Appendix J – Transportation Documentation

- Traffic Study (2006)
- On-Site Queuing Technical Memorandum (2006)
- Construction Traffic Technical Memorandum (2006)
- WSDOT Property Acquisition Meeting. Meeting Minutes. March 31, 2006. WSDOT Urban Corridor Office.
- Impacts of I-5/SR 509 Project on the Bow Lake Transfer Station. King County Solid Waste Division (2006).
- Local Street Traffic Impact Evaluation for King County Transfer Stations. King County Solid Waste Division (2005).
- Summary of Preliminary Transportation Assessment Bow Lake Transfer Station. King county Solid Waste Division (2004).

Traffic Impact Analysis

BOW LAKE TRANSFER/RECYCLING STATION

Prepared for:

King County Solid Waste Division

December 2006

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Executive Summary

This report summarizes the traffic impact analysis results for the Bow Lake Transfer/Recycling Station. The transfer station is located in unincorporated King County and the City of Tukwila. The station is located north of the S 188th Street/Orillia Road S intersection. The eight-acre site is bound on the west by I-5 and overlooks the Duwamish Valley to the east. The site is accessed from the S 188th Street/Orillia Road S intersection. The Bow Lake Transfer/Recycling Station is being upgraded primarily to meet current building and environmental standards, improve safety and efficiency, and accommodate projected regional growth trends. Construction is expected to be complete by the year 2011.

The traffic analysis was for the weekday AM and PM peak hours, which represent peak commuter traffic volumes on the roadway network. A Saturday peak hour was also analyzed since Saturday is the peak period of traffic flow attracted to the site. The primary State Environmental Policy Act (SEPA) analysis reviews existing conditions, year 2011 baseline conditions, and 2011 with-project conditions which reflect a horizon year consistent with project buildout. A future year 2030 planning level analysis is also included to support the long-range Master Plan. Five intersections were studied, which were:

- S 188th Street/Military Road S;
- S 188th Street/I-5 Southbound (SB) Ramps;
- S 188th Street/I-5 Northbound (NB) Ramps;
- S 188th Street/Orillia Road S (Bow Lake Transfer/Recycling Station Access); and
- Orillia Road S/S 200th Street.

Additional analysis was also conducted to measure the potential impacts of Bow Lake traffic when the proposed Tukwila South Project is included in the baseline conditions. Information contained in the Bow Lake Traffic Impact Analysis related to the proposed Tukwila South Project was derived from the Draft Environmental Impact Statement (DEIS) developed by La Pianta, LLC for that proposal. All technical and other information concerning that site was presumed to be accurate, and no additional independent analysis for that proposed site's development and traffic conditions was prepared by The Transpo Group, Inc.. Tukwila South is proposing mixed-use development of up to 14 million square feet under near-term (2015) and long-term (2030) build-out years. The Tukwila South Year 2015 Alternative 1 build-out is forecast to generate about 3,727 net new PM peak hour trips, and the Year 2030 Alternative 1 build-out is forecast to generate about 13,975 net new PM peak hour trips. This traffic would access the street system at S 180th Street and S 200th Street.

The existing conditions analysis shows that the five study intersections all operate at level of service (LOS) D or better during both the weekday AM and PM peak hours. During the Saturday peak hour, all intersections operate at LOS B, with the exception of S 188th Street/Military Road S which operates at LOS C. All intersection operations remain similar under 2011 baseline conditions.

The Bow Lake Transfer/Recycling Station is a currently operating site with existing and measurable traffic volumes. The methodology for estimating future traffic volumes is based on a linear increase of existing traffic volumes based on solid waste forecasts provided by the King County Solid Waste Division. As stated in econometric model forecasting prepared by the Solid Waste Division, it is estimated that the tonnage of solid waste disposal will increase by about 16 percent from year 2006 to 2011. Existing peak hour traffic volumes accessing the site were increased by 16 percent to estimate the net new trips accessing the site by year 2011. By year 2011 there is expected to be 12 net new trips during the AM peak hour, 7 net new trips during the PM peak hour, and 29 net new trips during the Saturday peak hour. When compared to baseline intersection total entering volume (TEV), the project trips account for less that 1 percent of the volume at the study intersections during the weekday AM and PM peak hours. On Saturday, the project trips account for about 2 percent of the TEV at S 188th Street/Orillia Road S (site access) and 1 percent or less at all remaining study intersections. Since traffic volumes vary by 5 to 10 percent from day-to-day, it is unlikely the average driver will notice these projected related forecast volume increases.

As can be expected due to the low volume impact on the study intersections, the with-project LOS does not change from baseline conditions. Since the project related traffic volumes are so light, the LOS is unchanged at most study intersections when comparing baseline to with-project conditions.

These results are echoed with the year 2030 long-range analysis, as well as the additional analysis that includes the Tukwila South Project traffic volumes in the baseline conditions. Under the long-range 2030 analysis, as well as the 2011 and 2030 analyses that include Tukwila South traffic volumes, when compared to with-Bow Lake project conditions, the LOS is similar between baseline and with-project conditions. The insignificant impacts of the Bow Lake project are a result of the project's future traffic volumes which have been calculated as comprising a small percentage of the overall traffic volumes on the roadway network.

Introduction

This report summarizes the transportation impact analysis (TIA) conducted for the Bow Lake Transfer/Recycling Station located in unincorporated King County and Tukwila, Washington. The analysis is consistent with TIA guidelines for a SEPA checklist.

Project Location and Description

The Bow Lake Transfer/Recycling Station is located north of the S 188th Street/Orillia Road S intersection in unincorporated King County and the City of Tukwila. The transfer station was constructed in 1977. The eight-acre site is located along the east edge of I-5 overlooking the Duwamish Valley. The site vicinity is shown in Figure 1. The transfer station operates 24 hours per day, Monday through Friday, and from 8:30 am to 5:30 pm on weekends. The site is open to commercial haulers, residential self-haulers, and business self-haul customers. The site is accessed from the S 188th Street/Orillia Road S intersection.

The Bow Lake Transfer/Recycling Station is being upgraded to meet current building and environmental standards, improve safety and operational efficiency, and accommodate projected future regional growth trends. It will incorporate solid waste management efficiencies that will help keep disposal rates as low as possible when the County's remaining landfill reaches capacity and solid waste is exported to an out-of-county disposal site.

Specific proposed improvements include:

- An expanded recycling area, including a yard waste area;
- A larger transfer building that will have easier-to-use waste unloading areas, which should reduce customer wait times;
- An enclosed transfer building;
- An enhanced site layout to improve on-site circulation and increased on-site vehicle queuing storage;
- Two preload compactors to improve operational efficiency and decrease the number of transfer trailer truck trips required to/from the transfer station;
- Improved building design; and
- Environmental enhancements to the storm and waste water system to protect public health.

It should be noted that the proposed improvements don't necessarily equate to increased site traffic generation. The site is being improved to accommodate the growing demands from local and regional population increases. At the same time, operational enhancements are being provided to provide enhanced compaction of solid waste to reduce the number of trailer truck trips to/from the site.

One of the site improvements will be new compaction technology know as a "preload compactor". This relates to the loading and compacting of waste containers which are used to transport waste from Bow Lake final disposal sites. The current practice is to top-load a waste transfer trailer and lightly compact the material with a knuckleboom crane. This practice allows transfer trailers to carry about 18 tons of waste. The new preload compactor will allow transfer trailers to carry about 27 to 30 tons of waste. In the short term, this could equate to 50 to 67 percent fewer truck trips from this site. The project will be completed by 2011.

Study Approach

The analysis of traffic operations of five off-site intersections focuses on the weekday AM and PM peak hour, as well as a Saturday peak hour. The AM and PM peak hours are typically the time periods with the highest roadway traffic volumes representative of commuter traffic. The Saturday peak hour represents the time period when the site generates their highest volume of trips. The following intersections were selected for study:

- S 188th Street/Military Road S;
- S 188th Street/I-5 Southbound (SB) Ramps;
- S 188th Street/I-5 Northbound (NB) Ramps;
- S 188th Street/Orillia Road S (Bow Lake Transfer/Recycling Station Access); and
- Orillia Road S/S 200th Street.

The following sections document existing, future baseline (without-project), and future with-project conditions within the study area. Project impacts are identified by comparing forecast with-project conditions against forecast baseline conditions. Potential mitigation measures are identified where necessary to offset these impacts. The report is divided into the following primary sections:

- Existing Conditions documents the current (year 2006) conditions within the study area. Existing levels of service at study intersections are calculated based on existing intersection geometry and traffic volumes. This section also includes descriptions of transportation facilities within the study area and on roadways adjacent to the site. This study documents AM, PM, and Saturday peak hour traffic operations at the study intersections.
- Future Baseline Conditions (Without-Project) documents the conditions expected to prevail in the study area in year 2011 without the proposed project. The operations analyses include all roadway improvements and increases in traffic volume resulting from other planned developments in the vicinity of the project site by year 2011.
- Future With-Project Conditions documents the impact of a "typical day" of the proposed project relative to year 2011 baseline conditions. A "typical day" is the

estimate of traffic that is expected to be generated by the normal use of the facility. The impacts are measured by comparing with-project conditions to the year 2011 baseline, which is the proposed year of opening. All SEPA-based mitigation will be based on year of opening (year 2011) conditions.

- Cumulative Analysis with Tukwila South documents the conditions expected to prevail in the study area when the Tukwila South Project traffic volumes are included in the background (baseline) conditions.
- **Proposed Mitigation** documents the results of the analysis and identifies measures to offset potential transportation impacts, if necessary.







Existing Conditions

This section of the report provides an inventory of existing transportation conditions throughout the study area. This inventory serves as the foundation from which future traffic conditions are forecast and evaluated. The following paragraphs describe the vicinity roadway network, existing traffic volumes and operations, and safety.

Roadway Network

The following roadways comprise the primary roadway system in the project site vicinity. Furthermore, these roadways are anticipated to accommodate a majority of the project-generated traffic and, in doing so, would experience the greatest project impacts. The following paragraphs describe the general characteristics of these roadways.

I-5 is a north-south interstate freeway facility providing regional access to the area. In the project vicinity, I-405 is five lanes (four general purpose lanes and one High Occupancy Vehicle [HOV] lane in both directions).

S 188th **Street** is classified as a principal arterial, providing access to I-5. It connects with Orillia Road, just east of the site and continues west to Normandy Park, near Puget Sound. It is a five-lane facility near the project site, providing left-turn lanes at each of the study intersections. There are paved shoulders within the project vicinity. Sidewalks are on the north side of the roadway starting just west of Military Road.

Orillia Road S is a principal arterial located southwest of the site. It connects S 188th Street and I-5 with the valley floor to the east via S 200th Street and S 212th Street. Orillia Road is a four-lane roadway with a posted speed limit of 40 mph. It has 11- and 12-foot lanes with 4- to 5-foot paved bicycle lanes. There is curb and gutter, as well as intermittent sidewalks.

Traffic Volumes

The weekday AM and PM peak hour was selected for the analysis since it is the time period that typically accounts for the highest background traffic volumes, and thus results in the most congested periods for a traffic analysis. A Saturday peak hour was also selected for analysis since this represents a time period when traffic volumes at the transfer station are typically the highest. Existing weekday AM, PM, and Saturday peak hour turning movement counts were performed in the field by All Traffic Data Services, Inc.

Transfer station traffic volume is primarily comprised of two types of trips: self-hauled and commercially collected. Self-hauled trips are comprised of residents or small businesses delivering their solid waste. Commercially collected trips are from the large waste hauling companies. Table 1 summarized the vehicle volumes accessing the transfer station during the three peak hours.

Table 1. Exis	Table 1. Existing Traffic Volumes: S 188th St/Orillia Rd S/Transfer Station									
	Accessing Station ¹	TEV ²	% Vol. Related to Station ³							
AM Peak Hour	73	2,833	2.6%							
PM Peak Hour	44	3,457	1.3%							
Sat. Peak Hour	181	1,222	14.8%							

- Total trips in/out from transfer station during peak hour counted. TEV = total entering volume of intersection. The percentage of intersection volume accessing the transfer station.

As Table 1 shows, the total volume accessing the transfer station is the lowest during the PM peak hour, which is when traffic volumes are the highest. The transfer station experiences higher volumes on a Saturday peak hour due to increased self-haul residential trips. Figure 2 shows the peak hour turning movement counts at all of the study intersections.

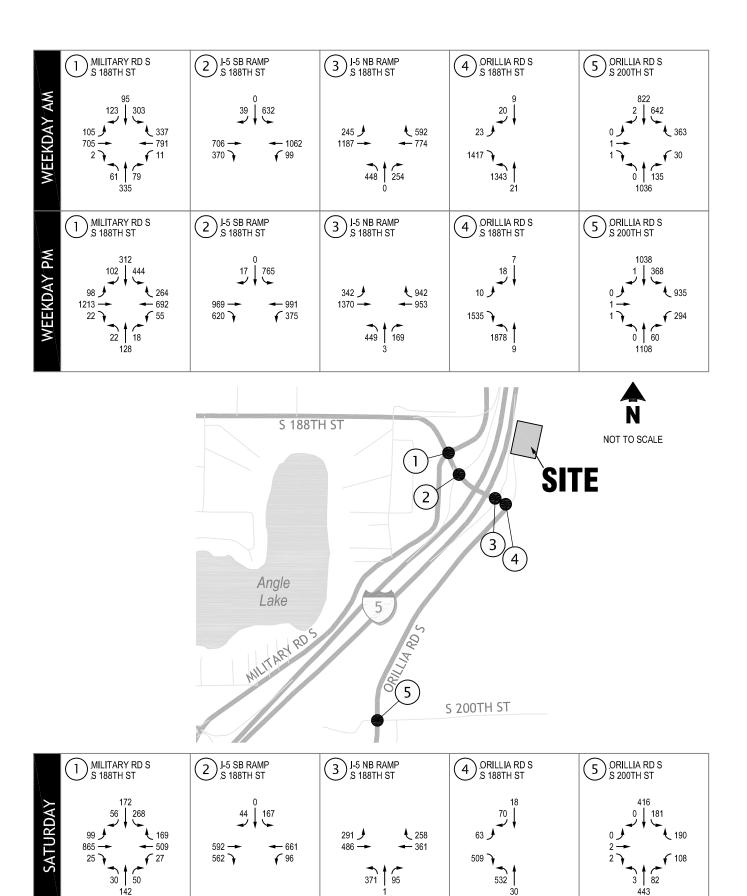




Figure 2
Existing Weekday AM, PM, and Sat. Peak Hour Volumes



Traffic Operations

This section of the report summarizes existing traffic operations at the study intersections. The operations analysis section summarizes LOS calculations as well as off-site vehicle queuing.

Level of Service

A LOS analysis was conducted for the study intersections under existing conditions. Level of service is a qualitative measure of the performance of an intersection. Levels of service values range from LOS A, indicating good operation and low vehicle delays, to LOS F, which indicates congestion and longer vehicle delays. Appendix A contains a detailed explanation of LOS criteria and definitions.

Synchro v.6.0 (Build 612) was used to evaluate intersection levels of service based on the 2000 Highway Capacity Manual (HCM) (Transportation Research Board, 2000) methodologies. As part of HCM methodologies, intersection operations are analyzed during the peak 15-minute period of the peak hour represented. Existing traffic volumes, lane geometries, and traffic controls were used to estimate existing traffic operations for the study intersections. The existing signal timing plans were obtained from the City of SeaTac, King County, and the Washington State Department of Transportation (WSDOT). Table 1 shows the LOS results for the study intersections. The detailed LOS worksheets are included in Appendix B of this report.

Table 2. Existing (2006) LOS Summary: Weekday AM, PM, and Sat. Peak Hours									
	ΑM	И Peak Ho	our	PN	1 Peak Ho	our	Sat. Peak Hour		
Intersection	LOS¹	Delay ²	V/C³ or WM⁴	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
S 188th St/Military Rd S	D	51.8	0.92	D	38.4	0.76	С	28.3	0.59
S 188th St/I-5 SB Ramps	В	16.8	0.64	D	40.3	0.88	В	10.9	0.39
S 188th St/I-5 NB Ramps	С	23.3	0.79	С	30.8	0.86	В	15.7	0.51
Orillia Rd S/S 200th St	С	32.2	0.77	С	26.1	0.77	В	16.8	0.36
<u>Unsignalized</u>									
S 188th St/Orillia Rd S	Α	4.0	NA	Α	4.2	NA	Α	1.4	NA
Worst Movement	F	>120	SB ⁵	F	>120	SB	В	13.2	SB

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- 2. Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.
- 5. SB = Southbound approach.
- NB = Northbound approach.

King County LOS standards for an urban area is LOS E. Both WSDOT and the City of SeaTac LOS standards are LOS D. As Table 2 shows, all of the signalized study area intersections operate at LOS D or better during the weekday peak hours. All intersections operate well during the Saturday peak hour.

The unsignalized intersection of S 188th Street/Orillia Road S (site access) operates at LOS A as a whole. Only the southbound movement of the unsignalized intersection operates at LOS F during the weekday peak hours analyzed. The S 188th Street/Orillia Road southbound exit does not impact operations along the S 188th Street – Orillia Road corridor, only the ability for vehicles to exit the transfer station.

Off-Site Traffic Queuing

This section of the report summarizes the calculated queuing between the study area intersections. Due to the close spacing of these intersections, queues can occur that may inhibit an adjacent intersection from functioning properly. Queue calculations are summarized on S 188th Street for both the westbound and eastbound directions. On S 188th Street, westbound queues are estimated to measure potential blocking between: Military Road S and I-5 Northbound (NB) Ramps, I-5 NB Ramps and I-5 Southbound (SB) Ramps, and I-5 SB Ramps and Orillia Road S (site access). In the eastbound direction, queues are estimated to measure potential blocking between Orillia Road S and I-5 NB Ramps, I-5 NB Ramps and I-5 SB Ramps, as well as I-5 SB Ramps and Military Road S.

Synchro v.6.0 (Build 612) was used to evaluate intersection queuing. The 95th percentile (maximum) queuing data is reported from Synchro. The 95th percentile would be the worst case queue during the time period with the highest traffic volumes. Thus, the 95th percentile queues are likely to occur for 1 to 2 cycles during the peak 15-minutes of the weekday PM peak hour. However, queues could be longer if there are multiple intersection blockages that are impacting corridor operations, as Synchro and HCM calculations cannot account for these situations.

Table 3 provides an estimate of capacity between the intersections compared with 95th percentile queue (maximum). The purpose of this data is to provide an estimate of queues to use as a bench mark to measure queue impacts with increased future traffic volumes.

AM Peak Hour										
Direction/Intersection	Capacity ¹ (ft)	95 th Percentile ² Queue (ft)	Available Capacity? (ft)							
Westbound										
S 188th St /Military Rd S	205	260	No							
S 188 th St /I-5 SB Ramps	490	200	Yes							
S 188 th St /I-5 NB Ramps	65	365	No							
Eastbound										
S 188 th St/Orillia Rd S	65	20	Yes							
S 188 th St /I-5 NB Ramps	490	330	Yes							
S 188 th St /I-5 SB Ramps	205	160	Yes							
	PM	l Peak Hour								
Westbound										
S 188th St /Military Rd S	205	245	No							
S 188th St /I-5 SB Ramps	490	230	Yes							
S 188th St /I-5 NB Ramps	65	600	No							
Eastbound										
S 188 th St/Orillia Rd S	65	20	Yes							
S 188 th St /I-5 NB Ramps	490	335	Yes							
S 188th St /I-5 SB Ramps	205	255	No							

During the AM and PM peak hour in the westbound direction the I-5 SB Ramps/S 188th Street and S 188th Street/Orillia Road S intersections will experience blockages from adjacent intersections. During the PM peak hour in the eastbound direction the S 188th Street/Military Road S intersection will experience blockages resulting from the S 188th Street/I-5 SB Ramps intersection.

During the AM and PM peak hour the east-to-north left-turn into the project site (S 188th Street/Orillia Road S) does not queue into the adjacent intersection based on model calculations. However, the left-turns would be blocked due to queues on the westbound approach at the S 188th Street /I-5 NB Ramps intersection. Eastbound leftturns into the site will depend on westbound traffic not blocking the site access during the weekday AM and PM peak hours.

Traffic Safety

Records of reported accidents at study intersections were reviewed to help identify if any existing traffic safety issues exist. The most recent summary of accidents is for the period between January 1, 2002/2003 through July, 2005. The data was provided by the City of SeaTac, King County, and WSDOT. A historical review of the frequency of accidents was conducted at all study intersections. Typically, intersections with collision rates greater than 1.0 collisions per million entering vehicles (MEV) are earmarked for continued evaluation and potential safety improvements. A summary of the total average annual and MEV of reported accidents at each study intersection is provided in Table 4.

⁹⁵th percentile queue length in feet as reported by Synchro 6.0.

	N	umber of	Acciden			
Intersection	2002/ 2003	2004	2005	Total	Annual Average	MEV ¹
S 188th St/Military Rd S	15	16	14	45	15.0	1.22
S 188 th St/I-5 SB Ramps	9	10	8	27	9.0	0.66
S 188 th St/I-5 NB Ramps	9	17	11	37	12.3	0.80
S 188 th St/Orillia Rd S	6	11	8	25	8.3	0.66
Orillia Rd S/S 200th St	7	10	6	23	7.7	0.55

As Table 4 shows, the MEV is less than 1.0 at all of the study intersections with the exception of S 188th Street/Military Road S. This intersection has an average of 15 accidents per year over the last three years. The accidents were 12 rear-end, 5 angle, 4 turning, 5 head-on, 6 sideswipe, 4 fixed object, and 9 other. The City of SeaTac currently does not have accident safety analysis standards.

Transit Service

King County Metro Transit (MT) and Sound Transit (ST) provide service to an eastbound stop at the near side of S 188th Street/Military Road S. Transit service is provided by three routes:

- MT 180 provides service on 30-minute headways between Burien and Auburn.
- MT 194 provides service on 45-minute headways between Seattle and Federal Way.
- ST 574 provides service on 30-minute headways between SeaTac and Lakewood.

Future Baseline Conditions (Without-Project)

A future 2011 baseline (representing a without-project scenario) analysis was developed to identify forecast traffic conditions. Although traffic volumes at the existing driveway will increase with or without the proposed transfer station improvements, traffic volumes accessing the site were assumed to remain consistent with existing conditions in order to isolate growth in site-related traffic volumes for the with-project analysis.

The evaluations in this section establish a baseline for identifying project impacts, which will be based upon a comparison of baseline traffic conditions to with-project conditions. The future roadway network, traffic volumes, and traffic operations are defined in this section.

Traffic Volumes

Year 2011 baseline traffic volumes were established based on a forecast from a regional traffic forecasting model (TMODEL2). This model was derived from the Puget Sound Regional Council model (PSRC) and used for the SR 509 extension studies. The model has recently been updated to support the Port of Seattle (POS) Comprehensive Development Plan (CDP). Model roadway link data was plotted for a short-term year of 2010 and a long-term year of 2024. The short-term model plot shows traffic volumes are expected to remain about the same over the next four years. This is due to traffic shifts created by the City of Kent's South 228th Street Extension. Some traffic volumes are expected to shift from S 212th Street and Orillia Road S to the new S 228th Street extension. The long-term plots show expected traffic volume increases at an annual rate of 1 percent.

Although traffic volumes in the short-term are not expected to increase near the study area due to the S 228th Street extension project, to be conservative, existing (year 2006) traffic volumes were increased at an annual rate of 1 percent to estimate year 2011 forecast traffic volumes. The volumes were rounded to the nearest 5 vehicles, and the site access volumes were assumed to remain unchanged. Site access traffic volumes will be addressed under the with-project conditions section. Figure 3 shows the future 2011 baseline traffic volumes for the weekday AM and PM, and Saturday peak hours. These volumes will be used to estimate year 2011 baseline conditions.

Planned Transportation Improvements

No short-term (year 2011) transportation improvement projects that would enhance capacity were identified for the study intersections.

Traffic Operations

This section of the report summarizes baseline traffic operations at the study intersections. The operations analysis section summarizes baseline LOS calculations as well as off-site vehicle queuing.

Level of Service

Future traffic operations in the study area were evaluated based on the year 2011 forecast traffic volumes. Since no short-term planned improvements were identified, intersection channelization is consistent with existing conditions. The traffic operations analysis uses the same methodologies discussed in the evaluation of existing levels of service. Table 5 summarizes the weekday AM and PM baseline LOS results; existing conditions results are provided for comparison purposes. The detailed LOS worksheets are provided in Appendix B.

Table 5. 2011 Baseline LOS Summary: Weekday AM and PM Peak Hours							
	AM	Existing (20	006)	AM	AM Baseline (2011)		
Intersection	LOS¹	Delay ²	V/C³ or WM⁴	LOS	Delay	V/C or WM	
S 188 th St/Military Rd S	D	51.8	0.92	D	46.7	1.03	
S 188 th St/I-5 SB Ramps	В	16.8	0.64	В	15.4	0.67	
S 188 th St/I-5 NB Ramps	С	23.3	0.79	С	24.0	0.78	
Orillia Rd S/S 200 th St	C	32.2	0.77	С	21.6	0.78	
<u>Unsignalized</u>							
S 188 th St/Orillia Rd S	Α	4.0	NA	Α	5.7	NA	
Worst Movement	F	>120	SB	F	>120	SB	

	<u>PM</u>	Existing (2	<u>2006)</u>	PM Baseline (2011)		
Intersection	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
S 188 th St/Military Rd S	D	38.4	0.76	С	33.5	0.82
S 188 th St/I-5 SB Ramps	D	40.3	0.88	D	35.2	0.94
S 188 th St/I-5 NB Ramps	С	30.8	0.86	С	30.3	0.90
Orillia Rd S/S 200 th St	С	26.1	0.77	С	29.3	0.82
<u>Unsignalized</u>						
S 188 th St/Orillia Rd S	Α	4.2	NA	Α	6.4	NA
Worst Movement	F	>120	SB	F	>120	SB

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- 2. Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

As Table 5 shows, under future baseline conditions all signalized intersections are calculated to operate at LOS D or better. The unsignalized S 188th Street/Orillia Rd S (site access) intersection continues to operate at LOS A as a whole, with the southbound movement expected to continue to operate at LOS F during the weekday peak hours.

Table 6 provides a summary of the Saturday peak hour LOS results. Both existing and baseline conditions are provided for comparison purposes.

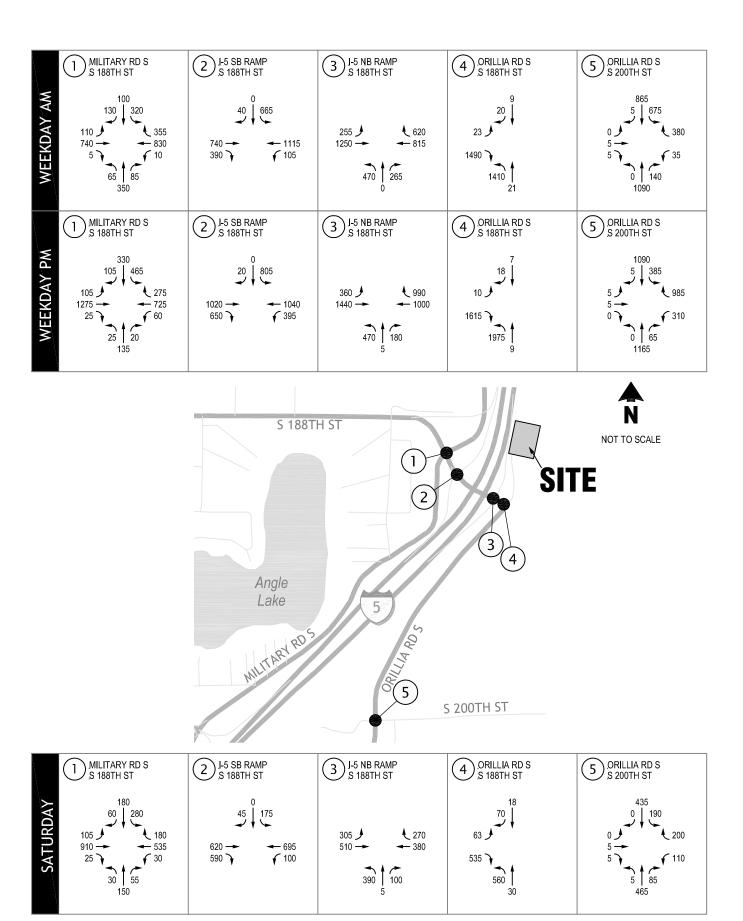








Table 6. 2011 Baseline LOS Summary: Saturday Peak Hour							
	<u>Exi</u>	sting (Sat. 2	006)	<u>Bas</u>	Baseline (Sat. 2011)		
Intersection	LOS¹	Delay ²	V/C³ or WM⁴	LOS	Delay	V/C or WM	
S 188 th St/Military Rd S	С	28.3	0.59	С	27.8	0.61	
S 188 th St/I-5 SB Ramps	В	10.9	0.39	Α	9.3	0.41	
S 188 th St/I-5 NB Ramps	В	15.7	0.51	В	16.4	0.54	
Orillia Rd S/S 200 th St	В	16.8	0.36	В	17.3	0.38	
<u>Unsignalized</u>							
S 188 th St/Orillia Rd S	Α	1.4	NA	Α	1.4	NA	
Worst Movement	В	13.2	SB	В	13.6	В	

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

As Table 6 shows, all intersections operate well during the Saturday peak hour.

Off-Site Traffic Queuing

This section of the report summarizes the calculated queuing between the study area intersections for the forecast baseline conditions. Queue calculations are summarized on S 188th Street for both the westbound and eastbound directions. On S 188th Street in the westbound direction queues are estimated to measure potential blocking between: Military Road S and I-5 NB Ramps, I-5 NB Ramps and I-5 SB Ramps, and I-5 SB Ramps and Orillia Road S (site access). In the eastbound direction queues are estimated to measure potential blocking between Orillia Road S and I-5 NB Ramps, I-5 NB Ramps and I-5 SB Ramps, as well as I-5 SB Ramps and Military Road S.

Table 7 compares the existing with future baseline calculated queues. Capacity between intersections is shown to help identify if there is blocking between intersections during baseline conditions.

Table 7. 2011 Baseline Intersection Queue Summary: Weekday AM and PM Peak Hours

	AM Peak Hour									
		95 th Percer	ntile² Queue	<u>Baseline</u>						
Direction/Intersection	Capacity ¹ (ft)	Existing (ft)	Baseline (ft)	Available Capacity?						
Westbound										
S 188 th St /Military Rd S	205	260	365	No						
S 188th St /I-5 SB Ramps	490	200	225	Yes						
S 188th St /I-5 NB Ramps	65	365	290	No						
Eastbound										
S 188 th St/Orillia Rd S	65	20	20	Yes						
S 188th St /I-5 NB Ramps	490	330	275	Yes						
S 188th St /I-5 SB Ramps	205	160	150	Yes						
		PM Peak Hour								
Westbound										
S 188th St /Military Rd S	205	245	230	No						
S 188th St /I-5 SB Ramps	490	230	365	Yes						
S 188th St /I-5 NB Ramps	65	600	620	No						
Eastbound										
S 188th St/Orillia Rd S	65	20	20	Yes						
S 188th St /I-5 NB Ramps	490	335	265	Yes						
S 188th St /I-5 SB Ramps	205	255	450	No						

As Table 7 shows, during AM and PM peak hour conditions, the queuing results are similar between existing and baseline conditions.

Distance between intersections. 95th percentile queue length in feet as reported by Synchro 6.0.

Future With-Project Conditions

This section highlights forecast traffic conditions with the proposed project. The results were compared to baseline traffic conditions to identify project impacts. A description of project trip generation, trip distribution, and future traffic operations with the proposed project is provided in this section.

Trip Generation

The Bow Lake Transfer/Recycling Station is an existing site with exiting traffic volumes. The methodology for estimating future traffic volumes is based on a linear increase of existing traffic volumes based on solid waste forecasts provided by the King County Solid Waste Division. The Solid Waste Division forecasts the total annual waste tonnage based on historic data and the expected development in economic activities and population growth. Factors influencing the waste tonnage being disposed are income, tip fees, number of jobs, service area population, household size, and the structure of the job market.

Based on econometric model forecasting done by the Solid Waste Division, it is estimated that the tonnage of solid waste disposal will increase by about 16 percent from year 2006 to 2011. It is assumed that traffic volumes accessing the site will increase at a linear rate. Thus, existing peak hour traffic volumes accessing the site will be increased by 16 percent to estimate the net new trips accessing the site by year 2011. Table 8 summarizes the estimated weekday AM and PM, and Saturday peak hour net new project traffic volumes.

Table 8. 2011 Trip Generation Estimate Summary									
	AM	AM Peak Hour PM Peak Ho					ır Sat. Peak Hour		
Land Use	Total	In	Out	Total	In	Out	Total	In	Out
Existing Traffic Volumes ¹	73	44	29	44	19	25	181	93	88
Increased by 16.0% ²	<u>85</u>	<u>51</u>	<u>34</u>	<u>51</u>	22	<u>29</u>	<u>210</u>	<u>108</u>	<u>102</u>
Total Net New Project Trips	12	7	5	7	3	4	29	15	14

^{1.} Based on existing year 2006 peak hour turning movement counts.

As Table 8 shows, by year 2011 there is expected to be 12 net new trips during the AM peak hour, 7 net new trips during the PM peak hour, and 29 net new trips during the Saturday peak hour. As this data shows, net new trips attracted to the site during the commuter peak hours is relatively low. Trips attracted to the site typically increase on weekends since this is the time period when residents (self-haul) have the opportunity to dispose of household waste.

These estimates are likely conservative, since no reduction to site truck volumes was applied due to the new preload compactor technology that will be used to load waste containers. In the short-term, this preload compactor application should reduce truck trips by 50 to 67 percent. In addition, the analysis is constructed to consider all growth

^{2.} Growth rate based on County econometric model forecasts.

traffic as, in effect, Net New Project Trips. Since there are no plans to close the transfer station site if the improvements are not made, this results in a systematic overestimate of the actual effect of the proposal on off-site traffic. However, the analysis is constructed this way to assure that potential impacts are not underestimated.

Project Trip Distribution/Assignment

Project trip distribution is based on existing site access traffic volumes and an origin/destination study summarized in an April 2004 report called "Waste Monitoring Program." Existing turning movement counts were used to identify existing distribution patterns at the site access (S 188th Street/Orillia Road S). Beyond the site access, trip distributions were assigned to roadways based on the origin/destination study. Project trip distribution is illustrated in Figures 4 and 5. As Figure 4 shows, distribution was distinctly different for inbound and outbound trips during the weekday AM and PM peak hours and trips were assigned accordingly. As Figure 5 illustrates, during the Saturday peak hour outbound trips tend to mirror inbound trips.

These differences between weekday and weekend traffic patterns are likely due to the difference in trip types. Weekday peak hour site traffic is going to tend to attract more commercial-haulers then self-haulers; and when commercial-haulers finish dumping solid waste many trucks likely continue community service routes other than where they originated. Whereas a weekend will have a higher concentration of self-haul trips (residents), and likely return home after they unload.

2011 Traffic Volume

The project-generated traffic was added to the baseline traffic volumes to obtain the with-project volumes for the study intersections illustrated in Figure 6. These are the volumes used to estimate project impacts in the operations analysis.

To characterize potential traffic volume impacts, with-project traffic volumes were compared to 2011 baseline volumes to determine the percent impact of project traffic on study intersections. Table 9 summarizes the project's peak hour contribution to total entering traffic volumes at the study intersections.

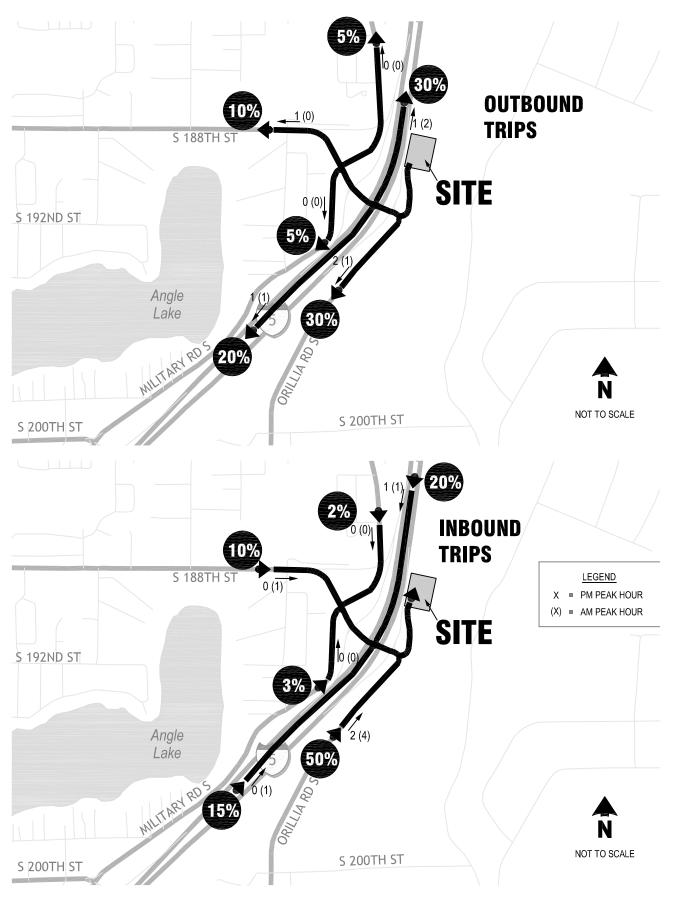
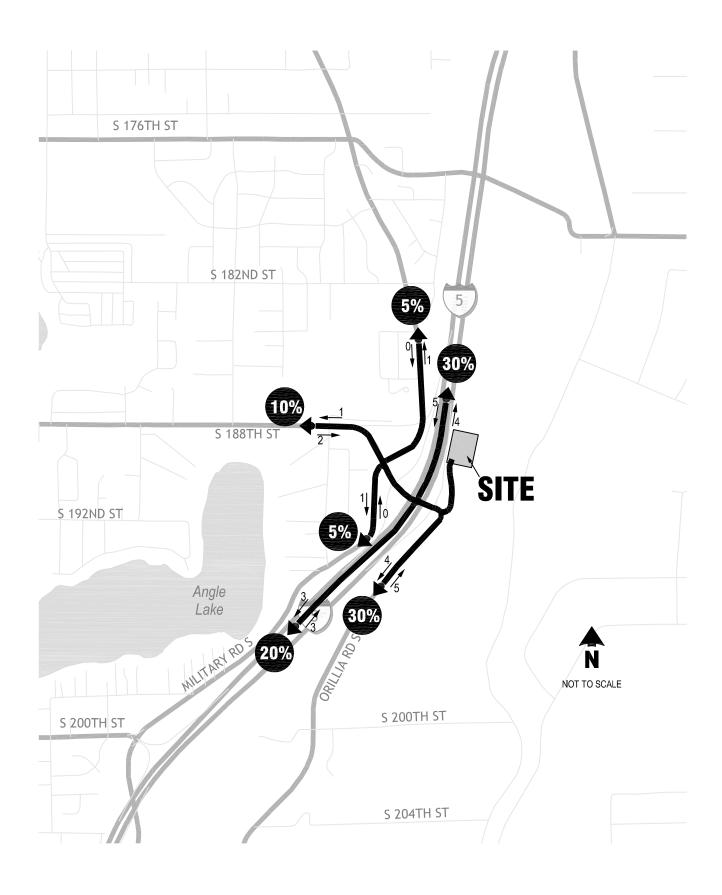




Figure 4
Project Trip Distribution and Assignment: Weekday Peak Hours
Bow Lake Transfer/Recycling Station



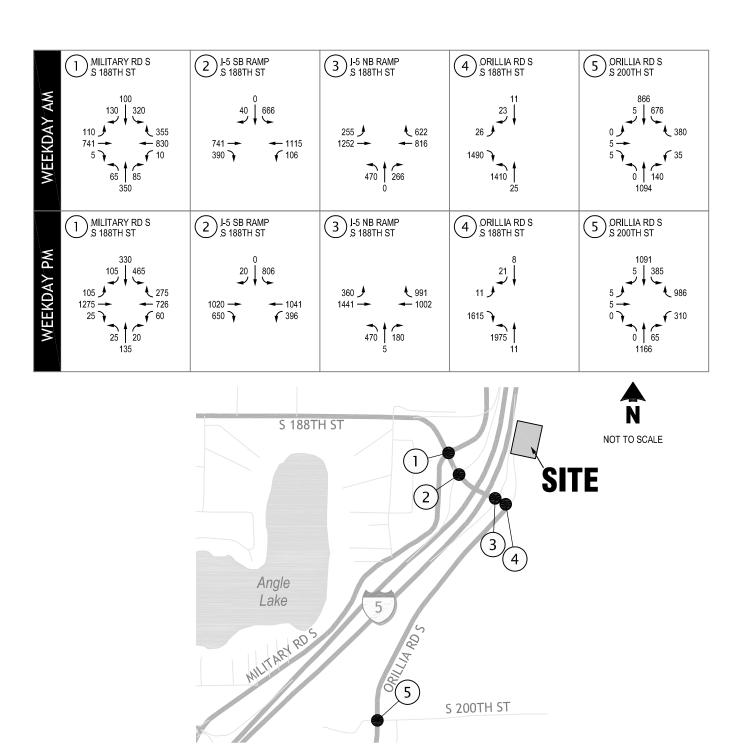








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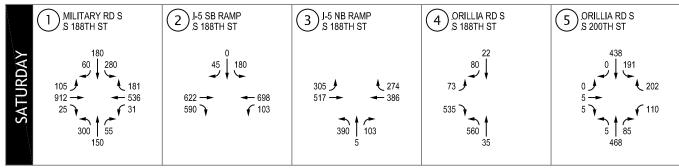




Figure 6
2011 With-Project AM and PM Weekday, and Sat. Volumes



Table 9. 2011 Proj	ect Traffic Volun	•							
<u>Intersection</u>	Intersection Total Entering Volume								
AM Peak Hour	2011 Baseline	Project Traffic	2011 With-Project	% Impact					
S 188th St/Military Rd S	3,100	1	3,101	>0.1					
S 188 th St/I-5 SB Ramps	3,055	3	3,058	0.1					
S 188 th St/I-5 NB Ramps	3,675	6	3,681	0.2					
S 188th St/Orillia Rd S	2,973	12	2,985	0.4					
Orillia Rd S/S 200 th St	3,200	6	3,206	0.2					
PM Peak Hour	2011 Baseline	Project Traffic	2011 With-Project	% Impact					
S 188 th St/Military Rd S	3,545	1	3,546	>0.1					
S 188 th St/I-5 SB Ramps	3,930	3	3,933	0.1					
S 188 th St/I-5 NB Ramps	4,445	4	4,449	0.1					
S 188th St/Orillia Rd S	3,634	7	3,641	0.2					
Orillia Rd S/S 200 th St	4,015	3	4,018	0.1					
Sat. Peak Hour	2011 Baseline	Project Traffic	2011 With-Project	% Impact					
S 188 th St/Military Rd S	2,540	5	2,545	0.2					
S 188th St/I-5 SB Ramps	2,225	13	2,238	0.6					
S 188th St/I-5 NB Ramps	1,960	20	1,980	1.0					
S 188 th St/Orillia Rd S	1,276	29	1,305	2.3					
Orillia Rd S/S 200 th St	1,500	9	1,509	0.6					

As Table 9 shows, during the AM and PM peak hours the expected increase in project-related traffic volumes will impact all study intersections by less than 1 percent. On Saturday project trips impact the site access driveway (188th Street/Orillia Road S) by about 2 percent. Project-related traffic volumes impact all remaining study intersections by less than 1 percent. Traffic volumes typically fluctuate about plus or minus 5 percent from day-to-day depending on factors such as the day of the week, weather, and traffic conditions elsewhere in the roadway network. Based on these results, it is unlikely that the average motorist would notice the forecast impact of increased site traffic volume. As noted above, even these impacts overstate the probable traffic impacts, since the waste stream forecasts are not dependent on the proposed action, and there are no plans to close the transfer station if the improvements are not made.

Traffic Operation Impacts

This section of the report summarizes with-project traffic operations at the study area intersections. The operations analysis section summarizes LOS calculations as well as off-site vehicle queuing. Baseline analysis results are provided to measure the degree of impact of project related traffic.

Level of Service

A LOS analysis was conducted for with-project conditions in order to quantify traffic operations in the study. The same HCM 2000 methodologies were applied and all intersection parameters such as channelization, intersection control, and signal timings were held consistent with those used in the evaluation of baseline conditions to measure

the degree of impact of the proposed project. With-project traffic operations forecasts are based on Figure 6 with-project traffic volumes. Table 10 summarizes the with-project LOS, baseline conditions are provided for comparison purposes. The detailed LOS worksheets are provided in Appendix B.

Table 10. 2011 With-Project LOS Summary: Weekday AM and PM Peak Hours							
	AM Baseline			AM With-Project			
Intersection	LOS¹	Delay²	V/C³ or WM⁴	LOS	Delay	V/C or WM	
S 188 th St/Military Rd S	D	46.7	1.03	D	46.6	1.03	
S 188th St/I-5 SB Ramps	В	15.4	0.67	В	15.4	0.67	
S 188 th St/I-5 NB Ramps	С	24.0	0.78	С	24.0	0.79	
Orillia Rd S/S 200 th St	С	21.6	0.78	С	21.7	0.79	
<u>Unsignalized</u>							
S 188 th St/Orillia Rd S	Α	5.7	NA	Α	8.1	NA	
Worst Movement	F	>120	SB	F	>120	SB	

	PM Baseline			PM With Project		
Intersection	LOS	Delay	V/C or WM	LOS	Delay	V/C or WM
S 188 th St/Military Rd S	С	33.5	0.82	С	33.5	0.82
S 188 th St/I-5 SB Ramps	D	35.2	0.94	D	35.3	0.94
S 188 th St/I-5 NB Ramps	С	30.3	0.90	С	30.4	0.90
Orillia Rd S/S 200 th St	С	29.3	0.82	С	29.3	0.82
<u>Unsignalized</u>						
S 188 th St/Orillia Rd S	Α	6.4	NA	С	22.2	NA
Worst Movement	F	>120	SB	F	>120	SB

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- 2. Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

As Table 10 shows, all of the study intersections are expected to remain at the same LOS as reported for baseline conditions during the weekday AM peak hour. During the PM peak hour, the overall operation of S 188th Street/Orillia Road S (site access) is expected to degrade from LOS A to LOS C. This change in LOS does not impact commuter traffic on S 188th Street. The change in LOS is due to the increased southbound delay at the site access, which results in increased delays for vehicles exiting the transfer station during the PM peak hour.

Table 11 provides a summary of the Saturday peak hour LOS results. Both baseline and with-project conditions are provided for comparison purposes.

	Baseline (Sat.)			With-Project (Sat.)		
Intersection	LOS¹	Delay ²	V/C³ or WM⁴	LOS	Delay	V/C or WM
S 188 th St/Military Rd S	С	27.8	0.61	С	27.8	0.61
S 188 th St/I-5 SB Ramps	Α	9.3	0.41	Α	9.4	0.41
S 188 th St/I-5 NB Ramps	В	16.4	0.54	В	16.5	0.54
Orillia Rd S/S 200th St	В	17.3	0.38	В	17.3	0.38
<u>Unsignalized</u>						
S 188th St/Orillia Rd S	Α	1.4	NA	Α	1.6	NA
Worst Movement	В	13.6	В	В	14.2	SB

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- 2. Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

As Table 11 shows, all study intersections are expected to continue to operate well on a Saturday peak hour when project related traffic volumes are added.

As previously described, while impacts are calculated to be negligible, they are likely an overstatement of probable traffic impacts, since no change in the waste stream would occur as a result of the project, nor are there plans to close the transfer station in the event the improvements are not constructed.

Off-Site Traffic Queuing

This section of the report summarizes the calculated queuing between the study area intersections for the with-project conditions. Similarly to baseline conditions, queue calculations are summarized on S 188th Street for both the westbound and eastbound directions. On S 188th Street in the westbound direction queues are estimated to measure potential blocking between: Military Road S and I-5 NB Ramps, I-5 NB Ramps and I-5 SB Ramps, and I-5 SB Ramps and Orillia Road S (site access). In the eastbound direction, queues are estimated to measure potential blocking between Orillia Road S and I-5 NB Ramps, I-5 NB Ramps and I-5 SB Ramps, as well as I-5 SB Ramps and Military Road S.

Table 12 provides a summary of the with-project queue calculations. The baseline queue calculations are provided for comparison purposes to measure the project impacts on queues.

Table 12. 2011 With-Project Intersection Queue Summary: Weekday AM and PM Pk Hours								
			AM Peak Hour					
			95 th Perce	ntile² Queue	With-Project			
Direction/In	Direction/Intersection Capacity¹ (ft)		rection/Intersection Capacity¹ (ft)		'Intersection <u>Capacity' (ft)</u> <u>Baseline (ft)</u> With-Project (f		With-Project (ft)	Available Capacity?
Westbound	ilitany Pd S	205	365	365	No			

		95 Perce	illie Queue	with-Project
Direction/Intersection	Capacity ¹ (ft)	Baseline (ft)	With-Project (ft)	Available Capacity?
Westbound				
S 188 th St /Military Rd S	205	365	365	No
S 188th St /I-5 SB Ramps	490	225	225	Yes
S 188th St /I-5 NB Ramps	65	290	290	No
Eastbound				
S 188th St/Orillia Rd S	65	20	20	Yes
S 188th St /I-5 NB Ramps	490	275	275	Yes
S 188 th St /I-5 SB Ramps	205	150	155	Yes
		PM Peak Hour		

PM Peak Hour							
Westbound							
S 188th St /Military Rd S	205	230	230	No			
S 188th St /I-5 SB Ramps	490	365	365	Yes			
S 188th St /I-5 NB Ramps	65	620	625	No			
Eastbound							
S 188 th St/Orillia Rd S	65	20	20	Yes			
S 188th St /I-5 NB Ramps	490	265	265	Yes			
S 188th St /I-5 SB Ramps	205	450	450	No			

Distance between intersections.

As Table 12 shows, during the AM and PM peak hour the queuing results are similar for future baseline and with-project conditions. Since the forecast project related traffic volumes are relatively low, the impacts of the proposed transfer station improvements to local queuing issues is expected to be negligible.

Concerns have been expressed with regard to added queuing from the transfer station further backing-up and inhibiting traffic on the southbound approach to S 188th Street at Orillia Road (transfer station exit). As noted in the analysis, this is an unsignalized approach to an arterial that operates at LOS F with average weekday peak hour delays in excess of 2 minutes, and will do so in the future with or without the growth increment added by the continued operation of the transfer facility. The minimal impact of this growth is reflected throughout the LOS and queuing analysis herein. The proposed action itself will result in no impact to these conditions, especially for outbound traffic, since the waste stream expected at the site is forecast to grow at approximately 2 percent annually with or without the project, and there are no plans to close the transfer station. Even with no transfer station and potential development to the north, delays would be very significant for any new development traffic.

Safety Impacts

As was illustrated in Table 9 (2011 Project Traffic Volume Impacts), this project is expected to increase the volumes by less than 1 percent during the weekday AM and PM

⁹⁵th percentile queue length in feet as reported by Synchro 6.0.

peak hours. As such, it is unlikely this project will impact safety conditions at the study intersections.

Year 2030 Planning Analysis

To support longer-range planning, a traffic analysis is also provided for the 2030 horizon year. This is consistent with the Master Plan for the Transfer Station. This section summarizes the traffic volumes for both baseline (without) and with-project conditions. Also, a future 2030 LOS analysis is provided of future baseline and with-project conditions.

Baseline Traffic Volumes

Forecast traffic volumes were established for year 2030 by increasing existing (2006) traffic volumes at an annual rate of 1 percent. This is based on information from the regional forecasting model. The 2030 baseline traffic volumes are provided in Figure 7.

Trip Generation

Based on waste tonnage forecasts provided by King County Solid Waste, year 2030 new project trips were estimated. Waste tonnage is forecast to increase from year 2006 to year 2030 at an annual rate of approximately 2 percent. It is assumed that traffic volumes accessing the site will increase at a linear rate. Thus, existing (2006) PM peak hour traffic volumes accessing the site were increased by 2 percent annually to estimate year 2030 net new project trips. Table 13 summarizes the estimated weekday PM peak hour net new project traffic volumes.

Table 13. Trip Generation Estimate Summary (Year 2030)						
	PM Peak Hour					
Land Use	Total	ln	Out			
Existing Traffic Volumes ¹	44	19	25			
Increased by 2.0% Annually ²	<u>71</u>	<u>31</u>	<u>40</u>			
Total Net New Project Trips	27	12	15			

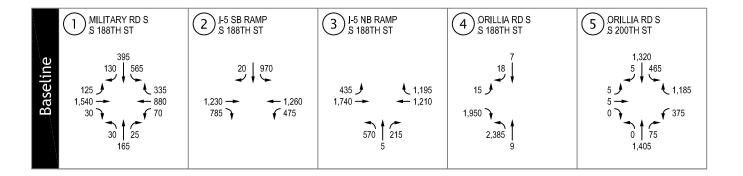
^{1.} Based on existing year 2006 peak hour turning movement counts.

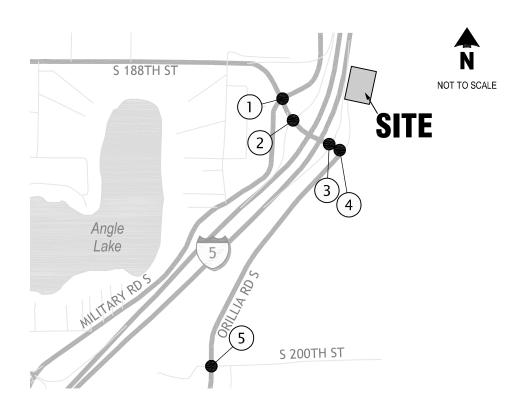
As Table 13 shows, by year 2030 the project is forecast to generate 27 net new weekday PM peak hour trips. As described in the analysis of 2011 conditions, these net new totals actually overstate the effect of project traffic, since there is no anticipated change in the waste stream arriving at Bow Lake Transfer/Recycling Station due to the proposal.

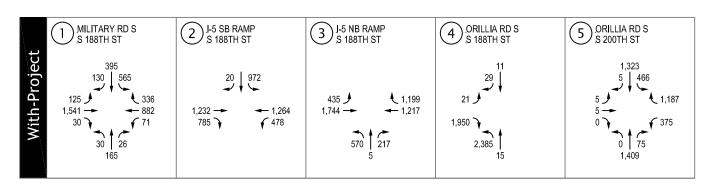
With-Project Traffic Volumes

The project-generated weekday PM peak hour traffic (Table 13) was added to the baseline traffic volumes to obtain the with-project volumes for the study intersections illustrated in Figure 7. These are the volumes used to estimate project impacts in the operations analysis under 2030 forecast conditions.

^{2.} Growth rate based on County waste tonnage forecasts.













Traffic Operations

A LOS analysis was conducted for year 2030 to quantify forecast traffic operations for both baseline and with-project conditions. The LOS is based on the same HCM methodologies used in the previous analysis. Signal timing was optimized to account for the expected growth in traffic volumes. The optimized signal timing data used to estimate baseline conditions was held constant for the evaluation of with-project conditions to measure the degree of impact of project volumes on study intersections. Table 14 summarizes the baseline and with-project LOS for 2030. The detailed LOS worksheets are provided in Appendix B.

Table 14. 2030 With-Project and Baseline LOS Summary: Weekday PM Peak Hour						
	PM Baseline (2030)			PM With-Project (2030)		
Intersection	LOS¹	Delay ²	V/C³ or WM⁴	LOS	Delay	V/C or WM
S 188 th St/Military Rd S	D	48.7	0.97	D	49.1	0.97
S 188 th St/I-5 SB Ramps	E	56.5	1.12	E	58.5	1.13
S 188 th St/I-5 NB Ramps	E	67.0	1.14	E	67.9	1.14
Orillia Rd S/S 200th St	D	49.2	0.97	D	49.5	D
<u>Unsignalized</u>						
S 188 th St/Orillia Rd S	С	16.2	NA	D	25.4	NA
Worst Movement	F	>120	SB	F	>120	SB

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- 2. Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

As Table 14 shows, during the PM peak hour the overall operation of S 188th Street/Orillia Road S (site access) is expected to degrade from LOS C to LOS D. This change in LOS does not impact commuter traffic on S 188th Street. The change in LOS is due to the increased southbound delay at the site access, which results in increased delays for vehicles exiting the transfer station during the PM peak hour. Project traffic volumes have a negligible impact on all remaining study intersections under 2030 conditions. As noted above, even these negligible impacts are an overestimate of actual impacts. The approach taken was intentionally conservative and assures impacts are not underestimated.

Off-Site Traffic Queuing

Similar to previous queue calculation summaries, this section of the report summarizes the calculated queues between the study area intersections. Table 15 provides a summary of the forecast queuing under baseline conditions compared to the with-project conditions.

Table 15. Intersection Queue Summary: 2030 Baseline and With-Project

PM Peak Hour							
	95 th Percentile ² Queue						
Direction/Intersection	Capacity ¹ (ft)	2030 Baseline (ft) ³	2030 With-Project (ft)				
Westbound							
S 188th St /Military Rd S	205	315	315				
S 188 th St /I-5 SB Ramps	490	520	525				
S 188 th St /I-5 NB Ramps	65	1,105	1,115				
Eastbound							
S 188 th St/Orillia Rd S	65	325	330				
S 188th St /I-5 NB Ramps	490	605	605				
S 188 th St /I-5 SB Ramps	205	800	805				

- Distance between intersections.
- 95th percentile queue length in feet as reported by Synchro 6.0.
 Baseline conditions include the volumes from the proposed Tukwila South Project.

As Table 15 shows, by year 2030 capacity between all intersections is expected to be exceeded assuming no capacity improvement projects occur. The addition of the Bow Lake with-project future traffic volume has a negligible impact on queuing along the S 188th Street corridor. Most of the forecast queuing is the result of background traffic volume unrelated to the project site. As previously described, these impacts are an overstatement of actual impacts.

Cumulative Analysis With Tukwila South Project

The purpose of this section is to analyze a future conditions scenario that includes the forecast traffic volumes from the proposed Tukwila South Project (La Pianta, LLC). Tukwila South is proposing development of up to approximately 14 million square feet in a large-scale, campus setting on approximately 498 contiguous acres. Proposed uses are office, research, commercial, retail, residential, hotel, and recreational. Tukwila South proposes three access points with the regional roadway system. The proposed access points are at S 180th Street/South Center Parkway, S 180th Street/Andover Park W, and S 200th Street/Frager Road S. Sixty percent of the Tukwila South traffic is forecast to access the site through the S 200th Street/Frager Road S intersection. From this location, 20 percent of the Tukwila South traffic is forecast to travel on Orillia Road S between S 200th Street and S 188th Street. Tukwila South evaluates the interim year of 2015 and the full-build out year of 2030.

This section of the report summarizes a baseline forecast condition that includes the Tukwila South traffic volumes. The project-generated traffic volumes are added to the baseline (with Tukwila South) volumes to estimate with-project impacts when Tukwila South volumes are included in the background traffic. The Tukwila South Project traffic volumes and data used in this analysis are derived from the Tukwila South Project DEIS (April 2005).

Baseline 2011 Volumes with Tukwila South

Baseline traffic volumes (without Bow Lake new trips) were developed that included the Tukwila South Alternative 1 year 2015 weekday PM peak hour volumes. During this time period, Tukwila South is forecast to generate a total of 3,727 (1,192 in/2,535 out) weekday PM peak hour trips. Of these PM peak hour trips, 745 (20%) are forecast to travel on Orillia Road S between S 188th Street and S 200th Street. These trips were assigned to the roadway network based on the distributions provided in the Tukwila South DEIS.

Only weekday PM peak hour is evaluated since this is typically the time period with highest adjacent street traffic volumes and it is the only time period that was analyzed by Tukwila South in its DEIS. Year 2011 future volumes were estimated by increasing the existing (2006) traffic volume by 1 percent annually and adding the Tukwila South weekday PM peak hour traffic volumes. The 2011 with baseline (with Tukwila South) weekday PM peak hour traffic volumes are summarized in Figure 8.

Tukwila South Planned Improvement Projects

The Tukwila South Project DEIS year 2015 analysis has no planned improvements for the Bow Lake Study intersections. Thus, there are roadway improvements assumed for the traffic operations analysis.

2011 With-Project Traffic Volumes

The project-generated weekday PM peak hour traffic (Table 8) was added to the baseline (with Tukwila South) traffic volumes to obtain the with-project volumes for the study intersections illustrated in Figure 8. These are the volumes used to estimate project impacts in the operations analysis when the Tukwila South project traffic volumes are assumed on the roadway system.

2011 Traffic Operation Impacts

This section of the report summarizes the baseline (with Tukwila South) and with-project (Bow Lake) traffic operations at the study intersections. The operations analysis section summarizes LOS calculations as well as off-site vehicle queuing.

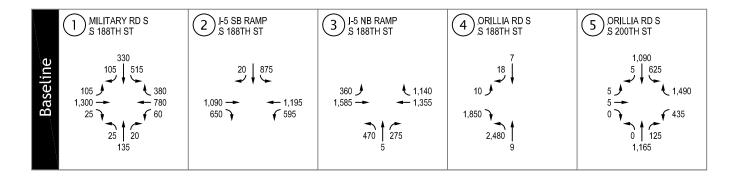
Level of Service

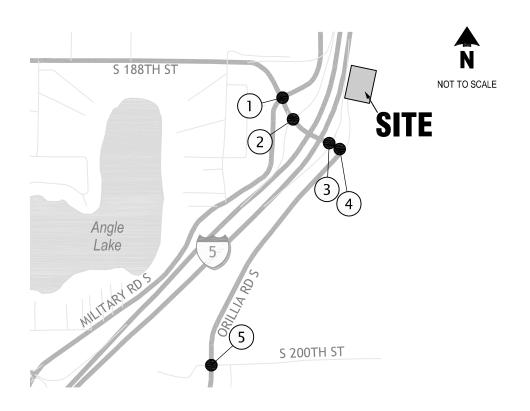
A LOS analysis was conducted for baseline (with Tukwila South) and with-project conditions in order to quantify traffic operations in the study area. For future baseline conditions, cycle lengths remained consistent with existing conditions; the splits were optimized within the max/min parameters on the existing timing plans. Signal timings were held consistent with those used in the evaluation of baseline conditions to measure the degree of impact of the proposed Bow Lake Project. Table 16 summarizes the baseline (with Tukwila South) and with-project (Bow Lake) conditions. The detailed LOS worksheets are provided in Appendix B.

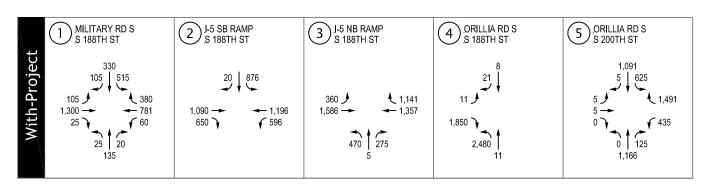
Table 16. 2011 With-Project and Baseline (Tukwila South) LOS Summary: PM Peak Hour									
	20	11 PM Basel	<u>ine</u>	2011	2011 PM With-Project				
Intersection	LOS¹	Delay²	V/C³ or WM⁴	LOS	Delay	V/C or WM			
S 188 th St/Military Rd S	С	34.8	0.83	С	34.8	0.83			
S 188 th St/I-5 SB Ramps	E	61.8	1.13	E	62.0	1.13			
S 188 th St/I-5 NB Ramps	E	55.4	1.11	E	55.6	1.11			
Orillia Rd S/S 200 th St	F	90.1	1.06	F	90.3	1.06			
<u>Unsignalized</u>									
S 188 th St/Orillia Rd S	С	16.3	NA	С	18.6	NA			
Worst Movement	F	>120	SB	F	>120	SB			

- 1. Level of service, based on 2000 Highway Capacity Manual methodology.
- Average delay in seconds per vehicle.
- 3. Volume-to-capacity ratio reported for signalized intersections.
- 4. Worst movement reported for unsignalized intersections.

As Table 16 shows, with the inclusion of the Tukwila South Project in the baseline traffic volumes, the Bow Lake project traffic volumes are expected to have an insignificant impact on calculated level of service. The roadways are expected to operate essentially the same with or without Bow Lake traffic volumes.











Off-Site Traffic Queuing

Similar to previous queue calculation summaries, this section of the report summarizes the calculated queuing between the study area intersections. Table 17 provides a summary of the forecast queuing under baseline conditions that include the Tukwila South traffic volumes, compared with the with-project (Bow Lake) conditions.

Table 17.	2011 Intersection Queue Summary: Weekday PM Peak Hours
-----------	--

PM Peak Hour										
95 th Percentile ² Queue										
Direction/Intersection	Capacity¹ (ft)	Baseline (ft) ³	With-Project (ft)							
Westbound										
S 188 th St /Military Rd S	205	260	260							
S 188 th St /I-5 SB Ramps	490	510	515							
S 188 th St /I-5 NB Ramps	65	865	865							
Eastbound										
S 188 th St/Orillia Rd S	65	255	255							
S 188th St /I-5 NB Ramps	490	540	540							
S 188 th St /I-5 SB Ramps	205	550	550							

- 1. Distance between intersections.
- 2. 95th percentile queue length in feet as reported by Synchro 6.0.
- 3. Baseline conditions include the volumes from the proposed Tukwila South Project.

As Table 17 shows, the addition of the Bow Lake with-project future traffic volume has a negligible impact on queuing along the S 188th Street corridor.

Baseline 2030 Volumes with Tukwila South

Baseline traffic volumes (without Bow Lake new trips) were developed that included the Tukwila South Alternative 1 year 2030 weekday PM peak hour volumes. During this time period Tukwila South is forecast to generate a total of 13,975 (4,304 in/9,671 out) weekday PM peak hour trips. Of these PM peak hour trips 2,795 (20%) are forecast to travel on Orillia Road S between S 188th Street and S 200th Street. These trips were assigned to the roadway network based on the distributions provided in the Tukwila South DEIS.

Only weekday PM peak hour is evaluated since this is typically the time period with highest adjacent street traffic volumes and it is the only time period analyzed by Tukwila South. Year 2030 future volumes were estimated by increasing the existing (2006) traffic volume by 1 percent annually and adding the Tukwila South weekday PM peak hour traffic volumes. The 2030 with baseline (with Tukwila South) weekday PM peak hour traffic volumes are summarized in Figure 9.

Tukwila South Planned Improvement Projects

The Tukwila South Project DEIS year 2030 analysis proposes improvement projects at three study intersections. The proposed improvements are as follows:

- **S 188th Street/I-5 SB Ramps:** Provide an additional westbound left-turn lane for dual lefts and an additional eastbound right-turn lane for dual rights. Rechannelize the southbound leg for dual left-turn lanes and a thru-right lane.
- **S 188**th **Street/I-5 NB Ramps:** Provide dual westbound right-turn lanes. Rechannelize the northbound leg for dual left-turn lanes, a thru-right lane and a right-turn lane.
- Orillia Road S/S 200th Street: Provide double westbound (WB) left-turn lanes, an additional northbound thru lane for three thru lanes, and a northbound rightturn only lane.

These projects were assumed as a baseline condition for the 2030 analysis.

2030 With-Project Traffic Volumes

The project-generated weekday PM peak hour traffic (Table 13) was added to the baseline (with Tukwila South) traffic volumes to obtain the with-project volumes for the study intersections illustrated in Figure 9. These are the volumes used to estimate project impacts in the operations analysis when the Tukwila South project traffic volumes are assumed on the roadway system.

2030 Traffic Operation Impacts

This section of the report summarizes the baseline (with Tukwila South) and with-project (Bow Lake) traffic operations at the study intersections. The operations analysis section summarizes LOS calculations as well as off-site vehicle queuing.

Level of Service

A LOS analysis was conducted for year 2030 to quantify forecast traffic operations for both baseline (with Tukwila South) and with-project (Bow Lake) conditions. The LOS is based on the same HCM methodologies used in the previous analysis. Signal timing was optimized to account for the expected growth in traffic volumes. Cycle lengths were limited to between 60 and 130 seconds for this planning analysis as a reasonable limit for optimization of the 2030 baseline conditions. The proposed intersections projects at the three study intersections were also coded into the model for both baseline and with-project conditions.

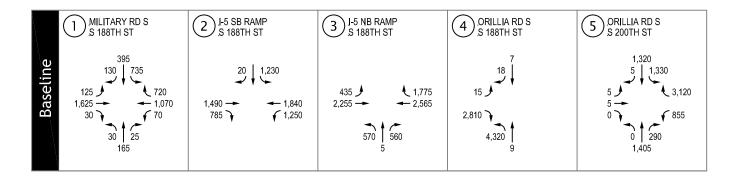
The optimized signal timing data used to estimate baseline conditions was held constant for the evaluation of with-project conditions to measure the degree of impact of project volumes on study intersections. Table 18 summarizes the baseline and with-project level of service for 2030, assuming the Tukwila South Project traffic volumes. The detailed LOS worksheets are provided in Appendix B.

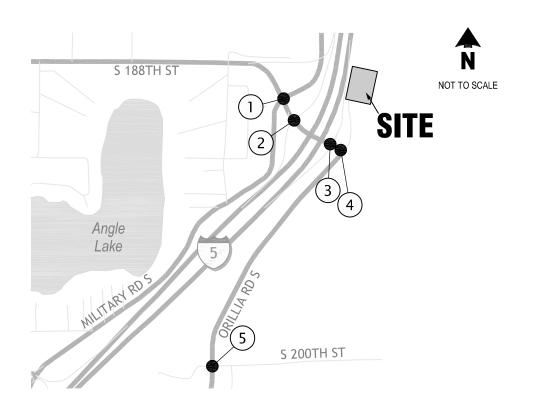
Table 18. 2030 With-Project and Baseline (Tukwila South) LOS Summary: PM Peak Hour

	<u>PM</u>	Baseline (20	<u>)30)</u>	PM With-Project (2030)			
Intersection	LOS¹	Delay ²	V/C³ or WM⁴	LOS	Delay	V/C or WM	
S 188 th St/Military Rd S	D	53.2	0.98	D	53.3	0.98	
S 188 th St/I-5 SB Ramps	F	>120	1.40	F	>120	1.41	
S 188 th St/I-5 NB Ramps	F	104.4	1.32	F	105.3	1.32	
Orillia Rd S/S 200 th St	F	>120	1.59	F	>120	1.59	
<u>Unsignalized</u>							
S 188 th St/Orillia Rd S	В	11.7	NA	С	20.1	NA	
Worst Movement	F	>120	SB	F	>120	SB	

- Level of service, based on 2000 Highway Capacity Manual methodology.
- Average delay in seconds per vehicle.
- Volume-to-capacity ratio reported for signalized intersections. Worst movement reported for unsignalized intersections.

As Table 18 shows, with the inclusion of the Tukwila South in the baseline traffic volumes, the Bow Lake project traffic volumes are expected to have an insignificant impact on calculated LOS. The roadways are expected to operate essentially the same with or without Bow Lake traffic volumes.





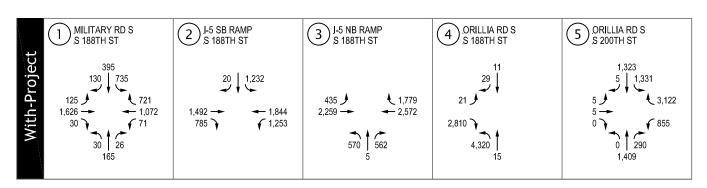




Figure 9 2030 With-Project and Baseline (with Tukwila south) PM Peak Hour Traffic Volumes **Transpo** Bow Lake Transfer/Recycling Station

Off-Site Traffic Queuing

Similar to previous queue calculation summaries, this section of the report summarizes the calculated queues between the study area intersections. Table 19 provides a summary of the forecast queuing under baseline conditions that include the Tukwila South traffic volumes, compared with the with-project (Bow Lake) conditions.

Table 19. 2030 Intersection Queue Summary: Weekday PM Peak Hours

PM Peak Hour										
95th Percentile ² Queue										
Direction/Intersection	Capacity¹ (ft)	Baseline ³ (ft)	With-Project (ft)							
Westbound										
S 188th St /Military Rd S	205	260	260							
S 188 th St /I-5 SB Ramps	490	450	450							
S 188 th St /I-5 NB Ramps	65	1680	1685							
Eastbound										
S 188 th St/Orillia Rd S	65	350	350							
S 188 th St /I-5 NB Ramps	490	865	870							
S 188 th St /I-5 SB Ramps	205	900	905							

- 1. Distance between intersections.
- 2. 95th percentile queue length in feet as reported by Synchro 6.0.
- 3. Baseline conditions include the volumes from the proposed Tukwila South Project.

As Table 19 shows, the addition of the Bow Lake with-project future traffic volume has a negligible impact on queuing along the S 188th Street corridor. When compared to Table 17, the intersection of S 188th Street/I-5 SB Ramps shows shorter queue lengths under 2030 conditions when compared to the 2011 results. This is due to the proposed improvements at S 188th Street/I-5 SB Ramps under the 2030 analysis.

Mitigation Measures

Based on the identified negligible impacts, no mitigation measures were identified. The negligible impacts are a result of the low volume of new site-generated traffic volume when compared to the TEV of traffic at the study intersections. During the weekday AM peak hour, site-generated future new traffic volume impacts the study intersections total traffic volume with a range of 0.1 to 0.4 percent. During the weekday PM peak hour, site-generated future new traffic volume impacts the study intersections total traffic volume with a range of 0.1 to 0.2 percent. As these results show, during peak commuter travel times the future new site-generated trips comprise a very small part of the traffic stream. The transfer station generates the highest traffic volumes on a Saturday, which coincides with the lowest volume of traffic volumes on the adjacent streets. During the Saturday peak hour, site-generated future new traffic volume impacts the study intersections total traffic volume with a range of 0.2 to 2.3 percent; the 2.3 percent is at the site access. Traffic volumes typically fluctuate about plus or minus 5 percent from day-to-day depending on factors such as the day of the week, weather, and traffic conditions elsewhere in the roadway network. Based on these results, it is unlikely that the average motorist would notice the forecast impact of increased site-generated traffic volume. These conclusions are also verified through the LOS analysis. In addition, even the negligible increases due to the site are an overstatement of actual impacts, since there is no probable difference in site traffic demand anticipated between the proposal and "no action."

Under year 2011, four of the study intersections experienced no LOS change when comparing baseline to with-project conditions. Level of service calculations show that the calculated delay is expected to change by less than 0.1 seconds at the four intersections. Only the intersection of S 188th Street/Orillia Road S (site access) experienced changes in LOS during the PM peak hour. During the weekday AM peak hour, S 188th Street/Orillia Road S operates at LOS A under both baseline and withproject conditions. During the weekday PM peak hour, S 188th Street/Orillia Road S changes from LOS A under baseline conditions to LOS C under with-project conditions. The southbound approach operates at LOS F under both weekday AM and PM conditions. As noted in the foregoing analysis, S 188th Street/Orillia Road S is an unsignalized approach to an arterial that operates at LOS F with average weekday peak hour delays in excess of 2 minutes, and will do so in the future with or without the growth increment added by the continued operation of the transfer facility. The proposed action itself will result in <u>no impact</u> to these conditions, especially for outbound traffic, since the waste stream expected at the site is forecast to grow at approximately 2 percent annually with or without the project, and there are no plans to close the transfer station. Even without a transfer station and potential development to the north, delays would be very significant for any new development traffic.

Appendix A: Level Of Service Criteria

Highway Capacity Manual, 2000

Signalized intersection level of service (LOS) is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table 1 shows LOS criteria for signalized intersections, as described in the *Highway Capacity Manual* (Transportation Research Board, Special Report 209, 2000).

ble 1. I	evel of Service Criteria f	or Signalized Intersections							
Level of Service	Average Control Delay (sec/veh)	General Description (Signalized Intersections)							
Α	≤10	Free Flow							
В	>10 - 20	Stable Flow (slight delays)							
С	>20 - 35	Stable flow (acceptable delays)							
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)							
E	>55 - 80	Unstable flow (intolerable delay)							
F	>80	Forced flow (jammed)							

Unsignalized intersection LOS criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way, stop-controlled intersection LOS is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way, stop-controlled intersection LOS is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way, stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall. For this reason, LOS for a two-way, stop-controlled intersection is defined in terms of its individual movements. With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way, stop-controlled intersection should be viewed with discretion. Table 2 shows LOS criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

Table 2.	Level of Service C	teria for Unsignalized Intersections						
L	evel of Service	Average Control Delay (sec/veh)						
	Α	0 - 10						
	В	>10 - 15						
	С	>15 - 25						
	D	>25 - 35						
	E	>35 - 50						
	F	>50						

Appendix B: Level of Service Worksheets

	_#		*	✓	←	€	4	7	4	√	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	117	783	2	12	879	374	68	460	337	243	
v/c Ratio	0.69	0.52	0.00	0.08	0.80	0.57	0.41	1.43	0.65	0.80	
Control Delay	57.3	18.5	12.0	46.5	25.4	9.5	41.8	237.7	37.6	44.3	
Queue Delay	0.0	0.3	0.0	0.0	14.7	2.4	0.0	2,0	0.0	0,0	
Total Delay	57.3	18.8	12.0	46.5	40.1	11.9	41.8	239.7	37.6	44.3	
Queue Length 50th (ft)	58	133	0	5	170	52	33	~319	86	91	
Queue Length 95th (ft)	#134	242	5	m12	261	64	72	#500	132	#219	
Internal Link Dist (ft)		436			107		431			246	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	170	1516	679	169	1097	658	169	322	537	302	
Starvation Cap Reductn	0	0	0	0	218	169	0	0	Ó	0	
Spillback Cap Reductn	0	249	0	0	0	0	0	1	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.69	0.62	0.00	0.07	1,00	0.76	0.40	1.43	0.63	0.80	

[~] Volume exceeds capacity, queue is theoretically infinite.

	_#	-	•	✓	4	۲	4	1	/	Ĺ	4	✓
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	^	7	ħ	ተተ	7	ሻ	Z.		ايراير	ă	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.92	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1,00	0.95	1.00		0.95	0.98	
Satd. Flow (prot)	1703	3406	1524	1687	3374	1509	1687	1509		3070	1448	
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1,00	
Satd. Flow (perm)	1703	3406	1524	1687	3374	1509	1687	1509		3070	1479	
Volume (vph)	105	705	2	11	791	337	61	335	79	303	95	123
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	783	2	12	879	374	68	372	88	337	106	137
RTOR Reduction (vph)	0	0	1	0	0	171	0	10	0	0	39	0
Lane Group Flow (vph)	117	783	1	12	879	203	68	450	0	337	204	0
Heavy Vehicles (%)	6%	6%	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	6.3	28.9	28.9	1.5	24.2	24.2	5.0	15.7		11.9	33.5	
Effective Green, g (s)	8.0	30.7	30.7	2.2	24.9	24.9	6.7	17.6		13.5	35.1	
Actuated g/C Ratio	0.10	0.38	0.38	0.03	0.31	0.31	0.08	0.22		0.17	0.44	a a comment
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	170	1307	585	46	1050	470	141	332		518	645	
v/s Ratio Prot	c0.07	0.23		0.01	c0.26		0.04	c0.30		c0.11	0.05	
v/s Ratio Perm			0.00			0.13					0.09	
v/c Ratio	0.69	0.60	0.00	0.26	0.84	0.43	0.48	1.36		0.65	0.32	
Uniform Delay, d1	34.8	19.7	15.2	38.1	25.7	21.9	35.0	31.2		31.0	14.6	
Progression Factor	1.00	1.00	1.00	1.36	0.79	0.82	1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.4	2.0	0.0	2.6	6.8	2.5	2.6	178.3		2.9	0.3	
Delay (s)	55.2	21.8	15.2	54.4	27.1	20.4	37.6	209.5		34.0	14.9	
Level of Service	E	C	В	D	C	င	D	F		С	В	
Approach Delay (s)		26.1			25.4		187.4				26.0	
Approach LOS	enikaj ji	С			С		F.				С	
Intersection Summary												
HCM Average Control E			51.8	F	ICM Le	vel of S	ervice		D			
HCM Volume to Capaci	ty ratio		0.92									
Actuated Cycle Length (80.0			ost time			16.0			
Intersection Capacity Ut	tilization		63.3%	1	CU Lev	el of Se	rvice		В			
Analysis Period (min) c Critical Lane Group			15									

1: S 188th St & Millitary Rd

Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues

2006 Existing Weekday AM

	-	•	V	←	>	↓	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	767	402	108	1154	383	346	
v/c Ratio	0.48	0.43	0.32	0.57	0.77	0.69	
Control Delay	16.4	4.0	14.9	11.1	36.1	31.3	Country to a surface of a consequence of the control of the contro
Queue Delay	0.5	0.8	0.0	1.9	0.1	0.6	
Total Delay	16.9	4.8	14.9	13.0	36.3	31.9	
Queue Length 50th (ft)	154	16	22	133	184	156	
Queue Length 95th (ft)	m160	m39	m38	198	247	215	
Internal Link Dist (ft)	107			326		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	1610	930	371	2021	665	664	
Starvation Cap Reductn	432	268	0	176	0	0	
Spillback Cap Reductn	0	0	0	668	23	97	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.65	0.61	0.29	0.85	0.60	0.61	
Intersection Summary							

	≯	-	•	•	4	•	4	†	~	-	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተ	7*	¥	ተተ					ሻ	€	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	190
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.02 Throad San Lon
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00				200-21120-00-00-00	1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	
Satd. Flow (prot)		3374	1509	1656	3312					1715	1698	
Flt Permitted		1.00	1.00	0.25	1.00					0.95	0.96	
Satd. Flow (perm)		3374	1509	439	3312					1715	1698	
Volume (vph)	0	706	370	99	1062	0	0	0	0	632	0	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	767	402	108	1154	0	0	0	0	687	0	42
RTOR Reduction (vph)	0	0	216	0	0	0	0	0	0	0	7	C
Lane Group Flow (vph)	0	767	186	108	1154	0	0	0	0	383	339	C
Heavy Vehicles (%)	7%	7%	7%	9%	9%	9%	9%	9%	9%	0%	0%	0%
Turn Type			Perm	ta+ma						Perm		
Protected Phases		2	Amarkatikan	1	6	.P.6171966JP6501				100 (8-74,000)	8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		36.1	36.1	47.8	47.8					22.2	22.2	32-65/69/02/02/02
Effective Green, g (s)		37.1	37.1	48.8	48.8					23.2	23.2	
Actuated g/C Ratio		0.46	0.46	0.61	0.61		Spirate Trabadystes			0.29	0.29	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	49284519333
Lane Gro Cap (vph)		1565	700	385	2020		7.10			497	492	
v/s Ratio Prot		0.23	WASHINGTON TO SERVICE STATES	0.03	c0.35					1007 803 8180 8100 1		
v/s Ratio Perm			0.12	0.14						c0.22	0.20	
v/c Ratio		0.49	0.27	0.28	0.57					0.77	0.69	
Uniform Delay, d1		14.9	13.1	7,7	9.3					26.0	25.2	
Progression Factor		0.91	1.18	1.63	0.97					1.00	1.00	ASSESSED FOR
Incremental Delay, d2		0.9	0.7	0.2	0.7					7.3	4.0	
Delay (s)		14.4	16.3	12.7	9.7					33.2	29.2	
Level of Service		В	В	В	A					°.c	- C	
Approach Delay (s)		15.1	restrou us tan ger	an and the second	10.0			0.0			31.3	.863850002548
Approach LOS		В			A			A			Č.C.	
Intersection Summary												
HCM Average Control D	elay		16.8	F	ICM Lev	el of Se	rvice		В			
HCM Volume to Capacity	y ratio		0.64		,							
Actuated Cycle Length (s	s)		80.0	S	um of lo	st time	(s)		8.0			
Intersection Capacity Uti	lization		96.4%	Ĩ	CU Leve	l of Sen	/ice		F			
Analysis Period (min)	VE 1879 H		15									
Critical Lane Group												14472774

Queues 2006 Existing Weekday AM

	≯	-	←	*	•	•	
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	278	1349	880	673	413	385	
v/c Ratio	0.66	0.67	0.79	0.73	0.83	0.79	
Control Delay	25.0	14.4	33.2	8.0	39.7	34.8	
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	
Total Delay	25.0	14.6	33.2	8.0	39.7	34.8	
Queue Length 50th (ft)	102	207	210	0	196	164	
Queue Length 95th (ft)	m186	332	#367	92	283	249	
Internal Link Dist (ft)		326	1.			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	488	2013	1111	926	587	564	
Starvation Cap Reductn	0	154	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	Mark to the control of the control o
Reduced v/c Ratio	0.57	0.73	0.79	0.73	0.70	0.68	
Intersection Summary							
# 95th percentile volur				ueue m	ay be lo	nger.	
Queue shown is max m Volume for 95th per							

	•	-	7	*	←	•	/	لر	ゥ	*	/
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	75	ት			ተተ	7			ኻ	M	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	- Character of the Control	720944030404453444	4.0	4.0	
Lane Util, Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.89	1411 2000017000000000000
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (prot)	1703	3406			3059	1369			1618	1492	
Fit Permitted	0.15	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (perm)	270	3406			3059	1369			1618	1492	
Volume (vph)	245	1187	0	0	774	592	0	0	448	0	254
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	278	1349	0	0	880	673	0	0	509	0	289
RTOR Reduction (vph)	0	0	0	0	0	428	0	0	0	26	0
Lane Group Flow (vph)	278	1349	0	0	880	245	0	0	413	359	0
Heavy Vehicles (%)	6%	6%	6%	18%	18%	18%	0%	0%	6%	6%	6%
Turn Type	pm+pt				7.5.7/1	Perm			Split		
Protected Phases	5	2			6	6125 TESSON			4	4	
Permitted Phases	2					6			BANKATINA		
Actuated Green, G (s)	46.3	46.3			28.1	28.1			23.7	23.7	:>6672x9724270000
Effective Green, g (s)	47.3	47.3			29.1	29.1			24.7	24.7	
Actuated g/C Ratio	0.59	0.59			0.36	0.36			0.31	0.31	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0		e construente	5.0	5.0			3.5	3.5	2880808202020
Lane Grp Cap (vph)	414	2014			1113	498			500	461	
v/s Ratio Prot	0.12	c0.40			c0.29				c0.26	0.24	
v/s Ratio Perm	0.28					0.18			100.20		
v/c Ratio	0.67	0.67			0.79	0.49			0.83	0.78	
Jniform Delay, d1	12.2	11.1		i Giral Maria	22.7	19.7	(34:15)(66)		25.7	25.2	
Progression Factor	1.55	1.05		100000000000000000000000000000000000000	1.00	1.00			1.00	1.00	-2002/06/2009
ncremental Delay, d2	3.3	1.5			5.8	3.4			11.0	8.4	
Delay (s)	22.2	13.1	Carbonne i Necestratori		28.5	23.2		25#560#25EC	36.6	33.6	
_evel of Service	C	В			- C	C			D.O	°C	
Approach Delay (s)	ancere augge	14.7	on more second	14 miles Edmines (111)	26.2		0.0		3004/2004/3000	35.1	
Approach LOS		В			- c		Ã			D	
ntersection Summary					_						
ICM Average Control D	elav		23.3	Н	CM Lev	el of Se	rvice		С		
ICM Volume to Capacit			0.79	en de la recomptigation							
Actuated Cycle Length (80.0	Sı	um of lo	st time	(s)		12.0		
ntersection Capacity Ut			96.4%			l of Serv			F		
Analysis Period (min)			15	A-0-6838888	94940000000000	945226077463	46575 KV (2404)		4469999940		

	†	7	4	↓	4	t		
Movement	NBT	NBR	SBL	SBT	SWL	SWR		
ane Configurations	† \$		*5	ተተ	ሻ	7		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Volume (veh/h)	1343	21	23	1417	9	20		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Hourly flow rate (vph) Pedestrians	1444	23	25	1524	10	22		
Lane Width (ft) Walking Speed (ft/s)								
Percent Blockage Right turn flare (veh)								
Median type Median storage veh)		iculais.			None			
Jpstream signal (ft)				74				
X, platoon unblocked					0.73			
C, conflicting volume			1467		2267	733		
C1, stage 1 conf vol			- See Marie					
C2, stage 2 conf vol								
Cu, unblocked vol			1467		2364	733		
C, single (s)			4.3		8.4	8.5		
C, 2 stage (s)	(manus(keepers)					Santa de Caracteria		
F (s)			2.3		4.3	4.1		
00 queue free %			94		0	91		
M capacity (veh/h)			418		7	231		
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2	
/olume Total	963	504	25	762	762	10	22	
/olume Left	0	0	25	0	0	10	0	
olume Right	0	23	0	0	0	0	22	
SH	1700	1700	418	1700	1700	. 7	231	
olume to Capacity	0.57	0.30	0.06	0.45	0.45	1.37	0.09	
Queue Length 95th (ft)	0	0	5	0	0	52	8	
Control Delay (s)	0.0	0.0	14.1	0.0	0.0	1164.9	22.2	
ane LOS			В			F	C	
Approach Delay (s) Approach LOS	0.0		0.2			376,8 F		
ntersection Summary								
Average Delay			4.0					
ntersection Capacity Uti	lization		49.2%	l (CU Lev	el of Ser	rvice A	
Analysis Period (min)			15					

	→	1	4	†	/	↓	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	2	31	374	1207	662	849	
v/c Ratio	0.01	0.19	0.45	0.66	0.99	0.29	
Control Delay	30.0	32.8	6.7	14.4	61.8	3.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.0	32.8	6.7	14.4	61.8	3.0	
Queue Length 50th (ft)	0	10	13	104	112	0	
Queue Length 95th (ft)	7	40	51	#394	#333	132	
Internal Link Dist (ft)	36			266		3370	
Turn Bay Length (ft)							
Base Capacity (vph)	171	313	828	1827	672	2967	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.10	0.45	0.66	0.99	0.29	
Intersection Summary							

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

	ၨ	-	7	•	-	*	4	†	-	/	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		4		*5		77	ሻ	<u>ተ</u> ጉ		ሻሻ	ተъ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88		0.95		0.97	0.95	
Frt		0.93		1.00		0.85		0.98		1.00	1.00	
Fit Protected		1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1772		1410		2221		3196		3273	3373	
FIt Permitted		1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1772		1410		2221		3196		3273	3373	
Volume (vph)	0	1	///2/201 1 2	30	0	363	0	1036	135	642	822	2
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1	1	31	0	374	0	1068	139	662	847	2
RTOR Reduction (vph)	0	1	0	Ó	0	222	0	9	0	0	0	Č
Lane Group Flow (vph)	0	/ 1	0	31	0	152	0	1198	0	662	849	
Heavy Vehicles (%)	0%	0%	0%	28%	28%	28%	11%	11%	11%	7%	7%	7%
Turn Type	Perm			Prot	C	ustom	Prot			Prot	5738 ilo	775.51
Protected Phases		3		4	Aleks Televisian Televis	1	5	2		1	6	
Permitted Phases	3					4	esticiano			9445949	vanaleisi	
Actuated Green, G (s)		0.8		3.0		14.3		34.9		11.3	52.2	
Effective Green, g (s)		2.8		4.0		17.3		36.9		13.3	54.2	
Actuated g/C Ratio		0.04		0.05		0.24		0.51		0.18	0.74	
Clearance Time (s)		6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		68		77	50% 640 650	648		1616	W. 1. 1. 119.027	596	2504	0.54474
v/s Ratio Prot		c0.00		c0.02		0.04		c0.37		c0.20	0.25	
v/s Ratio Perm						0.03		2472577			yayyiniye	
v/c Ratio		0.02		0.40		0.23		0.74		1.11	0.34	
Uniform Delay, d1		33.8		33.3		22.5		14.3		29.8	3.2	
Progression Factor		1.00	9645000400000	1.00		1.00		1.00		1.00	1.00	
incremental Delay, d2		0.1		3.4		0.2		3.1		71.1	0.4	
Delay (s)		33.9		36.8		22.7		17.4		100.9	3.6	
Level of Service		Č		D.O		Ξ̈.c		В		100.5 F	Α.	3044
Approach Delay (s)		33.9		di a con M ari	23.8	entana Ara		17.4		ala da Maria	46.2	
Approach LOS		Č			- C			В			-0.2 D	
intersection Summary												
HCM Average Control Do	elay		32.2	F	ICM Lev	el of Se	ervice		С	920025		
HCM Volume to Capacity	y ratio		0.77									
Actuated Cycle Length (s	s)		73.0	S	ium of k	st time	(s)		16.0			Years.
ntersection Capacity Util			69.6%		CU Leve				С			
Analysis Period (min)			15		TREESEN				a Argini			

Queues

2006 Existing Weekday PM

	_#	→	*	•	+	۴	4	ď	6	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	100	1238	22	56	706	269	22	149	453	422	
v/c Ratio	0.33	0.85	0.03	0.37	0.66	0.45	0.17	0.61	0.67	0.70	
Control Delay	42.5	36.4	13.8	40.3	28.0	12.6	46.1	48.2	41.9	34.2	
Queue Delay	0.0	8.6	0.0	0.0	3.8	1.7	0.0	0.0	0.0	0.0	
Total Delay	42.5	45.0	13.8	40.3	31.7	14.4	46.1	48.2	41.9	34.2	
Queue Length 50th (ft)	57	386	3	26	174	51	13	85	139	200	
Queue Length 95th (ft)	115	#624	21	m54	m244	m126	38	150	177	338	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	307	1455	660	189	1066	597	139	270	884	619	
Starvation Cap Reductn	0	0	0	0	268	187	0	0	0	0	
Spillback Cap Reductn	0	197	0	0	0	0	0	0	14	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.33	0.98	0.03	0.30	0.88	0.66	0.16	0.55	0.52	0.68	

Intersection Summary

												
	#	` →	*	✓	-	₹	1	Ť	-	(+	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	7	ተተ	7	7	ተተ	7	٦	ď.		لولو	¥	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Volume (vph)	98	1213	22	55	692	264	22	128	18	444	312	102
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	100	1238	22	56	706	269	22	131	18	453	318	104
RTOR Reduction (vph)	0	0	9	0	0	126	0	5	0	0	12	0
Lane Group Flow (vph)	100	1238	13	56	706	143	22	144	0	453	410	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot	68 SE 54 S		Prot		
Protected Phases	1	6	-th-employable toursels	5	2	00.000.000.0000.000	7	4		3	8	
Permitted Phases		the ends	6			2		024698456				
Actuated Green, G (s)	16.0	35.8	35.8	7.0	26.9	26.9	2.5	17.0		18.2	32.9	
Effective Green, q (s)	17.7	37.6	37.6	7.7	27.6	27.6	4.2	18.9		19.8	34.5	
Actuated g/C Ratio	0.18	0.38	0.38	0.08	0.28	0.28	0.04	0.19		0.20	0.34	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	0.000,000,000,000
Lane Grp Cap (vph)	307	1305	584	132	949	424	73	294	56502000	673	591	SE 15
v/s Ratio Prot	0.06	c0.36	1799 MM	c0.03	0.21		0.01	0.09		c0.13	c0.24	MINERAL SEC.
v/s Ratio Perm			0.01		2250000	0.09		0.00		00.10	00.24	
v/c Ratio	0.33	0.95	0.02	0.42	0.74	0.34	0.30	0.49		0.67	0.69	
Uniform Delay, d1	35.9	30.3	19.6	44.0	33.0	28.9	46.5	36.2		37.1	28.2	
Progression Factor	1.00	1.00	1.00	0.80	0.83	1.02	1.00	1.00		1.00	1.00	8650 SERVER
Incremental Delay, d2	2.8	15.3	0.1	2.0	4.7	1.02	2.3	1.3		2.7	3.5	
Delay (s)	38.7	45.6	19.7	37.4	32.0	31.5	48.8	37.5		39.8	31.7	
Level of Service	00.7 D	- D	В.	ם כ	52.0 C	∵.c	40.0 D	37.3 D		39.0 D	31.7 C	
Approach Delay (s)	800 35. 0	44.7	::::::::::::::::::::::::::::::::::::::	48),A281. M 46	32.2	/8/2/4 9 /4	39.0	ASSESS MAN		· · · · · ·	35.9	
Approach LOS		ີ D			32.2 C		39.0 D				33.9 D	
Intersection Summary												
HCM Average Control D	elav		38.4	Н	CM Lev	el of Se	ervice		ā		7.000	
HCM Volume to Capacit	v ratio		0.76		en en en en en	r-services service	anderstytter 2:		AND AND AND AND A	are a relief a grane		
Actuated Cycle Length (100.0	S	um of le	st time	(s)		12.0			
Intersection Capacity Uti			78.7%			of Ser			o			
Analysis Period (min)	ar exerge		15		10 mile				SANTEN.			
c Critical Lane Group			,					,				

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The Transpo Group

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^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	→	•	•	←	>	· •
Lane Group	EBT	EBR	WBL	WBT	SBL	- SBT
Lane Group Flow (vph)	999	639	387	1022	425	5 382
v/c Ratio	0.78	0.66	0.83	0.46	1.08	3 0.97
Control Delay	24.2	6.4	47.6	10.1	105.1	
Queue Delay	71.5	15.3	0.0	1.1	0.0	0.5
Total Delay	95.6	21.7	47.6	11.2	105.1	
Queue Length 50th (ft)	257	48	235	141	~333	3 ~264
Queue Length 95th (ft)	m216	m75	m316	m228	#530	
Internal Link Dist (ft)	126			410		462
Turn Bay Length (ft)			152			
Base Capacity (vph)	1281	972	512	2248	394	16 394 - Carlos de la carlo
Starvation Cap Reductn	414	324	0	468	0	0
Spillback Cap Reductn	0	0	0	909	0	Madas t isā viets disprisitiššis (jā stagtu apsti 178 be
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	1.15	0.99	0.76	0.76	1.08	Note 0.97 and a soften than the little and finite and a first in the control of
Intersection Summary						
 Volume exceeds cap 					finite.	
Queue shown is max	imum a	fter two	cycles.			

	۶	-	•	•	←	*	4	†	/	1	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations		ተተ	7	۲	ተተ					7	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1438	
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	196	3406					1441	1438	
Volume (vph)	0	969	620	375	991	0	0	0	0	765	0	17
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	999	639	387	1022	0	0	0	0	789	0	18
RTOR Reduction (vph)	0	0	399	0	0	0	0	0	0	0	1	(
Lane Group Flow (vph)	0	999	240	387	1022	0	0	0	0	425	381	C
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		36.6	36.6	63.7	63.7					26.3	26.3	
Effective Green, g (s)		37.6	37.6	64.7	64.7					27.3	27.3	
Actuated g/C Ratio		0.38	0.38	0.65	0.65					0.27	0.27	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		1281	573	475	2204					393	393	
v/s Ratio Prot		0.29		c0.19	0.30					C e C e De Senera De carighere conditir a	-co-co-co-contractive contra	
v/s Ratio Perm			0.16	c0.34						c0.29	0.26	
v/c Ratio		0.78	0.42	0.81	0.46					1.08	0.97	
Uniform Delay, d1		27.5	23.1	25.0	8.9					36.4	35.9	
Progression Factor		0.75	2.04	1.58	1.08					1.00	1.00	
Incremental Delay, d2		2.8	1.3	7.0	0.5					69.0	36,7	
Delay (s)		23.5	48.4	46.5	10.1					105.3	72.6	
Level of Service		С	D	D	В					F	E	
Approach Delay (s)		33.2			20.1			0.0			89.8	
Approach LOS		С			С			Α			F	
Intersection Summary												
HCM Average Control De			40,3	Н	CM Lev	el of Se	rvice		D			
HCM Volume to Capacity			0.88									
Actuated Cycle Length (s)			100.0			st time i			8.0			
Intersection Capacity Utili	zation	11	05.0%	IC	CU Leve	l of Serv	/ice		G			
Analysis Period (min)			15									

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

982 0.69 28.7 0.0 28.7 285 374	971 0.95 30.7 0.0 30.7 265 #602	NEL2 319 0.86 58.8 0.0 58.8 200 #346	46.2 0.0 46.2	kladusen galatak upabbik periodas kentodak adal Rak Dibuli Sali Balangi Barasaan Labi Sali Barasa Olembik Sesek kangangi berangan berangan dari s
0.69 28.7 0.0 28.7 285 374	0.95 30.7 0.0 30.7 265 #602	0.86 58.8 0.0 58.8 200	0.81 46.2 0.0 46.2 164	en e
28.7 0.0 28.7 285 374	30.7 0.0 30.7 265 #602	58.8 0.0 58.8 200	46.2 0.0 46.2 164	en e
0.0 28.7 285 374	0.0 30.7 265 #602	0.0 58.8 200	0.0 46.2 164	kali Geologia Kalandiga erre erri i talendar. Orrente Geologia godinarre erre erre erre
28.7 285 374	30.7 265 #602	58.8 200	46.2 164	
285 374	265 #602	200	164	
374	#602	5-1-5-1-1-1		
		#346	#304	
4.0				
			232	
1414	1017	398	419	
0	0	0	0	A 100 100 100 100 100 100 100 100 100 10
0	0	0	0	
0	0	0	0	
0.69	0,95	0.80	0.77	
	0 0 0	0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0

^{# 95}th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m. Volume for 95th percentile queue is metered by upstream signal.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	75	ተተ			ተተ	7			7	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.92	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (prot)	1641	3282			3406	1524			1531	1447	
Flt Permitted	0.14	1,00			1.00	1.00			0.95	0.98	
Satd. Flow (perm)	244	3282			3406	1524			1531	1447	
Volume (vph)	342	1370	0	0	953	942	0	0	449	3	169
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	353	1412	0	0	982	971	Ö	0	463	3	174
RTOR Reduction (vph)	0	0	0	0	0	384	0	0	0	44	0
Lane Group Flow (vph)	353	1412	0	0	982	587	0	0	319	277	0
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt					Perm			Split		
Protected Phases	5	2			6	cutto con table in			4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	66.8	66.8	4004 00 00 00 WARRE		40.6	40.6			23.2	23.2	- ALTERNATION OF THE SECTION OF THE
Effective Green, g (s)	67.8	67.8			41.6	41.6			24.2	24.2	
Actuated g/C Ratio	0.68	0.68		2100 10 275 100 100 100 100 100 100 100 100 100 10	0.42	0.42		10/22/229 (15/88 P.O.)	0.24	0.24	1-41-1-154-254-24-151-44-151-4-15-4-15-4
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0		27,00,000,000	5.0	5.0			3.5	3.5	Actual Control of the Assessment
Lane Grp Cap (vph)	476	2225			1417	634			371	350	
v/s Ratio Prot	c0.16	0.43			0.29				c0.21	0.19	2/02/2014/09/12/2016/01/2015
v/s Ratio Perm	0.34					c0.39					
v/c Ratio	0.74	0.63			0.69	0.93		559998000095555	0.86	0.79	2007/25/10/2004/05/2004/05/2004
Uniform Delay, d1	19.6	9.1			24.0	27.7			36.3	35.5	
Progression Factor	1.39	1.24			1.00	1.00			1.00	1.00	
Incremental Delay, d2	2.6	0.6			2.8	21.6			18.1	11.9	
Delay (s)	29.8	11.9		entre en	26.8	49.4		-9000000000000000	54.3	47.4	
Level of Service	C	В			C	D			D	D	
Approach Delay (s)	- 6 - 10 Table (14 - 15 - 16 - 16 - 16 - 16 - 16 - 16 - 16	15.5	(V)OVERSI DOSSERI		38.0		0.0	013818753636		50.9	
Approach LOS		В			D		A			D	
Intersection Summary											
HCM Average Control D	Delay		30.8	Н	ICM Le	vel of Se	rvice		С		
HCM Volume to Capaci	ity ratio		0.86								
Actuated Cycle Length	(s)		100.0	S	um of I	ost time	(s)		12.0		
Intersection Capacity U		10	05.0%	IC	CU Lev	el of Ser	vice		G		
Analysis Period (min)			15								
c Critical Lane Group				, and according to							

	1	T.	4	ţ	4	t	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	† }		7	^	7	7	
Sign Control	Free			Free	Stop	h partir	
Grade	0%			0%	0%		
Volume (veh/h)	1878	9	10	1535	7	18	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph)	2019	10	11	1651	8	19	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			ASSESS.		None		
Median storage veh)							
Jpstream signal (ft)				66			
X, platoon unblocked					0.76		
C, conflicting volume			2029		2871	1015	
C1, stage 1 conf vol							
C2, stage 2 conf vol			0000		24419		
Cu, unblocked vol			2029		3153	1015	
C, single (s) C, 2 stage (s)			4.3		7.3	7.4	
C, 2 stage (s) F (s)			2.3		3.7	i i nie	est Astronomical Control Contr
r (s) 00 queue free %			2.3 96		3. <i>1</i> 0	3.5 90	
M capacity (veh/h)			247		4	201	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2
/olume Total	1346	683	11	825	825	8	19
/olume Left	0	0	11	0	0	8	O
/olume Right	Ō	10	Ö	Ō	ŏ	o de la composição de l	
:SH	1700	1700	247	1700	1700	4	201
/olume to Capacity	0.79	0.40	0.04	0.49	0.49	1.87	0.10
Queue Length 95th (ft)	0	0	3	0	0	48	8
Control Delay (s)	0.0	0.0	20.2	0.0	0.0	1983.9	24,8
ane LOS			С			F	C
Approach Delay (s)	0.0		0.1	Mingai.		573.4	
Approach LOS						F	
ntersection Summary							
verage Delay			4.2				
ntersection Capacity Ut	ilization		62.2%	V. 300	CU Lev	el of Ser	vice
Analysis Period (min)			15				

	-	•	•	†	-	↓ ↓
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	2	309	984	1229	387	1094
v/c Ratio	0.01	0.82	0.74	0.79	0.75	0.51
Control Delay	38.5	49.8	17.9	24.7	43.7	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	49.8	17.9	24.7	43.7	8.7
Queue Length 50th (ft)	1	143	155	256	94	120
Queue Length 95th (ft)	8	#320	294	#467	#186	242
Internal Link Dist (ft)	36		11276	266		3373
Turn Bay Length (ft)				r		energies (higgsweiging) in the St. S.
Base Capacity (vph)	145	389	1337	1547	515	2166
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.79	0.74	0.79	0.75	0.51
Intersection Summary						

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	4		ሻ		717	ሻ	† ‡		14.54	↑ ₽	
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
	4.0		4.0		4.0		4.0		4.0	4.0	
	1.00		1.00		0.88		0.95		0.97	0.95	
	1.00		1.00		0.85		0.99		1.00	1.00	
	0.98		0.95		1.00		1.00		0.95	1.00	
	1854		1752		2760		3444		3183	3281	
	0.98		0.95		1.00		1.00		0.95	1.00	
	1854		1752		2760		3444		3183	3281	
1	1	0	294	0	935	0	1108	60	368	1038	1
0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
1	1	0	309	0	984	0	1166	63	387	1093	1
0	0	0	0	0	177	0	4	0	0	0	0
0	2	0	309	0	807	0	1225		387	1094	0
0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Perm	925		Prot	C	ustom	Prot	11773	DEPOSITE	Prot	111.32.5	2000 A.C.
	3		4		1	5	2		1	6	
3					4						
	0.9		16.4		27.4		34.2		11.0	51.2	
	2.9		17.4		30.4		36.2		13.0	53.2	
	0.03		0.20		0.36		0.42		0.15	0.62	
	6.0		5.0		6.0		6.0		6.0	6.0	
	3.0		3.0		3.0		3.0		3.0	3.0	
	63	Filmenia.	357		1110	50,500,134	1458	2001 April (A	484	2042	er jarin
					2.0000000000000000000000000000000000000		0.0000000000000000000000000000000000000				
	0.00						uning ga		půmy,	reige	
	0.03		0.87		0.73		0.84		0.80	0.54	
			the second process to								
	40.1	and the Albert State of			26.4				44.0	10.2	
		eren digitalen billionin dien.	A CONTRACTOR OF	32.5							
	D			С			С			В	
100											
elay		26.1	F	ICM Lev	el of Se	ervice	69. P.	С			7.1
y ratio		0.77									
ś)		85.5	S	Sum of le	st time	(s)		12.0			
lization		79.4%						D			
		15			maje.						₹\$40a
	EBL 1900 1900 1900 1900 1900 1900 1900 190	EBL EBT 1900 1900 4.0 1.00 0.98 1854 0.98 1854 1 1 0.95 0.95 1 1 1 0 0 0 0.98 2.9 0.03 6.00 0.03 3.0 6.30 0.00 0.02 40.1 D 40.1 D	EBL EBT EBR 1900 1900 1900 4.0 1.00 1.00 0.98 1854 0.98 1854 1 1 0 0.95 0.95 0.95 1 1 0	BBL BBR WBL	BBL BBT BBR WBL WBT	BBL BBT BBR WBL WBT WBR	BBL BBR BBR WBL WBT WBR NBL WBT MBL WBT WBT NBL WBT WBT NBL WBT MBL MBL	BBL BBT BBR WBL WBT WBR NBL NBT	BBL BBT BBR WBL WBT WBR NBL NBT NBR NBT NBT	BBL BBT BBR WBL WBT WBR NBL NBT NBR SBL	BBL BBR BBR WBL WBT WBR NBL NBT NBR SBL SBT

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	#	-	*	•	←	٧	4	ř	4	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	104	911	26	28	536	178	32	202	282	240	
v/c Ratio	0.36	0.56	0.04	0.19	0.46	0.28	0.21	0.70	0.53	0.46	
Control Delay	40.0	22.0	7.8	33.0	22.9	8.2	41.7	45.3	38.4	27.7	
Queue Delay	0.0	0.0	0.0	0.0	2.2	0.8	0.0	0.0	0.0	0.0	
Total Delay	40.0	22.0	7.8	33.0	25.0	9.0	41.7	45.3	38.4	27.7	
Queue Length 50th (ft)	55	222	0	17	151	26	17	96	77	106	
Queue Length 95th (ft)	107	305	17	m27	146	74	45	#192	111	176	
Internal Link Dist (ft)		436			126		431			246	
Turn Bay Length (ft)	319		192	122		90				·	
Base Capacity (vph)	285	1624	741	212	1157	634	157	308	655	529	
Starvation Cap Reductn	0	0	0	0	462	243	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0		Ō	Ō	Ö	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.56	0.04	0.13	0.77	0.46	0.20	0.66	0.43	0.45	

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

	_#	→	*	1	←	۲	4	7	~	4	4	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	¥	ተተ	ř	J.	ተተ	7	*1	Ž.		ኻኻ	ሻ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	71-41,-41,844, sector	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1,00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00	1,00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1787	3574	1599	1736	3471	1553	1770	1583		3467	1746	191011111111111111111111111111111111111
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1787	3574	1599	1736	3471	1553	1770	1583		3467	1746	
Volume (vph)	99	865	25	27	509	169	30	142	50	268	172	56
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	104	911	26	28	536	178	32	149	53	282	181	59
RTOR Reduction (vph)	0	0	15	0	0	120	0	14	0	0	13	0
Lane Group Flow (vph)	104	911	11	28	536	58	32	188	Ō	282	227	0
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	84444	1000414165				
Actuated Green, G (s)	12.7	34.9	34.9	4.7	27.0	27.0	3.8	16.1		12.3	24.8	
Effective Green, g (s)	14.4	36.7	36.7	5.4	27.7	27.7	5.5	18.0		13.9	26.4	
Actuated g/C Ratio	0.16	0.41	0.41	0.06	0.31	0.31	0.06	0.20		0.15	0.29	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	286	1457	652	104	1068	478	108	317		535	512	W. 1946
v/s Ratio Prot	c0.06	c0.25	Annalis Castalia	0.02	0.15		0.02	c0.12		c0.08	0.13	
v/s Ratio Perm	9069906		0.01		2000	0.04	20.02	00.12		60.00	0.10	M3464056
v/c Ratio	0.36	0.63	0.02	0.27	0.50	0.12	0.30	0.59		0.53	0.44	
Uniform Delay, d1	33.7	21.2	15.9	40.4	25.5	22.4	40.4	32.7		35.0	25.8	
Progression Factor	1.00	1.00	1.00	0.80	0.90	1.80	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	2.0	0.0	1.4	1.6	0.5	1.5	3.0		0.9	0.6	
Delay (s)	37.3	23.2	15.9	33.6	24.6	40.9	41.9	35.7		36.0	26.5	
Level of Service	D	C	В	C	- c	D	io	00.;		00.0 D	C	
Approach Delay (s)	CONTRACTOR	24.4	SUDMONIA (TOS)		28.8	V0000000000000000000000000000000000000	36.5			V-108035-745	31.6	
Approach LOS		Ċ			C		D.0				Ŭ.C	
Intersection Summary												
HCM Average Control D	elay		28.3	Н	CM Lev	el of Se	rvice		С	2.0000000000000000000000000000000000000	governo de la compansión de la compansió	
HCM Volume to Capacit	y ratio		0.59		AMPLICATION OF THE	nakan untuk	AND SECTION		**************************************		And of Budget	VA191016101 01244
Actuated Cycle Length (90.0	s	um of l	st time	(s)		16.0		10000000000000000000000000000000000000	
Intersection Capacity Ut			58.5%			l of Sen			В			
Analysis Period (min)			15		ave id							

Intersection Summary		
HCM Average Control Delay	28.3	HCM Level of Service C
HCM Volume to Capacity ratio	0.59	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	58.5%	ICU Level of Service B
Analysis Period (min)	15	
- 0		

	→	•	•	+	\	+
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	617	585	100	689	112	2 108
v/c Ratio	0.27	0.47	0.20	0.25	0.53	3 - 0.45 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Control Delay	6.5	2.9	4.6	5.1	44.4	
Queue Delay	0.4	0.5	0.0	0.0	0.0	
Total Delay	6.9	3.4	4.6	5.1	44.4	
Queue Length 50th (ft)	55	16	13	100	63	(4. 46 35)
Queue Length 95th (ft)	62	34	m33	140	112	2 83
Internal Link Dist (ft)	126			410		462
Turn Bay Length (ft)			152			
Base Capacity (vph)	2318	1239	671	2712	446	3
Starvation Cap Reductn	1096	292	0	0	0	
Spillback Cap Reductn	0	0	0	513	0	
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.62	0.15	0.31	0.25	\$84.0;246.1911.19-3846.675.879.93.3
Intersection Summary						

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		† †	7	ሻ	ተተ					۲	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.94	
Fit Protected		1.00	1,00	0.95	1,00					0.95	0.97	
Satd. Flow (prot)		3539	1583	1752	3505					1545	1480	
Flt Permitted		1.00	1.00	0.37	1.00					0.95	0.97	
Satd. Flow (perm)	2- 3	3539	1583	683	3505					1545	1480	
Volume (vph)	0	592	562	96	661	0	0	0	0	167	0	44
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	617	585	100	689	0	0	0	0	174	0	46
RTOR Reduction (vph)	0	0	209	0	0	0	0	0	0	0	36	0
Lane Group Flow (vph)	0	617	376	100	689	0	0	0	0	112	72	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	11%	11%	11%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6					1,796 61920000 0.151	8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		56.9	56.9	68.6	68.6					11.4	11.4	
Effective Green, g (s)		57.9	57.9	69.6	69.6					12.4	12.4	
Actuated g/C Ratio		0.64	0.64	0.77	0.77					0.14	0.14	110000000000000000000000000000000000000
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	320200
Vehicle Extension (s)		4.0	4.0	3.0	4.0	00.00000000000000000000000000000000000				3.0	3.0	3667366536534
Lane Grp Cap (vph)		2277	1018	620	2711					213	204	
v/s Ratio Prot	* (\$10200000000000000000000000000000000000	0.17		0.01	c0.20	h0045.04406.440					A SESTIMATE	SEMESTIC
v/s Ratio Perm		7015 E 100	c0.24	0.11						c0.07	0.05	
v/c Ratio	Character transcook	0.27	0.37	0.16	0.25		AA AA MATANA AA		3,0 5,278,35275 3- FF	0.53	0.35	
Uniform Delay, d1		6.9	7.5	2.8	2.9					36.1	35.2	
Progression Factor		0.81	1.86	1.28	1.52			10.2000.0000000		1.00	1.00	
Incremental Delay, d2		0.2	0.9	0.1	0.2					2.3	1.1	
Delay (s)		5.8	14.9	3.7	4.6					38.4	36.2	
Level of Service		A	В	A	A					Ď	D	
Approach Delay (s)		10.2	ADAMAAAATTAA	C 47 M SAMPERS	4.5			0.0		ili sersilgi ma tal as ji	37.3	evera beautific
Approach LOS		В			A			A			D	
Intersection Summary				3 (11 K-1) - MCC		CONTRACTOR STATE						
HCM Average Control D	alav		10.9	L	HCM Lev	el of Se	nice		В			
HCM Volume to Capacit			0.39		IOW LEV	(CI VI 36	IAICE		······································			
Actuated Cycle Length (90.0	estatega.	Sum of lo	set time	/e\======		12.0			
Intersection Capacity Uti			56.1%		CU Leve				12.0 B		voseista	
Analysis Pariod (min)	nzauvii		00.1% 45		OU LEVE	i oi ser	VIUU		D	millioneria.		

intersection Summary		
HCM Average Control Delay	10.9	HCM Level of Service B
HCM Volume to Capacity ratio	0.39	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	56.1%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

2000 Existing Gaturday Five							2000 Existing Sa			Jaturuay		
ナ→← 弋り ナ		٠		7	y	←	4	>	لر	7	*	/
Lane Group EBL EBT WBT WBR NEL2 NEL	Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Group Flow (vph) 313 523 388 277 257 245	Lane Configurations	ኝ	^			↑↑	7			ኣ	¥	
/c Ratio 0.51 0.22 0.22 0.30 0.71 0.64	Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900		1900
ontrol Delay 10.4 5.6 14.0 3.2 42.7 33.9	Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	< 0.00000000000000000000000000000000000
ueue Delay 0.0 0.0 0.0 0.0 0.0 0.0	Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
otal Delay 10.4 5.6 14.0 3.2 42.7 33.9	Frt	1.00	1.00			1.00	0.85		Children en belleve	1.00	0.94	
ueue Length 50th (ft) 63 54 58 0 142 111	Flt Protected	0.95	1.00			1.00	1.00			0.95	0.97	
ueue Length 95th (ft) 124 87 113 48 210 177	Satd. Flow (prot)	1719	3438			3406	1524			1665	1596	22-12-12-12-12-12-12-12-12-12-12-12-12-1
temal Link Dist (ft) 410 9 232	Fit Permitted	0.46	1.00			1.00	1.00			0.95	0.97	
urn Bay Length (ft) 170	Satd. Flow (perm)	841	3438			3406	1524			1665	1596	
ase Capacity (vph) 774 2381 1756 920 481 490	Volume (vph)	291	486	0	0	361	258	0	0	371	1	95
arvation Cap Reductn 0 0 0 0 0 0	Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
illback Cap Reductn 0 0 0 0 0	Adj. Flow (vph)	313	523	0	0	388	277	0	0.00	399	1	102
orage Cap Reductn 0 0 0 0 0 0	RTOR Reduction (vph)	0	0	0	0	0	134	0	0	0	31	0
educed v/c Ratio 0.40 0.22 0.22 0.30 0.53 0.50	Lane Group Flow (vph)		523	Ō	Ō	388	143	Ō	Ō	257	214	Ō
	Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	3%	3%	3%
ersection Summary		pm+pt	970 275 834	ALCONOMICS.	0,0	7,0	Perm	0.70	370	Split		0,0
	Protected Phases	рш. рс 5	2			6	i Gilli				4	
	Permitted Phases	2	eulasias			ariber di	6			J-7014/8/9-	talenen.	
	Actuated Green, G (s)	61.3	61.3			45.4	45.4			18.7	18.7	
	Effective Green, g (s)	62.3	62.3			46.4	46.4			19.7	19.7	
	Actuated g/C Ratio	0.69	0.69			0.52	0.52			0.22	0.22	
	Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
	Vehicle Extension (s)	2.5	4.0			5.0	5.0 5.0			3.5	3.5	
		698	2380	Maketyrotik	CERTAIN PROPERTY.	1756	786		500000000000000000000000000000000000000		349	14725000000000000
	Lane Grp Cap (vph)						780			364		
	v/s Ratio Prot	c0.06	0.15		.4155.e87586.ds	0.11	0.00			c0.15	0.13	
	v/s Ratio Perm	c0.25					0.09					
	v/c Ratio	0.45	0.22			0.22	0.18			0.71	0.61	
	Uniform Delay, d1	5.5	5.0			11.9	11.7			32.5	31.7	
	Progression Factor	1.23	0.96	6467494150(Accoss)		1.00	1.00	eoradous arek		1.00	1.00	
	Incremental Delay, d2	0.3	0.2			0.3	0.5			6.3	3.3	
	Delay (s)	7.0	5.0		10.11/0048-40	12.2	12.2			38.8	35.0	
	Level of Service	Α	A			В	В			D	D	
	Approach Delay (s)		5.8			12.2		0.0			37.0	
	Approach LOS		Α			В		Α			D	
	Intersection Summary											
	HCM Average Control D	elav		15.7	н	CMIA	vel of Se	rvice		В	100000000000000000000000000000000000000	
	HCM Volume to Capacit			0.51	- ABSTSEN	AINI FO.		MAIMPIGE				
	Actuated Cycle Length (90.0	Q.	um of k	ost time	/e\		8.0		
	Intersection Capacity Ut		909,995 (JARA 1996) 1	56.1%			of Ser			о.о В		
	Analysis Period (min)	mzauvii	1895a ji 188	15		O LEVE	31 OI J e l	VICE				
	c Critical Lane Group			57385 1.4 279		13894-9911.						

The Transpo Group

c Critical Lane Group

The Transpo Group

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	†	ř	4	ļ	₹	₹⁄	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	†		ሻ	ተተ	ሻ	7	
Sign Control	Free		,	Free	Stop	•	
Grade	0%			0%	0%		
Volume (veh/h)	532	30	63	509	18	70	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph) Pedestrians	566	32	67	541	. 19	74	
Lane Width (ft) Walking Speed (ft/s)							
Percent Blockage Right turn flare (veh)							
Median type Median storage veh)					None		
Jpstream signal (ft)				89			
pX, platoon unblocked					0.95		
C, conflicting volume			598		987	299	
C1, stage 1 conf vol							
C2, stage 2 conf vol							
Cu, unblocked vol			598		936	299	
C, single (s)			4.2		6.9	7.0	
C, 2 stage (s)							A STATE OF THE STA
F (s)			2.3		3.6	3.4	
00 queue free %			93		92	89	The same of the state of the same of the state of the same of the
M capacity (veh/h)			941		227	685	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2
/olume Total	377	221	67	271	271	19	74
/olume Left	0	0	67	0	0	19	0
/olume Right	0	32	0	0	0	0	74
SH	1700	1700	941	1700	1700	227	685
olume to Capacity	0.22	0.13	0.07	0.16	0.16	0.08	0.11
Queue Length 95th (ft)	0	0	6	0	0	7	9
Control Delay (s)	0.0	0.0	9.1	0.0	0.0	22.3	10.9
ane LOS	Section 1		Α			С	В
Approach Delay (s) Approach LOS	0.0		1.0			13.2 B	
ntersection Summary							
verage Delay			1.4				
ntersection Capacity Uti	ilization	1995	32.5%	K	CU Leve	of Ser	vice A
analysis Period (min)			15				

	→	·	4	•	<u>†</u>	<u> </u>	Ţ
Lane Group	EBT	WBL	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	112	209	3	577	199	457
v/c Ratio	0.03	0.44	0.20	0.02	0.31	0.39	· - ·
Control Delay	30.8	34.6	3.2	37.0	11.8	31.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	10 J. 0.0 M. M. Harriston - Cutani De Harriston
Total Delay	30.8	34.6	3.2	37.0	11.8	31.1	6.1
Queue Length 50th (ft)	1	44	0	100	67	40	24
Queue Length 95th (ft)	11	104	23	10	154	85	110
Internal Link Dist (ft)	36				266		3376
Turn Bay Length (ft)							
Base Capacity (vph)	156	390	1009	152	1848	582	2481
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.29	0.21	0.02	0.31	0.34	0.18
Intersection Summary							

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											9	
	۶	→	•	•	←	•	4	†	1	/	+	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4		75		77	*1	† }		14.54	† 1>	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88	1.00	0.95		0.97	0.95	
Frt		0.93		1.00		0.85	1.00	0.98		1.00	1.00	
Fit Protected		1.00		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1772		1752		2760	1752	3423		3273	3374	
Flt Permitted		1.00		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1772		1752		2760	1752	3423		3273	3374	
Volume (vph)	0	2	2	102	0	190	3	443	82	181	416	0
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	. 2	2	112	- 2 - 0	209	3	487	90	199	457	0
RTOR Reduction (vph)	0	2	0	0	0	157	0	13	0	0	0	ō
Lane Group Flow (vph)	0	2	0	112	0	52	3	564	0	199	457	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	3%	3%	3%	7%	7%	7%
Turn Type	Perm		177477	Prot	C	ustom	Prot	217 3 6324	109/52	Prot		
Protected Phases		3		4		1	5	2		1	6	
Permitted Phases	3					4				ty e in	ŭ	
Actuated Green, G (s)		8.0		8.5		17.6	0.8	41.7		9.1	50.0	
Effective Green, g (s)		2.8		9.5		20.6	2.8	43.7		11.1	52.0	
Actuated g/C Ratio		0.03		0.11		0.25	0.03	0.53		0.13	0.63	
Clearance Time (s)		6.0		5.0		6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		60		200		817	59	1800	(24.0 (45))	437	2111	
v/s Ratio Prot		c0.00		c0.06		0.01	0.00	c0.16	A PAUL AL	c0.06	0.14	
v/s Ratio Perm						0.01		againetich			e i distributi	
v/c Ratio		0.03		0.56		0.06	0.05	0.31		0.46	0.22	
Uniform Delay, d1		38.8	당당됐다	34.8		23.9	38.9	11.2		33.2	6.7	
Progression Factor		1.00		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2		3.6		0.0	0.4	0.5		8.0	0.2	
Delay (s)		39.1		38.4		23.9	39.2	11.6		34.0	7.0	
Level of Service		D		D		С	D			C	A	
Approach Delay (s)		39.1			29.0			11.8		-	15.2	
Approach LOS		D			С			В			В	
Intersection Summary												
HCM Average Control De			16.8	Н	CM Lev	el of Se	rvice		В		A. 7.24	
HCM Volume to Capacity	ratio		0.36									
Actuated Cycle Length (s)			83.1	S	um of lo	st time	(s)		16.0			
Intersection Capacity Utili	zation		42.3%	10	U Leve	l of Sen	vice		Α			
Analysis Period (min)			15									
c Critical Lane Group												

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	_#	-	*	1	4	€	4	7	Ĺ	€	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	122	822	6	11	922	394	72	483	356	255	
v/c Ratio	0.85	0.62	0.01	0.09	0.97	0,66	0.39	1.00	0.95	1.08	
Control Delay	83.7	23.2	11.4	50.5	49.9	16.0	39.5	70.3	72.0	109.9	
Queue Delay	0.0	0.7	0.0	0.0	78.2	5.5	0.0	0.5	0.0	0.0	
Total Delay	83.7	23.9	11.4	50.5	128.1	21.6	39.5	70.8	72.0	109.9	
Queue Length 50th (ft)	61	161	0	6	248	82	34	~234	98	~124	
Queue Length 95th (ft)	#157	#279	9	m10	#363	m85	74	#434	#185	#282	
Internal Link Dist (ft)		436			107		431			246	e galacii (Section
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	143	1331	599	120	949	593	194	483	376	236	
Starvation Cap Reductn	0	0	0	0	173	142	0	0	0	0	
Spillback Cap Reductn	0	211	0	0	0	0	0	-1	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.85	0.73	0.01	0.09	1.19	0.87	0.37	1.00	0.95	1.08	

	#	→	7	•	←	٤	4	ř	~	Ĺ,	4	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	J.	个 个	7	ሻ	ተተ	7	7	ž		1,1	Ž	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.98	
Satd. Flow (prot)	1703	3406	1524	1687	3374	1509	1687	1509		3070	1448	
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1703	3406	1524	1687	3374	1509	1687	1509		3070	1479	
Volume (vph)	110	740	5	10	830	355	65	350	85	320	100	130
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	822	6	11	922	394	72	389	94	356	111	144
RTOR Reduction (vph)	0	0	4	0	0	172	0	11	0	0	35	0
Lane Group Flow (vph)	122	822	2	11	922	222	72	472	0	356	220	0
Heavy Vehicles (%)	6%	6%	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	5.0	24.5	24.5	1.0	20.6	20.6	6.0	24.3		8.2	34.9	A 6500 H. (1500)
Effective Green, q (s)	6.7	26.3	26.3	1.7	21.3	21.3	7.7	26.2		9.8	38.1	
Actuated g/C Ratio	0.08	0.33	0.33	0.02	0.27	0.27	0.10	0.33		0.12	0.48	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	2002774 74-207
Lane Grp Cap (vph)	143	1120	501	36	898	402	162	494		376	701	G10.55
v/s Ratio Prot	c0.07	0.24		0.01	c0.27		0.04	c0.31		c0.12	0.04	
v/s Ratio Perm			0.00			0.15					c0.11	
v/c Ratio	0.85	0.73	0.00	0.31	1.03	0.55	0.44	0.96		0.95	0.31	aporton mayor
Uniform Delay, d1	36.2	23.8	18.0	38.6	29.4	25.3	34.1	26.3		34.8	12.9	
Progression Factor	1.00	1.00	1.00	1.40	0.97	1.06	1.00	1.00		1.00	1.00	100000000000000000000000000000000000000
Incremental Delay, d2	43.9	4.3	0.0	3.9	34.3	4.5	1.9	29.3		32.6	0.3	
Delay (s)	80.1	28.0	18.1	58.0	62.8	31.3	36.1	55.7	20 COMPLET D C	67.5	13.2	200000000000000000000000000000000000000
Level of Service	F	С	В	E	E	c	D	E		E	В	
Approach Delay (s)	se, kes is engaña igan	34.7	ni isan ngasara an ga a		53.4	erne en en en en en en en en en	53.1	2(446805) (2/ 174 0)			44.8	stytewest sweet to
Approach LOS		С			D		D				D	
Intersection Summary												
HCM Average Control D	elay		46.7	Н	CM Lev	vel of Se	rvice		D			
HCM Volume to Capacit	y ratio		1.03			ann ar an						
Actuated Cycle Length (80.0	S	um of lo	ost time	(s)		20.0			
ntersection Capacity Ut			66.0%			of Ser			С			0.000 to 1.00000
Analysis Period (min)			15		327.549							
Critical Lana Group												

Intersection Summary		
HCM Average Control Delay	46,7	HCM Level of Service D
HCM Volume to Capacity ratio	1.03	
Actuated Cycle Length (s)	80.0	Sum of lost time (s) 20.0
Intersection Capacity Utilization	66.0%	ICU Level of Service C
Analysis Period (min)	15	
a Critical Lana Craun		

[~] Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

2011 Baseline Weekday AM

	→	•	•	←	\	. ↓
Lane Group	EBT	EBR	WBL	WBT	SBL	· - SBT
Lane Group Flow (vph)	804	424	114	1212	402	2 364
v/c Ratio	0.50	0.45	0.34	0.61	0.79	96 0.72 0
Control Delay	11.7	2.7	11.2	11.3	37.4	
Queue Delay	1.0	1.5	0.0	3.9	0.0	0 673.9
Total Delay	12.7	4.3	11.2	15.2	37.4	
Queue Length 50th (ft)	153	11	23	160	192	2 / 164 groups and Alberta transition and the
Queue Length 95th (ft)	m82	m0	m39	m226	268	A POLICE POTENTIAL AND A CONTROL OF THE AREA OF THE AR
Internal Link Dist (ft)	107			326		462
Turn Bay Length (ft)	* 1***************		152			uan ma nan n waren et e kagmanyuan perusiran ini ini ini ini ini
Base Capacity (vph)	1611	942	344	2003	643	8 643
Starvation Cap Reductn	507	333	0	174	0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.73		. 7.			35. 91.00 Simute on Sapri Datay of the entitle term
Intersection Summary						
intersection Summary						

		ed by upstream	

e ·									2011	Sasenne	vveeku	ay Alvi
	۶	→	•	•	4	•	4	†	1	1	ļ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተ	7*	7	个 个					75	43	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.98	
Fit Protected		1.00	1.00	0.95	1.00					0.95	0,96	
Satd. Flow (prot)		3374	1509	1656	3312					1715	1698	
Flt Permitted		1.00	1.00	0.24	1.00					0.95	0.96	
Satd. Flow (perm)		3374	1509	413	3312					1715	1698	
Volume (vph)	0	740	390	105	1115	0	0	0	0	665	0	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	804	424	114	1212	0	0	0	0	723	0	43
RTOR Reduction (vph)	0	0	227	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	804	197	114	1212	0	0	0	0	402	357	0
Heavy Vehicles (%)	7%	7%	7%	9%	9%	9%	9%	9%	9%	0%	0%	0%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6	PROJECTO 25/09/16/400			Orania (Carana)	A 1 CH 45(815054)	8	
Permitted Phases			2	6						8	466000	
Actuated Green, G (s)		36.2	36.2	47.4	47.4	THE SOUTH COME				22.6	22.6	
Effective Green, g (s)		37.2	37.2	48.4	48.4					23.6	23.6	
Actuated g/C Ratio		0.46	0.46	0.60	0.60			390000000000000000000000000000000000000		0.30	0.30	254500000000000000000000000000000000000
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	2824266
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	100000000000000000000000000000000000000
Lane Grp Cap (vph)		1569	702	362	2004					506	501	
v/s Ratio Prot	. 24. / 100 () / 100 () 40	0.24	SA 1 2 10 10 10 10 10 10 10 10 10 10 10 10 10	0.03	c0.37			seleciminatori.		CHECKE CONTRACTOR	4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	#15055#P4166
v/s Ratio Perm			0.13	0.16						c0.23	0.21	
v/c Ratio		0.51	0.28	0.31	0.60	000000000000000000000000000000000000000		(24242)-024-030		0.79	0.71	00000000
Uniform Delay, d1		15.0	13.2	8.0	9.8					26.0	25.2	SAME TO
Progression Factor	S. or State of State	0.65	0.80	1.17	0.94					1.00	1.00	
Incremental Delay, d2		0.8	0.7	0.3	0.8					8.4	4.8	
Delay (s)	p-u-chapareagenr	10.6	11.2	9.7	10.0					34.4	29.9	
Level of Service		В	В	A	A					Č	- C	
Approach Delay (s)		10.8	J-10014001	(News, Salary Boltze)	10.0			0.0			32.3	
Approach LOS		В			A			A.			°C	
Intersection Summary												
HCM Average Control D	elay	77,945-1019	15,4	ŀ	ICM Lev	el of Se	rvice		В			
HCM Volume to Capacity	y ratio		0.67		a an tak a militara	AA-MANITER PARK	von nach and delt der					
Actuated Cycle Length (s	s)		80.0		Sum of k	st time	(s)		8.0			\$605KF
Intersection Capacity Uti		1	01.3%		CU Leve				G	 		
Analysis Period (min) c Critical Lane Group			15	: : : : : : : : : : : : : : : : : : :								

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	۶	→	←	*	•	<i>•</i>	•
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	290	1420	926	705	429	406	
v/c Ratio	0.78	0.70	0.78	0.73	0.87	0.84	
Control Delay	34.4	14.0	28.0	7.0	45.8	40.5	
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	
Total Delay	34.4	14.2	28.0	7.0	45.8	40.5	
Queue Length 50th (ft)	116	232	218	0	205	174	
Queue Length 95th (ft) m	#205	276	#288	70	#351	#315	
Internal Link Dist (ft)		326	1			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	379	2027	1189	963	526	512	
Starvation Cap Reductn	0	113	0	0	0	0	king geen of the company of the property of the
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.77	0.74	0.78	0.73	0.82	0.79	

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

	۶	-	7	*	←	•	/	إر	•	*	/
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	۲	ተተ	,		个 个	7			ኣ	M	
ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		27	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.89	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (prot)	1703	3406			3059	1369			1618	1494	1994 (Marketon) 1 - 2021 (1-
Flt Permitted	0.15	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (perm)	267	3406			3059	1369			1618	1494	
Volume (vph)	255	1250	0	0	815	620	0	0	470	0	265
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	290	1420	0	0	926	705	0	0	534	0.00	301
RTOR Reduction (vph)	0	0	0	0	0	431	0	0	0	27	0
Lane Group Flow (vph)	290	1420	0	0	926	274	0	ŏ	429	379	Ö
Heavy Vehicles (%)	6%	6%	6%	18%	18%	18%	0%	0%	6%	6%	6%
Turn Type	pm+pt	12 7 11 11				Perm	9,0	40000	Split	070	070
Protected Phases	5	2			6	iranganan pagar		200919401	4	4	
Permitted Phases	2				40,500	6			Gerterester	. 1000000000000000000000000000000000000	
Actuated Green, G (s)	46.6	46.6			30.1	30.1			23.4	23.4	40.482,800,1940.8
Effective Green, q (s)	47.6	47.6		20029400	31.1	31.1		1899550	24.4	24.4	
Actuated g/C Ratio	0.60	0.60			0.39	0.39			0.30	0.30	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
/ehicle Extension (s)	2.5	4.0	en-locationaloys		5.0	5.0			3.5	3.5	7720004579
ane Gro Cap (vph)	383	2027			1189	532	445.000zen	7500000	493	456	
/s Ratio Prot	0.12	c0.42			0.30	JUL			c0.27	0.25	
//s Ratio Perm	c0.33				0.50	0.20			60.27	0.23	
//c Ratio	0.76	0.70			0.78	0.52	H1424F169608		0.87	0.83	7/33/34/36/2020
Jniform Delay, d1	13.6	11.3			21.4	18.7			26.3	25.9	
Progression Factor	1.41	1.02			1.00	1.00			1.00	1.00	
ncremental Delay, d2	6.7	1.7			5.1	3.5			15.7	12.5	
Delay (s)	25.8	13.3			26.5	22.2			42.0	38.3	
evel of Service	. C	10.0			20.3 C	22.2 C			42.0 D	აი.ა D	
Approach Delay (s)	41.000000000000000000000000000000000000	15.4			24.7		0.0	POLICE (SECTION	U	40.2	
Approach LOS		В					0.0 A			40.2 D	
ntersection Summary								GRANIS DE PR			
ICM Average Control D			24.0	H	CM Lev	el of Se	rvice		С		
ICM Volume to Capacit			0.78	Shape and Get-re	eesusse - 2000	detartugaren e	unt controvers on				
ctuated Cycle Length (80.0			st time (8.0		
ntersection Capacity Uti	lization	10	01.3%	IC	U Leve	of Serv	/ice		G		

m Volume for 95th percentile queue is metered by upstream signal.

		•		. ▼	*	_	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	1		ሻ	^	74	7	
Sign Control	Free		· · ·	Free	Stop		
Grade	0%			0%	0%		
Volume (veh/h)	1410	21	23	1490	9	20	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph) Pedestrians	1516	23	25	1602	10	22	
Lane Width (ft) Walking Speed (ft/s)							
Percent Blockage Right turn flare (veh)							
Median type Median storage veh)					None		
Upstream signal (ft)				74			
pX, platoon unblocked					0.71		
vC, conflicting volume			1539		2378	769	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			1539		2532	769	
C, single (s)			4.3		8.4	8,5	
tC, 2 stage (s)							
F (s)			2.3		4.3	4.1	
00 queue free %			94		0 5	90	
cM capacity (veh/h)			391			216	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SATISTIC CONTRACTOR	
Volume Total	1011	528	25	801	801	10	22
Volume Left	0	0	25	0	0	10	0
Volume Right	0	23	0	0	0	0	
:SH	1700	1700	391	1700	1700	5	216
Volume to Capacity	0.59	0.31	0.06	0.47		1.98	
Queue Length 95th (ft)	0	0	5	0	0	56	8
Control Delay (s)	0.0	0.0	14.8	0.0	0.0	1804.0	23.5
ane LOS	on staglatic		В			F	C
Approach Delay (s) Approach LOS	0.0		0.2			576.1 F	
ntersection Summary							
Average Delay ntersection Capacity Uti Analysis Period (min)	lization	(FEE)	5.7 51.2% 15	923230	CU Lev	el of Ser	vice A

	→	•	4	†	\	1	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	10	36	392	1268	696	897	
v/c Ratio	0.07	0.34	0.42	0.75	0.79	0.30	
Control Delay	30.8	46.5	7.3	19.5	35.4	2.3	and the control of th
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.8	46.5	7.3	19.5	35.4	2.3	
Queue Length 50th (ft)	2	17	19	248	164	35	
Queue Length 95th (ft)	19	51	62	#473	#302	112	
Internal Link Dist (ft)	36			266		3370	
Turn Bay Length (ft)							
Base Capacity (vph)	150	105	954	1697	899	2944	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.34	0.41	0.75	0.77	0.30	
Internaction Commerce	200000000000000000000000000000000000000	60000000000000	and the second second	040000000000000000000000000000000000000	SENSON STATEMEN	01500000000000000000000000000000000000	

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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The Transpo Group

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HCM Signalized Intersection Capacity Analysis 2011 Baseline Weekday AM

	۶	→	•	•	←	*	4	†	<i>></i>	>	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4		*		77	ሻ	† }		16.56	↑ ↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88		0.95		0.97	0.95	
Frt		0.93		1.00		0.85		0.98		1.00	1.00	
Fit Protected		1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1772		1410		2221		3197		3273	3371	
Flt Permitted		1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1772		1410		2221		3197		3273	3371	
Volume (vph)	0	5	5	35	0	380	0	1090	140	675	865	5
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	5	5	36	0	392	0	1124	144	696	892	5
RTOR Reduction (vph)	0	5	Ō	0	0	198	ō	10	0	0	0	0
Lane Group Flow (vph)	0	5	0	36	0	194	0	1258	ō	696	897	ō
Heavy Vehicles (%)	0%	0%	0%	28%	28%	28%	11%	11%	11%	7%	7%	7%
Turn Type	Perm	7 77	1777	Prot		ustom	Prot	21245	100	Prot		
Protected Phases	10,000,000	3		4		1	5	2		1	6	
Permitted Phases	3					4					·	
Actuated Green, G (s)	2000	0.9		2.8		21.4		38.6		18.6	63.2	
Effective Green, g (s)		2.9		3.8		24.4		40.6		20.6	65.2	
Actuated g/C Ratio		0.03		0.05		0.29		0.48		0.25	0.78	
Clearance Time (s)		6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	78/0/PE2	61	farea in the	64	ana Primer	752	ar Seed a	1547	V197574	804	2620	777.7
v/s Ratio Prot		c0.00	Drug Verserer	c0.03		0.06		c0.39	MAY DATE	c0.21	0.27	
v/s Ratio Perm		00.00		00.00		0.02		00.00		00.21	0.27	
v/c Ratio		0.08		0.56		0.26		0.81		0.87	0.34	
Uniform Delay, d1		39.2		39.2		22.8		18.4		30.3	2.8	
Progression Factor		1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2		0.6		10.8		0.2		4.8		9.7	0.4	
Delay (s)		39.8		50.1	44000000	23.0		23.2		40.0	3.2	
Level of Service		00.0 D		D D		C				40.0 D	3.2 A	
Approach Delay (s)		39.8			25.3			23.2		U	19.3	
Approach LOS		39.0 D			20.0 C			23.2 C			19.3 B	
		Jagy (st.), 94 g/	radalelikusi.		ara kan u n						D	
Intersection Summary												
HCM Average Control D			21.6		ICM Lev	el of Se	rvice		С			
HCM Volume to Capacity			0.78									
Actuated Cycle Length (s			83.9		um of k				16.0			
Intersection Capacity Util	ization		72.5%	[0	CU Leve	I of Ser	vice		С			
Analysis Period (min)			15									
c Critical Lane Group												

The Transpo Group

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Queues

									2011 E	Baseline	Weekday PM
	_#	→	•	•	←	۲	1	7	4	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	107	1301	26	61	740	281	26	158	474	444	
v/c Ratio	0.40	0.81	0.04	0.54	0.61	0.42	0.22	0.62	0.82	0.83	
Control Delay	44.7	29.4	8.4	71.4	18.3	7.7	49.2	48.1	53.0	46.5	
Queue Delay	0.0	2.8	0.0	0.0	1.3	1.4	0.0	3.0	0.9	0.0	
Total Delay	44.7	32.3	8.4	71.4	19.6	9.0	49.2	51.1	53.9	46.5	
Queue Length 50th (ft)	64	393	2	34	169	73	16	88	151	260	
Queue Length 95th (ft)	119	#507	17	m#79	m232	m135	43	155	#225	#439	
Internal Link Dist (ft)		436			126	(1255)	426		11.77		
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	268	1612	733	113	1220	665	116	292	585	536	
Starvation Cap Reductn	0	0	0	0	275	214	0	0	0	0	
Spillback Cap Reductn	0	206	0	0	0	0	0	64	20	ñ	
Storage Cap Reductn	0	0	0	0	0	ō	0	0	0	0	
Reduced v/c Ratio	0.40	0.93	0.04	0.54	0.78	0.62	0.22	0.69	0.84	0.83	awarangan di

^{# 95}th percentile volume exceeds capacity, queue may be longer.

	#	→	*	•	4	€.	•	7	<i>*</i>	4	4	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	*	^	7	ሻ	^ ^	7	ኻ	4		74.74	k/f	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	CONTRACTOR	4.0	4.0	\$41 KAR-\$40 KG
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Fit Protected	0.95	1,00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Volume (vph)	105	1275	25	60	725	275	25	135	20	465	330	105
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	1301	26	61	740	281	26	138	20	474	337	107
RTOR Reduction (vph)	0	0	12	0	0	123	0	5	0	0	11	. 0
Lane Group Flow (vph)	107	1301	14	61	740	158	26	153	0	474	433	Ö
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	800783X	Perm	Prot	8.842 J. 184	Perm	Prot			Prot	0.4600000	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2	i cerein					
Actuated Green, G (s)	13.7	41.5	41.5	4.7	32.6	32.6	3.0	16.4		15.4	29.0	
Effective Green, g (s)	15.4	43.3	43.3	5.4	33.3	33.3	4.7	18.3		17.0	30.6	
Actuated g/C Ratio	0.15	0.43	0.43	0.05	0.33	0.33	0.05	0.18		0.17	0.31	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	1503	672	93	1145	512	82	284	5 M (10 M (10 M)	578	524	
v/s Ratio Prot	0.06	c0.37		c0.04	0.22	10000 TO 1-7500	0.01	0.10		c0.14	c0.25	
v/s Ratio Perm			0.01			0.10						
v/c Ratio	0.40	0.87	0.02	0.66	0.65	0.31	0.32	0.54		0.82	0.83	
Uniform Delay, d1	38.1	25.7	16.2	46.4	28.3	24.8	46.1	37.0		40.0	32.2	
Progression Factor	1.00	1.00	1.00	1.23	0.61	0.69	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4,4	6.9	0.1	13.4	2.4	1.3	2.2	2.0		9.1	10.3	AREAS F
Delay (s)	42.6	32.6	16.3	70.3	19.7	18.5	48.3	39.0		49.1	42.5	
Level of Service	D	С	В	Ε	В	В	D	D		D	D	
Approach Delay (s)		33.1			22.2		40.3	danie son <u>pe</u> stor		ne este sa ter	45.9	
Approach LOS		С			С		D				D	
Intersection Summary												
HCM Average Control D			33.5	Н	ICM Lev	el of Se	rvice		С			
HCM Volume to Capacity			0.82						a a como en contratiga			
Actuated Cycle Length (s			100.0	S	um of k	st time	(s)		12.0	40 0 000		
Intersection Capacity Util	lization		81.6%	IC	CU Leve	of Ser	vice	14.0140.000-17.1	D			
Analysis Period (min) c Critical Lane Group			15			100,785			Y40940			

. The Transpo Group

Intersection Summary Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	1052	670	407	1072	449	402	
v/c Ratio	0.90	0.70	0.94	0.53	0.96	0.86	
Control Delay	31.3	5.6	61.6	11.6	66.9	50.6	
Queue Delay	103.2	21.3	0.0	0.8	0.0	0.1	
Total Delay	134.6	27.0	61.6	12.4	66.9	50.7	
Queue Length 50th (ft)	268	51	252	183	290	247	
Queue Length 95th (ft)	#448	m72	m#366	m260	#497	#424	
Internal Link Dist (ft)	126			410		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	1173	964	431	2028	476	476	
Starvation Cap Reductn	318	303	0	303	0	0	
Spillback Cap Reductn	0	0	0	589	0	1	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.23	1.01	0.94	0.74	0.94	0.85	
Intersection Summary							
# 95th percentile volun Queue shown is max m Volume for 95th per	imum a	after tw	o cycles				

	۶	→	•	•	+	4	4	†	~	/	+	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		^	7	, J	† †					7	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Fit Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1437	
Fit Permitted		1.00	1,00	0.10	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	187	3406					1441	1437	
Volume (vph)	0	1020	650	395	1040	0	0	0	0	805	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1052	670	407	1072	0	0	0	0	830	0	21
RTOR Reduction (vph)	0	0	440	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1052	230	407	1072	0	0	0	0	449	400	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type			Perm	pm+pt						Perm		
Protected Phases	1,000,000,000	2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		33.4	33.4	58.5	58.5	1				31.5	31.5	
Effective Green, g (s)		34.4	34.4	59.5	59.5					32.5	32.5	
Actuated g/C Ratio		0.34	0.34	0.60	0.60					0.32	0.32	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		1172	524	431	2027					468	467	
v/s Ratio Prot		0.31		c0.20	0.31	(600-0-0-1-4-7-4-6-7-6-1)		-contrates and co		z ngeetham eva		
v/s Ratio Perm			0.15	c0.36						c0.31	0.28	
v/c Ratio		0.90	0.44	0.94	0.53					0.96	0.86	
Uniform Delay, d1		31,1	25.4	29.1	12.0					33.1	31.6	
Progression Factor		0.76	1.44	1.41	0.89					1.00	1.00	
Incremental Delay, d2		6.6	1.5	22.8	0.7					31.0	14.3	
Delay (s)		30.4	37.9	63.8	11.4					64.1	45.9	
Level of Service		С	D	E	В					E	D	
Approach Delay (s)		33.3			25.8			0.0			55.5	
Approach LOS		C	delika (С			Α			E	
Intersection Summary	- 9											
HCM Average Control D	elay		35.2	F	ICM Lev	vel of Se	rvice		D			
HCM Volume to Capacit			0.94									
Actuated Cycle Length (s)		100.0	S	ium of k	ost time	(s)		8.0			
Intersection Capacity Uti	lization	1	37.9%	[6	CU Leve	el of Ser	vice		Н			
Analysis Period (min)			15									
- Cuitical Lana Cuarin												

. LEDINE AND DESCRIPTION OF THE PROPERTY OF TH	- in en ga da da para an an an an an an an	
Intersection Summary		A Property of the Control of the Con
HCM Average Control Delay	35.2	HCM Level of Service D
HCM Volume to Capacity ratio	0.94	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	137.9%	ICU Level of Service H
Analysis Period (min)	15	
o Critical Lana Group		

c Critical Lane Group

3: S 188th St & I-5 NB

	۶	-	•	•	•	<i>•</i>	
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	371	1485	1031	1021	335	341	
v/c Ratio	0.91	0.66	0.63	0.93	0.93	0.88	
Control Delay	43.7	11.9	21.5	23.4	70.5	55.9	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	
Total Delay	43.7	12.3	21.5	23.4	70.5	55.9	
Queue Length 50th (ft)	188	238	248	219	218	187	
Queue Length 95th (ft) r	n#221	m263	316	#621	#393	#357	
Internal Link Dist (ft)		410	.1			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	409	2243	1640	1098	367	391	
Starvation Cap Reductn		281	0	0	0	0	
Spillback Cap Reductn	0	0	. 0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.91	0.76	0.63	0.93	0.91	0.87	
Intersection Summary							

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

		_	#	_	•	_	*	×	٦	7	/*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	ሻ	ተተ			ተተ	7			٦	M	
ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.92	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (prot)	1641	3282			3406	1524			1531	1447	
Flt Permitted	0.16	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (perm)	274	3282			3406	1524			1531	1447	
Volume (vph)	360	1440	0	0	1000	990	0	0	470	- 5	180
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	371	1485	0	0	1031	1021	0	0	485	5	186
RTOR Reduction (vph)	0	0	0	0	0	365	0	0	0	43	0
Lane Group Flow (vph)	371	1485	0	0	1031	656	0	0	335	298	0
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt					Perm			Split		
Protected Phases	5	2			6	A-1-14-0-0-09-0-6-0-			4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	67.3	67.3			47.1	47.1		A. 1904. Tale L. 1	22.7	22.7	
Effective Green, g (s)	68.3	68.3			48.1	48.1			23.7	23.7	
Actuated g/C Ratio	0.68	0.68			0.48	0.48			0.24	0.24	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
Lane Grp Cap (vph)	409	2242			1638	733			363	343	
v/s Ratio Prot	c0.15	0.45			0.30	COLOR SERVICE SERVICE SE			c0.22	0.21	
v/s Ratio Perm	c0.47				1000000	0.43					
v/c Ratio	0.91	0.66			0.63	0.90			0.92	0.87	
Uniform Delay, d1	20.2	9.2			19.3	23.7			37.3	36.6	
Progression Factor	1.86	1.19			1.00	1.00			1.00	1.00	er i etti anguderi eti etti aktivati seesti.
Incremental Delay, d2	11.5	0.6			1.8	15.7			28.8	20.4	
Delay (s)	49.1	11.5	100 10 10 10 2/2020 40		21.2	39.4	a che partigità de la		66.1	57.0	con Merchae Sack-Rouse (bese
Level of Service	D	В			С	D			É	E	State and the
Approach Delay (s)	. v - 1. v v v v v v v v v v v v v v v v v v	19.1	Average Control of the		30.2		0.0		elene enelogitate de	61.5	
Approach LOS		В			С		Α			E	
Intersection Summary	6										
HCM Average Control D			30.3	Н	CM Lev	el of Se	rvice		С		
HCM Volume to Capacit			0.90								
Actuated Cycle Length (100.0			ost time			8.0		
Intersection Capacity Uti	lization	1	37.9%	IC	U Leve	of Ser	vice		Н		
Analysis Period (min) C Critical Lane Group			15								

Queues

2011 Baseline Weekday PM

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\Baseline\PM-Baseline 2011.sy7

m Volume for 95th percentile queue is metered by upstream signal.

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\Baseline\PM-Baseline 2011.sy7

	†	7	4	↓	4	t	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	† }		ሻ	ተተ	7	7	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Volume (veh/h)	1975	9	10	1615	7	18	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph)	2124	10	11	1737	8	19	
Pedestrians							
Lane Width (ft) Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type					None		
Median storage veh)					110110		
Upstream signal (ft)				66			
pX, platoon unblocked				, , , ,	0.74		
vC, conflicting volume			2133			1067	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			2133		3384	1067	
tC, single (s)			4.3		7.3	7.4	
tC, 2 stage (s)							
tF (s)			2.3		3,7	3.5	
p0 queue free %			95		0	90	
cM capacity (veh/h)	54-9445F		224		3	184	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB3	and the second desired to the second	
Volume Total	1416	718	11	868	868	8	(1988)
Volume Left	0	0	11	0	0	8	0
Volume Right cSH	0	10	0	4700	1700	Ŏ	(Aug 1974 (1975)
Volume to Capacity	1700 0.83	1700 0.42	224 0.05	1700 0.51	1700 0.51	2.89	184 20 0:10
Queue Length 95th (ft)	. 0.63 0	0.42	0.05	0.51	0.31	2.09	\$\$# \$\$ \$
Control Delay (s)	0.0	0.0	21.9	0.0	-	3220.6	26.8 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
Lane LOS	0.0	0.0	Z,.3	0.0	0.0	5220.0 F	D
Approach Delay (s)	0.0		0.1			921.1	Ad Šultuia dur
Approach LOS	. Chica Markan		1.000 ≪3.0 00			F	
Intersection Summary							
Average Delay			6.4				
Intersection Capacity Ut	ilization		64.9%		CU Lev	ei of Se	rvice C
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis 2011 Baseline Weekday PM

14-10-210-2150	Day Lake	TCICONOC TIA	U OCIDagalinalE	PM-Baseline 2011.sv7

The Transpo Group

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	\rightarrow	1	•	Ť	-	↓	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	10	326	1037	1294	405	1152	
v/c Ratio	0.07	0.84	0.80	0.82	0.86	0.54	
Control Delay	39.8	52.3	21.6	25.2	53.6	9.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.8	52.3	21.6	25.2	53.6	9.1	
Queue Length 50th (ft)	- 5	153	185	271	101	130	
Queue Length 95th (ft)	21	#344	#377	#497	#209	261	
Internal Link Dist (ft)	36			266		3373	
Turn Bay Length (ft)							
Base Capacity (vph)	144	389	1301	1581	472	2151	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.84	0.80	0.82	0.86	0.54	
Intersection Summany							

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	*	→	•	1	←	•	4	†	~	>	↓	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		43		ሻ		77	7	4 1		44	∱ 1>	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88		0.95		0.97	0.95	
Frt		1.00		1.00		0.85		0.99		1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1854		1752		2760		3444		3183	3280	
Flt Permitted		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1854		1752		2760		3444		3183	3280	
Volume (vph)	5	5	0	310	0	985	0	1165	65	385	1090	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	5	0	326	0	1037	0	1226	68	405	1147	5
RTOR Reduction (vph)	0	0	0	0	0	163	0	5	0	0	0	0
Lane Group Flow (vph)	0	10	0	326	0	874	0	1289	0	405	1152	. 0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type	Perm	August 1960	77 Z.S.	Prot	C	ustom	Prot	1 1111	12.00	Prot	177	
Protected Phases		3		4		1	5	2		1	6	
Permitted Phases	3					4						
Actuated Green, G (s)		0.9		16.9		26.9		35.1		10.0	51.1	
Effective Green, g (s)		2.9		17.9		29.9		37.1		12.0	53.1	
Actuated g/C Ratio		0.03		0.21		0.35		0.43		0.14	0.62	
Clearance Time (s)		6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		63		365		1089	277.525	1487		445	2028	577 5
v/s Ratio Prot				c0.19		c0.11		c0.37		0.13	0.35	
v/s Ratio Perm		0.01				0.20						
v/c Ratio		0.16		0.89		0.80		0.87		0.91	0.57	
Uniform Delay, d1		40.3		33.1		25.3		22.2		36.4	9.6	
Progression Factor		1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.2		23.0		4.4		7.1		22.5	1.2	
Delay (s)		41.5		56.1		29.7		29.2		58.9	10.8	
Level of Service		D		E		С		С		Ε	В	
Approach Delay (s)		41.5			36.0			29.2			23.3	
Approach LOS		D			D			C			C	Galley e
Intersection Summary												
HCM Average Control D HCM Volume to Capacit			29.3 0.82	H	ICM Lev	el of Se	rvice		С			
Actuated Cycle Length (85.9		um of l	st time	(c)		120			
Intersection Capacity Ut			82.9%			ost time of Ser			12.0			
Analysis Period (min)	mzallūti		02.9%	IN 1 7/10	O LEVE	ii oi Ser	vice		Ε			
c Critical Lane Group			ijĴ									
- Chaoar Lane Oloup												

	#	-	•	✓	←	€	4	7	4	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	111	958	26	32	563	189	32	216	295	252	
v/c Ratio	0.35	0.58	0.03	0.25	0.52	0.31	0.24	0.68	0.61	0.46	
Control Delay	38.0	21.4	7.2	45.3	23.6	7.5	44.1	41.2	42.2	26.8	
Queue Delay	0.0	0.0	0.0	0.0	3.1	0.9	0.0	0.0	0.0	0.0	
Total Delay	38.0	21.4	7.2	45.3	26.7	8.4	44.1	41.2	42.2	26.8	
Queue Length 50th (ft)	57	234	0	14	162	28	18	104	81	112	
Queue Length 95th (ft)	112	309	16	m45	162	72	46	173	123	178	
Internal Link Dist (ft)		436			126		431			246	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	318	1658	756	127	1084	602	132	380	501	559	
Starvation Cap Reductn	0	0	0	0	405	213	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0.	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.35	0.58	0.03	0.25	0.83	0.49	0.24	0.57	0.59	0.45	
Intersection Summary											

m Volume for 95th percentile queue is metered by upstream signal.

	_#	→	•	•	←	۲	4	₹	~	4	4	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	7	ተተ	7	ሻ	十 个	7	ሻ	Ř	**********	ሻሻ	ሻ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1,00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1787	3574	1599	1736	3471	1553	1770	1583		3467	1745	
FIt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1787	3574	1599	1736	3471	1553	1770	1583		3467	1745	
Volume (vph)	105	910	25	30	535	180	30	150	55	280	180	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	958	26	32	563	189	32	158	58	295	189	63
RTOR Reduction (vph)	0	0	15	0	0	122	0	15	0	0	13	0
Lane Group Flow (vph)	111	958	11	32	563	67	32	201	0	295	239	0
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	14.3	35.8	35.8	3.6	25.2	25.2	3.0	17.6		11.0	25.8	
Effective Green, g (s)	16.0	37.6	37.6	4.3	25.9	25.9	4.7	19.5		12.6	27.4	
Actuated g/C Ratio	0.18	0.42	0.42	0.05	0.29	0.29	0.05	0.22		0.14	0.30	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9	gizara.	5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	1493	668	83	999	447	92	343		485	531	
v/s Ratio Prot	c0.06	c0.27		0.02	0.16		0.02	c0.13		c0.09	0.14	
v/s Ratio Perm			0.01			0.04						
v/c Ratio	0.35	0.64	0.02	0.39	0.56	0.15	0.35	0.59		0.61	0.45	- Colored at Sections
Uniform Delay, d1	32.4	20.8	15.4	41.6	27.2	23.9	41.2	31.6		36.4	25.2	
Progression Factor	1.00	1.00	1.00	1.01	0.85	1.21	1.00	1.00		1.00	1.00	7230-46-1 X11.
Incremental Delay, d2	3.0	2.1	0.0	2.9	2.2	0.7	2.3	2.6		2.2	0.6	
Delay (s)	35.4	23.0	15.4	45.1	25.4	29.6	43.4	34.2		38.5	25.8	And Arrange
Level of Service	D	С	В	D	С	C	D	С		D	С	
Approach Delay (s)		24.1			27.2		35.4				32.7	
Approach LOS		C			С		D				С	
Intersection Summary												
HCM Average Control D	elay		27.8	Н	CM Lev	el of Se	rvice		С			
HCM Volume to Capacit	y ratio		0.61			TO STATE OF THE PARTY	A				. 210-101-20-20-20-20-20-20-20-20-20-20-20-20-20-	
Actuated Cycle Length (90.0	s	um of lo	st time	(s)		16.0			
Intersection Capacity Ut			60.5%			of Ser			В			
Analysis Period (min)			15									

c Critical Lane Group

	-	•	•	←	/	↓	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	646	615	104	724	117	112	
v/c Ratio	0.28	0.49	0.20	0.27	0.54	0.46	
Control Delay	4.3	2.2	6.0	6.1	44.9	28.2	
Queue Delay	0.3	0.5	0.0	0.0	0.0	0.0	
Total Delay	4.6	2.7	6.0	6.1	44.9	28.2	
Queue Length 50th (ft)	45	10	23	114	66	37	
Queue Length 95th (ft)	17	20	m0	146	116	86	
Internal Link Dist (ft)	126			410		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	2313	1248	561	2707	498	506	
Starvation Cap Reductn	1021	271	0	0	0	0	
Spillback Cap Reductn	0	0	0	404	0	. 5	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.50	0.63	0.19	0.31	0.23	0.22	
Interportion Cummons		220000000000000000000000000000000000000			000000000000000000000000000000000000000		

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis 2011 Baseline Saturday PM

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		^ ^	7	¥	ተተ					* *	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util, Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.94	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.97	
Satd. Flow (prot)		3539	1583	1752	3505					1545	1481	
Flt Permitted		1.00	1,00	0.36	1.00					0.95	0.97	
Satd. Flow (perm)		3539	1583	659	3505					1545	1481	
Volume (vph)	0	620	590	100	695	0	0	0	0	175	0	45
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	646	615	104	724	0	0	0	0	182	0	47
RTOR Reduction (vph)	0	0	220	0	0	0	0	0	0	0	37	0
Lane Group Flow (vph)	0	646	395	104	724	0	0	0	0	117	75	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	11%	11%	11%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		56.8	56.8	68.5	68.5					11.5	11.5	
Effective Green, g (s)		57.8	57.8	69.5	69.5					12.5	12.5	
Actuated g/C Ratio		0.64	0.64	0.77	0.77					0.14	0.14	
Clearance Time (s)		5.0	5.0	5.0	5.0					5,0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		2273	1017	602	2707					215	206	
v/s Ratio Prot		0.18		0.01	c0.21							
v/s Ratio Perm			c0.25	0.12						c0.08	0.05	
v/c Ratio		0.28	0.39	0.17	0.27					0.54	0.36	
Uniform Delay, d1		7,0	7.7	2.8	2.9					36.1	35.1	
Progression Factor		0.50	1.14	1.74	1.79					1.00	1.00	
Incremental Delay, d2		0.3	0.9	0.1	0.2					2.8	1.1	
Delay (s)		3.8	9.7	5.1	5.5					38.9	36.2	
Level of Service		Α	Α	A	Α					D	D	
Approach Delay (s)		6.7			5.4			0.0			37.6	5748050555588
Approach LOS		Α			Α			A			D	
Intersection Summary						100						
HCM Average Control D			9.3	ŀ	ICM Le	vel of Se	rvice		Α			
HCM Volume to Capacit			0.41	CONTRACTOR OF		appropriate page 6 mil		SUCSENSITIVES OF				
Actuated Cycle Length (90.0			ost time			12.0			
Intersection Capacity Ut	ilization		58.3%		CU Lev	el of Sen	/ice		В			
Analysis Period (min)			15									
c Critical Lane Group												

c Critical Lane Group

Queues

ane Group Flow (vph) 328 548 409 290 273 259 (c Ratio 0.57 0.23 0.24 0.32 0.72 0.65 ontrol Delay 13.9 5.8 15.7 3.6 42.2 33.3 ueue Delay 0.0 0.0 0.0 0.0 0.0 0.0 otal Delay 13.9 5.8 15.7 3.6 42.2 33.3 ueue Length 50th (ft) 63 35 64 0 151 117 ueue Length 95th (ft) 183 110 131 53 216 182 termal Link Dist (ft) 410 9 232 urn Bay Length (ft) 170 asse Capacity (vph) 738 2345 1686 901 537 543 tarvation Cap Reductn 0 0 0 0 0 0 otorage Cap Reductn 0 0 0 0 0 0 educed v/c Ratio 0.44 0.23 0.24 0.32 0.51 0.48	ane Group EBL EBT WBT WBR NEL2 NEL ane Group Flow (vph) 328 548 409 290 273 259 (c Ratio 0.57 0.23 0.24 0.32 0.72 0.65 ontrol Delay 13.9 5.8 15.7 3.6 42.2 33.3 tueue Delay 0.0 0.0 0.0 0.0 0.0 0.0 otal Delay 13.9 5.8 15.7 3.6 42.2 33.3 tueue Length 50th (ft) 63 35 64 0 151 117 tueue Length 95th (ft) 183 110 131 53 216 182 tutemal Link Dist (ft) 410 9 232 urn Bay Length (ft) 170 ase Capacity (vph) 738 2345 1686 901 537 543 tarvation Cap Reductn 0 0 0 0 0 0 0 torage Cap Reductn 0 0 0 0 0 0 0 torage Cap Reductn 0 0 0 0 0 0 0 torage Cap Reductn 0 0 0 0 0 0 0								2011 Baseline Saturday PM
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tueue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	tueue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	/c Ratio	0.57	0.23	0.24	0.32	0.72	0.65	
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								-	
tersection Summary	itersection Summary	Reduced v/c Ratio	0.44	0.23	0.24	0.32	0.51	0.48	
		itersection Summary							

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	ሻ	ተተ			ተተ	7			ሻ	M	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.94	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.97	
Satd. Flow (prot)	1719	3438			3406	1524			1665	1596	
Fit Permitted	0.45	1.00			1.00	1.00			0.95	0.97	
Satd. Flow (perm)	809	3438			3406	1524			1665	1596	
Volume (vph)	305	510	0	0	380	270	0	0	390	5	100
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	328	548	0	0	409	290	0	0	419	5	108
RTOR Reduction (vph)	0	0	0	0	0	146	0	0	0	32	0
Lane Group Flow (vph)	328	548	0	0	409	144	0	0	273	227	0
Heavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	3%	3%	3%
Turn Type	pm+pt					Perm			Split		
Protected Phases	5	2			6				4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	60.4	60.4			43.6	43.6			19.6	19.6	
Effective Green, g (s)	61.4	61.4			44.6	44.6			20,6	20.6	
Actuated g/C Ratio	0.68	0.68			0.50	0.50			0.23	0.23	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
Lane Grp Cap (vph)	681	2345			1688	755			381	365	
v/s Ratio Prot	c0.07	0.16			0.12				c0.16	0.14	
v/s Ratio Perm	c0.26					0.09					
v/c Ratio	0.48	0.23			0.24	0.19			0.72	0.62	
Uniform Delay, d1	5.9	5.4			13.0	12.6			32.0	31,2	
Progression Factor	1.49	0.90			1.00	1.00			1.00	1.00	
Incremental Delay, d2	0.4	0.2			0.3	0.6			6.5	3.4	
Delay (s)	9.2	5.1			13.4	13.2			38.5	34.6	
Level of Service	Α	Α			В	В			D	С	
Approach Delay (s)		6.7			13.3		0.0			36.6	
Approach LOS		Α			В		Α			D	
Intersection Summary											
HCM Average Control I			16.4	- F	ICM Le	vel of Se	rvice		В		
HCM Volume to Capaci			0.54								
Actuated Cycle Length			90.0			ost time			8.0		
Intersection Capacity U	tilization		58.3%	10	CU Leve	el of Ser	vice		В		
Analysis Period (min)			15								

c Critical Lane Group

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	†	7	(w	↓	4	t	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	↑ Ъ		ኻ	^	75	7*	
Sign Control	Free		•	Free	Stop	•	
Grade	0%			0%	0%		
Volume (veh/h)	560	30	63	535	18	70	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	596	32	67	569	19	74	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type					None		
Median storage veh)							
Upstream signal (ft)				89			
pX, platoon unblocked					0.95		
vC, conflicting volume			628		1030	314	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol	SWW.						
vCu, unblocked vol			628		976	314	
tC, single (s)			4.2		6.9	7.0	
tC, 2 stage (s)							
tF (s)			2.3		3.6	3.4	
p0 queue free %			93		91	89	
cM capacity (veh/h)			917		212	670	
Direction, Lane#	NB 1	NB 2	SB 1	SB 2	SB3		SW 2
Volume Total	397	230	67	285	285	19	74
Volume Left	0	0	67	0	0	19	0
Volume Right	0	32	0		0	0	74.8 Marking the 1997 of 1997 of 1997
cSH	1700	1700	917	1700	1700	212	670
Volume to Capacity	0.23	0.14	0.07	0.17	0.17		0.11
Queue Length 95th (ft)	0	0	6	0	0	7	9
Control Delay (s)	0.0	0.0	9.2	0.0	0.0		411.0
Lane LOS			Α			С	B.
Approach Delay (s) Approach LOS	0.0		1.0			13,6 B	
Intersection Summary							
Average Delay			1.4				
Intersection Capacity Ut	ilization		33.3%	المهارينة	CU Levi	el of Ser	vice A
Analysis Period (min)			15				
SOFTEND SOFTENDED							

	→	•	•	*	†	-	Į.	
Lane Group	EBT	WBL	WBR	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	10	121	220	5	604	209	478	
v/c Ratio	0.06	0.47	0.21	0.03	0.33	0.41	0.19	
Control Delay	28.6	35.9	3.3	36.4	12.3	31.5	6.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.6	35.9	3.3	36.4	12.3	31.5	6.7	
Queue Length 50th (ft)	2	49	0	2	73	42	26	
Queue Length 95th (ft)	18	114	25	13	165	90	122	
Internal Link Dist (ft)	36				266		3376	
Turn Bay Length (ft)								
Base Capacity (vph)	219	339	1047	212	1824	586	2459	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.36	0.21	0.02	0.33	0.36	0.19	
Intersection Summary								

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The Transpo Group

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•	-	•	•	←	•	4	†	1	>	↓	1
Movement EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		ሻ		77	75	† }		ሻሻ	† Þ	
Ideal Flow (vphpl) 1900	1900	. 1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00		0.88	1.00	0.95		0.97	0.95	
Frt	0.93		1.00		0.85	1.00	0.98		1.00	1.00	
Flt Protected	1.00		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772		1752		2760	1752	3424		3273	3374	
Flt Permitted	1.00		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1772		1752		2760	1752	3424		3273	3374	
Volume (vph) 0	5	5	110	0	200	5	465	85	190	435	0
Peak-hour factor, PHF 0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph) 0	5	5	121	0	220	5	511	93	209	478	0
RTOR Reduction (vph) 0	5	Ō	0	0	165	0	13	0	0	0	0
Lane Group Flow (vph) 0	5	0	121	0	55	5	591	0	209	478	0
Heavy Vehicles (%) 0%	0%	0%	3%	3%	3%	3%	3%	3%	7%	7%	7%
Turn Type Perm			Prot	С	ustom	Prot			Prot		
Protected Phases	3		4	_	1	5	2		1	6	
Permitted Phases 3			,		4	_				_	
Actuated Green, G (s)	1.1		8.4		17.7	1.1	41.1		9.3	49.3	
Effective Green, g (s)	3.1		9.4		20.7	3.1	43.1		11.3	51.3	
Actuated g/C Ratio	0.04		0.11		0.25	0.04	0.52		0.14	0.62	
Clearance Time (s)	6.0		5.0		6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	66	12.12.1	199		822	66	1780	e de la consti	446	2088	
v/s Ratio Prot	c0.00		c0.07		0.01	0.00	c0.17		c0.06	0.14	
v/s Ratio Perm	00.00		00.01		0.01	0.00	00.17		00.00	0.14	
v/c Ratio	0.08		0.61		0.07	0.08	0.33		0.47	0.23	
Uniform Delay, d1	38.5		35.0		23.7	38.5	11.5		33.0	7.0	
Progression Factor	1.00		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5		5.2		0.0	0.5	0.5		0.8	0.3	
	39.0		40.2		23.8	39.0	12.0		33.8	7.3	
Delay (s)			40.2 D		23.6 C				33.0 C	7.3 A	
Level of Service	39.0		Ü	29.6	Ų.	D	12.3		C	15.3	
Approach Delay (s)				29.6 C			12.3 B			10.5 B:	
Approach LOS	D			- C C	e daga		D.	i i i filozof		D	
Intersection Summary											
HCM Average Control Delay		17.3	ŀ	ICM Lev	el of Se	rvice		В			
HCM Volume to Capacity ratio		0.38									
Actuated Cycle Length (s)		82.9		Sum of Ic				16.0			
Intersection Capacity Utilization		43.7%	10	CU Leve	of Serv	vice		Α			
Analysis Period (min)		15									
c Critical Lane Group											

	⊿ €	→	*	•	←	۳	4	7	4	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	122	823	6	11	922	394	72	483	356	255	
v/c Ratio	0.85	0.62	0.01	0.09	0.97	0.66	0.39	1.00	0.95	1.08	
Control Delay	83.7	23.2	11.4	50.5	49.8	16.0	39.5	70.3	72.0	109.9	
Queue Delay	0.0	0.7	0.0	0.0	78.2	5.5	0.0	0.5	0.0	0.0	
Total Delay	83.7	23.9	11.4	50.5	128.1	21.5	39.5	70.8	72.0	109.9	
Queue Length 50th (ft)	61	162	0	6	248	80	34	~234	98	~124	
Queue Length 95th (ft)	#157	#281	9	m10	#363	85	74	#434	#185	#282	
Internal Link Dist (ft)		436			107		431			246	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	143	1331	599	120	949	593	194	483	376	236	
Starvation Cap Reductn	0	0	0	0	173	142	0	0	0	0	
Spillback Cap Reductn	0	215	0	0	. 0	0	0	1	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.85	0.74	0.01	0.09	1.19	0,87	0.37	1.00	0.95	1.08	

[~] Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

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	#	-	•	•	←	€	4	*	1	6	4	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	^	7	7	^	7	ሻ	ď		ሻሻ	ă	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1,00	1.00	1.00		0.91	0.91	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.92	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1,00	0.95	1.00		0.95	0.98	
Satd. Flow (prot)	1703	3406	1524	1687	3374	1509	1687	1509		3070	1448	
Fit Permitted	0.95	1.00	1.00	0.95	1,00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1703	3406	1524	1687	3374	1509	1687	1509		3070	1479	
Volume (vph)	110	741	5	10	830	355	65	350	85	320	100	130
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	823	6	11	922	394	72	389	94	356	111	144
RTOR Reduction (vph)	0	0	4	0	0	172	0	11	0	0	35	0
Lane Group Flow (vph)	122	823	2	11	922	222	72	472	0	356	220	0
Heavy Vehicles (%)	6%	6%	6%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	Prot		4569	Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	5.0	24.5	24.5	1.0	20.6	20.6	6.0	24.3		8.2	34.9	
Effective Green, g (s)	6.7	26.3	26.3	1.7	21.3	21.3	7.7	26.2		9.8	38.1	
Actuated g/C Ratio	0.08	0.33	0.33	0.02	0.27	0.27	0.10	0.33		0.12	0.48	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	143	1120	501	36	898	402	162	494		376	701	
v/s Ratio Prot	c0.07	0.24	<	0.01	c0.27	11	0.04	c0.31		c0.12	0.04	
v/s Ratio Perm			0.00			0.15					c0.11	
v/c Ratio	0.85	0.73	0.00	0.31	1.03	0.55	0.44	0.96		0.95	0.31	
Uniform Delay, d1	36.2	23.8	18.0	38.6	29.4	25.3	34.1	26.3		34.8	12.9	
Progression Factor	1.00	1.00	1.00	1.40	0.97	1.06	1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.9	4.3	0.0	3.9	34.3	4.5	1.9	29.3		32.6	0.3	
Delay (s)	80.1	28.1	18.1	58.0	62.8	31.3	36.1	55.7		67.5	13.2	
Level of Service	F	С	В	Ε	E	С	D	E		E	В	
Approach Delay (s)		34.7			53.4		53.1				44.8	
Approach LOS		С			D		D				D	
Intersection Summary												
HCM Average Control D	elay		46.6	ŀ	ICM Le	vel of Se	ervice		D			
HCM Volume to Capaci			1.03			e om a tit e de tit ordenida						
Actuated Cycle Length (80.0		Sum of I	ost time	(s)		20.0			
Intersection Capacity Ut		J. A. S. V. M.	66.0%	Į.	CU Lev	el of Ser	vice		С			
Analysis Period (min)			15									

Intersection Summary HCM Average Control Delay	46.6	HCM Level of Service D
HCM Volume to Capacity ratio	1.03	
Actuated Cycle Length (s)	80.0	Sum of lost time (s) 20.0
Intersection Capacity Utilization	66.0%	ICU Level of Service C
Analysis Period (min)	15	
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^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	-	7	•	•	\	↓	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	805	424	115	1212	403	364	
v/c Ratio	0.50	0.45	0.34	0.61	0.79	0.71	
Control Delay	11.7	2.7	11.3	11.3	37.3	32.0	
Queue Delay	1.0	1.5	0.0	3.9	0.0	673.9	
Total Delay	12.7	4.3	11.3	15.1	37.3	705.9	
Queue Length 50th (ft)	155	13	23	160	192	164	
Queue Length 95th (ft)	m81	m0	m40	m225	269	234	
Internal Link Dist (ft)	107			326		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	1608	941	342	2001	643	643	
Starvation Cap Reductn	505	332	0	173	0	0	
Spillback Cap Reductn	0	0	0	685	0	639	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.73	0.70	0.34	0.92	0.63	91.00	
Intersection Summary							

 M. Volume for 95th percentile queue is meter 	

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተ	7	ሻ	ተተ					ነ	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.96	
Satd. Flow (prot)		3374	1509	1656	3312					1715	1698	
FIt Permitted		1.00	1.00	0.24	1.00					0.95	0.96	
Satd. Flow (perm)		3374	1509	411	3312					1715	1698	
Volume (vph)	0	741	390	106	1115	0	0	0	0	666	0	40
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	805	424	115	1212	0	0	0	0	724	0	43
RTOR Reduction (vph)	0	0	227	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	0	805	197	115	1212	0	0	0	0	403	357	0
Heavy Vehicles (%)	7%	7%	7%	9%	9%	9%	9%	9%	9%	0%	0%	0%
Turn Type		\$100 ABA	Perm	pm+pt				28785		Perm	100213	
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		36.1	36.1	47.3	47.3					22.7	22.7	
Effective Green, g (s)		37.1	37.1	48.3	48.3					23.7	23.7	
Actuated g/C Ratio		0.46	0.46	0.60	0.60					0.30	0.30	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	10.000
Lane Grp Cap (vph)		1565	700	360	2000					508	503	
v/s Ratio Prot		0.24	-9-2-68:5956	0.03	c0.37							
v/s Ratio Perm		: Piūlie	0.13	0.16						c0.24	0.21	
v/c Ratio		0.51	0.28	0.32	0.61					0.79	0.71	
Uniform Delay, d1		15.1	13.2	8.1	9.9					25.9	25.1	
Progression Factor		0.65	0.81	1.18	0.94					1.00	1.00	
Incremental Delay, d2		0.8	0.7	0.3	0.8					8.3	4.6	
Delay (s)		10.7	11.3	9.8	10.0	State of the state		MAC-JASTINIA III		34.2	29.6	NOV 010 07501
Level of Service		В	В	A	В			######################################		С	С	
Approach Delay (s)		10.9	garant m ad a	on a constant	10.0			0.0		* 1 (TS-0.25) T-20	32.0	
Approach LOS		В			В			Α			С	
Intersection Summary												
HCM Average Control De	elay		15.4	ŀ	ICM Le	vel of Se	rvice		В			
HCM Volume to Capacity	ratio		0.67									
Actuated Cycle Length (s			80.0	S	ium of I	ost time	(s)		8.0			
Intersection Capacity Util		1	01.5%			el of Ser			G			
Analysis Period (min)			15		MODEL ST							
c Critical Lane Group												

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Queues 2011 With-Project AM-Weekday

3: S 188th St & I-5 NB

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Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL		
Lane Group Flow (vph)	290	1423	927	707	430	406	•	
v/c Ratio	0.78	0.70	0.78	0.73	0.87	0.84		
Control Delay	34.4	14.0	28.1	7.0	46.1	40.7		
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0		
Total Delay	34.4	14.2	28.1	7.0	46.1	40.7		
Queue Length 50th (ft)	116	233	218	0	205	174		
Queue Length 95th (ft) r	n#205	276	#288	70	#352	#316		
Internal Link Dist (ft)		326	1			232		
Turn Bay Length (ft)	170							
Base Capacity (vph)	379	2027	1189	964	526	511		
Starvation Cap Reductn	0	113	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0		
Reduced v/c Ratio	0.77	0.74	0.78	0.73	0.82	0.79		
Intersection Summary								
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^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	ሻ	ተተ			^	7			*	H	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.89	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (prot)	1703	3406			3059	1369			1618	1494	
Flt Permitted	0.15	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (perm)	266	3406			3059	1369			1618	1494	
Volume (vph)	255	1252	0	0	816	622	0	0	470	0	266
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	290	1423	0	0	927	707	0	0	534	0	302
RTOR Reduction (vph)	0	0	0	0	0	432	0	0	0	27	0
Lane Group Flow (vph)	290	1423	0	0	927	275	0	0	430	379	0
Heavy Vehicles (%)	6%	6%	6%	18%	18%	18%	0%	0%	6%	6%	6%
Turn Type	pm+pt	Water Big		67 PAR		Perm			Split		
Protected Phases	5	2			6				4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	46.6	46.6			30.1	30.1			23.4	23.4	
Effective Green, g (s)	47.6	47.6			31.1	31.1			24.4	24.4	
Actuated g/C Ratio	0.60	0.60			0.39	0.39			0.30	0.30	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
Lane Grp Cap (vph)	383	2027			1189	532			493	456	
v/s Ratio Prot	0.12	c0.42			0.30				c0.27	0.25	
v/s Ratio Perm	c0.33				222.782	0.20					
v/c Ratio	0.76	0.70			0.78	0.52			0.87	0.83	
Uniform Delay, d1	13.6	11.3			21,4	18.7			26.3	25.9	
Progression Factor	1.41	1.02		And the second control of the	1.00	1.00			1.00	1.00	- TO NOT A STATE OF THE STATE OF THE
Incremental Delay, d2	6.7	1.7			5.1	3.6			15.9	12.5	
Delay (s)	25.9	13.3			26.5	22.3			42.2	38.3	
Level of Service	С	В	984070		С	Ç			D	D	
Approach Delay (s)	a contraction	15.4	************		24.7	AND PRODUCED	0.0	d de servicio		40.3	
Approach LOS		В			С		Α			D	
Intersection Summary											
HCM Average Control E	elay	anne Salan (alla de la companya de	24.0	Н	CM Lev	vel of Se	rvice		С	A STATE OF THE STA	
HCM Volume to Capaci			0.79				variation relation				,
Actuated Cycle Length	(s)		80.0	S	um of le	ost time	(s)		8.0		
Intersection Capacity Ut		1	01.5%			el of Ser			G		
Analysis Period (min)	THE STATE		15								
c Critical Lane Group											

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m Volume for 95th percentile queue is metered by upstream signal.

	†	*	4	↓	✓	t	
Novement	NBT	NBR	SBL	SBT	SWL	SWR	
ane Configurations	† }		J.	ተተ	ሻ	77	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
olume (veh/h)	1410	25	26	1490	11	23	
eak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
ourly flow rate (vph)	1516	27	. 28	1602	12	25	
edestrians							
ane Width (ft)							
/alking Speed (ft/s)							
ercent Blockage							
ight turn flare (veh)							
edian type					None		
edian storage veh)							
pstream signal (ft)				74			
X, platoon unblocked					0.71		
C, conflicting volume			1543		2387	772	
C1, stage 1 conf vol							
C2, stage 2 conf vol							
Cu, unblocked vol			1543		2545	772	
c, single (s)			4.3		8.4	8.5	
2, 2 stage (s)							
(s)			2.3		4.3	4.1	
0 queue free %			93		0	88	
M capacity (veh/h)			390		5	215	
irection, Lane#	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2
olume Total	1011	532	28	801	801	12	25
olume Left	0	0	28	0	0	12	0
olume Right	0	27	0	0	0	0	25
SH	1700	1700	390	1700	1700	5	215
olume to Capacity	0.59	0.31	0.07	0.47	0.47	2.51	0.12
ueue Length 95th (ft)	0	0	6	0	0	65	10
ontrol Delay (s)	0.0	0.0	14.9	0.0	0.0	2099.5	23.9
ane LOS			В			F	С
pproach Delay (s)	0.0		0.3			695.4	
pproach LOS						F	
tersection Summary							
verage Delay			8.1				
tersection Capacity Uti	lization		51.2%	j l t	CU Lev	el of Se	rvice A
nalysis Period (min)			15				

	-	•	4	†	1	↓	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	10	36	392	1272	697	898	
v/c Ratio	0.07	0.34	0.42	0.75	0.79	0.31	
Control Delay	30.8	46.5	7.3	19.5	35.4	2.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.8	46.5	7.3	19.5	35.4	2.4	
Queue Length 50th (ft)	2	17	19	250	164	35	
Queue Length 95th (ft)	19	51	62	#476	#303	112	
Internal Link Dist (ft)	36			266		3370	
Turn Bay Length (ft)							
Base Capacity (vph)	150	105	954	1696	899	2944	er a parti sapat da la caractería de la ca
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	0.34	0.41	0.75	0.78	0.31	
Intersection Summary							
Company of the contract of the						7-21-2-2-2-1	

^{# 95}th percentile volume exceeds capacity, queue may be longer:
Queue shown is maximum after two cycles.

	→	*	•	+	4	4	†	~	1	↓	4
Movement EBI	***************************************	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	€}-		J.		77	J.	∱ ⊅		14.64	↑ }	
Ideal Flow (vphpl) 1900		1900		1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00		0.88		0.95		0.97	0.95	
Frt	0.93		1.00		0.85		0.98		1.00	1.00	
Fit Protected	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1772		1410		2221		3197		3273	3371	
Fit Permitted	1.00		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1772		1410		2221		3197		3273	3371	
Volume (vph)	5	5	35	0	380	0	1094	140	676	866	5
Peak-hour factor, PHF 0.97	7 0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
) 5	5	36	0	392	0	1128	144	697	893	5
	5	0	0	0	198	0	10	0	0	0	0
Lane Group Flow (vph) (0	36	0	194	0	1262	0	697	898	0
Heavy Vehicles (%) 0%		0%	28%	28%	28%	11%	11%	11%	7%	7%	7%
Turn Type Perm			Prot		custom	Prot			Prot		
Protected Phases	. 3		4		1	5	2		1	6	
	3		·		4	-	_		•	_	
Actuated Green, G (s)	0.9		2.8		21.5		38.5		18.7	63.2	
Effective Green, g (s)	2.9		3.8		24.5		40.5		20.7	65.2	
Actuated g/C Ratio	0.03		0.05		0.29		0.48		0.25	0.78	
Clearance Time (s)	6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	61		64		754		1543		808	2620	
v/s Ratio Prot	c0.00		c0.03		0.06		c0.39		c0.21	0.27	
v/s Ratio Perm	60.00		00.03		0.02		00.00		00.21	0.27	
v/c Ratio	0.08		0.56		0.02		0.82		0.86	0.34	
Uniform Delay, d1	39.2		39.2		22.7		18.5		30.2	2.8	
	1.00		1.00		1.00		1.00		1.00	1.00	
Progression Factor	0.6		10.8		0.2		4.9		9.4	0.4	
Incremental Delay, d2					22.9		23.5		39.7	3.2	
Delay (s)	39.8		50.1		22.9 C		23.5 C		39.7 D	3.2 A	
Level of Service	D		D	05.0	C		23.5		D	19.1	
Approach Delay (s)	39.8			25.2			23.5 C			19.1 B	
Approach LOS	D			С			C			В	
Intersection Summary											
HCM Average Control Delay		21.7	217 Tal	ICM Le	vel of Se	rvice		C			
HCM Volume to Capacity ratio)	0.79									
Actuated Cycle Length (s)		83.9			ost time			16.0			
Intersection Capacity Utilization	on	72.6%	1	CU Lev	el of Ser	vice		C			
Analysis Period (min)		15									
c Critical Lane Group											

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	#		•	•	←	۲	4	7	4	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	107	1301	26	61	741	281	26	158	474	444	
v/c Ratio	0.40	0.81	0.04	0.54	0.61	0.42	0.22	0.62	0.82	0.83	
Control Delay	44.7	29.4	8.4	71.4	18.3	7.7	49.2	48.1	53.0	46.5	
Queue Delay	0.0	2.8	0.0	0.0	1.4	1.4	0.0	3.0	0.9	0.0	
Total Delay	44.7	32.3	8.4	71.4	19.7	9.0	49.2	51.1	53.9	46.5	
Queue Length 50th (ft)	64	393	2	34	170	73	16	88	151	260	
Queue Length 95th (ft)	119	#507	17	m#79	m232	m135	43	155	#225	#439	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	268	1612	733	113	1220	665	116	292	585	536	
Starvation Cap Reductn	0	0	0	0	275	214	0	0	0	0	
Spillback Cap Reductn	0	206	0	0.	. 0	0	0	64	20	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.40	0.93	0.04	0.54	0.78	0.62	0.22	0.69	0.84	0.83	

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

						-						
	_#	-	7	1	4	*	4	۲	~	Ĺ	₹	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	^	7	ħ	† †	7	ሻ	Ž.		1/1/	**	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Volume (vph)	105	1275	25	60	726	275	25	135	20	465	330	105
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	1301	26	61	741	281	26	138	20	474	337	107
RTOR Reduction (vph)	0	0	12	0	0	123	0	5	0	0	11	0
Lane Group Flow (vph)	107	1301	14	61	741	158	26	153	0	474	433	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	25/45/4E	Perm	Prot		Perm	Prot			Prot	Ace a	
Protected Phases	1	6		5	2	ANDRITAGISTI	7	4		3	8	
Permitted Phases		grad da	6			2						
Actuated Green, G (s)	13.7	41.5	41.5	4.7	32.6	32.6	3.0	16.4		15.4	29.0	
Effective Green, g (s)	15.4	43.3	43.3	5.4	33.3	33.3	4.7	18.3		17.0	30.6	
Actuated g/C Ratio	0.15	0.43	0.43	0.05	0.33	0.33	0.05	0.18		0.17	0.31	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	1503	672	93	1145	512	82	284		578	524	
v/s Ratio Prot	0.06	c0.37		c0.04	0.22	2903023663.2 79 80.	0.01	0.10		c0.14	c0.25	
v/s Ratio Perm			0.01			0.10					20.20	
v/c Ratio	0.40	0.87	0.02	0.66	0.65	0.31	0.32	0.54		0.82	0.83	MERSONIPLY
Uniform Delay, d1	38.1	25.7	16.2	46.4	28.4	24.8	46.1	37.0		40.0	32.2	
Progression Factor	1.00	1.00	1.00	1.23	0.61	0.69	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	6.9	0.1	13.3	2.4	1.3	2.2	2.0		9.1	10.3	
Delay (s)	42.6	32.6	16.3	70.3	19.7	18.5	48.3	39.0		49.1	42.5	
Level of Service	D	Č	В	Ë	В	. В	D.	D.		Ď	.z.o	
Approach Delay (s)		33.1	and a service of the	75174-78036 (*1 00)	22.3	-5500 (F-2) (2) 11 350	40.3	MOPANAMEN.		ummen et m	45.9	
Approach LOS	34/2/24	Č			Ē		D				.O.O	
Intersection Summary												
HCM Average Control D			33.5	F	ICM Le	vel of Se	ervice		C			
HCM Volume to Capacit			0.82									
Actuated Cycle Length (100,0	S	um of I	ost time	(s)		12.0			
Intersection Capacity Uti	lization		81.6%	10	CU Leve	el of Ser	vice		D			
Analysis Period (min)			15						98698			
c Critical Lane Group												

Intersection Summary				
HCM Average Control Delay	33.5	HCM Level of Service	С	
HCM Volume to Capacity ratio	0.82	WATER STREET		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			
0.111 0				

c Critical Lane Group

. The Transpo Group

The Transpo Group

Queues

2011 With-Project PM-Weekday

Queues 2011 With-Project PM-Weekday

es	2: S 188th St & I-5 SB

							2011 With-Project Pivi-Weekday
	→	•	•	←	/	ļ	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	1052	670	408	1073	449	403	
v/c Ratio	0.90	0.70	0.94	0.53	0.96	0.86	
Control Delay	31.4	5.6	61.8	11.6	66.9	50.8	
Queue Delay	103.9	21.3	0.0	0.8	0.0	0.1	
Total Delay	135.2	27.0	61.8	12.4	66.9	50.9	
Queue Length 50th (ft)	268	51	253	183	290	248	
Queue Length 95th (ft)	#448	m72 r	n#367	m260	#497	#425	
Internal Link Dist (ft)	126			410		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	1172	964	432	2028	476	476	
Starvation Cap Reductn	318	303	0	303	0	0	
Spillback Cap Reductn	0	0	0	588	0	1	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.23	1.01	0.94	0.75	0.94	0.85	
Intersection Summary							
# 95th percentile volur Queue shown is max m Volume for 95th per	imum a	fter two	cycles.				

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ት ተ	7	*	ተ ተ			Managar Parantal	200000000000000000000000000000000000000	*1	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Fit Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1437	
Fit Permitted		1.00	1.00	0.10	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	187	3406					1441	1437	
Volume (vph)	0	1020	650	396	1041	0	0	0	0	806	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1052	670	408	1073	0	0	0	0	831	0	21
RTOR Reduction (vph)	0	0	440	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1052	230	408	1073	0	0	0	0	449	401	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		33.4	33.4	58.5	58.5					31.5	31.5	
Effective Green, g (s)		34.4	34.4	59.5	59.5					32.5	32.5	
Actuated g/C Ratio		0.34	0.34	0.60	0.60					0.32	0.32	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		1172	524	431	2027					468	467	
v/s Ratio Prot		0.31		c0.20	0.32							
v/s Ratio Perm			0.15	c0.36						c0.31	0.28	
v/c Ratio		0.90	0.44	0.95	0.53					0.96	0.86	
Uniform Delay, d1		31.1	25.4	29.1	12.0					33.1	31.6	
Progression Factor		0.76	1.44	1.41	0.89					1.00	1.00	
Incremental Delay, d2		6.6	1.5	23.1	0.7					31.0	14,5	
Delay (s)		30.4	38.0	64.2	11.4					64.1	46.1	
Level of Service		С	D	Ε	В				ands.	E	D	
Approach Delay (s)		33.3			25.9			0.0			55.6	
Approach LOS		С			С			Α			E	
Intersection Summary												
HCM Average Control De			35.3	Ь	ICM Le	vel of Se	ervice		D			
HCM Volume to Capacity			0.94									
Actuated Cycle Length (s		100.0		Sum of lost time (s)					8.0			
Intersection Capacity Util	ization	1	38.0%	IC	CU Leve	el of Ser	vice		Н			
Analysis Period (min)			15									

Intersection Summary		
HCM Average Control Delay	35.3	HCM Level of Service D
HCM Volume to Capacity ratio	0.94	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	138.0%	ICU Level of Service H
Analysis Period (min)	15	

c Critical Lane Group

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Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	371	1486	1033	1022	335	341	
v/c Ratio	0.91	0.66	0.63	0.93	0.93	0.88	
Control Delay	44.0	11.9	21.5	23.7	70.5	55.9	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	
Total Delay	44.0	12.3	21.5	23.7	70.5	55.9	
Queue Length 50th (ft)	188	238	249	222	218	187	
Queue Length 95th (ft) m	#221	m263	317	#624	#393	#357	
Internal Link Dist (ft)		410	1			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	408	2243	1638	1098	367	391	
Starvation Cap Reductn	0	281	0	0	0	0	
Spillback Cap Reductn	. 0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.91	0.76	0.63	0.93	0.91	0.87	
Intersection Summary							

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

								20	I I VVILIE	-riojeci	. FIVI-VV eekua
	→	-	7	*	←	*	/	لر	•	<i>*</i>	/
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	ሻ	^			ተተ	7			ሻ	N.	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.92	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (prot)	1641	3282			3406	1524			1531	1447	
Fit Permitted	0.16	1.00			1,00	1.00			0.95	0.98	SARANSAN SAN
Satd. Flow (perm)	272	3282			3406	1524			1531	1447	
Volume (vph)	360	1441	0	0	1002	991	0	0	470	5	180
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	371	1486	0	0	1033	1022	0	0	485	5	186
RTOR Reduction (vph)	0	0	0	0	0	365	0	0	0	43	0
Lane Group Flow (vph)	371	1486	0	0	1033	657	0	0	335	298	0
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt	(Juliania)	14555		Digital (a)	Perm	494 NAV	(A.	Split	5176574	
Protected Phases	5	2			6	in to Make see a con-			4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	67.3	67.3			47.0	47.0			22.7	22.7	
Effective Green, g (s)	68.3	68.3			48.0	48.0			23.7	23.7	
Actuated g/C Ratio	0.68	0.68		and the second	0.48	0.48			0.24	0.24	
Clearance Time (s)	5.0	5.0	41721.75		5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	- a 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Lane Grp Cap (vph)	409	2242		37.2 (S) (S)	1635	732	ac. (1654)		363	343	
v/s Ratio Prot	c0.15	0.45			0.30	and the			c0.22	0.21	
v/s Ratio Perm	c0.47	45500000				0.43			00.22	valanitas.	
v/c Ratio	0.91	0.66			0.63	0.90			0.92	0.87	
Uniform Delay, d1	20.4	9.2			19.4	23.8			37.3	36.6	
Progression Factor	1.85	1.19			1.00	1.00			1.00	1.00	
Incremental Delay, d2	11.5	0.6			1.9	16.0			28.8	20.4	
Delay (s)	49.2	11.6		ection 1 104 for	21.3	39.7			66.1	57.0	
Level of Service	D	B			Č	D.		Mayor Bryon	∵.E	Ű.E	
Approach Delay (s)	r Dallarde M aria	19.1			30.5	54401050 14 066	0.0			61.5	
Approach LOS		В			ου.ο C		Ä			. E	
Intersection Summary											
HCM Average Control E	elav	eno esta de la companya de la compa	30.4	F	ICM Le	vel of Se	rvice		С		
HCM Volume to Capaci			0.90	an eggyase soldyl	anticological designation of the second		undistation)		co-co-coverable		
Actuated Cycle Length (100.0	S	um of l	ost time	(s)		8.0		
Intersection Capacity Ut		1:	38.0%			el of Ser			Н		un contrata de mente de Ciril d
Analysis Period (min)	40.000	2,13,451 Y	15	14572888	HAT THE				32888		
c Critical Lane Group			* * 0.00 (0.00 mag) (0.1								

Intersection Summary		
HCM Average Control Delay	30,4	HCM Level of Service C
HCM Volume to Capacity ratio	0.90	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	138.0%	ICU Level of Service H
Analysis Period (min)	15	
6 111 111 6		

c Critical Lane Group

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\PM-Future wp.sy7

m Volume for 95th percentile queue is metered by upstream signal.

	†	*	(w	↓	4	t				
Movement	NBT	NBR	SBL	SBT	SWL	SWR				
Lane Configurations	∱ Ъ		7	ተተ	J.				 	
Sign Control	Free			Free	Stop					
Grade	0%			0%	0%					
Volume (veh/h)	1975	11	11	1615	8	21				
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				
lourly flow rate (vph)	2124	12	12	1737	9	23				
Pedestrians										
ane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type					None					
Median storage veh)										
Jpstream signal (ft)				66						
X, platoon unblocked					0.74					
C, conflicting volume			2135		3022	1068				
C1, stage 1 conf vol										
C2, stage 2 conf vol										
Cu, unblocked vol			2135		3389	1068				
C, single (s)			4.3		7.3	7.4				
C, 2 stage (s)										
F (s)			2.3		3.7	3.5				
0 queue free %			95		0	88				
M capacity (veh/h)			224		3	184				
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2			
/olume Total	1416	720	12	868	868	9	23			
/olume Left	0	0	12	0	0	9	0			
/olume Right	0	12	0	0	0	0	23			
SH	1700	1700	224	1700	1700	3	184			
olume to Capacity	0.83	0.42	0.05	0.51	0.51	3.35	0.12			
Queue Length 95th (ft)	0	0	4	0	0	Err	10			
Control Delay (s)	0.0	0.0	22.0	0.0	0.0	Err	27.3			
ane LOS			С			F	D			
Approach Delay (s)	0.0		0.1			2778.1				
Approach LOS						F				
ntersection Summary										
verage Delay			22.2							
ntersection Capacity Uti	ilization		64.9%	10	CU Lev	el of Ser	vice	С		
nalysis Period (min)			15							
The state of the s			a de la Companya de							

Lane Group Flow (vph)	EBT 10	WBL	MODE			
	40		WBR	NBT	SBL	SBT
VIA Datio	10	326	1038	1295	405	1153
WC Natio	0.07	0.84	0.80	0.82	0.86	0.54
Control Delay	39.8	52.3	21.7	25.2	53.6	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	52.3	21.7	25.2	53.6	9.1
Queue Length 50th (ft)	5	153	184	271	101	130
Queue Length 95th (ft)	21	#344	#377	#497	#209	261
Internal Link Dist (ft)	36			266		3373
Turn Bay Length (ft)						
Base Capacity (vph)	144	389	1301	1581	472	2151
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio (0.07	0.84	0.80	0.82	0.86	0.54

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2011 With-Project PM-Weekday

•	—	•	•	+	4	•	†	<i>/</i> *	/	ţ	1
Movement EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4		ሻ		77	*1	ት ጮ		ሻሻ	∱ ⊅	
Ideal Flow (vphpl) 1900				1900		1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00		0.88		0.95		0.97	0.95	
Frt	1.00		1.00		0.85		0.99		1.00	1.00	
Fit Protected	0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1854		1752		2760		3444		3183	3280	
Flt Permitted	0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1854		1752		2760		3444		3183	3280	
Volume (vph) 5	5	0	310	0	986	0	1166	65	385	1091	5
Peak-hour factor, PHF 0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph) 5	5	0	326	0	1038	0	1227	68	405	1148	5
RTOR Reduction (vph) 0	0	0	0	0	163	0	5	0	0	0	0
Lane Group Flow (vph) 0	10	0	326	0	875	0	1290	0	405	1153	0
Heavy Vehicles (%) 0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type Perm			Prot	(ustom	Prot		ar e	Prot		
Protected Phases	3		4		1	5	2		1	6	
Permitted Phases 3					4	_			•	-	
Actuated Green, G (s)	0.9		16.9		26.9		35.1		10.0	51.1	
Effective Green, g (s)	2.9		17.9		29.9		37.1		12.0	53.1	
Actuated g/C Ratio	0.03		0.21		0.35		0.43		0.14	0.62	
Clearance Time (s)	6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	63		365		1089		1487		445	2028	
v/s Ratio Prot	00		c0.19		c0.11		c0.37		0.13	0.35	
v/s Ratio Perm	0.01		ÇU. 13		0.20		60.57		0.13	0.55	
v/c Ratio	0.16		0.89		0.80		0.87		0.91	0.57	
Uniform Delay, d1	40.3		33.1		25.3		22.2		36.4	9.7	
Progression Factor	1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2	1.00		23.0		4.4		7.1		22.5	1.00	
Delay (s)	41.5		56.1		29.7		29.3		58.9	10.8	
Level of Service	41.3 D		56.1 E		29.7 C		29.3 C.		56.9 E	10.6 B	
			_	20.0	C		-		_		
Approach Delay (s)	41.5			36.0			29.3			23.3	
Approach LOS	D			D			C			С	
Intersection Summary											
HCM Average Control Delay		29.3	H	ICM Lev	vel of Se	rvice		С	0.1 /T		
HCM Volume to Capacity ratio		0.82									
Actuated Cycle Length (s)		85.9	S	um of k	ost time	(s)		12.0			
Intersection Capacity Utilization	1	83.0%	10	CU Leve	el of Ser	vice		E			
Analysis Period (min)		15									
c Critical Lane Group											

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\PM-Future wp.sy7

	#	>	*	€	←	€	4	۴	6	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	111	960	26	33	564	191	32	216	295	252	
v/c Ratio	0.35	0.58	0.03	0.26	0.52	0.32	0.24	0.68	0.61	0.46	
Control Delay	38.0	21.4	7.2	45.8	23.7	7.5	44.1	41.2	42.2	26.8	
Queue Delay	0.0	0.0	0.0	0.0	3.1	0.9	0.0	0.0	0.0	0.0	
Total Delay	38.0	21.4	7.2	45.8	26.8	8.4	44.1	41.2	42.2	26.8	
Queue Length 50th (ft)	57	234	0	14	162	28	18	104	81	112	
Queue Length 95th (ft)	112	310	16	m46	165	72	46	173	123	178	
Internal Link Dist (ft)		436			126		431			246	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	318	1658	756	127	1084	603	132	380	501	559	
Starvation Cap Reductn	0	0	0	0	403	212	0	0	0	0	
Spillback Cap Reductn	0	0	. 0	0	. 0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.35	0.58	0.03	0.26	0.83	0.49	0.24	0.57	0.59	0.45	

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

	_#	→	•	•	←	€.	4	7	<i>></i>	4	4	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	^	7	7	ተተ	7	ኻ	Ž.		1,1	ሻ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1787	3574	1599	1736	3471	1553	1770	1583		3467	1745	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1787	3574	1599	1736	3471	1553	1770	1583		3467	1745	
Volume (vph)	105	912	25	31	536	181	30	150	55	280	180	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	960	26	33	564	191	32	158	58	295	189	63
RTOR Reduction (vph)	0	0	15	0	0	123	0	15	0	0	13	C
Lane Group Flow (vph)	111	960	11	33	564	68	32	201	0	295	239	C
Heavy Vehicles (%)	1%	1%	1%	4%	4%	4%	2%	2%	2%	1%	1%	1%
Turn Type	Prot	10 CATY	Perm	Prot		Perm	Prot		2775.5477	Prot	46.577/M	
Protected Phases	1	6	- Committee	5	2	ing with a seem	7	4		3	8	
Permitted Phases	Calabada.	Maradala Taradala	6	464.889	16/35/492	2	ki sida	ALEP SELL				
Actuated Green, G (s)	14.3	35.8	35.8	3.6	25.2	25.2	3.0	17.6		11.0	25.8	
Effective Green, q (s)	16.0	37.6	37.6	4.3	25.9	25.9	4.7	19.5		12.6	27.4	
Actuated g/C Ratio	0.18	0.42	0.42	0.05	0.29	0.29	0.05	0.22		0.14	0.30	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	318	1493	668	83	999	447	92	343		485	531	
v/s Ratio Prot	c0.06	c0.27	o aranga	0.02	0.16	\$2,5 \$10 MB (\$5.75) 9 t	0.02	c0.13		c0.09	0.14	
v/s Ratio Perm		887377.1	0.01		834507538	0.04				409000		
v/c Ratio	0.35	0.64	0.02	0.40	0.56	0.15	0.35	0.59		0.61	0.45	
Uniform Delay, d1	32.4	20.9	15.4	41.6	27.3	23.9	41.2	31.6		36.4	25.2	
Progression Factor	1.00	1.00	1.00	1.02	0.85	1.20	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	2.1	0.0	3.0	2.3	0.7	2.3	2.6		2.2	0.6	
Delay (s)	35.4	23.0	15.4	45.5	25.5	29.3	43.4	34.2		38.5	25.8	reservatively size
Level of Service	D	C	В	D	- c	C	D	C		D	C	
Approach Delay (s)	-0-0-W/011 11 00	24.1	aranga m ar	viriani a n	27.2	2 100 10 10 10 10 10 10 10 10 10 10 10 10	35.4	SHOWS BUILDING			32.7	10.000.000.000.0000
Approach LOS		- c			- c		D				C	
Intersection Summary												
HCM Average Control Delay 27.8					ICM Le	vel of Se	ervice		С			
HCM Volume to Capacity ratio 0.61					yezhiodera.ari		a anni a faith a fa		mind (), Prettiet			
Actuated Cycle Length (90.0									
Intersection Capacity Ut			60.5%						В			
Analysis Period (min)			15						\$7.48 <u>2</u> 2			

Intersection Summary		
HCM Average Control Delay	27.8	HCM Level of Service C
HCM Volume to Capacity ratio	0.61	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	60.5%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

The Transpo Group

	-	•	•	←	>	ļ	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	648	615	107	727	121	114	
v/c Ratio	0.28	0.49	0.20	0.27	0.55	0.47	
Control Delay	4.3	2.2	6.2	6.2	44.9	28.8	
Queue Delay	0.3	0.5	0.0	0.0	0.0	0.0	
Total Delay	4.6	2.8	6.2	6.2	44.9	28.8	
Queue Length 50th (ft)	45	10	24	113	68	40	
Queue Length 95th (ft)	17	21	m0	146	118	89	
Internal Link Dist (ft)	126			410		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	2300	1244	559	2697	498	505	
Starvation Cap Reductn	1006	270	0	0	0	0	
Spillback Cap Reductn	0	0	0	398	0	5	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.50	0.63	0.19	0.32	0.24	0.23	
Intersection Summary							

m	Volume	for 95th	percentile	queue is	metered	by	upstream	signal.
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		个 个	7	ሻ	个 个					75	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.94	
Fit Protected		1.00	1.00	0.95	1.00					0.95	0.97	
Satd. Flow (prot)		3539	1583	1752	3505					1545	1482	
Fit Permitted		1.00	1.00	0.36	1.00					0.95	0.97	
Satd. Flow (perm)		3539	1583	656	3505					1545	1482	
Volume (vph)	0	622	590	103	698	0	0	0	0	180	0	45
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	648	615	107	727	0	0	0	0	188	0	47
RTOR Reduction (vph)	0	0	222	0	0	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	648	393		727	0	0	0	0	121	79	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	11%	11%	11%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		56.5	56.5	68.3	68.3					11.7	11.7	
Effective Green, g (s)		57.5	57.5	69.3	69.3					12.7	12.7	
Actuated g/C Ratio		0.64	0.64	0.77	0.77					0.14	0.14	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		2261	1011	600	2699					218	209	
v/s Ratio Prot		0.18		0.02	c0.21							
v/s Ratio Perm			c0.25	0.12						c0.08	0.05	
v/c Ratio		0.29	0.39	0.18	0.27					0.56	0.38	
Uniform Delay, d1		7.2	7.8	2.9	3.0					36.0	35.1	
Progression Factor		0.50	1,12	1.73	1.76					1.00	1.00	
Incremental Delay, d2		0.3	0.9	0.1	0.2					3.0	1.1	
Delay (s)		3.8	9.6	5.2	5.5			A R PRINCIPLE		39.1	36.2	esternation and
Level of Service		Α	A	A	A					D	D	
Approach Delay (s)		6.7			5.5			0.0			37.7	
Approach LOS		Α			Α			Α			D	
Intersection Summary												
HCM Average Control D			9.4	ŀ	ICM Le	vel of Se	rvice		Α			
HCM Volume to Capacit			0.41									
Actuated Cycle Length (90.0			ost time	****		12.0			
Intersection Capacity Ut	ilization		58.6%	1	CU Leve	el of Ser	vice		В			
Analysis Period (min)			15									

c Critical Lane Group

The Transpo Group

Lane Group

Lane Group Flow (vph)

Queue Delay

Queue Length 50th (ft)

Queue Length 95th (ft)

Internal Link Dist (ft)

Turn Bay Length (ft)

Base Capacity (vph)

Starvation Cap Reductn

Intersection Summary

Spillback Cap Reductn

Storage Cap Reductn

Reduced v/c Ratio

v/c Ratio

Control Delay

Total Delay

丿→← < 9

EBL EBT WBT WBR NEL2

415

0.25

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NEL

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1900 4.0 1.00 1.00 0.95 1719 0.44	1900 4.0 0.95 1.00 1.00	1900	1900	1900		1000	,,	ሻ	34	
4.0 1.00 1.00 0.95 1719 0.44	4.0 0.95 1.00 1.00	1900	1900		1900	1000			61	
1.00 1.00 0.95 1719 0.44	0.95 1.00 1.00			4.0		1200	1900	1900	1900	1900
1.00 0.95 1719 0.44	1.00 1.00				4.0			4.0	4.0	
0.95 1719 0.44	1.00			0.95	1.00			0.95	0.95	
1719 0.44				1.00	0.85			1.00	0.94	
0.44	3438			1.00	1.00			0.95	0.97	
				3406	1524			1665	1595	
	1.00			1.00	1.00			0.95	0.97	
801	3438			3406	1524			1665	1595	
305	517	0	0	386	274	0	0	390	5	103
0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
328	556	0	0	415	295	0	0	419	5	111
0	0	0	0	0	150	0	0	0	34	0
		0		415				274	227	0
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					and a sales markets					
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elav	een.commonocolista	16.5	Н	CM Le	vel of Se	rvice	No. of the last of	В		
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s)			S.	um of k	ost time	(s)		8.0		
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			la superior	2500,50		 20-1-20-26				
- YS	801 305 0.93 328 5% 0 0328 5% 0m+pt 5 2 60.3 61.3 61.3 5.0 2.5 678 6.0.07 60.26 0.44 6.00 1.51 0.44 9.4	801 3438 305 517 0.93 0.93 328 556 0 0 0 328 556 5% 5% 0m+pt 5 2 2 60.3 60.3 60.3 61.3 61.3 61.3 0.68 0.68 0.68 5.0 5.0 2.5 4.0 678 2342 60.07 0.16 60.26 0.26 0.48 0.24 6.0 5.5 1.51 0.90 0.4 0.2 9.4 5.2 A A 6.8 A	801 3438 305 517 0 0.93 0.93 0.93 328 556 0 0 0 0 0 328 556 0 5% 5% 5% 0m+pt 5 2 2 60.3 60.3 61.3 61.3 0.68 0.68 5.0 5.0 2.5 4.0 678 2342 c0.07 0.16 c0.26 0.48 0.24 6.0 5.5 1.51 0.90 0.4 0.2 9.4 5.2 A A 6.8 A Selay 16.5 reatio 0.54) 90.0	801 3438 305 517 0 0 0.93 0.93 0.93 0.93 328 556 0 0 0 0 0 0 0 328 556 0 0 5% 5% 5% 6% 0m+pt 5 2 2 60.3 60.3 61.3 61.3 0.68 0.68 5.0 5.0 2.5 4.0 678 2342 c0.07 0.16 c0.26 0.48 0.24 6.0 5.5 1.51 0.90 0.44 0.2 9.4 5.2 A A A 6.8 A slay 16.5 H rratio 0.54 0) 90.0 S ization 58.6% IC	801 3438 3406 305 517 0 0 386 0.93 0.93 0.93 0.93 0.93 328 556 0 0 415 5 0 0 0 0 328 556 0 0 415 5% 5% 5% 6% 6% 0m+pt 5 2 6 6 2 60.3 43.3 44.3 44.3 0.68 0.49 0.49 5.0 5.0 5.0 5.0 5.0 2.5 0.0 5.0 5.0 2.5 0.0 5.0 0.5 0.0 5.0 0.5 0.0 0.0 0.12 0.0 0.12 0.0 0.12 0.25 6.0 5.5 13.2 1.51 0.90 1.00 0.4 0.2 0.4 9.4 5.2 13.6 A A B 6.8 13.5 A A B <td>801 3438 3406 1524 305 517 0 0 386 274 0.93 0.93 0.93 0.93 0.93 0.93 0.93 328 556 0 0 415 295 0 0 0 0 150 328 556 0 0 415 145 55 5% 5% 6.0 6.0 5</td> <td>801 3438 3406 1524 305 517 0 0 386 274 0 0.93 0.93 0.93 0.93 0.93 0.93 0.93 328 556 0 0 0 150 0 328 556 0 0 415 145 0 5% 5% 5% 6% 6% 6% 0% 0m+pt Perm 6 2 6 6 6% 0% 60.3 60.3 43.3 43.3 43.3 61.3 61.3 44.3 44.3 44.3 0.68 0.49 0.49 5.0 5.0 5.0 2.5 4.0 5.0 5.0 5.0 5.0 5.0 2.5 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0</td> <td>801 3438 3406 1524 305 517 0 0 386 274 0 0 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 328 556 0 0 415 295 0 0 328 556 0 0 415 145 0 0 328 556 0 0 415 145 0 0 5% 5% 5% 6% 6% 6% 0% 0% 0m+pt Perm 5 2 6 2 6 2 6 6 6 0%</td> <td>801 3438 3406 1524 1665 305 517 0 0 386 274 0 0 390 0.93 0</td> <td>801 3438 3406 1524 1665 1595 305 517 0 0 386 274 0 0 390 5 0.93</td>	801 3438 3406 1524 305 517 0 0 386 274 0.93 0.93 0.93 0.93 0.93 0.93 0.93 328 556 0 0 415 295 0 0 0 0 150 328 556 0 0 415 145 55 5% 5% 6.0 6.0 5	801 3438 3406 1524 305 517 0 0 386 274 0 0.93 0.93 0.93 0.93 0.93 0.93 0.93 328 556 0 0 0 150 0 328 556 0 0 415 145 0 5% 5% 5% 6% 6% 6% 0% 0m+pt Perm 6 2 6 6 6% 0% 60.3 60.3 43.3 43.3 43.3 61.3 61.3 44.3 44.3 44.3 0.68 0.49 0.49 5.0 5.0 5.0 2.5 4.0 5.0 5.0 5.0 5.0 5.0 2.5 4.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	801 3438 3406 1524 305 517 0 0 386 274 0 0 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93 328 556 0 0 415 295 0 0 328 556 0 0 415 145 0 0 328 556 0 0 415 145 0 0 5% 5% 5% 6% 6% 6% 0% 0% 0m+pt Perm 5 2 6 2 6 2 6 6 6 0%	801 3438 3406 1524 1665 305 517 0 0 386 274 0 0 390 0.93 0	801 3438 3406 1524 1665 1595 305 517 0 0 386 274 0 0 390 5 0.93

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
ane Configurations	7	个 个			^	7			ሻ	M	
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
ane Util. Factor	1.00	0.95			0.95	1,00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.94	
Fit Protected	0.95	1.00			1.00	1.00			0.95	0.97	
Satd. Flow (prot)	1719	3438			3406	1524			1665	1595	
It Permitted	0.44	1.00			1,00	1.00			0.95	0.97	
Satd. Flow (perm)	801	3438			3406	1524			1665	1595	
/olume (vph)	305	517	0	0	386	274	0	0	390	5	103
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	328	556	0	0	415	295	0	0	419	5	111
RTOR Reduction (vph)	0	0	0	Ö	0	150	0	0	0	34	0
ane Group Flow (vph)		556	0	0	415	145	0	0	274	227	0
leavy Vehicles (%)	5%	5%	5%	6%	6%	6%	0%	0%	3%	3%	3%
Furn Type	pm+pt	7.5 T	2.000	4470.		Perm	ğır Myki	X321525	Split	758875	79,75
Protected Phases	5	2			6				4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	60.3	60.3			43.3	43.3			19.7	19.7	
Effective Green, g (s)	61.3	61.3	West in		44.3	44.3			20.7	20.7	
Actuated g/C Ratio	0.68	0.68			0.49	0.49			0.23	0.23	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
/ehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
ane Grp Cap (vph)	678	2342	945112515	212896	1677	750	645 LSK	an solution	383	367	
//s Ratio Prot	c0.07	0.16			0.12	· · · · · · · · · · · · · · · · · · ·			c0.16	0.14	
/s Ratio Perm	c0.26	a alikagi,			ožika.	0.10		285-24CF	<0.697/3.5	o Militir	Assetta (Sa
/c Ratio	0.48	0.24			0.25	0.19			0.72	0.62	
Jniform Delay, d1	6.0	5.5			13.2	12.8			31.9	31.1	
Progression Factor	1.51	0.90			1.00	1.00			1.00	1.00	
ncremental Delay, d2	0.4	0.2			0.4	0.6			6.5	3.3	
Delay (s)	9.4	5.2			13.6	13.4			38.4	34.4	
evel of Service	A	A			. В	В			D	Č	
Approach Delay (s)	er skrivet de tre	6.8			13.5		0.0		· · · · · · · · · · · · · · · · · · ·	36.4	
Approach LOS		A			В		A			D	
	one contracts	SINGSPERSON	Technique de la company		and an analysis of the		kannunga pengapuna		C2505WC005CD2900	enanganganan	
ntersection Summary											
ICM Average Control I			16.5	Н	CM Lev	el of Se	rvice		В		
ICM Volume to Capac	ty ratio		0.54								
Actuated Cycle Length											
ntersection Capacity U	(s)		90.0 58.6%			st time			8.0 B		

HCM Unsignalized Intersection Capacity Analysis 2011 With-Project PM-Saturday

	†	7	(#	ļ	₹	t		
Movement	NBT	NBR	SBL	SBT	SWL	SWR		
Lane Configurations	↑ 1>		ሻ	ተተ	ሻ	77		
Sign Control	Free		40.40	Free	Stop	可有符件		
Grade	0%			0%	0%			
Volume (veh/h)	560	35	73	535		80		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Hourly flow rate (vph)	596	37	78	569	23	85		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage veh)								
Upstream signal (ft)				89	0.05			
pX, platoon unblocked					0.95	040		
vC, conflicting volume			633		1054	316		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol			000		1001	240		
vCu, unblocked vol			633		1001	316 7.0		
tC, single (s)			4.2		6.9	7.0		
tC, 2 stage (s)			0.0		2.0	3.4		
tF (s)			2.3 91		3.6 88	3.4 87		
p0 queue free %			913		201	668		
cM capacity (veh/h)	Austria	ENCHER TO SERVICE		more and a second				toppeart
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	THE PROPERTY OF THE PARTY OF TH	SW 1		
Volume Total	397	236	78	285	285	23 23	85 0	
Volume Left	0	0 37	78 0	0	0	23	85	
Volume Right	1700	1700	913	1700	1700	201	668	
cSH	0.23	0.14		0.17	0.17	0.12	0.13	
Volume to Capacity Queue Length 95th (ft)	0.23	0.14	7	0.17	0.17	10	11	
Control Delay (s)	0.0	0.0	9.3	0.0	0.0	25.2	11.2	
Lane LOS	0.0	0.0	9.3 A	0.0	0.0	23.2 D	B	
Approach Delay (s)	0.0		1.1			14.2	В	
Approach LOS	0.0		1.1			В		
		consequence and the	erona unemperatura de la comp			umate handanaa	NACO 1944 N. 1	ossiesest
Intersection Summary								
Average Delay			1.6		0111		_ d A	
Intersection Capacity Ut	ilization		34.0%	ı	CU Leve	ei or Ser	vice A	
Analysis Period (min)			15					

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The Transpo Group

5: S 200th St & Orillia Rd

Queues 2011 With-Project PM-Saturday

	-	•	•	4	†	\	ļ	
Lane Group	EBT	WBL	WBR	NBL	NBT	SBL	SBT	
Lane Group Flow (vph)	10	121	222	5	607	210	481	
v/c Ratio	0.06	0.47	0.21	0.03	0.33	0.41	0.20	
Control Delay	28.6	35.9	3.3	36.4	12.3	31.5	6.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0,0	0,0	
Total Delay	28.6	35.9	3.3	36.4	12.3	31.5	6.7	
Queue Length 50th (ft)	2	49	0	2	74	42	26	
Queue Length 95th (ft)	18	114	25	13	166	90	122	
Internal Link Dist (ft)	36				266		3376	
Turn Bay Length (ft)								
Base Capacity (vph)	219	339	1049	212	1822	587	2459	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.36	0.21	0.02	0.33	0.36	0.20	
Intersection Summary								

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HCM Signalized Intersection Capacity Analysis 2011 With-Project PM-Saturday

•	>	`	•	—	•	•	†	<u> </u>	1	Ţ	1
Movement EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	43-		۱۴		7474	ካ	† 1>		ኘጘ	ት ጌ	2
Ideal Flow (vphpl) 1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00		0.88	1.00	0.95		0.97	0.95	
Frt	0.93		1.00		0.85	1.00	0.98		1.00	1.00	
Fit Protected	1.00		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1772		1752		2760	1752	3424		3273	3374	
Flt Permitted	1.00		0.95		1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1772		1752		2760	1752	3424		3273	3374	
Volume (vph) 0	5	5	110	0	202	5	468	85	191	438	0
Peak-hour factor, PHF 0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph) 0	5	5	121	0.51	222	5	514	93	210	481	0.51
RTOR Reduction (vph) 0	5	0	0	0	167	0	13	0	0	0	Ö
Lane Group Flow (vph) 0	- 5	ŏ	121	ŏ	55	5	594	0	210	481	o.
Heavy Vehicles (%) 0%	0%	0%	3%	3%	3%	3%	3%	3%	7%	7%	7%
Turn Type Perm		(149 - 117)	Prot		ustom	Prot	- 070	. 44 : 7 . 4 . 7	Prot	170	- 170 - 170
Protected Phases	3		4		1	5	2		1 100	6	
Permitted Phases 3	J		~+		4	J	2		,	U	
Actuated Green, G (s)	1.1		8.4		17.7	1.1	41.1		9.3	49.3	
Effective Green, g (s)	3.1		9.4		20.7	3.1	43.1		11.3	51.3	
Actuated g/C Ratio	0.04		0.11		0.25	0.04	0.52		0.14	0.62	
Clearance Time (s)	6.0		5.0		6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	66	11.2.4	199		822	66	1780	-	446	2088	
v/s Ratio Prot	c0.00		c0.07		0.01	0.00	c0.17		c0.06	0.14	
v/s Ratio Perm	CO.00		60.07		0.01	0.00	60.17		60.00	0.14	
v/c Ratio	0.08		0.61		0.07	0.08	0.33		0.47	0.23	
Uniform Delay, d1	38.5		35.0		23.7	38.5	11.6		33.0	7.0	
Progression Factor	1.00		1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5		5.2		0.0	0.5	0.5		0.8	0.3	
Delay (s)	39.0		40.2		23.8	39.0	12.1		33.8	7.3	
Level of Service	39.0 D		40.2 D		23.6 C	39.0 D	12.1 B		33.6 C	7.3 A	
Approach Delay (s)	39.0		D	29.6	Ç	ט	12.3		C	15.3	
Approach LOS	39.0 D			29.0 C			12.3 B			13.3 B	
		erden lasianenskaphiann	enemocennumeholisekil	energiechienzeuch	elis onidas susab estini	per/onzero/wandels	D Silver to the Administration of the	endra-consumbani	eshawera, da encuela il anadro		kommonuovaves.
Intersection Summary		47.0		10111	1 (0						
HCM Average Control Delay		17.3	F	ICM Lev	el of Se	ervice		В			
HCM Volume to Capacity ratio		0.38	_	6 1		(-)		40.0			
Actuated Cycle Length (s)		82.9		ium of k				16.0			
Intersection Capacity Utilization	l	43.9%	19	CU Leve	ei of Ser	vice		Α			
Analysis Period (min)		15									
c Critical Lane Group											

									2030	Daseiiii	e rivi-vveeday
	_#	-	*	€	←	€.	4	۲	Ĺ	₹	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	128	1571	31	71	898	342	31	194	577	536	
v/c Ratio	0.51	0.99	0.04	0.78	0.72	0.52	0.32	0.80	0.83	0.91	
Control Delay	56.1	54.0	10.6	111.4	17.2	7.8	63.6	70.6	57.3	59.0	
Queue Delay	0.0	19.4	0.0	0.0	6.4	3.2	0.0	0.0	42.4	0.0	
Total Delay	56.1	73.4	10.6	111.4	23.5	11.0	63.6	70.6	99.6	59.0	
Queue Length 50th (ft)	94	622	5	52	181	83	24	141	223	406	
Queue Length 95th (ft)	159	#802	24	m#110	m314	m139	57	#252	#308	#644	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	249	1581	717	91	1255	661	97	257	695	589	
Starvation Cap Reductn	0	0	0	0	304	220	0	0	0	0	
Spillback Cap Reductn	0	92	0	0	0	0	0	0	160	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.51	1.06	0.04	0.78	0.94	0.78	0.32	0.75	1.08	0.91	
Intersection Summary											
# 95th percentile volum	e exce	eds cap	acity, o	ueue m	ay be lo	nger.					
Queue shown is maxi					•	•					
m Volume for 95th per					ostream	signal.					
		•		•		-					

	_#	-	*	✓	+	٤	•	ĩ	~	(€	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	^	7)Y	ተተ	7	ሻ	ř.		ሻሻ	*4*	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Flt Permitted	0.95	1.00	1,00	0.95	1.00	1,00	0.95	1,00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Volume (vph)	125	1540	30	70	880	335	30	165	25	565	395	130
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	128	1571	31	71	898	342	31	168	26	577	403	133
RTOR Reduction (vph)	0	0	10	0	0	103	0	5	0	0	9	0
Lane Group Flow (vph)	128	1571	21	71	898	239	31	189	0	577	527	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot		Perm	Prot	THE REST	Perm	Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	15.5	50.6	50.6	5.6	40.8	40.8	3.0	16.6		25.2	39.0	
Effective Green, g (s)	17.2	52.4	52.4	6.3	41.5	41.5	4.7	18.5		26.8	40.6	
Actuated g/C Ratio	0.14	0.44	0.44	0.05	0.35	0.35	0.04	0.15		0.22	0.34	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	249	1516	678	90	1189	532	68	239		759	579	
v/s Ratio Prot	0.07	c0.45		c0.04	0.26		0.02	c0.12		0.17	c0.31	
v/s Ratio Perm			0.01			0.16						
v/c Ratio	0.51	1.04	0.03	0.79	0.76	0.45	0.46	0.79		0.76	0.91	
Uniform Delay, d1	47.5	33.8	19.3	56.2	34.8	30.4	56.4	48.9		43.6	37.9	
Progression Factor	1.00	1.00	1.00	1.32	0.44	0.35	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.4	33.1	0.1	28.6	3,5	2.1	4.8	16.2		4.5	18.2	
Delay (s)	54.9	66.9	19.4	102.7	18.6	12.9	61.2	65.0		48.1	56.1	
Level of Service	D	E	В	F	В	В	E	E		D	E	
Approach Delay (s)		65.1			21.7		64.5				52.0	
Approach LOS	hadile in	E			С		E				D	
Intersection Summary												
HCM Average Control D			48.7		ICM Le	vel of Se	ervice		D			
HCM Volume to Capacit	y ratio		0.97									
Actuated Cycle Length (s)		120.0	۶	ium of I	ost time	(s)		16.0			
Intersection Capacity Uti	ilization		94.1%	- 1	CU Lev	el of Ser	vice		F			
Analysis Period (min)			15									

48.7	HCM Level of Service D
0.97	
120.0	Sum of lost time (s) 16.0
94.1%	ICU Level of Service F
15	
	0.97 120.0 94.1%

c Critical Lane Group

The Transpo Group

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Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	1268	809	490	1299	538	483	
v/c Ratio	1.06	0.87	1.14	0.64	1.12	1.01	
Control Delay	59.9	12.2	118.7	5.7	116.3	82.9	
Queue Delay	201.1	84.3	0.0	1.8	0.0	0.0	
Total Delay	261.0	96.4	118.7	7.5	116.3	82.9	
Queue Length 50th (ft)	~560	104	~400	80	~505	~395	
Queue Length 95th (ft)	m#603	m259	m#522	m132	#732	#634	
Internal Link Dist (ft)	126			410		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	1192	934	429	2044	480	480	
Starvation Cap Reductn	358	251	0	314	0	0	
Spillback Cap Reductn	0	0	0	543	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.52	1.18	1.14	0.87	1.12	1.01	
Intersection Summary							

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተ ተ	7	14	ተተ					75	4	
Ideal Flow (vphpl)	1900		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95		Sart Ri			0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Fit Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1438	
Fit Permitted		1.00	1.00	0.09	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	156	3406					1441	1438	
Volume (vph)	0	1230	785	475	1260	0	0	0	0	970	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1268	809	490	1299	0	0	0	0	1000	0	21
RTOR Reduction (vph)	0	0	400	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	1268	409	490	1299	0	0	0	0	538	482	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type		No.		pm+pt	907 TV 2				2078 Y	Perm	20000000	497457
Protected Phases		2	190,777,777	1	6					1.12 - 2021 212 212-1	8	
Permitted Phases	overske v	g ye têr	2	6	99989					8	LANGERS.	
Actuated Green, G (s)		41.0	41.0	71.0	71.0					39.0	39.0	
Effective Green, a (s)		42.0	42.0	72.0	72.0					40.0	40.0	
Actuated g/C Ratio		0.35	0.35	0.60	0.60					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)	01:00:33	1192	533	429	2044			1742.43	100000	480	479	25000000
v/s Ratio Prot		0.37		c0.25	0.38						Det et et et et e	
v/s Ratio Perm		0.57	0.27	c0.44	0.00					c0.37	0.33	
v/c Ratio		1.06	0.77	1.14	0.64	24) 5300W 6052				1.12	1.01	
Uniform Delay, d1		39.0	34.6	38.5	15.5					40.0	40.0	
Progression Factor		0.59	0.92	1.31	0.32					1.00	1.00	\$2000 A 77 C
Incremental Delay, d2		35.4	3.5	77.0	0.52					78.5	42.5	
Delay (s)		58.4	35.3	127.6	5.6				345.5505	118.5	82.5	
Level of Service		E.	00.0 D	127.6 F	J.0 A				31,000 tar-	110.0 F	OZ.G	
Approach Delay (s)		49.4	ara an Le g	10 11 AS AT 6 \$250	39.1			0.0		(USSESSED PRO	101.5	
Approach LOS					. D			Δ.			F	
												accionistració Secretarios
Intersection Summary	•		- FO F		1011	1.60						
HCM Average Control D			56.5		1CM Le	vel of Se	rvice		E			
HCM Volume to Capacit			1.12	stantini k	Silini ne e	2 24 41 2 °	/_X:		0.0			500414555
Actuated Cycle Length (erios Hill	120.0			ost time			8.0			
Intersection Capacity Ut	ilization	1 	67.4%	Jugar ang eks	CU Leve	el of Sen	vice		H			
Analysis Period (min)			15			1500000000						
c Critical Lane Group												

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

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Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	448	1794	1247	1232	415	400	
v/c Ratio	1.16	0.79	0.76	1.14	1.12	1.07	
Control Delay	108.0	10.1	29.0	92.5	126.1	106.5	
Queue Delay	0,0	3.9	0.0	0.0	0.0	0.0	
Total Delay	108.0	14.0	29.0	92.5	126.1	106.5	
Queue Length 50th (ft)	~326	234	403	~841	~390	~340	
Queue Length 95th (ft) n	n#284	m220	492	#1105	#601	#550	
Internal Link Dist (ft)		410	1			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	385	2270	1646	1076	370	374	
Starvation Cap Reductn	0	389	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.16	0.95	0.76	1.14	1.12	1.07	
Intersection Summary							

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

	•		7	×	←	•	-	لر	•	*	/*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	ሻ	^			十 十	7			*1	M	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.92	
Flt Protected	0.95	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (prot)	1641	3282			3406	1524			1531	1445	
Flt Permitted	0.11	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (perm)	190	3282			3406	1524			1531	1445	
Volume (vph)	435	1740	0	0	1210	1195	0	0	570	5	215
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	448	1794	0	0	1247	1232	0	0	588	5	222
RTOR Reduction (vph)	0	0	0	0	0	339	0	0	0	25	0
Lane Group Flow (vph)	448	1794	0	0	1247	893	0	0	415	375	0
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt	jai 154		(L4) \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	9.44.13	Perm		820 Sept.	Split	0.459.000	
Protected Phases	5	2			6				4	4	
Permitted Phases	2					6					
Actuated Green, G (s)	82.0	82.0			57.0	57.0			28.0	28.0	
Effective Green, g (s)	83.0	83.0			58.0	58.0			29.0	29.0	
Actuated g/C Ratio	0.69	0.69			0.48	0.48			0.24	0.24	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
Lane Grp Cap (vph)	385	2270		4896E	1646	737	96 P 35 P 9		370	349	
v/s Ratio Prot	c0.20	0.55			0.37	201 A TO TO SHOW	-1-1		c0.27	0.26	
v/s Ratio Perm	0.60	ar Preside.			red kino	c0.59			Magy.		
v/c Ratio	1.16	0.79			0.76	1.21			1.12	1.07	
Uniform Delay, d1	34.4	12.6			25.3	31.0			45.5	45.5	
Progression Factor	0.83	0.75			1.00	1.00			1.00	1.00	
Incremental Delay, d2	76.5	0.3			3.3	107.7			84.0	69.4	
Delay (s)	105.0	9.7			28.6	138.7			129.5	114.9	
Level of Service	SAME.	Α	JA-445		С	∂ F×			F	F	
Approach Delay (s)		28.8			83.3		0.0			122.3	
Approach LOS		С			F		A			F	
Intersection Summary											
HCM Average Control E			67.0	F	ICM Le	vel of Se	rvice		E		
HCM Volume to Capaci			1.14								
Actuated Cycle Length (120.0	S	um of I	ost time	(s)		8.0		
Intersection Capacity Ut	ilization	1	67.4%	10	CU Leve	el of Ser	vice		Н		
Analysis Period (min)			15		SEFER						
c Critical Lane Group											

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^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	†	7	(w	ţ	4	t		
Movement	NBT	NBR	SBL	SBT	SWL	SWR		
Lane Configurations	† ‡		*	ተተ	7	7		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Volume (veh/h)	2385	9	15	1950	7	18		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Hourly flow rate (vph)	2565	10	16	2097	8	19		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type					None			
Median storage veh)								
Upstream signal (ft)				66	State 1			
pX, platoon unblocked					0.62			
vC, conflicting volume			2574		3650	1287		
vC1, stage 1 conf vol								
vC2, stage 2 conf vol			1975					
vCu, unblocked vol			2574		4657	1287		
tC, single (s)			4.3		7.3	7.4		
tC, 2 stage (s)								
tF (s)			2.3		3.7	3.5		
p0 queue free %			89 - 147		0	85 128		
cM capacity (veh/h)	managaran managan	2002927270250		000000000000000000000000000000000000000	•			
Direction, Lane #	NB 1	NB 2	SB 1 16	SB 2 1048	***************************************	SW 1	W 2 19	
Volume Total	1710	865 0	16	1048	1048	8	0	
Volume Left	0	10	- 0	0	0	0	19	
Volume Right	1700	1700	147	1700	1700	0	128	
Volume to Capacity	1.01	0.51	0.11	0.62	0.62	35.66	0.15	
Queue Length 95th (ft)	0	0.31	9	0.02	0.02	Err	13	
Control Delay (s)	0.0	0.0	32.4	0.0	0.0	Err	38.0	
Lane LOS	0.0	0.0	52.4 D	0.0	0.0	F	50.0 E	
Approach Delay (s)	0.0		0.2			2827.1	<u></u>	
Approach LOS	0.0		0.2			F		
Intersection Summary								100
Average Delay			16.2					
Intersection Capacity Ut	ilization		76.2%	10	CU Lev	el of Ser	ce D	
Analysis Period (min)			15					

	-	•	*	†	1	↓
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	10	395	1247	1558	489	1394
v/c Ratio	0.10	0.98	0.95	0.96	0.85	0.62
Control Delay	60.9	85.8	43.4	46.0	62.7	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	85.8	43.4	46.0	62.7	12.4
Queue Length 50th (ft)	7	301	455	580	188	266
Queue Length 95th (ft)	27	#563	#728	#880	#309	437
Internal Link Dist (ft)	36			266		3373
Turn Bay Length (ft)						
Base Capacity (vph)	100	405	1319	1624	578	2248
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.98	0.95	0.96	0.85	0.62
Intersection Summary	00000000	Kirili in				

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

The Transpo Group

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The Transpo Group

HCM Signalized Intersection Capacity Analysis 2030 Baseline PM-Weeday

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Movement EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	STATES AND RESIDENCE	SBR
Lane Configurations	€}>		J.		77	J.	↑ ⊅		44	1 1>	
Ideal Flow (vphpl) 1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00		1.00		0.88		0.95		0.97	0.95	
Frt	1.00		1.00		0.85		0.99		1.00	1.00	
Flt Protected	0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1854		1752		2760		3445		3183	3280	
Flt Permitted	0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)	1854		1752		2760		3445		3183	3280	
Volume (vph) 5	5	0	375	0	1185	0	1405	75	465	1320	5
Peak-hour factor, PHF 0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph) 5	5	0	395	0	1247	0	1479	79	489	1389	5
RTOR Reduction (vph) 0	0	0	0	0	96	0	3	0	0	0	0
Lane Group Flow (vph) 0	10	0	395	0	1151	. 0	1555	0	489	1394	0
Heavy Vehicles (%) 0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type Perm		Y4787	Prot		ustom	Prot	, 45 V 25 V,	100/100	Prot	7.75	77.77
Protected Phases	3		4		1	5	2		1	6	
Permitted Phases 3					4						
Actuated Green, G (s)	0.9		27.0		47.0		55.1		20.0	81.1	
Effective Green, g (s)	2.9		28.0		50.0		57.1		22.0	83.1	
Actuated g/C Ratio	0.02		0.22		0.40		0.45		0.17	0.66	
Clearance Time (s)	6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)	3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	43	J. 2000	389		1183		1561		556	2163	
v/s Ratio Prot			0.23		c0.17		c0.45		0.15	0.42	
v/s Ratio Perm	0.01				0.25		*****			****	
v/c Ratio	0.23		1.02		0.97		1.00		0.88	0.64	
Uniform Delay, d1	60.5		49.0		37.3		34.3		50.7	12.7	
Progression Factor	1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2	2.8		49.6		19.8		21.9		14.7	1.5	
Delay (s)	63.2		98.6		57.2		56.3		65.4	14.2	
Level of Service	00.2 E		50.0 F		E		50.5 E		55.4 E	В	
Approach Delay (s)	63.2		•	67.1	_		56.3		_	27.5	
Approach LOS	00.2 E			E			50.5 E			27.5 C	
	L			L-			L			C	
Intersection Summary											
HCM Average Control Delay		49.2	H	ICM Le	vel of Se	rvice		D			
HCM Volume to Capacity ratio		0.97									
Actuated Cycle Length (s)		126.0	S	um of l	ost time	(s)		12.0			
Intersection Capacity Utilization		96.8%	11	CU Leve	el of Sen	vice		F			
Analysis Period (min)		15									
c Critical Lane Group											
•											

The Transpo Group

	_#		7	•	←	*	1	7	6	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	128	1572	31	72	900	343	31	195	577	536	
v/c Ratio	0.51	1.00	0.04	0.78	0.72	0.52	0.32	0.80	0.83	0.91	
Control Delay	56.1	54.6	10.7	111.0	17.3	7.8	63.6	70.8	57.4	59.0	
Queue Delay	0.0	19.7	0.0	0.0	6.5	3.2	0.0	0.0	44.7	0.0	
Total Delay	56.1	74.3	10.7	111.0	23.8	11.0	63.6	70.8	102.0	59.0	
Queue Length 50th (ft)	94	624	5	53	182	83	24	142	223	406	
Queue Length 95th (ft)	159	#804	24	m#111	m315	m140	57	#255	#308	#644	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	249	1578	716	92	1255	661	97	257	694	589	
Starvation Cap Reductn	0	0	0	0	304	220	0	0	0	0	
Spillback Cap Reductn	0	91	0	0	0	0	0	0	162	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.51	1.06	0.04	0.78	0.95	0.78	0.32	0.76	1.08	0.91	
Intersection Summary											

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

•			_	_		-						
	_#	→	*	•	-	<u>c</u>	*	r	1	4	¥	*
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2		SWL	SWR
Lane Configurations	ሻ	ተተ	7	ሻ	ተተ	7	ሻ	Ã		ሻሻ	¥γ	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Volume (vph)	125	1541	30	71	882	336	30	165	26	565	395	130
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	128	1572	31	72	900	343	31	168	27	577	403	133
RTOR Reduction (vph)	0	0	10	0	0	103	0	5	0	0	9	0
Lane Group Flow (vph)	128	1572	21	72	900	240	31	190	0	577	527	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot	1747 WY.	d (22.6)	Prot	4000	VVI.V
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases		-	6			2						
Actuated Green, G (s)	15.5	50.5	50.5	5.7	40.8	40.8	3.0	16.6		25.2	39.0	
Effective Green, q (s)	17.2	52.3	52.3	6.4	41.5	41.5	4.7	18.5		26.8	40.6	
Actuated g/C Ratio	0.14	0.44	0.44	0.05	0.35	0.35	0.04	0.15		0.22	0.34	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	249	1513	677	92	1189	532	68	239	etalen.	759	579	
v/s Ratio Prot	0.07	c0.45	a se mbol a.	c0.04	0.26	· · · · · · · · · · · · · · · · · · ·	0.02	c0.12		0.17	c0.31	
v/s Ratio Perm	1136		0.01		si-165 44	0.16		743183743		1988884		
v/c Ratio	0.51	1.04	0.03	0.78	0.76	0.45	0.46	0.79		0.76	0.91	
Uniform Delay, d1	47.5	33.8	19.4	56.1	34.8	30.4	56.4	48.9		43.6	37.9	
Progression Factor	1.00	1.00	1.00	1.32	0.44	0.35	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.4	33.9	0.1	27.3	3.5	2.1	4.8	16.5		4.5	18.2	
Delay (s)	54.9	67.8	19.4	101.2	18.7	12.9	61.2	65.4		48.1	56.1	
Level of Service	D.O	Ë	В	F	В	12.0 B	Ë	Ű.F		- O. I	. E	
Approach Delay (s)	f Makettar	66.0	A Conference	Lesi talahalaki	21.7		64.8	i Sokoni In ic		DO BIGA HAS	52.0	
Approach LOS		00.0 F			- 'c		04.0 E				02.0 D	
Intersection Summary		_			•		_			e a ganyasa an	_	
HCM Average Control D	elav		49.1	L	CMIA	vel of Se	Prvice		D			
HCM Volume to Capacit			0.97	***************************************			,, , 100		-distributed			
Actuated Cycle Length (120.0	::::::::::::::::::::::::::::::::::::::	um of l	ost time	/e\		16.0			
Intersection Capacity Uti			94.1%			of Ser			10.0 F	o swame		
Analysis Period (min)	nzauVII		15		O Leve	, 0, 36,	VIUE		.479(35)850			
c Critical Lane Group												
5 Silical Lane Oloup												

The Transpo Group

m Volume for 95th percentile queue is metered by upstream signal.

	-	*	•	←	/	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1270	809	493	1303	539	484
v/c Ratio	1.07	0.87	1.15	0.64	1.12	1.01
Control Delay	60.5	12.1	121.1	5.8	117.0	83.4
Queue Delay	201.6	85.0	0.0	1.9	0.0	.0.0 (2) (1) (2) (3) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4
Total Delay	262.0	97.1	121.1	7.6	117.0	83.4
Queue Length 50th (ft)	~561	97	~405	81	~507	~397 (a) 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 / 100 /
Queue Length 95th (ft)	m#603	m247	m#527	m135	#734	#636
Internal Link Dist (ft)	126			410		462
Turn Bay Length (ft)			152			
Base Capacity (vph)	1192	933	429	2044	480	480
Starvation Cap Reductn	358	251	0	315	0	0
Spillback Cap Reductn	0	0	0	546	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.52	1.19	1.15	0.87	1.12	1.01
Intersection Summary						

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\PM-Future 2030.sy7

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ት	7	Ĭ	ተተ					J.	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1438	
Flt Permitted		1.00	1.00	0.09	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	156	3406					1441	1438	
Volume (vph)	0	1232	785	478	1264	0	0	0	0	972	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	. 0	1270	809	493	1303	0	0	0	0	1002	0	21
RTOR Reduction (vph)	0	0	400	0	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	1270	409	493	1303	0	0	0	0	539	483	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type		ran Sij	Perm	pm+pt		72734857				Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		41.0	41.0	71.0	71.0					39.0	39.0	
Effective Green, g (s)		42.0	42.0	72.0	72.0					40.0	40.0	
Actuated g/C Ratio		0.35	0.35	0.60	0.60					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		1192	533	429	2044					480	479	
v/s Ratio Prot		0.37		c0.25	0.38							
v/s Ratio Perm			0.27	c0.44						c0.37	0.34	
v/c Ratio		1.07	0.77	1.15	0.64					1.12	1.01	
Uniform Delay, d1		39.0	34.7	49.2	15.5					40.0	40.0	
Progression Factor		0.59	0.91	1.31	0.32					1.00	1.00	
Incremental Delay, d2		36.0	3.5	79.7	0.7					79.2	43.0	
Delay (s)		59.0	35.1	144.4	5.7					119.2	83.0	
Level of Service		E	D	F	Α					F	F	
Approach Delay (s)		49.7			43.8			0.0			102.1	
Approach LOS		D			D			Α			F	
Intersection Summary												
HCM Average Control De			58,5	· · · · · · · · · · · · · · · · · · ·	ICM Lev	el of Se	rvice		E			
HCM Volume to Capacity			1.13									
Actuated Cycle Length (s			120.0			ost time			8.0			
Intersection Capacity Util	ization	10	67.8%	10	CU Leve	el of Sen	vice		Н			
Analysis Period (min)	veliki.		15									

Intersection Summary		
HCM Average Control Delay	58,5	HCM Level of Service E
HCM Volume to Capacity ratio	1.13	
Actuated Cycle Length (s)	120.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	167.8%	ICU Level of Service H
Analysis Period (min)	15	
a Critical Lana Croup		

c Critical Lane Group

^{# 95}th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

	٠		←	•	•)	
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	448	1798	1255	1236	416	401	
v/c Ratio	1.17	0.79	0.76	1.15	1.12	1.07	
Control Delay	109.4	10.1	29.2	94.5	127.0	107.3	
Queue Delay	0.0	4.0	0.0	0.0	0.0	0.0	
Total Delay	109.4	14.1	29.2	94.5	127.0	107.3	
Queue Length 50th (ft)	~329	235	406	~848	~391	~342	
Queue Length 95th (ft)	m#285	m220	496	#1114	#602	#552	
Internal Link Dist (ft)		410	7.351			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	384	2270	1646	1075	370	374	
Starvation Cap Reducti	n 0	388	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.17	0.96	0.76	1.15	1.12	1.07	

Intersection Summary

	۶	-	7	*	←	•	>	لر	•	<i>•</i>	/
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	*5	ተተ			ተተ	7			Ĭ,	M	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85		-acadonayere a	1.00	0.92	
Fit Protected	0.95	1.00			1.00	1.00			0.95	0.98	
Satd. Flow (prot)	1641	3282			3406	1524		ACTOR ACTOR A	1531	1445	
Flt Permitted	0.11	1.00		12160048	1.00	1.00			0.95	0.98	
Satd. Flow (perm)	186	3282			3406	1524	rayuneer diseason		1531	1445	
Volume (vph)	435	1744	0	0	1217	1199	0	0	570	5	217
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	448	1798	· 0	0	1255	1236	0	0	588	5	224
RTOR Reduction (vph)	0	0	0	0	0	338	0	0	0	25	0
Lane Group Flow (vph)	_	1798	Ŏ	Ö	1255	898	Ö	Ō	416	376	ŏ
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt			77.00	7488	Perm			Split		
Protected Phases	5	2			6	A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			4	4	
Permitted Phases	2				Berliner.	6					
Actuated Green, G (s)	82.0	82.0			57.0	57.0			28.0	28.0	
Effective Green, g (s)	83.0	83.0			58.0	58.0			29.0	29.0	
Actuated g/C Ratio	0.69	0.69			0.48	0.48			0.24	0.24	
Clearance Time (s)	5.0	5.0			5.0	5.0	2000A86		5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
Lane Grp Cap (vph)	383	2270	44-5004	044433	1646	737		West Sales	370	349	
v/s Ratio Prot	c0.20	0.55			0.37	Continuo de tento			c0.27	0.26	
v/s Ratio Perm	0.60					c0.59				0.586656	
v/c Ratio	1.17	0.79			0.76	1.22			1.12	1.08	le a costa de eleberado de actorio de el
Uniform Delay, d1	34.6	12.6			25.4	31.0			45.5	45.5	
Progression Factor	0.83	0.75			1.00	1.00			1.00	1.00	95160048660019608
Incremental Delay, d2	79.2	0.3			3.4	110.2			84.9	70.3	
Delay (s)	107.8	9.8			28.8	141.2			130.4	115.8	
Level of Service	F	Α.			- C	i F			100.4 F	110.0 F	
Approach Delay (s)	1.1.401	29.3			84.6	arave elektr	0.0		VI 140 40/856	123.3	
Approach LOS					04.0 F		Ο.0			123.3	
	continue Support terrory	anamarana ana	2000-200000-00046-00	nanatativa evapuan	wrondersonwoods		and the second			e de la constitución de la const	
Intersection Summary											
HCM Average Control D			67.9	(Second	ICM Le	vel of Se	ervice		E		
HCM Volume to Capaci			1.14			on Land of					
Actuated Cycle Length		ar it	120.0			ost time			8.0		
Intersection Capacity Ut	tilization	. 1	67.8%	10	CU Leve	el of Ser	vice		Н		
Analysis Period (min)			15				makagg				
c Critical Lane Group											

The Transpo Group

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	†	7	(w	↓	4	t		
Movement	NBT	NBR	SBL	SBT	SWL	SWR		
Lane Configurations	↑ ₽		ሻ	ተተ	Ţ	7		
Sign Control	Free			Free	Stop			
Grade	0%			0%	0%			
Volume (veh/h)	2385	15	21	1950	11	29		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Hourly flow rate (vph) Pedestrians	2565	16	23	2097	12	31		
Lane Width (ft)								
Walking Speed (ft/s) Percent Blockage								
Right turn flare (veh)								
Median type Median storage veh)					None			
Upstream signal (ft)				66			and the first transfer of the first transfer	
pX, platoon unblocked				•••	0.62			
vC, conflicting volume			2581			1290		
vC1, stage 1 conf vol			11.000000000000000000000000000000000000		,,,,,,,			
vC2, stage 2 conf vol								
vCu, unblocked vol			2581		4690	1290		
tC, single (s)			4.3		7.3	7.4		
tC, 2 stage (s)								
tF (s)			2.3		3.7	3.5		
p0 queue free %			85		0	76		
cM capacity (veh/h)			146		0	127		
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2	12.54
Volume Total	1710	871	23	1048	1048	12	31	1.47
Volume Left	0	0	23	0	0	12	0	
Volume Right	0	16	0	0	0	0	31	
cSH	1700	1700	146	1700	1700	0	127	
Volume to Capacity	1.01	0.51	0.15	0.62	0.62	62.84	0.24	
Queue Length 95th (ft)	0	0	13	0	0	Err	23	
Control Delay (s)	0.0	0.0	34.0	0.0	0.0	Err	42.2	
Lane LOS			D			F	E	
Approach Delay (s) Approach LOS	0.0		0.4			2780.3 F		
Intersection Summary								
Average Delay	SCHOOL SECURITY CONTRACTOR	onesingers of this	25.4		onesis in the second se			N-0483955
Intersection Capacity Ut	ilization		76.4%	16	CHLev	el of Ser	vice D	

	→	•	4	<u>†</u>	\	Ţ	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	10	395	1249	1562	491	1398	
v/c Ratio	0.10	0.98	0.95	0.96	0.85	0.62	
Control Delay	60.9	85.8	43.6	46.4	63.0	12.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	60.9	85.8	43.6	46.4	63.0	12.4	
Queue Length 50th (ft)	7	301	456	583	189	267	
Queue Length 95th (ft)	27	#563	#731	#884	#311	441	
Internal Link Dist (ft)	36	多光等的		266		3373	
Turn Bay Length (ft)							
Base Capacity (vph)	100	405	1319	1624	578	2248	
Starvation Cap Reductn	0	0	0	0	0	Ó	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.98	0.95	0.96	0.85	0.62	
Intersection Summary							
# 95th percentile volum	e exce	eds car	acity, a	ueue m	av be lo	naer.	

Queue shown is maximum after two cycles.

5: S 200th St & Orillia Rd

The Transpo Group

									500 TTT			
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		43-		7		77.77	75	↑ ₽		1,1	† ‡	
Ideal Flow (vphpl) 1	900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88		0.95		0.97	0.95	
Frt		1.00		1.00		0.85		0.99		1.00	1.00	
Flt Protected		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1854		1752		2760		3445		3183	3280	
Flt Permitted		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1854		1752		2760		3445		3183	3280	
Volume (vph)	5	5	0	375	0	1187	0	1409	75	466	1323	5
	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adi. Flow (vph)	5	5	0.00	395	0.00	1249	0.00	1483	79	491	1393	5
RTOR Reduction (vph)	0	0	0	0	0	96	0	3	0	0	0	0
Lane Group Flow (vph)	0	10	ŏ	395	Ö		ő	1559	ő	491	1398	ő
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
	erm	0 70	970	Prot		custom	Prot	770	- 770	Prot	.070	1070
Protected Phases	emi	3		4	a seath A	cusioni 1	5	2		1	6	
Permitted Phases	3			erin erinini.		4		sur espesiv		Sandal.	Ü	
Actuated Green, G (s)		0.9		27.0		47.0		55.1		20.0	81.1	
Effective Green, g (s)		2.9		28.0		50.0		57.1		22.0	83.1	
		0.02		0.22		0.40		0.45		0.17	0.66	
Actuated g/C Ratio		6.0		5.0		6.0		6.0		6.0	6.0	
Clearance Time (s)								3.0			3.0	
Vehicle Extension (s)	000 250 C	3.0	Transportation	3.0	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	3.0			170 to 370 to	3.0		
Lane Grp Cap (vph)		43		389		1183		1561		556	2163	
v/s Ratio Prot				0.23		c0.17		c0.45		0.15	0.43	
v/s Ratio Perm		0.01		100		0.25	6941 × 1					
v/c Ratio		0.23		1.02		0.97		1.00		0.88	0.65	
Uniform Delay, d1		60.5		49.0		37.4		34.4		50.7	12.7	
Progression Factor		1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2		2.8		49.6		20.2		22.5		15.3	1.5	
Delay (s)		63.2		98.6		57.5		56.9		66.1	14.2	
Level of Service		E		.F		E		E		Ε	В	
Approach Delay (s)		63.2			67.4			56.9			27.7	
Approach LOS		E			E			E			С	
Intersection Summary												
HCM Average Control Del	ay		49.5	F	ICM Le	vel of Se	ervice		D			
HCM Volume to Capacity	ratio		0.97									
Actuated Cycle Length (s)			126.0	S	Sum of	lost time	(s)		12.0			
Intersection Capacity Utiliz	ation		97.0%	10	CU Lev	el of Ser	vice		F			
Analysis Period (min)			15									
c Critical Lane Group												
•												

	_#	-	•	1	←	٤	4	7	6	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	107	1327	26	61	796	388	26	158	526	444	
v/c Ratio	0.41	0.83	0.04	0.54	0.65	0.55	0.22	0.66	0.83	0.81	
Control Delay	45.5	31.0	8.8	64.5	19.6	11.5	49.2	51.9	51.9	44.9	
Queue Delay	0.0	0.1	0.0	0.0	3.1	2.2	0.0	333.4	7.5	0.0	
Total Delay	45.5	31.0	8.8	64.5	22.6	13.8	49.2	385.3	59.4	44.9	
Queue Length 50th (ft)	64	406	2	31	203	131	16	90	167	260	
Queue Length 95th (ft)	119	#550	18	m#62	m260	m205	43	159	#244	#439	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	258	1592	723	113	1220	700	116	266	643	546	
Starvation Cap Reductn	0	0	0	0	311	188	0	0	0	0	
Spillback Cap Reductn	0	9	0	0	0	0	0	174	85	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.41	0.84	0.04	0.54	88.0	0.76	0.22	1.72	0.94	0.81	
Intersection Summary											

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

	#	→	7	*	+	₹	1	7	~	6	4	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2		SWL	SWR
Lane Configurations	ሻ	ተተ	7	ሻ	ተተ	7	7	Ĩ.		14	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util, Factor	1,00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Volume (vph)	105	1300	25	60	780	380	25	135	20	515	330	105
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	1327	26	61	796	388	26	138	20	526	337	107
RTOR Reduction (vph)	0	0	11	0	0	159	0	5	0	0	11	0
Lane Group Flow (vph)	107	1327	15	61	796	229	26	153	. 0	526	433	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	470	Perm	Prot	370	Perm	Prot		7 1 1 1	Prot	11269	
Protected Phases	1	6	Leiiii	5	2	I. CHIH	7	4		3	8	
	ı	O	6	3	2	2		. 4		Ü		
Permitted Phases	40.0	40.9	40.9	4.7	32.5	32.5	3.0	15.4		17.0	29.6	
Actuated Green, G (s)	13.2 14.9		40.9	5.4	33.2	33.2	4.7	17.3		18.6	31.2	
Effective Green, g (s)	1,1,5,5			0.05	0.33	0.33	0.05	0.17		0.19	0.31	
Actuated g/C Ratio	0.15	0.43	0.43		4.7	4.7	5.7	5.9		5.6	5.6	
Clearance Time (s)	5.7	5.8	5.8	4.7				3.0		3.0	3.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		9-7-3-1 T-3-7		534	93895 (F) F.L.
Lane Grp Cap (vph)	259	1482	663	93	1141	511	82	269		632	111.77.77.11.00.	
v/s Ratio Prot	0.06	c0.38		c0.04	0.23		0.01	0.10		c0.15	c0.25	
v/s Ratio Perm			0.01	F 1875.	47.435	0.15					1 - 27-253	
v/c Ratio	0.41	0.90	0.02	0.66	0.70	0.45	0.32	0.57		0.83	0.81	
Uniform Delay, d1	38.6	26.6	16.6	46.4	29.0	26.2	46.1	37.9		39.2	31.7	
Progression Factor	1.00	1.00	1.00	1.08	0.63	0.92	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.8	8.8	0.1	12.7	2.9	2.3	2.2	2.8		9.2	9.1	
Delay (s)	43.4	35.3	16.6	63.0	21.2	26.4	48.3	40.7		48.4	40.8	
Level of Service	D	D	В	Ε	С	С	D	D		D	D	
Approach Delay (s)		35.6			24.9		41.8				44.9	
Approach LOS		D			C		D				D	
Intersection Summary												
HCM Average Control D	elay		34.8	ŀ	ICM Le	vel of S	ervice		С			
HCM Volume to Capacit	ty ratio		0.83									
Actuated Cycle Length (s)		100.0			ost time			12.0			
Intersection Capacity Ut			82.3%	19	CU Lev	el of Se	rvice		Ε			
Analysis Period (min)			15									
c Critical Lane Group												

c Critical Lane Group

The Transpo Group

m Volume for 95th percentile queue is metered by upstream signal.

2: S 188th St & I-5 SB

	-	*	€	◄	1	↓
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	1124	670	613	1232	486	437
v/c Ratio	1,06	0.75	1.15	0.58	1.12	
Control Delay	69.0	7.3	112.6	16.9	116.2	81.2
Queue Delay	158.3	44.5	0.0	2.0	0.0	
Total Delay	227.3	51.8	112.6	18.9	116.2	81.8
Queue Length 50th (ft)	~406	61	~433	286	~378	~295
Queue Length 95th (ft)	#540	m90	m#512	m336	#586	#511
Internal Link Dist (ft)	126			410		462
Turn Bay Length (ft)			152			
Base Capacity (vph)	1056	895	531	2112	432	ne 434) 는 11,200円(64)(12년 전 원립하는 12년 -
Starvation Cap Reductr	268	276	0	512	0	0
Spillback Cap Reductn	0	. 0	0	689	0	 Fully (2) 1 (1) 1997 (2) 2003.
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.43	1.08	1.15	0.87	1.13	1.01
Intersection Summary						

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

	۶	→	•	✓	•	•	4	†	~	-	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		^	7	٦	ተ ተ					7	4	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0			CO INSPERSORS CO.		4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1437	
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	205	3406					1441	1437	
Volume (vph)	0	1090	650	595	1195	0	0	0	0	875	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1124	670	613	1232	0	0	0	0	902	0	21
RTOR Reduction (vph)	0	0	423	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	1124	247	613	1232	0	0	0	0	486	435	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type		775 TH	Perm	pm+pt		W 777				Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		30.0	30.0	61.0	61.0					29.0	29.0	
Effective Green, g (s)		31.0	31.0	62.0	62.0					30.0	30.0	
Actuated g/C Ratio		0.31	0.31	0.62	0.62					0.30	0.30	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)	undidê.	1056	472	532	2112				Medal P	432	431	
v/s Ratio Prot		0.33		c0.31	0.36							
v/s Ratio Perm			0.16	c0.40	POWER.					c0.34	0.30	
v/c Ratio		1.06	0.52	1.15	0.58					1.12	1.01	
Uniform Delay, d1		34.5	28.4	29.5	11.3					35.0	35.0	
Progression Factor		0.82	1.03	1.35	1.43					1.00	1.00	
Incremental Delay, d2		39.8	2.2	77.1	0.5					82.0	45.6	
Delay (s)		68.0	31.6	117.1	16.6					117.0	80.6	
Level of Service		E	C	F	В					. F	F	
Approach Delay (s)		54.4			50.0			0.0			99.8	
Approach LOS		D			D			Α			F	
Intersection Summary												
HCM Average Control D	elay		61.8	۲	ICM Lev	el of Se	rvice		E			
HCM Volume to Capacit	y ratio		1.13									
Actuated Cycle Length (s)		100.0	S	ium of k	st time	(s)		8.0			
Intersection Capacity Uti	lization	1	52.1%	10	CU Leve	of Sen	vice		Н			
Analysis Period (min)			15									
c Critical Lane Group												

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	۶	→	←	4	•	•	
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	
Lane Group Flow (vph)	371	1634	1397	1175	390	384	
v/c Ratio	1.07	0.73	0.87	1.10	1.06	1.03	
Control Delay	74.2	12.9	31.3	71.2	102.6	90.0	
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	
Total Delay	74.2	13.7	31.3	71.2	102.6	90.0	
Queue Length 50th (ft)	~227	257	407	~608	~289	~254	
Queue Length 95th (ft)	m208	m241	512	#863	#482	#448	
Internal Link Dist (ft)		410	10.01			232	
Turn Bay Length (ft)	170						
Base Capacity (vph)	348	2232	1601	1072	367	372	
Starvation Cap Reducting	0	299	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.07	0.85	0.87	1.10	1.06	1.03	

Intersection Summary

The Transpo Group

3: S 188th St & I-5 NB

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	ሻ	^			^	7			ሻ	M	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	,		4.0	4.0			4.0	4.0	
Lane Util. Factor	1,00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.89	
Fit Protected	0.95	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (prot)	1641	3282			3406	1524			1531	1414	
Flt Permitted	0.08	1.00			1.00	1,00			0.95	0.99	
Satd. Flow (perm)	135	3282			3406	1524			1531	1414	
Volume (vph)	360	1585	0	0	1355	1140	0	0	470	5	275
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	371	1634	0	0	1397	1175	0	0	485	5	284
RTOR Reduction (vph)	0	0	0	0	0	356	0	0	0	33	0
Lane Group Flow (vph)	371	1634	0	0	1397	819	0	0	390	351	0
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt	250000000000000000000000000000000000000				Perm			Split		
Protected Phases	5	2			6	0.0000000000000000000000000000000000000			4	4	7 - N. S.
Permitted Phases	2	gogi AVĀA			4634	6					
Actuated Green, G (s)	67.0	67.0			46.0	46.0	A Section of the Control		23.0	23.0	
Effective Green, g (s)	68.0	68.0			47.0	47.0			24.0	24.0	
Actuated g/C Ratio	0.68	0.68			0.47	0.47			0.24	0.24	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	9:12:153-12:00-10-40:00
Lane Grp Cap (vph)	348	2232		9495555	1601	716			367	339	
v/s Ratio Prot	c0.18	0.50			0.41	A1149 A164 A164 A164 A164 A164 A164 A164 A164			c0.25	0.25	
v/s Ratio Perm	0.54				a feather	c0.54					
v/c Ratio	1.07	0.73			0.87	1.14			1.06	1.04	
Uniform Delay, d1	32.0	10.2			23.8	26.5			38.0	38.0	
Progression Factor	1.41	1.20			1.00	1.00			1.00	1.00	
Incremental Delay, d2	36.0	0.2			6.9	81.0			64.5	58.6	
Delay (s)	81.1	12.5		1 - 2000 m	30.7	107.5			102.5	96.6	
Level of Service	F	' В			Č	F			/ Z E	F.	
Approach Delay (s)	or Condition)	25.2			65.8	s versions filter	0.0		gar jir egen 💖 (e	99.6	
Approach LOS		20.2 C			00.0 E		Ι.5			50.0 F	
• •							a a real de Maria.				
Intersection Summary HCM Average Control D)elav		55.4	L	ICM Le	vel of Se	nvice		E		
HCM Volume to Capaci			1.11	autoista t	OIVI LE	101 UI OE	il AICC		ariikt i j ti		
Actuated Cycle Length			100.0	·	um of t	ost time	(e)		12.0		
Intersection Capacity U		14 3 7 2 5 4 6 4	52.1%			el of Ser			12.U H		
Analysis David (min)	.mzauOII		JZ.170	11	OO LOV	., UI JEI	VICE		1.1 1		

HCM Signalized Intersection Capacity Analysis 2011 Baseline (with Tukwila south) PM

Intersection Summary		
HCM Average Control Delay	55.4	HCM Level of Service E
HCM Volume to Capacity ratio	1.11	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 12.0
Intersection Capacity Utilization	152.1%	ICU Level of Service H
Analysis Period (min)	15	
c Critical Lane Group		

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\LOS wpipeline\PM-Baseline 2011.sy7

Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	†	7	4	1	√	t				
Movement	NBT	NBR	SBL	SBT	SWL	SWR				
Lane Configurations	† ‡		ሻ	^	7	7				
Sign Control	Free			Free	Stop					
Grade	0%			0%	0%					
Volume (veh/h)	2480	9	10	1850	7					
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				
Hourly flow rate (vph)	2667	10	. 11	1989	8	19				
Pedestrians										
Lane Width (ft)	MONEY.									
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type					None	in Jackson				
Median storage veh)										
Upstream signal (ft)				66						
pX, platoon unblocked					0.68					
vC, conflicting volume			2676		3688	1338				
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol			2676		4489	1338				
tC, single (s)			4.3		7.3	7.4				
tC, 2 stage (s)										
tF (s)			2,3		3.7			William		
p0 queue free %			92		0	84				
cM capacity (veh/h)			134		0	118				
Direction, Lane#	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2			
Volume Total	1778	899	11	995	995	8	19			
Volume Left	0	0	11	0	0	8	0			
Volume Right	0	10	0	0	0	0	19			
cSH	1700	1700	134	1700	1700	0	118			
Volume to Capacity	1.05	0.53	0.08	0.59	0.59	23.35	0.16			
Queue Length 95th (ft)	0	0	6	0	0	Err	14			
Control Delay (s)	0.0	0.0	34.3	0.0	0.0	Err	41.5			
Lane LOS			D			F	E			
Approach Delay (s)	0.0		0.2			2829.6				
Approach LOS						F				
Intersection Summary										
Average Delay			16.3					 		
Intersection Capacity Ut	ilization		78.8%	10	CU Lev	el of Ser	vice	D		
Analysis Period (min)			15							

	>	1	•	†	1	↓	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	10	458	1568	1358	658	1152	
v/c Ratio	0.07	1.18	1.15	0.91	1.20	0.54	
Control Delay	39.8	134.8	95.5	33.1	137.2	9.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.8	134.8	95.5	33.1	137.2	9.2	
Queue Length 50th (ft)	5	~269	~474	308	~202	130	
Queue Length 95th (ft)	21	#523	#736	#564	#360	261	
Internal Link Dist (ft)	36			266		3373	
Turn Bay Length (ft)							
Base Capacity (vph)	144	389	1369	1486	550	2146	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	1.18	1.15	0.91	1.20	0.54	

Intersection Summary

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

	۶	→	•	•	←	*	4	†	~	>	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4		7		77	ሻ	↑ ↑		14.54	↑ ⊅	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88		0.95		0.97	0.95	
Frt		1.00		1.00		0.85		0.99		1.00	1.00	
Fit Protected		0.98		0.95	GREEN	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1854		1752		2760		3421		3183	3280	
Flt Permitted		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1854		1752		2760		3421		3183	3280	
Volume (vph)	5	5	0	435	0	1490	0	1165	125	625	1090	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	5	0	458	0	1568	0	1226	132	658	1147	5
RTOR Reduction (vph)	0	0	0	0	0	160	0	9	0	0	0	0
Lane Group Flow (vph)	0	10	0	458	0	1408	0	1349	0	658	1152	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type	Perm			Prot	(custom	Prot			Prot	3844	7.2%T
Protected Phases	-20/4-2/22/21-0-1	3		4		1	5	2		1	6	
Permitted Phases	3					4						
Actuated Green, G (s)	(m) 100m) 604 mm	0.9		17.0		29.0		33.1		12.0	51.1	
Effective Green, g (s)		2.9		18.0		32.0		35.1		14.0	53.1	
Actuated g/C Ratio		0.03		0.21		0.37		0.41		0.16	0.62	
Clearance Time (s)	建环绕程序	6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		63	3,848,000	367	4576	1155		1396	989855	518	2025	
v/s Ratio Prot				0.26		c0.20		c0.39		0.21	0.35	
v/s Ratio Perm		0.01				0.31						
v/c Ratio		0.16		1.25		1.22		0.97		1.27	0.57	
Uniform Delay, d1		40.4	Slotti	34.0		27.0		24.9		36.0	9.7	
Progression Factor		1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.2		132.4		106.5		17.3		136.2	1.2	
Delay (s)		41.5		166.4		133.5		42.2		172.2	10.9	
Level of Service		D		F		F		D		F	В	
Approach Delay (s)		41.5			141.0			42.2			69.5	
Approach LOS		D			F			D			E	
Intersection Summary												
HCM Average Control D	elay		90.1	ŀ	ICM Le	vel of Se	ervice	14486	F		1	.,
HCM Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			86.0		Sum of I	ost time	(s)		12.0			
Intersection Capacity Utilization		1	102.5% ICU Level of Service						G			
Analysis Period (min) c Critical Lane Group	e in Like Service		15	,					- 7.			

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\LOS wpipeline\PM-Baseline 2011.sy7

	#	→	*	•	+-	€	4	7	Ç.	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	107	1327	26	61	797	388	26	158	526	444	
v/c Ratio	0.41	0.83	0.04	0.54	0.65	0.55	0.22	0.66	0.83	0.81	
Control Delay	45.5	31.0	8.8	64.5	19.6	11.5	49.2	51.9	51.9	44.9	
Queue Delay	0.0	0.1	0.0	0.0	3.1	2.2	0.0	333.4	7.5	0.0	
Total Delay	45.5	31.0	8.8	64.5	22.7	13.8	49.2	385.3	59.4	44.9	
Queue Length 50th (ft)	64	406	2	31	204	131	16	90	167	260	
Queue Length 95th (ft)	119	#550	18	m#62	m260	m205	43	159	#244	#439	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	258	1592	723	113	1220	700	116	266	643	546	
Starvation Cap Reductn	0	0	0	0	311	188	0	0	0	0	
Spillback Cap Reductn	0	9	0	0	0	0	0	174	85	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.41	0.84	0.04	0.54	88.0	0.76	0.22	1.72	0.94	0.81	
Intersection Summany								60000000000000000000000000000000000000			

^{# 95}th percentile volume exceeds capacity, queue may be longer.

M:\02\02150 Bow Lake TS\\$2006 TIA\LOS\LOS wpipeline\PM-Future-wp 2011.sy7

	*	→	•	•	←	*	4	ř	~	Ĺ	4	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	ተተ	7	ሻ	ተተ	7	*	ž.		ሻሻ	ħγř	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1,00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1713	
Volume (vph)	105	1300	25	- 60	781	380	25	135	20	515	330	105
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	107	1327	26	61	797	388	26	138	20	526	337	107
RTOR Reduction (vph)	0	0	11	0	0	159	0	5	0	0	11	0
Lane Group Flow (vph)	107	1327	15	61	797	229	26	153	0	526	433	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot	(Design	Perm	Prot	Barrey.	Perm	Prot		7.37	Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	13.2	40.9	40.9	4.7	32.5	32.5	3.0	15.4		17.0	29.6	
Effective Green, g (s)	14.9	42.7	42.7	5.4	33.2	33.2	4.7	17.3		18.6	31.2	
Actuated g/C Ratio	0.15	0.43	0.43	0.05	0.33	0.33	0.05	0.17		0.19	0.31	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4,7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	1482	663	93	1141	511	82	269		632	534	
v/s Ratio Prot	0.06	c0.38		c0.04	0.23		0.01	0.10		c0.15	c0.25	
v/s Ratio Perm			0.01			0.15						
v/c Ratio	0.41	0.90	0.02	0.66	0.70	0.45	0.32	0.57		0.83	0.81	
Uniform Delay, d1	38.6	26.6	16.6	46.4	29.0	26.2	46.1	37.9		39.2	31.7	
Progression Factor	1.00	1.00	1.00	1.08	0.63	0.92	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4,8	8.8	0.1	12.7	2.9	2.3	2.2	2.8		9.2	9.1	
Delay (s)	43.4	35.3	16.6	63.0	21.3	26.4	48.3	40.7		48.4	40.8	
Level of Service	D	D	В	E	С	С	D	D		D	D	
Approach Delay (s)		35.6			24.9		41.8				44.9	
Approach LOS	11 (15)	D			C	W. Masi	D				D	
Intersection Summary												
HCM Average Control D	elay		34.8	A SOL	ICM Le	vel of Se	rvice		С			
HCM Volume to Capacit	y ratio		0.83									
Actuated Cycle Length (100.0	S	um of l	ost time	(s)		12.0			
Intersection Capacity Uti	lization		82.3%	10	CU Leve	el of Ser	vice		Ε			
Analysis Period (min)			15									
c Critical Lane Group												

The Transpo Group

Queues

2011 With-Project (with Tukwila south) PM

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	→	7	<	←	/	
Lane Group	EBT	EBR	WBL	WBT	SBL	. SBT
Lane Group Flow (vph)	1124	670	614	1233	486	3 438
v/c Ratio	1.06	0.75	1,16	0.58	1.12	
Control Delay	69.0	7.3	113.3	17.0	116.2	
Queue Delay	158.3	44.5	0.0	2.0	0.0	
Total Delay	227.3	51.8	113.3	18.9	116.2	
Queue Length 50th (ft)	~406	61	~435	287	~378	(ii ~297 (5))章 字中真多合(5) (5) (5) (5) (5) (5) (5)
Queue Length 95th (ft)	#540	m90	m#515	m336	#586	
Internal Link Dist (ft)	126			410		462
Turn Bay Length (ft)			152			
Base Capacity (vph)	1056	895	531	2112	432	Mar ,434 [2], 1444-147 (1444-147), 1771-1771
Starvation Cap Reductn	268	276	0	512	0	0
Spillback Cap Reductn	0	. 0	0	686	0	
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.43	1.08	1.16	0.86	1.13	Prof.01.01

Intersection Summary

The Transpo Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተ	7	ኻ	ተ ተ		parameter (Janos)		*************	*	4	pency serior property
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		CAIMA COM G	100000000000000000		4.0	4.0	0.000.000.000.000
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.99	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	
Satd. Flow (prot)		3406	1524	1703	3406					1441	1437	
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.95	
Satd. Flow (perm)		3406	1524	205	3406	*1101110111111111111111111111111111111				1441	1437	
Volume (vph)	0	1090	650	596	1196	0	0	0	0	876	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1124	670	614	1233	0	0	0	0	903	0	21
RTOR Reduction (vph)	0	0	423	0	0	0	0	0	0		2	0
Lane Group Flow (vph)	0	1124	247	614	1233	0	Ō	0	0	486	436	Ō
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type			Perm	pm+pt			Victoria de la composición dela composición de la composición de la composición de la composición dela composición de la composición dela composición dela composición de la c		DREY/DEZ/S	Perm	Herena e	Market Service
Protected Phases		2	. 2 B 2 - Tr. D. S. P. D. S.	1	6					CHEST AND LOS	8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		30.0	30.0	61.0	61.0					29.0	29.0	
Effective Green, g (s)		31.0	31.0	62.0	62.0					30.0	30.0	
Actuated g/C Ratio		0.31	0.31	0.62	0.62					0.30	0.30	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	3000 P
Vehicle Extension (s)		4.0	4.0	3.0	4.0		, 5 Tr ****Riss.			3.0	3.0	
Lane Grp Cap (vph)	1477	1056	472	532	2112		(1) (1) (1) (1)	SHEET WAS	20,045 (g)	432	431	
v/s Ratio Prot		0.33		c0.31	0.36					: ::::::::::::::::::::::::::::::::::::	A. 1. C. 1995 (1994)	
v/s Ratio Perm			0.16	c0.40)					c0.34	0.30	
v/c Ratio		1.06	0.52	1.15	0.58					1.12	1.01	
Uniform Delay, d1		34.5	28.4	29.5	11.3					35.0	35.0	
Progression Factor		0.82	1.03	1.35	1.43					1.00	1.00	
Incremental Delay, d2		39.8	2.2	77.9	0.4					82.0	46.2	
Delay (s)		68.0	31.6	117.8	16.6					117.0	81.2	
Level of Service		Е	С	F	В					F	∴ F	
Approach Delay (s)		54.4		1 2 2 3 3 5 5 5 5 5	50.3			0.0		7 Octobres	100.0	
Approach LOS		i D			D			Ã.			.00.5 F	
Intersection Summary												
HCM Average Control De	elay		62.0	Н	CM Lev	el of Se	rvice		Ε			
HCM Volume to Capacity	ratio		1.13				30 Table 1					
Actuated Cycle Length (s	i)		100.0	s	um of lo	st time	(s)		8.0			
Intersection Capacity Util		1	52.2%			l of Serv			Н			
Analysis Period (min)			15				45 G					
c Critical Lane Group												

Intersection Summary		
HCM Average Control Delay	62.0	HCM Level of Service E
HCM Volume to Capacity ratio	1.13	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	152.2%	ICU Level of Service H
Analysis Period (min)	15	e de sa la
c Critical Lanc Group		

Critical Lane Group

The Transpo Group

Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues 2011 With-Project (with Tukwila south) PM

	≯	-	←	•	•	<i>•</i>
Lane Group	EBL	EBT	WBT	WBR	NEL2	2 NEL
Lane Group Flow (vph)	371	1635	1399	1176	390	384
v/c Ratio	1.07	0.73	0.87	1.10	1.06	6 1,03 % 4
Control Delay	74.2	12.9	31.4	71.6	102.6	
Queue Delay	0.0	8.0	0.0	0.0	0.0	03:73 0.0 3 ii bad ii bagiya ii ekatoka na ekate eta ba
Total Delay	74.2	13.7	31.4	71.6	102.6	
Queue Length 50th (ft)	~226	257	408	~610	~289	9 ~254
Queue Length 95th (ft)	m208	m242	513	#864	#482	
Internal Link Dist (ft)		410	1			Tota 232 State of the state of the control of the
Turn Bay Length (ft)	170					
Base Capacity (vph)	348	2232	1601	1072	367	7/96/372/96: 7/1: 100/06/96/96/96/96 100/16: 1
Starvation Cap Reductn	0	299	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.07	0.85	0.87	1.10	1.06	3 (1,03 (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Intersection Summary						

[~] Volume exceeds capacity, queue is theoretically infinite.

	•	→	7		4—	•	/	لر	*	•	<i>/</i> *
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations	7	ተተ			^	7			7	Y	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	1.00			0.95	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.89	
Flt Protected	0.95	1.00			1.00	1,00			0.95	0.99	
Satd. Flow (prot)	1641	3282			3406	1524			1531	1414	
Fit Permitted	0.08	1.00			1.00	1.00			0.95	0.99	
Satd. Flow (perm)	135	3282			3406	1524			1531	1414	
Volume (vph)	360	1586	0	0	1357	1141	0	0	470	5	275
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	371	1635	0	0	1399	1176	0	0	485	5	284
RTOR Reduction (vph)	0	0	Ō	0	0	356	0	0	0	33	0
Lane Group Flow (vph)		1635	0	0	1399	820	Ō	0	390	351	0
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%
Turn Type	pm+pt					Perm			Split		
Protected Phases	5	2			6	errenarianan		utrajavori, i	4	4	
Permitted Phases	2	de dijekt			01/04/98 P	6			transfil.		
Actuated Green, G (s)	67.0	67.0			46.0	46.0			23.0	23.0	
Effective Green, g (s)	68.0	68.0			47.0	47.0			24.0	24.0	
Actuated g/C Ratio	0.68	0.68			0.47	0.47			0.24	0.24	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	
Lane Grp Cap (vph)	348	2232	1.00	514780447	1601	716			367	339	
v/s Ratio Prot	c0.18	0.50			0.41				c0.25	0.25	
v/s Ratio Perm	0.54				63513746	c0.54			00.20	- 1988 STAR	
v/c Ratio	1.07	0.73			0.87	1.15			1.06	1.04	
Uniform Delay, d1	32.0	10.2		12/3/3/3/3/4	23.8	26.5			38.0	38.0	
Progression Factor	1.41	1.20			1.00	1.00		e quitage en a	1.00	1.00	
Incremental Delay, d2	36.0	0.2			6.9	81.5			64.5	58.6	
Delay (s)	81.0	12.5			30.8	108.0			102.5	96.6	
Level of Service	F				°C				102.5 F	30.0	
Approach Delay (s)	100 100 200	25.1			66.0	un a meneral engla	0.0		Arrive the Bellin	99.6	Taraf (Spain Gallet) Taraf (Carlotte Age
Approach LOS		- c			E		A			. F	
Intersection Summary											
HCM Average Control E HCM Volume to Capaci	ty ratio		55.6 1.11	H	ICM Le	vel of Se	ervice		E		
Actuated Cycle Length (Intersection Capacity Ut Analysis Period (min) c Critical Lane Group	(s)	1	100.0 52.2% 15			ost time el of Ser			12.0 H		

The Transpo Group

The Transpo Group

<sup>Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.</sup>

	†	7	(Je	↓	4	t	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	↑ ↑	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	75	^	Ŋ	7	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Volume (veh/h)	2480	11	11		8	21	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph) Pedestrians	2667	12	12	1989	9	23	
Lane Width (ft) Walking Speed (ft/s)							
Percent Blockage Right turn flare (veh)							
Median type Median storage veh)					None		
Upstream signal (ft)	Pardicial of		Marin.	66			Japanesia Sukhara da karanca
pX, platoon unblocked					0.68		
vC, conflicting volume vC1, stage 1 conf vol			2678		3691	1339	
vC2, stage 2 conf vol	2404020A						
vCu, unblocked vol			2678		4496	1339	
tC, single (s)			4.3		7.3	7.4	
tC, 2 stage (s)						nin statistica (2002)	
tF(s)			2.3		3.7	3.5	
p0 queue free %			91		0	81	
cM capacity (veh/h)			133		0	117	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1 SW 2	
Volume Total	1778	901	12	995	995	9 23	
Volume Left	0	0	12	0	0	9 0	
Volume Right	0	12	0	0	0	0 23	
cSH	1700	1700	133	1700	1700	0 117	
Volume to Capacity	1.05	0.53	0.09	0.59	0.59	27.25 0.19	
Queue Length 95th (ft)	0	0	7	0	0	Err 17	
Control Delay (s)	0.0	0.0	34.6	0.0	0.0	Err 42.8	
Lane LOS			Ð			F E	
Approach Delay (s) Approach LOS	0.0		0.2			789.3 F	
Intersection Summary						10.00	
Average Delay			18.6				
Intersection Capacity Ut	ilization		78.9%	10	CU Lev	I of Service	D
Analysis Period (min)			15				

		1	*	†	-	↓	
Lane Group	EBT	WBL	WBR	NBT	SBL	SBT	
Lane Group Flow (vph)	10	458	1569	1359	658	1153	
v/c Ratio	0.07	1.18	1.15	0.91	1.20	0.54	
Control Delay	39.8	134.8	95.8	33.2	137.2	9.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0,0	
Total Delay	39.8	134.8	95.8	33.2	137.2	9.2	
Queue Length 50th (ft)	- 5	~269	~475	310	~202	130	
Queue Length 95th (ft)	21	#523	#738	#566	#360	261	
Internal Link Dist (ft)	36			266		3373	
Turn Bay Length (ft)							
Base Capacity (vph)	144	389	1369	1486	550	2146	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.07	1.18	1.15	0.91	1.20	0.54	

Intersection Summary

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Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2011 With-Project (with Tukwila south) PM

	٦	→	*	•	•	•	4	†	1	1	↓	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4		7		77	ሻ	† f>		إبرابر	† ‡	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00		0.88		0.95		0.97	0.95	
Frt		1.00		1.00		0.85		0.99		1.00	1.00	
Fit Protected		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1854		1752		2760		3421		3183	3280	
Fit Permitted		0.98		0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)		1854		1752		2760		3421		3183	3280	
Volume (vph)	5	5	0	435	0	1491	0	1166	125	625	1091	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	5	0	458	0	1569	0	1227	132	658	1148	5
RTOR Reduction (vph)	0	Ó	0	0	0	160	0	9	0	0	0	0
Lane Group Flow (vph)	0	10	0	458	0	1409	. 0	1350	0	658	1153	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type	Perm		H484/-	Prot		ustom	Prot	7 (O.F).	749447	Prot	50-44%	1.75
Protected Phases		3		4		1	5	2		1	6	
Permitted Phases	3				CETALLE.	4						
Actuated Green, G (s)		0.9		17.0		29.0		33.1		12.0	51.1	
Effective Green, g (s)		2.9		18.0		32.0		35.1		14.0	53.1	
Actuated g/C Ratio		0.03		0.21		0.37		0.41		0.16	0.62	
Clearance Time (s)		6.0		5.0		6.0		6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)		63		367	97940).A3	1155	2407 (M)	1396	W-5756	518	2025	100000
v/s Ratio Prot				0.26	e a ce filiped i	c0.20		c0.39		0.21	0.35	
v/s Ratio Perm	00000000	0.01				0.31		00.00		e e e e e e e e e e e e e e e e e e e		
v/c Ratio		0.16		1.25		1.22		0.97		1.27	0.57	
Uniform Delay, d1		40.4		34.0		27.0		24.9		36.0	9.7	
Progression Factor		1.00		1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2		1.2		132.4		106.9		17.4		136.2	1.2	
Delay (s)		41.5		166.4		133.9		42.3		172.2	10.9	
Level of Service		41.5 D		100.4 F		133.9 F		42.3 D		172.2 F	10.9	
		41.5		C 21 F	141.3	e e 'p.₽°°		42.3		1"	69.5	
Approach Delay (s)		41.5 D			141.5			42.3 D			09.5 E	
Approach LOS	REPORTS	U.			S-17 -			U				
Intersection Summary												
HCM Average Control D			90.3	/	ICM Le	vel of Se	ervice		F			
HCM Volume to Capacit			1.06									
Actuated Cycle Length (86.0		Sum of I				12.0			
Intersection Capacity Uti	lization	1	02.5%	I	CU Leve	el of Ser	vice		G			
Analysis Period (min)			15									
c Critical Lane Group												

	_*		•	•	←	€	4	7	4	₹	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	128	1658	31	71	1092	735	31	194	750	536	
v/c Ratio	0.90	1.00	0.04	0.88	0.72	0.87	0.35	0.91	1.02	0.93	
Control Delay	112.0	55.6	11.1	117.2	19.8	14.2	70.6	96.3	87.4	64.9	
Queue Delay	0.0	28.0	0.0	0.0	49.8	44.2	0.0	0.0	173.9	0,0	
Total Delay	112.0	83.7	11.1	117.2	69.6	58.4	70.6	96.3	261.3	64.9	
Queue Length 50th (ft)	109	717	7	59	194	114	26	160	~343	~473	
Queue Length 95th (ft)	#232	#901	25	m65	m263	m153	60	#308	#468	#697	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	142	1661	751	81	1526	846	89	213	738	579	
Starvation Cap Reductn	0	0	0	0	534	171	0	0	0	0	
Spillback Cap Reductn	0	124	0	0	0	0	0	0.0	213	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.90	1.08	0.04	0.88	1.10	1.09	0.35	0.91	1.43	0.93	

	#	→	•	✓	←	€	1	7	/	4	4	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	ተተ	7	7	^	7	ሻ	ď		ሻሻ	¥#	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1,00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Fit Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Volume (vph)	125	1625	30	70	1070	720	30	165	25	735	395	130
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	128	1658	31	71	1092	735	31	168	26	750	403	133
RTOR Reduction (vph)	0	0	9	0	0	168	0	4	0	0	9	0
Lane Group Flow (vph)	128	1658	22	71	1092	567	31	190	0	750	527	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	1	6	- 12 M SOUTH PHILIPS	5	2		7	4		3	8	
Permitted Phases			6			2						
Actuated Green, G (s)	8.9	58.1	58.1	5.4	54.7	54.7	3.0	15.6		28.9	41.7	
Effective Green, g (s)	10.6	59.9	59.9	6.1	55.4	55.4	4.7	17.5		30.5	43.3	
Actuated g/C Ratio	0.08	0.46	0.46	0.05	0.43	0.43	0.04	0.13		0.23	0.33	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	142	1599	716	81	1465	655	63	209		798	570	
v/s Ratio Prot	0.07	c0.48	~7 × 17 5 × 71 × 74 0 × 75 × 15 × 15 × 15 × 15 × 15 × 15 × 15	0.04	0.32	N.E. T. A. S. C. S	0.02	c0.12		0.22	c0.31	
v/s Ratio Perm			0.01			c0.37						
v/c Ratio	0.90	1.04	0.03	0.88	0.75	0.87	0.49	0.91		0.94	0.93	
Uniform Delay, d1	59.2	35.0	19.2	61.6	31.4	33.9	61.5	55.5		48.8	41.8	
Progression Factor	1.00	1.00	1.00	1.35	0.63	0.42	1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.9	32.7	0.1	31.9	1.4	6.4	5.9	37.4		18.6	21.0	
Delay (s)	112.1	67.7	19.3	115.3	21.0	20.7	67.4	92.8		67.4	62.8	
Level of Service	F	E	В	F	С	С	E	F		E	E	
Approach Delay (s)		70.0			24.4		89.3				65.5	
Approach LOS	45000000	E			C		F				E	
Intersection Summary												
HCM Average Control D			53.2	H	ICM Le	vel of Se	ervice		D			
HCM Volume to Capaci			0.98									
Actuated Cycle Length			130.0			ost time			12.0			
Intersection Capacity Ut	tilization		96.4%		CU Lev	el of Ser	vice		F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection Summary			
HCM Average Control Delay	53.2	HCM Level of Service D	
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 12.0	
Intersection Capacity Utilization	96.4%	ICU Level of Service F	
Analysis Period (min)	15		
c Critical Lane Group			

The Transpo Group

Queues

2030 Baseline (with Tukwila south) Weekday-PM

[~] Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

2030 Baseline (with Tukwila south) Weekday-PM

	→	`*	•	←	/	ļ	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	1536	809	1289	1897	1268	21	
v/c Ratio	1.30	0.66	1.48	0.92	1.30	0.05	
Control Delay	164.8	9.7	252.9	13.4	180.3	16.2	
Queue Delay	217.9	52.0	0.0	87.6	4.2	0.0	
Total Delay	382.7	61.7	252.9	101.0	184.5	16.2	
Queue Length 50th (ft)	~866	107	~718	316	~705	3	
Queue Length 95th (ft)	m#863	m106	m#448	m212	#840	23	
Internal Link Dist (ft)	126			410		462	
Turn Bay Length (ft)			152				
Base Capacity (vph)	1179	1233	870	2070	973	459	
Starvation Cap Reductr	320	499	0	484	0	0	
Spillback Cap Reductn	0	0	0	302	7	151	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1,79	1.10	1.48	1.20	1.31	0.07	

Intersection Summary

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተ	77	ሻሻ	^					1,1	₽	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	0.88	0.97	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3406	2682	3303	3406					2943	1357	
FIt Permitted		1.00	1.00	0.08	1.00					0.95	1.00	
Satd. Flow (perm)		3406	2682	284	3406					2943	1357	
Volume (vph)	0	1490	785	1250	1840	- 0	0	0	0	1230	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1536	809	1289	1897	0	0	0	0	1268	0	21
RTOR Reduction (vph)	0	0	305	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	1536	504	1289	1897	0	0	0	0	1268	11	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6						8	
Permitted Phases			2	6						8		
Actuated Green, G (s)		44.0	44.0	78.0	78.0					42.0	42.0	
Effective Green, g (s)		45.0	45.0	79.0	79.0					43.0	43.0	
Actuated g/C Ratio		0.35	0.35	0.61	0.61					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)		1179	928	869	2070					973	449	
v/s Ratio Prot		0.45		c0.34	0.56						0.01	
v/s Ratio Perm			0.19	c0.56						c0.43		
v/c Ratio		1.30	0.54	1.48	0.92					1.30	0.02	
Uniform Delay, d1		42.5	34.2	52.2	22.6					43.5	29.3	
Progression Factor		0.69	0.66	1.27	0.53					1.00	1.00	
Incremental Delay, d2		136.8	0.2	218.1	0.8					144.0	0.0	
Delay (s)		166.1	22.7	284.3	12.7					187.5	29.4	
Level of Service		F	С	F	В					F	С	
Approach Delay (s)		116.6			122.6			0.0			184.9	
Approach LOS		F			F			Α			F	
Intersection Summary												
HCM Average Control D	elay		132.3	H	ICM Lev	el of Se	rvice		F			
HCM Volume to Capacit			1.40		Control of the Contro	e e e e e e e e e e e e e e e e e e e						
Actuated Cycle Length (s	s)		130.0	S	Sum of lo	st time	(s)		8.0			
Intersection Capacity Uti		1	65.1%	þ	CU Leve	l of Sen	vice		Н			
Analysis Period (min)			15									
0												

Intersection Summary		
HCM Average Control Delay	132.3	HCM Level of Service F
HCM Volume to Capacity ratio	1.40	
Actuated Cycle Length (s)	130.0	Sum of lost time (s) 8.0
Intersection Capacity Utilization	165.1%	ICU Level of Service H
Analysis Period (min)	15	
c Critical Lane Group		

The Transpo Group

[~] Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

2030 Baseline (with Tukwila south) Weekday-PM

	۶	-	←	*	•	<i>•</i>	/	
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	NER	
Lane Group Flow (vph)	448	2325	2644	1830	588	293	289	
v/c Ratio	1.41	0.94	1.38	0.96	1.02	1.05	1.09	
Control Delay 2	18.1	14.6	202.2	26.9	94.3	114.6	126.7	
Queue Delay	0.0	45.0	18.0	0.0	0.0	0.0	0.0	
Total Delay 2	18.1	59.5	220.2	26.9	94.3	114.6	126.7	
Queue Length 50th (ft)	456	350	~1555	514	~270	~256	~275	
Queue Length 95th (ft) m#	271	m259	#1680	#817	#387	#441	#468	
Internal Link Dist (ft)		410	1			232		
Turn Bay Length (ft)	170							
Base Capacity (vph)	318	2474	1913	1906	577	280	266	
Starvation Cap Reductn	0	362	0	0	0	0	0	
Spillback Cap Reductn	0	0	54	0.	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.41	1.10	1.42	0.96	1.02	1.05	1.09	

[~] Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

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Movement	EBL.	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER	
Lane Configurations	J.	^			ተተ	77			44	¥γf	7	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95			0.95	0.88			0.97	1.00	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.85	0.85	
Flt Protected	0.95	1.00			1.00	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	1641	3282			3406	2682			3127	1445	1370	
Flt Permitted	0.05	1.00			1.00	1.00			0.95	1,00	1.00	
Satd. Flow (perm)	90	3282			3406	2682			3127	1445	1370	
Volume (vph)	435	2255	0	0	2565	1775	0	0	570	5	560	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	448	2325	0	0	2644	1830	0	0	588	5	577	
RTOR Reduction (vph)	0	0	0	0	0	400	0	0	0	13	13	
Lane Group Flow (vph)	448	2325	0	0	2644	1430	0	0	588	280	276	
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%	
Turn Type	pm+pt			KO GENE		Perm			Split		Perm	
Protected Phases	5	2			6				4	4		
Permitted Phases	2					6					4	
Actuated Green, G (s)	97.0	97.0			72.0	72.0			23.0	23.0	23.0	
Effective Green, g (s)	98.0	98.0			73.0	73.0			24.0	24.0	24.0	
Actuated g/C Ratio	0.75	0.75			0.56	0.56			0.18	0.18	0.18	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	3.5	
Lane Grp Cap (vph)	318	2474			1913	1506			577	267	253	
v/s Ratio Prot	c0.23	0.71			0.78	************			0.19	0.19		
v/s Ratio Perm	c0.84					0.53					c0.20	
v/c Ratio	1.41	0.94			1.38	0.95			1.02	1.05	1.09	
Uniform Delay, d1	51.1	13.5			28.5	26.8			53.0	53.0	53.0	
Progression Factor	0.86	0.95			1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2	185.7	1.0			175.3	13.9			42.4	68.4	82.9	
Delay (s)	229.5	13.8			203.8	40.7			95.4	121.4	135.9	Mar Popular
Level of Service	F	В			F	D			F	F	F	
Approach Delay (s)		48.6			137.1		0.0			111.9		
Approach LOS		D			F		Α			F		
Intersection Summary												
HCM Average Control D	elay		104.4	F	ICM Le	vel of Se	rvice		F			
HCM Volume to Capaci			1.32			ere servenere					- magazina	
Actuated Cycle Length (130.0	S	um of I	ost time	(s)		8.0			
Intersection Capacity Ut		1	65.1%			el of Ser			Н			
Analysis Period (min)			15	acondina.			#P50698	and All				
a Critical Lane Croun						Contraction and Contraction						

c Critical Lane Group

Page 5

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

M Volume for 95th percentile queue is metered by upstream signal.

	†	7	(de	ļ	4	€ ∕	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	↑ 1>		*	^	۲	7	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Volume (veh/h)	4320	. 9	15	2810	7	18	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph)	4645	10	16	3022	8	19	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type					None		
Median storage veh)							
Upstream signal (ft)				66	11.		
pX, platoon unblocked					0.25		
vC, conflicting volume			4655		6193	2327	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol			1626.5		T		
vCu, unblocked vol			4655		18654	2327	and the second s
C, single (s)			4.3		7.3	7.4	
C, 2 stage (s)			~~~				
F (s)	evene.		2.3		3.7		
00 queue free %			15		0	12	
cM capacity (veh/h)	ila il Albert	21 4 90	19	1.0	0	22	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	CONTROL OF PROPERTY	SW 1	SW 2
/olume Total	3097	1558	16	1511	1511	8	19
/olume Left	0	0	16	0	0	8	
Volume Right SH	4700	10	0	4700	4700	0	
	1700	1700	19	1700	1700	0	22
Volume to Capacity	1.82 0	0.92	0.85 57	0.89	0.89	Err Err	
Queue Length 95th (ft) Control Delay (s)	0.0	-	435.6	0.0	0.0	Err	63 3 399 2
ane LOS	0.0	0.0	F	0.0		F	9 999,2 who have the late of
Approach Delay (s) Approach LOS	0.0		2.3			3087.2 F	
ntersection Summary							
Average Delay			11.7				

	→	•	4	†	1	/	↓
Lane Group	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	900	3284	1479	305	1400	1394
v/c Ratio	0.11	1.65	1.78	1.09	0.54	0.97	0.56
Control Delay	71.6	336.1	375.4	100.5	19.1	55.7	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.6	336.1	375.4	100.5	19.1	55.7	9.1
Queue Length 50th (ft)	9	~598	~2475	~535	74	609	222
Queue Length 95th (ft)	31	#802	#2844	#714	185	#880	375
Internal Link Dist (ft)	36			266			3373
Turn Bay Length (ft)							
Base Capacity (vph)	87	546	1844	1359	569	1444	2473
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	1.65	1.78	1.09	0.54	0.97	0.56

Intersection Summary ~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis 2030 Baseline (with Tukwila south) Weekday-PM

•	-	•	•	←	•	4	†	<i>></i>	>	ļ	1
Movement EBL	EBT	EBR	WBL	WBT		NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4		44		77	Ŧ	ተተተ	7	44	↑ ₽	
Ideal Flow (vphpl) 1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00		0.97		0.88		0.91	1.00	0.97	0.95	
Frt	1.00		1.00		0.85		1.00	0.85	1.00	1.00	
Fit Protected	0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1854		3400		2760		4988	1553	3183	3280	
Fit Permitted	0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1854		3400		2760		4988	1553	3183	3280	
Volume (vph) 5	5	0	855	0	3120	0	1405	290	1330	1320	5
Peak-hour factor, PHF 0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adi. Flow (vph) 5	5	0	900	0	3284	0.	1479	305	1400	1389	5
RTOR Reduction (vph) 0	0	0	0	0	80	0	0	148	0	0	0
Lane Group Flow (vph) 0	10	0	900	0	3204	0	1479	157	1400	1394	0
Heavy Vehicles (%) 0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type Perm	V. 11.	og setti	Prot	17.5	custom	Prot		Perm	Prot		
Protected Phases	3		4		1	5	2	. 11	1	6	
Permitted Phases 3					4	g da E		2		10 m	
Actuated Green, G (s)	1.9		22.0		85.1		37.1	37.1	63.1	106.2	
Effective Green, a (s)	3.9		23.0		88.1		39.1	39.1	65.1	108.2	
Actuated g/C Ratio	0.03		0.16		0.60		0.27	0.27	0.44	0.74	
Clearance Time (s)	6.0		5.0		6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	49	200200	532	30000	1728	5-5-5	1326	413	1409	2413	Wild I
v/s Ratio Prot			0.26		c0.82		c0.30		0.44	0.42	
v/s Ratio Perm	0.01		1 (22)		0.34		e Bally,	0.10			
v/c Ratio	0.20		1.69		1.85		1.12	0.38	0.99	0.58	
Uniform Delay, d1	70.1		62.0		29.5		54.0	44.1	40.8	8.9	
Progression Factor	1.00		1.00	Cherry annual	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1		319.3		386.6	Carlotte	62.8	2.7	22.3	1.0	
Delay (s)	72.1		381.4		416.1		116.8	46.8	63.1	10.0	11.11
Level of Service	E		F		F		F	D	E	A	
Approach Delay (s)	72.1			408.6			104.8		_	36.6	
Approach LOS	E			F			F			D	
Intersection Summary											
HCM Average Control Delay	Alenda	227.9	Ç(A) F	ICM Le	vel of Se	rvice		F		- 21 Jung.	Jan 19
HCM Volume to Capacity ratio		1.59									
Actuated Cycle Length (s)		147.1		um of I	ost time	(s)		12.0			
Intersection Capacity Utilization	1	50.5%			el of Ser			Н			
Analysis Period (min) c Critical Lane Group		15	in tysi			VIII.		ytiski.			

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The Transpo Group

	#	-	•	•	←	€	4	*	Ç	4	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SWL2	SWL	
Lane Group Flow (vph)	128	1659	31	72	1094	736	31	195	750	536	
v/c Ratio	0.90	1.00	0.04	0.89	0.72	0.87	0.35	0.92	1.02	0.93	
Control Delay	112.0	55.8	11.1	118.7	19.9	14.3	70.6	97.2	87.4	64.9	
Queue Delay	0,0	28.2	0.0	0.0	50.6	45.4	0.0	0.0	173.9	0.0	
Total Delay	112.0	83.9	11.1	118.7	70.5	59.7	70.6	97.2	261.3	64.9	
Queue Length 50th (ft)	109	718	7	60	195	115	26	161	~343	~473	
Queue Length 95th (ft)	#232	#903	25	m66	m262	m153	60	#308	#468	#697	
Internal Link Dist (ft)		436			126		426			253	
Turn Bay Length (ft)	319		192	122		90					
Base Capacity (vph)	142	1661	751	81	1526	846	89	213	738	579	
Starvation Cap Reductn	0	0	0	0	534	172	0	0	0	0	
Spillback Cap Reductn	0	124	0	0	0	0	0	0	213	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.90	1.08	0.04	0.89	1.10	1.09	0.35	0.92	1.43	0.93	

Intersection Summary Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.

	_#		*	•	←	۴	•	۲	/	Ļ	€	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	NBR2	SWL2	SWL	SWR
Lane Configurations	ሻ	ተተ	7	7	十十	7	ሻ	ř.		ሻሻ	**	
ldeal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util, Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00		0.97	1,00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Flt Permitted	0.95	1.00	1,00	0.95	1.00	1.00	0.95	1,00		0.95	0.96	
Satd. Flow (perm)	1736	3471	1553	1719	3438	1538	1736	1553		3400	1712	
Volume (vph)	125	1626	30	71	1072	721	30	165	26	735	395	130
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	128	1659	31	72	1094	736	31	168	27	750	403	133
RTOR Reduction (vph)	0	0	9	0	0	168	0	4	0	0	9	0
Lane Group Flow (vph)	128	1659	22	72	1094	568	31	191	0	750	527	0
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	4%	4%	4%	3%	3%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			6			2						# 7 HZ
Actuated Green, G (s)	8.9	58.1	58.1	5.4	54.7	54.7	3.0	15.6		28.9	41.7	
Effective Green, g (s)	10.6	59.9	59.9	6.1	55.4	55.4	4.7	17.5		30.5	43.3	
Actuated g/C Ratio	0.08	0.46	0.46	0.05	0.43	0.43	0.04	0.13		0.23	0.33	
Clearance Time (s)	5.7	5.8	5.8	4.7	4.7	4.7	5.7	5.9		5.6	5.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
ane Grp Cap (vph)	142	1599	716	81	1465	655	63	209		798	570	7457500
/s Ratio Prot	0.07	c0.48		0.04	0.32		0.02	c0.12		0.22	c0.31	
//s Ratio Perm	40.000		0.01			c0.37			STUTE	all professional		
//c Ratio	0.90	1.04	0.03	0.89	0.75	0.87	0.49	0.91		0.94	0.93	
Jniform Delay, d1	59.2	35.0	19.2	61.6	31.4	33.9	61.5	55.5		48.8	41.8	
Progression Factor	1.00	1.00	1.00	1.35	0.63	0.42	1.00	1.00		1.00	1.00	
ncremental Delay, d2	52.9	32.9	0.1	34.1	1.4	6.4	5.9	38.7		18.6	21.0	
Delay (s)	112.1	67.9	19.3	117.2	21.1	20.8	67.4	94.2		67.4	62.8	
evel of Service	F	E	В	F	С	C	Ε	F		. ∕. ε	E	
Approach Delay (s)		70.2	on com-	141 T. J. J. J.	24.6		90.5	0.0000120120120101			65.5	
Approach LOS		E			C		F				E	
ntersection Summary												
HCM Average Control D	elay		53.3	H	ICM Lev	vel of Se	rvice		D	- « « · · · · · ·		
HCM Volume to Capacit	y ratio		0:98									
Actuated Cycle Length (130.0	S	um of le	ost time	(s)		12.0			
ntersection Capacity Ut			96.4%			el of Ser			F			
Analysis Period (min)			15									
Critical Lana Craun												

HCM Average Control Delay	53.3	HCM Level of Service	U	
HCM Volume to Capacity ratio	0:98			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	96.4%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

The Transpo Group

Queues

2030 With-Project (with Tukwila south) Weekday-PM

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

2: S 188th St & I-5 SB

Queues

2030 With-Project (with Tukwila south) Weekday-PM

	-	7	1	←	1	↓	
Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	
Lane Group Flow (vph)	1538	809	1292	1901	1270	21	
v/c Ratio	1.30	0.66	1.49	0.92	1.31	0.05	
Control Delay	165.6	9.7	254.4	13.4	181.1	16.2	
Queue Delay	218.2	52.0	0.0	88.7	6.0	0.0	
Total Delay	383.7	61.7	254.4	102.1	187.2	16.2	
Queue Length 50th (ft)	~868	107	~721	316	~706	3	
Queue Length 95th (ft)	m#865	m106	m#448	m212	#842	23	
Internal Link Dist (ft)	126			410		462	aliyaha jaya dalibada Mada Haray tarayi ke ili ba
Turn Bay Length (ft)			152				
Base Capacity (vph)	1179	1233	870	2070	973	459	
Starvation Cap Reductr	320	499	0	484	0	0	
Spillback Cap Reductn	0	0	0	302	10	151	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	1.79	1.10	1.49	1.20	1.32	0.07	

Intersection Summary

	۶	→	•	•	←	•	4	†	<i>></i>	/	ļ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		ተተ	77	ሻሻ	ተተ					ሻሻ	1>	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lane Util. Factor		0.95	0.88	0.97	0.95					0.97	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1,00	
Satd. Flow (prot)		3406	2682	3303	3406					2943	1357	
Flt Permitted		1.00	1.00	0.08	1.00					0.95	1.00	
Satd. Flow (perm)		3406	2682	284	3406					2943	1357	
Volume (vph)	0	1492	785	1253	1844	0	0	0	0	1232	0	20
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1538	809	1292	1901	0	0	0	0	1270	0	21
RTOR Reduction (vph)	0	0	305	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	1538	504	1292	1901	0	0	0	0	1270	11	0
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	0%	0%	0%	19%	19%	19%
Turn Type			Perm	pm+pt						Perm		
Protected Phases		2		1	6						8	
Permitted Phases		印刷鞘	2	6						8		
Actuated Green, G (s)		44.0	44.0	78.0	78.0					42.0	42.0	
Effective Green, g (s)		45.0	45.0	79.0	79.0					43.0	43.0	
Actuated g/C Ratio		0.35	0.35	0.61	0.61					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Grp Cap (vph)	PARKS.	1179	928	869	2070					973	449	
v/s Ratio Prot		0.45		c0.34	0.56						0.01	
v/s Ratio Perm			0.19	c0.56						c0.43		
v/c Ratio		1.30	0.54	1.49	0.92					1.31	0.02	
Uniform Delay, d1		42.5	34.2	52.2	22.6				al by the	43.5	29.3	
Progression Factor		0.69	0.66	1.27	0.53					1.00	1.00	
Incremental Delay, d2		137.6	0.2	219.6	0.9					144.9	0.0	
Delay (s)		166.9	22.6	285.9	12.8					188.4	29.4	
Level of Service		F	С	F	В					F	С	
Approach Delay (s)		117.2			123.3			0.0			185.8	
Approach LOS		F			F			Α			E	
Intersection Summary												
HCM Average Control D			133.0	H	ICM Lev	el of Se	rvice		F.			
HCM Volume to Capacit			1.41									
Actuated Cycle Length (130.0			ost time			8.0			
Intersection Capacity Uti	lization	1	65.5%	, K	CU Leve	of Sen	vice .		Н			
Analysis Period (min)			15									

c Critical Lane Group

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The Transpo Group

The Transpo Group

[~] Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

	*	-	-	•	•	*	/	
Lane Group	EBL	EBT	WBT	WBR	NEL2	NEL	NER	
Lane Group Flow (vph)	448	2329	2652	1834	588	294	290	
v/c Ratio	1.41	0.94	1.39	0.96	1.02	1.05	1.09	
Control Delay	218.1	14.7	204.0	27.3	94.3	115.5	127.8	
Queue Delay	0.0	45.5	18.4	0.0	0.0	0.0	0.0	
Total Delay	218.1	60.1	222.5	27.3	94.3	115.5	127.8	
Queue Length 50th (ft)	~457	352	~1562	519	~270	~258	~277	Pariza Arabasan da Araba
Queue Length 95th (ft)	m#271	m259	#1687	#822	#387	#443	#470	
Internal Link Dist (ft)		410	1			232		
Turn Bay Length (ft)	170							
Base Capacity (vph)	318	2474	1913	1906	577	280	266	
Starvation Cap Reductr	1 0	361	0	0	0	0	0	
Spillback Cap Reductn	0	0	55	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.41	1.10	1.43	0.96	1.02	1.05	1.09	

Intersection Summary

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

	*	→	7	/	←	•	-	Į.	•	•	/	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER	
Lane Configurations	75	ተተ			ተተ	7 7	and the same of the same	SON THE STREET	ሻሻ	¥/	7*	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0	4.0	ATTEMATICAL PROPERTY.
Lane Util. Factor	1.00	0.95			0.95	0.88			0.97	1.00	0.95	
Frt	1.00	1.00			1.00	0.85			1.00	0.85	0.85	
Fit Protected	0.95	1.00			1.00	1.00			0.95	1.00	1.00	
Satd. Flow (prot)	1641	3282			3406	2682			3127	1445	1370	
Flt Permitted	0.05	1.00			1.00	1.00			0.95	1.00	1,00	
Satd. Flow (perm)	90	3282			3406	2682			3127	1445	1370	
Volume (vph)	435	2259	0	0	2572	1779	0	0	570	5	562	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	448	2329	0	0	2652	1834	0	0	588	5	579	
RTOR Reduction (vph)	0	0	0	0	0	400	0	0	0	13	13	
Lane Group Flow (vph)	448	2329	. 0	0	2652	1434	0	0	588	281	277	
Heavy Vehicles (%)	10%	10%	10%	6%	6%	6%	0%	0%	12%	12%	12%	
Turn Type	pm+pt					Perm			Split		Perm	
Protected Phases	5	2			6	241-18-42279-5141-14		Zuchonius de de la co	4	4		
Permitted Phases	2					6					4	
Actuated Green, G (s)	97.0	97.0			72.0	72.0			23.0	23.0	23.0	
Effective Green, g (s)	98.0	98.0			73.0	73.0			24.0	24.0	24.0	
Actuated g/C Ratio	0.75	0.75			0.56	0.56			0.18	0.18	0.18	
Clearance Time (s)	5.0	5.0			5.0	5.0			5.0	5.0	5.0	
Vehicle Extension (s)	2.5	4.0			5.0	5.0			3.5	3.5	3.5	
Lane Grp Cap (vph)	318	2474			1913	1506			577	267	253	
v/s Ratio Prot	c0.23	0.71			0.78				0.19	0.19		
v/s Ratio Perm	c0.84		HENDY			0.53					c0.20	
v/c Ratio	1.41	0.94			1.39	0.95		an area area area area.	1.02	1.05	1.09	
Uniform Delay, d1	51.1	13.6			28.5	26.8			53.0	53.0	53.0	
Progression Factor	0.86	0.95			1.00	1.00			1.00	1.00	1.00	
Incremental Delay, d2	185.7	1.0			177.2	14.3			42.4	69.5	84.2	
Delay (s)	229.6	13.9			205.7	41.1			95.4	122.5	137.2	
Level of Service	F	В			F	D			F	F	F	
Approach Delay (s)		48.7			138.4		0.0			112.5		
Approach LOS		D			F		Α			4 % F		
Intersection Summary												
HCM Average Control D	elay		105.3	Н	CM Lev	el of Se	rvice		F			
HCM Volume to Capaci	ty ratio		1.32									
Actuated Cycle Length (130.0	S	um of lo	st time	(s)		8.0			
Intersection Capacity Ut	ilization		55.5%			of Sen			Н			1.22,015.571
Analysis Period (min)			15									
a Critical Lana Group												

c Critical Lane Group

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The Transpo Group

Queues

2030 With-Project (with Tukwila south) Weekday-PM

^{# 95}th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

	Ť	7	4	+	- €	t	
Movement	NBT	NBR	SBL	SBT	SWL	SWR	
Lane Configurations	↑ ₽		7	ተተ	ሻ	7	
Sign Control	Free		escillati	Free	Stop	1987),	
Grade	0%			0%	0%		
Volume (veh/h)	4320	15	21		11	29	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	
Hourly flow rate (vph) Pedestrians	4645	16	23	3022	12	31	
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type					None		
Median storage veh)							
Upstream signal (ft)				66			
pX, platoon unblocked					0.25		
vC, conflicting volume			4661		6209	2331	
vC1, stage 1 conf vol							
vC2, stage 2 conf vol		化异锑					
vCu, unblocked vol	eren gerer de		4661		18716	2331	
tC, single (s)			4,3		7.3	7.4	
tC, 2 stage (s)							
tF(s)			2.3		3.7	3.5	
p0 queue free %			0		0	0	
cM capacity (veh/h)			19		0	22	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	SW 1	SW 2
Volume Total	3097	1565	23	1511	1511	12	31
Volume Left	0	0	23	0	0	12	0
Volume Right	0	16	0	0	0	0	n in 31 0 basa isaa baan baha
cSH	1700	1700	19	1700	1700	0	22
Volume to Capacity	1.82	0.92	1.20	0.89	0.89	Err	1.43;
Queue Length 95th (ft)	0	0.0	79 568.4	0.0	0.0	Err	
Control Delay (s) Lane LOS	0.0	0.0		0.0	0.0	Err F	[6.06.4
Approach Delay (s)	0.0		F 4.2			Err	
Approach LOS	U.U		4.4			F	
Intersection Summary							
Average Delay			Err				
ntersection Capacity Ut	ilization	1	29.9%		CU Leve	of Se	rvice H
Analysis Period (min)	er ne autoriale		15				

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Page 7

5: S 200th St & Orillia Rd

Queues 2030 With-Project (with Tukwila south) Weekday-PM

	-	\checkmark	•	T		>	+	
Lane Group	EBT	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Group Flow (vph)	10	900	3286	1483	305	1401	1398	-
v/c Ratio	0.11	1.65	1.78	1.09	0.54	0.97	0.57	
Control Delay	71.6	336.1	375.9	101.5	19.2	55.9	9.1	
Queue Delay	0.0	0.0	0,0	0.0	0.0	0.0	0.0	
Total Delay	71.6	336.1	375.9	101.5	19.2	55.9	9.1	
Queue Length 50th (ft)	9	~598	~2477	~538	75	609	223	
Queue Length 95th (ft)	31	#802	#2846	#717	186	#881	376	
Internal Link Dist (ft)	36			266			3373	
Turn Bay Length (ft)								
Base Capacity (vph)	87	546	1844	1359	569	1444	2473	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	1.65	1.78	1,09	0.54	0.97	0.57	

Intersection Summary

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		44		ሻሻ		77	*	ተተተ	7	ሽሻ	† \$	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		0.97		0.88		0.91	1.00	0.97	0.95	
Frt		1.00		1.00		0.85		1.00	0.85	1.00	1.00	
Fit Protected		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1854		3400		2760		4988	1553	3183	3280	
Fit Permitted		0.98		0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1854		3400		2760		4988	1553	3183	3280	
Volume (vph)	5	5	0	855	0	3122	0	1409	290	1331	1323	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	5	0	900	0	3286	0	1483	305	1401	1393	5
RTOR Reduction (vph)	0	0	0	0	0	80	0	0	147	0	0	0
Lane Group Flow (vph)	Ō	10	0	900	0	3206	0	1483	158	1401	1398	0
Heavy Vehicles (%)	0%	0%	0%	3%	3%	3%	4%	4%	4%	10%	10%	10%
Turn Type	Perm			Prot		ustom	Prot		Perm	Prot		797
Protected Phases	STATE OF STA	3		4	14.200 120124.7	1	5	2		1	6	
Permitted Phases	3	autri Me				4			2			
Actuated Green, G (s)	0.dc. 2056/1000	1.9		22.0		85.1		37.1	37.1	63.1	106.2	
Effective Green, g (s)		3.9		23.0		88.1		39.1	39.1	65.1	108.2	
Actuated g/C Ratio		0.03		0.16		0.60		0.27	0.27	0.44	0.74	
Clearance Time (s)		6.0		5.0		6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	piskieloja :	49		532	0.000	1728	40 Y 53	1326	413	1409	2413	4.586.1
v/s Ratio Prot				0.26		c0.82		c0.30	er residence.	0.44	0.43	
v/s Ratio Perm		0.01		0.20		0.34		90/9/08	0.10	, Aliki b	4.5955	
v/c Ratio		0.20		1.69		1.86		1.12	0.38	0.99	0.58	
Uniform Delay, d1		70.1		62.0		29.5		54.0	44.1	40.8	9.0	
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1		319.3		387.1		64.0	2.7	22.5	1.0	
Delay (s)		72.1		381.4		416.6		118.0	46.8	63.3	10.0	
Level of Service		ं _ E		501.4 F		- F		F	ı	E	Α.	
Approach Delay (s)		72.1		-31,5 - 03	409.0	a in target		105.8			36.7	
Approach LOS	46-24-25	/2.1			403.0			100.0			00.7	
Approach LOS	garagası	.e 🗀	ruest carene		errorenania		ane anno approve pande	oranokiani birosh	SCALCOSCHER SWOODS	endosepaditiros	0.0000000000000000000000000000000000000	on ordina a reconstruction 4
Intersection Summary			0000		1011	1.60						
HCM Average Control D			228.3		ICM Le	vei or S	ervice		an di Fi			
HCM Volume to Capacit			1.59		S	aat tin	(0)		12.0			
Actuated Cycle Length (My say	147.1		Sum of I							
Intersection Capacity Ut	lization		150.6%	ı	CU Lev	ei or Se	rvice		Н			
Analysis Period (min)			15									
c Critical Lane Group												

Technical Memorandum

From: Karl Hufnagel, P.E.

To: Steve Bingham, ESA Adolfson

Subject: Bow Lake Transfer/Recycling Station Facility Master Plan Update and

Implementation – Summary of Preliminary Inbound Customer Queuing

Evaluation

Background

The purpose of this memorandum is to summarize the preliminary customer traffic queuing assessment that is discussed in Section 4.3 of the July 2006 Draft Facility Master Plan Update to demonstrate that there should be no back up of customer traffic onto the Orillia Road intersection. This discussion is focused on self-haul customer traffic as these are the vehicles that arrive in large numbers on weekends and historically have produced the longest traffic queues at the County's eight transfer stations including the Bow Lake station. The information presented in this memorandum is taken primarily from Section 4 of the updated Facility Master Plan. In addition, the County provided the following peak hour self-haul traffic forecasts for the period through 2020 and then through 2030:

Year 2020 peak weekday hour self-haul traffic: 136 Year 2030 peak weekday hour self-haul traffic: 158 Year 2020 peak weekend hour self-haul traffic: 163 Year 2030 peak weekend hour self-haul traffic: 190

On weekdays self-haul customers will use the south scale facility which at full build out will include four scales three of which can be operated as inbound scales. On weekends, when self-haul customer traffic is at its peak, self-haul customers will be allowed to use the north scale facility in addition to the south scale facility. For this discussion, we have assumed that fourth scale at the south scale facility will be added in the year 2021 (10 years after the initial reconstruction of the station) when customer traffic may increase to the point of needing the fourth scale.

The south scale facility has approximately 440 feet of inbound pre-scale queuing length. The north scale facility has approximately 1,250 feet of inbound pre-scale queuing length. There is an additional queuing length of approximately 240 feet between the site entrance gate and the point at which incoming trailer traffic and customer traffic diverge.

Weekday Assessment:

The peak hour weekday traffic forecast is 136 vehicles up to the year 2021 when it is assumed the fourth scale might become operational at the south scale facility. With two inbound scales processing customers at an average rate of 40 seconds per vehicle, the scale facility will be able to process around 180 vehicles per hour, which means that there should be no queue in the peak traffic hour. The capacity of the two scales provides over a 30% margin for error in the traffic forecast and in the transaction time estimate.

When the fourth scale is added, three inbound scale will be able to process 270 vehicles per hour. The peak hour weekday traffic forecast in 2030 is 158 vehicles, which means that there should be no queue in the peak traffic hour. The capacity of the three scales provides about a 70% margin for error in the traffic forecast and in the transaction time estimate.

Weekend Assessment:

The peak hour weekend traffic forecast is 163 vehicles up to the year 2021 when it is assumed the fourth scale may become operational at the south scale facility. With three inbound scales (two at the south scale facility and one at the north) processing customers at an average rate of 40 seconds per vehicle, the scale facilities will be able to process around 270 vehicles per hour, which means that there should be no queue in the peak traffic hour. The capacity of the three scales provides over a 65% margin for error in the traffic forecast and in the transaction time estimate.

When the fourth scale is added, four inbound scale will be able to process 360 vehicles per hour. The peak hour weekday traffic forecast in 2030 is 190 vehicles, which means that there should be no queue in the peak hour even if all traffic is routed to the south scale facility. The capacity of the three scales at the south scale facility provide over a 40% margin for error in the traffic forecast and in the transaction time estimate.

Therefore, in all cases there should be no backup of queued incoming traffic into the intersection at Orillia Road. However, it should be noted that traffic will not arrive at the transfer station at a uniform rate. Clumps of vehicles can arrive over a fraction of an hour. In these instances, which will happen on a daily basis and not just in the peak hour, there will be short periods where traffic queues begin to form and then dissipate at the scale facilities. Therefore it is good practice to have a significant margin of error in the assessment and more importantly to have generous traffic queuing provisions which this station will have.

Technical Memorandum

From: Karl Hufnagel, P.E.

To: Steve Bingham, ESA Adolfson

Kurt Gahnberg, The Transpo Group

Subject: Bow Lake Transfer/Recycling Station Facility Master Plan Update and

Implementation – Construction Traffic Forecast

Background

The purpose of this memorandum is to provide an estimate of the construction traffic traveling to and from the project site during the approximately three years that construction will be in progress at the site. This estimate is based on the attached preliminary project schedule dated August 28, 2006. As currently envisioned and shown in this schedule, the site construction will take place under two consecutive contracts: a site preparation contract schedule to run from April 1st through October 30, 2008, and a site facilities contract scheduled to run from April 1, 2009 through July 7, 2011.

Site Preparation Contract

This is primarily an earthworks contract with some retaining wall and stormwater system construction. At the completion of this construction the site will be "winterized" to protect it from stormwater erosion during the winter months of 2008/2009.

Soil Removal:

Based on preliminary estimates there is expected to be around 148,000 cubic yards of material excavated and removed from site. At 20 cubic yards per dump truck and pup trailer, this material will require around 7,400 round trip truck trips to/from the site over an estimated five month period. Assuming that the work is carried out only on weekdays, this would be 108 hauling days or an average of 68 truck trips per day.

Imported Materials:

It is estimated that there will be around 20,000 of earthwork material brought in to the site over a period of a month. At 20 cubic yards per dump truck and pup trailer, this material will require about 1,000 round trip truck trips. Assuming the work is carried out on weekdays, this would be around 22 hauling days or an average of 45 truck trips per day. These trips are expected to coincide with the soil removal trips.

Construction Traffic Forecast Technical Memorandum October 16, 2006 Page 2

Concrete:

It is estimated that there will be around 1,000 cubic yards of concrete brought to the site during the site preparation work, primarily for retaining walls. At 10 cubic yards per truck, this would require 100 truck trips. It is expected that concrete will be delivered and placed at an average rate of around 100 cubic yards per day, which equates to 10 truck trips per day. These trips are expected to coincide with the soil removal and soil import trips.

Workers:

The average workforce during the site preparation work is expected to be around 30 with a peak work force of 50. These workers are expected to park on site and to make an average of 1.5 round trips to the site each day. The peak workforce days are expected to coincide with the soil removal, import material and the concrete delivery trips.

Other:

It is expected that there will be other miscellaneous materials deliveries, vendor visits, labor union visits, contractor home office visits and County and consultant daily visits or between 25 and 30 per day though out the life of the construction.

Total:

The average daily traffic is expected to be around 223 trips through five of the seven months of this contract when soil is being hauled off site, and drop to around 155 trips for the remaining two months.

Site Facilities Contract

This is primarily a building, pavement and utilities contract with some additional earthwork, and site retaining wall construction.

Material Removal:

An estimated 20,000 cubic yards of rubble from the demolition of the existing transfer building and pavements will be removed during Phase 2 of this contract. At an average load of 20 cubic yards, this equates to 1,000 truck trips over a two month period, or around 25 trips per day.

Imported Materials:

The estimated material types, quantities, load size and number trips are provided in the following table:

Material Type	Estimated	Average Load Size	Number of Trips
	Quantity		
Concrete	7,700 CY	10 CY	770
Road Aggregates	7,100 CY	20 CY	355
Structural Fill,	2,000 CY	20 CY	100
Drain Rock			
Hot Mix Asphalt	3,700 CY	20 CY	185
Roadway			20
Appurtenances			
Topsoil &	1,500 CY	20 CY	75
Amendments			
4" and larger Utility	15,000 LF	2,000 LF	8
Pipe			
Manholes/CBs	80 EA	6 EA	14
Metal Building			50
Electrical			50
Equipment			
Plumbing Pipe &			20
Fixtures			
Compactors			10
Industrial			20
Wastewater			
Treatment System			
Miscellaneous			1000
Total			2677

These material delivery trips are expected to occur on weekday over the full 27 month construction period (585 weekdays). The average daily trips would therefore be around 5. It is estimated that a peak day for this category could be 30 trips.

Workers:

The average workforce during the site facilities work is expected to be around 50 with a peak work force of 150. These workers are expected to park on site and to make an average of 1.5 round trips to the site each day.

Other:

It is expected that there will be other miscellaneous materials deliveries, vendor visits, labor union visits, contractor home office visits and County and consultant daily visits or between 30 and 40 per day though out the life of the construction.

Total:

Construction Traffic Forecast Technical Memorandum October 16, 2006

Page 4

Disregarding the two months when soil is being removed from site, the average daily traffic is expected to be around 110 trips. The peak daily traffic is expected to be around 295 trips.

MEETING MINUTES Bow Lake Transfer Station Facility Master Plan Update and Implementation Phase 1 – FMP Update WSDOT Property Acquisition Meeting March 31, 2006 WSDOT Urban Corridors Office

Attendees:

Susan Everett, Engineering Manager WSDOT
Paul Johnson, Project Engineer, WSDOT
Andrew Lau, Property Manager, WSDOT
Neil Fujii, Managing Engineer, King Co.
Dwin Ugwoaba, Project Manager King Co.
Tim Hedges, Senior Transportation Engineer, The Transpo Group Harold McNelly, Facilities Management, King Co.
Lillian Holley, Facilities Management, King Co.
Karl Hufnagel, Project Manager, R. W. Beck

- 1. The purpose of the meeting was to review preliminary layout prepared for WSDOT for future possible north bound I-5 on ramp-improvements at the South 188th Street, and to identify whether there would be any conflicts stemming from the County's proposed Bow Lake Transfer Station redevelopment project that would impact WSDOT's future improvement plans.
- 2. Neil and Karl first reviewed the latest project site plan layout and site cross sections (attached). WSDOT staff noted that the north access road no longer suggests a future northward extension, which is consistent with WSDOT's preferences as expressed at a previous meeting. Karl made the point that the site plan does not accurately reflect where retaining walls may be needed along the west-side of the proposed north access road, whereas the cross sections (B and C) do indicate that the intention is to have retaining walls along a major part of this road so as not to infringe on WSDOT property. Average daily and peak daily and hourly customer traffic numbers at the transfer station in 2030 were briefly reviewed.
- 3. Susan said that King County should keep in mind that retaining walls adjoining I-5 will need to be designed to accommodate appropriate loading from future vehicular traffic.
- 4. Susan indicated that WSDOT would be amenable to granting a construction easement so that earth embankment on the WSDOT side of the retaining walls discussed in 2 could be removed down to freeway elevation, thereby reducing the overall height of the wall required.

WSDOT Meeting Minutes March 31, 2005 Page 2

- 5. Tim Hedges reviewed the preliminary layout drawing of the on ramp improvements. During the ensuing discussion, WSDOT staff indicated flexibility in the alignment of the ramp lanes such that the apparent conflict or near conflict in the vicinity of the existing cell phone towers might be avoided. It was suggested that the stop bar and control point be moved further north to achieve 1000 feet of queuing length if possible. Paul and Susan discussed the possibility of moving the off and on ramp intersection point further west to enlarge the left turn pocket for customers entering the transfer station.
- 6. Based on the preliminary layout, WSDOT staff indicated that there appeared to be adequate room for WSDOT's planned future improvements, including an additional travel lane on the main line, and the County's project. WSDOT staff indicated that their favorable recommendation on the sale of the property to WSDOT headquarters would be conditioned on maintaining limited access on the proposed north access road.
- 7. Susan discussed the possibility of impact fees or payment of mitigation costs based on the results of the traffic study that will accompany the SEPA environmental review process.
- 8. It was agreed that the next step was for the County to submit an updated drawing (pdf) showing the latest proposed site arrangement coupled with the on ramp improvements revised as discussed above.

Attachments

Distribution: Attendees, Greg Harry, KPG, Ian Sutton, R. W. Beck, Steve Bingham, Adolfson

File: 11-00839-10000/2003



MEMORANDUM

Date:	February 7, 2006	TG: 02150.00
To:		
From:		
cc:		
Subject:	Impacts of I 5/SR 509 Project on the Bow Lake Tra	ansfer Station

This memorandum discusses the I-5/SR 509 Freight and Congestion Relief project in southwest King County and the impacts that may be incurred near the Bow Lake Transfer Station.

Project Description/Need

The I-5/SR 509 Freight and Congestion Relief project will extend SR 509 from its existing termination point at South 188th Street /12th Place South to a connection with Interstate 5 at South 200th Street. In addition to this connection I-5 south will be widened from Military Road to South 320th Street. This connection will serve current and future transportation needs by enhancing the southern access to Sea-Tac Airport.

Existing/Future Conditions

Currently SR 509 terminates at South 188th Street / 12th Place South and does not connect to the regional transportation highway system, causing congestion along 188th Street, SR 99, and I-5 during peak hours. Increases in future traffic volumes caused by economic growth and increased airport activity will result in continued congestion along 188th Street, SR 99, and I-5.

Future Circulation With-Project

The implementation of the SR 509 extension to I-5 will provide a direct connection to Sea-Tac Airport and shift traffic from existing travel routes enabling better circulation on SR 99, I-5, and 188th Street corridor. The addition of travel lanes along I-5 will also reduce congestion in the area. Motorists currently traveling on I-5 to access SR 509 via South 188th Street will be removed from this interchange and shifted to the new connection provided at South 200th Street

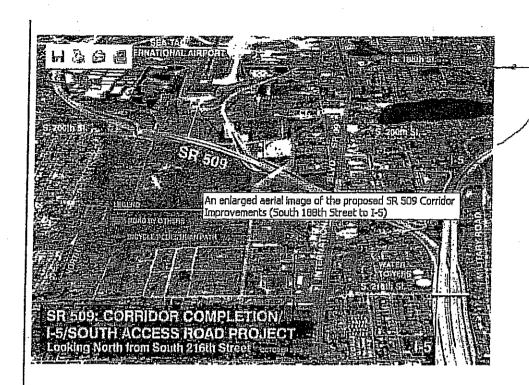
Impacts to Bow Lake Transfer Station

The SR 509 project should have little to no impacts on the area near the Bow Lake Transfer Station. Physically no changes to the interchange will affect right-of-way or access to Bow Lake Transfer Station. Additional lanes added to Interstate 5 will occur south of the site. Traffic volumes adjacent to the transfer station currently travel to/from the east via Orillia Road. Future circulation with the implementation of the SR 509 extension will not re-route the majority of these travelers. 2020 PM

The Transpo Group Inc. 11730 118th Avenue N.E., Suite 600 Kirkland, WA 98034-7120 425.821.3665 Fax: 425.825.8434

peak hour level of service on Orillia Road is not expected to change with or without the project. g grant of the company of the first program of the contract of al land a la <mark>company of the second states of the second states of the second states of the second second states of the second states of the second second states of the second states of the second second states of the s</mark> garage and the against the first section of we have the of the state of the second and the first of the companies are the state of the state of 新的人,只有有效的人,只要是1.60mm。 1985年 1985年 医垂直性 经收益 医二苯基酚 医神经病 医二氏管 the second of the second of the second the control of the co The growing decision of the late of the and the second and the second and the first transfer of the second state of

The Transpo Group



An enlarged aerial image of the proposed SR 509 Corridor Improvements (South 188th

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Local Street Traffic Impact Evaluation for King County Transfer Stations

Prepared for King County Solid Waste Division

Prepared by HDR Engineering, Inc. 500 108th Avenue NE, Suite 1200 Bellevue, WA 98004

March 18, 2005



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INTRODUCTION

King County is currently assessing existing conditions at five transfer stations in an effort to determine what improvements could be implemented at some or all of the facilities. The County is evaluating 19 measures of effectiveness, including but not limited to, travel time to the facility, time spent on site, recycling services meet goals, daily handling capacity, safety, meets local noise ordinances, and meets criteria for acceptable traffic impacts on local streets.

This technical report documents the analysis for addressing one of the 19 measures of effectiveness, specifically, Criteria 15 as follows:

- 15. Meets Criteria for Acceptable Traffic Impacts on Local Streets
 - a) Local intersections remain below capacity if additional traffic is added, as defined by the Highway Capacity Manual
 - b) On average, traffic queues entering the transfer station do not spillover onto or impede local streets during 95 percent of the operating hours

The five King County transfer stations that were evaluated are:

- Algona Station, located in the City of Algona and having immediate traffic impacts to Algona, Auburn and King County local streets,
- Bow Lake Station, located in the City of Tukwila and having immediate traffic impacts to Seatac, Kent, and King County local streets,
- Factoria Station, located in the City of Bellevue and having immediate traffic impacts to Bellevue local streets,
- Houghton Station, located in the City of Kirkland and having immediate traffic impacts to Kirkland, and
- Renton Station, located in the City of Renton and having immediate traffic impacts to Renton.

The methodology, data collection, and results for Criteria 15 are provided in detail in the following report.

METHODOLOGY

Intersection Analysis

For Criterion 15a, the traffic analysis software program Synchro/SimTraffic was used to analyze local intersections. Most agencies require the analysis of the weekday p.m. peak hour, because it is typically the time period that the local street system is experiencing the most traffic. Although traffic associated with King County transfer stations may not be the highest during the weekday p.m. peak hour, the total volume on the local street system will likely be higher during the weekday p.m. peak hour, than during an hour that demand is highest for a transfer station (typically on a weekend). For this reason the weekday p.m. peak hour was analyzed at each of the study intersections.

A traffic operational analysis (level of service (LOS) and volume-to-capacity calculation) was performed at the intersections selected by each host Agency deemed to be most impacted by transfer station traffic. LOS refers to the degree of congestion at an intersection, measured in average control delay, and based on the methodologies provided in the Highway Capacity Manual. LOS A represents free-flow conditions (motorists experience little or no delay and traffic levels are well below roadway capacity), LOS F represents forced-flow conditions (motorists experience very long delays, in excess of 80 seconds at signalized intersections

and more than 50 seconds at unsignalized intersections, and traffic levels exceed roadway capacity), and LOS B to E represent decreasing desirable conditions. A more detailed discussion of the LOS concept is presented in the technical report.

The volume-to-capacity ratio (v/c) is the peak hour traffic volume (vehicles/hour) at an intersection divided by the maximum traffic volume that the intersection can maintain. For example, when v/c equals 0.85, it can be said that peak hour traffic uses 85 percent of the intersection's capacity; or 15 percent of the capacity is not used. When v/c approaches 1.0 (e.g., 0.95), traffic flow becomes unstable such that small disruptions can cause traffic flow to break down and long traffic queues to form.

If an intersection operates at LOS F or exceeds a v/c of 1.0. Criteria 15a is not achieved.

As mentioned previously, each host Agency selected the intersections that they deemed to be most impacted by transfer station traffic, with the exception of the City of Renton. The intersections analyzed in the City of Renton were selected by the project team in the absence of recommendations directly from the City. Intersection p.m. peak hour turning movement counts and intersection channelization were either obtained directly from the host agency, or collected in the field. The selected intersections are as follows for each transfer station:

Algona

- West Valley Highway/Driveway
- West Valley Highway/15th Street SW
- West Valley Highway/15th Street Svv West Valley Highway/1st Avenue N

Bow Lake

- Orillia Road/Driveway
- S. 188th Street/I-5 NB Ramp
- S. 188th Street/Military Rd.

Factoria

- Richards Road/SE 32nd
- Richards Road/Eastgate Way

Houghton

- 116th Avenue NE/NE 60th Street
- 116th Avenue NE/NE 70th Street
- 116th Avenue NE/I-405 NB ramps
- NE 60th Street/Driveway

Renton

- NE 3rd St/Edmonds Avenue NE
- NE 4th St/Jefferson Avenue NE
- NE 4th St/Union Avenue NE

Queue Analysis

For Criterion 15b, basic queuing theory as described in Traffic Flow Fundamentals (Adolf D. May, 1990) was applied to estimate the average queue formed at each transfer station weigh station upon entering. The equation used to estimate the average queue is as follows:

$$E(n) = (2\rho - \rho^2) \div (2(1-\rho))$$

E(n) = average number in system (vehicle)

= traffic intensity

$$\rho = \frac{\lambda}{\mu}$$

 $\rho = \frac{\lambda}{\mu}$ $\lambda = \text{mean arrival rate (vehicles per hour)}$

= mean service rate per lane (vehicles per hour)

In addition, the following assumptions were made in order to apply the above queuing equation to the available data:

- Vehicle arrival rate is assumed to be random, that is, vehicles do not arrive at transfer stations at equal increments of time, rather they arrive at "random" times.
- Vehicle service rate is assumed to be constant
- Traffic intensity (volume-to-capacity ratio) must be less than 1.0
- There is only one inbound scale at each transfer station

If the average vehicle queue exceeds the available storage capacity, then the queue is spilling over onto the local street system or impeding local street operations. The available storage capacity was defined as the distance from the inbound transfer station scale to the first driveway or intersection on a local street or a point on the local street at which the queue from the transfer station would impede non-transfer station traffic.

If the average queue exceeds the available storage capacity more than 95 percent of the operating hours. Criteria 15b is not met.

For Criteria 15b, transaction data entering each transfer station was obtained from King County. for every operating hour and every operating day in 2004. That data indicates the hourly demand for each transfer station by vehicle type. Based on two studies performed by King County in the mid 1990's at the Algona, Renton. Bow Lake, and 1st Avenue NE transfer stations, it was determined that the average time spent on the inbound scale is between 22 and 28 seconds. With these two pieces of data (hourly demand and average transaction time) the average vehicle queue waiting to be served entering a transfer station was calculated based on the equations listed above.

At one station, the Bow Lake Transfer Station, each hour was not analyzed. Out of the 22 hours of the day that Bow Lake is open, only the core hours of 8 am to 6 pm for weekdays and 8:30 am to 5:30 pm for weekends were analyzed, so that the data did not skew the results for hours where little traffic is experienced.

Forecasts

Both Criteria 15a and 15b were also analyzed based on 2030 projections, provided by King County. The Solid Waste Division developed the projections using its forecast model. This model predicts waste disposal based on such factors as growth in population, employment, income, and assumptions about additional recycling activity.

RESULTS

Intersection Analysis

The results for Criteria 15a, the intersection operational analysis, are summarized in **Tables 1** and **2** for existing conditions (2005) and 2025, respectively. In 2005, the Algona, Factoria, and Renton transfer stations all meet current intersection LOS standards (Criteria 15a). Both the Bow Lake and Houghton transfer stations have one intersection that does not meet the current intersection LOS standard, meaning, the intersection is LOS F and/or the v/c ratio is greater than or equal to 1.0. At Bow Lake, it is estimated that if there were no vehicles related to the transfer station at the intersection, the intersection would operate below capacity. Conversely, at the Houghton station, the intersection exceeds capacity even without traffic associated with the transfer station.

By 2025, all of the transfer stations have at least one over-capacity intersection impacted by the transfer station, with or without additional growth at the transfer station (see **Table 2** and **Figure 2**)

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Figures 1 and 2 illustrate the same information presented in Tables 1 and 2, graphically.

Table 1
Criteria 15a - Existing Conditions (2005) Analysis Summary

		ation	Existing w/ Transfer Station							
Facility	Intersection		Delay (sec/veh)	LOS	V/C	Meets Criteria?	Delay (sec/veh)	LOS	V/C	Meets Criteria?
≟Algoria⊨	WVH/Driveway	9	n/a ,	n/a	0.82	YES	38.4	g E	0.83	YES
Bow Lake	WVE/15th St	8	22.0	C C	0.88	YES	227	6 °	0.89	YES
	WVH/1stAve	•	41.8	E	0.39	YES	43.0		0.40	YES
	Orillia Rd/Driveway	ø.	n/a	n/a .	0.75	YES	≥110 · ·		1,09	NO
	188th St/l-5INB Rmp	3	29.0	C	0.94	YES:	29.9	C,	0.95	YES
	(88th St/Military Rd	8	27.5	C	88.0	YES	27.6	G	0.68	YES
Factoria	Richards Rd/32nd St	*	13.2	В	0.48	YES	15.1	В	0.50	YES
	Richards Rd/Eastgate	*	31.5	С	0.81	YES	31.2	C	0.81	YES
fougaten:	(1) 6th Ave/60th St	D.	18.8	C	0.80	YES		Č	0.81	/-YES
	116th Ave/70th St 🗀 🖁		55.1	E	100	NO	583	ш	1000	NO
		8	38.7	C	0.93	YES	82.6	c	0.90	YES
	60th St/Driveway	9	n/a	n/a	0.08	YES	94	A	0.08	YES
*	3rd St/Edmonds Ave	Š	13.9	В	0.67	YES	13.9	В	0.67	YES
Renton	4th St/Jefferson Ave	E .	15.6	В	0.75	YES	15.6	В	0.75	YES
:	4th St/Union Ave	E .	17.0	В	0.72	YES	17.0	В	0.72	YES
lotoo										

Notes:

- 1. = signalized intersection, = stop-controlled intersection
- 2. Delay, or control delay, is measured in seconds per vehicle, and is a measure of all the delay contributable to traffic control measures, such as signals or stop signs. At signalized intersections and all-way stop-controlled intersections, the reported delay is the average of all the control delay experienced for all movements. At one-way and two-way stop-controlled intersections, the reported delay is for only one movement, the movement experiencing the worst control delay, which is typically one of the stop-controlled side street approaches. The control delay reported at two-way stop-controlled intersections is not a valid indication of the operations of the entire intersection.
- LOS refers to Level of Service and is based on the methodologies outlined in the 2000 Highway Capacity
 Manual. LOS is rated from "A" (low delay) to "F" (delay in excess of 80 seconds per vehicle at signalized
 intersections, and 50 seconds at unsignalized intersections).
- 4. V/C = volume-to-capacity ratio
- n/a = not available because this intersection is stop-controlled and the movement experiencing the worst
 control delay would be the movement exiting the transfer station, and because this scenario assumes no traffic
 associated with the transfer station, there is no control delay to report.

Table 2
Criteria 15a - Future Conditions (2025) Analysis Summary

			2025 w/o G	rowth at	Transfe	er Station	2025 w/ G	rowth at	Transf	er Station
Facility	Intersection		Delay (sec/veh)	LOS	V/C	Meets Criteria?	Delay (sec/veh)	LOS	V/C	Meets Criteria?
Algona	WVH/Driveway	-	≥110.		1,26	No :	>110		1:26	No
	WVH/15th St		94.8	E	1.28	NO	94.5	F	1,29	No
	WVH/1st Ave	0	1 ≥110 : .		n/c	NO	21r0	F	Π/G	NO
Bow Lake	Orillia Rd/Driveway	·o	: 15110	- F 21	π/ο	, ON	>1/10	Ī	n/c	, NO
	188th St/l-5 NB Rmp	8	≥(1(0	F	1.52	NO	≥110	F	1.54	NO -
	188lh Si/Military Rd	8	51.0	D	0.99	YES	51.5	D.	0.99	YES
Factoria	Richards Rd/32nd St		24.2	С	0.76	YES	26.6	С	0.79	YES
raciona	Richards Rd/Eastgate		>110	F	1.23	NO	>110	F	1.23	NO
Horghlon	i 16ih Ave/60ih St	P	≥110			NO.		F, a	1,44	พอ
	116th Ave/Zoth St	8	>110		151	NO	- 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	F	1.51	NO
	L16lh:Ave/L405 NB:Rm	. 86	i≥no.		192	No.	2 110	Ĭ.	1.33	NO
	. 60lh Sl/Driveway	Q.	102	В	0.12	YES	107		0.12	Y ES
Renton	3rd St/Edmonds Ave		21.8	C	0.95	YES	21.8	C.	0.95	YES
	4th St/Jefferson Ave		17.8	В	0.85	YES	18.4	В	0.86	YES
	4th St/Union Ave	*	90.6	F	1.13	NO	91.3	F.	1.13	NO
81 4										

Notes:

- 1. = signalized intersection, = stop-controlled intersection
- 2. Delay, or control delay, is measured in seconds per vehicle, and is a measure of all the delay contributable to traffic control measures, such as signals or stop signs. At signalized intersections and all-way stop-controlled intersections, the reported delay is the average of all the control delay experienced for all movements. At one-way and two-way stop-controlled intersections, the reported delay is for only one movement, the movement experiencing the worst control delay, which is typically one of the stop-controlled side street approaches. The control delay reported at two-way stop-controlled intersections is not a valid indication of the operations of the entire intersection.
- 3. LOS refers to Level of Service and is based on the methodologies outlined in the 2000 *Highway Capacity Manual*. LOS is rated from "A" (low delay) to "F" (delay in excess of 80 seconds per vehicle at signalized intersections, and 50 seconds at unsignalized intersections).
- 4. V/C = volume-to-capacity ratio
- 5. n/c = the volume-to-capacity ratio exceeds calculable limits.

Figure 1
Criteria 15a - Existing Conditions (2005) Analysis Summary

Existing w/o Transfer Station Existing w/ Transfer Station

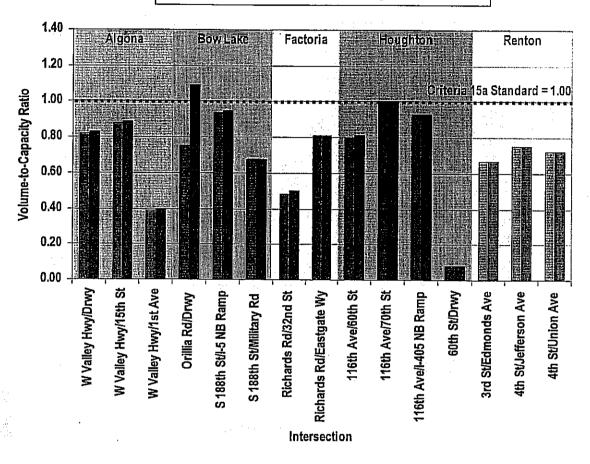
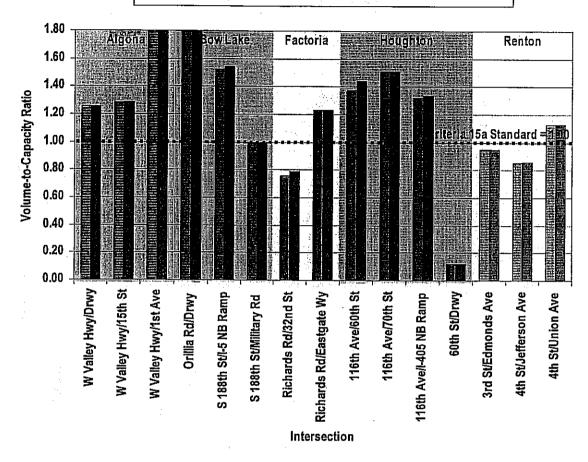


Figure 2 Criteria 15a - Future Conditions (2025) Analysis Summary

🗃 2025 w/o Transfer Station Growth 🗃 2025 w/ Transfer Station Growth



Queue Analysis

In order to determine if the average queue at each of the transfer stations exceed available storage, the average vehicle length must be calculated. The average vehicle length was calculated based on the mix of passenger cars versus transfer station trucks at each facility, and assuming 25 feet per passenger car and 75 feet per transfer station truck. The average vehicle length is summarized in **Table 3**.

Table 3
Average Queue Capacity by Site

	Average Vehicle	On-Site Queue Capacity						
Facility	Length (feet)	Length (feet)	No. of Vehicles					
Algona	27.4	135	4					
Bow Lake	32.5	476	14					
Factoria	26.8	64	2					
Houghton	28.6	346	12					
Renton	26.5	70	2					

Notes:

- The average vehicle length was calculated based on the average mix of passenger cars versus transfer station trucks at each facility, and assuming 25 feet per passenger car and 75 feet per transfer station truck.
- The queue capacity was provided by King County and is the distance from the weigh station to the first off-site intersection or driveway that would be impacted by the queue of vehicles at the transfer station.

The 2004 existing condition results of the Criteria 15b analysis, queuing, are presented in **Table 4**. Based on all data available in 2004 from January to December, only the Renton transfer station meets Criteria 15b, where traffic queues entering the transfer station do not spillover onto or impede local streets during 95 percent of the operating hours. The data was further analyzed to determine if the majority of the off-site queuing took place on the weekend or weekday. In fact, all of the transfer station sites would meet the queue criteria on a weekday, i.e. none of the sites queue off-site more than 95 percent of the operating hours on a weekday. Conversely, all of the transfer stations fail the criteria 15b on weekends.

Table 4

Criteria 15b – Queue Capacity Analysis Summary

Ali Days in 2004

		–	AUU-!		
Facility	Days of Week Analyzed	Total Hours Analyzed	No. of Hours Queue Exceeds Capacity	Percent of Hours Queue Exceeds Capacity	Meets Criteria?
Algona	Weekday	2,995	45	2%	YES
	Weekend	1,002	454	44%	NO
	All Days	4,017	499	12%	NO
Bow Lake	Weekday	2,615	20	1%	YES
	Weekend	1,007	286	28%	NO
	. Ali Days	3 622	306	8%	No
Factoria	Weekday	4,010	35	1%	YES
	Weekend	1,018	415	41%	NO
	All Days	5,028	450	9%	NO
	:= Weekday	2485		111111111111111111111111111111111111111	Yes
	Weekend:	1,014		17/96	NO
	AllDays	3,499	186	5%	NO
Renton	Weekday	2,658	न्याः स्थापनायः स्था स्थापनायः स्थापनायः	0%	YES
	Weekend	1,022	81	8%	NO
·	All Days	3,680	82	2%	YES

It should be noted that at the Bow Lake transfer station, the analysis for Criteria 5, which evaluated the onsite capacity of each transfer station, indicated that station has adequate capacity (LOS C) in 2005 on site to handle existing traffic flows. Therefore, the fact that Bow Lake does not meet the off-site queue criteria would indicate that the off-site queue is not related to the on-site capacity for this station. Rather, the constraint is the process time at the scale. King County implemented new operating hours and made some functional changes at all of the transfer stations in the latter half of 2004, specifically July to December. As a result, the queue data was reanalyzed using data from only the latter half of the year to determine if the hours of operation and functional changes would have made a difference with respect to off-site queuing. **Table 5** summarizes the queue analysis results for data represented by July to December 2004. Both Renton and Houghton meet Criteria 15b, when only the latter half of 2004 is analyzed, as well. Similar to the data analysis for the full year, all of the sites meet Criteria 15b on a weekday, while none of them meet the criteria on a weekend. With the exception of the Algona transfer station, all of the transfer stations experienced fewer occurrences of the queue spilling over onto City streets or impeding traffic flow.

Table 5
Criteria 15b – Queue Capacity Analysis Summary
July to December in 2004

.4 -		outy to boo	UIII201 III 200 .		
Facility	Days of Week Analyzed	Total Hours Analyzed	No. of Hours Queue Exceeds Capacity	Percent of Hours Queue Exceeds Capacity	Meets Criteria?
Algona		1,458	40	3%:	YES
	Weekend	491	221	45%	NO
	All Days	1,949	261	13%	NO
Bow Lake	. Weekday 🕒	1,508	18.	1%	YES .
	Weekend	487	1071	22%	NO::
	All Days	1795.	125	7%	NO
:	Weekday	1,786	26	1%	YES
Factoria	Weekend	490	184	38%	NO
4.* 	All Days	2,276	210	9%	NO
· Houghton	i i	1,799		1%	i eyes :
	Weekend	489	169	12%	NO
	- All Days	1 1,668	86	5%:	YES
Renton	Weekday	1,326	, i s - 1 s - 1 -	0%	YES
	Weekend	493	29	6%	NO
	All Days	1,819	30	2%	YES

Table 6 summarizes the queue analysis based on 2025 projections of transfer station use. By 2025, none of the facilities will satisfy Criteria 15b, with queues extending off-site between 15 and 41 percent of the time, depending on the location. In fact, even weekdays will experience queue failure at all the transfer stations, with the exception of Renton.

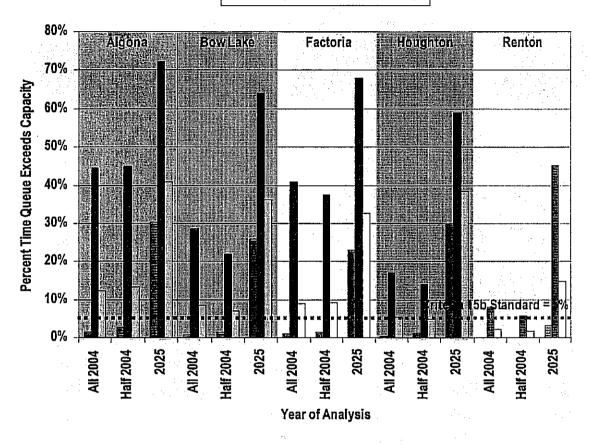
Table 6
Criteria 15b – 2025 Queue Capacity Analysis Summary

Facility	Days of Week Analyzed	Total Hours Analyzed	No. of Hours Queue Exceeds Capacity	Percent of Hours Queue Exceeds Capacity	Meets Criteria?
Algona	Weekday	1,458	442	30%	No
	Weekend	490	354	72%	NO
	All Days	1,948	796		NO
Bow Lake	Weekday	1,308	339	26%	NO NO
	Weekend	487	312	64%	. NO
	All Days	1,795	651	36%	NO.
	Weekday	1,786	412	23%	NO
Factoria	Weekend	490	333	68%	NO
·	All Days	2,276	745	33%	NO
Houghton	Weekday	1,199	660, 1	30%	NO
	Weekend	488	288	59%	NO.
	All Days	:1,687	648	38%	No
Renton	Weekday	1,326	43	3%	YES
•	Weekend	493	223	45%	NO
	All Days	1,819	266	15%	NO

Figure 3 illustrates the data provided Tables 4, 5, and 6, graphically.

Figure 3
Criteria 15b – Queue Capacity Analysis Summary

■ Weekday ■ Weekend □ All Days



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Volume Right	120年29	را و الراب و الراب المنظم والمستحد الماسية الماسية الماسية الماسية الماسية الماسية الماسية الماسية الماسية الم	.0型黑 0割	23		建筑。1980	- 1- 120,14
cSH	1700 1700	306 170		8 258	produktion and the contract of the	وها در بردد در دار در در و تعقورهمان	
Volume to Capacity	0.75 0.38	4.250、1.44.4万万元的公司 1.350元代	Particular Strategies of the Control	1.09 1.09		中国的 人员起手要	
Queue Length 95th (ft) Control Delay (s)	0 0	5 84758888	0 0	46 7	nikala membahan memba	i Kungganatan satur	
Lane LOS	1.0.0	in a second of the or of the second of the	い。一点でいる。	944.9 20.3 F C	P. India and A. Marinha	HERE CLEANED	$j_{\overline{\lambda}}$
Approach Delay (s)	型1.0 <u>.0.0</u> 0%分分元	C PARO DESCRI	不是是他的证据 。	F C	kale in outleve	。 中国:国际企业的主任党基本。在	4.72 I
Approach LOS	The contract of the contract o			LUISMEN 行堂 F		E SINGERIA AND	
				ı	Dec. 1111	par garanten ar e	
modeline stamely							
Average Delay	· · · · · · · · · · · · · · · · · · ·	2.6	en e		ner a fræderer skapparasere – me-	way 1 STP I and growing page 2 to 11 annual from	dia dia
Intersection Capacity Uti	iization :		LEU Léve	of Service at	WELL BY	是是是是其他	
Analysis Period (min)	de komer. Setto secale escribo	15	tinga angelogichici sagge	ana kalansiindan sala musik	engel a noon property of the second of the s	THE STREET COURSE TO SEE THE THAT	

		-	•	•	←		1	Ť	1	-	. ‡	4
1:16120G/0101F3600200000		Est	a a la c	WELL.	WBI	. Tylelet		NEE	an Belg	SPLA	SET	SEIR
Lane Configurations	ኝ	朴			44	7	4	4				
Ideal Flow (yphpi)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	进步15%		9	计学15 题		9	15	建设强于	一个 经	15	Y July 1	9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
所認識的影響		克特教 定				0.850		0,932			Design.	
Fit Protected	0.950			On top office contain	_ a compa de milion am	endes enderende	0.950	0.974	i saudananiminan	SALTAMENTERS	er ere Namensa – ind	ni Caramana wa 1227
Satd: Flow (prot)	1770	3539	. E.Q.	1.0	3539	1583			沙罗0	建定0 2	0	0.2
Fit Permitted	0.950	ten and and the second	reconstanting	uk elemene uk elemene			0.950	0.974	THURS AND	व्यवस्थान अ स्य	स्थानकार के अर्थ	netratera
Said: Flow (perm)	1770	3539	200 0	- O.	3539		168.	1606	是1000	沙沙河 O E	0.0	
Right Turn on Red	ander her helden in.	, s anderes	Yes	o prestanta	antellene	Yes 2.580		SEKAR F-LES	Yes	and the second second	GENERAL CANTER	Yes
Said Flow (ATOR)		AN COLOR WITE	SAME!			the second of the second of the second		47	1.00	1.00		1.00
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00 元型30章	1.00		1.00 第 3 0章	1.UU AGERCEON
Link Speed (mph)	相似的统动	650			244			835		a Partice d	894	
Link Distance (ft) Travel Time (s)		514.8第	HELEN		244 1955			第 19.0 章			20:3	
Volume (vph)	367	1362	0	0	884	923	39 7	説シ.い言 1	117	0	0	
Peak Hour Factor	图 0.92	0.92	0.92		0.92	20.92	0.92	•	0.92	_		0.92
Adj. Flow (vph)	399	1480	0.00	0	961	1003	432		127	0	क्राज्यात क्षेत्र 0	कार करणा 0
Lane Group Flow (vph)	##399£	1480	13 to 05	PEXOR		. 1003		a 280 a			-	
Turn Type	Prot	in any second seconds.	Page Partition of the	GANTA - MARKETER	Tel Antender	Perm	Perm	e la ferio de la composition della composition d	Madalani Merika Ing	· della S'acte Link, em bior	CENTER COLOR	THE STATE
Protected Phases	機能75	4.1	形 阿斯		8			582 2	隐認為有	1. 1		
Permitted Phases	intole when the	TORACE.	Section Color Street, W.	Pro-Character pades	A44. 357 144-115	8	2	mit. f.i. v a versibles . see .em. r	efter ved stores of		31071 001 - 07 43	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Total Split (s)	₩ 22.0 €	୍ର 59.0 🏄	水 0.0%	0.0	37.0	37.0	影21,0	图21.0章	學0.0個	题0.05	想0.0%	0.0
Act Effct Green (s)	18.0	55.0			33.0	33.0	17.0	17.0				
Actuated g/G Ratio	0.22	0.69			0.41	0.41	0.21	到0.21期			是思想要	能能
v/c Ratio	1.00	0.61			0.66	1.01	0.78	0.74	entween energy	red & low do Jerêse (Incomes)	International Control	MASS SEVER CORP.
Control Delay	79.6	≥8.0		起多問	21.6	431	47.3	〒385]	加地能			
Queue Delay	0.0	0.0	e Proposition and Proposition for	建筑设置的	0.0	0.0	0.0	0.0	michorneco c.	erengener.	san ee	*********
Total Delay & Total Delay	79.6	8.0	的美国		21.6	437	47,3	28H	加制量到		不管证	活动理
LOS	E	A 23.2	e and a second	uran Albuman	C 32.6	D		D 数42.7章			Mister state	THE TANK
Approach Delay		A STATE OF THE PARTY OF THE PAR			72.02 C			D D				
Approach LOS	灣 309	C 禁666₩			₩ 682#	410	いつつち	题192集			3.13-78-51	FAMILY
Stops (vph) Fuel Used(gal)	10	16			<u>.002</u> 9	12	5	5 - 12	MEN'S ALES		10世紀	
CO Emissions (g/hr)		1123			653			3315				
NOx Emissions (g/hr)	141	218		atabandar Atabandar	127	165	74	64	WELEPHINES		eskare e	
VOC/Emissions (g/hr)			LINE.			33796 7						THE THE
Dilemma Vehicles (#)	0	0		-Ministry 1610	0	0	0	0	THE PERSON NAMED IN		Martin Control	
Queue Length 50th (ft)		差177 磨				278		33148			0000000	
Queue Length 95th (ft)		231	TOTAL BLANCE STATE	i i i i i i i i i i i i i i i i i i i	263	#578	#267	#234	TIESTON CAMPAGE ASS	Marines and the Enterer		CONTRACTOR OF STREET
Internal Link Dist (ft)		570						755			814	是是是
Turn Bay Length (ft)	and the second of the second	CITES IN MICHAEL ST	to the second second	A STATE OF THE PARTY.	(,,						,,,	
Base Capacity (vpn)	398	2433号	學問題	過煙	1460	994	357	學378河		的想象		验证
Starvation Cap Reducti	n 0	0	,		0	Ö	0	0				
Spillback Gap Reducin	30.	\$0 8			製 0	0		108			a wan	AL SO
Storage Cap Reductn	Ó	0			0	0	0	0	a methodolog mobile a mercina		and disease	tea tot o = a - t
Reduced VC Rato	1.00	0.61			0.66	影[0]	0.78	0.74				
	of the financian internal and a side of			and the second second second	SPICEAR PROPERTY	Property Tyles (comment	STREET, STREET	e Self et Juis Jess	sue intercolettoria	solula i a mir viene la		or data to the desired like.

Area Type Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Control Type Pretimed Maximum v/c Ratio: 1.01

Intersection Signal Delay 29.9 Intersection Capacity Utilization 102.1%

Intersection LOS; C ICU Level of Service G

Analysis Period (min) 15 ~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles

Splits and Phases: 3: S 188th St & I-5 NB Ramp

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	. ≯ ø7	4 [®] - ø8	
	CAPACIONES CONTRACTOR	2745 AND AND SHEET AND SHEET	

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acine i Grenna de Cara		. Earl		EVIVIBILE	awaii	WELL	MEL	WEIG	@VIE)E	ala L	Auslens	N SER
Lane Configurations	ች	ጌ		ሻሻ	ڼ		* f	ተተ	7	7	ተተቡ	
Ideal Flow (vphpl)	_1900 <u>;</u>	1900	1900		1900	1900	1900		1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Tuming Speed (mph)	15		9	15		9	15		. 9	15		3.9
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Fit white was a second	· 医基础。	0.992	i) - 🚉 🤅		0.965		Note that	"我们是 "	0.850	Towns of	0.996	
Fit Protected	0.950			0.950	- 447 - 1	:	0.950			0.950		
Said: Flow (prot)	The sale and the whater	1848	0.	3433	1798	4.0点	1770	.3539	1583		5065	0
Fit Permitted	0.950	والمراضون	t 11 ±0.5	0.950	energia (m. 1818).	ki i mai emistre.	0.950	والمعالمة المساعدة	وماعد فوقد برادي	0.950	ر. محمد بدر عاملان	en aber et al.
The street of th	17703	1848		3433	§1798±	· b./ citrot.l lag., ef.;;,	1770	13539	1583	1770	5065	30
Right Turn on Red	G.A.S. tur-4%	elengerakan.	Yes	ሃ ታለፈር አመማለያነ <mark></mark> ።	ener Energia	Yes	eresis in secul	errea anteir	Yes	narantan	errentet avs	Yes
Said Flow (RTCR)		1.00			を記された				298			
Headway Factor Link Speed (mph)	1.00	1.00 30	1.00	1.00	1.00 黑氢 3 0部	1.00	1.00	1.00 #30	1.00	1.00	1.00 \$李 3 0〕	1.00
Link Distance (ft)		1070		HIS MA	798		理的表	る 306		5.社場當2	408	
Travel Time (s)	I di ana	24.3			/30 第185編	Y HOME		300 3通 7.0 》	Cara She	. Secondo	400 403	ST NOTE
Volume (vph)	15	128	61-101-1555 7	379	280	86	71	635	274	103	1167	34
Peak Hour Factor	© 0.921	0.92	0.92	0.92	£0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	139	. 3025X	412	304	93	77	690	298	112	1268	37
Lane Group Flow (vph)	16		}. v o≅	412	图 3976	-0.0	验77.7	690	298	∭112-		- V 0
Tum Type	Prot	Profesenti (c)	(15年17日) " (15年17日)	Prot	A Description	Properties	Prot	A Personal Control of the Pers	Perm	Prot	~ > \$\(\tau_{\text{\tinc{\text{\tinc{\text{\tinx{\tinit{\texitex{\text{\text{\text{\text{\texi}\text{\text{\text{\text{\texi}\text{\text{\texitin{\text{\texi}\text{\texitit{\text{\texi{\texi{\texi{\texi{\texi}\texit{\texi{\texi{\texi{\tin{\texi{\texi{\texi{\texi{\texi{\texi{\texi}\tii}\tiint{\	S \$44.00
Protected Phases	## 7	4	-83	· 1.3.	- 8	对图像 的	科里 5	- 2-		4. N. 1.	6∹	
Permitted Phases				***************************************		C 21.401. 17.5 222	22.20		2	-11.9		
Total Splir (s)	8.0	20.0	0.0	15.0	27.0	0.0	9.0	24,0	24.0	11.0	26.0	0.0
Act Effct Green (s)	4.0	16.0		11.0	23.0		5.0	20.0	20.0	7.0	22.0	
Actuated g/C Ratio	6.06 。	0.23	P. W. ART	0.16	0.33		40.07	0.29	0:29	0.10		
v/c Ratio	0.16	0.35	denses a desend	0.76	0.66	emet of automost (6% A	0.61	0.68	0.45	0.63	0.82	en voe an
Control Delay	35:12	Col. me betenettit Bat in		39.3	Christian caretti		54.4	26.3	512	48.4	27,3	基础机
Queue Delay	0.0	0.0 ≈ ••••••••••••••••••••••••••••••••••••	garan Jana	0.0	0.0	ra diserbit	0.0	0.0	0.0	0.0	0.0	
Total Delay LOS	第35] 1	24.7		39.3	والتوبير محربه والمراد وبالوا		54.4	26.3	352	in the property of the second	a film in bagilanian 1	N. SEMIF
Approach Delay	D Tarenta	25.8	1355E27	D Exception	C 32.3		D Transporter	C 22.4	A Same	D Havesteen	C ∄28.9∂	LaFest (1
Approach LOS		ري. م	e Cath S		まっと <u>.</u> つか C	學美國語	ERNARAM	F. 444			E 20.9	24.7
Stops (vph)	2 18 E	U ESTOPES	i mening	沙347	_		63	SEATE	34营	18 03°	210X50	当つでも
Fuel Used(gal)	0	2 2		7	6 A		###### 2	11	3	نهارين 2	16	Li di La
CO:Emissions (g/hr)		是168案	电影中容	≦508≅	_				_			尼亚岛 拉
NOx Emissions (g/hr)	5	33	enera espe	99	78		23	151	34	25	######################################	
VOC Emissions (g/hr)									EAIR			
Dilemma Vehicles (#)	0	0	والمنظاء فتلدانك	0	0		0	0	0	0	0	(Wenning)
Queue Length 50th (ft)		\$ 52 <u>2</u>			約135票	預整器類			生姜0萬		3187	THE W
Queue Length 95th (ft)	25	100	ern Dar-ardür	#149	226	Tarible meter mire articular	#92	194	52	#114	239	Table Marie Co.
		990			表7.18 素			£226±	克蓬蓬		328	
Turn Bay Length (ft)												
Base Capacity (vph)	101	425		539	606		第126	到011是	665	177	1596	
Starvation Cap Reductn	. 0	0		0	0		0	0	0	0	0	
Spillback Cap Reducting			跨列	温度0%		學學學	體級O無	and a second section of		经营0定	京縣0 號	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	100 as a 4 - a
Reduced Vc Ratio	#.O.16E	0.35		0.76	0.66		0.6	0.68	0.45	0.63	0.82	46.0

Lanes, Volumes, Timings 10: Military Rd S & S 188th St

Intersection Summary

Area Type Other

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Pretimed Maximum v/c Ratio: 0.82

Intersection Signal Delay: 27.6

Intersection LOS: C

Intersection Capacity Utilization 63.9%

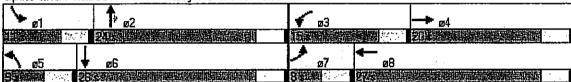
ICU Level of Service B

Analysis Period (min):15

nalysis Penod (min) 15 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles

10: Military Rd S & S 188th St





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Novement of the solution		HEILER SHINE HEIWI	PSWAP PROBLEM		
Lane Configurations	ሶ ኑ	ሻ ቀቀ ሻ	*		
Sign Control	Free States	Free Stor			
Grade	0%	0% 0%)		
Volume (veh/h)	1753 0	0 1444	序版数0 00000000000000000000000000000000000		
Peak Hour Factor		0.92 0.92 0.92			
Hourly flow rate (vph)	19050	0 1570	0:		: ' !
Pedestrians					a
Lane Width (ft)	是是在是大人的大			A A A CARE A PARTY AND A CARE	
Walking Speed (ft/s)		n da majajeje i dome maj vezitoraju iz 18.	and a more of the angle of the more	A contract fraction of the contract of the con	
Percent Blockage		· "我是一个,我们们	《西京学》,"阿尔	。 1. 数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据数据	
Right turn flare (veh)	والمراوع والمراد المهد مرياضية والمعاددة والمعادية والمعلق	sans summer in its 2000 as a post me	ngan Anggap ngan gamba inggap galay minggap pana ninggap dan jalay da	Tokker old i gleddien i gandy bellwed gefeled ybid, i'll gelo fill fil fel y y y yy y y	ari kija
Median type		None			5 4-
Median storage veh)	energy (* 1911) op legen kommunen (*	OS COSSET VIEW MEDICAL PER LA SERVICIO DE SERVICIO DE SERVICIONES DE SERVICIO DE SERVICIO DE SERVICIO DE SERVICIO DE SERVICIONES DE SERVICIO DE SERVIC	orevers en la companya de la company	建设。1985年 Miller 1975年 新加州 1975年	24. <i>441</i> .
Upstream signal (ft)	表示,从一个人	2 44 0.76		三等而於為時間獨於於於於於 1分分	11.25
pX, platoon unblocked	ARE SOUTH THE THEFT		。 這能 953 型 25 25 25 25 25 25 25 25 25 25 25 25 25	第三个的位为形式系统的数据的编辑的结合 。	5, 5,
vG. conflicting volume vC1, stage 1 conf vol	题作品的 建物质	land Francisco		A STATE OF A	e Pari
vC2, stage 2 cont vol					± (3°
vCu, unblocked vol		1905 2906	953	では、企業を開発を受けるできる。対象を対象を対象によって、これできる。	
tC; single (s)	ent at each		100 6.9 400 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		1. TE
tC, 2 stage (s)	Restrict March Charles (1997)	and the second of the second o		(中)(2)(h)(2)(h)(2	** "
tF (s)	ale de la lace	2.2	in 33		1.
p0 queue free %	ituran masa sa	100 100		The state of the s	
cM capacity (veh/h)		308	16260高温温息等		
TO WELL HIS MINE CONTROL OF THE PERSON OF TH		SEMPESEZ SEZ			
	#1270 # 635	785 785			
Volume Total Volume Left	0 0 0	0 0 0	The state of the s	一次是由自己的自己的自己的自己的自己的自己的自己的自己的自己的自己的自己的自己的自己的自	自動
Volume Right				MODELLA PROPERTY OF THE PROPER	子草
cSH		1700 1700 1700		国籍政治 医克尔特氏征 计图像记录 医克拉克氏征 化二甲基乙基	72.00
Volume to Capacity					î 4.
Queue Length 95th (ft)	0 0	0 0	trick in a second with a second s	1.317シアを選集を実施するとのでは、新聞を発展しています。 1.317シアを選集を実施するというできません。	f 12/4.
Control Delay (s)		0.0 0.0 0.0 0.0			
Lane LOS	Name and Property of the Control of	ىدىنلەرلىقى ئايىلىدە ئەلىنىدىنىڭ ئايىلىكى دىلىكى قىلىدولىك دىرى	AA	ر در محمد میرد در مهمد ۱۳۰۶ کید و بین و بین در تینونونیمی شکر است. در فقد نیز میشد و فرود بیشت بیشت	,-,
Approach Delay (s) 图像	则至0:03四重高级	Y0:0	[] 0.0] [] 10.0] 10.0		6.0
Approach LOS	Albama de la Esta maria Mandale de Lega Vallema e Maria de Campande e la		A		
indresion thingery	ang panggaraganan d				
		0.0			544
Average Delay Intersection Capacity U	Alization metales Et		vel of Service	ANGERTAIN SERVICE TO	53F.
Analysis Period (min)	THE STATE SERVICE STATE OF THE	15	TOTAL POPULATION AND AND AND AND AND AND AND AND AND AN		
Alialysis Fellou (IIIII)			CEUTE SEED OF THE	网络阿里斯斯斯斯斯斯斯斯斯斯斯	(1) AN 243 - C
A. G. M. M.		有意思如此的意思的意思的意思		医侧线线 医抗性性性 医二甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基	and the

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HEIRE CIROLETT			EBR	#Wicle	WE THE	WBR	NE		MEIR	y selo	e Sizile	e e e
Lane Configurations	*	ተ ተ			朴	7	1	€}>	47 100			- 17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900±	1900	1900	1900-	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15	121	9	15		9	: 15∌	7 4 T.	9:	15		. 9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Friedrich State (1987)	· »: , .	1 (1 m + 1)		والمنافع الماني	· · - : ' · · · .	0.850	4.1	0.936				
Flt Protected	0.950						0.950	0.972		in Britain Ann anns		
Satd. Flow (prot)	1770	3539	0	0.	3539			1610	· 0	⇒ 0	. 0	0
Flt Permitted	0.950		*		10 1000 1000		0.950	0.972				
Satd. Flow (perm)	1770	3539	0		3539	1583	1681	1610	* \$ O	. 70	0	0
Right Turn on Red			Yes			Yes		T LAND COLUMN TO	Yes	,, n		Yes
Satd. Flow (RTOR)	内质点 4			<u> 5</u> . 507		.580	心中情况	42	ا د ما الأولى الما الما الما الما الما الما الما ال			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30 %	o sign	The state of the s	30.		计可能定	30			30	524.89 7 124.99 12.
Link Distance (ft)		650			244			835	12.15		894	
Travel Time (s)		14:8		T THE PERSON	5.5	可是是	多洲形 鸟	19.0 f		建设的	~20.3	灣海馬
Volume (vph)	367	1362	Ó	0	874	912	397	1	107	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
Adj. Flow (vph)	399	1480	0	0	950	991	432	1	116	0	0	0
Lane Group Flow (vph)	399	1480	0		950	991	276	273	· 0	0 / 60 / 7	0	0
Turn Type	Prot					Perm	Perm					
Protected Phases	7	4		·	. ∜. 8∜	File S	1	~~	के संबंधी			
Permitted Phases						8	2					
Total Spit (s)	22.0	59.0	0.0	0.0	,				, 0.0	0.0	0.0	0.0
Act Effct Green (s)	18.0	55.0	Ok. Littari	. a.e. e	33.0	33.0	17.0	17.0	r Herry was interest	er spillige et a		J**
Actuated g/C Ratio	0.22	0.69	100		0.41潭	0.41	0.21	0.21				
v/c Ratio	1.00	0.61	الا دائمة	name na -	0.65	1.00	0.77	0.73	ent us nomen in in in	t de gerden		• • • •
Control Delay ೌನ	79.6	8.0	المنافعة المالا		21.5	39.9	46.3	37.8	生物 治疗	应收款。	40	i a volati - Transacti
Queue Delay	0.0	0.0	et see Little met	a strongstrat	0.0	0.0	0.0	0.0	Aut Bulk bereichtet	ra i statistica e i re	andrope make i	e, e gwy e
Total Delay	79.6	្ន់ ខ្វី.០ ្			The Principle of Labour.	39.9		· •		計劃的		
LOS	. E	A ™odiati	rgagiga - Jersa	in Markagan sent	C	D a annumen	D HANKAKAN	D	ማርፈ 5 የህ ብ ተደነገጥ	is editionaries	antina Nas	a Notal Land
Approach Delay		23.2			30.9	5903500	P. F.	42.1	EBBY:	PHEN		134 374
Approach LOS	mer dodic	∵ಪಂದರ್ಗಳು	an time	ారాశాడల క	U Stanasi	402	M.HAKS	U Bernaden	近点にも8円・1-7	200 25 6.4.0	en el Monados	w.,
Stops (vph)	309	666	Tarin William		A TO A SEC AND A PROPERTY			199°	E.≥?	1. 种植。		
Fuel Used(gal)	10	16 ⊶400°			9 ∹c/o‱	11 進 794 題	5 ≅465≅	ວ ≊ann≃	THE PROPERTY	ere francisco	建设设计。" "是"	rendek
CO Emissions (g/hr)		218		with the	125	155	72	63	Kalanini.			
NOx Emissions (g/hr)	141 ਕਵਾਬਰਤ		mayeris (Siri	<u> 단말</u> 당단 및 함께					学的经验的建设	Windshift S	Ser de la companya d	U. LUMBIE
VOC Emissions (g/hr)			il line	S. Landing	0 1452				Profite C		A SEPTEMBER	i vita i i i
Dilemma Vehicles (#) Queue Length 50th (ft)	0 ಚಿಕ್ಕಗಳು	0 かイフカジ	NI TYPE	ing salahan Tagan	194	O Septimon of the contraction of the	0 83.033	0 图1333	CHECOSTON"	" 第四四条章 公	24727	\$1.400.8
Queue Length 95th (ft)	#378	7€31,024.∷ 231	Minaal	. 2. 可益等	258		#261	#229				HE HE
Internal Link Dist (ft)) 14871884	1435H 443					54757#K			17 th My 1
Turn Bay Length (ft)	建新疆,西 斯曼	7.7.03		松 多距 阻塞	AS TANK	是就是原理					5-1811.9	
Base Capacity (vph)	aon"	₹ છે∆વવે %	第四条数据表数	等更有的数据。	1460	L-QQXFR	ZŽETZ	変々7年間		CANTON TO	전 발생 11.17 . 로 발생 11.17 .	earth St. f
Starvation Cap Reductr		ار ترکیمینی	eressida.	in Rule	の 第 255 年に	0	0 ********	0 0	存置特征还	ALTERNATION OF THE	II 图 表 2 4 .	
Spillback Cap Reducting		_	g. regre		**** 0	_				没有部门 。	a revision	.[3][7-4]
Storage Cap Reducting	##£ Y ## O	0	A. Herrie	San San California	0	0	0 0	0	ales establication of the second	mar Ari	NAME OF	Mark 1
Reduced V/c Ratio	-	_			0.65	_	_	_				સુધારા હતી.
	er Leaven		"" เป็นเรา โรงนัก	isti avutid 1	E ATAKES	er yan	nation of			nasidin)	Et veldő (Belad):	a+28*

Area Type Other

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Control Type: Pretimed Maximum v/c Ratio: 1.00

Intersection Signal Delay 29.0 Intersection LOS C
Intersection Capacity Utilization 101.1% ICU Level of Service G
Analysis Period (min) 15

 Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles

95th percentile volume exceeds capacity, queue may be longer.

Quelle shown is maximum after two cycles

Splits and Phases: 3: S 188th St & I-5 NB Ramp



)	-	*	1	——		1	†	1		↓	1
ano ciono	EAL	BEBTE	JEBR			WEIR.		NED	MARIA	SEL	SETTING.	SEE
Lane Configurations	· •	<u></u>		77	ĵ.		\K	ተተ	. بر	, Y	ተተ	1.75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	√1900∌	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15	•	9	15		9	: 15			15		9
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Fit ***		0.992	11.5	÷ ;;.	0.965				0.850	in si dana Santan	0.996	y 4 1 .
Flt Protected	0.950	:	•	0.950		·	0.950	· · ·		0.950	e e e e e e e e e e e e e e e e e e e	12
Satd. Flow (prot)	1770	1848	0:	3433	1798	· · · · · · · · · · · · · · · · · · ·	:1770	3539	1583	:1770	5065	0
Flt Permitted	0.950	+ ाता कर		0.950	-, ,- <u>1-1</u> -1		0.950	A British (A. 1)	Trans er 🕶	0.950		
Satd. Flow (perm)		1848	Ö		1798		1770	3539	1583	1770	5065	0
Right Turn on Red			Yes	· · · · · · · · · · · · · · · · · · ·	5.8	Yes	Straw straighter	ar la caracir a	Yes			Yes
Said Flow (RTOR)		: 4	91.43.1	d	23		实量的 证:	14.第.第.	298	$(24/\sqrt{5})$	- 6	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	रम्बिसी	30	ji takiri		30		H EUR	30	建門開設	出海海	30	
Link Distance (ft)		1070			798	ar an ro ra e e a. Gr	The Comment of the Co	306			408	
Travel Time (s)	1.17.77.32	24.3	w Talifa	· · · · · · · · · · · · · · · · · · ·	# 18.1	是可能的對	电影子的	7.0		NEW TOWN	9.3	15 5 : 20
Volume (vph)	15	128	7	378	280	86	71	630	274	103	1165	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92		ે 0.92 ંક	0.92	0.92	0.92	0.92	0.92
Adi. Flow (vph)	16	139	8	411	304	93	77	685	298	112	1266	37
Lane Group Flow (vph)	16	147	0	41.1	397	- TO:	77 <u>8</u>	685	298	112	1303	0
Turn Type	Prot	1		Prot	al de les elle l'ale blie	e a transfer	Prot	al. 1 Apr. 478 7	Perm	Prot		
Protected Phases	7	4		3	8 :	il express	5 5	2		1956 T	6	
Permitted Phases		. , ,	* 7	-414	· · · · · · ·		. 11 24 74 74 74	15 100 s.put %.	2			•
Total Split (s)	8.0	20.0	0.0	15.0	27.0	0.0	9.0	24.0	. 24.0	11.0	26.0	0.0
Act Effct Green (s)	4.0	16.0	A	11.0	23.0	a halip a rassing	5.0	20.0	20.0	7.0	22.0	
Actuated g/C Ratio	0.06	0.23	. 11 Th 18	0.16	0.33	阿拉拉斯	》0.07部	0.29	0.29	0.10	0.31	J 73
v/c Ratio	0.16	0.35	4 4	0.76	0.66	: 14 , e - 178 . e	0.61	0.68	0.45	0.63	0.82	
Control Delay	35.1	24.7		39.1			£ 54.4	26.2	5.2	48.4	27.2	្សំស្ន
Queue Delay	0.0	0.0	* 173. L	0.0	0:0	rubi www.wije.jo.i	0.0	0.0	0.0	0.0	0.0	
Total Delay	35.1	24.7			25.0	的空影號	£ 54.4	26.2	意5.2	48.4	27.2	
LOS	Ď	Ĉ	(*************************************	Ď	C	ng american sign	D	C	A	D	C	
Approach Delay	= چ ې د د اولون	25.8		A Sababasa	32.2 1	いかと	A PARTS	22.3		经验	28.9	
Approach LOS	. ₹*++ m`.F* .	С	a sa Migrida	ing a saffamatai	Ć	~ *+ #	A-24-24-14-4	Ċ			С	
Stops (vph)	18	3 107 8		340	288		63	535	34	93	1043	artyrti. Litati
Fuel Used(gal)	0	2		7	6	2 14 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1 m 1	2	. 11	3	2	16	,
CO Emissions (g/hr)	23	168		506	400	图第2次是	#116	770	176	130	1134	
NOx Emissions (g/hr)	5	33	- 1. 415	99	78	A	23	150	34	25	221	
VOC Emissions (g/hr)		39	No.	#117	93		湯差27編	益178	· 数41	- 30	263	in the second
Dilemma Vehicles (#)	0	0	. The first and the second	0	0	agreerance s, as coord	0	0	0	0	0	
Queue Length 50th (ft)	7.		otas in	3. 88	135		學[33]	3-136 3	20 X	188347	186	- 1. E.
Queue Length 95th (ft)	25	100	or an exercise	#148	226	with the printer	#92	192	52	#114	239	
Internal Link Dist (ft)		990	Tinā	NEW PROPERTY.		医斯·雷姆		226	2. 基础设施	当得就.		31 14 1 31 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Turn Bay Length (ft)	na Celebra (from e		resident distribution	145 3 m -, 1968	estation and in figure	· Ç pezzî (); 1984 (2 54)	AND THE PERSON AND THE PERSON AND PERSONS ASSESSMENT AND PERSONS ASSESSMENT AND PERSONS ASSESSMENT	, in the organizati lia	and the second of the second o	i a paramenti	THE CALL PROPERTY	
Base Capacity (vph)	€ 10f≆	425	# 13.4	539	606		到126点	1011	665	ii 177	1596	
Starvation Cap Reductr		Ô	er semi i te	0		ang 4 Tanah Terlain Tanah Terlain	0	0	0	0	0	
Spillback Cap Reducin		ំ ំ	S. S. S.	· Parago	3 20	新聞記憶	250	容潔0	验生变0 。	第5月 0 7	NE O	
Storage Cap Reductn	0	0	artina n≃4.1u	0	0	AND THE PARTY OF T	0	0	0	0	0	. a see
Reduced V/c Ratio	_	0.35		0.76	₹0.66§	建筑	¥0,613	0.68	0.45	. 0.63	0.82	(5.15.94) v
	فللناء وأرمن وسمتاء الا		را الشيفز السند و سوال ا	E P. Highwart with	- Latter law-in all said & t	a. Action of Contraction	e rendulation of the fire it	an - white that I want	·	- m m- manage "		- un (4) (*)

Area Type: Other

Cycle Length: 70

Actuated Cycle Length 70
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Pretimed Maximum v/c Ratio: 0.82

Intersection Signal Delay: 27.5% Intersection LOS. C. Intersection Capacity Utilization 63.8%

ICU Level of Service B

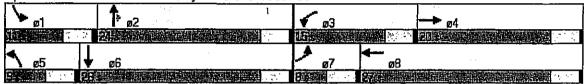
Intersection Capacity Utilization 63.8% ICU Level of Service B

Analysis Period (min): 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles

Splits and Phases: 10: Military Rd S & S 188th St



	1		*	1		* L	1	†	1	1	Ţ	1
Lana China Chi	AND THE REAL		EBR	W/BE	AWERIS	AWBIE!	54 2131 4	and the	NEEN	STELL	(4) (4) (4)	45121
Lane Configurations	· %	^ ^			^	7	ኘ	€}-	nja sili n	116.6		1.194
Ideal Flow (vphpl)	1900		1900	1900		1900	1900	1900	1900	1900	1900,	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15	. Companie.	9	15		9	15	A SA SA		15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00
Frt. die Alle 1985						0.850		0.930	83 7 E			
Flt Protected	0.950					ari e ge	0.950	0.974	1. 4.		suggi të	
Satd Flow (prot)	1770	3539	0	0	3539	1583	Contract Cable and the	1603	0	0	0	0
Flt Permitted	0.950	eria alteriore	era i i i riint	en e	دور افور مدام مدام ال	en e	0.950	0.974	on and server	in the same with the same of t	es es se s	·
Satd: Flow (perm)	1770	3539			3539	A SHARE SECTION	1681	1603	4570F	了特层 0 至	* 0	* : * 0
Right Turn on Red	nunganyan ya sasi asas s	թյունայ, թ երբող	Yes	इ.स.स्टब्स	ing one of the state of	Yes	matical designation (an and Laboration	Yes	나라네 중요공기	Vacetyr	Yes
Said: Flow (RTOR)						544		168	的知道是可		a (1830) 56	
Headway Factor	1.00	1.00	1.00 Satista	1.00	1.00 അത്ത്	1.00	1.00	1.00	1.00	1.00	1.00 30	1.00
Link Speed (mph)	14. 14. 14. 14. 14. 14. 14. 14. 14. 14.	30	o and	7.4.1.4.u	第30章		非是	230差		起建設法	894	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
Link Distance (ft)	the transfer	650 14.8	i i Transision	National	244 5.5			835 ∳1 9 .0∮		and the second		ana Walio
Travel Time (s)	FEC	2064			າງວາວ 1340	1399	602	- <u>719.0</u> -	177	0 0	zv.a 0	NEESSA O
Volume (vph) Peak Hour Factor	556 0.92	2004 [0.92]	0 0.92	0.92	0.92		0.92	0.92	0.92	: 0.92∑		∷0.92
Adj. Flow (vph)	604	2243		. v. 32.	1457	1521	654	. u. <u>se</u> 2	192	0.0	0.02	0 50.55
Lane Group Flow (vph			TEN DE	ଟ୍ଟେମ୍ବର ଟ୍ୟୁମ୍ବର		1521		409	·沙兰 0.5-	O S	່ ວ່າ	> 0
Tum Type	Prot		Live Gill	र्गियाः मध	8 13 5466	Pem	Perm	Mark T	THE PARTY	がある。	Sale O	Park" (M
Protected Phases	光三字 ス /	GENTATE	gita i gga	ر زمنی آوانیم د	(2) · 1.8第		TARISTA	2		kan Kalin	2-5123	
Permitted Phases	#adolo do #9a	illi saille é richtir).	ar i Grand Stad	್ಕ	ense være	8	ышкы <i>ы.</i> 2	E (REARFITTARE	Juli Melli Nesida	the proprietal as	a Talange Palik	is since
Total Split (s)	33.0	98.0	0.0	0.0	65.0		32.0	32.0	· 0.0	\$ 0.0 0	0.0	0.0
Act Effct Green (s)	29.0	94.0	34.ភា.គ. -	AND THE TOP	61.0	61.0	28.0	28.0	Contract of the second	W. w. w	e terrieraje d	
Actuated g/C Ratio	0.22	0.72	建型加热		0.475	0.47	0.22	0.22	西湖	13.67		
v/c Ratio	1.53	0.88	and the second second	ine stady i sambai pii ili ka	0.88	1.47	1.21	1.14				
Control Delay	285.8	18.9	跨自語句		38.5	239:1.	161.9	136.0				
Queue Delay	0.0	2.6	V TPECT - NEED	The property of	0.0	0.0	0.0	0.0				
Total Delay	285.8	21.4%	曾整理		† 38.5g	239.1	161.9	136.0	A MARKE			
LOS	F	С			D	F	F	F	teacher destinations	a. Three is restricted	a materials	raija, wa
Approach Delay	Step 9	77.5		17. 1742	141.03	網際	第0 基	149.4	iceolo II. a	i. Trina	it. Salira	3-7-4-
Approach LOS	nda —aperienda — hafine ti	E	rindt fledti	الواحرة كبياء بطويدني	F	an area area an	esenti di la materi	F	. Transpalet in	TO SEEDELLES	erina erreta esta.	and Storm take
Stops (vph)	The state of the s	1505	新 斯特	12世紀	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		327				grandist to militaria. Tali Belanda	が必要に
Fuel Used(gal)	39	32	eret Transforms Sa	i meladinan di politici	19	75 	18	15	24個語言發展問題	ri adayan 19 5-	enge estençen err	ere retar
CO Emissions (g/hr)	湿 2706	2211		特别等	<u> 1967</u> 的	5230	124]	到015世		(明显)		
NOx Emissions (g/hr)	527	430	residente de la compa	interior in a resort		1018 *********	241	197		Marka (1905)	STEEN HELD	TIMBALKI TIMBALKI
VOC Emissions (g/hr)	24 626		司 尼拉。		ERTON		EL 2007			ALL THE REAL		THE PARTY
Dilemma Vehicles (#)	0 ਕਰਵਤਸ਼ਨਤ	0 ~~~~~~	rania estatu	angen er ar eine	0 !!! = 77%	0 ≅र्यटनठः	0 ************************************	0 #20FW##			ere en la compa	克斯思烈 克
Queue Length 50th (ft)	#041	805			2 270	#1702	#694	#622	Chieffe	15990 12 to		THE SER
Queue Length 95th (ft)	#941		EFERS.	SPLANKE					Marie Co.			
Turn Bay Longth (ft)	o Die		10.11年2	ten Mark	AS LUCE				Representati		PER CONTRACTOR	CEPARAN
Turn Bay Length (ft) Base Capacity (vph)		OFFO			1661	31020 R	369	5 35 8	20年至15年	THE WAY		TERM.
Starvation Cap Reduct		209	ar. England	Maria Co	چرو <u>ں ہے</u> 0	ر 0	0	0 0		CAPACITY A	enekañ v	ere Malle
Spillback Cap Reducting	 Mariena								er partie		I.A.	TEAC.
Storage Cap Reductn	0	0	FFU, MGCS	e al renge a de la como	0	0	0	0	en a mariju d	nelski posedi	大学の発生が	enath Pat
Reduced V/c Ratio	25 153 A										Z III GO	
			er er er er er er er er	entrication district	en en vener				angareteng);	THE DESCRIPTION OF STREET	athra an Tal	erenantere.

Area Type: Other

Cycle Length: 130

Actuated Gycle Length 130
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Control Type: Pretimed Maximum v/c Ratio: 1.53

Intersection Signal Delay: 115.0

Intersection Capacity Utilization 149.6%

ICU Level of Service H

Analysis Period (min) 5

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles

Splits and Phases: 3: S 188th St & I-5 NB Ramp

1 p2	→ ø4	* *		
GREAT WAR IN THE SECOND SEC				
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		6		

	*	→	γ	*	←	K	1	†	1	1	1	1
Later Civille 1958 And Sales	WEBL	WEBIR	as Bal	WEL	AWBITE	WBR	ENBL	ANENT!	SINBER	SEIL	4831	SBR
Lane Configurations	ሻ	Þ		ሻሻ	þ		ሻ	个个	7	7	ተተ _ጉ	
Ideal Flow (vphpl)	1900	1900 ∺.	1900	1900	1900	1900	19007	1900=	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15		9	15		.9	· 15		. 19	河15	(1) (1) (1)	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.91	0.91
Fit.		0.992		是整備於	0.965				0.850		0.996	. , ,
Flt Protected	0.950			0.950			0.950	3 3 10 10 10 10 10 10 10 10 10 10 10 10 10	e Service George	0.950		og fattige Till
Satd: Flow (prot)	1770	1848	· . 0	3433	1798		1770	3539	1583	1770	5065	, F (0
Fit Permitted	0.950		* a* ba *3*	0.950	erro e ese e estador e	and services that were	0.950		e maraman anakan	0.950	ro anto taran er	a idaa ir sadaa.
Satd: Flow (perm)	1770	1848		-3433	1798	Transfer de la companie de la compan	1770	3539	. Literary very	1770	5065	(0
Right Turn on Red	Salata E	i in a second	Yes	Substitute 1 x	isa Artifetakan	Yes	version desired:	೯೬೬ ಪ್ರಶಿಣ್ಣವಾಗ	Yes	tomestate =	etta a aretaites	Yes
Said Flow (RTOR)		: <u>[</u> 3.			生 18章	建立	15.4	为特定的	451	学社的社	5 6	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	为西京 等	1,30 0		o linding.	30	建多种	是文學是	30		建新程 系	30	(M.14)
Link Distance (ft)	ಪರ್ಚಿ ಚಟ ಾನಾ	1070	STANCE STANCE	e na katalanan Kananan	798	a ennema	en en en en en en	306 ≋∙7.0≆	e la companie de la c	YATAN GALA	408	्रामक स्टब्स्ट
Travel Time (s)		24.3	也是		4183 18		100	962	Ad E	150	-5 9.3 1769	
Volume (vph)	23 - 7 obs	194	11 . 0.92	574 ₹0.92	424	130 ∉0.92⊴	108	962 - 0.92	415 0.92	156 0.92	0.92	52
Peak Hour Factor	0.92	. 0.92	A PER I	7.7.44 12		₹0.9 <u>८</u> ⊆ 141	0.92 117	1046	451	170	1923	0.92
Adj. Flow (vph)	25 25	211 223	12 歌作 的 》	624 624	461 602	141 350		1046	451 翌 451 %	· 70 图1703	1923	57 (1850
Lane Group Flow (vph) Turn Type	40 - 40 - 40 - 40 - 40 - 40 - 40 - 40 -		30.7 n 38	Prot	E OUSE	MRS NA	Prot	1 nac	Perm	Prot	1300	A CHECK
Protected Phases	Prot এটা সক	1. E. W.A.	19818	FIUL S.Jo∵	in in ordinal		FIUL	o ATTOL		FIOL RESERVA	F 3 60.	
Permitted Phases			er i serieta i		in at Par	E 1777 11 W.		i 4 € 15	5月14日200 ク	Table 1 and	astra Upi.	
Total Split (s)	8.0	20.0	0.0	21.0	33.0	₩n'n@	10.0%	36.0	36.0	#13.0 3	39.0	ed on de
Act Effct Green (s)	4.0	16.0	8 9.9.	17.0	29.0	med His	6.0	32.0	32.0	9.0	35.0	374. M.M .
Actuated g/C Ratio	≛ 0.04‡	至0.18基		 e 0.79	60:32 m	Ti de de c	0.07	0.36	0.36	#0.10	0.39	2 To 16 An
v/c Ratio	0.32	0.67	तित्रक्षिकीको ३ ज्यान	0.96	1.02	mattheria-is-	0.99	0.83	0.53	0.96	1.00	Total Margar
Control Delay	52.4	45.5		64.9	£72.6		126.13	:33.6	第4.6 第		49.5	11 THE P. LEWIS CO. 12
Queue Delay	0.0	<i>व्यक्तव</i> ाकरक 1.1	at (emission sold	6.5	0.0	emilien skiste	0.0	0.0	0.0	0.0	0.7	art Par Guar
Total Delay	52.4	46.5型	THE STATE	71.5	72.6量	四元的	126.1	33.6		101.29	50.1	
LOS	D	D	31 E. St. 54.24	E	E	Maganeral Latings africa	F	C	A	F	Ď	St. in "malfy care."
Approach Delay		47.1题	动生		₽72.0 %			32.2		把原理是	54.2	reger ook Kalender
Approach LOS	a well a filter to be	D	ny nigatan'a ga izagi. Ta	JY JY SIN PROSERVATE	E		D Devitable	C		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	D	1011 204 49 10.21
Stops (vph)	25	185	陆旗翼	508	459	品源的	87	839	38	130	1606	
Fuel Used(gal)	1	5		14	14		4	18	4	4	33	
CO/Emissions (g/hr)	上40	324	表影響	976	季991零		284	1286	258	309	2308	23.M
NOx Emissions (g/hr)	8	63		190	193		55	250	50	60	449	
VOC Emissions (g/hr)	9	差億75票	表達表	226	230		66	298	60	1372	535	制造模
Dilemma Vehicles (#)	0	0		0	0		0	0	0	0	0	
Queue Length 50th (ft)	是14	118	尼艾望	3182	6-344			282			≈406	
Queue Length 95th (ft)	40	#207		#290	#565		#177	364	62	#223	#532	
Internal Link Dist (ft)		990 a			源718%	驱船给	460	226	145		∮328 ₌	アニュア
Tum Bay Length (ft)					40.m	Pho. 10/2 at					umata	t re-
Base Capacity (vph)	题 793	331								到7個		
Starvation Cap Reductn	0	0		n	n		0	0	0	0	0	
Spillback Gap Reductn	經20	泛22号	的是		是20 要	過程到	第10 数	%性 0 法	20%是	数0 多	5	
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	a Tubura
Reduced V/c Ratio	0.32	0.72	以是是	₹1.00E	為1.02毫	电影	.0.99最	0.83	0.53	0.96	1.01	E.
the state of the s						· · · · · · · · · · · · · · · · · · ·						

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Pretimed Maximum v/c Ratio: 1.02

Intersection Signal Delay: 51.3 Intersection LOS: D
Intersection Capacity Utilization 88.2% ICU Level of Service E
Analysis Period (min): 15.

~ Volume exceeds capacity, queue is theoretically infinite.

95th percentile volume exceeds capacity, queue may be longer.

Queue showii is maximum after two cycles

Splits and Phases: 10: Military Rd S & S 188th St



1 1 4 1 6 0

Movement	ंधिहाँ	Makara Gallarani	#SWP
Lane Configurations	† 1>	T AA	7
Sign Control	Free	Free Stop	क्षान् क्रांची

Lane Configurations 7	THE SEC
Ideal Flow (vphp) 1900 1900 1900 1900 1900 1900 1900 190	BH
Ideal Flow (vphp) 1900 1900 1900 1900 1900 1900 1900 190	
Total Lost Time (s) 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	900
	4.0
Turning Speed (mph) 15 15 15 15 15 15 15 15 15 15 15 15 15	9
- The American Angles of the American Angle	.00
Fit 1980 1980 1980 1980 1980 1980 1980 1980	, g - 1.,
Flt Protected 0.950 0.974	
Said: Flow (prot) 1770 3539 0 0 3539 1583 1681 1603 0 0	0
Flt Permitted 0.950 0.974	are.
Said: Flow (pem) 25 1770 23539 21 0 22 0 3539 21583 21681 21603 22 0 22 0 22 0	0
- 一直の表現では、大型の表現では、「まし、「まし、一型の表現では、「まし、「まし、「まし、「まし、「まし、一型の表現では、「は、一は、「まし、一型の表現では、「	res .
Said Flow (RTOR)	
	.00
Link Speed (mph) 4 30 30 30 30 30 30 30 30 30 30 30 30 30	45
Link Distance (ft) 650 244 835 894	14 W 1
Travel/Time (s) 44.8 20.3	Str.
Volume (vph) 556 2064 0 0 1362 1421 602 2 177 0 0	ò
	.92
Adj. Flow (vph) 604 2243 0 0 1480 1545 654 2 192 0 0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Lane Group Flow (vph) 604 2243 0 0 1480 1545 439 409 0 0	0
Turn Type Prot Perm	44.5
Protected Phases	<u>-1</u>
Permitted Phases 8 2	2.34
Total Split (s) 32.0 98.0 0.0 0.0 66.0 82.0 32.0 0.0 0.0 0.0	0.0
Act Effct Green (s) 28.0 94.0 62.0 28.0 28.0	7.77
Actuated g/C Ratio 0.22 0.72 0.48 0.48 0.22 0.22	e. W.
v/c Ratio 1.59 0.88 0.88 1.48 1.21 1.14	S.C.C
Control Delay 2 309.9 18.9 37.8 242.2 161.9 136.0	1 150 1 150 1 150
Queue Delay 0.0 2.6 0.0 0.0 0.0	/_H
Total Delay 309.9 214. 37.8 242.2 161.9 136.0	را بارام د د د د
LOS F C D F F	2.74.2
Approach Delayan - 82.6	
Approach LOS F F	\$74.09°
Stops (yph) 395 1505 1505 178 744 327 3017	7.7
Fuel Used(gal) 41 32 20 77 18 15	A # 20%
CO Emissions (g/hr) 2894 5221 369 5375 1241 1015	推泛
NOx Emissions (g/hr) 563 430 266 1046 241 197	441.11
VCC Emissions (g/hr) = 67/1 512 317 1246 288 235	漂
Dilemma Vehicles (#) 0 0 0 0 0	E. in
Queue Length 50th (ft) = 724 / 672	r e
Queue Length 95th (ft) #953 805 686 #1816 #694 #632	2 A(14)
Internal Link Dist((ft)) 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	7. il:
Tum Bay Length (ft)	1
Base Capacity (Vph) 28 28 2559 2559 2568 2568 2568 2568 2568 2568 2568 2568	riri Fila
Starvation Cap Reductn 0 209 0 0 0	·~ IEE
Spillback Cap: Reducing 1: 0 1 2 10 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	of the second
Storage Cap Reductn 0 0 0 0 0 0	****
Reduced V/o Ratio 159 : 0.95 : 20 : 20 : 20 : 20 : 20 : 20 : 20 : 2	TOTAL Section
	-7-

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Viewell and the proposed to	製料的 實	MER	M SELW	Signe.	SWIE .	SWEDEW B					
Lane Configurations	1 13		ሻ	44	7	7			/////////////////////////////////////		-
Sign Control	Free			Free							1 .
Grade	0%			0%	0%					• • • • •	٠
Volume (veh/h)	2657	12	29	2189	29			15.		A G	: · .
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph) Pedestrians	2888	13	32	2379	: 32 (.: 83	With the latest		Teleparation of		
Lane Width (ft)							· ·斯克·				į.,
Walking Speed (ft/s)					I 1.441₹	 	in in the second of the secon				
Percent Blockage	4 .			. Distric						1.1	
Right turn flare (veh)		•	,		रेक कड़, <u>'</u>	CHERLERIE ELS	Transfer of a	4.5	a a sa	****	
Median type			$s_{t+1}(N)$		None &	A POST				1. S. C. C.	5.1
Median storage veh)									ani (* + tř.)	• • •	•
Upstream signal (ft)				244		是非类别的					
pX, platoon unblocked	b. Sulter Sur		oood da	eta erakteakaria. A	0.29	and when the	gevae See 75 oo oo	ini Jegana jaga jaka se	Tanan sa Marangan sa	en e	
vG; conflicting volume vC1, stage 1 conf vol			2901		414/	1451	建 的影響程度			Jack Street	
vC2; stage 2 cont vol		· -			ye ener	(新聞時 (20)	強制資料。彼れ		the type	• • • • • •	
vCu, unblocked vol		e i jednosti e	2901	er littelate	9390	1451	विकासित प्रदेश हो।	Distriction (i i ser sijer i	· • • · · · · · · · · · · · · · · · · ·	: 1.
tG, single (s)			4.1					7.7		11 × 1	
tC, 2 stage (s)	•				india ka a a contact	T Ass. of the art of the	\$ *	in the first of			,
tF(s)温温·			2.2		3.5	(å 3.3) ∤					
p0 queue free %			75	a wilderninger	0	31	Marine Commission of the Commi				
cM capacity (veh/h)	وسيقت والعاف	et c	124	THE PARTY	0.3	120			น้ำในให้ ค่อง ไ		Ç.
Dizeleiteta) Leangasta	NB 開露	NB 2	SBA	SB2	SB3#	SWEESV	V2EEE				
Volume Total	1925	976	· · · · · · · · · · · · · · · · · · ·	1190是	1190	7 72 7	83	表现的 包	建基础	建筑设施	-3
Volume Left	0	0	32	0	0	32	0				-,
Volume Right					輕20度					# 12 AV	HT.
Volume to Capacity	1700 1,13	1700	124 0.25	1700	1700 :::::::::::::::::::::::::::::::::::	0 1 孫Enæ∈0	20	er Wastelon, e.a	emin en en en en	والمراجع والمستعمل والمستعمل والمستعمل المستعمل المستعمل المستعمل المستعمل المستعمل المستعمل المستعمل المستعمل	ers.
Queue Length 95th (ft)	्राम् 0	ິບ.ວ <i>ະ</i> 0	. u.20 24	0.70 E	0 0	海与以際デリン Err	92			THE SE	34.3
Control Delay (s)	0.0	0.0		0.0		ETER 8				elare inserie	ng r
Lane LOS	ನಗಗನ - ನ		E	. (r . minafil	ere zizera	F	F	Mariana La	#11.15 BEET	(1982) (1984) 1	T.
Approach Delay (s)	0.0		0.6		3428	322.5元章				S. H. I.	
Approach LOS	· · ·		1-1-1-10 C		or :1010-6)-12",	F	madium of motion featings	e emether though changing the	Protection practical technic	kasiina kaesari 🕠	- 1
minesteller Stimmary	16/45/16/17			10123	建筑性的理	100			V 5 (2 st 2 f 2)	(4-4)	
Average Delay			59.6								44
Intersection Capacity Util	ization	严业 图		学学 (C	U Level	of Service		TEME		HALLAND	· ·
Analysis Period (min)	ettere på Sup S	· yms.c.P a	15	- Jim Bright Kalenda	Processory of the Section 1995	transación de la company de	districted the Parket and Autor I am	ement our manufalle	i, eu, c'urend e jiji i≡	Tarana Maria	. F.
REPORT OF THE PROPERTY OF THE PARTY OF THE P	(# 42 juny)	14.3514	人们是理想的 。	4. # Table 1869	机场的	AND AND THE PARTY OF THE	医特殊性性 自己的	and the section	anage - pro- 1	والرا وموجايز الرجاف بهي	٠

Area Type: Other

Cycle Length: 130

Actuated Cycle Length 130

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green

Control Type: Pretimed Maximum v/c Ratio: 1.59

Intersection Signal Delay: 117.9 Intersection LOS: F

Intersection Capacity Utilization 150.9% ICU Level of Service H
Analysis Period (min) 157

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles:

Splits and Phases: 3: S 188th St & I-5 NB Ramp

Opinto dire i Habbo. O.	C TOOLIT OLG TO THE TIE	···P
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Complement Com	•	*	→	***************************************	• • • • • • • • • • • • • • • • • • •	—	*	•	1	1	-	1	1
Ideal Flow (Priph)	<u>। वृत्त्यं द्वाराम् । वृत्त्रः । वृत्त</u>		Elille			Wen	Welfle	NBL	ENBIE	NBB		a) and	SER
Total Lost Time (s)	Lane Configurations	*1	f)		ሻሻ			• •		7	. =		
Totaling Speed (mph) Lane Util, Factor Fit Protected 0.950 Salid, Elow (port) 1.770 1848 0.950 0	Ideal Flow (vphpl)	1900	1900	1900	1900	1900						., ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	and the same
Lane Util. Factor			4.0	4.0		4.0		4.0	4.0			4.0	1144
Fit Protected 0.950	Tuming Speed (mph)	15		. 9∵	15		9	:: 15:	7.22	3 4 6 6 7 To a	الكناب مستوعة ا		
Fit Protected 0.950 0.95	Lane Util. Factor	1.00		1.00			1.00	1.00	0.95		1.00		0.91
Salid Flow (prin)	FICE		0.992			0.965	ET STEEL			0.850	被調整	0.996	
Fit Permitted	Flt Protected	0.950	-			545 							
Salid Flow (perm)	Satd: Flow (prot)	1770	1848	<i>≱</i> 0√	- Linesannia in	1798	9 0 9	and the same of	3539	्1583)		୍5065 ୁ	0
Right Turn on Red Satist Flow (RTORI)	Flt Permitted	0.950							in desired draw	en e			Liabertar
Said Flow (RTOR) 1.00		1770	1848	ant State of the second	3433	1798号	\$6.2 mg	1770	3539		1770	5065	O
Headway Factor				Yes		early due to the com-	Yes	the state of a second of	e mili om dagen		ar se national	e Lista de Carlo antesa	Yes
Link Speed (Imph)	Satd. Flow (RTOR)			13, 12								ration of the state of the stat	
Link Distance (ft) 1070 798 306 408 Travel time (s) 24.3 194 11 574 424 130 110 976 421 156 1769 52 Peak Hour Factor 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Travel time (s)	Link Speed (mph)		The second second	想到	i vitta	Car (a material)	到明語	的類構	74 74 74 74 74	246两位。	对法律总	The second second	加州
Volume (vph) 23 194 11 574 424 130 110 976 421 156 1769 52 Pēāk Hour Factor 0.92				new orthodopasta	i kan di sama mananda kan		elika en era arrelaken	r_ner a.w.e.itenton		in in a second s	.ovimestusietus		的人 在是一个
Peak Flour Factor				計模型		1 to			The			* **** Lon 254.	
Adj. Flow (vph)	Volume (vph)												
Care Group Flow (vph)		, Chia and about the	re- sour esta com	"" al air and the a	antemporation to a constitution	Car Furania a L	1 4444 1	triamanany - diam	ال الشجيطانية الأي	THE PERSON NAMED IN	السندية سيها التفر	De it was made at	144 673 615
Turn Type							141						
Protected Phases 7			223			£ 602	是U.D.S	The sections	1061	L'' , without w		1980	J. T. D.
Permitted Phases Tóial Splif (s)		Prot			Prot	n em turra cruzva cu	artistee (aartista	Prot	a erentek	Perm	Prot	or experience	nanyi gete
Total Spill (s)		7.	. 4			第23 8 8	金融和		经过程		三字数据	7 9 9 7	行为自制表
Act Effet Green (s)		والاستارين والمتعادم	etim with energy	ووسوا يراديا سرا	ration at Tenancian	en e	an ya ama	arra weekii	sa Saraha		ം മര്ത്	SEACH A	TOM AT A
Actilated I/C Ratio				#. 0.0	الباران تستعطلات ال	transport and services has	\$.0.0 t	ga direction of the	has a great property of 1 in a		with the same of t	an made to see at ma . "	ີ່ ທີ່ຕໍ່
V/c Ratio 0.32 0.67 0.96 1.02 1.02 0.84 0.53 0.96 1.00 Control Delay 524 45.5 64.9 72.6 132.4 34.3 4.7 101.2 49.5 Queue Delay 0.0 1.1 6.5 0.0 0.0 0.0 0.0 0.7 Total Delay 52.4 46.5 71.5 72.6 132.4 34.3 4.7 101.2 50.1 LOS D D E E F C A F D Approach LOS D D E E F C A F D Stops (vph) 25 185 508 459 88 854 39 130 16066 Fuel Used(gal) 1 5 14 14 4 4 19 4 4 33 CG'Emissions (g/hr) 8 63 190 193 58 256 <				dates arminuscus			energy and the property of the						y iliya metan
Confirol Delay 52.4 45.5 64.9 72.6 132.4 34.3 4.7 101.2 49.5 Queue Delay 0.0 1.1 6.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.7 Total Delay 52.4 46.5 77.5 72.6 132.4 34.3 4.7 101.2 50.1 LOS D D D E E E F C A F D Approach LOS D D E E E F C A F D Stops (vph) 25.5 185 508 45.9 88.8 85.1 39. 130. 1606 Puel Used(gal) 1 5 14 14 4 4 19 4 4 33 CO'Emissions (g/hr) 8 63 190 193 58 256 51 60 44.9 VOCEMISSIONS (g/hr) 9 75 226 230 69 305 61 72 535 DIemma Vehicles (#) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		The state of the same of the same of	man i the fact they		The state of the same of the	The state of the s		: 1±1 1±1:	Later of the control of				1,100
Queue Delay 0.0 1.1 6.5 0.0 <th< td=""><td>• -</td><td></td><td></td><td>ramatet</td><td></td><td></td><td>අතාල රාක්ෂණ</td><td></td><td></td><td></td><td></td><td></td><td>e do estados e</td></th<>	• -			ramatet			අතාල රාක්ෂණ						e do estados e
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Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Pretimed:

Maximum v/c Ratio: 1.02

Intersection Signal/Delay: 51.5
Intersection Capacity Utilization 88.3%
ICU Level of Service E
Analysis Penod (min): 15

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles # 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles

Splits and Phases: 10: Military Rd S & S 188th St

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LEVEL OF SERVICE CONCEPT

Because intersection capacity and traffic flow performance, or "level of service", are prime factors in the process of developing and evaluating alternatives, a brief description is presented here for the benefit of the lay reader.

The ratio of existing traffic volume to available capacity provides a measure of the intensity of traffic loading relative to the ability of the street intersection to accommodate the traffic. The number of lanes, presence of turn lanes, type of traffic control, signal phasing, etc., are important factors in determining capacity. As the volume-to-capacity (v/c) ratio approaches a value of 1.0 at signalized intersections, extreme congestion sets in, with long backups and several complete changes of the signal cycles occuring before a motorist can proceed. Motorists at stop-sign controlled intersection approaches face extremely long delays when the v/c ratio approaches 1.0. As traffic queues lengthen, this congestion can also impede access to and from upstream abutting property.

The term "level of service" is used to describe traffic flow at intersections. For signalized intersections, the level of service is based on control delay per vehicle (see **table A-1**). Control delay is a measure of all the delay contributable to traffic control measures, such as a traffic signal. Control delay includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration delay.

	Table / Level of Service and Vo Relationships for Signa	lume/Capacity Ratio	
Level of Service	General Description	Control Delay (seconds/vehicle) ¹	Intersection V/C Ratio ²
A	Free flow	≤ 10.0	≤ 0.60
В	Stable flow (slight delays)	10.1 to 20.0	0.61 to 0.70
С	Stable flow (acceptable delays)	20.1 to 35.0	0.71 to 0.80
D	Approaching unstable flow (tolerable delay - occasionally wait through more than one signal cycle before proceeding)	35.1 to 55.0	0.81 to 0.90
E	Unstable flow (intolerable delay, intersection operating at capacity)	55.1 to 80.0	0.91 to 1.00
F	Forced flow (jammed)	> 80.0	> 1.00

^{1.} For operational analysis method which requires detailed geometric, traffic, and signal information usually used for existing conditions analysis.

Source: "Highway Capacity Manual", Transportation Research Board, 2000; and "Interim Materials on Highway Capacity", Circular 212, Transportation Research Board, 1980.

^{2.} For planning-level analysis method. Planning-level analysis is used when there is less certainty in the input when default values are typically relied upon and future traffic forecasts are used.

Level of service A is a condition of unimpeded flow, while level of service C is often used in the design of new urban streets as the lowest acceptable level for peak periods. Congestion begins to occur at level of service D (v/c from 0.81 to 0.90). Because of funding and/or environmental constraints for improvements, this level of service is being used by more and more cities as an adequate level, particularly for improvements to congested existing facilities. Increasingly unstable traffic flow with excessive delay and congestion occurs as level of service E (capacity) is approached (v/c = 0.91 to 1.00). For v/c > 1.00, level of service F (forced flow) is obtained, and the intersection is overloaded or is jammed due to traffic backups from overloaded downstream intersections.

It should be noted that equal v/c ratios at several locations do not necessarily indicate equal overall performance of intersections. One intersection may experience a high v/c ratio for a considerable period of the day while at another intersection the peak period lasts a short time. In addition, a low level of service is more tolerable at a low-volume intersection than a high-volume location.

The general level of service concept also holds for stop-sign controlled intersections, although the capacity of the stop-sign controlled approaches is less than that of the signalized intersection approach. **Table A-2** shows the level of service criteria for unsignalized intersections.

Control Delay (d) ¹	Level of Service
d ≤ 10	,
10 < d ≤ 15	В
15 < d ≤ 25	
25 < d ≤ 35	D 444.11
35 < d ≤ 50	
d > 50	F2 4. 14.

- 1. Control delay is measured in seconds per vehicle.
- For level of service F, when demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants improvements to the intersection.

Source: "Highway Capacity Manual", Transportation Research Board, 2000.

Capacity analysis for two-way stop-sign controlled intersections is based on the assumption that major street traffic is not affected by the minor street movements, and that left-turns from the major streets to the minor streets are influenced only by opposing major street through flow. Therefore, the level of service calculated for two-way stop intersections is based on delay experienced by only the minor street movements and the major street left-turn movement.

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SUbject: Bow Lake Transfer Station - Summary of Preliminary Transportation Assessment	MANAGEMENT AND

This memorandum briefly documents the results of the preliminary traffic assessment of access enhancement options for the existing Bow Lake Transfer Station, that were presented to KCSWD staff at a meeting March 5, 2004. It includes:

- Background
- Comparison of Alternatives
- Summary

Background

Options to enhance access at the Bow Lake transfer station have been under investigation by the RW Beck team since summer 2003. Current site access is hampered by the close proximity of the transfer station access road to the existing ramp terminals at the S 188th Street/I-5 Interchange. This close spacing results in traffic queue interference with access traffic, especially slower moving transfer trucks. In addition, safety is a concern for traffic entering S 188th Street from the site, and for left turning traffic from S 188th Street into the site. The Bow Lake Transfer Station remains an important component of King County solid waste management strategy far into the future.

Range of Options Considered

A wide range of access enhancement options have been considered by the team, ranging from minor channelization modifications, to traffic signalization of the site entrance intersection with S. 188th Street, to significantly more-expensive roadway and ramp revisions requiring coordination with Washington State Department of Transportation (WSDOT) to effectively implement. None of the lowest cost options provided any substantial benefit to improve existing traffic operations, or adequately accommodate future traffic volume levels associated with anticipated growth.

The only conceptual option that was determined to provide adequate traffic operational benefit was to combine the I-5 northbound ramps with the site access road, as well as S. 188th Street and Orilla Road approaches, into what is commonly referred to as a single point interchange. The most recent analysis has focused on this

core option, with further examination of permutations of this option. The most current evaluation focuses on the following options:

- **Single Point Interchange (SPI)** Basic design which brings the west leg of S. 188th Street into a single intersection with the I-5 northbound ramps, the east approach from Orillia Road, together with the access to the Bow Lake Transfer Station.
- SPI With Right Turn Bypass Removes right turning traffic from the I-5 northbound off ramp from the intersection, and accommodates them in a separate turning ramp to eastbound Orillia Road.
- SPI With Right turn Bypass and Orillia Road/I-5 Northbound Flyover

 This option removes the westbound Orillia Road destined for northbound for northbound I-5 from the intersection operation by accommodating them in a flyover ramp.

The basic option (SPI) improves operation over existing conditions by accommodating all traffic at a single point, allowing signalized control of the Bow Lake Transfer Station access, and doing so in a way that increases intersection spacing between the northbound and southbound I-5 ramp terminals. Implementation of any of the options above will require the close coordination between WSDOT and King County, as well as the neighboring city of Tukwila.

The analysis considered the following traffic characteristics:

- Background Traffic Growth A long range traffic horizon was considered.
 Traffic forecast factors were acquired from King County, and included the
 Green River Valley and Highline subareas, which are forecast to grow at
 approximately 23 and 5 percent, respectively. Application of these two data
 points resulted in consideration of a worst case and probable traffic forecast
 for 2023 conditions.
- AM and PM Peak Hour Traffic Analysis Both AM and PM peak hour traffic conditions were examined.
- Intersection Level of Service Traditional intersection analysis was conducted to assess future traffic delays and compare the affect of the identified options on the traffic capacity of the I-5/S 188th Street/Orillia Road freeway ramps and site access driveway.
- Traffic Queuing The close spacing of the S. 188th Street ramp terminals with northbound and southbound I-5, together with the Bow Lake Transfer Station access road, requires consideration of the relative effect of traffic queues occurring between intersections to understand the operational viability of future options.

Comparison of Alternatives

The following summarizes the preliminary traffic assessment of the single point interchange options considered. It describes intersection Level of Service (LOS), traffic queuing, and other factors relevant to comparing the operational options for the following

Intersection Level of Service

Attachment 1 (E@S Handout from Meeting) summarizes the LOS analysis for each of the alternatives for 2023 conditions. Two scenarios were developed. First, a worst case assumption that all traffic would grow at a rate consistent with the Green river Valley growth factor (23%) was evaluated. Second, a hybrid growth rate that applied the Green River Valley rate only to the east leg of the intersection (Orillia Road approach) while applying the lower 5 percent growth rate to the other primary approaches. The latter reflects a more-reasonable approach, in that the high level of existing traffic associated with the I-5 off ramps, as well as S. 188th Street to the west, are likely to grow at a substantially lower rate than the higher growth Green River Valley. They are both presented to reflect sensitivity analysis.

The analysis summarized in Attachment 1 generally shows that the PM peak hour will continue to experience higher levels of traffic congestion than occur during the AM peak hour. It also shows that the blended growth rate results in more-feasible levels of service associated with each of the options. During the PM peak hour, resulting traffic operations would be similar for both the basic and basic with right turn bypass case, LOS "E". When the effect of the traffic removed as a result of the flyover ramp is added, operations would improve by a complete level of service, resulting in LOS "D", and about 15 seconds less delay than described for the other options in the PM peak hour.

In summary, traffic growth to 2023 will contribute to further substantial decline in overall street system and access performance surrounding the Bow Lake Transfer Station. The single point interchange will improve operations and safety compared to doing nothing, but alone would result in continued significant delays. Addition of the right turn ramp bypass alone would improve AM peak hour operations, but have a minimal impact on relieving PM peak hour congestion. However, with the addition of the flyover ramp to eliminate westbound traffic from Orillia Road to northbound I-5 from the intersection, a significant operational improvement could occur.

Traffic Queuing

Traffic queuing associated with the 2023 conditions were also reviewed. All options would provide adequate queuing capacity to accommodate anticipated traffic demand, with the exception of the eastbound approach to the intersection on S. 188th Street. This movement currently has traffic queues that exceed the available capacity, and will continue to do so in the future under any scenario. This queuing, while significant, would not directly affect the access viability for the single point

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interchange in serving the Bow Lake Transfer Station. However, fully understanding the interaction between traffic signals and intersections in the interchange area will require ongoing evaluation, and may receive additional scrutiny in light of any specific development or transportation improvement proposal.

Summary

KCSWD is considering the further development of the Bow Lake Transfer Station to support the County's solid waste management strategy. Current site access is problematic in that heavy through traffic volumes on S. 188th Street, together with turning movements associated with the closely spaced I-5 ramp terminals, result in substantial access delays, and safety concerns for traffic turning into and out of the Bow Lake site. Of the range of improvements considered, the modification of the I-5 northbound ramps to realign the landing point to provide a 5-way single intersection that combines the Bow Lake access road provides improved safety and operations. However, in order to provide operating conditions of LOS "D" or better during both AM and PM peak hour conditions, it is necessary to consider further substantial investment in the roadway infrastructure, including the development of a single point interchange with the I-5 northbound ramp terminal and the Bow Lake transfer station access, incorporation of a separate right turn access from the northbound off-ramp to eastbound Orillia Road, and the development of a flyover structure to intercept westbound Orillia Road traffic destined for northbound I-5.

Based on this analysis, further investigation of the feasibility and cost of construction associated with this concept should be undertaken.

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Attachment

M\02\02150 Bow Lake TS\Summary Memo - Traffic Assessment.doc

The Transpo Group

ATTACHMENT

Bow Lake Transfer Station Level of Service

PM Peak Ho	η , Ι (θ\$ <u>Ε</u>	Single P	oine NB	temoli	लिख्या)II ,
	2023 with	ı Green Vall	ey Growth		vith Highline alley Growt	n e
Intersection Options	.LOS!	Delay ^z	V/C!	LOS	Delay	V/C
Basic Design	Control of the contro	88.4	1.08	2 10 E 10 10 10 10 10 10 10 10 10 10 10 10 10		1.01
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flyover*

w/ right by-pass and

Level of Service.
Average delay in seconds per vehicle.
Volume to capacity ratio.
The flyover alternative was also evaluated with the existing intersection geometry. The results indicated overall operations were similar to or worse than the option with the flyover added to the single point intersection; and resulting traffic queues between existing intersections were unacceptable.

AM Peak Hour LOS - Single Point NB Ramp Intersection

	. 2023 with	Green Vall	ey Growth	. 2023 v	vith Highline /alley Growt	/Green h
Intersection Options	j. LOS=1	Delay	V/C	Los	Delay 😸	V/C :
Basic Design	The second secon		1.04	1,740 C. (1) E-17-10 E-17-10	61.4	0.98
w/ right by-pass	The second secon		0.98	D	A C 0	U.93
w/ right by-pass and flyover!	D	37.7	0.87	The second secon		0.78

- Level of Service:
 Average delay in seconds per vehicle.
 Volume to capacity ratio.
 The flyover alternative was also evaluated with the existing intersection geometry. The results indicated overall operations were similar to or worse than the option with the flyover added to the single point intersection; and resulting traffic queues between existing intersections were unacceptable.

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