

MaineDOT - HIGHWAY PRELIMINARY DESIGN REPORT

Project Name: *Broadway Intersection Improvements*
WIN: 18665.00

Draft Distribution Date: 1/31/2018
Final Distribution Date: 5/25/2018

Town(s): South Portland		Route(s): Route 77	
WIN: 18665.00		Federal Project No: STP-1866(500)	
Project Type: Spot Improvement			
Project Location: Three intersections along the Broadway Corridor, including Waterman Drive/Casco Bay Bridge, Ocean Street and Cottage Road.			
Length: 0.59 miles	BRLM: 1.77	ERLM: 2.36	RLM Date: 3/3/18
Program: Multimodal Program		Program Manager: Jeff Tweedie	
Project Manager: Brian Keezer		Designer: Gorrill Palmer	
FHWA Oversight: Yes		Engineer of Record: Don Ettinger	

LOCATION MAP

South Portland - Broadway Intersection Improvements



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PLANNING

Project History: A report completed by Sebago Technics entitled “Broadway Corridor Intersection Improvement Study” (dated July 16, 2012) identified numerous improvements to the Broadway corridor that would improve pedestrian and vehicular safety as well as improve traffic operations. The improvements considered include installation of signals at right turn lanes, pedestrian path improvements and lengthening of the right turn lane coming from the Casco Bay Bridge (CBB).

Purpose & Need:

In the existing condition, queuing traffic in the eastbound through lane coming from CBB blocks access to the right turn lane in the peak hour. Proposed work is to include lengthening of the right turn lane to provide more storage and improve the level of service of the right turn lane. The existing bike lane in the shoulder of the CBB approach will be narrowed from 8’ to 5’ and shifted from the roadway and onto a 7’ bike path approximately 100’ before the intersection.

The existing condition of the Broadway/Ocean eastbound right turn lane is a channelized right turn lane under a yield condition. The proposed work will consist of signaling this right turn lane with a flashing yellow arrow during normal operation to indicate a yield condition then shifting to a solid yellow arrow and a red arrow when the pedestrian button is activated. This will provide a safer crossing for pedestrians while maintaining traffic operations when pedestrians are not present.

At the Broadway/Cottage intersection the proposed work will match the Broadway/Ocean intersection with two channelized right turn lanes becoming signalized.

Pedestrian improvements are proposed along the Greenbelt Pathway as well as throughout the Broadway Corridor.

Brief Summary of Proposed Scope of Work: Reconstruction and restriping to add additional capacity for the eastbound right turn lane coming off of the Casco Bay Bridge, signaling right turn lanes at Ocean Street and Cottage Road, improvements to the greenbelt pathway connections and crossings, shared lane signing and striping along the corridor and signal interconnection of three intersections along Waterman Drive and Ocean Street.

Scope Changes: NA

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TRAFFIC

Intersections

Design Vehicle (without encroachment): NA

Design Vehicle (with encroachment): NA

Auxiliary Lanes: NA

Crash Data

Analysis Period: 2014 - 2016

High Crash Locations (including Critical Rate Factor and number of crashes):

Node: P14949 - Route 77 and Cottage Road

Number of Crashes: 35

Critical Rate Factor: 1.04

DESIGN CRITERIA

This section should reflect the criteria listed in the Highway Design Requirements (HDR) form.

Basic Design Controls

	SR 77 (Casco Bay Bridge)	SR 77 (Broadway)
Corridor Priority	2	2
Functional Class	Minor Arterial	Minor Arterial
NHS/Non-NHS	Fed-Aid Non-NHS	Fed-Aid Non-NHS
Posted Speed	40 MPH	30 MPH
2019 AADT (Current)	14220	23350
2039 AADT (Design)	16350	26850
DHV	12%	10%
Scope (choices below)	Spot Improvement	Spot Improvement
(New Construction, Reconstruction, Rehabilitation, Restoration/Resurfacing, Spot Improvement)		

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Controlling Criteria

Element	Required Standard	Required Standard
	SR 77 (Casco Bay Bridge)	SR 77 (Broadway)
Design Speed	40 MPH	30 MPH
Lane Width	12' (11' Striping)	12' (11' Striping)
Shoulder Width	4'-10'	4'-10'
Horizontal Curve Radius	533'	250'
Superelevation Rate	4%	4%
Stopping Sight Distance	305'	200'
Maximum Grade	8%	8%
Cross Slope (Travelway)	2%	2%
Vertical Clearance	16'6"	16'6"
Clear Zone	12'	10'

Typical Section

Element	Proposed Value	Proposed Value
	SR 77 (Casco Bay Bridge)	SR 77 (Broadway)
Lane Width	12'	Match Existing
Shoulder Width	5'	Match Existing
Cross Slope (Travelway)	2%	Match Existing
Side Slopes*	3:1	Match Existing

**If side slope standards cannot be met, no Design Exception will be required. If not meeting side slope standards results in clear zone standards not being met, a clear zone design exception will be required.*

DESIGN EXCEPTION SUMMARY

Controlling Criteria

Element	Required Standard	Proposed Value	Date Approved
NA			

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Drives and Entrances

Station	Maximum Grade	Grade Change	Date Approved
NA			

PAVEMENT STRUCTURE

(To be completed by Pavement Design & Quality Section)

Pavement Assessment Report (Title and Location): NA

Design Review Date: NA

Design Guidance Subgrade Soil Type (1-3): NA

Pavement Structure Design

Design Method	Design Guidance		Pavement-ME	
Layer	Thickness	Type	Thickness	Type
Hot Mix Asphalt Pavement	6"	12.5 mm		
Recycled Layer	-	-		
Base Course Gravel	-	-		
Subbase Course Gravel	12"	Type D		
Shoulder Pavement	6"	12.5 mm		

Pavement Design Coachpoint Date:

Final Pavement Structure Design

Design Method	Design Guidance		Pavement-ME	
Layer	Thickness	Type	Thickness	Type
Hot Mix Asphalt Pavement	6"	12.5 mm		
Recycled Layer				
Base Course Gravel				
Subbase Course Gravel	12"	Type D		
Shoulder Pavement	6"	12.5 mm		

Comments:

Existing pavement structure on CBB is 8" HMA and 30" gravel. Existing gravel will continue to daylight in the proposed condition. 6" HMA proposed for the auxiliary lane and shoulder construction.

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COMPLETE STREETS COMPLIANCE

A Complete Street is a roadway that provides safe and efficient access to the transportation system to all users. Each element of a Complete Street shall be considered according to the guidelines set forth in the MaineDOT Complete Streets Policy.

Select and summarize the Complete Streets elements that have been incorporated into the project:

Sidewalks

Crosswalks

Crosswalk restriping throughout the corridor as well as ADA improvements to curb ramps and tip downs are proposed.

Lighting (street or pedestrian scale)

Pedestrian Signals

Installation of pedestrian signals at the channelized right turn lanes at Broadway/Ocean and Broadway/Cottage is proposed. Modification to existing signage on flashing beacons for the Greenbelt Pathway is proposed.

Streetscaping (benches, landscaping, etc.)

Shoulder Improvements

Bike Lanes/Shared Use Paths

Widening of the Casco Bay Bridge to provide a 12' right turn lane as well as a 5' bike lane/shoulder is proposed.

Addition of a 7' bike path along the Casco Bay Bridge approach to the Broadway/Waterman intersection that connects into the Greenbelt Pathway is proposed.

Shared lane markings are also proposed along Broadway between Waterman Drive and Cottage Road.

Public Transit (bus stops, etc.)

Other (explain)

There are several reasons these elements may not be incorporated:

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*Use by pedestrians, bicyclists, and others is prohibited by law.
The cost is disproportionate to the need or probable use.
Components are outside the scope, due to the nature of the project.*

Summarize the reasons any elements were not incorporated:

The scope and budget for this project did not include provisions for lighting, streetscaping or public transit.

ADA COMPLIANCE

Pedestrian facilities shall be upgraded according to the guidelines set forth in the MaineDOT ADA Compliance Policy. The need for design exceptions shall be based on the MaineDOT Design Guidance on ADA Requirements for Pedestrian Facilities. This includes the discussion on “technical infeasibility”. Design Exceptions will be requested using the ADA specific request form.

Minimum Improvements based on the Policy:

Detectable warning surfaces, curb ramps and landing areas are to be upgraded for ADA compliance within the project limits.

On some project scopes, due to the nature of the work, pedestrian facilities will be reconstructed by default. These facilities must be upgraded to meet current ADA standards. On some project scopes, the nature of the work may not require that pedestrian facilities be reconstructed. However, if these facilities do not meet current ADA standard, they may still need to be upgraded.

Summarize the proposed improvements:

Detectable warning surfaces will be installed and/or updated as required. Curb ramps and landing areas will be updated throughout the Broadway Corridor as well as along the Greenbelt Pathway.

Existing Pedestrian Facilities

Element	Compliant? (Y/N)	Upgrades Proposed? (Y/N)	ADA Design Exception? (Y/N)
Curb Ramps			
Running Slope	N	Y	N
Cross Slope	N	Y	N
Width	N	Y	N
Counter Slope	N	Y	N
Flared Sides	N	Y	N
Landings	N	Y	N

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Diagonal Ramps	N	Y	N
Detectable Warnings	N	Y	N
Sidewalks			
Width	Y	N	N
Cross Slope	Y	N	N

Are pedestrian signals proposed to be installed or upgraded if required?

Pedestrian signals are proposed at the intersections of Broadway/Ocean and Broadway/Cottage due to the signalization of the right turn lanes.

ENVIRONMENTAL PERMITS / ISSUES

Team Member: Danielle Tetreau

NEPA	Programmatic Categorical Exclusion expected in June
Section 106	Architecture: <i>MHPC Concurrence pending. Effects unknown at this time.</i> National Register Eligible properties present: 482 Broadway, 37 Highland, 240 Ocean Street, 684 Broadway. Archaeology: no concerns
Section 6(f)	No takes.
Section 4(f)	Unknown at this time. Required if adverse effect to NRE properties.
Endangered Species	Northern long-eared bat: No effect if no clearing.
Essential Fish Habitat	Tidal flats of the Fore River are coastal EFH: No effect.
Fish Passage	Not required, no stream crossings.
In-Stream Window	<u>Not required, no in-stream work.</u>
Hazardous Material	Scope suggests no significant excavation. <i>Final review in process.</i>
Dredge Material	No dredge anticipated.
Stormwater/MS4	MS4 present. Stormwater unknown at this time. 100-year flood zone mapped at intersection of Broadway and Waterman.
DEP/LUPC	No resources.
ACOE	No resources.
Mitigation	Not expected to be required.
Other	

Avoidance & Minimization:

Guardrail and steepened side slopes are proposed along the Casco Bay Bridge to avoid impacts to the Fore River. The proposed design will be revised to match into the existing side slope above the Highest Annual Tide (HAT) elevation of 6.5 feet. See team comments on page 13.

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RIGHT-OF-WAY COORDINATION

Team Member: Andrew Johnson

	SR 77 (Casco Bay Bridge)	SR 77 (Broadway)
Total Existing Width:	160'	90'
Total Proposed Width:	N/A	N/A
# of Abutters: 13		
# of Acquisitions: None. Two properties will require temporary construction rights.		
# of Relocations: None.		
Building Availability: NA		
Reserved Limits: NA		

UTILITY IMPACTS/ISSUES

Team Member: Rick Paraschak

Above Ground Utilities:

AT&T (Portland Office), Boston & Maine Corporation, Buckeye Partners LP, Central Maine Power Company, FairPoint Communications –Northern New England Telephone Operations LLC, M C I World Com, Maine Fiber Company, MaineCom Services, Oxford Networks, Portland Terminal Company, Revolution Networks (aka NECAP), Time Warner Cable (Portland Office), Time Warner Cable-Chip Deane, U.S. Sprint

Below Ground Utilities:

Central Maine Power Company, Granite State Gas Transmission Inc, Portland Pipeline Corporation, Portland Water District, City of South Portland, Unitil Corp.

	Necessary for this Project? (Yes or No)	Coordination Still Needed? (Yes or No)
Pole List:	TBD	TBD
Utility Agreements:	TBD	TBD
RR PRTS:	No	No
Railroad Agreement:	No	No

ROW issues related to utilities: NA

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GEOTECHNICAL COORDINATION

Team Member: Kate Maguire

Available Soils Information: No

Additional Borings Required? (Y/N) No

Additional Geotechnical Analysis Required? (Y/N) TBD

Comments by Geotechnical Engineer:

Are Foundations for Overhead Sign Structures, Traffic Signals or Lighting Required? (Y/N) No
(If yes, one boring per foundation required.)

PUBLIC PROCESS

Proposed Public Contact Method and Date(s): Public meeting was held on May 2, 2018

Concerns Identified at Preliminary Public Meeting: No concerns were noted at the public meeting.

Municipal Agreement:

M&O ISSUES /CONCERNS

CONSTRUCTION SCHEDULE

PS&E Date	7/29/19
Advertise Date	8/12/19
Construction Begin Date	9/16/19
Construction Complete	12/10/19

TAME RESULTS *(Transfer results from returned Tame Request Form)*

Morning Restrictions	TBD
Evening Restrictions	TBD
Maximum Closure Length	TBD
Minimum Lane Width	TBD

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Additional Comments:

BUDGET

	Programmed	Available	PDR Estimate
Date			
Preliminary Engineering	\$74,328.00	\$74,328.00	\$70,000.00
Right of Way	\$6,082.00	\$6,082.00	\$5,000.00
Construction	\$289,476.00	\$289,476.00	\$380,000.00
Construction Engineering	\$32,164.00	\$32,164.00	\$50,000.00
Other			
TOTAL	\$402,050.00	\$402,050.00	\$505,000.00
Total Cost per Mile:			
Funding Strategy (Sources):	The City and PACTS are securing additional funding for this project.		

SUMMARY OF PRELIMINARY ENGINEERING

Alternatives Analysis

(This may only be applicable to some projects, such as Large Culverts, Rehabilitations, and Roundabouts.)

NA

Design Variances

(Discuss design elements that do not meet standard but do not require a formal design exception)

NA

Proposed Design Elements

(Discuss existing vs. proposed condition)

Horizontal Alignment:

The proposed horizontal alignments generally match the existing roadway centerlines.

Vertical Alignment:

The proposed roadway profile is to match the existing profile.

Typical Section:

Route 77 (Casco Bay Bridge) – The typical section in the EB direction consists of two existing 12' travel lanes and a proposed 12' right turn lane. 2' inside shoulders and a 5' outside shoulder/bike lane is proposed for approximately 350'. A 7' wide bike path is proposed approximately 100' prior to the intersection providing access to the Greenbelt pathway.

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Pavement Structure:

Route 77 (Casco Bay Bridge) – The proposed pavement structure is 6” Hot Mix Asphalt. As-Built plans indicate that existing gravel (30” depth) day lights along the Casco Bay Bridge, therefore only 12” of gravel is proposed.

Drainage/Hydrology:

Existing drainage along the Casco Bay Bridge consists of catch basins along the curb line. Drainage along the inside curb line adjacent to the median will be maintained. Proposed catch basins along the outside curb line will generally match the existing location and be adjusted to the proposed curb locations. Catch basin outlets will be maintained in the proposed condition.

Guardrail:

Guardrail is proposed in areas of widening on the Casco Bay Bridge. Proposed slopes of 2:1 are used to avoid potential impacts to the Fore River. Final guardrail locations will be determined according to length of need calculations, and placed flush with the face of curb.

Intersection Geometry:

Intersection geometry is to match the existing condition.

Right-of-Way:

See Right of Way section above for details.

Utilities:

See utilities section above for details. Utility coordination for underground utilities will be needed in final design. Details for existing drainage (rims, inverts, outlets, etc.) will be determined along the Casco Bay Bridge in final design.

Other Design Issues:

(Discuss any issues that have been identified but have not yet been resolved.)

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DRAFT PDR DISTRIBUTION TEAM COMMENTS AND RESPONSE

(Minor edits and corrections can be made to the body of this document above without reference in this section. More significant comments that result in design or other changes should be noted in this section before the Final Distribution.)

Comments:

1. The Env team member confirmed that the Fore River high tide mark is elevation 6.5'. Preliminary plans assumed a 5.0' elevation for high water mark. Plans will be revised during final design to avoid grading below elevation 6.5' along the Fore River.
2. A team member asked if the granite curb along the CBB widening area could be reused instead of installing new curb. Gorrill Palmer will consider reusing existing curb during final design.
3. A team member asked if there is enough existing gravel under the CBB widening or should full depth gravel be proposed in the widening area. The as-built plans suggest 30" of daylighted gravel is present. Therefore, full depth gravel is not required and underdrain is not required in this area.

Comment Deadline	Date:
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APPROVALS

Preliminary Design Report Complete		Date:
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For Large Culvert Projects, Preliminary Design Report Complete also signifies Plan Impacts Complete.