



SEATAC GAS CONVENIENCE  
TRAFFIC IMPACT ANALYSIS

*SeaTac, WA*



**1/15/2021**

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SEATAC GAS CONVENIENCE  
TRAFFIC IMPACT ANALYSIS

*TABLE OF CONTENTS*

1. Introduction .....3  
2. Project Description .....3  
3. Existing Conditions.....6  
4. Forecast Traffic Demand and Analysis .....9  
5. Conclusions & Mitigation .....16  
  
Appendix.....17

*LIST OF TABLES*

1. Bus Routes .....8  
2. Project Trip Generation .....9  
3. PM Peak Hour Level of Service .....15

*LIST OF FIGURES*

1. Vicinity Map & Roadway System .....4  
2. Site Plan.....5  
3. Existing PM Peak Hour Volumes .....7  
4. PM Peak Hour Trip Distribution & Assignment.....11  
5. Forecast 2027 PM Peak Hour Background Volumes.....12  
6. Forecast 2027 PM Peak Hour Volumes with Project .....13  
7. Forecast 2033 PM Peak Hour Volumes with Project .....14

# SEATAC GAS CONVENIENCE TRAFFIC IMPACT ANALYSIS

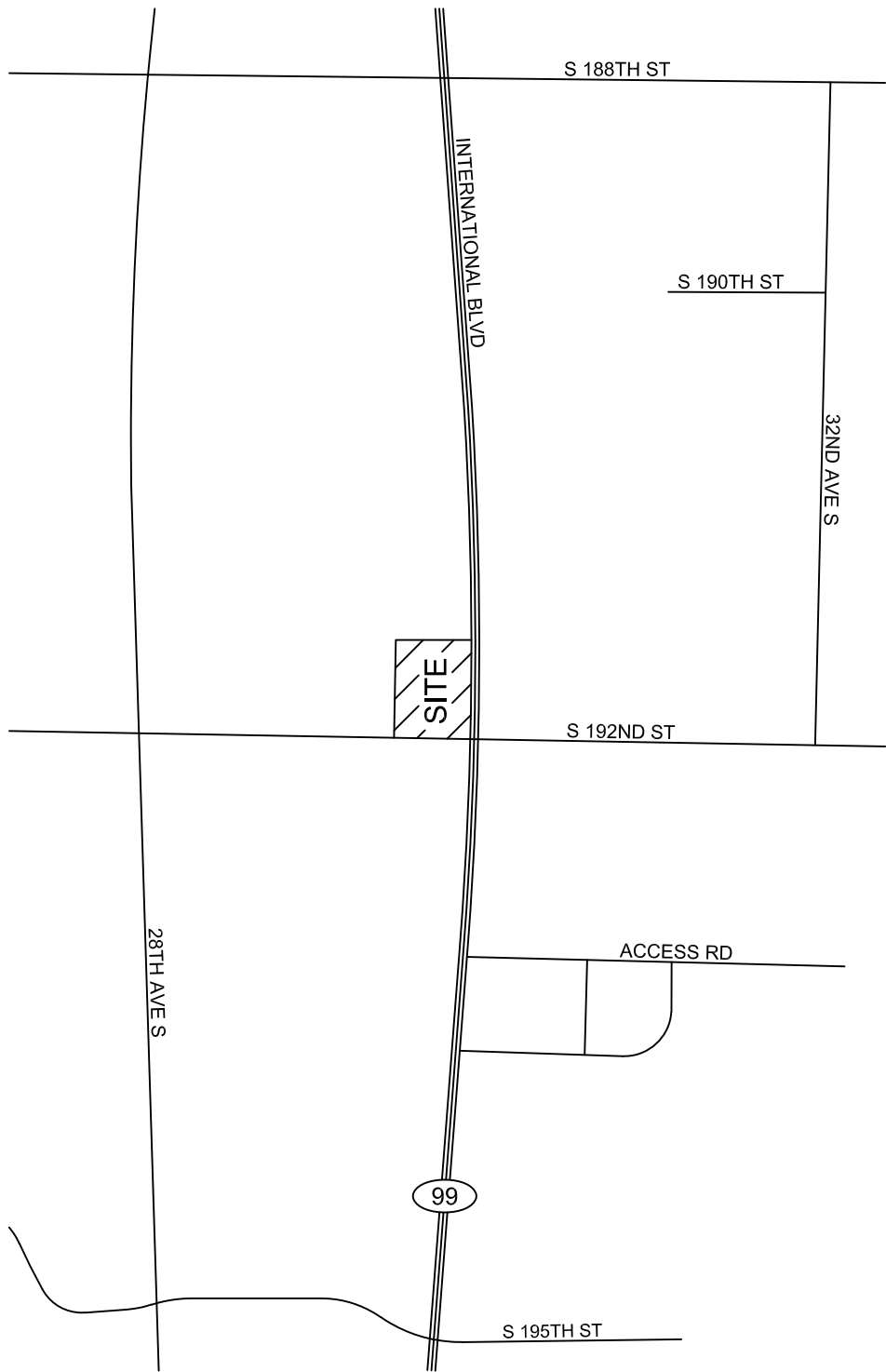
## 1. INTRODUCTION

The main goals of this study focus on the assessment of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent streets serving the subject site and gathering existing vehicular volumes within a defined study area. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined, if needed.

## 2. PROJECT DESCRIPTION

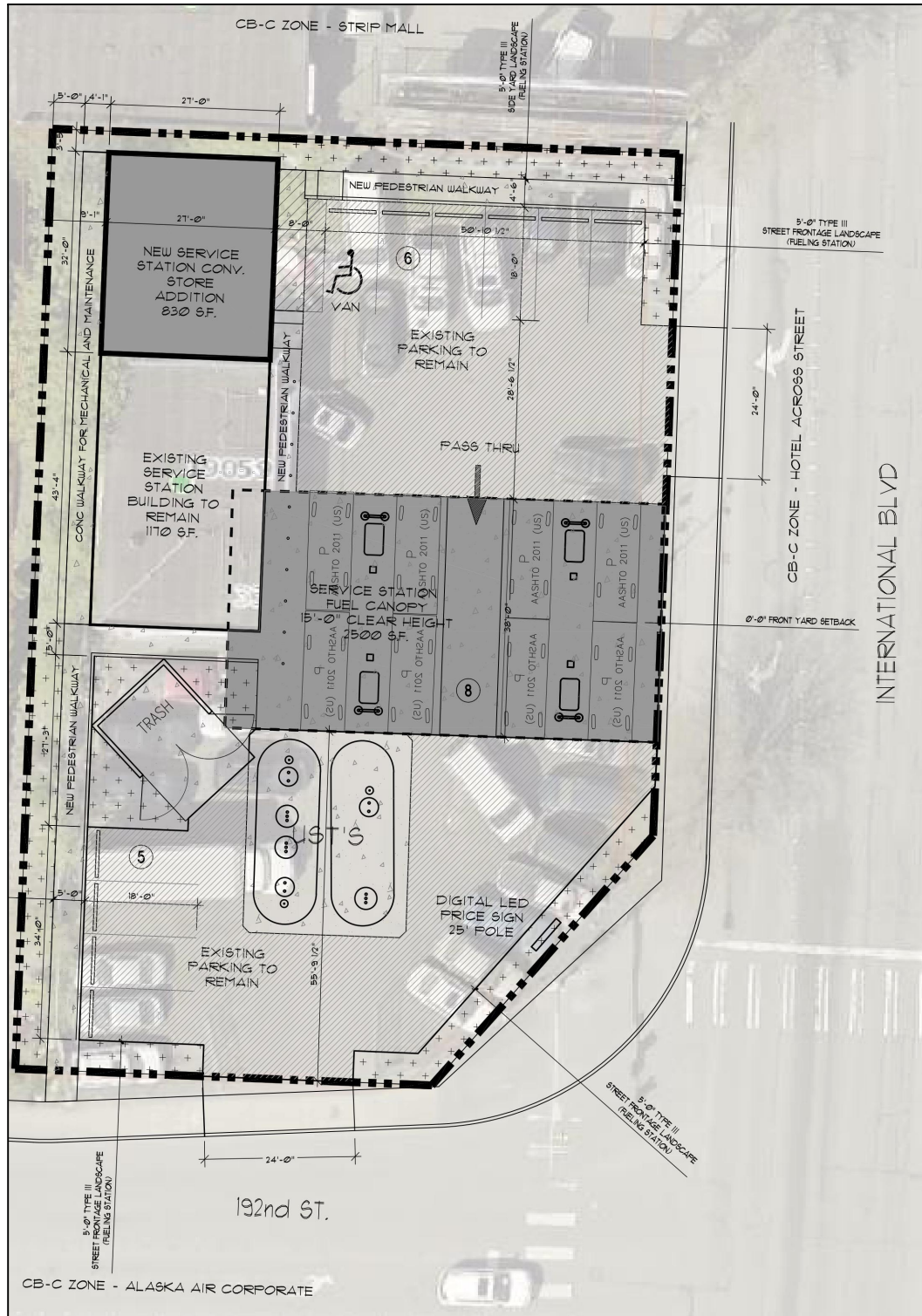
The SeaTac Gas Convenience project proposes for the construction of a gas station encompassing 8 fueling positions and a 2,000 square food convenience market in the city of SeaTac. The subject site is situated on an approximate 0.33-acres within tax parcel #: 332304-9101. An existing 1,170 square foot structure exists on-site, which previously operated as a used car sales building. This building is to be renovated and expanded to accommodate the proposed convenience market. Access to the site is proposed to continue via the two existing on-site driveways: one entrance extending north from S 192nd Street and one entrance extending west from SR-99 (right-in/right-out). Figure 1 on the following page shows the general site location with surrounding street network. A site plan illustrating the overall configuration of the project is given in Figure 2.





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**SEATAC GAS CONVENIENCE**  
VICINITY MAP & ROADWAY SYSTEM  
FIGURE 1



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SEATAC GAS CONVENIENCE

SITE PLAN  
FIGURE 2

### 3. EXISTING CONDITIONS

#### 3.1 Existing Street System

The street network serving the proposed project consists of a variety of roadways. The major roadways and arterials defined in the study area are listed and described below.

*SR-99 (International Boulevard):* is a multi-lane, north-south City designated principal arterial bordering the subject site to the east. Travel lanes are approximately 11-13 feet in width with turn-lanes and marked crosswalks provided at major intersections. A raised, vegetative median is predominantly present along the roadway. Shoulders are composed of curb, gutter and sidewalk. The posted speed limit is 40 mph.

*S 192nd Street:* is a 2- to 3-lane, east-west minor arterial bordering the subject site to the south. Travel lanes are approximately 11-15 feet in width with turn-lanes and marked crosswalks provided at major intersections. Adjacent the subject site, shoulders are composed of curb, gutter and sidewalk. The posted speed limit is 25-35 mph.

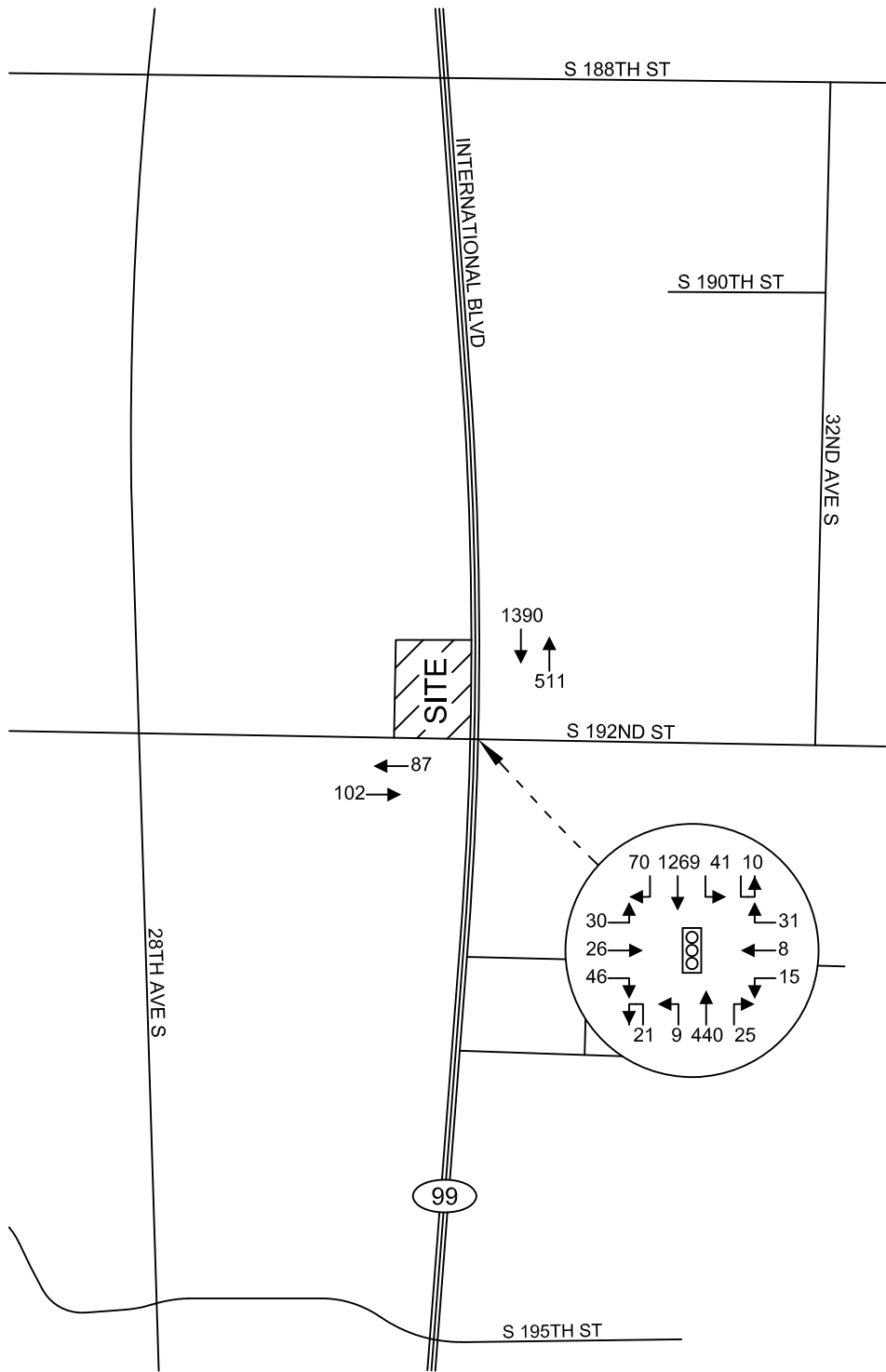
#### 3.2 Roadway Improvements

A review of the current SeaTac Six-Year Transportation Improvement Plan (2021-2026) indicates that the following project is currently planned in the vicinity. A summary of the identified project is provided below:

*International Boulevard Safety Improvements (ST-162):* This project intends to conduct a corridor study to evaluate safety improvements for collision reduction. Possible improvements assumed in cost estimates include four near-side traffic signals and improvements to discourage illegal pedestrian crossings. The total estimated cost is \$500,000.

#### 3.3 Existing Peak Hour Volumes

Field data for this study was obtained and collected in December of 2020 in order to establish baseline vehicular conditions near the subject site. Traffic counts were administered at the study intersection of SR-99 & S 192nd Street between the PM peak period of 4:00-6:00 PM. The one-hour exhibiting highest overall volumes for the time period (peak hour) was then derived and used for intersection capacity analysis to present worst case conditions. Existing PM peak hour volumes at the study intersection are illustrated in Figure 3 on the following page. Full-count sheets have been included in the appendix.



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**SEATAC GAS CONVENIENCE**  
EXISTING PM PEAK HOUR VOLUMES  
FIGURE 3

### 3.4 Public Transit

A review of the King County Metro and Sound Transit service systems indicates the nearest bus lines to the subject site are served via Route 156 (Highline College - Sea-Tac Airport – Southcenter) Route 161 (Kent Station - Burien TC), Route 574 (Lakewood – Sea-Tac Airport) and the A-Line (Federal Way TC - Tukwila Intl. Blvd Link Station). The site is also within walking distance of the Sound Transit operated Angle Lake Park & Ride and Link Light Rail Station Park & Ride (~3,500' southwest). The nearest aforementioned routes are listed and described in the table below.

**Table 1: Bus Routes**

Route	Description	Weekday Service	Saturday	Sunday	Nearest Stop
<b>156</b>	Highline College - Sea-Tac Airport - Southcenter	5:03 AM – 11:33 PM (every ~15 minutes)	5:25 AM – 11:01 PM (every ~60 minutes)	5:28 AM – 10:45 PM (every ~60 minutes)	~1,300'
<b>161</b>	Kent Station - Burien TC	4:43 AM – 4:02 AM (every ~15 minutes)	5:28 AM – 4:05 AM (every ~30 minutes)	5:29 AM – 4:06 AM (every ~30 minutes)	~1,300'
<b>574</b>	Lakewood – Sea-Tac Airport	2:03 AM – 12:38 AM (every ~30 minutes)	2:13 AM – 12:37 AM (every ~30 minutes)	2:13 AM – 12:37 AM (every ~30 minutes)	~1,300'
<b>A Line</b>	Federal Way TC - Tukwila Intl. Blvd Link Station	24 hours (every ~10 minutes)	24 hours (every ~10 minutes)	24 hours (every ~10 minutes)	~900'

Given the auto-centric services provided by the proposed subject site, transit usage as a result of the development is anticipated to be relatively low.

### 3.5 Non-Motorist Traffic

Pedestrian and bicycle activity were observed along the project frontage on SR-99 and S 192nd Street. During the PM peak hour, approximately 17 pedestrians and 0 bicyclists were observed. The proposed project is primarily a auto-centric development and will mainly attract vehicle trips; however, few non-motorist trips may utilize the convenience store component. Adequate pedestrian facilities are noted in the general vicinity to safely support non-motorist transport.



## 4. FORECAST TRAFFIC DEMAND AND ANALYSIS

### 4.1 Trip Generation

Trip generation is used to determine the magnitude of project impacts on the surrounding street system. This is usually denoted by the quantity or specific number of new trips that enter and exit a project during a designated time period, such as a specific peak hour (AM or PM) or an entire day. Data presented in this report was taken from the Institute of Transportation Engineer's publication *Trip Generation*, 10th Edition. The designated land use for the proposed project is defined as LUC 945 – Gasoline/ Service Station with Convenience Market. The independent variable vehicle fueling positions (8) was used for trip determination. For the previous on-site use, LUC 841 – Automobile Sales (Used) was applied towards the 1,165 square foot building. Table 2 below summarizes the estimated project trip generation using ITE rates. Included are the average weekday daily traffic (AWDT) and the AM and PM peak hour volumes.

**Table 2: Project Trip Generation**

Land Use	Units	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
<u>Proposed Use</u>								
Gas Station w/ Market (LUC 945)	8 fueling positions	674	20	18	38	25	24	49
	<i>Pass-by (62% AM; 56% PM)<sup>1</sup></i>	969	31	31	62	32	31	63
<b>Total Project Trips</b>		<b>1643</b>	<b>51</b>	<b>49</b>	<b>100</b>	<b>57</b>	<b>55</b>	<b>112</b>
<u>Previous Use</u>								
Used Car Sales (LUC 841)	1,165 sf	-32	-1	-1	-2	-2	-2	-4
<b>Net New Trips</b>		<b>1611</b>	<b>50</b>	<b>48</b>	<b>98</b>	<b>55</b>	<b>53</b>	<b>108</b>

Based on the estimated trip generation, the project is anticipated to generate a site total of 100 AM and 112 PM peak hour trips, not including the reduced trips from the previous use. As shown, a number of these trips are expected to be in the form of pass-by. Pass-by trips are defined as vehicles already captured on the adjacent roadway and are subsequently attracted to the site for a convenience-based stop. These trips are not considered as new trips but will impact the site's driveways. Gas stations are largely influenced by location and spur of the moment stops. With SR-99 supporting a significant amount of vehicular volumes already passing the site, a number of trips are assumed to use the proposed services.

<sup>1</sup> Pass-by rates were derived from *ITE Trip Generation Handbook*, 3rd Edition (2017).

## 4.2 Distribution & Assignment

Trip distribution describes the anticipated travel routes for inbound and outbound project traffic relative to the local street system. Assigned percentages are primarily based on existing travel patterns and proximity to major arterial routes. PM peak hour trip distribution percentages displaying primary and pass-by trips are illustrated in Figure 4. The access driveway on SR-99 would be restricted to right-turn movements only given the center raised median along the arterial. Drivers intending to exit the site and travel northbound have the ability to utilize the U-turn phase as the signalized intersection with S 192nd Street. Furthermore, the driveway on S 192nd Street is intended for full-movement access and would allow entry to SR-99 via the signalized intersection.

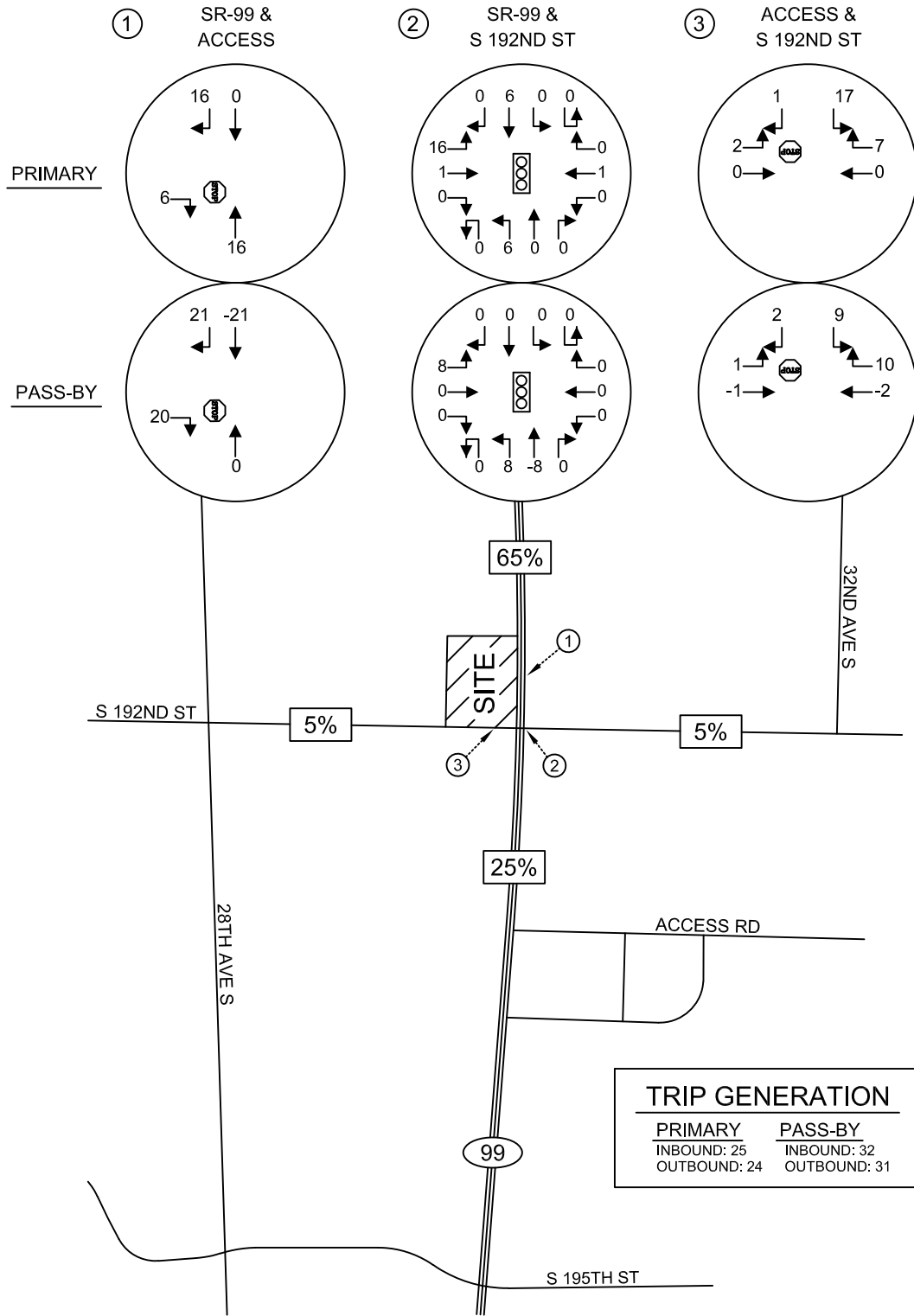
## 4.3 Future Peak Hour Volumes

A 6-year horizon of 2027 was used for future traffic delay analysis. Forecast 2027 background traffic volumes were derived by applying a 3.0 percent compound annual growth rate per year to the existing PM peak hour traffic volumes shown in Figure 3. Additionally, population and employment growth estimations provided in the City of SeaTac's Comprehensive Plan<sup>2</sup> from 2012-2035 forecast an annual growth rate under 3.0%. Forecast 2027 PM peak hour volumes without project are shown in Figure 5. Figure 6 illustrates forecast 2027 PM peak hour volumes with the addition of project-generated traffic.

Additionally, Figure 7 has been provided for the City's long-term planning which illustrates forecast 2033 (12-year horizon) PM peak hour volumes with project.

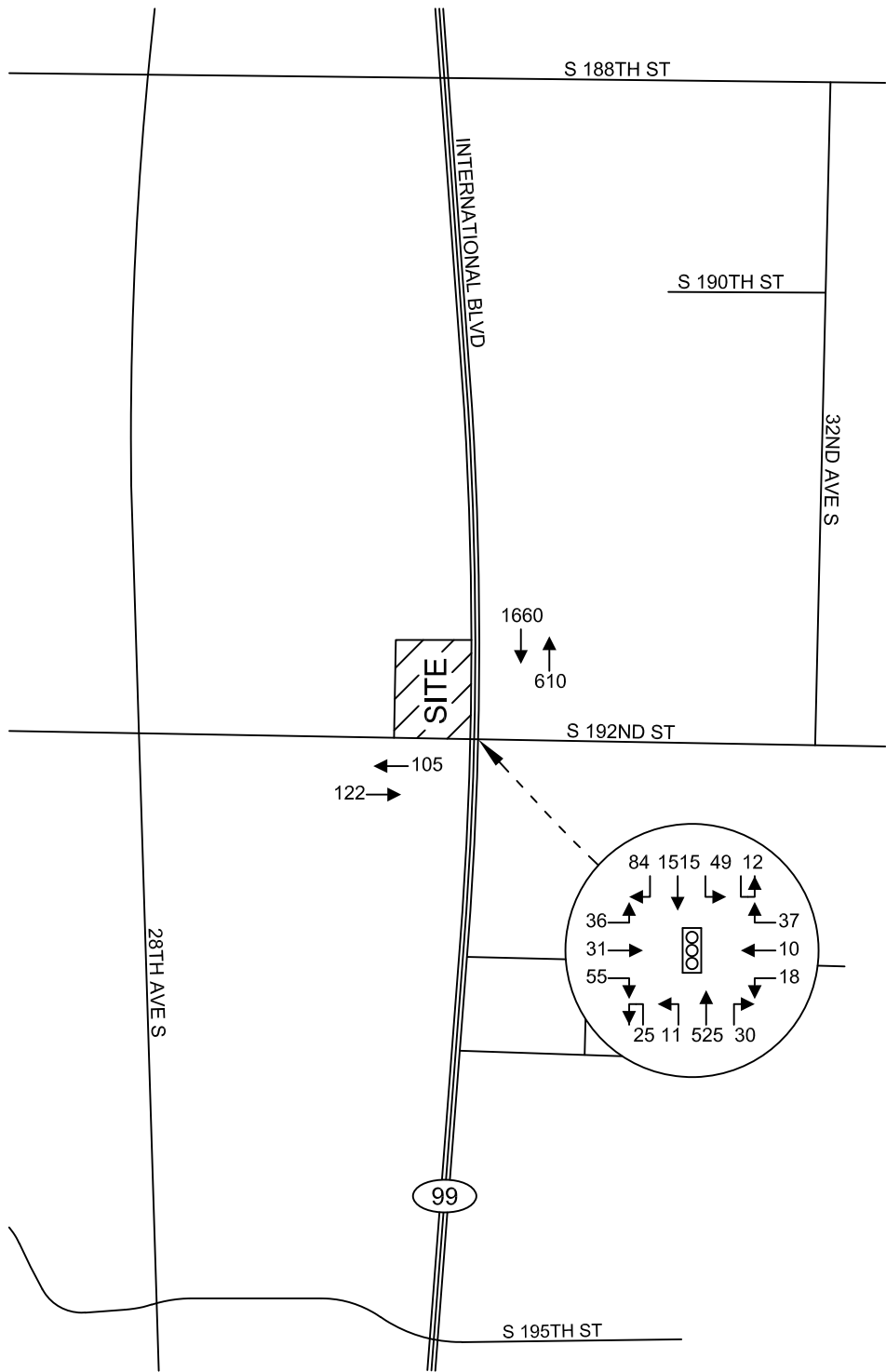
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<sup>2</sup> City of SeaTac Comprehensive Plan; 2. Land Use Background Report: Table BR2.3: Net New Growth for the Year 2035



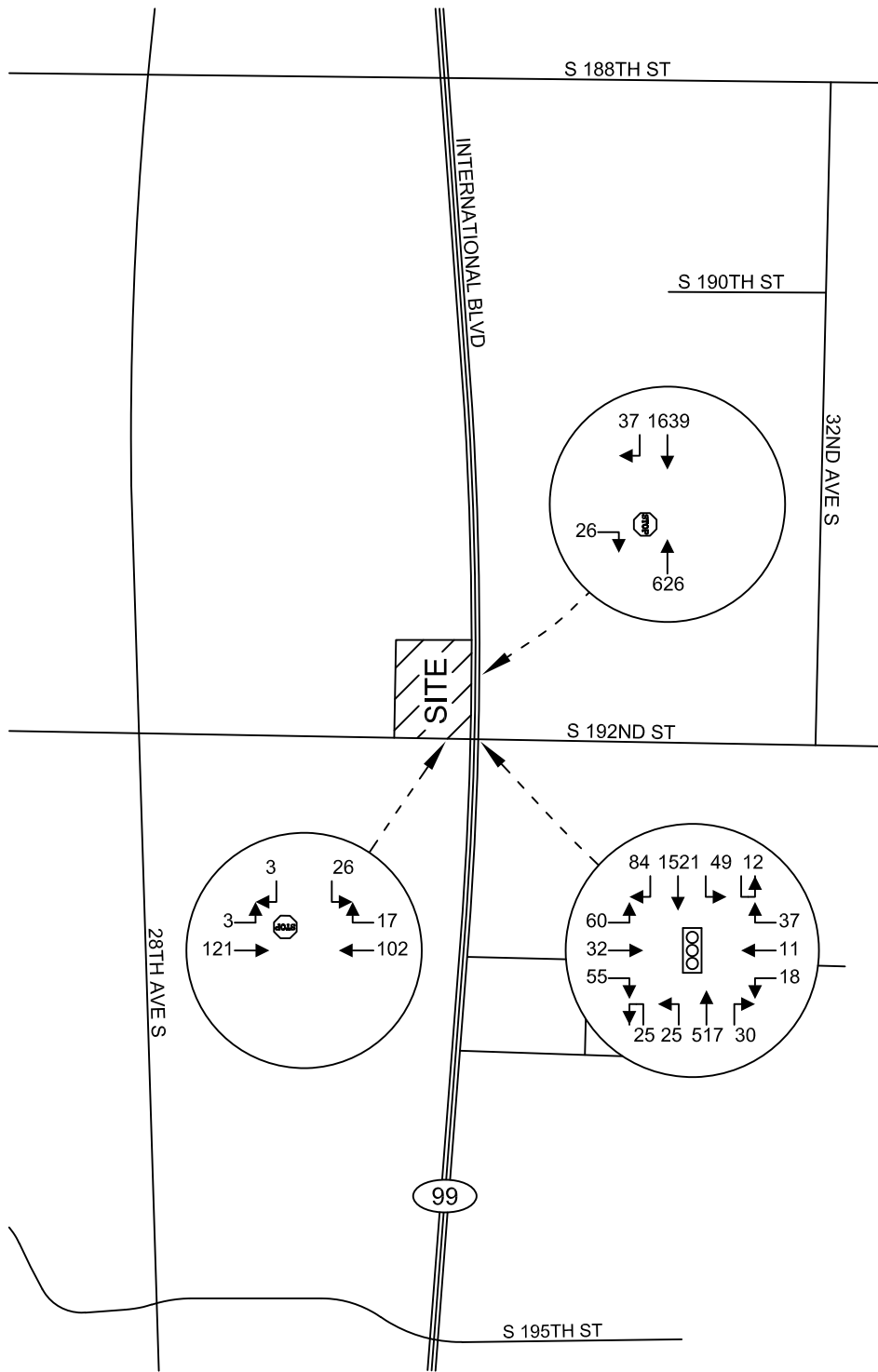
**HEATH & ASSOCIATES**  
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**SEATAC GAS CONVENIENCE**  
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT  
FIGURE 4



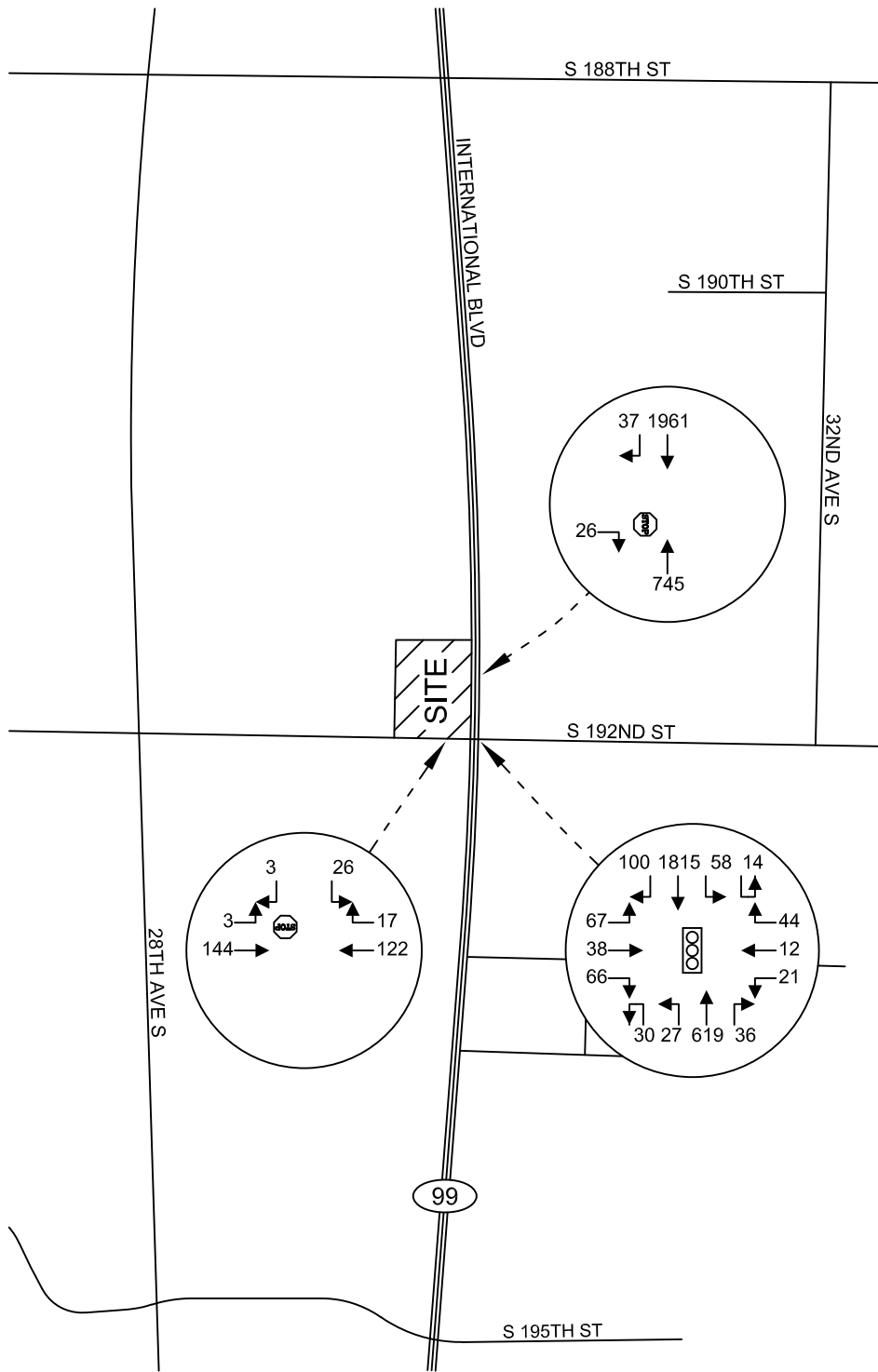
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**SEATAC GAS CONVENIENCE**  
FORECAST 2027 PM PEAK HOUR BACKGROUND VOLUMES  
FIGURE 5



**HEATH & ASSOCIATES**  
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**SEATAC GAS CONVENIENCE**  
FORECAST 2027 PM PEAK HOUR VOLUMES WITH PROJECT  
FIGURE 6



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**SEATAC GAS CONVENIENCE**  
FORECAST 2033 PM PEAK HOUR VOLUMES WITH PROJECT  
FIGURE 7

#### 4.4 Future Level of Service

Peak hour delays were determined through the use of the *Highway Capacity Manual* 6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range<sup>3</sup> for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the 2016 Highway Capacity Manual. Level of service calculations were made through the use of the *Synchro 10* analysis program. Delays for the study intersection and proposed accesses under existing and future conditions during the PM peak hour are shown below in Table 3 below.

**Table 3: PM Peak Hour Level of Service**

*Delays given in Seconds Per Vehicle*

Intersection	Control	Movement	<u>Existing</u>		<u>2027 Without</u>		<u>2027 With</u>		<u>2033 With</u>	
			LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SR-99 & S 192nd St	Signal	Overall	A	7.8	A	9.2	B	11.7	B	13.4
SR-99 & Access (RIRO)	Stop	EB	-	-	-	-	C	22.2	D	28.5
Access & S 192nd St	Stop	SB	-	-	-	-	B	10.0	B	10.4

*RIRO: Right in/Right out*

The City has set concurrency standards at LOS E. As indicated in Table 3, existing and forecast 2027 and 2033 PM peak hour delays with project are shown to operate with acceptable LOS D or better conditions. Based on forecast conditions, no LOS or capacity deficiencies are identified at the project accesses or study intersection as a result of the proposed development. The City may elect to restrict the S 192nd Street driveway to right-in/right-out only given the close proximity to SR-99; however, S 192nd Street has relatively low volumes and adequate entry opportunities would be available for motorists to leave the

<sup>3</sup> *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

*Stop Controlled Intersections – Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Highway Capacity Manual, 6th Edition

site via left-turns. On average, one to two eastbound vehicles are queued at the SR-99 signal along S 192nd Street. Drivers may have to wait for the eastbound queue to clear from the signal before entering the roadway.

## **5. CONCLUSIONS AND MITIGATION MEASURES**

SeaTac Gas Convenience is a proposed gas station development encompassing 8 fueling positions and a 2,000 square foot convenience market in the city of SeaTac. An existing 1,170 square foot structure exists on-site, which was previously used as a used car sales facility. Development would entail retrofitting the existing structure to be utilized as a convenience market and constructing an 830 square foot addition to the building (2,000 square feet total). The subject property is located on 0.33-acre tax parcel #: 332304-9101. Access to and from the site is proposed to continue via a single driveway on SR-99 and a single driveway on S 192nd Street. A site plan presenting the overall configuration of the project is illustrated in Figure 2.

Based on ITE data, the project site is estimated to generate a net increase of 1,611 average daily trips with 98 trips occurring in the AM hour and 101 in the PM peak hour. Over half of these trips are anticipated to be in the form of pass-by vehicles traveling along the fronting roadways. A six-year (2027) and twelve-year (2033) horizon years were evaluated in terms of level of service (LOS) with and without the project. The results indicate that the project would have a minimal impact to the adjacent street system as most of the site-generated traffic is not new but rather vehicles already traveling along SR-99. The SR-99 access, allowing right-turn movements only, is shown to operate with up to LOS D conditions in the 2033 forecast PM peak hour. The S 192nd Street driveway is shown to operate with LOS B conditions under are scenarios with full turning movements. At times, drivers may have to wait for the queues at the SR-99 & S 192nd Street intersection to clear before entering the roadway given the driveway's proximity to the signal.

Based on the above analysis, the following mitigation is identified:

1. Pay traffic impact fees as required by the City of SeaTac. Exact fees and calculations will be determined by the City at the time of building permit issuance.

No other mitigation is identified at this time.



SEATAC GAS CONVENIENCE  
TRAFFIC IMPACT ANALYSIS

*APPENDIX*

## LEVEL OF SERVICE

The following are excerpts from the *2016 Highway Capacity Manual - Transportation Research Board Special Report 209*.

Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions.

### Level-of-Service definitions

*Level of service A* represents primarily free-flow operations at average travel speeds, usually about 90 percent of the free-flow speed for the arterial classification. Vehicles are seldom impeded in their ability to maneuver in the traffic stream. Delay at signalized intersections is minimal.

*Level of service B* represents reasonably unimpeded operations at average travel speeds, usually about 70 percent of the free-flow speed for the arterial classification. The ability to maneuver in the traffic stream is only slightly restricted and delays are not bothersome.

*Level of service C* represents stable operations; however, ability to maneuver and change lanes in midblock locations may be more restricted than in LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the average free-flow speed for the arterial classification.

*Level of service D* borders on a range in which small increases in flow may cause substantial increases in approach delay and hence decreases in arterial speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free-flow speed.

*Level of service E* is characterized by significant delays and average travel speeds of one-third the free-flow speed or less. Such operations are caused by some combination of adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

*Level of service F* characterizes arterial flow at extremely low speeds, from less than one-third to one-quarter of the free-flow speed. Intersection congestion is likely at critical signalized locations, with long delays and extensive queuing.

# Heath & Associates

2214 Tacoma Rd E  
Puyallup, WA, 98371

File Name : 4543a  
Site Code : 00004543  
Start Date : 12/17/2020  
Page No : 1

## Groups Printed- Cars+ - Trucks

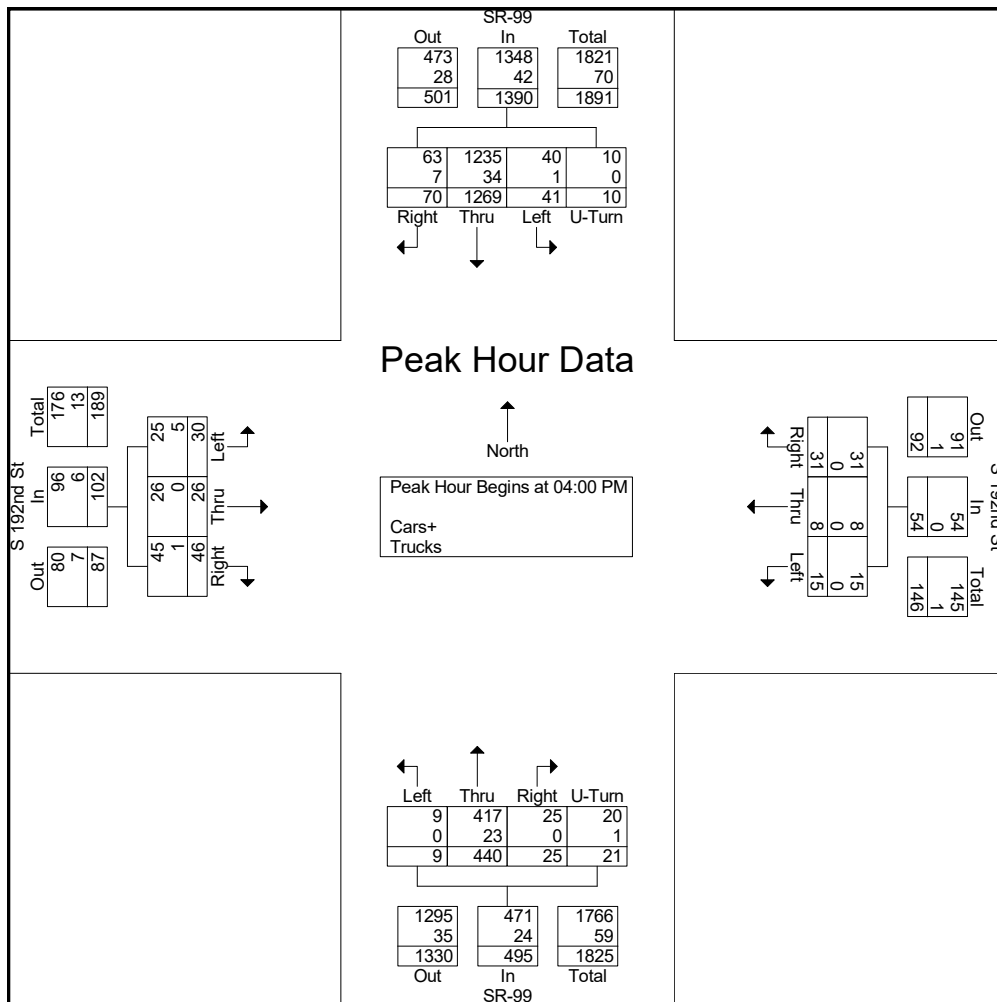
Start Time	SR-99 Southbound					S 192nd St Westbound				SR-99 Northbound					S 192nd St Eastbound				Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	
04:00 PM	17	317	7	2	343	8	3	3	14	9	102	1	5	117	12	4	8	24	498
04:15 PM	21	336	13	3	373	7	3	5	15	10	110	2	6	128	22	6	6	34	550
04:30 PM	13	340	12	4	369	8	0	4	12	5	113	3	6	127	6	6	9	21	529
04:45 PM	19	276	9	1	305	8	2	3	13	1	115	3	4	123	6	10	7	23	464
Total	70	1269	41	10	1390	31	8	15	54	25	440	9	21	495	46	26	30	102	2041
05:00 PM	17	287	12	5	321	8	2	6	16	7	114	4	4	129	10	3	3	16	482
05:15 PM	12	322	8	3	345	10	1	3	14	11	114	5	8	138	10	5	8	23	520
05:30 PM	11	247	12	2	272	1	1	6	8	2	106	5	4	117	9	7	6	22	419
05:45 PM	8	219	6	2	235	7	2	4	13	6	95	3	5	109	6	3	2	11	368
Total	48	1075	38	12	1173	26	6	19	51	26	429	17	21	493	35	18	19	72	1789
Grand Total	118	2344	79	22	2563	57	14	34	105	51	869	26	42	988	81	44	49	174	3830
Apprch %	4.6	91.5	3.1	0.9		54.3	13.3	32.4		5.2	88	2.6	4.3		46.6	25.3	28.2		
Total %	3.1	61.2	2.1	0.6	66.9	1.5	0.4	0.9	2.7	1.3	22.7	0.7	1.1	25.8	2.1	1.1	1.3	4.5	
Cars+	105	2274	78	21	2478	57	14	33	104	50	828	26	41	945	79	44	41	164	3691
% Cars+	89	97	98.7	95.5	96.7	100	100	97.1	99	98	95.3	100	97.6	95.6	97.5	100	83.7	94.3	96.4
Trucks	13	70	1	1	85	0	0	1	1	1	41	0	1	43	2	0	8	10	139
% Trucks	11	3	1.3	4.5	3.3	0	0	2.9	1	2	4.7	0	2.4	4.4	2.5	0	16.3	5.7	3.6

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2214 Tacoma Rd E  
Puyallup, WA, 98371

File Name : 4543a  
Site Code : 00004543  
Start Date : 12/17/2020  
Page No : 2

Start Time	SR-99 Southbound					S 192nd St Westbound				SR-99 Northbound					S 192nd St Eastbound				Int. Total
	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:00 PM																			
04:00 PM	17	317	7	2	343	8	3	3	14	9	102	1	5	117	12	4	8	24	498
04:15 PM	21	336	13	3	373	7	3	5	15	10	110	2	6	128	22	6	6	34	550
04:30 PM	13	340	12	4	369	8	0	4	12	5	113	3	6	127	6	6	9	21	529
04:45 PM	19	276	9	1	305	8	2	3	13	1	115	3	4	123	6	10	7	23	464
Total Volume	70	1269	41	10	1390	31	8	15	54	25	440	9	21	495	46	26	30	102	2041
% App. Total	5	91.3	2.9	0.7		57.4	14.8	27.8		5.1	88.9	1.8	4.2		45.1	25.5	29.4		
PHF	.833	.933	.788	.625	.932	.969	.667	.750	.900	.625	.957	.750	.875	.967	.523	.650	.833	.750	.928
Cars+	63	1235	40	10	1348	31	8	15	54	25	417	9	20	471	45	26	25	96	1969
% Cars+	90.0	97.3	97.6	100	97.0	100	100	100	100	100	94.8	100	95.2	95.2	97.8	100	83.3	94.1	96.5
Trucks	7	34	1	0	42	0	0	0	0	0	23	0	1	24	1	0	5	6	72
% Trucks	10.0	2.7	2.4	0	3.0	0	0	0	0	0	5.2	0	4.8	4.8	2.2	0	16.7	5.9	3.5



# Gasoline/Service Station With Convenience Market (945)

**Vehicle Trip Ends vs: Vehicle Fueling Positions**  
**On a: Weekday**

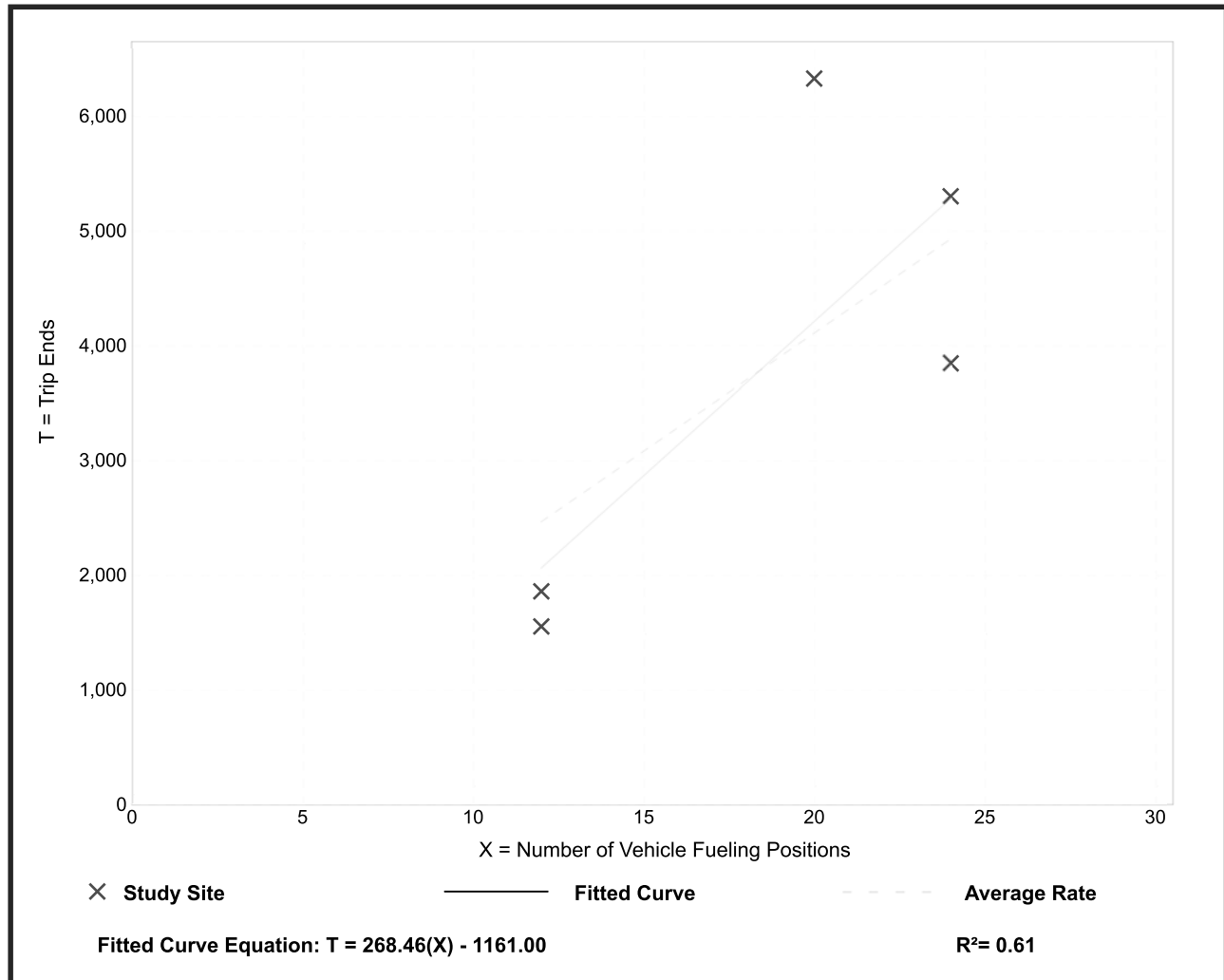
**Setting/Location: General Urban/Suburban**  
Number of Studies: 5  
Avg. Num. of Vehicle Fueling Positions: 18  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
205.36	129.50 - 316.45	73.80

## Data Plot and Equation

*Caution – Small Sample Size*



*Trip Generation Manual, 10th Edition • Institute of Transportation Engineers*

# Gasoline/Service Station With Convenience Market (945)

**Vehicle Trip Ends vs: Vehicle Fueling Positions**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**

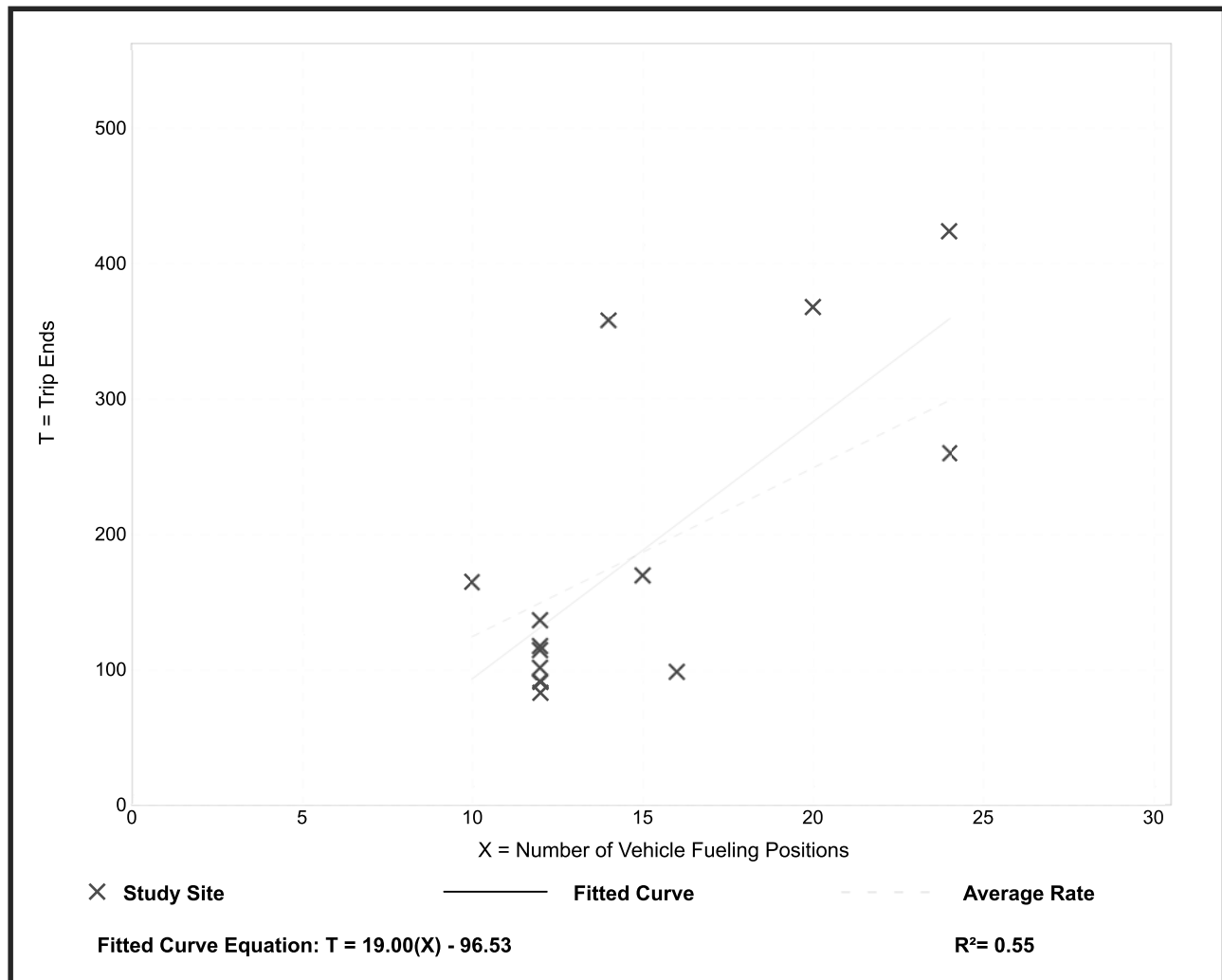
**Setting/Location: General Urban/Suburban**

Number of Studies: 14  
 Avg. Num. of Vehicle Fueling Positions: 15  
 Directional Distribution: 51% entering, 49% exiting

## Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
12.47	6.19 - 25.57	5.56

## Data Plot and Equation



*Trip Generation Manual, 10th Edition* • Institute of Transportation Engineers

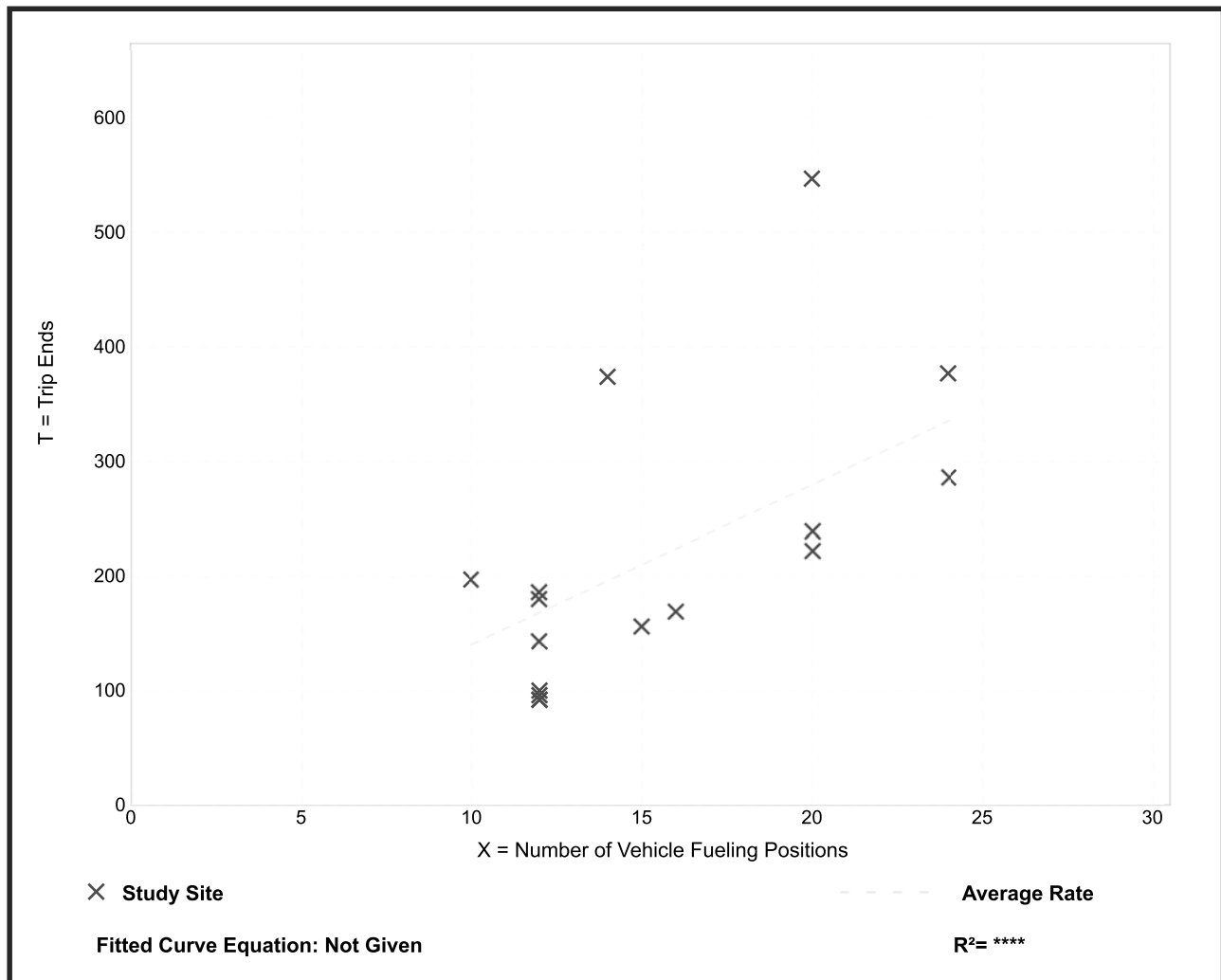
# Gasoline/Service Station With Convenience Market (945)

**Vehicle Trip Ends vs: Vehicle Fueling Positions**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 16  
 Avg. Num. of Vehicle Fueling Positions: 15  
 Directional Distribution: 51% entering, 49% exiting

## Vehicle Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
13.99	7.67 - 27.35	6.18

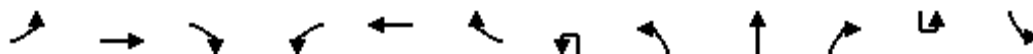
## Data Plot and Equation



*Trip Generation Manual, 10th Edition* • Institute of Transportation Engineers

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St

Existing PM Peak Hour  
01/14/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	30	26	46	15	8	31	21	9	440	25	10	41
Future Volume (vph)	30	26	46	15	8	31	21	9	440	25	10	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		300		425		0		275
Storage Lanes	1		0	0		1		1		0		1
Taper Length (ft)	25			25				25				25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95	1.00
Frt		0.905				0.850			0.992			
Flt Protected	0.950				0.969			0.950				0.950
Satd. Flow (prot)	1543	1692	0	0	1823	1599	0	1739	3418	0	0	1773
Flt Permitted	0.741				0.760			0.154				0.456
Satd. Flow (perm)	1203	1692	0	0	1430	1599	0	282	3418	0	0	851
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		49				47			9			
Link Speed (mph)		30			30				30			
Link Distance (ft)		105			686				443			
Travel Time (s)		2.4			15.6				10.1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93
Heavy Vehicles (%)	17%	1%	2%	1%	1%	1%	5%	1%	5%	1%	1%	2%
Adj. Flow (vph)	32	28	49	16	9	33	23	10	473	27	11	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	77	0	0	25	33	0	33	500	0	0	55
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	pm+pt	NA		pm+pt	pm+pt
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8	2	2			6	6
Total Split (s)	27.0	27.0		27.0	27.0	27.0	12.0	12.0	101.0		12.0	12.0
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5	4.5			4.5
Act Effct Green (s)	7.8	7.8			7.8	7.8		41.4	39.3			41.8
Actuated g/C Ratio	0.13	0.13			0.13	0.13		0.72	0.68			0.72
v/c Ratio	0.20	0.29			0.13	0.13		0.09	0.22			0.08
Control Delay	32.1	18.0			30.7	8.7		3.0	5.9			2.8
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Total Delay	32.1	18.0			30.7	8.7		3.0	5.9			2.8
LOS	C	B			C	A		A	A			A
Approach Delay		22.1			18.1				5.7			
Approach LOS		C			B				A			
Queue Length 50th (ft)	9	8			7	0		2	43			4
Queue Length 95th (ft)	43	53			35	19		9	74			12
Internal Link Dist (ft)		25			606				363			
Turn Bay Length (ft)	75					300		425				275
Base Capacity (vph)	515	753			613	712		411	3418			751
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	0.06	0.10			0.04	0.05		0.08	0.15			0.07

Intersection Summary

Area Type: Other



Lanes, Volumes, Timings  
2: SR-99 & S 192nd St

Existing PM Peak Hour  
01/14/2021



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1269	70
Future Volume (vph)	1269	70
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3539	1468
Flt Permitted		
Satd. Flow (perm)	3539	1468
Right Turn on Red		Yes
Satd. Flow (RTOR)		75
Link Speed (mph)	30	
Link Distance (ft)	194	
Travel Time (s)	4.4	
Peak Hour Factor	0.93	0.93
Heavy Vehicles (%)	2%	10%
Adj. Flow (vph)	1365	75
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1365	75
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Total Split (s)	101.0	101.0
Total Lost Time (s)	4.5	4.5
Act Effct Green (s)	41.4	41.4
Actuated g/C Ratio	0.72	0.72
v/c Ratio	0.54	0.07
Control Delay	7.5	1.9
Queue Delay	0.0	0.0
Total Delay	7.5	1.9
LOS	A	A
Approach Delay	7.0	
Approach LOS	A	
Queue Length 50th (ft)	84	0
Queue Length 95th (ft)	268	14
Internal Link Dist (ft)	114	
Turn Bay Length (ft)		
Base Capacity (vph)	3539	1468
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.39	0.05
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 2: SR-99 & S 192nd St

Existing PM Peak Hour  
 01/14/2021

Cycle Length: 140	
Actuated Cycle Length: 57.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 58.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: SR-99 & S 192nd St

 Ø1	 Ø2	 Ø4
12 s	101 s	27 s
 Ø5	 Ø6	 Ø8
12 s	101 s	27 s

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St

Forecast 2027 PM Peak Hour Without Project  
01/14/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	36	31	55	18	10	37	25	11	525	30	12	49
Future Volume (vph)	36	31	55	18	10	37	25	11	525	30	12	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		300		425		0		275
Storage Lanes	1		0	0		1		1		0		1
Taper Length (ft)	25			25				25				25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95	1.00
Frt		0.904				0.850			0.992			
Flt Protected	0.950				0.969			0.950				0.950
Satd. Flow (prot)	1543	1690	0	0	1823	1599	0	1739	3418	0	0	1773
Flt Permitted	0.738				0.753			0.107				0.412
Satd. Flow (perm)	1198	1690	0	0	1417	1599	0	196	3418	0	0	769
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		54				47			10			
Link Speed (mph)		30			30				30			
Link Distance (ft)		105			686				443			
Travel Time (s)		2.4			15.6				10.1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93
Heavy Vehicles (%)	17%	1%	2%	1%	1%	1%	5%	1%	5%	1%	1%	2%
Adj. Flow (vph)	39	33	59	19	11	40	27	12	565	32	13	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	92	0	0	30	40	0	39	597	0	0	66
Turn Type	Perm	NA		Perm	NA	Perm	pm+pt	pm+pt	NA		pm+pt	pm+pt
Protected Phases		4			8		5	5	2		1	1
Permitted Phases	4			8		8	2	2			6	6
Total Split (s)	25.0	25.0		25.0	25.0	25.0	12.0	12.0	104.0		11.0	11.0
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5	4.5			4.5
Act Effct Green (s)	8.8	8.8			8.8	8.8		58.6	54.8			58.8
Actuated g/C Ratio	0.11	0.11			0.11	0.11		0.76	0.71			0.76
v/c Ratio	0.29	0.38			0.19	0.18		0.13	0.24			0.10
Control Delay	44.9	25.3			42.0	13.0		3.2	5.8			2.6
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Total Delay	44.9	25.3			42.0	13.0		3.2	5.8			2.6
LOS	D	C			D	B		A	A			A
Approach Delay		31.1			25.4				5.6			
Approach LOS		C			C				A			
Queue Length 50th (ft)	18	17			14	0		3	56			5
Queue Length 95th (ft)	61	76			50	28		10	93			16
Internal Link Dist (ft)		25			606				363			
Turn Bay Length (ft)	75					300		425				275
Base Capacity (vph)	353	536			418	505		317	3341			682
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	0.17			0.07	0.08		0.12	0.18			0.10

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1515	84
Future Volume (vph)	1515	84
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3539	1468
Flt Permitted		
Satd. Flow (perm)	3539	1468
Right Turn on Red		Yes
Satd. Flow (RTOR)		90
Link Speed (mph)	30	
Link Distance (ft)	194	
Travel Time (s)	4.4	
Peak Hour Factor	0.93	0.93
Heavy Vehicles (%)	2%	10%
Adj. Flow (vph)	1629	90
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1629	90
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Total Split (s)	103.0	103.0
Total Lost Time (s)	4.5	4.5
Act Effct Green (s)	57.1	57.1
Actuated g/C Ratio	0.74	0.74
v/c Ratio	0.62	0.08
Control Delay	8.9	1.4
Queue Delay	0.0	0.0
Total Delay	8.9	1.4
LOS	A	A
Approach Delay	8.3	
Approach LOS	A	
Queue Length 50th (ft)	250	0
Queue Length 95th (ft)	380	14
Internal Link Dist (ft)	114	
Turn Bay Length (ft)		
Base Capacity (vph)	3452	1434
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.47	0.06
<b>Intersection Summary</b>		

Lanes, Volumes, Timings  
 2: SR-99 & S 192nd St

Forecast 2027 PM Peak Hour Without Project  
 01/14/2021

Cycle Length: 140	
Actuated Cycle Length: 76.9	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 66.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-99 & S 192nd St

 Ø1	 Ø2	 Ø4
11 s	104 s	25 s
 Ø5	 Ø6	 Ø8
12 s	103 s	25 s

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St

Forecast 2027 PM Peak Hour With Project  
01/14/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	60	32	55	18	11	37	25	25	517	30	12	61
Future Volume (vph)	60	32	55	18	11	37	25	25	517	30	12	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		300		425		0		275
Storage Lanes	1		0	0		1		1		0		1
Taper Length (ft)	25			25				25				25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95	1.00
Frt		0.905				0.850			0.992			
Flt Protected	0.950				0.970			0.950				0.950
Satd. Flow (prot)	1543	1692	0	0	1825	1599	0	1752	3418	0	0	1772
Flt Permitted	0.737				0.800			0.090				0.428
Satd. Flow (perm)	1197	1692	0	0	1505	1599	0	166	3418	0	0	799
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		52				47			10			
Link Speed (mph)		30			30				30			
Link Distance (ft)		105			686				443			
Travel Time (s)		2.4			15.6				10.1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93
Heavy Vehicles (%)	17%	1%	2%	1%	1%	1%	5%	1%	5%	1%	1%	2%
Adj. Flow (vph)	65	34	59	19	12	40	27	27	556	32	13	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	93	0	0	31	40	0	54	588	0	0	79
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA		custom	pm+pt
Protected Phases		4			8			5	2			1
Permitted Phases	4			8		8	5	2			1	6
Total Split (s)	25.0	25.0		25.0	25.0	25.0	12.0	12.0	104.8		10.2	10.2
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5	4.5			4.5
Act Effct Green (s)	10.7	10.7			10.7	10.7		64.2	58.7			61.9
Actuated g/C Ratio	0.12	0.12			0.12	0.12		0.74	0.68			0.71
v/c Ratio	0.44	0.37			0.17	0.17		0.21	0.25			0.12
Control Delay	51.0	26.0			42.6	12.4		4.6	6.1			3.3
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Total Delay	51.0	26.0			42.6	12.4		4.6	6.1			3.3
LOS	D	C			D	B		A	A			A
Approach Delay		36.3			25.6				6.0			
Approach LOS		D			C				A			
Queue Length 50th (ft)	33	20			15	0		5	60			8
Queue Length 95th (ft)	94	80			53	28		16	100			22
Internal Link Dist (ft)		25			606				363			
Turn Bay Length (ft)	75					300		425				275
Base Capacity (vph)	301	465			380	438		269	3295			637
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	0.22	0.20			0.08	0.09		0.20	0.18			0.12

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St

	↓	↙
Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1521	84
Future Volume (vph)	1521	84
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3539	1468
Flt Permitted		
Satd. Flow (perm)	3539	1468
Right Turn on Red		Yes
Satd. Flow (RTOR)		90
Link Speed (mph)	30	
Link Distance (ft)	525	
Travel Time (s)	11.9	
Peak Hour Factor	0.93	0.93
Heavy Vehicles (%)	2%	10%
Adj. Flow (vph)	1635	90
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1635	90
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Total Split (s)	103.0	103.0
Total Lost Time (s)	4.5	4.5
Act Effct Green (s)	57.5	57.5
Actuated g/C Ratio	0.66	0.66
v/c Ratio	0.70	0.09
Control Delay	11.8	1.6
Queue Delay	0.0	0.0
Total Delay	11.8	1.6
LOS	B	A
Approach Delay	10.9	
Approach LOS	B	
Queue Length 50th (ft)	281	0
Queue Length 95th (ft)	430	16
Internal Link Dist (ft)	445	
Turn Bay Length (ft)		
Base Capacity (vph)	3401	1414
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.48	0.06
<b>Intersection Summary</b>		

Cycle Length: 140	
Actuated Cycle Length: 86.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: SR-99 & S 192nd St

 Ø1	 Ø2	 Ø4
10.2 s	104.8 s	25 s
 Ø5	 Ø6	 Ø8
12 s	103 s	25 s



Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑↑	
Traffic Vol, veh/h	0	26	0	626	1639	37
Future Vol, veh/h	0	26	0	626	1639	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	2	2
Mvmt Flow	0	28	0	680	1782	40

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	911	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	238	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	238	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	238	-	-
HCM Lane V/C Ratio	-	0.119	-	-
HCM Control Delay (s)	-	22.2	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	121	102	17	26	3
Future Vol, veh/h	3	121	102	17	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	132	111	18	28	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	129	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1457	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1457	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1457	-	-	-	747
HCM Lane V/C Ratio	0.002	-	-	-	0.042
HCM Control Delay (s)	7.5	-	-	-	10
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St

Forecast 2033 PM Peak Hour With Project  
01/14/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	67	38	66	21	12	44	30	27	619	36	14	58
Future Volume (vph)	67	38	66	21	12	44	30	27	619	36	14	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		0	0		300		425		0		275
Storage Lanes	1		0	0		1		1		0		1
Taper Length (ft)	25			25				25				25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	0.95	0.95	1.00
Frt		0.905				0.850			0.992			
Flt Protected	0.950				0.969			0.950				0.950
Satd. Flow (prot)	1543	1692	0	0	1823	1599	0	1750	3418	0	0	1773
Flt Permitted	0.734				0.750			0.057				0.375
Satd. Flow (perm)	1192	1692	0	0	1411	1599	0	105	3418	0	0	700
Right Turn on Red			Yes			Yes				Yes		
Satd. Flow (RTOR)		51				47			11			
Link Speed (mph)		30			30				30			
Link Distance (ft)		105			686				443			
Travel Time (s)		2.4			15.6				10.1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.92	0.93
Heavy Vehicles (%)	17%	1%	2%	1%	1%	1%	5%	1%	5%	1%	1%	2%
Adj. Flow (vph)	72	41	71	23	13	47	33	29	666	39	15	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	72	112	0	0	36	47	0	62	705	0	0	77
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA		custom	pm+pt
Protected Phases		4			8			5	2			1
Permitted Phases	4			8		8	5	2			1	6
Total Split (s)	23.0	23.0		23.0	23.0	23.0	12.0	12.0	107.0		10.0	10.0
Total Lost Time (s)	4.5	4.5			4.5	4.5		4.5	4.5			4.5
Act Effct Green (s)	12.3	12.3			12.3	12.3		86.9	81.3			83.9
Actuated g/C Ratio	0.11	0.11			0.11	0.11		0.79	0.73			0.76
v/c Ratio	0.55	0.48			0.23	0.21		0.32	0.28			0.13
Control Delay	68.7	38.0			55.2	17.2		9.4	5.6			3.1
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			0.0
Total Delay	68.7	38.0			55.2	17.2		9.4	5.6			3.1
LOS	E	D			E	B		A	A			A
Approach Delay		50.0			33.7				5.9			
Approach LOS		D			C				A			
Queue Length 50th (ft)	50	42			24	0		7	81			9
Queue Length 95th (ft)	116	113			65	39		28	125			22
Internal Link Dist (ft)		25			606				363			
Turn Bay Length (ft)	75					300		425				275
Base Capacity (vph)	212	343			251	323		201	3005			587
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	0.34	0.33			0.14	0.15		0.31	0.23			0.13

Intersection Summary

Area Type: Other

Lanes, Volumes, Timings  
2: SR-99 & S 192nd St



Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1815	100
Future Volume (vph)	1815	100
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3539	1468
Flt Permitted		
Satd. Flow (perm)	3539	1468
Right Turn on Red		Yes
Satd. Flow (RTOR)		105
Link Speed (mph)	30	
Link Distance (ft)	249	
Travel Time (s)	5.7	
Peak Hour Factor	0.93	0.93
Heavy Vehicles (%)	2%	10%
Adj. Flow (vph)	1952	108
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1952	108
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Total Split (s)	105.0	105.0
Total Lost Time (s)	4.5	4.5
Act Effct Green (s)	79.8	79.8
Actuated g/C Ratio	0.72	0.72
v/c Ratio	0.77	0.10
Control Delay	13.0	1.4
Queue Delay	0.0	0.0
Total Delay	13.0	1.4
LOS	B	A
Approach Delay	12.1	
Approach LOS	B	
Queue Length 50th (ft)	438	1
Queue Length 95th (ft)	625	17
Internal Link Dist (ft)	169	
Turn Bay Length (ft)		
Base Capacity (vph)	3077	1290
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.63	0.08
<b>Intersection Summary</b>		

Cycle Length: 140	
Actuated Cycle Length: 110.7	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 76.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: SR-99 & S 192nd St

 Ø1		
10 s	107 s	23 s
 Ø5		
12 s	105 s	23 s

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑↑	
Traffic Vol, veh/h	0	26	0	745	1964	37
Future Vol, veh/h	0	26	0	745	1964	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	5	2	2
Mvmt Flow	0	28	0	810	2135	40

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	1088	-	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-
Pot Cap-1 Maneuver	0	181	0	-	-
Stage 1	0	-	0	-	-
Stage 2	0	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	181	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.5	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	181	-	-
HCM Lane V/C Ratio	-	0.156	-	-
HCM Control Delay (s)	-	28.5	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑	↗		↘	
Traffic Vol, veh/h	3	144	122	17	26	3
Future Vol, veh/h	3	144	122	17	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	157	133	18	28	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	151	0	0 305 142
Stage 1	-	-	- 142 -
Stage 2	-	-	- 163 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1430	-	- 687 906
Stage 1	-	-	- 885 -
Stage 2	-	-	- 866 -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	1430	-	- 686 906
Mov Cap-2 Maneuver	-	-	- 686 -
Stage 1	-	-	- 883 -
Stage 2	-	-	- 866 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1430	-	-	-	704
HCM Lane V/C Ratio	0.002	-	-	-	0.045
HCM Control Delay (s)	7.5	-	-	-	10.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1