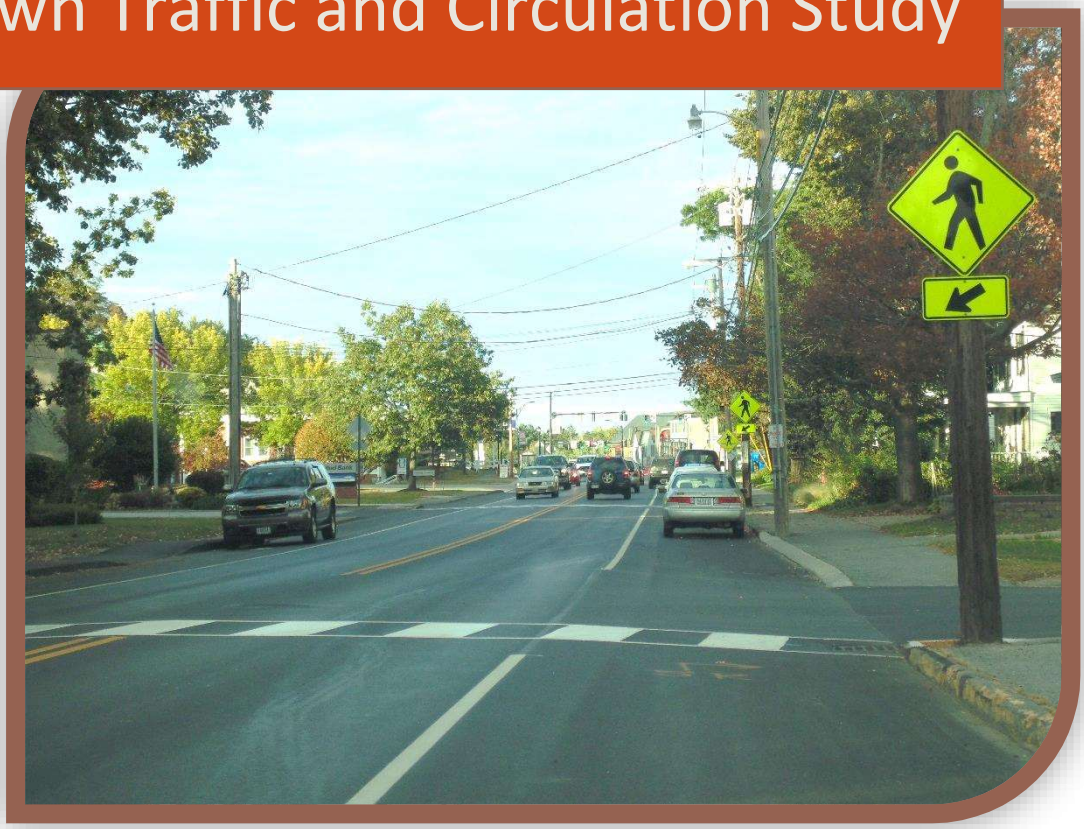
Downtown Traffic and Circulation Study



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Orono, Maine
by Sebago Technics, Inc.
August, 2017

SEBAGO TECHNICS
CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

Executive Summary

This Executive Summary is intended to provide the reader with a quick synopsis of the scope, findings, and resulting recommendations of this Study. It does not provide all of the specific details that went into the development of the final conclusions, which resulted from a thorough vetting process with Town staff. For this information we direct your attention to the full body of the Report.

The Town of Orono engaged Sebago Technics (Sebago) in late 2014 to conduct a comprehensive traffic and circulation study of their downtown with the primary objectives being twofold:

- To enhance the safe and efficient movement of all travel modes within the downtown, including vehicles, walkers, bicyclists, and transit users.
- To create safe connections for all interests within the downtown TIF District.

This evaluation has four main elements, each of which will be discussed separately herein:

1. Main Street – Westwood Drive to the Bridge
2. School Campus Circulation and Municipal Complex Access
3. The Alley between Mill Street and the Public Parking Lot off Pine Street
4. Longer-Term Considerations, Including Future Roadway Connectivity west of Main Street and Satellite Park-and-Ride Lots

The findings presented herein for each of the four main focus areas represent the results of a combination of new data collection by Sebago and BACTS; historical information from MaineDOT, BACTS, and the local transit providers (the Community Connector and the Black Bear Express); and input from interviews with Town staff and the local school administration. Sebago also spent time reviewing regional transportation plans and the Town's Comprehensive Plan to ensure that any suggestions put forth would be consistent with these overarching guidance documents.

A summary of our findings and recommendations for the Town's consideration is as follows:

<u>Section 2 - Main Street – Westwood Drive to the Bridge</u>

Section 2 of this Report outlines a total of 13 suggestions and recommendations for the Town's consideration in addition to a Conceptual Plan for upgrading Main Street in response to the

initial goals and objectives outlined at the commencement of this Project. These are discussed in detail within Section 2 and summarized at the end of this Section of the Report. Without repeating them verbatim, they include the following ideas:

- The Town should think of Main Street as a "Complete Street" and create a Town policy endorsing this.
- The intersection capacity on Main Street is quite good during the AM and PM peak hours by industry standards. Only minor adjustments in signal timings are suggested.
- There are no High Crash Locations (HCL's) on Main Street indicating that "safety" is not a significant issue that needs to be of concern. However, the Town should ensure that all crosswalks are well illuminated for nighttime safety of pedestrians using them.
- Suggestions are offered for consolidating and eliminating some existing crosswalks.
- The addition of curb extensions and/or speed tables should be considered at key crosswalks to enhance pedestrian visibility and safety.
- A Concept Plan is included at the rear of this document that illustrates how to enhance bicycle accommodations and clarify the limits of on-street parking in the corridor.
- The transit services that operate in Orono were evaluated and found to be quite successful. The only suggestion made in this area was to add bus shelters for the Black Bear Express as a service enhancement.
- A few signage suggestions were offered for clarity of messaging, and a formalized "wayfinding" program was suggested for additional consideration.
- Comments were offered on the merits of formalizing local streets as possible detours for Main Street traffic during peak travel times.

Section 3 - School Campus Circulation and Municipal Complex Access

Time was spent meeting with and reviewing the School Department's plans for the future and how they might relate transportation-wise to the existing campus and municipal complex's traffic circulation in Section 3. Comments were provided on the possibility of developing a connection between the school campus and Forest Avenue to relieve pressure on Main Street, the need for new wayfinding signage, and the internal traffic circulation within the school complex. On the latter matter, an alternative was examined that would convert Goodridge Drive to "in-only" off Main Street and we found that a traffic signal could then be "warranted" at Westwood Drive. However, weighing the pluses and minuses of this idea caused us to not recommend this change and to rather suggest that the circulation remain as it exists today.

Section 4 - The Alley between Mill Street and the Public Parking Lot off Pine Street

Section 4 reviewed the idea of closing the alley between Mill Street and the public parking lot off Pine Street for use as a public gathering space. A total of 7 prime parking spaces would be lost if the alley were closed as would the direct connection from Mill Street to the Pine Street parking lot. Closure of the alley would force motorists on Mill Street to take a rather circuitous route that is not currently marked to get to the Pine Street lot. The added distance would be about 1,300 feet or 1-2 minutes in travel time.

Section 5 – Longer-Term Considerations, Including Future Roadway Connectivity West of Main Street and Satellite Park-and-Ride Lots

Section 5 addresses two longer-term ideas for the Town's consideration. One is presented in the Comprehensive Plan Update and supports the notion of street interconnectivity and illustrates two rough corridors of how this might be accomplished between Kelley Road and Forest Avenue. The other is a new idea that involves the establishment of satellite park-and-ride lots off Kelley Road and Stillwater Avenue to be used by commuters destined for Orono and/or the University. These lots could help ease the burden of parking, which is at a premium, both within the Orono's downtown and on the University's campus. They could be serviced by the Community Connector and also provide an opportunity for people to park and ride their bikes to their destination, a concept that a growing interest locally.

Contents

1 - Introduction

The Town of Orono engaged Sebago Technics (Sebago) in late 2014 to conduct a comprehensive traffic and circulation study of their downtown with the primary objectives being twofold:

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See Figure 1 on the following page for the Study Area limits.

This evaluation has four main elements, each of which will be discussed separately herein:

1. Main Street – Westwood Drive to the Bridge
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The four main elements of this Study are discussed in the following chapters of this Report, with supporting materials contained in Appendices at the rear of this document for additional reference by the reader if interested.

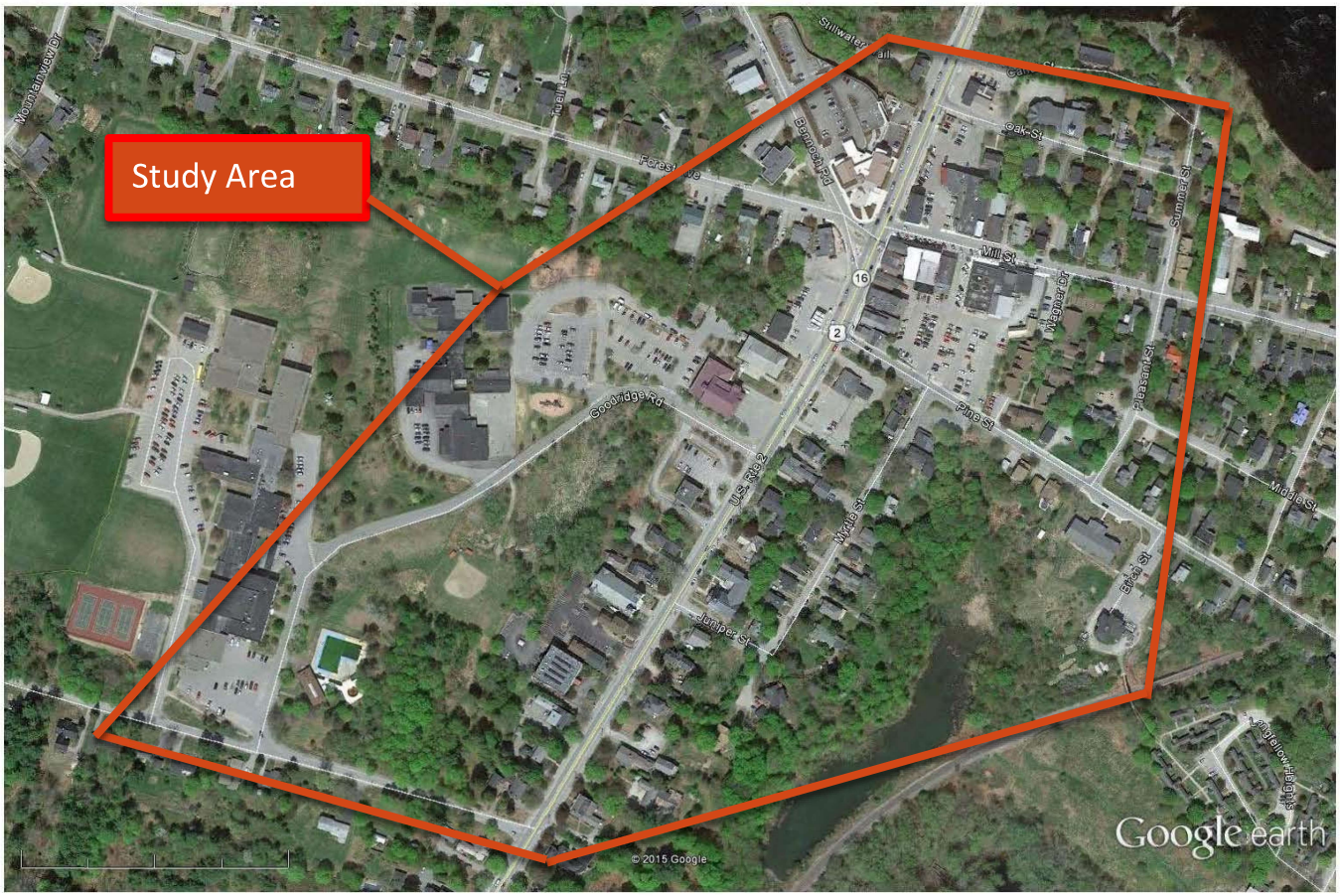


Figure 1 – Study Area

2 - Main Street – Westwood Drive to the Bridge

Introduction

While some improvements have been made to this main travel corridor in recent years including traffic signal timings, crosswalks, and a MaineDOT sponsored resurfacing and sidewalk improvement project, the Town is interested in knowing if there is more that could be suggested as part of this broader, more comprehensive Study to ease the burdens being felt by local motorists, pedestrians, and bicyclists during certain times of the day. A number of questions were posed to help clarify and focus the scope of this investigation. These were:

- How can conflicts and safety concerns between automobiles and bicycles/pedestrians be reduced during the beginning and ending of the school day from what they are presently?
- Are there any deficiencies in crosswalks and sidewalks that would enable safer connections between the west side of Main Street (including the municipal and school complex, and the new UCU headquarters and plaza) and the east side of Main Street (including Mill Street businesses, the public library, transit stops, and municipal parking lots)?
- Are bicycle accommodations adequate for this corridor?
- What is the current transit service (public and University) in this corridor and are there any future plans or opportunities for improving this service?
- What is the current crash history within this corridor? Are there any safety issues that should be addressed?
- How can signage be reduced and made more informative for unfamiliar drivers?
- How should new “school zone” signage be placed on Main Street in keeping with the MaineDOT’s recent designation?
- How can access to the municipal complex be improved?
- What are the implications for pedestrian, bicycle and vehicular flows of encouraging a parallel “detour” route to Main Street for local residents using Juniper, Myrtle, Pine, Pleasant, Summer, and Oak Streets to get from Goodridge Drive to the Bridge during peak times?

Existing Conditions

Main Street, also US Route 2, is a state owned (town maintained) highway that runs north-south through the center of Orono's downtown, and provides a secondary access to the University for those using the Kelley Road Exit off I-95. It is a two-lane bi-directional roadway with curb-to-curb widths varying between 39 and 45 feet and with a posted speed of 25 mph within the Study Area. Its current Federal Functional Classification is a Minor Arterial. MaineDOT has classified it as a Priority 3 roadway with Customer Service Levels ranging from B to D in terms of Condition, B to C in terms of Safety, and A to C in terms of Service. Sidewalks line both sides of the street throughout the Study Area, and on-street parallel parking is permitted in a number of spots. Painted crosswalks exist at several locations to link the east and west sides of the roadway for pedestrians. The existing travel lanes have been recently reduced in width to 10.5 to 11.0 feet as part of the MaineDOT's resurfacing project in 2015 and the roadway shoulders in many areas include some unofficial bike lane markings (arrows only – no bike symbols). Traffic signals control vehicular movements at the intersections of Mill/Bennoch Road and Pine Street. Both the Community Connector and Black Bear Express provide transit service to this corridor. The Community Connector, with service to Bangor, has formal shelters for patrons near Pine Street, and the Black Bear Express has stops on Mill and Pine Streets as part of their downtown Orono loop service to the University. 2014 Annual Average Daily Traffic (AADT) volumes on Main Street ranged from 12,620 at Westwood Drive to 15,200 at the Bridge. Additional AADT information is contained in Figure 2 below.

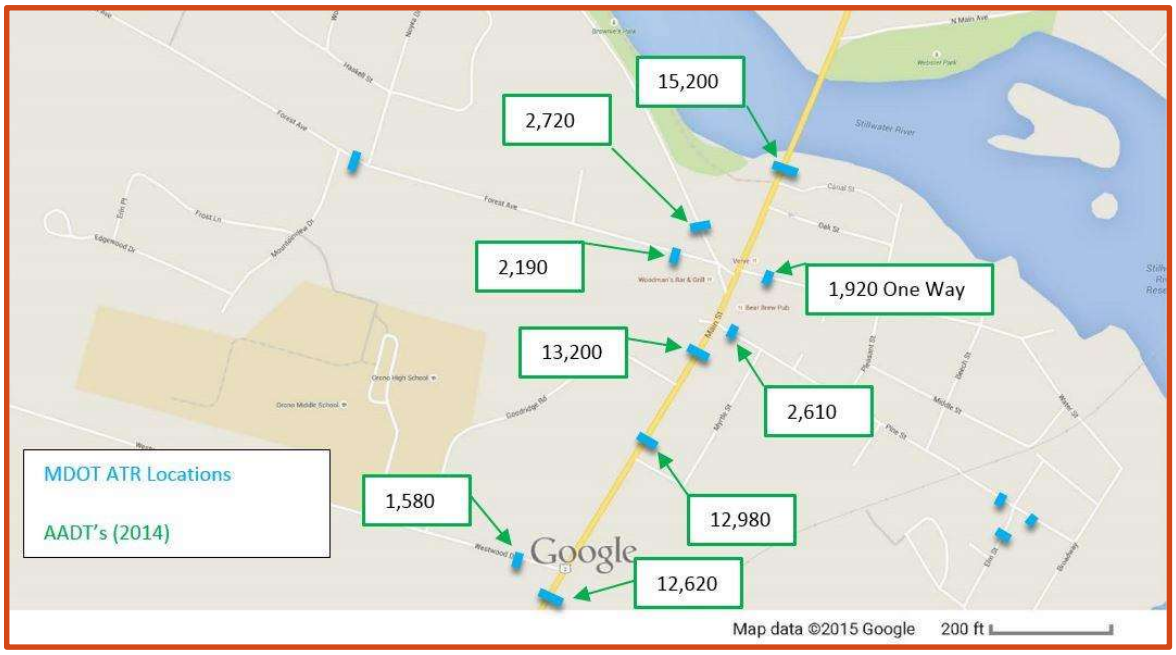


Figure 2 – 2014 Study Area AADT Data – Source MaineDOT

A number of important public institutions are located on, or accessed by, Main Street, including the local elementary, middle and high schools, a fire station, the municipal offices, and the public library.

The Town's Land Use Zoning in the Study Area includes the following Districts:

- VC – Village Commercial
- LC – Limited Commercial
- MDR – Medium Density Residential
- Tax Increment Financing
- Village Center
- Aquifer Protection

Common modes of travel on Main Street include motorists, pedestrians, bicyclists, and transit patrons. Therefore, it makes sense to think of Main Street in the context of a **Complete Street**[1], i.e. one that is specifically designed to meet the needs of all its users, not just motorists. MaineDOT adopted a Complete Streets policy in 2014, which they are now applying to all their projects, especially those through downtowns, like Main Street. A copy of the policy is included in the Appendix for your information. Orono's Comprehensive Plan Update (2014) recommends that Orono adopt its own policy like many other Maine municipalities have done.

Two plan sheets have been prepared to more completely illustrate the current, or existing, conditions along Main Street, including signage, on-street parking locations and restrictions, crosswalk locations, etc. that will serve as the baseline for our analysis and suggested recommendations for improvements. These Existing Concept Plans (the top halves of Sheets 1 and 2 of 2) can be found at the end of this document.

Existing Mobility

The following paragraphs examine more specific conditions with regard to mobility for the variety of users within the Main Street corridor. Supporting data used to perform the these analyses is a combination of new turning movement count information collected by BACTS at the intersections of Goodridge Road and Westwood Drive during April and June 2015 and historical information from MaineDOT collected in 2009, which was the basis of a traffic signal improvement project at the intersections of Pine Street and Mill/Bennoch Road in 2010.

[1] The term Complete Streets "is transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation. Complete Streets allow for safe travel by those walking, bicycling, driving automobiles, riding public transportation, and delivering goods." – Wikipedia. This policy is promoted by the National Complete Streets Coalition, a program sponsored by Smart Growth America.

Travel Lanes – Number, Widths, Speed, and Traffic Composition

The most current Annual Average Daily Traffic (AADT) information available for Main Street indicates a range of between 12,620 and 15,200 vehicles per day within the limits of the Study Area. These values have remained fairly stable according to MaineDOT's published historical traffic count data. See the following comparison for several locations within the corridor:

	2009	2011	2014
South of Pine	13,970	-	13,200
South of Goodridge	-	12,860	12,980
South of Westwood	-	12,730	12,620

The volumes shown above are well within the capacity of a two-lane arterial roadway, and unless something dramatic occurs these are not likely to change significantly in the future. It is therefore not necessary to be concerned that the current Main Street is not wide enough for the existing travel demand nor will it be in the future. To the contrary, it is our thought that some reallocation of the existing pavement could be made for the benefit of a broader spectrum of users.

Given the urban nature of this street, including the degree to which pedestrians and bicyclists use the corridor, traffic speed can be a concern. Studies have shown that a pedestrian is 8 times more likely to get killed when struck at 30 mph than at 20 mph. Even though the posted speed is 25 mph, reinforcement of this regulation through design is usually more effective. Our experience is, and the literature supports this, that reduced travel lane widths can have the positive effect of calming traffic in similar circumstances. ***It is therefore our recommendation that consideration be given to reducing travel lane widths where possible and appropriate to 11 feet and in some cases 10.5 feet, if necessary.***[2] This strategy is consistent with MaineDOT's Engineering Instruction C2 dated November 10, 2011.

Vehicular traffic volumes during peak hours along Main Street are currently comprised of three main constituencies. These are:

- University Commuters
- Non-University Commuters
- Orono School Traffic – buses, parent pick-ups and drop-offs, and student drivers

Each of these groups has an impact on the corridor's traffic operations, but they all do not have the same schedule during the year, i.e. during the winter, when both local schools and the University are in session, traffic congestion is at its worst. In the summer, when the University and local schools are on break, traffic conditions are the best. Figure 3 on the following page illustrates a typical day's traffic profile measured just north of Goodridge Drive on three

[2] This recommendation was implemented as part of the MaineDOT overlay project completed in 2015.

different dates – April 16 (when both schools were in session), April 23 (when local schools were on break), and June 24 (when both schools were on break). Disregarding any seasonal

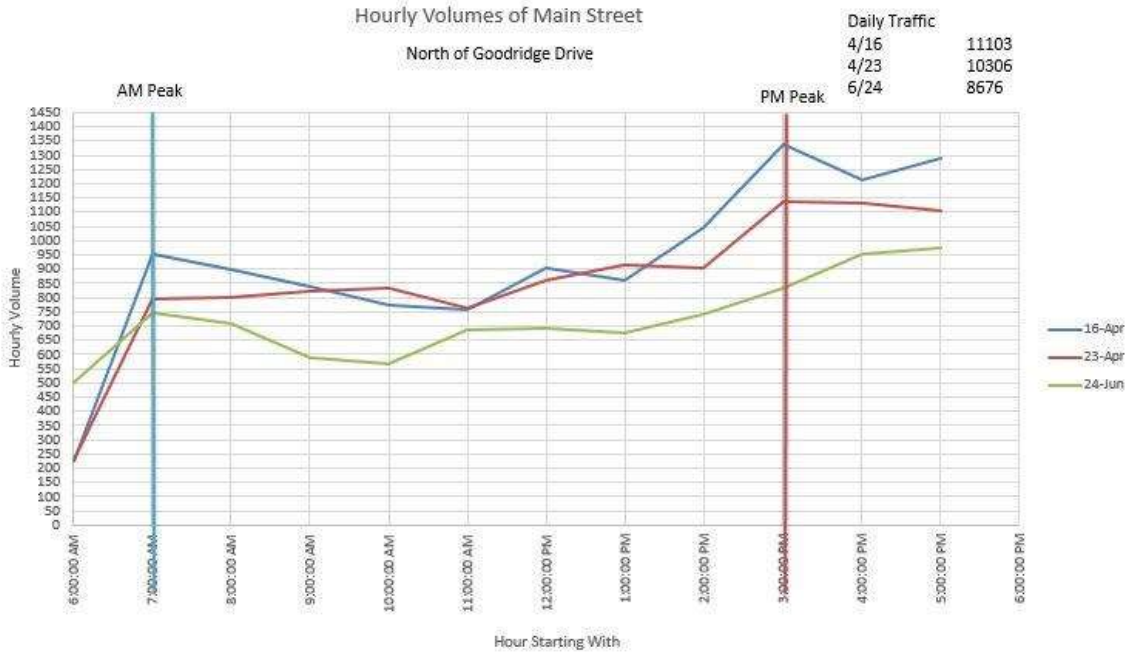


Figure 3 – Hourly Volumes of Main Street – North of Goodridge Drive

adjustments to the volumes to account for the different dates of measurement, the following is evident:

- The combined school traffic (local and University) represents approximately 30% of the AM and PM peak hour volumes and 20% of the total daily volumes.
- The University traffic, by itself, represents approximately 5% of the AM and 20% of the PM peak hour volumes and 15% of the total daily volumes.
- The local school traffic, by itself, represents approximately 15% of the AM and PM peak hour volumes and 7% of the total daily volumes.

The above rough approximations indicate that traffic operations on Main Street are quite heavily influenced during the AM and PM peak hours by both the local schools and the University. So much so, that it may be well to treat Main Street demands under these varying conditions separately going forward. This idea is discussed in more detail in the Intersection discussion below.

Intersections - Capacity

Traffic conditions, or Levels of Service (LOS), on urban arterial roadways are most often a function of their intersection LOS's, as these are the predominant locations where mainline traffic is interrupted to service side street traffic. This is true for Main Street in Orono. While the intersections of Pine Street and Mill/Bennoch Road have additional dedicated left turn lanes, they represent the major control points (or bottle necks) for this corridor in terms of mainline traffic flow. The unsignalized intersections of Oak, Goodridge Drive, Jupiter, and

Westwood Drive also present some negative influence on mainline traffic flow due do to turning maneuvers that occur at these locations without benefit of separate dedicated turning lanes, but these delays are not nearly as extensive as those at Pine and Mill/Bennoch Road. Tables 1-6 illustrate this point by providing AM and PM peak hour LOS values for movements at the intersections of Westwood, Goodridge, Pine, and Mill/Bennoch Road under two different traffic conditions – with both local schools and the University in operation (April 16th), and with both locals schools and the University closed (June 24th). It should be noted that Synchro/SimTraffic V9 was used for this modeling effort, and furthermore the "existing" traffic signal timings at Pine and Mill/Bennoch Road were used in the simulations, as well. As the reader reviews the delays indicated in the following Tables, it should be realized that these values are "average" times experienced by all drivers passing through these intersections during the peak hours. In some cases the actual individual delays may be more and in some cases they may be less, but what is more important is the relative comparisons derived by the simulations under varying conditions.

Table 1
Main Street at Westwood Drive
(AM Peak Hour)

Movement	Both Schools Open		Both Schools Closed	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
Main St. NB TH	1.4	A	0.5	A
Main St. NB LT	4.3	A	3.0	A
Main St. SB TH	1.7	A	1.0	A
Main St. SB RT	1.2	A	0.8	A
Westwood LT	14.9	B	10.3	B
Westwood RT	7.8	A	4.9	A
Overall	3.1	A	0.8	A

The AM Peak Hour was recorded as 7:00 AM to 8:00 AM.

Table 2
Main Street at Westwood Drive
(PM Peak Hour)

Movement	Both Schools Open		Both Schools Closed	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
Main St. NB TH	0.7	A	0.3	A
Main St. NB LT	4.6	A	2.7	A
Main St. SB TH	1.7	A	1.3	A
Main St. SB RT	1.5	A	0.9	A
Westwood LT	24.5	C	10.9	B
Westwood RT	13.0	B	5.4	A
Overall	2.7	A	1.1	A

The PM Peak Hour was recorded as 3:00 PM to 4:00 PM when schools were open and 5:00 PM to 6:00 PM when schools were closed.

Table 3
Main Street at Goodridge Drive
(AM Peak Hour)

Movement	Both Schools Open		Both Schools Closed	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
Main St. NB TH	1.8	A	1.0	A
Main St. NB LT	6.4	A	3.5	A
Main St. SB TH	1.6	A	0.7	A
Main St. SB RT	1.0	A	0.5	A
Goodridge LT	14.0	B	8.6	A
Goodridge RT	4.3	A	4.0	A
Overall	2.0	A	0.9	A

The AM Peak Hour was recorded as 7:00 AM to 8:00 AM.

Table 4
Main Street at Goodridge Drive
(PM Peak Hour)

Movement	Both Schools Open		Both Schools Closed	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
Main St. NB TH	2.6	A	1.0	A
Main St. NB LT	8.8	A	4.9	A
Main St. SB TH	1.3	A	0.7	A
Main St. SB RT	0.7	A	0.4	A
Goodridge LT	28.7	D	11.9	B
Goodridge RT	6.7	A	4.4	A
Overall	3.1	A	1.0	A

The PM Peak Hour was recorded as 3:00 PM to 4:00 PM when schools were open and 5:00 PM to 6:00 PM when schools were closed.

Table 5
Main Street at Pine and Mill/Bennoch Road
(AM Peak Hour)

Movement	Both Schools Open		Both Schools Closed	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
At Pine Street				
Main St. NB TH	10.5	B	10.4	B
Main St. NB RT	9.1	A	6.4	A
Main St. SB TH	5.6	A	3.9	A
Main St. SB LT	15.5	B	7.8	A
Pine LT	33.5	C	28.6	C
Pine RT	14.1	B	7.0	A
Overall	9.7	A	8.4	A
At Mill/Bennoch Road				
Main St. NB RT	2.2	A	1.8	A
Main St. NB TH	4.9	A	4.1	A
Main St. NB LT	6.1	A	4.0	A
Main St. SB RT	8.1	A	4.7	A
Main St. SB TH	11.2	B	9.5	A
Main St. SB LT	17.1	B	13.9	B
Bennoch LT	33.2	C	25.2	C
Bennoch TH	40.0	D	30.2	C
Bennoch RT	6.2	A	2.8	A
Overall	9.9	A	8.0	A

The AM Peak Hour was recorded as 7:00 AM to 8:00 AM.

The Table lists Bennoch Road's LT and TH as separate movements, but they share a single lane.

Table 6
Main Street at Pine and Mill/Bennoch Road
(PM Peak Hour)

Movement	Both Schools Open		Both Schools Closed	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
At Pine Street				
Main St. NB TH	9.8	A	7.0	A
Main St. NB RT	8.0	A	5.4	A
Main St. SB TH	6.9	A	4.0	A
Main St. SB LT	15.8	B	6.1	A
Pine LT	42.0	D	35.9	D
Pine RT	16.8	B	10.4	B
Overall	9.7	A	6.4	A
At Mill/Bennoch Road				
Main St. NB RT	2.7	A	1.7	A
Main St. NB TH	4.8	A	3.9	A
Main St. NB LT	28.3	C	10.3	B
Main St. SB RT	14.1	B	8.9	A
Main St. SB TH	16.5	B	12.3	B
Main St. SB LT	18.4	B	12.3	B
Bennoch LT	52.0	D	32.0	C
Bennoch TH	54.5	D	36.8	D
Bennoch RT	12.8	B	3.9	A
Overall	16.0	B	10.3	B

The PM Peak Hour was recorded as 3:00 PM to 4:00 PM when schools were open and 5:00 PM to 6:00 PM when schools were closed.
The Table lists Bennoch Road's LT and TH as separate movements, but they share a single lane.

It is apparent from the data presented in Tables 1-6 that the local schools and University have a noticeable impact on the traffic operations at all of the above intersections along Main Street.

As mentioned above, the analyses performed for the signalized intersections of Pine Street and Mill/Bennoch Road utilized the existing signal programing with no optimization based on changes in volumes as a result of the differing school scenarios. These intersections were reanalyzed using optimized traffic signal timings for each scenario and the improvements are shown in Tables 7 and 8.

Table 7
Main Street at Pine and Mill/Bennoch Road
(AM Peak Hour - Optimized)

Movement	Both Schools Open		Both Schools Closed	
	Delay Before (Secs.)*	Delay After (Secs.)	Delay Before (Secs.)*	Delay After (Secs.)
At Pine Street				
Main St. NB RT	9.1	8.1	6.4	7.1
Main St. NB TH	10.5	10.8	10.4	10.5
Main St. SB TH	5.6	5.4	3.9	4.2
Main St. SB LT	15.5	12.4	7.8	7.7
Pine LT	33.5	30.9	28.6	28.7
Pine RT	14.1	13.3	7.0	7.3
Overall	9.7	9.6	8.4	8.0
At Mill/Bennoch Road				
Main St. NB RT	2.2	2.4	1.8	1.9
Main St. NB TH	4.9	5.2	4.1	4.0
Main St. NB LT	6.1	6.5	4.0	4.0
Main St. SB RT	8.1	7.3	4.7	4.6
Main St. SB TH	11.2	10.8	9.5	9.6
Main St. SB LT	17.1	15.3	13.9	14.6
Bennoch LT	33.2	31.3	25.2	25.7
Bennoch TH	40.0	28.9	30.2	31.7
Bennoch RT	6.2	4.8	2.8	3.1
Overall	9.9	9.4	8.0	8.0

*These values result from existing signal timings and match those in Table 5.
The Table lists Bennoch Road's LT and TH as separate movements, but they share a single lane.

Table 8
Main Street at Pine and Mill/Bennoch Road
(PM Peak Hour - Optimized)

Movement	Both Schools Open		Both Schools Closed	
	Delay Before (Secs.)*	Delay After (Secs.)	Delay Before (Secs.)*	Delay After (Secs.)
At Pine Street				
Main St. NB RT	8.0	8.1	5.4	6.6
Main St. NB TH	9.8	9.6	7.0	7.1
Main St. SB TH	6.9	6.9	4.0	4.2
Main St. SB LT	15.8	12.6	6.1	6.7
Pine LT	42.0	43.2	35.9	36.2
Pine RT	16.8	21.3	10.4	12.4
Overall	9.7	9.9	6.4	6.6
At Mill/Bennoch Road				
Main St. NB RT	2.7	2.9	1.7	2.2
Main St. NB TH	4.8	5.1	3.9	4.2
Main St. NB LT	28.3	22.8	10.3	9.4
Main St. SB RT	14.1	13.0	8.9	9.1
Main St. SB TH	16.5	16.5	12.3	12.6
Main St. SB LT	18.4	21.5	12.3	12.8
Bennoch LT	52.0	41.2	32.0	29.1
Bennoch TH	54.5	50.4	36.8	33.2
Bennoch RT	12.8	8.5	3.9	3.7
Overall	16.0	14.8	10.3	10.3

*These values result from existing signal timings and match those in Table 6.
The Table lists Bennoch Road's LT and TH as separate movements, but they share a single lane.

As can be seen from Tables 7 and 8 there are some gains to be made, or reductions in delay that can be achieved, on the side streets (mainly when both schools are open) at these two intersections if the Max Green time is dialed back slightly (10 seconds) from what it is today. ***It is therefore our suggestion that the Town implement this minor change to optimize traffic flow under all school operational scenarios. However, it should be remembered that the primary goal for these intersections is to keep traffic moving on Main Street even if it creates some seemingly long delays on the side streets.***

Tables 1-4 indicate that the primary delays during the AM and PM peak hours at the intersections of Main Street with Goodridge Road and Westwood Drive occur on the side streets, not the mainline. Data collection efforts at these two locations included 12-hour counts, not just the AM and PM peak hours, so an evaluation could be made of the "warrants" for traffic signal installations at these intersections. It was evident from the volume data on

these two side streets, though, that neither intersection by itself would meet any of the Traffic Signal Warrants outlined in the Manual of Uniform Traffic Control Devices (MUTCD) under existing conditions.

However, if Goodridge Drive was converted to "in only" off Main Street and thus all exiting traffic from the Municipal Complex and the Elementary School had to exit through the High/Middle School Complex and Westwood Drive, MUTCD traffic signal Warrants 2 and 3 (4 Hour and Peak Hour) would be satisfied and thus the Town could partition the MaineDOT for a signal at Westwood and Main Streets. Because the current cost for a new signalized intersection is roughly $160-170,000, we looked at the merits of proceeding with this idea and listed the pro's and con's accordingly:

Pro's

- The number of conflicting traffic maneuvers would be reduced at the Goodridge/Main Street intersection by eliminating all exiting traffic. Because of this, safety at this intersection would be improved. There were a total of 2 crashes at this intersection in the last 3 years according to MaineDOT information.

Con's

- Municipal and Elementary School traffic would be detoured 0.6 mile through the High/Middle School Complex and onto Westwood Drive to get to Main Street and from there back to Goodridge Drive. The travel time for this detour loop route would be about 100 seconds using and average speed of 20 mph. The current delays for the exiting left turners in the AM and PM peak hours at the Goodridge intersection were calculated by our traffic simulation models to be only 14 seconds in the AM and 29 seconds in the PM. See Tables 3 and 4. On this basis there is no time savings in redirecting traffic in this manner. As such, there is no compelling benefit to outweigh the inconvenience.

- A signal at Westwood Drive would introduce delays to the Main Street traffic, which currently do not exist, and the volume of this traffic significantly outweighs that which would be exiting Westwood Drive. The Town has been clear that it wants to keep delays to Main Street to a minimum, especially during peak times, and a signal would run counter to this objective.

- Redirecting Municipal and Elementary School traffic through the High/Middle School Complex would introduce additional traffic to this area and thus decrease the safety of High/Middle School students.

Our conclusion regarding this matter is that while changing Goodridge Drive to one-way in would improve safety at this intersection and increase traffic enough on Westwood Drive to warrant a traffic signal at that intersection, we do not think that the advantages outweigh the cost and drawbacks of this strategy for the reasons listed above and thus do not recommend it.

Existing Safety Statistics

MaineDOT's Accident Records Section was contacted to obtain most recent crash history for Main Street within the Study Area. Data was provided that covered the 3-year period from 2012 to 2014. This detailed information is contained in the Appendix. A summary of it is provided below:

- There were a total of 52 report crashes within the Study Area during this time period – 31 occurred at intersections and 21 along the connecting roadway segments.
- There were no reported fatalities, 6 personal injuries, and 46 of the 52 crashes involved property damage.

This information is not a-typical for an urban street in Maine. Red flags get raised, though, when intersections or roadway links become classified as High Crash Locations (HCL's). MaineDOT categorizes HCL's (intersections or roadway links) as having 8 or more crashes within a 3-year period and a Critical Rate Factor (CRF) greater than 1.0. The CRF is a comparative value of the particular intersection's or roadway segment's crash history in relation to other similar locations within the state. The data for Main Street did not highlight any HCL's within the Study Area indicating that there are no particular areas of concern at MaineDOT with regard to vehicle safety that should be examined and corrected as part of this Study.

Ancillary Roadway Facilities

Pedestrian Accommodations

Orono's Comprehensive Plan Update 2014 provides some interesting commuter statistics that indicate Orono residents are 8 times more likely to walk to work than the rest of the Bangor Region or the state as a whole – 24% versus 4%. Another 7% use other travel modes rather than their vehicles - bikes (4%) and public transportation (2%). These figures rank Orono second behind Bar Harbor for having the highest share of human-powered commuting in Maine. For this reason alone, pedestrian, bike and public transportation facilities are important priorities for the Town in this Study Area.

Example Detectible Warning Field

As mentioned previously, Main Street is lined with 5-foot minimum wide sidewalks on both sides of the street throughout the Study Area. The concrete sidewalks from Goodridge Drive to the bridge are in decent condition with only minor damage in a few places. All the crosswalk ramps in this area except for Oak Street have detectible warning fields to alert people that they are leaving

the sidewalk. South of Goodridge Drive the sidewalks become bituminous and are similar in condition to the concrete sidewalks. At the time of our site visit on September 21th 2015 most of the sidewalk on the west side of the street had been recently repaired or replaced as part of the MaineDOT paving project and detectable warning fields were added at the crosswalks in this area.

Intersecting street crossings for the most part are painted with "piano key" style pavement markings. ***The exception appears to be Juniper Street, and this should be addressed.***

A total of 9 painted transverse crosswalks exist across Main Street. These are located at:

- Westwood Drive
- Main View Apartments
- Juniper Street
- Peoples United Bank (a diagonal layout)
- Municipal Complex
- Pine Street (at the signalized intersection with push buttons)
- Bennoch Road (at the signalized intersection with push buttons)
- Mill Street (at the signalized intersection with push buttons)
- Oak Street

The Police Department places "crossing guards" (non-officers) at the Municipal Complex and Westwood Drive crosswalks during school arrival and departure times when schools are in session.

MaineDOT has a crosswalk policy that guides the design and placement of crosswalks on state owned roadways. In general, their guidelines suggest that crosswalks should be a minimum of 400 feet apart in urban areas, and school crosswalks should be located at intersections where possible since driver expectation is not to have to stop at a mid-block location. The distance between the unsignalized crosswalk at the Municipal Complex and the signalized crosswalk at Pine Street is only 150 feet. While this is not optimum, nor is it consistent with MaineDOT's guidance, it is the most heavily used crosswalk on Main Street. In response to this non-standard situation the Town as part of a Healthy Maine Partnership Grant under the Active Community Enhancement Program has begun a "pilot" program of relocating the crossing guard to the Pine Street intersection and using the pedestrian phase of the traffic signal at this intersection to safely cross the students. ***We support this initiative and recommend that in addition to this change in crossing location, the Town modify the pedestrian phase in the traffic signal programming to include a Lead Pedestrian Interval (LPI) strategy to further enhance the safe crossing of all pedestrians at this location. Furthermore, we suggest that the Town purchase and install a "Yield to Pedestrians" blank out sign for the Pine Street approach similar to the one that exists at the Main/Bennoch Road intersection. This sign would illuminate when the pedestrian crossing phase was actuated on Main Street. With these changes at the Pine Street intersection, the existing crosswalk at the Municipal Complex could be eliminated and a more standard crosswalk spacing achieved in this area of Main Street.***

As further support for pedestrians at the school related crosswalks (with the above change this would only leave the unsignalized one at Westwood Drive), ***we suggest that the town consider the addition of Rectangular Rapid Flashing Beacons (RRFB's) because they are proven to increase driver awareness of pedestrians and thus improve safety for all corridor users. These units can be solar operated, and cost in the range of $12,000 per crosswalk pair installed.***

The crosswalk at Mill Street is in a location where it comes into conflict with exiting traffic from Bennoch Road turning left to head north across the bridge. Since it is only 100 feet northerly from the crosswalk at Bennoch Road, ***consideration should be given to eliminating this crosswalk and encouraging pedestrians to use the Bennoch Road crosswalk.***

Crosswalks located at unsignalized locations, often termed "mid-block crossings", represent potential conflicts between vehicles and pedestrians that are uncontrolled. Therefore, visibility of the pedestrians leaving the sidewalks and entering the crosswalks by motorists is extremely important for the safety of the pedestrian. In urban areas where on-street parking is allowed, the MUTCD requires a 20-foot buffer between parking stalls and crosswalks to provide improved motorist visibility. This situation can be further enhanced by installing "curb extensions" (or bump-outs) shown in the picture to the left to extend the sidewalk into the street and shorten the overall crosswalk length. This design treatment reduces the distance that pedestrians are in conflict with motorists and can have a "calming" effect on traffic, but complicates snow removal activities by Public Works Departments. ***Consideration should be given to this treatment on Main Street for the crosswalk at Westwood Drive, since this is the entrance into Orono's downtown from the south and will provide a driver queue that speeds are slower and to watch out for bicyclists which will be sharing the travel lane from this point northward. Another benefit of this treatment is that it will prevent motorists from passing left turn vehicles on the right that are stopped at Westwood Drive, which will increase bicycle safety at this location.***

Curb Extension in Downtown Kennebunk

Another option for increasing the prominence of unsignalized crosswalks for pedestrian safety would be the use of raised speed tables. These traffic "calming" devices are typically 22 feet in the direction of traffic with 6 foot ramps at each end and a 10 foot flat section in the middle. There height is usually 3-4 inches and the flat section can be constructed with textured materials to enhance their visibility. It is our understanding that MaineDOT permits these on urban roads of this nature. According to the Institute of Transportation Engineers (ITE), in addition to having a calming effect on traffic, speed tables do increase the visibility of pedestrians if used in combination with crosswalks. In many cases they are used in conjunction with curb extensions. It should be noted that vertical deflection devices for traffic calming due raise concerns from

emergency vehicle operators and public works personnel, but the design of speed tables seem to present the least objections from these communities.

From the perspective of pedestrian safety, both of the above crosswalk enhancement options (curb extensions and raised speed tables) by themselves or in combination would seem to improve crossing safety on Main Street. The Concept Plan at the end of this document illustrates curb extensions at Westwood Drive, as well as a possible raised speed table at this crosswalk location.

Speed Table on Maine Street, Brunswick Maine

Finally, we reviewed the crosswalk landings (tranverse and longitudinal) on Main Street and they appear to meet current ADA requirements, except for a few that lack "truncated domes". ***The crosswalk across Pine Street does not have these domes. These should be addressed.***

School Zone Treatments

According to state law, "school zones" are measured 300 feet either side of school entrances. In Orono's case, the entrances to the school campus are on Goodridge Road and Westwood Drive, not on Main Street. The official "school zone" then would be measured on both side roads. As it turns out the school entrance on Goodridge Road is more than 300 feet from Main Street and the school entrance on Westwood Drive is more than 300 feet from Main Street. Therefore, no official "school zone" exists on Main Street – only "school crossings". In our view, the addition of more signage on Main Street (school zone flashers) would only add visual clutter to an already message-filled environment. The crossing guards and the proposed crosswalk signage and pavement marking improvements presented herein seem sufficient to address this matter. If the town disagrees, they are free to partition the MaineDOT for an official opinion on this subject. The formal school crossing sign assemblies per the MUTCD consist of an S1-1 sign with a diagonal downward pointing arrow WS-7P plaque. These are shown on the Proposed Concept Plans at the rear of this document.

Bicycle Accommodations

Main Street is a primary route bicyclists use to travel to downtown, the public school campus, and the University. Traffic counts collected April of this year as part of the evaluations of the intersections of Goodridge Drive and Westwood Drive recorded bicycle traffic, as well as vehicular traffic. The 12-hour data for April 16th when both local schools and the University were in session showed the following results:

	Total Bicycle Volume (NB and SB)
Main Street at Goodridge	46
Main Street at Westwood	42

These numbers are not insignificant and might increase if more formal bicycle facilities were incorporated into the corridor. The regional transportation planning agency, BACTS, has ranked area roadways as to their bike "friendliness" and published a Bicycle Map on their website. Main Street in Orono is categorized on this Map as suitable for an "intermediate" level bicyclist – one that does not like riding on busy roadways unless there are wide shoulders.

As mentioned previously, the shoulders along Main Street are painted with arrows throughout much of the Study Area. According to the Comprehensive Plan Update (2014) these were first installed in the 1970's and intended for general bicycle guidance. Since then public interest and awareness of the benefits of cycling have increased dramatically. MaineDOT now has a Bicycle and Pedestrian Coordinator in response to the growing demand for safe facilities along our state's roadways. With this in mind, we examined two possibilities for incorporating more formal bike facilities on Main Street. Separate bike lanes (5' wide in curbed sections) was one option and the other was the creation of "shared" lanes. Because of the existing street widths, there is not enough room to retain parking on both sides of the street and provide dedicated bike lanes. As such, the bike lane concept would need to introduce a serpentine alignment for Main Street to allow for on-street parking to remain where it is most needed. This curvilinear alignment would not follow the crown line of the existing street and thus MaineDOT would not allow it and it was dropped from further consideration. This left the "shared lane" alternative that retains all existing on-street parking. Given the posted speed of 25 mph and the introduction of several traffic calming measures in this alternative we believe that bikes can be safely integrated into the travel lanes this approach. MaineDOT, AASHTO, and NACTO all have standard design guidance for both types of bike facilities. ***A conceptual layout of how this treatment could be installed can be found in the Appendix at the end of this document.***

Shared Use Lanes on an Urban Street

On-Street Parking

Both sides of Main Street have numerous signs related to on-street parking regulations as can be seen on the Existing Conditions Concept Plan at the end of this document. A review of Orono's current Parking Ordinances revealed the following No Parking locations:

Existing On Street Parking – Main Street

- Either side of Main Street from Mill Street to the bridge – Section 34-87, Item (11).
- Either side of -Main Street from the bridge to Goodridge Drive - Section 34-95.
- The west side of Main Street from 10 feet north of the northerly entrance to Main View Apartments to 10 feet south of the southerly entrance to Main View Apartments – Section 34-95.

All other areas of Main Street are, by ordinance, on-street parking zones. Comparing this information with the signs posted along the corridor, the following discrepancies were noted:

- There was a time restriction for parking on the east side of the street between the hours of 7:00 AM to 9:00 AM Monday through Friday. This restriction is not included in the town ordinance.
- The ordinance states that there will be no parking within 10 feet from both entrances to the Main View apartments. Currently there are two signs that state, no parking this side of the street and no parking any time. The existing signage suggests that there is a larger area of no parking than stated by the town ordinance.

These inconsistencies should be addressed and included as part of the final corridor improvement suggestions.

It should also be noted that in addition to these parking regulations, the Town also has a Winter Parking Ban in their ordinance that is in effect from November 1 to April 15. "Motor vehicles must be parked in off-street locations between 12 midnight and 8:00 am. During a major snow storm, the Public Works Department has to plow the streets in the daytime. Vehicles in residential areas are required to be parked off street at these times to aid in snow removal. If owners of motor vehicles do not comply, they can be fined from $10 to $100 each day or vehicles can be towed."

The Town's Comprehensive Plan Update (2014) provides information about a downtown parking survey that was conducted in 2012, which is relevant to this investigation. The 2012 survey found that there were 205 parking spaces (on and off-street) within 500 feet of the center of downtown and another 164 spaces within 1,000 feet of the center of downtown. If should be noted, though, that the on-street parking on Main Street between Goodridge Road and Westwood Drive, although within a 1,000 foot radius of downtown, was not included in this

survey. Occupancy rates were recorded at different times of the day over several days in the spring of 2012. The results showed that demand was high (70% or greater) for the 205 spaces within 500 feet of the downtown on Wednesday through Saturday evenings, and Friday and Saturday mid-days. All other times, occupancy rates were between 25% and 69%. The demand for the 164 spaces surveyed between 500 and 1,000 feet of downtown was quite different. At no time during the survey were these spaces 70% or greater occupied. The peak demand for these spaces occurred in the mornings and only reached 50-60%. The other interesting fact was that when the spaces were at peak levels within 500 feet of downtown, the spaces between 500 and 1,000 feet were relatively unused.

Given the high parking demand within the immediate downtown area, and the fact that available land for additional surface parking is currently non-existent in this area, there may come a time when the Town may want to consider structured parking at the municipal complex or on Pine Street. Structured parking is expensive to build and to maintain, but if parking is stifling economic growth within the downtown, consideration may be warranted in the future.

The 2012 parking survey also suggested that current downtown parking demand does not extend south of Goodridge Drive, even though the on-street spaces on Main Street are within 1,000 feet of the center of downtown – a distance that is generally accepted as reasonable for walking to a destination in an urban area. Therefore, the demand for the on-street spaces between Goodridge and Westwood is more likely related to the abutting land uses, which are mixed and include two churches, several businesses, and a few individual residences. ***In this area of Main Street, then, there needs to be careful consideration given to providing this parking in conjunction with the suggestions for bike accommodations.***

The Concept Plan at the end of this document preserves all existing on-street parking in combination with enhanced bicycle accommodations between Westwood Drive and Goodridge Road.

It should be noted that we are suggesting adding parking stall markings to formalize where parking is allowed and where it is not. This should better define the proper usage of the existing shoulders by parkers and bicyclists. Currently the wide shoulders with arrows is not that clear.

Transit Facilities and Operations

Main Street, as has been mentioned before, is currently serviced by two public transit operations – the Community Connector, a fixed-route bus service operated by City of Bangor; and the Black Bear Express, which is a Town/University sponsored venture that is also operated by the Community Connector when the University is in session. The

Community Connector

Community Connector provides hourly weekday service to Bangor between 7:00AM and 6:00PM, with 2-hour service on Saturdays. The Black Bear Express offers 30-minute shuttle service from downtown to campus between 7:00AM and 10:00PM weekdays and Noon to 10:00PM on Saturdays. Neither transit provider offers service on Sundays. The Community Connector is free to University students, and the Black Bear Express is free to everyone.

Ridership on the Black Bear Express and the Community Connector has generally been on the rise since its establishment in the fall of 2009. Yearly patronage is shown below:

School Year	Black Bear Express	Old Town Community Connector
2009-2010	39,317	129,147
2010-2011	41,080	129,666
2011-2012	49,355	150,015
2012-2013	53,870	162,070
2013-2014	60,088	157,116
2014-2015	54,004	158,446

The Community Connector has two shelters on Main Street – one for in-bound passengers to Bangor and one for out-bound passengers to the University or Old Town. These shelters are located at the Pine Street intersection. No formal bus pull-off areas are provided at these locations – the buses stop curbside in the Main Street travel lanes for loading and unloading. If the headways for this service were shorter, i.e. more frequent than hourly, the interruptions to Main Street traffic might be a concern. With the current schedule, though, this should only be a minor inconvenience, and therefore not any cause for attention at this time.

The Black Bear Shuttle has a kiosk on Mill Street and several curbside stops on Mill and Pine Streets while making its loop back across the bridge. ***The Town and University should consider adding some shelters at these locations as they explore ways to further improve this service.***

According to BACTS, the only route enhancements that are currently being discussed with either of these two transit services are the added stops into the new student housing complexes opposite the University Campus on Route 2 by the Black Bear Express, and the Town is well aware of these future upgrades. We also understand that the Community Connector is contemplating “designated stops” and getting away from “on-demand” or “flagged stops”. Should this change happen, then additional attention to the accommodations at these designated stops should be considered.

Given the past success of these two services, we urge the Town to continue to support these initiatives and seek ways to further enhance them where practical.

Signage

Main Street signage is a potpourri presently. There is a strong mixture of wayfinding, warning, and regulatory messages that when combined presents information overload and confusion to the average motorist. See the Existing Conditions Plan at the end of this document for more details.

A review of this situation was performed from a traffic engineer's perspective and some specific suggestions are offered in the final Conceptual Plan for improving the clarity of this situation.

Several key strategies that are included in the suggested improvements are:

- Add street name signage on the traffic signal mast arms at Mill/Bennoch and Pine Streets
- Rewire the "blank out" pedestrian crossing signs on the mast arms at Mill/Bennoch and Pine Streets so they only come on when the pedestrian push button is activated. They are currently wired to stay on all the time, which renders them ineffective. We estimate the cost to do this at $1,500 - $1,800.
- Remove outdated signage or signage that the message is too small to read from a vehicle.
- Consider changing the off-street parking signage from green on white to blue, so that it is more recognizable.

"Wayfinding signage" is specialized field in itself that requires a combination of talents in graphics arts and communications. The Town may wish to engage a specialized firm for consultation on this subject because the details of this are beyond the scope of this Study. It is worth noting that the School Department is looking at a new "wayfinding" program as part of their long-range plan, so coordination between the Town and School on this matter is important.

Local Main Street Detour Routes

One of the questions raised by the Town at this outset of this Study is whether consideration should be given to encouraging motorists to utilize Juniper, Myrtle, Pine, Pleasant, Summer, and Oak Streets as a northbound parallel "detour" route to Main Street during peak times?

Pine Street at Myrtle Street

Juniper, Myrtle, Summer and Oak Streets are local residential streets with on-street parking permitted in most areas. Pine Street is a somewhat wider street and acts like a collector roadway for this neighborhood along with providing access to the commercial businesses and

parking, as well as the Library. As was seen in a previous Section of this Report dealing with intersection capacities and LOS, making lefts out of Goodridge Road in the afternoon does involve some delay - 29 seconds on average when schools are in session (See Table 4). Some locals find it easier to make a right out of Goodridge Drive onto Main Street and then turn left onto Juniper where they can follow Myrtle, Pine, Pleasant, Summer, and Oak Streets to get to the bridge and avoid the congestion on Main Street caused by the traffic signals at Pine and Mill/Bennoch Road. The distance from Main Street at Goodridge Drive to the bridge is 1,050 feet if you make a left out of Goodridge onto Main and follow it straight to the bridge. On the other hand, if you use the more circuitous route of local streets east of Main Street, the distance is 3,275 feet - over three times as far, but you have no time delays due to the traffic signals. While this path may be appealing to some locals, it is our opinion, that because this route is comprised of mainly local residential streets, we do not think it would be wise to actively publicize it as a reliever path for the general public, including out-of-towners – to avoid congestion on Main Street. Therefore, we would suggest that no formal action be taken by the Town to promote this alternative route, but let word-of-mouth determine its usage. Closely monitoring the traffic signal timings on Main Street and keeping them optimized may be the more prudent approach for the Town to keeping travel times to a minimum.

Conclusions and Suggestions

In summary, our Main Street conclusions and suggestions for the Town's consideration are as follows:

- Consider the adoption of a Completes Streets Policy in keeping with the Town's Comprehensive Plan.
- Reduce the travel lane widths to 11 feet and in some cases 10.5 feet where necessary as a traffic calming measure and to allow greater pavement area for other mode uses. Note: This has already been accomplished as part of the MaineDOT paving project in 2015.
- Intersection capacity analyses at Westwood Drive, Goodridge Road, Pine Street, and Mill Street/Bennoch Road did not reveal any failing movements, but the analyses did seem to indicate that some minor revisions in the Pine Street/Mill/Bennoch signal timings could be made to reduce side street delays.
- The most recent crash data from MaineDOT did not reveal any High Crash Locations and reasons for concern within the corridor. However, all crosswalks should be assessed for their nighttime illumination.
- The crosswalk at the end of Jupiter Street should to be painted.
- Consideration should be given to consolidating crosswalks – there are an overabundance presently. In our view the one at the Main View Apartments could be eliminated, and we support the Town's pilot effort to eliminate the Municipal Complex crosswalk in favor of the Pine Street intersection's signalized crosswalk. In keeping with this initiative, we have suggested modifications to the pedestrian phase timing at this

location and the addition of a blank out sign warning motorists of pedestrians in the crosswalk.

- The crosswalk at Mill Street should be eliminated and pedestrians redirected to nearby the Bennoch Road crossing. This will remove some existing pedestrian/vehicle conflicts.
- Consideration should be given to the incorporation of curb extensions and/or speed tables, or both, for traffic calming and increased pedestrian safety within the corridor. See the proposed Concept Plan.
- Implementing a "school zone" on Main Street at Goodridge Drive does not seem necessary given all of the other signage that is present in this area and the fact that a crossing guard in present during school arrivals and departures.
- Enhanced bicycle accommodations are proposed for the corridor using the concept of "shared" lanes. This issue was dictated by the need to also accommodate on-street parking within the corridor.
- The existing transit service is quite successful within this area of Town. The addition of shelters for the Black Bear Express is one improvement that could be considered, though. Orono should also continue to be supportive of this initiative by looking for other ways to enhance these services in the future when practical.
- A few signage suggestions and recommendations have been identified along with the idea of conducting a formalized "wayfinding" program to coordinate and accentuate the messaging that is necessary within the corridor.
- Finally, the idea of formalizing a local detour route to Main Street using side streets was looked at but not recommended over keeping the signal timings on Main Street optimized.

3 - School Campus Circulation and Municipal Complex Access

The Study Team met with the Superintendent of the Orono Schools, Dr. Harriman, on May 19, 2015 to get apprised of the School Department's current operations and any future plans that may be under consideration for the campus. We learned that the overall population was roughly as follows:

Elementary Students	250
Middle School Students	160
High School Students	360 (180 are tuition students from other towns)
Staff	55
Total	825

Approximately 75% of the elementary students are driven to and from school by their parents. They use the mini-lot there for pick up and drop off. Very few students drive to school, and while there are traditional school buses for student transportation, the School Department is a strong advocate for the concept of a "walking school bus", a Safe Routes to School idea. As a result, there is a large percentage of walkers to and from school on a daily basis.

The complex is not only active during school hours, but also at most other times with after school events, various community activities, and the trail head on campus. As such, the School Department has been working on a multi-year, multi-phased improvement Master Plan. From a traffic engineering perspective if this Plan could include a secondary access to the campus from Forest Avenue it would have a noticeable positive impact on Main Street traffic during the AM peak hour. Residents traveling to the school campus on Forest Avenue and Bennoch Road could use the secondary entrance rather than Main Street as an alternative and relieve some of the peak hour pressure on Main Street. We do not think this would represent a large volume of traffic, but it would provide an option for residents and restore some capacity into the Main Street corridor.

Current start times in the morning for the schools were found to be:

Elementary	8:30AM
Middle/High	7:45-8:00AM

The traffic turning movements recorded on April 16 at Main Street and Goodridge and Main Street and Westwood reflect start these times. At Goodridge between 7:30AM and 8:30AM (all school as well as municipal complex arrivals) there were 174 RT's and 51 LT's into Goodridge from Main Street. Exiting traffic at this location between 8:15AM and 8:45AM (likely elementary student parents leaving) were 24 RT's and 40 LT's. As to be expected, these values represent the peak traffic on Goodridge in the AM. This also coincides with the peak traffic in the morning on Main Street. At Westwood the morning arrival numbers between 7:00 AM and 8:00 AM are 59 RT's and 84 LT's into Westwood with 68 RT's and 79 LT's exiting Westwood.

In the afternoon, the traffic patterns are similar. At Goodridge between 2:30PM and 3:15PM (likely arriving parents for pick up at the elementary school) the entering traffic to Goodridge was 71 RT's and 35 LT's. Exiting traffic at this location between 3:00PM and 3:45PM (likely elementary student parents leaving) were 30 RT's and 51 LT's. Similar to the morning pattern, these time periods represent the heaviest traffic volumes on Goodridge in the PM. Interestingly, this time period is also the peak travel time on Main Street. When schools are not in session Main Street's AM peak hour remains the same, but in the afternoon the PM peak hour shifts from 2:00 PM - 3:00 PM to 5:00 PM - 6:00PM.

The current internal circulation pattern within the school complex was also reviewed with School staff, and no significant issues warranting possible changes were identified. However, we did explore making some traffic pattern changes on Goodridge Drive to address levels of service issues at the Goodridge Drive intersection with Main Street and these have been discussed previously in Section 1. In the end, it is our opinion that the existing traffic circulation pattern is fine as is and no changes seem to offer any significant benefits.

4 - The Alley between Mill Street and the Public Parking Lot off Pine Street

The alley between Mill Street and the public parking lot off Pine Street currently provides 7 parking spaces (including 1 handicapped space) and a direct connection for vehicles between Mill Street and the Pine Street parking lot. The parking survey conducted in 2012 that is referenced in Section 1 under the Parking discussion indicated that the 26 Mill Street parking spaces are generally filled to capacity (greater than 70%) - 16 out of the 23 time periods surveyed. The Pine Street lot was found to be at capacity during Friday and Saturday evenings with heavy demand at a few other times.

It has been mentioned that delivery trucks sometimes block Mill Street when unloading for area establishments and the alley becomes a convenient way for vehicles to avoid this temporary roadblock.

Closure of this alley and converting it to a pedestrian only gathering space would mean losing 7 prime spaces within the downtown commercial area and the direct connection to the Pine Street parking lot from Mill Street. Closure would cause vehicles that had turned off Main Street looking for a parking space on Mill Street to continue on Mill Street to Pleasant Street, make a right onto Pleasant, travel to Pine, and make a right on Pine to access the Pine Street parking lot – a travel distance of 1,300 feet verses 130 feet if they used the alley. This added travel time would be roughly 1-2 minutes. In addition, this circuitous route is not intuitive, and therefore we would suggest that wayfinding signage should be added on Mill, Pleasant and Pine Streets to direct drivers not familiar with the area to the Pine Street lot if there were no available spaces on Mill Street.

5 – Longer-Term Considerations, including Future Roadway Connectivity West of Main Street and Satellite Park-and-Ride Lots

Roadway Connectivity

The development pattern along the west side of Main Street south of the downtown to Kelley Road is a series of dead end residential streets, with the exception of Dirigo Pines and portions of the Maplewood/Gilbert Street neighborhood. Westwood, Spencer, Mainewood, Gilbert, Page Place, Sunset Drive, Willow Drive, and Williamson Lane are all dead end streets. The Town's Comprehensive Plan Update (2014) discusses the advantages and disadvantages of this style of development and concludes that interconnectivity, even minimally so, is a better approach to local street design and should be followed going forward. The Comprehensive Plan Update (2014) goes on to recommend that an "official map" be prepared by the Town "to guide the future, interconnected routes of local streets in designated growth and transitional areas." As transportation planners and engineers, Sebago supports this policy recommendation and can see some long term benefits to interconnecting the dead end streets mentioned above. Interconnections will provide these neighborhoods an alternative north-south route to Main Street, which at some point in the future may welcome some congestion relief.

Satellite Park-and-Ride Lots

There has been some interest expressed locally about constructing Park-and-Ride Lots on the outskirts of town for commuters destined for the University and/or Orono's downtown. Both of these destinations are constrained for parking, and the thought is that a park-and-ride lot on Kelley Road or Stillwater Avenue for out-of-towners could provide a place for commuters to drop off their cars and ride their bikes to their final destination. The Community Connector also could service these lots and provide another alternative for travel to these two locations. This Travel Demand Management strategy would encourage carpooling, the use of alternative transportation modes, and supports the Town's Comprehensive Plan. As such, we think it is worthy of the Town's serious consideration for the future.

Off Road Multi-Use Path

The idea of an off-road multi-use path or trail has also emerged out of this Study effort. This notion combines the goal of roadway connectivity with the satellite Park-and-Ride Lots described above and would consist of the creation of a new off-road pathway or trail west of Main Street that would link Kelley Road with the School campus and possibly even Forest Avenue so that non-residents could travel to downtown or the University from a Park-and-Ride Lot on Kelley Road along a natural wooded off-road pathway without the conflict of traffic on Main Street (Route 2). Such a pathway, could also provide a new and desirable addition to the Town's trail network for Town residents.

Stillwater Avenue Traffic Signal Improvements

The MaineDOT is working on a traffic signal improvement project for Stillwater Avenue. It is felt that if this project is successful in increasing mobility within this corridor, it may result in University destined traffic using the Stillwater Exit off I-95 rather than the Kelley Road Exit and thus traffic on Main Street in Orono will realize some relief. We agree with this hypothesis and hope that the Town is supportive of this MaineDOT initiative.

Appendices

MaineDOT
Complete Streets Policy

The Maine Department of Transportation (MaineDOT) has a long history of providing for the needs of all modes of travel in the planning, programming, design, rehabilitation, maintenance, and construction of the state's transportation system. In partnership with municipalities, Metropolitan Planning Organizations, Regional Planning Organizations, Federal Highway Administration and other federal agencies, MaineDOT develops and implements a safe, comprehensive transportation system that balances the needs of all users.

By a letter dated May 24th, 2013, the Joint Standing Committee on Transportation specifically requested that MaineDOT formalize its current practices and policies into a Complete Streets policy, and to post all relevant and related policies on one section of the MaineDOT website. To that end, MaineDOT and its partners reviewed applicable state laws and policies (consistent with the goals of the Maine Sensible Transportation Policy Act and associated Rules (23 M.R.S. § 73 et al), federal laws and policies related to bicycle transportation and pedestrian walkways (23 US Code § 217 (g)), as well as federal laws and policies related to civil rights and other non-discrimination requirements, that either recommend or require that transportation agencies consider bicycle and pedestrian access needs as part of all transportation improvement plans and projects. MaineDOT and its partners developed this policy which incorporates current policies, best practices, as well as applicable state and federal requirements.

Policy Statement

The intent of this formalized policy (and related policies) is to help ensure that all users of Maine's transportation system—our customers—including bicyclists, pedestrians, people of all ages and abilities, transit users, and motor vehicle users, have safe and efficient access to the transportation system.

MaineDOT strongly supports a multimodal transportation system, and recognizes that pedestrian and bicycle infrastructure such as sidewalks, bicycle lanes, separated facilities, transit stops, ADA-accessible routes, and travel lanes are important elements of the transportation system. Such a multimodal system is crucial to the safety and economic vibrancy of businesses, villages, downtowns, neighborhoods, and rural areas.

Addressing the needs of bicyclists, motorists, pedestrians, and transit users early in the system planning process is cost-effective, efficient, and critical to the development of a balanced and safe transportation system.

MaineDOT and its project partners must consider the needs of all users when planning and developing projects. Implementation of this policy shall apply to relevant projects funded partially or in full through MaineDOT, including Metropolitan Planning Organization and Local Project Administration Program projects. This policy applies regardless of the reason the project was initiated.

This policy applies to relevant new construction, rehabilitation and reconstruction projects, including but not limited to bridge, highway, intersection, safety, multimodal, transit, rail, lane and shoulder widths/markings during repaving, developer-initiated projects, and new-capacity corridor projects.

Each relevant project undertaken or supported by MaineDOT will include an analysis and documentation of how consideration of all users (including motorists,, transit riders, bicyclists, and pedestrians of all abilities) of the transportation system will have safe access to the completed project where warranted and feasible. (see "Project Relevance and Feasibility" below)

A project meets the intent of this policy when the project includes proposed safe accommodations for all users, or project documentation outlines the reasoning for not providing specific accommodations. Statements pertaining to how pedestrians of all abilities and bicyclists will have safe access to the completed project will be included in all appropriate project related documentation, including the scoping and preliminary design reports. Safe and efficient mobility for motor vehicles is an important element of this policy; this policy is intended to help ensure that our streets are built to provide safe and efficient mobility for all users.

Project Relevance and Feasibility
A project is relevant if the type of project includes an opportunity to include safe accommodation as part of the project, including additional shoulder width through restriping, additional pavement for paved shoulders, crossing improvements, and/or a sidewalk or separated facility.

System preservation projects, which include repaving, are projects intended to address maintenance of the existing system and do not typically provide an opportunity to increase roadway width, add sidewalks, or otherwise add additional assets to the transportation system. These projects may offer the opportunity to improve conditions with signage, restriping, reducing travel lane widths, or other non-widening options. System preservation projects should not decrease the safety for any road users.

Specific accommodations including sidewalks are not warranted or feasible in some locations. The reasoning for a decision to not include a specific accommodation(s) can include:

- Where the project exists in an area where scarcity of population indicate the absence of a need for specific facilities currently or in the future. For pedestrian improvements, these are typically outside of Qualifying Pedestrian Areas as determined by MaineDOT as described in the Local Cost Sharing Policy and the Definitions section below.
- Where there are engineering, financial, or environmental constraints as approved by a Program Manager, and if necessary approved by a Bureau Director.
- Where pedestrians or bicyclists are prohibited.

If specific accommodations have been determined to be not warranted or feasible, the reasoning for such decisions will be included in appropriate project related documentation, including scoping and preliminary design reports.

Providing Safe Access Options
Safe access options are varied and determined on a case by case basis, and accommodation options may include but are not limited to:

- providing paved shoulders for bicyclists and pedestrians of all abilities outside of village and business areas;
- providing paved shoulders or bike lanes, separated facilities, sidewalks, and safe crossing and intersection improvements in village or business areas;
- providing traffic calming, signage, and proper maintenance of facilities.

MaineDOT's Local Cost Sharing Policy includes local match requirements for new sidewalks where warranted, and for community interest elements including lighting, park benches, landscaping, trees, etc. that MaineDOT determines is an eligible component of the project. As outlined in the Local Cost Sharing Policy, sidewalks requested outside of Qualifying Pedestrian Areas (determined on a project by project basis in coordination with the MaineDOT Bicycle and Pedestrian Coordinator), will be considered a local interest element.

Example Project Type and Potential Solution Matrix
This is a sample list and is not meant to be exclusive

Type of Work (SCOPE)	**Relevant to Complete Streets Policy**	**Potential Bicycle and Pedestrian Access Options where warranted**
Highway or Bridge New Construction or Reconstruction	Yes	Paved Shoulders, Bike Lanes, Sidewalks, Separated Facilities, Crossing Improvements, Pavement Markings, Signage, ADA access improvements.
Bridge Preservation including painting, deck replacement, etc.	Limited	No opportunity exists to widen bridge for additional shoulders and/or sidewalk, however restriping is a possibility
Preservation Paving including Light Capital Paving	Limited *(No opportunity for increased width for new sidewalks and/or shoulders)*	Potential ADA improvements (See ADA Compliance Policy). Potential restriping of travel widths, number of

		lanes, pavement markings, and shoulder widths if community requests or if MaineDOT initiates.
New Signal or Signal Modification	Yes	Potential ADA improvements (See ADA Compliance Policy). Pedestrian Crossing Improvements. Consider signal detection of bicycles and consider associated pavement markings.
Lighting	No	These projects typically improve the quality of the community environment by reducing light where not wanted, and reducing interference with the night sky.
Striping	Limited	Potential travel lane and shoulder width adjustments, or other pavement markings, if community requests or MaineDOT initiates.
Pavement Maintenance Activities	No	These projects typically improve the overall safety for all road users, but do not provide an opportunity to add additional width or restripe the roadway.

Continued Implementation

Collaboration throughout MaineDOT and its transportation partners is essential for the implementation of this policy. Implementation of this policy includes developing and updating relevant design and policy manuals, guidance and training necessary to ensure that individuals involved in planning, scope development, design, project development, and building the improvements have the tools, knowledge, and direction necessary to successfully implement this policy.

The Maine Bicycle and Pedestrian Council (MBPC) will serve as the appointed group that will review and recommend relevant policy changes to MaineDOT. The MaineDOT Complete Streets Policy Committee will meet regularly to review relevant policies, and to consider MBPC policy recommendations and propose changes to relevant policies through the Engineering Council.

Related Policies, Laws, Rules, Guides and Training Programs:
This policy statement and relevant internal guidelines and policies are available on the MaineDOT website for easy access and improved understanding by our customers and partners throughout the state.

The most updated policies, laws, rules, and training programs at MaineDOT that relate (including but not limited to those listed below) shall be maintained in the Complete Streets Policy section of the website. All policies will be continuously updated when necessary to further implement the goals of this policy.

- Department of Justice ADA Standards for Accessible Design
- Traffic Permit Approval Processes
- Entrance Permit Policies and Procedures
- MaineDOT ADA Compliance Policy
- MaineDOT Bridge Design Guide
- MaineDOT Design Exception Processes
- MaineDOT Guidelines on Crosswalks
- MaineDOT Guidelines for the Use of Traffic Calming Devices
- MaineDOT Highway Design Guide
- MaineDOT Local Cost-Sharing Policy
- MaineDOT Local Project Administration Manual/Trainings
- MaineDOT Practical Design Guidance
- MaineDOT Public Involvement Plan
- MaineDOT Shoulder Surface-Type Policy
- Maine's Strategic Highway Safety Plan
- Manual on Uniform Traffic Control Devices (MUTCD)
- Municipal Comprehensive Planning Requirements
- Sensible Transportation Policy Act and Rule
- Traffic Movement Policies and Procedures

Project Basic Implementation Checklist (not all-inclusive)
All phases of project planning, scoping, public participation and design:

1. Determine options for how bicyclists, pedestrians, transit, and motor vehicles including trucks will have safe and efficient access to project area when project is finished.
2. Determine whether a paved shoulder is needed and how wide it will be.
3. Determine whether a sidewalk is needed and proposed beginning and end points to ensure connectivity. (consult Bicycle and Pedestrian Program Manager for assistance if needed)
4. Determine whether a separated bike and pedestrian facility is needed.
5. Determine whether a pedestrian crossing improvement is needed at intersections and mid-block locations.
6. Determine appropriate travel lane widths.
7. Determine number of lanes required for current and projected traffic movements.

8. Determine whether a corner radius can or should be reduced to reduce pedestrian crossing time and distance, which can also benefit motor vehicles by reducing the pedestrian phase requirements for the intersection.
9. In all project related documents, including Preliminary Design Reports (use Projex for non-PDR projects), outline suggested access options for all modes including motor vehicles, bicyclists, and pedestrians.
10. Outline reasoning and appropriate approvals as listed in Policy for not including a preferred solution if solution is infeasible.
11. At initial public meetings, be prepared to include a description of how bicyclists and pedestrians of all ages and abilities are intended to use the project when completed.
12. Contact the MaineDOT Bicycle and Pedestrian Program Manager for assistance on the appropriate solution for bicyclists and pedestrians, and for which local bike and pedestrian plans or groups may be available for project consultation and/or communication.

Definitions

ADA: The American with Disabilities Act, 42 U.S.C § 12101, et. seq.

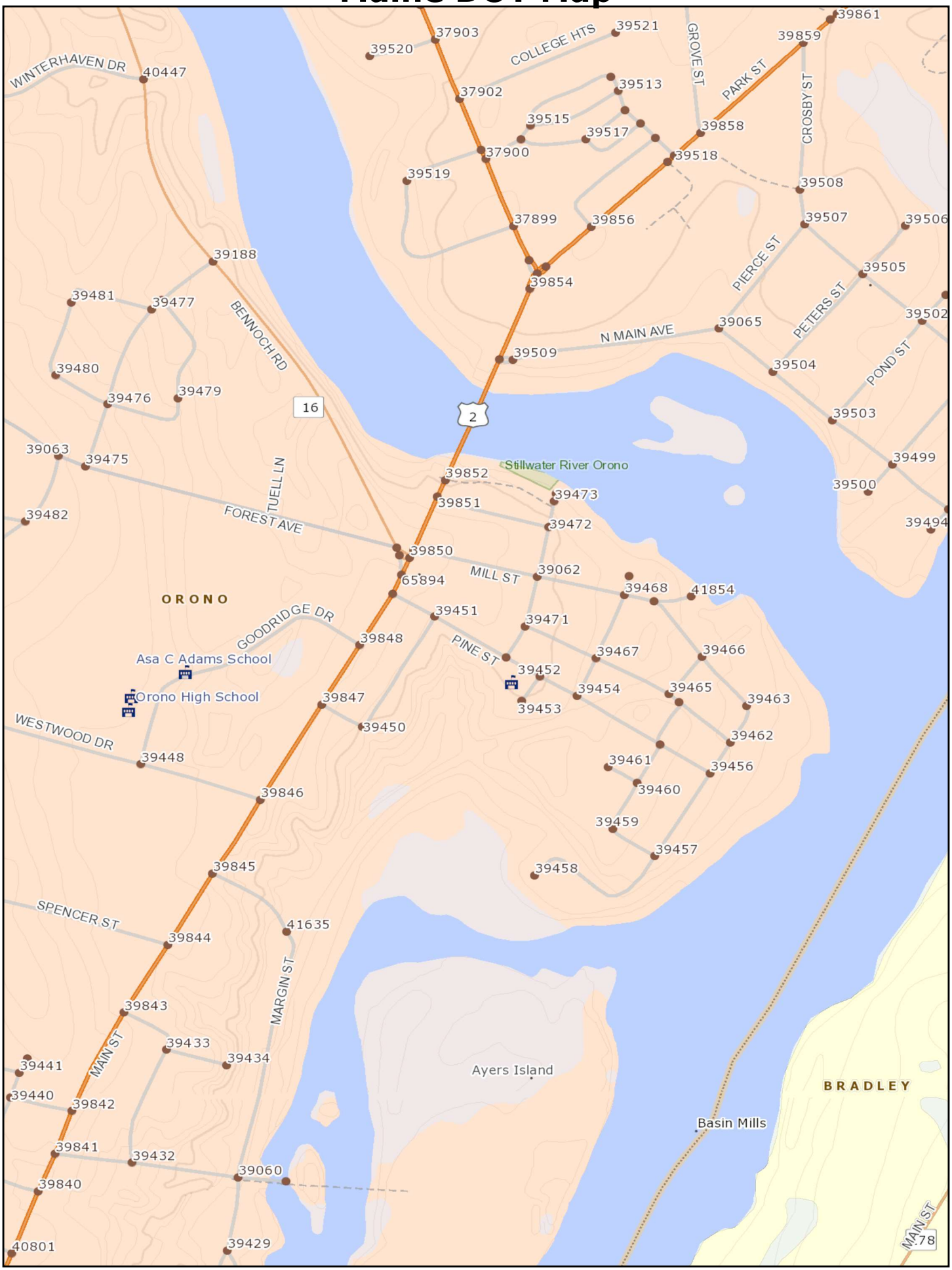
Qualifying Pedestrian Area: An area that MaineDOT determines will have substantive pedestrian activity or use during the expected life-cycle of the project. In making this determination, MaineDOT will be guided by the existing, planned, or forecasted sidewalks and/or pedestrian generators (including neighborhoods, businesses, government buildings, village areas, schools, recreational facilities, etc.), directly adjacent or within reasonable walking distance. Other factors include whether the existing or future pedestrian activity is consistent with the municipal transportation plan, comprehensive plans, capital plans, zoning, and/or other longer-term planning and investment (including actual documented funding implementation) documents that have been adopted by the legislative body of the municipality.

Date: 6/18/14

David Bernhardt

Commissioner

Maine DOT Map



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General Roads

- *Interstate*
- *US Routes*
- *State Routes*
- *Public Roads*

Nodes

MaineDOT Regions

State Urban

Water Bodies

Boundary Lines

- *coastline*
- *county*
- *state*
- *town*

Wetlands

Conserved Lands

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

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

Rt 2

REPORT PARAMETERS

Year 2012, Start Month 1 through Year 2014 End Month: 12

Route: 0002X	Start Node: 39846	Start Offset: 0	☐ Exclude First Node
	End Node: 39852	End Offset: 0	☐ Exclude Last Node

Crash Summary I

Nodes

Node	Route - MP	Node Description	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual M Ent-Veh	Crash Rate	Critical Rate	CRF
39846	0002X - 151.54	Int of MAIN ST WESTWOOD DR	2	2	0	0	0	0	2	0.0	4.949	0.13	0.36	0.00
												Statewide Crash Rate:	0.14	
39847	0002X - 151.66	Int of JUNIPER ST MAIN ST	2	2	0	0	0	1	1	50.0	4.773	0.14	0.36	0.00
												Statewide Crash Rate:	0.14	
39848	0002X - 151.73	Int of GOODRIDGE DR MAIN ST	2	1	0	0	0	0	1	0.0	4.973	0.07	0.36	0.00
												Statewide Crash Rate:	0.14	
39849	0002X - 151.79	Int of MAIN ST PINE ST	9	2	0	0	0	0	2	0.0	5.237	0.13	1.16	0.00
												Statewide Crash Rate:	0.66	
A65894	0002X - 151.81	Int of MAIN ST RD INV 3209229	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
P39850	0002X - 151.83	Int of BENNOCH RD MAIN ST	9	15	0	0	1	2	12	20.0	5.875	0.85	1.13	0.00
												Statewide Crash Rate:	0.66	
A39488	0002X - 151.84	Int of MAIN ST, MILL ST	2	0	0	0	0	0	0	0.0	0.000	0.00	0.00	0.00
												Statewide Crash Rate:	0.14	
39851	0002X - 151.90	Int of MAIN ST OAK ST	2	7	0	1	0	0	6	14.3	5.791	0.40	0.34	1.18
												Statewide Crash Rate:	0.14	
39852	0002X - 151.92	Non Int MAIN ST	2	2	0	0	0	1	1	50.0	2.774	0.24	0.41	0.00
												Statewide Crash Rate:	0.14	
Study Years:	3.00	NODE TOTALS:		31	0	1	1	4	25	19.4	34.372	0.30	0.44	0.68

Crash Summary I

Sections

Start Node	End Node	Element	Offset Begin - End	Route - MP	Section Length	U/R	Total Crashes	Injury Crashes K	A	B	C	PD	Percent Injury	Annual HMVM	Crash Rate	Critical Rate	CRF
39846	39847	3123179	0 - 0.12	0002X - 151.54	0.12	2	4	0	0	0	0	4	0.0	0.00566	235.61	433.15	0.00
Int of MAIN ST WESTWOOD DR				US 2											Statewide Crash Rate: 190.05		
39847	39848	3111078	0 - 0.07	0002X - 151.66	0.07	2	4	0	0	0	0	4	0.0	0.00332	402.04	495.82	0.00
Int of JUNIPER ST MAIN ST				US 2											Statewide Crash Rate: 190.05		
39848	39849	3111079	0 - 0.06	0002X - 151.73	0.06	2	5	0	0	0	0	5	0.0	0.00289	576.54	513.73	1.12
Int of GOODRIDGE DR MAIN ST				US 2											Statewide Crash Rate: 190.05		
39849	65894	3139918	0 - 0.02	0002X - 151.79	0.02	2	2	0	0	0	0	2	0.0	0.00094	708.60	681.34	1.04
Int of MAIN ST PINE ST				US 2											Statewide Crash Rate: 190.05		
65894	39850	2846305	0 - 0.02	0002X - 151.81	0.02	2	0	0	0	0	0	0	0.0	0.00089	0.00	689.59	0.00
Int of MAIN ST RD INV 3209229				US 2											Statewide Crash Rate: 190.05		
39488	39850	3116844	0 - 0.01	0002X - 151.83	0.01	2	0	0	0	0	0	0	0.0	0.00056	0.00	758.12	0.00
Int of MAIN ST, MILL ST				US 2											Statewide Crash Rate: 190.05		
39488	39851	3132115	0 - 0.06	0002X - 151.84	0.06	2	6	0	0	0	0	6	0.0	0.00323	618.56	499.08	1.24
Int of MAIN ST, MILL ST				US 2											Statewide Crash Rate: 190.05		
39851	39852	3111080	0 - 0.02	0002X - 151.90	0.02	2	0	0	0	0	0	0	0.0	0.00111	0.00	655.36	0.00
Int of MAIN ST OAK ST				US 2											Statewide Crash Rate: 190.05		
Study Years: 3.00				Section Totals:	0.38		21	0	0	0	0	21	0.0	0.01861	376.23	331.41	1.14
				Grand Totals:	0.38		52	0	1	1	4	46	11.5	0.01861	931.62	468.63	1.99

Crash Summary

Section Details

Start Node	End Node	Element	Offset Begin - End	Route - MP	Total Crashes	Injury Crashes K	A	B	C	PD	Crash Report	Crash Date	Crash Mile Point	Injury Degree
39846	39847	3123179	0 - 0.12	0002X - 151.54	4	0	0	0	0	4	2013-19056	08/05/2013	151.56	PD
											2013-28554	11/11/2013	151.59	PD
											2013-34575	12/26/2013	151.60	PD
											2012-22943	02/26/2012	151.64	PD
39847	39848	3111078	0 - 0.07	0002X - 151.66	4	0	0	0	0	4	2012-42924	10/31/2012	151.68	PD
											2014-24856	09/07/2014	151.69	PD
											2013-10988	04/28/2013	151.71	PD
											2014-14953	05/31/2014	151.72	PD
39848	39849	3111079	0 - 0.06	0002X - 151.73	5	0	0	0	0	5	2014-1761	01/15/2014	151.75	PD
											2014-35209	12/12/2014	151.75	PD
											2012-38048	09/04/2012	151.77	PD
											2014-15034	05/21/2014	151.77	PD
											2014-26733	10/03/2014	151.78	PD
39849	65894	3139918	0 - 0.02	0002X - 151.79	2	0	0	0	0	2	2013-30392	11/26/2013	151.80	PD
											2012-30286	06/02/2012	151.80	PD
65894	39850	2846305	0 - 0.02	0002X - 151.81	0	0	0	0	0	0				
39488	39850	3116844	0 - 0.01	0002X - 151.83	0	0	0	0	0	0				
39488	39851	3132115	0 - 0.06	0002X - 151.84	6	0	0	0	0	6	2014-26614	09/27/2014	151.86	PD
											2013-34453	12/17/2013	151.87	PD
											2013-33773	12/20/2013	151.88	PD
											2013-13287	05/30/2013	151.88	PD
											2012-26818	04/19/2012	151.88	PD
											2012-25018	03/20/2012	151.88	PD
39851	39852	3111080	0 - 0.02	0002X - 151.90	0	0	0	0	0	0				
				Totals:	21	0	0	0	0	21				

Crash Summary II - Characteristics

Crashes by Day and Hour

	AM												PM													
	Hour of Day																									
Day Of Week	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	Un	Tot
SUNDAY	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3
MONDAY	0	0	0	0	0	0	0	0	0	1	2	1	0	0	1	1	0	1	0	1	0	0	0	0	0	8
TUESDAY	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	1	0	0	0	1	0	0	0	0	7
WEDNESDAY	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	2	1	0	1	0	0	0	0	0	0	8
THURSDAY	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	2	1	1	1	2	1	0	0	0	0	10
FRIDAY	0	0	0	0	0	0	1	1	0	1	0	1	1	2	1	0	0	0	1	0	0	0	1	0	0	10
SATURDAY	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	1	1	0	0	0	0	0	0	0	6
Totals	0	1	0	0	0	0	2	1	3	3	5	3	4	3	5	5	4	3	4	3	2	0	1	0	0	52

Vehicle Counts by Type

Unit Type	Total
1-Passenger Car	66
2-(Sport) Utility Vehicle	12
3-Passenger Van	5
4-Cargo Van (10K lbs or Less)	2
5-Pickup	13
6-Motor Home	0
7-School Bus	1
8-Transit Bus	1
9-Motor Coach	0
10-Other Bus	1
11-Motorcycle	1
12-Moped	0
13-Low Speed Vehicle	0
14-Autocycle	0
15-Experimental	0
16-Other Light Trucks (10,000 lbs or Less)	0
17-Medium/Heavy Trucks (More than 10,000 lbs)	6
18-ATV - (4 wheel)	0
20-ATV - (2 wheel)	0
21-Snowmobile	0
22-Pedestrian	0

Unit Type	Total
23-Bicyclist	0
24-Witness	8
25-Other	0
Total	116

Crash Summary II - Characteristics

Crashes by Driver Action at Time of Crash

Driver Action at Time of Crash	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
No Contributing Action	6	41	8	1	0	0	56
Ran Off Roadway	0	0	0	0	0	0	0
Failed to Yield Right-of-Way	14	0	0	0	0	0	14
Ran Red Light	0	0	0	0	0	0	0
Ran Stop Sign	0	0	0	0	0	0	0
Disregarded Other Traffic Sign	0	0	0	0	0	0	0
Disregarded Other Road Markings	0	0	0	0	0	0	0
Exceeded Posted Speed Limit	0	0	0	0	0	0	0
Drove Too Fast For Conditions	2	0	0	0	0	0	2
Improper Turn	3	0	0	0	0	0	3
Improper Backing	2	0	0	0	0	0	2
Improper Passing	1	0	0	0	0	0	1
Wrong Way	0	0	0	0	0	0	0
Followed Too Closely	15	2	1	0	0	0	18
Failed to Keep in Proper Lane	3	0	0	0	0	0	3
Operated Motor Vehicle in Erratic, Reckless, Careless, Negligent or Aggressive Manner	2	1	0	0	0	0	3
Swerved or Avoided Due to Wind, Slippery Surface, Motor Vehicle, Object, Non-Motorist in Roadway	0	0	0	0	0	0	0
Over-Correcting/Over-Steering	0	0	0	0	0	0	0
Other Contributing Action	3	0	0	0	0	0	3
Unknown	1	0	0	0	0	0	1
Total	52	44	9	1	0	0	106

Crashes by Apparent Physical Condition And Driver

Apparent Physical Condition	Dr 1	Dr 2	Dr 3	Dr 4	Dr 5	Other	Total
Apparently Normal	50	45	9	1	0	0	105
Physically Impaired or Handicapped	0	0	0	0	0	0	0
Emotional(Depressed, Angry, Disturbed, etc.)	0	0	0	0	0	0	0
Ill (Sick)	0	0	0	0	0	0	0
Asleep or Fatigued	1	0	0	0	0	0	1
Under the Influence of Medications/Drugs/Alcohol	0	0	0	0	0	0	0
Other	1	0	0	0	0	0	1
Total	52	45	9	1	0	0	107

Driver Age by Unit Type

Age	Driver	Bicycle	SnowMobile	Pedestrian	ATV	Total
09-Under	0	0	0	0	0	0
10-14	0	0	0	0	0	0
15-19	13	0	0	0	0	13
20-24	40	0	0	0	0	40
25-29	5	0	0	0	0	5
30-39	9	0	0	0	0	9
40-49	14	0	0	0	0	14
50-59	12	0	0	0	0	12
60-69	10	0	0	0	0	10
70-79	4	0	0	0	0	4
80-Over	1	0	0	0	0	1
Unknown	0	0	0	0	0	0
Total	108	0	0	0	0	108

Crash Summary II - Characteristics

Most Harmful Event

Most Harmful Event	Total	Most Harmful Event	Total
1-Overturn / Rollover	0	38-Other Fixed Object (wall, building, tunnel, etc.)	1
2-Fire / Explosion	0	39-Unknown	3
3-Immersion	0	40-Gate or Cable	0
4-Jackknife	0	41-Pressure Ridge	0
5-Cargo / Equipment Loss Or Shift	0	Total	108
6-Fell / Jumped from Motor Vehicle	0		
7-Thrown or Falling Object	0		
8-Other Non-Collision	0		
9-Pedestrian	0		
10-Pedalcycle	0		
11-Railway Vehicle - Train, Engine	0		
12-Animal	0		
13-Motor Vehicle in Transport	93		
14-Parked Motor Vehicle	9		
15-Struck by Falling, Shifting Cargo or Anything Set in Motion by Motor Vehicle	0		
16-Work Zone / Maintenance Equipment	0		
17-Other Non-Fixed Object	0		
18-Impact Attenuator / Crash Cushion	0		
19-Bridge Overhead Structure	0		
20-Bridge Pier or Support	0		
21-Bridge Rail	0		
22-Cable Barrier	0		
23-Culvert	0		
24-Curb	0		
25-Ditch	0		
26-Embankment	0		
27-Guardrail Face	0		
28-Guardrail End	0		
29-Concrete Traffic Barrier	0		
30-Other Traffic Barrier	0		
31-Tree (Standing)	0		
32-Utility Pole / Light Support	2		
33-Traffic Sign Support	0		
34-Traffic Signal Support	0		
35-Fence	0		
36-Mailbox	0		
37-Other Post Pole or Support	0		

Injury Data

Severity Code	Injury Crashes	Number Of Injuries
K	0	0
A	1	1
B	1	1
C	4	4
PD	46	0
Total	52	6

Road Character

Road Grade	Total
1-Level	25
2-On Grade	25
3-Top of Hill	1
4-Bottom of Hill	1
5-Other	0
Total	52

Traffic Control Devices

Traffic Control Device	Total
1-Traffic Signals (Stop & Go)	22
2-Traffic Signals (Flashing)	2
3-Advisory/Warning Sign	0
4-Stop Signs - All Approaches	0
5-Stop Signs - Other	5
6-Yield Sign	0
7-Curve Warning Sign	0
8-Officer, Flagman, School Patrol	0
9-School Bus Stop Arm	0
10-School Zone Sign	0
11-R.R. Crossing Device	0
12-No Passing Zone	1
13-None	22
14-Other	0
Total	52

Light

Light Condition	Total
1-Daylight	42
2-Dawn	0
3-Dusk	2
4-Dark - Lighted	8
5-Dark - Not Lighted	0
6-Dark - Unknown Lighting	0
7-Unknown	0
Total	52

Crash Summary II - Characteristics

Crashes by Year and Month

Month	2012	2013	2014	Total
JANUARY	1	1	1	3
FEBRUARY	2	1	1	4
MARCH	1	0	0	1
APRIL	1	2	0	3
MAY	0	2	2	4
JUNE	3	1	1	5
JULY	0	0	0	0
AUGUST	1	3	1	5
SEPTEMBER	3	2	5	10
OCTOBER	2	0	4	6
NOVEMBER	1	2	2	5
DECEMBER	1	4	1	6
Total	16	18	18	52

Report is limited to the last 10 years of data.

Crash Summary II - Characteristics

Crashes by Crash Type and Type of Location

Crash Type	Straight Road	Curved Road	Three Leg Intersection	Four Leg Intersection	Five or More Leg Intersection	Driveways	Bridges	Interchanges	Other	Parking Lot	Private Way	Cross Over	Railroad Crossing	Total
Object in Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rear End / Sideswipe	9	0	17	2	0	3	0	0	0	0	0	0	0	31
Head-on / Sideswipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Movement	0	0	8	0	0	7	0	0	0	0	0	0	0	15
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Train	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Went Off Road	2	0	1	0	0	1	0	0	0	0	0	0	0	4
All Other Animal	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Jackknife	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rollover	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Submersion	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thrown or Falling Object	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bear	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deer	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Moose	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	12	0	27	2	0	11	0	0	0	0	0	0	0	52

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather / Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Blowing Sand, Soil, Dirt												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Blowing Snow												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Clear												
Dark - Lighted	7	0	0	0	0	0	0	0	0	0	0	7
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	25	0	0	0	0	0	1	0	0	0	0	26
Dusk	1	0	0	0	0	0	0	0	0	0	1	2
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Cloudy												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	10	0	0	0	0	0	0	0	0	0	3	13
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

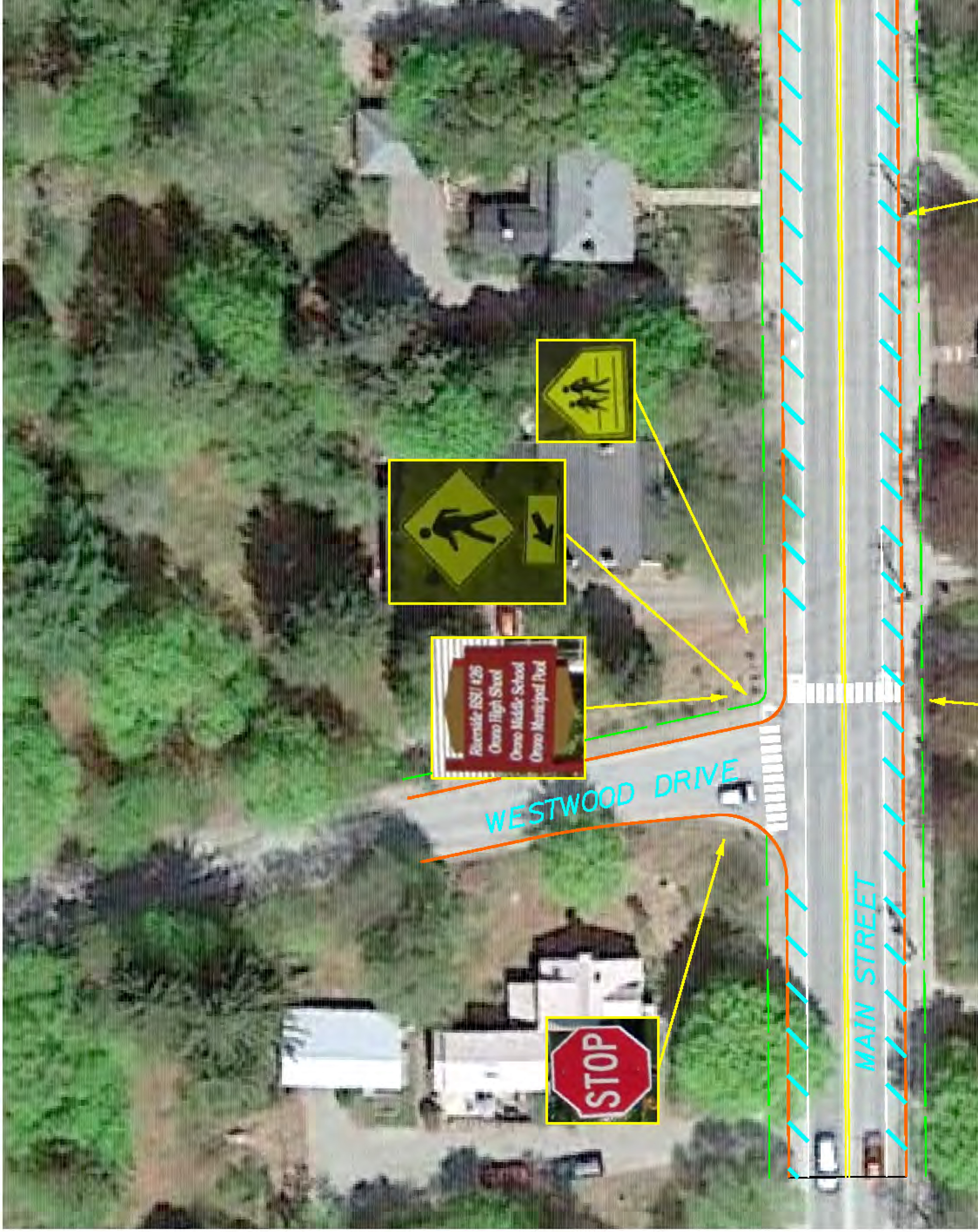
Crashes by Weather, Light Condition and Road Surface

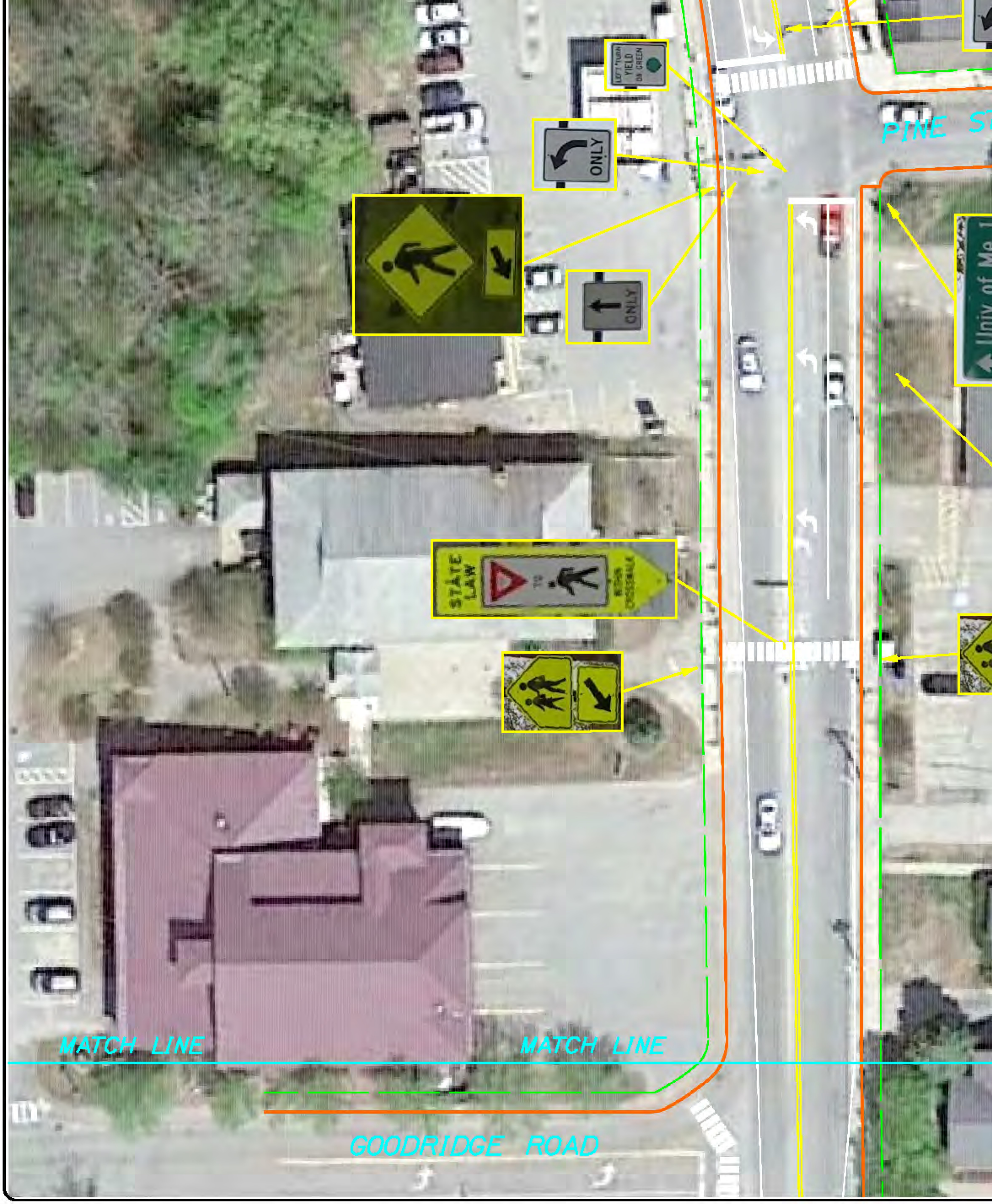
Weather / Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Fog, Smog, Smoke												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Other												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Rain												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	2	2
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Severe Crosswinds												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0

Crash Summary II - Characteristics

Crashes by Weather, Light Condition and Road Surface

Weather / Light	Dry	Ice/Frost	Mud, Dirt, Gravel	Oil	Other	Sand	Slush	Snow	Unknown	Water (Standing, Moving)	Wet	Total
Sleet, Hail (Freezing Rain or Drizzle)												
Dark - Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	0	0	0	0	0
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
Snow												
Dark - Lighted	0	0	0	0	0	0	1	0	0	0	0	1
Dark - Not Lighted	0	0	0	0	0	0	0	0	0	0	0	0
Dark - Unknown Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Dawn	0	0	0	0	0	0	0	0	0	0	0	0
Daylight	0	0	0	0	0	0	0	1	0	0	0	1
Dusk	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	43	0	0	0	0	0	2	1	0	0	0	52


WESTWOOD DRIVE
MAIN STREET
STOP


LEFT TURN YIELD ON GREEN
ONLY
ONLY
STATE LAW
MATCH LINE
MATCH LINE
GOODRIDGE ROAD