March 16, 2020

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## RE: <br> TRAFFIC IMPACT ANALYSIS FOR PROPOSED BANGOR SAVINGS BANK IN WINDHAM

## INTRODUCTION

Sewall was retained by Bangor Savings Bank to provide traffic analysis regarding their proposed new branch bank in Windham, Maine. The site is located in the northeast quadrant of the intersection of Route 302 and Route 115, as shown in Figure 1. Two parcels are being combined and redeveloped to provide for the proposed Bangor Savings Bank development. One parcel is currently occupied by a 938 square foot (S.F.) retail building. The other parcel is occupied by the 2,972 S.F. Cross Insurance office building. Both existing buildings will be demolished to provide for a new building, which will provide for both a 3,516 S.F. Bangor Savings Bank branch with an attached 3,492 tenant office space for Cross Insurance.

The current site plan provides for significant access improvements. Currently, there are five (5) existing curb cuts; two to Route 302, one to Route 115 and two to Abby Road, one of which only serves a few parking spaces. These five (5) curb cuts, each full movement, provide for twenty (20) potential drive movements. The revised site plan reduces the curb cuts from five (5) to three (3). It eliminates the two Route 302 full movement curb cuts and replaces them with a single right-in and right-out as far from the signal as practical. It eliminates the Route 115 curb cut, replacing it with a simple right-in only. The overall site access reduces the allowed movements from 20 to just 7, eliminating all left turn moments to and from both Route 302 and Route 115.

Construction is expected to begin in summer of 2020 with occupancy currently planned for February of 2021. As a result, 2021 was used as the study year for traffic analysis purposes.

## TRIP GENERATION ANALYSIS

The number of trips to be generated by the existing and proposed development was determined utilizing the Institute of Transportation Engineers (ITE) "Trip Generation" manual. The most recent $10^{\text {th }}$ edition was used for the calculations since it is derived from the largest database and considered the most current information. Land use codes 710 - General Office, 820 - Shopping Center (the only general related retail use) and 912 -Drive-In Bank were used as the basis of the calculations. The retail and office uses were based upon square footages. The bank trips were estimated on the bases of both square footage and number of drive-through lanes, and averaged, as is customary practice in Maine. The results are summarized in the following tables:
Time Period
Daily
AM Peak Hour - Adjacent Street
AM Peak Hour - Generator
PM Peak Hour - Adjacent Street
PM Peak Hour - Generator
Saturday Peak Hour

| Time Period | Office |  | S.F. | Lanes | Avg. |  |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Total |  |  |  |
| Daily | 34 |  | 352 |  | 250 | 302 |
| AM Peak Hour - Adjacent Street | 4 |  | 34 | 18 | 26 | 336 |
| AM Peak Hour - Generator | 5 | 52 | 35 | 44 | 30 |  |
| PM Peak Hour - Adjacent Street | 4 | 72 | 54 | 63 | 49 |  |
| PM Peak Hour - Generator | 5 | 72 | 54 | 63 | 67 |  |
| Saturday Peak Hour | 2 | 93 | 55 | 74 | 76 |  |


| Existing Office <br> Office | Retail <br> Retail | Development <br> 30 |
| :---: | :---: | :---: |
|  | 36 | 66 |
| 3 | 1 | 4 |
| 4 | 3 | 7 |
| 3 | 4 | 7 |
| 4 | 4 | 8 |
| 2 | 4 | 6 |

Bank

## Proposed Office and Bank Development

Bank

Time Period
Daily
AM Peak Hour - Adjacent Street
AM Peak Hour - Generator
PM Peak Hour - Adjacent Street
PM Peak Hour - Generator
Saturday Peak Hour

Overall Change in Trip Generation
Proposed Existing New

336
66
270
30
4
26
49
7
42
67
7
60

68
8
60

76
6
70

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As seen in the preceding tables, the redevelopment of the parcels to provide for the new Cross Insurance offices and Bangor Savings Bank branch is expected to result in 26 new one-way trips during the weekday AM peak hour of the adjacent street, 60 during the PM peak hour and 70 during the mid-day Saturday peak hour. Given these peak hour trip increases, the redevelopment project does not require a Traffic Movement Permit (TMP) from MaineDOT since they are less than the 100-trip threshold. It is important to note that the calculations were also performed using the $7^{\text {th }}$ edition ITE report since that is the edition currently being utilized by MaineDOT for traffic permitting purposes and the projected increases were very similar and still well under 100.

## TURNING MOVEMENT COUNTS

Turning movement counts were conducted at the intersection of Route 115 and Abby Road during the weekday AM (7:00-9:00) and PM (3:00-6:00) peak hour periods to determine existing volumes. The counts were conducted on October $15^{\text {th }}$ and $16^{\text {th }}, 2019$. The counts were factored to 30 th highest hour conditions utilizing MaineDOT's group mean factors. These $30^{\text {th }}$ highest hour volumes typically occur in Maine under peak summer conditions in late July and early August. The count records are attached to this memorandum. The resulting 2019 peak hour volumes are shown Figure 2.

## FUTURE VOLUMES

Existing average annual daily traffic (AADT) data for Route 115 in the vicinity was obtained from "Traffic Volume Counts, 2017, 2013 and 2009 Annual Reports", published by MaineDOT. This data is summarized below:

|  | Average Annual Daily Traffic |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Location Description | $\underline{2005}$ | $\underline{2007}$ | $\underline{2010}$ | 2013 | 2016 |
| Route 115, east of Abby Road | 14290 | 14590 | 15020 | 14970 | 15500 |
| Route 115, east of Falmouth Road | 9910 | 10070 | 10420 | 10230 | 10670 |

As seen above, traffic volumes on Route 115 in the vicinity of the site have grown at an average annual rate of approximately 0.75 \% during the longer term 2005 to 2016 period. Over the more recent short-term period they grew at an average annual rate of 1.25 \%. This higher 1.25 \% annual rate was utilized to project the 2019 volumes to No Build 2021 conditions. The resulting projected 2021 No-Build volumes are shown in Figure 3.

## TRIP ASSIGNMENTS

Based upon the previous trip generation analysis, the distribution and type of trips was determined for the AM and PM peak hours of the adjacent street. Based upon ITE data, many of a bank's trips are pass-by trips, trips that would already be on Route 115 or Route 302. The percentage of pass-by trips for a bank is $47 \%$ for the PM peak hour. A lesser 40 \% would be assumed for the AM peak hour. Given that the study area for this

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analysis was limited to the Route 115 and Abby Road intersection. All trips were assigned as primary (or new trips) for simplification and to be conservative without consideration of pass-by trips. The trip types are summarized as follows strictly for informational purposes:

| Analysis Period | TRIP GENERATION SUMMARY (One-way Trip-Ends) |  |  |
| :---: | :---: | :---: | :---: |
|  | Pass-by | Primary | Total |
| AM Peak Hour - Adjacent Street | 8 | 18 | 26 |
| Entering | 4 | 11 | 15 |
| Exiting | 4 | 7 | 11 |
| PM Peak Hour - Adjacent Street | 26 | 34 | 60 |
| Entering | 13 | 17 | 30 |
| Exiting | 13 | 17 | 30 |

The new trips to and from the site were assigned to the site drives based upon the traffic patterns reflected by the turning movement counts as well as average annual daily traffic (AADT) data for the vicinity of the site. The traffic volumes indicate the following patterns:

To and from North via Route 302-35\%
To and From South via Route 302-30\%
To and From West via Route 35-15 \%
To and From East via Route 115-20\%

The trip assignments for the new trips to the site, since both the retail building and existing Cross Insurance building were occupied and generating trips at the time of the counts, are shown in Figure 4. Based upon these volumes, the development is expected to have little impact beyond the intersection of Abby Road. Generally, a project will not have a significant impact on off-site traffic operations unless it generates in excess of 25 lane hour trips. As shown by the trip assignments, this project will generate a maximum of 15 new lane hour trips. The projected Build peak hour volumes, with Bangor Savings fully occupied in 2021, are shown in Figure 5.

## 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<br>LOS Delay Range<br>A $<=10.0$ seconds<br>B $\quad>10.0$ and $<=15.0$<br>C $\quad>15.0$ and $<=25.0$<br>D $\quad>25.0$ and $<=35.0$<br>E $\quad>35.0$ and $<=50.0$<br>$\mathrm{F} \quad>50.0$

## UNSIGNALIZED INTERSECTION ANALYSIS

The levels of service were calculated using Synchro 10/SimTraffic and reported based upon the Synchro Highway Capacity Manual approach. The analysis was only performed for the Route 115 and Abby Road intersection since the Route 302 exit is limited to right-turn movements only so no capacity concerns would be expected there. The analysis was performed for projected 2021 volumes with and without the proposed Bangor Savings Bank development, No Build and Build conditions. The results for the AM peak and PM peak hours are summarized in the following tables. The results are presented as level of service followed by delay, in seconds, in parentheses:

|  | Route 115 and Abby Road <br> AM Peak Hour Levels of Service |  |
| :--- | :---: | :---: |
| Approach/Movement | 2021 <br> No-Build | Build |
| Northbound Walgreens Throughs-Lefts | D (26.8) | D (27.9) |
| Northbound Walgreens Rights | B (13.7) | B (13.7) |
| Northbound Walgreens Overall | C (17.3) | C (17.6) |
| Southbound Abby Road | C (17.7) | C (19.6) |
| Eastbound Left Turns onto Abby Road | $\mathrm{A}(9.0)$ | $\mathrm{A}(9.0)$ |
| Westbound Lefts Turns into Walgreens | $\mathrm{A}(9.1)$ | $\mathrm{A}(9.1)$ |

As seen above, the Abby Road intersection is projected to operate at an acceptable level of service during the AM peak hour period, at LOS "C", as will the Walgreens drive. The same level of services are projected for 2021 Build volumes showing the Bangor Savings Bank development will have little impact on operations at the intersection, as would be expected based upon the trip assignments.

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|  | Route 115 and Abby Road PM Peak Hour Levels of Service |  |
| :---: | :---: | :---: |
|  | 2021 | 2021 |
| Approach/Movement | No-Build | Build |
| Northbound Walgreens Throughs-Lefts | F (76.0) | F (91.9) |
| Northbound Walgreens Rights | C (16.3) | C (16.3) |
| Northbound Walgreens Overall | E (45.7) | F (53.5) |
| Southbound Abby Road | F (78.6) | F (132.5) |
| Eastbound Left Turns onto Abby Road | B (10.7) | B (10.8) |
| Westbound Lefts Turns into Walgreens | A (9.7) | A (9.7) |

As seen above, during the PM peak hour under projected 2021 volumes, Abby Road will operate at LOS " $F$ " while the Walgreens drive will operate at LOS "E". With the additional Bangor Savings Bank trips at the intersection the LOS will remain " $F$ " for Abby Road and will fall to " $F$ " for Walgreens. It is important to note that capacity analysis forecasts of delay increase exponentially once an intersection is at LOS " $F$ " and the projected delays are generally not considered realistic. There is little that can be done to improve LOS for side streets onto busy arterials except for signalization. Signalization of Abby Road would not be warranted by the Abby Road volumes and additionally, couldn't be signalized given its proximity to Route 302. While the LOS is " $F$ " for Abby Road the project is implementing substantial access improvements and the LOS for drives with left-turn movements on Route 302 or Route 115 would experience substantial delays given higher volumes and closer signal proximity, respectively.

## SAFETY ANALYSIS

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 both Route 115 and Route 302 in the vicinity of the site was obtained from MaineDOT and is attached. The CRF and number of accidents are summarized by location for the most recent three-year period, 2016 to 2018, in the following tables:

| Route 302 Location Description | \# of Acc. | CRF |
| :---: | :---: | :---: |
| Intersection of Route 35 and Route 115 | 42 | 0.97 |
| Between Route 35/115 and Shaw's Plaza/No. Windham Shopping Center | 39 | 2.16 |
| Intersection of Shaw's Plaza and No. Windham Shopping Center | 11 | 0.32 |
| Route 115 Location Description | \# of Acc. | CRF |
| Between Abby Road and Route 302 | 5 | 0.95 |
| Intersection of Abby Road | 12 | 1.83 |
| Between Abby Road and Sandbar Road | 11 | 0.78 |
| Intersection of Sandbar Road | 4 | 0.61 |

As seen above in the accident tables, there are two high crash locations in the vicinity of the site, highlighted in bold print. Collision diagrams were obtained from MaineDOT for both locations so that they could be evaluated for accident patterns or trends that may possibly be indicative of correctable roadway deficiencies. The diagrams are evaluated as follows:

## Between Route 35/115 and Shaw's Plaza/No. Windham Shopping Center

There were nine crashes in 2016, sixteen in 2017 and fourteen in 2018 along this 0.19 mile long segment of Route 302. Ten of the crashes were rear-ends, mostly attributed to following too closely, which are generally considered uncorrectable. Seven were sideswipe types due to lane changes or failures to stay in lane, typical of multi-lane roadways. There was a single vehicle pole hit, attributed to OUI. The remaining twenty-one collisions were angle collisions involving entering or exiting drive movements. These are typical of developed areas with multiple drives on busy arterials. Access management is recommended in these areas to reduce curb cuts and accident potential. The proposed project will fully eliminate one full movement drive on this stretch of roadway and will reduce the single remaining curb cut to right-turn movements only. These access management improvements should reduce accident potential along the site frontage and along this segment of Route 302.

## Intersection of Abby Road <br> 1.83

There were four crashes in 2016, three in 2017 and five in 2018 at this intersection. One was a rear-end on Route 115. One was a sideswipe turning into Walgreens due to an improper turn. One was a pedestrian hit by a right turning vehicle, attributed to failure to yield. Two angle collisions involved vehicles exiting Walgreens. The remaining seven collisions involved vehicles either exiting or entering Abby Road as left turns, constituting a pattern. These are likely due to the poor level of service but also the widened multiple lane approach to the signal where vehicles queued in one lane block sight of those in another. To improve the safety of this

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intersection, Sewall recommends "Do Not Block Intersection" pavement markings and an accompanying sign. This will keep the area open to improve visibility and make it safer for vehicles to enter and exit Abby Road when traffic is queued at the route 302 signal.

## SUMMARY

The redevelopment of the site to provide for a Bangor Savings Bank branch and new cross insurance offices is expected to generate 26 new one-way trips during the AM peak hour analysis period and 60 one-way trips during the PM period. The project is implementing substantial access management improvements given its site location in the northeast quadrant of the intersection of Route 302 and Route 115. Currently there are two full movement drives to Route 302. These two drives will be replaced with a single right-turn only drive eliminating 6 driveway movements and locating that single right-turn drive as far from the signal as possible. The project is also eliminating the full movement drive to Route 115 and replacing it with a single right-turn entrance only, eliminating 3 movements. Lastly, the project is eliminating one curb cut to Abby Road and locating the single Abby Road drive as far from Route 115 as possible. All told, the project is reducing movements from the current twenty (20) to just seven (7). The LOS analysis shows acceptable operations under both No Build and Build volumes during the AM peak hour at Abby Road and Route 115. During the PM peak hour, the LOS will be " $F$ " under both No Build and Build volumes. In terms of safety, there are two existing high crash locations in the vicinity of the site. The first is the segment of Route 302 which extends from the signal to Shaw's Plaza/No. Windham Shopping Plaza. Access management is recommended along this corridor to reduce accident potential. The proposed site plan contributes greatly to that effort. The other high crash location is the intersection of Abby Road where a pattern of angle collisons was identified. "Do Not Block Intersection" pavement markings and signage are recommended to reduce crash potential there.

As always, please do not hesitate to contact me if you or the Town of Windham have any questions or concerns regarding our analysis, results or recommendations.


Diane W. Morabito, P.E. PTOE
Vice President Traffic Engineering


XX = PM Peak Hour 4:30-5:30 PM
(XX) = AM Peak Hour 7:30-8:30 AM


Figure 2

XX = PM Peak Hour
(XX) = AM Peak Hour


Figure 3


Figure 4
Trip Assignments


Figure 5

Maine Traffic Resources
40 Forest Falls Drive, Suite 2
Yarmouth, Maine 04096
www.mainetrafficresources.com

Title: Route 115 \& Abby Road
Town: Windham, ME
Counter: JAM
Weather: Sunny

File Name: WinhamRoute115AbbyRd2019AM
Site Code : 31312344
Start Date : 10/15/2019
Page No : 1

Groups Printed- Passenger Cars - Light Trucks - Heavy Trucks




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Maine Traffic Resources
40 Forest Falls Drive, Suite 2
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www.mainetrafficresources.com

Title: Route 115 \& Abby Road
Town: Windham, ME
Counter: JAM
Weather: Sunny

File Name: WinhamRoute115AbbyRd2019AM
Site Code : 31312344
Start Date : 10/15/2019
Page No : 2


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:30 AM

6. $X \times Y=191 / .03=1.096$

Maine Traffic Resources
40 Forest Falls Drive, Suite 2
Yarmouth, Maine 04096
www.mainetrafficresources.com

Title: Route 115 and Abby Road
Town: Windham
Counter: JAM
Weather: Cloudy

File Name: WindhamRte115Abby2019PM
Site Code : 31312345
Start Date : 10/16/2019
Page No : 1

Groups Printed- Passenger Cars - Light Trucks - Heavy Trucks




|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Grand Total | 57 | 7 | 28 | 10 | 102 | 108 | 2219 | 37 | 0 | 2364 | 89 | 8 | 85 | 0 | 182 | 68 | 1945 | 62 | 1 | 2076 | 4724 |
| Apprch \% | 55.9 | 6.9 | 27.5 | 9.8 |  | 4.6 | 93.9 | 1.6 | 0 |  | 48.9 | 4.4 | 46.7 | 0 |  | 3.3 | 93.7 | 3 | 0 |  |  |
| Total \% | 1.2 | 0.1 | 0.6 | 0.2 | 2.2 | 2.3 | 47 | 0.8 | 0 | 50 | 1.9 | 0.2 | 1.8 | 0 | 3.9 | 1.4 | 41.2 | 1.3 | 0 | 43.9 |  |
| Passenger Cars | 55 | 7 | 27 | 9 | 98 | 107 | 2125 | 37 | 0 | 2269 | 89 | 8 | 85 | 0 | 182 | 68 | 1932 | 62 | 1 | 2063 | 4612 |
| क Peaseener Cars | 96.5 | 100 | 96.4 | 90 | 96.1 | 99.1 | 95.8 | 100 | 0 | 96 | 100 | 100 | 100 | 0 | 100 | 100 | 99.3 | 100 | 100 | 99.4 | 97.6 |
| Light Trucks | 2 | 0 | 1 | 1 | 4 | 1 | 85 | 0 | 0 | 86 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 99 |
| \%Light Trucks | 3.5 | 0 | 3.6 | 10 | 3.9 | 0.9 | 3.8 | 0 | 0 | 3.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 0 | 0 | 0.4 | 2.1 |
| Heavy Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 13 |
| \% Heavy Trucks | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 0 | 0 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0 | 0 | 0.2 | 0.3 |

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Maine Traffic Resources
40 Forest Falls Drive, Suite 2
Yarmouth, Maine 04096
www.mainetrafficresources.com

Title: Route 115 and Abby Road
Town: Windham
Counter: JAM
Weather: Cloudy

File Name: WindhamRte115Abby2019PM
Site Code : 31312345
Start Date : 10/16/2019
Page No : 2


Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:30 PM


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Abby Road \& Route 115
AM Peak Hour - No Build


| Major/Minor | Major1 | Major2 |  |  |  | Minor1 |  | Minor2 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 667 | 0 | 0 | 714 | 0 | 0 | 1076 | 1422 | 711 | 1418 | 1413 | 334 |
| Stage 1 | . | . | . |  | . |  | 747 | 747 |  | 663 | 663 |  |
| Stage 2 | - | - | - | - | - | - | 329 | 675 | - | 755 | 750 |  |
| Critical Hdwy | 4.13 | - | - | 4.13 | . | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - |  | - | - | 6.13 | 5.53 |  | 6.53 | 5.53 |  |
| Critical Hdwy Stg 2 |  |  | . |  | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 |  |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 921 | - |  | 884 | - | - | 185 | 136 | 432 | 105 | 137 | 663 |
| Stage 1 | - | - | - | - | - | - | 404 | 419 | - | 418 | 458 | - |
| Stage 2 |  | - | - |  | - | - | 659 | 452 | - | 400 | 418 |  |

Platoon blocked, \%

| Mov Cap-1 Maneuver | 921 | - | - | 884 | - | - | 171 | 131 | 432 | 98 | 132 | 663 |
| :---: | ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 171 | 131 | - | 98 | 132 | - |
| Stage 1 | - | - | - | - | - | - | 391 | 406 | - | 405 | 455 | - |
| Stage 2 | - | - | - | - | - | - | 623 | 449 |  | 373 | 405 | - |


| Approach | EB | WB | NB | SB |
| :--- | :---: | :---: | ---: | ---: |
| HCM Control Delay, s | 0.2 | 0.1 | 17.3 | 17.7 |
| HCM LOS |  | $C$ | $C$ |  |


| Minor Lane/Major Mvmt | NBLn1 | NBLL2 | EBL | EBT | EBR | WBL | WBT | WBR SBLn1 |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Capacity (veh/h) | 171 | 432 | 921 | - | -884 | - | -031 |  |
| HCM Lane V/C Ratio | 0.035 | 0.037 | 0.019 | - | -0.005 | - | -0.12 |  |
| HCM Control Delay (s) | 26.8 | 13.7 | 9 | - | - | 9.1 | 0 | -17.7 |
| HCM Lane LOS | D | B | A | - | - | A | A | - |
| HCM 95th \%tile Q(veh) | 0.1 | 0.1 | 0.1 | - | - | 0 | - | - |




Platoon blocked, \%

| Mov Cap-1 Maneuver | 918 | - | - | 884 | - | - | 163 | 125 | 432 | 94 | 127 | 662 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 163 | 125 | - | 94 | 127 | - |
| Stage 1 | - | - | - | - | - | - | 377 | 393 | - | 396 | 453 | - |
| Stage 2 | - | - | - | - | - | - | 614 | 448 | - | 360 | 392 | - |


| Approach | EB | WB | NB | SB |
| :--- | :---: | :---: | ---: | ---: |
| HCM Control Delay, s | 0.3 | 0.1 | 17.6 | 19.6 |
| HCM LOS |  | C | C |  |



Abby Road \& Route 115
PM Peak Hour - No Build


| Major/Minor | Major1 | Major2 |  |  |  | Minor1 |  | Minor2 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 1046 | 0 | 0 | 870 | 0 | 0 | 1437 | 1984 | 858 | 1980 | 1972 | 523 |
| Stage 1 |  | - | - | - | - | - | 910 | 910 | - | 1050 | 1050 |  |
| Stage 2 | - | - | - | - | - | - | 527 | 1074 | - | 930 | 922 |  |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 |  | 6.53 | 5.53 |  |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 |  | 6.13 | 5.53 |  |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - |  | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 663 | - | - | 773 | - | - | 102 | 61 | 356 | 41 | 62 | 500 |
| Stage 1 | - | - | - | - | - |  | 328 | 353 | - | 244 | 303 |  |
| Stage 2 |  | - | - | - | - | - | 503 | 295 |  | 320 | 348 |  |

Platoon blocked, \%

| Mov Cap-1 Maneuver | 663 | - | - | 773 | - | - | 87 | 54 | 356 | 33 | 55 | 500 |
| :---: | ---: | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 87 | 54 | - | 33 | 55 | - |
| Stage 1 | - | - | - | - | - | - | 303 | 326 | - | 225 | 290 | - |
| Stage 2 | - | - | - | - | - | - | 456 | 282 | - | 263 | 322 | - |


| Approach | EB | WB | NB | SB |
| :--- | :---: | :---: | ---: | ---: |
| HCM Control Delay, s | 0.3 | 0.3 | 45.7 | 78.6 |
| HCM LOS |  | E | F |  |


| Minor Lane/Major Mvmt | NBLn1 |  | NBLn2 | EBL | EBT | EBR | WBL | WBT |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: | WBR SBLn1

Abby Road \& Route 115
PM Peak Hour - Build


| Major/Minor | Major1 | Major2 |  |  |  | Minor1 |  | Minor2 |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Conflicting Flow All | 1053 | 0 | 0 | 870 | 0 | 0 | 1471 | 2023 | 858 | 2017 | 2009 | 527 |
| Stage 1 |  |  | . | . | . | . | 942 | 942 |  | 1055 | 1055 |  |
| Stage 2 | - | - | - | - | - | - | 529 | 1081 |  | 962 | 954 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - |  | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 |  | - | - | - | . |  | 6.53 | 5.53 |  | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 659 | - | - | 773 | - | - | 97 | 58 | 356 | 39 | 59 | 497 |
| Stage 1 | - | - | - | - | - |  | 315 | 341 |  | 242 | 302 | - |
| Stage 2 |  | - | - |  | - |  | 502 | 293 |  | 307 | 336 |  |

Platoon blocked, \%

| Mov Cap-1 Maneuver | 659 | - | - | 773 | - | - | 76 | 49 | 356 | 30 | 49 | 497 |
| :---: | ---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 76 | 49 | - | 30 | 49 | - |
| Stage 1 | - | - | - | - | - | - | 276 | 299 | - | 212 | 289 | - |
| Stage 2 | - | - | - | - | - | - | 438 | 280 | - | 240 | 294 | - |


| Approach | EB | WB | NB | SB |
| :--- | :---: | :---: | ---: | ---: |
| HCM Control Delay, s | 0.5 | 0.3 | 53.5 | 132.5 |
| HCM LOS |  | F | F |  |


| Minor Lane/Major Mumt <br> Capacity (veh/h) | NBLn1 NBLn2 |  | EBL | EBT | EBR | WBL | WBT | WBR S | SBLn 1 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 75 | 356 | 659 | . | . | 773 | . | - | 81 |
| HCM Lane V/C Ratio | 0.486 | 0.106 | 0.064 | - | - | 0.018 | - | - | 0.772 |
| HCM Control Delay (s) | 91.9 | 16.3 | 10.8 | - | . | 9.7 | 0.2 | - | 132.5 |
| HCM Lane LOS | F | C | B | - | - | A | A | - | F |
| HCM 95th \%tile Q(veh) | 2 | 0.4 | 0.2 | . | . | 0.1 | . | - | 3.8 |

# Maine Department Of Transportation - Traffic Engineering, Crash Records Section <br> Crash Summary Report <br> \section*{Report Selections and Input Parameters} 

REPORT SELECTIONSSection Detail
$\checkmark$ Crash Summary II1320 Public1320 Private1320 Summary

## REPORT DESCRIPTION

Windham: Rte $302 /$ Roosevelt Trl from intersection with Rte $35 / 115$ (node 16919) to entrance to N Windham Shopping Center (node 17872); Rte 115/35/Tandenberg Trl from intersection with Rte 302 to intersection with Sandbar Rd (node 14819)

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

| Route: 0302X | Start Node: $\mathbf{1 6 9 1 9}$ | Start Offset: $\mathbf{0}$ | $\square$ Exclude First Node |
| :---: | ---: | :---: | :---: |
|  | End Node: $\mathbf{1 7 8 7 2}$ | End Offset: $\mathbf{0}$ | $\square$ Exclude Last Node |
| Route: 0115X | Start Node: $\mathbf{1 6 9 1 9}$ | Start Offset: 0 | $\square$ Exclude First Node |
|  | End Node: $\mathbf{1 4 8 1 9}$ | End Offset: $\mathbf{0}$ | $\square$ Exclude Last Node |

Crash Summary I

| Nodes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Node | Route - MP | Node Description | U/R | Total Crashes | Injury Crashes |  |  |  | Percent Annual M Crash RatePD Injury Ent-Veh |  |  |  | Critical Rate | CRF |
| 16919 | 0302X-15.16 | Int of ROOSEVELT TRL TANDBERG TRL | 9 | 42 | 0 | 0 | 0 | 9 | 33 | 21.4 | $\begin{gathered} 13.594 \\ \text { State } \end{gathered}$ | $\begin{gathered} 1.03 \\ \text { tewide Crash Rate: } \end{gathered}$ | $0.73$ | 0.00 |
| 17872 | 0302X-15.35 | Int of ENT TO SHAWS NORTH WINDHAM SHOPPING CNTF | 9 | 11 | 0 | 0 | 2 | 3 | 6 | 45.5 | $\begin{gathered} 10.229 \\ \text { State } \end{gathered}$ | $0.36$ <br> ewide Crash Rate: | $\begin{aligned} & 1.11 \\ & 0.73 \end{aligned}$ | 0.00 |
| 10923 | 0115X-0.06 | Int of ABBY RD, TANDBERG TRL | 2 | 12 | 0 | 0 | 1 | 0 | 11 | 8.3 | $5.75 \text { State }^{2}$ | $0.69$ <br> ewide Crash Rate: | $\begin{aligned} & 0.38 \\ & 0.16 \end{aligned}$ | 1.83 |
| 14819 | 0115X-0.26 | Int of SANDBAR RD TANDBERG TRL | 2 | 4 | 0 | 0 | 1 | 0 | 3 | 25.0 | $5.742$ | $0.23$ <br> ewide Crash Rate: | $\begin{aligned} & 0.38 \\ & 0.16 \end{aligned}$ | 0.00 |
| Study Y | Years: 3.00 | NODE TOTALS |  | 69 | 0 | 0 | 4 | 12 | 53 | 23.2 | 35.322 | 0.65 | 0.72 | 0.90 |

Maine Department Of Transportation - Traffic Engineering, Crash Records Section
Crash Summary I

| Sections |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Start Node | End Node | Element | Offset <br> Begin - End | Route - MP | Section Length |  | Total Crashes | K | Inj | y C | $\begin{aligned} & \text { shes } \\ & \text { C } \end{aligned}$ | PD | Percent Injury | Annual HMVM | Crash Rate | Critical Rate | CRF |
| $\begin{array}{r} 16919 \\ \text { Int of ROC } \end{array}$ | $\begin{gathered} 17872 \\ \text { SEVELT } \end{gathered}$ | $3130492$ | $\begin{aligned} & \text { O-0.19 } \\ & \text { RG TRL } \end{aligned}$ | $\begin{aligned} & \text { 0302X - } 15.16 \\ & \text { US } 302 \end{aligned}$ | 0.19 | 2 | 39 | 0 | 0 | 1 | 3 | 35 | 10.3 | 0.01770 | $734.51$ <br> Statewide Crash | $\begin{array}{r} 340.24 \\ \text { ate: } 193.96 \end{array}$ | 2.16 |
| $\begin{aligned} & 10923 \\ & \text { Int of } \mathrm{ABB} \end{aligned}$ | $\begin{array}{r} 16919 \\ \text { Y RD, TAN } \end{array}$ | $\begin{aligned} & 3105218 \\ & \text { OBERG TRL } \end{aligned}$ | 0-0.06 | 0115X-0 ST RTE 115 | 0.06 | 2 | 5 | 0 | 0 | 0 | 1 | 4 | 20.0 | 0.00318 | $524.31$ <br> Statewide Crash | $\begin{array}{r} 551.26 \\ \text { ate: } 216.00 \end{array}$ | 0.00 |
| $\begin{gathered} 10923 \\ \text { Int of } \mathrm{ABB} \end{gathered}$ | $\begin{array}{r} 14819 \\ \text { Y RD, TAN } \end{array}$ | $\begin{gathered} 3123906 \\ \text { OBERG TRL } \end{gathered}$ | 0-0.20 | 0115X-0.06 ST RTE 115 | 0.20 | 2 | 11 | 0 | 0 | 0 | 3 | 8 | 27.3 | 0.01159 | Statewide Crash Rate: ${ }^{316.42}{ }^{\text {a }}$ |  | 0.00 |
| Study Years: 3.00 |  |  |  | Section Totals: | 0.45 |  | 55 | 0 | 0 | 1 | 7 | 47 | 14.5 | 0.03247 | 564.70 | 316.74 | 1.78 |
|  |  |  |  | Grand Totals: | 0.45 |  | 124 | 0 | 0 | 5 | 19 | 100 | 19.4 | 0.03247 | 1273.14 | 445.54 | 2.86 |



# H. C. L. <br> CRASH COLLISION DIAGRAM DATA PACKAGE 

COUNTY: CUMBERLAND TOWN: WINDHAM

LOW NODE: 16919 HIGH NODE: 17872 REGION: 1 U/R: URBAN

DESCRIPTION: Roosevelt Trl from Tandberg Trl to Shaws Mall

RTE \# / RD \#: 0035X DATE DRAWN: 10/16/2019DRAWN BY: Michelle STUDY FROM: 1/1/2016 STUDY TO: 12/31/2018

CRASH RATE: $\mathbf{7 3 4 . 5 1}$ CRF: 2.16 \% INJURY: 10.3 TOTAL CRASHES: 39



# H. C. L. <br> CRASH COLLISION DIAGRAM DATA PACKAGE 

COUNTY: CUMBERLAND TOWN: WINDHAM

LOW NODE: 10923 HIGH NODE: 0000 REGION: 1 U/R: URBAN

DESCRIPTION: Intersection of Tandberg Trail \& Abby Road

RTE \# / RD \#: 0115X DATE DRAWN: 10/10/2019DRAWN BY: Rachel

STUDY FROM: 1/1/2016 STUDY TO: 12/31/2018

CRASH RATE: 0.69 CRF: 1.92 \% INJURY: 8.3 TOTAL CRASHES: 12



