2	A	0.14
15	SE Bluff Road / SE Orient Drive	AM	12.5	B	0.20	12.5	B	0.20
		PM	24.1	C	0.78	14.8	B	0.50
A	SE Dodge Park Boulevard / Site Access A	AM	10.0	B	0.12	10.0	B	0.12
		PM	11.2	B	0.36	11.2	B	0.36
B	SE Bluff Road / Site Access B	AM	6.4	A	0.22	6.6	A	0.22
		PM	12.3	B	0.44	12.2	B	0.44

As shown in Table 8, distributing approximately 52% of Commuter traffic along Route 3 through Site Access B, while maintaining all other worst-case distributions for Commuters and Trucks, allows for all study intersections to perform at acceptable levels of service. A simple travel demand management strategy which assigns Commuters with specific entry and exit points (Access A or B) would achieve this distribution and mitigate the level of service issues which otherwise could be created by Project

traffic during peak construction conditions, including during the roadway closures necessary for pipeline construction.

The results of the analysis may also be applied to a scenario where Site Access B is not available for some time during the construction period. For this scenario, a TDM measure that reduces the total number of vehicles utilizing Site Access A to 387 or fewer total peak hour vehicles (Commuter and Truck combined) will allow the study intersections to meet performance standards.

Agricultural Business Access

Roadways with field access impacts to agricultural businesses include SE Oxbow Drive, SE Lusted Road, SE Dodge Park Boulevard, SE Bluff Road, and SE Altman Road. Farm traffic will be maintained through work zone full closures when no alternative field access is possible. Pipeline construction will be sequenced to minimize farm detours and impacts during seasonal peaks for agricultural traffic.

Outreach to farmers by the CM/CG throughout construction will ensure their access needs will be addressed. Farmer outreach will include the following information:

- Farmers will be notified ahead of time when increased deliveries of construction supplies are planned.
- Farm, residential, and business accesses necessary to be maintained during the construction process.
- Which larger agricultural equipment and heavy vehicles need to be facilitated.
- Construction schedules.
- Agricultural vehicle routes between sites.

Haul Routes

Primary haul routes have been developed by the CM/GCs and are considered in the traffic analysis above as Truck Routes 1-4 (and corresponding Distribution Scenarios 1-4). As noted above, the Distribution Scenarios represent a conservative analysis by assuming that all Trucks are taking a single route, to ensure that even with 100% of Trucks on one of Routes 1-4, any issues are identified and addressed. This is a conservative analysis because Trucks will instead be dispersed among Routes 1-4 and because alternative haul routes exist that will disperse trucks through the transportation system. Examples of alternative haul route roadways include SE Pleasant Home Road, SE 352nd Avenue, SE Compton Road, and SE 282nd Avenue. For all Distribution Scenarios, no operational or capacity impacts were identified, and no mitigations are recommended with regard to Truck routes.

Emergency Vehicle and Bus Routes

During all lane and full roadway closures, emergency vehicle access will be maintained. For school bus routes, PWB and the CM/GCs will coordinate with the schools and districts on schedules, bus routes that need to be maintained, and bus routes that can be temporarily modified.

Schools

There are four schools along or near anticipated and possible Project construction traffic routes:

- Oregon Trail Academy – 36225 Proctor Rd, Boring, OR 97009
- Sam Barlow High School – 5105 SE 302nd Ave, Gresham, OR 97080

- West Orient Middle School – 29805 SE Orient Dr, Gresham, OR 97080
- East Orient Elementary School – 7431 SE 302nd Ave, Gresham, OR 97080

Sam Barlow High School and West Orient Middle School are located along (or are shown to have vehicle queueing along) roadways that are likely to be impacted by construction traffic. As such, queueing observations were conducted at these schools.

Oregon Trail Academy (OTA) is located along Bluff Road, with student drop-off/pick-up traffic queueing along SE Proctor Road to the east of Bluff Road. Proctor Road is not expected to have significant construction traffic. Because of the school's proximity to the proposed Site Access B location on SE Bluff Road, queueing observations were conducted at OTA.

East Orient Middle School is located on SE 302nd Avenue, which is not a primary truck route or commuter route and is not anticipated to have significant construction traffic. As such, this school was not observed for queueing.

CM/GCs will take note of start and end times for these schools (listed below) when developing delivery schedules for transporting materials to avoid impacting the schools and creating delays due to construction traffic. Contractors will allot an additional 20 minutes before school starts in the morning and an additional 20 minutes before and after school ends in the afternoon to allow for school-related traffic to dissipate. The start and end times as of May 2023 are as follows:

- Oregon Trail Academy – 7:45 AM and 2:45 PM
- Sam Barlow High School – 7:35 AM (8:35 AM Wednesday) and 2:30 PM
- West Orient Middle School – 9:05 AM (10:05 AM Wednesday) and 3:35 PM
- East Orient Elementary School – 8:35 AM and 3:05 PM

Queueing observations were conducted for the start and end times at Sam Barlow High School and West Orient Middle School in March 2023 and at Oregon Trail Academy in May 2023. The observations started 45 minutes before the start and end times for both schools and continued for 15 minutes after those designated times. These observations are summarized in the following subsections.

Oregon Trail Academy

At Oregon Trail Academy, drop-off and pick-up queueing was observed during the following periods:

- Morning – 7:15 AM to 8:00 AM
- Afternoon – 2:15 PM to 3:00 PM

During the morning observation period, vehicles began arriving at the school at 7:20 AM. Vehicles queueing to drop off students were observed to utilize a pass-through route on the school grounds on the south side of Proctor Road to double back on Proctor Road to reach the pick-up location in the drive aisles adjacent to the school building on the north side of the road. Some vehicles parked in the parking lot on the south side of Proctor Road to drop off students, who were then assisted across Proctor Road at a crosswalk by a crossing guard. No queues reached SE Bluff Road. Queues had completely cleared by 8:00 AM. The same queueing characteristics were seen during the afternoon pick-up period. Vehicles began arriving for pick-up at 2:15 PM. By 2:30 PM the three drive aisles on the north side of Proctor Road were full of queued vehicles. By 2:45 PM the drive aisle on the south

side of Proctor Road was full as well, and that is when students began departing. No queues reached Bluff Road. All queues cleared by 3:00 PM.

Since construction traffic is not anticipated on SE Proctor Road and since no queueing impacts were seen for SE Bluff Road, no mitigations are recommended.

Sam Barlow High School

At Sam Barlow High School, queueing involving cars and buses was observed to be present along SE Lusted Road and SE 302nd Avenue during the start time observation period consistent with students arriving to school by car and bus in the morning. Cars and buses arriving from the southeast along SE 302nd Avenue were observed to turn left onto SE Lusted Road and then left again into the school parking lot at the marked accesses 2 and 4. Cars and buses arriving from the west along SE Lusted Road turned right into accesses 2 and 4. Figure 5 shows the school driveways labeled with their driveway numbers and frontage road that wraps around the north and east sides of the school where buses queue.

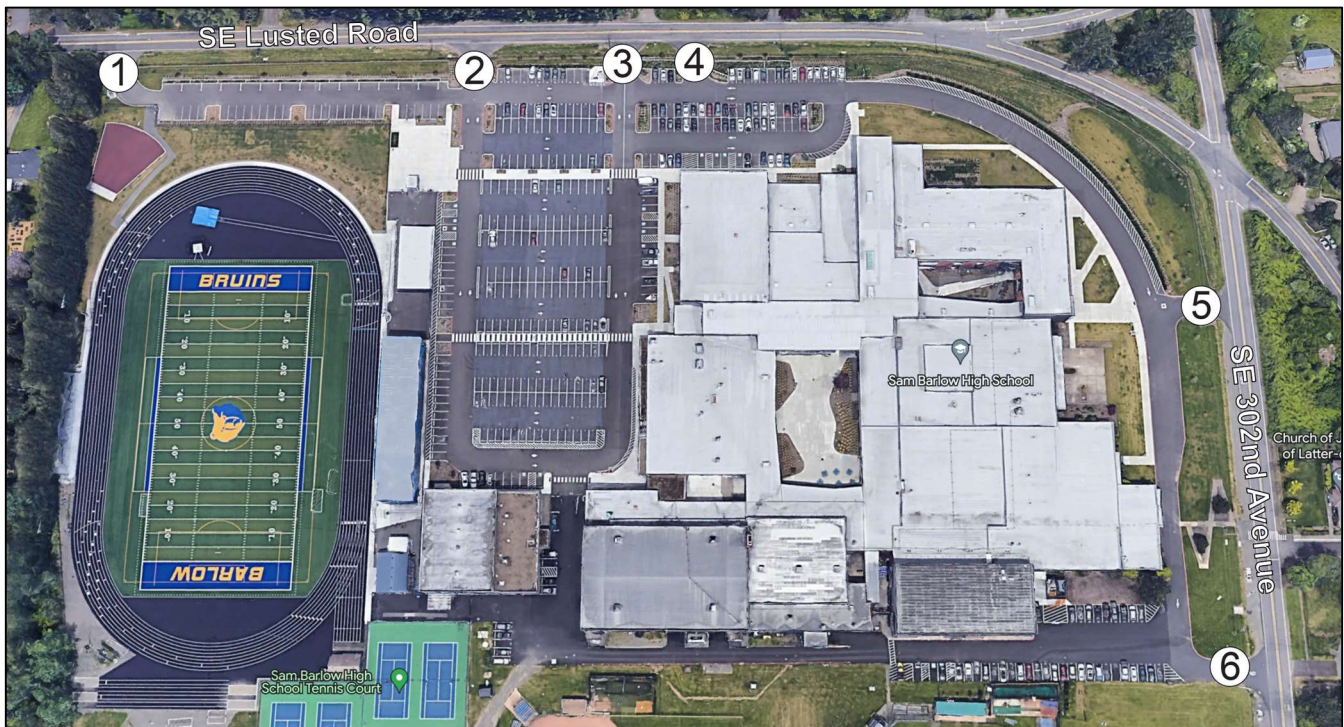


Figure 5: Sam Barlow School Accesses

Significant queueing from all directions began at 7:15 AM, 20 minutes before the first bell at 7:35AM. Queues for vehicles traveling westbound on SE Lusted Road stretched through the intersection at SE 302nd Avenue and back to approximately the driveway at 5100 SE 302nd Ave, Gresham, OR 97080, just north of the school's access 5. Eastbound queues on SE Lusted Road were observed to be up to 10 vehicles in length. Cars entering access 2 created a zipper-type control scenario where eastbound and westbound vehicles took turns entering the school parking lot. The longest queues took up to three minutes to dissipate. All queueing was dissipated by 7:35 AM. No significant queueing was observed east of SE 302nd Avenue on either SE Lusted Road or SE Pipeline Road.

No queues on any of the public roadways were observed in the afternoon after school ended at 2:30 PM. Buses began arriving at the school to take students home at approximately 2:05 PM. All of the after-school queueing occurred along the school's on-site frontage road that wraps around the building, and within the parking lot. All vehicles that queued up to leave after school ended cleared the parking lot and the school vicinity by 2:45 PM.

During both the start and end of school observations, one student was observed walking along SE Lusted Road west of SE 302nd Avenue. Up to five students were observed walking along SE 302nd Avenue south of SE Lusted Road during both periods as well.

West Orient Middle School

At West Orient Middle School, queueing was observed along SE Orient Drive in the vicinity of the school during the morning drop-off and afternoon pick-up periods. Both periods showed similar queueing characteristics. The following start and end times for vehicle queueing were observed:

- Morning drop-off – 8:35 AM to 9:15 AM
- Afternoon pick-up – 3:00 PM to 3:45 PM

During both observation periods, cars carrying students to and from the school queued within a pull-through area adjacent to the school building on SE Orient Drive and the parking lot east of that pull-through area. Cars also queued on the side of the road on both sides of SE Orient Drive, partially or fully obstructing driveways and other accesses to neighboring properties between SE Short Road and the driveway at 29925 SE Orient Drive. During drop-off and pick-up, students crossed the street at the marked crosswalk at the east end of the school building with the aid of a crossing guard. While the crossing guard helped students cross, queues of up to 10 vehicles would form on SE Orient Drive.

To avoid impacting schools and to reduce construction traffic related delays, construction traffic will avoid SE Lusted Road and SE 302nd Avenue in the vicinity of Sam Barlow High School for 20 minutes before and after the start and end times of school; and construction traffic will avoid SE Orient Drive in the vicinity of West Orient Middle School for 20 minutes before and after the start and end times of school.

RESULTS

A traffic impact study was conducted for the construction traffic related to the development of the Filtration Facility and associated pipelines located in Multnomah County, Oregon. Two proposed site accesses and 15 existing intersections were identified for evaluation under this analysis:

1. SE Oxbow Drive / SE Altman Road (Multnomah County)
2. SE Oxbow Drive / SE Hosner Road (Multnomah County)
3. SE Lusted Road / SE Altman Road (Multnomah County)
4. SE Lusted Road / SE Cottrell Road (Multnomah County)
5. SE Dodge Park Boulevard / SE Altman Road (Multnomah County)
6. SE Dodge Park Boulevard / SE Cottrell Road (Multnomah County)
7. SE Carpenter Lane / SE Altman Road (Multnomah County)
8. SE Carpenter Lane / SE Cottrell Road (Multnomah County)
9. SE Bluff Road / SE Altman Road (Clackamas County)

10. SE Bluff Road / SE Cottrell Road (Clackamas County)
11. SE Bluff Road / SE Proctor Road (Clackamas County)
12. SE Dodge Park Boulevard / SE Lusted Road (Clackamas County)
13. SE Lusted Road / SE Hudson Road (Clackamas County)
14. SE Lusted Road / SE 302nd Avenue (Multnomah County)
15. SE Bluff Road / SE Orient Drive (Multnomah County)
- A. SE Carpenter Lane at Site Access A
- B. SE Bluff Road at Site Access B

A safety analysis was conducted to examine the existing physical conditions and evaluate safety concerns along study roadways and intersections. Most of the roadways and intersections showed acceptable pavement conditions, lane and shoulder widths, and sight lines to adequately serve construction traffic. As discussed above, areas of potential concern identified during the evaluation include:

- SE Lusted Road: SE Lusted Road shows fair-to-poor pavement conditions in the roadway curves east of SE Cottrell Road. The PCI score for this segment is 61.08. This section of roadway is not planned to be utilized as a route for Project construction traffic. For this reason, no mitigation is recommended for this section of roadway.
- SE Altman Road: The PCI score for SE Altman Road is 43.59 north of SE Lusted Road and 20.06 south of SE Lusted Road. SE Altman Road is narrow with unpaved shoulders and no pavement markings in the study area. The southbound stop-controlled approach to the intersection of SE Altman Road at SE Bluff Road has a steep incline grade that meets the superelevation of SE Bluff Road. This can create slow acceleration for large construction vehicles. SE Altman Road is not planned as a haul route between SE Dodge Park Boulevard and SE Bluff Road, so no mitigations are recommended for this segment. Segments north of Dodge Park can accommodate construction traffic within the posted speeds from an operational perspective.
- SE Carpenter Lane: SE Carpenter Lane is narrow and unmarked between SE Altman Road and the proposed Access A. The pavement is in poor condition with cracking and potholes. The PCI grade for Carpenter Lane between Altman Road and “End of Pavement” is 22.48.

The segment between SE Altman Road and SE Cottrell Road is not planned for construction traffic. Therefore, no mitigation is recommended for that segment of SE Carpenter Road. Construction traffic will use SE Carpenter Lane between SE Cottrell Road and Access A at the northwest corner of the Filtration Facility. Therefore, pavement improvements to that segment of SE Carpenter Lane are recommended as mitigation to correct this condition and will be made as part of the Project prior to commencing significant trucking for material import/export.

- SE Cottrell Road: The PCI grade for SE Cottrell Road is 55.46 north of SE Dodge Park Boulevard and 65.03 south of SE Dodge Park Boulevard. These roadway segments showed fair pavement conditions that can accommodate construction traffic. The segment between SE Dodge Park Boulevard and SE Carpenter Lane is part of the primary route to Access A and will therefore be improved as part of the Project prior to commencing construction truck traffic for materials import/export.
- SE Hosner Road: The PCI grade for SE Hosner Road is 40.53 between SE Oxbow Drive and

SE Lusted Road. This roadway segment showed fair pavement conditions that can accommodate construction traffic.

Based on the information available at the time of this report, with the incorporation into the Project of the recommended improvements to Carpenter Lane and Cottrell Road noted above, there are no concerns with the physical condition of study roadways and intersections being able to safely serve both construction traffic and existing background traffic during construction. In addition, the Portland Water Bureau is committed to maintaining in serviceable condition throughout project construction the following roadway segments expected to be used for primary haul routes and detours:

- SE Altman Road – between SE Oxbow Drive and Dodge Park Road
- SE Cottrell Road – between SE Lusted Road and SE Dodge Park Road
- SE Lusted Road – between SE Altman Road and SE Cottrell Road
- SE Hosner Road – between SE Lusted Road and SE Oxbow Drive

Trip generation and distribution analyses were completed for the peak construction traffic modeled for 2025 based on the anticipated construction peak year. Trip distribution for all Project site trips was modeled with two accesses: on SE Carpenter Lane and SE Bluff Road. Trip distribution results are provided in Appendix C. Intersection performance was analyzed for the following conditions:

- 2022 Existing Conditions
- 2025 Peak Construction Traffic Conditions
 - Distribution Scenario 1
 - Distribution Scenario 2
 - Distribution Scenario 3
 - Distribution Scenario 4

The intersection LOS was analyzed based on procedures described in the HCM. Multnomah County Design Standards specify that facilities shall be designed to accommodate LOS C or better during the design hour in rural areas. Clackamas County Comprehensive Plan utilizes LOS E or better for unsignalized intersections in rural areas during AM and PM peak hours.

This analysis shows that all study intersections will meet performance standards established by Multnomah and Clackamas counties for all Distribution Scenarios except for SE Carpenter Lane / SE Cottrell Road under all 2025 Peak Construction conditions and SE Dodge Park Boulevard / SE Altman Road for Scenario 2 only. SE Carpenter Lane / SE Cottrell Road falls below standards for the AM peak hour due to delays created by construction traffic experienced by the minor stop-controlled west leg of the intersection where fewer than five vehicles during the peak period will experience delays. SE Dodge Park Boulevard / SE Altman Road meets performance standards for Scenarios 1, 3, and 4 that show Commuter traffic traveling through the intersection but falls below standards for Scenario 2 where Truck traffic is added. The TDM strategies recommended in the Mitigation Analysis section above will alleviate these issues.

Partial and total roadway closures will be necessary to complete pipeline construction along several study roadways. The impacts of these closures were studied using volumes from the 2025 Peak Construction Traffic Conditions Distribution Scenario 2, and detour routes were identified for roadway closures along study roadways. Capacity analyses were conducted for the two paired roadway closure

scenarios and showed that some study intersections fall below standards based on the worst-case local detours.

A Mitigation Analysis was conducted to determine if alternative peak hour trip distribution for the roadway closure scenarios will allow all study intersections to meet standards. Re-distributing Commuter vehicles such that 52% of all peak hour commuters utilize Route 3 (through Site Access B) while maintaining all other detoured peak hour trips allows for all intersections to meet performance standards. A simple TDM strategy that assigns Commuter vehicles in this manner between Accesses A and B will allow all intersections to meet standards for all analysis scenarios. If Site Access B is not available, additional analysis shows the other available TDM strategies discussed will allow all intersections to meet standards during any analysis scenario.

Nearby schools, agricultural uses, and emergency vehicle needs were examined. Queueing observations were made during school drop-off and pick-up at Sam Barlow High School, West Orient Middle School, and Oregon Trail Academy. Most school-related queueing occurs within approximately a 40-minute window around drop-off and pick-up times. CM/GCs will be instructed to avoid roadway segments adjacent to Sam Barlow High School and West Orient Middle School for 20 minutes before and after the start and end times of school to reduce potential conflict with school vehicles and pedestrians and to reduce construction delays.

School bus routes may vary over the course of construction based on changes in ridership. These routes are evaluated annually by the bussing companies. Coordination will be done to accommodate their routes and any adjustments needed within those routes.

The CM/GCs will coordinate with agricultural uses to maintain access to their fields.

All emergency vehicles will be accommodated throughout construction. Communication will be maintained throughout the duration of the Project to keep neighbors apprised of schedule updates and Project changes.

Overall, this study concludes that impacts to intersection and roadway operations due to construction traffic from the Project will be minimal even under conservative analysis assumptions, such as all Truck trips taking a single haul route, and during roadway closures needed for pipeline construction. The minimal potential impacts will be mitigated effectively by the Project's inclusion of TDM strategies outlined in the Mitigations Section. No other mitigation is recommended to ensure that study area roadways and intersections are able to meet standards and safely serve both Project traffic and existing background traffic during construction.

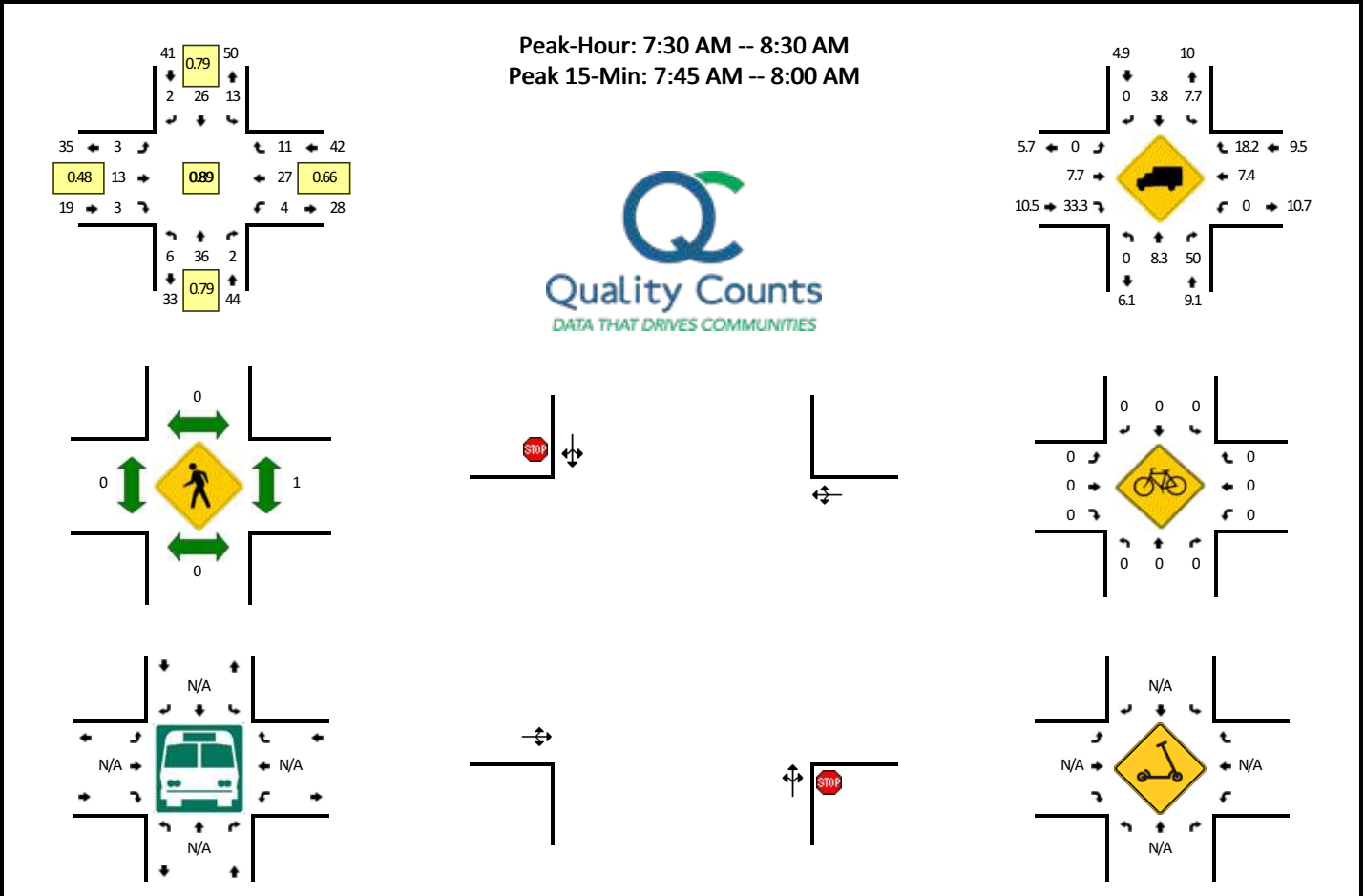
Appendix

Appendix A: Traffic Count Data

LOCATION: Altman Road -- Lusted Road
CITY/STATE: Multnomah, OR

QC JOB #: 15711501
DATE: Wed, Feb 23 2022

Peak-Hour: 7:30 AM -- 8:30 AM
 Peak 15-Min: 7:45 AM -- 8:00 AM

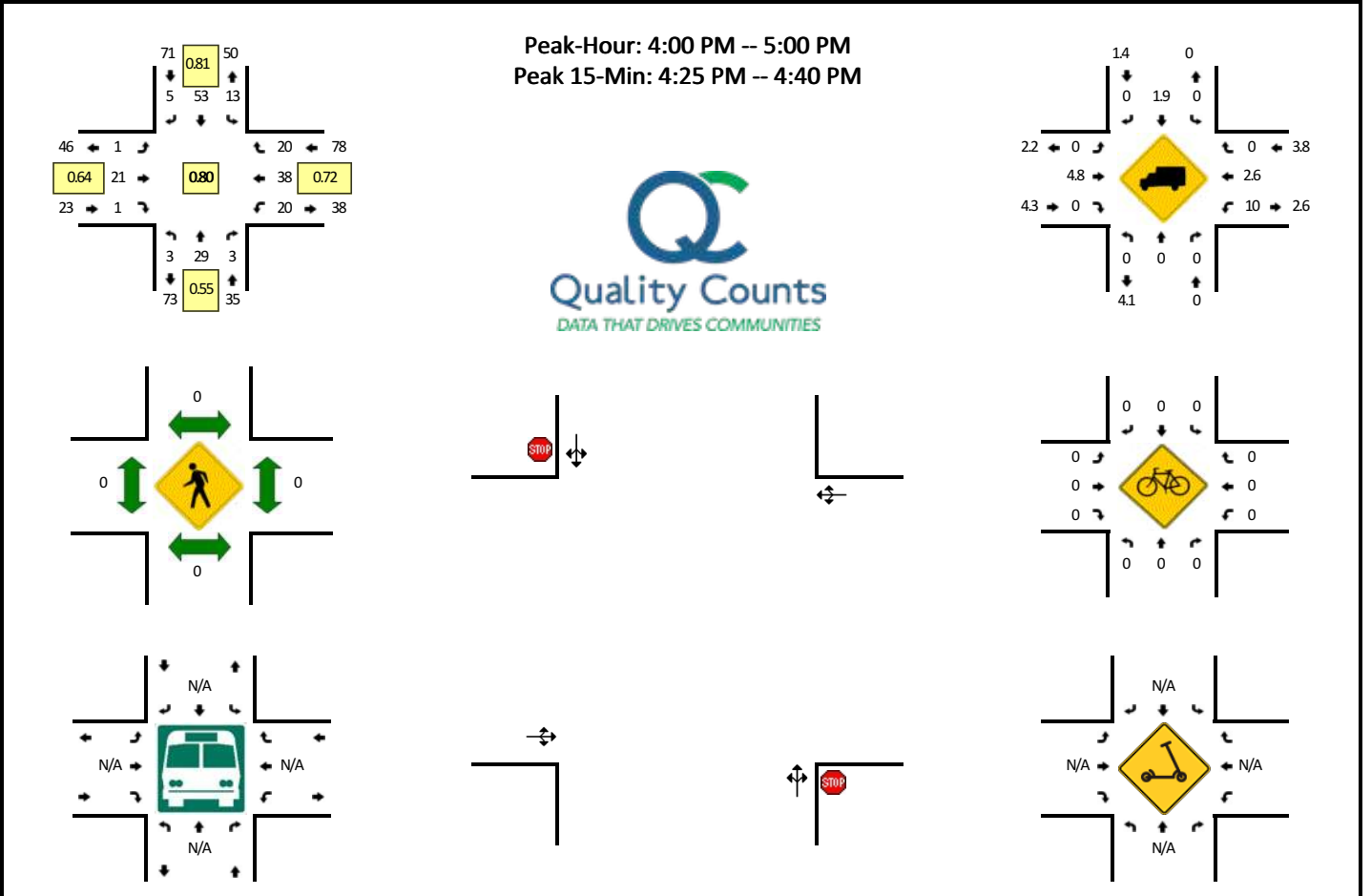


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U					
7:00 AM	0	4	0	0	0	1	0	0	0	0	3	0	0	0	0	1	1	0	0	10	
7:05 AM	0	2	1	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	6	
7:10 AM	0	2	0	0	2	3	0	0	0	0	1	0	0	0	0	0	1	0	0	9	
7:15 AM	1	5	2	0	0	3	0	0	0	1	2	0	0	0	0	3	0	0	0	17	
7:20 AM	0	3	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	7	
7:25 AM	0	3	0	0	1	6	0	0	0	1	0	0	0	0	0	2	0	0	0	13	
7:30 AM	0	2	0	0	2	5	0	0	0	0	1	0	0	0	0	2	0	0	0	12	
7:35 AM	0	3	0	0	1	1	0	0	0	0	1	0	0	0	0	3	1	0	0	10	
7:40 AM	0	5	0	0	1	2	0	0	0	0	0	0	0	0	1	2	0	0	0	11	
7:45 AM	0	3	0	0	1	4	0	0	0	0	0	0	0	0	0	3	0	0	0	11	
7:50 AM	1	3	0	0	0	2	1	0	0	0	2	0	0	0	0	2	1	0	0	12	
7:55 AM	1	5	1	0	2	3	0	0	0	0	1	1	0	0	0	2	2	0	0	18	136
8:00 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2	0	0	7	133
8:05 AM	1	1	0	0	1	1	0	0	0	1	0	1	0	0	0	5	3	0	0	14	141
8:10 AM	0	6	1	0	0	1	0	0	0	0	1	0	0	0	0	2	0	0	0	11	143
8:15 AM	2	3	0	0	1	3	0	0	0	2	0	0	0	0	0	1	0	0	0	12	138
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8:50 AM	1	2	0	0	1	3	0	0	0	0	2	0	0	0	0	0	0	0	0	9	133
8:55 AM	0	1	1	0	1	2	0	0	0	0	4	0	0	0	1	3	3	0	0	16	131
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total				
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U					
All Vehicles	8	44	4	0	12	36	4	0	0	12	4	0	0	28	12	0	0	0	164		
Heavy Trucks	0	4	4	0	4	4	0	0	0	0	4	0	0	4	0	0	0	0	24		
Buses																					
Pedestrians		0				0				0				0						0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0				0		
Scoters																				0	

Comments:

LOCATION: Altman Road -- Lusted Road
CITY/STATE: Multnomah, OR

QC JOB #: 15711502
DATE: Wed, Feb 23 2022



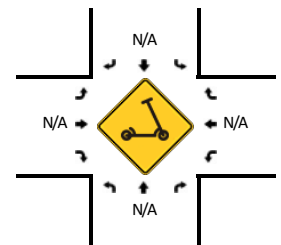
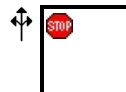
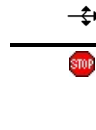
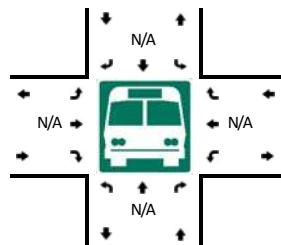
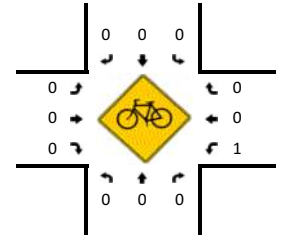
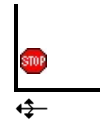
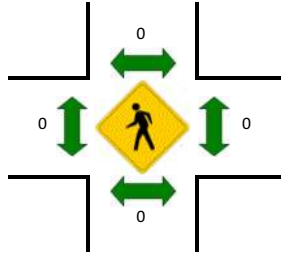
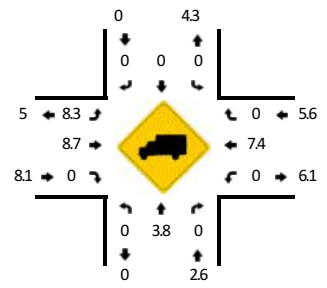
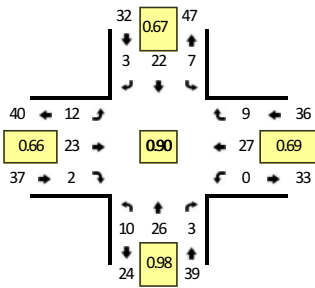
5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:00 PM	0	2	0	0	2	3	0	0	0	2	0	0	0	0	1	1	0	11	
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4:15 PM	0	1	0	0	0	3	0	0	0	0	3	0	0	3	5	1	0	16	
4:20 PM	0	1	0	0	1	7	0	0	0	0	1	0	0	0	2	3	1	16	
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4:35 PM	1	3	1	0	0	5	0	0	0	0	2	0	0	5	10	3	0	30	
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4:50 PM	0	2	0	0	1	4	0	0	0	0	0	0	0	2	1	1	0	11	
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Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	8	48	8	0	0	52	16	0	0	16	4	0	28	60	20	0	260		
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	0	0		4		
Buses																			
Pedestrians		0				0				0				0				0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																		0	

Comments:

LOCATION: Altman Road -- Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 15711503
DATE: Wed, Feb 23 2022

Peak-Hour: 7:00 AM -- 8:00 AM
 Peak 15-Min: 7:35 AM -- 7:50 AM

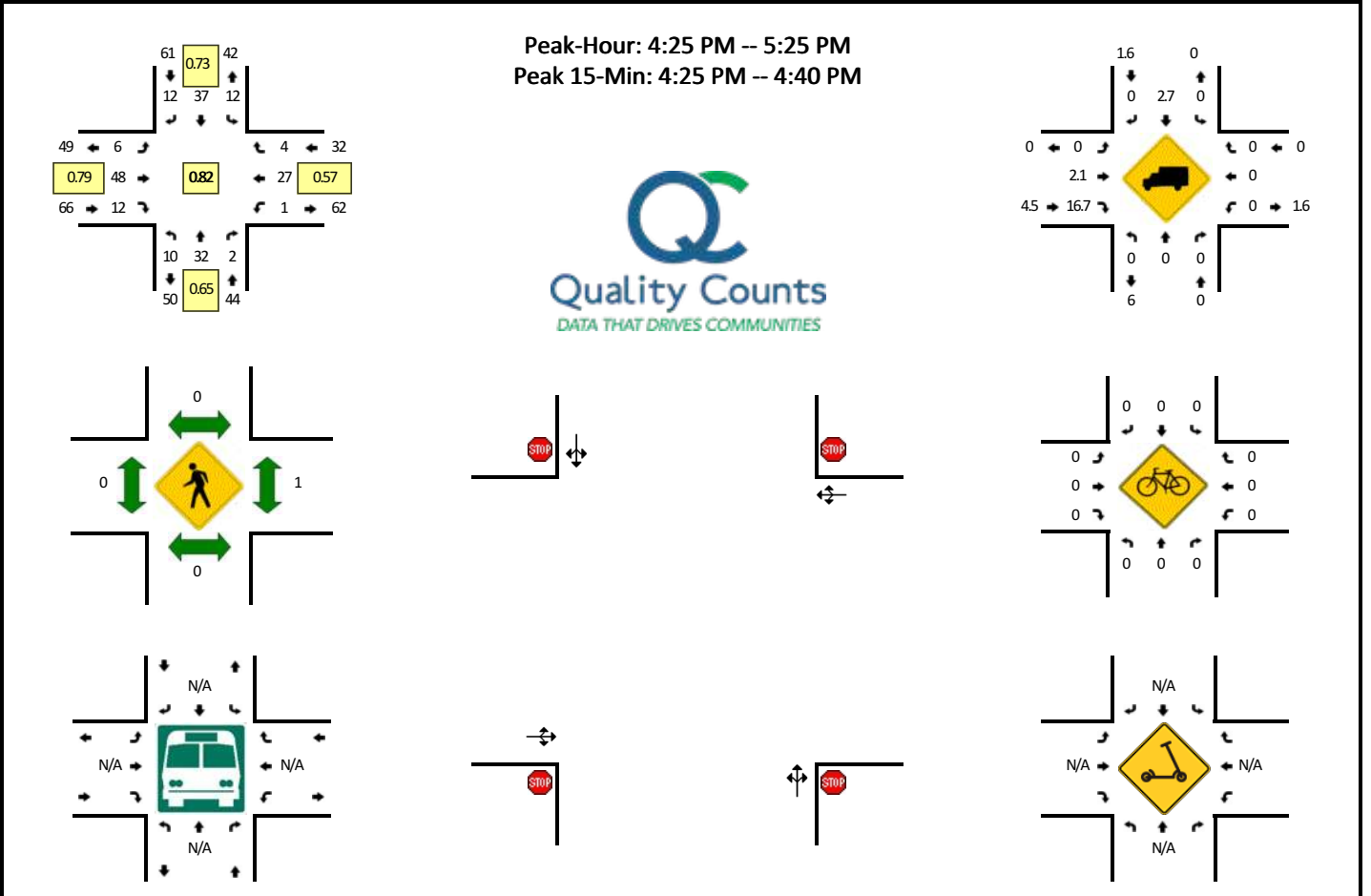


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Dodge Park Blvd (Eastbound)				Dodge Park Blvd (Westbound)				Total	Hourly Totals	
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7:05 AM	2	3	1	0	1	0	0	0	2	4	1	0	0	0	2	0	0	16	
7:10 AM	0	0	0	0	0	3	0	0	1	1	0	0	0	0	2	1	0	8	
7:15 AM	0	3	0	0	0	3	0	0	2	2	1	0	0	0	0	1	0	12	
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7:35 AM	1	2	0	0	1	1	1	0	1	1	0	0	0	0	0	1	0	9	
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Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	12	28	0	0	12	24	4	0	12	28	0	0	0	32	8	0	0	160	
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	8	0	0	0	12	
Buses																		0	
Pedestrians		0				0				0					0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0			0	
Scoters																		0	

Comments:

LOCATION: Altman Road -- Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 15711504
DATE: Wed, Feb 23 2022



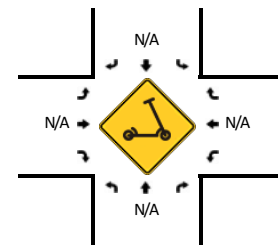
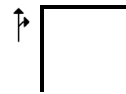
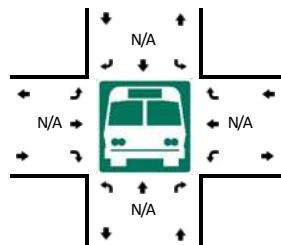
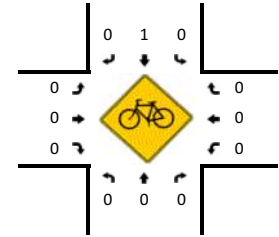
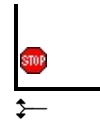
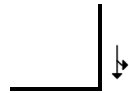
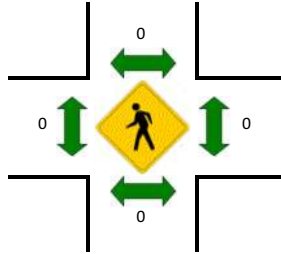
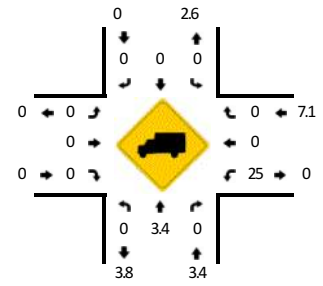
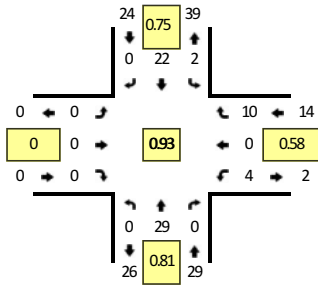
5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Dodge Park Blvd (Eastbound)				Dodge Park Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	2	0	0	0	3	1	0	0	0	0	0	0	5	0	0	12	
4:05 PM	0	2	0	0	1	2	1	0	0	0	0	0	0	2	0	0	8	
4:10 PM	1	1	0	0	1	5	2	0	1	3	1	0	0	2	0	0	17	
4:15 PM	0	1	0	0	1	1	4	0	0	4	1	0	0	2	1	0	15	
4:20 PM	0	2	0	0	0	5	4	0	0	1	2	0	0	0	0	0	14	
4:25 PM	1	6	0	0	2	4	0	0	0	4	0	0	0	3	1	0	21	
4:30 PM	1	2	1	0	0	3	2	0	0	4	1	0	0	1	1	0	16	
4:35 PM	1	4	1	0	3	4	3	0	1	3	2	0	0	3	0	0	25	
4:40 PM	2	4	0	0	0	1	2	0	0	6	1	0	0	0	1	0	17	
4:45 PM	0	3	0	0	1	4	1	0	2	0	3	0	0	2	0	0	16	
4:50 PM	0	1	0	0	1	3	1	0	0	5	0	0	0	3	0	0	14	
4:55 PM	0	2	0	0	0	1	2	0	2	7	2	0	0	2	0	0	18	
5:00 PM	1	5	0	0	2	4	0	0	0	3	0	0	0	0	0	0	15	193
5:05 PM	1	1	0	0	1	3	0	0	0	1	1	0	0	1	0	0	9	196
5:10 PM	2	1	0	0	0	1	0	0	1	6	1	0	0	2	0	0	14	197
5:15 PM	0	1	0	0	0	5	0	0	0	4	1	0	0	4	0	0	15	194
5:20 PM	1	2	0	0	2	4	1	0	0	5	0	0	1	6	1	0	23	199
5:25 PM	0	0	0	0	1	2	0	0	0	7	0	0	0	9	1	0	20	202
5:30 PM	0	4	1	0	0	4	0	0	0	4	0	0	1	2	1	0	17	203
5:35 PM	2	2	0	0	1	2	2	0	1	2	0	0	0	1	0	0	13	191
5:40 PM	0	3	0	0	1	1	0	0	1	2	0	0	0	0	1	0	9	183
5:45 PM	0	2	0	0	2	0	0	0	1	4	1	0	0	1	0	0	11	178
5:50 PM	1	1	0	0	3	6	1	0	2	4	0	0	0	1	0	0	19	183
5:55 PM	1	2	0	0	0	0	1	0	1	2	4	0	0	0	0	0	11	176
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	12	48	8	0	20	44	20	0	4	44	12	0	0	28	8	0	248	
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	0	0		4	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: Altman Road -- Carpenter Lane
CITY/STATE: Multnomah, OR

QC JOB #: 15711505
DATE: Wed, Feb 23 2022

Peak-Hour: 7:00 AM -- 8:00 AM
 Peak 15-Min: 7:05 AM -- 7:20 AM

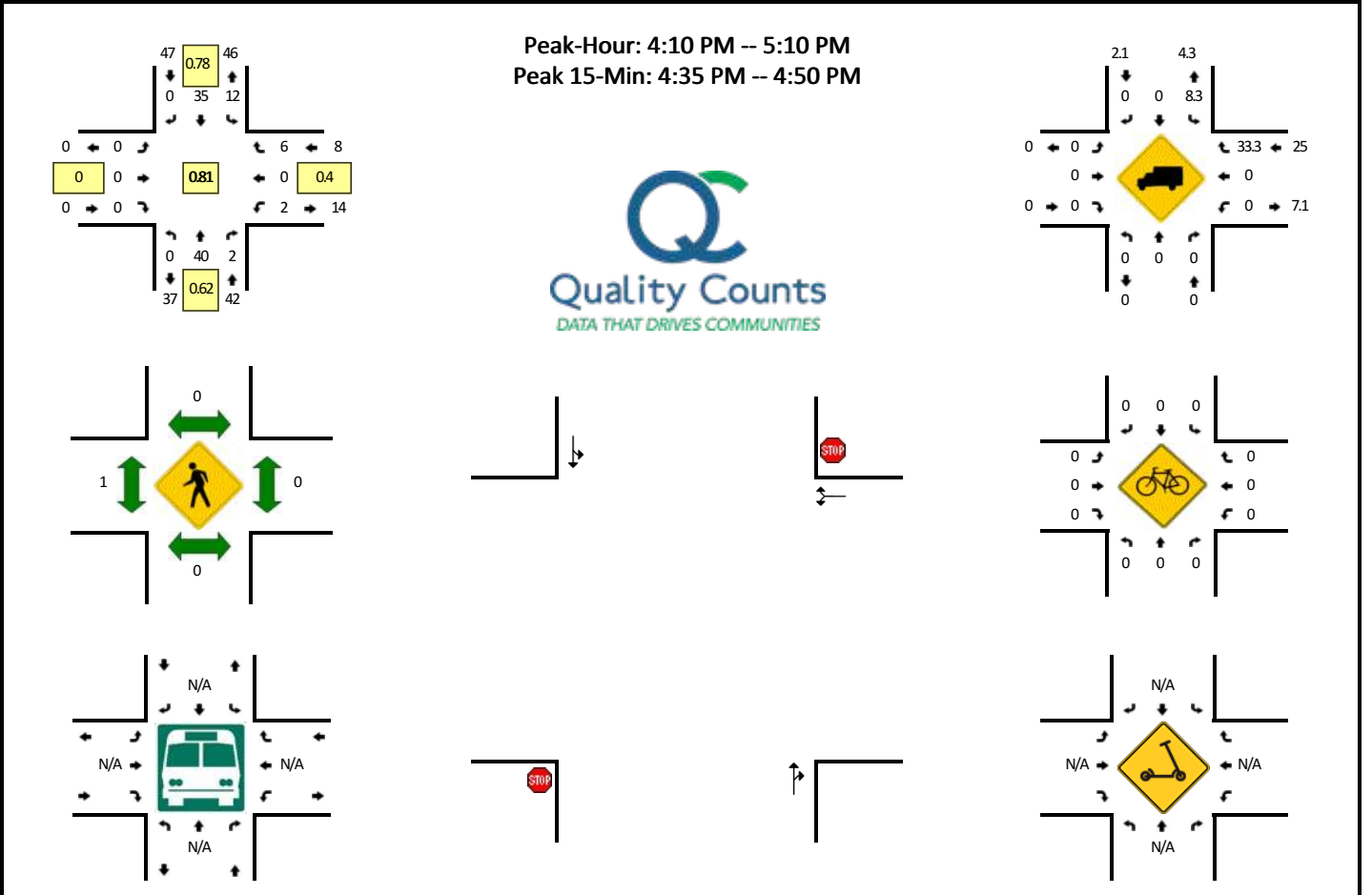


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Carpenter Lane (Eastbound)				Carpenter Lane (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	6	
7:05 AM	0	3	0	0	1	0	0	0	0	0	0	0	0	1	0	2	0	7	
7:10 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	4	
7:15 AM	0	2	0	0	1	3	0	0	0	0	0	0	0	0	0	1	0	7	
7:20 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
7:25 AM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	7	
7:30 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	4	
7:35 AM	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	5	
7:40 AM	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	2	0	8	
7:45 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	4	
7:50 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	5	
7:55 AM	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	7	67
8:00 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	4	65
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
8:10 AM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	58
8:15 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	54
8:20 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	3	54
8:25 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	4	51
8:30 AM	0	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	6	53
8:35 AM	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0	1	0	6	54
8:40 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	5	51
8:45 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	5	52
8:50 AM	0	1	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0	5	52
8:55 AM	0	2	0	0	1	2	0	0	0	0	0	0	0	0	0	1	0	6	51
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	20	0	0	8	24	0	0	0	0	0	0	0	8	0	12	0	72	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																			
Pedestrians		0				0					0				0			0	
Bicycles		0				4					0				0			4	
Scoters																			

Comments:

LOCATION: Altman Road -- Carpenter Lane
CITY/STATE: Multnomah, OR

QC JOB #: 15711506
DATE: Wed, Feb 23 2022

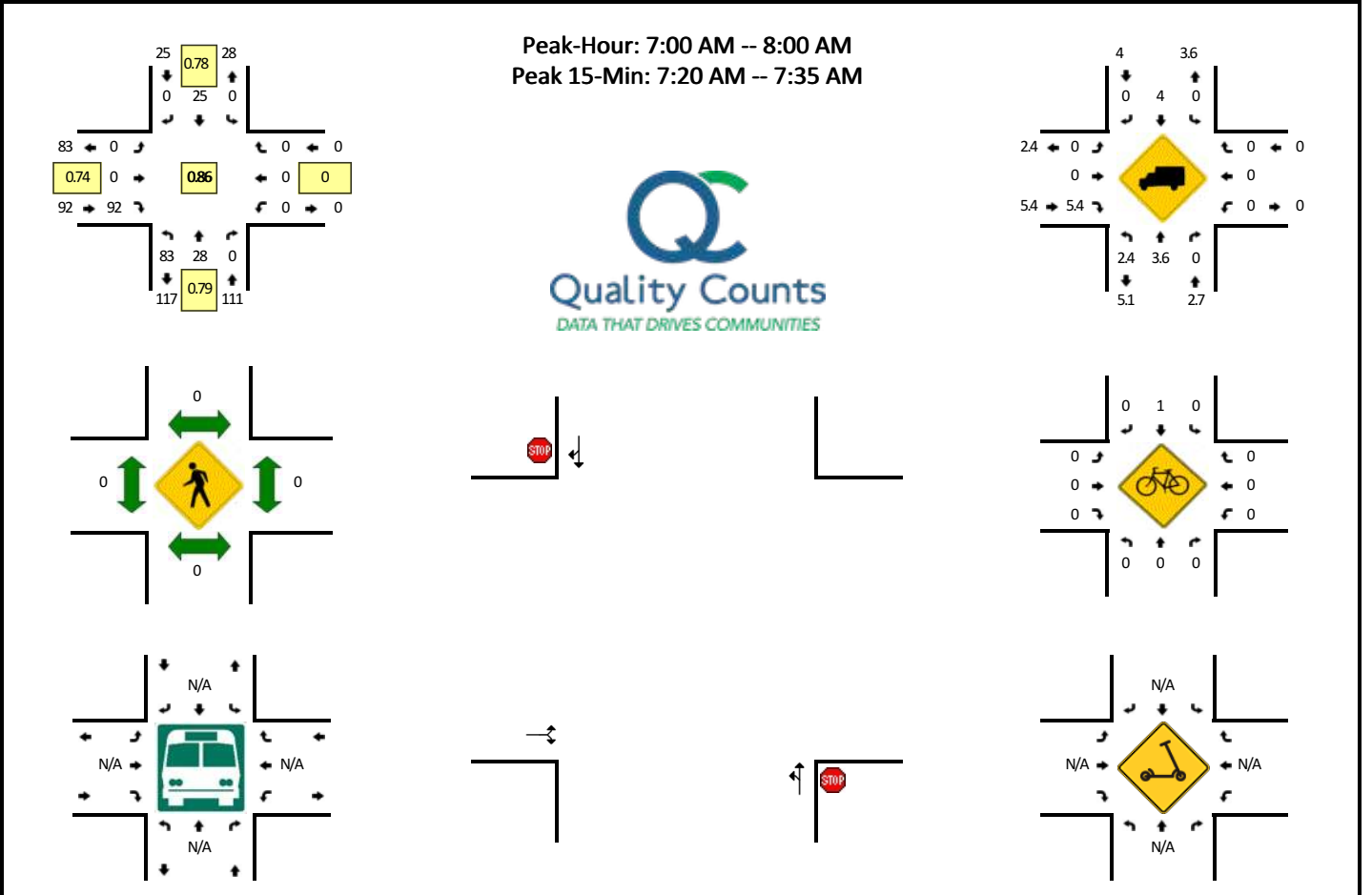


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Carpenter Lane (Eastbound)				Carpenter Lane (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	2	0	0	0	2	0	0	0	0	0	0	2	0	1	0	7	
4:05 PM	0	2	0	0	0	3	0	0	0	0	0	0	1	0	0	0	6	
4:10 PM	0	1	0	0	0	6	0	0	0	0	0	0	1	0	1	0	9	
4:15 PM	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	
4:20 PM	0	3	0	0	3	3	0	0	0	0	0	0	1	0	0	0	10	
4:25 PM	0	6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	9	
4:30 PM	0	4	0	0	2	2	0	0	0	0	0	0	0	0	0	0	8	
4:35 PM	0	7	0	0	0	4	0	0	0	0	0	0	0	0	0	0	11	
4:40 PM	0	6	0	0	2	1	0	0	0	0	0	0	0	0	0	0	9	
4:45 PM	0	2	0	0	4	4	0	0	0	0	0	0	0	0	0	0	10	
4:50 PM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4	
4:55 PM	0	5	2	0	0	1	0	0	0	0	0	0	0	0	0	0	8	94
5:00 PM	0	2	0	0	0	3	0	0	0	0	0	0	0	0	2	0	7	94
5:05 PM	0	2	0	0	0	4	0	0	0	0	0	0	0	0	3	0	9	97
5:10 PM	0	0	0	0	2	1	0	0	0	0	0	0	1	0	1	0	5	93
5:15 PM	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7	97
5:20 PM	0	3	0	0	0	4	0	0	0	0	0	0	1	0	0	0	8	95
5:25 PM	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	4	90
5:30 PM	0	2	0	0	0	5	0	0	0	0	0	0	0	0	2	0	9	91
5:35 PM	0	4	1	0	0	2	0	0	0	0	0	0	1	0	0	0	8	88
5:40 PM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	83
5:45 PM	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	4	77
5:50 PM	0	1	1	0	0	6	0	0	0	0	0	0	0	0	1	0	9	82
5:55 PM	0	1	0	0	2	2	0	0	0	0	0	0	0	0	2	0	7	81
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	60	0	0	24	36	0	0	0	0	0	0	0	0	0	0	120	
Heavy Trucks	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4	
Buses																		
Pedestrians		0				0					4			0			4	
Bicycles	0	0	0		0	0	0			0	0	0	0	0	0		0	
Scoters																		

Comments:

LOCATION: Altman Road -- Bluff Road (north)
CITY/STATE: Clackamas, OR

QC JOB #: 15711507
DATE: Wed, Feb 23 2022

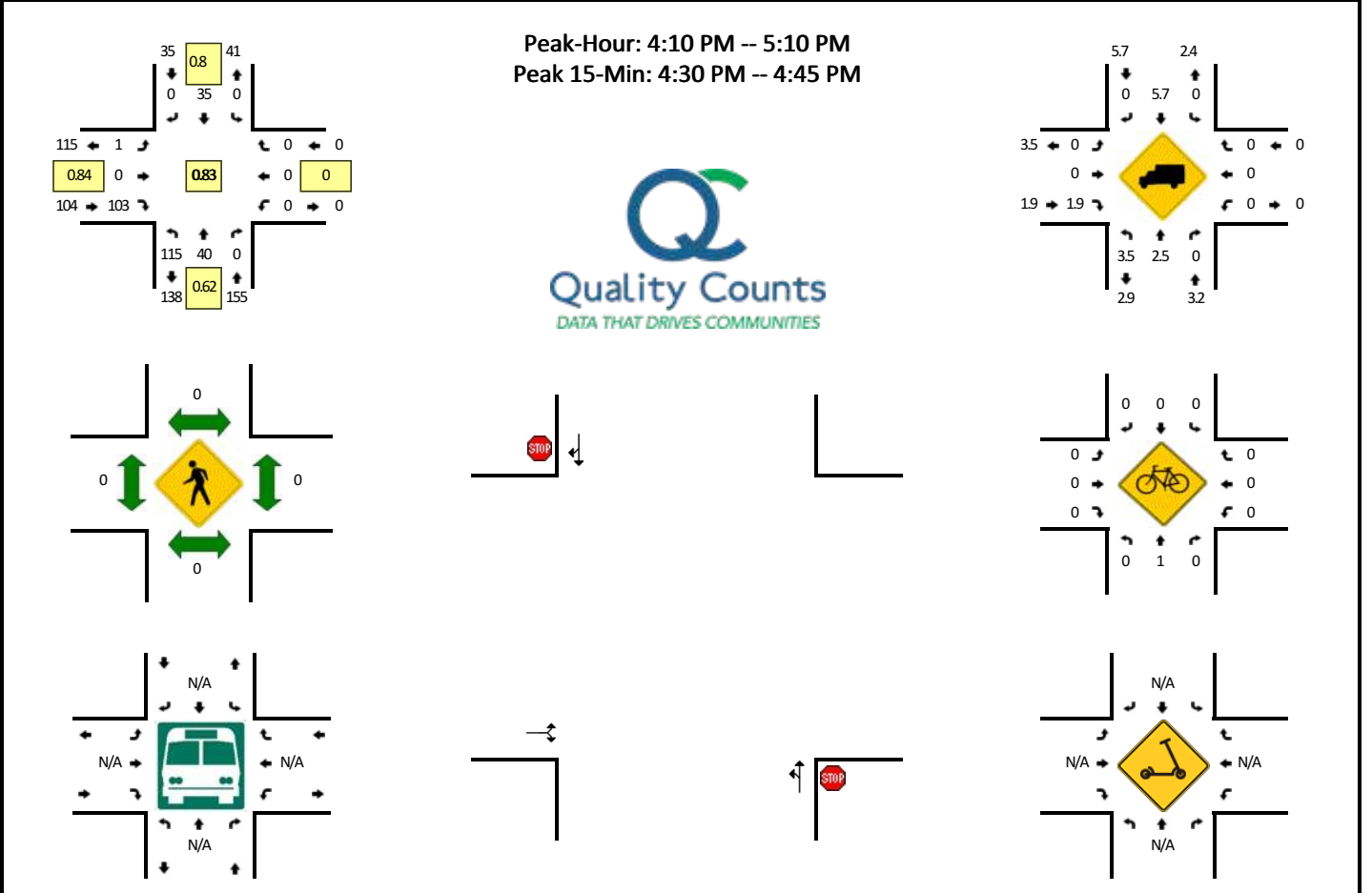


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Bluff Road (north) (Eastbound)				Bluff Road (north) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	4	0	0	0	2	0	0	0	0	0	10	0	0	0	0	19	
7:05 AM	5	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	11	
7:10 AM	7	1	0	0	0	4	0	0	0	0	0	9	0	0	0	0	21	
7:15 AM	9	1	0	0	0	2	0	0	0	0	0	7	0	0	0	0	19	
7:20 AM	6	3	0	0	0	1	0	0	0	0	0	12	0	0	0	0	22	
7:25 AM	10	3	0	0	0	2	0	0	0	0	0	7	0	0	0	0	22	
7:30 AM	6	1	0	0	0	3	0	0	0	0	0	12	0	0	0	0	22	
7:35 AM	8	1	0	0	0	2	0	0	0	0	0	9	0	0	0	0	20	
7:40 AM	4	2	0	0	0	2	0	0	0	0	0	7	0	0	0	0	15	
7:45 AM	12	2	0	0	0	4	0	0	0	0	0	5	0	0	0	0	23	
7:50 AM	11	3	0	0	0	1	0	0	0	0	0	5	0	0	0	0	20	
7:55 AM	2	5	0	0	0	2	0	0	0	0	0	5	0	0	0	0	14	228
8:00 AM	7	1	0	0	0	3	0	0	0	0	0	4	0	0	0	0	15	224
8:05 AM	2	2	0	0	0	0	0	0	0	0	0	4	0	0	0	0	8	221
8:10 AM	1	3	0	0	0	0	0	0	0	0	0	3	0	0	0	0	7	207
8:15 AM	1	2	0	0	0	1	0	0	0	0	0	5	0	0	0	0	9	197
8:20 AM	4	2	0	0	0	1	0	0	0	0	0	2	0	0	0	0	9	184
8:25 AM	2	1	0	0	0	1	0	0	0	0	0	6	0	0	0	0	10	172
8:30 AM	3	1	0	0	0	3	0	0	0	0	0	3	0	0	0	0	10	160
8:35 AM	4	2	0	0	0	2	0	0	0	0	0	4	0	0	0	0	12	152
8:40 AM	8	3	0	0	0	1	0	0	0	0	0	2	0	0	0	0	14	151
8:45 AM	4	1	0	0	0	1	0	0	0	0	0	4	0	0	0	0	10	138
8:50 AM	4	1	0	0	0	2	0	0	0	0	0	4	0	0	0	0	11	129
8:55 AM	4	2	0	0	0	2	0	0	0	0	0	4	0	0	0	0	12	127
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	88	28	0	0	0	24	0	0	0	0	0	124	0	0	0	0	264	
Heavy Trucks	4	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	12	
Buses																	0	
Pedestrians		0				0					0			0			0	
Bicycles	0	0	0		0	0	0			0	0	0		0	0		0	
Scooters																	0	

Comments:

LOCATION: Altman Road -- Bluff Road (north)
CITY/STATE: Clackamas, OR

QC JOB #: 15711508
DATE: Wed, Feb 23 2022

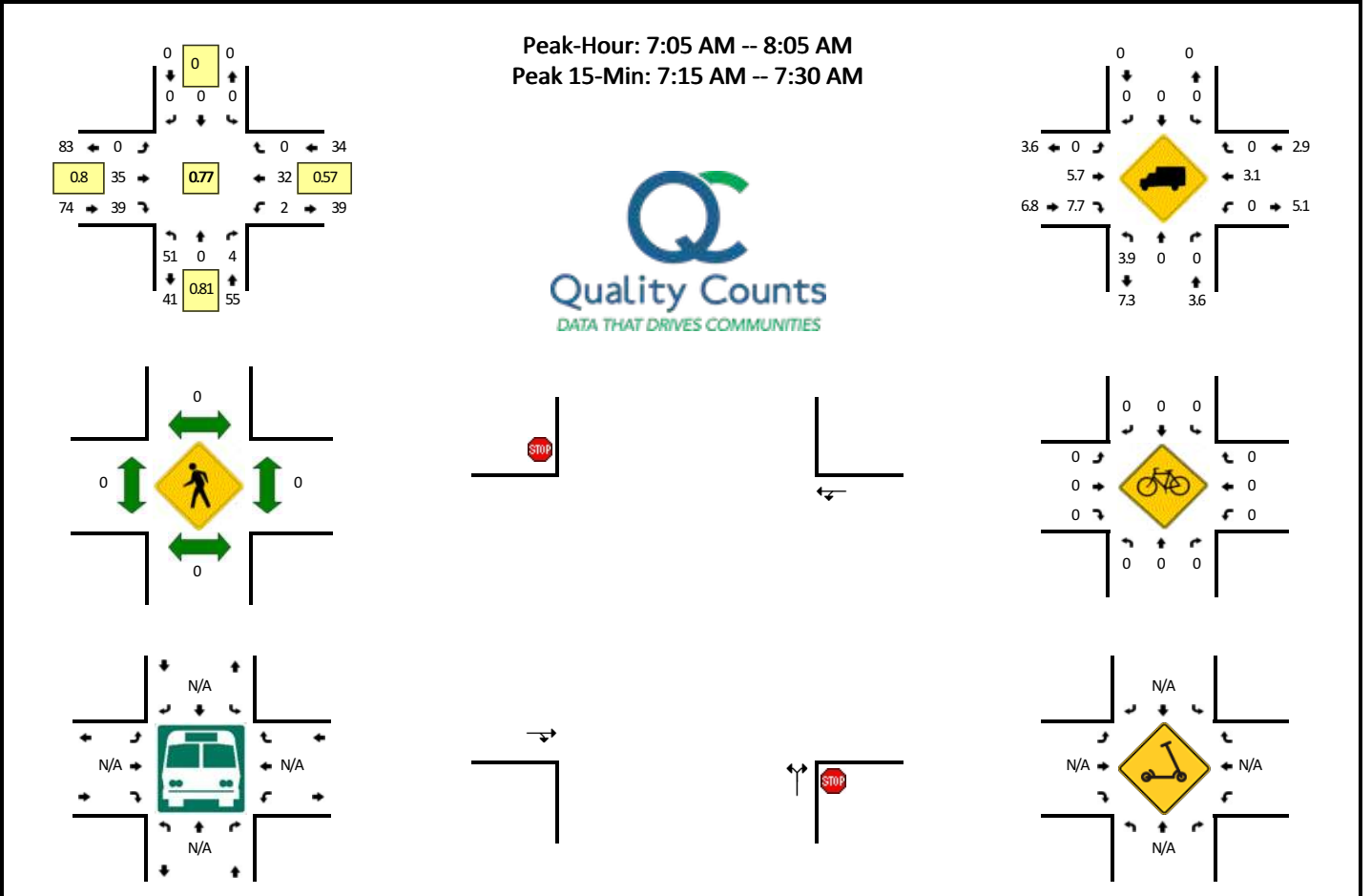


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Bluff Road (north) (Eastbound)				Bluff Road (north) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	2	0	0	0	2	1	0	0	0	0	3	0	0	0	0	11	
4:05 PM	7	1	0	0	0	4	0	0	0	0	0	7	0	0	0	0	19	
4:10 PM	13	1	0	0	0	8	0	0	0	0	0	15	0	0	0	0	37	
4:15 PM	7	1	0	0	0	1	0	0	0	0	0	7	0	0	0	0	16	
4:20 PM	5	5	0	0	0	2	0	0	0	0	0	9	0	0	0	0	21	
4:25 PM	9	3	0	0	0	4	0	0	0	0	0	7	0	0	0	0	23	
4:30 PM	10	7	0	0	0	2	0	0	0	0	0	6	0	0	0	0	25	
4:35 PM	21	6	0	0	0	2	0	0	0	0	0	2	0	0	0	0	31	
4:40 PM	14	5	0	0	0	2	0	0	0	0	0	12	0	0	0	0	33	
4:45 PM	10	2	0	0	0	2	0	0	0	0	0	9	0	0	0	0	23	
4:50 PM	5	1	0	0	0	5	0	0	0	0	0	10	0	0	0	0	21	
4:55 PM	6	6	0	0	0	1	0	0	0	0	0	8	0	0	0	0	21	281
5:00 PM	4	1	0	0	0	4	0	0	0	1	0	7	0	0	0	0	17	287
5:05 PM	11	2	0	0	0	2	0	0	0	0	0	11	0	0	0	0	26	294
5:10 PM	6	0	0	0	0	4	0	0	0	0	0	7	0	0	0	0	17	274
5:15 PM	6	2	0	0	0	5	0	0	0	0	0	10	0	0	0	0	23	281
5:20 PM	4	2	0	0	0	5	0	0	0	0	0	9	0	0	0	0	20	280
5:25 PM	3	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	7	264
5:30 PM	5	3	0	0	0	5	0	0	0	0	0	13	0	0	0	0	26	265
5:35 PM	12	5	0	0	0	3	0	0	0	0	0	8	0	0	0	0	28	262
5:40 PM	2	2	0	0	0	2	0	0	0	0	0	6	0	0	0	0	12	241
5:45 PM	5	4	0	0	0	0	0	0	0	0	0	8	0	0	0	0	17	235
5:50 PM	4	2	0	0	0	5	0	0	0	0	0	8	0	0	0	0	19	233
5:55 PM	5	1	0	0	0	2	1	0	0	0	0	6	0	0	0	0	15	227
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	180	72	0	0	0	24	0	0	0	0	0	80	0	0	0	0	356	
Heavy Trucks	0	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0	8	
Buses																		
Pedestrians		0				0					0			0			0	
Bicycles	0	4	0		0	0	0			0	0	0		0	0		4	
Scoters																		

Comments:

LOCATION: Altman Road -- Oxbow Drive
CITY/STATE: Multnomah, OR

QC JOB #: 15711511
DATE: Wed, Feb 23 2022

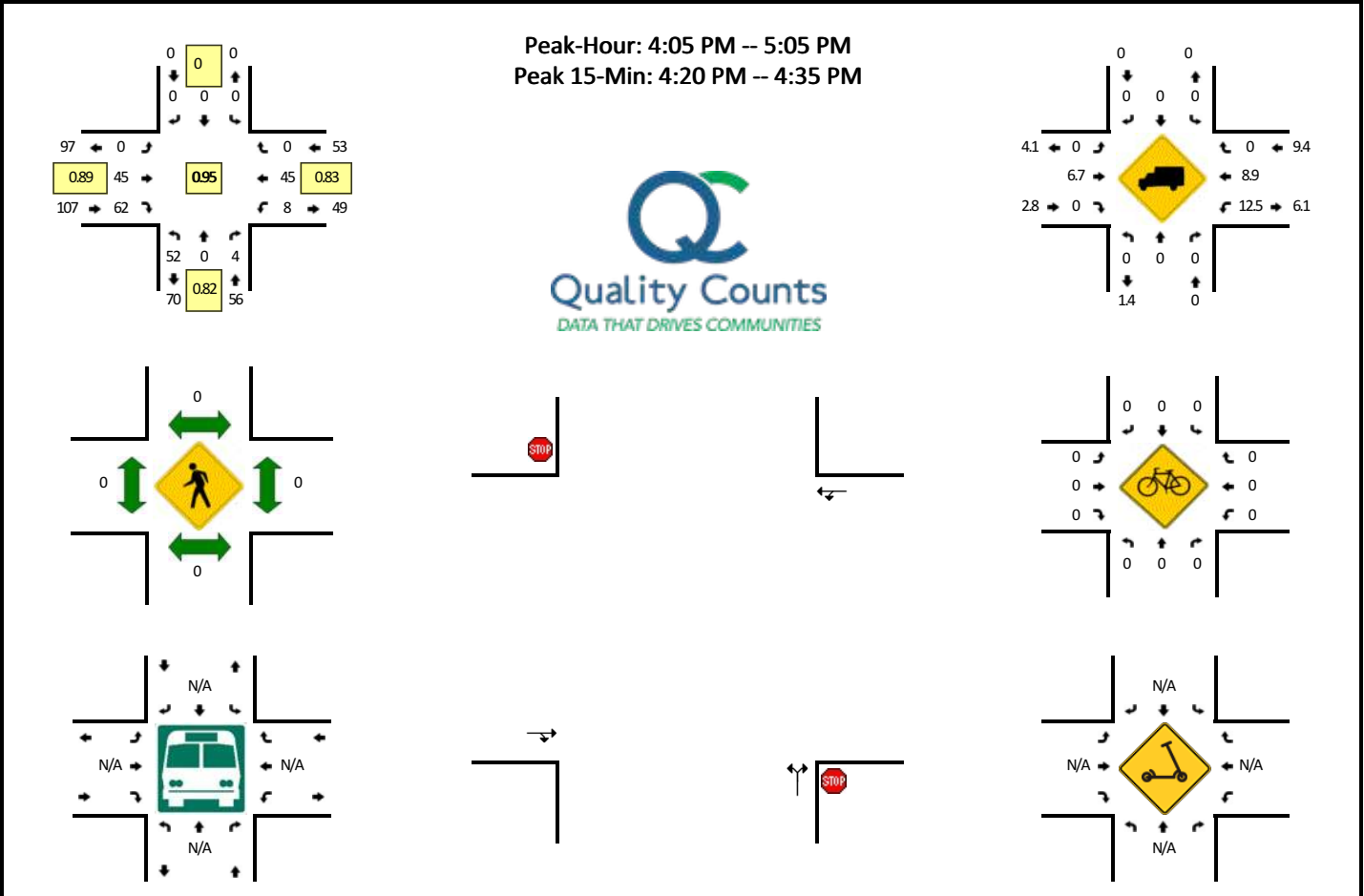


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Oxbow Drive (Eastbound)				Oxbow Drive (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	3	0	2	0	0	0	0	0	0	3	1	0	0	0	0	0	9	
7:05 AM	4	0	1	0	0	0	0	0	0	2	2	0	0	0	0	0	9	
7:10 AM	4	0	0	0	0	0	0	0	0	3	4	0	0	2	0	0	13	
7:15 AM	5	0	0	0	0	0	0	0	0	5	3	0	0	5	0	0	18	
7:20 AM	6	0	0	0	0	0	0	0	0	4	1	0	0	5	0	0	16	
7:25 AM	4	0	0	0	0	0	0	0	0	3	7	0	1	4	0	0	19	
7:30 AM	2	0	0	0	0	0	0	0	0	1	6	0	0	3	0	0	12	
7:35 AM	3	0	1	0	0	0	0	0	0	5	1	0	1	2	0	0	13	
7:40 AM	5	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0	9	
7:45 AM	2	0	1	0	0	0	0	0	0	3	3	0	0	2	0	0	11	
7:50 AM	4	0	1	0	0	0	0	0	0	1	3	0	0	6	0	0	15	
7:55 AM	7	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	17	161
8:00 AM	5	0	0	0	0	0	0	0	0	3	1	0	0	2	0	0	11	163
8:05 AM	5	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	8	162
8:10 AM	6	0	0	0	0	0	0	0	0	1	3	0	0	3	0	0	13	162
8:15 AM	3	0	1	0	0	0	0	0	0	1	2	0	0	5	0	0	12	156
8:20 AM	1	0	0	0	0	0	0	0	0	3	4	0	2	3	0	0	13	153
8:25 AM	3	0	0	0	0	0	0	0	0	1	3	0	0	1	0	0	8	142
8:30 AM	2	0	0	0	0	0	0	0	0	1	4	0	0	3	0	0	10	140
8:35 AM	1	0	1	0	0	0	0	0	0	1	3	0	0	0	0	0	6	133
8:40 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	4	128
8:45 AM	2	0	2	0	0	0	0	0	0	2	2	0	0	3	0	0	11	128
8:50 AM	2	0	0	0	0	0	0	0	0	1	4	0	0	2	0	0	9	122
8:55 AM	3	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	9	114
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	60	0	0	0	0	0	0	0	0	48	44	0	4	56	0	0	212	
Heavy Trucks	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	8	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Altman Road -- Oxbow Drive
CITY/STATE: Multnomah, OR

QC JOB #: 15711512
DATE: Wed, Feb 23 2022

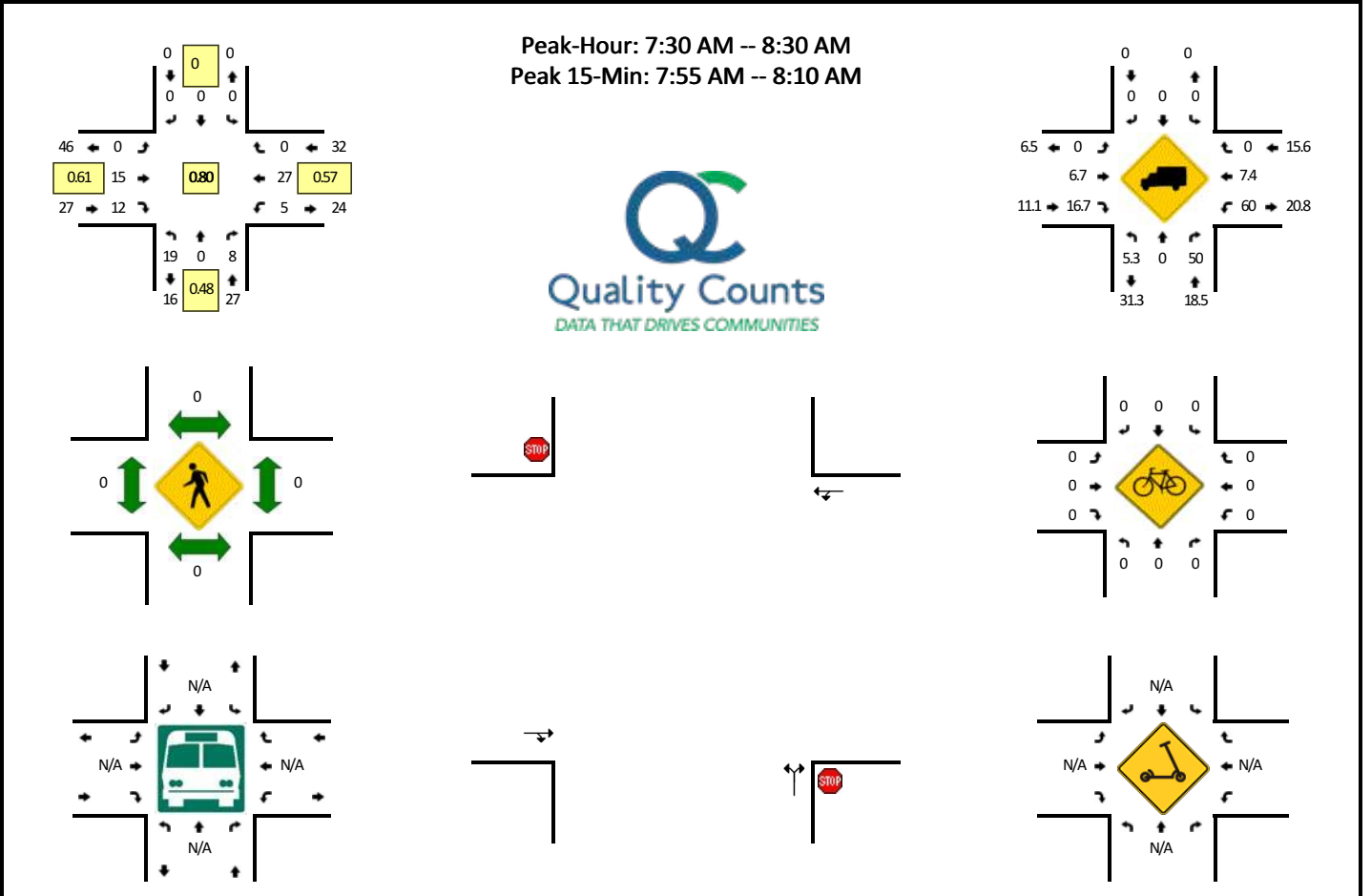


5-Min Count Period Beginning At	Altman Road (Northbound)				Altman Road (Southbound)				Oxbow Drive (Eastbound)				Oxbow Drive (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	0	0	0	0	0	0	0	0	6	0	1	2	0	0	11	
4:05 PM	5	0	0	0	0	0	0	0	0	8	8	0	0	2	0	0	23	
4:10 PM	2	0	1	0	0	0	0	0	0	4	4	0	2	2	0	0	15	
4:15 PM	3	0	1	0	0	0	0	0	0	1	2	0	1	4	0	0	12	
4:20 PM	3	0	0	0	0	0	0	0	0	6	7	0	2	5	0	0	23	
4:25 PM	4	0	0	0	0	0	0	0	0	2	6	0	1	3	0	0	16	
4:30 PM	7	0	0	0	0	0	0	0	0	3	6	0	1	1	0	0	18	
4:35 PM	4	0	1	0	0	0	0	0	0	6	4	0	0	5	0	0	20	
4:40 PM	4	0	1	0	0	0	0	0	0	5	4	0	0	4	0	0	18	
4:45 PM	5	0	0	0	0	0	0	0	0	2	6	0	1	3	0	0	17	
4:50 PM	3	0	0	0	0	0	0	0	0	1	4	0	0	4	0	0	12	
4:55 PM	6	0	0	0	0	0	0	0	0	3	9	0	0	6	0	0	24	209
5:00 PM	6	0	0	0	0	0	0	0	0	4	2	0	0	6	0	0	18	216
5:05 PM	0	0	0	0	0	0	0	0	0	2	5	0	1	5	0	0	13	206
5:10 PM	4	0	1	0	0	0	0	0	0	2	1	0	0	1	0	0	9	200
5:15 PM	2	0	1	0	0	0	0	0	0	4	10	0	0	2	0	0	19	207
5:20 PM	2	0	0	0	0	0	0	0	0	1	3	0	1	5	0	0	12	196
5:25 PM	4	0	0	0	0	0	0	0	0	2	3	0	0	2	0	0	11	191
5:30 PM	5	0	0	0	0	0	0	0	0	5	3	0	1	2	0	0	16	189
5:35 PM	3	0	0	0	0	0	0	0	0	4	5	0	0	3	0	0	15	184
5:40 PM	5	0	0	0	0	0	0	0	0	5	5	0	0	1	0	0	16	182
5:45 PM	7	0	0	0	0	0	0	0	0	4	6	0	0	2	0	0	19	184
5:50 PM	2	0	0	0	0	0	0	0	0	5	1	0	0	2	0	0	10	182
5:55 PM	2	0	0	0	0	0	0	0	0	5	4	0	0	0	0	0	11	169
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	56	0	0	0	0	0	0	0	0	44	76	0	16	36	0	0	228	
Heavy Trucks	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	8	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: Cottrell Road -- Lusted Road
CITY/STATE: Multnomah, OR

QC JOB #: 15711513
DATE: Wed, Feb 23 2022

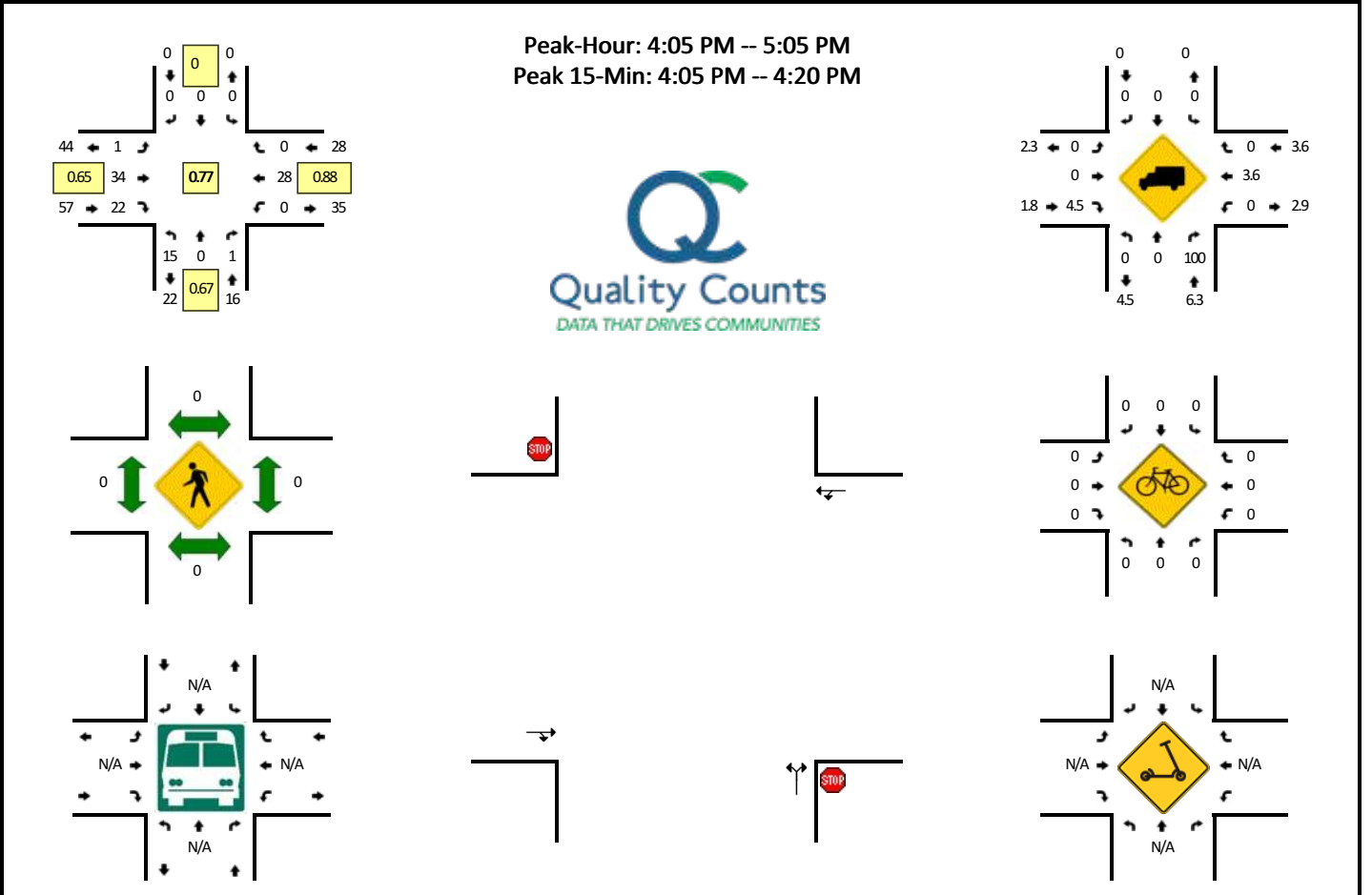


5-Min Count Period Beginning At	Cottrell Road (Northbound)				Cottrell Road (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3		
7:05 AM	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	4	
7:10 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	2	1	0	0	7	
7:15 AM	4	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	7	
7:20 AM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	
7:25 AM	1	0	0	0	0	0	0	0	0	0	1	1	0	0	3	0	0	6	
7:30 AM	3	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0	7	
7:35 AM	1	0	0	0	0	0	0	0	0	0	1	2	0	0	2	0	0	6	
7:40 AM	2	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	5	
7:45 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	2	0	0	5	
7:50 AM	2	0	0	0	0	0	0	0	0	0	3	1	0	1	1	0	0	8	
7:55 AM	1	0	0	0	0	0	0	0	0	0	2	2	0	0	5	0	0	10	72
8:00 AM	1	0	0	0	0	0	0	0	0	0	1	0	0	1	4	0	0	7	76
8:05 AM	4	0	0	0	0	0	0	0	0	0	0	2	0	1	2	0	1	10	82
8:10 AM	3	0	5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	9	84
8:15 AM	1	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0	0	6	83
8:20 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	4	83
8:25 AM	1	0	1	0	0	0	0	0	0	0	3	2	0	0	2	0	0	9	86
8:30 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3	82
8:35 AM	1	0	0	0	0	0	0	0	0	0	2	0	0	1	4	0	0	8	84
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3	82
8:45 AM	0	0	1	0	0	0	0	0	0	0	2	2	0	2	1	0	0	8	85
8:50 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4	81
8:55 AM	2	0	1	0	0	0	0	0	0	0	5	0	0	1	1	0	0	10	81
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	24	0	0	0	0	0	0	0	0	0	12	16	0	8	44	0	4	108	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	8	
Buses																			
Pedestrians		0				0					0				0			0	
Bicycles	0	0	0		0	0	0			0	0	0		0	0	0		0	
Scoters																			

Comments:

LOCATION: Cottrell Road -- Lusted Road
CITY/STATE: Multnomah, OR

QC JOB #: 15711514
DATE: Wed, Feb 23 2022

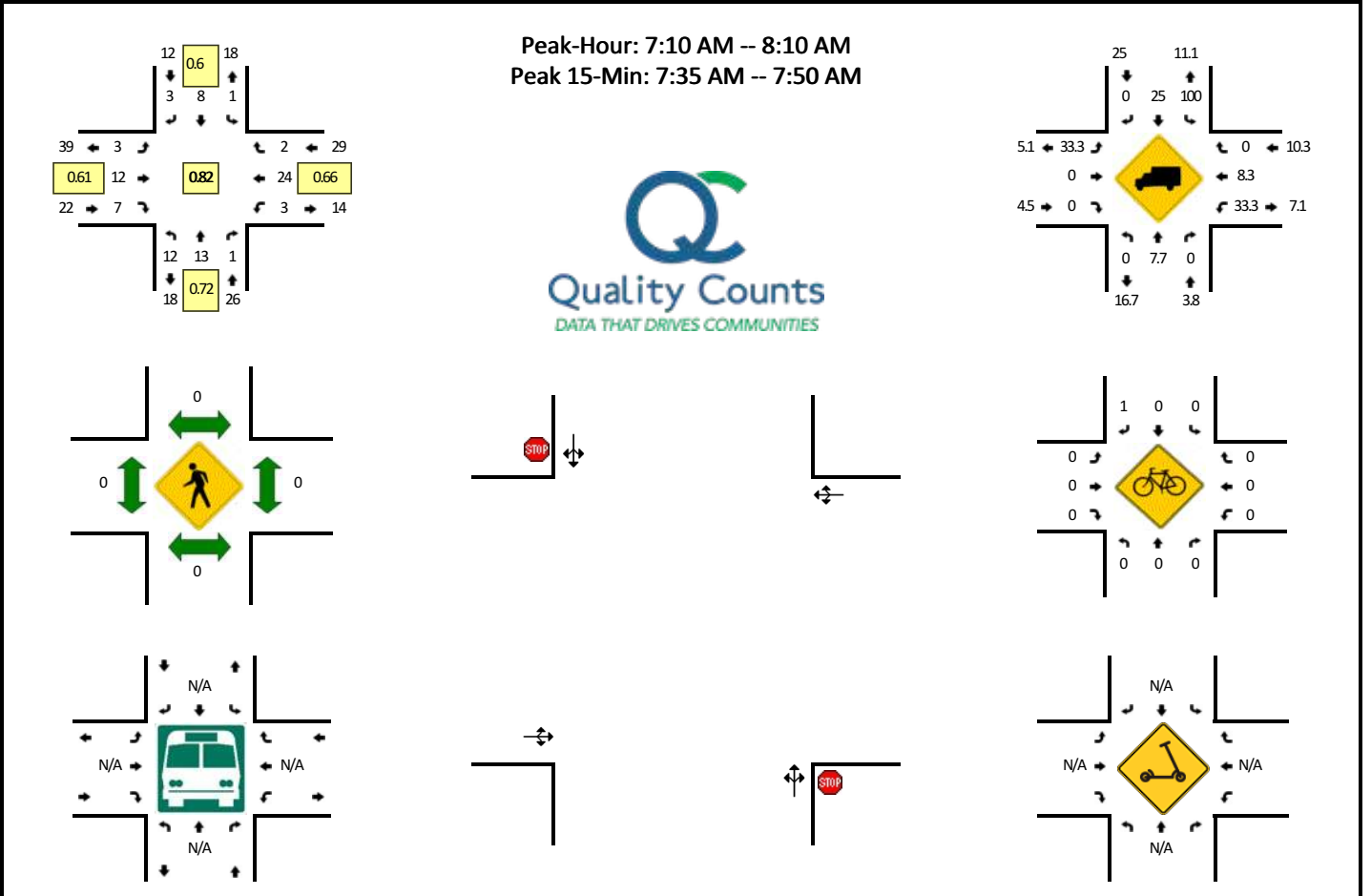


5-Min Count Period Beginning At	Cottrell Road (Northbound)				Cottrell Road (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	3	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	6	
4:05 PM	1	0	0	0	0	0	0	0	0	8	2	0	0	4	0	0	15	
4:10 PM	2	0	0	0	0	0	0	0	0	7	2	0	0	1	0	0	12	
4:15 PM	1	0	0	0	0	0	0	0	0	2	1	0	0	2	0	0	6	
4:20 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4	
4:25 PM	0	0	1	0	0	0	0	0	0	3	2	0	0	1	0	0	7	
4:30 PM	1	0	0	0	0	0	0	0	0	2	2	0	0	4	0	0	9	
4:35 PM	1	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	4	
4:40 PM	1	0	0	0	0	0	0	0	0	3	3	1	0	3	0	0	11	
4:45 PM	4	0	0	0	0	0	0	0	0	2	2	0	0	1	0	0	9	
4:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	
4:55 PM	1	0	0	0	0	0	0	0	0	4	3	0	0	6	0	0	14	
5:00 PM	3	0	0	0	0	0	0	0	0	1	3	0	0	1	0	0	8	99
5:05 PM	1	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	5	91
5:10 PM	3	0	0	0	0	0	0	0	0	2	1	0	1	3	0	0	10	89
5:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	85
5:20 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3	84
5:25 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	3	80
5:30 PM	0	0	0	0	0	0	0	0	0	2	2	0	0	1	0	0	5	76
5:35 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	2	0	0	5	77
5:40 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3	69
5:45 PM	2	0	1	0	0	0	0	0	0	4	1	0	0	3	0	0	11	71
5:50 PM	0	0	0	0	0	0	0	0	0	0	5	0	1	4	0	0	10	79
5:55 PM	2	0	0	0	0	0	0	0	0	4	1	0	0	1	0	0	8	73
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	16	0	0	0	0	0	0	0	0	68	20	0	0	28	0	0	132	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	0	8	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																	0	

Comments:

LOCATION: Cottrell Road -- Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 15711515
DATE: Wed, Feb 23 2022

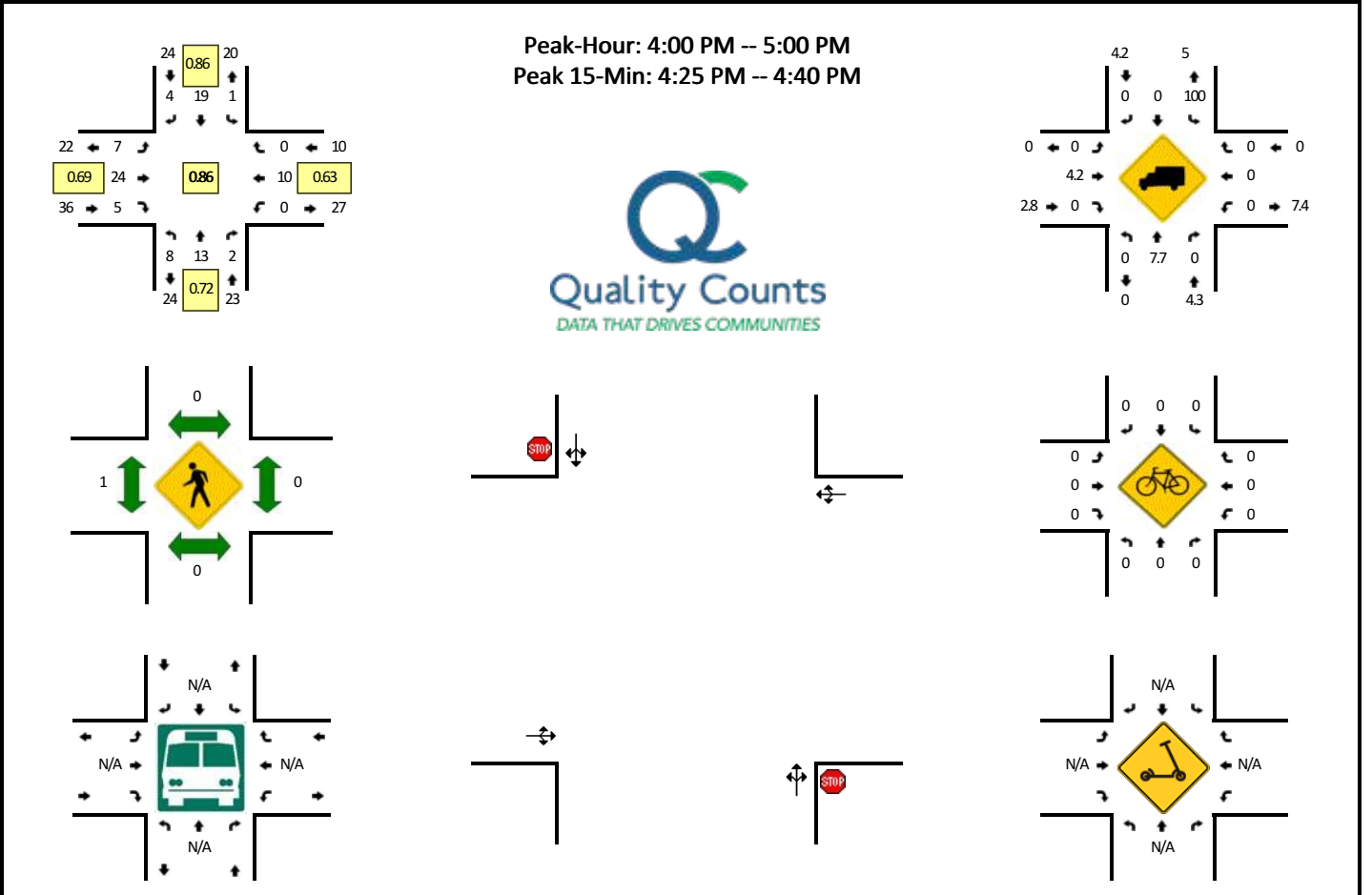


5-Min Count Period Beginning At	Cottrell Road (Northbound)				Cottrell Road (Southbound)				Dodge Park Blvd (Eastbound)				Dodge Park Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	2	1	0	0	0	0	3	0	0	0	0	6	
7:05 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	3	
7:10 AM	1	0	0	0	0	0	0	0	0	1	2	0	0	0	2	0	6	
7:15 AM	3	2	0	0	0	0	0	0	0	0	1	0	0	0	2	0	8	
7:20 AM	1	1	0	0	0	0	0	0	0	0	0	1	0	0	2	1	6	
7:25 AM	0	2	0	0	0	0	0	0	0	0	3	1	0	0	1	0	7	
7:30 AM	2	1	0	0	0	1	1	0	0	1	0	2	0	0	2	0	10	
7:35 AM	1	0	1	0	0	1	0	0	0	0	1	1	0	1	1	1	8	
7:40 AM	1	2	0	0	0	1	0	0	0	0	1	0	0	0	2	0	7	
7:45 AM	1	0	0	0	0	3	0	0	0	1	1	0	0	0	6	0	12	
7:50 AM	1	1	0	0	1	0	0	0	0	0	1	1	0	1	1	0	7	
7:55 AM	0	1	0	0	0	1	0	0	0	0	0	1	0	0	2	0	5	85
8:00 AM	1	0	0	0	0	1	0	0	0	0	2	0	0	0	1	0	5	84
8:05 AM	0	3	0	0	0	0	2	0	0	0	0	0	0	1	2	0	8	89
8:10 AM	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	4	87
8:15 AM	2	0	0	0	0	0	1	0	0	2	1	0	0	0	1	0	7	86
8:20 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	3	83
8:25 AM	1	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	4	80
8:30 AM	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	73
8:35 AM	0	0	0	0	0	0	1	0	0	0	4	0	0	0	1	0	6	71
8:40 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	3	67
8:45 AM	0	0	0	0	0	4	1	0	0	1	2	0	0	0	0	0	8	63
8:50 AM	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	4	60
8:55 AM	0	2	0	0	0	0	1	0	0	0	0	0	0	0	2	1	6	61
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	12	8	4	0	0	20	0	0	4	12	4	0	4	36	4	0	108	
Heavy Trucks	0	0	0		0	4	0		4	0	0		0	8	0		16	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Cottrell Road -- Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 15711516
DATE: Wed, Feb 23 2022



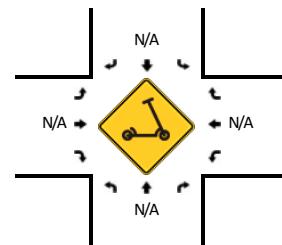
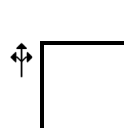
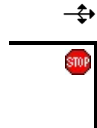
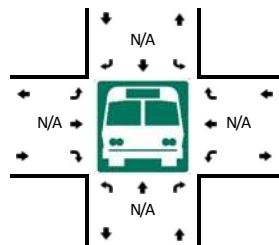
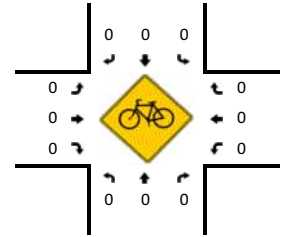
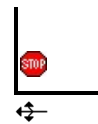
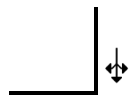
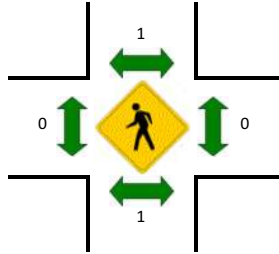
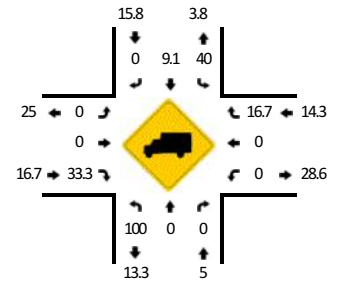
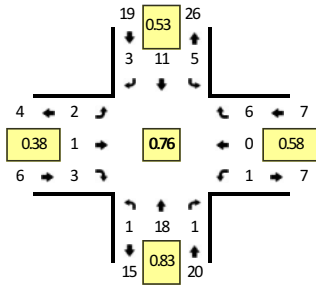
5-Min Count Period Beginning At	Cottrell Road (Northbound)				Cottrell Road (Southbound)				Dodge Park Blvd (Eastbound)				Dodge Park Blvd (Westbound)				Total	Hourly Totals		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U				
4:00 PM	2	2	0	0	0	2	1	0	0	0	1	0	0	0	1	0	0	9		
4:05 PM	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	4	
4:10 PM	1	3	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	7		
4:15 PM	1	0	0	0	0	2	0	0	0	1	5	0	0	0	2	0	0	11		
4:20 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2		
4:25 PM	1	1	0	0	0	2	1	0	0	0	2	0	0	0	0	0	0	7		
4:30 PM	1	1	0	0	0	1	1	0	0	0	4	2	0	0	1	0	0	11		
4:35 PM	1	1	1	0	0	2	0	0	0	1	2	1	0	0	0	0	0	9		
4:40 PM	0	0	1	0	0	3	0	0	0	1	2	0	0	0	0	0	0	7		
4:45 PM	0	3	0	0	0	2	0	0	0	1	1	0	0	0	1	0	0	8		
4:50 PM	1	0	0	0	0	1	0	0	0	0	4	0	0	0	2	0	0	8		
4:55 PM	0	2	0	0	0	2	1	0	0	1	2	1	0	0	1	0	0	10	93	
5:00 PM	1	1	0	0	0	3	0	0	0	1	0	1	0	0	0	0	0	7	91	
5:05 PM	0	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	4	91	
5:10 PM	1	2	0	0	1	0	0	0	0	0	1	1	0	0	1	0	0	7	91	
5:15 PM	0	0	0	0	1	0	0	0	0	0	2	0	0	1	2	0	0	6	86	
5:20 PM	1	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	5	89	
5:25 PM	1	0	0	0	0	1	0	0	0	1	2	2	0	0	1	0	0	8	90	
5:30 PM	0	0	0	0	0	1	1	0	0	0	4	2	0	0	0	0	0	8	87	
5:35 PM	0	0	0	0	1	2	0	0	0	0	2	0	0	0	1	0	0	6	84	
5:40 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	3	80	
5:45 PM	1	0	0	0	0	1	0	0	0	2	1	1	0	0	0	0	0	6	78	
5:50 PM	0	0	0	0	0	3	0	0	0	0	2	7	0	0	0	0	0	12	82	
5:55 PM	0	2	0	0	0	1	0	0	0	1	1	2	0	0	0	0	0	7	79	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U				
All Vehicles	12	12	4	0	0	20	8	0	4	32	12	0	0	4	0	0	108			
Heavy Trucks	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4			
Buses																				
Pedestrians		0				0				0				0			0			
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0			
Scoters																				

Comments:

LOCATION: Cottrell Road -- Carpenter Lane
CITY/STATE: Multnomah, OR

QC JOB #: 15711517
DATE: Wed, Feb 23 2022

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:30 AM -- 7:45 AM



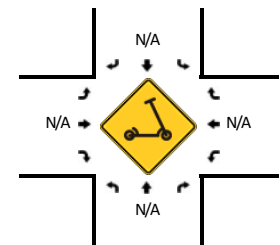
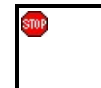
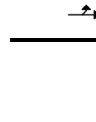
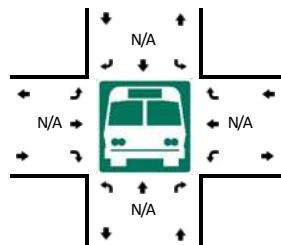
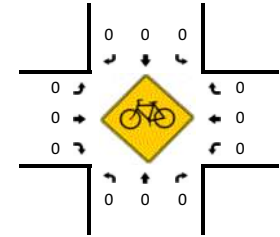
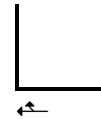
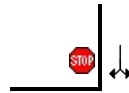
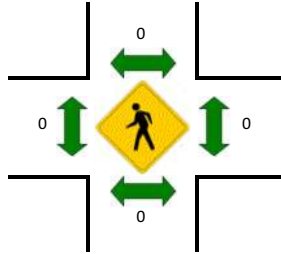
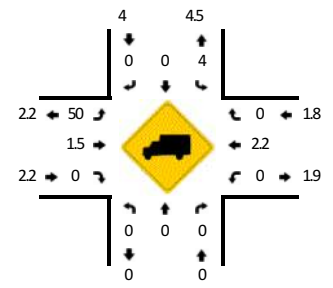
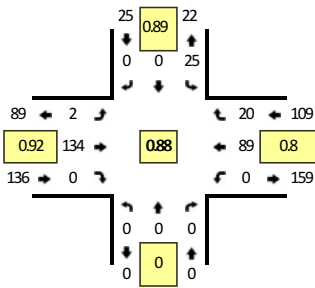
5-Min Count Period Beginning At	Cottrell Road (Northbound)				Cottrell Road (Southbound)				Carpenter Lane (Eastbound)				Carpenter Lane (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	
7:05 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
7:10 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
7:15 AM	0	3	0	0	0	0	0	0	1	0	1	0	0	0	1	0	6	
7:20 AM	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3	
7:25 AM	0	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	4	
7:30 AM	0	3	0	0	1	1	1	0	0	0	0	0	0	0	0	0	6	
7:35 AM	0	1	0	0	0	3	0	0	1	0	0	0	0	0	0	0	5	
7:40 AM	0	2	0	0	0	2	1	0	0	0	0	0	0	0	1	0	6	
7:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	3	
7:50 AM	0	2	0	0	0	2	1	0	0	0	0	0	0	0	0	0	5	
7:55 AM	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	48
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	46
8:05 AM	0	1	1	0	0	1	0	0	0	0	0	0	1	0	2	0	6	51
8:10 AM	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3	52
8:15 AM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	48
8:20 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	46
8:25 AM	0	3	0	0	1	1	0	0	0	0	0	0	0	0	1	0	6	48
8:30 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	3	45
8:35 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	41
8:40 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	37
8:45 AM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	38
8:50 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	35
8:55 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	33
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	24	0	0	4	24	8	0	4	0	0	0	0	0	4	0	68	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Cottrell Road -- Bluff Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711520
DATE: Wed, Feb 23 2022

Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:10 PM -- 4:25 PM



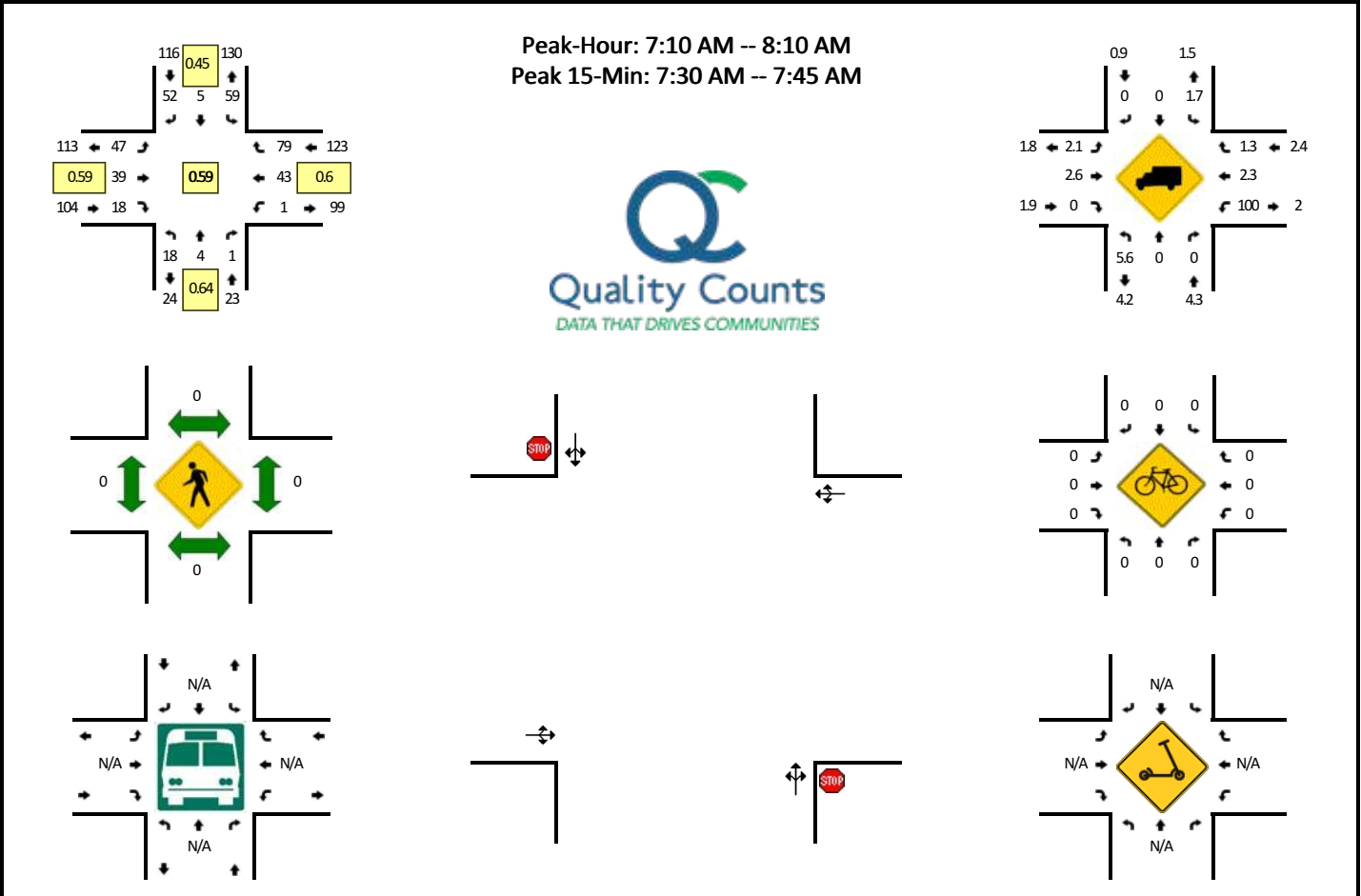
5-Min Count Period Beginning At	Cottrell Road (Northbound)				Cottrell Road (Southbound)				Bluff Road (Eastbound)				Bluff Road (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:00 PM	0	0	0	0	7	0	0	0	0	7	0	0	0	0	5	1	0	20	
4:05 PM	0	0	0	0	1	0	0	0	0	14	0	0	0	0	5	1	0	21	
4:10 PM	0	0	0	0	3	0	0	0	0	17	0	0	0	0	11	4	0	35	
4:15 PM	0	0	0	0	2	0	0	0	0	10	0	0	0	0	11	0	0	23	
4:20 PM	0	0	0	0	2	0	0	0	1	8	0	0	0	0	8	0	0	19	
4:25 PM	0	0	0	0	1	0	0	0	1	10	0	0	0	0	10	1	0	23	
4:30 PM	0	0	0	0	3	0	0	0	0	14	0	0	0	0	4	2	0	23	
4:35 PM	0	0	0	0	2	0	0	0	0	12	0	0	0	0	6	2	0	22	
4:40 PM	0	0	0	0	2	0	0	0	0	9	0	0	0	0	7	4	0	22	
4:45 PM	0	0	0	0	3	0	0	0	0	12	0	0	0	0	4	1	0	20	
4:50 PM	0	0	0	0	1	0	0	0	0	11	0	0	0	0	4	1	0	17	
4:55 PM	0	0	0	0	2	0	0	0	0	7	0	0	0	0	11	3	0	23	268
5:00 PM	0	0	0	0	2	0	0	0	0	14	0	0	0	0	4	0	0	20	268
5:05 PM	0	0	0	0	2	0	0	0	0	10	0	0	0	0	9	2	0	23	270
5:10 PM	0	0	0	0	0	0	0	0	0	11	0	0	0	0	6	0	0	17	252
5:15 PM	0	0	0	0	2	0	0	0	0	12	0	0	0	0	6	1	0	21	250
5:20 PM	0	0	0	0	1	0	0	0	0	11	0	0	0	0	4	1	0	17	248
5:25 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	0	5	0	0	13	238
5:30 PM	0	0	0	0	4	0	0	0	0	9	0	0	0	0	3	0	0	16	231
5:35 PM	0	0	0	0	2	0	1	0	0	12	0	0	0	0	14	0	0	29	238
5:40 PM	0	0	0	0	2	0	0	0	0	11	0	0	0	0	5	1	0	19	235
5:45 PM	0	0	0	0	1	0	1	0	0	6	0	0	0	0	7	0	0	15	230
5:50 PM	0	0	0	0	4	0	0	0	0	12	0	0	0	0	2	0	0	18	231
5:55 PM	0	0	0	0	4	0	0	0	0	9	0	0	0	0	10	1	0	24	232
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	0	0	0	28	0	0	0	4	140	0	0	0	120	16	0	308		
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	8		
Buses																			
Pedestrians		0				0				0				0			0		
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																			

Comments:

LOCATION: Proctor Road -- Bluff Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711521
DATE: Wed, Feb 23 2022

Peak-Hour: 7:10 AM -- 8:10 AM
 Peak 15-Min: 7:30 AM -- 7:45 AM



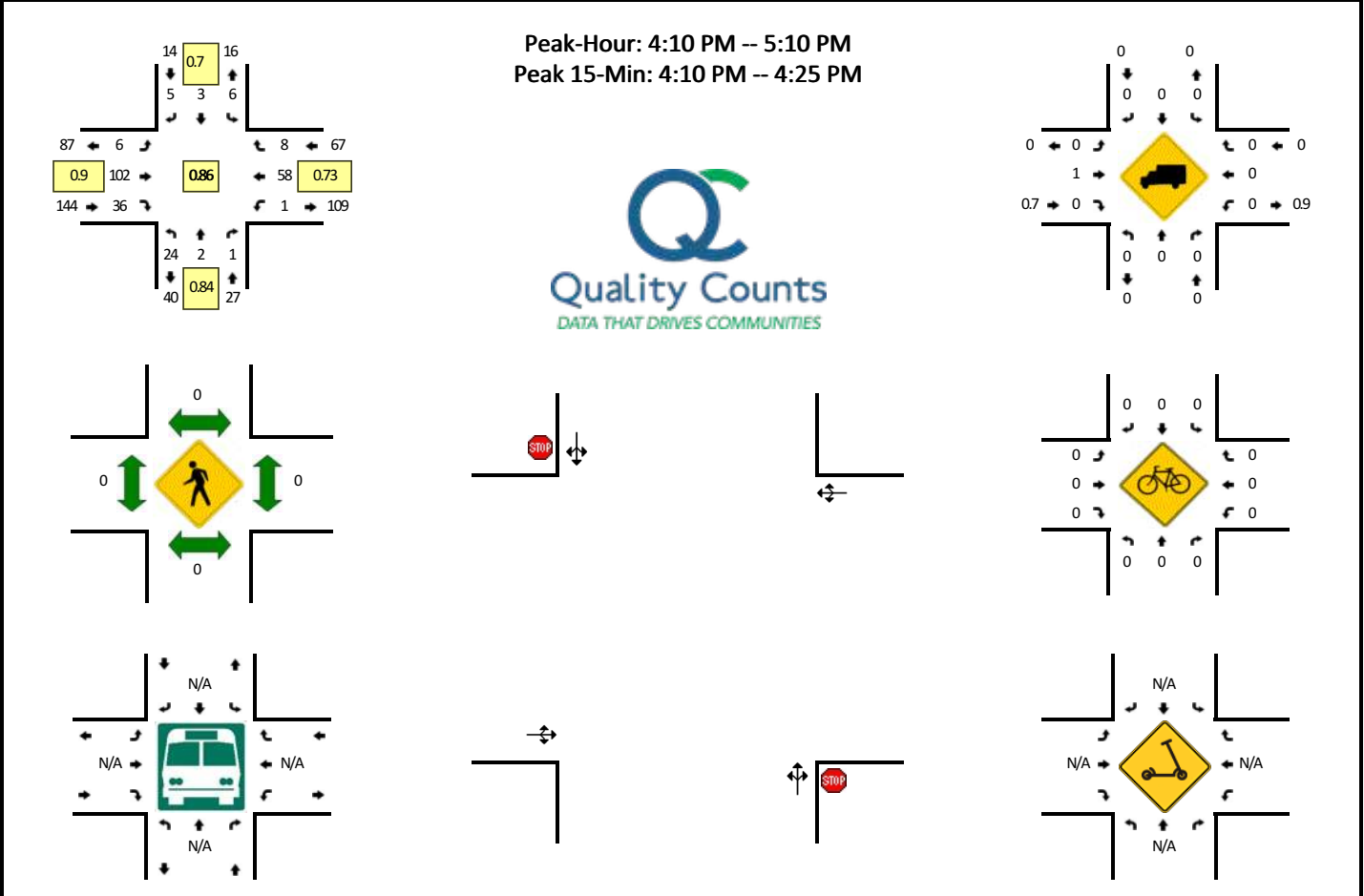
5-Min Count Period Beginning At	Proctor Road (Northbound)				Proctor Road (Southbound)				Bluff Road (Eastbound)				Bluff Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	4	0	0	0	0	0	1	0	0	2	0	0	0	3	1	0	11	
7:05 AM	3	0	0	0	0	0	0	0	0	2	2	0	0	1	0	0	9	
7:10 AM	2	0	0	0	1	0	0	0	3	1	0	0	0	8	3	0	18	
7:15 AM	3	0	1	0	1	0	1	0	2	3	1	0	0	6	2	0	20	
7:20 AM	3	0	0	0	1	0	0	0	3	5	1	0	0	5	7	0	25	
7:25 AM	1	1	0	0	7	1	10	0	5	1	1	0	0	3	9	0	39	
7:30 AM	1	0	0	0	8	0	6	0	9	4	2	0	0	3	14	0	47	
7:35 AM	0	0	0	0	7	2	6	0	8	5	1	0	0	2	16	0	47	
7:40 AM	0	2	0	0	17	0	12	0	8	5	2	0	0	2	14	0	62	
7:45 AM	2	0	0	0	9	0	11	0	6	0	1	0	0	4	9	0	42	
7:50 AM	3	0	0	0	5	0	4	0	1	3	1	0	0	2	3	0	22	
7:55 AM	0	0	0	0	3	0	1	0	1	4	3	0	0	2	0	0	14	356
8:00 AM	1	0	0	0	0	1	1	0	1	6	1	0	1	2	1	0	15	360
8:05 AM	2	1	0	0	0	1	0	0	0	2	4	0	0	4	1	0	15	366
8:10 AM	3	0	0	0	2	0	0	0	0	3	1	0	1	2	0	0	12	360
8:15 AM	1	0	0	0	0	0	1	0	0	7	5	0	0	2	0	0	16	356
8:20 AM	3	0	0	0	1	2	0	0	2	1	1	0	0	2	1	0	13	344
8:25 AM	2	0	0	0	1	0	1	0	1	1	5	0	0	1	0	0	12	317
8:30 AM	2	0	0	0	0	0	0	0	0	3	2	0	0	3	0	0	10	280
8:35 AM	0	0	0	0	0	1	0	0	0	2	3	0	0	1	1	0	8	241
8:40 AM	3	0	0	0	0	0	0	0	0	1	1	0	0	6	0	0	11	190
8:45 AM	1	0	0	0	0	0	0	0	1	0	2	0	0	2	0	0	6	154
8:50 AM	1	0	0	0	2	0	3	0	0	6	0	0	1	3	0	0	16	148
8:55 AM	0	0	0	0	1	0	0	0	0	0	2	0	1	3	0	0	7	141
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	8	0	0	128	8	96	0	100	56	20	0	0	28	176	0	624	
Heavy Trucks	0	0	0	0	4	0	0	0	0	0	0	0	0	4	4	0	12	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Proctor Road -- Bluff Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711522
DATE: Wed, Feb 23 2022

Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:10 PM -- 4:25 PM

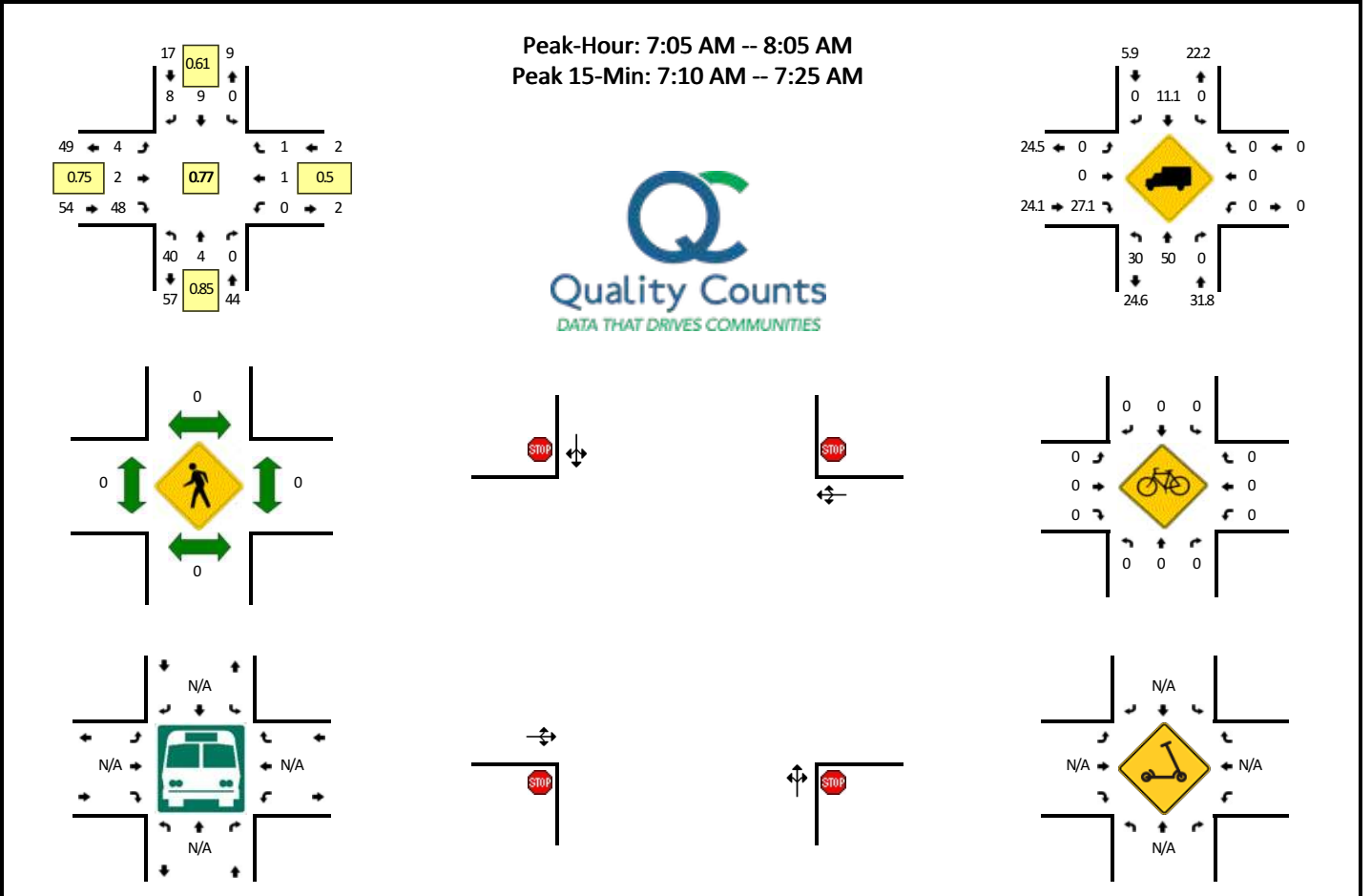


5-Min Count Period Beginning At	Proctor Road (Northbound)				Proctor Road (Southbound)				Bluff Road (Eastbound)				Bluff Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	0	0	0	2	0	1	0	3	8	0	0	0	5	0	0	21	
4:05 PM	0	0	2	0	1	1	0	0	0	8	2	0	1	2	0	0	17	
4:10 PM	1	0	0	0	0	0	0	0	1	10	7	0	1	7	1	0	28	
4:15 PM	2	0	0	0	0	0	2	0	0	6	4	0	0	8	0	0	22	
4:20 PM	4	1	0	0	0	0	0	0	0	11	1	0	0	6	0	0	23	
4:25 PM	0	0	1	0	1	1	0	0	0	6	3	0	0	5	2	0	19	
4:30 PM	1	0	0	0	2	1	0	0	0	10	4	0	0	4	3	0	25	
4:35 PM	3	1	0	0	0	0	0	0	0	8	2	0	0	5	0	0	19	
4:40 PM	2	0	0	0	1	1	0	0	0	9	4	0	0	6	1	0	24	
4:45 PM	1	0	0	0	0	0	1	0	0	8	2	0	0	2	0	0	14	
4:50 PM	2	0	0	0	0	0	0	0	1	9	2	0	0	2	0	0	16	
4:55 PM	2	0	0	0	2	0	0	0	1	9	2	0	0	7	0	0	23	251
5:00 PM	2	0	0	0	0	0	0	0	0	8	2	0	0	3	0	0	15	245
5:05 PM	4	0	0	0	0	0	2	0	3	8	3	0	0	3	1	0	24	252
5:10 PM	3	0	0	0	0	0	0	0	2	4	3	0	0	5	1	0	18	242
5:15 PM	1	1	0	0	0	0	0	0	1	8	5	0	1	3	1	0	21	241
5:20 PM	2	0	1	0	0	0	2	0	0	7	0	0	0	2	0	0	14	232
5:25 PM	3	1	1	0	1	0	1	0	1	10	0	0	0	1	1	0	20	233
5:30 PM	2	0	0	0	0	1	1	0	1	5	4	0	0	2	1	0	17	225
5:35 PM	5	0	0	0	0	0	0	0	2	12	1	0	0	4	2	0	26	232
5:40 PM	1	1	0	0	1	1	0	0	1	8	2	0	0	5	0	0	20	228
5:45 PM	3	0	0	0	1	0	0	0	0	7	1	0	0	1	0	0	13	227
5:50 PM	0	1	0	0	1	0	0	0	1	3	4	0	0	1	1	0	12	223
5:55 PM	5	0	0	0	0	0	1	0	0	10	2	0	0	4	1	0	23	223
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	28	4	0	0	0	0	8	0	4	108	48	0	4	84	4	0	292	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0			0				0				0				0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: SE Hosner Rd -- Homan Road/Oxbow Drive
CITY/STATE: Multnomah, OR

QC JOB #: 15711523
DATE: Wed, Feb 23 2022

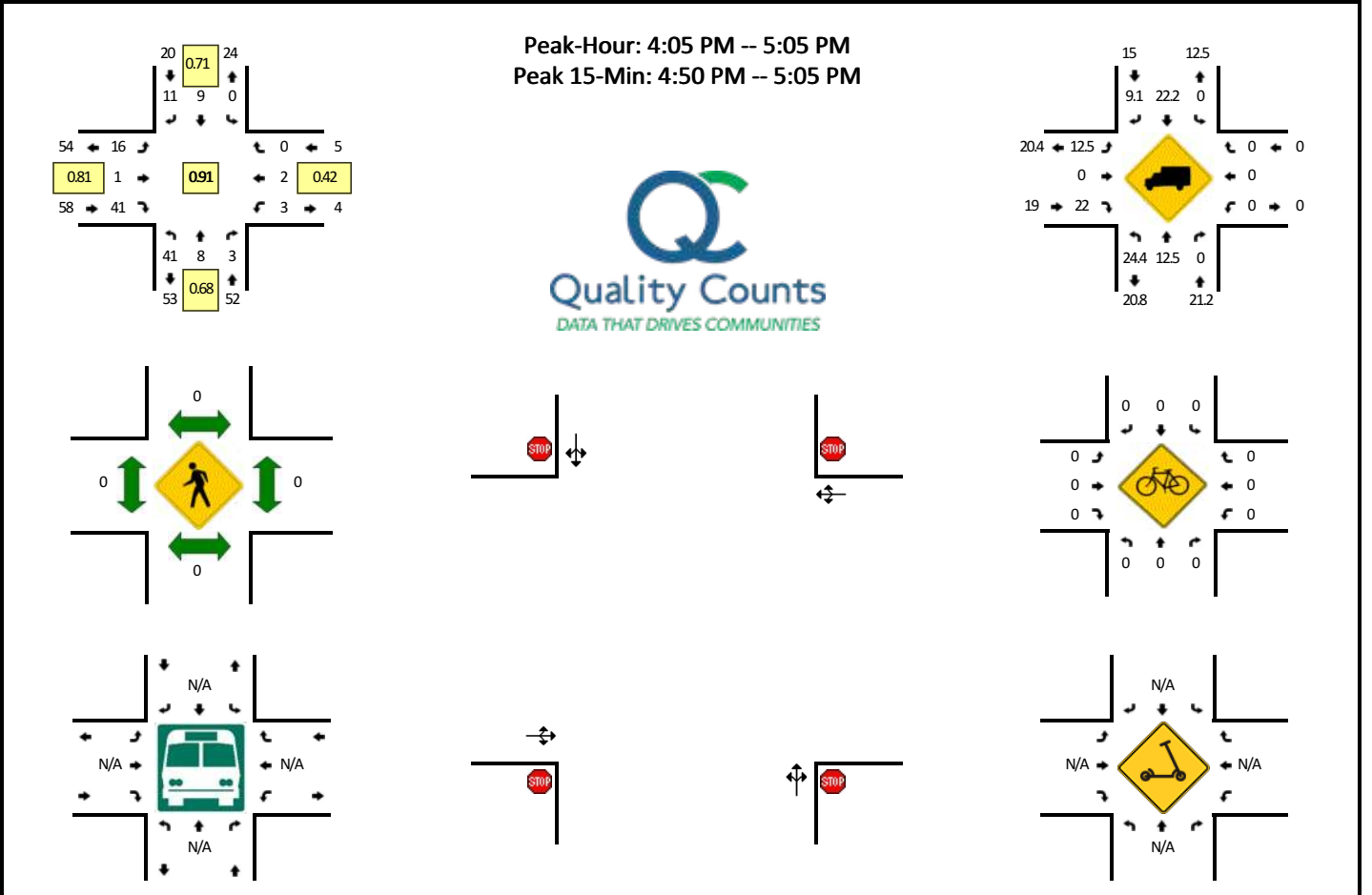


5-Min Count Period Beginning At	SE Hosner Rd (Northbound)				SE Hosner Rd (Southbound)				Homan Road/Oxbow Drive (Eastbound)				Homan Road/Oxbow Drive (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	3	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	7	
7:05 AM	4	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	7	
7:10 AM	3	1	0	0	0	2	1	0	0	0	1	5	0	0	0	0	0	13	
7:15 AM	4	1	0	0	0	1	2	0	0	0	0	7	0	0	0	1	0	16	
7:20 AM	3	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0	0	9	
7:25 AM	5	0	0	0	0	1	0	0	0	0	1	3	0	0	0	0	0	10	
7:30 AM	2	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	5	
7:35 AM	5	0	0	0	0	1	1	0	0	1	0	7	0	0	1	0	0	16	
7:40 AM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
7:45 AM	1	0	0	0	0	2	1	0	0	0	0	3	0	0	0	0	0	7	
7:50 AM	3	1	0	0	0	0	2	0	0	1	0	3	0	0	0	0	0	10	
7:55 AM	2	0	0	0	0	1	0	0	0	0	0	6	0	0	0	0	0	9	112
8:00 AM	5	1	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	12	117
8:05 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2	112
8:10 AM	4	1	0	0	0	1	0	0	0	1	0	1	0	1	0	0	0	9	108
8:15 AM	4	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	6	98
8:20 AM	1	0	0	0	0	1	4	0	0	0	0	2	0	0	1	0	0	9	98
8:25 AM	1	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	5	93
8:30 AM	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	4	92
8:35 AM	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	5	81
8:40 AM	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	82
8:45 AM	4	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	8	83
8:50 AM	2	1	0	0	0	1	1	0	0	1	1	2	0	0	0	0	0	9	82
8:55 AM	0	0	0	0	0	1	1	0	0	2	0	1	0	0	0	0	0	5	78
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	40	8	0	0	0	16	12	0	0	4	68	0	0	0	4	0	152		
Heavy Trucks	8	0	0	0	0	0	0	0	0	0	32	0	0	0	0	40			
Buses																			
Pedestrians		0				0				0				0			0		
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																			

Comments:

LOCATION: SE Hosner Rd -- Homan Road/Oxbow Drive
CITY/STATE: Multnomah, OR

QC JOB #: 15711524
DATE: Wed, Feb 23 2022

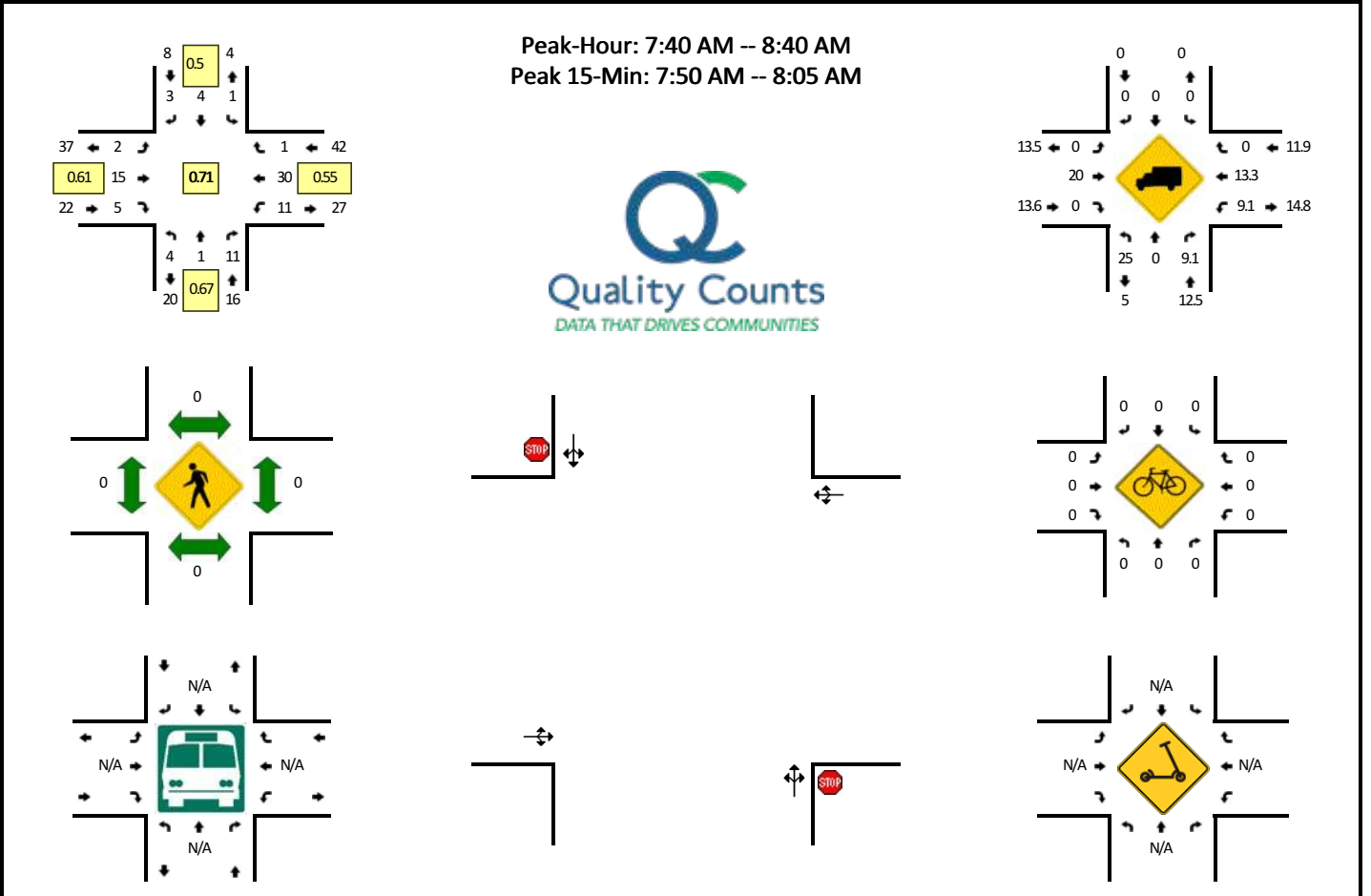


5-Min Count Period Beginning At	SE Hosner Rd (Northbound)				SE Hosner Rd (Southbound)				Homan Road/Oxbow Drive (Eastbound)				Homan Road/Oxbow Drive (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	4	
4:05 PM	3	1	0	0	0	1	1	1	0	3	0	8	0	0	0	0	17	
4:10 PM	1	1	0	0	0	0	1	0	0	0	4	0	0	1	0	0	8	
4:15 PM	2	0	0	0	0	2	2	0	0	0	3	0	0	0	0	0	9	
4:20 PM	4	1	0	0	0	0	1	0	0	3	0	4	0	2	0	0	15	
4:25 PM	1	0	1	0	0	0	1	0	0	0	3	0	0	0	0	0	6	
4:30 PM	4	1	0	0	0	0	0	0	0	1	0	2	0	0	1	0	9	
4:35 PM	1	1	0	0	0	0	2	0	0	4	0	2	0	1	0	0	11	
4:40 PM	7	0	0	0	0	2	0	0	0	1	1	4	0	0	0	0	15	
4:45 PM	2	2	0	0	0	1	1	0	0	0	2	0	0	0	0	0	8	
4:50 PM	3	0	0	0	0	2	1	0	0	1	0	3	0	0	0	0	10	
4:55 PM	4	1	0	0	0	1	0	0	0	1	0	3	0	0	0	0	10	122
5:00 PM	9	0	2	0	0	0	1	0	0	2	0	3	0	0	0	0	17	135
5:05 PM	0	0	0	0	0	0	1	0	0	1	0	4	0	0	0	0	6	124
5:10 PM	3	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	6	122
5:15 PM	2	1	0	0	0	1	0	0	0	3	0	3	0	0	0	0	10	123
5:20 PM	1	0	0	0	0	0	3	0	0	0	0	2	0	0	0	0	6	114
5:25 PM	0	0	0	0	0	2	2	0	0	0	1	2	0	0	3	0	10	118
5:30 PM	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	4	113
5:35 PM	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	4	106
5:40 PM	0	0	0	0	0	1	0	0	0	2	0	3	0	0	0	0	6	97
5:45 PM	1	0	0	0	0	0	1	0	0	2	0	1	0	0	0	0	5	94
5:50 PM	2	0	0	0	0	0	0	0	0	2	0	5	0	0	0	0	9	93
5:55 PM	0	0	0	0	0	1	0	0	0	1	0	6	0	0	0	0	8	91
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	64	4	8	0	0	12	8	0	0	16	0	36	0	0	0	0	148	
Heavy Trucks	12	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	20	
Buses																	0	
Pedestrians		0				0					0			0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: Dodge Park Blvd -- Lusted Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711531
DATE: Wed, Feb 23 2022

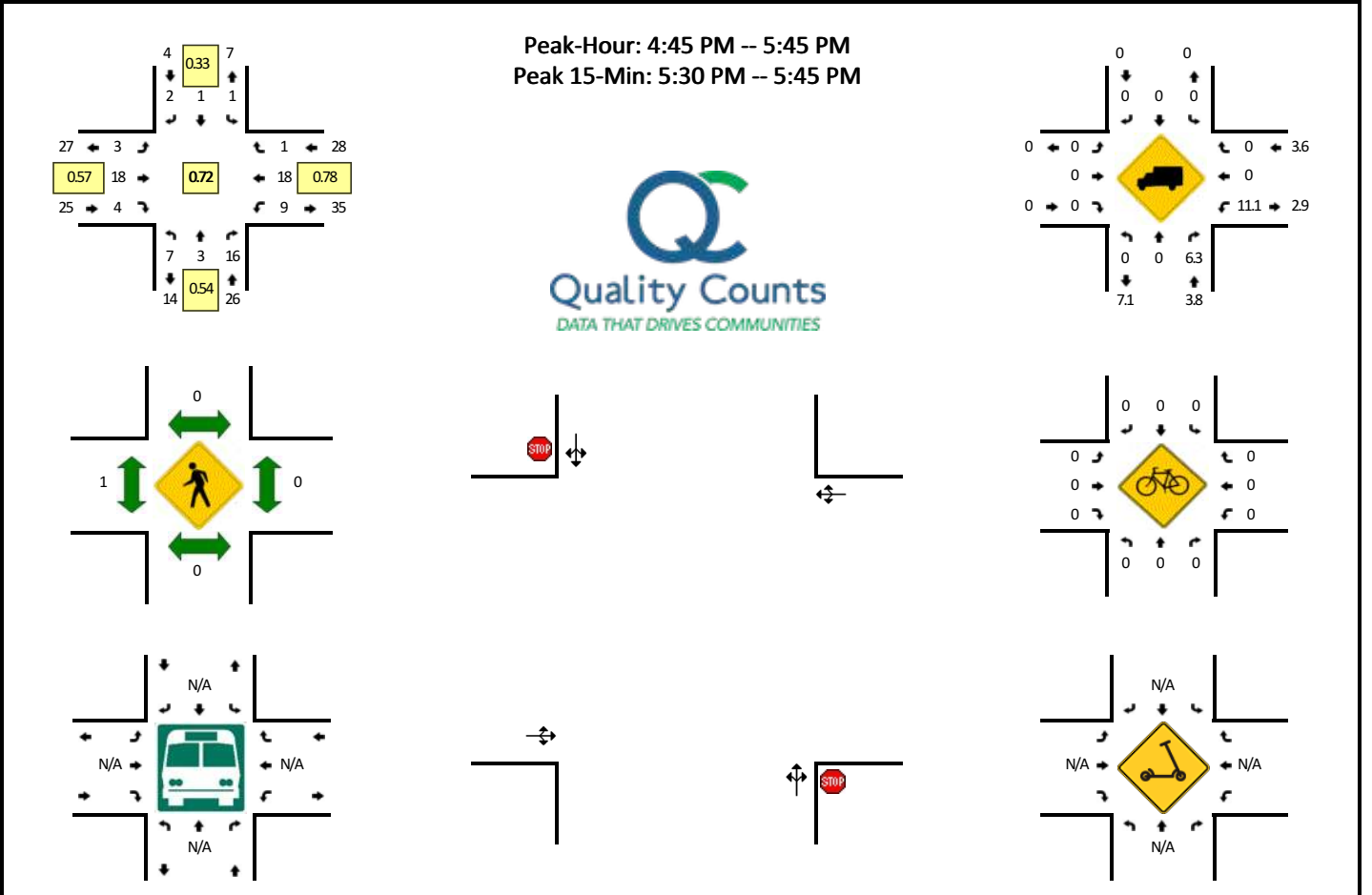


5-Min Count Period Beginning At	Dodge Park Blvd (Northbound)				Dodge Park Blvd (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1		
7:05 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	
7:10 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	3	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:20 AM	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	4	
7:25 AM	0	0	2	0	0	0	0	0	0	0	1	0	0	2	0	0	0	5	
7:30 AM	0	0	1	0	0	0	1	0	0	0	3	0	0	2	0	0	0	7	
7:35 AM	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	3	
7:40 AM	1	1	2	0	1	0	0	0	0	0	2	0	0	0	1	0	0	8	
7:45 AM	0	0	1	0	0	0	0	0	0	0	1	1	0	2	3	0	0	8	
7:50 AM	0	0	1	0	0	1	0	0	0	0	2	1	0	1	5	1	0	12	
7:55 AM	1	0	0	0	0	0	1	0	0	1	0	0	0	1	6	0	0	10	64
8:00 AM	0	0	2	0	0	1	1	0	0	1	0	0	0	2	2	0	0	9	72
8:05 AM	1	0	0	0	0	1	0	0	0	0	1	1	0	1	2	0	0	7	77
8:10 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	75
8:15 AM	0	0	0	0	0	1	1	0	0	0	3	0	0	1	1	0	0	7	81
8:20 AM	1	0	2	0	0	0	0	0	0	0	1	2	0	0	1	0	0	7	84
8:25 AM	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	0	0	7	86
8:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4	83
8:35 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	3	3	0	0	8	88
8:40 AM	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	4	84
8:45 AM	0	0	1	0	0	0	0	0	0	1	0	0	0	0	2	0	0	4	80
8:50 AM	0	0	2	0	0	0	0	0	0	0	1	1	0	1	2	0	0	7	75
8:55 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	4	69
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	4	0	12	0	0	8	8	0	8	8	4	0	16	52	4	0	124		
Heavy Trucks	4	0	0		0	0	0		0	0	0		4	8	0		16		
Buses																			
Pedestrians		0				0				0				0			0		
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																			

Comments:

LOCATION: Dodge Park Blvd -- Lusted Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711532
DATE: Wed, Feb 23 2022



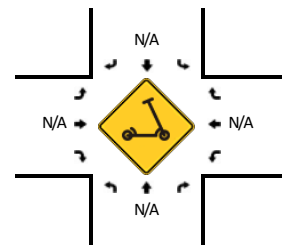
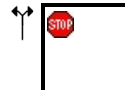
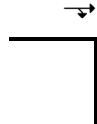
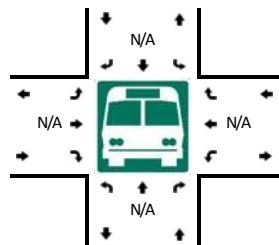
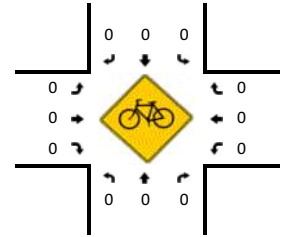
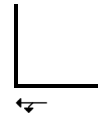
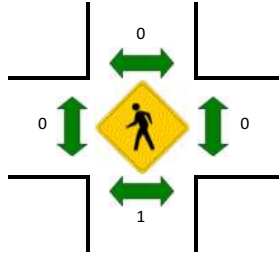
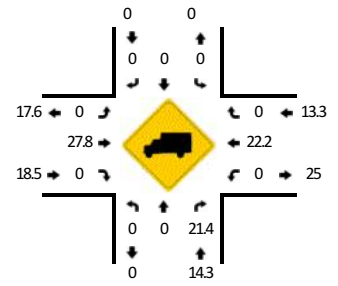
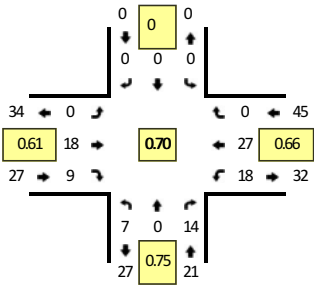
5-Min Count Period Beginning At	Dodge Park Blvd (Northbound)				Dodge Park Blvd (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	2	3	0	0	6		
4:05 PM	0	0	1	0	0	0	0	0	0	1	0	1	0	0	3	0	0	6	
4:10 PM	1	0	1	0	0	0	0	0	0	0	5	1	0	0	1	0	0	9	
4:15 PM	1	1	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	8	
4:20 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	5	
4:25 PM	0	1	0	0	0	0	0	0	0	0	3	1	0	0	2	0	0	7	
4:30 PM	0	1	1	0	0	0	0	0	0	0	2	0	0	0	1	2	0	7	
4:35 PM	1	1	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	7	
4:40 PM	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0	5	
4:45 PM	0	0	3	0	0	0	0	0	0	0	2	1	0	0	2	0	0	8	
4:50 PM	0	1	1	0	0	0	0	0	0	0	2	1	0	0	4	1	0	11	
4:55 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	82
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	77
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	3	74
5:10 PM	2	0	2	0	0	0	0	0	0	1	2	0	0	2	2	0	0	11	76
5:15 PM	1	0	1	0	0	0	0	0	0	0	3	0	0	1	0	0	0	6	74
5:20 PM	0	0	0	0	0	1	0	0	0	0	5	0	0	1	1	0	0	8	77
5:25 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3	73
5:30 PM	2	1	3	0	0	0	0	0	0	0	1	0	0	0	1	0	0	8	74
5:35 PM	0	0	2	0	1	0	1	0	0	2	0	1	0	1	2	0	0	10	77
5:40 PM	1	0	3	0	0	0	1	0	0	0	2	0	0	1	3	0	0	11	83
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	77
5:50 PM	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	4	70
5:55 PM	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	70
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	12	4	32	0	4	0	8	0	8	12	4	0	8	24	0	0	116		
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0	0	0		
Buses																			
Pedestrians		0				0				0				0			0		
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																			

Comments:

LOCATION: Hudson Road -- Lusted Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711533
DATE: Wed, Feb 23 2022

Peak-Hour: 7:45 AM -- 8:45 AM
 Peak 15-Min: 8:20 AM -- 8:35 AM

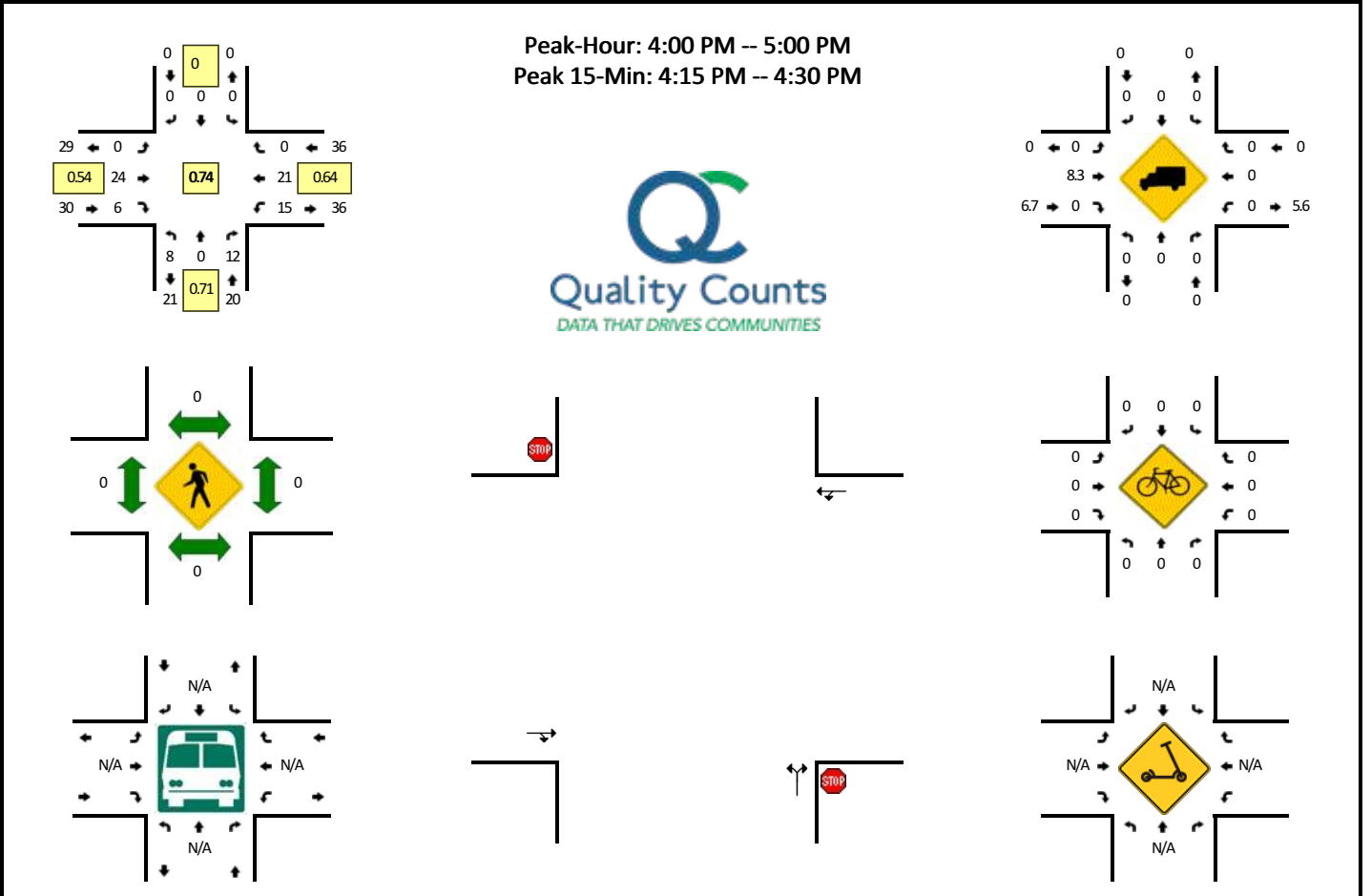


5-Min Count Period Beginning At	Hudson Road (Northbound)				Hudson Road (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:05 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3	0	0	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	
7:20 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	2	0	0	0	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	1	2	0	0	
7:35 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	1	1	0	0	
7:40 AM	0	0	1	0	0	0	0	0	0	0	2	1	0	1	0	0	0	
7:45 AM	1	0	4	0	0	0	0	0	0	0	3	0	0	1	4	0	0	
7:50 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	
7:55 AM	1	0	0	0	0	0	0	0	0	0	3	1	0	1	8	0	0	
8:00 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	1	3	0	0	
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	
8:10 AM	0	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	
8:15 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	2	1	0	0	
8:20 AM	0	0	2	0	0	0	0	0	0	0	3	1	0	3	2	0	0	
8:25 AM	4	0	0	0	0	0	0	0	0	0	2	1	0	3	1	0	0	
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	4	3	0	0	
8:35 AM	0	0	1	0	0	0	0	0	0	0	0	2	0	1	0	0	0	
8:40 AM	0	0	3	0	0	0	0	0	0	0	3	0	0	0	2	0	0	
8:45 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	1	2	0	0	
8:50 AM	0	0	2	0	0	0	0	0	0	0	1	0	0	0	2	0	0	
8:55 AM	0	0	2	0	0	0	0	0	0	0	3	0	0	1	0	0	0	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	16	0	8	0	0	0	0	0	0	28	16	0	40	24	0	0	132	
Heavy Trucks	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	8	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Hudson Road -- Lusted Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711534
DATE: Wed, Feb 23 2022



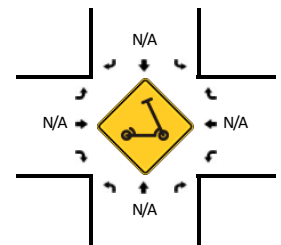
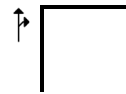
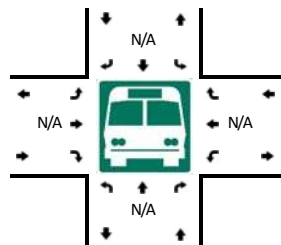
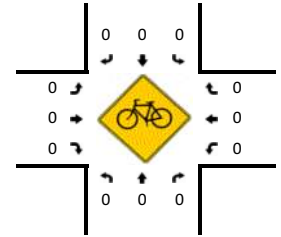
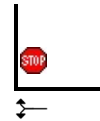
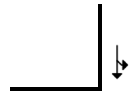
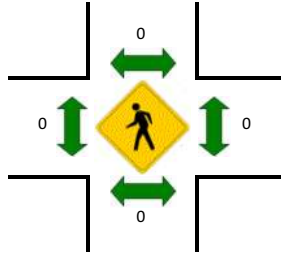
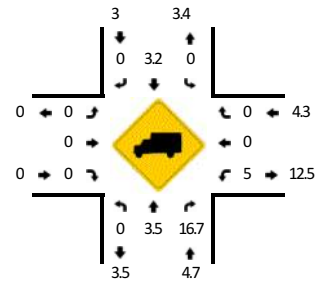
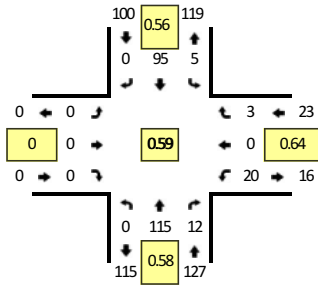
5-Min Count Period Beginning At	Hudson Road (Northbound)				Hudson Road (Southbound)				Lusted Road (Eastbound)				Lusted Road (Westbound)				Total	Hourly Totals		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U				
4:00 PM	1	0	0	0	0	0	0	0	0	0	2	1	0	0	5	7	0	0	16	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	
4:10 PM	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	6	
4:15 PM	0	0	2	0	0	0	0	0	0	0	7	1	0	0	2	2	0	0	14	
4:20 PM	0	0	2	0	0	0	0	0	0	0	1	1	0	0	2	1	0	0	7	
4:25 PM	2	0	1	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	8	
4:30 PM	1	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	6	
4:35 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	
4:40 PM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	5	
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	3	
4:50 PM	2	0	2	0	0	0	0	0	0	0	3	0	0	0	1	3	0	0	11	
4:55 PM	0	0	3	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	6	86
5:00 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	4	74
5:05 PM	1	0	4	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	8	80
5:10 PM	1	0	3	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	8	82
5:15 PM	0	0	1	0	0	0	0	0	0	0	3	1	0	0	1	0	0	0	6	74
5:20 PM	0	0	1	0	0	0	0	0	0	0	3	1	0	0	1	2	0	0	8	75
5:25 PM	1	0	1	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	6	73
5:30 PM	2	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	6	73
5:35 PM	2	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	6	77
5:40 PM	0	0	1	0	0	0	0	0	0	0	3	1	0	0	1	2	0	0	8	80
5:45 PM	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	4	81
5:50 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	3	73
5:55 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	69
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U				
All Vehicles	8	0	20	0	0	0	0	0	0	32	12	0	16	28	0	0	116			
Heavy Trucks	0	0	0		0	0	0		0	4	0		0	0	0		4			
Buses																				
Pedestrians		0			0				0					0			0			
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0			
Scoters																				

Comments:

LOCATION: Bluff Road -- Hudson Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711535
DATE: Wed, Feb 23 2022

Peak-Hour: 7:10 AM -- 8:10 AM
 Peak 15-Min: 7:30 AM -- 7:45 AM



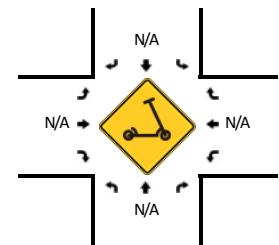
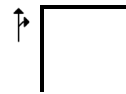
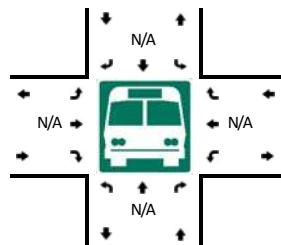
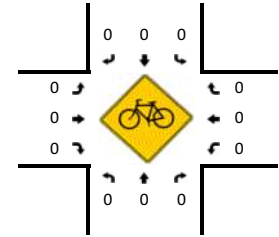
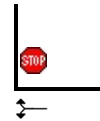
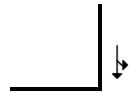
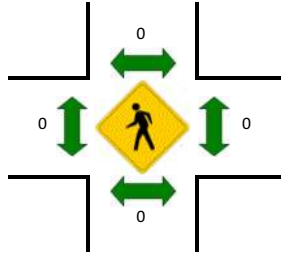
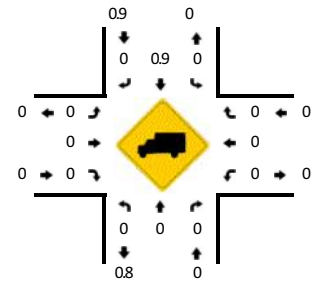
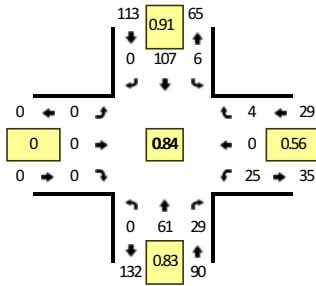
5-Min Count Period Beginning At	Bluff Road (Northbound)				Bluff Road (Southbound)				Hudson Road (Eastbound)				Hudson Road (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	3	1	0	0	2	0	0	0	0	0	0	0	3	0	0	0	9	
7:05 AM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	
7:10 AM	0	9	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	11	
7:15 AM	0	8	1	0	0	4	0	0	0	0	0	0	0	1	0	1	0	15	
7:20 AM	0	9	1	0	0	3	0	0	0	0	0	0	0	3	0	0	0	16	
7:25 AM	0	15	0	0	0	7	0	0	0	0	0	0	0	2	0	1	0	25	
7:30 AM	0	16	1	0	0	13	0	0	0	0	0	0	0	3	0	0	0	33	
7:35 AM	0	18	1	0	0	14	0	0	0	0	0	0	0	1	0	0	0	34	
7:40 AM	0	17	2	0	0	17	0	0	0	0	0	0	0	3	0	0	0	39	
7:45 AM	0	8	3	0	0	13	0	1	0	0	0	0	0	1	0	0	0	26	
7:50 AM	0	4	0	0	0	9	0	0	0	0	0	0	0	1	0	0	0	14	
7:55 AM	0	3	2	0	2	4	0	0	0	0	0	0	0	2	0	1	0	14	240
8:00 AM	0	3	1	0	2	5	0	0	0	0	0	0	0	1	0	0	0	12	243
8:05 AM	0	5	0	0	0	5	0	0	0	0	0	0	0	1	0	0	0	11	250
8:10 AM	0	2	3	0	0	4	0	0	0	0	0	0	0	1	0	0	0	10	249
8:15 AM	0	1	1	0	0	7	0	0	0	0	0	0	0	1	0	0	0	10	244
8:20 AM	0	4	3	0	0	3	0	0	0	0	0	0	0	3	0	0	0	13	241
8:25 AM	0	2	3	0	0	1	0	0	0	0	0	0	0	5	0	0	0	11	227
8:30 AM	0	1	1	0	0	2	0	0	0	0	0	0	0	7	0	1	0	12	206
8:35 AM	0	3	1	0	0	3	0	0	0	0	0	0	0	5	0	1	0	13	185
8:40 AM	0	4	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	9	155
8:45 AM	0	2	3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	6	135
8:50 AM	0	3	3	1	0	8	0	0	0	0	0	0	0	1	0	1	0	17	138
8:55 AM	0	2	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	5	129
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	204	16	0	0	176	0	0	0	0	0	0	0	28	0	0	0	424	
Heavy Trucks	0	8	4		0	0	0		0	0	0		0	0	0		12		
Buses																			
Pedestrians		0				0					0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																			

Comments:

LOCATION: Bluff Road -- Hudson Road
CITY/STATE: Clackamas, OR

QC JOB #: 15711536
DATE: Wed, Feb 23 2022

Peak-Hour: 4:00 PM -- 5:00 PM
 Peak 15-Min: 4:10 PM -- 4:25 PM

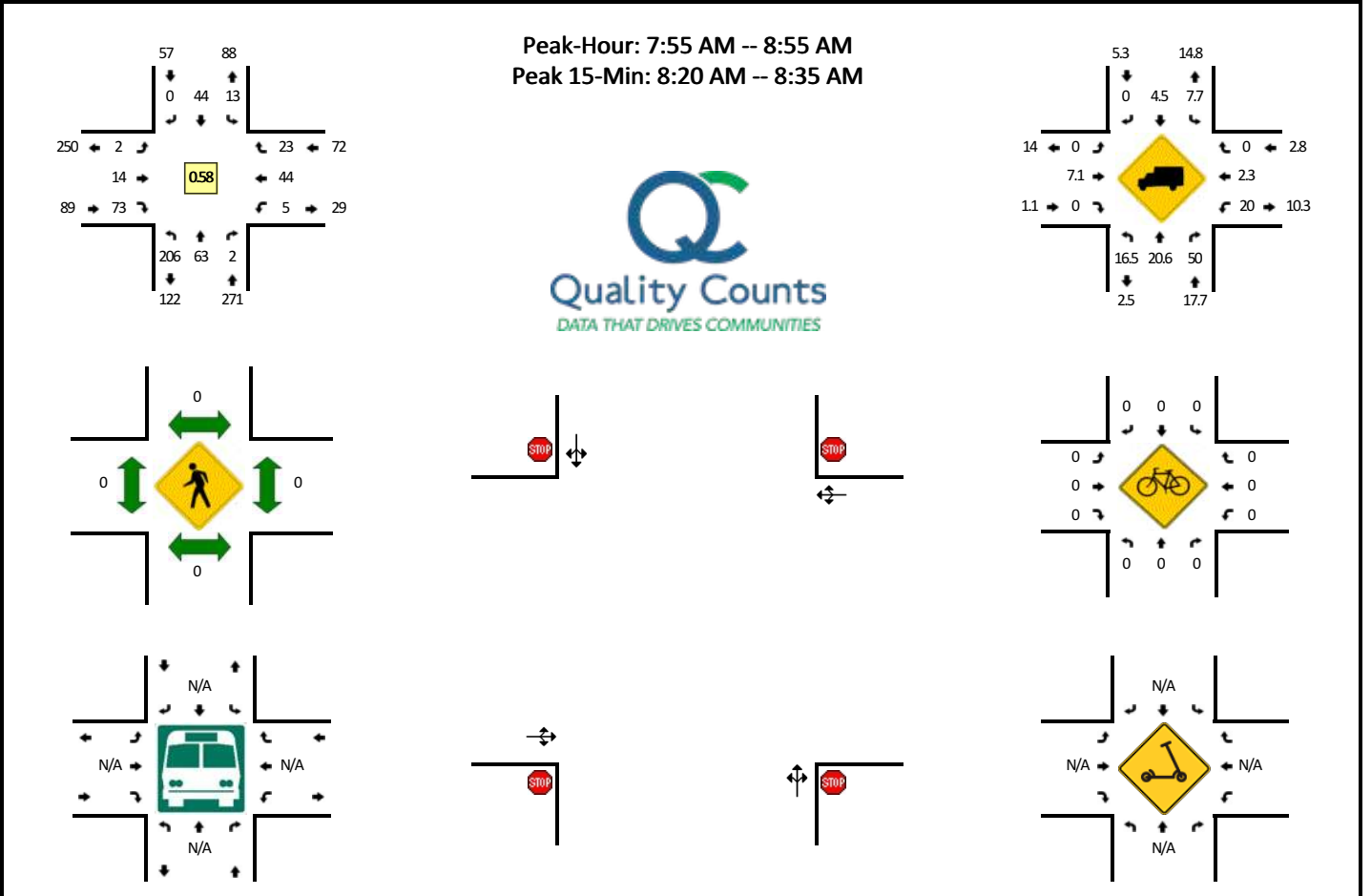


5-Min Count Period Beginning At	Bluff Road (Northbound)				Bluff Road (Southbound)				Hudson Road (Eastbound)				Hudson Road (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	4	4	0	2	9	0	0	0	0	0	0	5	0	1	0	25	
4:05 PM	0	3	1	0	0	10	0	0	0	0	0	0	3	0	0	0	17	
4:10 PM	0	9	2	0	0	10	0	0	0	0	0	0	2	0	2	0	25	
4:15 PM	0	4	2	0	0	9	0	0	0	0	0	0	2	0	0	0	17	
4:20 PM	0	8	2	0	0	11	0	0	0	0	0	0	6	0	0	0	27	
4:25 PM	0	5	3	0	1	8	0	0	0	0	0	0	0	0	0	0	17	
4:30 PM	0	7	1	0	0	10	0	0	0	0	0	0	3	0	0	0	21	
4:35 PM	0	4	2	0	0	10	0	0	0	0	0	0	0	0	0	0	16	
4:40 PM	0	7	1	0	0	5	0	0	0	0	0	0	0	0	1	0	14	
4:45 PM	0	2	1	0	1	10	0	0	0	0	0	0	2	0	0	0	16	
4:50 PM	0	1	7	0	1	9	0	0	0	0	0	0	0	0	0	0	18	
4:55 PM	0	7	3	0	1	6	0	0	0	0	0	0	2	0	0	0	19	232
5:00 PM	0	4	3	0	0	9	0	0	0	0	0	0	0	0	0	0	16	223
5:05 PM	0	2	5	0	1	8	0	0	0	0	0	0	2	0	0	0	18	224
5:10 PM	0	4	3	0	2	5	0	0	0	0	0	0	1	0	1	0	16	215
5:15 PM	0	3	1	0	0	6	0	0	0	0	0	0	0	0	0	0	10	208
5:20 PM	0	2	2	0	1	7	0	0	0	0	0	0	2	0	1	0	15	196
5:25 PM	0	2	1	0	1	12	0	0	0	0	0	0	1	0	0	0	17	196
5:30 PM	0	3	6	0	1	4	0	0	0	0	0	0	1	0	1	0	16	191
5:35 PM	0	5	4	0	0	12	0	0	0	0	0	0	0	0	0	0	21	196
5:40 PM	0	3	1	0	2	8	0	0	0	0	0	0	3	0	0	0	17	199
5:45 PM	0	2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	7	190
5:50 PM	0	2	1	0	0	4	0	0	0	0	0	0	2	0	0	0	9	181
5:55 PM	0	5	2	0	1	9	0	0	0	0	0	0	1	0	0	0	18	180
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	84	24	0	0	120	0	0	0	0	0	0	40	0	8	0	276	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: SE 302nd Ave -- SE Lusted Rd
CITY/STATE: Multnomah, OR

QC JOB #: 16123903
DATE: Wed, Mar 15 2023

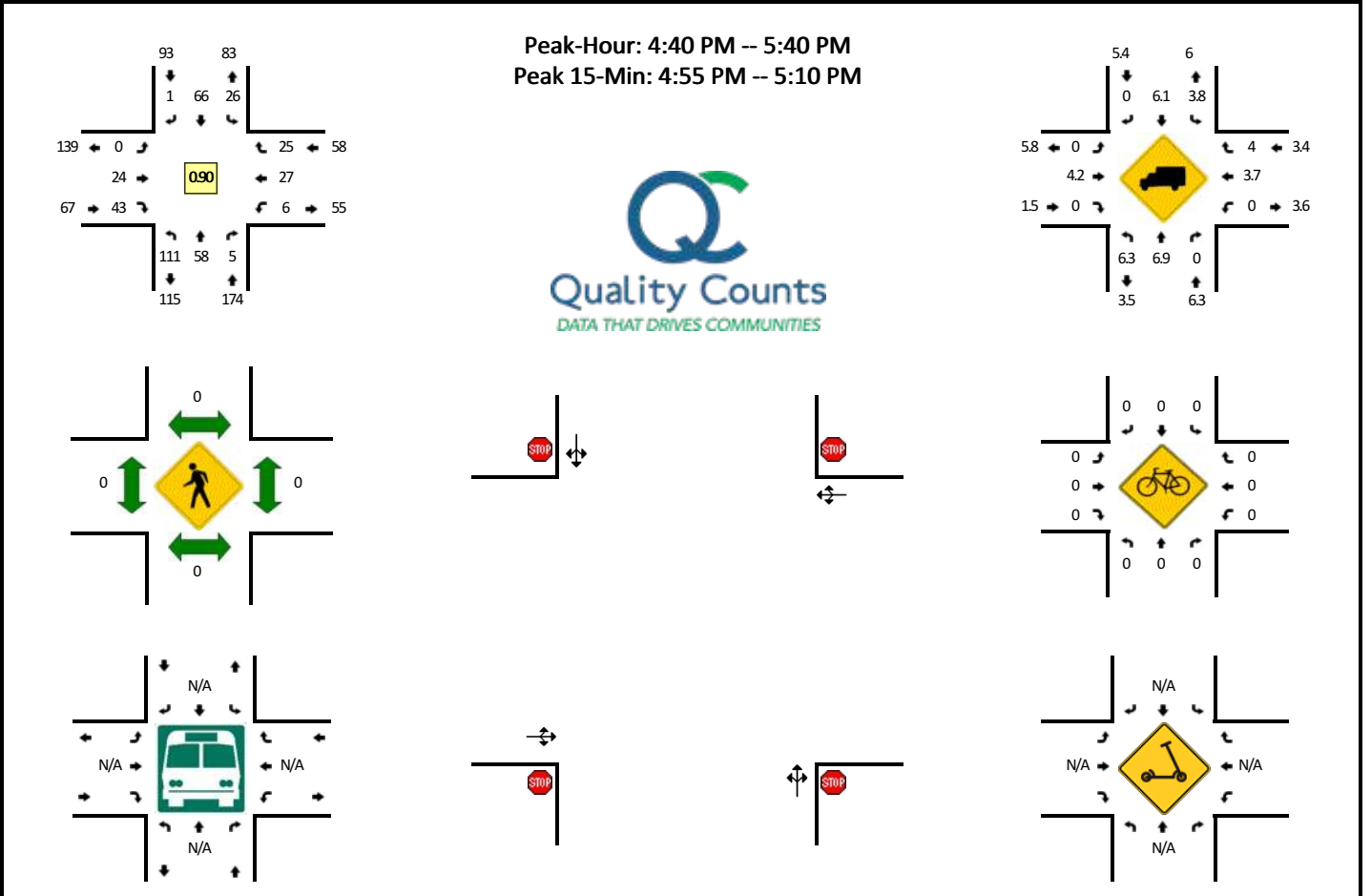


5-Min Count Period Beginning At	SE 302nd Ave (Northbound)				SE 302nd Ave (Southbound)				SE Lusted Rd (Eastbound)				SE Lusted Rd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	6	5	0	0	0	1	0	0	0	0	1	2	0	0	2	2	0	19	
7:05 AM	6	4	0	0	1	3	0	0	0	0	1	3	0	0	3	1	0	22	
7:10 AM	6	2	1	0	0	7	0	0	0	0	2	1	0	0	2	1	0	22	
7:15 AM	1	4	1	0	1	3	0	0	0	0	1	1	0	0	1	2	0	15	
7:20 AM	2	8	0	0	0	3	0	0	0	0	1	0	0	0	3	5	0	22	
7:25 AM	1	5	0	0	1	3	0	0	0	0	0	1	0	0	0	1	0	12	
7:30 AM	3	5	0	0	1	3	0	0	0	0	2	1	0	0	1	0	0	16	
7:35 AM	3	8	0	0	2	3	0	0	0	0	0	1	0	0	1	3	0	21	
7:40 AM	1	6	0	0	1	2	0	0	0	0	0	0	0	0	0	3	0	13	
7:45 AM	4	4	0	0	1	0	0	0	0	0	0	1	0	0	2	1	0	13	
7:50 AM	4	1	0	0	2	4	0	0	0	0	2	1	0	0	4	0	0	18	
7:55 AM	7	5	0	0	0	3	0	0	0	0	2	0	0	0	1	2	0	20	213
8:00 AM	9	2	1	0	0	3	0	0	0	0	0	1	0	0	1	2	0	20	214
8:05 AM	21	5	0	0	2	2	0	0	0	0	0	6	0	1	5	0	0	42	234
8:10 AM	32	6	0	0	2	3	0	0	0	0	0	6	0	0	5	4	0	58	270
8:15 AM	34	11	0	0	1	3	0	0	0	0	0	11	0	0	3	3	0	66	321
8:20 AM	30	6	0	0	3	6	0	0	0	0	3	14	0	0	12	2	0	76	375
8:25 AM	25	2	0	0	0	9	0	0	0	1	3	10	0	1	7	1	0	59	422
8:30 AM	30	11	0	0	2	4	0	0	0	1	5	15	0	1	4	2	0	75	481
8:35 AM	4	3	0	0	0	0	0	0	0	0	1	5	0	1	1	0	0	15	475
8:40 AM	2	3	1	0	1	2	0	0	0	0	0	2	0	0	4	2	0	17	479
8:45 AM	6	5	0	0	1	5	0	0	0	0	0	1	0	0	1	1	0	20	486
8:50 AM	6	4	0	0	1	4	0	0	0	0	0	2	0	0	0	4	0	21	489
8:55 AM	3	5	0	0	0	1	0	0	0	0	1	1	0	0	3	0	0	14	483
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	340	76	0	0	20	76	0	0	8	44	156	0	8	92	20	0	840		
Heavy Trucks	40	24	0	0	0	4	0	0	0	4	0	0	0	0	0	0	72		
Buses																			
Pedestrians		0				0				0				0			0		
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0		
Scoters																			

Comments:

LOCATION: SE 302nd Ave -- SE Lusted Rd
CITY/STATE: Multnomah, OR

QC JOB #: 16123904
DATE: Wed, Mar 15 2023



5-Min Count Period Beginning At	SE 302nd Ave (Northbound)				SE 302nd Ave (Southbound)				SE Lusted Rd (Eastbound)				SE Lusted Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	7	9	1	0	1	6	1	0	0	4	1	0	0	4	0	0	34	
4:05 PM	6	6	0	0	3	5	0	0	0	1	2	0	0	6	3	0	32	
4:10 PM	8	2	0	0	0	5	0	0	0	1	1	0	0	5	2	0	24	
4:15 PM	5	7	0	0	1	5	0	0	0	3	0	0	0	4	4	0	29	
4:20 PM	7	3	0	0	4	5	0	0	0	2	0	0	1	5	0	0	27	
4:25 PM	5	8	0	0	2	6	0	0	0	3	4	0	0	1	1	0	30	
4:30 PM	5	5	0	0	2	6	0	0	0	1	1	0	1	5	0	0	26	
4:35 PM	3	5	0	0	0	7	0	0	0	1	3	0	1	2	0	0	22	
4:40 PM	8	2	0	0	1	14	0	0	0	3	3	0	0	0	4	0	35	
4:45 PM	9	6	1	0	4	7	0	0	0	1	2	0	0	2	2	0	34	
4:50 PM	9	3	0	0	1	5	0	0	0	2	4	0	0	1	3	0	28	
4:55 PM	17	3	1	0	1	5	0	0	0	2	6	0	1	2	1	0	39	360
5:00 PM	15	4	0	0	2	3	1	0	0	3	4	0	0	2	3	0	37	363
5:05 PM	7	3	1	0	3	6	0	0	0	3	5	0	2	2	1	0	33	364
5:10 PM	10	6	0	0	2	3	0	0	0	1	4	0	1	3	3	0	33	373
5:15 PM	10	5	0	0	1	5	0	0	0	2	4	0	1	2	2	0	32	376
5:20 PM	8	5	0	0	4	2	0	0	0	1	4	0	0	2	0	0	26	375
5:25 PM	6	7	0	0	4	3	0	0	0	4	3	0	0	4	1	0	32	377
5:30 PM	6	8	1	0	1	3	0	0	0	1	1	0	0	5	5	0	31	382
5:35 PM	6	6	1	0	2	10	0	0	0	1	3	0	1	2	0	0	32	392
5:40 PM	4	4	1	0	0	7	0	0	0	3	0	0	0	1	4	0	24	381
5:45 PM	6	7	0	0	0	1	0	0	0	2	1	0	0	1	1	0	19	366
5:50 PM	6	2	0	0	2	3	0	0	0	0	2	0	0	3	3	0	21	359
5:55 PM	6	3	0	0	2	2	0	0	0	1	1	0	0	5	3	0	23	343
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	156	40	8	0	24	56	4	0	0	32	60	0	12	24	20	0	436	
Heavy Trucks	8	4	0	0	0	0	0	0	0	0	0	0	0	0	4	0	16	
Buses																	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters																	0	

Comments:



Location: SE Orient Dr -- SE Bluff Rd/SE Teton Dr
 Date: 3/15/2023
 Site Code: 16123905

Start Time	SE Orient Dr Southbound					Flat Creek Garden Center Dwy Southwestbound					SE Bluff Rd Westbound				SE Orient Dr Northbound				SE Teton Dr Eastbound						
	Right	Thru	Left	Left to Flat Creek Garden Center Dwy	U-Turn	Right to SE Orient Dr	Right to SE Teton Dr	Left to SE Orient Dr	Left to SE Bluff Rd	U-Turn	Right to Flat Creek Garden Center Dwy	Right	Thru	Left	U-Turn	Right	Right to Flat Creek Garden Center Dwy	Thru	Left	U-Turn	Right	Thru	Left to Flat Creek Garden Center Dwy	Left	U-Turn
07:00 AM	0	9	13	0	0	0	0	0	0	0	0	6	0	0	0	2	0	6	0	0	0	0	0	0	0
07:05 AM	0	8	13	0	0	0	0	0	0	0	0	5	0	0	0	5	0	8	0	0	0	0	0	0	1
07:10 AM	0	6	14	0	0	0	0	0	0	0	0	10	0	2	0	0	0	5	0	0	0	0	0	0	0
07:15 AM	0	11	12	0	0	0	0	0	0	0	0	7	0	2	0	2	0	4	0	0	0	0	0	0	0
07:20 AM	0	4	22	0	0	0	0	0	0	0	0	4	0	0	0	1	0	4	0	0	0	0	0	0	0
07:25 AM	0	3	13	0	0	0	0	0	0	0	0	10	0	2	0	4	0	6	0	0	0	0	0	0	0
07:30 AM	0	11	16	0	0	0	0	0	0	0	0	6	0	0	0	1	0	5	0	0	0	0	0	0	0
07:35 AM	1	9	9	0	0	0	0	0	0	0	0	7	0	0	0	2	0	5	0	0	0	0	0	0	0
07:40 AM	0	9	11	0	0	0	0	0	0	0	0	10	0	3	0	2	0	10	0	0	0	0	0	1	0
07:45 AM	0	11	11	0	0	0	0	0	0	0	0	14	0	0	0	1	0	7	0	0	0	0	0	1	0
07:50 AM	0	6	3	0	0	0	0	0	0	0	0	10	0	0	0	1	0	12	0	0	0	0	0	0	0
07:55 AM	0	2	4	0	0	0	0	0	0	0	0	6	0	2	0	3	0	7	0	0	0	0	0	0	0
08:00 AM	0	4	8	0	0	0	0	0	0	0	0	6	0	1	0	4	0	8	0	0	0	0	0	0	0
08:05 AM	0	8	3	0	0	0	0	0	0	0	0	5	0	1	0	3	0	8	0	0	0	0	0	0	0
08:10 AM	0	5	10	0	0	0	0	0	0	0	0	3	0	0	0	4	0	7	0	0	0	0	0	0	0
08:15 AM	0	10	9	0	0	0	0	0	0	0	0	10	0	3	0	4	0	6	0	0	0	0	0	0	0
08:20 AM	0	6	9	0	0	0	0	0	0	0	0	6	0	4	0	9	0	6	0	0	0	0	0	0	0
08:25 AM	0	4	3	0	0	0	0	0	0	0	0	5	0	1	0	3	0	4	0	0	0	0	0	0	0
08:30 AM	0	7	2	0	0	0	0	0	0	0	0	7	0	3	0	1	0	5	0	0	0	0	0	0	0
08:35 AM	0	4	1	0	0	0	0	0	0	0	0	2	0	5	0	1	0	5	0	0	0	0	0	0	0
08:40 AM	0	5	4	0	0	0	0	0	0	0	0	8	1	0	0	1	0	7	0	0	1	0	0	0	0
08:45 AM	0	9	2	0	0	0	0	0	0	0	0	10	0	1	0	1	0	4	0	0	0	0	0	0	0
08:50 AM	0	6	4	0	0	0	0	0	0	0	0	6	0	2	1	2	0	4	0	0	0	0	0	0	0
08:55 AM	0	9	7	0	0	0	0	0	0	0	0	0	0	1	0	1	0	7	0	0	0	0	0	0	0
Total	1	166	203	0	0	0	0	0	0	0	0	163	1	33	1	58	0	150	0	0	1	0	0	3	0

Peak Hour: 7:00 AM - 8:00 AM
 Peak 15: 7:35 AM - 7:50 AM
 PHF: 0.893145



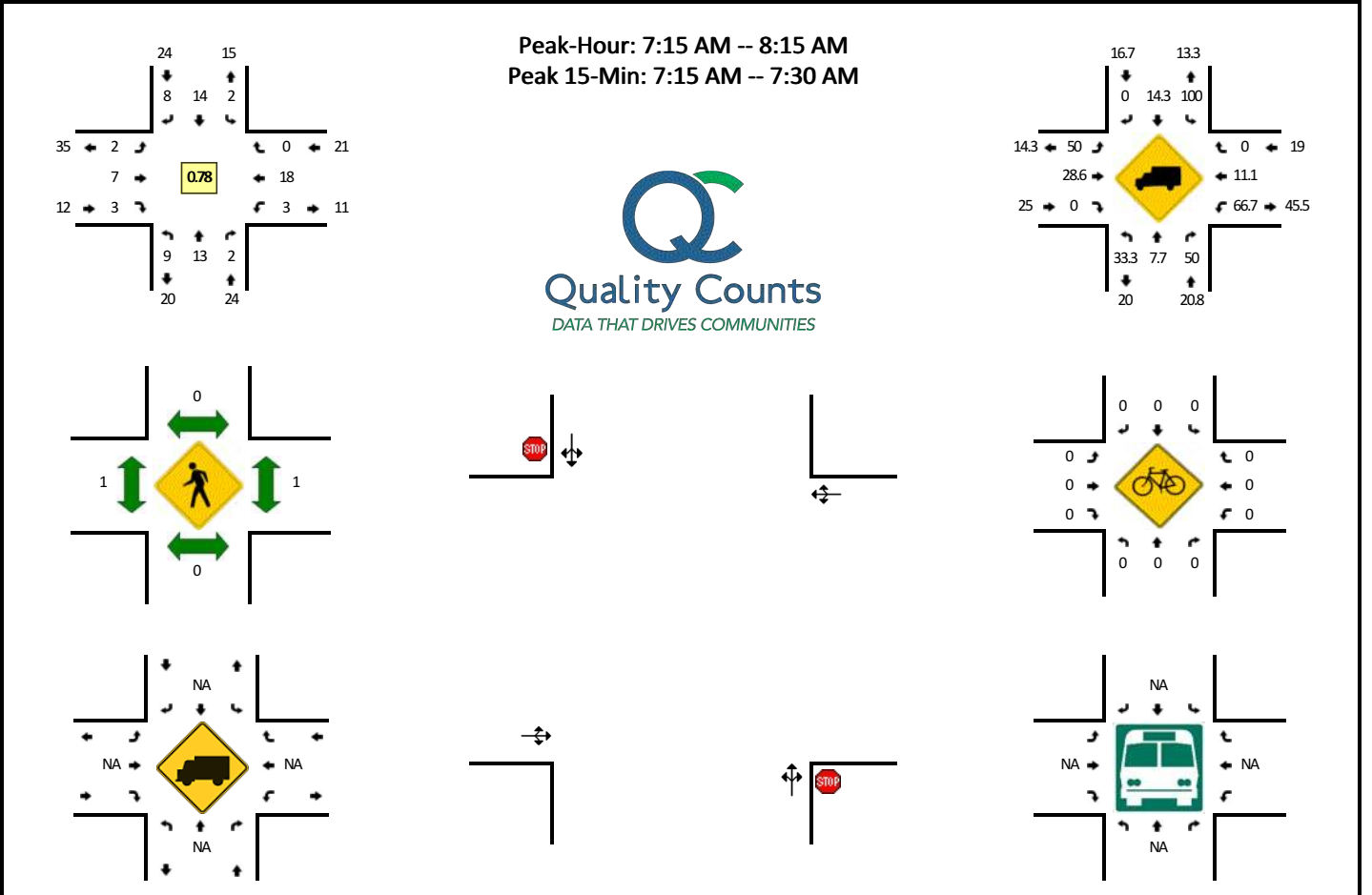
Location: SE Orient Dr -- SE Bluff Rd/SE Teton Dr
 Date: 3/15/2023
 Site Code: 16123906

Start Time	SE Orient Dr Southbound					Flat Creek Garden Center Dwy Southwestbound					SE Bluff Rd Westbound				SE Orient Dr Northbound				SE Teton Dr Eastbound					
	Right	Thru	Left	Left to Flat Creek Garden Center Dwy	U-Turn	Right to SE Orient Dr	Right to SE Teton Dr	Left to SE Orient Dr	Left to SE Bluff Rd	U-Turn	Right to Flat Creek Garden Center Dwy	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left to Flat Creek Garden Center Dwy	Left	U-Turn
04:00 PM	0	14	9	0	0	0	0	0	0	0	0	20	0	4	0	4	0	10	0	0	0	0	0	0
04:05 PM	1	19	11	0	0	0	0	0	0	0	0	25	0	3	0	5	0	17	0	0	0	0	0	0
04:10 PM	1	14	4	0	0	0	0	0	0	0	0	19	0	6	0	2	0	18	0	0	0	0	0	0
04:15 PM	0	19	8	0	0	0	0	0	0	0	0	11	0	2	0	2	0	12	0	0	0	0	0	0
04:20 PM	0	9	6	0	0	0	0	0	0	0	0	24	0	3	0	0	0	10	0	0	0	0	0	0
04:25 PM	0	16	6	0	0	0	0	0	0	0	0	4	0	2	0	1	0	11	0	0	0	0	0	0
04:30 PM	0	15	11	0	0	0	0	0	0	0	0	7	0	3	0	2	0	14	0	0	0	0	0	0
04:35 PM	0	22	9	0	0	0	0	0	0	0	0	22	0	0	0	0	0	6	0	0	0	0	0	0
04:40 PM	0	15	7	0	0	0	0	0	0	0	0	31	0	2	0	2	0	12	0	0	0	0	0	0
04:45 PM	1	20	11	0	0	0	0	0	0	0	0	8	0	5	0	4	0	10	0	0	0	0	0	0
04:50 PM	1	23	9	0	0	0	0	0	0	0	0	7	0	3	0	2	0	16	0	0	1	0	0	0
04:55 PM	0	18	16	0	0	0	0	0	0	0	0	5	0	3	0	2	0	7	0	0	0	0	0	0
05:00 PM	0	10	8	0	0	0	0	0	0	0	0	5	0	2	0	2	0	8	0	0	0	0	0	0
05:05 PM	0	17	11	0	0	0	0	0	0	0	0	8	0	6	0	1	0	10	0	0	0	0	0	0
05:10 PM	0	15	7	0	0	0	0	0	0	0	0	11	0	4	0	1	0	5	0	0	0	0	0	0
05:15 PM	0	22	6	0	0	0	0	0	0	0	0	6	0	2	0	2	0	9	0	0	0	0	0	0
05:20 PM	0	18	11	1	0	0	0	0	0	0	0	3	0	0	0	3	0	8	0	0	0	0	0	0
05:25 PM	0	10	17	0	0	0	0	0	0	0	0	13	0	1	0	4	0	11	1	0	0	0	0	0
05:30 PM	0	10	12	0	0	0	0	0	0	0	0	12	0	1	0	5	0	6	0	0	0	0	0	0
05:35 PM	0	12	7	0	0	0	0	0	0	0	0	9	0	3	0	1	0	6	0	0	0	0	0	0
05:40 PM	0	15	9	0	0	0	0	0	0	0	0	4	0	1	0	1	0	14	0	0	0	0	0	0
05:45 PM	0	12	6	0	0	0	0	0	0	0	0	7	0	2	0	2	0	16	0	0	0	0	0	0
05:50 PM	0	15	10	0	0	0	0	0	0	0	0	2	0	3	0	1	0	7	0	0	0	0	0	0
05:55 PM	1	6	4	0	0	0	0	0	0	0	0	6	0	2	0	1	0	7	0	0	0	0	0	0
Total	5	366	215	1	0	0	0	0	0	0	0	269	0	63	0	50	0	250	1	0	1	0	0	0

Peak Hour: 4:00 PM - 5:00 PM
 Peak 15: 4:00 PM - 4:15 PM
 PHF: 0.854369

LOCATION: SE Cottell Rd -- SE Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 14910307
DATE: Thu, Feb 28 2019

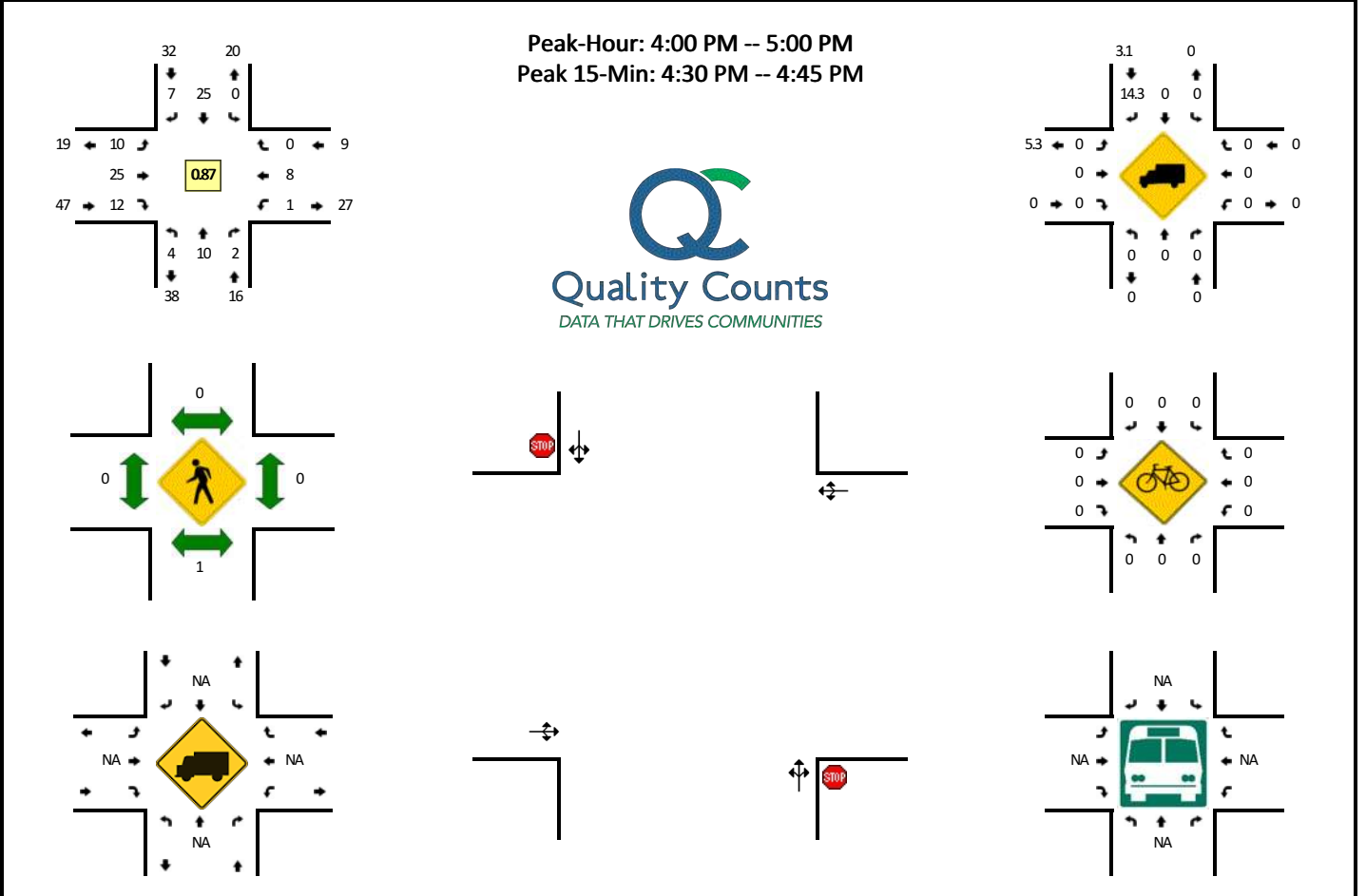


15-Min Count Period Beginning At	SE Cottell Rd (Northbound)				SE Cottell Rd (Southbound)				SE Dodge Park Blvd (Eastbound)				SE Dodge Park Blvd (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	3	3	0	0	0	1	1	0	1	0	2	0	0	3	0	0	0	14	
7:15 AM	3	5	1	0	1	4	2	0	0	1	2	0	1	6	0	0	0	26	
7:30 AM	3	4	1	0	1	5	0	0	1	1	0	0	0	5	0	0	0	21	
7:45 AM	2	3	0	0	0	1	2	0	1	4	1	0	0	5	0	0	0	19	80
8:00 AM	1	1	0	0	0	4	4	0	0	1	0	0	2	2	0	0	0	15	81
8:15 AM	4	2	0	0	0	0	1	0	1	1	1	0	0	2	0	0	0	12	67
8:30 AM	2	1	1	0	1	1	2	0	1	2	5	0	0	4	0	0	0	20	66
8:45 AM	2	1	0	0	0	2	2	0	0	1	0	0	1	1	0	0	0	10	57
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	12	20	4	0	4	16	8	0	0	4	8	0	4	24	0	0	0	104	
Heavy Trucks	0	0	4	0	4	0	0	0	0	0	0	0	4	4	0	0	0	16	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																			
Stopped Buses																			

Comments:

LOCATION: SE Cottell Rd -- SE Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 14910308
DATE: Thu, Mar 7 2019

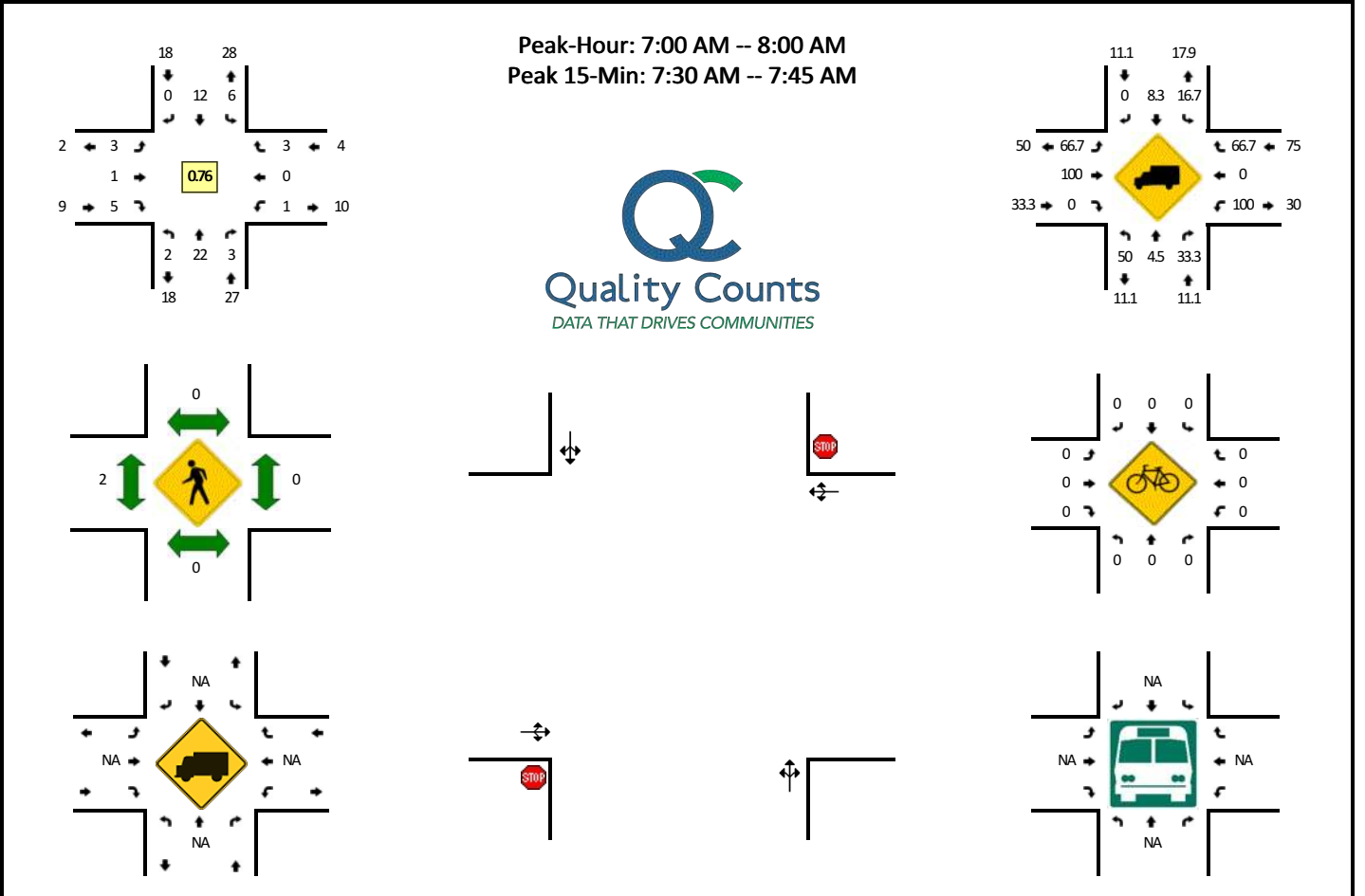


15-Min Count Period Beginning At	SE Cottell Rd (Northbound)				SE Cottell Rd (Southbound)				SE Dodge Park Blvd (Eastbound)				SE Dodge Park Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	6	1	0	0	7	3	0	0	5	4	0	0	0	0	0	27	
4:15 PM	0	2	0	0	0	2	3	0	3	6	3	0	1	2	0	0	22	
4:30 PM	2	1	0	0	0	12	1	0	4	7	1	0	0	2	0	0	30	
4:45 PM	1	1	1	0	0	4	0	0	3	7	4	0	0	4	0	0	25	104
5:00 PM	2	1	0	0	1	7	0	0	1	2	1	0	0	4	0	0	19	96
5:15 PM	3	3	0	0	0	3	0	0	2	6	2	0	0	4	0	0	23	97
5:30 PM	1	1	0	0	1	2	1	0	2	8	5	0	1	3	0	0	25	92
5:45 PM	1	1	0	0	0	1	0	0	2	11	3	0	0	3	0	0	22	89
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	8	4	0	0	0	48	4	0	16	28	4	0	0	8	0	0	120	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Cottell Rd -- SE Carpenter Ln
CITY/STATE: Multnomah, OR

QC JOB #: 14910309
DATE: Thu, Feb 28 2019

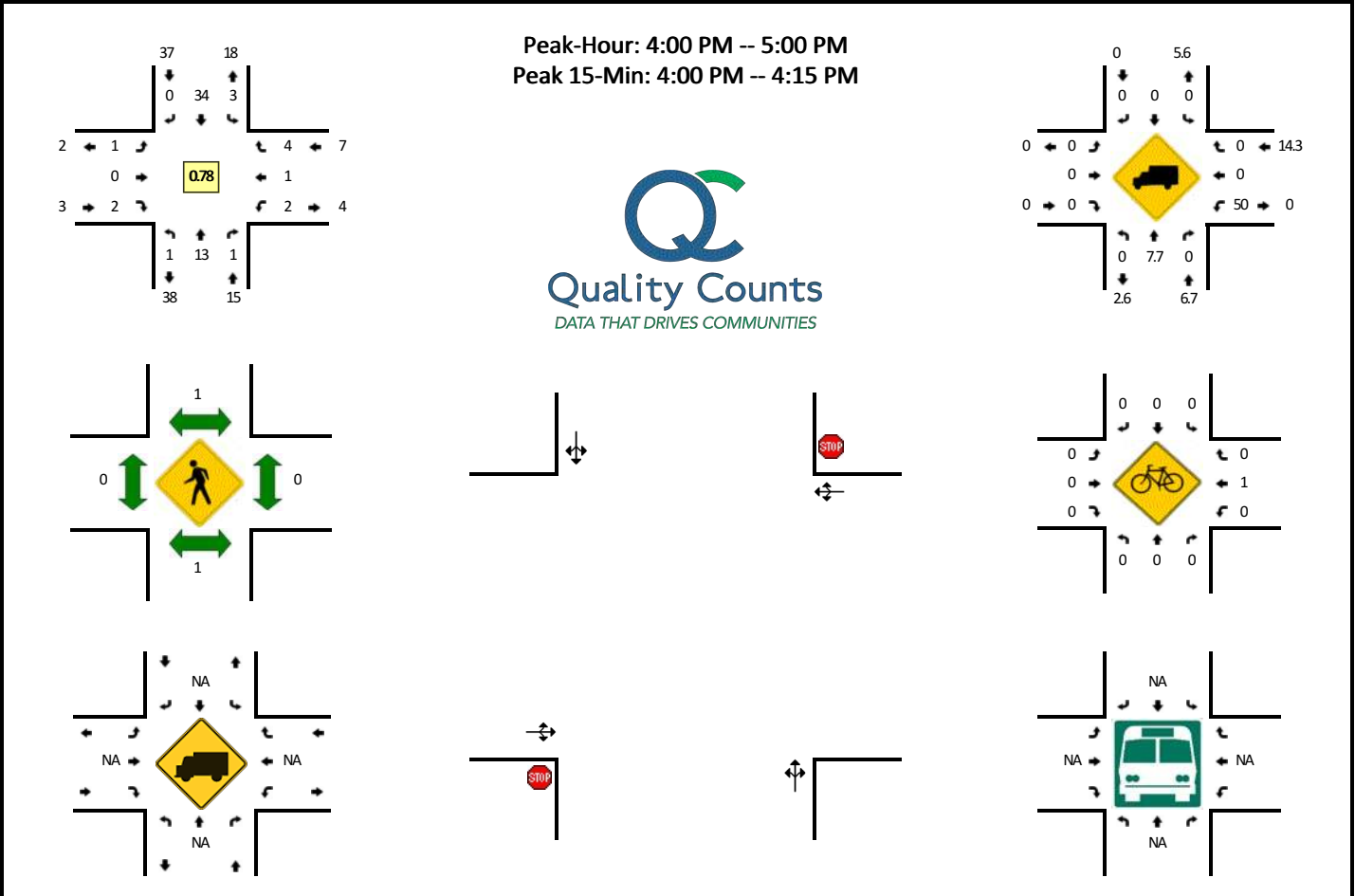


15-Min Count Period Beginning At	SE Cottell Rd (Northbound)				SE Cottell Rd (Southbound)				SE Carpenter Ln (Eastbound)				SE Carpenter Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	5	0	0	2	2	0	0	1	0	2	0	0	0	0	0	12	
7:15 AM	0	8	1	0	2	4	0	0	1	0	1	0	0	0	0	0	17	
7:30 AM	0	6	2	0	1	5	0	0	0	1	1	0	1	0	2	0	19	
7:45 AM	2	3	0	0	1	1	0	0	1	0	1	0	0	0	1	0	10	58
8:00 AM	1	1	0	0	1	4	1	0	1	0	0	0	0	0	0	0	9	55
8:15 AM	1	3	1	0	1	0	0	0	0	0	1	0	0	0	2	0	9	47
8:30 AM	0	3	1	0	2	1	1	0	1	0	0	0	0	0	0	0	9	37
8:45 AM	0	2	0	0	2	1	0	0	0	0	0	0	0	0	1	0	6	33
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	24	8	0	4	20	0	0	0	4	4	0	4	0	8	0	76	
Heavy Trucks	0	0	4		4	0	0		0	4	0		4	0	4		20	
Pedestrians	0	0	0		0	0	0		4	0	0		0	0	0		4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Cottell Rd -- SE Carpenter Ln
CITY/STATE: Multnomah, OR

QC JOB #: 14910310
DATE: Thu, Mar 7 2019



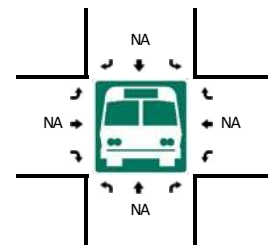
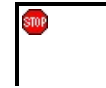
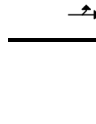
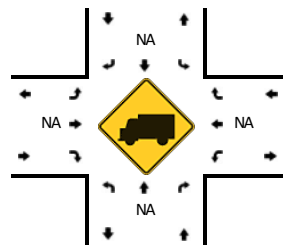
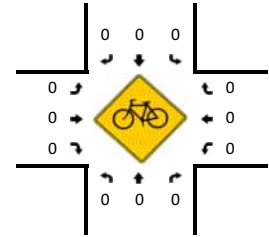
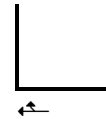
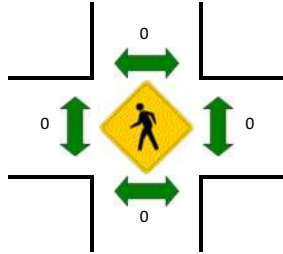
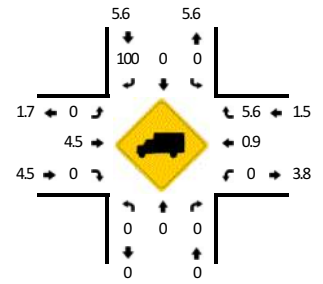
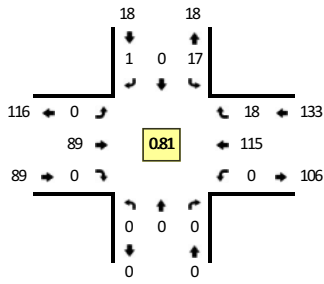
15-Min Count Period Beginning At	SE Cottell Rd (Northbound)				SE Cottell Rd (Southbound)				SE Carpenter Ln (Eastbound)				SE Carpenter Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	6	0	0	1	8	0	0	0	0	2	0	1	0	2	0	20	
4:15 PM	0	3	0	0	0	7	0	0	0	0	0	0	1	0	1	0	12	
4:30 PM	0	2	0	0	0	13	0	0	0	0	0	0	0	0	1	0	16	
4:45 PM	1	2	1	0	2	6	0	0	1	0	0	0	0	1	0	0	14	62
5:00 PM	1	2	0	0	0	7	1	1	0	0	1	0	0	0	1	0	14	56
5:15 PM	1	5	0	0	0	5	0	0	0	0	0	0	0	0	1	0	12	56
5:30 PM	0	1	0	0	1	7	0	0	0	0	3	0	0	0	1	0	13	53
5:45 PM	0	2	1	0	0	3	1	0	0	0	1	0	0	0	0	0	8	47
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	24	0	0	4	32	0	0	0	0	8	0	4	0	8	0	80	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Cottell Rd -- SE Bluff Rd
CITY/STATE: Clackamas, OR

QC JOB #: 14910311
DATE: Thu, Feb 28 2019

Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:30 AM -- 7:45 AM

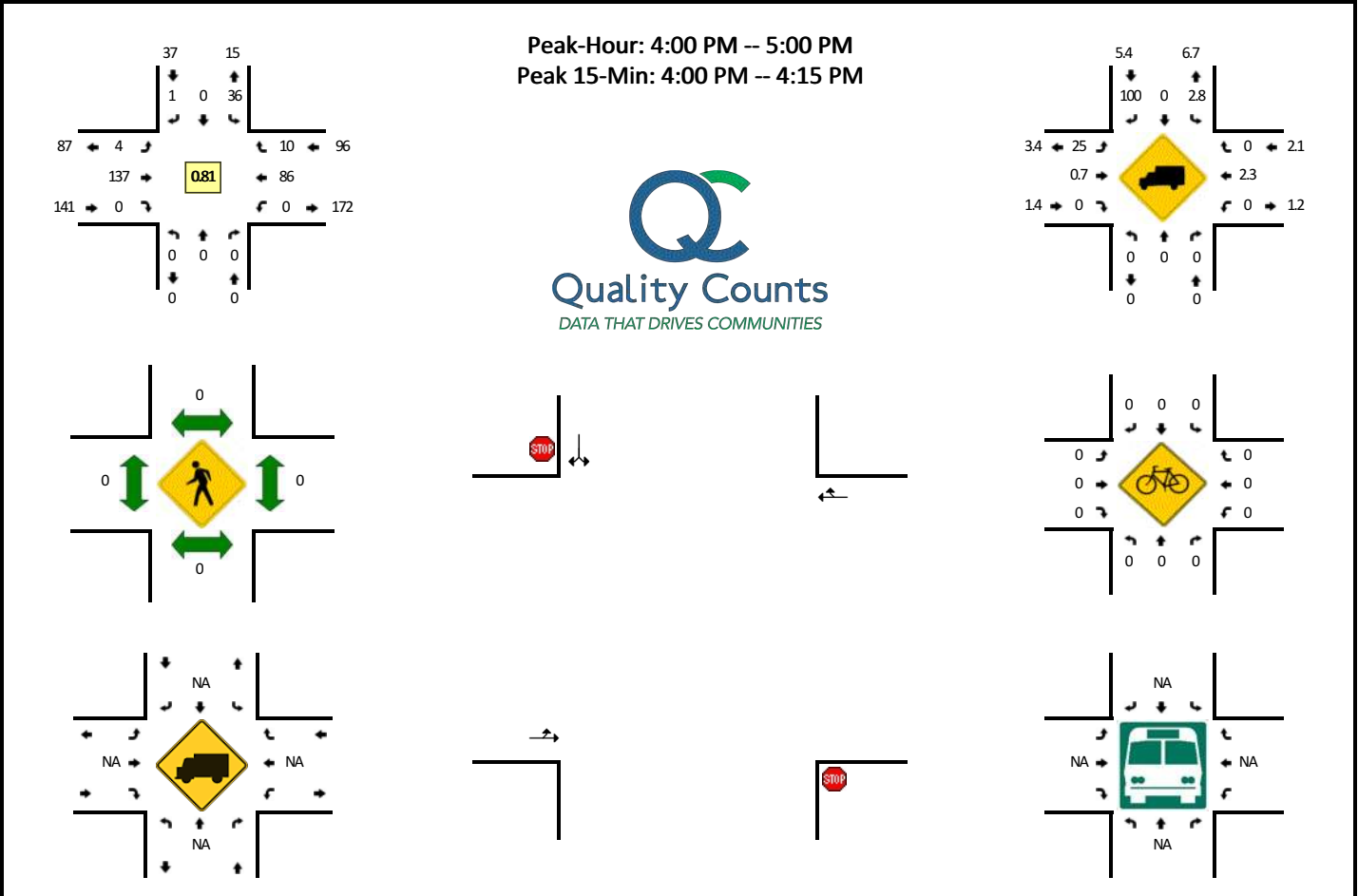


15-Min Count Period Beginning At	SE Cottell Rd (Northbound)				SE Cottell Rd (Southbound)				SE Bluff Rd (Eastbound)				SE Bluff Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	4	0	0	0	0	12	0	0	0	31	3	0	50	
7:15 AM	0	0	0	0	5	0	0	0	0	28	0	0	0	26	4	0	63	
7:30 AM	0	0	0	0	6	0	1	0	0	29	0	0	0	32	6	0	74	
7:45 AM	0	0	0	0	2	0	0	0	0	20	0	0	0	26	5	0	53	240
8:00 AM	0	0	0	0	6	0	0	0	1	14	0	0	0	14	1	0	36	226
8:15 AM	0	0	0	0	1	0	0	0	2	8	0	0	0	14	4	0	29	192
8:30 AM	0	0	0	0	2	0	0	0	0	8	0	0	0	15	2	0	27	145
8:45 AM	0	0	0	0	1	0	0	0	1	3	0	0	0	8	1	0	14	106
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	24	0	4	0	0	116	0	0	0	128	24	0	296	
Heavy Trucks	0	0	0	0	0	0	4	0	0	0	0	0	0	4	0	0	8	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

LOCATION: SE Cottell Rd -- SE Bluff Rd
CITY/STATE: Clackamas, OR

QC JOB #: 14910312
DATE: Thu, Mar 7 2019



15-Min Count Period Beginning At	SE Cottell Rd (Northbound)				SE Cottell Rd (Southbound)				SE Bluff Rd (Eastbound)				SE Bluff Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	11	0	0	0	2	46	0	0	0	22	4	0	85	
4:15 PM	0	0	0	0	9	0	0	0	2	27	0	0	0	25	3	0	66	
4:30 PM	0	0	0	0	10	0	1	0	0	34	0	0	0	23	1	0	69	
4:45 PM	0	0	0	0	5	0	0	1	0	30	0	0	0	16	2	0	54	274
5:00 PM	0	0	0	0	7	0	0	0	2	27	0	0	0	15	2	0	53	242
5:15 PM	0	0	0	0	5	0	0	0	0	15	0	0	0	16	4	0	40	216
5:30 PM	0	0	0	0	7	0	1	0	0	24	0	0	0	15	4	0	51	198
5:45 PM	0	0	0	0	3	0	0	0	1	28	0	0	0	11	0	0	43	187
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	44	0	0	0	8	184	0	0	0	88	16	0	340	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

Type of report: Tube Count - Volume Data

LOCATION: SE Bluff Rd 300' west of SE 352nd Ave							QC JOB #: 14910315			
SPECIFIC LOCATION:							DIRECTION: EB, WB			
CITY/STATE: Clackamas, OR							DATE: Mar 7 2019 - Mar 7 2019			
Start Time	Mon	Tue	Wed	Thu 7 Mar 19	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM				12		12			12	
1:00 AM				2		2			2	
2:00 AM				6		6			6	
3:00 AM				3		3			3	
4:00 AM				12		12			12	
5:00 AM				40		40			40	
6:00 AM				83		83			83	
7:00 AM				114		114			114	
8:00 AM				92		92			92	
9:00 AM				162		162			162	
10:00 AM				97		97			97	
11:00 AM				106		106			106	
12:00 PM				128		128			128	
1:00 PM				126		126			126	
2:00 PM				179		179			179	
3:00 PM				165		165			165	
4:00 PM				267		267			267	
5:00 PM				175		175			175	
6:00 PM				106		106			106	
7:00 PM				69		69			69	
8:00 PM				49		49			49	
9:00 PM				41		41			41	
10:00 PM				31		31			31	
11:00 PM				22		22			22	
Day Total				2087		2087			2087	
% Weekday Average				100%						
% Week Average				100%		100%				
AM Peak Volume				9:00 AM 162		9:00 AM 162			9:00 AM 162	
PM Peak Volume				4:00 PM 267		4:00 PM 267			4:00 PM 267	

Comments:

Type of report: Tube Count - Volume Data

LOCATION: SE Dodge Park Blvd 0.5m east of Cottell Rd							QC JOB #: 14910316			
SPECIFIC LOCATION:							DIRECTION: EB, WB			
CITY/STATE: Multnomah, OR							DATE: Mar 7 2019 - Mar 7 2019			
Start Time	Mon	Tue	Wed	Thu 7 Mar 19	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM				1		1			1	
1:00 AM				1		1			1	
2:00 AM				0		0			0	
3:00 AM				1		1			1	
4:00 AM				10		10			10	
5:00 AM				16		16			16	
6:00 AM				24		24			24	
7:00 AM				28		28			28	
8:00 AM				25		25			25	
9:00 AM				18		18			18	
10:00 AM				25		25			25	
11:00 AM				30		30			30	
12:00 PM				29		29			29	
1:00 PM				22		22			22	
2:00 PM				23		23			23	
3:00 PM				27		27			27	
4:00 PM				36		36			36	
5:00 PM				40		40			40	
6:00 PM				27		27			27	
7:00 PM				14		14			14	
8:00 PM				12		12			12	
9:00 PM				11		11			11	
10:00 PM				7		7			7	
11:00 PM				6		6			6	
Day Total				433		433			433	
% Weekday Average				100%						
% Week Average				100%		100%				
AM Peak Volume				11:00 AM 30		11:00 AM 30			11:00 AM 30	
PM Peak Volume				5:00 PM 40		5:00 PM 40			5:00 PM 40	
<i>Comments:</i>										



Location: SE Proctor Rd -- SE Bluff Rd

Date: 2/28/2019

Site Code: 14910313

Start Time	SE Proctor Rd Southbound					SE Bluff Rd Westbound					SE 362nd Ave Northbound					SE Bluff Rd Eastbound					Oregon Trail Academy Dwy Southeastbound				
	Right to School Dwy	Right	Thru	Left	U-Turn	Right	Right to School Dwy	Thru	Left	U-Turn	Right	Thru	Left to School Dwy	Left	U-Turn	Right	Thru	Left	Left to School Dwy	U-Turn	Right to Bluff Rd	Right to 362nd Ave	Left to Bluff Rd	Left to Proctor Rd	U-Turn
07:00 AM	0	0	0	1	0	0	0	5	0	0	0	0	0	2	0	1	3	0	1	0	0	0	0	0	0
07:05 AM	0	1	0	0	0	1	0	5	0	0	0	0	4	0	1	3	1	0	0	0	0	0	0	0	0
07:10 AM	0	0	0	0	0	2	2	10	0	0	0	0	9	0	2	4	1	0	0	0	1	0	0	0	0
07:15 AM	0	0	0	0	0	2	0	3	0	0	0	0	7	0	1	3	1	0	0	0	0	0	0	0	0
07:20 AM	0	2	0	0	0	3	0	6	0	0	1	0	6	0	1	6	5	1	0	1	0	0	0	0	0
07:25 AM	0	1	0	1	0	12	0	1	0	0	0	1	0	0	0	3	5	0	0	0	0	0	0	0	0
07:30 AM	0	3	0	7	0	19	0	5	0	0	0	2	0	1	0	3	1	9	0	0	6	0	6	0	0
07:35 AM	0	9	1	5	0	18	0	1	0	0	0	1	0	1	0	1	6	6	0	0	6	1	11	0	0
07:40 AM	0	6	1	4	0	20	0	2	0	0	0	0	3	0	1	1	5	0	0	4	0	4	1	0	
07:45 AM	0	4	0	1	0	11	0	4	0	0	0	0	2	0	1	2	8	0	0	9	0	17	1	0	
07:50 AM	0	0	0	3	0	3	0	4	0	0	0	0	1	0	1	3	1	0	0	1	0	3	0	0	
07:55 AM	0	0	0	3	0	3	0	4	0	0	0	0	1	0	1	4	1	0	0	0	0	0	0	0	
08:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	4	2	0	0	0	0	0	1	0	0
08:05 AM	0	3	0	0	0	0	0	4	0	0	0	0	1	0	1	4	0	0	0	0	0	0	0	0	0
08:10 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	4	1	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	0	0	0	2	2	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0
08:20 AM	0	1	0	0	0	0	0	2	0	0	0	0	3	0	1	3	0	0	0	0	0	0	0	0	0
08:25 AM	0	0	0	0	0	0	0	2	0	0	0	0	2	0	2	2	0	0	0	0	0	0	0	0	0
08:30 AM	0	3	0	1	0	2	0	7	0	0	0	0	1	0	0	3	1	0	0	0	0	0	0	0	0
08:35 AM	0	0	0	0	0	1	0	1	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0
08:40 AM	0	1	0	1	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
08:45 AM	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
08:50 AM	0	0	0	0	0	1	0	2	0	0	0	0	1	0	0	2	1	0	0	0	0	0	0	0	0
08:55 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Total	0	36	2	27	0	101	2	78	2	0	1	4	0	53	0	20	68	49	2	0	28	1	43	2	0

Peak Hour: 7:00 AM - 8:00 AM

Peak 15: 7:30 AM - 7:45 AM

PHF: 0.56768



Location: SE Proctor Rd -- SE Bluff Rd

Date: 3/7/2019

Site Code: 14910314

Start Time	SE Proctor Rd Southbound					SE Bluff Rd Westbound					SE 362nd Ave Northbound					SE Bluff Rd Eastbound					Oregon Trail Academy Dwy Southeastbound				
	Right to School Dwy	Right	Thru	Left	U-Turn	Right	Right to School Dwy	Thru	Left	U-Turn	Right	Thru	Left to School Dwy	Left	U-Turn	Right	Thru	Left	Left to School Dwy	U-Turn	Right to SE Bluff Rd	Right to SE 362nd Ave	Left to SE Bluff Rd	Left to SE Proctor Rd	U-Turn
4:00 PM	0	0	0	0	0	1	0	6	0	0	0	0	0	1	0	1	10	0	0	0	0	0	0	0	0
4:05 PM	0	2	0	1	0	0	0	3	0	0	0	0	0	0	0	6	15	0	0	0	0	0	0	2	0
4:10 PM	0	1	0	2	0	2	0	1	0	0	1	0	0	2	0	5	13	0	0	0	0	0	0	0	0
4:15 PM	0	2	0	0	0	2	0	4	0	0	0	0	0	0	0	9	0	0	0	0	1	0	0	0	0
4:20 PM	0	1	0	0	0	3	0	2	0	0	0	1	0	3	0	3	5	1	0	0	0	0	0	0	0
4:25 PM	0	1	0	0	0	2	0	1	0	0	0	0	0	5	0	4	2	1	0	0	0	0	0	0	0
4:30 PM	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	4	14	1	0	0	0	0	0	0	0
4:35 PM	0	2	0	7	0	0	0	8	0	0	0	0	0	1	0	2	4	1	0	0	0	0	0	0	0
4:40 PM	0	1	1	2	0	1	0	1	0	0	0	0	3	0	2	12	1	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	2	0	0	1	0	0	3	0	2	8	0	0	0	1	0	1	0	0
4:50 PM	0	0	1	0	0	2	0	1	0	0	0	1	0	1	0	0	8	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	8	0	4	0	0	0	0	4	0	2	9	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	4	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	1	0	0	0	0	0	0	3	0	5	5	1	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	1	0	1	1	0	0	0	2	0	4	7	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	0	2	0	0	0	0	0	0	2	7	1	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	6	2	0	0	0	2	0	1	6	0	0	0	0	0	0	0	0	0
5:25 PM	0	1	0	0	0	1	0	5	0	0	0	0	3	0	2	5	1	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	3	2	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	1	0	3	0	0	0	0	1	0	2	5	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	1	0	0	0	4	0	0	0	0	3	0	3	7	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	0	0	0	0	3	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	1	0	2	0	0	0	0	1	0	7	5	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	7	2	0	0	0	0	0	0	0	0
Total	1	11	3	14	0	27	0	66	6	0	2	2	0	44	0	60	171	10	0	0	2	0	3	0	0

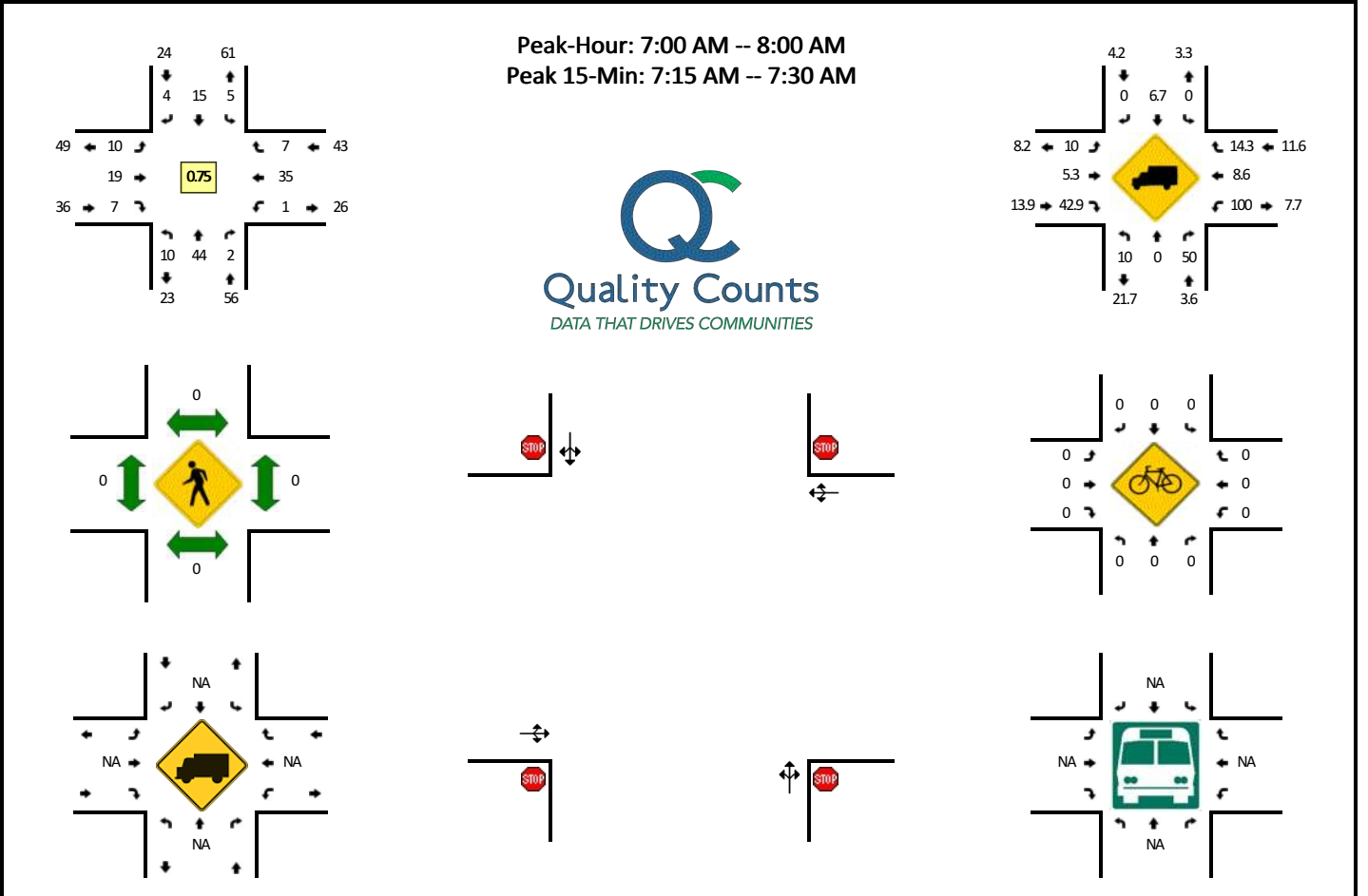
Peak Hour: 4:00 PM - 5:00 PM

Peak 15: 4:00 PM - 4:15 PM

PHF: 0.86333

LOCATION: SE Altman Rd -- SE Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 14910301
DATE: Thu, Feb 28 2019

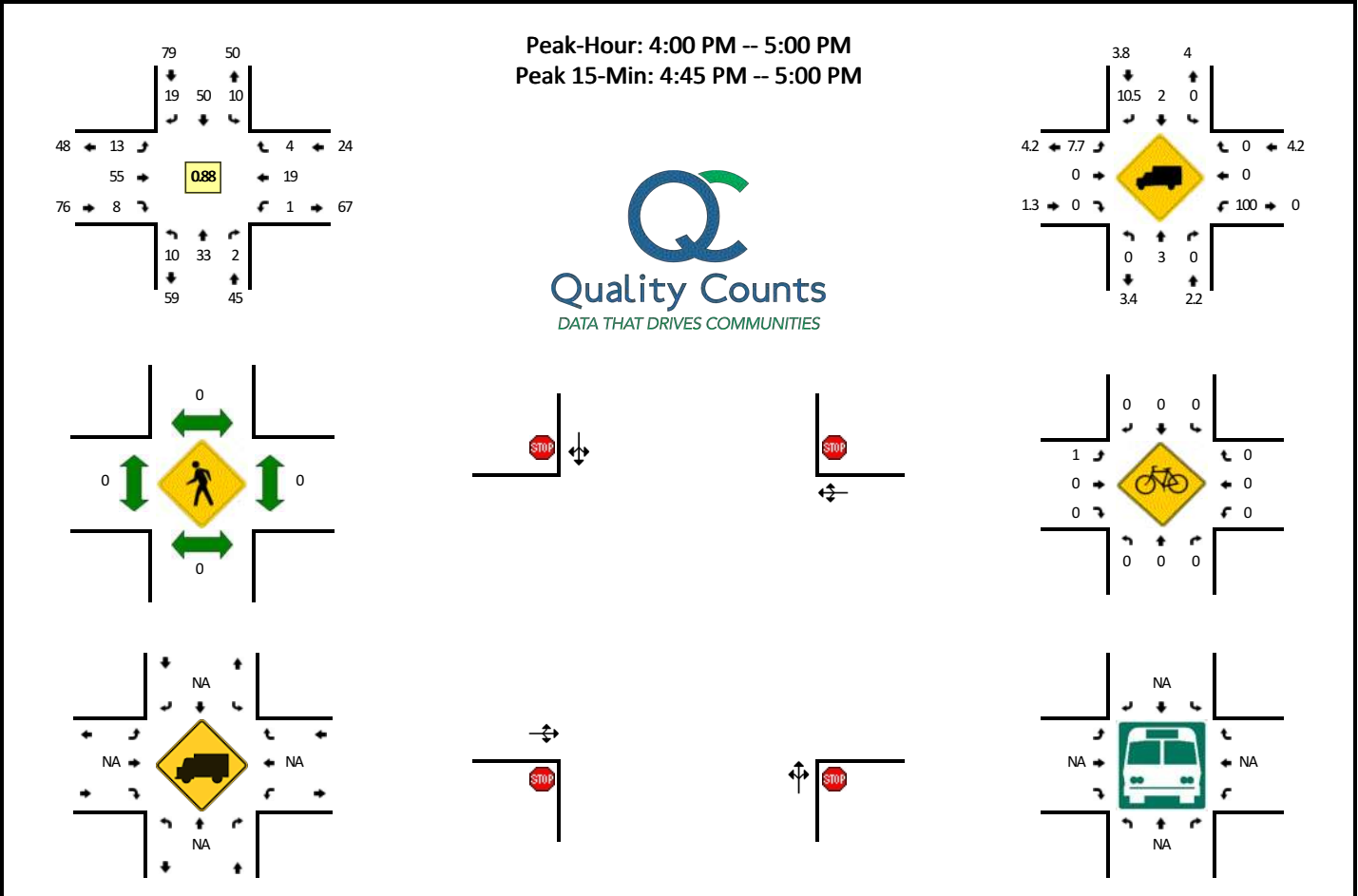


15-Min Count Period Beginning At	SE Altman Rd (Northbound)				SE Altman Rd (Southbound)				SE Dodge Park Blvd (Eastbound)				SE Dodge Park Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	12	0	0	0	2	1	0	2	3	1	0	0	6	2	0	30	
7:15 AM	3	17	0	0	2	6	1	0	6	5	1	0	0	10	2	0	53	
7:30 AM	6	9	1	0	0	4	1	0	1	4	2	0	0	10	1	0	39	
7:45 AM	0	6	1	0	3	3	1	0	1	7	3	0	1	9	2	0	37	159
8:00 AM	1	3	1	0	1	4	3	0	2	2	0	0	1	8	0	0	26	155
8:15 AM	3	0	1	0	0	4	5	0	1	3	2	0	0	4	3	0	26	128
8:30 AM	4	4	1	0	0	8	3	0	4	8	0	0	0	6	2	0	40	129
8:45 AM	2	4	1	0	0	4	5	0	2	0	0	0	0	7	0	0	25	117
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	12	68	0	0	8	24	4	0	24	20	4	0	0	40	8	0	212	
Heavy Trucks	4	0	0	0	0	4	0	0	0	0	0	0	0	4	0	0	12	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Altman Rd -- SE Dodge Park Blvd
CITY/STATE: Multnomah, OR

QC JOB #: 14910302
DATE: Thu, Mar 7 2019



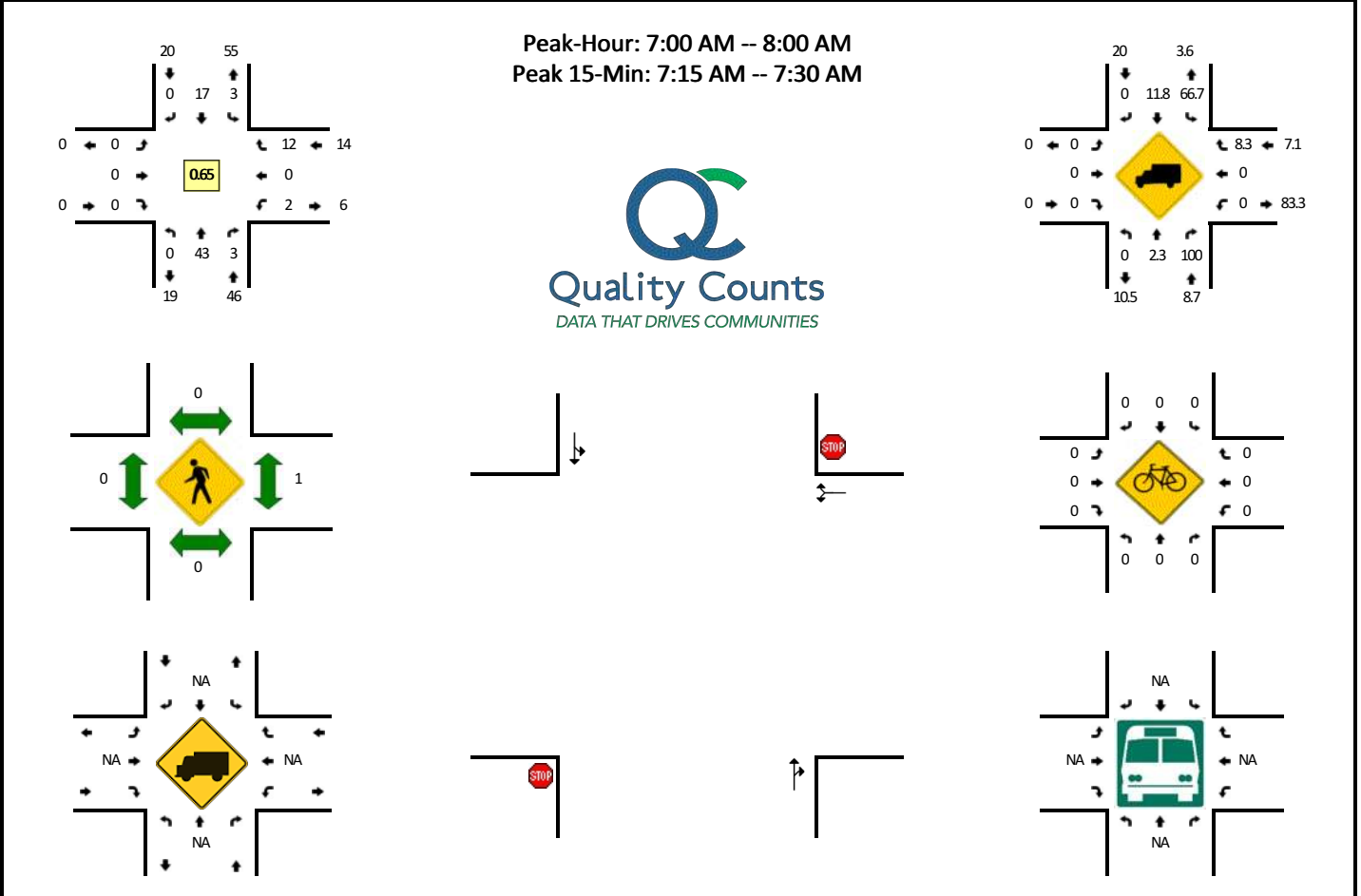
15-Min Count Period Beginning At	SE Altman Rd (Northbound)				SE Altman Rd (Southbound)				SE Dodge Park Blvd (Eastbound)				SE Dodge Park Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	13	0	0	1	11	9	0	2	9	3	0	1	4	1	0	56	
4:15 PM	1	8	0	0	3	16	6	0	2	14	2	0	0	4	1	0	57	
4:30 PM	2	6	2	0	2	9	3	0	5	11	2	0	0	5	0	0	47	
4:45 PM	5	6	0	0	4	14	1	0	4	21	1	0	0	6	2	0	64	224
5:00 PM	4	7	0	0	1	7	3	0	0	6	3	0	0	8	1	0	40	208
5:15 PM	2	4	0	0	4	5	2	0	0	6	5	0	1	13	0	0	42	193
5:30 PM	2	4	2	0	1	6	5	0	1	11	4	0	0	6	6	0	48	194
5:45 PM	0	5	0	0	3	14	2	0	1	13	3	0	1	3	0	0	45	175

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	20	24	0	0	16	56	4	0	16	84	4	0	0	24	8	0	256	
Heavy Trucks	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Altman Rd -- SE Carpenter Ln
CITY/STATE: Multnomah, OR

QC JOB #: 14910303
DATE: Thu, Feb 28 2019

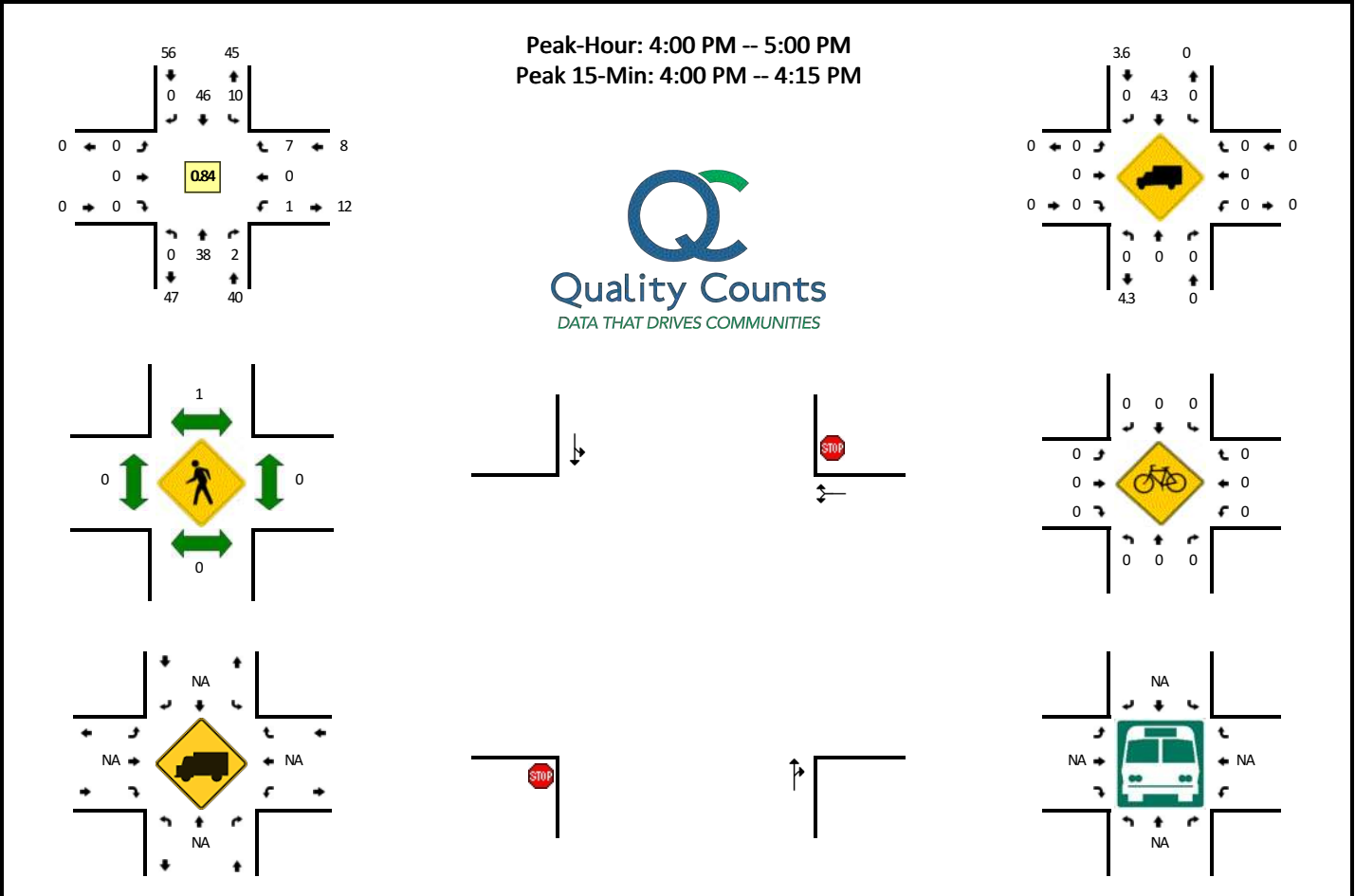


15-Min Count Period Beginning At	SE Altman Rd (Northbound)				SE Altman Rd (Southbound)				SE Carpenter Ln (Eastbound)				SE Carpenter Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	9	1	0	1	2	0	0	0	0	0	0	0	0	3	0	16	
7:15 AM	0	16	0	0	1	7	0	0	0	0	0	0	2	0	5	0	31	
7:30 AM	0	12	1	0	0	5	0	0	0	0	0	0	0	0	3	0	21	
7:45 AM	0	6	1	0	1	3	0	0	0	0	0	0	0	0	1	0	12	80
8:00 AM	0	4	1	0	0	5	0	0	0	0	0	0	0	0	1	0	11	75
8:15 AM	0	2	0	0	1	5	0	0	0	0	0	0	0	0	3	0	11	55
8:30 AM	0	5	2	0	1	6	0	0	0	0	0	0	2	0	3	0	19	53
8:45 AM	0	5	0	0	0	3	0	0	0	0	0	0	0	0	2	0	10	51
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	64	0	0	4	28	0	0	0	0	0	0	8	0	20	0	124	
Heavy Trucks	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0	8	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Altman Rd -- SE Carpenter Ln
CITY/STATE: Multnomah, OR

QC JOB #: 14910304
DATE: Thu, Mar 7 2019

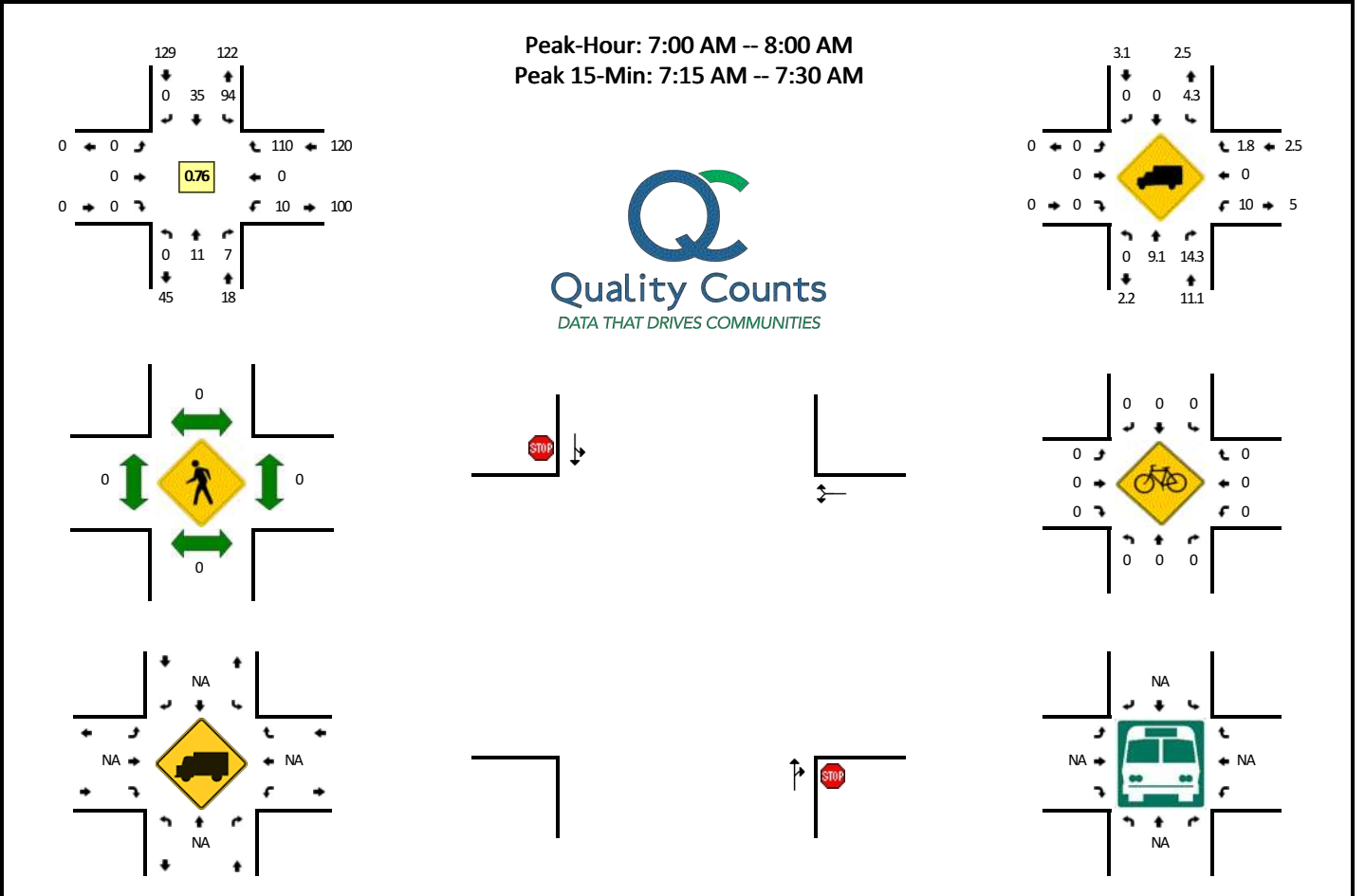


15-Min Count Period Beginning At	SE Altman Rd (Northbound)				SE Altman Rd (Southbound)				SE Carpenter Ln (Eastbound)				SE Carpenter Ln (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	15	1	0	2	12	0	0	0	0	0	0	0	0	1	0	31	
4:15 PM	0	7	0	0	3	14	0	0	0	0	0	0	0	0	1	0	25	
4:30 PM	0	8	0	0	2	9	0	0	0	0	0	0	0	0	2	0	21	
4:45 PM	0	8	1	0	3	11	0	0	0	0	0	0	1	0	3	0	27	104
5:00 PM	0	7	1	0	2	8	0	0	0	0	0	0	0	0	4	0	22	95
5:15 PM	0	5	0	0	4	6	0	0	0	0	0	0	0	0	1	0	16	86
5:30 PM	0	7	1	0	3	6	0	0	0	0	0	0	0	0	2	0	19	84
5:45 PM	0	2	0	0	4	14	0	0	0	0	0	0	0	0	2	0	22	79
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	60	4	0	8	48	0	0	0	0	0	0	0	0	4	0	124	
Heavy Trucks	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

LOCATION: SE Altman Rd -- SE Bluff Rd
CITY/STATE: Clackamas, OR

QC JOB #: 14910305
DATE: Thu, Feb 28 2019

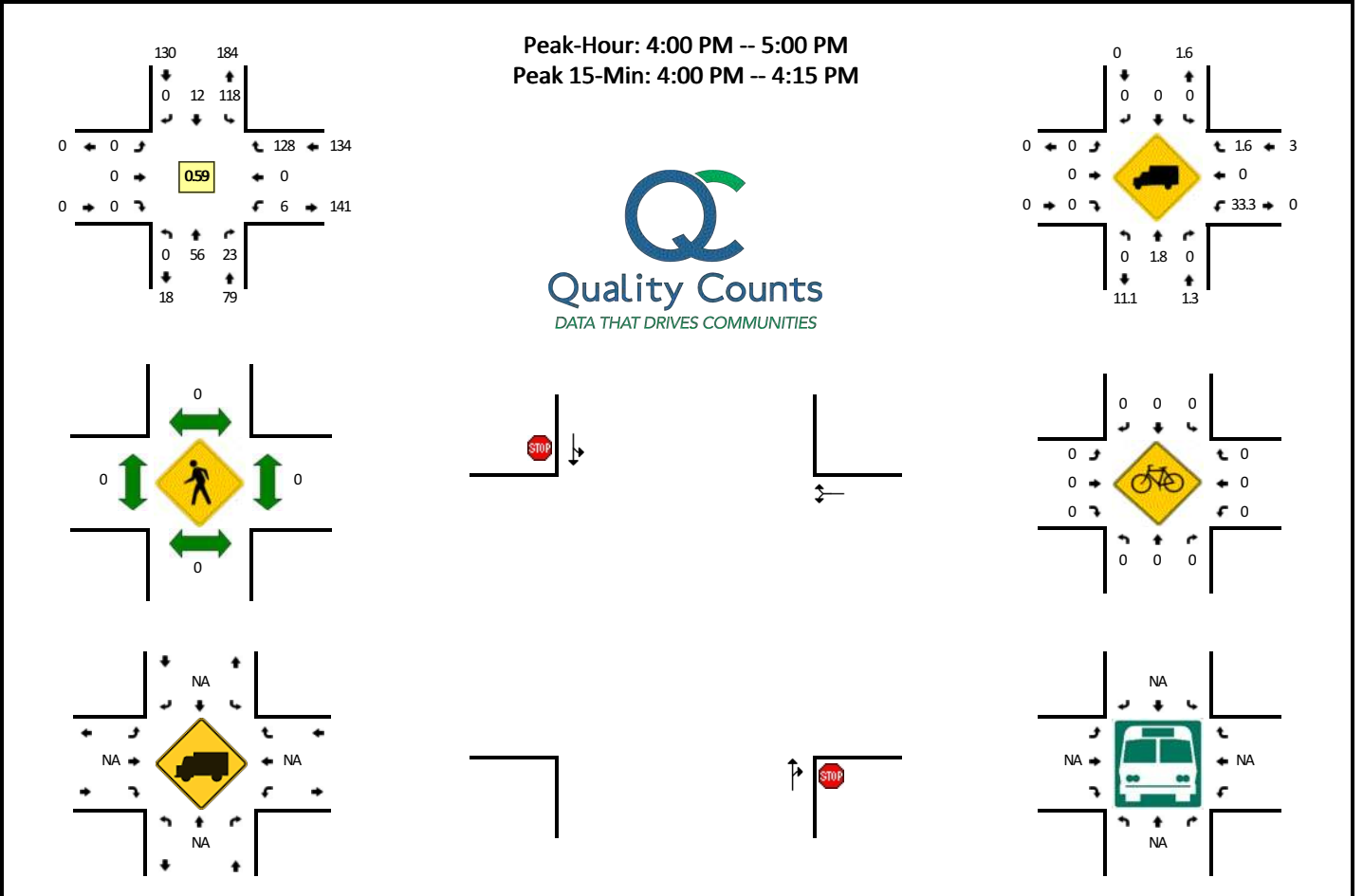


15-Min Count Period Beginning At	SE Altman Rd (Northbound)				SE Altman Rd (Southbound)				SE Bluff Rd (Eastbound)				SE Bluff Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	1	4	0	22	17	0	0	0	0	0	0	3	0	21	0	68	
7:15 AM	0	4	1	0	35	14	0	0	0	0	0	0	5	0	29	0	88	
7:30 AM	0	5	1	0	21	4	0	1	0	0	0	0	1	0	31	0	64	
7:45 AM	0	1	1	0	15	0	0	0	0	0	0	0	1	0	29	0	47	
8:00 AM	0	3	2	0	12	4	0	0	0	0	0	0	3	0	12	0	36	
8:15 AM	0	1	2	0	11	3	0	1	0	0	0	0	0	0	14	0	32	
8:30 AM	0	3	0	0	7	7	0	0	0	0	0	0	1	0	17	0	35	
8:45 AM	0	3	2	0	7	0	0	0	0	0	0	0	1	0	10	0	23	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	16	4	0	140	56	0	0	0	0	0	0	20	0	116	0	352	
Heavy Trucks	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

Comments:

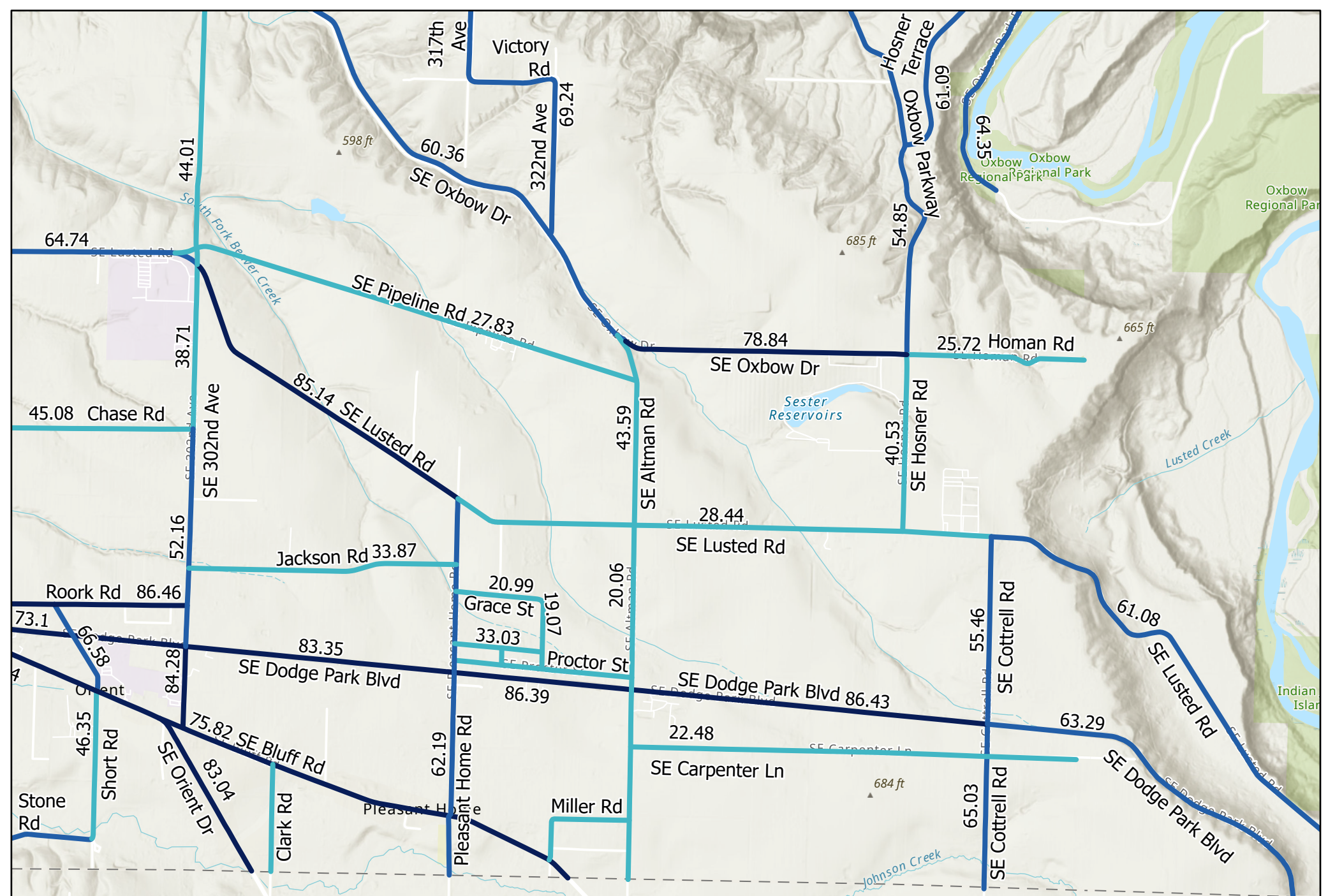
LOCATION: SE Altman Rd -- SE Bluff Rd
CITY/STATE: Clackamas, OR

QC JOB #: 14910306
DATE: Thu, Mar 7 2019



15-Min Count Period Beginning At	SE Altman Rd (Northbound)				SE Altman Rd (Southbound)				SE Bluff Rd (Eastbound)				SE Bluff Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	32	16	0	33	5	0	0	0	0	0	0	3	0	56	0	145	
4:15 PM	0	5	2	0	30	5	0	0	0	0	0	0	0	0	27	0	69	
4:30 PM	0	14	3	0	25	1	0	0	0	0	0	0	3	0	25	0	71	
4:45 PM	0	5	2	0	30	1	0	0	0	0	0	0	0	0	20	0	58	343
5:00 PM	0	7	1	0	28	2	0	0	0	0	0	0	0	0	15	0	53	251
5:15 PM	0	5	1	0	18	5	0	0	0	0	0	0	0	0	15	0	44	226
5:30 PM	0	3	1	0	23	0	0	0	0	0	0	0	0	0	13	0	40	195
5:45 PM	0	1	1	0	31	3	0	0	0	0	0	0	0	0	16	0	52	189
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	128	64	0	132	20	0	0	0	0	0	0	12	0	224	0	580	
Heavy Trucks	0	4	0	0	0	0	0	0	0	0	0	0	4	0	4	0	12	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

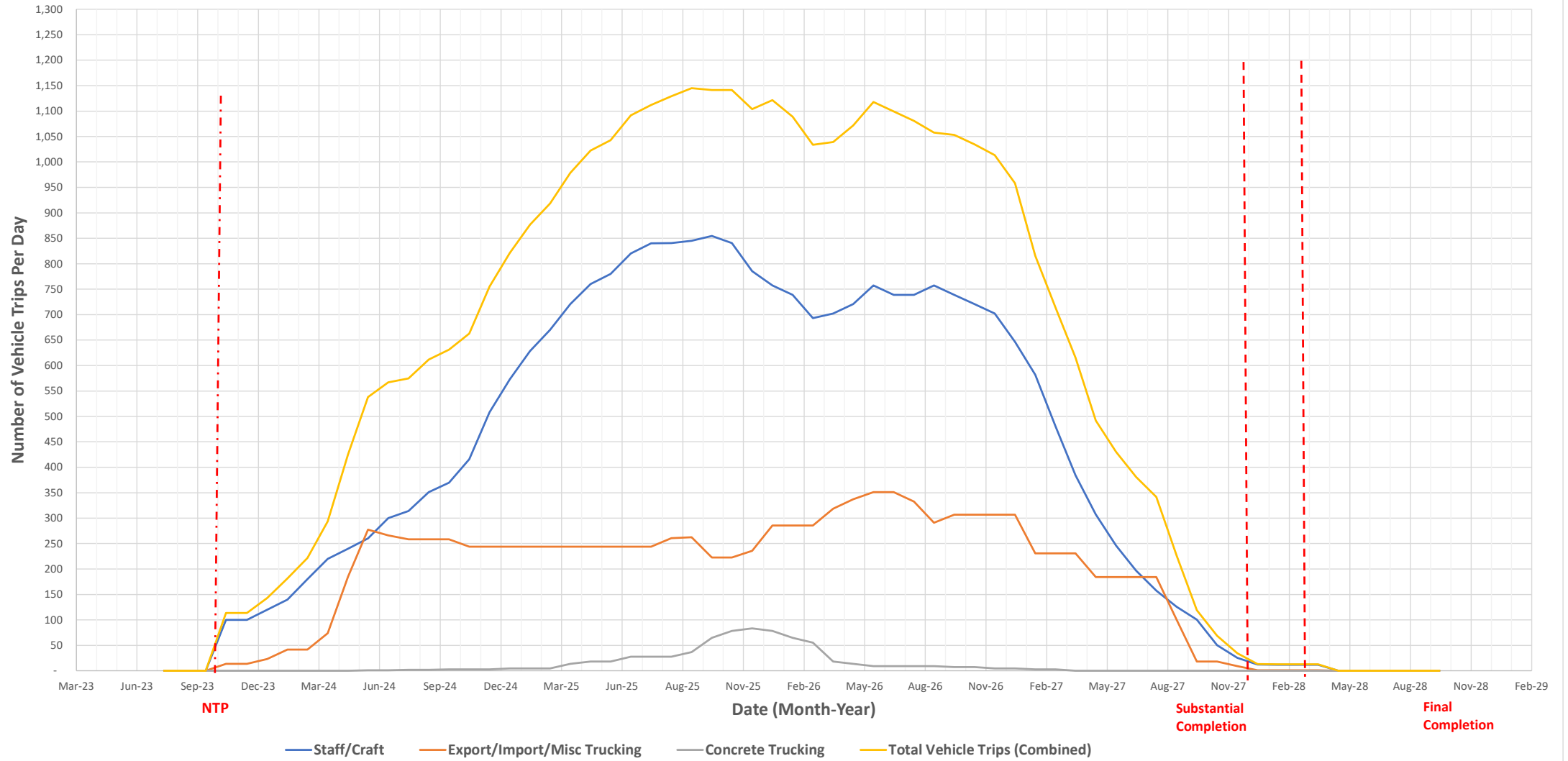
Comments:



Multnomah County Pavement Condition Index Scores 5/31/23

**Appendix B: Filtration Facility and Pipelines Trip Counts
Trip Assignment Figures**

Total Vehicle Trips Per Day 3.8.23



Vehicle Per Day 3.8.23 Bull Run Filtration Facility

Category	Average Daily (A)	Peak Daily (B)	Total Vehicles (C=A x 5 days/wk x 208 wks)	Trips In/Out (D=C x 2)
Staffing				-
Client	15	25	15,600	31,200
Staff	40	70	41,600	83,200
All Craft	215	350	223,600	447,200
Staff Subtotal	270	445	280,800	561,600
Export/Import Trucking				
Export Trucking	76	110	79,040	158,080
Import Trucking	24	50	24,960	49,920
Material Subtotal =	100	160	104,000	208,000
Concrete				
Ready-Mix	8	75	7,500	15,000
Concrete Subtotal =	8	75	7,500	15,000
Miscellaneous Deliveries				
Miscellaneous Deliveries	10	20	10,400	20,800
Miscellaneous Subtotal =	10	20	10,400	20,800
Water Off-haul				
Start-up water offhaul	30	40	1,450	2,900
Water Subtotal=Subtotal =	30	175	3,675	7,350

Bull Run- Pipelines

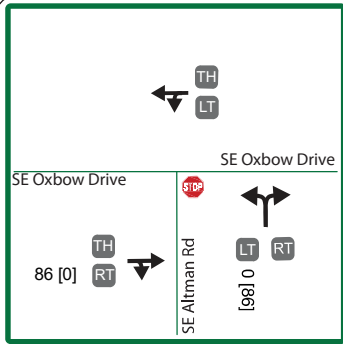
updated

Construction Traffic- Trip Count

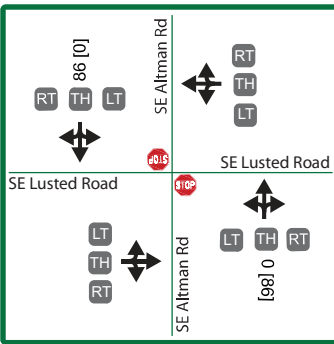
Items highlighted yellow cannot be completed simultaneously as other items in the category, and were omitted from subtotals.

3/3/2023 12:03

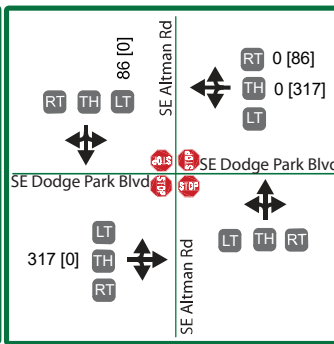
Category	Average Daily (A)	Peak Daily (B)	Total Vehicles	Total Trips In/Out	
Staffing			(C = A x 5days/wk. x 208 wks.)	(D= Cx2)	
PWB Staff	5	10	5,200	10,400	
CM/GC Staff	20	30	20,800	41,600	
Craft Labor	60	90	62,400	124,800	
Staffing Subtotal	85	130	88,400	176,800	
Export/Import Materials			(C = A x Estimated Activity Days)	Total Trips In/Out	Estimated No of Activity Days
Export Trucking					
Pipeline- Dodge Park Segment	14	28	3,460	6,920	250
Pipeline- Farm Field Segment	12	24	1,480	2,960	125
Pipeline- Altman Rd Segment	13	26	1,940	3,880	150
Pipeline- Lusted Rd Segment(C2/C4)	16	33	2,060	4,120	125
Pipeline- Lusted Rd Segment(C3)	10	20	1,020	2,040	100
Pipeline- Cottrell Segment	3	6	303	605	110
Pipeline- Lusted Raw Segment	11	23	1,710	3,420	150
Tunnel Excavation	3	6	600	1,200	200
Tunnel - Shaft Excavation	5	11	650	1,300	120
Import Trucking					
Pipeline- Dodge Park Segment	11	23	2,967	5,933	260
Pipeline- Farm Field Segment	10	20	1,219	2,438	125
Pipeline- Altman Rd Segment	13	25	1,762	3,524	140
Pipeline- Lusted Rd Segment	13	27	1,667	3,333	125
Pipeline- Lusted Rd Segment(C3)	8	17	829	1,657	100
Pipeline- Cottrell Segment	2	5	257	514	110
Pipeline- Lusted Raw Segment	15	29	1,452	2,905	100
Tunnel - Shaft Backfill	6	12	588	1,176	100
Export/ Import-Materials Subtotal	108	216	23,375	46,750	
Concrete/Pipe			(C = A x Estimated Activity Days)	Total Trips In/Out	
Outside Ready-Mix Plant	6	25	1,111	2,222	200
Pipe Deliveries	5	25	700	1,400	150
Concrete/Pipe Subtotal	11	50	1,811	3,622	
Miscellaneous Deliveries			(C = A x 5days/wk. x 208 wks.)	Total Trips In/Out	
Miscellaneous Deliveries	3	10	3,120	6,240	
Miscellaneous Subtotal	3	10	3,120	6,240	



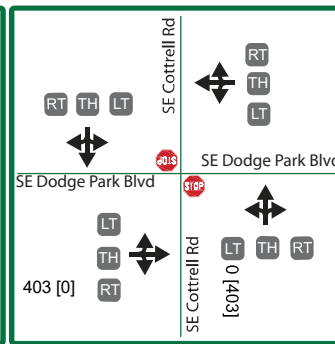
① SE Altman Road at SE Oxbow Drive



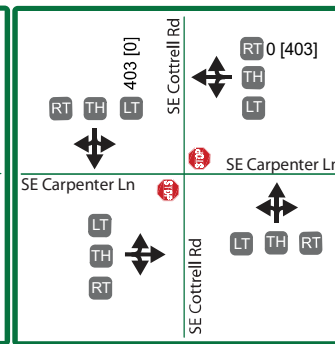
③ SE Altman Road at SE Lusted Road



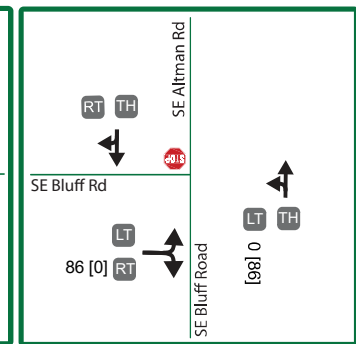
⑤ SE Altman Road at SE Dodge Park Boulevard



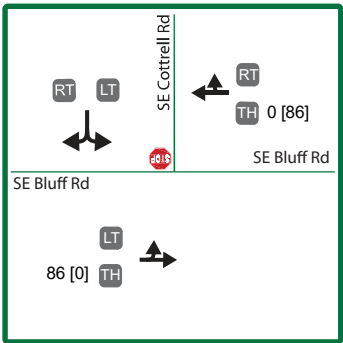
⑥ SE Cottrell Road at SE Dodge Park Boulevard



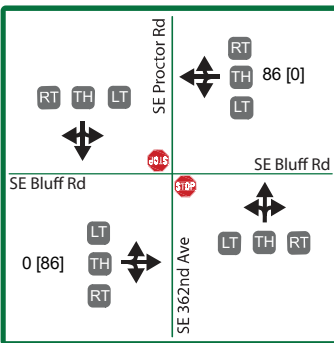
⑧ SE Cottrell Road at SE Carpenter Lane



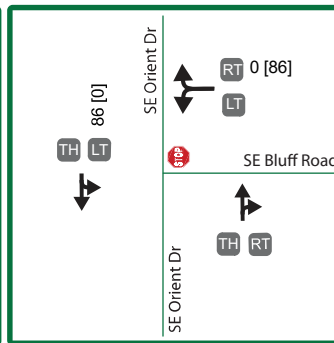
⑨ SE Altman Road at SE Bluff Road



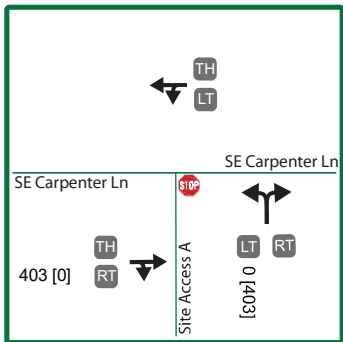
⑩ SE Cottrell Road at SE Bluff Road



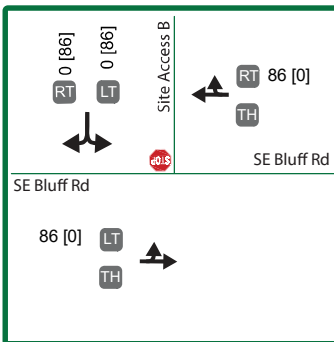
⑪ SE Bluff Road at SE Proctor Road



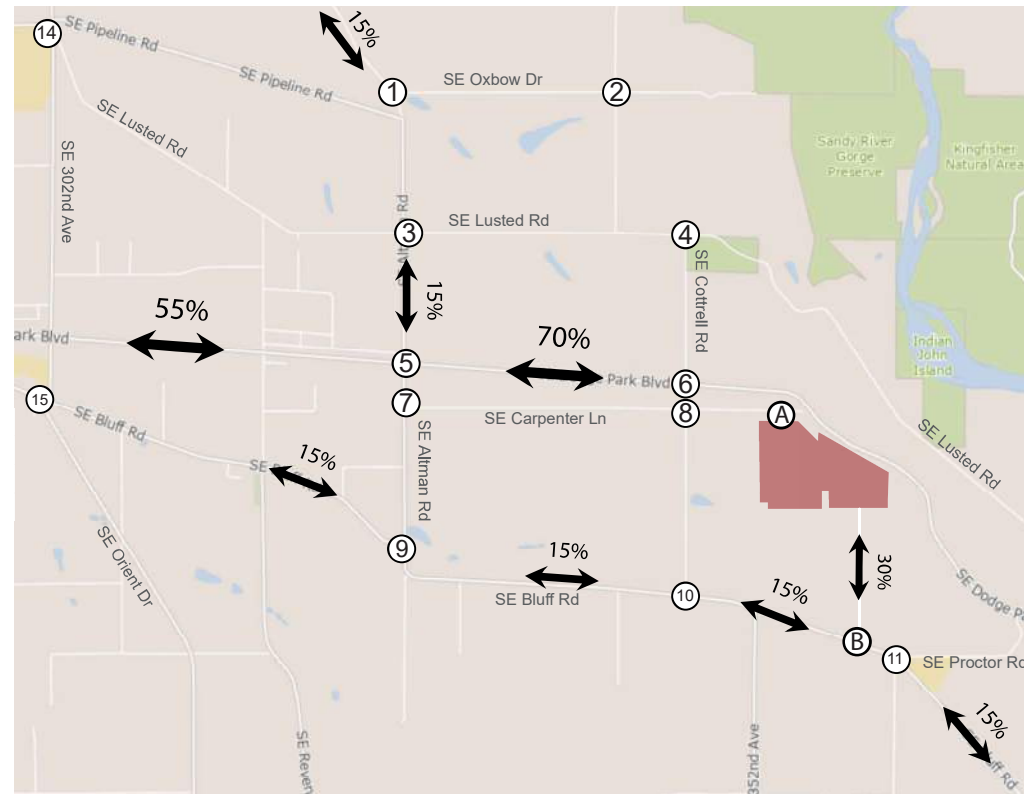
⑮ SE Orient Drive at SE Bluff Road



Ⓐ SE Carpenter Lane at Site Access A

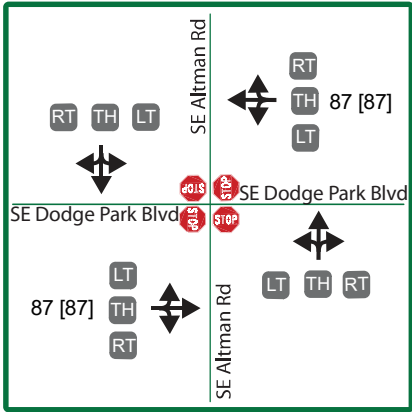


Ⓑ SE Bluff Road at Site Access B

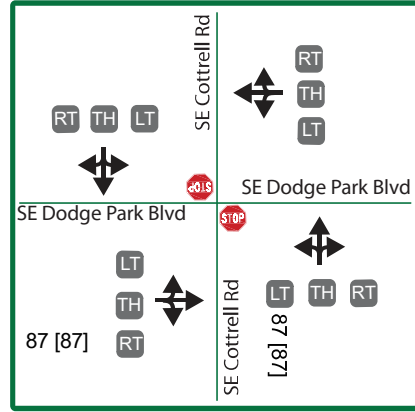


ⓧ = Study Intersection ← = Lane Configuration ⏹ = Stop Sign
 ⓧ LT TH RT = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

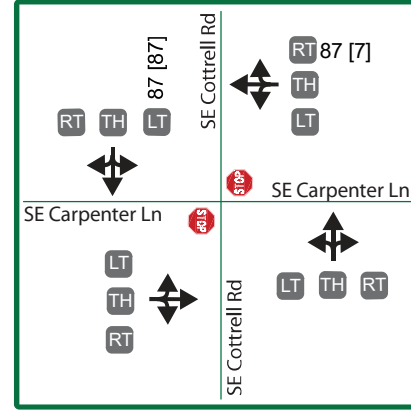
Appendix B: Traffic Volumes
 Peak Construction Traffic
 Site Trip Distribution
 Commuters



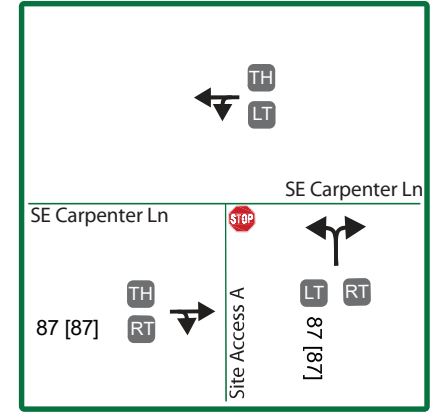
⑤ SE Altman Road at SE Dodge Park Boulevard



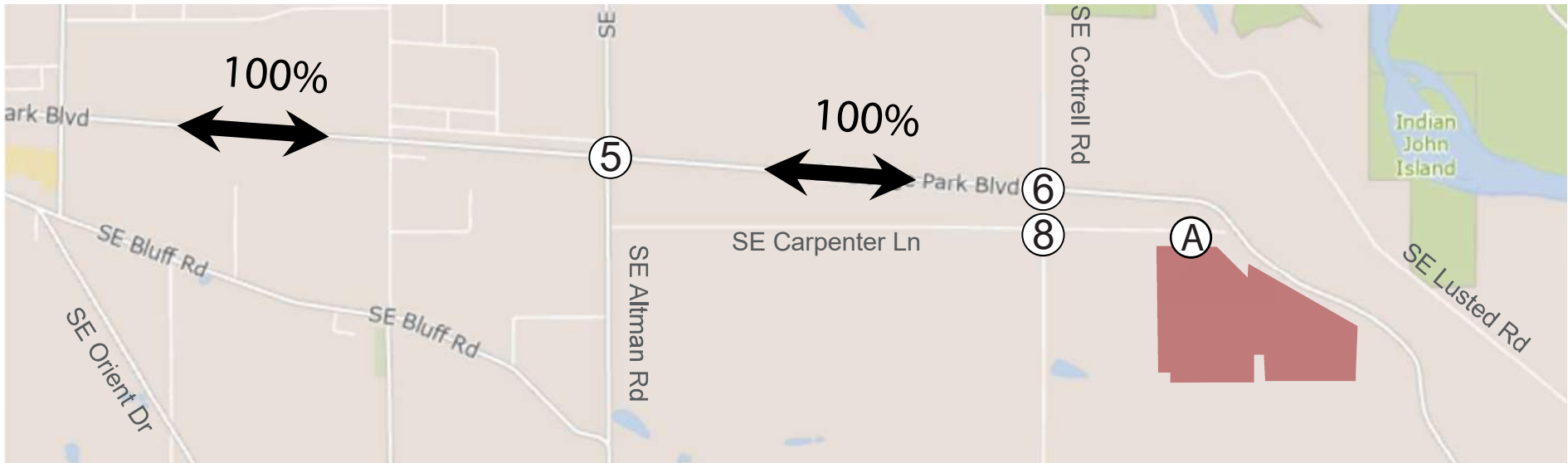
⑥ SE Cottrell Road at SE Dodge Park Boulevard



⑧ SE Cottrell Road at SE Carpenter Lane

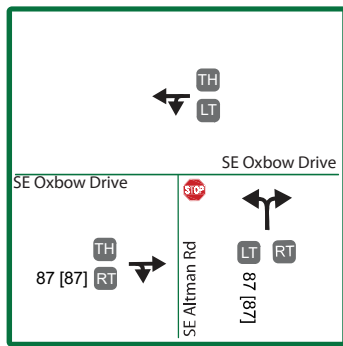


Ⓐ SE Carpenter Lane at Site Access A

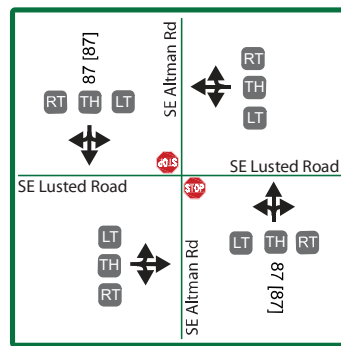


ⓧ = Study Intersection ← = Lane Configuration Ⓢ = Stop Sign
 LT TH RT = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

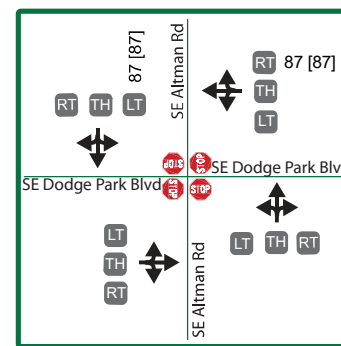
Appendix B: Traffic Volumes
 Peak Construction Traffic
 Site Trip Distribution
 Truck Route 1



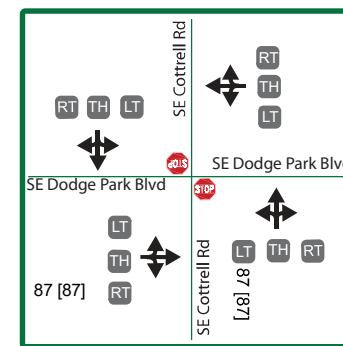
① SE Altman Road at SE Oxbow Drive



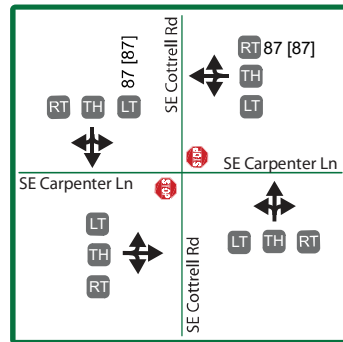
③ SE Altman Road at SE Lusted Road



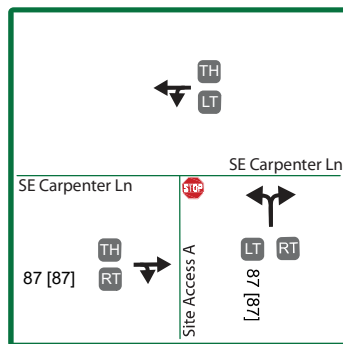
⑤ SE Altman Road at SE Dodge Park Boulevard



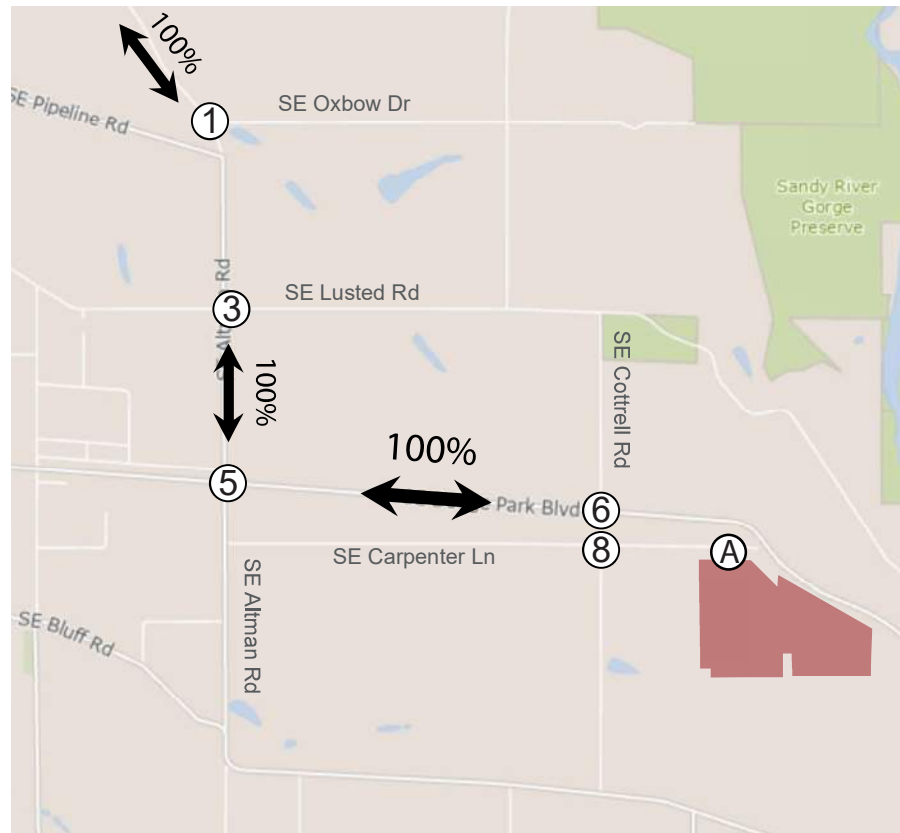
⑥ SE Cottrell Road at SE Dodge Park Boulevard



⑧ SE Cottrell Road at SE Carpenter Lane

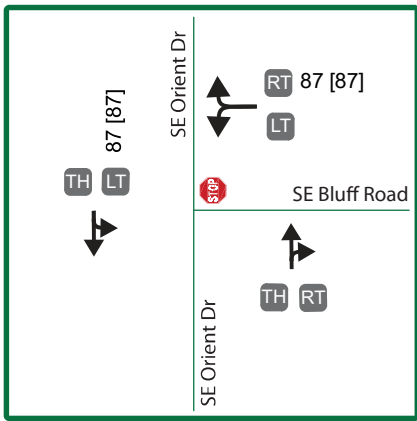


Ⓐ SE Carpenter Lane at Site Access A

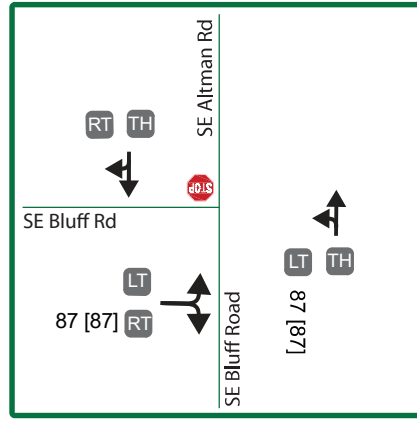


ⓧ = Study Intersection ← = Lane Configuration Ⓢ = Stop Sign
 Ⓛ Ⓣ Ⓡ = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

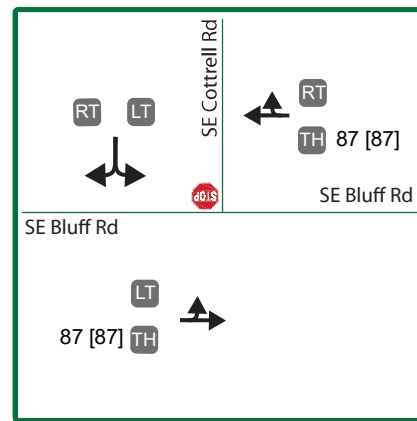
Appendix B: Traffic Volumes
 Peak Construction Traffic
 Site Trip Distribution
 Truck Route 2



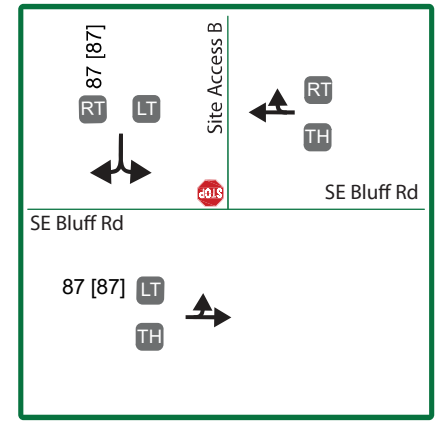
15 SE Orient Drive at SE Bluff Road



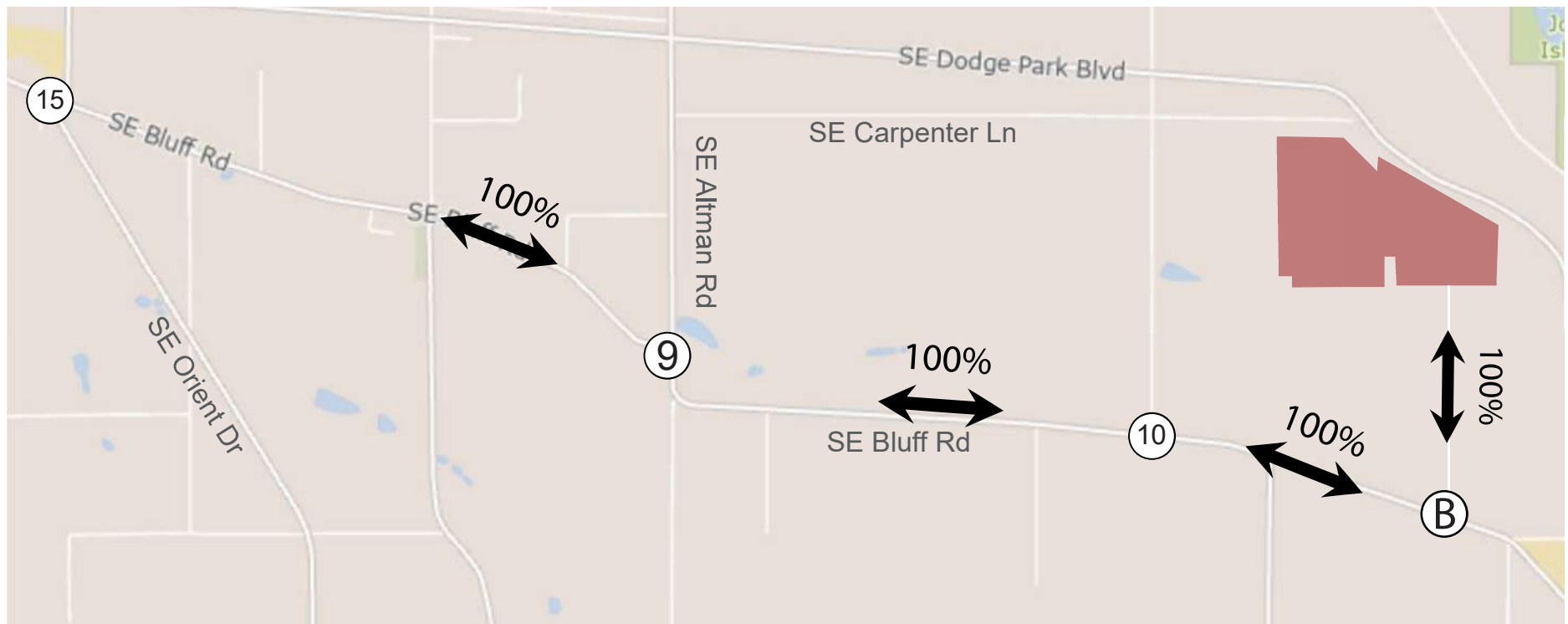
9 SE Altman Road at SE Bluff Road



10 SE Cottrell Road at SE Bluff Road

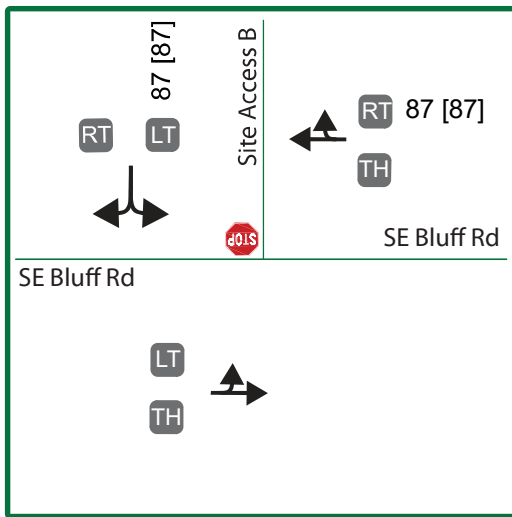


B SE Bluff Road at Site Access B

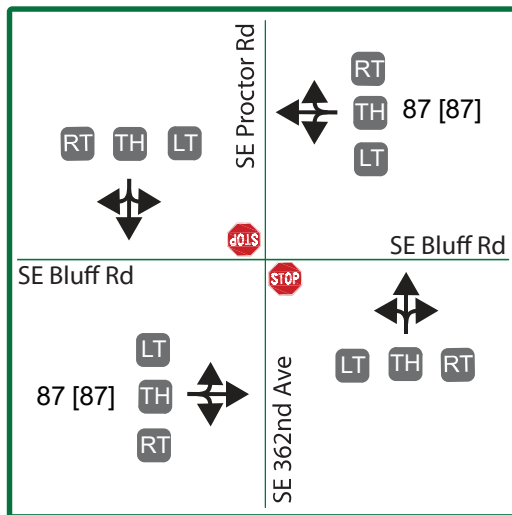


(X) = Study Intersection ↶ = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

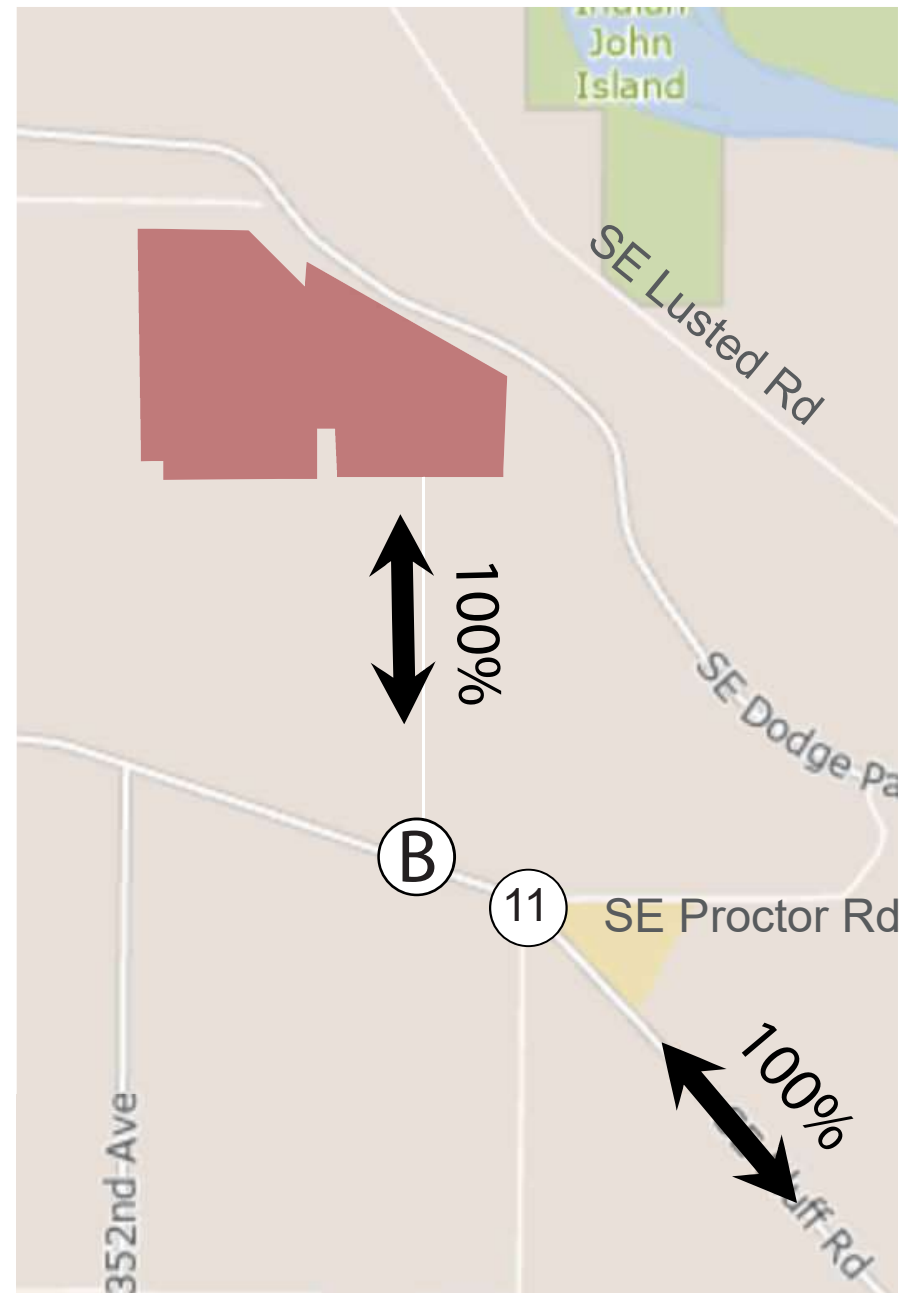
Appendix B: Traffic Volumes
 Peak Construction Traffic
 Site Trip Distribution
 Truck Route 3



(B) SE Bluff Road at Site Access B



(11) SE Bluff Road at SE Proctor Road



(X) = Study Intersection ← = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

Appendix B: Traffic Volumes
 Peak Construction Traffic
 Site Trip Distribution
 Truck Route 4

Appendix C: 2022 HCM Results
2025 HCM Results

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023

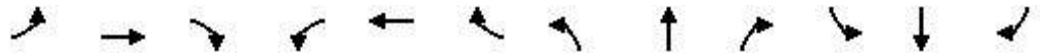


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	35	39	2	32	51	4
Future Volume (Veh/h)	35	39	2	32	51	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	45	51	3	42	66	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			96			70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			96			70
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			100			99
cM capacity (veh/h)			1510			998
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	96	45	71			
Volume Left	0	3	66			
Volume Right	51	0	5			
cSH	1700	1510	879			
Volume to Capacity	0.06	0.00	0.08			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.5	9.5			
Lane LOS			A			
Approach Delay (s)	0.0	0.5	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			14.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



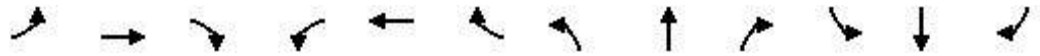
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	48	0	1	1	40	4	0	0	9	8
Future Volume (vph)	4	2	48	0	1	1	40	4	0	0	9	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	62	0	1	1	52	5	0	0	12	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	70	2	57	22
Volume Left (vph)	5	0	52	0
Volume Right (vph)	62	1	0	10
Hadj (s)	-0.11	-0.30	0.72	-0.17
Departure Headway (s)	4.0	3.9	4.8	3.9
Degree Utilization, x	0.08	0.00	0.08	0.02
Capacity (veh/h)	882	906	730	889
Control Delay (s)	7.3	6.9	8.2	7.0
Approach Delay (s)	7.3	6.9	8.2	7.0
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.6	
Level of Service		A	
Intersection Capacity Utilization	22.6%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 3: SE Altman Road & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	13	3	4	27	11	6	36	2	13	26	2
Future Volume (Veh/h)	3	13	3	4	27	11	6	36	2	13	26	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	15	3	4	30	12	7	40	2	15	29	2
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	42			18			83	72	18	90	68	36
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	42			18			83	72	18	90	68	36
tC, single (s)	4.1			4.1			7.1	6.6	6.7	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.8	3.6	4.0	3.3
p0 queue free %	100			100			99	95	100	98	96	100
cM capacity (veh/h)	1580			1612			880	803	937	842	815	1042
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	21	46	49	46								
Volume Left	3	4	7	15								
Volume Right	3	12	2	2								
cSH	1580	1612	818	832								
Volume to Capacity	0.00	0.00	0.06	0.06								
Queue Length 95th (ft)	0	0	5	4								
Control Delay (s)	1.1	0.6	9.7	9.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.1	0.6	9.7	9.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			6.0									
Intersection Capacity Utilization			14.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	15	12	5	27	19	8
Future Volume (Veh/h)	15	12	5	27	19	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	19	15	6	34	24	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			34		72	26
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			34		72	26
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		97	99
cM capacity (veh/h)			1273		920	926
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	34	40	34			
Volume Left	0	6	24			
Volume Right	15	0	10			
cSH	1700	1273	922			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	1.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			15.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	14	73	5	44	23	206	63	2	13	44	0
Future Volume (vph)	2	14	73	5	44	23	206	63	2	13	44	0
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Hourly flow rate (vph)	3	24	126	9	76	40	355	109	3	22	76	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	153	125	467	98								
Volume Left (vph)	3	9	355	22								
Volume Right (vph)	126	40	3	0								
Hadj (s)	-0.47	-0.13	0.46	0.14								
Departure Headway (s)	5.2	5.6	5.3	5.5								
Degree Utilization, x	0.22	0.19	0.69	0.15								
Capacity (veh/h)	617	572	659	594								
Control Delay (s)	9.7	9.9	19.0	9.5								
Approach Delay (s)	9.7	9.9	19.0	9.5								
Approach LOS	A	A	C	A								
Intersection Summary												
Delay			14.9									
Level of Service			B									
Intersection Capacity Utilization			34.5%	ICU Level of Service								A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	95	79	24	141	89
Future Volume (Veh/h)	11	95	79	24	141	89
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	107	89	27	158	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	518	102			116	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	518	102			116	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	97	89			89	
cM capacity (veh/h)	449	942			1466	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	119	116	258			
Volume Left	12	0	158			
Volume Right	107	27	0			
cSH	848	1700	1466			
Volume to Capacity	0.14	0.07	0.11			
Queue Length 95th (ft)	12	0	9			
Control Delay (s)	9.9	0.0	5.1			
Lane LOS	A		A			
Approach Delay (s)	9.9	0.0	5.1			
Approach LOS	A					
Intersection Summary						
Average Delay			5.1			
Intersection Capacity Utilization		32.3%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	23	2	0	27	9	10	26	3	7	22	3
Future Volume (vph)	12	23	2	0	27	9	10	26	3	7	22	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	13	26	2	0	30	10	11	29	3	8	24	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	41	40	43	35								
Volume Left (vph)	13	0	11	8								
Volume Right (vph)	2	10	3	3								
Hadj (s)	0.17	-0.05	0.06	-0.01								
Departure Headway (s)	4.3	4.1	4.2	4.1								
Degree Utilization, x	0.05	0.05	0.05	0.04								
Capacity (veh/h)	819	863	836	852								
Control Delay (s)	7.5	7.3	7.4	7.3								
Approach Delay (s)	7.5	7.3	7.4	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			18.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	12	7	3	24	2	12	13	1	1	8	3
Future Volume (Veh/h)	3	12	7	3	24	2	12	13	1	1	8	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	4	15	9	4	29	2	15	16	1	1	10	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	31			24			74	66	20	74	70	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	31			24			74	66	20	74	70	30
tC, single (s)	4.4			4.4			7.1	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			3.5	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			100			98	98	100	100	99	100
cM capacity (veh/h)	1403			1411			904	808	1064	709	774	1050
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	28	35	32	15								
Volume Left	4	4	15	1								
Volume Right	9	2	1	4								
cSH	1403	1411	857	827								
Volume to Capacity	0.00	0.00	0.04	0.02								
Queue Length 95th (ft)	0	0	3	1								
Control Delay (s)	1.1	0.9	9.4	9.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	1.1	0.9	9.4	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			14.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	10	29	0	2	22
Future Volume (Veh/h)	4	10	29	0	2	22
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	11	31	0	2	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	59	31			31	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	59	31			31	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	892	1049			1595	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	15	31	26			
Volume Left	4	0	2			
Volume Right	11	0	0			
cSH	1002	1700	1595			
Volume to Capacity	0.01	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.6	0.0	0.6			
Lane LOS	A		A			
Approach Delay (s)	8.6	0.0	0.6			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	3	1	0	6	1	18	1	5	11	3
Future Volume (Veh/h)	2	1	3	1	0	6	1	18	1	5	11	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	8	1	24	1	7	14	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	66	59	18	61	60	24	20			25		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	66	59	18	61	60	24	20			25		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	6.9	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	3.9	2.7			2.4		
p0 queue free %	100	100	100	100	100	99	100			100		
cM capacity (veh/h)	776	671	1064	732	828	892	1331			1497		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	9	26	25								
Volume Left	3	1	1	7								
Volume Right	4	8	1	4								
cSH	878	871	1331	1497								
Volume to Capacity	0.01	0.01	0.00	0.00								
Queue Length 95th (ft)	1	1	0	0								
Control Delay (s)	9.1	9.2	0.3	2.1								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.1	9.2	0.3	2.1								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			14.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	92	83	28	25	0
Future Volume (Veh/h)	0	92	83	28	25	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	107	97	33	29	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	130			220	114	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130			220	114	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			96	100	
cM capacity (veh/h)	1468			763	945	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	107	130	29			
Volume Left	0	0	29			
Volume Right	0	33	0			
cSH	1468	1700	763			
Volume to Capacity	0.00	0.08	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	9.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			16.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	1	91	105	14	15	0
Future Volume (Veh/h)	1	91	105	14	15	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	1	112	130	17	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	147				252	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	147				252	138
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				97	100
cM capacity (veh/h)	1447				740	704
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	113	147	19			
Volume Left	1	0	19			
Volume Right	0	17	0			
cSH	1447	1700	740			
Volume to Capacity	0.00	0.09	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.1	0.0	10.0			
Lane LOS	A		A			
Approach Delay (s)	0.1	0.0	10.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			16.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

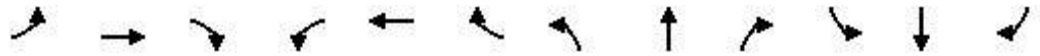
11: 362nd Ave/Proctor Rd & Bluff Rd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	39	18	1	43	79	18	4	1	59	5	52
Future Volume (Veh/h)	47	39	18	1	43	79	18	4	1	59	5	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	42	20	1	47	86	20	4	1	64	5	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	133			62			306	289	52	249	256	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			62			306	289	52	249	256	90
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			97	99	100	91	99	94
cM capacity (veh/h)	1452			1541			589	599	1016	681	625	968
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	113	134	25	126								
Volume Left	51	1	20	64								
Volume Right	20	86	1	57								
cSH	1452	1541	600	783								
Volume to Capacity	0.04	0.00	0.04	0.16								
Queue Length 95th (ft)	3	0	3	14								
Control Delay (s)	3.6	0.1	11.3	10.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.6	0.1	11.3	10.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			29.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 12: SE Dodge Park Blvd & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	15	5	11	30	1	4	1	11	1	4	3
Future Volume (Veh/h)	2	15	5	11	30	1	4	1	11	1	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	3	21	7	15	42	1	6	1	15	1	6	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43			28			110	104	24	118	106	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43			28			110	104	24	118	106	42
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	100	99	100
cM capacity (veh/h)	1579			1541			802	781	1032	841	778	1034
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	31	58	22	11								
Volume Left	3	15	6	1								
Volume Right	7	1	15	4								
cSH	1579	1541	944	862								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	0.7	2.0	8.9	9.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.7	2.0	8.9	9.2								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			14.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	18	9	18	27	7	14
Future Volume (Veh/h)	18	9	18	27	7	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	26	13	26	39	10	20
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			40		124	34
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			40		124	34
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			98		99	98
cM capacity (veh/h)			1581		860	987
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	39	65	30			
Volume Left	0	26	10			
Volume Right	13	0	20			
cSH	1700	1581	941			
Volume to Capacity	0.02	0.02	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.0	9.0			
Lane LOS			A			
Approach Delay (s)	0.0	3.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			19.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	45	62	8	45	52	4
Future Volume (Veh/h)	45	62	8	45	52	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	47	65	8	47	55	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			112		142	80
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			112		142	80
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		94	100
cM capacity (veh/h)			1412		850	986
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	112	55	59			
Volume Left	0	8	55			
Volume Right	65	0	4			
cSH	1700	1412	858			
Volume to Capacity	0.07	0.01	0.07			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.0	1.1	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.1	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	1	41	3	2	0	41	8	3	0	9	11
Future Volume (vph)	16	1	41	3	2	0	41	8	3	0	9	11
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	18	1	45	3	2	0	45	9	3	0	10	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	64	5	57	22								
Volume Left (vph)	18	3	45	0								
Volume Right (vph)	45	0	3	12								
Hadj (s)	-0.04	0.12	0.48	-0.07								
Departure Headway (s)	4.0	4.3	4.6	4.0								
Degree Utilization, x	0.07	0.01	0.07	0.02								
Capacity (veh/h)	867	821	769	870								
Control Delay (s)	7.4	7.3	7.9	7.1								
Approach Delay (s)	7.4	7.3	7.9	7.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.5									
Level of Service			A									
Intersection Capacity Utilization			19.8%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	21	1	20	38	20	3	29	3	13	53	5
Future Volume (Veh/h)	1	21	1	20	38	20	3	29	3	13	53	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	26	1	25	48	25	4	36	4	16	66	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	73			27			178	152	26	161	140	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	73			27			178	152	26	161	140	60
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	95	100	98	91	99
cM capacity (veh/h)	1540			1536			721	731	1055	766	739	1010
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	28	98	44	88								
Volume Left	1	25	4	16								
Volume Right	1	25	4	6								
cSH	1540	1536	751	758								
Volume to Capacity	0.00	0.02	0.06	0.12								
Queue Length 95th (ft)	0	1	5	10								
Control Delay (s)	0.3	2.0	10.1	10.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	2.0	10.1	10.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			6.0									
Intersection Capacity Utilization			24.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	34	22	0	28	15	1
Future Volume (Veh/h)	34	22	0	28	15	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	44	29	0	36	19	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			73		94	58
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			73		94	58
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		98	100
cM capacity (veh/h)			1540		910	789
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	73	36	20			
Volume Left	0	0	19			
Volume Right	29	0	1			
cSH	1700	1540	903			
Volume to Capacity	0.04	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	24	43	6	27	25	111	58	5	26	66	1
Future Volume (vph)	0	24	43	6	27	25	111	58	5	26	66	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	27	48	7	30	28	123	64	6	29	73	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	75	65	193	103								
Volume Left (vph)	0	7	123	29								
Volume Right (vph)	48	28	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.3	4.5	4.6	4.6								
Degree Utilization, x	0.09	0.08	0.24	0.13								
Capacity (veh/h)	765	734	761	744								
Control Delay (s)	7.8	7.9	9.0	8.3								
Approach Delay (s)	7.8	7.9	9.0	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			31.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	36	183	143	26	107	204
Future Volume (Veh/h)	36	183	143	26	107	204
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	42	215	168	31	126	240
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	676	184			199	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676	184			199	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	89	75			91	
cM capacity (veh/h)	372	846			1361	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	257	199	366			
Volume Left	42	0	126			
Volume Right	215	31	0			
cSH	700	1700	1361			
Volume to Capacity	0.37	0.12	0.09			
Queue Length 95th (ft)	42	0	8			
Control Delay (s)	13.1	0.0	3.3			
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	3.3			
Approach LOS	B					
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			49.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

















04/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	48	12	1	27	4	10	32	2	12	37	12
Future Volume (vph)	6	48	12	1	27	4	10	32	2	12	37	12
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	7	59	15	1	33	5	12	39	2	15	45	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	81	39	53	75								
Volume Left (vph)	7	1	12	15								
Volume Right (vph)	15	5	2	15								
Hadj (s)	-0.02	-0.07	0.02	-0.05								
Departure Headway (s)	4.2	4.2	4.3	4.2								
Degree Utilization, x	0.09	0.05	0.06	0.09								
Capacity (veh/h)	826	825	810	835								
Control Delay (s)	7.6	7.4	7.5	7.6								
Approach Delay (s)	7.6	7.4	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			17.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Cottrell Rd & Dodge Park Blvd

04/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	24	5	0	10	0	8	13	2	1	19	4
Future Volume (Veh/h)	7	24	5	0	10	0	8	13	2	1	19	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	28	6	0	12	0	9	15	2	1	22	5
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	12			34			76	59	31	68	62	13
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	12			34			76	59	31	68	62	13
tC, single (s)	4.1			4.1			7.1	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			99	98	100	100	97	100
cM capacity (veh/h)	1620			1591			891	816	1049	717	829	1072
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	42	12	26	28								
Volume Left	8	0	9	1								
Volume Right	6	0	2	5								
cSH	1620	1591	856	859								
Volume to Capacity	0.00	0.00	0.03	0.03								
Queue Length 95th (ft)	0	0	2	3								
Control Delay (s)	1.4	0.0	9.3	9.3								
Lane LOS	A		A	A								
Approach Delay (s)	1.4	0.0	9.3	9.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			18.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

04/11/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	40	2	12	35
Future Volume (Veh/h)	2	6	40	2	12	35
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	49	2	15	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	123	50			51	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	123	50			51	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	868	937			1518	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	51	58			
Volume Left	2	0	15			
Volume Right	7	2	0			
cSH	921	1700	1518			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	8.9	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	8.9	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

04/11/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	0	0	4	1	0	6	2	16	2	2	20	1
Future Volume (Veh/h)	0	0	4	1	0	6	2	16	2	2	20	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	0	6	1	0	8	3	23	3	3	28	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	73	66	28	71	66	24	29			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	73	66	28	71	66	24	29			26		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	99	100			100		
cM capacity (veh/h)	913	825	1052	917	826	1058	1597			1601		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	6	9	29	32								
Volume Left	0	1	3	3								
Volume Right	6	8	3	1								
cSH	1052	1040	1597	1601								
Volume to Capacity	0.01	0.01	0.00	0.00								
Queue Length 95th (ft)	0	1	0	0								
Control Delay (s)	8.4	8.5	0.8	0.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	8.4	8.5	0.8	0.7								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			13.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/11/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	103	115	40	35	0
Future Volume (Veh/h)	1	103	115	40	35	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	1	124	139	48	42	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	187			289	163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	187			289	163	
tC, single (s)	4.1			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.6	3.3	
p0 queue free %	100			94	100	
cM capacity (veh/h)	1399			693	887	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	125	187	42			
Volume Left	1	0	42			
Volume Right	0	48	0			
cSH	1399	1700	693			
Volume to Capacity	0.00	0.11	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.1	0.0	10.5			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			18.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/11/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	2	134	89	20	25	0
Future Volume (Veh/h)	2	134	89	20	25	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	152	101	23	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	124			268	112	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124			268	112	
tC, single (s)	4.6			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.7			3.5	3.3	
p0 queue free %	100			96	100	
cM capacity (veh/h)	1213			715	946	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	154	124	28			
Volume Left	2	0	28			
Volume Right	0	23	0			
cSH	1213	1700	715			
Volume to Capacity	0.00	0.07	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.1	0.0	10.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

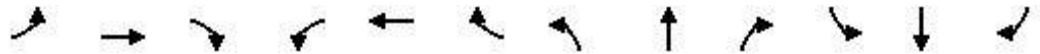
04/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	102	36	1	58	8	24	2	1	6	3	5
Future Volume (Veh/h)	6	102	36	1	58	8	24	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	119	42	1	67	9	28	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			161			235	232	140	230	248	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			161			235	232	140	230	248	72
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	99	100	99
cM capacity (veh/h)	1536			1430			714	668	913	724	654	996
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	168	77	31	16								
Volume Left	7	1	28	7								
Volume Right	42	9	1	6								
cSH	1536	1430	716	789								
Volume to Capacity	0.00	0.00	0.04	0.02								
Queue Length 95th (ft)	0	0	3	2								
Control Delay (s)	0.3	0.1	10.3	9.7								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.3	0.1	10.3	9.7								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			21.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

04/11/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	18	4	9	18	1	7	3	16	1	1	2
Future Volume (Veh/h)	3	18	4	9	18	1	7	3	16	1	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	25	6	12	25	1	10	4	22	1	1	3
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	26			31			90	86	28	110	88	26
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	26			31			90	86	28	110	88	26
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	99	98	100	100	100
cM capacity (veh/h)	1601			1595			888	800	1036	845	797	1054
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	38	36	5								
Volume Left	4	12	10	1								
Volume Right	6	1	22	3								
cSH	1601	1595	960	946								
Volume to Capacity	0.00	0.01	0.04	0.01								
Queue Length 95th (ft)	0	1	3	0								
Control Delay (s)	0.8	2.3	8.9	8.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.8	2.3	8.9	8.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			13.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

04/11/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	24	6	15	21	8	12
Future Volume (Veh/h)	24	6	15	21	8	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	32	8	20	28	11	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			40		104	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			40		104	36
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1583		888	1042
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	40	48	27			
Volume Left	0	20	11			
Volume Right	8	0	16			
cSH	1700	1583	973			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.1	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			18.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	37	127	2	34	54	4
Future Volume (Veh/h)	37	127	2	34	54	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	48	165	3	44	70	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			213		180	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			213		180	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	99
cM capacity (veh/h)			1369		803	924
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	213	47	75			
Volume Left	0	3	70			
Volume Right	165	0	5			
cSH	1700	1369	810			
Volume to Capacity	0.13	0.00	0.09			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.5	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			19.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Future Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	66	0	1	1	55	5	0	0	13	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	74	2	60	23
Volume Left (vph)	5	0	55	0
Volume Right (vph)	66	1	0	10
Hadj (s)	-0.11	-0.30	0.72	-0.16
Departure Headway (s)	4.0	3.9	4.8	4.0
Degree Utilization, x	0.08	0.00	0.08	0.03
Capacity (veh/h)	879	902	728	882
Control Delay (s)	7.3	6.9	8.2	7.1
Approach Delay (s)	7.3	6.9	8.2	7.1
Approach LOS	A	A	A	A

Intersection Summary

Delay	7.6
Level of Service	A
Intersection Capacity Utilization	22.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	14	3	4	29	12	6	38	2	14	114	2
Future Volume (Veh/h)	3	14	3	4	29	12	6	38	2	14	114	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	16	3	4	33	13	7	43	2	16	128	2
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			19			137	78	18	96	72	40
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			19			137	78	18	96	72	40
tC, single (s)	4.1			4.1			7.1	6.6	6.7	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.8	3.6	4.0	3.3
p0 queue free %	100			100			99	95	100	98	84	100
cM capacity (veh/h)	1575			1611			733	798	936	832	811	1038
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	50	52	146								
Volume Left	3	4	7	16								
Volume Right	3	13	2	2								
cSH	1575	1611	793	815								
Volume to Capacity	0.00	0.00	0.07	0.18								
Queue Length 95th (ft)	0	0	5	16								
Control Delay (s)	1.0	0.6	9.9	10.4								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.0	0.6	9.9	10.4								
Approach LOS			A	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			18.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	13	5	29	20	8
Future Volume (Veh/h)	16	13	5	29	20	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	16	6	36	25	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			36		76	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			36		76	28
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		97	99
cM capacity (veh/h)			1271		915	925
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	36	42	35			
Volume Left	0	6	25			
Volume Right	16	0	10			
cSH	1700	1271	918			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	1.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			15.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	28	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	89	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	28	2	0								
Hadj (s)	-0.35	-0.13	0.46	0.14								
Departure Headway (s)	4.7	5.0	5.0	5.0								
Degree Utilization, x	0.15	0.12	0.46	0.10								
Capacity (veh/h)	690	655	704	672								
Control Delay (s)	8.5	8.7	12.2	8.5								
Approach Delay (s)	8.5	8.7	12.2	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			35.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	233	93
Future Volume (Veh/h)	11	99	82	25	233	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	262	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	96	88			82	
cM capacity (veh/h)	308	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	366			
Volume Left	12	0	262			
Volume Right	111	28	0			
cSH	782	1700	1462			
Volume to Capacity	0.16	0.07	0.18			
Queue Length 95th (ft)	14	0	16			
Control Delay (s)	10.5	0.0	6.2			
Lane LOS	B		A			
Approach Delay (s)	10.5	0.0	6.2			
Approach LOS	B					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			37.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

04/06/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	428	2	0	116	10	11	28	3	93	23	3
Future Volume (vph)	13	428	2	0	116	10	11	28	3	93	23	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	476	2	0	129	11	12	31	3	103	26	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	492	140	46	132								
Volume Left (vph)	14	0	12	103								
Volume Right (vph)	2	11	3	3								
Hadj (s)	0.37	1.13	0.06	1.40								
Departure Headway (s)	5.2	6.4	6.1	7.2								
Degree Utilization, x	0.71	0.25	0.08	0.26								
Capacity (veh/h)	681	534	511	462								
Control Delay (s)	19.5	11.5	9.6	12.7								
Approach Delay (s)	19.5	11.5	9.6	12.7								
Approach LOS	C	B	A	B								
Intersection Summary												
Delay			16.5									
Level of Service			C									
Intersection Capacity Utilization			53.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

04/06/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	13	497	3	25	2	100	14	1	1	8	3
Future Volume (Veh/h)	3	13	497	3	25	2	100	14	1	1	8	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	15	585	4	29	2	118	16	1	1	9	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	31			600			362	354	308	362	646	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	31			600			362	354	308	362	646	30
tC, single (s)	4.4			4.4			8.0	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			4.3	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			100			74	97	100	100	97	100
cM capacity (veh/h)	1403			842			451	557	737	435	359	1050
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	604	35	135	14								
Volume Left	4	4	118	1								
Volume Right	585	2	1	4								
cSH	1403	842	463	449								
Volume to Capacity	0.00	0.00	0.29	0.03								
Queue Length 95th (ft)	0	0	30	2								
Control Delay (s)	0.1	1.1	16.0	13.3								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	1.1	16.0	13.3								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			51.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

04/06/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	11	31	0	2	23
Future Volume (Veh/h)	4	11	31	0	2	23
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	12	33	0	2	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	889	1046			1592	
Direction, Lane #						
	WB 1	NB 1	SB 1			
Volume Total	16	33	27			
Volume Left	4	0	2			
Volume Right	12	0	0			
cSH	1002	1700	1592			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.7	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

04/06/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	1	3	1	0	93	1	19	1	495	12	3
Future Volume (Veh/h)	2	1	3	1	0	93	1	19	1	495	12	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	122	1	25	1	651	16	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1472	1350	20	1352	1352	26	22			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1472	1350	20	1352	1352	26	22			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	7.2	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	4.2	2.7			2.4		
p0 queue free %	93	98	100	98	100	85	100			55		
cM capacity (veh/h)	42	53	1062	51	83	836	1329			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	123	27	671								
Volume Left	3	1	1	651								
Volume Right	4	122	1	4								
cSH	85	743	1329	1451								
Volume to Capacity	0.09	0.17	0.00	0.45								
Queue Length 95th (ft)	8	15	0	60								
Control Delay (s)	51.9	10.8	0.3	9.3								
Lane LOS	F	B	A	A								
Approach Delay (s)	51.9	10.8	0.3	9.3								
Approach LOS	F	B										
Intersection Summary												
Average Delay			9.7									
Intersection Capacity Utilization			47.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/06/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Volume (veh/h)	0	184	88	30	27	0
Future Volume (Veh/h)	0	184	88	30	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	214	102	35	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				334	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				334	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1459				657	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	214	137	31			
Volume Left	0	0	31			
Volume Right	0	35	0			
cSH	1459	1700	657			
Volume to Capacity	0.00	0.08	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/06/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	182	111	15	16	0
Future Volume (Veh/h)	1	182	111	15	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	214	131	18	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				356	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				356	140
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				97	100
cM capacity (veh/h)	1445				646	702
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	215	149	19			
Volume Left	1	0	19			
Volume Right	0	18	0			
cSH	1445	1700	646			
Volume to Capacity	0.00	0.09	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		20.4%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis










11: 362nd Ave/Proctor Rd & Bluff Rd

04/06/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	45	21	1	143	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234			66			416	400	56	357	364	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			66			416	400	56	357	364	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			96	99	100	88	99	93
cM capacity (veh/h)	1333			1536			489	516	1011	576	540	853
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	235	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1333	1536	503	673								
Volume to Capacity	0.04	0.00	0.05	0.20								
Queue Length 95th (ft)	3	0	4	18								
Control Delay (s)	3.7	0.0	12.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.7	0.0	12.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
16: Site Access A

04/06/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	490	0	7	87	0
Future Volume (Veh/h)	7	490	0	7	87	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	533	0	8	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			541		282	274
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			541		282	274
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	100
cM capacity (veh/h)			1028		708	764
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	541	8	95			
Volume Left	0	0	95			
Volume Right	533	0	0			
cSH	1700	1028	708			
Volume to Capacity	0.32	0.00	0.13			
Queue Length 95th (ft)	0	0	12			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			42.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/06/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	86	110	120	86	0	0
Future Volume (Veh/h)	86	110	120	86	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	120	130	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223				482	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223				482	176
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	100
cM capacity (veh/h)	1346				505	867
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	213	223	0			
Volume Left	93	0	0			
Volume Right	0	93	0			
cSH	1346	1700	1700			
Volume to Capacity	0.07	0.13	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	3.8	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	3.8	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			28.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

















04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	48	66	8	48	141	4
Future Volume (Veh/h)	48	66	8	48	141	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	51	69	8	51	148	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			120		152	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			120		152	86
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		82	100
cM capacity (veh/h)			1402		839	979
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	120	59	152			
Volume Left	0	8	148			
Volume Right	69	0	4			
cSH	1700	1402	842			
Volume to Capacity	0.07	0.01	0.18			
Queue Length 95th (ft)	0	0	16			
Control Delay (s)	0.0	1.1	10.2			
Lane LOS			A	B		
Approach Delay (s)	0.0	1.1	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			24.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Future Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	47	3	2	0	47	9	3	0	11	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	67	5	59	24								
Volume Left (vph)	19	3	47	0								
Volume Right (vph)	47	0	3	13								
Hadj (s)	-0.04	0.12	0.49	-0.07								
Departure Headway (s)	4.1	4.3	4.6	4.0								
Degree Utilization, x	0.08	0.01	0.07	0.03								
Capacity (veh/h)	864	818	766	867								
Control Delay (s)	7.4	7.3	7.9	7.2								
Approach Delay (s)	7.4	7.3	7.9	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			20.0%	ICU Level of Service								A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

04/07/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	22	1	21	40	21	3	117	3	14	56	5
Future Volume (Veh/h)	1	22	1	21	40	21	3	117	3	14	56	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	28	1	26	50	26	4	146	4	18	70	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			29			186	158	28	222	146	63
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			29			186	158	28	222	146	63
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	80	100	97	90	99
cM capacity (veh/h)	1536			1534			708	724	1052	613	732	1007
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	30	102	154	94								
Volume Left	1	26	4	18								
Volume Right	1	26	4	6								
cSH	1536	1534	730	718								
Volume to Capacity	0.00	0.02	0.21	0.13								
Queue Length 95th (ft)	0	1	20	11								
Control Delay (s)	0.2	2.0	11.2	10.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	2.0	11.2	10.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			28.6%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (veh/h)	36	23	0	30	16	1
Future Volume (Veh/h)	36	23	0	30	16	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	47	30	0	39	21	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			77		101	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		101	62
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		98	100
cM capacity (veh/h)			1535		902	785
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	39	22			
Volume Left	0	0	21			
Volume Right	30	0	1			
cSH	1700	1535	896			
Volume to Capacity	0.05	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	30	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	69	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	30	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.4	4.6	4.6	4.6								
Degree Utilization, x	0.10	0.09	0.26	0.14								
Capacity (veh/h)	754	724	755	737								
Control Delay (s)	7.8	8.0	9.2	8.4								
Approach Delay (s)	7.8	8.0	9.2	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			31.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















04/07/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	276	149	27	111	212
Future Volume (Veh/h)	37	276	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	325	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	61			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	369	207	380			
Volume Left	44	0	131			
Volume Right	325	32	0			
cSH	722	1700	1352			
Volume to Capacity	0.51	0.12	0.10			
Queue Length 95th (ft)	73	0	8			
Control Delay (s)	15.1	0.0	3.3			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			55.9%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	138	13	1	433	4	11	34	2	13	39	13
Future Volume (vph)	6	138	13	1	433	4	11	34	2	13	39	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	162	15	1	509	5	13	40	2	15	46	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	184	515	55	76								
Volume Left (vph)	7	1	13	15								
Volume Right (vph)	15	5	2	15								
Hadj (s)	0.94	0.35	0.03	-0.05								
Departure Headway (s)	5.9	4.9	5.9	5.8								
Degree Utilization, x	0.30	0.71	0.09	0.12								
Capacity (veh/h)	579	716	525	545								
Control Delay (s)	11.4	18.9	9.5	9.6								
Approach Delay (s)	11.4	18.9	9.5	9.6								
Approach LOS	B	C	A	A								
Intersection Summary												
Delay			15.7									
Level of Service			C									
Intersection Capacity Utilization			34.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Cottrell Rd & Dodge Park Blvd

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	7	25	92	0	11	0	498	14	2	1	20	4
Future Volume (Veh/h)	7	25	92	0	11	0	498	14	2	1	20	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	29	107	0	13	0	579	16	2	1	23	5
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	13			136			129	112	82	122	165	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	13			136			129	112	82	122	165	14
tC, single (s)	4.1			4.1			7.3	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			26	98	100	100	97	100
cM capacity (veh/h)	1619			1461			781	764	983	655	728	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	144	13	597	29								
Volume Left	8	0	579	1								
Volume Right	107	0	2	5								
cSH	1619	1461	781	767								
Volume to Capacity	0.00	0.00	0.76	0.04								
Queue Length 95th (ft)	0	0	184	3								
Control Delay (s)	0.4	0.0	22.9	9.9								
Lane LOS	A		C	A								
Approach Delay (s)	0.4	0.0	22.9	9.9								
Approach LOS			C	A								
Intersection Summary												
Average Delay			17.9									
Intersection Capacity Utilization			55.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	42	2	13	37
Future Volume (Veh/h)	2	6	42	2	13	37
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	52	2	16	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	859	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	54	62			
Volume Left	2	0	16			
Volume Right	7	2	0			
cSH	916	1700	1514			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	4	1	0	496	2	17	2	89	21	1
Future Volume (Veh/h)	0	0	4	1	0	496	2	17	2	89	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	584	2	20	2	105	25	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	844	262	26	266	261	21	26			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844	262	26	266	261	21	26			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			3.1		
p0 queue free %	100	100	100	100	100	42	100			91		
cM capacity (veh/h)	112	586	1056	639	587	1012	1601			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	585	24	131								
Volume Left	0	1	2	105								
Volume Right	5	584	2	1								
cSH	1056	1011	1601	1140								
Volume to Capacity	0.00	0.58	0.00	0.09								
Queue Length 95th (ft)	0	96	0	8								
Control Delay (s)	8.4	13.3	0.6	7.0								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	13.3	0.6	7.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			51.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	109	208	42	37	0
Future Volume (Veh/h)	1	109	208	42	37	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	245	49	44	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	294				400	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294				400	270
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1279				598	774
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	129	294	44			
Volume Left	1	0	44			
Volume Right	0	49	0			
cSH	1279	1700	598			
Volume to Capacity	0.00	0.17	0.07			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.1	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Volume (veh/h)	2	142	180	21	27	0
Future Volume (Veh/h)	2	142	180	21	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	161	205	24	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229			382	217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229			382	217	
tC, single (s)	4.6			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.7			3.5	3.3	
p0 queue free %	100			95	100	
cM capacity (veh/h)	1102			615	828	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	163	229	31			
Volume Left	2	0	31			
Volume Right	0	24	0			
cSH	1102	1700	615			
Volume to Capacity	0.00	0.13	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.1	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			20.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

05/04/2023













Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	226	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			270			347	344	248	342	362	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			270			347	344	248	342	362	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1305			603	579	796	611	566	991
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	277	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1305	606	702								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			26.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/04/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	4	87	0	7	490	0
Future Volume (Veh/h)	4	87	0	7	490	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	0	8	533	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		60	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		60	52
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			100		41	100
cM capacity (veh/h)			1494		909	1016
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	8	533			
Volume Left	0	0	533			
Volume Right	95	0	0			
cSH	1700	1494	909			
Volume to Capacity	0.06	0.00	0.59			
Queue Length 95th (ft)	0	0	98			
Control Delay (s)	0.0	0.0	14.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	14.4			
Approach LOS			B			
Intersection Summary						
Average Delay			12.0			
Intersection Capacity Utilization			39.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	153	92	0	86	86
Future Volume (Veh/h)	0	153	92	0	86	86
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	166	100	0	93	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100				266	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				266	100
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	90
cM capacity (veh/h)	1493				723	956
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	100	186			
Volume Left	0	0	93			
Volume Right	0	0	93			
cSH	1493	1700	823			
Volume to Capacity	0.00	0.06	0.23			
Queue Length 95th (ft)	0	0	22			
Control Delay (s)	0.0	0.0	10.6			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			24.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	37	214	2	34	141	4
Future Volume (Veh/h)	37	214	2	34	141	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	48	278	3	44	183	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			326		237	187
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		237	187
tC, single (s)			4.1		7.0	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.1	3.3
p0 queue free %			100		71	99
cM capacity (veh/h)			1245		635	860
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	326	47	188			
Volume Left	0	3	183			
Volume Right	278	0	5			
cSH	1700	1245	640			
Volume to Capacity	0.19	0.00	0.29			
Queue Length 95th (ft)	0	0	31			
Control Delay (s)	0.0	0.5	13.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	0.5	13.0			
Approach LOS			B			
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			29.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

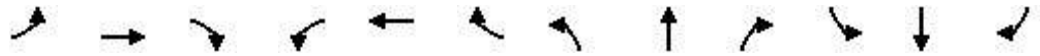
05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Future Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	66	0	1	1	55	5	0	0	13	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	74	2	60	23								
Volume Left (vph)	5	0	55	0								
Volume Right (vph)	66	1	0	10								
Hadj (s)	-0.11	-0.30	0.72	-0.16								
Departure Headway (s)	4.0	3.9	4.8	4.0								
Degree Utilization, x	0.08	0.00	0.08	0.03								
Capacity (veh/h)	879	902	728	882								
Control Delay (s)	7.3	6.9	8.2	7.1								
Approach Delay (s)	7.3	6.9	8.2	7.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	14	3	4	29	12	6	125	2	14	201	2
Future Volume (Veh/h)	3	14	3	4	29	12	6	125	2	14	201	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	16	3	4	33	13	7	140	2	16	226	2
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			19			186	78	18	144	72	40
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			19			186	78	18	144	72	40
tC, single (s)	4.1			4.1			7.1	7.2	6.7	7.2	6.9	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.8	3.6	4.4	3.3
p0 queue free %	100			100			99	80	100	98	69	100
cM capacity (veh/h)	1575			1611			592	697	936	682	741	1038
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	50	149	244								
Volume Left	3	4	7	16								
Volume Right	3	13	2	2								
cSH	1575	1611	693	738								
Volume to Capacity	0.00	0.00	0.21	0.33								
Queue Length 95th (ft)	0	0	20	36								
Control Delay (s)	1.0	0.6	11.6	12.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.0	0.6	11.6	12.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			10.3									
Intersection Capacity Utilization			25.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	13	5	29	20	8
Future Volume (Veh/h)	16	13	5	29	20	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	16	6	36	25	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			36		76	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			36		76	28
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		97	99
cM capacity (veh/h)			1271		915	925
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	36	42	35			
Volume Left	0	6	25			
Volume Right	16	0	10			
cSH	1700	1271	918			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	1.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			15.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	28	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	89	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	28	2	0								
Hadj (s)	-0.35	-0.13	0.46	0.14								
Departure Headway (s)	4.7	5.0	5.0	5.0								
Degree Utilization, x	0.15	0.12	0.46	0.10								
Capacity (veh/h)	690	655	704	672								
Control Delay (s)	8.5	8.7	12.2	8.5								
Approach Delay (s)	8.5	8.7	12.2	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			35.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	233	93
Future Volume (Veh/h)	11	99	82	25	233	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	262	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	96	88			82	
cM capacity (veh/h)	308	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	366			
Volume Left	12	0	262			
Volume Right	111	28	0			
cSH	782	1700	1462			
Volume to Capacity	0.16	0.07	0.18			
Queue Length 95th (ft)	14	0	16			
Control Delay (s)	10.5	0.0	6.2			
Lane LOS	B		A			
Approach Delay (s)	10.5	0.0	6.2			
Approach LOS	B					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			37.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Altman Rd & Dodge Park Blvd

















04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	341	2	0	29	97	11	28	3	180	23	3
Future Volume (vph)	13	341	2	0	29	97	11	28	3	180	23	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	379	2	0	32	108	12	31	3	200	26	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	395	140	46	229								
Volume Left (vph)	14	0	12	200								
Volume Right (vph)	2	108	3	3								
Hadj (s)	0.04	0.79	0.06	0.91								
Departure Headway (s)	5.1	6.2	5.9	6.4								
Degree Utilization, x	0.56	0.24	0.08	0.41								
Capacity (veh/h)	678	541	520	528								
Control Delay (s)	14.4	11.2	9.4	13.7								
Approach Delay (s)	14.4	11.2	9.4	13.7								
Approach LOS	B	B	A	B								
Intersection Summary												
Delay			13.4									
Level of Service			B									
Intersection Capacity Utilization			53.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Cottrell Rd & Dodge Park Blvd

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	13	497	3	25	2	100	14	1	1	8	3
Future Volume (Veh/h)	3	13	497	3	25	2	100	14	1	1	8	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	15	585	4	29	2	118	16	1	1	9	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	31			600			362	354	308	362	646	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	31			600			362	354	308	362	646	30
tC, single (s)	4.4			4.4			8.0	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			4.3	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			100			74	97	100	100	97	100
cM capacity (veh/h)	1403			842			451	557	737	435	359	1050
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	604	35	135	14								
Volume Left	4	4	118	1								
Volume Right	585	2	1	4								
cSH	1403	842	463	449								
Volume to Capacity	0.00	0.00	0.29	0.03								
Queue Length 95th (ft)	0	0	30	2								
Control Delay (s)	0.1	1.1	16.0	13.3								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	1.1	16.0	13.3								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			51.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

















04/07/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	11	31	0	2	23
Future Volume (Veh/h)	4	11	31	0	2	23
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	12	33	0	2	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	889	1046			1592	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	16	33	27			
Volume Left	4	0	2			
Volume Right	12	0	0			
cSH	1002	1700	1592			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.7	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	3	1	0	93	1	19	1	495	12	3
Future Volume (Veh/h)	2	1	3	1	0	93	1	19	1	495	12	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	122	1	25	1	651	16	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1472	1350	20	1352	1352	26	22			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1472	1350	20	1352	1352	26	22			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	7.2	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	4.2	2.7			2.4		
p0 queue free %	93	98	100	98	100	85	100			55		
cM capacity (veh/h)	42	53	1062	51	83	836	1329			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	123	27	671								
Volume Left	3	1	1	651								
Volume Right	4	122	1	4								
cSH	85	743	1329	1451								
Volume to Capacity	0.09	0.17	0.00	0.45								
Queue Length 95th (ft)	8	15	0	60								
Control Delay (s)	51.9	10.8	0.3	9.3								
Lane LOS	F	B	A	A								
Approach Delay (s)	51.9	10.8	0.3	9.3								
Approach LOS	F	B										
Intersection Summary												
Average Delay			9.7									
Intersection Capacity Utilization			47.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/07/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Volume (veh/h)	0	184	88	30	27	0
Future Volume (Veh/h)	0	184	88	30	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	214	102	35	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				334	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				334	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1459				657	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	214	137	31			
Volume Left	0	0	31			
Volume Right	0	35	0			
cSH	1459	1700	657			
Volume to Capacity	0.00	0.08	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/07/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	182	111	15	16	0
Future Volume (Veh/h)	1	182	111	15	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	214	131	18	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				356	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				356	140
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				97	100
cM capacity (veh/h)	1445				646	702
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	215	149	19			
Volume Left	1	0	19			
Volume Right	0	18	0			
cSH	1445	1700	646			
Volume to Capacity	0.00	0.09	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			20.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis










11: 362nd Ave/Proctor Rd & Bluff Rd

04/07/2023

																								
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR												
Lane Configurations																								
Traffic Volume (veh/h)	50	41	19	1	132	84	19	4	1	63	5	55												
Future Volume (Veh/h)	50	41	19	1	132	84	19	4	1	63	5	55												
Sign Control		Free			Free			Stop			Stop													
Grade		0%			0%			0%			0%													
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92												
Hourly flow rate (vph)	54	45	21	1	143	91	21	4	1	68	5	60												
Pedestrians																								
Lane Width (ft)																								
Walking Speed (ft/s)																								
Percent Blockage																								
Right turn flare (veh)																								
Median type	None					None																		
Median storage (veh)																								
Upstream signal (ft)																								
pX, platoon unblocked																								
vC, conflicting volume	234			66			416			400			56			357			364			188		
vC1, stage 1 conf vol																								
vC2, stage 2 conf vol																								
vCu, unblocked vol	234			66			416			400			56			357			364			188		
tC, single (s)	4.1			4.1			7.1			6.5			6.2			7.1			6.5			6.2		
tC, 2 stage (s)																								
tF (s)	2.2			2.2			3.5			4.0			3.3			3.5			4.0			3.3		
p0 queue free %	96			100			96			99			100			88			99			93		
cM capacity (veh/h)	1333			1536			489			516			1011			576			540			853		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1																				
Volume Total	120	235	26	133																				
Volume Left	54	1	21	68																				
Volume Right	21	91	1	60																				
cSH	1333	1536	503	673																				
Volume to Capacity	0.04	0.00	0.05	0.20																				
Queue Length 95th (ft)	3	0	4	18																				
Control Delay (s)	3.7	0.0	12.5	11.7																				
Lane LOS	A	A	B	B																				
Approach Delay (s)	3.7	0.0	12.5	11.7																				
Approach LOS			B	B																				
Intersection Summary																								
Average Delay				4.5																				
Intersection Capacity Utilization				35.3%			ICU Level of Service			A														
Analysis Period (min)				15																				

HCM Unsignalized Intersection Capacity Analysis
 16: Site Access A

04/07/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	490	0	7	87	0
Future Volume (Veh/h)	7	490	0	7	87	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	533	0	8	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			541		282	274
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			541		282	274
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	100
cM capacity (veh/h)			1028		708	764
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	541	8	95			
Volume Left	0	0	95			
Volume Right	533	0	0			
cSH	1700	1028	708			
Volume to Capacity	0.32	0.00	0.13			
Queue Length 95th (ft)	0	0	12			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			42.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/07/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	86	110	120	86	0	0
Future Volume (Veh/h)	86	110	120	86	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	120	130	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223				482	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223				482	176
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	100
cM capacity (veh/h)	1346				505	867
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	213	223	0			
Volume Left	93	0	0			
Volume Right	0	93	0			
cSH	1346	1700	1700			
Volume to Capacity	0.07	0.13	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	3.8	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	3.8	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			28.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

















04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	48	153	8	48	228	4
Future Volume (Veh/h)	48	153	8	48	228	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	51	161	8	51	240	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		198	132
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		198	132
tC, single (s)			4.2		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.3
p0 queue free %			99		67	100
cM capacity (veh/h)			1296		717	923
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	212	59	244			
Volume Left	0	8	240			
Volume Right	161	0	4			
cSH	1700	1296	719			
Volume to Capacity	0.12	0.01	0.34			
Queue Length 95th (ft)	0	0	38			
Control Delay (s)	0.0	1.1	12.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.1	12.6			
Approach LOS			B			
Intersection Summary						
Average Delay			6.1			
Intersection Capacity Utilization			31.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

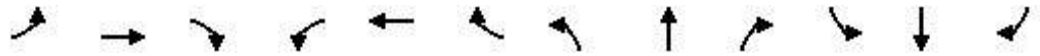
04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Future Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	47	3	2	0	47	9	3	0	11	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	67	5	59	24								
Volume Left (vph)	19	3	47	0								
Volume Right (vph)	47	0	3	13								
Hadj (s)	-0.04	0.12	0.49	-0.07								
Departure Headway (s)	4.1	4.3	4.6	4.0								
Degree Utilization, x	0.08	0.01	0.07	0.03								
Capacity (veh/h)	864	818	766	867								
Control Delay (s)	7.4	7.3	7.9	7.2								
Approach Delay (s)	7.4	7.3	7.9	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			20.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

04/07/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	22	1	21	40	21	3	204	3	14	143	5
Future Volume (Veh/h)	1	22	1	21	40	21	3	204	3	14	143	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	28	1	26	50	26	4	255	4	18	179	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			29			241	158	28	277	146	63
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			29			241	158	28	277	146	63
tC, single (s)	4.1			4.2			7.1	7.0	6.2	7.1	7.2	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.4	3.3	3.5	4.7	3.3
p0 queue free %	100			98			99	61	100	96	71	99
cM capacity (veh/h)	1536			1534			546	650	1052	464	619	1007
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	30	102	263	203								
Volume Left	1	26	4	18								
Volume Right	1	26	4	6								
cSH	1536	1534	652	608								
Volume to Capacity	0.00	0.02	0.40	0.33								
Queue Length 95th (ft)	0	1	49	37								
Control Delay (s)	0.2	2.0	14.2	13.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	2.0	14.2	13.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			11.3									
Intersection Capacity Utilization			34.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	36	23	0	30	16	1
Future Volume (Veh/h)	36	23	0	30	16	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	47	30	0	39	21	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			77		101	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		101	62
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		98	100
cM capacity (veh/h)			1535		902	785
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	39	22			
Volume Left	0	0	21			
Volume Right	30	0	1			
cSH	1700	1535	896			
Volume to Capacity	0.05	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	30	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	69	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	30	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.4	4.6	4.6	4.6								
Degree Utilization, x	0.10	0.09	0.26	0.14								
Capacity (veh/h)	754	724	755	737								
Control Delay (s)	7.8	8.0	9.2	8.4								
Approach Delay (s)	7.8	8.0	9.2	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			31.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

04/07/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	276	149	27	111	212
Future Volume (Veh/h)	37	276	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	325	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	61			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	369	207	380			
Volume Left	44	0	131			
Volume Right	325	32	0			
cSH	722	1700	1352			
Volume to Capacity	0.51	0.12	0.10			
Queue Length 95th (ft)	73	0	8			
Control Delay (s)	15.1	0.0	3.3			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			55.9%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	51	13	1	346	177	11	34	2	100	39	13
Future Volume (vph)	6	51	13	1	346	177	11	34	2	100	39	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	60	15	1	407	208	13	40	2	118	46	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	82	616	55	179								
Volume Left (vph)	7	1	13	118								
Volume Right (vph)	15	208	2	15								
Hadj (s)	-0.01	0.38	0.03	1.07								
Departure Headway (s)	5.7	5.3	6.3	7.0								
Degree Utilization, x	0.13	0.90	0.10	0.35								
Capacity (veh/h)	597	677	538	492								
Control Delay (s)	9.5	36.9	10.0	13.8								
Approach Delay (s)	9.5	36.9	10.0	13.8								
Approach LOS	A	E	A	B								
Intersection Summary												
Delay			28.4									
Level of Service			D									
Intersection Capacity Utilization			50.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	25	92	0	11	0	498	14	2	1	20	4
Future Volume (Veh/h)	7	25	92	0	11	0	498	14	2	1	20	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	29	107	0	13	0	579	16	2	1	23	5
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	13			136			129	112	82	122	165	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	13			136			129	112	82	122	165	14
tC, single (s)	4.1			4.1			7.3	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			26	98	100	100	97	100
cM capacity (veh/h)	1619			1461			781	764	983	655	728	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	144	13	597	29								
Volume Left	8	0	579	1								
Volume Right	107	0	2	5								
cSH	1619	1461	781	767								
Volume to Capacity	0.00	0.00	0.76	0.04								
Queue Length 95th (ft)	0	0	184	3								
Control Delay (s)	0.4	0.0	22.9	9.9								
Lane LOS	A		C	A								
Approach Delay (s)	0.4	0.0	22.9	9.9								
Approach LOS			C	A								
Intersection Summary												
Average Delay			17.9									
Intersection Capacity Utilization			55.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	42	2	13	37
Future Volume (Veh/h)	2	6	42	2	13	37
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	52	2	16	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	859	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	54	62			
Volume Left	2	0	16			
Volume Right	7	2	0			
cSH	916	1700	1514			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	4	1	0	496	2	17	2	89	21	1
Future Volume (Veh/h)	0	0	4	1	0	496	2	17	2	89	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	584	2	20	2	105	25	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	844	262	26	266	261	21	26			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844	262	26	266	261	21	26			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			3.1		
p0 queue free %	100	100	100	100	100	42	100			91		
cM capacity (veh/h)	112	586	1056	639	587	1012	1601			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	585	24	131								
Volume Left	0	1	2	105								
Volume Right	5	584	2	1								
cSH	1056	1011	1601	1140								
Volume to Capacity	0.00	0.58	0.00	0.09								
Queue Length 95th (ft)	0	96	0	8								
Control Delay (s)	8.4	13.3	0.6	7.0								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	13.3	0.6	7.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			51.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	109	208	42	37	0
Future Volume (Veh/h)	1	109	208	42	37	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	245	49	44	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	294				400	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294				400	270
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1279				598	774
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	129	294	44			
Volume Left	1	0	44			
Volume Right	0	49	0			
cSH	1279	1700	598			
Volume to Capacity	0.00	0.17	0.07			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.1	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	142	180	21	27	0
Future Volume (Veh/h)	2	142	180	21	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	161	205	24	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229			382	217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229			382	217	
tC, single (s)	4.6			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.7			3.5	3.3	
p0 queue free %	100			95	100	
cM capacity (veh/h)	1102			615	828	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	163	229	31			
Volume Left	2	0	31			
Volume Right	0	24	0			
cSH	1102	1700	615			
Volume to Capacity	0.00	0.13	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.1	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			20.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd











05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	226	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			270			347	344	248	342	362	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			270			347	344	248	342	362	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1305			603	579	796	611	566	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	277	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1305	606	702								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			26.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/04/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	4	87	0	7	490	0
Future Volume (Veh/h)	4	87	0	7	490	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	0	8	533	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		60	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		60	52
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			100		41	100
cM capacity (veh/h)			1494		909	1016
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	8	533			
Volume Left	0	0	533			
Volume Right	95	0	0			
cSH	1700	1494	909			
Volume to Capacity	0.06	0.00	0.59			
Queue Length 95th (ft)	0	0	98			
Control Delay (s)	0.0	0.0	14.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	14.4			
Approach LOS			B			
Intersection Summary						
Average Delay			12.0			
Intersection Capacity Utilization			39.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	0	153	92	0	86	86
Future Volume (Veh/h)	0	153	92	0	86	86
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	166	100	0	93	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100			266	100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100			266	100	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			87	90	
cM capacity (veh/h)	1493			723	956	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	100	186			
Volume Left	0	0	93			
Volume Right	0	0	93			
cSH	1493	1700	823			
Volume to Capacity	0.00	0.06	0.23			
Queue Length 95th (ft)	0	0	22			
Control Delay (s)	0.0	0.0	10.6			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			24.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	37	127	2	34	54	4
Future Volume (Veh/h)	37	127	2	34	54	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	48	165	3	44	70	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			213		180	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			213		180	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	99
cM capacity (veh/h)			1369		803	924
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	213	47	75			
Volume Left	0	3	70			
Volume Right	165	0	5			
cSH	1700	1369	810			
Volume to Capacity	0.13	0.00	0.09			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.5	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			19.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Future Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	66	0	1	1	55	5	0	0	13	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	74	2	60	23								
Volume Left (vph)	5	0	55	0								
Volume Right (vph)	66	1	0	10								
Hadj (s)	-0.11	-0.30	0.72	-0.16								
Departure Headway (s)	4.0	3.9	4.8	4.0								
Degree Utilization, x	0.08	0.00	0.08	0.03								
Capacity (veh/h)	879	902	728	882								
Control Delay (s)	7.3	6.9	8.2	7.1								
Approach Delay (s)	7.3	6.9	8.2	7.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	14	3	4	29	12	6	38	2	14	114	2
Future Volume (Veh/h)	3	14	3	4	29	12	6	38	2	14	114	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	16	3	4	33	13	7	43	2	16	128	2
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			19			137	78	18	96	72	40
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			19			137	78	18	96	72	40
tC, single (s)	4.1			4.1			7.1	6.6	6.7	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.8	3.6	4.0	3.3
p0 queue free %	100			100			99	95	100	98	84	100
cM capacity (veh/h)	1575			1611			733	798	936	832	811	1038
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	50	52	146								
Volume Left	3	4	7	16								
Volume Right	3	13	2	2								
cSH	1575	1611	793	815								
Volume to Capacity	0.00	0.00	0.07	0.18								
Queue Length 95th (ft)	0	0	5	16								
Control Delay (s)	1.0	0.6	9.9	10.4								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.0	0.6	9.9	10.4								
Approach LOS			A	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			18.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	13	5	29	20	8
Future Volume (Veh/h)	16	13	5	29	20	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	16	6	36	25	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			36		76	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			36		76	28
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		97	99
cM capacity (veh/h)			1271		915	925
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	36	42	35			
Volume Left	0	6	25			
Volume Right	16	0	10			
cSH	1700	1271	918			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	1.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			15.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	28	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	89	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	28	2	0								
Hadj (s)	-0.35	-0.13	0.46	0.14								
Departure Headway (s)	4.7	5.0	5.0	5.0								
Degree Utilization, x	0.15	0.12	0.46	0.10								
Capacity (veh/h)	690	655	704	672								
Control Delay (s)	8.5	8.7	12.2	8.5								
Approach Delay (s)	8.5	8.7	12.2	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			35.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	186	82	25	320	93
Future Volume (Veh/h)	11	186	82	25	320	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	209	92	28	360	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	930	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	106			120	
tC, single (s)	6.5	6.7			4.4	
tC, 2 stage (s)						
tF (s)	3.6	3.7			2.5	
p0 queue free %	94	75			73	
cM capacity (veh/h)	208	843			1311	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	221	120	464			
Volume Left	12	0	360			
Volume Right	209	28	0			
cSH	723	1700	1311			
Volume to Capacity	0.31	0.07	0.27			
Queue Length 95th (ft)	32	0	28			
Control Delay (s)	12.2	0.0	7.4			
Lane LOS	B		A			
Approach Delay (s)	12.2	0.0	7.4			
Approach LOS	B					
Intersection Summary						
Average Delay			7.6			
Intersection Capacity Utilization			48.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	341	2	0	29	10	11	28	3	93	23	3
Future Volume (vph)	13	341	2	0	29	10	11	28	3	93	23	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	379	2	0	32	11	12	31	3	103	26	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	395	43	46	132								
Volume Left (vph)	14	0	12	103								
Volume Right (vph)	2	11	3	3								
Hadj (s)	0.04	-0.12	0.06	0.17								
Departure Headway (s)	4.5	4.7	5.2	5.2								
Degree Utilization, x	0.49	0.06	0.07	0.19								
Capacity (veh/h)	774	707	626	640								
Control Delay (s)	11.7	8.0	8.6	9.4								
Approach Delay (s)	11.7	8.0	8.6	9.4								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			10.7									
Level of Service			B									
Intersection Capacity Utilization			45.3%		ICU Level of Service	A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 6: Cottrell Rd & Dodge Park Blvd

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	13	410	3	25	2	13	14	1	1	8	3
Future Volume (Veh/h)	3	13	410	3	25	2	13	14	1	1	8	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	15	482	4	29	2	15	16	1	1	9	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	31			497			310	303	256	311	543	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	31			497			310	303	256	311	543	30
tC, single (s)	4.4			4.4			7.1	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			3.5	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			100			98	97	100	100	98	100
cM capacity (veh/h)	1403			925			625	596	788	475	413	1050
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	501	35	32	14								
Volume Left	4	4	15	1								
Volume Right	482	2	1	4								
cSH	1403	925	614	506								
Volume to Capacity	0.00	0.00	0.05	0.03								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.1	1.1	11.2	12.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.1	11.2	12.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			38.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

















04/07/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	11	31	0	2	23
Future Volume (Veh/h)	4	11	31	0	2	23
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	12	33	0	2	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	889	1046			1592	
Direction, Lane #						
	WB 1	NB 1	SB 1			
Volume Total	16	33	27			
Volume Left	4	0	2			
Volume Right	12	0	0			
cSH	1002	1700	1592			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.7	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	3	1	0	6	1	19	1	408	12	3
Future Volume (Veh/h)	2	1	3	1	0	6	1	19	1	408	12	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	8	1	25	1	537	16	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1130	1122	20	1124	1124	26	22			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1130	1122	20	1124	1124	26	22			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	6.4	4.6			4.1		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	3.5	2.7			2.2		
p0 queue free %	97	99	100	99	100	99	100			66		
cM capacity (veh/h)	99	91	1062	87	137	1001	1329			1588		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	9	27	557								
Volume Left	3	1	1	537								
Volume Right	4	8	1	4								
cSH	178	463	1329	1588								
Volume to Capacity	0.04	0.02	0.00	0.34								
Queue Length 95th (ft)	4	1	0	38								
Control Delay (s)	26.2	12.9	0.3	8.2								
Lane LOS	D	B	A	A								
Approach Delay (s)	26.2	12.9	0.3	8.2								
Approach LOS	D	B										
Intersection Summary												
Average Delay			8.2									
Intersection Capacity Utilization			40.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 9: SE Bluff Road & SE Altman Road

04/07/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	271	175	30	27	0
Future Volume (Veh/h)	0	271	175	30	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	315	203	35	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	238				536	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	238				536	220
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1341				502	824
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	315	238	31			
Volume Left	0	0	31			
Volume Right	0	35	0			
cSH	1341	1700	502			
Volume to Capacity	0.00	0.14	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	12.6			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	12.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			24.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/07/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	1	269	198	15	16	0
Future Volume (Veh/h)	1	269	198	15	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	316	233	18	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	251				560	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	251				560	242
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				96	100
cM capacity (veh/h)	1326				493	606
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	317	251	19			
Volume Left	1	0	19			
Volume Right	0	18	0			
cSH	1326	1700	493			
Volume to Capacity	0.00	0.15	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	12.6			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	12.6			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization		25.0%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd










04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	45	21	1	143	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234			66			416	400	56	357	364	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			66			416	400	56	357	364	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			96	99	100	88	99	93
cM capacity (veh/h)	1333			1536			489	516	1011	576	540	853
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	235	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1333	1536	503	673								
Volume to Capacity	0.04	0.00	0.05	0.20								
Queue Length 95th (ft)	3	0	4	18								
Control Delay (s)	3.7	0.0	12.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.7	0.0	12.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

04/07/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	403	0	7	0	0
Future Volume (Veh/h)	7	403	0	7	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	438	0	8	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			446		235	227
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		235	227
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1114		753	812
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	446	8	0			
Volume Left	0	0	0			
Volume Right	438	0	0			
cSH	1700	1114	1700			
Volume to Capacity	0.26	0.00	0.13			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			28.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/07/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	173	110	120	86	0	87
Future Volume (Veh/h)	173	110	120	86	0	87
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	188	120	130	93	0	95
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223			672	176	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223			672	176	
tC, single (s)	4.6			7.4	6.2	
tC, 2 stage (s)						
tF (s)	2.7			4.4	3.3	
p0 queue free %	83			100	89	
cM capacity (veh/h)	1104			250	867	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	308	223	95			
Volume Left	188	0	0			
Volume Right	0	93	95			
cSH	1104	1700	867			
Volume to Capacity	0.17	0.13	0.11			
Queue Length 95th (ft)	15	0	9			
Control Delay (s)	6.1	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	6.1	0.0	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			42.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

04/07/2023

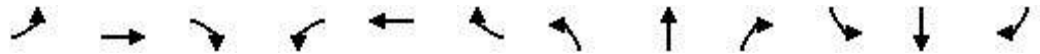


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	48	66	8	48	141	4
Future Volume (Veh/h)	48	66	8	48	141	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	51	69	8	51	148	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			120		152	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			120		152	86
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		82	100
cM capacity (veh/h)			1402		839	979
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	120	59	152			
Volume Left	0	8	148			
Volume Right	69	0	4			
cSH	1700	1402	842			
Volume to Capacity	0.07	0.01	0.18			
Queue Length 95th (ft)	0	0	16			
Control Delay (s)	0.0	1.1	10.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.1	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			24.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/07/2023

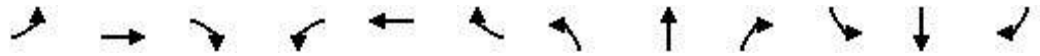


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Future Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	47	3	2	0	47	9	3	0	11	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	67	5	59	24								
Volume Left (vph)	19	3	47	0								
Volume Right (vph)	47	0	3	13								
Hadj (s)	-0.04	0.12	0.49	-0.07								
Departure Headway (s)	4.1	4.3	4.6	4.0								
Degree Utilization, x	0.08	0.01	0.07	0.03								
Capacity (veh/h)	864	818	766	867								
Control Delay (s)	7.4	7.3	7.9	7.2								
Approach Delay (s)	7.4	7.3	7.9	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			20.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

04/07/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	1	22	1	21	40	21	3	117	3	14	56	5
Future Volume (Veh/h)	1	22	1	21	40	21	3	117	3	14	56	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	28	1	26	50	26	4	146	4	18	70	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			29			186	158	28	222	146	63
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			29			186	158	28	222	146	63
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	80	100	97	90	99
cM capacity (veh/h)	1536			1534			708	724	1052	613	732	1007
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	30	102	154	94								
Volume Left	1	26	4	18								
Volume Right	1	26	4	6								
cSH	1536	1534	730	718								
Volume to Capacity	0.00	0.02	0.21	0.13								
Queue Length 95th (ft)	0	1	20	11								
Control Delay (s)	0.2	2.0	11.2	10.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	2.0	11.2	10.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			28.6%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	36	23	0	30	16	1
Future Volume (Veh/h)	36	23	0	30	16	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	47	30	0	39	21	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			77		101	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		101	62
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		98	100
cM capacity (veh/h)			1535		902	785
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	39	22			
Volume Left	0	0	21			
Volume Right	30	0	1			
cSH	1700	1535	896			
Volume to Capacity	0.05	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	30	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	69	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	30	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.4	4.6	4.6	4.6								
Degree Utilization, x	0.10	0.09	0.26	0.14								
Capacity (veh/h)	754	724	755	737								
Control Delay (s)	7.8	8.0	9.2	8.4								
Approach Delay (s)	7.8	8.0	9.2	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			31.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

04/07/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	363	149	27	198	212
Future Volume (Veh/h)	37	363	149	27	198	212
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	427	175	32	233	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	906	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	906	191			207	
tC, single (s)	6.5	6.5			4.5	
tC, 2 stage (s)						
tF (s)	3.6	3.5			2.6	
p0 queue free %	82	46			80	
cM capacity (veh/h)	238	795			1145	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	471	207	482			
Volume Left	44	0	233			
Volume Right	427	32	0			
cSH	653	1700	1145			
Volume to Capacity	0.72	0.12	0.20			
Queue Length 95th (ft)	153	0	19			
Control Delay (s)	23.5	0.0	5.4			
Lane LOS	C		A			
Approach Delay (s)	23.5	0.0	5.4			
Approach LOS	C					
Intersection Summary						
Average Delay			11.8			
Intersection Capacity Utilization			66.1%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Altman Rd & Dodge Park Blvd

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	51	13	1	346	90	11	34	2	13	39	13
Future Volume (vph)	6	51	13	1	346	90	11	34	2	13	39	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	60	15	1	407	106	13	40	2	15	46	15

















Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	82	514	55	76
Volume Left (vph)	7	1	13	15
Volume Right (vph)	15	106	2	15
Hadj (s)	-0.01	-0.10	0.03	-0.05
Departure Headway (s)	4.8	4.3	5.4	5.3
Degree Utilization, x	0.11	0.61	0.08	0.11
Capacity (veh/h)	707	821	592	605
Control Delay (s)	8.4	13.7	8.9	9.0
Approach Delay (s)	8.4	13.7	8.9	9.0
Approach LOS	A	B	A	A

Intersection Summary

Delay	12.2
Level of Service	B
Intersection Capacity Utilization	35.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	25	5	0	11	0	411	14	2	1	20	4
Future Volume (Veh/h)	7	25	5	0	11	0	411	14	2	1	20	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	29	6	0	13	0	478	16	2	1	23	5
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	13			35			78	61	32	71	64	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	13			35			78	61	32	71	64	14
tC, single (s)	4.1			4.1			7.1	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			46	98	100	100	97	100
cM capacity (veh/h)	1619			1589			883	814	1048	713	827	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	43	13	496	29								
Volume Left	8	0	478	1								
Volume Right	6	0	2	5								
cSH	1619	1589	881	855								
Volume to Capacity	0.00	0.00	0.56	0.03								
Queue Length 95th (ft)	0	0	90	3								
Control Delay (s)	1.4	0.0	14.2	9.4								
Lane LOS	A		B	A								
Approach Delay (s)	1.4	0.0	14.2	9.4								
Approach LOS			B	A								
Intersection Summary												
Average Delay			12.7									
Intersection Capacity Utilization			44.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	42	2	13	37
Future Volume (Veh/h)	2	6	42	2	13	37
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	52	2	16	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	859	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	54	62			
Volume Left	2	0	16			
Volume Right	7	2	0			
cSH	916	1700	1514			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	4	1	0	409	2	17	2	2	21	1
Future Volume (Veh/h)	0	0	4	1	0	409	2	17	2	2	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	481	2	20	2	2	25	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	536	56	26	60	55	21	26			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	536	56	26	60	55	21	26			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			3.1		
p0 queue free %	100	100	100	100	100	54	100			100		
cM capacity (veh/h)	249	837	1056	935	838	1056	1601			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	482	24	28								
Volume Left	0	1	2	2								
Volume Right	5	481	2	1								
cSH	1056	1056	1601	1140								
Volume to Capacity	0.00	0.46	0.00	0.00								
Queue Length 95th (ft)	0	61	0	0								
Control Delay (s)	8.4	11.2	0.6	0.6								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	11.2	0.6	0.6								
Approach LOS	A	B										
Intersection Summary												
Average Delay			10.2									
Intersection Capacity Utilization			36.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	196	295	42	37	0
Future Volume (Veh/h)	1	196	295	42	37	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	231	347	49	44	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	396			604	372	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396			604	372	
tC, single (s)	4.1			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.6	3.3	
p0 queue free %	100			90	100	
cM capacity (veh/h)	1174			454	679	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	232	396	44			
Volume Left	1	0	44			
Volume Right	0	49	0			
cSH	1174	1700	454			
Volume to Capacity	0.00	0.23	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	13.8			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	13.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			28.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Volume (veh/h)	2	229	267	21	27	0
Future Volume (Veh/h)	2	229	267	21	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	260	303	24	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	327				579	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	327				579	315
tC, single (s)	4.6				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.7				3.5	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1007				473	730
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	262	327	31			
Volume Left	2	0	31			
Volume Right	0	24	0			
cSH	1007	1700	473			
Volume to Capacity	0.00	0.19	0.07			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.1	0.0	13.1			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	13.1			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			25.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis










11: 362nd Ave/Proctor Rd & Bluff Rd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	226	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			270			347	344	248	342	362	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			270			347	344	248	342	362	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1305			603	579	796	611	566	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	277	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1305	606	702								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			26.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 16: Site Access A

05/04/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	4	0	0	7	403	0
Future Volume (Veh/h)	4	0	0	7	403	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	8	438	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			4		12	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			4		12	4
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		57	100
cM capacity (veh/h)			1618		1008	1080
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	4	8	438			
Volume Left	0	0	438			
Volume Right	0	0	0			
cSH	1700	1618	1008			
Volume to Capacity	0.00	0.00	0.43			
Queue Length 95th (ft)	0	0	56			
Control Delay (s)	0.0	0.0	11.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			11.0			
Intersection Capacity Utilization			32.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	87	153	92	0	86	173
Future Volume (Veh/h)	87	153	92	0	86	173
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	95	166	100	0	93	188
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100				456	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				456	100
tC, single (s)	5.1				6.4	6.7
tC, 2 stage (s)						
tF (s)	3.1				3.5	3.8
p0 queue free %	91				82	78
cM capacity (veh/h)	1052				512	837
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	261	100	281			
Volume Left	95	0	93			
Volume Right	0	0	188			
cSH	1052	1700	691			
Volume to Capacity	0.09	0.06	0.41			
Queue Length 95th (ft)	7	0	49			
Control Delay (s)	3.7	0.0	13.7			
Lane LOS	A		B			
Approach Delay (s)	3.7	0.0	13.7			
Approach LOS			B			
Intersection Summary						
Average Delay			7.5			
Intersection Capacity Utilization			41.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	37	127	2	34	54	4
Future Volume (Veh/h)	37	127	2	34	54	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	48	165	3	44	70	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			213		180	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			213		180	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	99
cM capacity (veh/h)			1369		803	924
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	213	47	75			
Volume Left	0	3	70			
Volume Right	165	0	5			
cSH	1700	1369	810			
Volume to Capacity	0.13	0.00	0.09			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.5	9.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.5	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			19.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Future Volume (vph)	4	2	51	0	1	1	42	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	66	0	1	1	55	5	0	0	13	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	74	2	60	23								
Volume Left (vph)	5	0	55	0								
Volume Right (vph)	66	1	0	10								
Hadj (s)	-0.11	-0.30	0.72	-0.16								
Departure Headway (s)	4.0	3.9	4.8	4.0								
Degree Utilization, x	0.08	0.00	0.08	0.03								
Capacity (veh/h)	879	902	728	882								
Control Delay (s)	7.3	6.9	8.2	7.1								
Approach Delay (s)	7.3	6.9	8.2	7.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	14	3	4	29	12	6	38	2	14	114	2
Future Volume (Veh/h)	3	14	3	4	29	12	6	38	2	14	114	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	16	3	4	33	13	7	43	2	16	128	2
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			19			137	78	18	96	72	40
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			19			137	78	18	96	72	40
tC, single (s)	4.1			4.1			7.1	6.6	6.7	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.8	3.6	4.0	3.3
p0 queue free %	100			100			99	95	100	98	84	100
cM capacity (veh/h)	1575			1611			733	798	936	832	811	1038
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	50	52	146								
Volume Left	3	4	7	16								
Volume Right	3	13	2	2								
cSH	1575	1611	793	815								
Volume to Capacity	0.00	0.00	0.07	0.18								
Queue Length 95th (ft)	0	0	5	16								
Control Delay (s)	1.0	0.6	9.9	10.4								
Lane LOS	A	A	A	B								
Approach Delay (s)	1.0	0.6	9.9	10.4								
Approach LOS			A	B								
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			18.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

05/04/2023



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	13	5	29	20	8
Future Volume (Veh/h)	16	13	5	29	20	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	16	6	36	25	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			36		76	28
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			36		76	28
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		97	99
cM capacity (veh/h)			1271		915	925
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	36	42	35			
Volume Left	0	6	25			
Volume Right	16	0	10			
cSH	1700	1271	918			
Volume to Capacity	0.02	0.00	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	1.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			15.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	28	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	89	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	28	2	0								
Hadj (s)	-0.35	-0.13	0.46	0.14								
Departure Headway (s)	4.7	5.0	5.0	5.0								
Degree Utilization, x	0.15	0.12	0.46	0.10								
Capacity (veh/h)	690	655	704	672								
Control Delay (s)	8.5	8.7	12.2	8.5								
Approach Delay (s)	8.5	8.7	12.2	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			35.7%	ICU Level of Service								A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	233	93
Future Volume (Veh/h)	11	99	82	25	233	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	262	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	96	88			82	
cM capacity (veh/h)	308	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	366			
Volume Left	12	0	262			
Volume Right	111	28	0			
cSH	782	1700	1462			
Volume to Capacity	0.16	0.07	0.18			
Queue Length 95th (ft)	14	0	16			
Control Delay (s)	10.5	0.0	6.2			
Lane LOS	B		A			
Approach Delay (s)	10.5	0.0	6.2			
Approach LOS	B					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			37.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

















04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	341	2	0	29	10	11	28	3	93	23	3
Future Volume (vph)	13	341	2	0	29	10	11	28	3	93	23	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	14	379	2	0	32	11	12	31	3	103	26	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	395	43	46	132								
Volume Left (vph)	14	0	12	103								
Volume Right (vph)	2	11	3	3								
Hadj (s)	0.04	-0.12	0.06	0.17								
Departure Headway (s)	4.5	4.7	5.2	5.2								
Degree Utilization, x	0.49	0.06	0.07	0.19								
Capacity (veh/h)	774	707	626	640								
Control Delay (s)	11.7	8.0	8.6	9.4								
Approach Delay (s)	11.7	8.0	8.6	9.4								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			10.7									
Level of Service			B									
Intersection Capacity Utilization			45.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Cottrell Rd & Dodge Park Blvd

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	13	410	3	25	2	13	14	1	1	8	3
Future Volume (Veh/h)	3	13	410	3	25	2	13	14	1	1	8	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	15	482	4	29	2	15	16	1	1	9	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None					None						
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	31			497			310	303	256	311	543	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	31			497			310	303	256	311	543	30
tC, single (s)	4.4			4.4			7.1	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			3.5	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			100			98	97	100	100	98	100
cM capacity (veh/h)	1403			925			625	596	788	475	413	1050
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	501	35	32	14								
Volume Left	4	4	15	1								
Volume Right	482	2	1	4								
cSH	1403	925	614	506								
Volume to Capacity	0.00	0.00	0.05	0.03								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.1	1.1	11.2	12.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.1	11.2	12.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			38.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

















04/07/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	11	31	0	2	23
Future Volume (Veh/h)	4	11	31	0	2	23
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	12	33	0	2	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	889	1046			1592	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	16	33	27			
Volume Left	4	0	2			
Volume Right	12	0	0			
cSH	1002	1700	1592			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.7	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	3	1	0	6	1	19	1	408	12	3
Future Volume (Veh/h)	2	1	3	1	0	6	1	19	1	408	12	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	8	1	25	1	537	16	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1130	1122	20	1124	1124	26	22			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1130	1122	20	1124	1124	26	22			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	6.4	4.6			4.1		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	3.5	2.7			2.2		
p0 queue free %	97	99	100	99	100	99	100			66		
cM capacity (veh/h)	99	91	1062	87	137	1001	1329			1588		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	9	27	557								
Volume Left	3	1	1	537								
Volume Right	4	8	1	4								
cSH	178	463	1329	1588								
Volume to Capacity	0.04	0.02	0.00	0.34								
Queue Length 95th (ft)	4	1	0	38								
Control Delay (s)	26.2	12.9	0.3	8.2								
Lane LOS	D	B	A	A								
Approach Delay (s)	26.2	12.9	0.3	8.2								
Approach LOS	D	B										
Intersection Summary												
Average Delay			8.2									
Intersection Capacity Utilization			40.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/07/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	184	88	30	27	0
Future Volume (Veh/h)	0	184	88	30	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	214	102	35	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				334	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				334	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1459				657	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	214	137	31			
Volume Left	0	0	31			
Volume Right	0	35	0			
cSH	1459	1700	657			
Volume to Capacity	0.00	0.08	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/07/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	1	182	111	15	16	0
Future Volume (Veh/h)	1	182	111	15	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	214	131	18	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				356	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				356	140
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				97	100
cM capacity (veh/h)	1445				646	702
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	215	149	19			
Volume Left	1	0	19			
Volume Right	0	18	0			
cSH	1445	1700	646			
Volume to Capacity	0.00	0.09	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			20.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	128	19	1	219	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	128	19	1	219	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	139	21	1	238	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	329			160			606	588	150	546	554	284
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329			160			606	588	150	546	554	284
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			94	99	100	84	99	92
cM capacity (veh/h)	1231			1419			361	402	897	429	421	755
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	214	330	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1231	1419	375	533								
Volume to Capacity	0.04	0.00	0.07	0.25								
Queue Length 95th (ft)	3	0	6	24								
Control Delay (s)	2.3	0.0	15.3	14.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	2.3	0.0	15.3	14.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			44.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	7	403	0	7	0	0
Future Volume (Veh/h)	7	403	0	7	0	0
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	438	0	8	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			446		235	227
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			446		235	227
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1114		753	812
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	446	8	0			
Volume Left	0	0	0			
Volume Right	438	0	0			
cSH	1700	1114	1700			
Volume to Capacity	0.26	0.00	0.13			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			28.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/07/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	110	120	173	87	0
Future Volume (Veh/h)	86	110	120	173	87	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	120	130	188	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	318			530	224	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	318			530	224	
tC, single (s)	4.1			7.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			4.4	3.3	
p0 queue free %	93			73	100	
cM capacity (veh/h)	1242			346	820	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	213	318	95			
Volume Left	93	0	95			
Volume Right	0	188	0			
cSH	1242	1700	346			
Volume to Capacity	0.07	0.19	0.27			
Queue Length 95th (ft)	6	0	27			
Control Delay (s)	3.9	0.0	19.3			
Lane LOS	A		C			
Approach Delay (s)	3.9	0.0	19.3			
Approach LOS			C			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			42.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

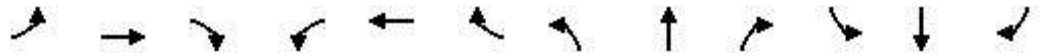
04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	48	66	8	48	141	4
Future Volume (Veh/h)	48	66	8	48	141	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	51	69	8	51	148	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			120		152	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			120		152	86
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		82	100
cM capacity (veh/h)			1402		839	979
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	120	59	152			
Volume Left	0	8	148			
Volume Right	69	0	4			
cSH	1700	1402	842			
Volume to Capacity	0.07	0.01	0.18			
Queue Length 95th (ft)	0	0	16			
Control Delay (s)	0.0	1.1	10.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.1	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			24.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/07/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Future Volume (vph)	17	1	43	3	2	0	43	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	47	3	2	0	47	9	3	0	11	13

















Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	67	5	59	24
Volume Left (vph)	19	3	47	0
Volume Right (vph)	47	0	3	13
Hadj (s)	-0.04	0.12	0.49	-0.07
Departure Headway (s)	4.1	4.3	4.6	4.0
Degree Utilization, x	0.08	0.01	0.07	0.03
Capacity (veh/h)	864	818	766	867
Control Delay (s)	7.4	7.3	7.9	7.2
Approach Delay (s)	7.4	7.3	7.9	7.2
Approach LOS	A	A	A	A

Intersection Summary

Delay	7.6
Level of Service	A
Intersection Capacity Utilization	20.0%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 3: SE Altman Road & SE Lusted Road

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	22	1	21	40	21	3	117	3	14	56	5
Future Volume (Veh/h)	1	22	1	21	40	21	3	117	3	14	56	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	1	28	1	26	50	26	4	146	4	18	70	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			29			186	158	28	222	146	63
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			29			186	158	28	222	146	63
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	80	100	97	90	99
cM capacity (veh/h)	1536			1534			708	724	1052	613	732	1007
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	30	102	154	94								
Volume Left	1	26	4	18								
Volume Right	1	26	4	6								
cSH	1536	1534	730	718								
Volume to Capacity	0.00	0.02	0.21	0.13								
Queue Length 95th (ft)	0	1	20	11								
Control Delay (s)	0.2	2.0	11.2	10.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	2.0	11.2	10.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			28.6%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/07/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	36	23	0	30	16	1
Future Volume (Veh/h)	36	23	0	30	16	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	47	30	0	39	21	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			77		101	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		101	62
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		98	100
cM capacity (veh/h)			1535		902	785
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	39	22			
Volume Left	0	0	21			
Volume Right	30	0	1			
cSH	1700	1535	896			
Volume to Capacity	0.05	0.00	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/07/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	30	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	69	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	30	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.4	4.6	4.6	4.6								
Degree Utilization, x	0.10	0.09	0.26	0.14								
Capacity (veh/h)	754	724	755	737								
Control Delay (s)	7.8	8.0	9.2	8.4								
Approach Delay (s)	7.8	8.0	9.2	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			31.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 15: SE Orient Drive & SE Bluff Road

04/07/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	276	149	27	111	212
Future Volume (Veh/h)	37	276	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	325	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	61			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	369	207	380			
Volume Left	44	0	131			
Volume Right	325	32	0			
cSH	722	1700	1352			
Volume to Capacity	0.51	0.12	0.10			
Queue Length 95th (ft)	73	0	8			
Control Delay (s)	15.1	0.0	3.3			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization		55.9%		ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	51	13	1	346	90	11	34	2	13	39	13
Future Volume (vph)	6	51	13	1	346	90	11	34	2	13	39	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	7	60	15	1	407	106	13	40	2	15	46	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	82	514	55	76								
Volume Left (vph)	7	1	13	15								
Volume Right (vph)	15	106	2	15								
Hadj (s)	-0.01	-0.10	0.03	-0.05								
Departure Headway (s)	4.8	4.3	5.4	5.3								
Degree Utilization, x	0.11	0.61	0.08	0.11								
Capacity (veh/h)	707	821	592	605								
Control Delay (s)	8.4	13.7	8.9	9.0								
Approach Delay (s)	8.4	13.7	8.9	9.0								
Approach LOS	A	B	A	A								
Intersection Summary												
Delay			12.2									
Level of Service			B									
Intersection Capacity Utilization			35.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	25	5	0	11	0	411	14	2	1	20	4
Future Volume (Veh/h)	7	25	5	0	11	0	411	14	2	1	20	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	29	6	0	13	0	478	16	2	1	23	5
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	13			35			78	61	32	71	64	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	13			35			78	61	32	71	64	14
tC, single (s)	4.1			4.1			7.1	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			46	98	100	100	97	100
cM capacity (veh/h)	1619			1589			883	814	1048	713	827	1071
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	43	13	496	29								
Volume Left	8	0	478	1								
Volume Right	6	0	2	5								
cSH	1619	1589	881	855								
Volume to Capacity	0.00	0.00	0.56	0.03								
Queue Length 95th (ft)	0	0	90	3								
Control Delay (s)	1.4	0.0	14.2	9.4								
Lane LOS	A		B	A								
Approach Delay (s)	1.4	0.0	14.2	9.4								
Approach LOS			B	A								
Intersection Summary												
Average Delay			12.7									
Intersection Capacity Utilization			44.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	42	2	13	37
Future Volume (Veh/h)	2	6	42	2	13	37
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	52	2	16	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	859	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	54	62			
Volume Left	2	0	16			
Volume Right	7	2	0			
cSH	916	1700	1514			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	4	1	0	409	2	17	2	2	21	1
Future Volume (Veh/h)	0	0	4	1	0	409	2	17	2	2	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	481	2	20	2	2	25	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	536	56	26	60	55	21	26			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	536	56	26	60	55	21	26			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			3.1		
p0 queue free %	100	100	100	100	100	54	100			100		
cM capacity (veh/h)	249	837	1056	935	838	1056	1601			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	482	24	28								
Volume Left	0	1	2	2								
Volume Right	5	481	2	1								
cSH	1056	1056	1601	1140								
Volume to Capacity	0.00	0.46	0.00	0.00								
Queue Length 95th (ft)	0	61	0	0								
Control Delay (s)	8.4	11.2	0.6	0.6								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	11.2	0.6	0.6								
Approach LOS	A	B										
Intersection Summary												
Average Delay			10.2									
Intersection Capacity Utilization			36.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	109	208	42	37	0
Future Volume (Veh/h)	1	109	208	42	37	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	245	49	44	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	294				400	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294				400	270
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1279				598	774
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	129	294	44			
Volume Left	1	0	44			
Volume Right	0	49	0			
cSH	1279	1700	598			
Volume to Capacity	0.00	0.17	0.07			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.1	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	2	142	180	21	27	0
Future Volume (Veh/h)	2	142	180	21	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	161	205	24	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229			382	217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229			382	217	
tC, single (s)	4.6			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.7			3.5	3.3	
p0 queue free %	100			95	100	
cM capacity (veh/h)	1102			615	828	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	163	229	31			
Volume Left	2	0	31			
Volume Right	0	24	0			
cSH	1102	1700	615			
Volume to Capacity	0.00	0.13	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.1	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			20.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	281	38	1	148	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	281	38	1	148	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	327	44	1	172	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	181			371			549	546	349	544	564	176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181			371			549	546	349	544	564	176
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	100	98	99	99
cM capacity (veh/h)	1407			1199			442	445	699	449	435	872
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	378	182	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1407	1199	447	545								
Volume to Capacity	0.00	0.00	0.07	0.03								
Queue Length 95th (ft)	0	0	6	2								
Control Delay (s)	0.2	0.1	13.7	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	13.7	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			31.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	4	0	0	7	403	0
Future Volume (Veh/h)	4	0	0	7	403	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	0	8	438	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			4		12	4
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			4		12	4
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		57	100
cM capacity (veh/h)			1618		1008	1080
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	4	8	438			
Volume Left	0	0	438			
Volume Right	0	0	0			
cSH	1700	1618	1008			
Volume to Capacity	0.00	0.00	0.43			
Queue Length 95th (ft)	0	0	56			
Control Delay (s)	0.0	0.0	11.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.3			
Approach LOS			B			
Intersection Summary						
Average Delay			11.0			
Intersection Capacity Utilization			32.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	0	153	92	87	173	86
Future Volume (Veh/h)	0	153	92	87	173	86
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	166	100	95	188	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	195				314	148
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	195				314	148
tC, single (s)	4.1				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.2				4.0	3.3
p0 queue free %	100				68	90
cM capacity (veh/h)	1390				589	899
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	195	281			
Volume Left	0	0	188			
Volume Right	0	95	93			
cSH	1390	1700	665			
Volume to Capacity	0.00	0.11	0.42			
Queue Length 95th (ft)	0	0	53			
Control Delay (s)	0.0	0.0	14.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	14.3			
Approach LOS			B			
Intersection Summary						
Average Delay			6.3			
Intersection Capacity Utilization			31.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

11/16/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	16	5	12	32	1	4	1	12	1	4	3
Future Volume (Veh/h)	2	16	5	12	32	1	4	1	12	1	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	3	23	7	17	45	1	6	1	17	1	6	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			30			119	112	26	130	116	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			30			119	112	26	130	116	46
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	100	98	100	99	100
cM capacity (veh/h)	1575			1539			790	771	1029	825	768	1030
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	63	24	11								
Volume Left	3	17	6	1								
Volume Right	7	1	17	4								
cSH	1575	1539	945	852								
Volume to Capacity	0.00	0.01	0.03	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	0.7	2.0	8.9	9.3								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.7	2.0	8.9	9.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			15.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

11/16/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	19	10	19	29	7	15
Future Volume (Veh/h)	19	10	19	29	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	27	14	27	41	10	21
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			42		130	35
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			42		130	35
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			98		99	98
cM capacity (veh/h)			1579		853	985
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	68	31			
Volume Left	0	27	10			
Volume Right	14	0	21			
cSH	1700	1579	938			
Volume to Capacity	0.02	0.02	0.03			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	3.0	9.0			
Lane LOS			A			
Approach Delay (s)	0.0	3.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

05/16/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	19	4	10	19	1	7	3	17	1	1	2
Future Volume (Veh/h)	3	19	4	10	19	1	7	3	17	1	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	26	6	14	26	1	10	4	24	1	1	3
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			32			96	92	29	118	94	28
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			32			96	92	29	118	94	28
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	99	98	100	100	100
cM capacity (veh/h)	1600			1593			880	793	1034	833	790	1053
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	36	41	38	5								
Volume Left	4	14	10	1								
Volume Right	6	1	24	3								
cSH	1600	1593	959	941								
Volume to Capacity	0.00	0.01	0.04	0.01								
Queue Length 95th (ft)	0	1	3	0								
Control Delay (s)	0.8	2.5	8.9	8.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.8	2.5	8.9	8.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			13.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

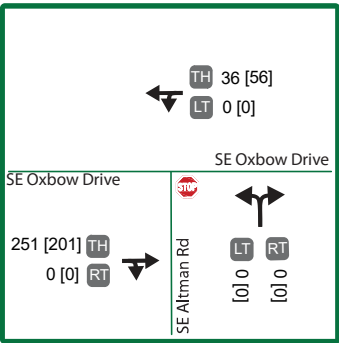
13: SE Hudson Road & SE Lusted Road

05/16/2022

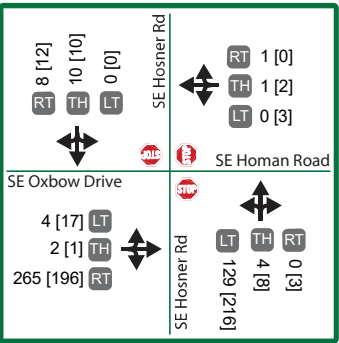


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	25	6	16	22	8	13
Future Volume (Veh/h)	25	6	16	22	8	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	34	8	22	30	11	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			42		112	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			42		112	38
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1580		877	1040
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	42	52	29			
Volume Left	0	22	11			
Volume Right	8	0	18			
cSH	1700	1580	971			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.2	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			

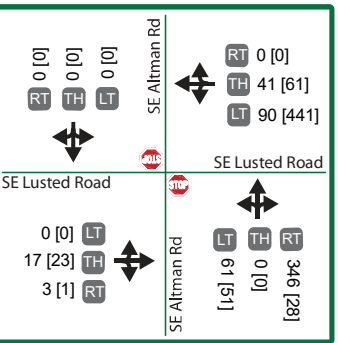
Appendix D: Roadway Closure Detour Routes
Detour HCM Results
Detour Volumes Figures



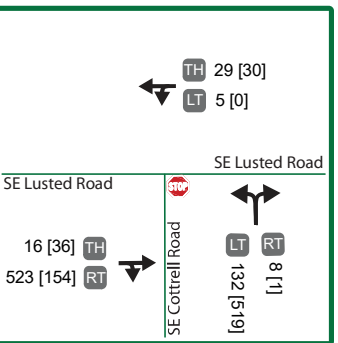
① SE Altman Road at SE Oxbow Drive



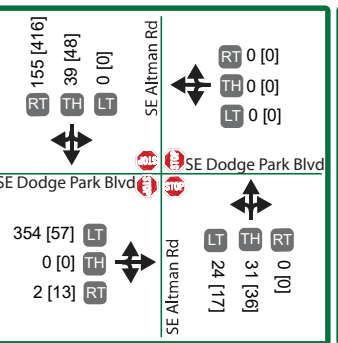
② SE Hosner Road at SE Oxbow Dr / SE Homan Rd



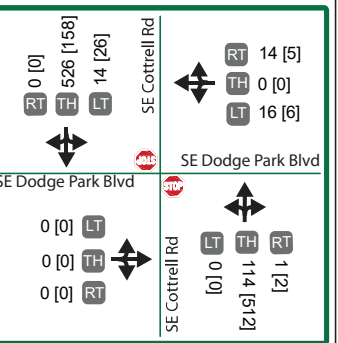
③ SE Altman Road at SE Lusted Road



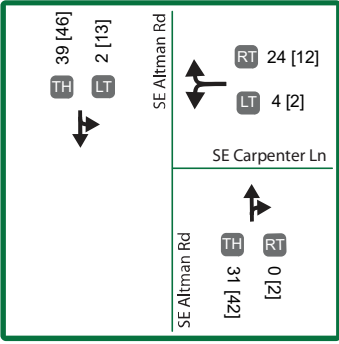
④ SE Cottrell Road at SE Lusted Road



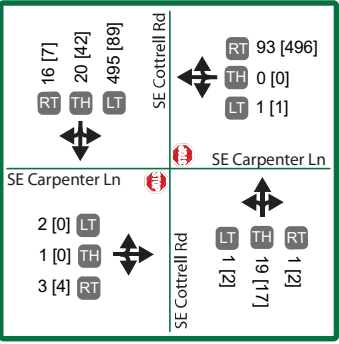
⑤ SE Altman Road at SE Dodge Park Boulevard



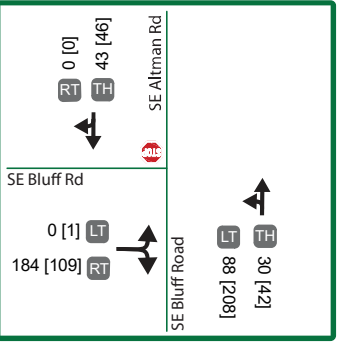
⑥ SE Cottrell Road at SE Dodge Park Boulevard



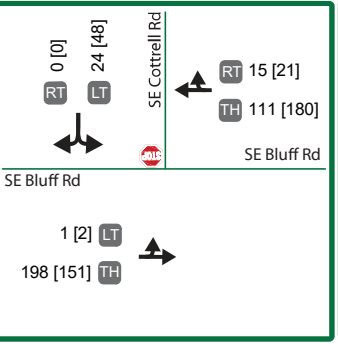
⑦ SE Altman Road at SE Carpenter Lane



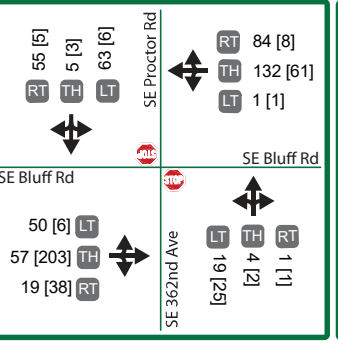
⑧ SE Cottrell Road at SE Carpenter Lane



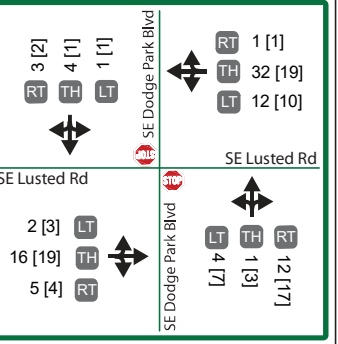
⑨ SE Altman Road at SE Bluff Road



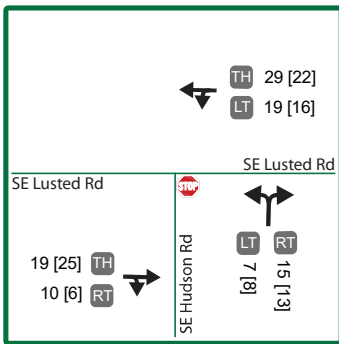
⑩ SE Cottrell Road at SE Bluff Road



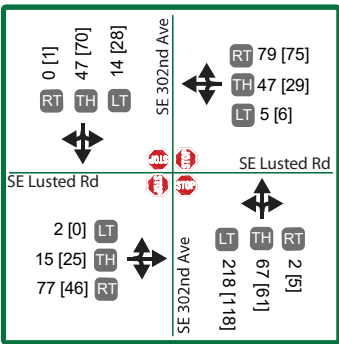
⑪ SE Bluff Road at SE Proctor Road



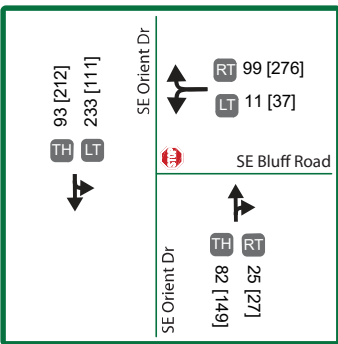
⑫ SE Dodge Park Boulevard at SE Lusted Road



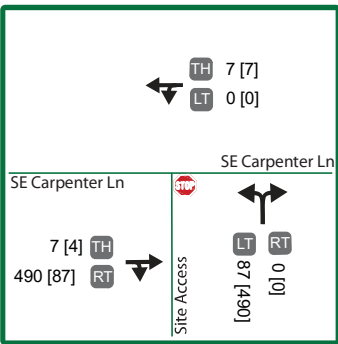
⑬ SE Lusted Road at SE Hudson Road



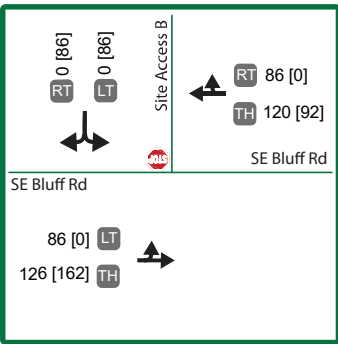
⑭ SE Lusted Road at SE 302nd Avenue



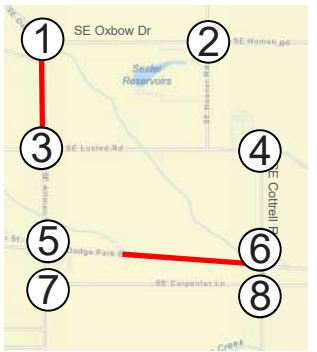
⑮ SE Orient Drive at SE Bluff Road



A SE Carpenter Lane at Site Access A

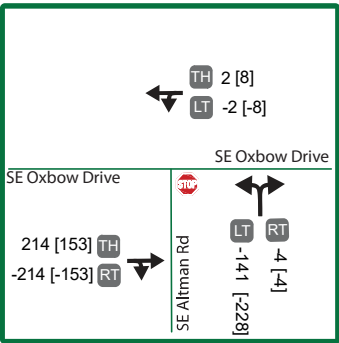


B SE Bluff Road at Site Access B

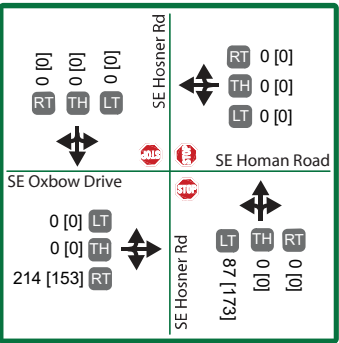


(X) = Study Intersection ↩ = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn — = Dodge/Altman Closure
 AM [PM] = Peak Hour Traffic Volumes

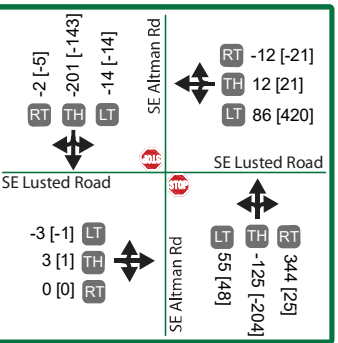
Appendix D: Traffic Volumes
2025 Peak Construction
Conditions
Dodge/Altman Closure



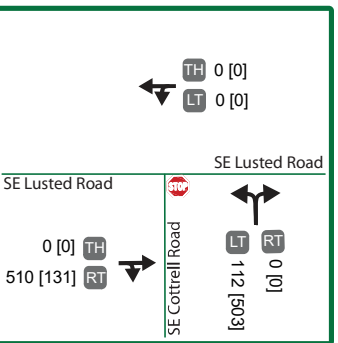
① SE Altman Road at SE Oxbow Drive



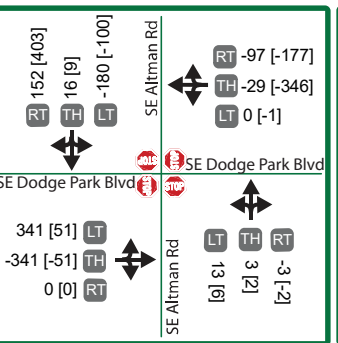
② SE Hosner Road at SE Oxbow Dr / SE Homan Rd



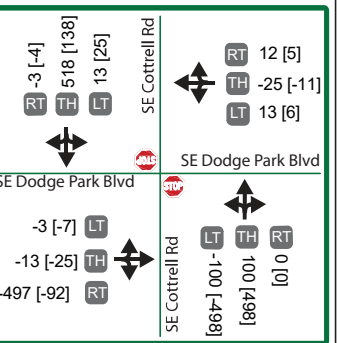
③ SE Altman Road at SE Lusted Road



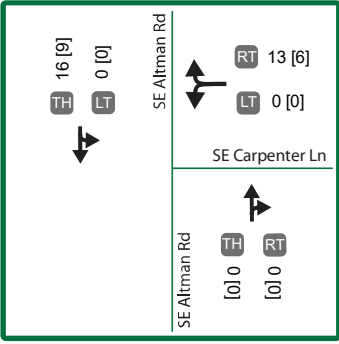
④ SE Cottrell Road at SE Lusted Road



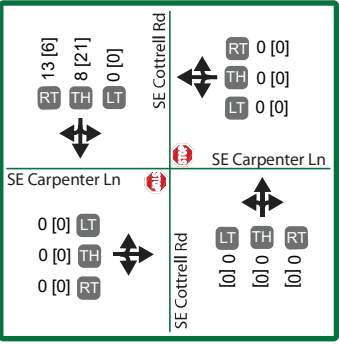
⑤ SE Altman Road at SE Dodge Park Boulevard



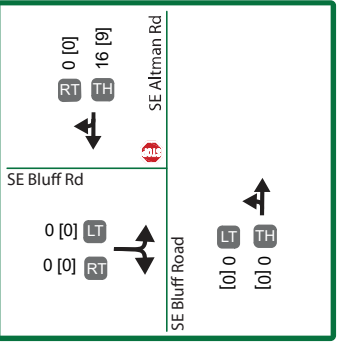
⑥ SE Cottrell Road at SE Dodge Park Boulevard



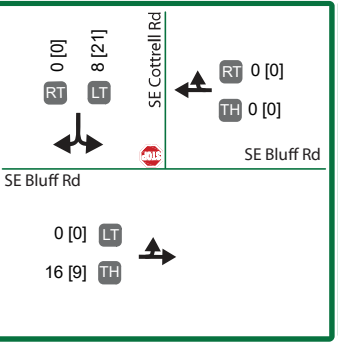
⑦ SE Altman Road at SE Carpenter Lane



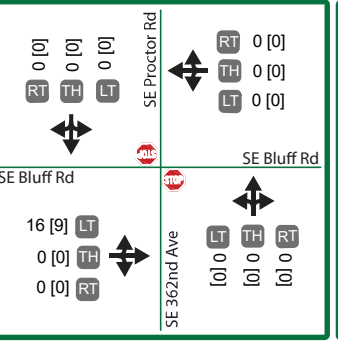
⑧ SE Cottrell Road at SE Carpenter Lane



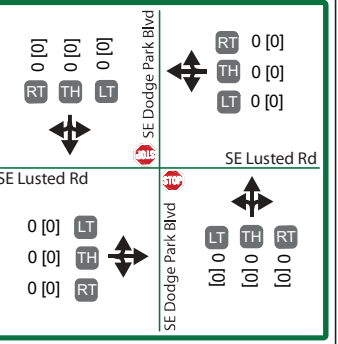
⑨ SE Altman Road at SE Bluff Road



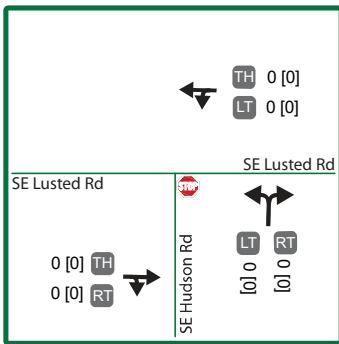
⑩ SE Cottrell Road at SE Bluff Road



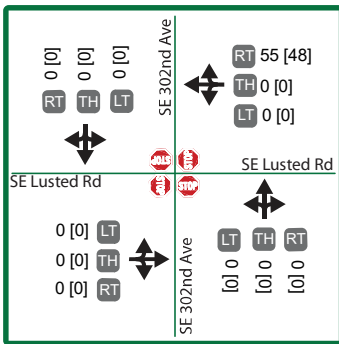
⑪ SE Bluff Road at SE Proctor Road



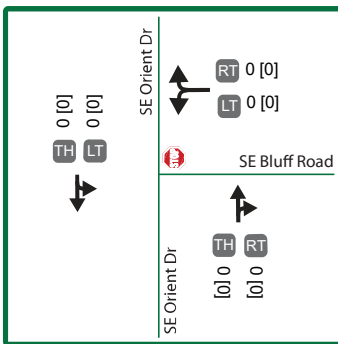
⑫ SE Dodge Park Boulevard at SE Lusted Road



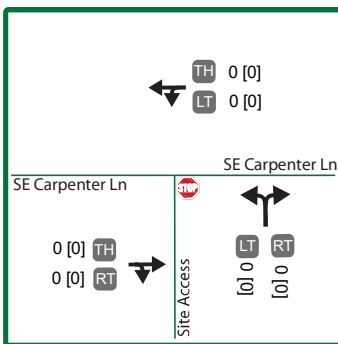
⑬ SE Bluff Road at SE Proctor Road



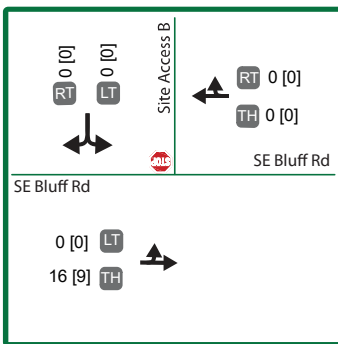
⑭ SE Lusted Road at SE 302nd Avenue



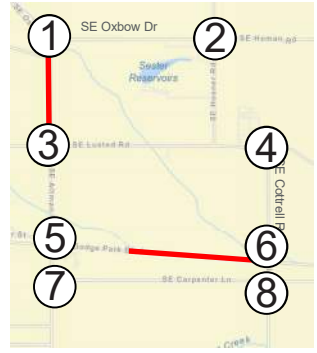
⑮ SE Orient Drive at SE Bluff Road



A SE Carpenter Lane at Site Access A

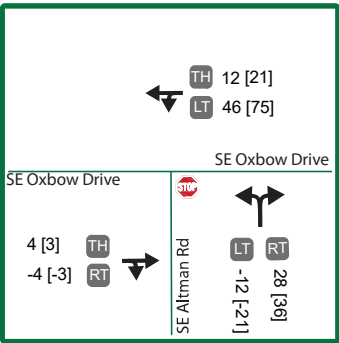


B SE Bluff Road at Site Access B

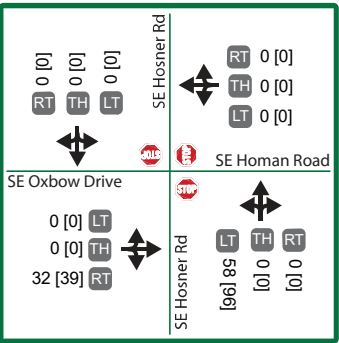


(X) = Study Intersection ↩ = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes
 — = Dodge/Altman Closure

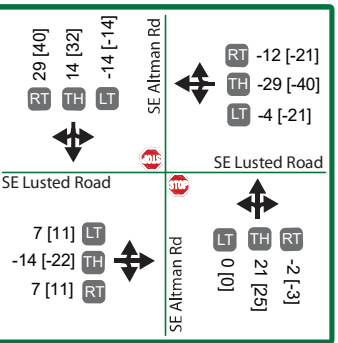
Appendix D: Traffic Volumes
2025 Peak Construction
Conditions Change in Volumes
with Dodge/Altman Closure



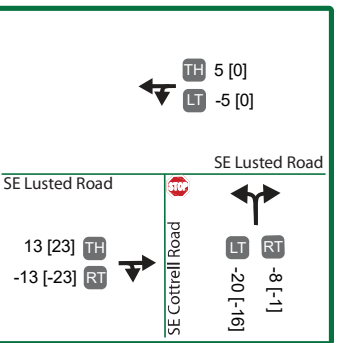
① SE Altman Road at SE Oxbow Drive



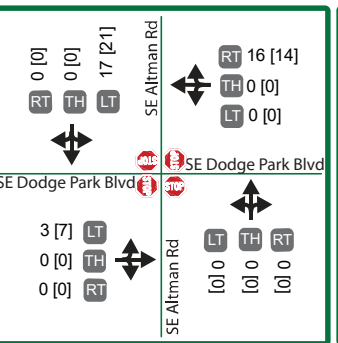
② SE Hosner Road at SE Oxbow Dr / SE Homan Rd



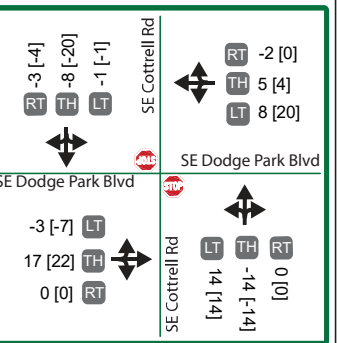
③ SE Altman Road at SE Lusted Road



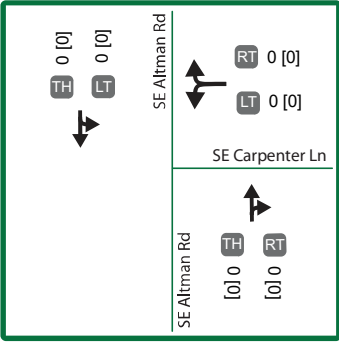
④ SE Cottrell Road at SE Lusted Road



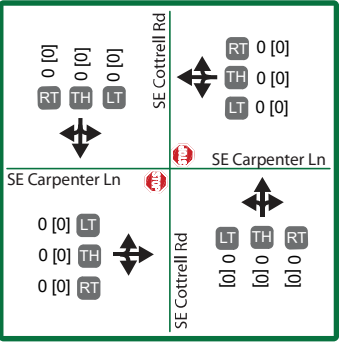
⑤ SE Altman Road at SE Dodge Park Boulevard



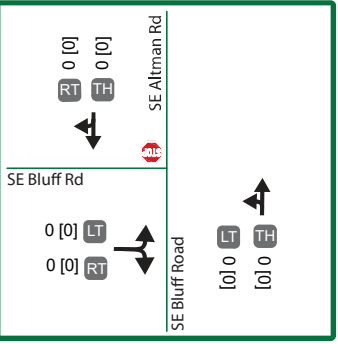
⑥ SE Cottrell Road at SE Dodge Park Boulevard



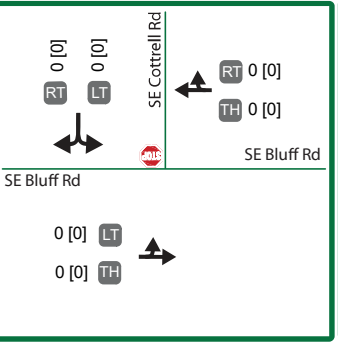
⑦ SE Altman Road at SE Carpenter Lane



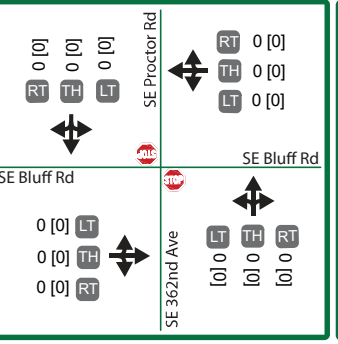
⑧ SE Cottrell Road at SE Carpenter Lane



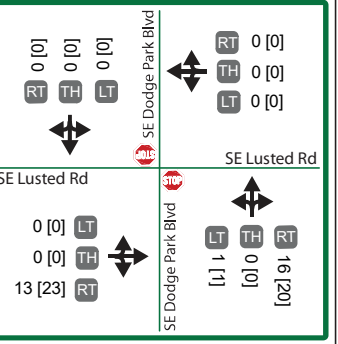
⑨ SE Altman Road at SE Bluff Road



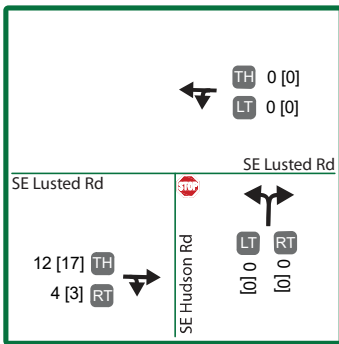
⑩ SE Cottrell Road at SE Bluff Road



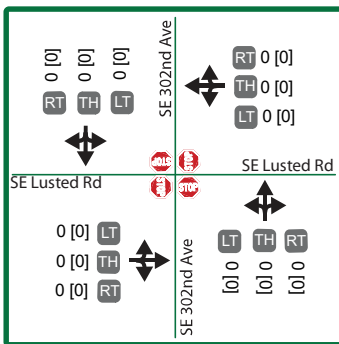
⑪ SE Bluff Road at SE Proctor Road



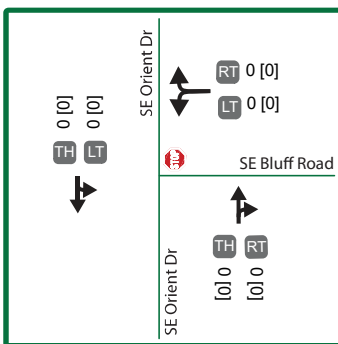
⑫ SE Dodge Park Boulevard at SE Lusted Road



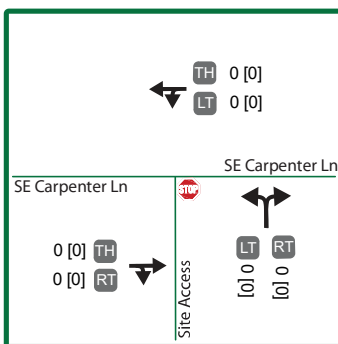
⑬ SE Lusted Road at SE Hudson Road



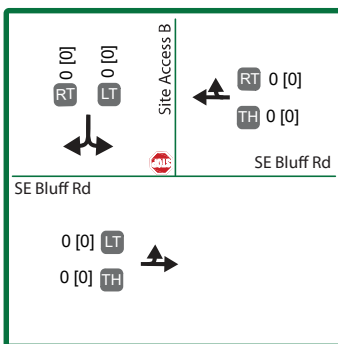
⑭ SE Lusted Road at SE 302nd Avenue



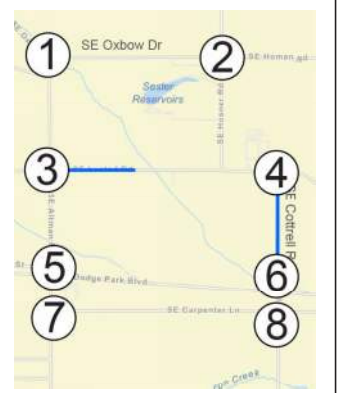
⑮ SE Orient Drive at SE Bluff Road



A SE Carpenter Lane at Site Access A

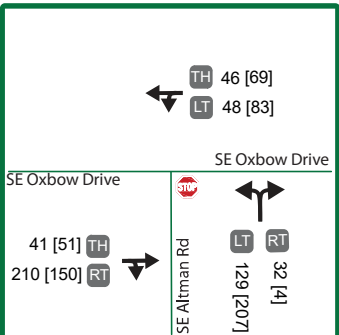


B SE Bluff Road at Site Access B

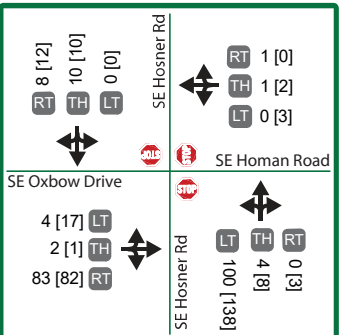


(X) = Study Intersection ↶ = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn — = Lusted/Cottrell Closure
 AM [PM] = Peak Hour Traffic Volumes

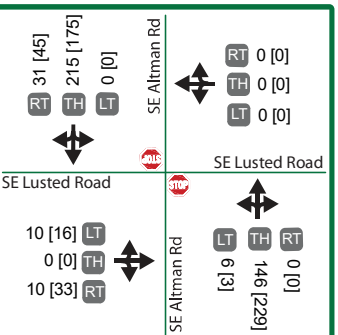
Appendix D: Traffic Volumes 2025 Peak Construction Conditions Change In Volumes with Lusted/Cottrell Detours



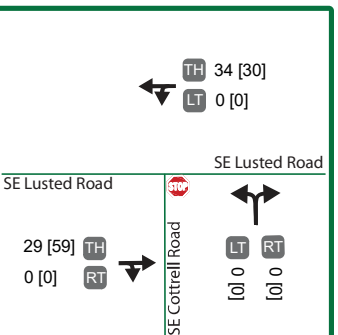
① SE Altman Road at SE Oxbow Drive



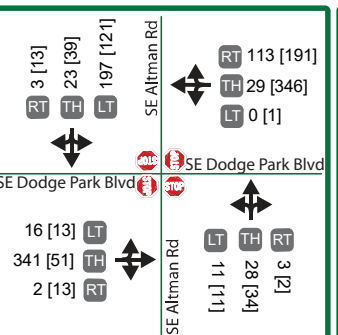
② SE Hosner Road at SE Oxbow Dr / SE Homan Rd



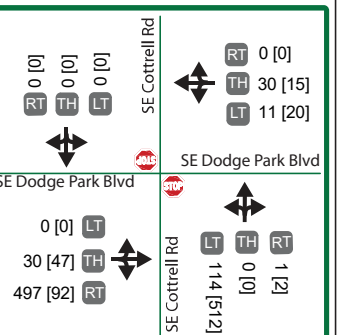
③ SE Altman Road at SE Lusted Road



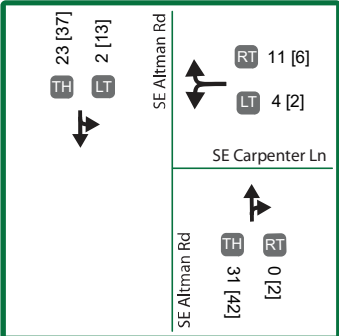
④ SE Cottrell Road at SE Lusted Road



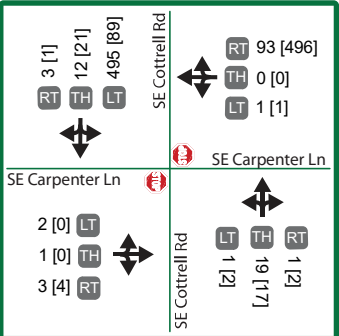
⑤ SE Altman Road at SE Dodge Park Boulevard



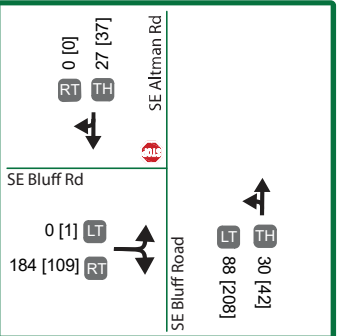
⑥ SE Cottrell Road at SE Dodge Park Boulevard



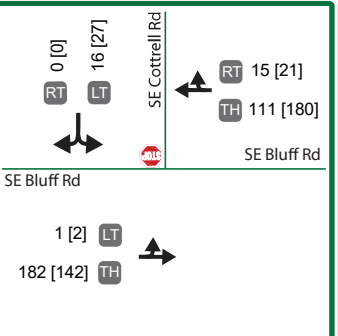
⑦ SE Altman Road at SE Carpenter Lane



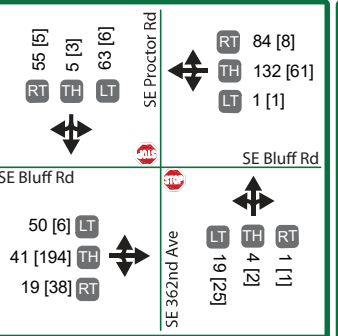
⑧ SE Cottrell Road at SE Carpenter Lane



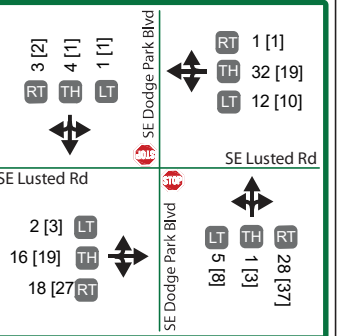
⑨ SE Altman Road at SE Bluff Road



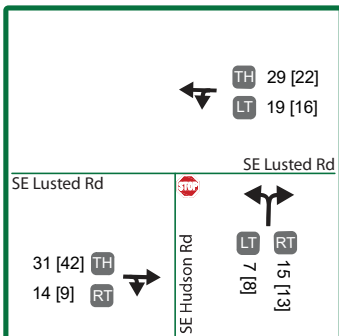
⑩ SE Cottrell Road at SE Bluff Road



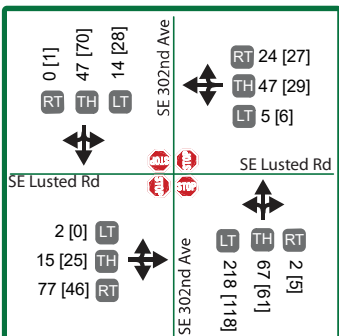
⑪ SE Bluff Road at SE Proctor Road



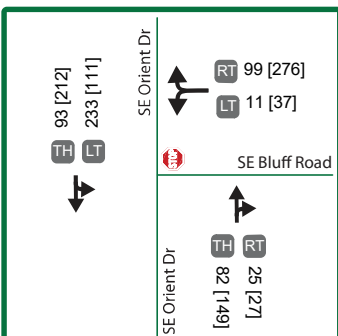
⑫ SE Dodge Park Boulevard at SE Lusted Road



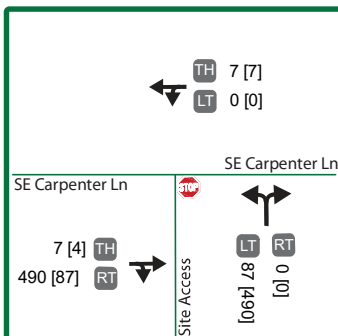
⑬ SE Lusted Road at SE Hudson Road



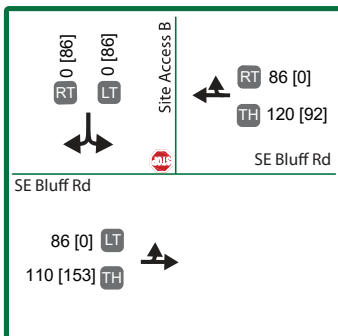
⑭ SE Lusted Road at SE 302nd Avenue



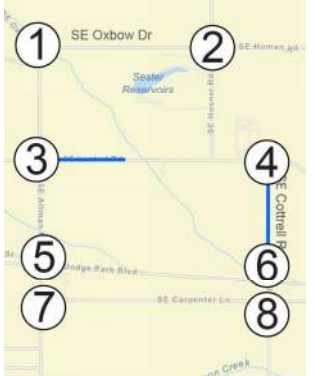
⑮ SE Orient Drive at SE Bluff Road



A SE Carpenter Lane at Site Access A



B SE Bluff Road at Site Access B



(X) = Study Intersection ↶ = Lane Configuration STOP = Stop Sign
 LT TH RT = Left / Through / Right Turn — = Lusted/Cottrell Closure
 AM [PM] = Peak Hour Traffic Volumes

**Appendix D: Traffic Volumes
 2025 Peak Construction
 Conditions Lusted Cottrell
 Closure Scenario**

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	251	0	0	36	0	0
Future Volume (Veh/h)	251	0	0	36	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	326	0	0	47	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			326		373	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		373	326
tC, single (s)			4.1		7.0	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.1	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1245		525	720
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	326	47	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1245	1700			
Volume to Capacity	0.19	0.00	0.39			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			16.5%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	265	0	1	1	129	4	0	0	10	8
Future Volume (vph)	4	2	265	0	1	1	129	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	344	0	1	1	168	5	0	0	13	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	352	2	173	23								
Volume Left (vph)	5	0	168	0								
Volume Right (vph)	344	1	0	10								
Hadj (s)	-0.13	-0.30	0.71	-0.16								
Departure Headway (s)	4.3	4.6	5.5	4.8								
Degree Utilization, x	0.42	0.00	0.26	0.03								
Capacity (veh/h)	797	727	623	677								
Control Delay (s)	10.5	7.6	10.4	8.0								
Approach Delay (s)	10.5	7.6	10.4	8.0								
Approach LOS	B	A	B	A								
Intersection Summary												
Delay			10.3									
Level of Service			B									
Intersection Capacity Utilization			40.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: SE Altman Road & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	17	3	90	41	0	61	0	346	0	0	0
Future Volume (Veh/h)	0	17	3	90	41	0	61	0	346	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	19	3	101	46	0	69	0	389	0	0	0
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			22			268	268	22	658	270	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			22			268	268	22	658	270	46
tC, single (s)	4.1			4.1			7.1	7.2	6.7	7.2	6.9	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.8	3.6	4.4	3.3
p0 queue free %	100			94			89	100	58	100	100	100
cM capacity (veh/h)	1575			1607			655	504	932	205	535	1029
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	147	458	0								
Volume Left	0	101	69	0								
Volume Right	3	0	389	0								
cSH	1575	1607	876	1700								
Volume to Capacity	0.00	0.06	0.52	0.34								
Queue Length 95th (ft)	0	5	78	0								
Control Delay (s)	0.0	5.2	13.5	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	5.2	13.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			11.1									
Intersection Capacity Utilization			45.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	16	523	5	29	132	8
Future Volume (Veh/h)	16	523	5	29	132	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	654	6	36	165	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			674		395	347
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			674		395	347
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			99		72	98
cM capacity (veh/h)			697		599	600
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	674	42	175			
Volume Left	0	6	165			
Volume Right	654	0	10			
cSH	1700	697	599			
Volume to Capacity	0.40	0.01	0.29			
Queue Length 95th (ft)	0	1	30			
Control Delay (s)	0.0	1.5	13.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.5	13.5			
Approach LOS			B			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			47.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	79	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	79	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	93	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	154	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	93	2	0								
Hadj (s)	-0.35	-0.33	0.46	0.14								
Departure Headway (s)	4.9	4.8	5.1	5.2								
Degree Utilization, x	0.15	0.21	0.48	0.10								
Capacity (veh/h)	668	681	678	636								
Control Delay (s)	8.7	9.1	12.7	8.8								
Approach Delay (s)	8.7	9.1	12.7	8.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.8									
Level of Service			B									
Intersection Capacity Utilization			39.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	233	93
Future Volume (Veh/h)	11	99	82	25	233	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	262	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	96	88			82	
cM capacity (veh/h)	308	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	366			
Volume Left	12	0	262			
Volume Right	111	28	0			
cSH	782	1700	1462			
Volume to Capacity	0.16	0.07	0.18			
Queue Length 95th (ft)	14	0	16			
Control Delay (s)	10.5	0.0	6.2			
Lane LOS	B		A			
Approach Delay (s)	10.5	0.0	6.2			
Approach LOS	B					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			37.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	354	0	2	0	0	0	24	31	0	0	39	155
Future Volume (vph)	354	0	2	0	0	0	24	31	0	0	39	155
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	393	0	2	0	0	0	27	34	0	0	43	172
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	395	0	61	215								
Volume Left (vph)	393	0	27	0								
Volume Right (vph)	2	0	0	172								
Hadj (s)	0.33	0.00	0.13	-0.48								
Departure Headway (s)	4.9	5.1	5.4	4.6								
Degree Utilization, x	0.54	0.00	0.09	0.27								
Capacity (veh/h)	706	647	612	730								
Control Delay (s)	13.5	8.1	8.9	9.3								
Approach Delay (s)	13.5	0.0	8.9	9.3								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			11.7									
Level of Service			B									
Intersection Capacity Utilization			44.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 6: Cottrell Rd & Dodge Park Blvd

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	16	0	14	0	114	1	14	526	0
Future Volume (Veh/h)	0	0	0	16	0	14	0	114	1	14	526	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	19	0	16	0	134	1	16	619	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	16			0			356	54	0	114	46	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			0			356	54	0	114	46	8
tC, single (s)	4.4			4.4			8.0	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			4.3	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			99			100	84	100	97	22	100
cM capacity (veh/h)	1421			1442			165	815	1091	586	792	1080
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	35	135	635								
Volume Left	0	19	0	16								
Volume Right	0	16	1	0								
cSH	1700	1442	816	785								
Volume to Capacity	0.00	0.01	0.17	0.81								
Queue Length 95th (ft)	0	1	15	217								
Control Delay (s)	0.0	4.1	10.3	25.9								
Lane LOS		A	B	D								
Approach Delay (s)	0.0	4.1	10.3	25.9								
Approach LOS			B	D								
Intersection Summary												
Average Delay			22.3									
Intersection Capacity Utilization			45.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

















04/10/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	24	31	0	2	39
Future Volume (Veh/h)	4	24	31	0	2	39
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	26	33	0	2	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	79	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	79	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	869	1046			1592	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	30	33	44			
Volume Left	4	0	2			
Volume Right	26	0	0			
cSH	1019	1700	1592			
Volume to Capacity	0.03	0.02	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	8.6	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	8.6	0.0	0.3			
Approach LOS	A					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization		13.7%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	3	1	0	93	1	19	1	495	20	16
Future Volume (Veh/h)	2	1	3	1	0	93	1	19	1	495	20	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	122	1	25	1	651	26	21
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1490	1368	38	1370	1378	26	49			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1490	1368	38	1370	1378	26	49			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	7.2	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	4.2	2.7			2.4		
p0 queue free %	93	98	100	98	100	85	100			55		
cM capacity (veh/h)	40	51	1037	49	80	836	1297			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	123	27	698								
Volume Left	3	1	1	651								
Volume Right	4	122	1	21								
cSH	82	740	1297	1451								
Volume to Capacity	0.10	0.17	0.00	0.45								
Queue Length 95th (ft)	8	15	0	60								
Control Delay (s)	53.6	10.8	0.3	9.1								
Lane LOS	F	B	A	A								
Approach Delay (s)	53.6	10.8	0.3	9.1								
Approach LOS	F	B										
Intersection Summary												
Average Delay			9.5									
Intersection Capacity Utilization			48.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/10/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	184	88	30	43	0
Future Volume (Veh/h)	0	184	88	30	43	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	214	102	35	50	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				334	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				334	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	100
cM capacity (veh/h)	1459				657	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	214	137	50			
Volume Left	0	0	50			
Volume Right	0	35	0			
cSH	1459	1700	657			
Volume to Capacity	0.00	0.08	0.08			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/10/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	198	111	15	24	0
Future Volume (Veh/h)	1	198	111	15	24	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	233	131	18	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				375	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				375	140
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				96	100
cM capacity (veh/h)	1445				630	702
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	234	149	28			
Volume Left	1	0	28			
Volume Right	0	18	0			
cSH	1445	1700	630			
Volume to Capacity	0.00	0.09	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	11.0			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			21.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis










11: 362nd Ave/Proctor Rd & Bluff Rd

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	57	19	1	132	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	57	19	1	132	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	62	21	1	143	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234			83			434	416	72	374	382	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			83			434	416	72	374	382	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			96	99	100	88	99	93
cM capacity (veh/h)	1333			1514			476	505	990	561	529	853
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	137	235	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1333	1514	490	662								
Volume to Capacity	0.04	0.00	0.05	0.20								
Queue Length 95th (ft)	3	0	4	19								
Control Delay (s)	3.3	0.0	12.8	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.3	0.0	12.8	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			36.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 16: Site Access A

04/10/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	490	0	7	87	0
Future Volume (Veh/h)	7	490	0	7	87	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	533	0	8	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			541		282	274
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			541		282	274
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	100
cM capacity (veh/h)			1028		708	764
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	541	8	95			
Volume Left	0	0	95			
Volume Right	533	0	0			
cSH	1700	1028	708			
Volume to Capacity	0.32	0.00	0.13			
Queue Length 95th (ft)	0	0	12			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			42.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/10/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Volume (veh/h)	86	126	120	86	0	0
Future Volume (Veh/h)	86	126	120	86	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	137	130	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223				500	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223				500	176
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				100	100
cM capacity (veh/h)	1346				494	867
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	230	223	0			
Volume Left	93	0	0			
Volume Right	0	93	0			
cSH	1346	1700	1700			
Volume to Capacity	0.07	0.13	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	3.5	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	3.5	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			29.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

12/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	16	5	12	32	1	4	1	12	1	4	3
Future Volume (Veh/h)	2	16	5	12	32	1	4	1	12	1	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	3	23	7	17	45	1	6	1	17	1	6	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			30			119	112	26	130	116	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			30			119	112	26	130	116	46
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	100	98	100	99	100
cM capacity (veh/h)	1575			1539			790	771	1029	825	768	1030
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	63	24	11								
Volume Left	3	17	6	1								
Volume Right	7	1	17	4								
cSH	1575	1539	945	852								
Volume to Capacity	0.00	0.01	0.03	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	0.7	2.0	8.9	9.3								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.7	2.0	8.9	9.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			15.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

12/23/2022












Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	19	10	19	29	7	15
Future Volume (Veh/h)	19	10	19	29	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	27	14	27	41	10	21
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			42		130	35
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			42		130	35
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			98		99	98
cM capacity (veh/h)			1579		853	985
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	68	31			
Volume Left	0	27	10			
Volume Right	14	0	21			
cSH	1700	1579	938			
Volume to Capacity	0.02	0.02	0.03			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	3.0	9.0			
Lane LOS			A			
Approach Delay (s)	0.0	3.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

04/14/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	201	0	0	56	0	0
Future Volume (Veh/h)	201	0	0	56	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	212	0	0	59	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		271	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		271	212
tC, single (s)			4.2		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1296		653	833
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	212	59	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1296	1700			
Volume to Capacity	0.12	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			13.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	196	3	2	0	216	8	3	0	10	12
Future Volume (vph)	17	1	196	3	2	0	216	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	215	3	2	0	237	9	3	0	11	13

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	235	5	249	24
Volume Left (vph)	19	3	237	0
Volume Right (vph)	215	0	3	13
Hadj (s)	-0.17	0.12	0.58	-0.07
Departure Headway (s)	4.5	5.0	5.1	4.7
Degree Utilization, x	0.29	0.01	0.35	0.03
Capacity (veh/h)	760	654	681	703
Control Delay (s)	9.3	8.1	10.8	7.9
Approach Delay (s)	9.3	8.1	10.8	7.9
Approach LOS	A	A	B	A

















Intersection Summary

Delay	10.0
Level of Service	A
Intersection Capacity Utilization	38.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	23	1	441	61	0	51	0	28	0	0	0
Future Volume (Veh/h)	0	23	1	441	61	0	51	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	29	1	551	76	0	64	0	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			30			1208	1208	30	1242	1208	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			30			1208	1208	30	1242	1208	76
tC, single (s)	4.1			4.2			7.1	7.0	6.2	7.1	7.2	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.4	3.3	3.5	4.7	3.3
p0 queue free %	100			64			45	100	97	100	100	100
cM capacity (veh/h)	1536			1533			116	97	1051	106	86	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	30	627	99	0								
Volume Left	0	551	64	0								
Volume Right	1	0	35	0								
cSH	1536	1533	170	1700								
Volume to Capacity	0.00	0.36	0.58	0.00								
Queue Length 95th (ft)	0	42	78	0								
Control Delay (s)	0.0	8.0	52.3	0.0								
Lane LOS		A	F	A								
Approach Delay (s)	0.0	8.0	52.3	0.0								
Approach LOS			F	A								
Intersection Summary												
Average Delay			13.5									
Intersection Capacity Utilization			45.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/14/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	36	154	0	30	519	1
Future Volume (Veh/h)	36	154	0	30	519	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	47	200	0	39	674	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			247		186	147
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			247		186	147
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		17	100
cM capacity (veh/h)			1331		808	695
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	247	39	675			
Volume Left	0	0	674			
Volume Right	200	0	1			
cSH	1700	1331	808			
Volume to Capacity	0.15	0.00	0.84			
Queue Length 95th (ft)	0	0	241			
Control Delay (s)	0.0	0.0	27.7			
Lane LOS			D			
Approach Delay (s)	0.0	0.0	27.7			
Approach LOS			D			
Intersection Summary						
Average Delay			19.4			
Intersection Capacity Utilization			46.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	75	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	75	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	83	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	122	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	83	6	1								
Hadj (s)	-0.36	-0.33	0.21	0.14								
Departure Headway (s)	4.5	4.4	4.7	4.8								
Degree Utilization, x	0.10	0.15	0.27	0.15								
Capacity (veh/h)	737	748	729	709								
Control Delay (s)	7.9	8.2	9.4	8.6								
Approach Delay (s)	7.9	8.2	9.4	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
Level of Service			A									
Intersection Capacity Utilization			34.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















04/14/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	276	149	27	111	212
Future Volume (Veh/h)	37	276	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	325	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	61			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	369	207	380			
Volume Left	44	0	131			
Volume Right	325	32	0			
cSH	722	1700	1352			
Volume to Capacity	0.51	0.12	0.10			
Queue Length 95th (ft)	73	0	8			
Control Delay (s)	15.1	0.0	3.3			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			55.9%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

















05/05/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	0	13	0	0	0	17	36	0	0	48	416
Future Volume (vph)	57	0	13	0	0	0	17	36	0	0	48	416
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	67	0	15	0	0	0	20	42	0	0	56	489
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	82	0	62	545								
Volume Left (vph)	67	0	20	0								
Volume Right (vph)	15	0	0	489								
Hadj (s)	0.11	0.00	0.06	0.31								
Departure Headway (s)	5.4	5.5	4.8	4.5								
Degree Utilization, x	0.12	0.00	0.08	0.68								
Capacity (veh/h)	597	585	713	783								
Control Delay (s)	9.2	8.5	8.2	16.7								
Approach Delay (s)	9.2	0.0	8.2	16.7								
Approach LOS	A	A	A	C								
Intersection Summary												
Delay			15.1									
Level of Service			C									
Intersection Capacity Utilization			38.8%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Cottrell Rd & Dodge Park Blvd

05/05/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	6	0	5	0	512	2	26	158	0
Future Volume (Veh/h)	0	0	0	6	0	5	0	512	2	26	158	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	0	0	7	0	6	0	595	2	30	184	0
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	6			0			110	20	0	316	17	4
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	6			0			110	20	0	316	17	4
tC, single (s)	4.1			4.1			7.3	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			100	31	100	86	79	100
cM capacity (veh/h)	1628			1636			695	858	1091	212	877	1084
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	13	597	214								
Volume Left	0	7	0	30								
Volume Right	0	6	2	0								
cSH	1700	1636	859	609								
Volume to Capacity	0.00	0.00	0.70	0.35								
Queue Length 95th (ft)	0	0	145	39								
Control Delay (s)	0.0	3.9	18.2	14.1								
Lane LOS		A	C	B								
Approach Delay (s)	0.0	3.9	18.2	14.1								
Approach LOS			C	B								
Intersection Summary												
Average Delay			16.9									
Intersection Capacity Utilization			40.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

05/05/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	12	42	2	13	46
Future Volume (Veh/h)	2	12	42	2	13	46
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	15	52	2	16	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	142	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	142	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	98			99	
cM capacity (veh/h)	846	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	17	54	73			
Volume Left	2	0	16			
Volume Right	15	2	0			
cSH	922	1700	1514			
Volume to Capacity	0.02	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	1.7			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	1.7			
Approach LOS	A					
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

05/05/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	4	1	0	496	2	17	2	89	42	7
Future Volume (Veh/h)	0	0	4	1	0	496	2	17	2	89	42	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	584	2	20	2	105	49	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	872	289	53	293	292	21	57			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	872	289	53	293	292	21	57			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			3.1		
p0 queue free %	100	100	100	100	100	42	100			91		
cM capacity (veh/h)	107	566	1020	613	564	1012	1560			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	585	24	162								
Volume Left	0	1	2	105								
Volume Right	5	584	2	8								
cSH	1020	1011	1560	1140								
Volume to Capacity	0.00	0.58	0.00	0.09								
Queue Length 95th (ft)	0	96	0	8								
Control Delay (s)	8.5	13.3	0.6	5.8								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.5	13.3	0.6	5.8								
Approach LOS	A	B										
Intersection Summary												
Average Delay			11.3									
Intersection Capacity Utilization			52.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

05/05/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	109	208	42	46	0
Future Volume (Veh/h)	1	109	208	42	46	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	245	49	54	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	294				400	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294				400	270
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				91	100
cM capacity (veh/h)	1279				598	774
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	129	294	54			
Volume Left	1	0	54			
Volume Right	0	49	0			
cSH	1279	1700	598			
Volume to Capacity	0.00	0.17	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.1	0.0	11.6			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			23.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/05/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	151	180	21	48	0
Future Volume (Veh/h)	2	151	180	21	48	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	172	205	24	55	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229				393	217
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229				393	217
tC, single (s)	4.6				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.7				3.5	3.3
p0 queue free %	100				91	100
cM capacity (veh/h)	1102				606	828
Direction, Lane #						
	EB 1	WB 1	SB 1			
Volume Total	174	229	55			
Volume Left	2	0	55			
Volume Right	0	24	0			
cSH	1102	1700	606			
Volume to Capacity	0.00	0.13	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.1	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			20.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd











05/05/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	203	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	236	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			280			357	354	258	352	372	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			280			357	354	258	352	372	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1294			594	571	786	602	559	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	287	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1294	597	694								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.4	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.4	10.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			26.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/05/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	4	87	0	7	490	0
Future Volume (Veh/h)	4	87	0	7	490	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	0	8	533	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		60	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		60	52
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			100		41	100
cM capacity (veh/h)			1494		909	1016
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	8	533			
Volume Left	0	0	533			
Volume Right	95	0	0			
cSH	1700	1494	909			
Volume to Capacity	0.06	0.00	0.59			
Queue Length 95th (ft)	0	0	98			
Control Delay (s)	0.0	0.0	14.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	14.4			
Approach LOS			B			
Intersection Summary						
Average Delay			12.0			
Intersection Capacity Utilization			39.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/05/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	162	92	0	86	86
Future Volume (Veh/h)	0	162	92	0	86	86
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	176	100	0	93	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100			276	100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100			276	100	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			87	90	
cM capacity (veh/h)	1493			714	956	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	176	100	186			
Volume Left	0	0	93			
Volume Right	0	0	93			
cSH	1493	1700	817			
Volume to Capacity	0.00	0.06	0.23			
Queue Length 95th (ft)	0	0	22			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			25.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

12/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	19	4	10	19	1	7	3	17	1	1	2
Future Volume (Veh/h)	3	19	4	10	19	1	7	3	17	1	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	26	6	14	26	1	10	4	24	1	1	3
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			32			96	92	29	118	94	28
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			32			96	92	29	118	94	28
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	99	98	100	100	100
cM capacity (veh/h)	1600			1593			880	793	1034	833	790	1053
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	36	41	38	5								
Volume Left	4	14	10	1								
Volume Right	6	1	24	3								
cSH	1600	1593	959	941								
Volume to Capacity	0.00	0.01	0.04	0.01								
Queue Length 95th (ft)	0	1	3	0								
Control Delay (s)	0.8	2.5	8.9	8.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.8	2.5	8.9	8.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			13.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

12/23/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	25	6	16	22	8	13
Future Volume (Veh/h)	25	6	16	22	8	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	34	8	22	30	11	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			42		112	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			42		112	38
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1580		877	1040
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	42	52	29			
Volume Left	0	22	11			
Volume Right	8	0	18			
cSH	1700	1580	971			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.2	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023

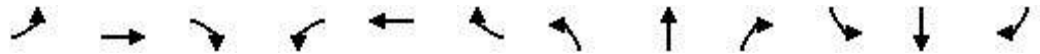


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	41	210	48	46	129	32
Future Volume (Veh/h)	41	210	48	46	129	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	53	273	62	60	168	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			326			190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326			190
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			95			95
cM capacity (veh/h)			1245			857
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	326	122	210			
Volume Left	0	62	168			
Volume Right	273	0	42			
cSH	1700	1245	544			
Volume to Capacity	0.19	0.05	0.39			
Queue Length 95th (ft)	0	4	45			
Control Delay (s)	0.0	4.3	15.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	4.3	15.7			
Approach LOS			C			
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			39.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	83	0	1	1	100	4	0	0	10	8
Future Volume (vph)	4	2	83	0	1	1	100	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	108	0	1	1	130	5	0	0	13	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	116	2	135	23								
Volume Left (vph)	5	0	130	0								
Volume Right (vph)	108	1	0	10								
Hadj (s)	-0.12	-0.30	0.72	-0.16								
Departure Headway (s)	4.2	4.1	4.9	4.2								
Degree Utilization, x	0.13	0.00	0.18	0.03								
Capacity (veh/h)	828	829	712	829								
Control Delay (s)	7.8	7.1	9.0	7.3								
Approach Delay (s)	7.8	7.1	9.0	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.4									
Level of Service			A									
Intersection Capacity Utilization			28.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	0	0	0	6	146	0	0	215	31
Future Volume (Veh/h)	10	0	10	0	0	0	6	146	0	0	215	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	11	0	11	0	0	0	7	164	0	0	242	35
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			11			184	28	6	110	33	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			11			184	28	6	110	33	0
tC, single (s)	4.1			4.1			7.1	7.2	6.7	7.2	6.9	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.8	3.6	4.4	3.3
p0 queue free %	99			100			99	78	100	100	69	97
cM capacity (veh/h)	1636			1621			572	744	951	705	779	1091
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	0	171	277								
Volume Left	11	0	7	0								
Volume Right	11	0	0	35								
cSH	1636	1700	735	808								
Volume to Capacity	0.01	0.00	0.23	0.34								
Queue Length 95th (ft)	1	0	22	38								
Control Delay (s)	3.6	0.0	11.4	11.8								
Lane LOS	A		B	B								
Approach Delay (s)	3.6	0.0	11.4	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			11.2									
Intersection Capacity Utilization			23.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

05/04/2023



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	29	0	0	34	0	0
Future Volume (Veh/h)	29	0	0	34	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	36	0	0	42	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	36			78	36	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	36			78	36	
tC, single (s)	4.7			6.4	6.7	
tC, 2 stage (s)						
tF (s)	2.7			3.5	3.8	
p0 queue free %	100			100	100	
cM capacity (veh/h)	1271			917	915	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	36	42	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1271	1700			
Volume to Capacity	0.02	0.00	0.25			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	6.7%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	28	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	89	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	28	2	0								
Hadj (s)	-0.35	-0.13	0.46	0.14								
Departure Headway (s)	4.7	5.0	5.0	5.0								
Degree Utilization, x	0.15	0.12	0.46	0.10								
Capacity (veh/h)	690	655	704	672								
Control Delay (s)	8.5	8.7	12.2	8.5								
Approach Delay (s)	8.5	8.7	12.2	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			35.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	233	93
Future Volume (Veh/h)	11	99	82	25	233	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	262	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	96	88			82	
cM capacity (veh/h)	308	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	366			
Volume Left	12	0	262			
Volume Right	111	28	0			
cSH	782	1700	1462			
Volume to Capacity	0.16	0.07	0.18			
Queue Length 95th (ft)	14	0	16			
Control Delay (s)	10.5	0.0	6.2			
Lane LOS	B		A			
Approach Delay (s)	10.5	0.0	6.2			
Approach LOS	B					
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			37.9%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	341	2	0	29	113	11	28	3	197	23	3
Future Volume (vph)	16	341	2	0	29	113	11	28	3	197	23	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	379	2	0	32	126	12	31	3	219	26	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	399	158	46	248								
Volume Left (vph)	18	0	12	219								
Volume Right (vph)	2	126	3	3								
Hadj (s)	0.04	0.82	0.06	0.92								
Departure Headway (s)	5.2	6.3	6.1	6.5								
Degree Utilization, x	0.58	0.28	0.08	0.45								
Capacity (veh/h)	660	530	501	520								
Control Delay (s)	15.2	11.8	9.6	14.6								
Approach Delay (s)	15.2	11.8	9.6	14.6								
Approach LOS	C	B	A	B								
Intersection Summary												
Delay			14.1									
Level of Service			B									
Intersection Capacity Utilization			56.4%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	30	497	11	30	0	114	0	1	0	0	0
Future Volume (Veh/h)	0	30	497	11	30	0	114	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	35	585	13	35	0	134	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	35			620			388	388	328	390	681	35
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35			620			388	388	328	390	681	35
tC, single (s)	4.4			4.4			8.0	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			4.3	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			98			69	100	100	100	100	100
cM capacity (veh/h)	1398			827			439	529	718	422	340	1044
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	620	48	135	0								
Volume Left	0	13	134	0								
Volume Right	585	0	1	0								
cSH	1398	827	440	1700								
Volume to Capacity	0.00	0.02	0.31	0.00								
Queue Length 95th (ft)	0	1	32	0								
Control Delay (s)	0.0	2.7	16.8	0.0								
Lane LOS		A	C	A								
Approach Delay (s)	0.0	2.7	16.8	0.0								
Approach LOS			C	A								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			45.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

04/20/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	11	31	0	2	23
Future Volume (Veh/h)	4	11	31	0	2	23
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	12	33	0	2	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	889	1046			1592	
Direction, Lane #						
	WB 1	NB 1	SB 1			
Volume Total	16	33	27			
Volume Left	4	0	2			
Volume Right	12	0	0			
cSH	1002	1700	1592			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.7	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

04/20/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	1	3	1	0	93	1	19	1	495	12	3
Future Volume (Veh/h)	2	1	3	1	0	93	1	19	1	495	12	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	122	1	25	1	651	16	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1472	1350	20	1352	1352	26	22			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1472	1350	20	1352	1352	26	22			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	7.2	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	4.2	2.7			2.4		
p0 queue free %	93	98	100	98	100	85	100			55		
cM capacity (veh/h)	42	53	1062	51	83	836	1329			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	123	27	671								
Volume Left	3	1	1	651								
Volume Right	4	122	1	4								
cSH	85	743	1329	1451								
Volume to Capacity	0.09	0.17	0.00	0.45								
Queue Length 95th (ft)	8	15	0	60								
Control Delay (s)	51.9	10.8	0.3	9.3								
Lane LOS	F	B	A	A								
Approach Delay (s)	51.9	10.8	0.3	9.3								
Approach LOS	F	B										
Intersection Summary												
Average Delay			9.7									
Intersection Capacity Utilization			47.4%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/20/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	0	184	88	30	27	0
Future Volume (Veh/h)	0	184	88	30	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	214	102	35	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137			334	120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137			334	120	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			95	100	
cM capacity (veh/h)	1459			657	938	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	214	137	31			
Volume Left	0	0	31			
Volume Right	0	35	0			
cSH	1459	1700	657			
Volume to Capacity	0.00	0.08	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/20/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	182	111	15	16	0
Future Volume (Veh/h)	1	182	111	15	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	214	131	18	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149			356	140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149			356	140	
tC, single (s)	4.1			6.4	7.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	4.2	
p0 queue free %	100			97	100	
cM capacity (veh/h)	1445			646	702	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	215	149	19			
Volume Left	1	0	19			
Volume Right	0	18	0			
cSH	1445	1700	646			
Volume to Capacity	0.00	0.09	0.03			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.0	0.0	10.7			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	10.7			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			20.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd










04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	45	21	1	143	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234			66			416	400	56	357	364	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			66			416	400	56	357	364	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			96	99	100	88	99	93
cM capacity (veh/h)	1333			1536			489	516	1011	576	540	853
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	235	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1333	1536	503	673								
Volume to Capacity	0.04	0.00	0.05	0.20								
Queue Length 95th (ft)	3	0	4	18								
Control Delay (s)	3.7	0.0	12.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.7	0.0	12.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

04/20/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	7	490	0	7	87	0
Future Volume (Veh/h)	7	490	0	7	87	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	533	0	8	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			541		282	274
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			541		282	274
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		87	100
cM capacity (veh/h)			1028		708	764
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	541	8	95			
Volume Left	0	0	95			
Volume Right	533	0	0			
cSH	1700	1028	708			
Volume to Capacity	0.32	0.00	0.13			
Queue Length 95th (ft)	0	0	12			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			42.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/20/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	110	120	86	0	0
Future Volume (Veh/h)	86	110	120	86	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	93	120	130	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223			482	176	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223			482	176	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	93			100	100	
cM capacity (veh/h)	1346			505	867	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	213	223	0			
Volume Left	93	0	0			
Volume Right	0	93	0			
cSH	1346	1700	1700			
Volume to Capacity	0.07	0.13	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	3.8	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	3.8	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			28.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

12/23/2022

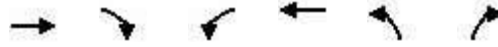


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	2	16	18	12	32	1	5	1	28	1	4	3
Future Volume (Veh/h)	2	16	18	12	32	1	5	1	28	1	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	3	23	25	17	45	1	7	1	39	1	6	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			48			128	122	36	160	134	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			48			128	122	36	160	134	46
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	100	96	100	99	100
cM capacity (veh/h)	1575			1515			779	762	1018	770	751	1030
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	51	63	47	11								
Volume Left	3	17	7	1								
Volume Right	25	1	39	4								
cSH	1575	1515	967	835								
Volume to Capacity	0.00	0.01	0.05	0.01								
Queue Length 95th (ft)	0	1	4	1								
Control Delay (s)	0.4	2.1	8.9	9.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	2.1	8.9	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			16.3%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

12/23/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	14	19	29	7	15
Future Volume (Veh/h)	31	14	19	29	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	44	20	27	41	10	21
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			65		150	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			65		150	55
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			98		99	98
cM capacity (veh/h)			1549		831	960
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	64	68	31			
Volume Left	0	27	10			
Volume Right	20	0	21			
cSH	1700	1549	914			
Volume to Capacity	0.04	0.02	0.03			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	3.0	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

















04/10/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	51	150	83	69	207	4
Future Volume (Veh/h)	51	150	83	69	207	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	54	158	87	73	218	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		380	133
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		380	133
tC, single (s)			4.2		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.3
p0 queue free %			93		58	100
cM capacity (veh/h)			1296		524	922
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	212	160	222			
Volume Left	0	87	218			
Volume Right	158	0	4			
cSH	1700	1296	529			
Volume to Capacity	0.12	0.07	0.42			
Queue Length 95th (ft)	0	5	52			
Control Delay (s)	0.0	4.6	16.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	4.6	16.7			
Approach LOS			C			
Intersection Summary						
Average Delay			7.5			
Intersection Capacity Utilization			41.8%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	82	3	2	0	138	8	3	0	10	12
Future Volume (vph)	17	1	82	3	2	0	138	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	90	3	2	0	152	9	3	0	11	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	110	5	164	24								
Volume Left (vph)	19	3	152	0								
Volume Right (vph)	90	0	3	13								
Hadj (s)	-0.11	0.12	0.56	-0.07								
Departure Headway (s)	4.3	4.6	4.8	4.3								
Degree Utilization, x	0.13	0.01	0.22	0.03								
Capacity (veh/h)	808	731	735	808								
Control Delay (s)	7.9	7.6	9.1	7.4								
Approach Delay (s)	7.9	7.6	9.1	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			27.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: SE Altman Road & SE Lusted Road

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	33	0	0	0	3	229	0	0	175	45
Future Volume (Veh/h)	16	0	33	0	0	0	3	229	0	0	175	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	0	41	0	0	0	4	286	0	0	219	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			41			226	60	20	204	81	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			41			226	60	20	204	81	0
tC, single (s)	4.1			4.2			7.1	7.0	6.2	7.1	7.2	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.4	3.3	3.5	4.7	3.3
p0 queue free %	99			100			99	62	100	100	68	95
cM capacity (veh/h)	1636			1518			518	745	1063	527	681	1091
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	61	0	290	275								
Volume Left	20	0	4	0								
Volume Right	41	0	0	56								
cSH	1636	1700	741	737								
Volume to Capacity	0.01	0.00	0.39	0.37								
Queue Length 95th (ft)	1	0	47	43								
Control Delay (s)	2.4	0.0	13.0	12.8								
Lane LOS	A		B	B								
Approach Delay (s)	2.4	0.0	13.0	12.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			24.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/10/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	59	0	0	30	0	0
Future Volume (Veh/h)	59	0	0	30	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	77	0	0	39	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			77		116	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		116	77
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		100	100
cM capacity (veh/h)			1535		885	768
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	39	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1535	1700			
Volume to Capacity	0.05	0.00	0.84			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/10/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	30	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	69	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	30	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.4	4.6	4.6	4.6								
Degree Utilization, x	0.10	0.09	0.26	0.14								
Capacity (veh/h)	754	724	755	737								
Control Delay (s)	7.8	8.0	9.2	8.4								
Approach Delay (s)	7.8	8.0	9.2	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			31.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















04/10/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	276	149	27	111	212
Future Volume (Veh/h)	37	276	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	325	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	61			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	369	207	380			
Volume Left	44	0	131			
Volume Right	325	32	0			
cSH	722	1700	1352			
Volume to Capacity	0.51	0.12	0.10			
Queue Length 95th (ft)	73	0	8			
Control Delay (s)	15.1	0.0	3.3			
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			7.1			
Intersection Capacity Utilization			55.9%	ICU Level of Service	B	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	51	13	1	346	191	11	34	2	121	39	13
Future Volume (vph)	13	51	13	1	346	191	11	34	2	121	39	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	15	60	15	1	407	225	13	40	2	142	46	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	90	633	55	203								
Volume Left (vph)	15	1	13	142								
Volume Right (vph)	15	225	2	15								
Hadj (s)	0.00	0.14	0.03	1.14								
Departure Headway (s)	5.8	5.1	6.4	7.1								
Degree Utilization, x	0.15	0.90	0.10	0.40								
Capacity (veh/h)	581	692	527	486								
Control Delay (s)	9.8	36.9	10.1	14.8								
Approach Delay (s)	9.8	36.9	10.1	14.8								
Approach LOS	A	E	B	B								
Intersection Summary												
Delay			28.4									
Level of Service			D									
Intersection Capacity Utilization			52.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	47	92	20	15	0	512	0	2	0	0	0
Future Volume (Veh/h)	0	47	92	20	15	0	512	0	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	55	107	23	17	0	595	0	2	0	0	0
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			162			172	172	108	174	225	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	17			162			172	172	108	174	225	18
tC, single (s)	4.1			4.1			7.3	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			98			20	100	100	100	100	100
cM capacity (veh/h)	1613			1429			746	699	951	606	667	1065
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	162	40	597	0								
Volume Left	0	23	595	0								
Volume Right	107	0	2	0								
cSH	1613	1429	747	1700								
Volume to Capacity	0.00	0.02	0.80	0.29								
Queue Length 95th (ft)	0	1	207	0								
Control Delay (s)	0.0	4.4	26.1	0.0								
Lane LOS		A	D	A								
Approach Delay (s)	0.0	4.4	26.1	0.0								
Approach LOS			D	A								
Intersection Summary												
Average Delay			19.7									
Intersection Capacity Utilization			56.6%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	42	2	13	37
Future Volume (Veh/h)	2	6	42	2	13	37
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	52	2	16	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	859	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	54	62			
Volume Left	2	0	16			
Volume Right	7	2	0			
cSH	916	1700	1514			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	4	1	0	496	2	17	2	89	21	1
Future Volume (Veh/h)	0	0	4	1	0	496	2	17	2	89	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	584	2	20	2	105	25	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	844	262	26	266	261	21	26			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844	262	26	266	261	21	26			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			3.1		
p0 queue free %	100	100	100	100	100	42	100			91		
cM capacity (veh/h)	112	586	1056	639	587	1012	1601			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	585	24	131								
Volume Left	0	1	2	105								
Volume Right	5	584	2	1								
cSH	1056	1011	1601	1140								
Volume to Capacity	0.00	0.58	0.00	0.09								
Queue Length 95th (ft)	0	96	0	8								
Control Delay (s)	8.4	13.3	0.6	7.0								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	13.3	0.6	7.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay				11.8								
Intersection Capacity Utilization			51.1%			ICU Level of Service				A		
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	1	109	208	42	37	0
Future Volume (Veh/h)	1	109	208	42	37	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	245	49	44	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	294				400	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	294				400	270
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	1279				598	774
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	129	294	44			
Volume Left	1	0	44			
Volume Right	0	49	0			
cSH	1279	1700	598			
Volume to Capacity	0.00	0.17	0.07			
Queue Length 95th (ft)	0	0	6			
Control Delay (s)	0.1	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	142	180	21	27	0
Future Volume (Veh/h)	2	142	180	21	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	161	205	24	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229			382	217	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229			382	217	
tC, single (s)	4.6			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.7			3.5	3.3	
p0 queue free %	100			95	100	
cM capacity (veh/h)	1102			615	828	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	163	229	31			
Volume Left	2	0	31			
Volume Right	0	24	0			
cSH	1102	1700	615			
Volume to Capacity	0.00	0.13	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.1	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			20.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	226	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			270			347	344	248	342	362	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			270			347	344	248	342	362	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1305			603	579	796	611	566	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	277	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1305	606	702								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			26.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	4	87	0	7	490	0
Future Volume (Veh/h)	4	87	0	7	490	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	0	8	533	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		60	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		60	52
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			100		41	100
cM capacity (veh/h)			1494		909	1016
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	8	533			
Volume Left	0	0	533			
Volume Right	95	0	0			
cSH	1700	1494	909			
Volume to Capacity	0.06	0.00	0.59			
Queue Length 95th (ft)	0	0	98			
Control Delay (s)	0.0	0.0	14.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	14.4			
Approach LOS			B			
Intersection Summary						
Average Delay			12.0			
Intersection Capacity Utilization			39.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	153	92	0	86	86
Future Volume (Veh/h)	0	153	92	0	86	86
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	166	100	0	93	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100				266	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				266	100
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	90
cM capacity (veh/h)	1493				723	956
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	100	186			
Volume Left	0	0	93			
Volume Right	0	0	93			
cSH	1493	1700	823			
Volume to Capacity	0.00	0.06	0.23			
Queue Length 95th (ft)	0	0	22			
Control Delay (s)	0.0	0.0	10.6			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.6			
Approach LOS			B			
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			24.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

12/23/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	3	19	27	10	19	1	8	3	37	1	1	2
Future Volume (Veh/h)	3	19	27	10	19	1	8	3	37	1	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	26	38	14	26	1	11	4	51	1	1	3
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			64			112	108	45	160	126	28
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			64			112	108	45	160	126	28
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	99	95	100	100	100
cM capacity (veh/h)	1600			1551			859	777	1014	759	759	1053
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	41	66	5								
Volume Left	4	14	11	1								
Volume Right	38	1	51	3								
cSH	1600	1551	967	912								
Volume to Capacity	0.00	0.01	0.07	0.01								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.4	2.6	9.0	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	2.6	9.0	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			15.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

12/23/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	42	9	16	22	8	13
Future Volume (Veh/h)	42	9	16	22	8	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	57	12	22	30	11	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			69		137	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			69		137	63
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1545		849	1007
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	69	52	29			
Volume Left	0	22	11			
Volume Right	12	0	18			
cSH	1700	1545	941			
Volume to Capacity	0.04	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.2	8.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	8.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			

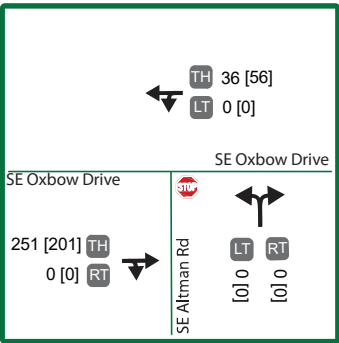
Bull Run Filtration Program - Pipelines Project

Proposed Lane/Road Closures During Construction

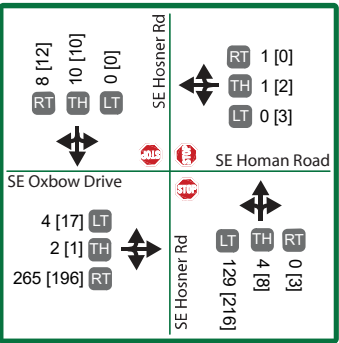
5/25/2023

<i>Location</i>	<i>Closure Type</i>	<i>Approx. Start, Month-Year</i>	<i>Approx. End, Month-Year</i>	<i>Approx. Duration, Months</i>
Dodge Park Blvd. (Altman Rd. to 1,500 feet east of Cottrell Rd.)	Single lane closure during working hours / shifted 2 lanes non-working hours	September-24	November-25	14
Altman Rd. (Lusted Rd. to Oxbow Dr.)	Full closure - local / emergency access only	September-24	November-25	14
Lusted Rd. Upper, C2 & C4 (Altman Rd. to 2,000 feet east of Altman Rd.)	Full closure - local / emergency access only	November-25	September-26	10
Cottrell Rd. (Dodge Park Blvd. to Lusted Rd.)	Single lane closure during working hours	November-25	July-26	8
Lusted Rd. Lower, Multnomah Connection C2 & C4 (just NW of county line)	Full closure - local / emergency access only	October-25	March-26	5
Lusted Rd. Lower, Multnomah Connection C3 (just NW of county line)	Full closure - local / emergency access only	October-27	January-28	2
Lusted Rd. Upper, C3 (just west of Altman Rd. to 2,000 feet east of Altman Rd.)	Full closure - local / emergency access only	October-27	May-28	7

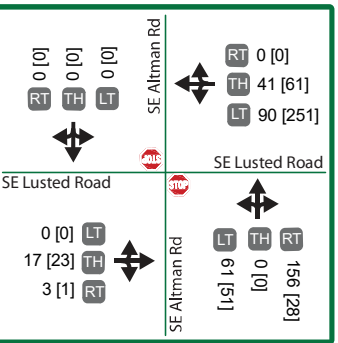
Appendix E: Mitigations HCM Results
Mitigations Volumes Figures



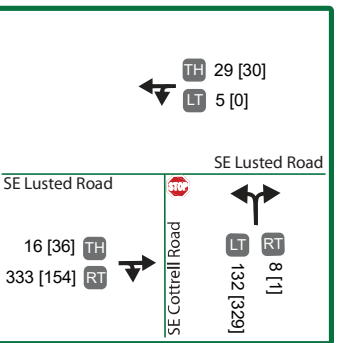
① SE Altman Road at SE Oxbow Drive



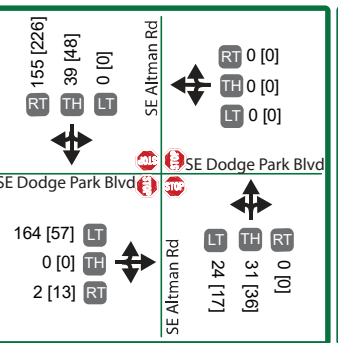
② SE Hosner Road at SE Oxbow Dr / SE Homan Rd



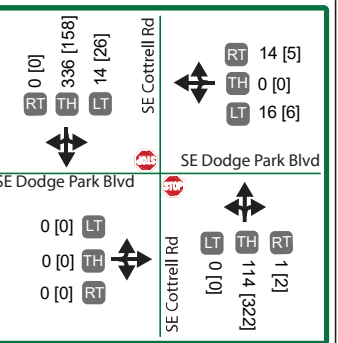
③ SE Altman Road at SE Lusted Road



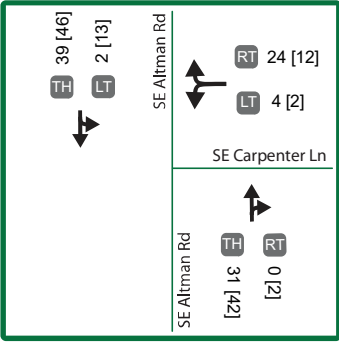
④ SE Cottrell Road at SE Lusted Road



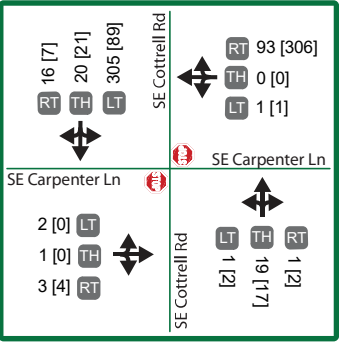
⑤ SE Altman Road at SE Dodge Park Boulevard



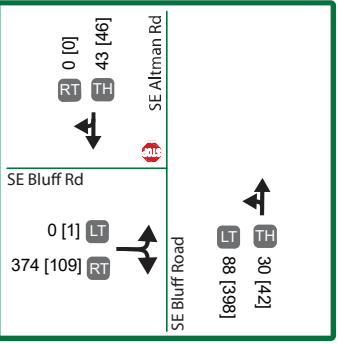
⑥ SE Cottrell Road at SE Dodge Park Boulevard



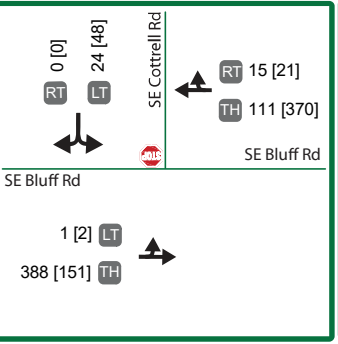
⑦ SE Altman Road at SE Carpenter Lane



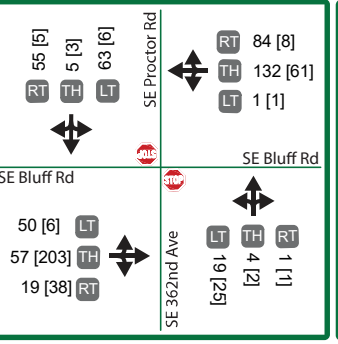
⑧ SE Cottrell Road at SE Carpenter Lane



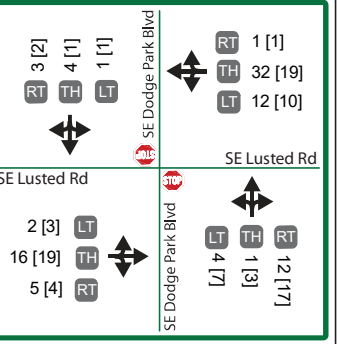
⑨ SE Altman Road at SE Bluff Road



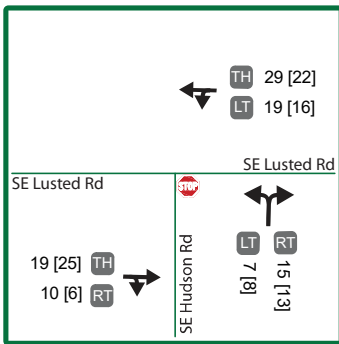
⑩ SE Cottrell Road at SE Bluff Road



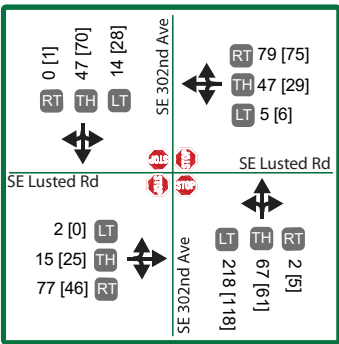
⑪ SE Bluff Road at SE Proctor Road



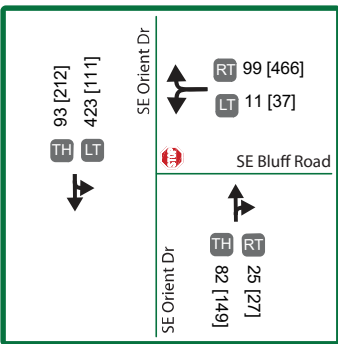
⑫ SE Dodge Park Boulevard at SE Lusted Road



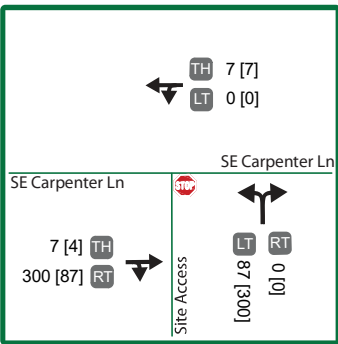
⑬ SE Lusted Road at SE Hudson Road



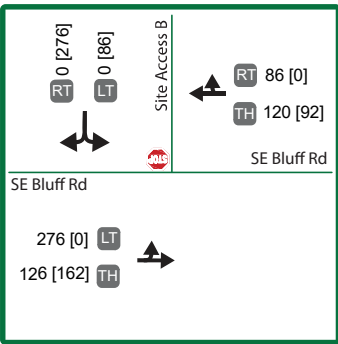
⑭ SE Lusted Road at SE 302nd Avenue



⑮ SE Orient Drive at SE Bluff Road



A SE Carpenter Lane at Site Access A



B SE Bluff Road at Site Access B

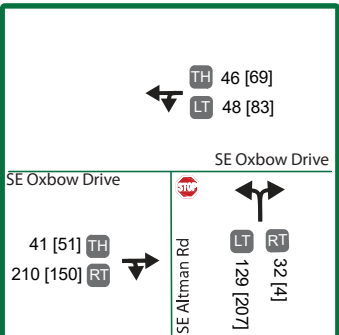


⊗ = Study Intersection ↶ = Lane Configuration ⛔ = Stop Sign

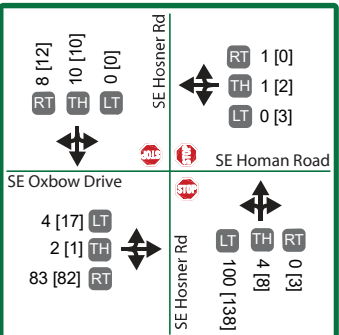
LT TH RT = Left / Through / Right Turn

AM [PM] = Peak Hour Traffic Volumes

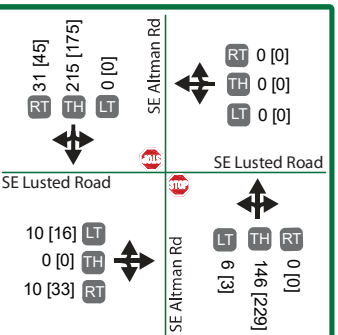
Appendix E: Traffic Volumes 2025 Peak Construction Dodge/Altman Closure Mitigation Analysis



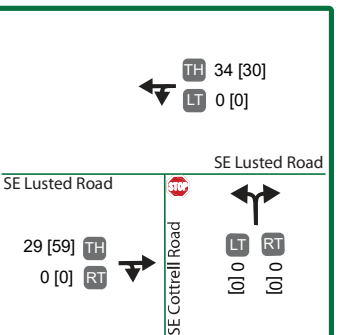
① SE Altman Road at SE Oxbow Drive



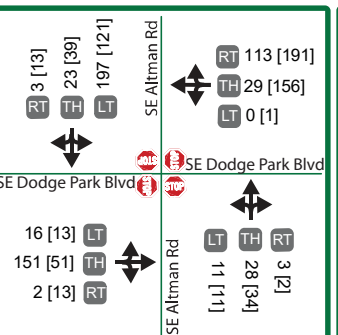
② SE Hosner Road at SE Oxbow Dr / SE Homan Rd



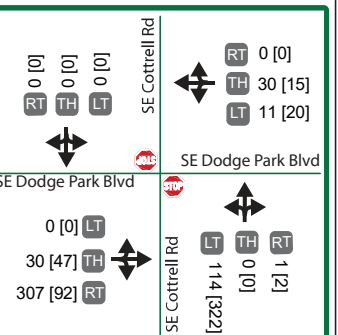
③ SE Altman Road at SE Lusted Road



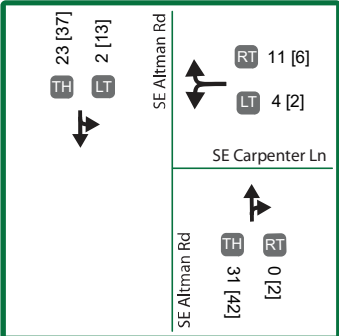
④ SE Cottrell Road at SE Lusted Road



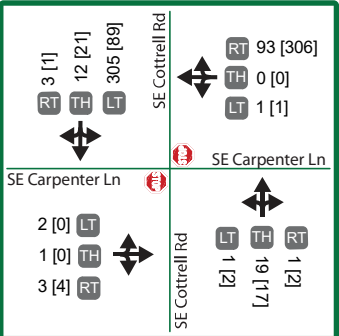
⑤ SE Altman Road at SE Dodge Park Boulevard



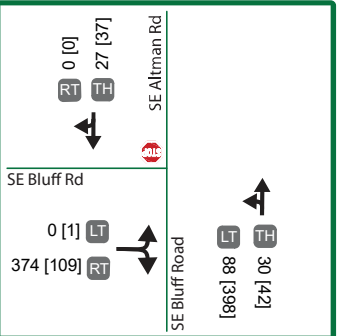
⑥ SE Cottrell Road at SE Dodge Park Boulevard



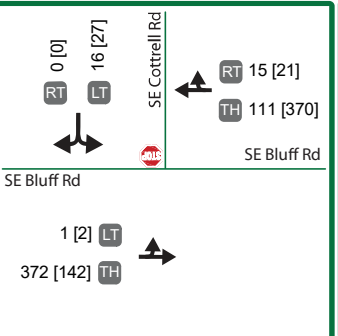
⑦ SE Altman Road at SE Carpenter Lane



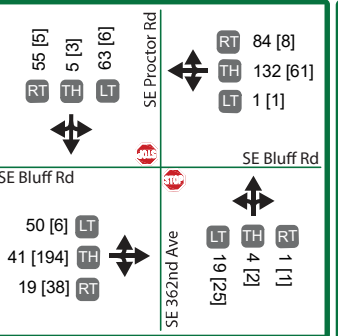
⑧ SE Cottrell Road at SE Carpenter Lane



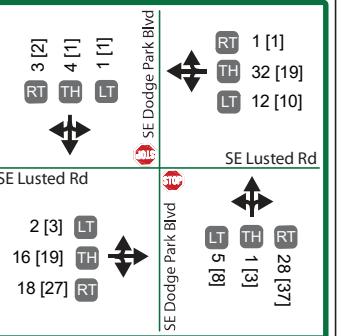
⑨ SE Altman Road at SE Bluff Road



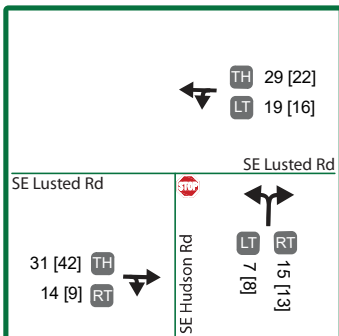
⑩ SE Cottrell Road at SE Bluff Road



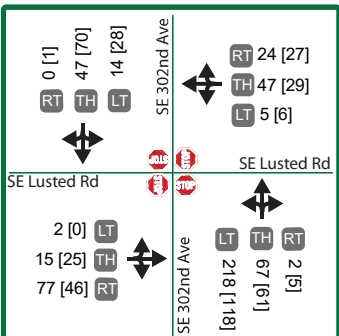
⑪ SE Bluff Road at SE Proctor Road



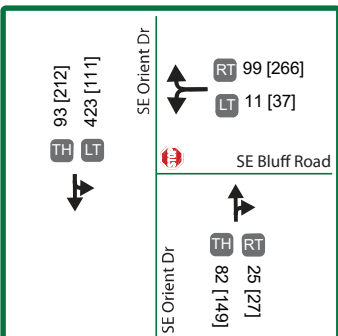
⑫ SE Dodge Park Boulevard at SE Lusted Road



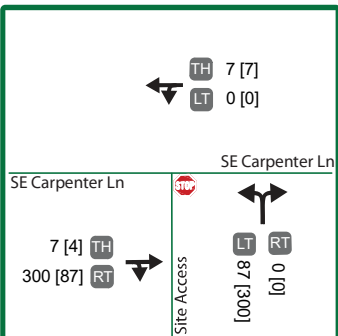
⑬ SE Lusted Road at SE Hudson Road



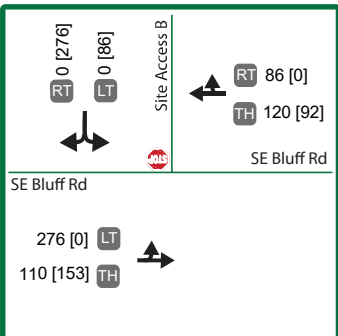
⑭ SE Lusted Road at SE 302nd Avenue



⑮ SE Orient Drive at SE Bluff Road



A SE Carpenter Lane at Site Access A



B SE Bluff Road at Site Access B



= Study Intersection
 = Lane Configuration
 = Stop Sign
 = Left / Through / Right Turn
 AM [PM] = Peak Hour Traffic Volumes

Appendix E: Traffic Volumes 2025 Peak Construction Lusted/Cottrell Closure Mitigation Analysis

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

05/04/2023

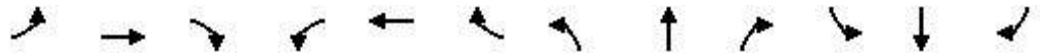


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	1	
Traffic Volume (veh/h)	251	0	0	36	0	0
Future Volume (Veh/h)	251	0	0	36	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	326	0	0	47	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			326		373	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		373	326
tC, single (s)			4.1		7.0	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.1	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1245		525	720
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	326	47	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1245	1700			
Volume to Capacity	0.19	0.00	0.09			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			16.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	265	0	1	1	129	4	0	0	10	8
Future Volume (vph)	4	2	265	0	1	1	129	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	344	0	1	1	168	5	0	0	13	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	352	2	173	23
Volume Left (vph)	5	0	168	0
Volume Right (vph)	344	1	0	10
Hadj (s)	-0.13	-0.30	0.71	-0.16
Departure Headway (s)	4.3	4.6	5.5	4.8
Degree Utilization, x	0.42	0.00	0.26	0.03
Capacity (veh/h)	797	727	623	677
Control Delay (s)	10.5	7.6	10.4	8.0
Approach Delay (s)	10.5	7.6	10.4	8.0
Approach LOS	B	A	B	A

Intersection Summary			
Delay		10.3	
Level of Service		B	
Intersection Capacity Utilization	40.9%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 3: SE Altman Road & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	17	3	90	41	0	61	0	156	0	0	0
Future Volume (Veh/h)	0	17	3	90	41	0	61	0	156	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	19	3	101	46	0	69	0	175	0	0	0
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			22			268	268	22	444	270	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			22			268	268	22	444	270	46
tC, single (s)	4.1			4.1			7.1	7.2	6.7	7.2	6.9	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.8	3.6	4.4	3.3
p0 queue free %	100			94			89	100	81	100	100	100
cM capacity (veh/h)	1575			1607			655	504	932	397	535	1029
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	147	244	0								
Volume Left	0	101	69	0								
Volume Right	3	0	175	0								
cSH	1575	1607	832	1700								
Volume to Capacity	0.00	0.06	0.29	0.18								
Queue Length 95th (ft)	0	5	31	0								
Control Delay (s)	0.0	5.2	11.1	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	5.2	11.1	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			33.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

05/04/2023



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	16	333	5	29	132	8
Future Volume (Veh/h)	16	333	5	29	132	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	416	6	36	165	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			436		276	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		276	228
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			99		77	99
cM capacity (veh/h)			874		702	706
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	436	42	175			
Volume Left	0	6	165			
Volume Right	416	0	10			
cSH	1700	874	703			
Volume to Capacity	0.26	0.01	0.25			
Queue Length 95th (ft)	0	1	25			
Control Delay (s)	0.0	1.4	11.8			
Lane LOS		A	B			
Approach Delay (s)	0.0	1.4	11.8			
Approach LOS			B			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			35.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	79	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	79	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	93	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	154	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	93	2	0								
Hadj (s)	-0.35	-0.33	0.46	0.14								
Departure Headway (s)	4.9	4.8	5.1	5.2								
Degree Utilization, x	0.15	0.21	0.48	0.10								
Capacity (veh/h)	668	681	678	636								
Control Delay (s)	8.7	9.1	12.7	8.8								
Approach Delay (s)	8.7	9.1	12.7	8.8								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.8									
Level of Service			B									
Intersection Capacity Utilization			39.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	423	93
Future Volume (Veh/h)	11	99	82	25	423	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	475	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1160	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1160	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	91	88			68	
cM capacity (veh/h)	141	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	579			
Volume Left	12	0	475			
Volume Right	111	28	0			
cSH	604	1700	1462			
Volume to Capacity	0.20	0.07	0.32			
Queue Length 95th (ft)	19	0	36			
Control Delay (s)	12.5	0.0	7.6			
Lane LOS	B		A			
Approach Delay (s)	12.5	0.0	7.6			
Approach LOS	B					
Intersection Summary						
Average Delay			7.2			
Intersection Capacity Utilization			48.4%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	164	0	2	0	0	0	24	31	0	0	39	155
Future Volume (vph)	164	0	2	0	0	0	24	31	0	0	39	155
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	182	0	2	0	0	0	27	34	0	0	43	172
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	184	0	61	215								
Volume Left (vph)	182	0	27	0								
Volume Right (vph)	2	0	0	172								
Hadj (s)	0.33	0.00	0.13	-0.48								
Departure Headway (s)	4.8	4.7	4.7	4.0								
Degree Utilization, x	0.25	0.00	0.08	0.24								
Capacity (veh/h)	705	707	718	858								
Control Delay (s)	9.4	7.7	8.1	8.2								
Approach Delay (s)	9.4	0.0	8.1	8.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
Level of Service			A									
Intersection Capacity Utilization			34.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 6: Cottrell Rd & Dodge Park Blvd

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	16	0	14	0	114	1	14	336	0
Future Volume (Veh/h)	0	0	0	16	0	14	0	114	1	14	336	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	19	0	16	0	134	1	16	395	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	16			0			244	54	0	114	46	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	16			0			244	54	0	114	46	8
tC, single (s)	4.4			4.4			8.0	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			4.3	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			99			100	84	100	97	50	100
cM capacity (veh/h)	1421			1442			340	815	1091	586	792	1080
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	35	135	411								
Volume Left	0	19	0	16								
Volume Right	0	16	1	0								
cSH	1700	1442	816	782								
Volume to Capacity	0.00	0.01	0.17	0.53								
Queue Length 95th (ft)	0	1	15	78								
Control Delay (s)	0.0	4.1	10.3	14.6								
Lane LOS		A	B	B								
Approach Delay (s)	0.0	4.1	10.3	14.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			13.0									
Intersection Capacity Utilization			35.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: SE Altman Road/Altman Rd & Carpenter Ln

04/14/2023

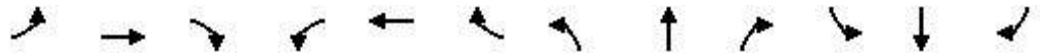


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	24	31	0	2	39
Future Volume (Veh/h)	4	24	31	0	2	39
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	26	33	0	2	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	79	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	79	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	869	1046			1592	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	30	33	44			
Volume Left	4	0	2			
Volume Right	26	0	0			
cSH	1019	1700	1592			
Volume to Capacity	0.03	0.02	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	8.6	0.0	0.3			
Lane LOS	A		A			
Approach Delay (s)	8.6	0.0	0.3			
Approach LOS	A					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			13.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

04/14/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	2	1	3	1	0	93	1	19	1	305	20	16
Future Volume (Veh/h)	2	1	3	1	0	93	1	19	1	305	20	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	122	1	25	1	401	26	21
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	990	868	38	870	878	26	49			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	990	868	38	870	878	26	49			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	7.2	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	4.2	2.7			2.4		
p0 queue free %	97	99	100	99	100	85	100			72		
cM capacity (veh/h)	116	148	1037	146	208	836	1297			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	123	27	448								
Volume Left	3	1	1	401								
Volume Right	4	122	1	21								
cSH	219	805	1297	1451								
Volume to Capacity	0.04	0.15	0.00	0.28								
Queue Length 95th (ft)	3	13	0	28								
Control Delay (s)	22.1	10.3	0.3	7.8								
Lane LOS	C	B	A	A								
Approach Delay (s)	22.1	10.3	0.3	7.8								
Approach LOS	C	B										
Intersection Summary												
Average Delay			8.2									
Intersection Capacity Utilization			38.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↘	
Traffic Volume (veh/h)	0	374	88	30	43	0
Future Volume (Veh/h)	0	374	88	30	43	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	435	102	35	50	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				554	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				554	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	100
cM capacity (veh/h)	1459				490	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	435	137	50			
Volume Left	0	0	50			
Volume Right	0	35	0			
cSH	1459	1700	490			
Volume to Capacity	0.00	0.08	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	13.2			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			29.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/14/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	1	388	111	15	24	0
Future Volume (Veh/h)	1	388	111	15	24	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	456	131	18	28	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				598	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				598	140
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				94	100
cM capacity (veh/h)	1445				468	702
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	457	149	28			
Volume Left	1	0	28			
Volume Right	0	18	0			
cSH	1445	1700	468			
Volume to Capacity	0.00	0.09	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	13.2			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			31.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	57	19	1	132	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	57	19	1	132	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	62	21	1	143	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234			83			434	416	72	374	382	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			83			434	416	72	374	382	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			96	99	100	88	99	93
cM capacity (veh/h)	1333			1514			476	505	990	561	529	853
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	137	235	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1333	1514	490	662								
Volume to Capacity	0.04	0.00	0.05	0.20								
Queue Length 95th (ft)	3	0	4	19								
Control Delay (s)	3.3	0.0	12.8	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.3	0.0	12.8	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			36.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

04/14/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	7	300	0	7	87	0
Future Volume (Veh/h)	7	300	0	7	87	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	326	0	8	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			334		179	171
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			334		179	171
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		88	100
cM capacity (veh/h)			1225		811	873
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	334	8	95			
Volume Left	0	0	95			
Volume Right	326	0	0			
cSH	1700	1225	811			
Volume to Capacity	0.20	0.00	0.12			
Queue Length 95th (ft)	0	0	10			
Control Delay (s)	0.0	0.0	10.0			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			30.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/14/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	276	126	120	86	0	0
Future Volume (Veh/h)	276	126	120	86	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	300	137	130	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223				914	176
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223				914	176
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	78				100	100
cM capacity (veh/h)	1346				236	867
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	437	223	0			
Volume Left	300	0	0			
Volume Right	0	93	0			
cSH	1346	1700	1700			
Volume to Capacity	0.22	0.13	0.00			
Queue Length 95th (ft)	21	0	0			
Control Delay (s)	6.4	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	6.4	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			40.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

05/05/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	16	5	12	32	1	4	1	12	1	4	3
Future Volume (Veh/h)	2	16	5	12	32	1	4	1	12	1	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	3	23	7	17	45	1	6	1	17	1	6	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			30			119	112	26	130	116	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			30			119	112	26	130	116	46
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	100	98	100	99	100
cM capacity (veh/h)	1575			1539			790	771	1029	825	768	1030
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	63	24	11								
Volume Left	3	17	6	1								
Volume Right	7	1	17	4								
cSH	1575	1539	945	852								
Volume to Capacity	0.00	0.01	0.03	0.01								
Queue Length 95th (ft)	0	1	2	1								
Control Delay (s)	0.7	2.0	8.9	9.3								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.7	2.0	8.9	9.3								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			15.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

05/05/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	19	10	19	29	7	15
Future Volume (Veh/h)	19	10	19	29	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	27	14	27	41	10	21
Pedestrians						1
Lane Width (ft)						12.0
Walking Speed (ft/s)						3.5
Percent Blockage						0
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			42		130	35
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			42		130	35
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			98		99	98
cM capacity (veh/h)			1579		853	985
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	41	68	31			
Volume Left	0	27	10			
Volume Right	14	0	21			
cSH	1700	1579	938			
Volume to Capacity	0.02	0.02	0.03			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	3.0	9.0			
Lane LOS			A			
Approach Delay (s)	0.0	3.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















1: SE Altman Road & SE Oxbow Drive

04/14/2023

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	P			4	Y	
Traffic Volume (veh/h)	201	0	0	56	0	0
Future Volume (Veh/h)	201	0	0	56	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	212	0	0	59	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		271	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		271	212
tC, single (s)			4.2		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1296		653	833
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	212	59	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1296	1700			
Volume to Capacity	0.12	0.00	0.00			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			13.9%	ICU Level of Service	A	
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	196	3	2	0	216	8	3	0	10	12
Future Volume (vph)	17	1	196	3	2	0	216	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	215	3	2	0	237	9	3	0	11	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	235	5	249	24								
Volume Left (vph)	19	3	237	0								
Volume Right (vph)	215	0	3	13								
Hadj (s)	-0.17	0.12	0.58	-0.07								
Departure Headway (s)	4.5	5.0	5.1	4.7								
Degree Utilization, x	0.29	0.01	0.35	0.03								
Capacity (veh/h)	760	654	681	703								
Control Delay (s)	9.3	8.1	10.8	7.9								
Approach Delay (s)	9.3	8.1	10.8	7.9								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.0									
Level of Service			A									
Intersection Capacity Utilization			38.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: SE Altman Road & SE Lusted Road

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	23	1	251	61	0	51	0	28	0	0	0
Future Volume (Veh/h)	0	23	1	251	61	0	51	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	29	1	314	76	0	64	0	35	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			30			734	734	30	768	734	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			30			734	734	30	768	734	76
tC, single (s)	4.1			4.2			7.1	7.0	6.2	7.1	7.2	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.4	3.3	3.5	4.7	3.3
p0 queue free %	100			80			78	100	97	100	100	100
cM capacity (veh/h)	1536			1533			285	239	1051	261	217	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	30	390	99	0								
Volume Left	0	314	64	0								
Volume Right	1	0	35	0								
cSH	1536	1533	384	1700								
Volume to Capacity	0.00	0.20	0.26	0.00								
Queue Length 95th (ft)	0	19	25	0								
Control Delay (s)	0.0	6.7	17.6	0.0								
Lane LOS		A	C	A								
Approach Delay (s)	0.0	6.7	17.6	0.0								
Approach LOS			C	A								
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			35.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/14/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Traffic Volume (veh/h)	36	154	0	30	329	1
Future Volume (Veh/h)	36	154	0	30	329	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	47	200	0	39	427	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			247		186	147
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			247		186	147
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		47	100
cM capacity (veh/h)			1331		808	695
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	247	39	428			
Volume Left	0	0	427			
Volume Right	200	0	1			
cSH	1700	1331	807			
Volume to Capacity	0.15	0.00	0.53			
Queue Length 95th (ft)	0	0	79			
Control Delay (s)	0.0	0.0	14.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	14.4			
Approach LOS			B			
Intersection Summary						
Average Delay			8.6			
Intersection Capacity Utilization			36.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/14/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	75	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	75	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	83	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	122	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	83	6	1								
Hadj (s)	-0.36	-0.33	0.21	0.14								
Departure Headway (s)	4.5	4.4	4.7	4.8								
Degree Utilization, x	0.10	0.15	0.27	0.15								
Capacity (veh/h)	737	748	729	709								
Control Delay (s)	7.9	8.2	9.4	8.6								
Approach Delay (s)	7.9	8.2	9.4	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
Level of Service			A									
Intersection Capacity Utilization			34.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

















04/14/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	466	149	27	111	212
Future Volume (Veh/h)	37	466	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	548	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	35			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #						
	WB 1	NB 1	SB 1			
Volume Total	592	207	380			
Volume Left	44	0	131			
Volume Right	548	32	0			
cSH	762	1700	1352			
Volume to Capacity	0.78	0.12	0.10			
Queue Length 95th (ft)	192	0	8			
Control Delay (s)	24.1	0.0	3.3			
Lane LOS	C		A			
Approach Delay (s)	24.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			13.2			
Intersection Capacity Utilization			67.6%		ICU Level of Service	C
Analysis Period (min)			15			

















HCM Unsignalized Intersection Capacity Analysis
 5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	0	13	0	0	0	17	36	0	0	48	226
Future Volume (vph)	57	0	13	0	0	0	17	36	0	0	48	226
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	67	0	15	0	0	0	20	42	0	0	56	266
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	82	0	62	322								
Volume Left (vph)	67	0	20	0								
Volume Right (vph)	15	0	0	266								
Hadj (s)	0.11	0.00	0.06	0.29								
Departure Headway (s)	4.9	4.9	4.5	4.5								
Degree Utilization, x	0.11	0.00	0.08	0.40								
Capacity (veh/h)	677	674	761	783								
Control Delay (s)	8.5	7.9	7.9	10.4								
Approach Delay (s)	8.5	0.0	7.9	10.4								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay			9.8									
Level of Service			A									
Intersection Capacity Utilization			27.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	6	0	5	0	322	2	26	158	0
Future Volume (Veh/h)	0	0	0	6	0	5	0	322	2	26	158	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	0	0	7	0	6	0	374	2	30	184	0
Pedestrians	1											
Lane Width (ft)	12.0											
Walking Speed (ft/s)	3.5											
Percent Blockage	0											
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	6			0			110	20	0	206	17	4
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	6			0			110	20	0	206	17	4
tC, single (s)	4.1			4.1			7.3	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			100			100	56	100	92	79	100
cM capacity (veh/h)	1628			1636			695	858	1091	382	877	1084
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	13	376	214								
Volume Left	0	7	0	30								
Volume Right	0	6	2	0								
cSH	1700	1636	859	742								
Volume to Capacity	0.00	0.00	0.44	0.29								
Queue Length 95th (ft)	0	0	56	30								
Control Delay (s)	0.0	3.9	12.4	11.8								
Lane LOS		A	B	B								
Approach Delay (s)	0.0	3.9	12.4	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay				12.0								
Intersection Capacity Utilization				40.3%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

05/04/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	12	42	2	13	46
Future Volume (Veh/h)	2	12	42	2	13	46
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	15	52	2	16	57
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	142	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	142	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	98			99	
cM capacity (veh/h)	846	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	17	54	73			
Volume Left	2	0	16			
Volume Right	15	2	0			
cSH	922	1700	1514			
Volume to Capacity	0.02	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	1.7			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	1.7			
Approach LOS	A					
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.8%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

05/04/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	4	1	0	306	2	17	2	89	21	7
Future Volume (Veh/h)	0	0	4	1	0	306	2	17	2	89	21	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	360	2	20	2	105	25	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	624	265	29	269	268	21	33			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	624	265	29	269	268	21	33			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			3.1		
p0 queue free %	100	100	100	100	100	64	100			91		
cM capacity (veh/h)	240	584	1052	636	582	1012	1592			1140		
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	361	24	138								
Volume Left	0	1	2	105								
Volume Right	5	360	2	8								
cSH	1052	1010	1592	1140								
Volume to Capacity	0.00	0.36	0.00	0.09								
Queue Length 95th (ft)	0	41	0	8								
Control Delay (s)	8.4	10.5	0.6	6.6								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	10.5	0.6	6.6								
Approach LOS	A	B										
Intersection Summary												
Average Delay			9.0									
Intersection Capacity Utilization			39.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↘	
Traffic Volume (veh/h)	1	109	398	42	46	0
Future Volume (Veh/h)	1	109	398	42	46	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	468	49	54	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	517			622	492	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	517			622	492	
tC, single (s)	4.1			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.6	3.3	
p0 queue free %	100			88	100	
cM capacity (veh/h)	1059			443	580	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	129	517	54			
Volume Left	1	0	54			
Volume Right	0	49	0			
cSH	1059	1700	443			
Volume to Capacity	0.00	0.30	0.12			
Queue Length 95th (ft)	0	0	10			
Control Delay (s)	0.1	0.0	14.2			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	14.2			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			33.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	2	151	370	21	48	0
Future Volume (Veh/h)	2	151	370	21	48	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	172	420	24	55	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	444				608	432
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444				608	432
tC, single (s)	4.6				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.7				3.5	3.3
p0 queue free %	100				88	100
cM capacity (veh/h)	903				455	628
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	174	444	55			
Volume Left	2	0	55			
Volume Right	0	24	0			
cSH	903	1700	455			
Volume to Capacity	0.00	0.26	0.12			
Queue Length 95th (ft)	0	0	10			
Control Delay (s)	0.1	0.0	14.0			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	14.0			
Approach LOS			B			
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			30.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd











05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	203	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	236	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			280			357	354	258	352	372	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			280			357	354	258	352	372	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1294			594	571	786	602	559	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	287	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1294	597	694								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.4	10.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.4	10.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			26.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/04/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	4	87	0	7	300	0
Future Volume (Veh/h)	4	87	0	7	300	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	0	8	326	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99		60	52
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		60	52
tC, single (s)			4.1		6.6	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.7	3.3
p0 queue free %			100		64	100
cM capacity (veh/h)			1494		909	1016
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	8	326			
Volume Left	0	0	326			
Volume Right	95	0	0			
cSH	1700	1494	909			
Volume to Capacity	0.06	0.00	0.36			
Queue Length 95th (ft)	0	0	41			
Control Delay (s)	0.0	0.0	11.2			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			28.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

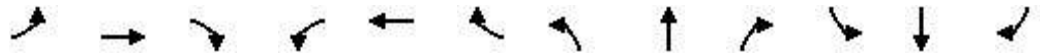
05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	162	92	0	86	276
Future Volume (Veh/h)	0	162	92	0	86	276
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	176	100	0	93	300
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100				276	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				276	100
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	69
cM capacity (veh/h)	1493				714	956
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	176	100	393			
Volume Left	0	0	93			
Volume Right	0	0	300			
cSH	1493	1700	885			
Volume to Capacity	0.00	0.06	0.44			
Queue Length 95th (ft)	0	0	58			
Control Delay (s)	0.0	0.0	12.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	12.3			
Approach LOS			B			
Intersection Summary						
Average Delay			7.2			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 12: SE Dodge Park Blvd & SE Lusted Road

05/05/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	19	4	10	19	1	7	3	17	1	1	2
Future Volume (Veh/h)	3	19	4	10	19	1	7	3	17	1	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	26	6	14	26	1	10	4	24	1	1	3
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			32			96	92	29	118	94	28
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			32			96	92	29	118	94	28
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	99	98	100	100	100
cM capacity (veh/h)	1600			1593			880	793	1034	833	790	1053
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	36	41	38	5								
Volume Left	4	14	10	1								
Volume Right	6	1	24	3								
cSH	1600	1593	959	941								
Volume to Capacity	0.00	0.01	0.04	0.01								
Queue Length 95th (ft)	0	1	3	0								
Control Delay (s)	0.8	2.5	8.9	8.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.8	2.5	8.9	8.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			13.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

05/05/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	25	6	16	22	8	13
Future Volume (Veh/h)	25	6	16	22	8	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	34	8	22	30	11	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			42		112	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			42		112	38
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1580		877	1040
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	42	52	29			
Volume Left	0	22	11			
Volume Right	8	0	18			
cSH	1700	1580	971			
Volume to Capacity	0.02	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.2	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			18.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

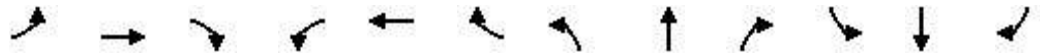
05/04/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	41	210	48	46	129	32
Future Volume (Veh/h)	41	210	48	46	129	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	53	273	62	60	168	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			326		374	190
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		374	190
tC, single (s)			4.1		7.0	6.2
tC, 2 stage (s)						
tF (s)			2.2		4.1	3.3
p0 queue free %			95		66	95
cM capacity (veh/h)			1245		499	857
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	326	122	210			
Volume Left	0	62	168			
Volume Right	273	0	42			
cSH	1700	1245	544			
Volume to Capacity	0.19	0.05	0.39			
Queue Length 95th (ft)	0	4	45			
Control Delay (s)	0.0	4.3	15.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	4.3	15.7			
Approach LOS			C			
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			39.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

05/04/2023



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	2	83	0	1	1	100	4	0	0	10	8
Future Volume (vph)	4	2	83	0	1	1	100	4	0	0	10	8
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	5	3	108	0	1	1	130	5	0	0	13	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	116	2	135	23								
Volume Left (vph)	5	0	130	0								
Volume Right (vph)	108	1	0	10								
Hadj (s)	-0.12	-0.30	0.72	-0.16								
Departure Headway (s)	4.2	4.1	4.9	4.2								
Degree Utilization, x	0.13	0.00	0.18	0.03								
Capacity (veh/h)	828	829	712	829								
Control Delay (s)	7.8	7.1	9.0	7.3								
Approach Delay (s)	7.8	7.1	9.0	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.4									
Level of Service			A									
Intersection Capacity Utilization			28.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	0	0	0	6	146	0	0	215	31
Future Volume (Veh/h)	10	0	10	0	0	0	6	146	0	0	215	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	11	0	11	0	0	0	7	164	0	0	242	35
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			11			184	28	6	110	33	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			11			184	28	6	110	33	0
tC, single (s)	4.1			4.1			7.1	7.2	6.7	7.2	6.9	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.8	3.6	4.4	3.3
p0 queue free %	99			100			99	78	100	100	69	97
cM capacity (veh/h)	1636			1621			572	744	951	705	779	1091
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	0	171	277								
Volume Left	11	0	7	0								
Volume Right	11	0	0	35								
cSH	1636	1700	735	808								
Volume to Capacity	0.01	0.00	0.23	0.34								
Queue Length 95th (ft)	1	0	22	38								
Control Delay (s)	3.6	0.0	11.4	11.8								
Lane LOS	A		B	B								
Approach Delay (s)	3.6	0.0	11.4	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			11.2									
Intersection Capacity Utilization			23.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

05/04/2023



















Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	29	0	0	34	0	0
Future Volume (Veh/h)	29	0	0	34	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	36	0	0	42	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			36		78	36
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			36		78	36
tC, single (s)			4.7		6.4	6.7
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.8
p0 queue free %			100		100	100
cM capacity (veh/h)			1271		917	915
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	36	42	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1271	1700			
Volume to Capacity	0.02	0.00	0.25			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

14: SE 302nd Avenue & SE Lusted Road

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Future Volume (vph)	2	15	77	5	47	24	218	67	2	14	47	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	2	18	91	6	55	28	256	79	2	16	55	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	89	337	71								
Volume Left (vph)	2	6	256	16								
Volume Right (vph)	91	28	2	0								
Hadj (s)	-0.35	-0.13	0.46	0.14								
Departure Headway (s)	4.7	5.0	5.0	5.0								
Degree Utilization, x	0.15	0.12	0.46	0.10								
Capacity (veh/h)	690	655	704	672								
Control Delay (s)	8.5	8.7	12.2	8.5								
Approach Delay (s)	8.5	8.7	12.2	8.5								
Approach LOS	A	A	B	A								
Intersection Summary												
Delay			10.6									
Level of Service			B									
Intersection Capacity Utilization			35.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 15: SE Orient Drive & SE Bluff Road

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	99	82	25	423	93
Future Volume (Veh/h)	11	99	82	25	423	93
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	12	111	92	28	475	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1160	106			120	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1160	106			120	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	91	88			68	
cM capacity (veh/h)	141	937			1462	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	123	120	579			
Volume Left	12	0	475			
Volume Right	111	28	0			
cSH	604	1700	1462			
Volume to Capacity	0.20	0.07	0.32			
Queue Length 95th (ft)	19	0	36			
Control Delay (s)	12.5	0.0	7.6			
Lane LOS	B		A			
Approach Delay (s)	12.5	0.0	7.6			
Approach LOS	B					
Intersection Summary						
Average Delay			7.2			
Intersection Capacity Utilization			48.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Altman Rd & Dodge Park Blvd

















04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	151	2	0	29	113	11	28	3	197	23	3
Future Volume (vph)	16	151	2	0	29	113	11	28	3	197	23	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	168	2	0	32	126	12	31	3	219	26	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	188	158	46	248								
Volume Left (vph)	18	0	12	219								
Volume Right (vph)	2	126	3	3								
Hadj (s)	0.06	0.82	0.06	0.92								
Departure Headway (s)	5.1	5.9	5.4	5.9								
Degree Utilization, x	0.27	0.26	0.07	0.40								
Capacity (veh/h)	657	573	605	583								
Control Delay (s)	10.0	11.0	8.8	12.8								
Approach Delay (s)	10.0	11.0	8.8	12.8								
Approach LOS	A	B	A	B								
Intersection Summary												
Delay			11.2									
Level of Service			B									
Intersection Capacity Utilization			46.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Cottrell Rd & Dodge Park Blvd

04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	30	307	11	30	0	114	0	1	0	0	0
Future Volume (Veh/h)	0	30	307	11	30	0	114	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	35	361	13	35	0	134	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	35			396			276	276	216	278	457	35
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35			396			276	276	216	278	457	35
tC, single (s)	4.4			4.4			8.0	6.6	6.2	8.1	6.8	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.5			4.3	4.1	3.3	4.4	4.2	3.3
p0 queue free %	100			99			75	100	100	100	100	100
cM capacity (veh/h)	1398			1013			530	613	829	511	461	1044
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	396	48	135	0								
Volume Left	0	13	134	0								
Volume Right	361	0	1	0								
cSH	1398	1013	531	1700								
Volume to Capacity	0.00	0.01	0.25	0.00								
Queue Length 95th (ft)	0	1	25	0								
Control Delay (s)	0.0	2.4	14.1	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	2.4	14.1	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			33.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

















04/20/2023



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	11	31	0	2	23
Future Volume (Veh/h)	4	11	31	0	2	23
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	12	33	0	2	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	62	33			33	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62	33			33	
tC, single (s)	6.6	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.7	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	889	1046			1592	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	16	33	27			
Volume Left	4	0	2			
Volume Right	12	0	0			
cSH	1002	1700	1592			
Volume to Capacity	0.02	0.02	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.7	0.0	0.5			
Lane LOS	A		A			
Approach Delay (s)	8.7	0.0	0.5			
Approach LOS	A					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			13.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 8: Cottrell Rd & Carpenter Ln

04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	3	1	0	93	1	19	1	305	12	3
Future Volume (Veh/h)	2	1	3	1	0	93	1	19	1	305	12	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Hourly flow rate (vph)	3	1	4	1	0	122	1	25	1	401	16	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	972	850	20	852	852	26	22			26		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	972	850	20	852	852	26	22			26		
tC, single (s)	7.8	7.5	6.2	8.1	6.5	7.2	4.6			4.3		
tC, 2 stage (s)												
tF (s)	4.1	4.9	3.3	4.4	4.0	4.2	2.7			2.4		
p0 queue free %	97	99	100	99	100	85	100			72		
cM capacity (veh/h)	119	152	1062	151	216	836	1329			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	123	27	421								
Volume Left	3	1	1	401								
Volume Right	4	122	1	4								
cSH	225	806	1329	1451								
Volume to Capacity	0.04	0.15	0.00	0.28								
Queue Length 95th (ft)	3	13	0	28								
Control Delay (s)	21.6	10.3	0.3	8.1								
Lane LOS	C	B	A	A								
Approach Delay (s)	21.6	10.3	0.3	8.1								
Approach LOS	C	B										
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			36.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

04/20/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	0	374	88	30	27	0
Future Volume (Veh/h)	0	374	88	30	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	435	102	35	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	137				554	120
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137				554	120
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1459				490	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	435	137	31			
Volume Left	0	0	31			
Volume Right	0	35	0			
cSH	1459	1700	490			
Volume to Capacity	0.00	0.08	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	12.8			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	12.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			29.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

04/20/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	1	372	111	15	16	0
Future Volume (Veh/h)	1	372	111	15	16	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	438	131	18	19	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	149				580	140
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	149				580	140
tC, single (s)	4.1				6.4	7.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	4.2
p0 queue free %	100				96	100
cM capacity (veh/h)	1445				480	702
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	439	149	19			
Volume Left	1	0	19			
Volume Right	0	18	0			
cSH	1445	1700	480			
Volume to Capacity	0.00	0.09	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	12.8			
Lane LOS	A		B			
Approach Delay (s)	0.0	0.0	12.8			
Approach LOS			B			
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			30.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd

04/20/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Future Volume (Veh/h)	50	41	19	1	132	84	19	4	1	63	5	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	45	21	1	143	91	21	4	1	68	5	60
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	234			66			416	400	56	357	364	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	234			66			416	400	56	357	364	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			96	99	100	88	99	93
cM capacity (veh/h)	1333			1536			489	516	1011	576	540	853
Direction, Lane #												
	EB 1	WB 1	NB 1	SB 1								
Volume Total	120	235	26	133								
Volume Left	54	1	21	68								
Volume Right	21	91	1	60								
cSH	1333	1536	503	673								
Volume to Capacity	0.04	0.00	0.05	0.20								
Queue Length 95th (ft)	3	0	4	18								
Control Delay (s)	3.7	0.0	12.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	3.7	0.0	12.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

04/20/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (veh/h)	7	300	0	7	87	0
Future Volume (Veh/h)	7	300	0	7	87	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	326	0	8	95	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			334		179	171
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			334		179	171
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		88	100
cM capacity (veh/h)			1225		811	873
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	334	8	95			
Volume Left	0	0	95			
Volume Right	326	0	0			
cSH	1700	1225	811			
Volume to Capacity	0.20	0.00	0.12			
Queue Length 95th (ft)	0	0	10			
Control Delay (s)	0.0	0.0	10.0			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay			2.2			
Intersection Capacity Utilization			30.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

04/20/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	276	110	120	86	0	0
Future Volume (Veh/h)	276	110	120	86	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	300	120	130	93	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	223			896	176	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	223			896	176	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	78			100	100	
cM capacity (veh/h)	1346			241	867	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	420	223	0			
Volume Left	300	0	0			
Volume Right	0	93	0			
cSH	1346	1700	1700			
Volume to Capacity	0.22	0.13	0.00			
Queue Length 95th (ft)	21	0	0			
Control Delay (s)	6.6	0.0	0.0			
Lane LOS	A		A			
Approach Delay (s)	6.6	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			39.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

05/05/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	16	18	12	32	1	5	1	28	1	4	3
Future Volume (Veh/h)	2	16	18	12	32	1	5	1	28	1	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	3	23	25	17	45	1	7	1	39	1	6	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	46			48			128	122	36	160	134	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	46			48			128	122	36	160	134	46
tC, single (s)	4.1			4.2			7.3	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.7	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	100	96	100	99	100
cM capacity (veh/h)	1575			1515			779	762	1018	770	751	1030
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	51	63	47	11								
Volume Left	3	17	7	1								
Volume Right	25	1	39	4								
cSH	1575	1515	967	835								
Volume to Capacity	0.00	0.01	0.05	0.01								
Queue Length 95th (ft)	0	1	4	1								
Control Delay (s)	0.4	2.1	8.9	9.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	2.1	8.9	9.4								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			16.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

05/05/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	14	19	29	7	15
Future Volume (Veh/h)	31	14	19	29	7	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	44	20	27	41	10	21
Pedestrians					1	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			65		150	55
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			65		150	55
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			98		99	98
cM capacity (veh/h)			1549		831	960
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	64	68	31			
Volume Left	0	27	10			
Volume Right	20	0	21			
cSH	1700	1549	914			
Volume to Capacity	0.04	0.02	0.03			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	3.0	9.1			
Lane LOS			A			
Approach Delay (s)	0.0	3.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			19.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

1: SE Altman Road & SE Oxbow Drive

04/11/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	51	150	83	69	207	4
Future Volume (Veh/h)	51	150	83	69	207	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	54	158	87	73	218	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			212		380	133
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		380	133
tC, single (s)			4.2		6.7	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.8	3.3
p0 queue free %			93		58	100
cM capacity (veh/h)			1296		524	922
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	212	160	222			
Volume Left	0	87	218			
Volume Right	158	0	4			
cSH	1700	1296	529			
Volume to Capacity	0.12	0.07	0.42			
Queue Length 95th (ft)	0	5	52			
Control Delay (s)	0.0	4.6	16.7			
Lane LOS		A	C			
Approach Delay (s)	0.0	4.6	16.7			
Approach LOS			C			
Intersection Summary						
Average Delay			7.5			
Intersection Capacity Utilization			41.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: SE Hosner Road & SE Oxbow Drive/SE Homan Road

04/11/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	1	82	3	2	0	138	8	3	0	10	12
Future Volume (vph)	17	1	82	3	2	0	138	8	3	0	10	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	19	1	90	3	2	0	152	9	3	0	11	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	110	5	164	24								
Volume Left (vph)	19	3	152	0								
Volume Right (vph)	90	0	3	13								
Hadj (s)	-0.11	0.12	0.56	-0.07								
Departure Headway (s)	4.3	4.6	4.8	4.3								
Degree Utilization, x	0.13	0.01	0.22	0.03								
Capacity (veh/h)	808	731	735	808								
Control Delay (s)	7.9	7.6	9.1	7.4								
Approach Delay (s)	7.9	7.6	9.1	7.4								
Approach LOS	A	A	A	A								

















Intersection Summary

Delay	8.5		
Level of Service	A		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

3: SE Altman Road & SE Lusted Road

04/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	0	33	0	0	0	3	229	0	0	175	45
Future Volume (Veh/h)	16	0	33	0	0	0	3	229	0	0	175	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	20	0	41	0	0	0	4	286	0	0	219	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			41			226	60	20	204	81	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			41			226	60	20	204	81	0
tC, single (s)	4.1			4.2			7.1	7.0	6.2	7.1	7.2	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.4	3.3	3.5	4.7	3.3
p0 queue free %	99			100			99	62	100	100	68	95
cM capacity (veh/h)	1636			1518			518	745	1063	527	681	1091
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	61	0	290	275								
Volume Left	20	0	4	0								
Volume Right	41	0	0	56								
cSH	1636	1700	741	737								
Volume to Capacity	0.01	0.00	0.39	0.37								
Queue Length 95th (ft)	1	0	47	43								
Control Delay (s)	2.4	0.0	13.0	12.8								
Lane LOS	A		B	B								
Approach Delay (s)	2.4	0.0	13.0	12.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			24.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

4: SE Cottrell Road & SE Lusted Road

















04/11/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Traffic Volume (veh/h)	59	0	0	30	0	0
Future Volume (Veh/h)	59	0	0	30	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	77	0	0	39	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			77		116	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			77		116	77
tC, single (s)			4.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	4.2
p0 queue free %			100		100	100
cM capacity (veh/h)			1535		885	768
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	77	39	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1535	1700			
Volume to Capacity	0.05	0.00	0.53			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: SE 302nd Avenue & SE Lusted Road

04/11/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Future Volume (vph)	0	25	46	6	29	27	118	61	5	28	70	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	28	51	7	32	30	131	68	6	31	78	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	69	205	110								
Volume Left (vph)	0	7	131	31								
Volume Right (vph)	51	30	6	1								
Hadj (s)	-0.36	-0.18	0.21	0.14								
Departure Headway (s)	4.4	4.6	4.6	4.6								
Degree Utilization, x	0.10	0.09	0.26	0.14								
Capacity (veh/h)	754	724	755	737								
Control Delay (s)	7.8	8.0	9.2	8.4								
Approach Delay (s)	7.8	8.0	9.2	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			31.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: SE Orient Drive & SE Bluff Road

04/11/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	37	266	149	27	111	212
Future Volume (Veh/h)	37	266	149	27	111	212
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	44	313	175	32	131	249
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	702	191			207	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	702	191			207	
tC, single (s)	6.5	6.3			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.2	
p0 queue free %	88	63			90	
cM capacity (veh/h)	357	838			1352	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	357	207	380			
Volume Left	44	0	131			
Volume Right	313	32	0			
cSH	719	1700	1352			
Volume to Capacity	0.50	0.12	0.10			
Queue Length 95th (ft)	70	0	8			
Control Delay (s)	14.8	0.0	3.3			
Lane LOS	B		A			
Approach Delay (s)	14.8	0.0	3.3			
Approach LOS	B					
Intersection Summary						
Average Delay			7.0			
Intersection Capacity Utilization			55.3%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

















5: Altman Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	13	51	13	1	156	191	11	34	2	121	39	13
Future Volume (vph)	13	51	13	1	156	191	11	34	2	121	39	13
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	15	60	15	1	184	225	13	40	2	142	46	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	90	410	55	203								
Volume Left (vph)	15	1	13	142								
Volume Right (vph)	15	225	2	15								
Hadj (s)	0.00	0.20	0.03	1.14								
Departure Headway (s)	5.4	5.1	5.7	6.5								
Degree Utilization, x	0.13	0.58	0.09	0.37								
Capacity (veh/h)	614	683	552	520								
Control Delay (s)	9.2	14.9	9.2	13.2								
Approach Delay (s)	9.2	14.9	9.2	13.2								
Approach LOS	A	B	A	B								
Intersection Summary												
Delay			13.4									
Level of Service			B									
Intersection Capacity Utilization			42.9%		ICU Level of Service	A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
6: Cottrell Rd & Dodge Park Blvd

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	47	92	20	15	0	322	0	2	0	0	0
Future Volume (Veh/h)	0	47	92	20	15	0	322	0	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	55	107	23	17	0	374	0	2	0	0	0
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	17			162			172	172	108	174	225	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	17			162			172	172	108	174	225	18
tC, single (s)	4.1			4.1			7.3	6.6	6.2	8.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.7	4.1	3.3	4.4	4.0	3.3
p0 queue free %	100			98			50	100	100	100	100	100
cM capacity (veh/h)	1613			1429			746	699	951	606	667	1065
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	162	40	376	0								
Volume Left	0	23	374	0								
Volume Right	107	0	2	0								
cSH	1613	1429	747	1700								
Volume to Capacity	0.00	0.02	0.50	0.29								
Queue Length 95th (ft)	0	1	72	0								
Control Delay (s)	0.0	4.4	14.6	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	4.4	14.6	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			9.8									
Intersection Capacity Utilization			46.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 7: SE Altman Road/Altman Rd & Carpenter Ln

05/04/2023



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	2	6	42	2	13	37
Future Volume (Veh/h)	2	6	42	2	13	37
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	2	7	52	2	16	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	53			54	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	53			54	
tC, single (s)	6.4	6.5			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.3	
p0 queue free %	100	99			99	
cM capacity (veh/h)	859	933			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	54	62			
Volume Left	2	0	16			
Volume Right	7	2	0			
cSH	916	1700	1514			
Volume to Capacity	0.01	0.03	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			19.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

8: Cottrell Rd & Carpenter Ln

05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	4	1	0	306	2	17	2	89	21	1
Future Volume (Veh/h)	0	0	4	1	0	306	2	17	2	89	21	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	5	1	0	360	2	20	2	105	25	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	620	262	26	266	261	21	26			22		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	620	262	26	266	261	21	26			22		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.4	4.1			5.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.5	2.2			3.1		
p0 queue free %	100	100	100	100	100	64	100			91		
cM capacity (veh/h)	241	586	1056	639	587	1012	1601			1140		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	5	361	24	131								
Volume Left	0	1	2	105								
Volume Right	5	360	2	1								
cSH	1056	1010	1601	1140								
Volume to Capacity	0.00	0.36	0.00	0.09								
Queue Length 95th (ft)	0	41	0	8								
Control Delay (s)	8.4	10.5	0.6	7.0								
Lane LOS	A	B	A	A								
Approach Delay (s)	8.4	10.5	0.6	7.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			9.2									
Intersection Capacity Utilization			39.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

9: SE Bluff Road & SE Altman Road

05/04/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	109	398	42	37	0
Future Volume (Veh/h)	1	109	398	42	37	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	128	468	49	44	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	517			622	492	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	517			622	492	
tC, single (s)	4.1			6.5	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.6	3.3	
p0 queue free %	100			90	100	
cM capacity (veh/h)	1059			443	580	
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	129	517	44			
Volume Left	1	0	44			
Volume Right	0	49	0			
cSH	1059	1700	443			
Volume to Capacity	0.00	0.30	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.1	0.0	14.0			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	14.0			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			33.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

10: Bluff Rd & Cottrell Rd

05/04/2023



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	2	142	370	21	27	0
Future Volume (Veh/h)	2	142	370	21	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	161	420	24	31	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	444				597	432
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	444				597	432
tC, single (s)	4.6				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.7				3.5	3.3
p0 queue free %	100				93	100
cM capacity (veh/h)	903				461	628
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	163	444	31			
Volume Left	2	0	31			
Volume Right	0	24	0			
cSH	903	1700	461			
Volume to Capacity	0.00	0.26	0.07			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.1	0.0	13.4			
Lane LOS	A		B			
Approach Delay (s)	0.1	0.0	13.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			30.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

11: 362nd Ave/Proctor Rd & Bluff Rd











05/04/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Future Volume (Veh/h)	6	194	38	1	61	8	25	2	1	6	3	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	226	44	1	71	9	29	2	1	7	3	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			270			347	344	248	342	362	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			270			347	344	248	342	362	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	100	99	99	99
cM capacity (veh/h)	1531			1305			603	579	796	611	566	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	277	81	32	16								
Volume Left	7	1	29	7								
Volume Right	44	9	1	6								
cSH	1531	1305	606	702								
Volume to Capacity	0.00	0.00	0.05	0.02								
Queue Length 95th (ft)	0	0	4	2								
Control Delay (s)	0.2	0.1	11.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.1	11.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			26.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Site Access A

05/04/2023

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	4	87	0	7	300	0
Future Volume (Veh/h)	4	87	0	7	300	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	95	0	8	326	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			99	60	52	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99	60	52	
tC, single (s)			4.1	6.6	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.7	3.3	
p0 queue free %			100	64	100	
cM capacity (veh/h)			1494	909	1016	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	8	326			
Volume Left	0	0	326			
Volume Right	95	0	0			
cSH	1700	1494	909			
Volume to Capacity	0.06	0.00	0.36			
Queue Length 95th (ft)	0	0	41			
Control Delay (s)	0.0	0.0	11.2			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			28.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

17: Bluff Rd & Site Access B

05/04/2023

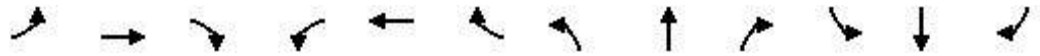


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Volume (veh/h)	0	153	92	0	86	276
Future Volume (Veh/h)	0	153	92	0	86	276
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	166	100	0	93	300
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100				266	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				266	100
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	69
cM capacity (veh/h)	1493				723	956
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	100	393			
Volume Left	0	0	93			
Volume Right	0	0	300			
cSH	1493	1700	888			
Volume to Capacity	0.00	0.06	0.44			
Queue Length 95th (ft)	0	0	57			
Control Delay (s)	0.0	0.0	12.2			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	12.2			
Approach LOS			B			
Intersection Summary						
Average Delay			7.3			
Intersection Capacity Utilization			36.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

12: SE Dodge Park Blvd & SE Lusted Road

05/05/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	3	19	27	10	19	1	8	3	37	1	1	2
Future Volume (Veh/h)	3	19	27	10	19	1	8	3	37	1	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	4	26	38	14	26	1	11	4	51	1	1	3
Pedestrians		1										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	27			64			112	108	45	160	126	28
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			64			112	108	45	160	126	28
tC, single (s)	4.1			4.1			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	100			99			99	99	95	100	100	100
cM capacity (veh/h)	1600			1551			859	777	1014	759	759	1053
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	41	66	5								
Volume Left	4	14	11	1								
Volume Right	38	1	51	3								
cSH	1600	1551	967	912								
Volume to Capacity	0.00	0.01	0.07	0.01								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.4	2.6	9.0	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	2.6	9.0	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			15.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

13: SE Hudson Road & SE Lusted Road

05/05/2023



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	42	9	16	22	8	13
Future Volume (Veh/h)	42	9	16	22	8	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	57	12	22	30	11	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			69		137	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			69		137	63
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	98
cM capacity (veh/h)			1545		849	1007
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	69	52	29			
Volume Left	0	22	11			
Volume Right	12	0	18			
cSH	1700	1545	941			
Volume to Capacity	0.04	0.01	0.03			
Queue Length 95th (ft)	0	1	2			
Control Delay (s)	0.0	3.2	8.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	8.9			
Approach LOS			A			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			