

Route 3 Safety Improvements Study

Peabody Drive, Mount Desert

PREPARED FOR



Tony Smith
Public Works Director
Town of Mount Desert
P.O. Box 248
Northeast Harbor, ME 04662
207.276.5743

PREPARED BY



500 Southborough Drive
Suite 105B
South Portland, ME 04106
207.889.3150

September 9, 2020

Table of Contents

Route 3 Safety Improvements Study	1
Executive Summary	1
1. Introduction.....	2
2. Existing Conditions.....	4
2.1 Environment.....	4
Registered Historic Properties	4
Public Parks and Recreation Areas	4
Wetlands	5
Surface Waters	5
Threatened and Endangered Species	5
2.2 Previous Plans and Studies	6
Town of Mount Desert Comprehensive Plan Update	6
Acadia National Park Final Transportation Plan/EIS	7
Town of Mount Desert – Crosswalk Review and Recommendations	7
2.3 Planned and Programmed Projects	7
2.4 Assessment of Current Conditions.....	7
Traffic Volume Data	7
Roadway Data.....	9
Crash Data.....	12
3. Safety Assessment	14
3.1 RSA Team.....	14
3.2 RSA Process.....	14
3.3 Safety Findings	16
Overarching	16
Location 1: Route 198 Intersection to Asticou Inn	18
Location 2: Rock Wall	20
Location 3: Land & Garden Preserve Trailhead	21
Location 4: Little Long Pond	22
Location 5: Stanley Brook Park Entrance/Seal Harbor	24
4. Future Conditions	26
4.1 Future Growth Projections.....	26
Traffic Operations.....	26

4.2 Future Corridor Improvements	28
RSA Recommended Short Term Improvements	28
RSA Recommended Long Term Improvements.....	29
Recommended Geometric Improvements.....	30
Option 1 – Widening Throughout with Retaining Wall Replacement	31
Option 2 – Partial Widening	31
4.3 Opinion of Cost.....	32
Funding Context.....	32
Funding/Implementation.....	33
Appendix A: Endangered Species	34
Appendix B: Traffic Data	35
Appendix C: Crash Data	36
Appendix D1: Concept Plans – Option 1 Widening Throughout with Retaining Wall Replacement.....	37
Appendix D2: Concept Plans – Option 2 Partial Widening	38
Appendix E1: Opinion of Cost – Option 1 Widening Throughout with Retaining Wall Replacement.....	39
Appendix E2: Opinion of Cost – Option 2 Partial Widening	40

Executive Summary

The following report details the Safety Improvements Study conducted along a 2.9-mile section of Route 3 (Peabody Drive) in Mount Desert. Peabody Drive is a scenic route between Northeast Harbor and Seal Harbor and the mountainous terrain leads to fairly steep grades and several sharp or winding curves. The road is used by vehicles, pedestrians, and bicyclists, but current roadway geometries are inconsistent with lane and shoulder widths and types varying throughout the corridor. A team of multidisciplinary stakeholders reviewed traffic, roadway, and crash data for the corridor and conducted field observations to note safety issues and recommend potential solutions.

The long-term safety recommendation is to use reclaimed pavement to construct 11-ft lanes and 5-ft shoulders for most of the corridor and a retaining wall replacement. However, there are also short-term recommendations and maintenance activities that can be implemented in the interim to increase safety for all users. The table below shows corridor-wide recommendations based on timeframe and cost.

	High-Cost	Low-Cost	Non-Capital
Short-Term	Light Capital Paving	Increase level of enforcement for no-parking areas	Upgrade/enhance signage reflectivity
			Add new signage and pavement markings
		Re-evaluate speed limits and lower if warranted	Address drainage structures in disrepair
			Regular tree trimming and ditch maintenance
Long Term	Widen roadway to 11' lanes and 5' shoulders	Increase level of enforcement for no-parking areas	Rock wall preventative maintenance
	Replace retaining wall		Regular tree trimming and ditch maintenance

1. Introduction

VHB was contracted by the Town of Mount Desert (Town) in collaboration with the Maine Department of Transportation (MaineDOT) through MaineDOT's Planning Partnership Initiative (PPI) program to conduct a Safety Improvements Study along a 2.9-mile section of Route 3, also known as Peabody Drive. The project limits for the study begin at the intersection of State Routes 3 and 198 in the Village of Northeast Harbor and continue along Route 3 to the intersection of Stanley Brook Road in the Village of Seal Harbor, as shown in Figure 1 below. This stretch of Route 3 is classified as a State Highway with a Corridor Priority of 3 and is characterized as a Rural Major Collector carrying approximately 3000 vehicles per day, annually. However, due to the seasonal nature of the area this number is much higher during the summer months.

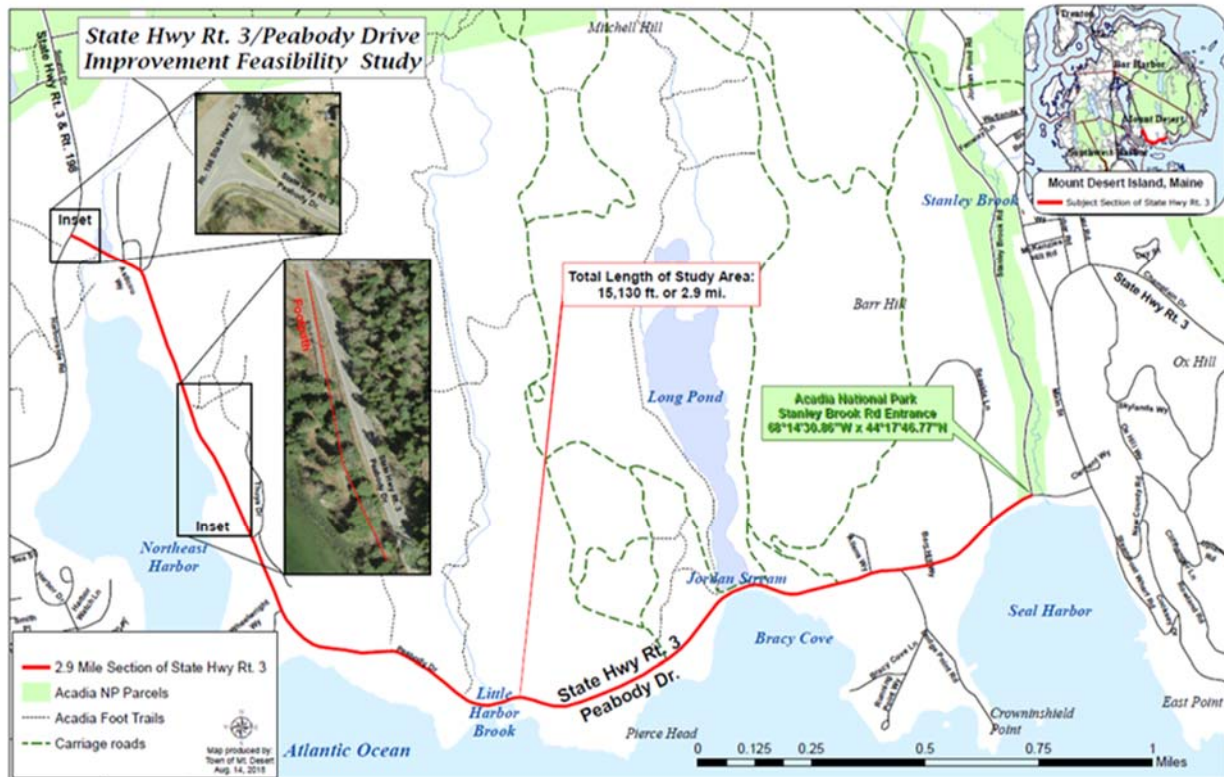


Figure 1. Route 3, Mount Desert Safety Improvements Study Area.

The idea for this study was first brought to the attention of the Town by a group of cyclists who ride this roadway segment on a regular basis and took the initiative to organize and gain local support for the study, including funding, before approaching the Town about their concerns, which include narrow and sometimes unpaved shoulders, varying lane and shoulder widths, and challenging sight distance due to vegetation growth.

This corridor provides access to several of Mount Desert Island's (MDI) most visited locations, including Acadia National Park (ANP), which is one of the most visited National Parks in the

country with over 3.5 million recreational visits in 2018¹. The study corridor includes several local side roads and driveways, which are mostly residential, and includes several trail access points, some with small parking areas. As a result, the traffic increases in the warmer months and includes larger vehicles, some pulling trailers or boats, which makes this corridor a challenge for cyclists and pedestrians. The corridor is also serviced by the Island Explorer bus route #5 as part of its transit service throughout MDI, with stops at Seal Harbor (stop #31) and Asticou Inn/Thuya Garden (stop #67).

Also, ANP is planning on implementing a reservation system for visitor's to Cadillac Mountain and other select locations, which may have secondary traffic impacts along this corridor.

This study will evaluate both low-cost and major improvement options for improving safety for all modes including motorists, buses, cyclists, and pedestrians.

¹ National Park Service. Annual Visitation Highlights, 2018. Available: <https://www.nps.gov/subjects/socialscience/annual-visitation-highlights.htm>

2. Existing Conditions

2.1 Environment

Mount Desert is full of a rich history combined with a majestic landscape, which makes this a prime location for both historic and environmental preservation. A cursory evaluation of the existing environmental features within the study corridor was completed using readily available GIS information from MaineGIS and is documented below.

Registered Historic Properties

There are two properties along the study corridor that are currently listed in the National Register of Historic Places. Seal Harbor Congregational Church, located on the corner of Dodge Point Road, was built in 1900 and was listed in 1986 for its architectural significance, however this property is now a residential home. Saint Jude's Episcopal Church (*shown here in the photo*), located just east of Dodge Point Road along the south side of Peabody Drive, was built in the 1800s and was listed in 1986, also for its architectural significance.



Saint Jude's Episcopal Church

Public Parks and Recreation Areas

The following are public parks and recreational areas in the vicinity of the study area.

1. Acadia National Park
2. Seal Harbor Beach
3. Mount Desert Land & Garden Preserve: this organization manages and cares for approximately 1,683 acres of historic gardens, lands, and trails for the enjoyment of all visitors. Biking, motor vehicles, camping, hunting, trapping, and fires are not permitted. The following are facilities that are included in the preserve:
 - a. Gardens
 - i. Asticou Azalea Garden
 - ii. Thuya Garden
 - iii. Abby Garden
 - b. Trails
 - i. Eliot Mountain Trail
 - ii. Asticou Ridge Trail
 - iii. Asticou Stream Trail
 - iv. Harbor Brook Trail
 - v. David & Neva Trail
 - vi. Friend's Trail
 - c. Little Long Pond: Swimming at Little Long Pond is allowed in designated areas. There are three parking areas with easy access to Little Long Pond, its carriage roads and hiking trails. All have informational kiosks and maps.

- i. Main Gate (10 parking spots) – On Peabody Drive at Bracy Cove. Parallel parking spots along the road, with a couple of head-in spots by the gate.
- ii. Upper Lot (12 parking spots) – Off Peabody Drive less than ½ mile west of the Main Gate entrance.
- iii. Harbor Brook Lot (10 parking spots) – Off Peabody Drive approximately ½ mile west of the Upper Lot.

Wetlands

The National Wetlands Inventory (NWI) mapping was reviewed to determine the potential location of wetlands within the Study Area and are generally only located in the areas where the roadway directly abuts water. Therefore, wetland impacts, if any, will be minimal and have not been identified at this time but would be confirmed as part of a preliminary design phase.

Surface Waters

The Route 3 study corridor runs between Northeast Harbor and Seal Harbor and is adjacent to the Atlantic Ocean, which is to the south of the roadway. There are also several water courses that run down to the ocean from the hillside to the north and cross the roadway at various points. These water courses are Little Harbor Brook, Little Long Pond, and Stanley Brook.

Threatened and Endangered Species

VHB utilized the state’s “Beginning with Habitat” web viewer and found that mapped resources proximate but are likely just outside of our project disturbance limits. Habitat in proximity to the study area include mapped shellfish beds, tidal wading bird habitat, and brook trout habitat as shown in Figure 2. Unless the project will involve in-water work and/or direct impact to these resources, these would not be significant from a permitting perspective.

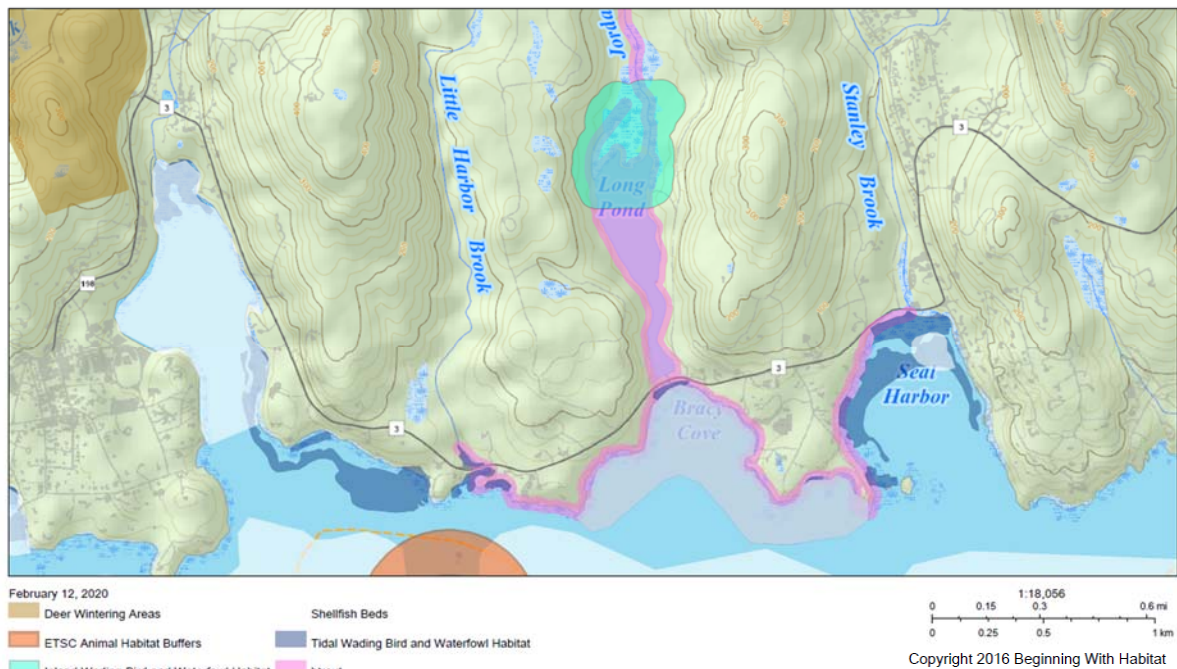


Figure 2. Study Area map from Beginning with Habitat website

The data shown on the map comes with the following disclaimer:

“This map depicts known rare, threatened, or endangered plant and animal occurrences, as well as “Significant Wildlife Habitat” and “Essential Wildlife Habitat.” Its purpose is to assist landowners, resource managers, planners, and municipalities in identifying and making informed decisions about areas of potential natural resource concern. This data includes the best available information provided through BwH’s coalition partners and is intended for information purposes only. It should not be interpreted as a comprehensive analysis of plant and animal occurrences or other local resources, but rather as an initial screen to flag areas where agency consultation may be appropriate. We recommend consultation with MDIFW Regional Biologists or MNAP Ecologists if activities are proposed within resource areas depicted on this map.”

A larger version of the habitat map can be found in Appendix A.

VHB also used the US Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website to check for potential federal Threatened or Endangered Species. IPaC is a project planning tool which streamlines the USFWS environmental review process. The website identified a total of 2 threatened, endangered, or candidate species on this species list. The Northern Long-eared Bat *Myotis septentrionalis*, which is considered a Threatened species, and Atlantic Salmon *Salmo salar*, which is considered an Endangered species. The fact that both of these species were listed is no surprise based on the region and specific project location.

As stated previously, unless the project will involve in-water work and/or direct impact to these resources, these would not be significant from a permitting perspective. MaineDOT has been addressing potential concerns with regard to bats on almost every project and this should not be an issue. The complete documentation received from IPaC for this project can be found in Appendix A.

2.2 Previous Plans and Studies

There are several existing studies available from various sources including the Town, Acadia National Park, and MaineDOT that have information related to this corridor. The following is a summary of these plans and studies and their applicability to the study area and safety enhancements.

Town of Mount Desert Comprehensive Plan Update

This document was prepared by The Town of Mount Desert Comprehensive Planning Committee and adopted by the Town on May 5, 2009. The Town’s transportation goal provided in this plan is “to promote a transportation network that allows residents, visitors, and commuters to move safely, efficiently, and pleasurably throughout Mount Desert’s villages, the Town, and Mount Desert Island.” In addition, the Town is interested in “...promoting land use patterns that encourage denser development, walkable communities, infill in the villages, and by promoting a wide variety of transportation options, such as public transportation, and bicycle and pedestrian opportunities”. These goals have been considered in this study. The document also indicated “additional improvements remain in order to improve safety and the quality of travel for those individuals traveling in and through our Town. The Town will lobby and press the Maine Department of Transportation to improve and rehabilitate the major collector Route 3 corridor from Otter Creek to Northeast Harbor.”

Acadia National Park Final Transportation Plan/EIS

This document was prepared by VHB for the National Park Service and the focus of proposed alternatives did not have any impacts related to the corridor under study or the Stanley Brook Road entrance.

Town of Mount Desert – Crosswalk Review and Recommendations

This report was prepared by MaineDOT’s Bicycle and Pedestrian Program Manager in May 2017 and provided a review and associated recommendations for crosswalks located throughout the Town including several locations along the study corridor. Recommendations included removal of existing crossing locations at The Asticou to the Gardens, the crossing at the corner of Asticou Way, and the crossing at the Long Pond Entrance. Other crossing locations within the study area that were recommended for improvement included the crossing at the Seal Harbor Parking Lot and the crossing to Thuya Gardens, which was characterized as a “High-Priority Pedestrian Crossing Needing Improvement”.

2.3 Planned and Programmed Projects

The following are projects that have been recently planned or programmed. Not only is it important to understand the safety impacts of these projects, but those projects may provide opportunities to implement some of the safety enhancements identified through this effort.

Seal Harbor Sidewalk – Although this has been in place for several years, the Town constructed a sidewalk from Seal Harbor to just east of Dodge Point Road along the south side of the road.

Crosswalk Improvements – The Town is in the process of addressing several of the crossings within the study corridor in 2019 and has also eliminated the crossing at Long Pond.

Drainage Improvements near Asticou Way – In 2016, MaineDOT completed some minor drainage improvements along a short segment of Route 3 directly in front of the Asticou Inn, on the north side of the road.

Rock Scaling – MaineDOT conducted some rock scaling in 2016 along the sheer rock wall section to try and mitigate falling rocks in this area.

Guardrail Replacement – In the fall of 2019 MaineDOT replaced the guardrail along the opposite side of the sheer rock wall just east of the crossing to Thuya Gardens.

2.4 Assessment of Current Conditions

The three primary sets of safety data include traffic volumes, roadway data (including speed data), and crash data. Those data sets provide an objective way to identify those locations in greatest need of safety improvements. The following sections describe the current condition of each of those data elements for the study area.

Traffic Volume Data

Figure 3 shows annual average daily traffic (AADT) volume estimates that were obtained from MaineDOT for each of the three zones where a different posted speed limit is present (indicated by the black lines) along the Route 3 corridor. The AADT shown in Table 1 provides an average annual daily traffic count as well as an average summertime (peak condition) daily count. The

AADTs range between 2,500 and 3,000 vehicles per day while the summer averages are much higher ranging between 4,000 and 4,600 vehicles per day along Route 3. The large increase in volumes during the summer conditions is accounted due to the seasonal/recreational use of Route 3 with the draw of the national parks during the warmer months.



Figure 3. Route 3, Annual average daily traffic (AADT) volume estimates from MaineDOT

Table 1. Traffic Volume Summary by Segment.

<u>Location</u>	<u>Posted Speed</u>		<u>ADT**</u>
	<u>(mph)</u>	<u>AADT*</u>	<u>(Summer)</u>
Segment #1 (approximately 0.3 miles long)	30	2,940	4,615
Segment #2 (approximately 1 mile long)	40	2,710	4,345
Segment #3 (approximately 1.6 miles long)	35	2,580	4,065

* Average Annual Daily Traffic from MaineDOT

** Average Daily Traffic during July 2019

Most of the travel along Route 3 is occurring during the daylight hours between 7AM and 7PM. As stated above the seasonal/recreational nature of this portion has the peak hour of travel along the roadway occurring during the middle of the day (12 PM) and not during rush hours as with a road primarily utilized by commuters. Additional details on the hourly counts recorded can be found in Appendix B.

Pedestrian and Bicycle Data

In addition to vehicle volumes, a pedestrian and bicyclist count was completed on a Saturday in July 2019 at the midblock pedestrian crosswalk located at the Asticou Terraces parking lot, which provides access to Thuya Gardens. Over 130 pedestrians and 7 bicyclists were observed using this crossing over the 4-hour period with approximately 45 percent (56 trips) of the trips occurring during the peak hour of 12 PM. As with the vehicles, the peak use by pedestrians and bicyclists occurs in the middle of the day. More details of these counts can be found in Appendix B.

Roadway Data

Existing Features

Peabody Drive is a very scenic drive between Northeast Harbor and Seal Harbor and includes some fairly steep grades and several sharp or winding curves, which are not unusual for this type of facility considering the mountainous terrain in this region. The elevation of the roadway within this 2.9-mile corridor varies from a high of 96 to a low of 8, an 88-foot difference. It consists of a two-lane paved roadway with varying lane and shoulder widths throughout.

The majority of lane widths range between 11 and 12 feet while the shoulder widths vary from less than 1 foot to approximately 5 feet in width. Some shoulder areas are paved while others are gravel. There are several stretches along the corridor with either granite or bituminous curb, some in disrepair. There are also two stretches of existing sidewalk along the corridor, both along the southerly side of the corridor. One is located at the beginning of the project, from the intersection of Route 198 to the crossing for Thuya Gardens. The other is located at the end of the project, begins just east of Dodge Point Road and continues to Seal Harbor. The beginning section also includes several crosswalk locations at Asticou Gardens, Asticou Inn, and Thuya Gardens, while the northerly sidewalk only includes one crosswalk located at Seal Harbor. Although there is no longer a designated crosswalk at the Long Pond parking area people still cross the street in this vicinity to gain access to the ocean.

The study area includes drainage crossings throughout the 2.9-mile length, including several large culverts. Major structure crossings are located at Harbor Brook, Long Pond, and Stanley Brook. Drainage along the corridor is in disrepair in several locations with runoff shooting off the rock slopes in several locations during and just after storm events, in some cases with runoff traveling across the roadway. Ditches are also silted over and in need of reconstruction. Vegetation is also a problem with overgrowth hiding signage and, in some cases, obstructing sight distance.



There are several locations where vehicles have space to pull off to the side of the roadway including a short scenic viewing area within the long guardrail section adjacent to Northeast Harbor and just east of the Thuya Gardens crossing. There are two additional locations for parking adjacent to the roadway further east, and several small parking lots within the study area.

Right of Way width varies along the corridor but is generally 50' wide though the majority, widens out to 100' in one area, and includes additional easements throughout to accommodate maintenance of slopes, drainage, or falling rock mitigation.

Utilities also exist along the corridor within the study area including utility poles on both sides of the road along with underground water throughout and sewer at the northerly end of the project.

Speed Data

Driving is a self-paced activity where each individual driver controls the speed of their vehicle according to perceived and actual roadway conditions. Posted speed limits provide the legal or allowed limit of travel speeds, which are imposed by law enforcement agencies. Speed data was collected by Accurate Counts for a three-day period in July 2019 in three locations along the corridor to identify speed trends. Each collection location was in a segment of the corridor with a different posted speed. The posted speed limit zones are shown in Figure 4 along with each of the count locations indicated by the location of the colored boxes.



Figure 4. Route 3, Mount Desert Study Area – Posted Speed Limits and Count Locations

Statistical data for each of the segments where speed data was collected are summarized in Table 2. The average speed was calculated as the arithmetic mean of all the observed speeds (the sum of all speeds divided by the number of speed observations). The 85th percentile speed indicates

the speed at or below which 85 percent of drivers consider safe and reasonable under ideal conditions. Pace speed is the 10-mph range of speed with the greatest number of observations. It should be noted that the ADT provided in the table is an average volume over the three observed days under peak summer conditions. Detailed speed count reports are provided in Appendix B, including additional statistics such as the 15th and 95th percentile speeds.

Table 2. Speed Summary by Segment

<u>Location</u>	<u>Posted Speed (mph)*</u>	<u>Average Speed (mph)</u>	<u>85th % Speed (mph)</u>	<u>10 mph Pace (mph)</u>	<u>(%)</u>	<u>ADT (vpd)^</u>
Segment 1: East of Asticou Hill Trail						
Northbound		22	26	19-28	80.4%	2,645
Southbound		<u>25</u>	<u>28</u>	<u>21-30</u>	<u>85.4%</u>	<u>1,975</u>
Combined	30	23	27	19-28	79.4%	4,615
Segment 2: East of Highlands Ln						
Northbound		37	43	36-45	65.2%	2,365
Southbound		<u>38</u>	<u>43</u>	<u>36-45</u>	<u>69.7%</u>	<u>1,980</u>
Combined	40	37	43	36-45	67.2%	4,345
Segment 3: West of Little Long Pond Trailhead						
Westbound		35	40	31-40	73.4%	2,225
Eastbound		<u>38</u>	<u>43</u>	<u>36-45</u>	<u>76.4%</u>	<u>1,845</u>
Combined	35	36	42	31-40	68.8%	4,065

* mph - miles per hour

^ vpd - vehicles per day

In segment #1 speed data was recorded just to the east of Asticou Hill Trail, where there are many driveways, a midblock pedestrian crosswalk, sidewalks present on at least one side of the road, and a relatively sharp horizontal curve. The recorded speeds in both directions was lower than the posted 30 mph speed limit for both the average speed and the 85th percentile speed. Approximately 80 percent of vehicles were observed traveling under the speed limit. The roadside conditions and the posted speed limit appear to therefore match the drivers' expectations and speeds.

Speed data in segment #2 was recorded just east of the intersection with Highlands Lane. This location is directly in the center portion of this speed zone. In this segment of Route 3, the roadway is heavily forested and there are few driveways present. The average speed was

recorded at 37 mph and the 85th percentile speed was 43 mph. These are just under and just over the 40-mph speed limit with the 10-mph pace again surrounding the posted speed limit being observed between 36 and 45 mph. In this segment approximately 70 percent of vehicle speeds were located within the pace speed which still puts the majority of vehicles traveling near the speed limit.

The third segment had speed data collected to the west of Little Long Pond Trailhead and Bracy Cove and relatively near where there is a warning sign for pedestrians. Both the average and 85th percentile speeds were recorded as being above the 35-mph posted speed limit. However, the 10 mph pace ranges from 31-40 mph with almost 70 percent of observed vehicles falling into that grouping. The eastbound vehicles at this location have speeds that are generally higher than the westbound vehicles by approximately 3 mph.

An analysis of the speed limits was performed using USLIMITS2. This tool is intended to provide supplemental and objective guidance to practitioners when setting reasonable, safe, and consistent maximum speed limits for specific conditions on a roadway section. Factors considered include the 50th and 85th percentile speeds along segments, existing statutory speed limits, crash history, roadway geometry and roadway type.

Using the existing conditions data compiled in this study, USLIMITS2 was used to gauge the posted speed limits for each of the three segments with the Route 3 study area where speed was collected in Mount Desert. The results of the USLIMITS2 program are summarized in Table 3.

Table 3. USLIMITS2 Speed Limit Evaluation Summary.

<u>Route 3</u>	Existing Posted	USLIMITS2 Recommended
	<u>Speed Limit</u> (mph)	Speed Limit (mph)
		<u>Based on 2019 Speed Data</u>
Segment #1	30	25
Segment #2	40	35
Segment #3	35	35

As shown above, the analysis of Segment #1 and Segment #2 resulted in a recommended speed limit 5 mph lower than what is posted today. The other segment was identified to have the same recommended speed limits as the current posted speed limits. These results show that the current speed limits generally match the recommended limits as well as driver behaviors with most vehicles not displaying speeding operations.

Crash Data

Three years of crash data, covering the period of January 1, 2015 through December 31, 2017, were reviewed for the study area along Route 3. A total of 11 crashes were reported over the three-year period along the Route 3 corridor. All the crashes reported during this study period were property damage only (PDO). No crashes were reported to be located in the section of the

road with a 30-mph speed limit. The crashes were all located in the remainder of the corridor with the mix of 40 and 35 mph posted speed limits.

Table 4 includes a summary of crashes by crash type. Crashes involving deer were the most predominant crash type (36%) followed by rear-end/sideswipe crashes (27%). Crashes occurred between the months of June and October which corresponds with the months of higher volumes and higher percentage of unfamiliar drivers on the road. The majority (9 of 11) crashes took place under daylight hours with only 2 crashes occurring in dark conditions when lights were not present. All these reported crashes occurred in clear or cloudy conditions.

More detailed crash data can be found in Appendix C.

Table 4. Crashes by Type, 2015-2017.

Number of Crashes by Type					
<u>Rear-end/ side swipe</u>	<u>Fire</u>	<u>Went off Road</u>	<u>Intersection Movement</u>	<u>Rollover</u>	<u>Deer</u>
3	1	1	1	1	4

3. Safety Assessment

The purpose of this study is to evaluate and analyze safety improvements within the study area. The Federal Highway Administration (FHWA) defines a Road Safety Assessment (RSA) as a “formal safety performance evaluation of an existing or future road or intersection by an independent, multidisciplinary team”. The RSA Team applied a collaborative approach to identify current safety issues and potential alternatives for improvement. This chapter provides an overview of the RSA Team, how the RSA process was applied, and the identified safety issues and corresponding recommendations to improve safety.

3.1 RSA Team

The RSA Team was comprised of a variety of team members with expertise in safety, roadway design, traffic operations, transportation planning, bicycle and pedestrian safety, ADA/accessibility, and advocacy. The team included representatives from the town, MaineDOT, and emergency services personnel. The following is a list of the RSA Team members:

- Tony Smith, Mount Desert Public Works Director
- Jim Willis, Mount Desert Chief of Police
- David Kerns, Mount Desert Police Lieutenant
- Mike Bender, Mount Desert Fire Chief
- Gordon Beck, Mount Desert local advocacy group
- John Devin, MaineDOT, Region 4 Engineer
- Bruce Mattson, MaineDOT, Region 4 Traffic Engineer
- Bob Skehan, MaineDOT, Director, Office of Safety
- Theresa Savoy, MaineDOT, ADA Coordinator
- Marty Rooney, MaineDOT, Bureau of Planning
- Patrick Adams, MaineDOT, Active Transportation Program Manager
- Tony Grande, VHB
- Elissa Goughnour, VHB
- Greg Bakos, VHB
- Ethan Flynn, VHB



RSA Team members at crossing for Asticou Terraces parking area

3.2 RSA Process

The RSA Team followed the FHWA eight-step process, as shown in Figure 5.

Responsibilities



Figure 5. FHWA RSA Process.

VHB began this process by reviewing all available existing data, including expanded crash data from January 2014 through December 2018, and noting existing conditions and deficiencies along the corridor, which included the following:

- deteriorating pavement and shoulder conditions
- drainage facilities in need of repair
- intermittent parking
- lack of sufficient accommodations for bicycles and pedestrians
- variable speeds
- blind driveways
- hidden/obstructed warning/advisory signs due to vegetation growth
- intermittent pedestrian crossing locations
- steep slopes, along both sides of the road in some locations
- exposed bedrock and sheer rock faces, some locations experiencing falling rocks
- utility poles throughout the corridor



Cars pulling off road just east of Little Long Pond parking area

The RSA was conducted over a two-day period on July 30-31, 2019 with the following goals:

- To observe traffic during peak visitation
- To observe road user interactions with each other and their environment during varying times of day
- To identify safety issues and potential mitigation measures

- To evaluate the corridor as a whole, along with specific locations of concern

The RSA Team began the field review by driving the 2.9-mile corridor in each direction to experience the corridor in its entirety. The team then performed field reviews at five specific locations, as shown in Figure .

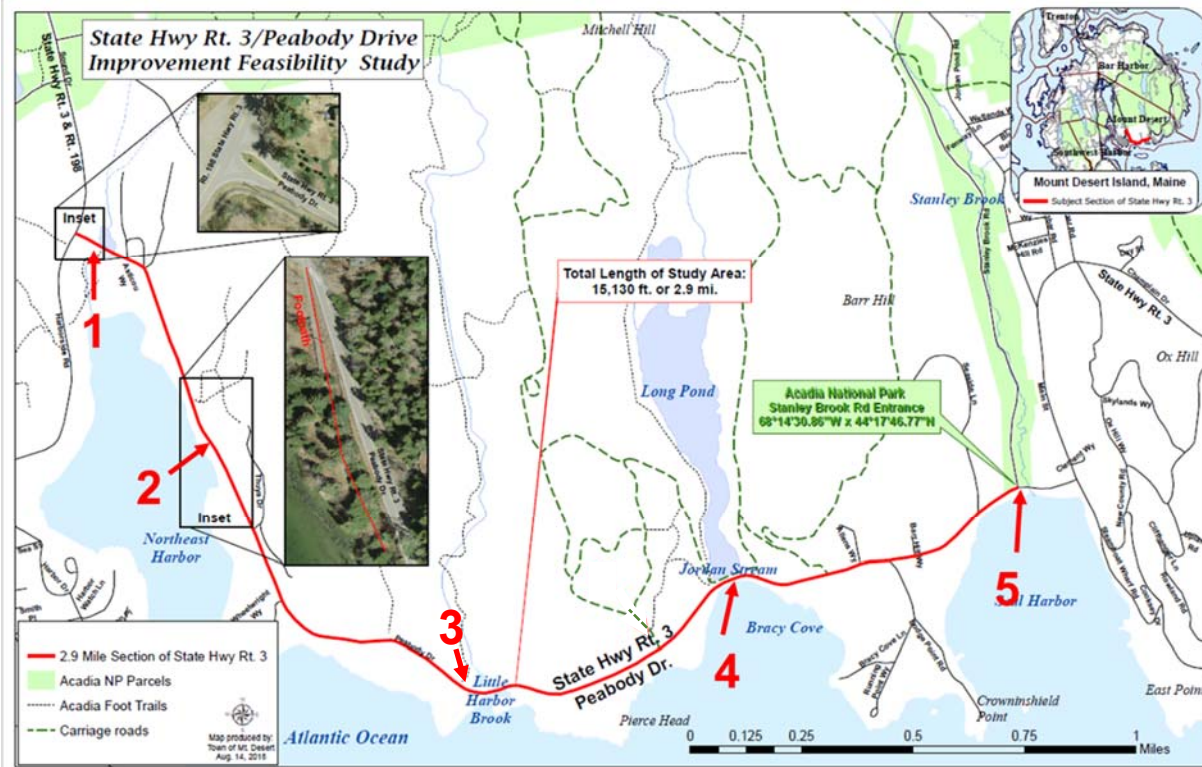


Figure 6. RSA Field Review Locations.

3.3 Safety Findings

This section is a summary of the positive safety features, safety issues, and recommended improvements for the corridor as a whole, and each of the five field review locations.

Overarching

Existing Positive Safety Features

- LED street lighting – While most of the corridor is unlit, fitting the rural nature of the site, there were LED street lights on Seal Harbor side of the corridor. These street lights greatly enhanced nighttime visibility.
- Community leadership – there is strong local support to improve safety along the corridor.
- Crosswalk study – the crosswalk study performed by MaineDOT reviewed the safety of marked crosswalks along the corridor and some of the suggested improvements have already been implemented.

- Low speeds – the existing roadway geometry, horizontal and vertical curvature, and narrow lanes encourage drivers to maintain slower speeds throughout the corridor.
- Pavement markings – the edge and centerline pavement markings help to define the roadway during dark and foggy conditions.
- Corridor signage and reflective markers – the warning signage and reflective delineation of guardrail help drivers to see and prepare for horizontal and vertical curves during dark and foggy conditions. Also, signs appeared to be in good condition with adequate retroreflectivity.
- Positive yielding of pedestrians crossing within the crosswalk – the RSA Team noted that drivers were ready to yield to pedestrians in the crosswalk or waiting to cross.
- Good pavement condition – within the travel lane, the roadway surface was in good condition. The pavement condition is important to the safety of all road users, but particularly for cyclists who are more sensitive to cracks and potholes due to their thinner tires.

Safety Concerns

- Limited law enforcement – due to shared responsibilities between communities, it may be difficult for law enforcement officers to provide additional, proactive safety patrols (such as enforcing no-parking zones).
- Narrowness of roadway – the narrow roadway, with limited paved shoulder and pinch points, limits operating/recovery space for all roadway users.
- Limited ability to recover from lane departure – if a vehicle leaves the roadway, it would be difficult to recover given current roadway and roadside conditions. With the large proportion of visitors to the island, and the beautiful landscape, it can be easy for drivers to become distracted and drift from the travel lane.
- Overgrown vegetation – throughout the corridor, it was noted that vegetation oftentimes obscured signs and restricted sight distance.
- Old/damaged guardrail and outdated end treatments – if a vehicle were to strike the guardrail, it is unclear if the guardrail would function properly due to deterioration and outdated end treatments.
- Inconsistent speeds – there are three different speed limit zones within the three-mile corridor. This can cause confusion among drivers and can be difficult to know exactly what speed they should be driving.
- Distractibility of the area (scenery) and people in “vacation mode” – as a vacation destination with beautiful scenery, drivers may not be paying attention to the roadway or notice other road users, such as a cyclist or crossing pedestrian.
- Lack of parking – during peak visitation periods, there is a notable lack of available parking. This can lead to vehicles parking in restricted locations or performing unexpected maneuvers, such as trying to turn around on a narrow and curvy roadway.
- Blocked stormwater drainage – along the corridor, many of the catch basins were damaged and filled with silt. Improper drainage can lead to roadway deterioration and

can cause water and silt to pond on the roadway, potentially leading to hydroplaning or cyclists falling on the remaining silt and debris.

- Lack of bike/ped facilities – the RSA Team noted that visitors do not understand the risk of walking and biking along the corridor. The attractions along the corridor and Acadia National Park access can entice visitors to try to walk or bike along the corridor, but they may not fully understand the roadway conditions.
- Lack of multimodal connections – there is a lack of defined connection between modes; specifically, the relationship of bicycle and pedestrian facilities with bus stop locations and bus routes. Additionally, there is a lack of comprehensive area-wide bicycle and pedestrian network to access popular destinations.

Potential Countermeasures

- Investigate the potential of widening the roadway to 11-ft lanes with 5-ft shoulders throughout the corridor to provide additional operating and recovery space for all road users. With widening the road, there is the potential that this will make drivers feel more comfortable driving at faster speeds. However, the evaluation team feels that narrowing lanes below 11-feet is not an appropriate measure for this site due to the size of vehicles, such as recreational vehicles, using the roadway. The widening should also include retaining wall improvements to provide roadway stability and space for bicycle and pedestrian facilities on enhanced shoulders.
- Review desired multimodal network connectivity, particularly for bicyclists and pedestrians, with adjacent communities and destinations including Acadia National Park.
- Work with neighboring communities, bicycle rental companies, property rental agencies, and the transit service to develop and provide educational materials on walking and biking safety and local routes. By working together, the message will be consistent throughout Mount Desert Island.
- Create a network bicycle and pedestrian map for the island to communicate messages on how to access destinations and trails. Bangor has a bike map that could be used as a model.
- Perform regular vegetation trimming, particularly during the summer months when there is peak visitation.
- Ensure that enhanced safety measures are in place, to offset the need for intensive law enforcement.

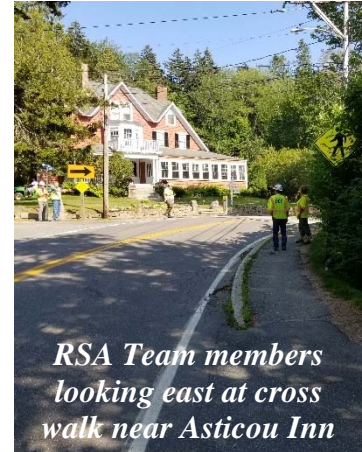
Location 1: Route 198 Intersection to Asticou Inn

Description

This location included the roadway segment between the intersection of Route 198 and the furthest pedestrian crossing just east of the Asticou Inn entrance at the tight curve, approximately 1000 linear feet.

Existing Positive Safety Features

- Lighting over the crosswalk located on the curve – this helps to ensure drivers can see crossing pedestrians.
- Pedestrian warning sign presence/placement – the sign was located in a position that was easily viewable by drivers. *[Note: the crossing at the curve has been improved by the Town since the RSA was conducted.]*
- A new, accessible crossing is planned at the intersection of Route 198.



Safety Concerns

- Proximity of Asticou Inn driveway to the curve – drivers, particularly in the westbound direction may not expect vehicles entering/exiting the driveway.
- Lack of a clear zone – fixed objects, such as poles and trees, are located immediately adjacent to the roadway, preventing drivers from correcting course and returning to the roadway and also potentially increasing the severity of a crash.
- Narrow roadway, particularly at the curve – the roadway narrows at the location where vehicles may need some extra room to maneuver. This is particularly important given the high numbers of visitors to the area - many drivers may not be familiar with the roadway and may not expect that sharp of a turn.
- Pedestrians crossing at the Inn driveway rather than the crosswalk – the RSA Team observed pedestrians crossing at the driveway rather than at the marked crosswalk. With the proximity of the driveway to the curve, and the clearly marked crosswalk close by, drivers may not expect pedestrians crossing at that location. By the time they see and react to the pedestrians, they may not be able to stop in time to avoid a collision.

Potential Countermeasures

- Work with the Asticou Inn to discuss the possibility of restricting exiting traffic from the entrance closest to the curve (i.e., convert it to “entrance only”).
- Trim/clear vegetation to improve sight distance and view of signs, particularly the pedestrian warning sign in southeast-bound direction and on trees, poles, and electrical lines that abut the travel lane. Note that some of this clearing may require notifying the utility owner.
- Enhance conspicuity and warning of the pedestrian crossing at the curve with warning beacons or a Rectangular Rapid Flashing Beacon (RRFB).
- Use targeted law enforcement, particularly during peak visitation periods where there are large proportions of drivers who are unfamiliar with the area, to ensure that drivers are not speeding and are yielding to pedestrians in the crosswalk.
- Engage Asticou Inn management in discussions about employee education of crossing risks and the safety benefits of using the marked crosswalk.
- Evaluate the feasibility of lowering the speed limit from 30 to 25 mph. This would help to improve speed limit consistency and reduce the variation in speed limits throughout

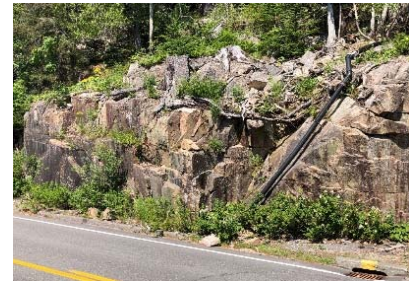
the corridor. At slower speeds, it would help drivers to see and react to crossing pedestrians and also help to ensure that drivers can navigate the sharp curve. This could also help to lessen the crash severity if one were to occur.

- Include shared lane markings to help remind drivers of the bicycle activity on the corridor, as there is no available width for the inclusion of dedicated bicycle facilities.
- Investigate the need for a collection basin or other drainage improvements just east of Cranberry Lodge.

Location 2: Rock Wall

Description

This location included the roadway segment beginning at the parking area for Asticou Terraces and extending approximately 1,500 linear feet to the end of the guard rail on the southerly, shore side of the road including the entire length of the sheer rock face on the north side.



Rock wall and waterline – taken from guardrail looking north

Existing Positive Safety Features

- Rock scaling – rock scaling and tree removal was performed in 2016 by MaineDOT to reduce the potential for rock falls.
- Marked pedestrian crossing - there is a marked crosswalk with advance warning signage providing a connection to the popular Asticou trail. There were also plans for crosswalk improvements that were installed since the time of the field review (and therefore are not depicted in the field review photos included in this report).
- Reflective strips on the guardrail – the reflective material improves delineation of the travel lane, which is particularly helpful to drivers who have to navigate the curvy road in dark, unlit and sometimes foggy conditions.

Safety Concerns

- Roadway instability and degradation – the retaining wall failure on the shore side is causing the roadway to slope down towards the water and both sides of the roadway edges are deteriorating.
- Rock instability on land side – a study was performed to investigate this issue and it was determined that rock bolting is needed; however, that project was put on hold and has not been performed yet.
- Compromised guardrail – due to the retaining wall failure and roadway instability, the guardrail has also been compromised. However, improvements were made since the time of the field review and the guardrail has been replaced along this segment.
- Narrow roadway – the roadway is narrow, particularly along this stretch of Route 3. The lack of space and abutting rocks could push drivers into oncoming lanes or away from each other and into the rock wall/guard rail. This is particularly challenging with the



Crossing at the Asticou Terraces parking area

presence of local wildlife and mix of roadway users (recreational vehicles, cyclists, passenger cars, etc.) and natural terrain.

- Crosswalk design – the current crosswalk connects a parking area with a popular trail and should be retained. There are advance crosswalk warning signs, but none placed at the crosswalk itself. Additionally, the placement and angle of the crosswalk resulted in a long crossing distance. In addition, the centerline pavement markings indicated that the crosswalk was located in a passing zone, which could distract drivers from crossing pedestrians and lead to a higher speed crash with passing vehicles at the crosswalk.

Potential Countermeasures

- There are several options for addressing the roadway instability due to retaining wall failure on the shore side of Peabody Drive:
 - Continue to fill in with pavement, as has been done in the past. This is a temporary measure and more permanent countermeasures should be planned to proactively address the roadway instability, which would reduce the chances of having to conduct costly emergency repairs.
 - Replace retaining wall and provide wider shoulders on both sides of the road, which would provide numerous benefits, including providing recovery space, providing a wide shoulder for bicyclists and pedestrians, and general roadway longevity.
 - Investigate culvert improvements at the dip of the road. These improvements could be performed in coordination with the planned guardrail improvements.
- On the land side of Peabody Drive, perform any additional scaling necessary, vegetation removal, and rock bolting to address rock stability issues. Also, consider wire netting to prevent rock from falling on the roadway.
- Clear vegetation to improve sight lines.
- Perform culvert improvements and catch basin repairs to address drainage issues.
- Review and adjust the frequency of maintenance activities to ensure the travel lanes and shoulders are free from debris from fallen rocks, the drains are clear of debris, and pavement is patched.
- Crosswalk enhancements should include modifying the marked crosswalk so that it is placed more perpendicular to the roadway, reducing the crossing distance and improving the visibility of crossing pedestrians. Pedestrian warning signs with arrow plaque should also be placed at the crosswalk and the passing zone should be removed. (Note: at least some of this work was performed after the field review and before the preparation of this report).

Location 3: Land & Garden Preserve Trailhead

Description

This location included the Harbor Brook Parking lot, which is an off-road parking area located just west of the Harbor Brook bridge crossing.

Existing Positive Safety Features

- Off-road parking – this parking area was installed two years ago and helps to prevent vehicles from parking along the roadway or parking elsewhere and walking to the trailhead located here.



Westbound view of Peabody Drive from the parking lot entrance.

Safety Concerns

- Limited sight distance – vegetation can impede visibility for drivers pulling out of the parking lot, particularly looking towards the west.
- Trailhead and parking area are not clearly defined – the lack of signage decreases driver expectancy and may result in drivers making last second maneuvers to slow down or turn, or if they pass the parking lot they may decide to turn around elsewhere on the narrow corridor.

Potential Countermeasures

- Trim vegetation to maintain adequate sight distance. A permit was issued and requirement to maintain 100' to the west; however, no specifics were included about width. It may be worthwhile to review the driveway permit to further look into the associated requirement for trimming vegetation.
- Work with the landowner and municipality to install signage, which will help with wayfinding and ultimately improve the expectancy of drivers entering/exiting the parking area.
- Corridor widening may provide recovery space in case drivers come upon an unexpected vehicle entering/exiting the driveway.

Location 4: Little Long Pond

Description

This location included the roadway segment in the vicinity of the popular Little Long Pond Trail Head and parking area, extending approximately 500 linear feet east and west of the gate.

Existing Positive Safety Features

- Designated parking – there was designated parking along the roadway, along the Little Long Pond side of the road. The parking designation helps to contain drivers to an area where there is space for them to park and improves expectancy of drivers along the corridor. There was also accompanying “No Parking” signage in adjacent areas to help contain the parking to the designated area.



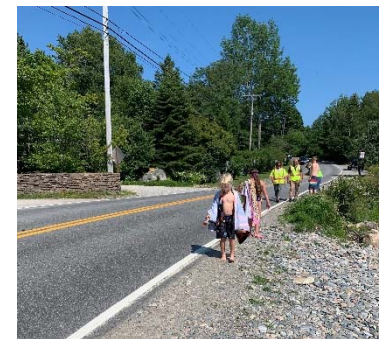
Little Long Pond is a popular destination and during the peak season, the parking area is oftentimes full.

Safety Concerns

- Parking conflicts – while having designated parking helped to increase expectancy for drivers along the corridor, the RSA Team noted several issues with the parking area. The parking was located at the bottom of a vertical curve and was in the middle of a stretch of road with many horizontal curves. Therefore, drivers could not see the parking area ahead of time, with some cars backing into the roadway. There is limited enforcement of no-parking areas.
- Lack of sight distance – the vertical and horizontal curvature of the roadway, the sea wall, and vegetation all reduced sight distance for drivers along the corridor.
- Variable speeds – Peabody Drive has a speed limit of 35 mph at this location but has a pedestrian warning sign with a “25 mph” advisory speed plaque. The RSA Team observed drivers traveling at speeds that appeared to be fast for conditions.
- Pedestrian risk – With the parking area across from the beach area, pedestrians oftentimes cross the roadway at this location. However, with limited sight distance, drivers may not expect to see pedestrian activity and depending on their speed, may not be able to see the pedestrians and react in time to stop.
- Debris on roadway – the sea wall moves with the tide and can come onto the roadway. The debris can damage vehicles and surrounding people and/or property.
- Overgrown vegetation – vegetation along the road obscured warning signs.
- Incorrect signage – a crosswalk warning sign facing westbound drivers is present, although the crosswalk was removed due to safety concerns. The sign should be removed.



Eastbound view from the shore-side of the site displaying the horizontal and vertical curvature approaching the site.



Pedestrians walking from their parked vehicle to the shore at Little Long Pond.

Potential Countermeasures

- Trim vegetation so that signs are visible.
- Ensure timely removal of rocks that are pushed into roadway from the storm surge.
- Install road narrows warning sign (MUTCD W5-1) at the pond culvert. Increase enforcement of no-parking areas.
- Review the parking and no parking areas and investigate options for redesigning the existing parking area or possibly provide off-street parking. An enhanced parking area could provide adequate space for people entering and exiting vehicles. Engage the Land & Garden Preserve in discussions about potential roadway widening as discussed throughout this report, along with potential parking area modifications.

- Install a warning sign to alert roadway users of pedestrians and unexpected entries into the road. Consider enhancements to the signage, such as double posting the signs to help ensure that drivers see/notice the signs, particularly with the horizontal curvature. Another potential sign enhancement could include dynamic warning beacons to alert drivers along Peabody Drive of activity in the parking/pedestrian crossing area. The sign would be helpful at all times during the year but could potentially only be made active during peak visitation periods.
- As the former marked crosswalk was removed, the crosswalk warning sign facing westbound drivers should also be removed.
- Consider speed reduction measures in this zone, such as the use of speed feedback signs, or pavement markings (“SLOW”) provided on either side of the parking area.

Location 5: Stanley Brook Park Entrance/Seal Harbor

Description

This location focused on the roadway segment in the vicinity of the Stanley Brook Road entrance and Seal Harbor parking area, including the pedestrian crossing area and bus stop.

Existing Positive Safety Features

- Parking and crossing enhancements at the beach area – the parking area allows vehicles to enter and exit the roadway at a defined location and park off-street. This also allows for a defined and marked pedestrian crossing and a convenient transit stop location.
- Sidewalk connectivity – on the shore side, sidewalks extend from the intersection of Steamboat Wharf Road, on the eastern edge of the study area, to St. Jude’s Episcopal Church. There is no existing sidewalk on the opposite side of the road.



The transit bus oftentimes stopped on the crosswalk to pick up waiting passengers at Seal Harbor.

Safety Concerns

- Low visibility of the fixed object in the center of the intersection – at night there is low visibility of the fountain at the intersection of Peabody Drive and Main Street/Steamboat Wharf Road.
- Lack of detectable warning – there is no detectable warning on the shore side of the crosswalk to help alert blind or low vision pedestrians that they are entering the roadway.
- Lack of pedestrian warning signage - there is no pedestrian signage at the marked crosswalk.



Pedestrians crossing outside of the marked crosswalk at Seal Harbor.

- Lack of pedestrian accommodations to the park entrance – there is no crossing at the park entrance or sidewalk to the park along Stanley Brook Road.
- Pedestrians crossing outside of crosswalk – there is a large opening at beach area, which can encourage pedestrians to cross the road without using the crosswalk. Additionally, transit buses were observed stopping on the crosswalk to let passengers board and alight the bus, which forced pedestrians to cross outside of the crosswalk. With vehicular traffic turning in and out of the parking lot, and stopped transit buses obscuring the view, drivers may not see or expect pedestrians to be crossing at locations outside of the marked crosswalk.
- Traffic congestion – during peak seasons, there can be congestion due to drivers entering and exiting the parking lot and navigating through the intersection of Peabody Drive and Main Street/Steamboat Wharf Road.

Potential Countermeasures

- Improve visibility of the fountain at night, either through lighting or reflective delineation.
- Add an accessible landing on the harbor side of the crosswalk.
- Reduce and/or better define the beach access opening, which could help to encourage use of the crosswalk and would help to keep debris off of the roadway.
- To enhance crosswalk visibility and safety, add an in-street pedestrian warning sign (MUTCD R1-6) and on the side of the road, add a pedestrian warning sign with a diagonal downward pointing arrow plaque (MUTCD W11-2 and W16-7P).
- Move bus stop location so that it does not block the crosswalk.
- Change the parking lot access so that one access point is designated as an entrance and the other as an exit.



On the left: an example of an in-street pedestrian warning sign (R1-6). On the right: an example of a pedestrian warning sign with arrow plaque (W11-2 and W16-7P).

4. Future Conditions

4.1 Future Growth Projections

Using information provided from the Maine Statewide Model an annual growth rate of 0.5% was assumed for the Route 3 study corridor. This allows for the future 2040 ADT and AADT to be estimated throughout the roadway. In 2040, volumes are anticipated to increase to 5,100 vehicles per day during the summer and to increase to 3,250 vehicles per day on an annual average day throughout the busiest portion of Route 3. The future volumes are summarized in Table 5.

Table 5. Route 3 Future Volumes.

Location	Posted Speed (MPH)	Current AADT*	Summer ADT** (VPD)	2040 AADT (VPD)	Summer 2040 ADT** (VPD)
Segment #1 (approximately 0.3 miles long)	30	2,940	4,615	3,250	5,100
Segment #2 (approximately 1 mile long)	40	2,710	4,345	2,995	4,800
Segment #3 (approximately 1.6 miles long)	35	2,580	4,065	2,850	4,490

* Average Annual Daily Traffic from MaineDOT

** Average Daily Traffic during July 2019

No private development projects have been identified that would be anticipated to influence the traffic forecasting and therefore only background growth was used to develop these future volumes.

Traffic Operations

Level of service (LOS) is a performance measure that describes the quality of service on a given roadway facility or at an intersection when accommodating various traffic volume loads. LOS is defined by letter grades similar to academic grading, with LOS A representing the best conditions and LOS F representing the worst. More detailed definitions for each LOS grade are provided in the Highway Capacity Manual (HCM) and the American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets. In general, LOS for uninterrupted (corridor) flows is described as follows:

- LOS A – Free flow. Traffic flows at or above the posted speed limit and vehicles have complete mobility and flexibility of movement.
- LOS B – Reasonably free flow. Traffic flows are similar to LOS A, but flexibility is restricted slightly.
- LOS C- stable flow. Posted speeds are generally maintained but movement and comfort levels are reduced.
- LOS D – Approaching unstable flow. Slight decrease in speeds, limited freedom and decrease in comfort levels of drivers.

- LOS E – Unstable flow, operating at capacity.
- LOS F – Breakdown or forced flow. Generally, demand exceeds the capacity of the roadway and causes traffic jams. Operations are unpredictable and can cause prolong breakdown of service.

The ability to evaluate the operations of a roadway is an important part of being able to predict how changes in the physical environment or traffic volume demands will impact how well the facility will operate. The HCM provides methodologies to evaluate operations on various types of facilities, including two-lane highways such as the Route 3 corridor. However, the methodology for two-lane highways is limited in that it does not apply to roadways where the posted speed limit is less than 45 mph. The Route 3 corridor with speeds ranging from 30 to 40 mph falls outside the applicable limits for two-lane highway analysis and does not meet the criteria for any of the other methodologies provided in the HCM.

In order to provide an estimate of LOS for Route 3, the peak hour traffic volume demands were reviewed. The highest hourly flow observed was 500 vehicles per hour with the highest directional flow being 260 vehicles per hour. This represents a flow rate of approximately 4.3 vehicles per minute or 1 vehicle every 14 seconds in the busiest direction under the existing conditions. While there is no LOS connected to this rate, this would be considered generally free flowing conditions. Field reconnaissance conducted during the summer (peak) months confirm that no congestion or unstable flow of vehicles was observed. Therefore, it is estimated that the facility likely operates in the LOS A to LOS C range during peak conditions.

In 2040, when the summer ADT increases to 5,100 vehicles per day the peak hour volume will increase to 550 vehicles per hour, with the peak direction increasing to 285 vehicles per hour. This only increases vehicle flow on Route 3 to 4.8 vehicles per minute or 1 vehicle every 12 seconds. This still allows large gaps between vehicles and lets each driver operate without undue influence of other vehicles on the road and continues to be a free-flowing condition. The future flows are not anticipated to be substantially different with the anticipated growth.

While there is no published methodology for analyzing a two-lane corridor with speeds under 45 mph, in general it can be said that operations appear to be at good levels (LOS C or above) and that operations will remain at the same levels in future conditions along Route 3.

Predicted change in mobility and crash rates

With the projected increases in traffic volumes, crash rates would also likely increase. It is impossible to determine exactly what the future crash typology will be; however, with increases in congestion, it is likely that there will be larger proportions of vehicle-to-vehicle crashes and a smaller proportion of vehicle-animal crashes than experienced presently. For bicyclists and pedestrians, the potential increase in crashes would pose an even greater risk to them as crash injuries are typically more severe for non-motorized road users. Additionally, with greater congestion, there is the potential for more aggressive driving maneuvers, particularly when encountering cyclists on the roadway or crossing pedestrians.

This potential increase in bicycle and pedestrian crash risk supports the need for dedicated space for bicyclists and pedestrians. It also highlights the continuing need of supporting the safety culture of being aware and cautious around bicyclists and pedestrians. Another method to help offset the increased crash risk is to encourage a shift from driving to using other modes such as transit, walking, and bicycling. The free transit service is a popular way to visit destinations and

travel around the island. Supporting other modes through a comprehensive bicycle and pedestrian network would further help to reduce driving and would also be supportive of the outdoor experience that so many people enjoy on the island.

4.2 Future Corridor Improvements

Based on the information collected during the RSA and using additional information gathered from various sources, combined with a detailed field review, we have developed the following proposed conceptual improvements for the corridor.

RSA Recommended Short Term Improvements

There are several short-term improvements identified as part of the RSA countermeasures that could be implemented within a six-month to one-year time frame. These improvements include addressing general maintenance concerns on a more regular basis, specifically tree trimming and ditch maintenance. If the tree trimming included a more significant clearing area within say 10-15-feet from the edge of pavement, this would help to improve sight distance and visibility of signs and would also provide additional time for a driver to react to a deer that may be close to the edge of the road, which was one of the highest crash statistics for the study area. Tree trimming or clearing is also considered a low-cost improvement.

Although drainage is a more costly improvement it is still considered a short-term improvement since there are several drainage structures that are in disrepair and currently exhibit safety concerns that could be addressed at low cost.

Crossing improvements is another low-cost item that could be implemented to enhance safety at each of the current crossing locations and some of these are already being undertaken by the Town.

Discussion during the RSA of potentially approaching the owner of the Asticou Inn to discuss driveway operations and the potential to change operations of the drive closest to the curve since sight distance is challenging at that location.

Planned improvements

- At Location 1, there are plans for crosswalk improvements.
- At Location 2, the closure of the passing zone where the crosswalk lies is planned along with guardrail replacement.

Location 1: Route 198 Intersection to Asticou Inn

- Coordinate with Asticou Inn for “entrance only” access to the driveway closest to the curve.
- Consider installing a RRFB at the crosswalk on the curve.
- Clear and trim vegetation along the road and if blocking signs.
- Communicate with Asticou Inn about employee education.
- Mark lanes as shared lanes.
- Targeted enforcement at the crosswalk.

Location 2: Rock Wall

- Continue to fill any pavement deficiencies.
- Perform additional scaling, vegetation removal, and rock bolting.
- More frequent maintenance (i.e., patching) to improve roadway degradation.
- Clear vegetation to improve sight lines.
- Clear debris on travel lanes and shoulders from fallen rocks (and review the frequency of maintenance).

Location 3: Land & Garden Preserve Trailhead

- Trim vegetation to improve intersection sight distance.
- Install signage for trailhead and parking.

Location 4: Little Long Pond

- Increase level of enforcement of no-parking areas.
- Trim vegetation so that signs are visible.
- Install road narrows warning sign (MUTCD W5-1) at the pond culvert.
- The current signage for the former pedestrian crosswalk should be removed.
- Install enhanced pedestrian warning signage.
- Ensure timely removal of rocks that are pushed into roadway from the storm surge.
- Install (a potentially custom) warning sign(s) that alert roadway users of pedestrians and unexpected entries into the road. Also, consider double posting the signs.

Location 5: Stanley Brook Park Entrance/Seal Harbor

- Improve lighting of the fountain at night.
- Add an accessible landing on the harbor side of the crosswalk.
- Reduce and/or better define the beach access opening.
- Define the entrance and exit from the parking area.
- Add MUTCD sign R1-6 in the crosswalk. On the side of the road, add sign W11-2 with a diagonal downward pointing arrow (W16-7P) plaque at the crosswalk.
- Move bus stop location so that it does not block the crosswalk.

RSA Recommended Long Term Improvements

In addition to the treatments that can be implemented relatively quickly, the RSA Team noted others that would take longer to plan, design, and implement.

Location 1: Route 198 Intersection to Asticou Inn

- Enhance the crossing at the curve [*in process by the Town*].
- Reevaluate speed limits, specifically lowering from 30 mph to 25 mph.
- Investigate 11'-5' throughout corridor.
- Add a collection basin and other drainage improvements.

Location 2: Rock Wall

- Replace retaining wall.
- Investigate culvert improvements at the dip in the road.
- Consider wire netting.
- Widen shoulders in conjunction with potential roadway widening.

Location 3: Land & Garden Preserve Trailhead

- Widening the roadway may allow for drivers more operating space to enter/exit the roadway.
- Revisit driveway permit and the associated requirement for trimming vegetation (a permit was issued and requirement to maintain 100' to the west; however, no specifics were included about width).

Location 4: Little Long Pond

- Review the parking (and no parking) areas and design (possible off-street parking). An enhanced parking area could provide adequate space for people entering and exiting vehicles. Discussion on parking improvements in combination with road widening should include the Land & Garden Preserve.
- Due to limited visibility from the presence of horizontal and vertical curves, drivers could be alerted of activity in the area with a dynamic lighted warning sign that is activated by approaching vehicles and could include an advisory speed plaque. The sign would only be active in the peak season.

Location 5: Stanley Brook Park Entrance/Seal Harbor

- No specific long-term improvement recommendations were identified for this location during the RSA. This location generally exhibits the desired paved lane and shoulder widths and the study area ends at the Stanley Brook Road entrance to Acadia National Park.

Recommended Geometric Improvements

This corridor would benefit from consistent lane and shoulder widths and this was one of the primary recommendations from the town and from the local advocacy group to improve safety along the corridor, for all users. The typical section that was evaluated for this corridor consisted of one 11' lane and 5' shoulder in each direction. That evaluation also included consideration of a context sensitive partial widening approach, which in some cases meant that due to physical or other constraints, the shoulder width would be less than the ideal 5' width to minimize impacts and costs.

As part of the RSA process, the potential for any widening in Location 2, the Rock Wall segment between the Asticou Terrace parking area and the end of the long guardrail segment along the shoreline, was discussed in detail during the RSA and determined that any widening along that stretch of road would require a full investigation of the retaining wall along the shoreline, which MaineDOT stated is not something they are planning on evaluating in the short term. As a result, a determination of the potential for a separate path or trail that would extend the existing path

that leads to the Asticou Dock and Landing Area was not deemed feasible to evaluate at this time unless the entire rock wall section was evaluated further.

Option 1 – Widening Throughout with Retaining Wall Replacement

The proposed improvements for option 1 would include the long-term recommendations from the RSA, and the project would likely be split out into at least four or more phases. The proposed improvements include widening throughout the study area to accommodate additional shoulder width and, in some locations, converting existing gravel shoulders to paved shoulders. This option would provide 11 ft. wide lanes with 5 ft. wide shoulders throughout most of the corridor. The only exceptions would be south of the existing rock face area, which would include limited shoulder widening. There are no proposed vertical changes to the roadway however there is a shift in the horizontal alignment along the rock face area to accommodate widening towards the east with replacement of the existing rock wall on the water side, and another shift east of Dodge Point Road to retain the existing sidewalk on the south side and widen to the north to accommodate the required width.

For option 1 we have assumed the entire roadway pavement would be reclaimed, which would still need to be confirmed with pavement borings as part of the preliminary design phase. Most of the existing curbing will be replaced, and new curbing added in other locations to minimize impacts. Where possible, recently installed curb will either remain in place or be reset. Although clearing limits are not shown on the plans, trimming of existing trees and vegetation along with selected clearing is required throughout the corridor.

There are above ground utility poles along both sides of the corridor and many of these will likely need to be relocated, which may require additional clearing to accommodate these relocations. Below ground utilities also need to be confirmed within the corridor and there may be hydrants, water gates, manhole covers, or other existing features that may need to be adjusted or relocated as a result of the proposed improvements.

The conceptual geometric improvement plans for option 1 are shown in Appendix D-1. Although the plans do not show colored areas for the entire roadway, we have assumed the pavement would be reclaimed throughout, with full depth construction assumed in areas where shoulders will be widened. Underdrain will be added as required in areas of new curbing.

Roadway stationing is provided on each plan sheet for reference purposes and begins at Station 10+00 at the Route 198/Route 3 intersection and proceeds easterly to Station 161+00 at Stanley Brook Road/Seal Harbor. Each of the 23 11"x17" sheets depict approximately 700 linear feet of roadway at a scale of 1"=50'.

Option 2 – Partial Widening

The proposed improvements for option 2 would include at least some of the short- and long-term recommendations from the RSA, and the project would likely be split out into at least three phases, with each phase approximately one mile in length. The proposed improvements include minor widening to accommodate additional shoulder width in selected areas and, in some locations, converting existing gravel shoulders to paved shoulders. Replacement of the rock wall is not included in Option 2.

For option 2, we have assumed the entire roadway would have a pavement overlay, which would need to be confirmed with pavement borings as part of the preliminary design phase. Most of the

existing curbing will be replaced, and new curbing added in other locations to minimize impacts. Recently installed curb will either remain in place or be reset. Although clearing limits are not shown on the plans, trimming of existing trees and vegetation along with selected clearing is recommended throughout the corridor, even in areas where minimal or no widening is proposed.

As mentioned previously, there are above ground utility poles along both sides of the corridor and many of these will likely need to be relocated, which may require additional clearing to accommodate these relocations. Below ground utilities also need to be confirmed within the corridor and there may be hydrants, water gates, manhole covers, or other existing features that may need to be adjusted or relocated as a result of the proposed improvements.

The conceptual geometric improvement plans developed for option 2 are shown in Appendix D-2. Although the plans do not show colored areas for the entire roadway, we have assumed a final pavement overlay over the entire roadway surface, with full depth construction assumed in areas where shoulders will be widened. Underdrain will be added as required in areas of new curbing.

Roadway stationing is provided on each plan sheet for reference purposes and begins at Station 10+00 at the Route 198/Route 3 intersection and proceeds easterly to Station 161+00 at Stanley brook Road/Seal Harbor. Each of the 23 11"x17" sheets depict approximately 700 linear feet of roadway at a scale of 1"=50'.

4.3 Opinion of Cost

Development of opinions of probable construction costs were calculated for each option based on current dollars for the recommended geometric improvements along the study corridor. The costs listed below include costs for preliminary engineering and construction inspection, but do not include costs for ROW, utility relocations, environmental permitting or mitigation. Although construction will likely be phased, we recommend completing the Preliminary Design Report (PDR) for the entire corridor so more informed decisions can be made regarding phasing.

There are also some interim/periodic maintenance improvements that could be completed in the short-term that could help with current safety concerns as recommended in the RSA including regular tree and brush trimming, updating signage, regular ditch maintenance, and repair or replacement of drainage structures in disrepair.

Approximate probable construction costs for the proposed improvements are listed below and further broken out in Appendix E:

<u>Option 1 - Widening Throughout with Retaining Wall Replacement:</u>	\$16,525,000
<u>Option 2 – Partial Widening:</u>	\$6,440,000
<u>Short-Term – Interim/Periodic Maintenance Improvements:</u>	\$175,000

Funding Context

The recommendations can be divided into categories to be implemented based on timeframe and cost. The ultimate solution calls for roadway widening throughout and replacement of the retaining wall. There are also short-term solutions and maintenance activities that could have an immediate safety impact. The table below presents a summary of recommendations that can be implemented based on cost and timeframe.

	High-Cost	Low-Cost	Non-Capital
Short-Term	Light Capital Paving	Increase level of enforcement for no-parking areas	Upgrade/enhance signage reflectivity
			Add new signage and pavement markings
		Re-evaluate speed limits and lower if warranted	Address drainage structures in disrepair
			Regular tree trimming and ditch maintenance
			Remove passing zone at Asticou Terraces crosswalk
Long Term	Widen roadway to 11' lanes and 5' shoulders	Increase level of enforcement for no-parking areas	Rock wall preventative maintenance
	Replace retaining wall		Regular tree trimming and ditch maintenance

Funding/Implementation

MaineDOT divides highways into Highway Corridor Priority (HCP) based on function/statewide regional mobility. This section of Route 3 is an HCP 3, which are generally the remaining arterials and significant major collector highways not designated as HCP 1 or 2. The 2,211 miles of HCP 3 statewide carry 9 percent of mileage but 16 percent of the traffic.

The statewide goals for HCP 3 are to (1) preserve the Built miles, and (2) improve Unbuilt sections. Most of Route 3 in the town of Mount Desert is Unbuilt, including this section, which received a Light Capital Paving (LCP) treatment in 2017. This section of Route 3 is tentatively scheduled for LCP again in 2024.

Given needs versus funding, the proposed improvements along this Section of Route 3 are unlikely to be 100% funded by MaineDOT thus The Town will need to rely on Municipal Partnership Initiative (MPI) funds and explore other MaineDOT matching programs that may be available, in addition to exploring the potential for local/private donations or partnerships to fund proposed improvements.

Appendix A: Endangered Species

Appendix B: Traffic Data

Appendix C: Crash Data

Appendix D1: Concept Plans – Option 1 Widening Throughout with Retaining Wall Replacement

(See Separate 11x17 Conceptual Plan Set)

Appendix D2: Concept Plans – Option 2 Partial Widening

(See Separate 11x17 Conceptual Plan Set)

Appendix E1: Opinion of Cost – Option 1 Widening Throughout with Retaining Wall Replacement

Appendix E2: Opinion of Cost – Option 2 Partial Widening