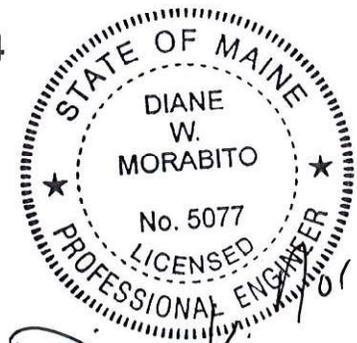


**Traffic Impact Study  
Proposed Aquafarm  
Belfast, Maine**

**June 3, 2019**

**Prepared for:**

**Ransom Consulting, Inc.  
400 Commercial Street, Suite 404  
Portland, ME 04101**



**Prepared by:**

**Maine  
Traffic  
Resources**



## **Introduction**

The purpose of this study is to assess the traffic impacts of a proposed salmon farm by Nordic Aquafarms, to be located off Route 1 in Belfast, Maine. The site, just a short distance north of the Northport town line, is currently occupied by the Belfast Water District. The site location is shown on the map in Figure 1.

The speed limit is posted at 50 mph at the site drive. The speed limit drops to 40 mph just 300' north of the existing Water District site drive. With increased activity at this drive the City of Belfast should consider asking MaineDOT to extend the 40 mph speed limit 400' south to encompass the site drive after the salmon farm is operational.

The salmon farming facility is expected to be developed in two phases. Phase 1 is expected to employ 60 people while at the completion of Phase 2 total employment is expected to be 100. The employees will be spread over two shifts spanning an early day shift and a late afternoon shift, operating Monday through Saturday.

Construction of Phase 1 is expected to begin late in 2019 with completion and startup anticipated at the end of 2020. Phase 2 construction is currently anticipated to begin in 2021 with startup late in 2024. Hence, 2024 was utilized as the study year for traffic analysis purposes to allow for completion and full occupancy of Phase 2.

## **Traffic Volumes**

Turning movement counts were conducted at the nearby intersection of Route 1 and Perkins Road to determine existing traffic volumes and area traffic patterns during the weekday PM peak hour period on July 11, 2018 from 2:00 to 5:30 PM. The PM peak hour occurred from 3:45 – 4:45 PM. The AM peak hour period was counted on July 18, 2018. The AM peak hour occurred from 8:00 – 9:00 AM. The count records are included in the appendix of this report.

Since the counts were conducted under peak summer conditions, no factoring was required to obtain 30<sup>th</sup> highest hour volumes, which are used for traffic analysis purposes. These 30<sup>th</sup> highest hour volumes generally occur during peak hours in July and August in Maine. These peak summer 2018 volumes are shown in Figure 2.

**Trip Generation**

The number of trips to be generated by the proposed salmon farm was first estimated using the Institute of Transportation Engineers (ITE) “Trip Generation, 7<sup>th</sup> Edition” report, the edition being utilized by MaineDOT for traffic permitting purposes and information provided by Nordic Aquafarms. This older edition was utilized to assure that a Traffic Movement Permit (TMP) would not be required from MaineDOT.

The farming facility is expected to operate most like a manufacturing facility with employees reporting to two shifts, supply deliveries and out shipment of product. As such, land use code (LUC) 140 – Manufacturing would be most appropriate. However, given that the first shift is expected to employ more persons than the second, use of LUC 710 – General Office, where most employees arrive in the AM peak hour and depart in the PM peak hour was also utilized. The results for both land use codes, on the basis of 60 Phase 1 employees and 100 employees at Phase 2 completion, based upon the older 7<sup>th</sup> edition data are shown below:

<u>Time Period</u>	<b>ITE Trip Generation Results -7<sup>th</sup> Edition</b>					
	<b>Phase 1</b>			<b>Phase 2</b>		
	<u>Man.</u>	<u>Office</u>	<u>Avg.</u>	<u>Man.</u>	<u>Office</u>	<u>Avg.</u>
Weekday	128	200	164	214	332	274
AM Peak Hour	24	29	27	40	48	44
Entering	18	26	22	29	42	36
Exiting	6	3	5	11	6	8
PM Peak Hour	24	28	26	40	46	43
Entering	11	5	8	19	8	14
Exiting	13	23	18	21	38	29

As seen above, based upon the older ITE data, the salmon farm does not require a TMP since it will generate significantly fewer than 100 new one-way trips in peak hours. Additionally, there is a grandfathered trip credit for pre-existing trips into the site. Since the Belfast Water District currently occupies the site there is a credit for their pre-existing trips, further reducing new site trips from the 100-trip threshold.

The newest 10<sup>th</sup> edition ITE report was utilized as the basis of this study since it is considered to provide the most current and reliable information and is based upon the largest possible data sample size. The same land use codes and approach previously detailed above were used. The results are summarized in the following table:

<u>Time Period</u>	<b>ITE Trip Generation – Newest 10<sup>th</sup> Edition</b>					
	<b>Phase 1</b>			<b>Phase 2</b>		
	<u>Man.</u>	<u>Office</u>	<u>Avg.</u>	<u>Man.</u>	<u>Office</u>	<u>Avg.</u>
Weekday	148	196	172	248	328	288
AM Peak Hour	26	28	27	43	47	45
Entering	21	25	23	35	41	38
Exiting	5	3	4	8	6	7
PM Peak Hour	27	27	27	45	45	45
Entering	12	5	8	20	8	14
Exiting	15	22	19	25	37	31

As demonstrated above, based upon the average of the ITE data for both manufacturing and office facilities, the salmon farm facility is expected to generate 27 one-way trips during the AM peak hour and 27 during the PM peak hour at the completion of Phase 1. At the completion of Phase 2 the facility will generate 45 one-way trips during peak hours. Based upon this, peak hour trip generation will be well under 100 trips so a Traffic Movement Permit (TMP) is not required from the Maine Department of Transportation (MaineDOT). It is important to note again that actual new traffic volumes to the site will be less than those shown above since the Water District currently generates some trips and no credit was taken for these pre-existing trips to be conservative.

Given that the facility is projected to generate similar trip levels during both the AM and PM peak hours, both the weekday AM and PM peak hours were selected as analysis periods. The trip assignments, based upon the recorded travel patterns during both the AM and PM counts, demonstrate that 80 % of the trips will be destined to and from the north, as shown in Figure 3. All of the trips are assumed to be primary, or new trips, with no pass-by trips, since they are work related trips.

Based upon the trip assignments, the study area for capacity analysis purposes extends only from the facility through the site drive intersection. Given the resulting trip assignments, this level of new traffic is not expected to have any significant impact off-site on traffic operations beyond the site drive. In order to demonstrate the impact on Route 1 and other nearby intersections, the intersection of Perkins Road is evaluated later in this report under unsignalized intersection analysis.

Existing average annual daily traffic (AADT) data for the area was obtained from "Traffic Volume Counts, 2017, 2014 and 2009 Annual Reports", published by MaineDOT. This data is summarized in the following table:

<u>Location Description</u>	<b>Average Annual Daily Traffic</b>				
	<u>2005</u>	<u>2007</u>	<u>2010</u>	<u>2014</u>	<u>2017</u>
Route 1, southeast of Northport Avenue	---	---	---	8760	9720
Route 1, northwest of Northport Avenue	---	--	7760	7510	8430
Route 1 at Northport Town Line	9250	8220	7760	7390	8040

As seen above, traffic volumes on Route 1 in the vicinity of the site have generally declined over the long term 2005 to 2017 period. There has been some growth in the more recent short term from 2014 to 2017 period, averaging 3.5 % annually, which is a fairly high annual growth rate for Maine.

The City of Belfast Planner was contacted to see if there are any other developments planned in the vicinity of the site that will impact study area volumes, which should be considered in the future 2024 traffic analysis. Several potential projects were identified.

The Belfast Planning Board approved an expansion of the Seacoast Village Mobile Home Park, which will add 33 new dwelling units. The trips to be generated by these units were estimated using ITE rates. The park expansion will generate 15 new trips (3 in, 12 out) during the AM peak hour and 20 (12 in, 8 out) during the PM peak hour. These trips were assigned to Route 1 based upon the recorded 80/20 travel patterns. This results in 2 new AM and PM trips northbound and southbound on Route 1 in the vicinity of the site and Perkins Road.

Mathews Brothers, located on Perkins Road, has been growing and adding employees but has filed no application for any physical expansion. Similarly, Waldo County General Hospital has been growing and expanding in recent years. Much of the higher recent annual traffic growth is likely due to expansions and growth of area businesses, such as the hospital and Mathews Brothers. Given this historical growth rate, the 3.5 % recent annual traffic growth rate was utilized to project 2018 volumes for both Perkins Road and Route 1 to current 2019 conditions, shown in Figure 4, and for the longer five-year study period through 2024.

The resulting 2024 No Build volumes, allowing for the Seacoast Village Mobile Home Park expansion and based upon a continued 3.5 % annual traffic growth rate for the five-year period are shown in Figure 5. The projected 2024 Build volumes, assuming completion of both Phases 1 and 2 of Nordic Aquafarms, are shown in Figure 6.

**Traffic Analysis**

Traffic operations are evaluated in terms of level of service (LOS). Level of service is a qualitative measure that describes operations by letter designation. The levels range from A - very little delay to F - extreme delays. Level of service "D" is generally considered acceptable in urban locations while LOS "E" is generally considered the capacity of a facility and the minimum tolerable level. The level of service for unsignalized intersections is based upon average control delay per vehicle for each minor, opposed movement, as defined in the following table excerpted from the 2010 "Highway Capacity Manual":

**Unsignalized Intersection Level of Service**

<u>LOS</u>	<u>Delay Range</u>
A	<= 10.0 seconds
B	> 10.0 and <= 15.0
C	> 15.0 and <= 25.0
D	> 25.0 and <= 35.0
E	> 35.0 and <= 50.0
F	> 50.0

**Unsignalized Intersection Analysis**

The level of service was calculated for the nearby unsignalized intersection of Perkins Road and Route 1 using Synchro 10 and SimTraffic, the average of five (5) simulation runs. The results for existing 2019 and projected 2024 conditions for the AM and PM peak hours are included in the appendix and are shown in the following tables with the level of service followed by the delay, in seconds:

**Route 1 and Perkins Road**

**AM Peak Hour Level of Service**

<u>Approach/Movement</u>	2019	2024	2024
	<u>Existing</u>	<u>No-Build</u>	<u>Build</u>
Eastbound Perkins Road	A (7.4)	A (8.8)	A (8.8)
Northbound Route 1	A (0.7)	A (0.8)	A (0.9)
Southbound Route 1	A (0.8)	A (0.9)	A (0.8)

**PM Peak Hour Level of Service**

<u>Approach/Movement</u>	2019	2024	2024
	<u>Existing</u>	<u>No-Build</u>	<u>Build</u>
Eastbound Perkins Road	B (11.8)	C (15.7)	C (16.9)
Northbound Route 1	A (0.8)	A (1.1)	A (1.2)
Southbound Route 1	A (1.1)	A (1.2)	A (1.1)

As seen in the preceding table, Perkins Road currently operates at a good LOS “A” during the AM peak hour and at LOS “B” during the PM peak hour. By 2024, with the projected growth in traffic the LOS will drop to “C” for the PM peak hour but remain at “A” during the AM peak hour. The same levels of service are projected under Build volumes as No Build volumes for both the AM and PM hours. This demonstrates that the proposed salmon farming operation will have no significant impact off site on traffic operations. The delay for vehicles exiting Perkins Road will increase minimally by 1.2 seconds during the PM peak hour due to the additional salmon farming trips on Route 1 with no increase in delay in the AM peak hour. Again, the results are somewhat conservative since no credit was taken for existing Water District trips. To summarize, the analysis did not identify any capacity concerns and it demonstrated that Route 1 has the capacity to accommodate the additional trips.

**Site Drive**

The level of service was also calculated for the proposed site drive to assure acceptable operations using Synchro 10. The results are summarized below for the peak hours:

	<b>2024 Build Level of Service</b>	
	<u>AM Peak</u>	<u>PM Peak</u>
Eastbound Site Drive	A (7.6)	B (11.1)

As seen above, the site drive will operate at level of service “A” during the AM peak hour and “B” during the PM peak hour, again demonstrating that Route 1 has the capacity to accommodate the salmon farm trips and that there are no capacity concerns.

**Auxiliary Turn Lane Analysis**

Left-turn and right turn lane warrant analysis was performed for Route 1 at the site drive for both the AM and PM peak hours to determine if formal turn lanes should be considered on Route 1 to serve traffic turning into Nordic Aquafarms. The left-turn warrant was performed according to the procedures in the MaineDOT “Highway Design Guide” for 50 mph roadways since Route 1 is currently posted at 50 mph at the site drive. The warrant chart is shown in Figure 7. The results show that a left-turn lane is not warranted or necessary on Route 1 to serve traffic turning into the proposed salmon farm.

Similarly, the right turn lane warrant was performed using the MaineDOT chart, as shown in Figure 8. The right turn lane warrant is not close to being met during either peak hour. Given that there is a wide 8 - 9’ paved shoulder on Route 1, consideration could be given to a minor shoulder widening to provide a short, widened shoulder that would allow slower right turning vehicles to get out of the through traffic stream given the current 50 mph speed limit.

**Safety Analysis**

**Accident Review**

The Maine Department of Transportation uses two criteria to determine high crash locations (HCLs). The first is the critical rate factor (CRF), which is a measure of the accident rate. A CRF greater than one indicates a location which has a higher than expected accident rate. The expected rate is calculated as a statewide average of similar facilities.

The second criterion, which must also be met, is based upon the number of accidents that occur at a particular location. Eight or more accidents must also occur over the three-year study period for the location to be considered a high crash location. Accident data for Route 1 in the vicinity of the site was obtained from MaineDOT and is included in the appendix. The CRF and number of accidents are summarized by location for the most recent three-year period, 2016 to 2018, below:

<u>Route 1 Location Description</u>	<u># of Acc.</u>	<u>CRF</u>
Intersection of Bayside Road in Northport	1	0.31
Between Bayside Road and Birchcrest Road in Northport	2	0.45
Between Birchcrest Road and Cemetery Road in Northport	3	0.63
Intersection of Cemetery Road in Northport	1	0.53
Between Cemetery Road and Belfast Northport town line	4	0.47
Between town line and Tozier Street	2	0.25
Between Tozier Street and Seaside Drive	2	0.56
Between Seaside Drive and Perkins Road	1	0.13
Intersection of Perkins Road	1	0.27
Between Perkins Road and Northport Avenue/reverse direction ramp	2	0.10
<b>Intersection of Northport Avenue and reverse direction ramp</b>	<b>9</b>	<b>2.51</b>
Intersection of Northport Avenue	3	0.87
Between Northport Avenue and reverse direction entrance	1	0.53
Between reverse direction entrance and 0.55 mile northwest	8	0.45
<b>Intersection of Congress Street</b>	<b>8</b>	<b>1.87</b>

As seen above, there are two high crash locations on Route 1 within the vicinity of the proposed aquafarm, highlighted in bold print. As a result, collision diagrams were obtained from MaineDOT for each location to evaluate if there are any accident patterns or trends apparent that may indicate a correctable safety deficiency. The diagrams are included in the appendix and are discussed as follows:

Intersection of Route 1, Northport Avenue and reverse direction ramp 9 2.51

There was one crash in 2016, four in 2017 and four in 2018. All nine collisions were angle collisions between vehicles exiting the jug handle to reverse direction and Route 1 vehicles. Two occurred with southbound Route 1 vehicles and seven with northbound vehicles, constituting a pattern of crashes with northbound vehicles. Given the pattern, a field review was conducted to determine if there is an apparent deficiency, such as a sight distance restriction, contributing to the accident problem. No deficiencies were identified and sight distances were found to be more than adequate for the posted 40 mph speed limit.

Intersection of Congress Street 8 1.87

There was one crash in 2016, one in 2017 and six in 2018 at the intersection of Route 1 and Congress Street. There was one rear end southbound on Route 1 as a vehicle turned right onto Lower Congress Street. There was one angle collision between a vehicle exiting Congress Street from the north and Route 1. There were two angle type collisions as vehicles turned left off Route 1 onto Lower Congress Street, failing to yield to southbound Route 1 vehicles. Two angle type crashes occurred as vehicles exited left from Lower Congress onto Route 1. One crash occurred when a Route 1 vehicle struck a vehicle waiting to exit Congress Street avoiding another vehicle. The last crash, an angle type, occurred between a vehicle exiting Lower Congress Street and a southbound Route 1 vehicle. There is no pattern of accidents evident here that would indicate any correctable type safety deficiency.

**Driveway Sight Distance**

One of the most important safety factors to consider for a project is sight distance from the access drives. This sight distance is measured ten feet back from the edge of travel way at a driver's eye height of 3.5 feet to an object height of 4.25 feet. Maine Traffic Resources recommends a minimum sight distance of 500' feet for the posted 50 mile per hour speed limit on Route 1. The Belfast ordinance recommends a similar 500' of sight distance with a minimum requirement of 475'.

Maine Traffic Resources field checked the sight distances and found it to be over 600' to the right (south) and in excess of 700' to the left (north), exceeding the recommended minimum. Some brush is growing on the immediate pavement edge to north of the site drive, beyond the area currently mowed by the Water District, which has the potential to partially restrict sight distance to the left in the future. It is recommended that this roadside edge be mowed further to the north and maintained to assure greater than adequate sight distance at all times.

## **SUMMARY**

To summarize, the proposed Nordic Aquafarms salmon farm is expected to generate 45 one-way trips during peak hours at the completion of Phase 2. Since peak hour trip generation will be well under 100 trips a Traffic Movement Permit (TMP) is not required from the Maine Department of Transportation (MaineDOT). Given that the facility will generate similar traffic levels during the AM and PM peak hours both were selected as analysis periods.

Nearby Perkins Road currently operates at LOS “A” during the AM peak hour and at LOS “B” during the PM peak hour. By 2024, the LOS will drop to “C” during the PM peak hour but will remain at “A” during the AM peak hour. The same levels of service are projected under Build volumes as No Build volumes, for both peak hours, showing no significant impact off site on traffic operations. The analysis did not identify any capacity concerns and Route 1 has the capacity to accommodate the additional trips. Similarly, the site drive will operate at LOS “A” during the AM peak hour and LOS “B” during the PM peak hour with no capacity concerns.

Auxiliary left and right turn lane warrants were evaluated for Route 1 at the site drive to determine if formal turn lanes are desirable on Route 1 to store traffic turning into Nordic Aquafarms. Neither turn lane warrant was met under projected 2024 full build volumes.

In terms of safety, there are two high crash locations on Route 1 within the vicinity of the Nordic Aquafarms site. Collision diagrams were evaluated for each to determine if there are any accident patterns, indicating a potential safety deficiency. There is a pattern of angle accidents between vehicles exiting the reverse direction loop and northbound Route 1 at the intersection of Route 1, Congress Street and the reverse direction jug handle. A field review was conducted and no contributing deficiencies were identified.

Sight distance from the existing site drive exceeds the recommended minimum to both the north and the south. Some additional mowing of the roadside edge is recommended to the north of the site drive to assure that the sight distance does not become partially restricted in the future.

Given that the current speed limit change from 40 mph to 50 mph occurs just 300’ north of the site drive, the City of Belfast should consider asking MaineDOT to extend the 40 mph zone 400’ further to the south to encompass the site drive after the salmon farm is operational and driveway volumes and activity increase.

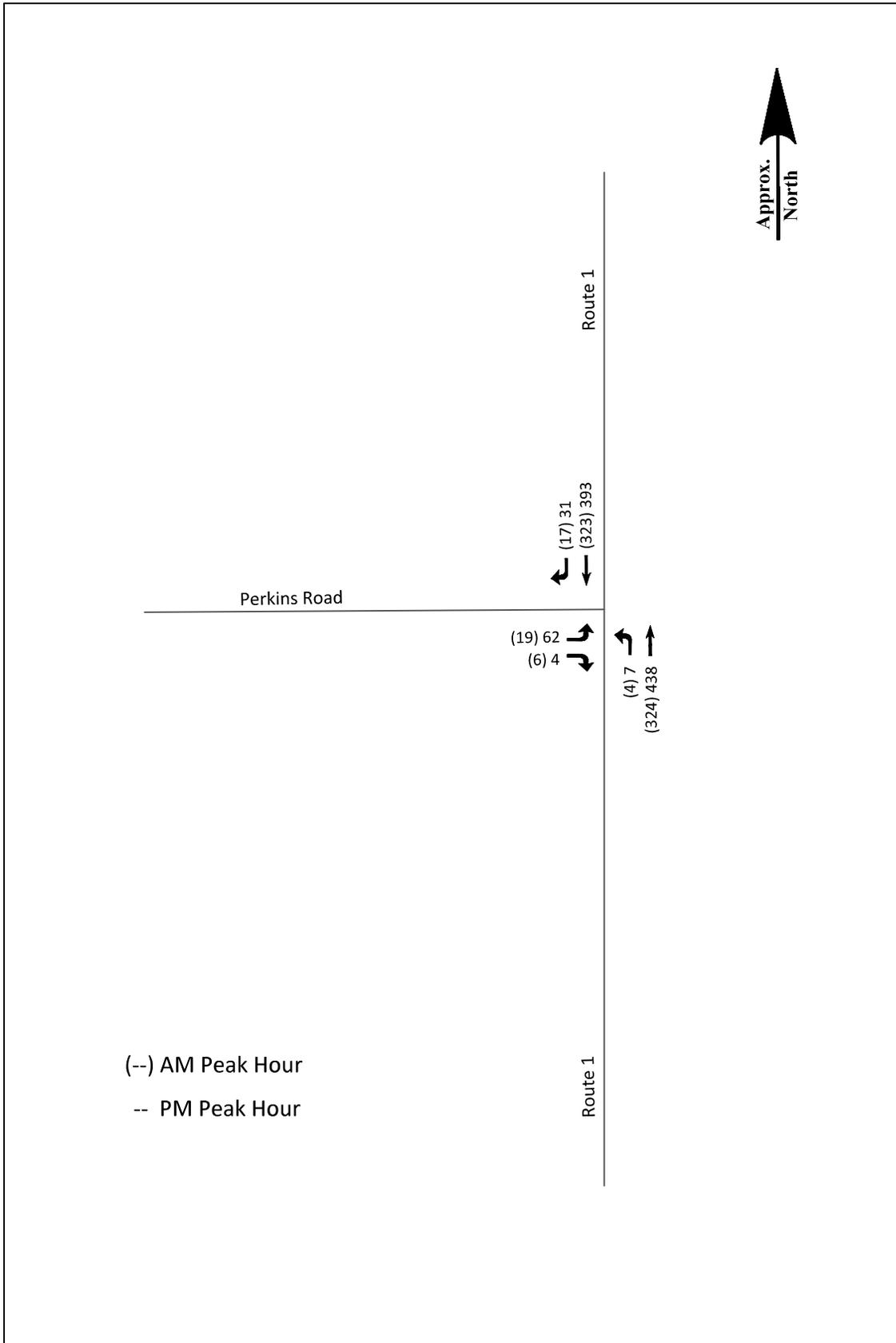


**Figure 1**

**Site Location Map  
Nordic Aquafarms  
Belfast, Maine**

**Maine  
Traffic  
Resources**

**SEWALL**  
JAMES W. SEWALL COMPANY / Since 1880  
40 Forest Falls Drive, Suite 2  
Yarmouth, ME 04096  
tel: (207) 207-817-5440



**Figure 2**

**2018 30th Highest Hour Volumes**

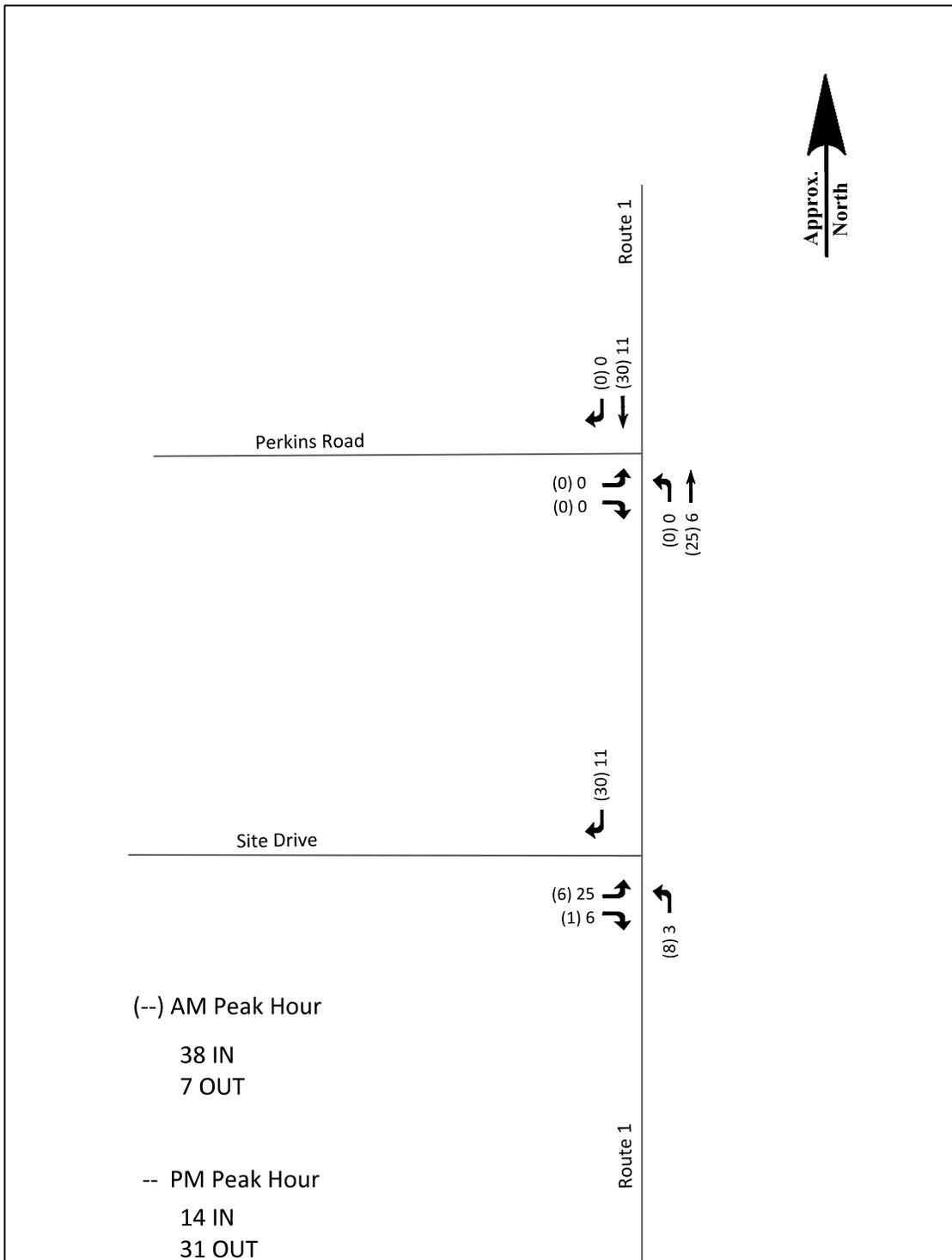
**Nordic Aquafarms**

**Belfast, Maine**

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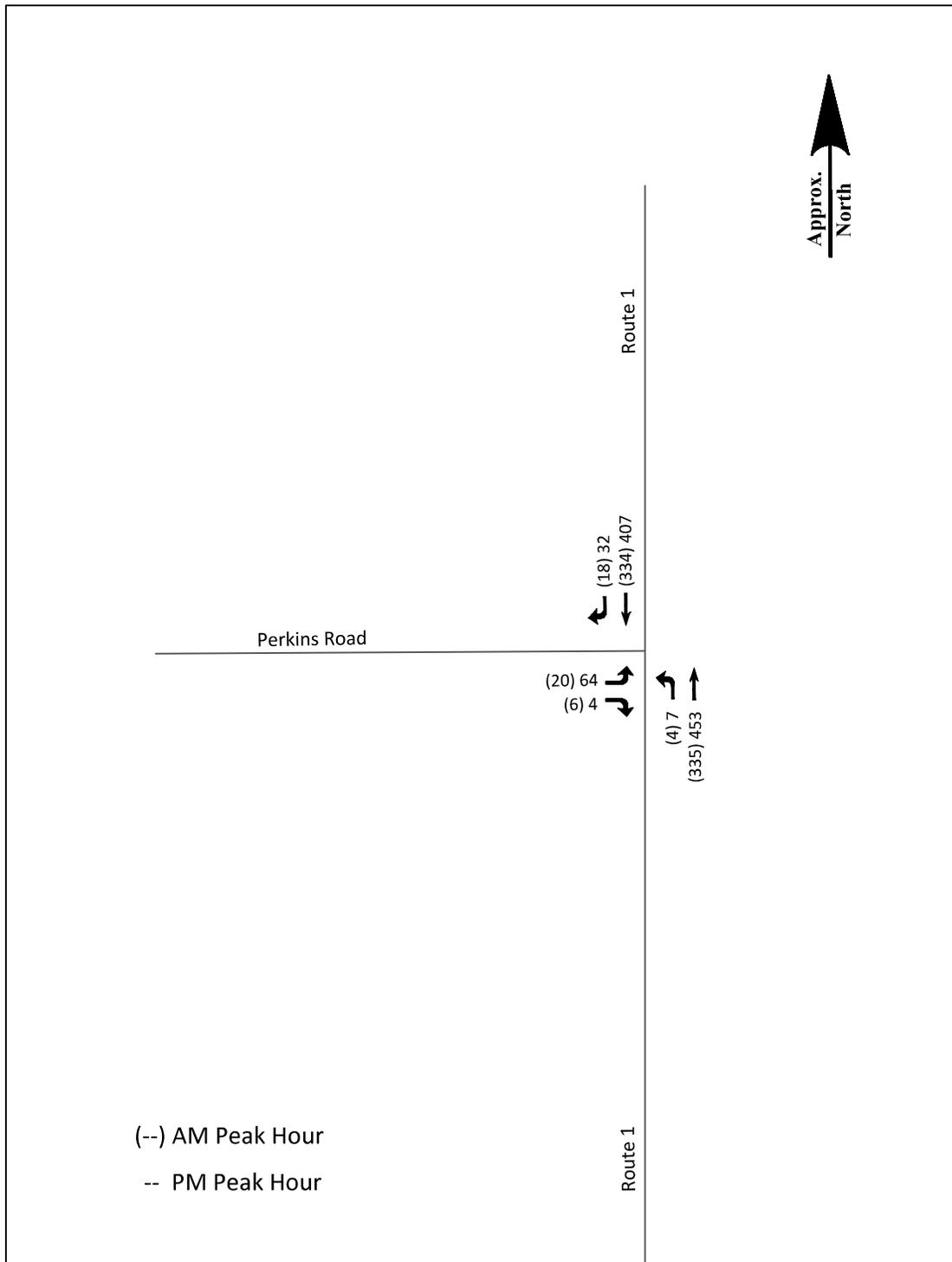
**Figure 3**

**Trip Assignments**  
**Nordic Aquafarms**  
**Belfast, Maine**

Maine  
 Traffic  
 Resources



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**Figure 4**

**Existing 2019 30th Highest Hour Volumes**

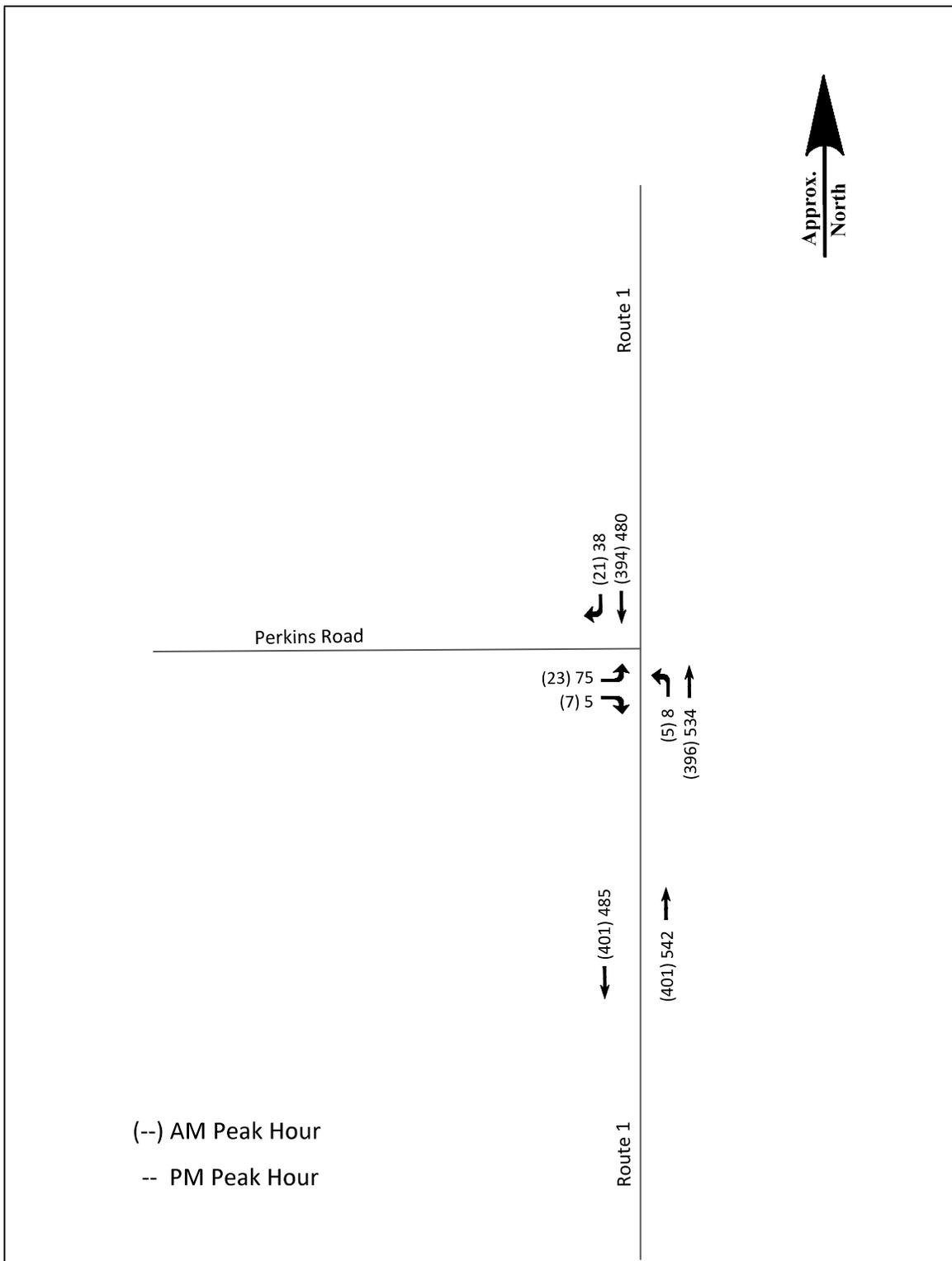
**Nordic Aquafarms**

**Belfast, Maine**

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**Figure 5**

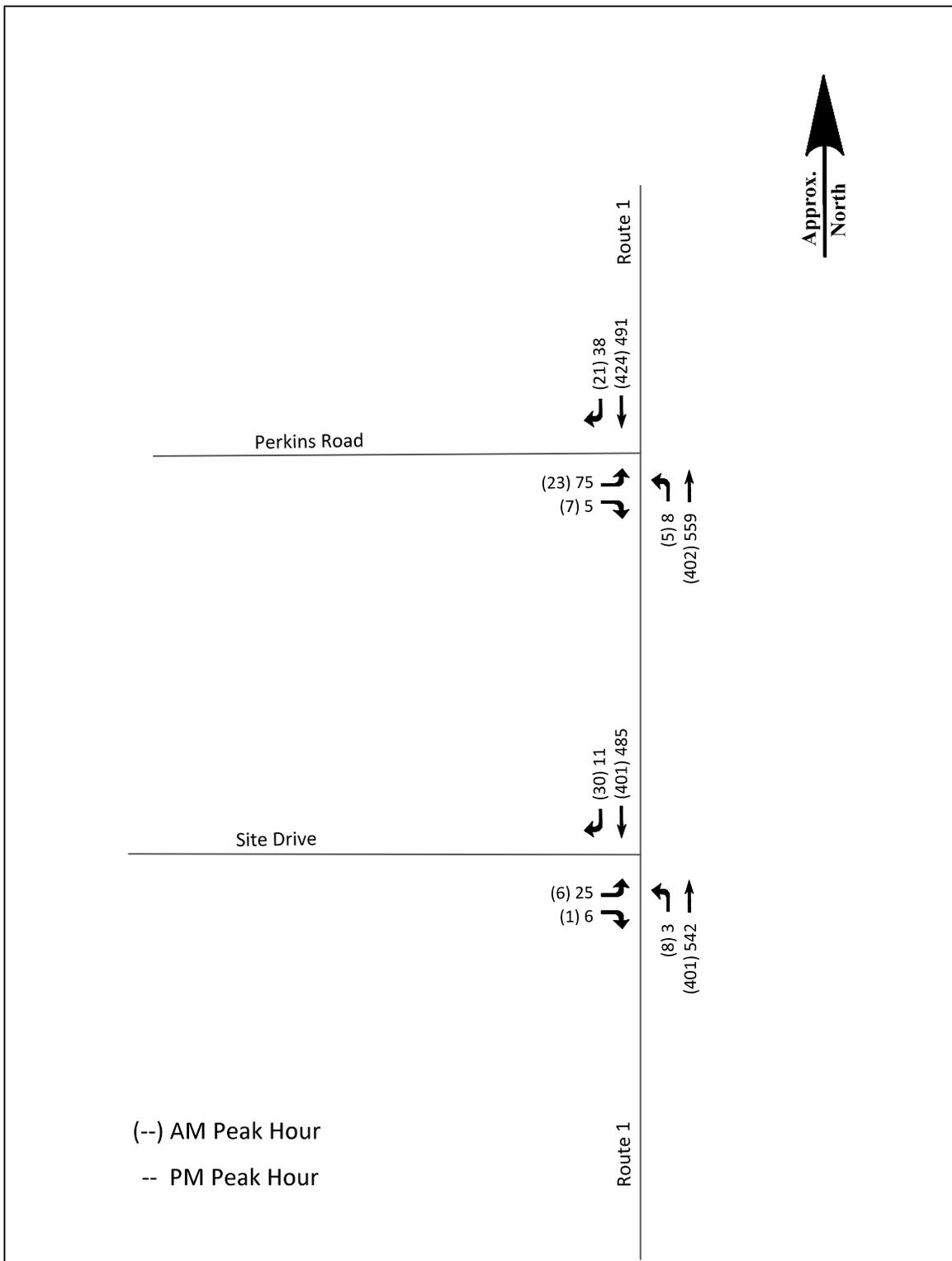
**Projected 2024 No Build Volumes**

**Nordic Aquafarms**

**Belfast, Maine**



  
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 Yarmouth, ME 04096  
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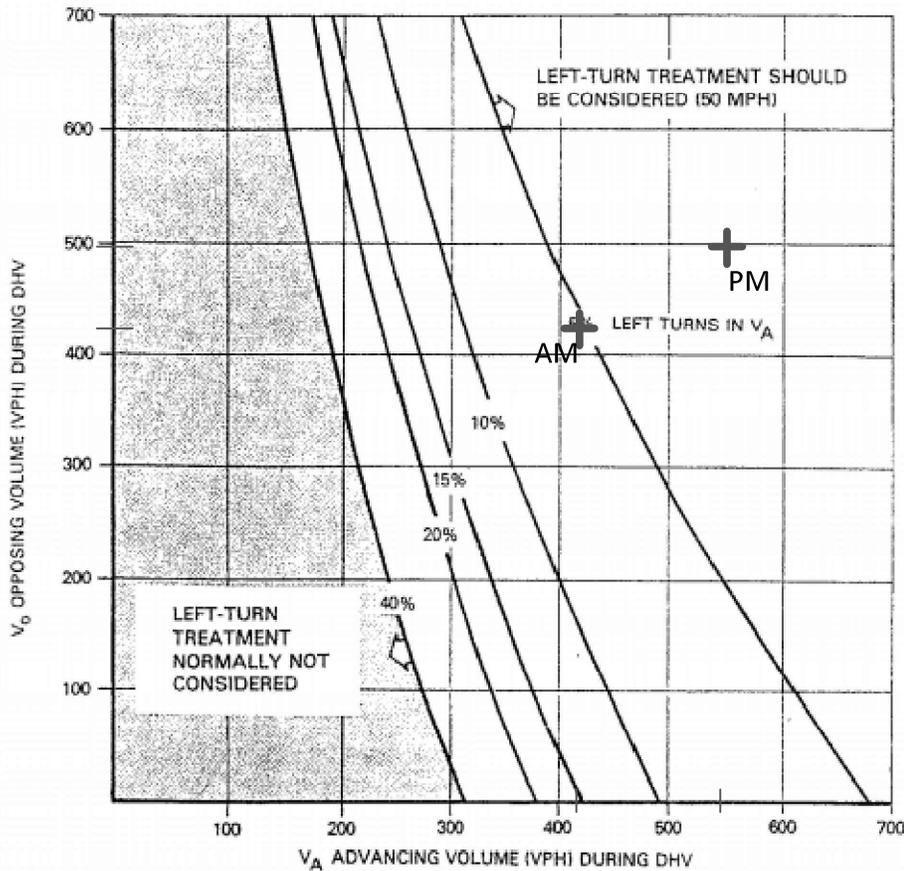


**Figure 6**

<b>Projected 2024 Build Volumes</b>
<b>Nordic Aquafarms</b>
<b>Belfast, Maine</b>



  
 JAMES W SEWALL COMPANY / Since 1880  
 40 Forest Falls Drive, Suite 2  
 Yarmouth, ME 04096  
 tel: (207) 207-817-5440



- Instructions:**
1. The family of curves represent the percent of left turns in the advancing volume ( $V_A$ ). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.
  2. Read  $V_A$  and  $V_O$  into the chart and locate the intersection of the two volumes.
  3. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is warranted. If the point is to the left of the line, then a left-turn lane is not warranted based on traffic volumes.

**VOLUME WARRANTS FOR LEFT-TURN LANES  
AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS  
(50 mph)**

Figure 8-18

AM  
ADV = 409  
OPD = 431  
 $\%L = 8/409 = 2.0\%$

WARRANTED AT 5% - NO

PM  
ADV = 545  
OPD = 496  
 $\%L = 3/545 = <1\%$

WARRANTED AT 3% - NO

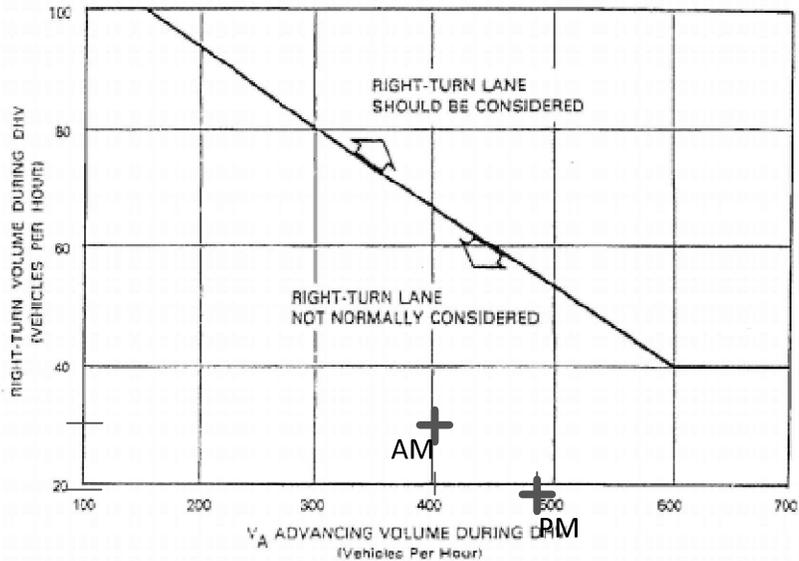
Figure 7

Nordic Aquafarms

Belfast, Maine

Maine Traffic Resources

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Yarmouth, ME 04096  
tel: (207) 207-817-5440



**Note:** For highways with a design speed below 50 mph and  $DHV < 300$  and Right Turns  $> 40$ , an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

**Example**

**Given:** Design Speed = 40 mph  
 $V_A = 250$  vph  
 Right Turns = 100 vph

**Problem:** Determine if a right-turn lane should be considered.

**Solution:** To read the vertical axis, use  $100 - 20 = 80$  vph. The figure indicates that a right-turn lane should not normally be considered, unless other factors (e.g., high accident rate) indicate a lane is needed.

**GUIDELINES FOR RIGHT-TURN LANES  
 AT UNSIGNALIZED INTERSECTIONS ON 2-LANE HIGHWAYS**

**Figure 8-16**

AM  
 Design Speed = 50 mph  
 $V_a = 401$  vph  
 Right Turns = 30 vph  
 WARRANTED - NO

PM  
 Design Speed = 50 mph  
 $V_a = 485$  vph  
 Right Turns = 11 vph  
 WARRANTED - NO

**Figure 8**  
**Nordic Aquafarms**  
**Belfast, Maine**

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## **APPENDIX**

Turning Movement Counts

Capacity Analysis

Accident Data

Collision Diagrams

# Maine Traffic Resources

25 Vine Street

Gardiner, Maine 04345

www.mainetrafficresources.com

Title: Route 1 & Perkins Road  
 Town: Belfast  
 Counter: DWM  
 Weather: Sunny

File Name : BelfastPerkins1AM2018  
 Site Code : 00771423  
 Start Date : 7/18/2018  
 Page No : 1

## Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

Start Time	Route 1 From North					From East					Route 1 From South					Perkins Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
06:30 AM	7	59	0	0	66	0	0	0	0	0	0	36	1	1	38	0	0	1	0	1	105
06:45 AM	3	60	0	0	63	0	0	0	0	0	0	63	2	1	66	0	0	6	0	6	135
Total	10	119	0	0	129	0	0	0	0	0	0	99	3	2	104	0	0	7	0	7	240
07:00 AM	5	69	0	0	74	0	0	0	0	0	0	51	0	0	51	0	0	5	0	5	130
07:15 AM	1	86	0	0	87	0	0	0	0	0	0	57	2	0	59	1	0	1	0	2	148
07:30 AM	2	79	0	0	81	0	0	0	0	0	0	80	0	1	81	0	0	4	0	4	166
07:45 AM	5	69	0	0	74	0	0	0	0	0	0	98	3	0	101	3	0	0	0	3	178
Total	13	303	0	0	316	0	0	0	0	0	0	286	5	1	292	4	0	10	0	14	622
08:00 AM	1	76	0	0	77	0	0	0	0	0	0	83	2	0	85	3	0	3	0	6	168
08:15 AM	7	78	0	0	85	0	0	0	0	0	0	75	2	0	77	0	0	3	0	3	165
08:30 AM	3	77	0	0	80	0	0	0	0	0	0	78	0	0	78	1	0	6	0	7	165
08:45 AM	6	92	0	0	98	0	0	0	0	0	0	88	0	0	88	2	0	7	0	9	195
Total	17	323	0	0	340	0	0	0	0	0	0	324	4	0	328	6	0	19	0	25	693

# Maine Traffic Resources

25 Vine Street

Gardiner, Maine 04345

www.mainetrafficresources.com

File Name : BelfastPerkins1AM2018

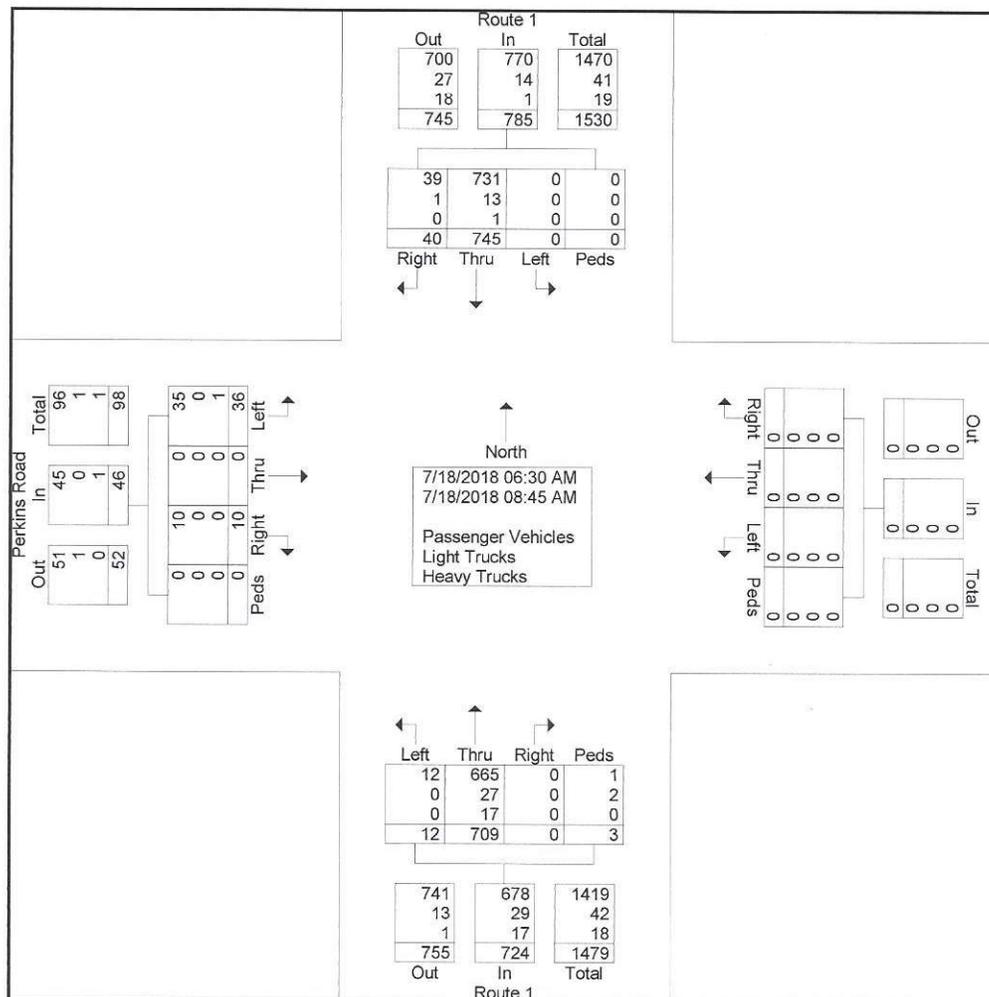
Site Code : 00771423

Start Date : 7/18/2018

Page No : 2

## Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

	Route 1 From North					From East					Route 1 From South					Perkins Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Grand Total	40	745	0	0	785	0	0	0	0	0	0	709	12	3	724	10	0	36	0	46	1555
Apprch %	5.1	94.9	0	0		0	0	0	0		0	97.9	1.7	0.4		21.7	0	78.3	0		
Total %	2.6	47.9	0	0	50.5	0	0	0	0	0	0	45.6	0.8	0.2	46.6	0.6	0	2.3	0	3	
Passenger Vehicles	39	731	0	0	770	0	0	0	0	0	0	665	12	1	678	10	0	35	0	45	1493
% Passenger Vehicles	97.5	98.1	0	0	98.1	0	0	0	0	0	0	93.8	100	33.3	93.6	100	0	97.2	0	97.8	96
Light Trucks	1	13	0	0	14	0	0	0	0	0	0	27	0	2	29	0	0	0	0	0	43
% Light Trucks	2.5	1.7	0	0	1.8	0	0	0	0	0	0	3.8	0	66.7	4	0	0	0	0	0	2.8
Heavy Trucks	0	1	0	0	1	0	0	0	0	0	0	17	0	0	17	0	0	1	0	1	19
% Heavy Trucks	0	0.1	0	0	0.1	0	0	0	0	0	0	2.4	0	0	2.3	0	0	2.8	0	2.2	1.2



# Maine Traffic Resources

25 Vine Street

Gardiner, Maine 04345

www.mainetrafficresources.com

Title: Route 1 & Perkins Road  
 City: Belfast  
 Counter: DWM  
 Weather: Sun/clouds

File Name : BelfastRte1PerkinsPM2018  
 Site Code : 00667781  
 Start Date : 7/11/2018  
 Page No : 1

## Groups Printed- Passenger Vehicles - Light Trucks - Heavy Trucks

Start Time	Route 1 From North					Perkins Road From East					Route 1 From South					Perkins Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
02:00 PM	4	84	0	0	88	0	0	0	0	0	0	101	1	0	102	1	0	2	0	3	193
02:15 PM	7	88	0	0	95	0	0	0	0	0	0	91	3	0	94	5	0	4	0	9	198
02:30 PM	8	101	0	0	109	0	0	0	0	0	0	100	1	0	101	1	0	43	0	44	254
02:45 PM	7	96	0	0	103	0	0	0	0	0	0	107	1	0	108	1	0	7	0	8	219
Total	26	369	0	0	395	0	0	0	0	0	0	399	6	0	405	8	0	56	0	64	864
03:00 PM	8	94	0	0	102	0	0	0	0	0	0	86	1	1	88	4	0	6	0	10	200
03:15 PM	10	98	0	0	108	0	0	0	0	0	0	97	2	0	99	2	0	8	0	10	217
03:30 PM	7	88	0	0	95	0	0	0	0	0	0	107	4	1	112	0	0	12	0	12	219
03:45 PM	8	91	0	0	99	0	0	0	0	0	0	123	1	0	124	1	0	14	0	15	238
Total	33	371	0	0	404	0	0	0	0	0	0	413	8	2	423	7	0	40	0	47	874
04:00 PM	11	92	0	0	103	0	0	0	0	0	0	108	1	0	109	1	0	3	0	4	216
04:15 PM	8	110	0	0	118	0	0	0	0	0	0	113	4	0	117	0	0	7	0	7	242
04:30 PM	4	100	0	0	104	0	0	0	0	0	0	94	1	0	95	2	0	38	0	40	239
04:45 PM	1	108	0	0	109	0	0	0	0	0	0	114	1	0	115	3	0	2	0	5	229
Total	24	410	0	0	434	0	0	0	0	0	0	429	7	0	436	6	0	50	0	56	926
05:00 PM	1	106	0	0	107	0	0	0	0	0	0	87	0	0	87	0	0	3	0	3	197
05:15 PM	3	94	0	0	97	0	0	0	0	0	0	83	4	0	87	0	0	2	0	2	186



Lanes, Volumes, Timings  
4: Route 1/Route 1 & Perkins Road

2019 Existing AM  
05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	20	6	4	335	334	18
Future Volume (vph)	20	6	4	335	334	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.968			0.993		
Fl <sub>t</sub> Protected	0.963			0.999		
Satd. Flow (prot)	1703	0	0	1861	1850	0
Fl <sub>t</sub> Permitted	0.963			0.999		
Satd. Flow (perm)	1703	0	0	1861	1850	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	317			448	507	
Travel Time (s)	7.2			7.6	8.6	
Peak Hour Factor	0.69	0.69	0.93	0.93	0.87	0.87
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Adj. Flow (vph)	29	9	4	360	384	21
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	364	405	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	30.8%
ICU Level of Service	A
Analysis Period (min)	15

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	716	778	722	701	644	712
Vehs Exited	713	773	725	701	640	710
Starting Vehs	1	2	5	4	1	3
Ending Vehs	4	7	2	4	5	4
Travel Distance (mi)	128	139	129	126	115	127
Travel Time (hr)	4.2	4.5	4.2	4.1	3.7	4.1
Total Delay (hr)	0.3	0.3	0.3	0.3	0.2	0.3
Total Stops	34	28	18	22	20	25
Fuel Used (gal)	3.6	3.8	3.5	3.4	3.1	3.5

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	716	778	722	701	644	712
Vehs Exited	713	773	725	701	640	710
Starting Vehs	1	2	5	4	1	3
Ending Vehs	4	7	2	4	5	4
Travel Distance (mi)	128	139	129	126	115	127
Travel Time (hr)	4.2	4.5	4.2	4.1	3.7	4.1
Total Delay (hr)	0.3	0.3	0.3	0.3	0.2	0.3
Total Stops	34	28	18	22	20	25
Fuel Used (gal)	3.6	3.8	3.5	3.4	3.1	3.5

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4: Route 1/Route 1 & Perkins Road Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.3	0.3	0.3
Total Del/Veh (s)	7.4	0.7	0.8	0.9

---

Total Network Performance

---

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	1.1

Lanes, Volumes, Timings  
4: Route 1/Route 1 & Perkins Road

2019 Existing PM  
05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	64	4	7	453	407	32
Future Volume (vph)	64	4	7	453	407	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.992			0.990		
Fl <sub>t</sub> Protected	0.955			0.999		
Satd. Flow (prot)	1800	0	0	1843	1862	0
Fl <sub>t</sub> Permitted	0.955			0.999		
Satd. Flow (perm)	1800	0	0	1843	1862	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	317			448	507	
Travel Time (s)	7.2			7.6	8.6	
Peak Hour Factor	0.41	0.41	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	3%	3%	1%	1%
Adj. Flow (vph)	156	10	8	503	452	36
Shared Lane Traffic (%)						
Lane Group Flow (vph)	166	0	0	511	488	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.9%
ICU Level of Service	A
Analysis Period (min)	15

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	990	1006	939	944	929	962
Vehs Exited	990	1008	943	946	927	962
Starting Vehs	5	5	9	4	5	6
Ending Vehs	5	3	5	2	7	4
Travel Distance (mi)	176	179	167	168	166	171
Travel Time (hr)	6.1	6.2	5.7	5.8	5.6	5.9
Total Delay (hr)	0.7	0.7	0.6	0.6	0.6	0.6
Total Stops	78	73	71	74	60	71
Fuel Used (gal)	5.2	5.3	4.9	4.9	4.7	5.0

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	990	1006	939	944	929	962
Vehs Exited	990	1008	943	946	927	962
Starting Vehs	5	5	9	4	5	6
Ending Vehs	5	3	5	2	7	4
Travel Distance (mi)	176	179	167	168	166	171
Travel Time (hr)	6.1	6.2	5.7	5.8	5.6	5.9
Total Delay (hr)	0.7	0.7	0.6	0.6	0.6	0.6
Total Stops	78	73	71	74	60	71
Fuel Used (gal)	5.2	5.3	4.9	4.9	4.7	5.0

---

4: Route 1/Route 1 & Perkins Road Performance by approach

---

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.4	0.3	0.3
Total Del/Veh (s)	11.8	0.8	1.1	1.7

---

Total Network Performance

---

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	2.0

Lanes, Volumes, Timings  
 4: Route 1/Route 1 & Perkins Road

2024 No Build AM  
 05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	23	7	5	396	394	21
Future Volume (vph)	23	7	5	396	394	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.969			0.993		
Fl <sub>t</sub> Protected	0.963			0.999		
Satd. Flow (prot)	1705	0	0	1861	1850	0
Fl <sub>t</sub> Permitted	0.963			0.999		
Satd. Flow (perm)	1705	0	0	1861	1850	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	317			448	507	
Travel Time (s)	7.2			7.6	8.6	
Peak Hour Factor	0.69	0.69	0.93	0.93	0.87	0.87
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Adj. Flow (vph)	33	10	5	426	453	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	431	477	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	34.8%
	ICU Level of Service A
Analysis Period (min)	15

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	878	908	857	825	772	847
Vehs Exited	876	907	858	828	766	848
Starting Vehs	2	4	4	7	1	3
Ending Vehs	4	5	3	4	7	5
Travel Distance (mi)	157	163	154	148	138	152
Travel Time (hr)	5.2	5.4	5.0	4.9	4.4	5.0
Total Delay (hr)	0.4	0.4	0.4	0.4	0.3	0.4
Total Stops	37	30	23	27	23	28
Fuel Used (gal)	4.4	4.5	4.1	4.1	3.7	4.2

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	878	908	857	825	772	847
Vehs Exited	876	907	858	828	766	848
Starting Vehs	2	4	4	7	1	3
Ending Vehs	4	5	3	4	7	5
Travel Distance (mi)	157	163	154	148	138	152
Travel Time (hr)	5.2	5.4	5.0	4.9	4.4	5.0
Total Delay (hr)	0.4	0.4	0.4	0.4	0.3	0.4
Total Stops	37	30	23	27	23	28
Fuel Used (gal)	4.4	4.5	4.1	4.1	3.7	4.2

---

4: Route 1/Route 1 & Perkins Road Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.3	0.3	0.3
Total Del/Veh (s)	8.8	0.8	0.9	1.0

---

Total Network Performance

---

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	1.3

Lanes, Volumes, Timings  
4: Route 1/Route 1 & Perkins Road

2024 No Build PM  
05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	75	5	8	534	480	38
Future Volume (vph)	75	5	8	534	480	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.992			0.990		
Fl <sub>t</sub> Protected	0.955			0.999		
Satd. Flow (prot)	1731	0	0	1861	1844	0
Fl <sub>t</sub> Permitted	0.955			0.999		
Satd. Flow (perm)	1731	0	0	1861	1844	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	317			448	507	
Travel Time (s)	7.2			7.6	8.6	
Peak Hour Factor	0.69	0.69	0.93	0.93	0.87	0.87
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Adj. Flow (vph)	109	7	9	574	552	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	116	0	0	583	596	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.6% ICU Level of Service A
Analysis Period (min)	15

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1169	1208	1162	1098	1051	1139
Vehs Exited	1161	1211	1159	1103	1050	1136
Starting Vehs	2	7	6	10	5	6
Ending Vehs	10	4	9	5	6	7
Travel Distance (mi)	208	216	207	196	187	203
Travel Time (hr)	7.3	7.6	7.2	6.9	6.5	7.1
Total Delay (hr)	1.0	1.0	0.9	0.9	0.8	0.9
Total Stops	85	82	81	78	79	82
Fuel Used (gal)	6.2	6.4	6.0	5.7	5.5	6.0

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00
End Time	6:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	1169	1208	1162	1098	1051	1139
Vehs Exited	1161	1211	1159	1103	1050	1136
Starting Vehs	2	7	6	10	5	6
Ending Vehs	10	4	9	5	6	7
Travel Distance (mi)	208	216	207	196	187	203
Travel Time (hr)	7.3	7.6	7.2	6.9	6.5	7.1
Total Delay (hr)	1.0	1.0	0.9	0.9	0.8	0.9
Total Stops	85	82	81	78	79	82
Fuel Used (gal)	6.2	6.4	6.0	5.7	5.5	6.0

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4: Route 1/Route 1 & Perkins Road Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.2	0.4	0.4	0.4
Total Del/Veh (s)	15.7	1.1	1.2	2.1

---

Total Network Performance

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Denied Del/Veh (s)	0.4
Total Del/Veh (s)	2.4

Lanes, Volumes, Timings  
 4: Route 1/Route 1 & Perkins Road

2024 Build AM  
 05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	23	7	5	402	424	21
Future Volume (vph)	23	7	5	402	424	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.969			0.994		
Fl <sub>t</sub> Protected	0.963			0.999		
Satd. Flow (prot)	1705	0	0	1861	1852	0
Fl <sub>t</sub> Permitted	0.963			0.999		
Satd. Flow (perm)	1705	0	0	1861	1852	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	317			448	507	
Travel Time (s)	7.2			7.6	8.6	
Peak Hour Factor	0.69	0.69	0.93	0.93	0.87	0.87
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%
Adj. Flow (vph)	33	10	5	432	487	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	437	511	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	35.1%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings  
8: Route 1/Route 1 & Site Drive

2024 Build AM  
05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	6	1	8	401	401	30
Future Volume (vph)	6	1	8	401	401	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.981			0.991		
Fl <sub>t</sub> Protected	0.959			0.999		
Satd. Flow (prot)	1752	0	0	1843	1864	0
Fl <sub>t</sub> Permitted	0.959			0.999		
Satd. Flow (perm)	1752	0	0	1843	1864	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	222			658	169	
Travel Time (s)	5.0			15.0	3.8	
Peak Hour Factor	0.50	0.50	0.93	0.93	0.87	0.87
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	12	2	9	431	461	34
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	0	440	495	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	37.5% ICU Level of Service A
Analysis Period (min)	15

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	950	847	896	863	871	885
Vehs Exited	940	856	893	863	874	885
Starting Vehs	6	15	10	12	11	8
Ending Vehs	16	6	13	12	8	12
Travel Distance (mi)	355	317	332	320	324	330
Travel Time (hr)	12.2	10.9	11.5	11.0	11.2	11.4
Total Delay (hr)	0.7	0.6	0.7	0.7	0.7	0.7
Total Stops	41	41	47	37	46	41
Fuel Used (gal)	10.7	9.7	10.1	9.7	9.7	10.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60
Volumes adjusted by Growth Factors.	

Run Number	1	2	3	4	5	Avg
Vehs Entered	950	847	896	863	871	885
Vehs Exited	940	856	893	863	874	885
Starting Vehs	6	15	10	12	11	8
Ending Vehs	16	6	13	12	8	12
Travel Distance (mi)	355	317	332	320	324	330
Travel Time (hr)	12.2	10.9	11.5	11.0	11.2	11.4
Total Delay (hr)	0.7	0.6	0.7	0.7	0.7	0.7
Total Stops	41	41	47	37	46	41
Fuel Used (gal)	10.7	9.7	10.1	9.7	9.7	10.0

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4: Route 1/Route 1 & Perkins Road Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.3	0.2
Total Del/Veh (s)	8.8	0.9	0.8	1.1

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8: Route 1/Route 1 & Site Drive Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.3	0.0	0.2
Total Del/Veh (s)	7.6	0.5	0.3	0.5

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Total Network Performance

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Denied Del/Veh (s)	0.3
Total Del/Veh (s)	2.4

Lanes, Volumes, Timings  
4: Route 1/Route 1 & Perkins Road

2024 Build PM  
05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	75	5	8	559	491	38
Future Volume (vph)	75	5	8	559	491	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.992			0.990		
Fl <sub>t</sub> Protected	0.955			0.999		
Satd. Flow (prot)	1800	0	0	1843	1862	0
Fl <sub>t</sub> Permitted	0.955			0.999		
Satd. Flow (perm)	1800	0	0	1843	1862	0
Link Speed (mph)	30			40	40	
Link Distance (ft)	317			448	507	
Travel Time (s)	7.2			7.6	8.6	
Peak Hour Factor	0.41	0.41	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	0%	3%	3%	1%	1%
Adj. Flow (vph)	183	12	9	621	546	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	195	0	0	630	588	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.9% ICU Level of Service A
Analysis Period (min)	15

Lanes, Volumes, Timings  
8: Route 1 & Site Drive

2024 Build PM  
05/24/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	6	3	542	485	11
Future Volume (vph)	25	6	3	542	485	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr <sub>t</sub>	0.974				0.997	
Fl <sub>t</sub> Protected	0.961					
Satd. Flow (prot)	1744	0	0	1845	1876	0
Fl <sub>t</sub> Permitted	0.961					
Satd. Flow (perm)	1744	0	0	1845	1876	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	318			618	79	
Travel Time (s)	7.2			14.0	1.8	
Peak Hour Factor	0.60	0.60	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	42	10	3	602	539	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	0	0	605	551	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	40.9%
	ICU Level of Service A
Analysis Period (min)	15

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:50	4:50	4:50	4:50	4:50	4:50
End Time	6:00	6:00	6:00	6:00	6:00	6:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1234	1225	1145	1124	1112	1169
Vehs Exited	1231	1230	1145	1128	1113	1170
Starting Vehs	14	18	9	14	13	13
Ending Vehs	17	13	9	10	12	13
Travel Distance (mi)	425	420	398	387	379	402
Travel Time (hr)	15.2	15.0	14.2	13.9	13.6	14.4
Total Delay (hr)	1.4	1.4	1.3	1.3	1.3	1.4
Total Stops	121	120	100	124	121	116
Fuel Used (gal)	13.3	13.2	12.3	12.0	11.8	12.5

Interval #0 Information Seeding

Start Time	4:50
End Time	5:00
Total Time (min)	10
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

Interval #1 Information Recording

Start Time	5:00					
End Time	6:00					
Total Time (min)	60					
Volumes adjusted by Growth Factors.						
Run Number	1	2	3	4	5	Avg
Vehs Entered	1234	1225	1145	1124	1112	1169
Vehs Exited	1231	1230	1145	1128	1113	1170
Starting Vehs	14	18	9	14	13	13
Ending Vehs	17	13	9	10	12	13
Travel Distance (mi)	425	420	398	387	379	402
Travel Time (hr)	15.2	15.0	14.2	13.9	13.6	14.4
Total Delay (hr)	1.4	1.4	1.3	1.3	1.3	1.4
Total Stops	121	120	100	124	121	116
Fuel Used (gal)	13.3	13.2	12.3	12.0	11.8	12.5

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4: Route 1/Route 1 & Perkins Road Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.4	0.2
Total Del/Veh (s)	16.9	1.2	1.1	2.2

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8: Route 1 & Site Drive Performance by approach

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Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.4	0.0	0.2
Total Del/Veh (s)	11.1	0.6	0.1	0.6

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Total Network Performance

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Denied Del/Veh (s)			0.4	
Total Del/Veh (s)			3.8	

# Crash Summary Report

## Report Selections and Input Parameters

REPORT SELECTIONS

**Crash Summary I**     **Section Detail**     **Crash Summary II**     **1320 Public**     **1320 Private**     **1320 Summary**

REPORT DESCRIPTION

Northport-Belfast: Rte 1 from intersection with Bayside Rd in Northport (node 48737) to intersection with Congress St in Belfast (node 48742)

REPORT PARAMETERS

Year 2016, Start Month 1 through Year 2018 End Month: 12

Route: <b>0001X</b>	Start Node: <b>48737</b>	Start Offset: <b>0</b>	<input type="checkbox"/> <b>Exclude First Node</b>
	End Node: <b>48742</b>	End Offset: <b>0</b>	<input type="checkbox"/> <b>Exclude Last Node</b>
Route: <b>0001S</b>	Start Node: <b>48742</b>	Start Offset: <b>0</b>	<input checked="" type="checkbox"/> <b>Exclude First Node</b>
	End Node: <b>66500</b>	End Offset: <b>0</b>	<input checked="" type="checkbox"/> <b>Exclude Last Node</b>

# Crash Summary I

## Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	K	A	B	C	PD	Injury Crashes	Percent Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
48737	0001X - 150.59	Int of ATLANTIC HWY BAYSIDE RD	1	1	0	0	0	0	1	0.0	2.954	0.11	0.36	0.00
												Statewide Crash Rate: 0.12	0.12	
48739	0001X - 151.79	Int of NORTHPORT AV PERKINS RD	2	1	0	0	0	1	0	100.0	3.412	0.10	0.37	0.00
												Statewide Crash Rate: 0.13	0.13	
49093	0001X - 150.94	Int of ATLANTIC HWY CEMETERY RD	1	1	0	0	0	1	0	100.0	1.475	0.23	0.43	0.00
												Statewide Crash Rate: 0.12	0.12	
48501	0001X - 151.54	Int of NORTHPORT AV, TOZIER ST	2	0	0	0	0	0	0	0.0	1.479	0.00	0.46	0.00
												Statewide Crash Rate: 0.13	0.13	
48738	0001X - 151.33	TL Belfast Northport	2	0	0	0	0	0	0	0.0	1.473	0.00	0.46	0.00
												Statewide Crash Rate: 0.13	0.13	
48843	0001X - 150.76	Int of ATLANTIC HWY BIRCHCREST RD	1	0	0	0	0	0	0	0.0	2.909	0.00	0.36	0.00
												Statewide Crash Rate: 0.12	0.12	
48741	0001X - 152.35	Int of NORTHPORT AV RAMP REV DIR ROUTE 1 BYP	2	9	0	0	1	2	6	33.3	3.148	0.95	0.38	2.51
												Statewide Crash Rate: 0.13	0.13	
48742	0001X - 153.02	Int of CONGRESS ST ROUTE 1 BYP	2	8	0	0	1	1	6	25.0	4.014	0.66	0.36	1.87
												Statewide Crash Rate: 0.13	0.13	
48511	0001X - 152.41	Int of RAMP REV DIR ROUTE 1 BYP	2	0	0	0	0	0	0	0.0	3.047	0.00	0.38	0.00
												Statewide Crash Rate: 0.13	0.13	
61759	0001X - 152.38	Int of RD INV 3201039 ROUTE 1 BYP	2	3	1	0	0	0	2	33.3	2.942	0.34	0.39	0.00
												Statewide Crash Rate: 0.13	0.13	
66500	0001X - 152.96	Non Int ROUTE 1 BYP	2	0	0	0	0	0	0	0.0	1.545	0.00	0.45	0.00
												Statewide Crash Rate: 0.13	0.13	
48502	0001X - 151.61	Int of NORTHPORT AV SEASIDE DR	2	0	0	0	0	0	0	0.0	3.027	0.00	0.38	0.00
												Statewide Crash Rate: 0.13	0.13	

Study Years: 3.00

NODE TOTALS:

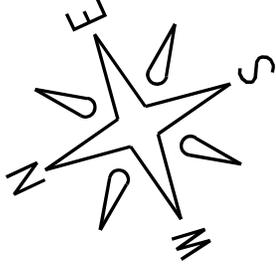
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# Crash Summary I

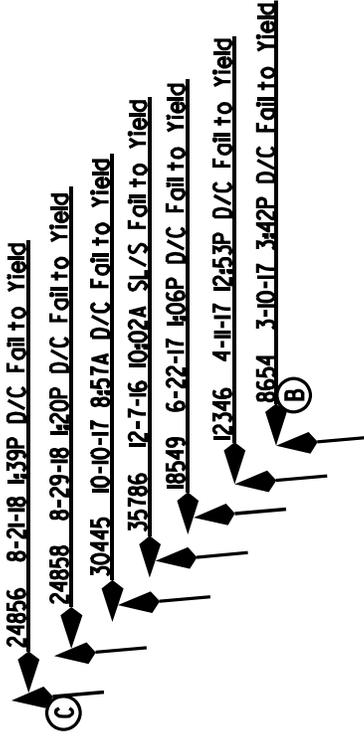
## Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section U/R Length	Total Crashes	K	A	B	C	PD	Injury	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
48737	48843	3119643	0 - 0.17	0001X - 150.59 US 1	0.17	1	2	0	1	0	0	1	50.0	0.00486	137.25	306.19	0.00
		Int of ATLANTIC HWY BAYSIDE RD													Statewide Crash Rate: 113.33		
48843	49093	3112993	0 - 0.18	0001X - 150.76 US 1	0.18	1	3	0	1	0	2	2	33.3	0.00530	188.56	299.32	0.00
		Int of ATLANTIC HWY BIRCHCREST RD													Statewide Crash Rate: 113.33		
48738	49093	3129522	0 - 0.39	0001X - 150.94 US 1	0.39	1	4	0	0	1	3	3	25.0	0.01149	116.04	246.53	0.00
		TL Belfast Northport													Statewide Crash Rate: 113.33		
48501	48738	3119635	0 - 0.21	0001X - 151.33 US 1	0.21	2	2	0	0	0	2	2	0.0	0.00619	107.75	432.65	0.00
		Int of NORTHPORT AV, TOZIER ST													Statewide Crash Rate: 195.33		
48501	48502	3119634	0 - 0.07	0001X - 151.54 US 1	0.07	2	2	0	1	0	1	1	50.0	0.00206	323.25	572.22	0.00
		Int of NORTHPORT AV, TOZIER ST													Statewide Crash Rate: 195.33		
48502	48739	3112787	0 - 0.18	0001X - 151.61 US 1	0.18	2	1	0	0	0	1	1	0.0	0.00557	59.81	443.85	0.00
		Int of NORTHPORT AV, SEASIDE DR													Statewide Crash Rate: 195.33		
48739	48741	3944379	0 - 0.56	0001X - 151.79 US 1	0.56	2	2	0	0	1	1	1	50.0	0.01995	33.42	334.15	0.00
		Int of NORTHPORT AV, PERKINS RD													Statewide Crash Rate: 195.33		
61759	48741	3120208	0 - 0.03	0001X - 152.35 US 1	0.03	2	0	0	0	0	0	0	0.0	0.00077	0.00	728.04	0.00
		Int of RD INV 3201039 ROUTE 1 BYP													Statewide Crash Rate: 195.33		
48511	61759	3129672	0 - 0.03	0001X - 152.38 US 1	0.03	2	1	0	0	0	1	1	0.0	0.00090	369.79	702.76	0.00
		Int of RAMP REV DIR ROUTE 1 BYP													Statewide Crash Rate: 195.33		
48511	66500	3117301	0 - 0.55	0001X - 152.41 US 1	0.55	2	8	0	0	0	8	8	0.0	0.01699	156.94	344.98	0.00
		Int of RAMP REV DIR ROUTE 1 BYP													Statewide Crash Rate: 195.33		
66500	48742	3140133	0 - 0.06	0001X - 152.96 US 1	0.06	2	0	0	0	0	0	0	0.0	0.00093	0.00	698.27	0.00
		Non Int ROUTE 1 BYP													Statewide Crash Rate: 195.33		
48742	66500	3140138	0 - 0.06	0001S - 4.06 US 1 SB	0.06	2	0	0	0	0	0	0	0.0	0.00093	0.00	698.27	0.00
		Int of CONGRESS ST, ROUTE 1 BYP													Statewide Crash Rate: 195.33		
<b>Study Years:</b> 3.00					<b>Section Totals:</b>	2.49	25	0	2	1	2	20	20.0	0.07594	109.74	240.53	0.46
<b>Grand Totals:</b>					2.49	48	1	2	3	7	35	27.1	0.07594	210.70	333.31	0.63	

Northport  
Ave.



Route 1



Route 1

Belfast

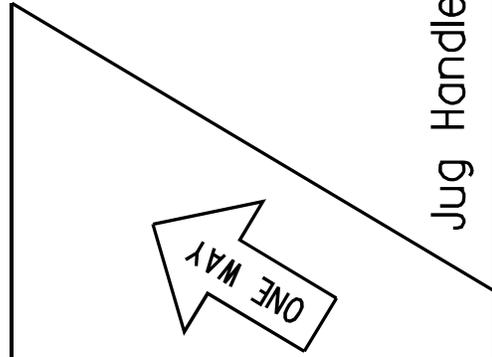
Node: 48741

Study Period: 2016-2018

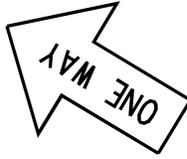
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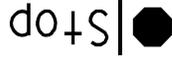
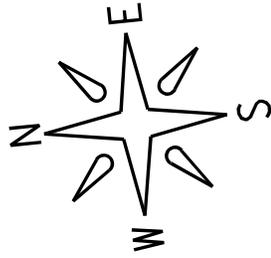
Prepared by Office of Safety

(R.A. - 5/20/19)



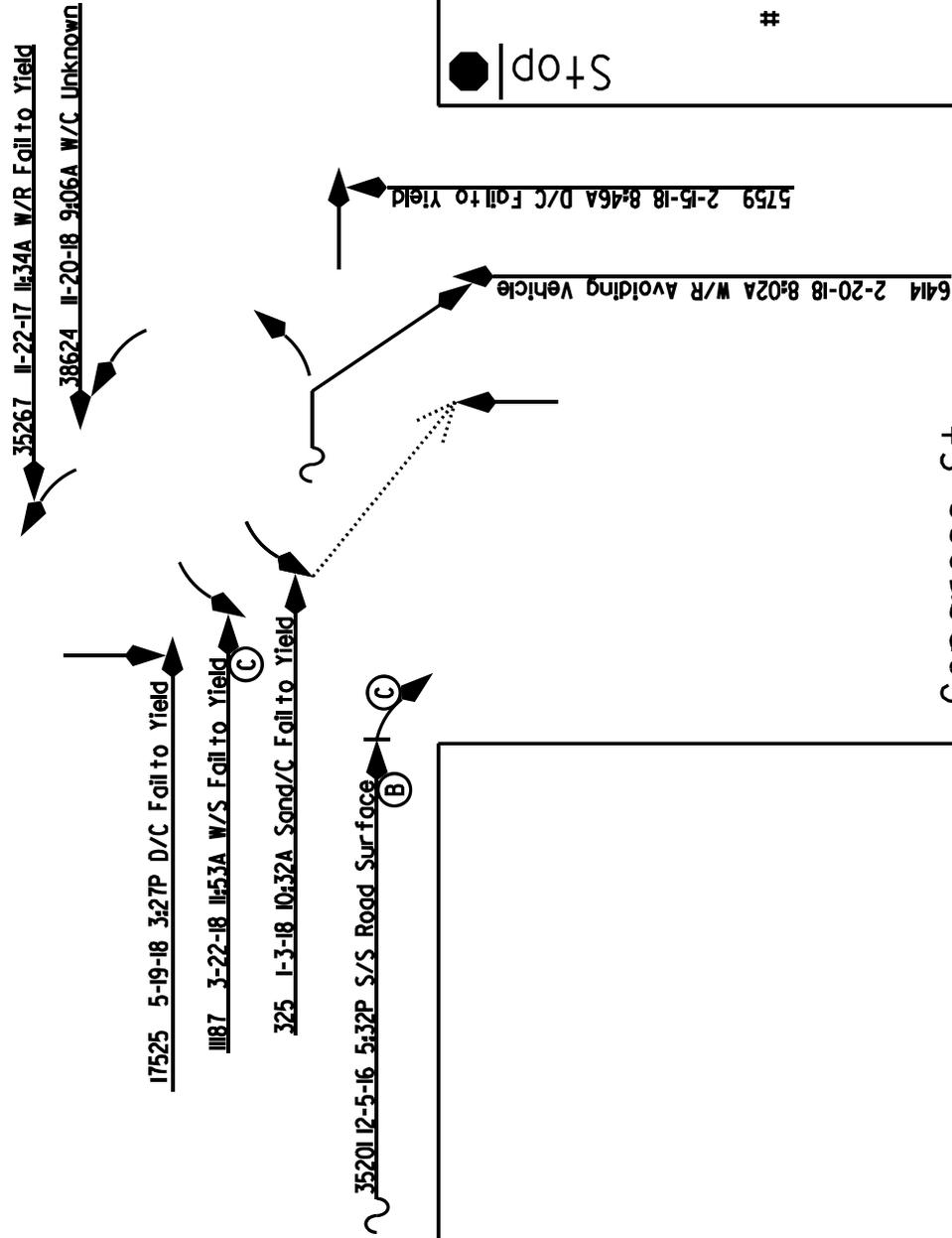
Jug Handle





Congress St.

Route 1 Bypass



Route 1 Bypass

Belfast

Node: 48742

Study Period: 2016-2018

# of Crashes: 8 / CRF: 1.86

Prepared by Office of Safety

(R.A. - 5/21/19)



Congress St.