

**APPENDIX A**

**City of Hudson LWRP and**

**O&G Truck Route Alternatives- Traffic Analysis**

## LWRP Build-Out Traffic Generation

### Existing Zoning

Area	Building Use	ITE code	Size	Size Unit	Vehicle Trips		
					PM Peak Hour		
					Total	In	Out
1A and 1B	Residential	210 & 230	1,555	D.U	1,197	778	419
2, 3, 3A, 5B	Residential	221	403	D.U	234	152	82
	Industrial	110	260,543	S.F	281	39	242
	<b>Subtotal</b>				515	191	324
	<b>Minus Internal Trips</b>				20	10	10
<b>Net Total</b>				<b>495</b>	<b>181</b>	<b>314</b>	
<b>Total LWRP Area</b>					<b>1,692</b>	<b>959</b>	<b>733</b>

Rate  
Rate  
Rate

### Minus Internal Trips

### Internal %

Residential	to	Industrial	5%	2.0	2.0
Industrial	to	Residential	5%	7.6	7.6
<b>Internal Trips</b>				<b>10</b>	<b>10</b>
<b>% Internal</b>				<b>4%</b>	

# LWRP Build-Out Traffic Generation

## Proposed Zoning

Area	Building Use	ITE code	Size	Size Unit	Vehicle Trips			
					PM Peak Hour			
					Total	In	Out	
1A and 1B	Residential	210 & 230	777	D.U*	598	389	209	
2, 3, 3A, 5B	Residential	221	308	D.U*	179	116	63	
	Retail	820	159,000	S.F	593	291	302	
	Office	710	190,000	S.F	283	48	235	
	Restaurant	931	65,000	S.F	487	326	161	
	Hotel	310	50	Room	30	16	14	
	Subtotal					1,572	797	775
	Minus Internal Trips					280	140	140
	Retail Pass-By-Trips (25%)					149	73	76
	Walk Trips (15%)					236	120	116
Net Total					907	464	443	
Total LWRP Area					1,505	853	652	

Rate  
Rate  
Rate  
Rate  
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Rate

\* Average of ranges shown in Table 3.1-2

Minus Internal Trips		Internal %	
Residential	to	Retail	10% 17.9 17.9
Residential	to	Office	5% 2.4 2.4
Residential	to	Restaurant	10% 17.9 17.9
Residential	to	Hotel	5% 0.8 0.8
Retail	to	Residential	10% 11.6 11.6
Retail	to	Office	5% 2.4 2.4
Retail	to	Restaurant	5% 16.3 16.3
Retail	to	Hotel	5% 0.8 0.8
Office	to	Residential	5% 5.8 5.8
Office	to	Retail	5% 14.2 14.2
Office	to	Restaurant	5% 14.2 14.2
Office	to	Hotel	5% 0.8 0.8
Restaurant	to	Residential	10% 11.6 11.6
Restaurant	to	Retail	5% 14.6 14.6
Restaurant	to	Office	5% 2.4 2.4
Restaurant	to	Hotel	5% 0.8 0.8
Hotel	to	Residential	5% 1.5 1.5
Hotel	to	Retail	5% 1.5 1.5
Hotel	to	Office	5% 1.5 1.5
Hotel	to	Restaurant	5% 1.5 1.5
<b>Internal Trips</b>			<b>140.4 140.4</b>
<b>% Internal</b>			<b>18%</b>

## Verification of Internal Trips

out of Residential	39.0	61.9%
into Residential	30.5	26.3%
out of Retail	31.1	10.3%
into Retail	48.1	16.5%
out of Office	34.9	14.9%
into Office	8.7	18.1%
out of Restaurant	29.4	18.2%
into Restaurant	49.9	15.3%
out of Hotel	6.0	42.9%
into Hotel	3.2	20.0%

## O&G Truck Route Alternatives- Traffic Analysis

In order to compare the existing state truck route, the Proposed Action (South Bay Causeway Truck Route) and the other site specific transportation alternatives analyzed in the Draft Generic Environmental Impact Statement (DGEIS), BFJ performed a travel and capacity analysis of the key intersections in the area.

Figure 1 shows the existing state truck route (in red), the proposed South Bay Causeway Truck Route (in magenta – Proposed Action), Alternatives 2A, 2B, and 2C (in green – LB Furniture Route Alternatives), Alternative 3A (in yellow – Scenic Hudson Correctional Facility Alternative), Alternative 3B (in orange – Scenic Hudson Union Street Alternative), and Alternative 4 (in blue – Long Path Alternative). The starting point for the truck route under all of the South Bay Causeway Truck Route and all of the other alternatives is the intersection of the Colarusso & Sons site driveway with Newman Road (truck scale location); the ending point is the intersection of the Holcim Industries driveway (deep water port) with South Front Street. Alternatives 1A (Conveyor Belt Alternative) and 1B (Rail Alternative) are not considered in this analysis because they do not utilize trucks to transport the aggregate material from the quarry to the deep water port and will therefore have no impact on traffic conditions in the area. However, these alternatives traverse the same path as the South Bay Causeway Truck Route.

Table 1 below, presents the measured one-way path length for each route. BFJ Planning followed O&G trucks along the existing state truck route to measure current travel times. The average existing truck travel speed from the intersection of the quarry driveway and Newman Road to the Holcim site driveway at South Front Street is 16mph. Figure 2 shows the travel speeds assumed for the different alternative route segments.

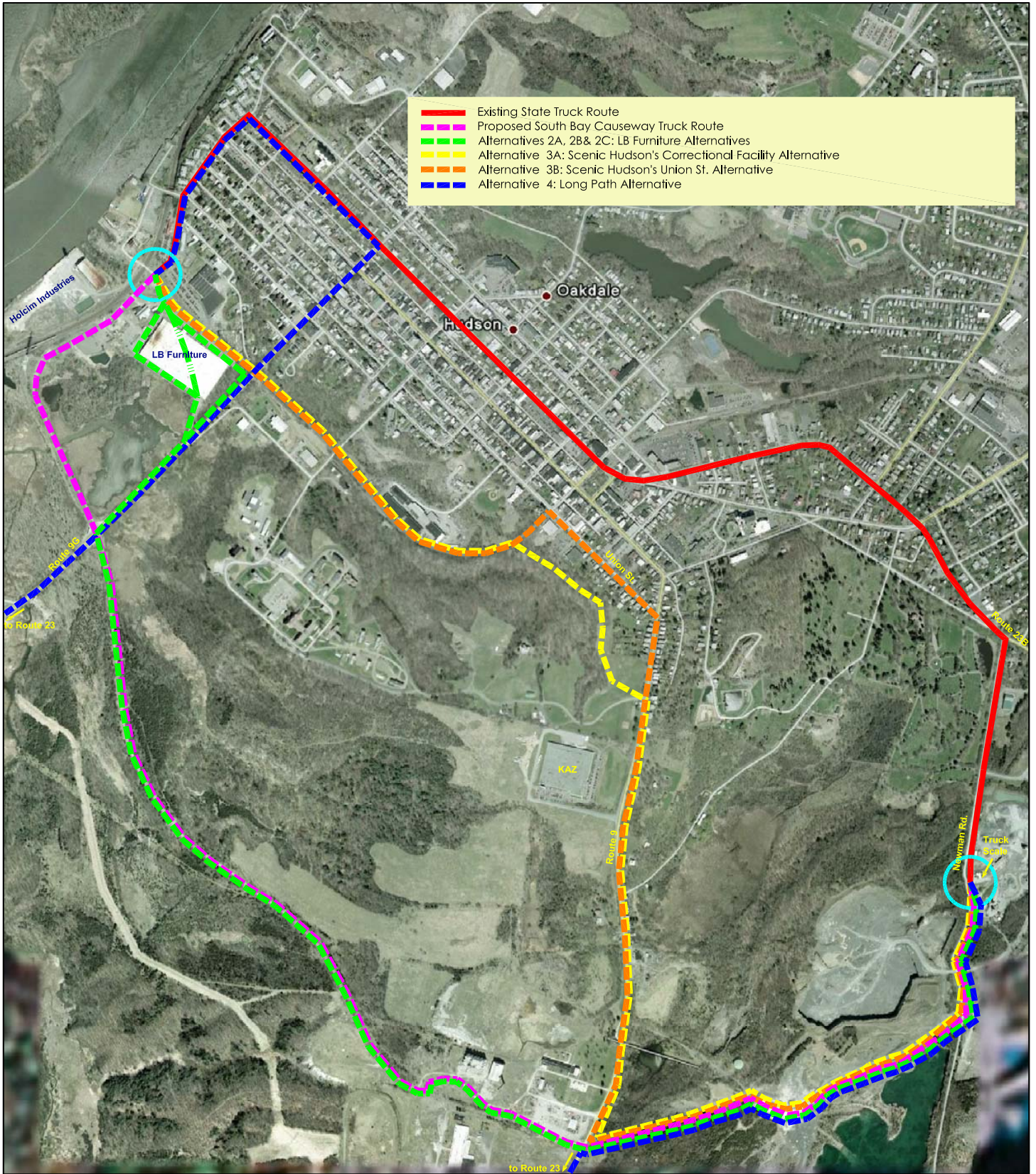
As demonstrated by Table 1, the existing truck route is the shortest route but is the route that takes the greatest time to traverse due to the stop and go conditions (except Alternative 4: Long Path Alternative). The Proposed Action, as well as Alternatives 2A, 2B, 2C and 3A have the shortest duration due to the relatively short path lengths and higher travel speeds.

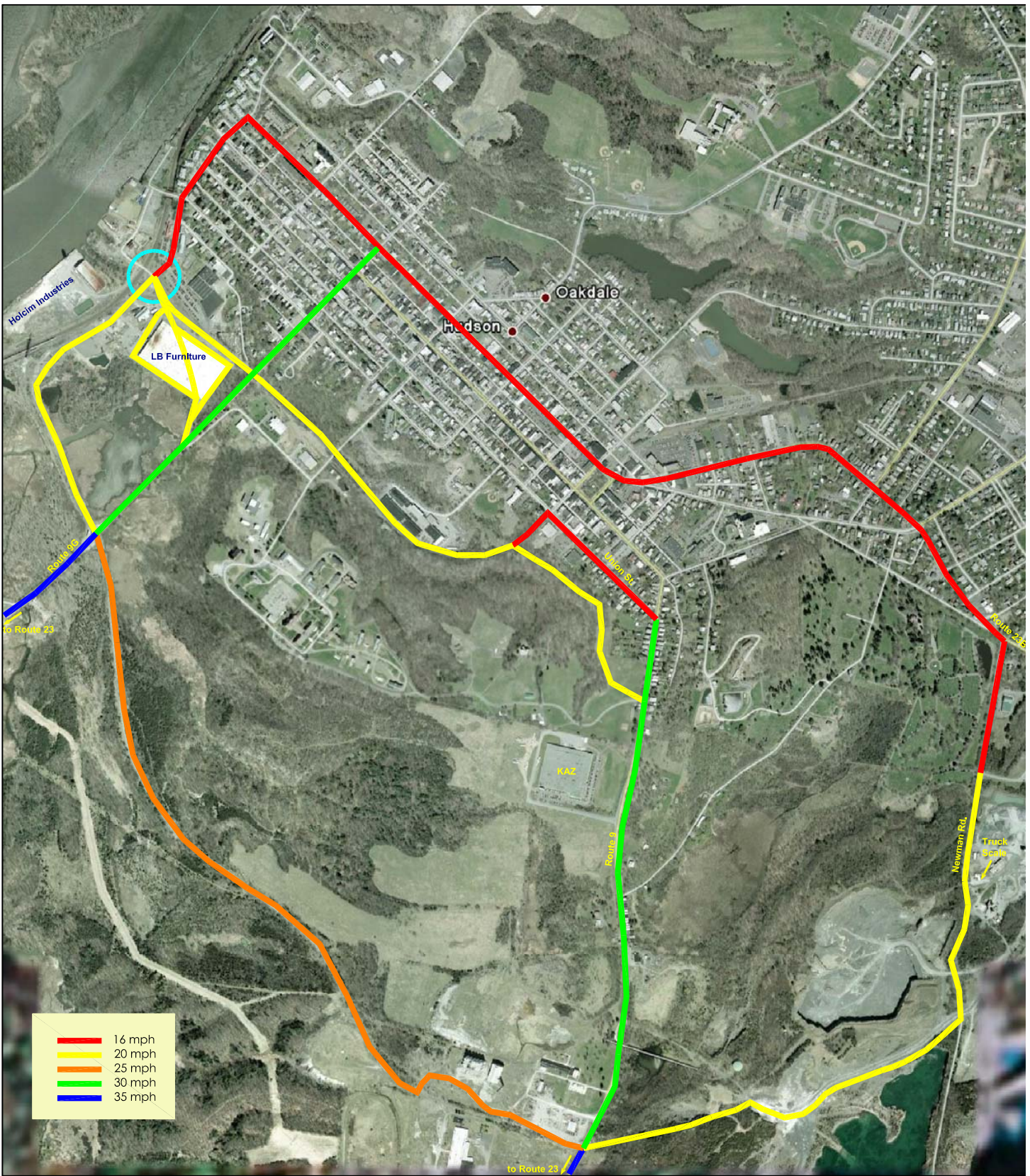
The two last columns in Table 1 show the Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) for each route, using the truck travel speed and path length information. The VMT and VHT are calculated for an average of 80 trips (roundtrips) per day. As demonstrated by the data, the existing state truck route has the lowest VMT. However, the South Bay Causeway Truck Route and Alternatives 3A, 2A, 2B, and 2C have the lowest VHT as compared to the other routes.

In addition, BFJ also performed traffic counts at the intersections of Route 9 with the KAZ driveway and Route 9G with the LB Furniture property driveway. Using the collected traffic data, BFJ performed a capacity analysis at the intersection of the proposed South Bay Causeway road with Route 9 and Route 9G. Table 2 presents the comparison between delay and level of service (LOS) under the existing conditions, the proposed South Bay Causeway Truck Route, and the other

transportation alternatives. In the worst case scenario, a maximum of 14 trucks per hour leave the quarry toward the dock. Assuming one truck is equivalent to 1.5 passenger car (1.5pce), an equivalent amount of 21 passenger cars would be traveling between the quarry and the dock in the peak hours. As Table 2 demonstrates, traffic quality will not be impacted along Route 9 and Route 9G during any of the peak hours. The maximum delay per vehicle for the trucks traveling along the South Bay Causeway at the intersection with Route 9 and Route 9G would be 15.4 seconds in the A.M. peak hour and 16.7 seconds in the P.M. peak hour. Given these conditions, a traffic signal is not warranted under the Manual on Uniform Traffic Control Devices (MUTCD) section 4C.04.

Further, BFJ conducted a review of stopping sight distances along the proposed South Bay Causeway Truck Route. According to "A Policy on Geometric design of Highways and Streets" published by the American Association of State Highway and Transportation Officials (AASHTO), the maximum stopping distance for a highway with 45mph posted speed is 360'. Both intersections of the proposed South Bay Causeway road with Route 9 and Route 9G have more than 500' clear stopping sight distance.





HUDSON LWRP DRAFT GEIS

FIGURE 2: ALTERNATIVE TRANSPORTATION ROUTE SPEED

HUDSON, NEW YORK

SOURCE: GOOGLE EARTH MAP



**Table 1: Alternative Truck Route Travel Comparison**

Alternative Transportation Routes	Length (mile)	Length (foot)	Route Segments						Time (min)	Average Speed (mph)	VMT (80trucks daily)	VHT (80trucks daily)
			Length Speed	Length Speed	Length Speed	Length Speed	Length Speed	Length Speed				
Existing State Truck Route	2.55	13,479	1,070 20	1,252 16	11,157 16	--	--	9.4	16.3	408.5	25.1	
Proposed Action	3.13	16,506	5,264 20	8,162 25	3,080 20	--	--	8.5	22.2	500.2	22.5	
Alternatives 2A, 2B, and 2C: LB Furniture Route Alternatives	3.18	16,772	5,264 20	8,162 25	1,270 30	2,076 20		8.4	22.8	508.2	22.3	
Alternative 3A: Scenic Hudson's Correctional Facility Alternative	3.05	16,083	5,264 20	4,280 30	2,126 20	4,413 20		8.3	21.9	487.4	22.2	
Alternative 3B: Scenic Hudson's Union St. Alternative	3.16	16,671	5,264 20	4,280 30	2,714 16	4,413 20		9.0	20.9	505.2	24.1	
Alternative 4: Long Path (Through Route 9/ Route 23 & Route 9G)	8.28	43,710	5,264 20	31,100 35	2,088 30	5,258 16		17.6	28.2	1,324.5	47.0	



**Table 2 - Additional intersections Capacity Analysis**

			Existing		Proposed Action		Alternatives 2A, 2B, and 2C		Alternatives 3A and 3B		Alternative 5	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Rte. 9 & Proposed temporary road	AM Peak Hour	EB	--	--	13.5	B	13.5	B	--	--	--	--
		WB	--	--	13.5	B	13.5	B	10.4	B	13.6	B
		NB	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
		SB	0.0	A	0.0	A	0.0	A	1.0	A	0.0	A
	PM Peak Hour	EB	--	--	15.0	B	15.0	B	--	--	--	--
		WB	--	--	15.0	B	15.0	B	9.7	A	15.4	C
		NB	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
		SB	0.0	A	0.0	A	0.0	A	0.6	A	0.0	A
Rte. 9G & Proposed temporary road	AM Peak Hour	EB	--	--	15.4	B	--	--	--	--	--	--
		WB	--	--	15.4	B	10.0	B	--	--	--	--
		NB	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
		SB	0.0	A	0.0	A	0.6	A	0.0	A	0.0	A
	PM Peak Hour	EB	--	--	16.7	C	--	--	--	--	--	--
		WB	--	--	16.7	C	11.1	B	--	--	--	--
		NB	0.0	A	0.0	A	0.0	A	0.0	A	0.0	A
		SB	0.0	A	0.0	A	0.9	A	0.0	A	0.0	A