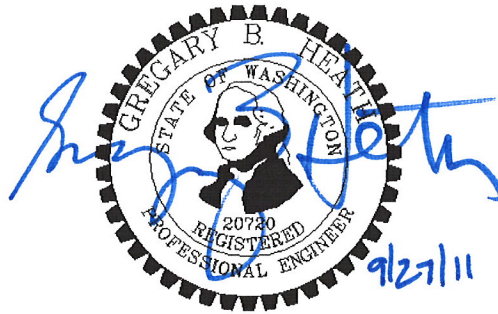




FRED HILL MATERIALS  
CENTRAL CONVEYOR & PIER  
TRAFFIC IMPACT ANALYSIS

*JEFFERSON COUNTY, WA*



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90th Percentile Existing Hourly Volumes and Vehicle Type Percentages  
Existing, 2021, and 2031 Volumes  
2021 Queues  
2031 Queues

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*I. INTRODUCTION*

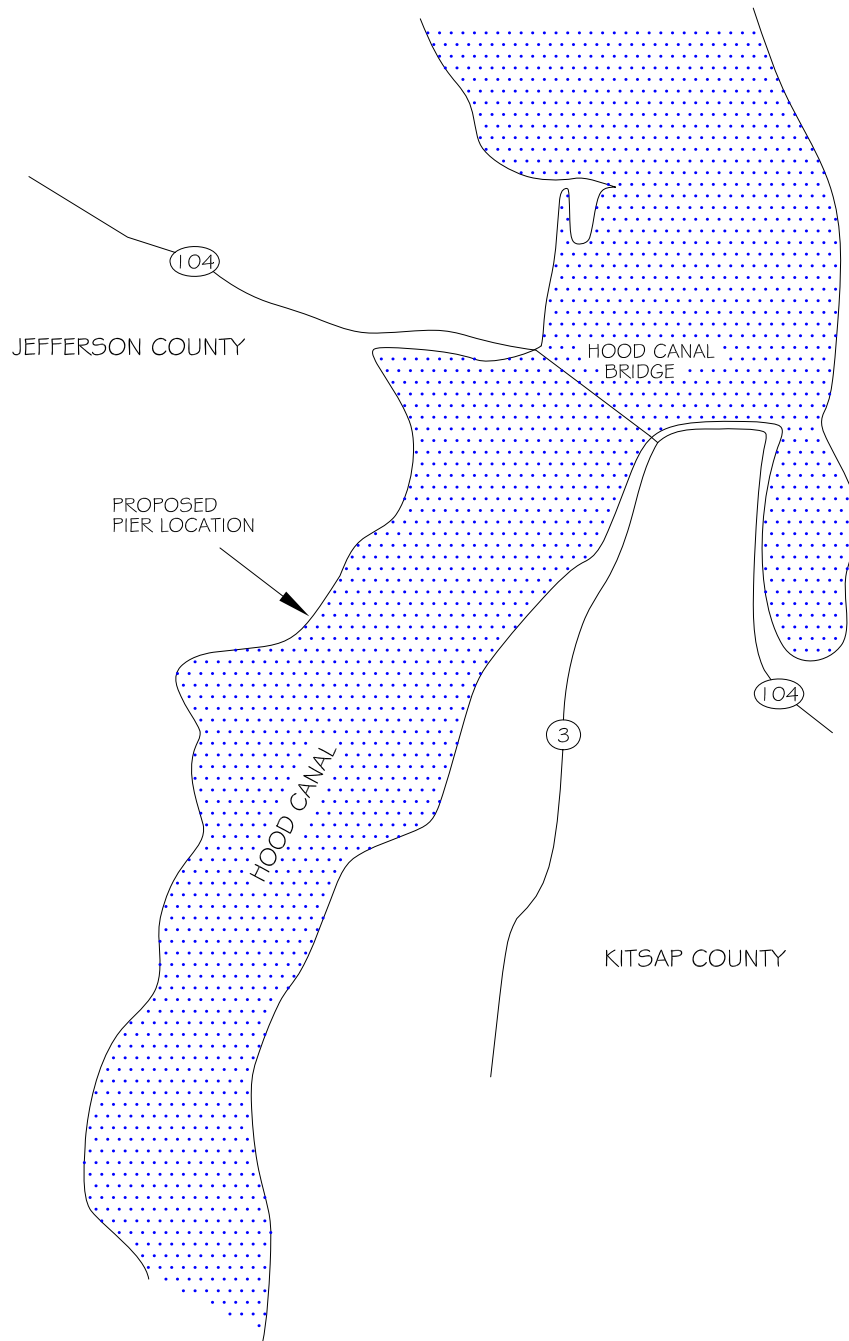
Vehicular travel is an indirect yet important and dynamic element of new development which affects existing street networks and intersections near a project site. New development, such as residential subdivisions or commercial projects, typically translate into added vehicle trips on adjacent roadways which often causes an increase in traffic congestion to the local area. This study serves to examine traffic impacts related to the proposed Fred Hill Materials Central Conveyor & Pier project. The main goals of this study focus on the assessment of existing traffic conditions and congestion on the Hood Canal Bridge, forecasts of future traffic levels, estimations of future project ship activity through the Hood Canal, and estimations of future queues during potential bridge closures. The first task includes the collection of general roadway information, road improvement information, and hourly traffic counts. Next, future volume levels were determined for applicable horizon years. Following this forecast, a time of day analysis was performed to determine potential queues from bridge openings, and optimal operational times for project ship activity in order to minimize traffic impacts. As a final step, appropriate conclusions and possible mitigation measures are defined.

*II. PROJECT DESCRIPTION*

The proposed project is a conveyor and pier to move sand and gravel from the Thorndyke Resource Operations Complex (T-ROC) hub to Hood Canal for marine transport by barges and ships. The general project site is located in Jefferson County, to the west of the Hood Canal Bridge. Figure 1 on the following page provides a general site map of the vicinity, and shows the WSDOT traffic camera locations.

The project will have multiple components, including an increase in mining extraction rates from the marine transport capacity, a reconfiguration of the Operations Hub at the Shine Pit, a central conveyor connecting the Operations Hub to the pier, and the pier which will be located on the Olympic Peninsula side of Hood Canal, roughly five miles south of the Hood Canal Bridge and one mile northeast of Thorndyke Bay. Finally, barges and ships up to Panamax class will provide marine transport of the sand and gravel to local, regional, intrastate, and interstate markets.

Sand and gravel extraction would be from the Wahl and Meridian extraction areas. Pier operations would be limited to barge transport for the first 8 to 12 years, after which ship transport is expected to become available. Barges are low enough to pass under the Hood Canal Bridge without requiring the bridge to be opened. Ships would require the bridge to be opened, however.



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### III. EXISTING CONDITIONS

#### A. Surrounding Roadway Network

The primary road of interest is *SR-104*, which runs between US-101 and Kingston, and includes the Hood Canal Bridge. The typical cross section is two 12 foot lanes plus 8 foot shoulders on the bridge. The posted speed limit ranges from 40 mph on the bridge to 60 mph west of the bridge. Pedestrian and bicycle crossings are permitted.

The other road of interest is *SR-3*, which begins on the east side of the Hood Canal Bridge and runs southerly towards Shelton. The cross section in the bridge vicinity is typically two 12 foot lanes plus 8 foot shoulders. The speed limit is 45 mph just south of the bridge, transitioning to 55 mph further south.

#### B. Roadway Improvements

The WSDOT projects list indicates a future improvement to the Hood Canal Bridge of shoulder enhancements for bicyclists and pedestrians. The project is to go out to bid in 2012.

A review of the latest (2011-2016) Kitsap County Six-Year Transportation Improvement Program (TIP) indicates no improvement projects in the bridge vicinity. A review of the 2012-2017 Jefferson County Six Year TIP also indicates no improvement projects in the vicinity.

#### C. Existing Hourly Volumes

Field data for this study was collected from the WSDOT permanent traffic recorder R085, located on SR-104 at the Hood Canal Bridge at milepost 13.92. Traffic count data used in this report is from January 1, 2007 through April 30, 2011. Data includes hourly volumes for both the eastbound and westbound directions, as well as vehicle class. The raw data was processed to determine the average volumes, various percentile volumes, and vehicle classification for each hour of day for each day of week over the 5-year span. This analysis will focus on the 90th percentile volumes for each hour of day, and each day of week. The 90th percentile provides statistical volumes that are much higher than the typical average volumes, and is higher than the 85th percentile typically used in traffic applications. It should be noted that if too high of a percentile is used, there is a risk of influence from anomalous data such as high volumes from the days before scheduled bridge closures, hourly volumes that are higher than normal due to a bridge closure in the previous hour, or holidays (which are not relevant since barge and ship loading would not occur, see Section IV Part A below). Note that since calculations are performed individually for each hour of day, the sum of the 90th percentile volumes per hour for each of the 24 hours of a day will be higher than most continuous 24 hour days from the raw data. Summaries of the peak hourly volumes per direction and day of week can be found in the appendix.

#### D. Existing Bridge Operations

The Hood Canal Bridge has the capacity to open a single draw span for 300 feet of opening, or both draw spans for a 600 foot opening. The opening procedure takes less time than the closing procedure, due to additional time required for realignment of the spans when closing. The typical total time for the full bridge opening/closing procedure (traffic gates down to traffic gates up) is 25 to 30 minutes for ships crossing under their own power, or 30 to 40 minutes for a tug and tow crossing (when height or width precludes crossing without having to open the bridge). The times can vary depending on tide conditions, as the cables are stretched out more during high and low tides. The crossing speed for marine traffic is asked to be held to 7 knots. Requests for bridge openings must give at least 1 hour notice. Current data indicates approximately 32 bridge openings per month for marine vessels. Openings for Navy vessels are not recorded, although SR-104 closure times can be substantially longer for Navy ship crossings.

The Hood Canal Bridge Project was completed in 2010 by the Washington State Department of Transportation (WSDOT). In 2008, the east half of the Hood Canal Bridge was replaced as part of an overall structural upgrade, bridge widening and improved draw span design and function. The west half was then retrofitted so that the hydraulic, electrical and mechanical systems matched the new east half. There were numerous bridge closures throughout the project. The bridge is currently two lanes (capable of four) with wide shoulders.

WSDOT operates the Hood Canal Bridge under license *No. 105c-80-13* from the U.S. Coast Guard. Federal law requires that WSDOT open the bridge for all requests by ship captains. Bridge safety and navigation fall under federal legislation (*see U.S. Coast Guard Bridge Administration Commandant Publication P16591.3B*) and are the exclusive domain of the U.S. Coast Guard. The Rivers and Harbors Act of 1899, the General Bridge Act of 1946 and subsequent Acts and amendments preserve the public right of navigation and prevent interference with interstate and foreign commerce. The authority granted to the Secretary of Transportation pertaining to bridges and causeways over U.S. navigable waters was delegated in 1967 to the Commandant, U.S. Coast Guard (*Department of Transportation Order 1100.1 dated 31 March 1967 (49 CFR 1.46(c))*).

As such, the navigable waters of the United States are under the exclusive control of the Coast Guard to prevent any interference with their navigability by bridges or other obstructions except by express permission of the U.S. government. A recent example (2011) was evidenced when WSDOT requested the Coast Guard to prohibit Hood Canal Bridge openings during afternoon commuter hours (3 PM to 6 PM). The Coast Guard granted the request under trial conditions for a few months, with the trial period ending on September 30. Analysis done in this report presumes that this prohibition will become permanent, pending test results and feedback on the trial program.

#### IV. FUTURE TRAFFIC CONDITIONS

##### A. Pier Transport Activity

As mentioned previously, transport for the first 8 to 12 years of pier operation is expected to be via barges with tugs. Barges would be required by contract to cross the Hood Canal Bridge under the 230 foot eastern span, and not require a bridge opening. As such, barge activity would have no impact to vehicular traffic crossing the bridge. The typical barge capacity would be around 5,000 dwt. The loading time for such a barge would be roughly 2 to 3 hours. Barge transport would be in operation 24 hours a day, seven days a week, and 300 days a year. Up to 6 barges a day could be berthed and processed, resulting in up to 12 barge crossings a day under the eastern span.

The ships required for transport of sand and gravel at the proposed pier are currently not available in this region. The Thorndyke Resource project application limits itself to a maximum berthing of six ships (12 bridge openings) each month, when such ships do become available on the West Coast, and further stipulates that “only ships will require opening of the Hood Canal Bridge.” The Applicant also states that all captains of tugs and barges calling on the proposed pier are required to transect the bridge under its eastern span (Kitsap County end), and expressly prohibits tugs and barges to compel bridge openings. Furthermore, the application excludes Pier use 65 days annually for holidays, tribal fishing, inclement weather and periods of non-use. Analysis done in this report incorporates these project limitations.

After 8 to 12 years, market conditions and activity are expected to be such that the required ships would become available. Ships up to Panamax class, which is up to 110 feet wide and 745 feet long, could be used. The capacity of a Panamax class ship would be up to roughly 65,000 dwt. The time due to loading at the pier would result in turnaround times of up to 24 hours for the Panamax class, or as low as 8 hours for a smaller ship of 20,000 dwt capacity.

Some comments received by Jefferson County during its scoping process focused on the likelihood of vessels calling on the proposed pier hitting and damaging the bridge. The Coast Guard defines the act of vessels (moving object) hitting a bridge (stationary object) as an “allision” (*Coast Guard-American Waterways Operators Bridge Allision Work Group Report, 2003*).

Bridge allisions are not a presumed condition of this report and are outside the scope of this report, which pertains to county and state jurisdictions. The Coast Guard will review the proposed project as part of the U.S. Army Corps of Engineers (COE) permit application for determination of any required condition and/or mitigating measure to assure compliance with applicable regulations.

## B. Future Traffic Volumes

For this project the horizon analysis years of 2021 and 2031 were chosen for 10 year and 20 year outlooks. The 10 year horizon represents the start of ship transport for the pier. Traffic volumes for the horizon years was taken by applying a 1 percent annual growth rate to the 90th percentile volumes obtained from the existing counts of SR-104 at the Hood Canal Bridge. This annual growth rate should be a conservative estimate, as WSDOT data indicates no growth over the past 4 years. Refer to the WSDOT Annual Traffic Report at the back of the appendix. However, a rate of 1 percent was chosen in order to incorporate some future growth.

## C. Queue Model

The queue analysis was performed to determine the extent of traffic backups for a typical 30 minute bridge opening during higher than average traffic volumes. As noted above, this study uses 90th percentile volumes for each hour of day and day of week, using the last 5 years of WSDOT data from the automated counter. A Panamax class ship is larger than average, however with a crossing speed of 7 knots and 750 foot in length, a Panamax ship would cross the bridge itself in just over a minute. As noted previously, the bridge span operations, especially closing (due to alignment issues), are the key factor in the time duration during which the bridge is closed to traffic. A 30 minute opening is assumed for this analysis, on the high end of the 25-30 minute range.

The queue analysis takes into account the percentage of each design vehicle, assigning lengths based on AASHTO design vehicle specifications. The vehicle types are: Passenger Vehicle (P design vehicle), Single Unit Truck (SU design vehicle), Double Unit Truck (WB50 design vehicle), and Triple Unit Truck (WB67D design vehicle). The assumed lengths for vehicle spacing (front of bumper to the following front of bumper) are: Passenger Vehicles (including motorcycles) 25 feet, SU Trucks 45 feet, DU Trucks 70 feet, TU Trucks 90 feet. Base queue calculations for the 30 minute bridge opening were calculated by multiplying the 90th percentile hourly numbers of vehicles by the vehicle lengths, then dividing by 2 to get the queue for a 30 minute bridge opening period instead of the full hour.

Additional queuing continues after the gates are lifted, as traffic does not instantaneously start moving at the back of the queue. Instead, there is a “wave” that occurs from the start of the queue moving backwards as the cars start moving and accelerating. A queue departure wave at an isolated signal was assumed to have a constant speed of 19.4 ft/s based on observations of queue departure waves by Akcelik and Besley in their report *Queue Discharge Flow and Speed Models for Signalized Intersections*. In this bridge queue analysis, however, a lower speed of 15 ft/s was chosen due to assumptions of additional time for vehicles restarting engines and drivers possibly having a longer reaction time than at a traffic signal. The additional time for the wave to reach the back of the queue (which has meanwhile been increasing) was calculated, then the additional queue accrued during this time was calculated. Naturally, the longer the base queue, the



longer the discharge wave takes to reach the back of the queue. This significant extra time in addition to the 30 minutes assumed during which the bridge is closed, adds up to the point that peak hour factors were not employed in these calculations. Peak hour factors are used for shorter intervals, typically 15 minutes.

Eastbound queues accumulate on the bridge and continue back on SR-104 into Jefferson County. Westbound queues, however, typically extend past the bridge to the SR3/SR-104 intersection. Beyond this intersection, queues stack up to the southwest on SR-3 towards Silverdale and to the northeast on SR-104 towards Port Gamble. Observations indicate queue splits of roughly 85% on SR-3 and 15% on SR-104. These percentages were incorporated into the queue model.

The queue model was entered into an excel spreadsheet, and was then calibrated to approximate existing queues noted in the WSDOT traffic cameras during bridge openings. The specific bridge opening duration for the calibration queue was obtained from the Hood Canal Bridge Supervisor's office. The specific traffic volumes during this period were not known but assumed based on the previous 5 years' worth of collected data. The primary model adjustment in this calibration process was lowering the queue departure wave speed to 15 ft/s, mentioned above.

#### D. Queue Analysis Results

The spreadsheet queue model was applied for each hour for each day of week for the 2021 and 2031 horizon years. Queue output sheets may be found in the appendix. Table 1 on the following page gives the expected queue lengths in feet for the 2021 horizon year. Wednesday was chosen to represent a typical weekday. Data for Monday, Tuesday, and Thursday is not shown in the table for space reasons, but can be found in the appendix. The WB to S and WB to N values represent the westbound queue splits from the SR-3/SR-104 intersection, with WB to S for SR-3 queues towards Silverdale and WB to N for SR-104 queues towards Port Gamble. As the westbound queuing focus is on the split queues on SR-3 and SR-104, the queues from the gates to the SR-3/SR-104 intersection 3200 feet away are not shown. Total westbound queue lengths under 3200 feet correspondingly show up as 0 in the WB to S and WB to N columns. Total westbound queues incorporating this length can be found in the appendix sheets. Line charts for 2021 queues are also provided in Figures 2 through 5. Please note that the queue lengths and data points are not for the specific point in time for the hour of day, but represent the calculated queues for the full hour. For example, the Wednesday peak queue length of 17192 feet is calculated for the hour long period from 10 AM to 11 AM.

The 2021 queue results in Table 1 tend to show more pronounced peaking for the westbound direction than the eastbound direction. It should be noted that the volume data also typically showed higher daily volumes for the westbound direction than the eastbound direction, except for on Sundays. This could be due to tourist volumes leaving the peninsula at the end of the weekend.

**TABLE 1**  
2021 Queue Lengths

Starting Hour	Wednesday			Friday			Saturday			Sunday		
	EB	WB to S	WB to N	EB	WB to S	WB to N	EB	WB to S	WB to N	EB	WB to S	WB to N
12 AM	478	0	0	561	0	0	661	0	0	862	0	0
1 AM	331	0	0	412	0	0	434	0	0	480	0	0
2 AM	544	0	0	555	0	0	503	0	0	364	0	0
3 AM	1161	0	0	1089	0	0	554	0	0	369	0	0
4 AM	2717	0	0	2730	0	0	941	0	0	614	0	0
5 AM	5470	0	0	4586	0	0	1603	0	0	1066	0	0
6 AM	9471	3355	592	8282	2305	407	3264	401	71	1794	0	0
7 AM	12766	5566	982	10707	5089	898	6293	3158	557	3965	182	32
8 AM	13751	6313	1114	12698	5581	985	10013	5831	1029	7013	775	137
9 AM	16759	6841	1207	16025	7420	1309	16030	10292	1816	13442	4840	854
10 AM	17912	8994	1587	20099	11606	2048	18823	17116	3020	21092	8740	1542
11 AM	16701	10246	1808	19531	14413	2543	19673	23182	4091	25856	12490	2204
12 PM	15682	11687	2062	18782	15872	2801	17034	20215	3567	26564	13676	2413
1 PM	16571	11526	2034	18819	17042	3007	16759	20166	3559	29827	12866	2270
2 PM	16404	11936	2106	19968	21351	3768	17024	17116	3020	28339	11713	2067
3 PM	16142	14514	2561	18480	21870	3859	17644	16343	2884	28950	11311	1996
4 PM	15406	15432	2723	17272	23696	4182	20018	13566	2394	30378	10788	1904
5 PM	12828	10419	1839	15782	20358	3593	19258	9819	1733	26926	8734	1541
6 PM	9554	7894	1393	12966	14718	2597	16247	7975	1407	20538	9013	1591
7 PM	6206	4497	794	8237	11661	2058	12042	5452	962	14678	5865	1035
8 PM	4227	3073	542	5575	8269	1459	9451	3857	681	9887	3598	635
9 PM	2877	1745	308	3846	5650	997	6752	2335	412	5803	1775	313
10 PM	2137	0	0	2924	1976	349	4692	1204	212	3599	103	18
11 PM	832	0	0	1284	436	77	1956	0	0	1257	0	0

Figure 2

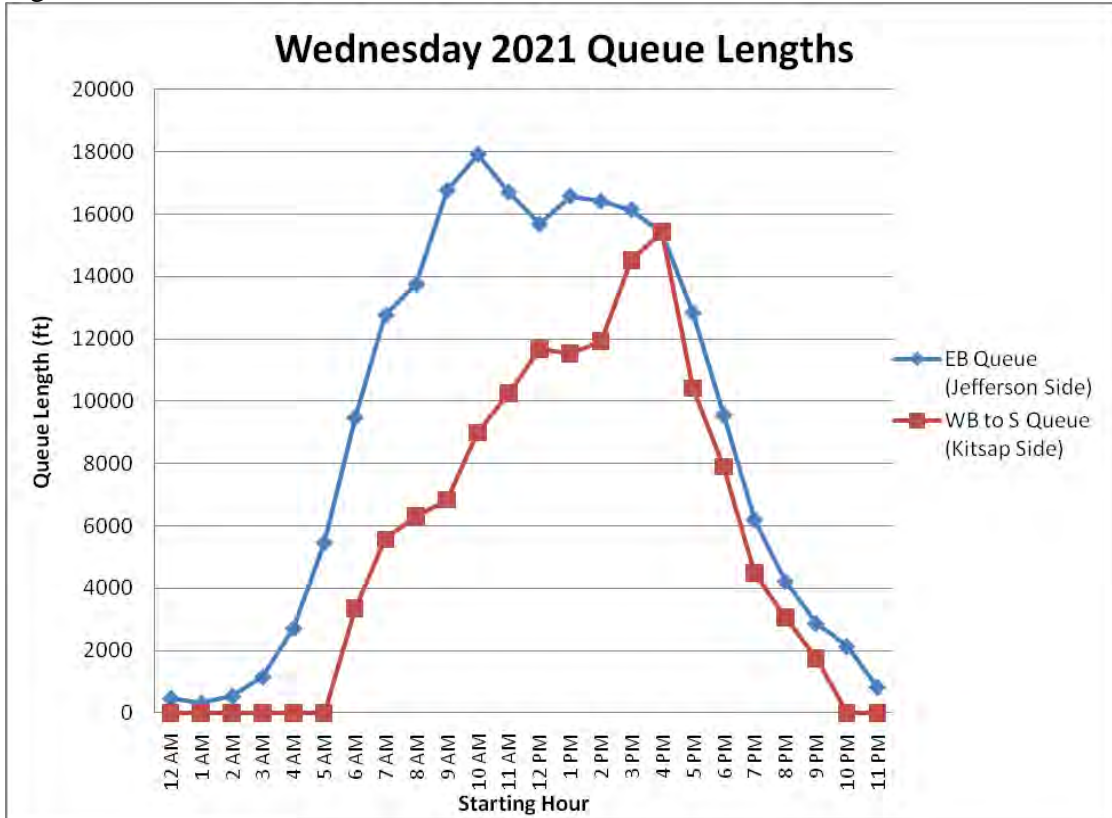


Figure 3

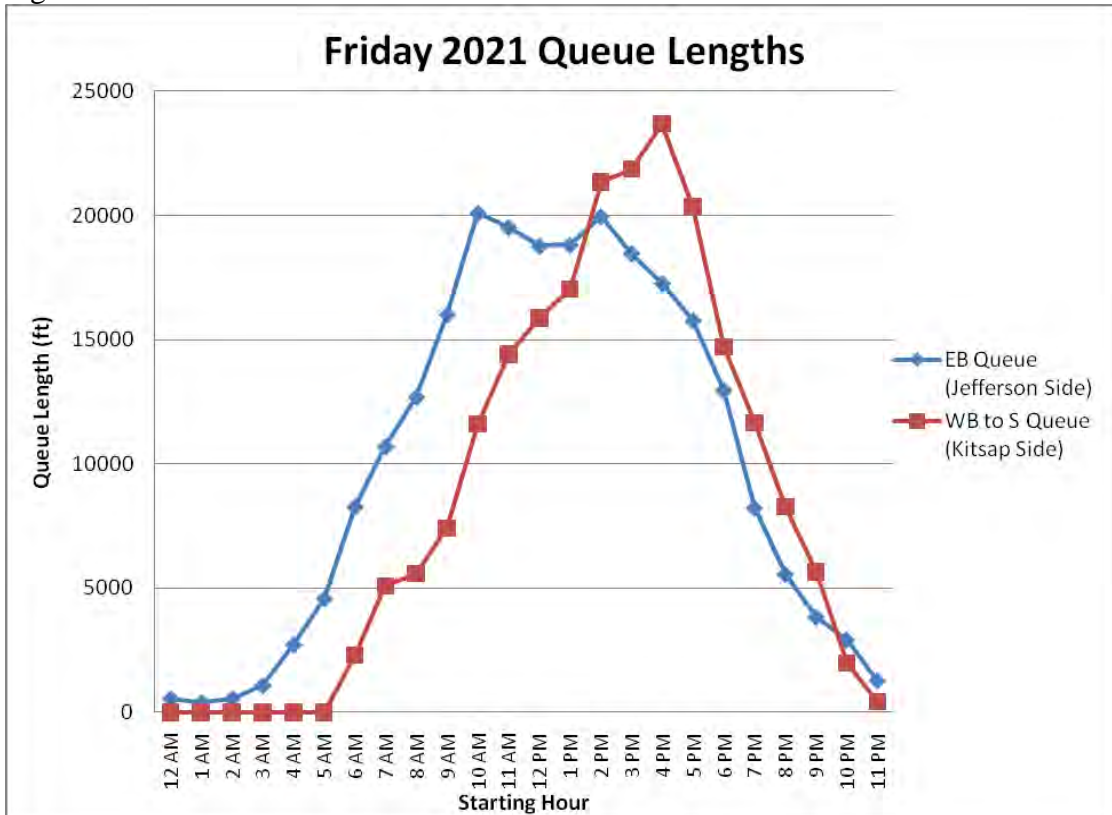


Figure 4

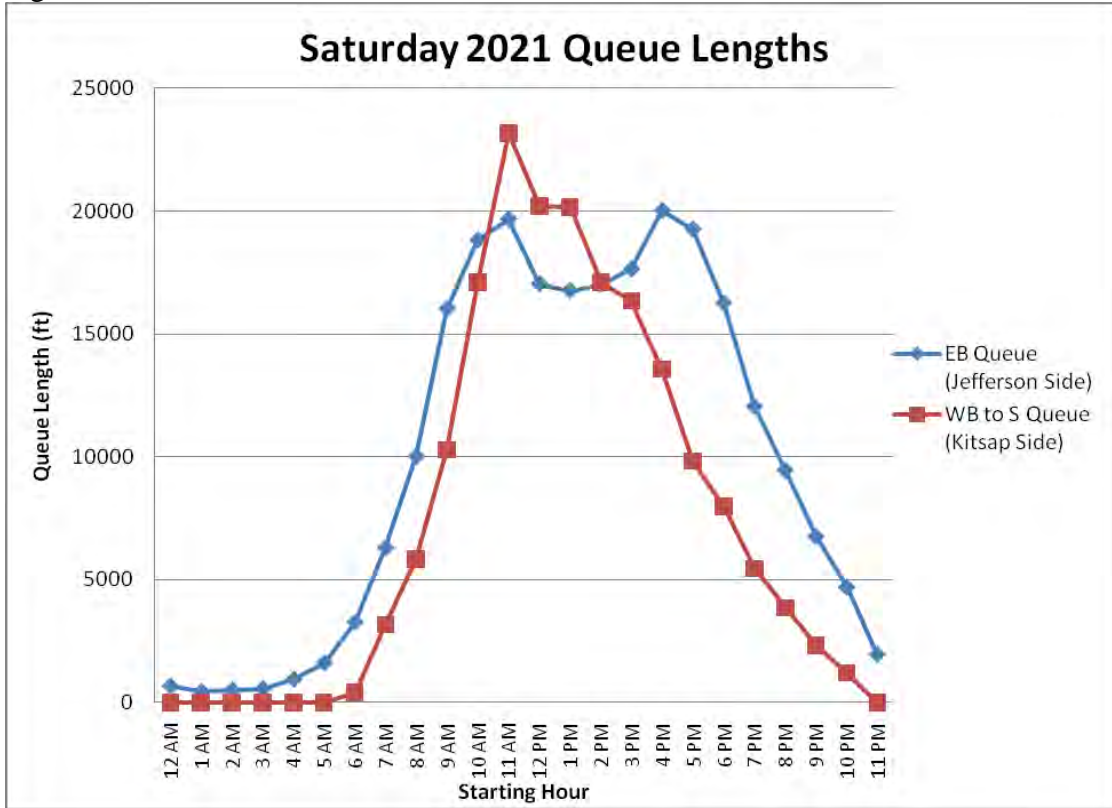
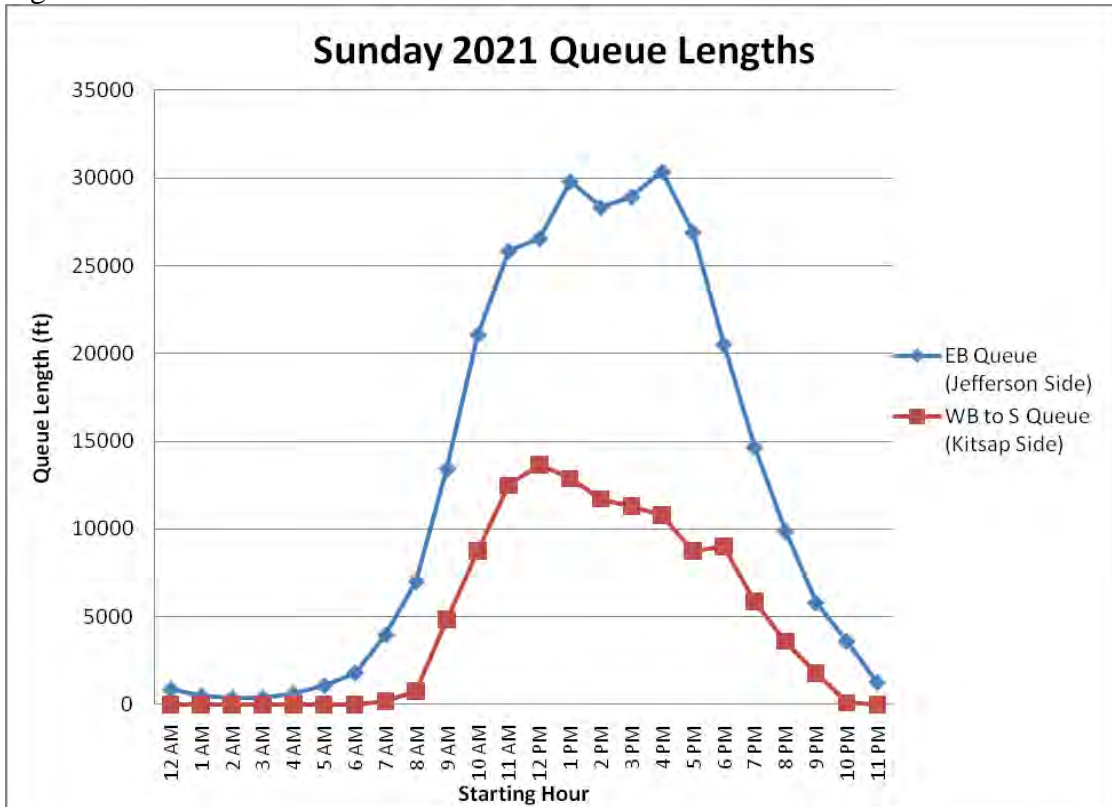


Figure 5



As expected, 90th percentile weekday queues in the AM would be more apparent for the eastbound direction, following the majority of commuter traffic. Eastbound queues would start to become pronounced at roughly 6 AM, increasing every hour until the 10-11 AM period, after which the eastbound queues would start to taper down. Westbound queues would hold steady roughly from this point until increasing substantially at 3 PM through 5 PM, and tapering off after 6 PM.

90th percentile queues would be substantially higher on Friday than during the normal weekdays. Again, AM queuing would be mostly in the eastbound direction particularly starting at 6 AM. Periods of the longest queues would begin roughly around 10 AM and continue to 6 PM, although the westbound queues would show continued increases from the late morning until the peak at 5 PM, without a midday lull.

Saturday eastbound queues would show a peak between 10 AM and 12 AM followed by a pronounced lull, then another peak between 4 PM and 6 PM. Westbound queues show a single peak roughly between 10 AM and 2 PM. The interplay between the two directions results in a lull in overall midday traffic between 2 PM and 4 PM.

Sunday eastbound queues appear to represent the highest expected queuing in the analysis, especially from 10 AM through 7 PM. Westbound queues on Sunday are substantially lower in comparison, with peaks from 11 AM to 5 PM.

Table 2 on the following page shows the expected 90th percentile queue lengths for the 2031 horizon year, while Figures 6 through 9 show the 2031 daily queues in line charts. 2031 shows the same peaking intervals as in 2021, however the queues are naturally higher from the additional years over which the annual growth rate is applied.

Most of the largest queues show an increase of roughly 15 to 20 percent for the 2031 horizon year over the 2021 horizon year. The anticipated higher vehicles per hour rate compounds the queue length due to the additional time required for the back of the queue to start moving, during which the queue continues to accrue. This effect is less pronounced for shorter queues. Also note that the 2031 analysis assumes continual growth and no road improvements for a worst case analysis.

**TABLE 2**  
2031 Queue Lengths

Starting Hour	Wednesday			Friday			Saturday			Sunday		
	EB	WB to S	WB to N	EB	WB to S	WB to N	EB	WB to S	WB to N	EB	WB to S	WB to N
12 AM	529	0	0	621	0	0	732	0	0	955	0	0
1 AM	367	0	0	456	0	0	480	0	0	531	0	0
2 AM	602	0	0	615	0	0	557	0	0	403	0	0
3 AM	1288	0	0	1208	0	0	613	0	0	408	0	0
4 AM	3033	0	0	3048	0	0	1043	0	0	680	0	0
5 AM	6174	232	41	5157	74	13	1781	0	0	1182	0	0
6 AM	10860	4182	738	9451	2961	522	3652	777	137	1995	0	0
7 AM	14836	6793	1199	12339	6225	1098	7126	3952	697	4449	528	93
8 AM	16045	7686	1356	14752	6810	1202	11507	7109	1254	7964	1204	212
9 AM	19799	8322	1469	18874	9023	1592	18880	12560	2216	15665	5929	1046
10 AM	21262	10950	1932	24077	14211	2508	22428	21369	3771	25373	10637	1877
11 AM	19725	12503	2206	23340	17809	3143	23524	29723	5245	31741	15334	2706
12 PM	18443	14313	2526	22375	19719	3480	20146	25573	4513	32710	16854	2974
1 PM	19560	14109	2490	22423	21271	3754	19798	25506	4501	37253	15814	2791
2 PM	19350	14629	2582	23907	27146	4790	20133	21369	3771	35165	14346	2532
3 PM	19020	17940	3166	21988	27872	4919	20920	20341	3590	36019	13838	2442
4 PM	18098	19140	3378	20448	30455	5374	23971	16713	2949	38033	13180	2326
5 PM	14911	12718	2244	18569	25769	4548	22989	11971	2113	33208	10629	1876
6 PM	10960	9601	1694	15080	18206	3213	19153	9700	1712	24648	10973	1936
7 PM	7024	5523	975	9399	14280	2520	13953	6656	1175	17191	7150	1262
8 PM	4747	3852	680	6294	10059	1775	10836	4770	842	11357	4466	788
9 PM	3214	2315	408	4312	6893	1216	7659	2995	529	6558	2349	415
10 PM	2380	111	20	3267	2581	455	5279	1693	299	4032	439	78
11 PM	922	0	0	1426	817	144	2177	104	18	1396	0	0

Figure 6

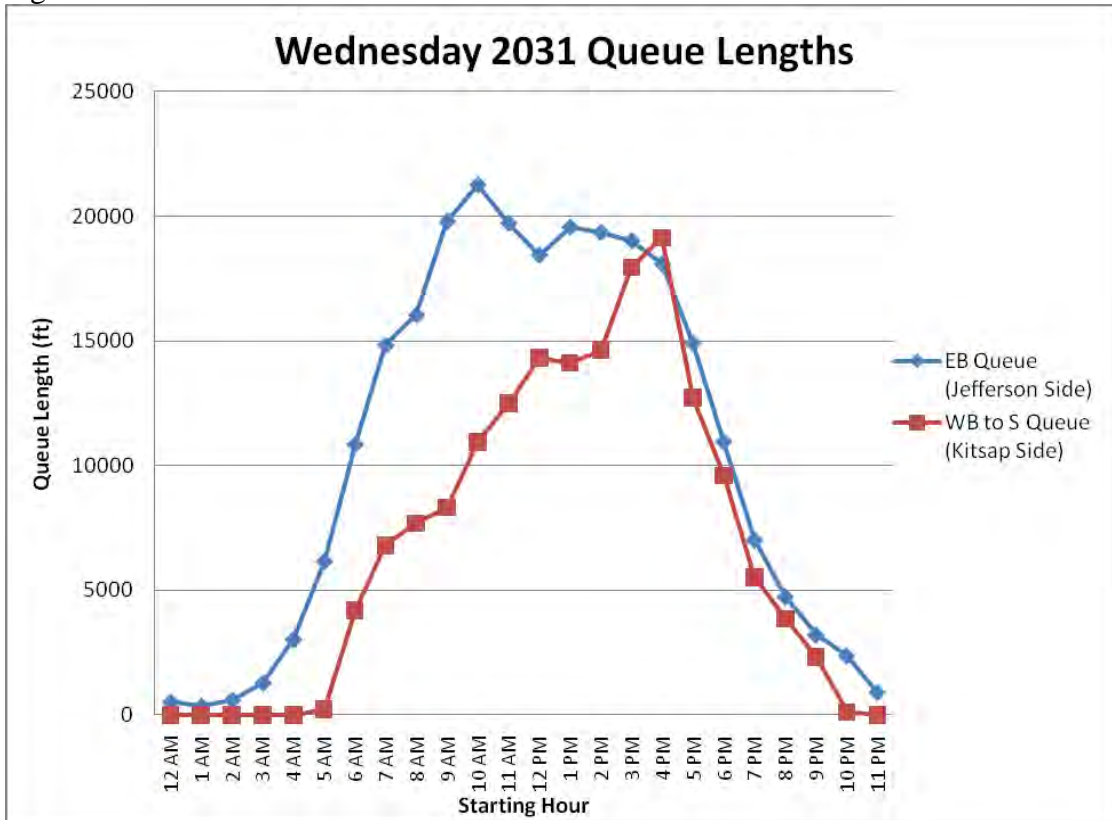


Figure 7

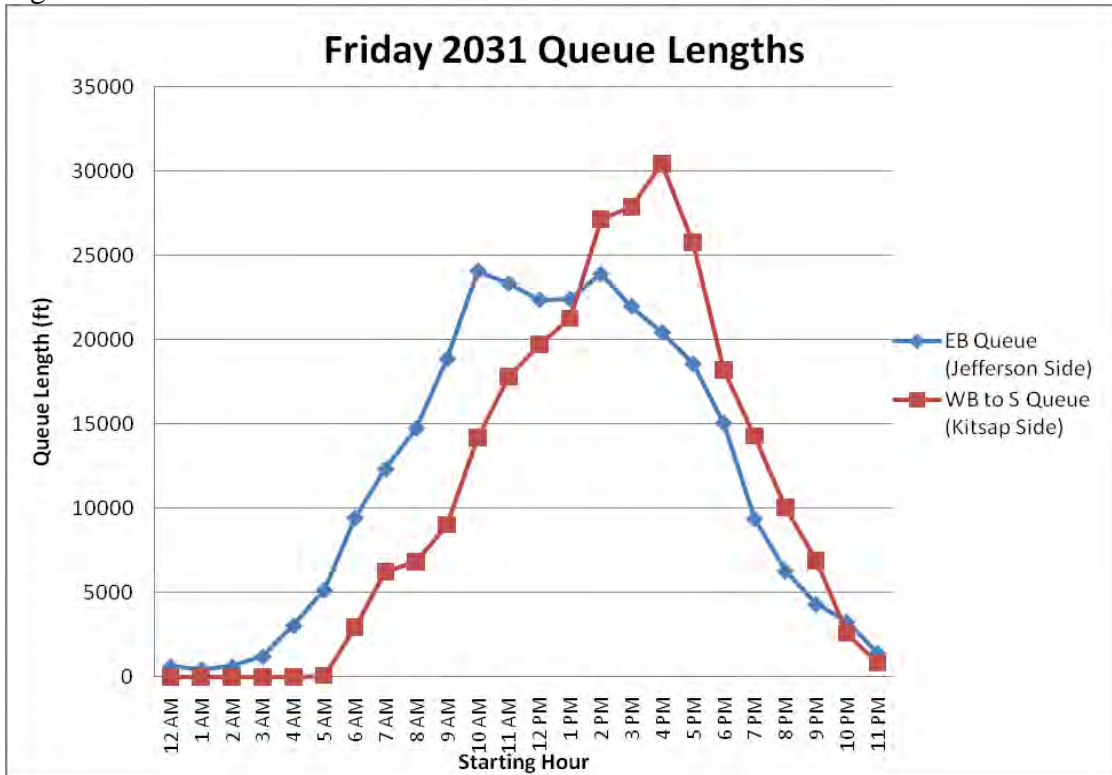


Figure 8

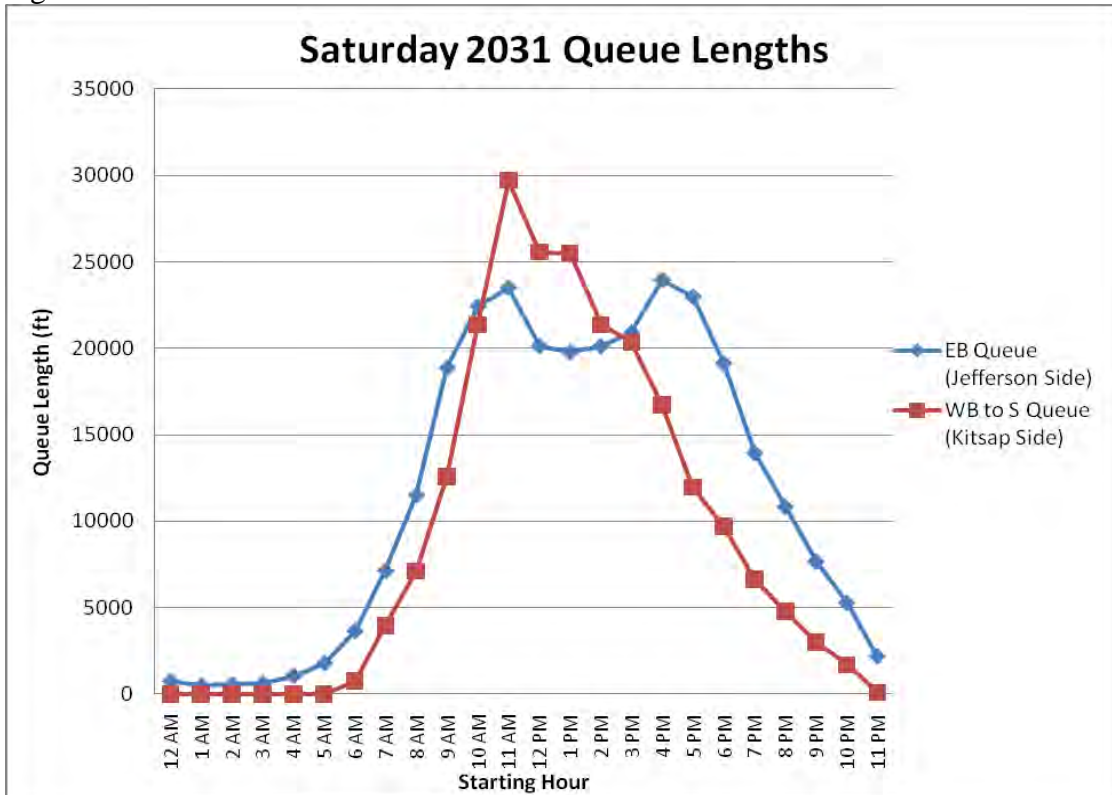
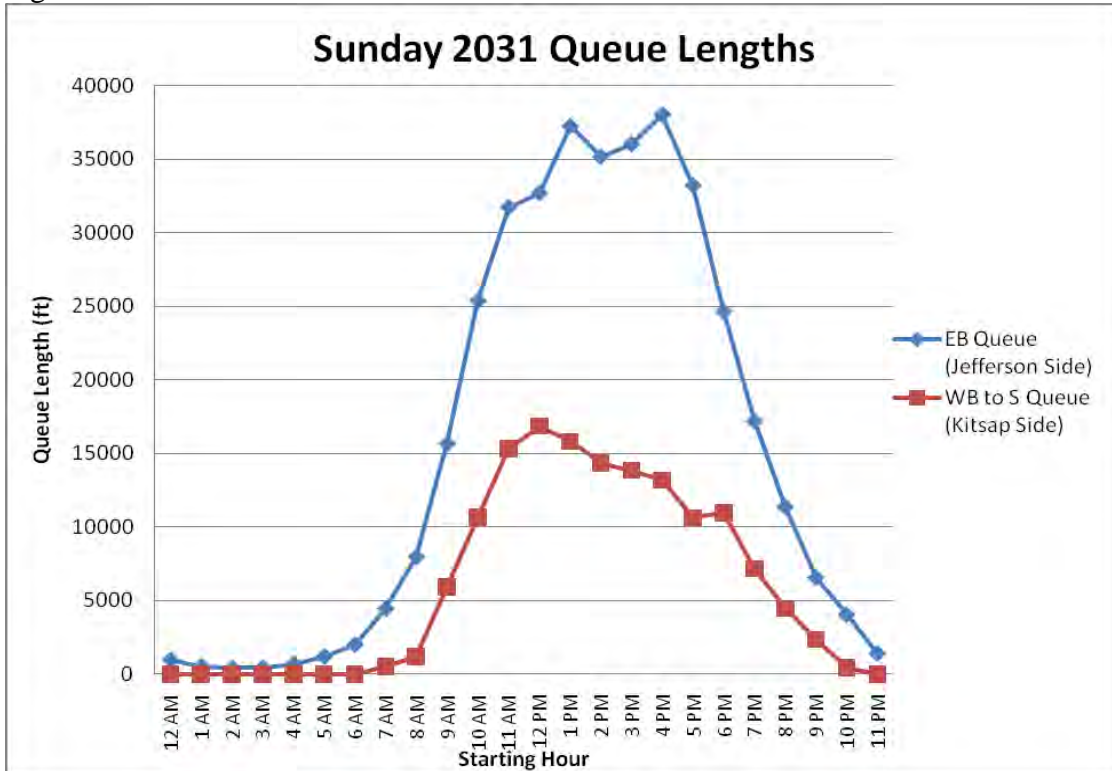


Figure 9





## V. CONCLUSIONS

The Fred Hill Materials Central Conveyor and Pier project is to be located to the southwest of the Hood Canal Bridge on the Jefferson County side. The completed project will begin sand and gravel transport via barge, with no bridge crossing impacts to traffic. Within 8 to 12 years, ships up to Panamax class will be expected to begin transport to and from the proposed pier. These ships would require openings of the Hood Canal Bridge of roughly 30 minutes each trip, with a turnaround cycle time of 24 hours. Ship activity for this project would require 12 bridge openings a month: 6 inbound trips and 6 outbound trips.

In order to assess the impacts to vehicular traffic, a queuing model was employed using data from a WSDOT automated counter at the bridge. Queuing activity was based on 90th percentile hourly volumes for each day of week, with annual increases in volumes expected through the 2021 and 2031 horizon years. The model output could then be used to determine the hours during which bridge openings could cause the least impacts to vehicular traffic on SR-104.

The results of the data are as follows:

- Monday through Thursday weekdays would have the least impact for the window roughly from 6 PM through 6 AM, with a midday lull in traffic from 11 AM to 3 PM. (Peaks from 6 AM to 11 AM, 3 PM to 6 PM)
- Fridays would also have the lowest queues before 6 AM and after 6 PM, however there would be no appreciable midday lull in traffic. (Peak from 6 AM to 6 PM)
- Saturday impacts would be the lowest before 10 AM and after 7 PM, with a midday lull between 2 PM and 4 PM. However, it should be noted that queues during this lull would exceed the peak overall queues on a typical weekday due to the increased volumes. (Peaks from 10 AM to 2 PM, 4 PM to 7 PM)
- Sunday impacts would be lowest before 10 AM and after 7 PM, with potentially the highest 90th percentile volumes of the week for the eastbound direction between those hours. (Peak from 10 AM to 7 PM)

The above peak times could be used to coordinate ship activity for the pier in order to target certain time periods for Hood Canal Bridge openings. The project applicant is proposing to only open the bridge for ships during non-peak hours. Bridge openings during the non-peak hours would minimize impacts so as to not have a substantial impact on queuing and commuter traffic patterns.

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*APPENDIX*

**SR-104 Monday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	32	78	110	0.92	0.03	0.04	0.01	0.9	0.03	0.07	0
1 AM	21	45	66	0.89	0.07	0.02	0.02	0.85	0.08	0.06	0.01
2 AM	25	27	52	0.84	0.04	0.12	0	0.72	0.09	0.15	0.04
3 AM	62	29	91	0.72	0.05	0.22	0.01	0.69	0.15	0.13	0.03
4 AM	178	52	230	0.89	0.04	0.03	0.04	0.58	0.25	0.15	0.02
5 AM	307	158	465	0.91	0.06	0.03	0	0.79	0.1	0.1	0.01
6 AM	439	291	730	0.92	0.04	0.04	0	0.78	0.12	0.07	0.03
7 AM	517	387	904	0.93	0.06	0.01	0	0.82	0.08	0.08	0.02
8 AM	547	417	964	0.94	0.05	0.01	0	0.82	0.09	0.08	0.01
9 AM	625	469	1094	0.92	0.05	0.02	0.01	0.81	0.1	0.07	0.02
10 AM	708	559	1267	0.94	0.04	0.02	0	0.84	0.1	0.05	0.01
11 AM	725	616	1341	0.94	0.05	0.01	0	0.87	0.06	0.06	0.01
12 PM	673	631	1304	0.94	0.05	0.01	0	0.87	0.06	0.06	0.01
1 PM	682	615	1297	0.95	0.04	0.01	0	0.87	0.07	0.05	0.01
2 PM	656	641	1297	0.95	0.04	0.01	0	0.89	0.05	0.05	0.01
3 PM	661	727	1388	0.95	0.04	0.01	0	0.91	0.06	0.02	0.01
4 PM	657	752	1409	0.95	0.04	0.01	0	0.92	0.05	0.03	0
5 PM	590	657	1247	0.94	0.05	0.01	0	0.94	0.05	0.01	0
6 PM	485	513	998	0.96	0.03	0.01	0	0.94	0.05	0.01	0
7 PM	341	378	719	0.95	0.04	0.01	0	0.94	0.04	0.02	0
8 PM	247	328	575	0.95	0.04	0.01	0	0.95	0.03	0.02	0
9 PM	174	254	428	0.95	0.04	0.01	0	0.95	0.04	0.01	0
10 PM	131	149	280	0.97	0.02	0.01	0	0.89	0.06	0.05	0
11 PM	49	128	177	0.92	0.06	0.02	0	0.93	0.03	0.03	0.01
Total	9532	8901	18433								

**SR-104 Monday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	32	78	110	35	86	122	39	95	134
1 AM	21	45	66	23	50	73	26	55	81
2 AM	25	27	52	28	30	57	31	33	63
3 AM	62	29	91	68	32	101	76	35	111
4 AM	178	52	230	197	57	254	217	63	281
5 AM	307	158	465	339	175	514	375	193	567
6 AM	439	291	730	485	321	806	536	355	891
7 AM	517	387	904	571	427	999	631	472	1103
8 AM	547	417	964	604	461	1065	667	509	1176
9 AM	625	469	1094	690	518	1208	763	572	1335
10 AM	708	559	1267	782	617	1400	864	682	1546
11 AM	725	616	1341	801	680	1481	885	752	1636
12 PM	673	631	1304	743	697	1440	821	770	1591
1 PM	682	615	1297	753	679	1433	832	750	1583
2 PM	656	641	1297	725	708	1433	800	782	1583
3 PM	661	727	1388	730	803	1533	807	887	1694
4 PM	657	752	1409	726	831	1556	802	918	1719
5 PM	590	657	1247	652	726	1377	720	802	1522
6 PM	485	513	998	536	567	1102	592	626	1218
7 PM	341	378	719	377	418	794	416	461	877
8 PM	247	328	575	273	362	635	301	400	702
9 PM	174	254	428	192	281	473	212	310	522
10 PM	131	149	280	145	165	309	160	182	342
11 PM	49	128	177	54	141	196	60	156	216
Total	9532	8901	18433	10529	9832	20361	11631	10861	22492

**SR-104 Monday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	496	34	9	<b>505</b>	1239	87	60	<b>1298</b>	0	0
1 AM	332	22	4	<b>336</b>	744	51	21	<b>765</b>	0	0
2 AM	431	29	7	<b>438</b>	539	37	11	<b>550</b>	0	0
3 AM	1252	87	61	<b>1312</b>	573	39	12	<b>586</b>	0	0
4 AM	2925	219	355	<b>3280</b>	1093	76	46	<b>1139</b>	0	0
5 AM	4671	377	977	<b>5649</b>	2806	209	325	<b>3131</b>	0	0
6 AM	6692	593	2205	<b>8897</b>	5223	432	1253	<b>6476</b>	2785	491
7 AM	7610	706	2986	<b>10596</b>	6733	598	2237	<b>8970</b>	4904	865
8 AM	7991	757	3359	<b>11350</b>	7151	649	2576	<b>9728</b>	5549	979
9 AM	9510	979	5171	<b>14681</b>	8147	778	3520	<b>11667</b>	7197	1270
10 AM	10441	1135	6583	<b>17024</b>	9231	935	4796	<b>14027</b>	9203	1624
11 AM	10591	1162	6836	<b>17428</b>	10054	1068	5964	<b>16018</b>	10895	1923
12 PM	9832	1031	5630	<b>15462</b>	10298	1110	6350	<b>16649</b>	11431	2017
1 PM	9888	1040	5713	<b>15601</b>	9952	1051	5810	<b>15763</b>	10678	1884
2 PM	9511	979	5172	<b>14683</b>	10232	1098	6243	<b>16474</b>	11283	1991
3 PM	9583	990	5273	<b>14856</b>	11142	1265	7829	<b>18972</b>	13406	2366
4 PM	9525	981	5192	<b>14717</b>	11359	1307	8250	<b>19610</b>	13948	2461
5 PM	8619	844	4042	<b>12661</b>	9598	993	5294	<b>14891</b>	9938	1754
6 PM	6978	627	2432	<b>9410</b>	7494	692	2879	<b>10374</b>	6098	1076
7 PM	4944	403	1108	<b>6052</b>	5574	468	1450	<b>7024</b>	3251	574
8 PM	3581	275	548	<b>4129</b>	4801	389	1038	<b>5839</b>	2243	396
9 PM	2523	186	260	<b>2783</b>	3683	284	582	<b>4264</b>	905	160
10 PM	1870	134	139	<b>2010</b>	2341	171	222	<b>2564</b>	0	0
11 PM	733	50	20	<b>754</b>	1951	140	152	<b>2103</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Monday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	548	37	11	<b>559</b>	1368	96	73	<b>1441</b>	0	0
1 AM	366	25	5	<b>371</b>	822	57	26	<b>848</b>	0	0
2 AM	476	32	9	<b>484</b>	595	41	13	<b>609</b>	0	0
3 AM	1383	97	75	<b>1457</b>	633	43	15	<b>649</b>	0	0
4 AM	3231	245	439	<b>3670</b>	1207	84	56	<b>1264</b>	0	0
5 AM	5160	425	1219	<b>6379</b>	3099	233	402	<b>3501</b>	256	45
6 AM	7392	679	2787	<b>10179</b>	5770	489	1568	<b>7338</b>	3517	621
7 AM	8406	814	3800	<b>12206</b>	7437	684	2828	<b>10265</b>	6005	1060
8 AM	8827	874	4287	<b>13114</b>	7899	744	3267	<b>11166</b>	6771	1195
9 AM	10505	1146	6690	<b>17195</b>	8999	900	4499	<b>13498</b>	8753	1545
10 AM	11533	1342	8600	<b>20133</b>	10197	1092	6188	<b>16386</b>	11208	1978
11 AM	11699	1376	8946	<b>20645</b>	11105	1258	7759	<b>18865</b>	13315	2350
12 PM	10860	1211	7308	<b>18168</b>	11376	1311	8283	<b>19659</b>	13990	2469
1 PM	10922	1223	7420	<b>18342</b>	10994	1236	7551	<b>18544</b>	13043	2302
2 PM	10506	1146	6692	<b>17197</b>	11302	1296	8137	<b>19439</b>	13803	2436
3 PM	10586	1161	6827	<b>17413</b>	12308	1508	10311	<b>22620</b>	16507	2913
4 PM	10522	1149	6719	<b>17240</b>	12548	1563	10895	<b>23443</b>	17206	3036
5 PM	9521	980	5186	<b>14707</b>	10602	1164	6855	<b>17457</b>	12118	2139
6 PM	7708	719	3080	<b>10788</b>	8278	796	3660	<b>11939</b>	7428	1311
7 PM	5461	456	1385	<b>6846</b>	6157	532	1819	<b>7977</b>	4060	716
8 PM	3956	309	679	<b>4635</b>	5303	440	1296	<b>6599</b>	2889	510
9 PM	2787	207	321	<b>3107</b>	4068	319	722	<b>4789</b>	1351	238
10 PM	2066	149	171	<b>2237</b>	2586	191	274	<b>2860</b>	0	0
11 PM	810	56	25	<b>835</b>	2155	156	187	<b>2342</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Tuesday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	25	77	102	0.77	0.1	0.12	0.01	0.94	0.03	0.03	0
1 AM	19	45	64	0.73	0.16	0.11	0	0.89	0.04	0.06	0.01
2 AM	24	30	54	0.65	0.09	0.2	0.06	0.83	0.02	0.1	0.05
3 AM	56	25	81	0.69	0.05	0.24	0.02	0.78	0.11	0.07	0.04
4 AM	156	45	201	0.86	0.06	0.06	0.02	0.53	0.27	0.14	0.06
5 AM	289	145	434	0.86	0.09	0.04	0.01	0.73	0.13	0.11	0.03
6 AM	447	287	734	0.88	0.07	0.03	0.02	0.76	0.12	0.09	0.03
7 AM	519	389	908	0.87	0.07	0.04	0.02	0.79	0.1	0.09	0.02
8 AM	582	424	1006	0.85	0.07	0.06	0.02	0.78	0.11	0.09	0.02
9 AM	635	480	1115	0.86	0.08	0.05	0.01	0.83	0.09	0.07	0.01
10 AM	659	548	1207	0.88	0.06	0.05	0.01	0.84	0.09	0.06	0.01
11 AM	630	589	1219	0.87	0.07	0.05	0.01	0.87	0.07	0.06	0
12 PM	612	635	1247	0.87	0.07	0.05	0.01	0.86	0.06	0.06	0.02
1 PM	616	591	1207	0.87	0.08	0.04	0.01	0.88	0.07	0.04	0.01
2 PM	603	625	1228	0.87	0.08	0.04	0.01	0.88	0.07	0.04	0.01
3 PM	616	755	1371	0.89	0.07	0.04	0	0.91	0.06	0.02	0.01
4 PM	630	767	1397	0.9	0.07	0.03	0	0.93	0.05	0.02	0
5 PM	558	670	1228	0.92	0.05	0.02	0.01	0.93	0.05	0.02	0
6 PM	440	551	991	0.94	0.04	0.02	0	0.94	0.04	0.02	0
7 PM	310	412	722	0.93	0.04	0.02	0.01	0.94	0.04	0.02	0
8 PM	232	343	575	0.93	0.05	0.02	0	0.93	0.04	0.02	0.01
9 PM	165	268	433	0.94	0.04	0.01	0.01	0.94	0.04	0.02	0
10 PM	117	155	272	0.91	0.04	0.03	0.02	0.94	0.04	0.02	0
11 PM	44	138	182	0.84	0.07	0.09	0	0.93	0.04	0.02	0.01
Total	8984	8994	17978								

**SR-104 Tuesday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	25	77	102	28	85	113	31	94	124
1 AM	19	45	64	21	50	71	23	55	78
2 AM	24	30	54	27	33	60	29	37	66
3 AM	56	25	81	62	28	89	68	31	99
4 AM	156	45	201	172	50	222	190	55	245
5 AM	289	145	434	319	160	479	353	177	530
6 AM	447	287	734	494	317	811	545	350	896
7 AM	519	389	908	573	430	1003	633	475	1108
8 AM	582	424	1006	643	468	1111	710	517	1228
9 AM	635	480	1115	701	530	1232	775	586	1361
10 AM	659	548	1207	728	605	1333	804	669	1473
11 AM	630	589	1219	696	651	1347	769	719	1487
12 PM	612	635	1247	676	701	1377	747	775	1522
1 PM	616	591	1207	680	653	1333	752	721	1473
2 PM	603	625	1228	666	690	1356	736	763	1498
3 PM	616	755	1371	680	834	1514	752	921	1673
4 PM	630	767	1397	696	847	1543	769	936	1705
5 PM	558	670	1228	616	740	1356	681	818	1498
6 PM	440	551	991	486	609	1095	537	672	1209
7 PM	310	412	722	342	455	798	378	503	881
8 PM	232	343	575	256	379	635	283	419	702
9 PM	165	268	433	182	296	478	201	327	528
10 PM	117	155	272	129	171	300	143	189	332
11 PM	44	138	182	49	152	201	54	168	222
Total	8984	8994	17978	9924	9935	19859	10962	10974	21937



**SR-104 Tuesday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	456	31	8	<b>464</b>	1146	80	51	<b>1197</b>	0	0
1 AM	348	23	5	<b>352</b>	724	50	20	<b>744</b>	0	0
2 AM	526	36	10	<b>537</b>	549	37	11	<b>561</b>	0	0
3 AM	1178	82	54	<b>1232</b>	455	31	8	<b>463</b>	0	0
4 AM	2602	192	278	<b>2880</b>	1009	70	39	<b>1048</b>	0	0
5 AM	4669	376	976	<b>5645</b>	2763	205	315	<b>3078</b>	0	0
6 AM	7172	651	2594	<b>9766</b>	5294	439	1291	<b>6586</b>	2878	508
7 AM	8456	821	3856	<b>12312</b>	6950	624	2409	<b>9360</b>	5236	924
8 AM	9772	1021	5543	<b>15315</b>	7623	708	2999	<b>10621</b>	6308	1113
9 AM	10346	1118	6428	<b>16774</b>	8112	773	3484	<b>11597</b>	7137	1259
10 AM	10592	1162	6837	<b>17429</b>	9125	919	4659	<b>13784</b>	8996	1588
11 AM	10195	1092	6185	<b>16380</b>	9467	972	5111	<b>14578</b>	9671	1707
12 PM	9904	1043	5737	<b>15641</b>	10592	1162	6837	<b>17429</b>	12094	2134
1 PM	9883	1039	5707	<b>15590</b>	9417	964	5044	<b>14461</b>	9572	1689
2 PM	9675	1005	5403	<b>15078</b>	9959	1052	5820	<b>15779</b>	10692	1887
3 PM	9594	992	5289	<b>14883</b>	11572	1350	8679	<b>20251</b>	14493	2558
4 PM	9656	1002	5376	<b>15031</b>	11395	1314	8322	<b>19717</b>	14040	2478
5 PM	8491	826	3895	<b>12385</b>	9954	1051	5813	<b>15767</b>	10682	1885
6 PM	6489	569	2053	<b>8541</b>	8125	775	3498	<b>11623</b>	7160	1264
7 PM	4683	378	983	<b>5665</b>	6076	523	1764	<b>7840</b>	3944	696
8 PM	3447	263	504	<b>3951</b>	5181	427	1230	<b>6412</b>	2730	482
9 PM	2451	180	245	<b>2696</b>	3952	309	678	<b>4630</b>	1215	214
10 PM	1838	132	134	<b>1973</b>	2286	166	211	<b>2497</b>	0	0
11 PM	740	51	21	<b>761</b>	2085	151	174	<b>2259</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Tuesday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	504	34	10	<b>514</b>	1266	89	62	<b>1328</b>	0	0
1 AM	384	26	6	<b>390</b>	800	55	24	<b>825</b>	0	0
2 AM	581	40	13	<b>594</b>	607	41	14	<b>621</b>	0	0
3 AM	1302	91	66	<b>1368</b>	503	34	10	<b>512</b>	0	0
4 AM	2874	214	342	<b>3217</b>	1115	78	48	<b>1163</b>	0	0
5 AM	5157	425	1218	<b>6375</b>	3052	229	389	<b>3441</b>	205	36
6 AM	7922	747	3290	<b>11212</b>	5848	498	1617	<b>7465</b>	3625	640
7 AM	9341	952	4941	<b>14282</b>	7678	715	3051	<b>10728</b>	6399	1129
8 AM	10794	1199	7190	<b>17984</b>	8420	816	3816	<b>12236</b>	7680	1355
9 AM	11429	1321	8388	<b>19817</b>	8961	894	4452	<b>13413</b>	8681	1532
10 AM	11700	1376	8946	<b>20646</b>	10080	1072	6005	<b>16085</b>	10953	1933
11 AM	11262	1288	8059	<b>19320</b>	10457	1138	6610	<b>17067</b>	11787	2080
12 PM	10940	1226	7452	<b>18392</b>	11700	1376	8947	<b>20646</b>	14829	2617
1 PM	10918	1222	7411	<b>18329</b>	10402	1128	6520	<b>16922</b>	11664	2058
2 PM	10687	1179	7002	<b>17689</b>	11001	1238	7564	<b>18565</b>	13060	2305
3 PM	10598	1163	6848	<b>17446</b>	12782	1618	11492	<b>24274</b>	17913	3161
4 PM	10666	1175	6965	<b>17631</b>	12588	1572	10994	<b>23582</b>	17324	3057
5 PM	9379	958	4992	<b>14371</b>	10996	1237	7555	<b>18550</b>	13048	2303
6 PM	7167	651	2590	<b>9758</b>	8976	896	4469	<b>13445</b>	8708	1537
7 PM	5173	427	1226	<b>6399</b>	6711	595	2220	<b>8931</b>	4872	860
8 PM	3807	296	625	<b>4433</b>	5723	484	1540	<b>7263</b>	3453	609
9 PM	2708	201	302	<b>3010</b>	4366	347	842	<b>5208</b>	1706	301
10 PM	2031	146	165	<b>2196</b>	2525	186	260	<b>2785</b>	0	0
11 PM	817	56	26	<b>843</b>	2303	168	215	<b>2517</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Wednesday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	26	83	109	0.79	0.07	0.14	0	0.94	0.02	0.04	0
1 AM	19	45	64	0.79	0.13	0.08	0	0.9	0.07	0.02	0.01
2 AM	24	32	56	0.66	0.06	0.21	0.07	0.83	0.07	0.09	0.01
3 AM	52	28	80	0.68	0.05	0.24	0.03	0.69	0.06	0.21	0.04
4 AM	148	44	192	0.85	0.07	0.07	0.01	0.67	0.18	0.13	0.02
5 AM	284	149	433	0.86	0.1	0.03	0.01	0.73	0.14	0.12	0.01
6 AM	434	297	731	0.86	0.09	0.04	0.01	0.73	0.14	0.09	0.04
7 AM	524	404	928	0.86	0.07	0.05	0.02	0.79	0.11	0.08	0.02
8 AM	563	439	1002	0.87	0.07	0.05	0.01	0.81	0.1	0.07	0.02
9 AM	639	480	1119	0.88	0.06	0.04	0.02	0.84	0.09	0.07	0
10 AM	670	560	1230	0.88	0.06	0.05	0.01	0.86	0.08	0.05	0.01
11 AM	642	616	1258	0.88	0.06	0.05	0.01	0.88	0.07	0.05	0
12 PM	613	638	1251	0.86	0.08	0.06	0	0.87	0.06	0.06	0.01
1 PM	640	639	1279	0.87	0.08	0.04	0.01	0.87	0.07	0.05	0.01
2 PM	636	665	1301	0.87	0.08	0.04	0.01	0.89	0.06	0.04	0.01
3 PM	634	761	1395	0.88	0.07	0.04	0.01	0.91	0.06	0.03	0
4 PM	640	778	1418	0.91	0.06	0.02	0.01	0.91	0.06	0.02	0.01
5 PM	581	678	1259	0.92	0.06	0.02	0	0.95	0.04	0.01	0
6 PM	475	579	1054	0.93	0.05	0.02	0	0.94	0.04	0.02	0
7 PM	339	438	777	0.94	0.03	0.03	0	0.94	0.04	0.02	0
8 PM	246	369	615	0.93	0.05	0.02	0	0.94	0.04	0.02	0
9 PM	175	289	464	0.93	0.05	0.02	0	0.91	0.06	0.03	0
10 PM	126	179	305	0.9	0.05	0.04	0.01	0.93	0.04	0.03	0
11 PM	48	144	192	0.84	0.07	0.09	0	0.92	0.04	0.03	0.01
Total	9178	9334	18512								

**SR-104 Wednesday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	26	83	109	29	92	120	32	101	133
1 AM	19	45	64	21	50	71	23	55	78
2 AM	24	32	56	27	35	62	29	39	68
3 AM	52	28	80	57	31	88	63	34	98
4 AM	148	44	192	163	49	212	181	54	234
5 AM	284	149	433	314	165	478	347	182	528
6 AM	434	297	731	479	328	807	530	362	892
7 AM	524	404	928	579	446	1025	639	493	1132
8 AM	563	439	1002	622	485	1107	687	536	1223
9 AM	639	480	1119	706	530	1236	780	586	1365
10 AM	670	560	1230	740	619	1359	818	683	1501
11 AM	642	616	1258	709	680	1390	783	752	1535
12 PM	613	638	1251	677	705	1382	748	778	1526
1 PM	640	639	1279	707	706	1413	781	780	1561
2 PM	636	665	1301	703	735	1437	776	811	1587
3 PM	634	761	1395	700	841	1541	774	929	1702
4 PM	640	778	1418	707	859	1566	781	949	1730
5 PM	581	678	1259	642	749	1391	709	827	1536
6 PM	475	579	1054	525	640	1164	580	706	1286
7 PM	339	438	777	374	484	858	414	534	948
8 PM	246	369	615	272	408	679	300	450	750
9 PM	175	289	464	193	319	513	214	353	566
10 PM	126	179	305	139	198	337	154	218	372
11 PM	48	144	192	53	159	212	59	176	234
Total	9178	9334	18512	10138.2	10310.5	20449	11198.9	11389.3	22588

**SR-104 Wednesday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	470	32	8	<b>478</b>	1247	87	60	<b>1307</b>	0	0
1 AM	327	22	4	<b>331</b>	695	48	18	<b>713</b>	0	0
2 AM	533	36	11	<b>544</b>	550	37	11	<b>561</b>	0	0
3 AM	1113	77	48	<b>1161</b>	592	40	13	<b>605</b>	0	0
4 AM	2469	181	248	<b>2717</b>	869	60	29	<b>898</b>	0	0
5 AM	4549	365	922	<b>5470</b>	2786	207	320	<b>3106</b>	0	0
6 AM	7011	631	2459	<b>9471</b>	5651	476	1496	<b>7147</b>	3355	592
7 AM	8668	851	4098	<b>12766</b>	7163	650	2586	<b>9749</b>	5566	982
8 AM	9111	917	4640	<b>13751</b>	7626	708	3001	<b>10627</b>	6313	1114
9 AM	10341	1117	6419	<b>16759</b>	7940	750	3308	<b>11248</b>	6841	1207
10 AM	10768	1194	7144	<b>17912</b>	9124	919	4657	<b>13781</b>	8994	1587
11 AM	10318	1113	6382	<b>16701</b>	9747	1017	5507	<b>15255</b>	10246	1808
12 PM	9920	1045	5762	<b>15682</b>	10413	1130	6537	<b>16949</b>	11687	2062
1 PM	10269	1105	6302	<b>16571</b>	10341	1117	6419	<b>16759</b>	11526	2034
2 PM	10204	1094	6200	<b>16404</b>	10523	1150	6720	<b>17243</b>	11936	2106
3 PM	10102	1076	6040	<b>16142</b>	11580	1352	8695	<b>20275</b>	14514	2561
4 PM	9809	1027	5597	<b>15406</b>	11924	1424	9431	<b>21355</b>	15432	2723
5 PM	8696	855	4132	<b>12828</b>	9830	1030	5627	<b>15457</b>	10419	1839
6 PM	7057	637	2497	<b>9554</b>	8538	832	3949	<b>12487</b>	7894	1393
7 PM	5046	414	1160	<b>6206</b>	6459	566	2031	<b>8490</b>	4497	794
8 PM	3655	282	572	<b>4227</b>	5442	454	1373	<b>6815</b>	3073	542
9 PM	2600	192	277	<b>2877</b>	4397	350	856	<b>5253</b>	1745	308
10 PM	1980	142	157	<b>2137</b>	2684	199	296	<b>2980</b>	0	0
11 PM	807	55	25	<b>832</b>	2211	161	197	<b>2408</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Wednesday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	519	35	10	<b>529</b>	1377	97	74	<b>1451</b>	0	0
1 AM	362	24	5	<b>367</b>	767	53	22	<b>790</b>	0	0
2 AM	589	40	13	<b>602</b>	607	41	14	<b>621</b>	0	0
3 AM	1229	86	59	<b>1288</b>	653	45	16	<b>670</b>	0	0
4 AM	2727	202	306	<b>3033</b>	960	66	35	<b>995</b>	0	0
5 AM	5025	412	1149	<b>6174</b>	3077	232	396	<b>3473</b>	232	41
6 AM	7745	724	3115	<b>10860</b>	6242	541	1877	<b>8119</b>	4182	738
7 AM	9575	989	5261	<b>14836</b>	7912	746	3279	<b>11191</b>	6793	1199
8 AM	10064	1070	5981	<b>16045</b>	8423	816	3819	<b>12243</b>	7686	1356
9 AM	11423	1320	8376	<b>19799</b>	8771	866	4220	<b>12991</b>	8322	1469
10 AM	11895	1417	9367	<b>21262</b>	10079	1072	6003	<b>16082</b>	10950	1932
11 AM	11398	1315	8327	<b>19725</b>	10767	1194	7142	<b>17909</b>	12503	2206
12 PM	10958	1230	7485	<b>18443</b>	11502	1336	8536	<b>20039</b>	14313	2526
1 PM	11343	1304	8217	<b>19560</b>	11423	1320	8376	<b>19799</b>	14109	2490
2 PM	11272	1290	8078	<b>19350</b>	11624	1361	8787	<b>20411</b>	14629	2582
3 PM	11159	1268	7861	<b>19020</b>	12791	1620	11514	<b>24305</b>	17940	3166
4 PM	10835	1207	7263	<b>18098</b>	13172	1715	12546	<b>25718</b>	19140	3378
5 PM	9606	994	5305	<b>14911</b>	10858	1211	7304	<b>18162</b>	12718	2244
6 PM	7795	731	3164	<b>10960</b>	9432	966	5063	<b>14495</b>	9601	1694
7 PM	5574	468	1450	<b>7024</b>	7135	646	2563	<b>9697</b>	5523	975
8 PM	4037	316	710	<b>4747</b>	6011	515	1721	<b>7732</b>	3852	680
9 PM	2872	214	342	<b>3214</b>	4858	395	1066	<b>5923</b>	2315	408
10 PM	2187	159	193	<b>2380</b>	2965	222	366	<b>3331</b>	111	20
11 PM	892	61	30	<b>922</b>	2442	179	243	<b>2685</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Thursday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	26	92	118	0.75	0.07	0.16	0.02	0.89	0.03	0.07	0.01
1 AM	21	49	70	0.63	0.13	0.21	0.03	0.87	0.05	0.08	0
2 AM	25	34	59	0.61	0.07	0.27	0.05	0.7	0.08	0.19	0.03
3 AM	51	28	79	0.62	0.1	0.2	0.08	0.66	0.13	0.19	0.02
4 AM	144	48	192	0.79	0.1	0.09	0.02	0.65	0.16	0.16	0.03
5 AM	272	147	419	0.85	0.09	0.04	0.02	0.73	0.12	0.12	0.03
6 AM	426	295	721	0.87	0.08	0.04	0.01	0.79	0.1	0.09	0.02
7 AM	524	404	928	0.88	0.07	0.05	0	0.77	0.11	0.1	0.02
8 AM	577	455	1032	0.86	0.07	0.05	0.02	0.79	0.12	0.07	0.02
9 AM	652	504	1156	0.85	0.08	0.06	0.01	0.84	0.09	0.06	0.01
10 AM	691	615	1306	0.86	0.08	0.05	0.01	0.86	0.08	0.06	0
11 AM	670	660	1330	0.87	0.07	0.05	0.01	0.87	0.07	0.05	0.01
12 PM	654	669	1323	0.86	0.08	0.05	0.01	0.86	0.07	0.06	0.01
1 PM	649	667	1316	0.88	0.07	0.04	0.01	0.9	0.06	0.04	0
2 PM	662	721	1383	0.87	0.07	0.04	0.02	0.89	0.07	0.04	0
3 PM	659	799	1458	0.88	0.08	0.04	0	0.91	0.07	0.02	0
4 PM	668	788	1456	0.9	0.07	0.02	0.01	0.92	0.05	0.02	0.01
5 PM	616	712	1328	0.92	0.05	0.02	0.01	0.92	0.05	0.02	0.01
6 PM	497	618	1115	0.93	0.05	0.02	0	0.94	0.05	0.01	0
7 PM	369	499	868	0.92	0.05	0.02	0.01	0.92	0.06	0.02	0
8 PM	274	454	728	0.94	0.03	0.02	0.01	0.93	0.05	0.02	0
9 PM	190	361	551	0.94	0.04	0.02	0	0.94	0.04	0.02	0
10 PM	135	206	341	0.93	0.04	0.03	0	0.95	0.03	0.02	0
11 PM	54	158	212	0.82	0.1	0.06	0.02	0.94	0.03	0.03	0
Total	9506	9983	19489								

**SR-104 Thursday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	26	92	118	29	102	130	32	112	144
1 AM	21	49	70	23	54	77	26	60	85
2 AM	25	34	59	28	38	65	31	41	72
3 AM	51	28	79	56	31	87	62	34	96
4 AM	144	48	192	159	53	212	176	59	234
5 AM	272	147	419	300	162	463	332	179	511
6 AM	426	295	721	471	326	796	520	360	880
7 AM	524	404	928	579	446	1025	639	493	1132
8 AM	577	455	1032	637	503	1140	704	555	1259
9 AM	652	504	1156	720	557	1277	796	615	1411
10 AM	691	615	1306	763	679	1443	843	750	1594
11 AM	670	660	1330	740	729	1469	818	805	1623
12 PM	654	669	1323	722	739	1461	798	816	1614
1 PM	649	667	1316	717	737	1454	792	814	1606
2 PM	662	721	1383	731	796	1528	808	880	1688
3 PM	659	799	1458	728	883	1611	804	975	1779
4 PM	668	788	1456	738	870	1608	815	962	1777
5 PM	616	712	1328	680	786	1467	752	869	1620
6 PM	497	618	1115	549	683	1232	606	754	1361
7 PM	369	499	868	408	551	959	450	609	1059
8 PM	274	454	728	303	501	804	334	554	888
9 PM	190	361	551	210	399	609	232	440	672
10 PM	135	206	341	149	228	377	165	251	416
11 PM	54	158	212	60	175	234	66	193	259
Total	9506	9983	19489	10501	11027	21528	11599	12181	23780



**SR-104 Thursday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	501	34	9	<b>511</b>	1494	105	87	<b>1581</b>	0	0
1 AM	452	31	8	<b>460</b>	801	55	24	<b>826</b>	0	0
2 AM	577	39	13	<b>590</b>	697	48	18	<b>715</b>	0	0
3 AM	1161	81	52	<b>1213</b>	579	39	13	<b>592</b>	0	0
4 AM	2573	190	271	<b>2844</b>	990	69	38	<b>1028</b>	0	0
5 AM	4492	359	896	<b>5388</b>	2821	210	329	<b>3151</b>	0	0
6 AM	6835	610	2317	<b>9152</b>	5271	437	1279	<b>6549</b>	2847	502
7 AM	8292	798	3675	<b>11967</b>	7363	675	2761	<b>10125</b>	5886	1039
8 AM	9545	984	5219	<b>14764</b>	8004	758	3372	<b>11376</b>	6950	1226
9 AM	10785	1197	7174	<b>17959</b>	8393	812	3785	<b>12178</b>	7631	1347
10 AM	11259	1287	8052	<b>19311</b>	9952	1051	5810	<b>15763</b>	10678	1884
11 AM	10842	1208	7276	<b>18118</b>	10681	1178	6990	<b>17671</b>	12300	2171
12 PM	10656	1174	6947	<b>17603</b>	10993	1236	7549	<b>18541</b>	13040	2301
1 PM	10341	1117	6420	<b>16761</b>	10315	1113	6377	<b>16692</b>	11468	2024
2 PM	10786	1197	7175	<b>17961</b>	11230	1282	7996	<b>19226</b>	13622	2404
3 PM	10337	1117	6412	<b>16749</b>	12047	1450	9707	<b>21754</b>	15771	2783
4 PM	10312	1112	6372	<b>16684</b>	11990	1438	9578	<b>21569</b>	15613	2755
5 PM	9373	957	4984	<b>14357</b>	10834	1206	7260	<b>18094</b>	12660	2234
6 PM	7384	678	2780	<b>10164</b>	9028	904	4535	<b>13563</b>	8809	1555
7 PM	5615	473	1474	<b>7089</b>	7469	688	2856	<b>10325</b>	6056	1069
8 PM	4109	323	737	<b>4846</b>	6745	599	2246	<b>8991</b>	4923	869
9 PM	2802	208	324	<b>3126</b>	5324	442	1307	<b>6631</b>	2916	515
10 PM	2024	146	164	<b>2188</b>	3015	226	379	<b>3394</b>	165	29
11 PM	925	64	33	<b>957</b>	2352	172	224	<b>2576</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Thursday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	554	38	12	<b>565</b>	1650	117	107	<b>1758</b>	0	0
1 AM	500	34	9	<b>509</b>	885	61	30	<b>915</b>	0	0
2 AM	638	44	15	<b>653</b>	770	53	23	<b>792</b>	0	0
3 AM	1282	90	64	<b>1346</b>	640	44	16	<b>655</b>	0	0
4 AM	2842	212	334	<b>3176</b>	1094	76	46	<b>1140</b>	0	0
5 AM	4962	405	1117	<b>6079</b>	3117	235	407	<b>3523</b>	275	48
6 AM	7550	699	2931	<b>10481</b>	5822	495	1601	<b>7423</b>	3590	633
7 AM	9159	924	4702	<b>13861</b>	8134	776	3507	<b>11641</b>	7174	1266
8 AM	10543	1153	6755	<b>17298</b>	8841	876	4305	<b>13146</b>	8454	1492
9 AM	11914	1421	9408	<b>21322</b>	9271	941	4848	<b>14119</b>	9281	1638
10 AM	12436	1537	10620	<b>23057</b>	10994	1236	7551	<b>18544</b>	13043	2302
11 AM	11977	1435	9548	<b>21525</b>	11798	1397	9156	<b>20954</b>	15091	2663
12 PM	11771	1391	9097	<b>20868</b>	12143	1471	9924	<b>22066</b>	16036	2830
1 PM	11423	1320	8377	<b>19800</b>	11394	1314	8319	<b>19713</b>	14036	2477
2 PM	11915	1422	9410	<b>21325</b>	12405	1530	10543	<b>22947</b>	16785	2962
3 PM	11418	1319	8367	<b>19786</b>	13308	1749	12934	<b>26242</b>	19586	3456
4 PM	11391	1314	8313	<b>19703</b>	13245	1733	12753	<b>25998</b>	19378	3420
5 PM	10354	1120	6440	<b>16794</b>	11967	1433	9527	<b>21495</b>	15550	2744
6 PM	8157	779	3531	<b>11687</b>	9973	1054	5841	<b>15814</b>	10722	1892
7 PM	6202	537	1850	<b>8052</b>	8250	792	3630	<b>11881</b>	7378	1302
8 PM	4539	364	917	<b>5456</b>	7451	686	2840	<b>10291</b>	6027	1064
9 PM	3095	233	401	<b>3496</b>	5881	501	1637	<b>7518</b>	3670	648
10 PM	2236	163	202	<b>2438</b>	3331	253	469	<b>3799</b>	509	90
11 PM	1021	71	40	<b>1061</b>	2598	192	277	<b>2874</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Friday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	32	94	126	0.82	0.08	0.1	0	0.9	0.04	0.05	0.01
1 AM	21	50	71	0.7	0.14	0.16	0	0.84	0.05	0.11	0
2 AM	26	39	65	0.64	0.14	0.21	0.01	0.75	0.11	0.11	0.03
3 AM	51	31	82	0.7	0.07	0.21	0.02	0.74	0.07	0.18	0.01
4 AM	135	47	182	0.77	0.1	0.11	0.02	0.62	0.16	0.21	0.01
5 AM	246	144	390	0.87	0.08	0.05	0	0.79	0.06	0.13	0.02
6 AM	395	277	672	0.87	0.08	0.04	0.01	0.81	0.09	0.08	0.02
7 AM	477	394	871	0.88	0.06	0.05	0.01	0.81	0.09	0.09	0.01
8 AM	542	447	989	0.88	0.07	0.04	0.01	0.87	0.08	0.04	0.01
9 AM	640	535	1175	0.89	0.06	0.05	0	0.9	0.06	0.04	0
10 AM	712	671	1383	0.87	0.07	0.05	0.01	0.91	0.05	0.03	0.01
11 AM	710	764	1474	0.88	0.06	0.06	0	0.92	0.05	0.03	0
12 PM	700	787	1487	0.89	0.06	0.04	0.01	0.92	0.04	0.03	0.01
1 PM	712	827	1539	0.89	0.07	0.04	0	0.92	0.05	0.03	0
2 PM	737	915	1652	0.89	0.07	0.04	0	0.92	0.05	0.03	0
3 PM	721	940	1661	0.91	0.06	0.03	0	0.93	0.05	0.02	0
4 PM	709	989	1698	0.93	0.05	0.02	0	0.94	0.05	0.01	0
5 PM	687	918	1605	0.95	0.04	0.01	0	0.94	0.04	0.02	0
6 PM	594	798	1392	0.94	0.04	0.02	0	0.94	0.05	0.01	0
7 PM	428	712	1140	0.94	0.04	0.02	0	0.94	0.05	0.01	0
8 PM	311	603	914	0.94	0.04	0.01	0.01	0.95	0.04	0.01	0
9 PM	230	493	723	0.95	0.03	0.02	0	0.95	0.03	0.02	0
10 PM	182	311	493	0.95	0.04	0.01	0	0.94	0.04	0.02	0
11 PM	81	223	304	0.93	0.03	0.04	0	0.95	0.03	0.02	0
Total	10079	12009	22088								

**SR-104 Friday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	32	94	126	35	104	139	39	115	154
1 AM	21	50	71	23	55	78	26	61	87
2 AM	26	39	65	29	43	72	32	48	79
3 AM	51	31	82	56	34	91	62	38	100
4 AM	135	47	182	149	52	201	165	57	222
5 AM	246	144	390	272	159	431	300	176	476
6 AM	395	277	672	436	306	742	482	338	820
7 AM	477	394	871	527	435	962	582	481	1063
8 AM	542	447	989	599	494	1092	661	545	1207
9 AM	640	535	1175	707	591	1298	781	653	1434
10 AM	712	671	1383	786	741	1528	869	819	1688
11 AM	710	764	1474	784	844	1628	866	932	1799
12 PM	700	787	1487	773	869	1643	854	960	1814
1 PM	712	827	1539	786	914	1700	869	1009	1878
2 PM	737	915	1652	814	1011	1825	899	1116	2016
3 PM	721	940	1661	796	1038	1835	880	1147	2027
4 PM	709	989	1698	783	1092	1876	865	1207	2072
5 PM	687	918	1605	759	1014	1773	838	1120	1958
6 PM	594	798	1392	656	881	1538	725	974	1699
7 PM	428	712	1140	473	786	1259	522	869	1391
8 PM	311	603	914	344	666	1010	379	736	1115
9 PM	230	493	723	254	545	799	281	602	882
10 PM	182	311	493	201	344	545	222	379	602
11 PM	81	223	304	89	246	336	99	272	371
Total	10079	12009	22088	11133	13265	24399	12298	14653	26952

**SR-104 Friday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	550	37	11	<b>561</b>	1490	105	87	<b>1577</b>	0	0
1 AM	406	27	6	<b>412</b>	855	59	28	<b>883</b>	0	0
2 AM	544	37	11	<b>555</b>	735	50	21	<b>755</b>	0	0
3 AM	1046	73	42	<b>1089</b>	602	41	14	<b>616</b>	0	0
4 AM	2479	182	251	<b>2730</b>	994	69	38	<b>1032</b>	0	0
5 AM	3920	306	666	<b>4586</b>	2652	196	289	<b>2941</b>	0	0
6 AM	6338	552	1944	<b>8282</b>	4850	394	1062	<b>5912</b>	2305	407
7 AM	7666	714	3040	<b>10707</b>	6855	612	2332	<b>9187</b>	5089	898
8 AM	8636	847	4062	<b>12698</b>	7172	651	2594	<b>9766</b>	5581	985
9 AM	10056	1068	5969	<b>16025</b>	8274	795	3655	<b>11929</b>	7420	1309
10 AM	11522	1340	8577	<b>20099</b>	10377	1124	6478	<b>16854</b>	11606	2048
11 AM	11333	1302	8198	<b>19531</b>	11541	1344	8616	<b>20156</b>	14413	2543
12 PM	11077	1252	7705	<b>18782</b>	12084	1458	9789	<b>21873</b>	15872	2801
1 PM	11090	1255	7729	<b>18819</b>	12492	1550	10757	<b>23250</b>	17042	3007
2 PM	11479	1331	8489	<b>19968</b>	13822	1888	14497	<b>28318</b>	21351	3768
3 PM	10971	1232	7509	<b>18480</b>	13966	1929	14964	<b>28930</b>	21870	3859
4 PM	10534	1151	6739	<b>17272</b>	14448	2072	16630	<b>31078</b>	23696	4182
5 PM	9960	1052	5822	<b>15782</b>	13537	1810	13613	<b>27150</b>	20358	3593
6 PM	8760	864	4207	<b>12966</b>	11658	1368	8858	<b>20516</b>	14718	2597
7 PM	6312	549	1926	<b>8237</b>	10401	1128	6518	<b>16919</b>	11661	2058
8 PM	4621	372	954	<b>5575</b>	8742	862	4186	<b>12929</b>	8269	1459
9 PM	3366	256	479	<b>3846</b>	7216	656	2632	<b>9847</b>	5650	997
10 PM	2639	195	286	<b>2924</b>	4586	368	938	<b>5525</b>	1976	349
11 PM	1226	86	58	<b>1284</b>	3264	248	449	<b>3713</b>	436	77

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Friday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	607	41	14	<b>621</b>	1646	117	107	<b>1753</b>	0	0
1 AM	448	30	8	<b>456</b>	944	65	34	<b>978</b>	0	0
2 AM	601	41	14	<b>615</b>	811	56	25	<b>837</b>	0	0
3 AM	1156	81	52	<b>1208</b>	665	45	17	<b>682</b>	0	0
4 AM	2739	203	309	<b>3048</b>	1098	76	47	<b>1145</b>	0	0
5 AM	4330	344	827	<b>5157</b>	2930	219	357	<b>3287</b>	74	13
6 AM	7001	630	2451	<b>9451</b>	5357	446	1326	<b>6683</b>	2961	522
7 AM	8469	823	3870	<b>12339</b>	7572	702	2951	<b>10523</b>	6225	1098
8 AM	9540	983	5212	<b>14752</b>	7922	747	3290	<b>11212</b>	6810	1202
9 AM	11109	1258	7765	<b>18874</b>	9139	921	4676	<b>13816</b>	9023	1592
10 AM	12728	1605	11350	<b>24077</b>	11462	1328	8456	<b>19919</b>	14211	2508
11 AM	12519	1556	10822	<b>23340</b>	12748	1610	11403	<b>24151</b>	17809	3143
12 PM	12235	1492	10140	<b>22375</b>	13348	1760	13051	<b>26399</b>	19719	3480
1 PM	12250	1495	10173	<b>22423</b>	13799	1882	14425	<b>28225</b>	21271	3754
2 PM	12680	1594	11227	<b>23907</b>	15268	2342	19869	<b>35137</b>	27146	4790
3 PM	12119	1466	9869	<b>21988</b>	15427	2399	20564	<b>35991</b>	27872	4919
4 PM	11636	1363	8812	<b>20448</b>	15960	2602	23070	<b>39030</b>	30455	5374
5 PM	11002	1238	7567	<b>18569</b>	14954	2234	18563	<b>33517</b>	25769	4548
6 PM	9676	1005	5404	<b>15080</b>	12877	1641	11742	<b>24619</b>	18206	3213
7 PM	6972	627	2427	<b>9399</b>	11490	1333	8511	<b>20001</b>	14280	2520
8 PM	5104	420	1190	<b>6294</b>	9657	1002	5377	<b>15034</b>	10059	1775
9 PM	3719	287	594	<b>4312</b>	7971	754	3339	<b>11309</b>	6893	1216
10 PM	2915	218	353	<b>3267</b>	5066	416	1170	<b>6236</b>	2581	455
11 PM	1354	95	71	<b>1426</b>	3605	277	556	<b>4161</b>	817	144

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Saturday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	40	135	175	0.89	0.03	0.08	0	0.91	0.04	0.05	0
1 AM	26	86	112	0.85	0.08	0.07	0	0.95	0.03	0.02	0
2 AM	26	48	74	0.75	0.09	0.14	0.02	0.85	0.08	0.07	0
3 AM	28	34	62	0.75	0.07	0.15	0.03	0.82	0.06	0.12	0
4 AM	59	44	103	0.88	0.1	0.02	0	0.8	0.05	0.15	0
5 AM	98	89	187	0.89	0.08	0.03	0	0.85	0.06	0.09	0
6 AM	190	209	399	0.91	0.06	0.02	0.01	0.9	0.06	0.04	0
7 AM	333	356	689	0.9	0.07	0.03	0	0.91	0.05	0.03	0.01
8 AM	488	497	985	0.92	0.06	0.02	0	0.94	0.04	0.02	0
9 AM	677	679	1356	0.93	0.05	0.02	0	0.96	0.03	0.01	0
10 AM	741	870	1611	0.92	0.06	0.02	0	0.96	0.03	0.01	0
11 AM	766	995	1761	0.93	0.05	0.02	0	0.96	0.03	0.01	0
12 PM	703	938	1641	0.93	0.05	0.02	0	0.96	0.03	0.01	0
1 PM	696	937	1633	0.93	0.05	0.02	0	0.96	0.03	0.01	0
2 PM	708	870	1578	0.94	0.04	0.02	0	0.96	0.03	0.01	0
3 PM	736	845	1581	0.95	0.04	0.01	0	0.95	0.04	0.01	0
4 PM	813	773	1586	0.97	0.03	0	0	0.95	0.04	0.01	0
5 PM	795	658	1453	0.97	0.03	0	0	0.95	0.04	0.01	0
6 PM	705	592	1297	0.96	0.03	0.01	0	0.95	0.04	0.01	0
7 PM	589	489	1078	0.97	0.03	0	0	0.95	0.04	0.01	0
8 PM	499	418	917	0.98	0.02	0	0	0.96	0.03	0.01	0
9 PM	382	342	724	0.97	0.03	0	0	0.96	0.04	0	0
10 PM	280	274	554	0.97	0.02	0.01	0	0.96	0.03	0.01	0
11 PM	129	183	312	0.97	0.03	0	0	0.95	0.03	0.02	0
Total	10507	11361	21868								

**SR-104 Saturday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	40	135	175	44	149	193	49	165	214
1 AM	26	86	112	29	95	124	32	105	137
2 AM	26	48	74	29	53	82	32	59	90
3 AM	28	34	62	31	38	68	34	41	76
4 AM	59	44	103	65	49	114	72	54	126
5 AM	98	89	187	108	98	207	120	109	228
6 AM	190	209	399	210	231	441	232	255	487
7 AM	333	356	689	368	393	761	406	434	841
8 AM	488	497	985	539	549	1088	595	606	1202
9 AM	677	679	1356	748	750	1498	826	829	1655
10 AM	741	870	1611	819	961	1780	904	1062	1966
11 AM	766	995	1761	846	1099	1945	935	1214	2149
12 PM	703	938	1641	777	1036	1813	858	1145	2002
1 PM	696	937	1633	769	1035	1804	849	1143	1993
2 PM	708	870	1578	782	961	1743	864	1062	1925
3 PM	736	845	1581	813	933	1746	898	1031	1929
4 PM	813	773	1586	898	854	1752	992	943	1935
5 PM	795	658	1453	878	727	1605	970	803	1773
6 PM	705	592	1297	779	654	1433	860	722	1583
7 PM	589	489	1078	651	540	1191	719	597	1315
8 PM	499	418	917	551	462	1013	609	510	1119
9 PM	382	342	724	422	378	800	466	417	883
10 PM	280	274	554	309	303	612	342	334	676
11 PM	129	183	312	142	202	345	157	223	381
Total	10507	11361	21868	11606	12550	24156	12821	13863	26683



**SR-104 Saturday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	645	44	16	<b>661</b>	2091	151	176	<b>2267</b>	0	0
1 AM	427	29	7	<b>434</b>	1259	88	62	<b>1320</b>	0	0
2 AM	494	34	9	<b>503</b>	789	54	24	<b>812</b>	0	0
3 AM	543	37	11	<b>554</b>	593	40	13	<b>607</b>	0	0
4 AM	909	63	32	<b>941</b>	796	55	24	<b>820</b>	0	0
5 AM	1513	107	90	<b>1603</b>	1487	105	87	<b>1574</b>	0	0
6 AM	2912	218	352	<b>3264</b>	3232	245	440	<b>3672</b>	401	71
7 AM	5104	420	1190	<b>6293</b>	5505	461	1410	<b>6916</b>	3158	557
8 AM	7304	668	2709	<b>10013</b>	7329	671	2731	<b>10060</b>	5831	1029
9 AM	10058	1069	5972	<b>16030</b>	9769	1021	5539	<b>15308</b>	10292	1816
10 AM	11091	1255	7732	<b>18823</b>	12517	1556	10819	<b>23336</b>	17116	3020
11 AM	11381	1312	8292	<b>19673</b>	14316	2032	16157	<b>30473</b>	23182	4091
12 PM	10445	1136	6589	<b>17034</b>	13496	1799	13487	<b>26983</b>	20215	3567
1 PM	10341	1117	6418	<b>16759</b>	13481	1795	13444	<b>26925</b>	20166	3559
2 PM	10441	1135	6583	<b>17024</b>	12517	1556	10819	<b>23336</b>	17116	3020
3 PM	10671	1176	6973	<b>17644</b>	12251	1495	10176	<b>22427</b>	16343	2884
4 PM	11495	1335	8522	<b>20018</b>	11207	1277	7953	<b>19160</b>	13566	2394
5 PM	11241	1284	8018	<b>19258</b>	9540	983	5212	<b>14752</b>	9819	1733
6 PM	10143	1083	6104	<b>16247</b>	8583	839	4000	<b>12583</b>	7975	1407
7 PM	8328	803	3714	<b>12042</b>	7090	641	2524	<b>9614</b>	5452	962
8 PM	7000	630	2450	<b>9451</b>	6014	516	1723	<b>7738</b>	3857	681
9 PM	5401	450	1351	<b>6752</b>	4873	396	1073	<b>5947</b>	2335	412
10 PM	3998	313	695	<b>4692</b>	3942	308	674	<b>4616</b>	1204	212
11 PM	1824	130	132	<b>1956</b>	2678	198	295	<b>2973</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Saturday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	713	49	19	<b>732</b>	2310	168	216	<b>2526</b>	0	0
1 AM	472	32	8	<b>480</b>	1390	98	75	<b>1466</b>	0	0
2 AM	546	37	11	<b>557</b>	871	60	29	<b>900</b>	0	0
3 AM	600	41	14	<b>613</b>	655	45	16	<b>672</b>	0	0
4 AM	1004	70	39	<b>1043</b>	879	61	30	<b>909</b>	0	0
5 AM	1671	119	110	<b>1781</b>	1643	117	106	<b>1749</b>	0	0
6 AM	3217	243	435	<b>3652</b>	3570	274	544	<b>4114</b>	777	137
7 AM	5638	475	1488	<b>7126</b>	6081	523	1768	<b>7849</b>	3952	697
8 AM	8068	767	3439	<b>11507</b>	8096	771	3467	<b>11563</b>	7109	1254
9 AM	11111	1259	7769	<b>18880</b>	10791	1198	7185	<b>17976</b>	12560	2216
10 AM	12251	1495	10177	<b>22428</b>	13827	1889	14513	<b>28340</b>	21369	3771
11 AM	12571	1568	10953	<b>23524</b>	15814	2545	22354	<b>38168</b>	29723	5245
12 PM	11537	1343	8608	<b>20146</b>	14908	2219	18378	<b>33286</b>	25573	4513
1 PM	11422	1320	8376	<b>19798</b>	14892	2214	18315	<b>33207</b>	25506	4501
2 PM	11533	1342	8600	<b>20133</b>	13827	1889	14513	<b>28340</b>	21369	3771
3 PM	11787	1395	9133	<b>20920</b>	13533	1809	13598	<b>27131</b>	20341	3590
4 PM	12698	1598	11273	<b>23971</b>	12380	1524	10482	<b>22862</b>	16713	2949
5 PM	12417	1533	10572	<b>22989</b>	10538	1152	6746	<b>17283</b>	11971	2113
6 PM	11205	1277	7948	<b>19153</b>	9481	974	5131	<b>14612</b>	9700	1712
7 PM	9199	930	4754	<b>13953</b>	7831	735	3199	<b>11031</b>	6656	1175
8 PM	7733	722	3103	<b>10836</b>	6643	587	2168	<b>8811</b>	4770	842
9 PM	5966	511	1692	<b>7659</b>	5383	448	1341	<b>6724</b>	2995	529
10 PM	4416	352	863	<b>5279</b>	4355	346	837	<b>5192</b>	1693	299
11 PM	2015	145	162	<b>2177</b>	2959	222	364	<b>3323</b>	104	18

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Sunday 90th Percentile Hourly Volumes**

	Existing Volumes			EB Vehicles by Type				WB Vehicles by Type			
	EB	WB	Total	% Cars	% SU	% DU	% TU	% Cars	% SU	% DU	% TU
12 AM	54	131	185	0.9	0.06	0.04	0	0.94	0.04	0.02	0
1 AM	30	72	102	0.9	0.05	0.04	0.01	0.94	0.04	0.02	0
2 AM	22	40	62	0.87	0.06	0.06	0.01	0.92	0.05	0.03	0
3 AM	23	29	52	0.88	0.07	0.05	0	0.91	0.06	0.03	0
4 AM	41	29	70	0.95	0.03	0.02	0	0.91	0.03	0.06	0
5 AM	68	55	123	0.91	0.07	0.02	0	0.88	0.04	0.08	0
6 AM	113	102	215	0.94	0.03	0.03	0	0.93	0.03	0.03	0.01
7 AM	231	201	432	0.93	0.05	0.01	0.01	0.92	0.06	0.01	0.01
8 AM	384	242	626	0.95	0.04	0.01	0	0.94	0.04	0.02	0
9 AM	619	465	1084	0.95	0.04	0.01	0	0.96	0.03	0.01	0
10 AM	803	625	1428	0.95	0.03	0.01	0.01	0.96	0.03	0.01	0
11 AM	911	748	1659	0.95	0.04	0.01	0	0.96	0.03	0.01	0
12 PM	908	782	1690	0.94	0.04	0.02	0	0.96	0.03	0.01	0
1 PM	961	759	1720	0.94	0.04	0.02	0	0.96	0.03	0.01	0
2 PM	961	719	1680	0.96	0.03	0.01	0	0.95	0.04	0.01	0
3 PM	971	712	1683	0.96	0.03	0.01	0	0.96	0.03	0.01	0
4 PM	1011	690	1701	0.97	0.03	0	0	0.95	0.04	0.01	0
5 PM	961	620	1581	0.98	0.02	0	0	0.95	0.04	0.01	0
6 PM	825	630	1455	0.97	0.03	0	0	0.95	0.04	0.01	0
7 PM	666	507	1173	0.97	0.02	0.01	0	0.95	0.04	0.01	0
8 PM	503	402	905	0.96	0.03	0.01	0	0.95	0.04	0.01	0
9 PM	332	305	637	0.96	0.03	0.01	0	0.95	0.04	0.01	0
10 PM	217	204	421	0.95	0.03	0.02	0	0.95	0.04	0.01	0
11 PM	77	117	194	0.91	0.04	0.04	0.01	0.93	0.02	0.05	0
Total	11692	9186	20878								

**SR-104 Sunday Horizon Year 90th Percentile Hourly Volumes**

	Existing Volumes			2021 Volumes			2031 Volumes		
	EB	WB	Total	EB	WB	Total	EB	WB	Total
12 AM	54	131	185	60	145	204	66	160	226
1 AM	30	72	102	33	80	113	37	88	124
2 AM	22	40	62	24	44	68	27	49	76
3 AM	23	29	52	25	32	57	28	35	63
4 AM	41	29	70	45	32	77	50	35	85
5 AM	68	55	123	75	61	136	83	67	150
6 AM	113	102	215	125	113	237	138	124	262
7 AM	231	201	432	255	222	477	282	245	527
8 AM	384	242	626	424	267	691	469	295	764
9 AM	619	465	1084	684	514	1197	755	567	1323
10 AM	803	625	1428	887	690	1577	980	763	1742
11 AM	911	748	1659	1006	826	1833	1112	913	2024
12 PM	908	782	1690	1003	864	1867	1108	954	2062
1 PM	961	759	1720	1062	838	1900	1173	926	2099
2 PM	961	719	1680	1062	794	1856	1173	877	2050
3 PM	971	712	1683	1073	786	1859	1185	869	2054
4 PM	1011	690	1701	1117	762	1879	1234	842	2076
5 PM	961	620	1581	1062	685	1746	1173	757	1929
6 PM	825	630	1455	911	696	1607	1007	769	1775
7 PM	666	507	1173	736	560	1296	813	619	1431
8 PM	503	402	905	556	444	1000	614	491	1104
9 PM	332	305	637	367	337	704	405	372	777
10 PM	217	204	421	240	225	465	265	249	514
11 PM	77	117	194	85	129	214	94	143	237
Total	11692	9186	20878	12915	10147	23062	14266	11209	25475

**SR-104 Sunday 2021 Horizon Year Queues**

	2021 Eastbound				2021 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	835	57	27	<b>862</b>	1932	139	149	<b>2081</b>	0	0
1 AM	471	32	8	<b>480</b>	1062	74	43	<b>1105</b>	0	0
2 AM	359	24	5	<b>364</b>	604	41	14	<b>618</b>	0	0
3 AM	364	25	5	<b>369</b>	441	30	7	<b>449</b>	0	0
4 AM	600	41	14	<b>614</b>	453	31	8	<b>461</b>	0	0
5 AM	1025	71	40	<b>1066</b>	893	62	31	<b>924</b>	0	0
6 AM	1682	120	112	<b>1794</b>	1555	110	95	<b>1650</b>	0	0
7 AM	3458	264	508	<b>3965</b>	3031	228	383	<b>3414</b>	182	32
8 AM	5567	468	1446	<b>7013</b>	3569	274	544	<b>4112</b>	775	137
9 AM	8974	896	4468	<b>13442</b>	6690	593	2204	<b>8894</b>	4840	854
10 AM	11842	1406	9251	<b>21092</b>	8992	899	4490	<b>13483</b>	8740	1542
11 AM	13208	1724	12648	<b>25856</b>	10762	1193	7133	<b>17895</b>	12490	2204
12 PM	13390	1771	13174	<b>26564</b>	11251	1286	8038	<b>19289</b>	13676	2413
1 PM	14172	1988	15655	<b>29827</b>	10920	1222	7416	<b>18337</b>	12866	2270
2 PM	13827	1889	14512	<b>28339</b>	10424	1132	6556	<b>16980</b>	11713	2067
3 PM	13970	1930	14979	<b>28950</b>	10244	1100	6263	<b>16507</b>	11311	1996
4 PM	14295	2025	16083	<b>30378</b>	10004	1059	5888	<b>15892</b>	10788	1904
5 PM	13482	1795	13445	<b>26926</b>	8989	898	4486	<b>13475</b>	8734	1541
6 PM	11665	1369	8873	<b>20538</b>	9134	920	4670	<b>13803</b>	9013	1591
7 PM	9509	979	5169	<b>14678</b>	7351	673	2750	<b>10100</b>	5865	1035
8 PM	7237	659	2650	<b>9887</b>	5828	496	1604	<b>7433</b>	3598	635
9 PM	4777	387	1027	<b>5803</b>	4422	353	866	<b>5288</b>	1775	313
10 PM	3176	240	423	<b>3599</b>	2958	221	364	<b>3321</b>	103	18
11 PM	1201	84	56	<b>1257</b>	1787	128	127	<b>1913</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

added Q = additional queue length formed until the wave reaches the back

Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

**SR-104 Sunday 2031 Horizon Year Queues**

	2031 Eastbound				2031 Westbound					
	Base Q	added t	added Q	Total Q	Base Q	added t	added Q	Total Q	Q to S	Q to N
12 AM	922	64	33	<b>955</b>	2134	154	183	<b>2317</b>	0	0
1 AM	521	35	10	<b>531</b>	1173	82	53	<b>1226</b>	0	0
2 AM	397	27	6	<b>403</b>	667	46	17	<b>684</b>	0	0
3 AM	402	27	6	<b>408</b>	487	33	9	<b>496</b>	0	0
4 AM	663	45	17	<b>680</b>	501	34	9	<b>510</b>	0	0
5 AM	1133	79	50	<b>1182</b>	987	68	37	<b>1024</b>	0	0
6 AM	1858	133	137	<b>1995</b>	1718	122	117	<b>1834</b>	0	0
7 AM	3819	297	629	<b>4449</b>	3348	255	474	<b>3822</b>	528	93
8 AM	6150	531	1814	<b>7964</b>	3942	308	674	<b>4616</b>	1204	212
9 AM	9913	1044	5751	<b>15665</b>	7390	678	2785	<b>10175</b>	5929	1046
10 AM	13080	1692	12292	<b>25373</b>	9933	1048	5781	<b>15714</b>	10637	1877
11 AM	14590	2116	17152	<b>31741</b>	11888	1416	9352	<b>21240</b>	15334	2706
12 PM	14791	2181	17919	<b>32710</b>	12428	1535	10600	<b>23029</b>	16854	2974
1 PM	15654	2484	21599	<b>37253</b>	12063	1454	9741	<b>21804</b>	15814	2791
2 PM	15273	2344	19892	<b>35165</b>	11515	1338	8562	<b>20077</b>	14346	2532
3 PM	15432	2401	20587	<b>36019</b>	11316	1299	8164	<b>19480</b>	13838	2442
4 PM	15790	2536	22242	<b>38033</b>	11050	1247	7656	<b>18706</b>	13180	2326
5 PM	14892	2214	18316	<b>33208</b>	9929	1047	5775	<b>15705</b>	10629	1876
6 PM	12885	1643	11763	<b>24648</b>	10089	1074	6020	<b>16109</b>	10973	1936
7 PM	10503	1146	6688	<b>17191</b>	8120	774	3492	<b>11611</b>	7150	1262
8 PM	7994	757	3362	<b>11357</b>	6438	564	2016	<b>8454</b>	4466	788
9 PM	5276	437	1282	<b>6558</b>	4885	398	1079	<b>5963</b>	2349	415
10 PM	3508	269	524	<b>4032</b>	3267	248	450	<b>3717</b>	439	78
11 PM	1327	93	69	<b>1396</b>	1974	142	156	<b>2129</b>	0	0

Base Q = queue formed after 30 minutes (gates closed to gates open)

added t = time for queue discharge wave to reach the back of the growing queue

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Total Q = Base Q + added Q

Q to S = westbound queue split extending to the southwest on SR-3

Q to N = westbound queue split extending to the northeast on SR-104

Note: a westbound Total Q under 3200 feet does not extend past the SR3/SR104 intersection

Q is in feet, t is in seconds

STATE OF WASHINGTON - DEPARTMENT OF TRANSPORTATION  
 T R I P S S Y S T E M  
 ANNUAL TRAFFIC REPORT

STATE ROUTE	ROUTE MILEPOST	LOCATION	COUPLLET CLASS	FUNCTION	TRUCK PERCENTAGES SNGL DBL TRIPLE TOTAL	AVERAGE DAILY TRAFFIC VOLUME				
						2007 UNITS	2008 UNITS	2009 UNITS	2010 UNITS	
103	016.25	BEFORE JCT OYSTERVILLE RD		3		510	570*	610	610	
103	016.25	AFTER JCT OYSTERVILLE RD		3		230	260*	280	280	
STATE ROUTE NO 104 MAINLINE SR 101 TO SR 522/L F PRK										
104	000.41	AFTER JCT SR 104 W BND		1		6400	6200*	6400	6400	
104	008.87	BEFORE JCT SR 19-BEAVER VALLEY RD		1		8100	7300*	7600	7500	
104	008.87	AFTER JCT SR 19-BEAVER VALLEY RD		1		13000	13000*	13000	13000	
104	013.76	BEFORE JCT PARADISE BAY RD*SHINE RD		1		13000	13000*	13000	13000	
104	013.92	AT PTR LOCATION R085		1	06 03 09	16000*	16000*	16000*	16000+	
104	015.59	AFTER JCT SR 104 WYE CONN		1		6500	5900	5700*	6000	
104	016.51	BEFORE JCT GAMBLE WAY		1		6000	5500	5300*	5600	
104	019.48	AT PTR LOCATION R095		1	06 01 08	6100*	5600*	5300*	5500+	
104	020.58	BEFORE JCT SR 307		1		7300	6700*	6400	6700	
104	020.58	AFTER JCT SR 307		1		16000	15000*	15000	16000	
104	023.06	BEFORE JCT PARCELL RD WYE CONN		1		12000*	12000	12000	12000	
104	023.12	AFTER JCT BARBER CUTOFF RD WYE CONN		1		10000*	11000*	11000*	11000	
104	024.10	AFTER JCT W 1ST ST NE		1		7700*	7800	7800	7900	
104	** 024.23	AFTER JCT SR 104 COKNGSTN (COUPLT)	C	1		4200	4000*	4000	4000	
104	024.32	BEFORE JCT KINGSTON RD*IOWA AVE	C	1		4100	3900*	4000	4000	
104	024.32	AFTER JCT KINGSTON RD*IOWA AVE	C	1		4600	4200*	4300	4300	
104	024.53B	KINGSTON FERRY LANDING	C	1		3000*	2900*	2900*	2900*	
104	024.45	EDMONDS FERRY LANDING		1		6200*	5800*	5800*	5900*	
104	024.50	BEFORE JCT SR 104 E BND WYE CONN		1		7400	6800*	6800	6800	
104	024.51	AFTER JCT SR 524*SUNSET AVE		1		4400	4000*	4000	4100	
104	025.12	BEFORE JCT PINE ST WYE CONN		1		10000	9800*	10000	10000	
104	025.15	AFTER JCT SR 524 SPUR WYE CONN		1		10000	9400*	9500	9600	
104	025.55	BEFORE JCT FIFTH ST		1		10000	9400*	9500	9600	
104	025.70	AFTER JCT SR 104 W BND		1		19000*	17000	18000	17000	

No Growth

\* BASED ON ACTUAL COUNT  
 + SOURCE OF TRUCK PERCENTAGES

\*\* COUPLLET SKETCH IN BACK OF BOOK