PRESENTED TO THE MAINE TURNPIKE AUTHORITY

OPERATION AND MAINTENANCE ANNUAL REPORT

2013

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Maine Turnpike Authority
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Portland, ME 04102

Ladies and Gentlemen,

We are pleased to submit our 2013 Operation and Maintenance Annual Report for the Maine Turnpike. This report sets forth our findings as to the condition of the Maine Turnpike and our recommendations concerning maintenance, operation, insurance, and deposits to be made to the Capital Improvement and Reserve Maintenance funds and the Operation and Maintenance budget.

Our findings and recommendations are based on a visual inspection of the turnpike facilities performed between January and June 2013; several additional visual inspections of turnpike facilities made during the year; and, on a careful evaluation of turnpike operation and maintenance procedures. We have periodically reported to the Executive Director, Chief Operations Officer, or Director of Engineering, on other items which warranted prompt attention.

We appreciate the opportunity to provide Consulting Engineering Services and we acknowledge the excellent cooperation of Authority members and personnel in the performance of these services.

Best regards,

Roland A. Lavallee

Roland A. Lavallee, P.E., PLS
Vice President
Director of Operations

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1 INTRODUCTION

This 2013 Operation and Maintenance Annual Report is based on the findings of a visual inspection of turnpike facilities; a review of current operating practices; and a review of the insurance coverage currently in effect, all as conducted by the licensed Professional Engineers of HNTB Corporation. It sets forth observations, conclusions and recommendations concerning the condition, maintenance, repair, and operation of the turnpike and its associated structures. Additionally, this report includes recommendations for the amount of funding required for the proper maintenance, repair, and operation of the turnpike to be deposited into the Capital Improvement and Reserve Maintenance funds, and the Operation and Maintenance budget. Finally, recommendations regarding insurance coverage have also been provided.

In 1941, the Maine Turnpike Authority (Authority) was created as an independent state agency and given the mandate to construct a turnpike "from some point at or near Kittery to a point at or near Fort Kent". The legislature intentionally delegated the responsibility for turnpike construction and operation and maintenance to the Authority and precluded any financial commitment by the state.

The original 45 miles of turnpike, Section I, from Kittery to Portland opened to traffic in 1947 and Section II, from Portland to Augusta, was completed in 1955. Almost two-thirds of the 109 mile turnpike is a four-lane divided highway; the other one-third is a six-lane divided highway. Turnpike facilities include 195 structures (177 bridges and 18 minor spans), 19 interchanges, 19 toll plazas, an administration building including the E-ZPass Customer Service Center and the State Police offices, five service areas, nine maintenance facilities, and associated structures.

The Maine Turnpike, designated as I-95, is one of the major north-south highways in the state, extending from Kittery to Augusta, Maine. The turnpike is the only interstate highway from Kittery to Portland, making it one of the most critical elements of Maine's transportation network (see **FIGURE 1**). It also includes a three mile spur from the turnpike mainline to Route 1 and Interstate 295 in Falmouth. The turnpike is a safe and efficient highway that accommodated over 60 million vehicles in 2012.

The demands placed on turnpike facilities are enormous. Its roadways, bridges, interchanges, toll plazas, service areas and maintenance areas are subjected to increasing stress due to age, traffic levels, high weight limit (100,000 lb. trucks allowed), and the demands of the harsh northern New England climate. To ensure the sound condition and effective operation of the turnpike, the Authority funds and implements aggressive Operation and Maintenance, Reserve Maintenance, and Capital Improvement programs. The vigilance of the Authority through these programs has resulted in a well maintained and efficiently operated turnpike. The Authority looks to continue initiatives such as pavement rehabilitation, bridge rehabilitations and replacements, and system modernization to assure that turnpike facilities meet current safety standards as well as projected demands.

ANNUAL INSPECTION PROGRAM

In accordance with Section 806 of the Bond Resolution dated May 1, 1991, HNTB Corporation, as the consulting engineers, is required to inspect the turnpike at least once a year and submit to the Authority a report setting forth the following:

- Opinion as to whether the turnpike has been maintained in good repair, working order and condition;

- Advice and recommendations as to the proper maintenance, repair and operation of the turnpike during the ensuing fiscal year and an estimate of the amount of money necessary for such purposes;

- Advice and recommendations as to the amounts and types of insurance to be carried; and,

- Recommendations as to the amount of money that should be deposited into the Reserve Maintenance fund during the upcoming fiscal year.

To comply with the listed requirements, the engineers and staff of HNTB Corporation annually conduct a visual inspection of the entire Maine Turnpike. The inspection covers pavement, cut sections, embankments, bridges, roadway lighting, drainage structures, signs, pavement markings, toll plazas, utility buildings, service areas, maintenance areas, and other facilities. This report is based on observations made during the inspection which was conducted between January and June of 2013. The opinions, statements and recommendations made herein are based solely on conditions revealed by visual inspection. No representation or warranty is made that all defects have been discovered or that defects will not appear later. Inspections of specific turnpike facilities are conducted whenever special attention is warranted.

A detailed Annual Inspection Report was submitted to the Authority in July of 2013, to be used in conjunction with this 2013 Operation and Maintenance Annual Report.

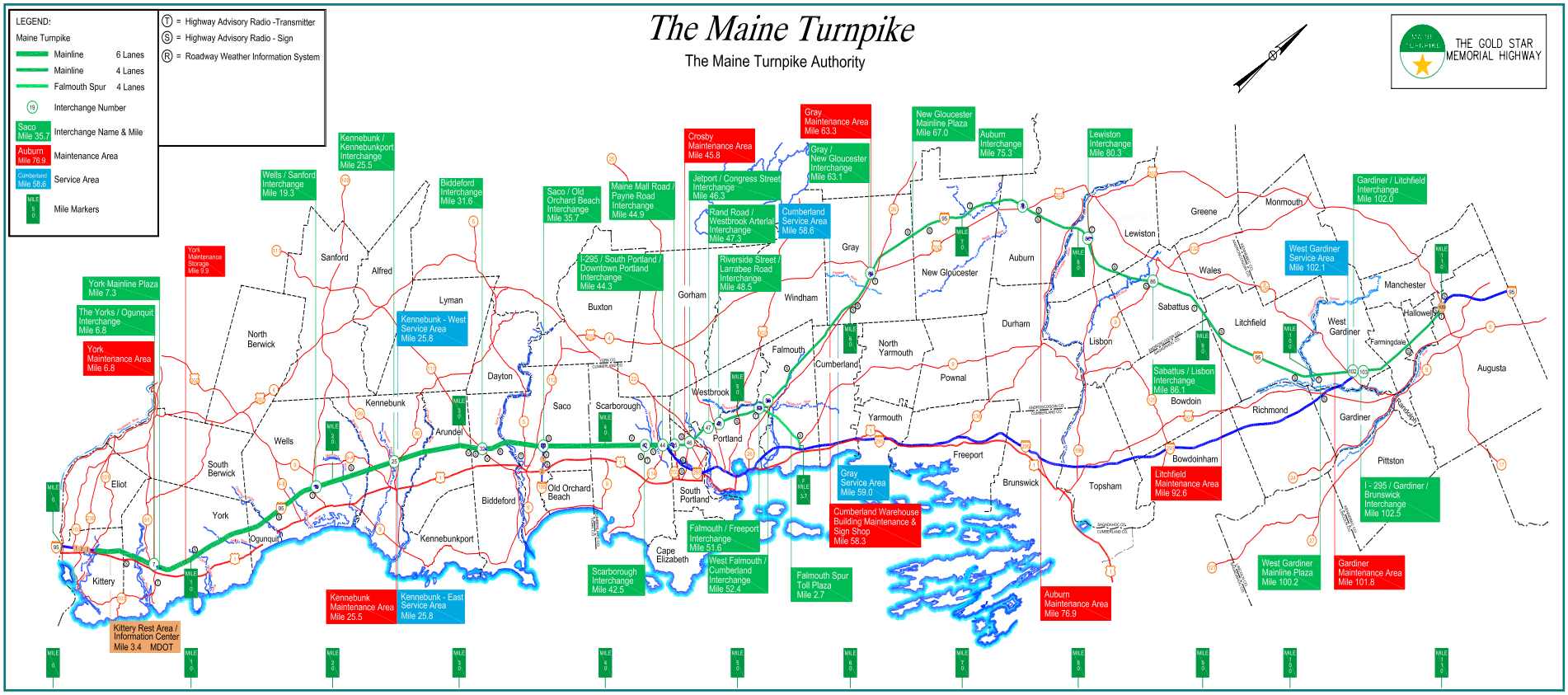

The Maine Turnpike
The Maine Turnpike Authority
THE GOLD STAR MEMORIAL HIGHWAY
LEGEND:
Maine Turnpike
Mainline 6 Lanes
Mainline 4 Lanes
Falmouth Spur 4 Lanes
Interchange Number
Saco Mile 35.7 Interchange Name & Mile
Auburn Mile 76.9 Maintenance Area
Cumberland Mile 58.6 Service Area
Mile Markers
T = Highway Advisory Radio -Transmitter
S = Highway Advisory Radio - Sign
R = Roadway Weather Information System
York Mainline Plaza Mile 7.3
The Yorks / Ogunquit Interchange Mile 6.8
York Maintenance Area Mile 6.8
York Maintenance Storage Mile 9.9
Kennebunk / Kennebunkport Interchange Mile 25.5
Wells / Sanford Interchange Mile 19.3
Biddeford Interchange Mile 31.6
Kennebunk - West Service Area Mile 25.8
Saco / Old Orchard Beach Interchange Mile 35.7
Maine Mall Road / Payne Road Interchange Mile 44.9
I-295 / South Portland / Downtown Portland Interchange Mile 44.3
Crosby Maintenance Area Mile 45.8
Jetport / Congress Street Interchange Mile 46.3
Rand Road / Westbrook Arterial Interchange Mile 47.3
Riverside Street / Larrabee Road Interchange Mile 48.5
Cumberland Service Area Mile 58.6
Gray Maintenance Area Mile 63.3
Gray / New Gloucester Interchange Mile 63.1
New Gloucester Mainline Plaza Mile 67.0
Auburn Interchange Mile 75.3
Lewiston Interchange Mile 80.3
Gardiner / Litchfield Interchange Mile 102.0
West Gardiner Service Area Mile 102.1
Sabattus / Lisbon Interchange Mile 86.1
Litchfield Maintenance Area Mile 92.6
I - 295 / Gardiner / Brunswick Interchange Mile 102.5
West Gardiner Mainline Plaza Mile 100.2
Gardiner Maintenance Area Mile 101.8
Auburn Maintenance Area Mile 76.9
Gray Service Area Mile 59.0
Cumberland Warehouse Building Maintenance & Sign Shop Mile 58.3
Falmouth / Freeport Interchange Mile 51.6
West Falmouth / Cumberland Interchange Mile 52.4
Falmouth Spur Toll Plaza Mile 2.7
Scarborough Interchange Mile 42.5
Kennebunk Maintenance Area Mile 25.5
Kennebunk - East Service Area Mile 25.8
Kittery Rest Area / Information Center Mile 3.4 MDOT
Kittery
Eliot
South Berwick
North Berwick
Wells
Ogunquit
York
Kennebunkport
Arundel
Biddeford
Dayton
Lyman
Alfred
Sanford
Buxton
Saco
Old Orchard Beach
Scarborough
South Portland
Portland
Cape Elizabeth
Westbrook
Falmouth
Gorham
Windham
Gray
Cumberland
North Yarmouth
Yarmouth
Freeport
Brunswick
Topsham
Pownal
Durham
New Gloucester
Auburn
Lewiston
Greene
Monmouth
Wales
Sabattus
Lisbon
Litchfield
Bowdoin
Bowdoinham
Richmond
Gardiner
West Gardiner
Farmingdale
Hallowell
Manchester
Pittston
Augusta

FIGURE 1

2 INSPECTION FINDINGS AND CORRECTIVE MEASURES

The Maine Turnpike has been maintained in generally good condition and presents a favorable appearance. Traffic volumes and the age of the facility necessitate continued high levels of maintenance. The Authority's Maintenance forces undertake routine maintenance while private contractors normally construct larger projects which are publicly bid. These contracts include pavement resurfacing, bridge deck replacements, bridge repairs and painting, slope repairs, and new building construction. The following sections summarize the findings of the 2013 Maine Turnpike Inspection by HNTB Corporation.

VEGETATIVE COVER

Vegetative cover generally includes the grass median and side slopes of the roadway. The inspection revealed that most median slopes are in good condition and most side slopes are stable with good vegetative cover. Slope locations requiring minor corrective action are detailed in the Annual Inspection Report. Corrective actions are warranted due to loss of berm drop-off (gravel shoulder directly adjacent to the paved shoulder) and minor gullying which may lead to an erosion issue if not mitigated. In most instances, the Authority's Maintenance forces can accomplish this work.

TURNPIKE MAINLINE

PAVEMENT

Roadway and shoulder pavement is in generally good condition and the riding quality of the turnpike continues to be acceptable. Approximately 23% of the turnpike pavement (based on centerline miles) is rated in good or new condition, 34% is rated in generally good condition, and 43% is rated in generally fair to fair condition. No pavement was rated in marginal condition.

To maintain pavement quality and roadway safety, the Authority has a planned program of pavement rehabilitation and the turnpike generally rehabilitates a pavement section every 12 to 15 years. **TABLE 1** illustrates pavement contracts over the past 18 years.

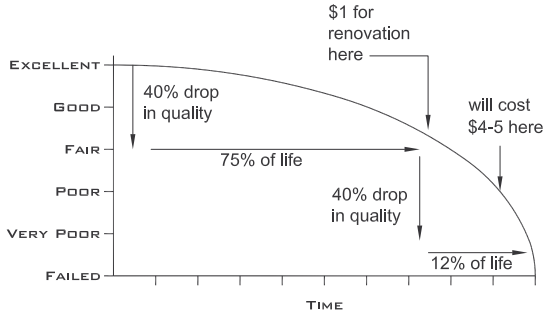
TABLE 1 - PAVEMENT CONTRACTS 1996 - 2013

Year	From MM	To MM	Roadway
2013	7.4	13.5	NB/SB
	88	92	NB/SB
	Int. 7 & 44		
2012	30.0	35.0	NB/SB
	92.0	98.0	NB/SB
	102.0	Plaza	NB/SB
	Int. 42, 45 & 53		
2011	13.3	23.3	NB/SB
	Int. 19 & 48		
2010	2.2	7.0	NB/SB
	44.0	51.2	SB
	45.0	51.2	NB
2009	35.3	43.9	SB
	35.4	44.5	NB
2008	57.0	64.4	SB
	80.8	85.2	NB/SB
	Int. 102 & 103		
2007	64.4	68.5	NB/SB
	25.0	Plaza	NB/SB
	58.0	Plaza	SB
	59.0	Plaza	NB
	Int. 36		
2006	45.3	45.8	SB
	74.9	80.8	NB/SB
	Int. 80		
2005	59.4	64.8	NB
	85.2	88.6	NB/SB
2004	98.0	102.6	NB/SB
	102.6	109.1	NB/SB
	Int. 86		
2003	56.6	58.3	NB
	68.4	74.9	NB/SB
2002	99.6	106.2	NB/SB
2001	25.4	28.4	NB/SB
2000	86.0	90.0	NB/SB
1999	45.8	50.5	NB/SB
	Int. 35		
1998	28.4	33.4	NB/SB
	Int. 7	Ramps	NB
	Int. 63		
1997	33.35	42.36	NB/SB
1996	42.5	54.7	NB/SB
	90.0	95.0	NB/SB

Studies indicate that pavement maintained in good condition costs substantially less to preserve than pavement that is allowed to deteriorate to poor condition. Based on this concept, the Authority's resurfacing program consists of rehabilitating one or more sections of roadway, totaling approximately six to seven centerline miles each year, in order to minimize the cost of future repairs.

FIGURE 2 illustrates the rate of deterioration and relative cost of rehabilitation at various times throughout the life cycle of a section of pavement. Evidence that pavement requires rehabilitation includes wheel rutting, excessive cracking, and poor ride quality.

FIGURE 2 - PAVEMENT LIFE CYCLE



In 2013, the Authority issued three pavement rehabilitation contracts and the work is currently ongoing. Contract 2013.01 rehabilitates the pavement from Mile 7.40 to Mile 13.5. This Contract has three components: 1) the mainline between Mile 7.4 and Mile 13.5 will be overlain with a 1/2" leveling course and a 1-1/2" surface course of pavement; 2) the approaches to the York Toll Plaza will be overlain with a 1/2" leveling course and 1-1/2" course of surface pavement; and, 3) the ramps at Exit 7 will remove 1-1/2" of pavement from the travel lanes by milling and replace it with 1-1/2" of surface pavement. The ramp shoulders will not be treated. Contract 2013.02 rehabilitates the pavement from Mile 88.6 to Mile 92.8. The project will remove 2" of pavement from the travel lanes by milling and replace it with 2" of surface pavement. Contract 2013.03 rehabilitates the pavement at Interchange 44. The project will remove 2" of pavement from the travel lanes by milling and replace it with 2" of surface pavement.

Since 2011, the Authority has specified the addition of a latex additive to the asphalt. The latex's purpose is to alter several characteristics of the asphalt, each of which help improve pavement durability, weatherability and performance, compared to an unmodified asphalt. This practice continued in 2013. In addition, Contract 2013.03 allowed the Contractor to either use a latex modified asphalt or a polymer modified asphalt. This practice is consistent with the current Maine Department of Transportation (MaineDOT) pavement specifications. Both the Maine Turnpike Authority (MTA) and the MaineDOT continue to modify their paving specifications in an attempt to increase the cost effectiveness of the pavement by increasing its durability.

2014 RECOMMENDATION

Due to generally fair conditions of the pavement, and to maintain pavement quality and roadway safety, HNTB recommends the rehabilitation of the northbound and southbound roadway from Mile 23.3 to Mile 30, and Mile 102.6 to Mile 109. In addition, we recommend the rehabilitation of the pavement from Mile 57 to Mile 59, northbound only, to mitigate a rutting issue at this long incline. These projects should also include repairs to the drainage system as warranted.

In addition to rehabilitating the bituminous surface, sealing cracks in pavement is another method of maintaining the pavement in good condition. This sealing reduces the water infiltration of the pavement into the subbase helping to extend the life of the pavement structure. HNTB recommends that MTA Maintenance forces continue the crack sealing program in 2014 in locations where the surface pavement has opened sufficiently.

DISPENSED AT OVER 350 DEGREES THE RUBBERIZED ASPHALT SEALANT IS INJECTED DIRECTLY INTO THE PAVEMENT CRACKS

BRIDGES AND MINOR SPANS

The Maine Turnpike Authority is responsible for the operation and maintenance of 177 bridges, defined as spans measuring more than 20 feet in length, and 18 minor spans measuring between 10 and 20 feet in length. The Authority's operation and maintenance program for these structures involves multiple aspects including developing and maintaining a detailed inventory of Authority-owned structures, scheduling and completing condition and safety inspections, compiling repair and replacement recommendations, and the development and execution of contracts for repair or replacement. The goals of this program are to accurately forecast bridge and minor span repair needs, identify critical deficiencies, repair and upgrade structures on a timely basis, and to maintain the safe condition of MTA bridges and minor spans.

This report quantifies and discusses bridges and minor spans separately. The Federal Highway Administration's (FHWA) National Bridge Inspection Standards require that bridges are inspected on a predetermined schedule and that the inspection data is reported to the National Bridge Inventory. No federal inspection or reporting requirements exist for minor spans. However, the MaineDOT collects and monitors condition data for minor spans for internal use. To provide inspection consistency between the MTA and MaineDOT, and to document the condition of the Authority's minor spans, the inspection of MTA minor spans was completed and reported using bridge inspection procedures in 2013. This practice is expected to continue into the foreseeable future. Previously, these structures had been inspected as highway culverts.

BRIDGE AND MINOR SPAN INSPECTION PROGRAM

Inspections of Maine Turnpike structures are completed by qualified inspectors in accordance with the National Bridge Inspection Standards established by FHWA. Once these inspections are complete, the condition ratings for each bridge are compiled and transmitted to FHWA for inclusion in the National Bridge Inventory. The inspection data also becomes part of the Authority's records which are used to develop the MTA's repair program.

The following inspections were completed in 2013:

ROUTINE BRIDGE AND MINOR SPAN INSPECTIONS

All MTA bridges and minor spans undergo routine inspections on an annual basis. The purpose of these inspections are to identify potential safety concerns, document areas of deterioration, and to record condition ratings for key bridge elements. The 2013 routine inspection by HNTB identified that the 177 bridges and 18 minor spans along the turnpike range from poor to very good condition. Structures that have been rehabilitated or reconstructed during the past 20 years were found to be in fair to very good condition, while those that have never been rehabilitated were generally noted to be in fair condition.

DETAILED INSPECTIONS

Detailed inspections are completed on bridges with special features that warrant increased attention and inspection effort. Two sets of turnpike structures, the Androscoggin River Bridges and the York River Bridges, require detailed inspections.

The Androscoggin River Bridges, each measuring 850 feet long, consist of roadway surfaces supported on stringer and floorbeam framing systems. The loads from these roadway framing systems are carried nearly entirely by two primary girders. Because these structures are carried by only two primary girders, the bridge has insufficient redundancy to prevent a progressive collapse of all, or part of, the bridge if one of the primary girders were to fail. As a result, these structures are classified as "fracture

critical" and are subject to more rigorous inspection requirements as outlined in FHWA's Bridge Inspection Standards. To achieve compliance with these inspection standards, the Androscoggin River Bridges should have a fracture critical inspection completed at least once every 24 months. The last fracture critical inspection was completed by HNTB in July 2012 and found no serious structural deficiencies. The next fracture critical inspection should be completed in July 2014.

ANDROSCOGGIN RIVER BRIDGE

At the York River Bridges, the girder framing system includes pin-and-hanger assemblies. Because routine inspection procedures are insufficient to identify defects in the pins, ultrasonic testing of these elements is necessary. A detailed inspection of the pin-and-hanger systems at the York River Bridges was completed in December 2011. No serious structural deficiencies were noted during that inspection. The next ultrasonic inspection of the pins should be completed in December 2016.

PIN-AND-HANGER ASSEMBLY AT THE YORK RIVER BRIDGE

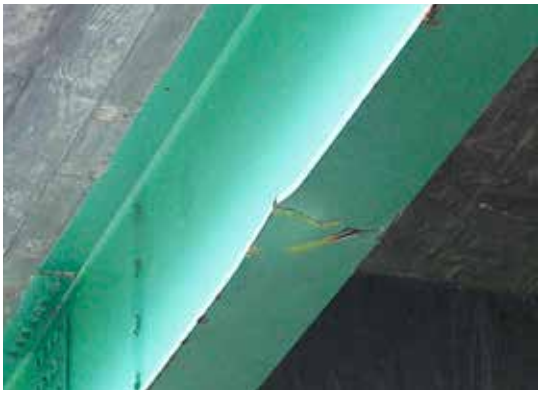
UNDERWATER INSPECTION

The Federal Highway Administration requires an inspection of underwater bridge substructures every five years. Accordingly, an underwater inspection was performed in September 2011 for the 15 bridges that carry the turnpike over rivers and water bodies. No serious structural deficiencies were noted during the 2011 underwater inspection. The overall conditions of the exposed portions of the underwater substructures were fair to good with most deficiencies attributed to freeze-thaw deterioration and abrasion from ice and debris. The next underwater inspection should be completed in 2016.

Based on the 2011 Underwater Inspection Report Recommendation, substructure repairs are currently underway at the Saco River, Nonesuch River, and Potters Brook Bridges. In addition, substructure repairs for the York River Bridges (are programmed) in 2014.

SPECIAL DAMAGE INSPECTIONS

Special Damage Inspections are required when an overheight vehicle hits the underside of a bridge or a vehicle collides with a section of bridge railing. When this occurs, HNTB conducts an immediate field investigation to determine the extent of the damage and whether it is safe for traffic to continue using the structure. In some cases, emergency repairs or lane restrictions are required to maintain traffic on the structure.



GODDARD ROAD SOUTHBOUND OVERPASS, MILE 79.6

HNTB conducted one special inspection in 2013. This inspection was completed at the Goddard Road Southbound Overpass, Mile 79.6, to evaluate bridge damage caused by a piece of heavy equipment operating under the overpass. Based on this inspection, HNTB has made recommendations to the Authority for the repair of this impact damage.

BRIDGE AND MINOR SPAN REHABILITATION

During the Annual Inspection, structure components such as the concrete deck, superstructure, substructure, culvert, and river channel conditions are assigned condition ratings. Using these ratings, structures requiring repair are further separated into five groups based on their overall condition and the safety implications of their deficiencies.

- **GROUP V** - Bridges are not in need of any repair (typically new or recently rehabilitated).
- **GROUP IV** - Bridges need repair, but of a minor nature. This work can most likely be done by Maintenance crews.
- **GROUP III** - Bridges need repair, but generally the structural safety is not jeopardized at present.
- **GROUP II** - Bridges should be repaired as soon as possible. However, the problem is such that a short delay is not likely to create a safety problem. If left too long, it will become a Group I Bridge.
- **GROUP I** - Bridges need immediate repair. The problem is such that the safety of the highway is in danger if the repair is not made quickly. For example, heavy concrete deterioration under bridge bearings, scour around bridge foundations, weakened girders due to impact, etc.

TABLE 2, Bridge and Minor Span Tabulation, illustrates the number of structures in each group category based on the 2013 Annual Bridge Inspection. The previous three years of data has also been provided for reference. The grouped structures are then further prioritized for repair or replacement considering factors such as safety, bridge age, importance, rate of deterioration, scour susceptibility, load capacity, and traffic volumes.

In addition, higher priorities are typically assigned to bridges and minor spans that are classified as "structurally deficient". A structure classified as structurally deficient is not necessarily unsafe; however, these structures require repair and maintenance

TABLE 2 - BRIDGE AND MINOR SPAN TABULATION

BRIDGES						
Year	Group V	Group IV	Group III	Group II	Group I	Total
2013	6	73	98	0	0	177
2012	17	70	90	0	0	177
2011	9	66	100	1	0	176
2010	10	66	99	1	0	176
MINOR SPANS						
Year	Group V	Group IV	Group III	Group II	Group I	Total
2013	1	7	10	0	0	18

in the near future to ensure their continued safe operation. There are several key structural components that are considered by FHWA in reaching this classification. These components primarily include: Deck, Substructure, Superstructure, and Culvert. If any one of these components has a condition rating of 4 or less (indicating that an element is in 'poor' condition), the bridge is considered "structurally deficient".

As a result of the 2011 Annual Inspection, HNTB noted 15 structurally deficient bridges. Based on this information, the focus of the Authority's 2012 bridge program was to repair or rehabilitate structurally deficient bridges. Ten structurally deficient bridges were repaired or rehabilitated in 2012.

During the 2013 bridge inspection, nine structurally deficient bridges were identified out of a total of 177 (5.1%), well below the national and Maine averages. An additional two minor spans out of a total of 18 (11.1%) were also identified as being structurally deficient, which is well below the Maine average.

TABLE 3, Structurally Deficient Structure Summary, provides a listing of Maine Turnpike structures currently classified as "structurally deficient". The table also identifies programmed repair or rehabilitation dates for these bridges. The Authority's planned bridge and minor span rehabilitation program is reviewed and adjusted after each year's inspection program.

2013 BRIDGE REHABILITATION AND REPLACEMENT PROJECTS

Several rehabilitation and repair contracts were issued for Maine Turnpike Structures in 2013. These contracts included deck replacement, repairing concrete deterioration, replacing substandard bridge elements such as railings and endposts, increasing bridge under clearance, and improving load capacity.

TABLE 3 - STRUCTURALLY DEFICIENT STRUCTURE SUMMARY

Structure Name	Structure Type	Mile Marker	Status
Cape Neddick River Box Culvert	Minor Span	9.60	Programmed for repair in 2015
Josias River Box Culvert	Minor Span	11.80	Programmed for repair in 2015
Stroudwater River Overpass (Northbound)	Bridge	46.7	Programmed for repair in 2014
Piscataqua River Overpass - Structure # 28	Bridge	55.5	Programmed for rehabilitation in 2014
Hurricane Road Underpass	Bridge	56.6	Currently under construction
Piscataqua River Overpass - Structure # 31	Bridge	56.7	Programmed for rehabilitation in 2014
Gray Interchange Underpass	Bridge	63.1	Gray interchange study ongoing
Lewiston Interchange Overpass (Southbound)	Bridge	80.31	Programmed for replacement in 2015
Old Lisbon Road Underpass	Bridge	81.8	Currently under construction
Lunts Hill Road Underpass	Bridge	99.00	Programmed for repair in 2016
Ramp E Underpass (I-295 Toll Plaza)	Bridge	102.01	Programmed for repair in 2015

The following is a brief summary of the 2013 bridge work:

- **MILE 33.0 - SACO INTERCHANGE BRIDGE (NB & SB)**

Work at these two bridges, one carrying northbound traffic and one carrying southbound traffic, is currently underway and includes substructure repairs above and below the water line, replacement of deteriorated bearings, and girder strengthening. This work is scheduled to be substantially complete in November 2013.

SACO RIVER OVERPASSES

- **MILE 43.4 - NONESUCH RIVER ARCH CULVERT**

Repairs at the Nonesuch River Arch Culvert structure include removal and replacement of deteriorated concrete and repair of riverbed erosion. The repairs are currently ongoing and are scheduled to be substantially complete in November 2013.

- **MILE 51.6 - FALMOUTH SPUR INTERCHANGE OVERPASS**

The work includes replacing the heavily deteriorated "pork chop" bridge rail system with modern concrete parapets, partial replacement of the concrete bridge deck, new expansion joints, new pavement and membrane, substructure repairs, and new concrete end posts. The work also includes raising the existing bridge superstructure to minimize the potential for impacts by overheight vehicles. Construction at this interchange bridge is currently underway. This work is scheduled to be substantially complete in November 2014.

FALMOUTH SPUR INTERCHANGE OVERPASS

- **MILE 52.0 - BLACKSTRAP ROAD UNDERPASS**

The work includes replacement of the existing bridge deck, curbs, joints, and railing, and abutment and pier repairs. The bridge superstructure is being raised to minimize the potential for impacts by overheight vehicles. Rehabilitation of the Blackstrap Road Underpass is currently in progress and is scheduled to be substantially complete in November 2013.

BLACKSTRAP ROAD UNDERPASS

- **MILE 56.6 - HURRICANE ROAD UNDERPASS** [Structurally Deficient]

The improvements include deck patching, new expansion joints, deck membrane and pavement, construction of new concrete endposts, and abutment pier repairs. The bridge superstructure is being raised to improve clearance over the turnpike and to minimize the potential for impacts by overheight vehicles.

Once these repairs are complete the bridge will no longer be classified as structurally deficient. The Hurricane Road Underpass over the Maine Turnpike is currently under construction.

HURRICANE ROAD UNDERPASS

- **MILE 56.61 - HURRICANE ROAD OVER PISCATAQUA RIVER**

The work includes repairs to the concrete bridge piers and abutments, bridge deck, expansion joints, and replacement of the existing waterproofing membrane and pavement. The work is scheduled to be substantially complete in November 2013.

HURRICANE ROAD OVER PISCATAQUA RIVER

- **MILE 70.8 - SNOW HILL ROAD UNDERPASS**

The work includes replacement of the existing bridge superstructure (bridge beams, roadway deck, curbs, and railing), and abutment and pier repairs. The bridge superstructure is also being raised to minimize the potential for impacts by overheight vehicles. Rehabilitation of the Snow Hill Road Underpass is currently underway and scheduled to be substantially complete in November 2013.

SNOW HILL ROAD UNDERPASS

- **MILE 78.9 - ANDROSCOGGIN RIVER OVERPASSES (NB & SB)**

Work at the Androscoggin River Bridges includes girder post-tensioning to improve the load capacity of the structures, partial bridge painting, concrete deck repairs, and replacement of the existing waterproofing membrane and bituminous overlay. The work is scheduled to be substantially complete in November 2014.

- **MILE 81.8 - OLD LISBON ROAD UNDERPASS** [Structurally Deficient]

The work includes replacement of the existing bridge superstructure (bridge beams, roadway deck, curbs, and railing), and abutment and pier repairs. The bridge superstructure is being raised as part of the work to minimize the potential for impacts by overheight vehicles. Once this work is completed, the bridge will no longer be classified as structurally deficient. Rehabilitation of the Old Lisbon Road Underpass is underway and is scheduled to be substantially complete in November 2013.

OLD LISBON ROAD UNDERPASS

- **MILE 96.62 - POTTERS BROOK BOX CULVERT**

Repairs to this structure include repairing areas of cracked and deteriorated concrete. Repairs at the Potters Brook Box Culvert are scheduled to be substantially complete this year.

- **MILE FS.1 - FALMOUTH SPUR OVER THE PRESUMPSCOT RIVER OVERPASSES (EB & WB)**

These two 30' wide bridges carry eastbound and westbound traffic over the Presumpscot River and are being rehabilitated as part of MTA Contract 2012.05.

PRESUMPSCOT RIVER BRIDGE OVERPASS

The rehabilitation includes replacement of the existing concrete decks and painted metal "pork chop" bridge rails, repairing areas of deterioration on the bridge piers and abutments, installation of stone downspouts to control water runoff, and replacement of the bridge endposts. The work on these structures began in 2012. Work on the westbound bridge is complete, and work on the eastbound bridge is scheduled for completion in November of this year.

- **MILE 6.8 TO 79.6 - BRIDE JOINT REPAIRS, VARIOUS LOCATIONS**

This repair contract includes the repair and rehabilitation of bridge deck expansion joints at six turnpike underpasses including: Chases Pond Road, Mile 6.8; Mountain Road, Mile 10.6; Clay Hill Road, Mile 11.9; Cummings Road, Mile 44.6; Running Hill Road, Mile 45.4; and Hackett Road, Mile 76.9. The work on these structures is currently underway and is expected to be complete in November 2013.

2013 BRIDGE PAINTING

The Authority has implemented an effective painting program by issuing painting contracts. This painting program is important because it reduces the potential for costly future repairs to correct steel corrosion. Since 1990, 51 Authority-owned bridges have been repainted with the last three bridges completed in 2012.

During development of the Authority's Capital Improvement Plan, the cost of repainting existing steel girders versus replacing them is considered for all bridge rehabilitation projects. This analysis considers cost, the load capacity of the existing girders, and the condition of the existing paint system. Through this evaluation the Authority included partial repainting in the 2013 bridge repair contract for the Androscoggin River Bridges.

In addition, the Authority has identified multiple bridges which are not scheduled for rehabilitation in the next five to 10 years that are beginning to exhibit advanced deterioration of their paint systems. These structures are programmed to be recoated as part of stand-alone painting contracts. The next stand-alone painting contract, expected to be issued in 2014, will involve the partial repainting the Saco River Overpasses (NB & SB).

2013 EMERGENCY BRIDGE REPAIRS

OVERHEIGHT BRIDGE HITS

The Goddard Road Southbound Underpass was damaged in July 2013 by heavy equipment that was operating under the bridge. The damage was minor and emergency repairs were not warranted.

OVERHEIGHT VEHICLE DETECTION SYSTEM

Although the Authority is typically reimbursed for the cost of these repairs from its insurance, or that of the vehicle operator, damage to bridges caused by overheight vehicles continues to be a concern. The Authority is addressing these concerns by reviewing and often improving under clearance when bridges are rehabilitated. An additional measure being implemented by the Authority is the installation of Overheight Vehicle Detection Systems at select locations. These systems detect overheight vehicles and send a signal to a flashing sign that notifies the driver of an overheight vehicle to come to a stop. The turnpike's communication center is also notified of the occurrence and receives video of the incident. A system was installed on Warren Avenue in 2012 and an additional system was installed at the Auburn Interchange in 2013. A system is scheduled to be installed on the mainline in West Gardiner in 2014.

2014 BRIDGE REHABILITATION AND REPLACEMENT RECOMMENDATIONS

STRUCTURALLY DEFICIENT BRIDGES AND MINOR SPANS

The repair or replacement of structurally deficient bridges and minor spans has been, and should remain, a priority for the MTA. This focus has allowed the Authority to reduce the number of structurally deficient bridges in their inventory from 13.4% to 5.1% over a five year period. For comparison, approximately 11% of the nation's bridges were classified as "structurally deficient" in 2012.

METAL "PORK CHOP" BRIDGE RAILINGS

Over the past several years, the MTA has rehabilitated many of its bridges that have metal "pork chop" railing systems. These pork chop rail systems are typically in poor condition due to rust and section loss and the repair and repainting of these bridge rails is not cost effective. HNTB recommends a continued emphasis on these structures so that they are programmed for rehabilitation as soon as feasible. The rehabilitations should include the replacement of the existing bridge rail system with a rail system meeting current crash test standards.

TABLE 4, Bridges with Metal "Pork Chop" Bridge Railing, on the following page, lists the remaining six bridges with this rail type. Ongoing and programmed repairs for these bridges are also listed. Three bridges with this rail type will remain in service following completion of the 2013 Bridge Repair Program.

LEWISTON INTERCHANGE "PORK CHOP" BRIDGE RAIL

The 2013 Annual Inspection of the Lewiston Interchange Overpasses found the existing metal 'pork chop' bridge railing system to be severely deteriorated. For the past several years, replacing these substandard rail systems with modern crashworthy barrier has been a focus of the Authority's Capital Improvement Program. During this time, HNTB has continued to monitor the condition of these rail systems. Our monitoring has shown that the Lewiston Interchange Bridge rail continues to deteriorate rapidly.

Based on this ongoing deterioration, HNTB recommends supplementing the existing rail with a crashworthy barrier system until the existing bridges are replaced in 2015. This work will likely include the installation of a temporary steel or concrete barrier system along each shoulder. We recommend this work be completed as quickly as possible.

TABLE 4 - BRIDGES WITH METAL "PORK CHOP" BRIDGE RAILING

Bridge Name	Mile Marker	Status
South Portland Interchange Underpass	44.90	Currently in fair condition
Falmouth Spur Interchange Underpass	51.60	Currently under construction
Lewiston Interchange Overpass (NB)	80.30	Programmed for replacement 2015
Lewiston Interchange Overpass (SB)	80.31	Programmed for replacement 2015
Presumpscot River Overpass, Falmouth Spur (EB)	FS 1.10	Currently under construction

BRIDGE LOAD RATINGS

Load ratings are used primarily to understand the safe load capacity of bridges, to identify structures that should be posted for load, and in the prioritization of bridge projects. The Authority's ongoing load rating initiative has identified structures with calculated load capacities that are substandard. HNTB recommends that structures that do not meet minimum load requirements be considered for posting. The prioritization of posted bridges for strengthening or replacement should be made based on the required posting level, structure importance, volume of traffic carried, the proximity of alternate routes, and the availability of funding.

RECOMMENDED BRIDGE PROJECTS

Based on the preceeding factors, and the findings of the 2013 Bridge Inspection Program, HNTB recommends the repair or rehabilitation of three structurally deficient structures in 2014. These structures include three bridges: the Stroudwater River Northbound Overpass; Piscataqua River Overpass, Structure #28; and Piscataqua River Overpass, Structure #31. The remaining structurally deficient bridges should be scheduled for repair or rehabilitation over the next five years as part of the Maine Turnpike Authority's Capital Improvement Program. In addition, the rehabilitation of several additional structures is recommended to repair areas of deterioration and to improve bridge under clearance.

The following is a brief description of each bridge recommended for repair in 2014:

- **MILE 3.1 - CUTTS ROAD UNDERPASS**

The Cutts Road Underpass built in 1978, does not meet minimum load requirements for bridge load rating. The recommended work for this structure includes adding web stiffeners to increase the shear capacity of the bridge girders. This work will result in a sufficient bridge load rating.

- **MILE 5.2 - YORK RIVER OVERPASSES (NB & SB)**

These two bridges, one carrying northbound traffic and one carrying southbound traffic, have deteriorated substructures, pin-and-hanger assemblies, bridge joint drainage collection systems, and wearing surfaces. The project should include jacketing of the deteriorated pier columns, patching substructure concrete, cleaning and painting pin-and-hanger assemblies, containing bridge joint drainage, and the installation of a new concrete wearing surface.

YORK RIVER OVERPASSES

- **MILE 25.0 - MOUSAM RIVER OVERPASSES (NB & SB)**

Our inspection of these structures identified several areas of deterioration to the concrete abutments and piers and along the pavement surface. HNTB recommends deck repairs, substructure repairs, installation of a new waterproofing membrane, and the replacement of the bituminous wearing surface.

- **MILE 27.2 - KENNEBUNK RIVER OVERPASSES (NB & SB)**

These two bridges, one carrying northbound traffic and one carrying southbound traffic, have deteriorated abutments and pavement. The recommended repairs at this location include patching of the concrete abutments, installing new waterproofing membrane, and the replacement of the bituminous wearing surface.

- **MILE 46.7 - STROUDWATER RIVER OVERPASSES (NB & SB)**
  [NB Structurally Deficient]

The 2013 inspection of the Stroudwater River Overpasses identified deterioration to the bridge expansion joints (NB), concrete deck (SB), pavement surface (SB) and substructure concrete (NB & SB). Therefore, the work on these bridges should include deck and substructure repairs and joint modification and replacement. In addition, the southbound overpass should receive a new waterproofing membrane and pavement. Once the repairs are completed, the northbound structure will no longer be classified as structurally deficient.

- **MILE 50.0 - FOREST AVENUE UNDERPASS (NB & SB)**

The 2013 inspected identified deterioration of the joints and the substructure concrete. The work at these structures should include joint replacement and substructure repair.

- **MILE 51.2 - RIVERSIDE STREET OVERPASSES (NB & SB)**

Our inspection of these structures identified several areas of deterioration to the concrete abutments and piers, to the bridge joints, and along the pavement surface. HNTB recommends substructure repairs, bridge deck repairs, joint modifications or replacements, installation of a new waterproofing membrane, and the replacement of the bituminous wearing surfaces.

- **MILE 55.5 - PISCATAQUA RIVER OVERPASS, STRUCTURE #28 (NB & SB)**
  [Structurally Deficient]

These two bridges, one carrying northbound traffic and one carrying southbound traffic, exhibit deteriorated abutments and extensive deterioration of the deck slab and steel girders. The work on these bridges should include replacement of the superstructures (steel girders, concrete deck, joints and pavement), and repairs to the bridge substructures. Once these repairs are completed, these structures will no longer be classified as structurally deficient.

- **MILE 56.6 - PISCATAQUA RIVER OVERPASS, STRUCTURE #31 (NB & SB)**
  [Structurally Deficient]

Similar to Piscataqua River Structure #28, these two bridges exhibit deteriorated abutments and extensive deterioration of the deck slab and steel girders. The recommended work includes replacement of the superstructure (steel girders, concrete deck, joints and pavement), and repairs to the bridge substructure. Once these repairs are completed, these structures will no longer be classified as structurally deficient.

PISCATAQUA RIVER STRUCTURE #31

- **MILE 62.9 - CENTER STREET UNDERPASS**

The 2013 bridge inspection of this underpass identified several areas of deterioration to the concrete abutments and piers, along the bridge joints, and to the pavement surface. We recommend substructure repairs, bridge repairs, joint modification or replacement, installation of new waterproofing membrane, and pavement.

- **MILE 82.5 - NO-NAME RIVER OVERPASS**

This triple-cell 14'x10' concrete box culvert exhibits areas of advanced concrete deterioration throughout the structure. The recommended work includes chipping and patching areas of deteriorated concrete within the culvert and on its headwalls and wingwalls.

NO-NAME RIVER CULVERT

- **MILE 84.3 - LISBON ROAD UNDERPASS**

This underpass exhibits several areas of deterioration to the concrete abutments and piers and along the pavement surface. Substructure repairs, deck repairs, and installation of new waterproofing membrane and pavement is recommended.

- **MILE 91.0 - WEST ROAD UNDERPASS**

The 2013 inspection of the West Road Underpass, a single-lane bridge originally built in the 1950's, identified deterioration of the concrete deck, bridge girders, and substructure concrete. Additionally, a load rating of the existing girders found them to be undersized by current standards. The recommended work on this bridge includes replacement of the superstructure (steel girders, concrete deck and joints), and repairs to the bridge substructure. Raising the bridge superstructure is also recommended to minimize the potential for impacts by over-height vehicles.

- **MILE 101.7 - ROUTE 126 UNDERPASS**

The Route 126 Underpass, originally built in the 1950's, exhibits deterioration of the substructure concrete and wearing surface. The recommended work for this structure includes deck repair and new membrane and pavement, new joints, and repairs to the bridge substructure. Raising the bridge superstructure is also recommended to minimize the potential for impacts by overheight vehicles.

- **MILE 106.9 - LITCHFIELD ROAD UNDERPASS**

The 2013 inspection of the Litchfield Road Underpass identified deterioration of the concrete deck, joints, and substructure concrete. The recommended work on this bridge includes replacement of the concrete deck and joints, and replacement of the bridge substructure.

- **MILE 106.94 - VAUGHAN BROOK OVERPASS**

This double-cell 10'x6' concrete box culvert exhibits areas of advanced concrete deterioration throughout the structure. The project should include chipping and patching areas of deteriorated concrete within the culvert and on its headwalls and wingwalls.

- **MILE F1.7 - FALMOUTH ROAD UNDERPASS**

This underpass exhibits several areas of deterioration at the concrete abutments and piers and along the pavement surface. HNTB recommends substructure repairs, deck repairs, and installation of new waterproofing

membrane, and pavement.

BRIDGE REPAIR

Several structures such as the Maine Central Railroad, Mile 47.9, and Forest Avenue Overpasses, Mile 50, warrant concrete and joint repairs. HNTB recommends that a contract be issued for bridge repair to address these issues in 2014. Mitigating these deficiencies now will minimize the potential of more costly repairs in the future.

BRIDGE PAINTING

HNTB recommends the issuance of a bridge painting contract for the Saco River Overpasses in 2014.

These two bridges are currently under construction to repair areas of deterioration observed at the bridge substructure and girders. The structures paint systems and facia exhibit failure, especially along the original four built-up riveted girders on each bridge. To extend the service life of these structures, cleaning and repainting the original girders is recommended.

BRIDGE OPERATIONS AND MAINTENANCE PROGRAM

HNTB recommends the following annual bridge maintenance activities on Maine Turnpike Bridges:

- Decks - Sweep (power broom) and flush with ordinary water (preferably power rinse) particularly the gutter areas. Patch obvious delaminations and potholes, scaling. Remove loose spalls over lanes of traffic.
- Parapets - Power rinse.
- Superstructure - Pressure rinse the beams/girders and bearings particular at the joint locations.

The Authority maintains detailed bridge files as part of their bridge Operations and Maintenance Program. In accordance with FHWA requirements, these bridge files contain inventory and appraisal information such as bridge geometrics and age, as-built drawings, condition ratings, safe load capacities, and scour evaluations.

In 2013, the following initiatives were undertaken to update the Authority's bridge files:

LOAD RATING OF IN-SERVICE BRIDGES

In 2013, the Maine Turnpike continued its initiative to develop updated load ratings for all 177 Authority-owned bridges. Load ratings are used primarily to understand the safe load capacity of bridges and to identify structures that should be posted for load limits. Additionally, load ratings are used to evaluate overweight permit load requests and to prioritize bridge repair projects. These uses require that bridge load ratings be reliable, uniformly consistent, and current. This load rating initiative began in late-2010 and scheduled for completion in December 2013. The results of these load ratings are reported to FHWA and are saved in the Authority's bridge files.

BRIDGE INSPECTION PROCEDURES

In March 2013, FHWA issued a memorandum regarding new legislation established under the Moving Ahead for Progress in the 21st Century Act (MAP-21). This new legislation modifies existing inspection standards for bridges located on the National Highway System and requires the collection of element level data for those structures beginning October 1, 2014. Additional guidance is

expected to be provided by FHWA's Office of Bridge Technology later this year.

HNTB will work with the Maine Turnpike Authority to understand what effect the new standards will have on the Authority's existing inspection program and to identify and implement any required changes resulting from this legislation.

DRAINAGE

The roadway's surface drainage system, consisting of drainage ditches, catch basins and cross culverts, was inspected and found to be in fair to good condition.

Catch basin repair is typically included as part of the pavement rehabilitation projects. This practice appears to be adequate to maintain the catch basins in fair to good condition.

Routine ditch and side slope repairs are required for proper upkeep of the highway. Turnpike Maintenance forces routinely clear debris from drainage ditches and regrade the surrounding areas as necessary. All ditches will continue to be evaluated and recommendations for reconstruction will be made as required.

Numerous rivers and streams pass under the turnpike through box culverts and culvert pipes. All box culverts and pipes 60 inches in diameter or greater are inspected every year (a total of 70 individual culvert ends) and are in satisfactory condition. The remaining culvert pipes, smaller than 60 inches, are scheduled for inspection over the next five years. In 2013, all pipes 36 to 54 inches in diameter were inspected along with 12 to 36 inch cross culverts from Mile 90 to Mile 109. Many of the cross culverts are reinforced concrete under the core roadway but change to metal under the side slopes. While the concrete portion of the culverts are generally in fair to good condition, many of the metal pipe ends are in poor condition. Common issues observed are rusted flow lines, disconnected joints, and disconnected metal flared end sections. These conditions lead to erosion issues on the side slope which may eventually impact the roadway.

FALMOUTH SPUR MM 47, 36" PIPE

The Maine Turnpike Authority's Maintenance forces conduct drainage repairs annually. Over the past year, maintenance has constructed the following repairs:

- Exit 44 Plaza: Riprap downspout and 24-inch culvert.
- MM 87.0: Replaced a 12-inch CB outlet and constructed new riprap apron.
- MM 108 Culvert Ends: Replaced the metal pipe inlet and outlet end of a 30-inch crossing culvert. Riprap aprons and slope protection were constructed to protect the pipe ends, and fencing was added to the culvert inlets to discourage beaver activity.
- MM 49.8: Replaced a failed 12-inch CB outlet and repaired the washed out slope. A riprap apron was also constructed.
- MM 10.0 36-inch Flared End: York Maintenance crew added a 36-inch RCP flared end to increase the efficiency of the inlet during high flow events.
- MM 52 Ramp: Filled and regraded eroded sideslope and reconstructed a damaged riprap downspout.
- MM 51: Repaired an eroded slope.
- MM 53.8: Replaced a 12-inch CB outlet pipe and repaired the damaged sideslope.

Periodically the Authority issues contracts to repair drainage issues that the Authority's Maintenance forces cannot repair due to their location or the type of equipment required to cost effectively complete the repair. A contract to repair a damaged culvert end and

eroded slopes at Mile 53 was awarded for construction in September 2013.

HNTB RECOMMENDATION

We recommend the locations rated poor in the detailed Annual Inspection Report be monitored by the Authority. Locations that can reasonably be repaired by Turnpike Maintenance should be repaired. Areas that are not feasible for repair by Turnpike Maintenance should be programmed for repair. These repairs include the complete removal of the deteriorated metal pipe ends and their replacement with high density polyethylene or concrete pipe, along with slope and drainage channel stabilization. These drainage repairs should be included in the pavement rehabilitation contracts.

GUARDRAIL AND SAFETY IMPROVEMENTS

The Authority has continued its program of improving safety by upgrading large sections of their roadway sideslopes each year. These improvements include removal of vegetation, installation of impact attenuating guardrail end treatments, installing additional guardrail and adjusting the rail height. Safety improvements have also been made to the median. These improvements include closing some median openings that are not critical for authorized vehicles, and constructing new median openings at areas with adequate sight distance. Non-crash attenuating guardrail terminal end sections of the existing median openings have been replaced with impact attenuating units. In addition, guardrail heights have been adjusted and the strength of the guardrail has been increased at locations where the guardrail was in close proximity to bridge piers.

With the exception of the Falmouth Spur, which is scheduled for guardrail upgrades in 2016, the majority of the median and outside shoulder guardrail has been upgraded to NCHRP 350 Standards.

The clearing of vegetation in close proximity to the roadway in non–guardrail sections commenced in 2012 with clearing from Mile 92.8 to Mile 100.3. This program continued in 2013 with clearing from Mile 82.9 to Mile 93.0. This clearing improves safety by removing vegetation in close proximity to the roadway and helps with winter maintenance by minimizing the shading of the roadway.

THE GUARDRAIL IMPROVEMENT PROGRAM HAS BEEN COMBINED WITH THE PAVEMENT REHABILITATION CONTRACTS

In 2013, HNTB conducted a study of the clear zones between Miles 52 and 63 and Miles 103 and 109. The clear zone is the traversable unobstructed area provided beyond the edge of the traveled way for the recovery of errant vehicles. This study identified clear zone deficiencies such as steep slopes, ledge cuts, and fixed objects within the clear zone and included a cost estimate to mitigate them. This study will be discussed with the Authority in the fall of 2013 to determine priorities for clear zone improvements.

2014 RECOMMENDATION

HNTB recommends the Authority continue to include guardrail improvements with the 2014 paving projects. HNTB also recommends that the Authority continue the clearing of vegetation in close proximity to the roadway. Clearing should be programmed from Mile 51 to Mile 63 in 2014.

EMERGENCY VEHICLE RAMPS (EVRS)

To promote improved safety, the Authority is constructing Emergency Vehicle Access Ramps (EVRs). The EVRs are gated ramps between the mainline and a local road that

allows authorized vehicles such as MTA vehicles, fire trucks and police vehicles access to the mainline. These EVR's improve safety by minimizing the need for median openings and allow authorized vehicles to reverse direction without having to cross mainline traffic. The MTA and HNTB have identified critical locations along the Maine Turnpike where EVRs are desired and feasible. Locations are based upon criteria such as interchange spacing, plowing routes, and access for emergency vehicles.

Locations where the Authority is considering ramps are:

- **CAPTAIN THOMAS ROAD, MILE 14.8 - OGUNQUIT**
- **HACKETT ROAD, MILE 76.9 - AUBURN**

2014 RECOMMENDATION

HNTB recommends the Authority study the feasibility of constructing Emergency Vehicle Ramps at the Captain Thomas Road and Hackett Road locations. The feasibility study should address safety, cost, environmental and property impacts.

LIGHTING

The roadway lighting system is generally in good condition. During the inspection, we noted that most interchanges and service plazas had a few lights that were not in operation. We understand that the turnpike replaces these lights as required to maintain acceptable lighting levels.

In 2010, the MTA implemented a pilot study by installing Light-Emitting Diode (LED) lighting at the Cumberland Service Area, the Exit 46 Area, the Exit 45 canopies, Crosby Maintenance, and the Kennebunk Park & Ride lot. While LED lights are more costly to purchase, they have longer service life and use substantially less electricity to operate.

In 2011, LED light fixtures were installed at Interchange 48 as part of a construction project to extend the acceleration lanes. This program continued in 2012 with the installation of LED luminaires at Interchange 45, Interchange 53, and Interchange 75 as part of the acceleration lane lengthening projects. As a result of these changes, lighting maintenance and power consumption has been reduced.

HNTB RECOMMENDATION

The Maine Turnpike should continue to maintain their roadway lighting system on a regular basis to minimize the number of outages. In addition, the Authority should continue evaluating the cost effectiveness of the LED lighting.

SIGNAGE

The MTA maintains its signs in generally good condition. The MTA routinely replaces signs that are damaged, faded, or otherwise in poor condition. A sticker with the month and year the sign was fabricated is affixed to each sign to allow MTA Maintenance forces to readily assess the sign's age.

In 2012, MTA contracted with 3M to capture sign attributes, locations, and photographs for all signs within the turnpike right-of-way. Included in 3M's deliverables were the sign photos and a GIS sign database. The MTA has been enhancing the database with night time retro-reflectivity inspection results, sign updates, and other pertinent data.

The MTA Sign Shop fabricates the majority of the regulatory, route marker, warning, and specialty signs on the Maine Turnpike. The Authority also procured signs from the MaineDOT Sign Shop on a limited basis. Maine Logo, Inc. maintains all logo signs along the Maine Turnpike as part of a separate contract with the MTA.

HNTB RECOMMENDATION

HNTB recommends the Authority continue to monitor, maintain, and replace signs as needed.

ROADWAY MARKINGS

The Authority's Maintenance forces re-stripe the turnpike once a year to maintain roadway markings in good condition.

Double yellow lines in two-way traffic areas in the interchanges, as well as new pavement, are typically painted twice a year. The paint lines are adequately maintained.

HNTB RECOMMENDATION

HNTB recommends the MTA continue their current practice.

TOLL PLAZAS

The MTA has 19 toll plazas that include tollbooths, canopies, utility buildings and other structures. The tollbooths and canopies are rated in fair to good condition while other components, such as concrete slabs, bumpers and tunnels, are rated in poor to fair condition. Repairs to these components at various locations have been completed over the past several years by MTA Maintenance forces and through separate toll plaza repair contracts.

More comprehensive repairs to the concrete slabs, bumpers, canopies, and tunnels are warranted in the near future to maintain these facilities in fair condition. A study by HNTB is currently underway to identify warranted toll plaza repairs by location. This study will allow the MTA to make an informed decision on repairs and will allow the repairs to be coordinated with the scheduled toll system conversion.

The following sections specifically discuss the MTA's mainline toll plazas.

YORK TOLL PLAZA

In 2012, approximately 16 million vehicles passed through the York Toll Plaza. Approximately $39.4 million in revenue was collected at York in 2012, accounting for over one-third of all toll revenue collected on the Maine Turnpike. Truck traffic (MTA Classes 3 through 6) accounted for 11.3% of the toll plaza transactions at York. About 65% of all traffic through the York Toll Plaza (including over 83% of all trucks) utilized E-ZPass in 2012.

The existing York Toll Plaza was constructed in 1969 and is challenged by both operational and safety issues. Due to these issues, the Authority is in the process of developing a more comprehensive plan for this facility.

The Authority has studied the feasibility of an Open Road Toll plaza and is in the process of understanding the feasibility of an all-electronic toll collection plaza to replace the current York Toll Plaza. This feasibility study is scheduled to be complete in the fall of 2013. At the completion of this study, the Authority will need to make a definitive decision on the future of the existing York Toll Plaza. If the Authority determines that the existing toll plaza is to remain for the foreseeable future, HNTB recommends a comprehensive review of the plaza conditions so that a detailed plan for operations, safety, and rehabilitation can be developed.

EXISTING YORK TOLL PLAZA

NEW GLOUCESTER TOLL PLAZA

In 2012, about 6.8 million vehicles passed through the New Gloucester Toll Plaza. The plaza collected approximately $13.0 million in revenue, accounting for about one out of every eight dollars in tolls collected on the Maine Turnpike. Truck traffic (MTA Classes 3 through 6) accounted for 12.1% of the toll plaza transactions at New Gloucester. E-ZPass usage at New Gloucester in 2012 was about 60%; however, with commercial vehicles at this plaza, E-ZPass usage exceeded 86% for the year.

On April 1, 2013, the MTA opened the Open Road Tolling (ORT) lanes at New Gloucester. These ORT lanes allow E-ZPass patrons to safely proceed through the toll plaza at highway speeds without slowing or stopping. Additionally, cash toll collection equipment replacement is currently ongoing. These upgrades will provide a cost effective next generation toll technology, create additional maintenance efficiencies for the future, and enhance audit functions for toll operations monitoring.

WEST GARDINER AND GARDINER I-295 TOLL PLAZAS

HNTB was retained by the Authority to study the feasibility of converting the existing West Gardiner mainline toll plaza and the Gardiner I-295 toll plaza to Open Road Tolling System (ORT) and to study the feasibility of replacements of these toll facilities with a new combined ORT facility. A report was submitted to the Authority in September 2012.

The Authority should develop a long-term plan for the disposition of these toll facilities. Once this plan is finalized, a comprehensive maintenance and operations plan should be developed for these toll facilities.

SIDE TOLL PLAZAS

The MTA has programmed the replacement of all the cash toll collection equipment at all the toll plazas. These upgrades will provide a cost effective next generation toll technology, create additional maintenance efficiencies for the future, and enhance audit functions for toll operations monitoring. Repairs are ongoing at Kennebunk, Scarborough, and Rand Road Toll Plazas in 2013. Repairs at the remaining side toll plazas are programmed for 2014 and 2015.

SERVICE AREAS

There are five service plazas in four locations on the turnpike.

In 2007, new buildings were completed, and parking was improved for cars and trucks at the Kennebunk northbound and Kennebunk southbound service plazas. Each location has a service station, food services, and a convenience store.

The new service plaza buildings at Cumberland southbound and Gray northbound opened in early 2007. Each location has a Service Station, food services, and a convenience store.

New service plaza located at the confluence of the turnpike (I-95) and I-295 in West Gardiner, opened in November 2008. This plaza has a service station, food services, and a convenience store.

The service plazas are in good condition.

MAINTENANCE FACILITIES

Nine maintenance facilities are located along the turnpike. Each maintenance area has a different combination of buildings ranging from maintenance garages to offices. A listing of buildings at the maintenance areas is shown in **APPENDIX A**. Between 1992 and 2012, seven of the nine Maintenance Facilities were upgraded. All the maintenance areas are in fair to good condition.

3 TOLL COLLECTION SYSTEM

ELECTRONIC TOLL COLLECTION

The MTA operates its Electronic Toll Collection (ETC) system as a closed-barrier toll system from the York Toll Plaza north to the New Gloucester Toll Plaza, and as an open-barrier toll system from the New Gloucester Toll Plaza north to the turnpike terminus in Augusta. The open-barrier toll system allows free travel between interchanges within the limits of the mainline barrier toll plazas on the northern section of the turnpike. All trips between Exit 75 in Auburn and Exit 86 in Sabattus are toll-free. It is estimated that toll-free trips account for roughly 3% of all Maine Turnpike trips.

E-ZPASS GROUP

On February 1, 2005, the Maine Turnpike Authority implemented its current ETC system, E-ZPass. One of the greatest benefits to the Authority for converting to E-ZPass was admittance into the E-ZPass Group, formerly known as the Inter Agency Group (IAG). The E-ZPass Group includes 25 toll agencies that operate over 46 toll roads, bridges and tunnels in 15 states from Maine to North Carolina to Illinois. The E-ZPass Group's primary objective is the operation of a regionally compatible toll system with seamless travel based on common operating protocols and policies. The backbone of the E-ZPass Group's system is a network of multiple customer service centers and computer systems used to support the 24 million E-ZPass toll tags currently in circulation.

Membership in the E-ZPass Group allows the Authority a voice in one of the largest interoperable and reciprocal ETC systems in the world. This group collectively manages the procurement and deployment of the E-ZPass technology. Started in 1990 with seven agencies, today the E-ZPass Group boasts 14.6 million active accounts.

ONGOING ACTIVITIES

Since the deployment of E-ZPass, strategic goals have been set to improve the services available to E-ZPass account holders, the Maine Turnpike Authority's E-ZPass Customer Service Center (CSC), and various departments within the organization in the future. Specific initiatives that have been recently implemented by the Authority relative to E-ZPass include:

- Deployment of Open Road Tolling (ORT) at the New Gloucester toll barrier.
- Deployment of new cash lane technology at the New Gloucester toll barrier as a prototype for the entire highway. This technology has proven to be highly successful, increasing reliability and reducing maintenance costs. The Authority is now in the process of rolling out this technology to four more plazas (Exit 25 NB in Kennebunk, Exit 25 SB in Kennebunk, Exit 42 in Scarborough, and Exit 47 at Rand Rd).
- Enabling patrons to open new accounts via the Maine Turnpike E-ZPass website.
- Providing active E-ZPass tags at the retail counter for both new and existing accounts at a reduced cost of $10.
- Converting the commuter program to a volume-based discount available to all Class 1 E-ZPass customers with an account based in Maine.

TOLL SCHEDULE

On November 1, 2012, the Maine Turnpike Authority increased cash and E-ZPass toll rates to raise an additional $21.4 million annually in toll revenue to meet 30-year plan requirements to maintain and rehabilitate the turnpike's network of bridges, interchanges

and pavement as well as paying off debt.

For cash-paying passenger vehicles, the updated toll is $3.00 at the York Toll Plaza; $2.25 at the New Gloucester Toll Plaza; $1.75 at the West Gardiner Toll Plaza; $1.50 for motorists traveling north from Exit 19 in Wells, and south from Exit 63 in Gray; and $1.00 at all other locations. Maine E-ZPass fares increased by 15%, from 6.7 cents per mile to 7.7 cents per mile. The E-ZPass fares are also structured in such a way that they are always equal to or less than the cash rate for a particular movement.

A passenger car traveling the full length of the turnpike pays $7.00 (6.6 cents per mile) for passenger cars, and $28.00 (26.4 cents per mile) for five-axle tractor trailers respectively. E-ZPass patrons who have an E-ZPass tag from other toll system highways are charged the cash fare.

For those who acquire their E-ZPass tag from the Maine Turnpike Authority, the following discount programs are available:

* VOLUME BASED DISCOUNT PROGRAM

The Maine Turnpike Authority offers the Volume Based Discount Program to all Maine E-ZPass account holders. Under this system, frequent travelers of the turnpike receive a 25% discount off their total fare for 30-39 one-way trips per month, and a 50% discount off their total fare per month for 40 or more one-way trips per month.

The Volume Based Discount Program will be applied as shown below.

The volume based discount program replaces the previous Commuter Discount Program that was in effect from 1982 through 2012.

* PERSONAL

Patrons who drive a passenger car, van, pick-up or motorcycle with four tires or less can establish a personal account. Advantages of the personal include establishing a pre-paid balance, having tolls automatically deducted from your account when traveling on the Maine Turnpike or other E-ZPass compatible facility, and paying the same or oftentimes less than the cash fare. Trips are charged based on the lesser of the current cash fare or the E-ZPass rate per mile fare.

NUMBER OF TRIPS PER MONTH	VOLUME BASED DISCOUNT PROGRAM
30-39 account trips per month	25% discount applied to monthly account trips
40 + account trips per month	50% discount applied to monthly account trips

* BUSINESS

The Business program is intended for commercial vehicles. As with passenger cars, commercial vehicles having an E-ZPass tag from the Maine Turnpike Authority are charged the lesser of the current cash fare or the underlying per-mile rate. Commercial vehicles that enroll in this program can establish either a pre-paid or a post-paid account. The post-paid account requires a $5,000 surety bond, and it qualifies the account holder for a volume discount (see below). The pre-paid account does not require a surety bond, but neither does it provide a volume discount.

* POST-PAID PLAN VOLUME DISCOUNT

Commercial vehicles having a post-paid E-ZPass account with the Maine Turnpike Authority receive additional discounts based on their usage. By combining the average in-state E-ZPass discount of 21% with the "volume discount", the average in-state commercial vehicle with a post-paid E-ZPass account saves an average of 33% over the cash rate.

This discount follows the below schedule:

MONTHLY E-ZPASS CHARGES	POST-PAID PLAN VOLUME DISCOUNT
Between $0 and $50	No discount
Between $50 and $100	10% discount off everything over $50
Between $100 and $300	$5 discount plus 15% off everything over $100
Over $300	$35 discount plus 20% off everything over $300

4 TRAFFIC MANAGEMENT AND TECHNOLOGY

Since opening in 1947, the Maine Turnpike has served as the transportation lifeline for the state. In 1956, a total of 3.8 million vehicles traveled on the turnpike. This volume rose to over 60 million in 2003, and it has stayed at or above this level ever since.

Two common measures of turnpike traffic are annual Vehicle-Miles Traveled (VMT) and average trips per day (also known as Average Annual Daily Traffic, or AADT). In 2012, the Maine Turnpike logged 1.21 billion Vehicle-Miles Traveled, while serving an average of about 166,000 trips per day.

FIGURE 3 illustrates the trends of both of these measures over the past 13 years. It is interesting to note that neither trips nor VMT has experienced growth since 2004. In fact, traffic levels in 2012 were slightly lower (both in terms of trips and VMT) than the levels observed in 2003.

In 2012, the average number of daily trips held steady compared to 2011, while total VMT declined by 0.9%. The sustained impact of high fuel prices and a sluggish economy continue to limit traffic growth. Since the high-water mark of 2004, trips have declined by 2.9% while VMT has declined by 7.9%.

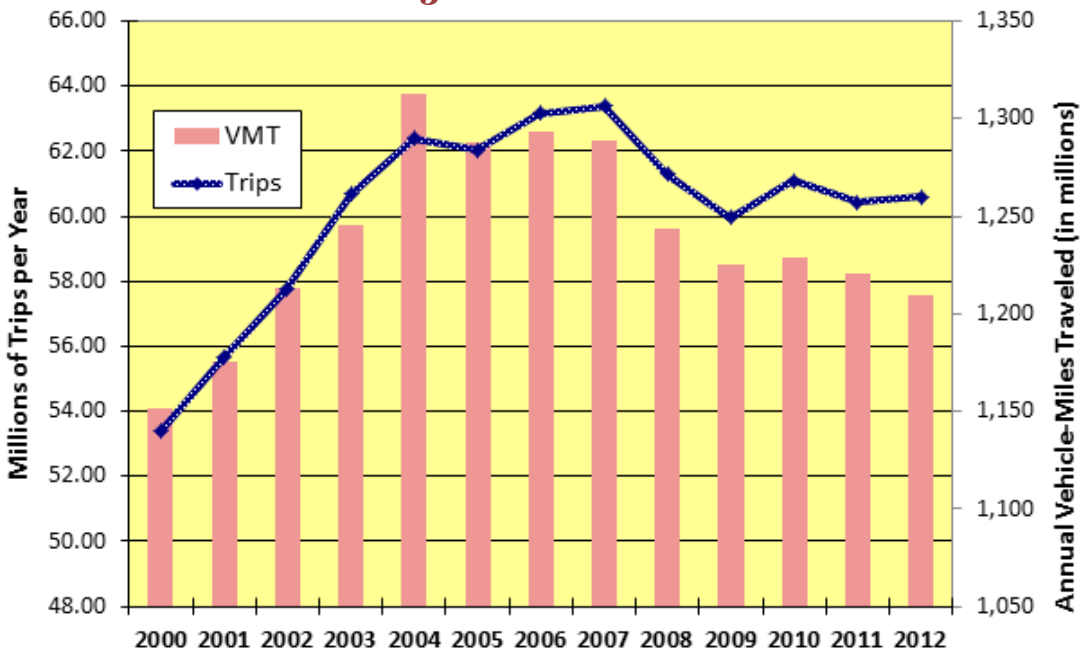
The average trip length on the Maine Turnpike was 20.0 miles in 2011. This is down about 7.4% since 2000, when the average trip was 21.6 miles. Some of this reduction in trip length may be attributed to the growth in shorter trips in the Greater Portland area.

In 2011 (the most recent year for which data was available), a total of 14.3 billion Vehicle-Miles Traveled were recorded in the State of Maine. This means that approximately 8.5% of all miles driven within Maine are driven on the Maine Turnpike.

TRAFFIC COUNT STATIONS

To gather accurate and timely traffic data, the Authority began installing traffic count stations at interchanges in 1996. Each station

FIGURE 3 - VMT & ANNUAL TRIPS



is composed of a Type 170 Controller housed in a traffic cabinet. The controller utilizes loop detectors placed in each mainline lane and on each entrance and exit ramp to continuously record traffic volume and speed data. The system, via software and dial-up telephone connections, enables the Authority to collect the data automatically at predetermined intervals. The data is then transferred to a database for analysis. By 2004, all interchanges were equipped with traffic count stations.

With the more frequent failure of the aging traffic loops, and the more regular disruption of the traffic loops during paving projects, the Authority and HNTB determined that upgrading the traffic count stations to newer technology was necessary to provide continued count and speed data to the Authority. The MTA is upgrading the count stations to side-fired radar technology to replace the loops. Upgrades to the count stations are expected to be complete by the end of 2014.

ROADWAY SENSORS

Roadway Weather Information Systems (RWIS) were installed in the fall of 2008 at the Saco River Bridge Overpass in Saco and at the Eagles Nest Bridge Overpass in Gray.

The RWIS measures the surface temperature of the road, road state (wet, dry, snow, ice), and roadway friction. These RWIS units provide information that can help maintenance supervisors make cost effective decisions regarding frost, chemical applications, and whether any precipitation on the pavement will freeze or thaw. The pavement sensors are also used to understand road conditions. Road conditions can be reported as dry, damp, wet, frost or ice.

VARIABLE MESSAGE SIGNS (VMS)

The Authority currently maintains a network of Variable Message Signs (VMS) to provide motorists with critical real-time traffic information. The VMS are installed at 14 different locations along the turnpike, primarily focused in the more heavily traveled southern section. The signs typically advise turnpike patrons of current traffic conditions, weather restrictions, accidents, delays, etc. Message displays are controlled by turnpike dispatchers from the communications center at the Maine Turnpike Authority Headquarters. The 14 VMS were recent upgraded with new controllers and power supplies, which has extended the useful life of the VMS.

Eleven Portable Changeable Message Signs (PCMS) have been deployed long-term throughout portions of the turnpike for incident management purposes and can be controlled from the communication center in the same manner as the fixed VMS.

HIGHWAY ADVISORY RADIO

HIGHWAY ADVISORY RADIO

The Maine Turnpike Authority installed its first Highway Advisory Radio (HAR) transmitter in Saco in 1997.

Today, 11 transmitters along the turnpike are located in strategic locations to provide information at critical decision points along the highway, typically at or near interchanges. The radios are supplemented by signs advising motorists to tune their radios to 1610 AM to receive real-time turnpike information. Prerecorded messages are continually broadcast to provide information about traffic conditions, weather, and construction zones. The communications center has the ability to control and quickly update messages. The HAR system is a significant resource for providing information to motorists. In 2007, the Authority upgraded the 11 transmitter sites and the software platform located in the communications center. This upgrade synchronized all the HAR transmitters improving coverage on the mainline.

An additional HAR transmitter was installed in 2011 in the vicinity of the Kennebunk Service Plazas to better cover the gap in reception

TABLE 5 - HIGHWAY ADVISORY RADIO TRANSMITTER LOCATIONS

TOWN / CITY	GENERAL LOCATION	MILE MARKER
York	I-95 SB at York Toll Plaza	7.3
Wells	I-95 SB at Sanford Road Overpass	19.1
Kennebunk	I-95 NB at Fletcher Street Overpass	25.3
Saco	I-95 NB at Boom Road Underpass	33.4
Scarborough	I-95 NB at Holmes Road Underpass	43.0
Falmouth	Exit 53 On-Ramp	53.0
Gray	I-95 SB at Gray Maintenance	63.3
Auburn	Exit 75 NB On-Ramp	75.4
Lewiston	Exit 80 SB On-Ramp	80.3
Litchfield	I-95 NB at Marsh Road Underpass	89.2
West Gardiner	I-95 NB at West Gardiner Toll Plaza	100.2
Augusta	I-95 SB, N. of Winthrop Street Underpass	108.7

between the two adjacent transmitters. The locations of these transmitters are summarized in **TABLE 5**.

CLOSED CIRCUIT TELEVISION (CCTV) SYSTEM

There are currently 12 CCTV cameras transmitting streaming video 24-hours a day, seven days a week, to monitors located in the communications center at the turnpike headquarters. Still images from these cameras are also viewable on the Maine Turnpike website.

The CCTV cameras are located at the following locations:

- **YORK TOLL PLAZA - NB & SB**
- **EXIT 25 (ROUTE 35) - NB & SB**
- **EXIT 32 (ROUTE 111) - NB & SB**
- **BETWEEN EXITS 32 & 36 (BOOM RD) - NB ONLY**
- **BETWEEN EXITS 36 & 42 (FLAG POND RD) - NB & SB**
- **EXIT 42 (HOLMES RD) - NB ONLY**
- **EXIT 63 (GRAY) - NB & SB**

These cameras allow the communications center to view traffic in the vicinity of these heavily traveled interchanges.

Two additional CCTV cameras are located with the RWIS that were installed in the fall of 2008 at the Saco River Bridge in Saco and Eagles Nest Overpass in Gray. These cameras are providing still images viewable through the RWIS website only at this point in time, but the cameras do have the capability to provide streaming video. It is anticipated that these cameras will be incorporated into the CCTV system in the near future.

Three additional trailer-mounted CCTVs were purchased in 2010 for temporary work zone monitoring and incident management.

ZOOM TURNPIKE EXPRESS

The Maine Turnpike Authority provides partial funding for the ZOOM Turnpike Express, a commuter bus service operating between Biddeford, Saco, and Portland. Currently, the Maine Turnpike Authority and ZOOM have a Memorandum of Understanding for July 2012 to June 2014. The MTA also provides designated bus pickup and drop-off areas in the Exit 32 and Exit 36 Park & Ride lots.

The commuter bus provides an alternative to driving on the most heavily traveled commuter route in the state. Averages of about 67,000 vehicles per day travel the section of the turnpike between Biddeford and Portland. Traditionally, ZOOM buses serve about 155 travelers per weekday. Ridership on the ZOOM Turnpike Express for fiscal year 2012 was 31,488. This ridership level is below the

record set in fiscal year 2009, yet since fiscal year 2008, yearly ridership has been above 30,000.

A regular one-way fare on ZOOM costs $5, with a 10 ride ticket costing $39. There are also monthly commuter cards available for $100 and a quarterly pass for $260. ZOOM riders are eligible to transfer for free to any connecting Shuttlebus, Metro, or South Portland bus route.

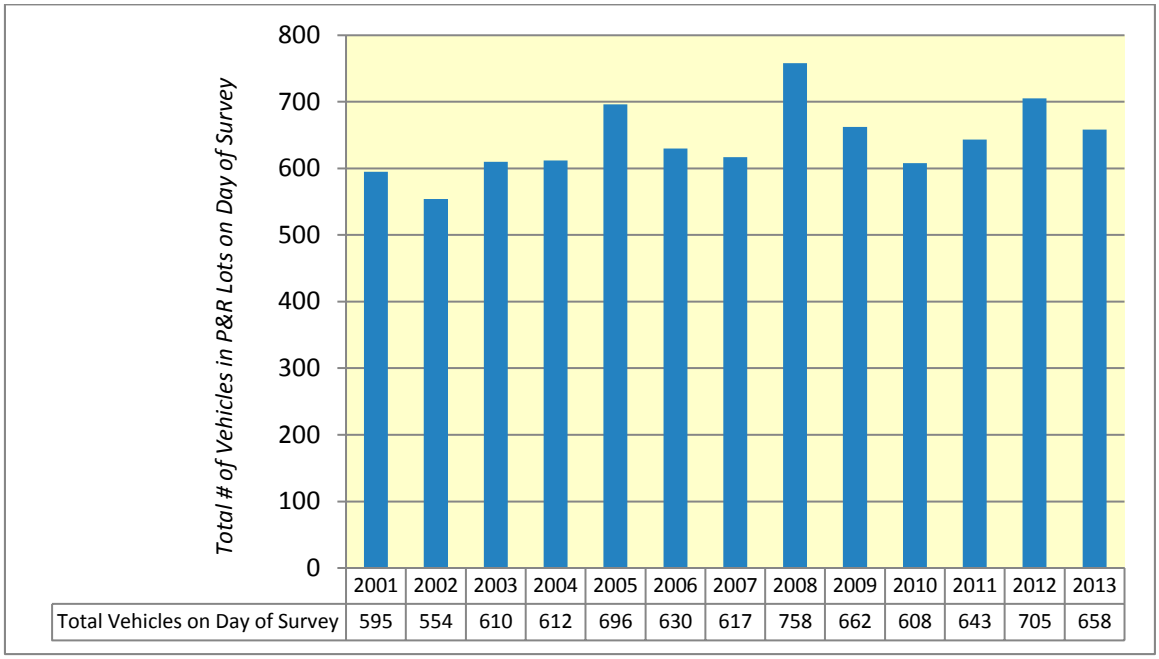
GO MAINE PROGRAM

The GO Maine Program provides information to commuters to help increase vehicle occupancy, ease peak hour congestion, and improve air quality while helping commuters save money. On April 1, 2013, the Maine Turnpike Authority assumed the administration of the statewide commuter program. The MaineDOT and the Greater Portland Council of Governments (GPCOG) had been administering the program previously. The MaineDOT remains a funding and collaborative partner.

There are three main components of the administration of this program. They are: Program Administration and Coordination, Rideshare and Technology Services, and Marketing, Education and Outreach. The MTA and the MaineDOT's goals are to have a robust, updated, and well-functioning database of commuters who wish to carpool or commute by another means other than a single occupancy vehicle. This will be done by using existing technologies and other media tools as appropriate. Secondarily, the two agencies want to have GO Maine be a conduit for information on commuting in Maine. GO Maine will work with statewide transit agencies, MPO's, planning organizations, and other interested parties.

Since the MTA has taken over the program, the database has been "purged" to only contain the information of those actively seeking car or vanpools or actively commuting by an alternative means. As of July 2013, there are 8,582 people in the database active for matching.

TABLE 6 - PARK & RIDE LOT USAGE - 2001 THROUGH 2013



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Vehicles on Day of Survey	595	554	610	612	696	630	617	758	662	608	643	705	658

Since September 2012, GO Maine no longer sponsors vanpools in Maine. Instead there are two private companies that work in concert with GO Maine to help start up new vanpools in Maine.

GO Maine plans to continue to manage the database to ensure that good commuter matches are made, as well as reach out to local businesses, municipalities, and others to tell people about the program and how easy it is to find a carpool match.

PARK & RIDE LOT PROGRAM

The Authority strongly encourages motorists to utilize its Park & Ride lots to reduce congestion on the turnpike through ridesharing. Currently, the Authority maintains a network of 16 Park & Ride lots located at or near most interchanges. The Authority monitors the use of these lots to assure that adequate capacity is available.

TABLE 6, on the previous page, summarizes overall Park & Ride usage from 2001 through 2013 on the day of the survey.

The following observations may be drawn from Table 6:

- Total Park & Ride lot usage has stayed in a fairly narrow range from about 550 vehicles (recorded in 2002) to just over 750 vehicles (recorded in 2008).

- Although lot usage has both risen and fallen over the years, the overall trend has been very gradual growth. A regression analysis suggests that average growth has been about 1.1% per year.

- In 2013, total usage on the day of the survey was 658 vehicles. Given that a total of 1,181 spaces were available, the overall system operated at about 56% of its capacity. By comparison, in 2002, the Park & Ride lots were operating at less than 50% capacity.

- Three relative spikes in usage have been noted over the past decade:

  - The first was in the fall of 2005, when fuel prices rose rapidly in the wake of Hurricane Katrina.

  - The second was in the spring of 2008, when fuel prices hit record highs.

  - The third was in the spring of 2012, when prices again climbed abruptly after a temporary reprieve in prices over the winter.

Interestingly, all three times in which Park & Ride lot usage hit a relative peak were also times in which gas prices reached approximately $4.00 per gallon (in 2013 dollars).

TABLE 7 summarizes Park & Ride lot usage at each location, as recorded during the 2013 Annual Inspection of the Maine Turnpike. The table also records the number of spaces available at each lot, as well as each lot's operational capacity.

As Table 7 indicates, the four busiest lots on the turnpike are at Biddeford (Exit 32), Saco (Exit 36), Gray (Exit 63), and Auburn (Exit 75). Each serves over 70 vehicles. Saco serves well over 100 vehicles.

Three lots - York, Saco, and Gray - are currently operating at over 75% capacity. The capacity issue at the Saco lot has been alleviated by the addition of an overflow lot on Route 112. However, the other two lots have no such adjacent area to provide relief.

Overall usage of the Park & Ride lots dipped from just over 700 vehicles in 2012 down to about 660 vehicles in 2013. Part of the dip can be attributed to changes at Exit 80. In 2012, two Park & Ride lots existed at this interchange. Each was operating at over 90% capacity, and together they served 85 vehicles. However, because of construction at the interchange, the two existing lots were closed down and a new lot was created on Route 196. This lot is located further from the

TABLE 7 - PARK & RIDE USAGE PER LOCATION - 2013

Town	Location	Owner	Spaces	2013 Volume	% Capacity
York	Chases Pond Road, US-1 Connector	MaineDOT	26	20	76.9%
Wells	Maine Tpk Exit 19, adj. to Wells Trans Ctr.	MTA	100	39	39.0%
Kennebunk	Maine Tpk Exit 25 SB, on Rt. 35	MTA	52	35	67.3%
Biddeford	Maine Tpk Exit 32, on Rt. 111	MTA	155	98	63.2%
Saco	I-195 Exit 1, on Industrial Park Road	MaineDOT	135	117	86.7%
Scarborough	Maine Tpk Exit 42, shared w/ Cabela's Parking Lot	MTA	66	22	33.3%
S. Portland	Maine Tpk Exit 45, on Rt. 703	MaineDOT	111	38	34.2%
Portland	Maine Tpk Exit 46, adj. to toll plaza	MTA	68	17	25.0%
Westbrook	Larrabee Road, near Maine Tpk Exit 47	MaineDOT	91	45	49.5%
W. Falmouth	Maine Tpk Exit 53, adj. to toll plaza	MTA	19	8	42.1%
Gray	Maine Tpk Exit 63, on US-202	MTA	74	72	97.3%
Auburn	Maine Tpk Exit 75, on US-202	MTA	137	75	54.7%
Lewiston	Maine Tpk Exit 80 - Route 196	MTA	93	42	45.2%
W. Gardiner	Maine Tpk Exit 102, near Rt. 126	MTA	54	30	55.6%
Overall			1,181	658	55.7%

interchange and is less convenient to utilize. As a result, Park & Ride usage at Exit 80 was cut in half. Only 42 vehicles were observed at this new lot in 2013. This change alone accounts for much of the system-wide decline that was observed in 2013 as compared to 2012.

TURNPIKE SAFETY AND LAW ENFORCEMENT

In 2012, approximately 737 crashes were reported on the Maine Turnpike and its ramps. This is a 4% decrease from 2011 (767 crashes) as reported by the Maine Turnpike Authority. The majority of crashes are in the northbound direction (364 vs. 302), with the remaining 71 of the crashes occurring on the Maine Turnpike ramps.

From 2010 to 2012, there were nine (9) High Crash Locations (HCL) on the Maine Turnpike, which includes the mainline, toll plazas, and interchange ramps. This is a reduction of four over the number of HCL's from 2009 - 2011. A High Crash Location is defined as a roadway node or segment that has more than eight crashes in a three-year period, and a Critical Rate Factor (CRF) greater than 1.0. A summary of locations is shown in **TABLE 8** on the following page. HNTB recommends that the crash data for High Crash Locations be reviewed to understand if mitigation measures are warranted.

Law enforcement services on the turnpike are provided by Troop G of the Maine State Police. Troop G is funded entirely by the MTA and

located in the MTA Administration Building. With access at Exit 46, Troop G has a safe entry/exit to the turnpike mainline, and good accessibility to the public. In addition, Troop G now benefits from a modern facility with state-of-the-art law enforcement components similar to other recently constructed state police facilities.

In 2012, Troop G had an average of 27 troopers assigned to the turnpike. At full strength, Troop G has 35 troopers. They patrol the entire turnpike, 24-hours a day, 365 days per year. This provides turnpike patrons with a very high level of coverage.

These troopers are dedicated to making the road safer by enforcing speed limits; assisting disabled motorists; detecting and apprehending operators who are under the influence of drugs or alcohol; and, enforcing other Maine State laws.

TABLE 8 - HCL AND CRF (2010 - 2012)

	Town/City	*Location Description*	*Crashes*	*CRF*
Northbound Mainline	New Gloucester	I-95 NB from Gray T/L to Mayall Rd. Overpass	9	1.32
Southbound Mainline	York	I-95 SB from York Toll Plaza to Exit 7 off-ramp	11	2.38
	Biddeford	I-95 SB from Exit 32 on-ramp to Route 111 bridge	9	1.21
	New Gloucester	I-95 SB from Gray T/L to Mayall Rd. Overpass	12	1.69
	New Gloucester	I-95 SB from Mayall Rd. Overpass to Bennett Rd.	14	1.03
	West Gardiner	I-95 SB from High Street Overpass to Farmingdale T/L	15	1.06
Ramps	Biddeford	Exit 32 ramp from Route 111 to Ramps merge	13	2.56
	Saco	Exit 36 SB off-ramp to I-195 EB	8	1.20
	Portland	Exit 48 - Riverside St. ramp merge to I-95 on/off ramp	8	2.81

5 MAINE TURNPIKE AUTHORITY/MAINEDOT JOINT INITIATIVES

OPERATIONS & MAINTENANCE

As part of LD 1538 (the MTA Omnibus Bill), the MTA will provide transportation dollars to the MaineDOT for projects and initiatives that will provide a benefit to the MTA. This includes MaineDOT projects that physically connect to the Maine Turnpike or are consistent with the overall Maine Turnpike Authority mission. Alternative Programs, such as the ones identified below, are included in these transportation dollars provided to MaineDOT.

The Maine Turnpike Authority and the Maine Department of Transportation have a long history of working together to provide an efficient transportation system. Since 1995, the Authority has been providing winter maintenance and litter patrol for a fee on a two mile stretch of I-95 (from Kittery to York) owned and maintained by the MaineDOT (sharing with NHDOT, the winter maintenance of the Piscataqua River Bridge). In 2004, the two agencies agreed that the Maine Turnpike Authority would provide winter maintenance on I-195, and the MaineDOT would provide winter maintenance at the Kittery Rest Area and the Park & Ride lot in South Portland. Additional discussions occur annually to confirm that all overlap points are being covered in the most efficient manner.

The Authority has also procured signs from the MaineDOT Sign Shop on a limited basis. The MTA coordinates with the MaineDOT when developing Pavement Rehabilitation projects. This relationship has provided more consistent Interstate paving specifications between the two agencies.

The MTA and MaineDOT also work together regarding storm-water issues. Permitting processes through MaineDEP are reviewed jointly by both agencies and three party agreements are signed so that MaineDOT and MTA are treated the same for transportation purposes.

This working relationship also involves the planning and construction of projects. Both agencies worked together on the recently constructed Maine Turnpike Gardiner Service Plaza project, the Gorham East-West Corridor and Central York County Studies, and the paving of a two mile section of MaineDOT owned I-95 in Kittery where MaineDOT reimbursed the MTA the cost of the work included in their Mainline Pavement and Rehabilitation project.

PARK & RIDE LOT COORDINATION

The MTA and MaineDOT continue to coordinate on the use, condition, and improvements to Park & Ride lots. The MTA, in coordination with MaineDOT, performed an updated inventory of all Park & Ride lots throughout the State of Maine in the spring of 2013. This involved an inventory of available parking spaces, an assessment of signing and amenities, and a count of the number of vehicles served by each lot. A follow-up report is anticipated in 2014, to be prepared by MaineDOT, that focuses on the usage characteristics of the lots that were surveyed. Information and findings from this report will be used by both agencies to identify near-term Park & Ride lot needs.

The Maine Turnpike Authority and MaineDOT agree to continue to work to identify future Park & Ride lot needs through the continued inventory and evaluation of these lots.

ALTERNATIVES PROGRAM COORDINATION

The Maine Turnpike Authority has participated in and funded all or part of Alternative Programs that were deemed to have a direct or indirect benefit to the Maine Turnpike. Examples of these Alternative Programs include GO Maine and ZOOM Turnpike Express. These are

described in more detail in Chapter 4.

PROJECT DEVELOPMENT

The Maine Turnpike Authority is currently coordinating with the MaineDOT on the development of three projects. In Lewiston, the Authority is planning to reconstruct the interchange ramps and replace the existing overpass structure. As part of this project, the MaineDOT is planning to implement improvements to the Plourde Parkway in the vicinity of the Maine Turnpike ramps. In Auburn, the MaineDOT is planning to upgrade the Exit 75/Washington Street intersection and other intersections in the vicinity of the Exit 75 Interchange. In West Gardiner, the MTA is coordinating with the MaineDOT on improvements to the Route 126/Exit 102 intersection. The MTA has committed to provide a financial contribution to the project.

6 PLANNING STUDIES

As the Authority evaluates possible new transportation projects, various planning studies must be undertaken to evaluate and identify the best available alternatives. Recent or ongoing planning studies are described in the following paragraphs.

THE CENTRAL YORK COUNTY AND GORHAM EAST-WEST CORRIDOR STUDIES

In response to growing pressures to improve east-west connections in York and Cumberland Counties, the 123rd Maine State Legislature directed the MaineDOT and MTA to study the opportunity to enhance, expand, and preserve highway connections west of Route 1 in York and Cumberland Counties, specifically noting the Gorham and Sanford areas.

Jointly, the MaineDOT and MTA developed a scope of services for two separate studies to directly address this resolve. The resolve specifically requires that these studies assess all modes of transportation in addition to land use strategies, in accordance with the Sensible Transportation Policy Act (STPA) and the Growth Management Act (GMA).

Both the York and Cumberland County studies are referenced in the MaineDOT's Long Range Plan and the PACTS Destination Tomorrow Long Range Plan, and are consistent with the mission statement in the MTA's 10 Year Plan. Each study is noted in detail below:

- ### GORHAM EAST-WEST CORRIDOR STUDY

The Gorham East-West Corridor Study began in the spring of 2009 and is a major new transportation and land use study of the corridor immediately west of Portland. This area is the location of what has historically been the fastest-growing residential market in Maine. The study's goal is to evaluate all the options and find the right package of alternatives to protect homeowners' quality of life over the long-term, without adding excess transportation capacity.

The study began when the municipalities of Gorham, Westbrook, Scarborough, and South Portland signed a joint resolution in 2007 asking for such a study, specifically to assess the feasibility of a new Turnpike Spur that will connect to the new Gorham Bypass. The resolution states that existing ways to manage traffic congestion, such as widening roads and adding turning lanes, will have a negative effect on their downtowns, village centers and neighborhoods. Both the MTA and MaineDOT officials believe that integrating all modes of transportation (transit, bike, pedestrian) is an integral part of the study.

A Draft Study Report was completed in the spring of 2011. Study findings determined that a combination of land use, transit, and roadway actions could help to improve transportation mobility, mode choice, and community quality of life. Study recommendations included identification of additional tasks to further evaluate and identify possible funding for specific land use, transit, and roadway actions.

Additional analysis was completed to better determine the feasibility of the recommended actions identified in the Draft Study Report, specifically the roadway improvement scenario that will address current and future safety and congestion. Findings from this additional analysis were presented to the Maine Turnpike Authority Board and MaineDOT to determine next steps.

A Final Study Report was completed in the fall of 2012. A copy of the Report can be found at www.gorhamcorridor.org. The Maine Turnpike Authority and MaineDOT are currently in discussion with the Army Corps of Engineers (ACOE) to determine the range of alternatives to be evaluated in the

next phase of study.

- **CENTRAL YORK COUNTY STUDY**

The Central York County Study began in September of 2010 and focused on connections between Central York County and the Maine Turnpike, with Route 1 forming a southeastern border of the analysis area. Traffic considerations along Route 1 itself will be a subject of the study to assess whether proposed improvements elsewhere have the potential to increase or decrease traffic levels on Route 1. This study will seek to integrate transportation and land use decision-making that will result in more effective connections between Central York County communities and the larger transportation network.

Current study findings indicate that MaineDOT upgrades to Route 111, a connector road in the vicinity of the Biddeford Interchange, in conjunction with modifications to the interchange and improvements to Exit 19 in Wells, will primarily address mobility and safety needs identified as part of this study.

The study was completed in the fall of 2012. Specific improvements were identified to be addressed within the study area. Current study information can be found at www.connectingyorkcounty.org.

SAFETY AND CAPACITY STUDY

Periodically, the MTA requests that a System-Wide Traffic Operation and Safety Study of the Maine Turnpike be conducted to assess both current and future operating conditions of all interchanges, mainline sections, ramps, and toll plazas between Kittery and Augusta. HNTB recently completed this study for the MTA in the fall of 2012.

Based on the data collected and results of the analyses performed for this study, a series of recommendations were presented. These recommendations include possible future improvements (such as roadway or interchange ramp widening, addition of toll plaza capacity, and safety improvements), an approximate time table of when the improvements become necessary, and an estimate of the forecasted construction costs. This document is used by the MTA as a long-range planning tool.

GRAY INTERCHANGE FEASIBILITY STUDY

The Maine Turnpike Authority has initiated the Gray Interchange Feasibility Study to improve transportation efficiency and reduce safety problems at the Exit 63 Interchange in the Town of Gray, Maine. This study is a continuation of several transportation initiatives that have occurred over the course of many years. The Study of this interchange and the local area to alleviate congestion in Gray Village and increase accessibility to the Exit 63 Interchange began with the Gray/New Gloucester Access Study, completed in 1998.

A Draft Gray Interchange Feasibility Study was completed and presented to the MTA in the spring of 2013. This study evaluated the transportation operations and efficiency, safety improvements, environmental impacts and construction costs for the alternatives that are evaluated at the Exit 63 Interchange. The Final Gray Interchange Feasibility Study is anticipated in the fall of 2013.

7 FUNDING

Funds for the operation, maintenance and improvement of the Maine Turnpike are deposited into accounts designated for specific purposes. These accounts are:

- **CAPITAL IMPROVEMENT FUND:**

  Includes specific projects to upgrade roadway facilities and improve highway safety, such as the Electronic Toll Collection system.

- **RESERVE MAINTENANCE FUND:**

  Includes projects that exceed the constraints of normal maintenance, such as bridge reconstruction programs.

- **OPERATION AND MAINTENANCE FUND:**

  Includes routine operation and maintenance work carried out by Authority personnel such as daily operations, repairs, and improvements.

The details of each fund are described below, as well as the recommended amounts of money to be deposited for fiscal year 2014. In addition, the recommendation regarding insurance coverage is included.

CAPITAL IMPROVEMENT FUND

As part of the Sensible Transportation Policy Act, the Authority identified projected deficiencies in turnpike facilities that needed to be addressed in the near- and long-term. From this planning effort, the Authority developed a Capital Improvement Program which detailed the need to significantly expand the extent of rehabilitation and maintenance work. It was clear that routine maintenance programs could no longer stem the deterioration of turnpike facilities nor provide the higher level of operational efficiency made possible by current technologies.

The Capital Improvement Program was proposed for projects that require a faster pace of reconstruction work due to compelling public safety interests and for projects intended to significantly enhance operations. At the end of 2013, we estimate this fund will have a balance of $42,739,810.

Including carryover projects from 2013, we estimate $63,094,022 in Capital Improvement expenditures in 2014.

We recommend $20,500,000 be deposited in the Capital Improvement Fund for 2014 projects.

RESERVE MAINTENANCE FUND

The Reserve Maintenance Fund dedicates the revenue required to keep turnpike infrastructure safe and in proper operational condition. This category normally funds contract work, which exceeds the scope of routine maintenance such as bridge rehabilitation, bridge painting, and annual paving projects. The recommended deposit to the Reserve Maintenance Fund for fiscal year 2014 is $30,000,000.

OPERATION AND MAINTENANCE FUND

Operation and Maintenance work is usually carried out by Authority personnel and includes activities such as administration, toll collection, snow plowing, minor repair work, sign replacements and other activities. We estimate that the cost of Operation and Maintenance during 2014, exclusive of Reserve Maintenance and Capital Improvement expenditures, will be in the amount of $37,879,295. This estimate is based on careful examination of 2013 expenditures and an evaluation of factors expected to influence these costs during 2014.

INSURANCE

Based on the replacement values provided by HNTB, the current turnpike insurance coverage appears to adequately protect the properties, interests, and operations of the Authority. Insurance is provided under a number of policies including a comprehensive commercial package; worker's compensation; and public officials and employee's liability. A detailed schedule of insurance is presented in **APPENDIX B**.

APPENDIX A - MAINTENANCE AREA BUILDINGS

DESCRIPTION	York Mile 7	Old York Mile 10	Kennebunk Mile 25	Crosby Mile 46	Sign Shop Mile 58	Gray Mile 63	Auburn Mile 77	Litchfield Mile 93	Gardiner Mile 102	TOTAL
Maintenance Garage, 3 Bay		1						1		**2**
Maintenance Garage, 4 Bay			1			1			1	**3**
Maintenance Garage, 5 Bay				1						**1**
Maintenance Garage, 8 Bay			2	1		1	1	1		**6**
Maintenance Garage, 10 Bay			1	1						**2**
Salt Shed	1		1	1		1	1	1	1	**7**
Sand/Salt Storage Building	1		1	1		1	2	1	1	**8**
Flammable Storage Building	1		1	1						**3**
Storage/Body Shop Building						1				**1**
Cold Storage Building	1	1	2	1	1		1	1	1	**9**
Hazardous Waste Storage Vault						1				**1**
Central Inventory Building					1					**1**
Sign Shop					1					**1**
Storage/Tool Shed					1		1			**2**
Office Building				1						**1**
Office Building, 6 Bay Garage						1				**1**
Office Building, 7 Bay Garage							1	1	1	**3**
Office Building, 10 Bay Garage			1							**1**
Office Building, 14 Bay Garage	1									**1**
Fuel Distribution System	1			1			1			**3**
Generator Building	1		1	1		1	1	1	1	**7**

APPENDIX B - SCHEDULE OF INSURANCE

Comprehensive Package Policy Including Turnpike Property
Underwritten by the Acadia Insurance Company — Agent: Cross Insurance

Commercial Package
Policy No. CFA1000627-31 — **Term: October 1, 2013 to October 1, 2014**

Risk	Coverage	Limit	Remarks
Fire and Related Blanket	Buildings	$ 81,118,000	Agreed Amount and
	Contents	$ 20,894,000	Replacement Cost
	Extra Expense & Loss of Rents	$ 3,611,500	
	Boiler and Machinery	Included	
	Scheduled Property:		
	Miscellaneous Unscheduled Locations**	$ 500,000	
	Bridges, Overpasses, and Underpasses	$253,701,000	
	Ordinance of Law Coverage	$ 10,000,000	
	Fine Arts**	$ 200,000	
	Property In Transit*	$ 100,000	
	Business Income - (Specific to flood/quake/auto accident to the roads only)	$ 10,000,000	
Inland Marine			
a Direct Physical loss or damage	Scheduled Maintenance Equipment	$ 5,113,081	
b. Direct Physical loss or damage	Valuable Papers*	$ 500,000	
	EDP Includes E-ZPass Equipment*	$ 1,292,714	
	Radar Counters, Radios, camera equipment, Signs and transmitting equipment		
	Message Boards	$ 400,884	
	Flood & Earthquake	$ 10,000,000	

***Included in the Contents Limit on Policy**

Business Auto
Policy No. CAA1000628-31 — **Term: October 1, 2013 to October 1, 2014**

Comprehensive	Bodily Injury Liability, CSL, BI & PD	$ 1,000,000	Each Occurrence
	Uninsured Motorist	$ 1,000,000	Each Occurrence
	Medical Payments	$ 5,000	Per Person
	Hired & Non-Owned Liability	$ 1,000,000	
	MCS-90		Included
Auto Physical Damage	Comprehensive and Collision	$ 1,000	
	Deductible Applies to PPT and applies to light trucks	$ 3,000	
	Hired Physical Damage	$ 200,000	
	Garagekeepers	$ 100,000	

Comprehensive General Liability Policy
Underwritten by Acadia Insurance Co. Agent: Cross Insurance

General Liability
Policy No. CLA5062485-10 **Term: October 1, 2013 to October 1, 2014**

Comprehensive General Liability	
Each Occurrence Limit	$1,000,000
Personal & Advetising Injury	$1,000,000
General Aggregate Limit	$2,000,000
Products-Completed Ops Aggregate	$2,000,000
Fire Legal Liability	$ 500,000
Premises Medical Payments	$ 5,000
Employee Benefits Liability	$1,000,000

Comprehensive Crime
Underwritten by Zurich American Insurance Company Agent Cross Insurance

Policy No. MPL 5834934-01 **Term: November 1, 2013 to October 1, 2014**

Crime	Coverage	Limits	Deductible
	Employee Theft	$2,000,000	$10,000
	Forgery or Alteration	$2,000,000	$10,000
	On Premises	$2,000,000	$10,000
	In Transit	$2,000,000	$10,000
	Computer Fraud	$2,000,000	$10,000
	Funds Transfer Fraud	$2,000,000	$10,000
	Money Orders/Counterfeit Money	$2,000,000	$ 2,500
	Electronic Data or Computer Programs Restoration Cost	$ 50,000	$10,000
	Investigative Expenses	$ 10,000	$ 0

Worker's Compensation Self-Insurance Excess Policy
Underwritten by New York Marine & General Insurance Company Agent: USI Insurance Services

Policy No. WC2013EPP00249 **Expires: February 1, 2013 to February 1, 2014**

Policy in keeping with the laws of the State of Maine; cancellation; 60 days

$750,000 Insurers retention for each accident or each employee for disease insurer's Limit of Indemnity for each employee for disease

1. As respects Coverage A (worker's compensation)
   $25,000,000 Each Accident
   $25,000,000 Aggregate - Disease
2. As respects Coverage B
   $1,000,000 Each Accident
   $1,000,000 Aggregate - Disease

$20,846,563 Total Estimated Annual Remuneration - February 2012-2013

Claim Service: Cannon, Cochran Management Service, Inc.

Public Officials and Employees Liability
Underwritten by ACE American Insurance Company Agent: Cross Insurance

Policy No. TBD **Term: October 1, 2013, to October 1, 2014**

Public Officials Employee Liability	Elected and appointed officials and all full-time and part-time employees	$5,000,000 each loss and aggregate for each policy year	Retention: $50,000 loss

Fidelity Bond-Public Officials
Underwritten by Travelers Insurance Company: Agent TD Insurance , Inc

Member of Authority	Term	Amount of Bond	Remarks
Peter S. Mills Executive Director Policy No. 105619973	May 24, 2013-2014	$500,000	Insures faithful performance of duties by the individual
Douglas D. Davidson Treasurer Policy No. 105220484	January 1, 2013-2014	$500,000	
Jonathan A. Arey Secretary Policy No. 105220456	January 2, 2013-2014	$ 50,000	

Fiduciary Responsibility
Underwritten by ACE Insurance Company — Agent: Cross Insurance

Policy No. G25749522 001 — **Term: November 7, 2013, to October 1, 2014**

Limit $2,000,000
Provides protection for your errors/omissions or negligent acts in connection with handling of employee benefit plans: Maine State Health Insurance Plan; Maine State Dental Insurance Plan; Maine Turnpike Group Life Insurance Plan; and Maine State Retirement System

Group Hospital-Surgical
Effective April 1999

Primary Coverage	Anthem Blue Cross of Maine State Select Program	Full semi-private room allowance

Self-Insured Workers Compensation Bond
Underwritten by Travelers Insurance Company

Policy No. 103464379 — **Term: December 2013**

Obligee: Maine Insurance Bureau

HNTB