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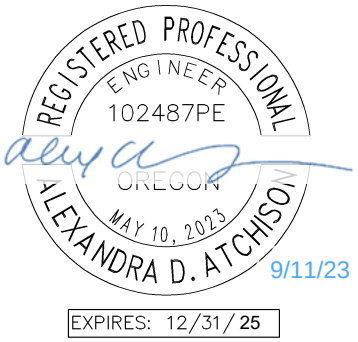
TECHNICAL MEMORANDUM

DATE:	September 11, 2023
TO:	Brett Perkins, Perk Development
FROM:	Alex Atchison, PE, PTOE
SUBJECT:	Gravel Point Development - Traffic Assessment
CC:	Darren Sandeno
PROJECT NUMBER:	217-8837-002
PROJECT NAME:	Gravel Point Development



This technical memorandum analyzes potential traffic impacts of the proposed Gravel Point development in Bandon, Oregon. This transportation technical memo evaluates traffic volumes, estimated weekday PM peak hour trips generated by the project, and traffic operations for the existing and future conditions. As discussed with City Planning Department staff, a formal traffic impact analysis is not required for this development.

PROJECT OVERVIEW

The proposed Gravel Point project includes a 110-room hotel and 32 associated suites on a 24.8-acre site along Beach Loop Road SW in the City of Bandon, Oregon. The hotel will have amenities that include a spa, meeting rooms and a 258-seat restaurant and bar. The proposed project is anticipated to be constructed by 2026.

STUDY AREA

Roadways

Highway 101, also known as the Oregon Coast Highway, connects the northern border of Washington with the southern border of California. Highway 101 is under the jurisdictional responsibility of the Oregon Department of Transportation (ODOT). Except for Highway 101, streets located within the city limits of Bandon are the responsibility of the city and streets located outside the city limits are the responsibility of Coos County.

Functional classification is designed to serve the transportation needs within the community. In general, arterials serve longer trips and through traffic, have limited access points, and are less desirable for pedestrian and bicycle trips. Local streets serve shorter trips with nearby destinations, have frequent access points and are ideal for pedestrian and bicycle trips. Collectors connect the arterial system to the local street system.

Highway 101 is a two-way three-lane facility with two through lanes and one center lane. It is classified as an arterial and has a posted speed of 45 mph. Seabird Drive and Beach Loop Road SW are two-way, two-lane roadways and are both classified as collectors. Seabird Drive has a posted speed limit of 30 mph and Beach Loop Road SW has a posted speed limit of 25 mph.

Study Intersections

This traffic assessment evaluates traffic operations at three intersections: Highway 101/Seabird Drive, Beach Loop Road SW/Seabird Drive and Beach Loop Road SW/Main Site Access. **Figure 1** shows the study area and study intersections. The intersections of Highway 101/Seabird Drive and Beach Loop Road SW/ Seabird Drive are both stop-controlled on Seabird Drive only.

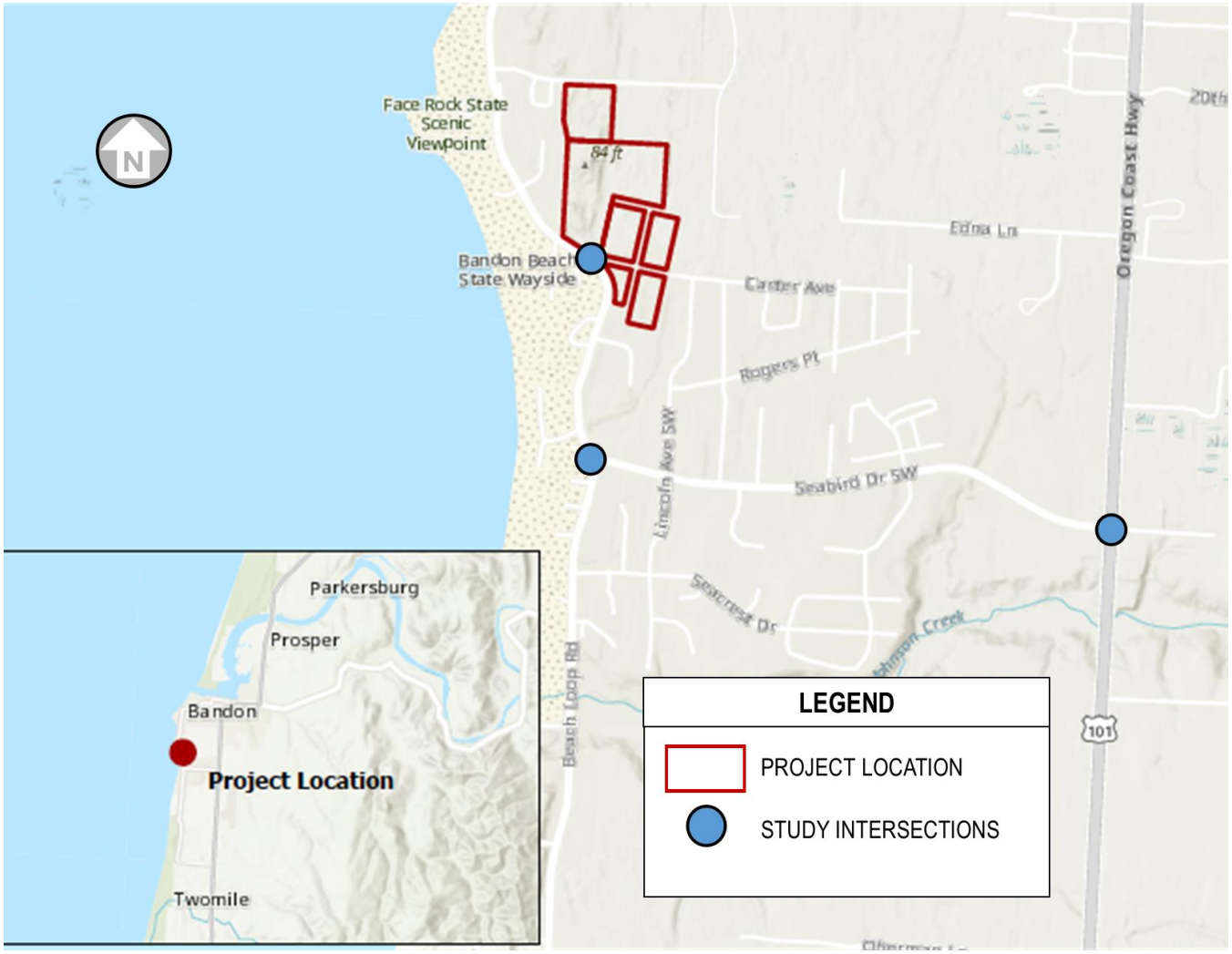


Figure 1. Study Area

TRAFFIC VOLUMES

PM peak hour traffic counts at the intersection of Highway 101/Seabird Drive were collected in May 2021 as part of the Seabird Drive Multifamily Traffic Impact Analysis (2021). This count was reflective of off-season conditions. Because traffic volumes vary during different times of year, especially in areas like Bandon that experience significant volumes of recreational traffic, counts must be adjusted to represent the peak month by applying a seasonal factor, consistent with the ODOT's (2023) Analysis Procedures Manual (APM). The traffic volumes adjusted for seasonal variation are also referred to as the 30th highest annual traffic volumes and are commonly used for traffic analysis on ODOT facilities.

To account for seasonal variations, the Seabird Drive Multifamily TIA study increased traffic counts by 26%. This adjustment was based on five years of traffic data from ODOT's Automatic Traffic Recorder (ATR)at Station 06-004 (located on Highway 101, 1.02 miles south of 18th SW Street) approximately 0.3 miles south of Seabird Drive.

No existing traffic counts are currently available at the intersection of Beach Loop Road SW/Seabird Drive. However, the City of Bandon (2010) Bandon Transportation Refinement Plan includes PM Peak hour traffic counts collected in at the intersections of Highway 101/Seabird Drive and Beach Loop Road SW/Seabird Drive in January 2009. A seasonal adjustment factor was applied to the 2009 traffic counts and resulting 30th highest annual hour traffic volumes are included in Figure 5 of the Bandon Transportation Refinement Plan.

The seasonally adjusted 2009 traffic count at the intersection of Highway 101/Seabird Drive was compared to the 2021 seasonally adjusted traffic count to calculate the total growth along Seabird Drive. Weekday PM peak hour, seasonally adjusted volumes on Seabird Drive grew by 58% between 2009 and 2021. This growth rate was applied to the 2009 seasonally adjusted traffic counts at the intersection of Beach Loop Road SW/Seabird Drive to estimate 2021 PM Peak hour traffic counts.

The *Year 2026 No Build* traffic volumes were estimated by applying a background annual growth of 2% to the 2021 traffic volumes. The annual growth rate of 2% is the average of the growth rates reported in the Coos County (2011) Transportation System Plan (TSP) and the Bandon Transportation Refinement Plan. Traffic volumes are included in **Attachment A**.

TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

The proposed project includes a resort hotel that includes 110 room, 32 suites and a 258-seat restaurant and bar. Trip generation estimates were prepared for the proposed hospitality development based on trip rates identified using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (2022).

Table 1 summarizes weekday PM peak hour trip generation estimates. The net new total trips do not include project traffic that would be internal to the site (linked trips between the hotel and restaurant uses). To be conservative, trips for the restaurant were calculated as if the use was stand-alone. However, it is anticipated that hotel guests will make up a large majority of the people patronizing the restaurant and bar and the PM peak hour trips generated by the restaurant will be lower than what is shown in Table 1. See **Attachment B** for detailed trip generation calculations.

As shown in Table 1, the development is estimated to generate approximately 111 net new PM peak hour trips (75 in/36 out). Trip distribution patterns are consistent with trip distribution estimates shown in Figure 7 of the Bandon Transportation Refinement Plan, with 55% coming to/from the north on Highway 101, 10% coming from the south on Highway 101, 20% coming to/from the south on Beach Loop Road SW, and the remaining 15% coming to/from the north on Beach Loop Road SW.

Table 1: Weekday PM Peak Project Trip Generation

Land Use[1]	Unit	Size	Gross Trips Total (in/out)[2]	Internal Trips Total (in/out)[3]	Net New Trips Total (in/out)[4]
Resort Hotel (LU 330)	Room	110	35 (25/10)	4 (2/2)	31 (23/8)
Suite Hotel (LU 311)	Room	32	12 (6/6)	0	12 (6/6)
Restaurant (LU 931)	Seats	258	72 (48/24)	4 (2/2)	683 (46/22)
Total			**119 (79/40)**	**8 (4/4)**	**111 (75/36)**

1) Land use from ITE Trip Generation Manual (11th edition)

2) Total vehicle trips based on rates/equations from ITE Trip Generation Manual (11th edition)

3) Trips that would remain internal to the project site and would not use external roads, based on rates from Trip Generation Handbook and NCHRP report 685.

4) Overall new trips that would travel externally to/from the proposed project.

TRAFFIC OPERATIONS

Traffic operations are often measured by an approach called intersection level of service (LOS). LOS is a scale ranging from A to F in which rankings are based on the delay at a given intersection. LOS A represents the best conditions with minimal amount of delay, and LOS F represents the worst conditions with severe congestion and delay. **Table 2** lists the intersection LOS delay thresholds for signalized intersections and unsignalized intersections.

At signalized and all-way stop-control intersections, LOS is calculated based on the delay of all vehicles entering the intersection. At two-way or one-way stop-control intersections, LOS is calculated and reported based on the worst movement at the intersection.

Table 2. Highway Capacity Manual LOS Ratings

Level of Service (LOS)	Average Delay (seconds/vehicle) Signalized Intersections	Average Delay (seconds/vehicle) Unsignalized Intersections
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Source: *Highway Capacity Manual* (6th Edition), Transportation Research Board, 2022.

Another measure of intersection operations is the volume to capacity (v/c) ratio. V/C is a measure of the adequacy of an intersection geometry and capacity. The v/c ratio is a measure of the capacity sufficiency of the overall intersection and is a good indication of whether the physical geometry design features provide sufficient capacity for the intersection. A v/c ratio of 1.0 indicates that an intersection is operating at capacity.

Traffic analysis was performed to identify intersection operations conditions for comparison to adopted mobility standards. Mobility standards for the study intersections differ, depending on the jurisdiction. The intersection of US 101/Seabird Drive is an ODOT facility, and the other two intersections are City of Bandon facilities.

The City's 2010 Bandon Transportation Refinement Plan states that the collector street network shall be maintained at LOS D during the peak hour. ODOT's mobility targets are typically based on the intersection location, its classification, and speed. The ODOT mobility standard for the US 101/Seabird Drive intersection is a V/C ratio of 0-75 for US 101 approaches and 0.80 for Seabird Drive. It should be noted that at unsignalized ODOT intersections, these standards are applicable only to minor street movements.

Study intersections, traffic control, roadway jurisdiction, and operational standards/mobility targets at the study intersections are summarized in Table 3.

Table 3: Study Area Intersection Operational Standards and Mobility Targets

Intersection	Traffic Control	Jurisdiction	Performance / Mobility Standard
Highway 101 / Seabird Drive	Minor-Street Stop-Control	ODOT	Highway 101 v/c ≤ 0.75 Seabird Dr v/c ≤ 0.80
Beach Loop Road SW / Seabird Drive	Minor-Street Stop-Control	City on Bandon	LOS D
Beach Loop Road SW / Site Access	Driveway Stop-Control	City of Bandon	LOS D

Operations Results

Analysis was performed using Synchro 11 software and implementing the Highway Capacity Manual 6th Edition operations methods for stop-controlled intersections. Operational measures—including LOS, delay, and v/c ratios—of existing year 2023, future year *2026 No Build*, and future year *2026 Build* conditions are summarized in Table 4. Synchro reports are included in Attachment C.

As shown in Table 4, all the study intersections are forecasted to operate well within ODOT and City standards through project buildout in the year 2026.

Table 4: PM Peak Hour Intersection Operations Summary

Intersection	LOS or Mobility Standard	2023 Existing			2026 No Build			2026 Build		
		LOS[1]	Delay (sec/veh)[2]	v/c ratio	LOS	Delay (sec/veh)	v/c ratio	LOS	Delay (sec/veh)	v/c ratio
Highway 101 / Seabird Drive	Seabird Dr v/c ≤ 0.80	EB = D	31.8	0.44	EB = E	44.6	0.58	EB = F	61.8	0.73
Beach Loop Rd SW / Seabird Drive	LOS D	WB = A	9.4	0.09	WB = A	9.5	0.10	WB = A	9.8	0.17
Beach Loop Rd SW/ Site Access	LOS D	-	-	-	-	-	-	EB = A	9.7	0.05

1. LOS is for worst movement; EB = eastbound; WB = westbound
2. Sec/veh = seconds per vehicle

FINDINGS AND CONCLUSIONS

This technical memorandum summarizes the traffic assessment conducted for the proposed Gravel Point development in the City of Bandon, Oregon. General findings include:

- The project would construct a 110-room hotel and 32 associated suites on a 24.8-acre site along Beach Loop Road SW in the City of Bandon, Oregon. The hotel will have amenities that include a spa, meeting rooms and a 258-seat restaurant and bar.
- The proposed project is anticipated to be constructed by 2026.
- The development is estimated to generate approximately 111 new PM peak hour trips.
- With the addition of the project trips, the off-site study intersections are forecast to continue to meet ODOT and City LOS and mobility standards.

REFERENCES

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ODOT. 2023. Analysis Procedures Manual, Version 2. https://www.oregon.gov/odot/Planning/Pages/APM.aspx. Accessed August 2023.

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ATTACHMENT A – TRAFFIC VOLUMES

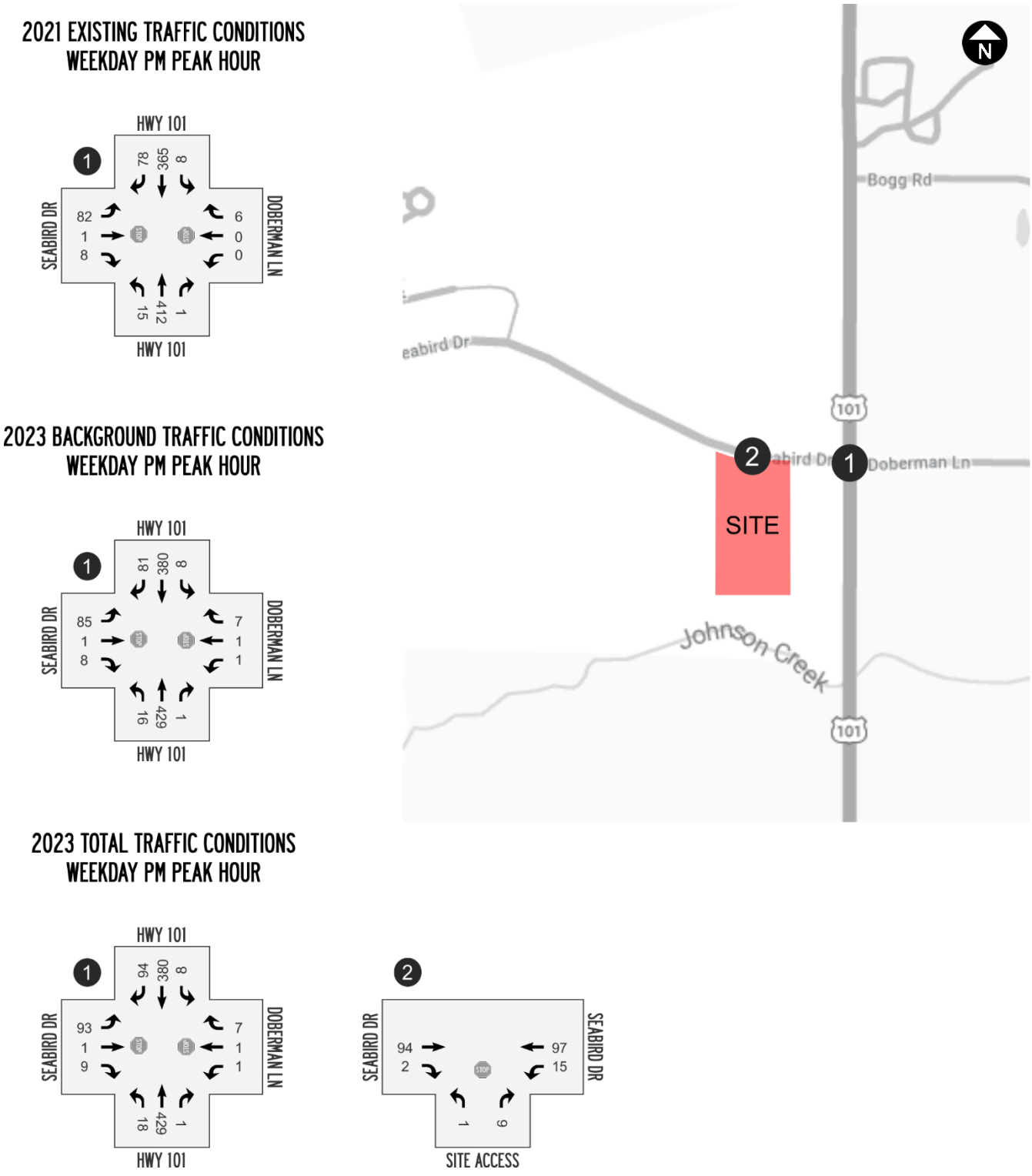
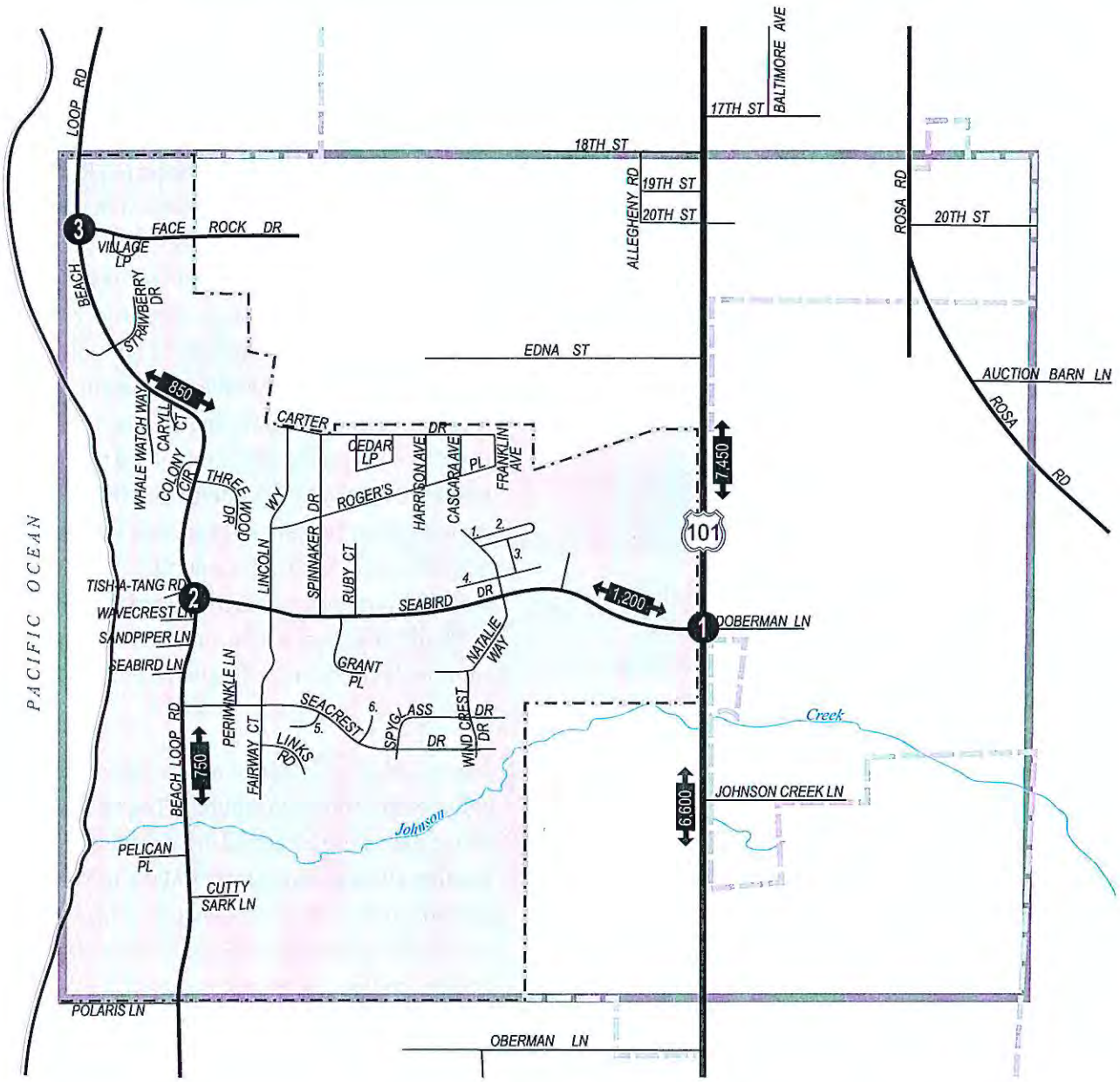
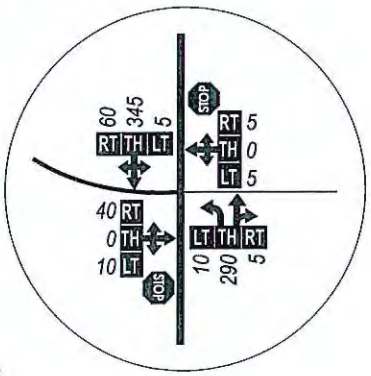


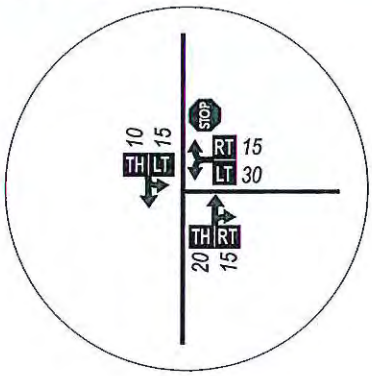
Figure 9. 2021 Existing and 2023 Forecast Traffic Volumes, Weekday PM Peak Hour.



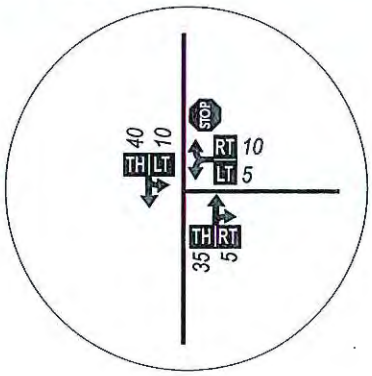
1 US-101 @ Seabird Ln/ Doberman Ln



2 Beach Loop Rd @ Seabird Ln



3 Beach Loop Rd @ Face Rock Dr



1. SALTY DOG DR
2. SHEARWATER CIR
3. PIPIT WAY
4. AVOCET AVE
5. GRETCHENS CT
6. HAILEY LN

LEGEND

- 1 - Study Intersection
- ← - Lane Configuration
- STOP - Stop Sign
- 1,150 - Average Daily Traffic
- 00 - 30th Highest Hour Traffic Volume
- LT TH RT (Left • Thru • Right) - Volume Turn Movement
- - Study Area
- - Urban Growth Boundary
- - Bandon City Limits

DKS Associates
TRANSPORTATION SOLUTIONS

NO SCALE

Figure 5

EXISTING TRAFFIC VOLUMES, LANE GEOMETRY & TRAFFIC CONTROL

2023 No Build

Main Site Access / Beach Loop Drive

		RT		LT	
		0		0	
LT					RT
TH	40		95		55 TH

Beach Loop Road / Seabird Drive

	TH	LT		
	15	25		
			25	RT
165				
			45	LT
	30	25		
	TH	RT		

Highway 101 / Seabird Drive

		RT	TH	LT		
		81	380	8		
LT	85				7	RT
TH	1		1018		1	TH
RT	8				1	LT
		16	429	1		
		LT	TH	RT		

Pipeline Projects SeabirdApt_TIA.pdf

Main Site Access / Beach Loop Drive

		RT		LT	
		0		0	
LT					RT
TH	2		3		1 TH

Beach Loop Road / Seabird Drive

	TH	LT		
	0	2		
			1	RT
3				
			0	LT
	0	0		
	TH	RT		

Highway 101 / Seabird Drive

		RT	TH	LT		
		13				
LT	8					RT
TH	0		24		0	TH
RT	1					LT
		2				
		LT	TH	RT		

2026 No Build

Main Site Access / Beach Loop Drive

		RT		LT	
		0		0	
LT	0				0 RT
TH	44		104		59 TH

Beach Loop Road / Seabird Drive

	TH	LT		
	16	29		
			28	RT
177.9				
			48	LT
	32	27		
	TH	RT		

Highway 101 / Seabird Drive

		RT	TH	LT		
		99	403	8		
LT	98				7	RT
TH	1		1104		1	TH
RT	10				1	LT
		19	455	1		
		LT	TH	RT		

2026 Project Trips - Trip Distribution

Main Site Access / Beach Loop Drive

		RT		LT	
		35%		65%	
LT	35%				65% RT
TH			2		TH

Beach Loop Road / Seabird Drive

	TH	LT		
	0	65%		
			65%	RT
1.3				
			0	LT
	0	0		
	TH	RT		

Highway 101 / Seabird Drive

		RT	TH	LT		
		55%				
LT	55%					RT
TH			1.3			TH
RT	10%					LT
		10%				
		LT	TH	RT		

2026 Project Trips - Trip Assignment

Main Site Access / Beach Loop Drive

		RT		LT	
		13		23	
LT	26				49 RT
TH			111		TH

Beach Loop Road / Seabird Drive

	TH	LT		
	0	23		
			49	RT
72.15				
			0	LT
	0	0		
	TH	RT		

Highway 101 / Seabird Drive

		RT	TH	LT		
		41				
LT	20					RT
TH			72.15			TH
RT	4					LT
		8				
		LT	TH	RT		

2026 Build

Main Site Access / Beach Loop Drive

		RT		LT	
		13		23	
LT	26				49 RT
TH	44		215		59 TH

Beach Loop Road / Seabird Drive

	TH	LT		
	16	52		
			76	RT
250.1				
			48	LT
	32	27		
	TH	RT		

Highway 101 / Seabird Drive

		RT	TH	LT		
		140	403	8		
LT	118				7	RT
TH	1		1176		1	TH
RT	14				1	LT
		26	455	1		
		LT	TH	RT		

ATTACHMENT B – TRIP GENERATION

PM PEAK HOUR - TRIP GENERATION

					Gross Trips[2]				Internal Trips[3]			Net New Trips[5]		
Land Use	**ITE LU**	**Size**	**Units**	**PM Peak Trip Rate[1]**	**Total Trips**	**% Inbound**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	Out
Resort Hotel	330	110	room	0.32	35	72%	25	10	4	2	2	31	23	8
Suite Hotel	311	32	room	0.36	12	49%	6	6	0	0	0	12	6	6
Resturant	931	258	seats	0.28	72	67%	48	24	4	2	2	68	46	22
					119		**79**	**40**	8	4	4	**111**	**75**	**36**

1) Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition (2022)

2) Total vehicle trips based on rates/equations from ITE Trip Generation Manual (11th edition)

3) Trips that would remain internal to the project site and would not use external roads, based on rates from Trip Generation Handbook and NCHRP report 685

4) Trips already on the adjacent street system that make a stop at the proejct site before continuing to final destination; rate based on ITE Trip Generation Manual (2021 rates); included as turning movements at project access points

5) Overall new trips that would travel externally to the proposed project

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Gravel Point	**Organization:**	Parametrix
Project Location:	Bandon, Oregon	**Performed By:**	A Atchison
Scenario Description:		**Date:**	8/14/2023
Analysis Year:	2026	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				0		
Restaurant				72	48	24
Cinema/Entertainment				0		
Residential				0		
Hotel				47	31	16
All Other Land Uses[2]				0		
Total				119	79	40

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	0	0
Restaurant	0	0		0	0	2
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	2	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	119	79	40
Internal Capture Percentage	7%	5%	10%
External Vehicle-Trips[3]	111	75	36
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	N/A	N/A
Restaurant	4%	8%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	6%	13%

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Gravel Point
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	0	0	1.00	0	0
Restaurant	1.00	48	48	1.00	24	24
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	31	31	1.00	16	16

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	0	0
Restaurant	1	10		2	4	2
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	3	11	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	1	0	0	0
Retail	0		14	0	0	5
Restaurant	0	0		0	0	22
Cinema/Entertainment	0	0	1		0	0
Residential	0	0	7	0		4
Hotel	0	0	2	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	2	46	48	46	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	2	29	31	29	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	0	0	0	0	0	0
Restaurant	2	22	24	22	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	2	14	16	14	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

ATTACHMENT C – SYNCHRO REPORTS

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	1	8	1	1	7	16	429	1	8	380	81
Future Vol, veh/h	85	1	8	1	1	7	16	429	1	8	380	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	92	1	9	1	1	8	17	466	1	9	413	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	980	976	457	981	1020	467	501	0	0	467	0	0
Stage 1	475	475	-	501	501	-	-	-	-	-	-	-
Stage 2	505	501	-	480	519	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	229	251	604	229	237	596	1063	-	-	1094	-	-
Stage 1	570	557	-	552	543	-	-	-	-	-	-	-
Stage 2	549	543	-	567	533	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	221	244	604	220	230	596	1063	-	-	1094	-	-
Mov Cap-2 Maneuver	221	244	-	220	230	-	-	-	-	-	-	-
Stage 1	561	550	-	543	534	-	-	-	-	-	-	-
Stage 2	532	534	-	551	527	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.8	13.4	0.3	0.1
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1063	-	-	234	436	1094	-	-
HCM Lane V/C Ratio	0.016	-	-	0.437	0.022	0.008	-	-
HCM Control Delay (s)	8.4	-	-	31.8	13.4	8.3	0	-
HCM Lane LOS	A	-	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	25	30	25	25	15
Future Vol, veh/h	45	25	30	25	25	15
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	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	30	36	30	30	18

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	129	51	0	0	66	0
Stage 1	51	-	-	-	-	-
Stage 2	78	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	865	1017	-	-	1536	-
Stage 1	971	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	848	1017	-	-	1536	-
Mov Cap-2 Maneuver	848	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	926	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	4.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	902	1536	-
HCM Lane V/C Ratio	-	-	0.094	0.02	-
HCM Control Delay (s)	-	-	9.4	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	98	1	10	1	1	17	19	455	1	8	403	99
Future Vol, veh/h	98	1	10	1	1	17	19	455	1	8	403	99
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	107	1	11	1	1	18	21	495	1	9	438	108

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1057	1048	492	1054	1102	496	546	0	0	496	0	0
Stage 1	510	510	-	538	538	-	-	-	-	-	-	-
Stage 2	547	538	-	516	564	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	203	228	577	204	212	574	1023	-	-	1068	-	-
Stage 1	546	538	-	527	522	-	-	-	-	-	-	-
Stage 2	521	522	-	542	508	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	191	220	577	194	205	574	1023	-	-	1068	-	-
Mov Cap-2 Maneuver	191	220	-	194	205	-	-	-	-	-	-	-
Stage 1	535	532	-	516	511	-	-	-	-	-	-	-
Stage 2	493	511	-	524	502	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	44.6	12.9	0.3	0.1
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1023	-	-	204	479	1068	-	-
HCM Lane V/C Ratio	0.02	-	-	0.581	0.043	0.008	-	-
HCM Control Delay (s)	8.6	-	-	44.6	12.9	8.4	0	-
HCM Lane LOS	A	-	-	E	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	28	32	27	29	16
Future Vol, veh/h	48	28	32	27	29	16
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	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	34	39	33	35	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	145	56	0	0	72	0
Stage 1	56	-	-	-	-	-
Stage 2	89	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	847	1011	-	-	1528	-
Stage 1	967	-	-	-	-	-
Stage 2	934	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	828	1011	-	-	1528	-
Mov Cap-2 Maneuver	828	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	913	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	4.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	887	1528	-
HCM Lane V/C Ratio	-	-	0.103	0.023	-
HCM Control Delay (s)	-	-	9.5	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	1	14	1	1	7	26	455	1	8	403	140
Future Vol, veh/h	118	1	14	1	1	7	26	455	1	8	403	140
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	150	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	1	15	1	1	8	28	495	1	9	438	152

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1088	1084	514	1092	1160	496	590	0	0	496	0	0
Stage 1	532	532	-	552	552	-	-	-	-	-	-	-
Stage 2	556	552	-	540	608	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	193	217	560	192	195	574	985	-	-	1068	-	-
Stage 1	531	526	-	518	515	-	-	-	-	-	-	-
Stage 2	515	515	-	526	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	184	208	560	180	187	574	985	-	-	1068	-	-
Mov Cap-2 Maneuver	184	208	-	180	187	-	-	-	-	-	-	-
Stage 1	516	519	-	503	501	-	-	-	-	-	-	-
Stage 2	493	501	-	504	480	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	60.8	14.5	0.5	0.1
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	985	-	-	198	390	1068	-	-
HCM Lane V/C Ratio	0.029	-	-	0.73	0.025	0.008	-	-
HCM Control Delay (s)	8.8	-	-	60.8	14.5	8.4	0	-
HCM Lane LOS	A	-	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	4.7	0.1	0	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	76	32	27	52	16
Future Vol, veh/h	48	76	32	27	52	16
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	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	58	92	39	33	63	19

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	201	56	0	0	72	0
Stage 1	56	-	-	-	-	-
Stage 2	145	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	788	1011	-	-	1528	-
Stage 1	967	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	755	1011	-	-	1528	-
Mov Cap-2 Maneuver	755	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	845	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	5.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	894	1528	-
HCM Lane V/C Ratio	-	-	0.167	0.041	-
HCM Control Delay (s)	-	-	9.8	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	44	59	49	23	13
Future Vol, veh/h	26	44	59	49	23	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	53	71	59	28	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	130	0	-	0	216	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	115	-
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	1455	-	-	-	772	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	910	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1455	-	-	-	755	954
Mov Cap-2 Maneuver	-	-	-	-	755	-
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	910	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1455	-	-	-	817
HCM Lane V/C Ratio	0.022	-	-	-	0.053
HCM Control Delay (s)	7.5	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2