

2.0 • Alternatives Analysis

A range of alternatives was proposed to address the transportation problems along Route 1 in Wiscasset and Edgecomb. In identifying, planning, and developing the alternatives, the MaineDOT consulted with the FHWA, regulatory and resource agencies at the state and federal levels, local officials, stakeholder groups, and the public. A screening process was established to systematically consider the wide range of potential alternatives and to identify a reasonable range of alternatives to retain for further consideration. Of the 30 alternatives developed, six—including the No-build Alternative—were retained for further consideration at the conclusion of the screening process.

2.1 Phase I Alternative Identification Development and Screening

A study area was developed that encompassed a range of reasonable alternatives for satisfying the study purpose, satisfying the USACE's basic purpose statement, and solving the identified problems (exhibit 2.1). A planning-level analysis of the natural, social, economic, and cultural resources and features in the study area was performed.

Strategies and alternatives were subsequently identified and developed in accordance with the Maine Sensible Transportation Policy Act (STPA) and the National Environmental Policy Act (NEPA). The MaineDOT and the FHWA are the decision-makers with consideration of agency and public input through the NEPA process. It is the role of the MaineDOT to identify, plan, develop, analyze, and select an alternative that best meets the study purpose and solves the identified problems, with the least adverse impact to the natural, social, economic, and cultural resources of the area, at a reasonable cost in funding resources.

In identifying and developing the alternatives, the MaineDOT consulted with the FHWA, the regulatory and resource agencies at the state and federal levels, regional and local officials, other stakeholder groups, and the public. In Maine, the federal and state regulatory and resource agencies participate in the review of the alternatives-screening process via monthly interagency meetings. The following agencies attend these meetings:

- The USACE
- The U.S. Fish and Wildlife Service (USFWS)
- The U.S. Environmental Protection Agency (USEPA)
- The National Marine Fisheries Service (NMFS)
- The Maine Department of Inland Fisheries and Wildlife (MDIFW)
- The Maine Historic Preservation Commission (MHPC)
- The Maine Department of Environmental Protection (MDEP)
- The Maine Department of Conservation (MDOC)
- The Maine Department of Marine Resources (MDMR)

The role of the regulatory and resource agencies in the alternatives development and screening process is to advise the MaineDOT by reviewing and commenting on the alternatives. These agencies assist the MaineDOT by identifying potential impacts to the natural, social, economic, and cultural resources of the area and issues of concern and by suggesting methods and measures to further avoid and minimize those impacts.

Using the inventory of the natural, social, economic, and cultural resources of the study area, and with the assistance of the Public Advisory Committee (PAC) and the public, the MaineDOT identified a wide range of potential corridors within which alternatives would be developed.

2.1.1 Alternatives Identified and Developed in Stage I

With the assistance of federal and state regulatory and resource agencies, the PAC, and the public, the MaineDOT avoided resources to the extent possible and developed the potential corridors to initially identify 30 alternatives, including the No-build Alternative and 29 new roadway, tunnel, and railroad-relocation alternatives.

During the screening process, the MaineDOT developed measures of effectiveness to qualitatively assess whether alternatives satisfy, partially satisfy, or do not satisfy the study purpose and the USACE basic purpose or solve the identified problems (exhibit 2.2). These criteria were used in conjunction with overall engineering feasibility; preliminary cost estimates (to determine which alternatives would be economically practicable); and potential impacts to natural, social, economic, and cultural resources to dismiss alternatives from further consideration. The alternatives-screening process occurred in successive stages that narrowed the range of alternatives

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Exhibit 2.2 – Measures of Effectiveness for Alternatives

<i>Purpose and Need Criteria</i>	<i>Measure of Effectiveness</i>	<i>Does Satisfy Criteria</i>	<i>Partially Satisfies Criteria</i>	<i>Does Not Satisfy Criteria</i>
Traffic Congestion Need	Vehicle-hours of back-up delay on Route 1 routinely caused by volumes of traffic that exceed the highway capacity	Eliminates Route 1 back-up delay through 2030	Reduces Route 1 back-up delay below 1,800 vehicle-hours per summer day (2005 level) through 2030	Fails to reduce Route 1 back-up delay below 1,800 vehicle-hours per summer day (2005 level) through 2030
Safety Concerns Need	Number of the 5 HCLs (based on 2001–2003 data) where safety would be improved	Improves safety at all 5 HCLs	Improves safety at 2 to 4 HCLs	Fails to improve safety at 2 or more HCLs
	Range of posted speeds for Route 1 through-traffic in the study area	Posted speed would range from 45 to 50 mph	Posted speed would range from 35 to 50 mph	Posted speed would range from 25 to 50 mph
	Vehicle–pedestrian conflict as measured by the SADT in 2030	2030 SADT reduced below 2005 level	2030 SADT reduced but not below 2005 level	2030 SADT not reduced
	Separation of local and Route 1 through-traffic	Separates local and through-traffic	Reduces mix of local and through-traffic	Local and through-traffic remains mixed
Community Character Need	Vehicle–pedestrian conflict as measured by the SADT in 2030	2030 SADT reduced below 2005 level	2030 SADT reduced but not below 2005 level	2030 SADT not reduced
	Impact on on-street parking on Main Street	Preserves on-street parking on Main Street	Reduces on-street parking on Main Street	Eliminates on-street parking on Main Street
	Impact on properties potentially eligible for the NRHP in Wiscasset Village	Has no impact on properties potentially eligible for NRHP in Wiscasset Village	Uses but does not displace properties potentially eligible for NRHP in Wiscasset Village	Displaces properties potentially eligible for NRHP in Wiscasset Village
Study Purpose	Ability to increase public safety, enhance mobility, and provide a net improvement to the environment	Meets all three elements of the study purpose	—	Fails to meet all three elements of the study purpose
USACE Basic Purpose	Ability to improve east-west along Route 1 in order to improve public safety and relieve traffic congestion	Meets both traffic and safety needs (at least partially)	—	Fails to meet both traffic and safety needs

and refined those retained for further consideration (exhibit 2.3 and DEIS Appendix A: Alternative Analysis Matrix).

During each subsequent screening stage, the alternatives were further developed and refined. At each stage, the alternatives were developed consistently and to the same level of detail to allow an equal comparison among them. Cost estimates were based on applying readily available unit costs to the alternatives information available at that stage.

Exhibit 2.3 – Alternatives Considered

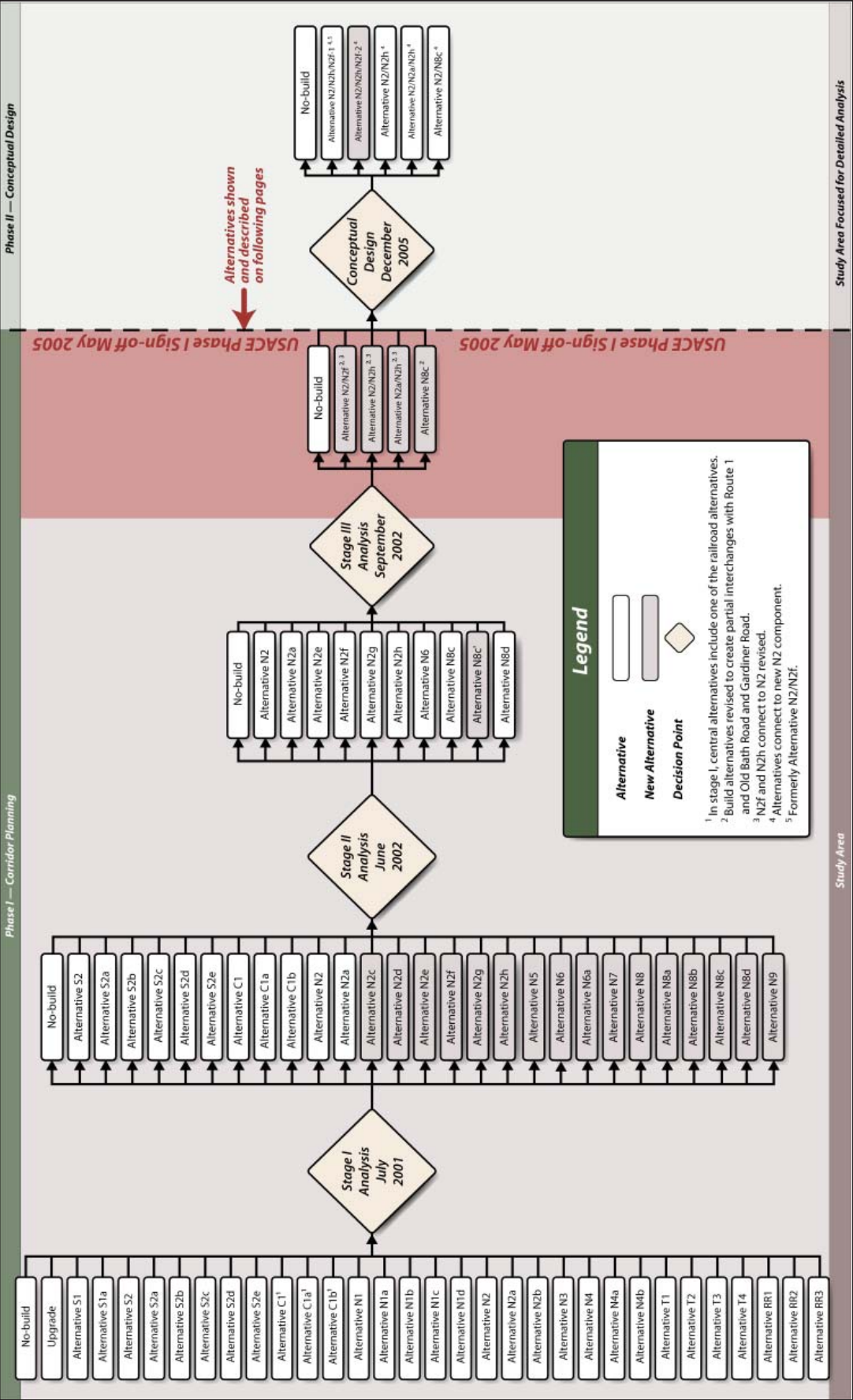


Exhibit 2.3 – Alternatives Considered (continued)

Alternatives Retained for Further Consideration at The Start of Phase II

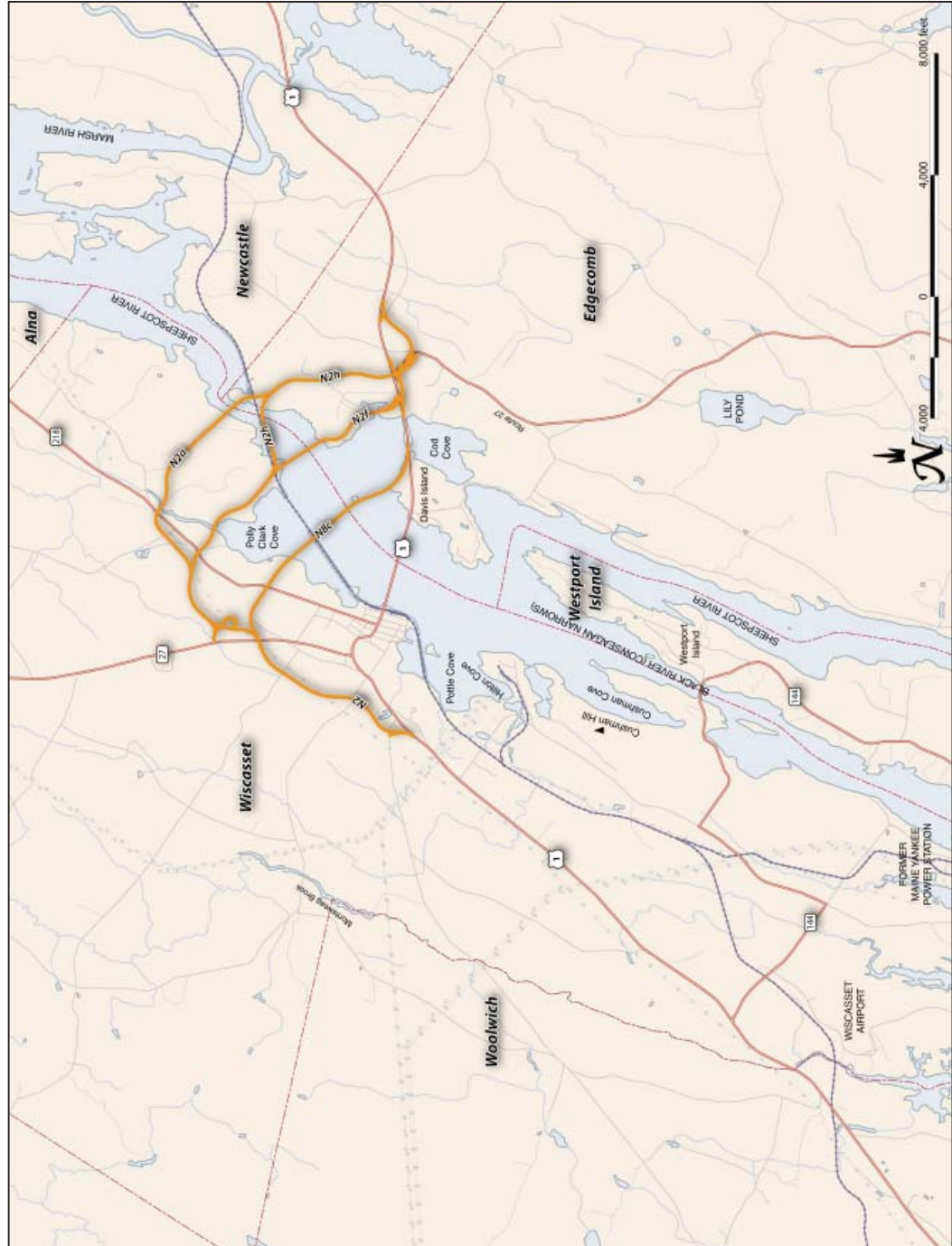


Exhibit 2.3 – Alternatives Considered (continued)

Key: ✓ = Yes X = No

ALTERNATIVES RETAINED FOR FURTHER CONSIDERATION AT THE START OF PHASE II

Alternative	Meets purpose?					Meets needs?			What was the outcome?	Why?
	Study Purpose	USACE Purpose	Traffic Congestion	Safety Concerns	Community Character					
No-build	X	X	X	X	X			Retained for further consideration	Although the No-build Alternative satisfies neither the study purpose and needs nor the USACE's basic project purpose, it was retained for further consideration. (The No-build Alternative fails to address the worsening traffic congestion, safety, and community-character issues in Wiscasset Village). The No-build Alternative and its consequences allow equal comparison to the build alternatives and help decision-makers understand the consequences of taking no action.	
N2a/N2h	✓	✓	✓	✓	✓			Retained for further consideration	Determined to be one of the few alternatives that best satisfied the purpose and needs of the study with the least adverse impact to the environment.	
N2/N2f	✓	✓	✓	✓	✓			Retained for further consideration	Determined to be one of the few alternatives that best satisfied the purpose and needs of the study with the least adverse impact to the environment.	
N2/N2h	✓	✓	✓	✓	✓			Retained for further consideration	Determined to be one of the few alternatives that best satisfied the purpose and needs of the study with the least adverse impact to the environment.	
N8c	✓	✓	✓	✓	✓			Retained for further consideration	Determined to be one of the few alternatives that best satisfied the purpose and needs of the study with the least adverse impact to the environment.	

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The screening analysis performed in Stage I occurred from 2000 to 2001. It considered alternatives that fit into seven broad families: no-build, upgrade, southern, central, northern, tunnel, and railroad-relocation alternatives. In Stage I and subsequent stages, the No-build Alternative was fully developed to allow an equal comparison to the build alternatives.

The Stage I screening process involved the use of basic quantitative and qualitative data to identify within each family the alternative that would be more effective, less costly, and less environmentally damaging than other alternatives in that family. The process also identified families in which alternatives would be impracticable for reasons of effectiveness, cost, or impacts to the environment.

The Upgrade Alternative was developed to analyze the potential of increasing the capacity of Route 1 by adding travel lanes in Wiscasset Village. Because the current number of travel lanes on Route 1 is unable to accommodate existing and future mobility needs, additional travel lanes in each direction would be needed to provide adequate roadway capacity.

The family of southern alternatives (Alternatives S1, S2, and their variations) and some of the northern alternatives (Alternatives N1 through N4 and their variations) were developed to explore routes that avoided interference with residential and commercial land uses in Wiscasset Village by completely bypassing the downtown area. The family of central alternatives (Alternative C1 and its variations) was developed to examine a shorter bypass located closer to Wiscasset Village, which would minimize the impacts to the natural, social, and human environment from new construction and property acquisition. The central alternatives included a railroad-relocation alternative.

The family of railroad-relocation alternatives (Alternatives RR1, RR2, and RR3) was developed and intended to be used in conjunction with the central alternatives. It was envisioned that relocating the railroad could reduce congestion on Route 1 by eliminating traffic back-ups when trains cross Main Street and that improved rail service might divert additional travelers from road to rail.

The family of tunnel alternatives (Alternatives T1 through T4) explored various options for placing Route 1 underneath Wiscasset Village to shorten the length of the bypass, restrict construction to the more urban areas, and avoid potential aesthetic impacts of a new bridge.

The analysis performed in Stage I resulted in the No-build Alternative and Alternatives S2, C1, and N2 (and their variations) being retained for further consideration. Other alternatives were dismissed because of their inability to satisfy the study purpose and solve the identified problems, their potential impact to the natural, social, economic, and cultural environments of the area, or both.

2.1.2 Alternatives Identified and Developed in Stage II

The screening analysis performed in Stage II occurred from 2001 to 2002 and focused on the select group of alternatives carried over from Stage I. New alternatives, modifications of alternatives, and combinations of alternatives were considered. The alternatives in Stage II were developed to a greater level of detail than in Stage I; more detailed cost, environmental, and traffic data were developed and analyzed. New alternatives in Stage II underwent a Stage I review before consideration at a Stage II level of detail. Some new alternatives were dismissed at a Stage I level of detail. Stage II included regular consultation with affected municipalities and the public. Northern alternatives were emphasized in this stage; the new alternatives introduced during Stage II were all northern alternatives. At the end of the analysis in Stage II, the No-build Alternative and Alternatives N2, N6, and N8 (and their variations) were retained for further consideration.

2.1.3 Alternatives Identified and Developed in Stage III

The screening analysis performed in Stage III occurred in 2002. It relied on extensive information from, and coordination with, regulatory and resource agencies at the state and federal levels to refine the permitting and regulatory issues and on continued coordination with affected towns, and the public. Variations of northern alternatives were dismissed or combined with alternatives retained for further consideration. For the build alternatives, interchanges with Route 1 and Route 27 were limited to two ramps each to minimize environmental impacts. At the conclusion of the analysis in Stage III, the MaineDOT retained the No-build Alternative and four build alternatives (i.e., Alternatives N2/N2f, N2/N2h, N2a/N2h, and N8c) for further consideration.

Consideration was given to the location for interchanges as part of the planning and conceptual design of the build alternatives. In Stage III, the decision was made to limit the number of interchange ramps to minimize

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the footprint and impacts of the build alternatives. Partial interchanges with only two ramps would be used in Wiscasset to maximize the traffic and travel benefits and minimize adverse environmental impacts. The following factors led to the decision to construct an interchange with Gardiner Road (Route 27) and not to construct an interchange with Route 218.

Given that the termini of the build alternatives would connect to Route 1 in Wiscasset, which is functionally classified as a principal arterial, the next logical connection would be to Gardiner Road, which is functionally classified as a minor arterial. Route 218 is functionally classified as a major collector.

With approximately a half-mile of spacing between Gardiner Road and Route 218, construction of interchanges that would serve both routes would be difficult to develop while adhering to design criteria related to safety.

Data from the traffic origin–destination studies showed that Gardiner Road generates more than three times the Davey Bridge river-crossing traffic than does Route 218. An interchange with Gardiner Road would also do more to relieve traffic congestion in Wiscasset Village than an interchange with Route 218.

In conjunction with the three-stage screening process, the alternatives were evaluated in accordance with Section 404 of the CWA. Section 404 of the CWA requires a permit from the USACE for the discharge of dredged or fill material into Waters of the U.S.; Waters of the U.S. include wetlands. Section 404(b)(1) of the CWA provides guidance to the USACE for issuing permits; compliance with section 404(b)(1) is required for a permit to be issued. Section 404(b)(1) requires that the LEDPA be chosen as the preferred alternative. In May 2005, the USACE concurred with the alternatives-screening process to date and the range of alternatives retained for further consideration (Appendix B).

Following the conclusion of the screening process, the MaineDOT initiated, in December 2005, the conceptual design of the build alternatives retained for further consideration. After the Stage III analysis, the alternatives retained for further consideration were the No-build Alternative and Alternatives N2/N2f, N2/N2h, N2a/N2h, and N8c. The purpose of conceptual design was to further develop each build alternative to better understand how each would operate and what potential impacts each would have on the transportation, natural, social, economic, and cultural resources of the area. During conceptual design, the build alternatives were renamed to more

accurately reflect their components; for example, Alternative N2/N2f was renamed N2/N2h/N2f. The MaineDOT developed a modification of Alternative N2/N2h/N2f with a different connection to Route 1 in Edgecomb. The original alternative is referred to as N2/N2h/N2f-1; the modification is referred to as N2/N2h/N2f-2.

The alternatives retained for further consideration at the start of the Phase II analysis and included in the DEIS/Section 4(f) Evaluation, October 2007 were:

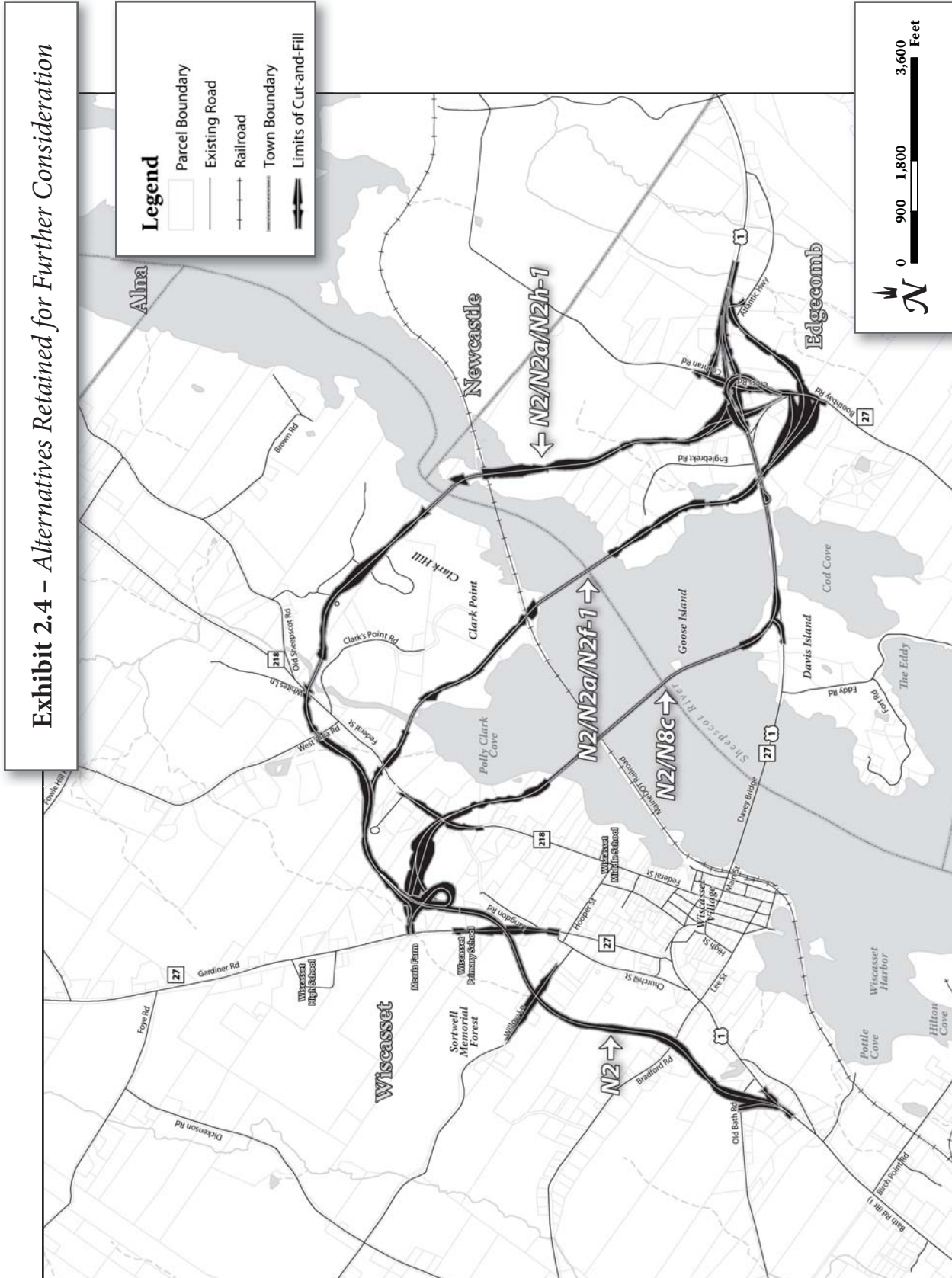
- No-build
- N2/N8c
- N2/N2h/N2f-1
- N2/N2h/N2f-2
- N2/N2h
- N2/N2a/N2h

The build alternatives would be controlled-access highways. A controlled-access highway provides limited points of access and egress; typically, these points are only at interchanges. Controlled-access highways are used to improve regional mobility and accommodate higher traffic speeds. The build alternatives would be designed and operated within right-of-ways that are approximately 250 feet wide.

The build alternatives share N2, which is the same between Route 1 near Old Bath Road and to the east of Gardiner Road in Wiscasset. The differences in the build alternatives occur between Gardiner Road and Route 1 in Edgecomb (exhibit 2.4).

The build alternatives were designed to adhere to the design criteria established (exhibit 2.5), with one potential exception: the minimum stopping sight distance for vertical curves. For the first vertical curve with N2 (south of Old Bath Road) and the last vertical curve in Alternative N2/N8c (on Davis Island), the minimum stopping sight distance is 360 feet, which corresponds to a speed of 45 mph. This potential design exception improves the constructability of the build alternatives in these two locations by minimizing the reconstruction needed at the termini with Route 1. Further detailed study of these potential design exceptions would be undertaken during final detailed design.

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As a further refinement, the clear-zone width of each build alternative was reduced and a bicycle and pedestrian lane was added to help reduce potential natural, social, economic, and cultural impacts from the build alternatives and to create the appearance of a “parkway” to fit with the landscape and desires for the area. The MaineDOT designed a bicycle and pedestrian lane that would be constructed between Old Bath Road and Route 218 as part of each build alternative. To allow the MaineDOT to decrease the required clear zone from 28 to 9 feet (i.e., reducing the amount of property to be acquired, reducing the amount of construction, reducing impacts, and giving the roadway more of a parkway appearance), a guardrail was added to the design of the build alternatives.

N2 would start at Route 1 near Old Bath Road and continue north and east of Gardiner Road. N2 would be used by Sheepscot River-crossing traffic either originated from or destined to Route 1 south of Old Bath Road. Southbound traffic from Wiscasset Village would use a new ramp off Old Bath Road to continue southbound on Route 1. N2 would be approximately 1.4 miles long from Route 1 to Gardiner Road. N2 would cross the following four roads:

- Old Bath Road: N2 would be constructed approximately 20 feet below existing ground level at its deepest location under Old Bath Road, and an overpass would be constructed to carry Old Bath Road over N2.

Exhibit 2.5 – Criteria for Conceptual Design

Design Element	Design Criteria
Type of Roadway	Rural Arterial with controlled access
Design Speed	50 mph
Posted Speed	45 mph
Terrain	Mountainous
Lane Width	12 feet
Shoulder Width	8 feet
Cross Slopes	6.0% Maximum Super Elevation 2.1% Normal 4.2% Shoulder – Normal
Clear Zone	28 feet Reduced to 9 feet with guardrail
Side Slopes	
Cut	Front slope at 4:1 Back slope at 2:1
Fill	4:1; guardrail is needed when the embankment height is greater than 15 feet
Minimum Stopping Sight Distance	400 feet
Maximum Degree of Curvature	6°45'
Vertical Grades	7% Maximum 0.25% Minimum Desirable 0% Minimum
Minimum Vertical Clearance	16 feet 6 inches over roads 23 feet 6 inches over railroads
Super Elevation Transition Length	200 feet
Bicycle and Pedestrian Lane Width	10 feet with barrier separation from vehicular traffic

Sources: AASHTO, 2001 and MaineDOT, 1994

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- Bradford Road: N2 would be constructed approximately 20 feet below existing ground level at its deepest location under Bradford Road and an overpass would be constructed to carry Bradford Road over N2.
- Willow Lane: N2 would be constructed under Willow Lane at approximately the same elevation as Willow Lane currently exists. Willow Lane would be raised approximately 30 feet above its existing elevation, at its highest point, to pass over N2. Approximately 1,800 feet of Willow Lane would be reconstructed. Driveways connecting with this section of Willow Lane would be reconstructed, and the front-yard slopes of the affected residences would be adjusted as necessary.
- Gardiner Road: N2 would be constructed under Gardiner Road at approximately the same elevation as Gardiner Road currently exists. Gardiner Road would be raised approximately 25 feet above its existing elevation, at its highest point, to cross over N2. Approximately 1,800 feet of Gardiner Road would be reconstructed to cross over N2. Driveways connecting with this section of Gardiner Road would be reconstructed and the front-yard slopes of the affected residences and businesses would be adjusted as necessary.

2.1.4 Alternatives Considered and Dismissed from Further Consideration Following the Circulation of the DEIS/Section 4(f) Evaluation, October 2007

The MaineDOT evaluated two new alternatives – C2 and C3 – suggested during and after the comment period of the DEIS/Section 4(f) Evaluation, and further evaluated the No-build and build alternatives retained from Phase II (MaineDOT, 2008a).

2.1.4.1 Alternative C2

Alternative C2 begins on Route 1 in Wiscasset near Birch Point Road and proceeds east over the Maine Eastern Railroad through Pottle Cove. Alternative C2 turns northeast over the Sheepscot River and terminates near the east end of the Davey Bridge in Edgecomb. This alternative is similar to Alternative C1, except the latter started at Birch Point Road, followed the waterfront, and terminated near the westerly end of the Davey Bridge. Alternative C1 was considered and dismissed during Phase I.

Alternative C2 has been proposed as a bridge crossing or as a combination bridge/tunnel crossing of the Sheepscot River. The bridge crossing would be

approximately 9,500 feet long, while the bridge/tunnel combination would be 8,500 feet of bridge and 1,000 feet of tunnel. The tunnel section of the bridge/tunnel crossing would allow for river navigation, while the single bridge concept would require a moveable span structure. The tunnel would be constructed using immersed tube technology, which would require cutting a 100-foot wide trench in the Sheepscot River channel, placing and assembling the tube sections, and covering the completed tunnel.

The MaineDOT performed a Stage I analysis of Alternative C2 and compared it (and its derivations) to the other alternatives retained for further consideration. Alternative C2 with a single bridge is similar to N2/N8c, except the latter has a bridge which is 5,300 feet shorter. The bridge with Alternative C2 would require approximately 39 piers impacting 0.92 acre of the Sheepscot River bottom, which is more than the 17 piers and 0.4 acre impact for Alternative N2/N8c.

The Alternative C2 bridge/tunnel concept would require two bridges totaling approximately 8,500 feet, with a 1,000-foot long immersed tube tunnel. The bridge structures are longer than the bridge with Alternative N2/N8c, and would require approximately 35 piers impacting 0.82 acre. The 1,000-foot long tunnel would impact 2.30 acres. The total impact of the bridge/tunnel concept to the Sheepscot River bottom is 3.12 acres.

The MaineDOT determined the cost of both Alternative C2 concepts to be approximately \$40 million more than the most expensive alternative retained for further consideration (exhibit 2.6). Due to the higher cost and greater impact to the Sheepscot River bottom, the MaineDOT determined the Alternative C2 concepts do not warrant a Stage II analysis, and were dismissed from further consideration.

2.1.4.2 Alternative C3

Alternative C3 begins on Route 1 in Wiscasset near Birch Point Road and proceeds east over the Maine Eastern Railroad through Pottle Cove and over the Sheepscot River. Alternative C3 crosses the Sheepscot River south of Davis Island, and turns northeast to pass through Cod Cove, terminating at Route 1 on the Edgecomb mainland. This alternative is similar to alternative C1, except the latter started at Birch Point Road, followed the waterfront,

Exhibit 2.6 – Alternative Costs

<i>Alternative</i>	<i>Length (miles)</i>	<i>Cost (millions)</i>
No-build	-	\$1M
N2/N8c	3.1	\$79M
N2/N2h/N2f-1	3.9	\$72M
N2/N2a/N2h-1	4.8	\$68M
C2-bridge	1.8	\$115M
C2-bridge/tunnel	1.8	\$120M
C3-bridge	2.7	\$133M
C3-bridge/tunnel	2.7	\$168M
C3-tunnel	2.7	\$299M

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and terminated near the westerly end of the Davey Bridge. Alternative C3 was proposed as a tunnel crossing of the Sheepscot River, which is similar to Alternative T4. Alternatives C1 and T4 were considered and dismissed during Phase I.

Alternative C3 has been proposed as a bridge crossing or as a combination bridge/tunnel crossing of the Sheepscot River. The bridge crossing would be approximately 14,250 feet long, while the bridge/tunnel combination would be 13,250 feet of bridge structure and 1,000 feet of tunnel. The tunnel sections of the crossings would allow for river navigation, while the single bridge concept would require a moveable span structure. The tunnels would be constructed using immersed tube technology.

The MaineDOT performed a Stage I analysis of Alternative C3 and compared it (and its derivations) to the other alternatives retained for further consideration. The Alternative C3 single bridge structure is similar to Alternative N2/N8c, except the latter is 10,100 feet shorter. This bridge would require approximately 58 piers impacting 1.37 acres of the Sheepscot River bottom, which is more than the 17 piers and 0.4 acre impact for Alternative N2/N8c.

The Alternative C3 bridge/tunnel concept would require two bridges totaling approximately 13,250 feet long, with a 1,000-foot long immersed tube tunnel. The bridge structures are 9,100 feet longer than the bridge with Alternative N2/N8c, and would require approximately 54 piers impacting 1.28 acres of the Sheepscot River bottom. The 1,000-foot long tunnel would impact 2.30 acres of the Sheepscot River bottom. The total impact of the bridge/tunnel concept on the Sheepscot River bottom is 3.57 acres.

The Alternative C3 tunnel concept would require a 14,250-foot long immersed tube tunnel. Digging the 100-foot wide trench for this tunnel would impact 33 acres of the Sheepscot River bottom.

The MaineDOT determined the cost of the Alternative C3 bridge and bridge/tunnel concepts to be approximately \$90 million more than the most expensive alternative retained for further consideration; the tunnel concept is even more expensive at almost \$300 million (exhibit 2.6). Due to the much higher cost and extremely high impacts to the Sheepscot River bottom, the MaineDOT determined the C3 alternative concepts do not warrant a Stage II analysis, and were dismissed from further consideration.

2.1.4.3 No-build and Build Alternatives Retained for Further Consideration

The MaineDOT further evaluated the No-build and build alternatives retained for further consideration. The MaineDOT collected and analyzed new information following the circulation of the DEIS/Section 4(f) Evaluation in October 2007:

- Freshwater fisheries survey
- Essential fisheries habitat impacts
- Wetland Functional Assessment
- Eelgrass impacts
- Viewshed impacts
- Englebrekt Road neighborhood impacts
- Residential displacements

This new data, along with the original information was characterized into three categories: natural environment, human environment, and transportation and costs.

The MaineDOT and the FHWA developed a spreadsheet that collectively ranked each of the data elements by degree of negative impact: minor, moderate, or significant (MaineDOT 2008b). These rankings showed N2/N2h/N2f-2 and N2/N2h have more impact than the other build alternatives.

In comparison to the other build alternatives, the Alternative N2/N2h/N2f-2 has one of the highest impacts to streams, highest impact to archaeological resources (6 sites), and highest number of residential displacements (33 houses). Alternative N2/N2h/N2f-2 has excess earthwork of 185,000 cubic yards, bisects the Englebrekt Road neighborhood, and encroaches upon the Bayview Heights neighborhood and Wiscasset Village. Alternative N2/N2h/N2f-2 impacts four resources afforded consideration and protection under Section 4(f): the Wiscasset Historic District, the Sortwell Farm, 16 Bradford Road, and the former motor court (AKA, Race's Cabins) in Edgecomb.¹

¹ Following the circulation of the DEIS/Section 4(f) Evaluation in October 2007, the MaineDOT learned the former Race's Cabins on the southwestern side of Route 1/Boothbay Road intersection should be considered potentially eligible for listing in the National Register of Historic Places.

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In comparison to the other build alternatives, the Alternative N2/N2h has the highest impact to streams, highest impact to coastal resources (1.0 acre), high impact to archaeological resources (3), and one of the highest impacts to forests (15.1 acres). Alternative N2/N2h has the highest excess earthwork (207,000 cubic yards), and high estimated capital and life cycle costs (\$77,650,000 and \$123,743,000). Alternative N2/N2h has one of the highest impacts on threatened and endangered species caused by new bridge pier construction in the Sheepscot River (up to 0.3 acre). Alternative N2/N2h impacts four resources afforded consideration and protection under Section 4(f): the Wiscasset Historic District, the Sortwell Farm, 16 Bradford Road, and the Sheepscot River Bridge.

For these reasons, N2/N2h/N2f-2 and N2/N2h were dismissed from further consideration in the Phase II analysis.

2.2 Alternatives Retained for Further Consideration in Phase II

The alternatives retained for further consideration in Phase II are:

- No-Build
- N2/N8c
- N2/N2h/N2f-1
- N2/N2a/N2h-1

Each of these alternatives has been modified since the DEIS/Section 4(f) Evaluation was circulated for public review and comment in October 2007 (Appendix C).

2.2.1 No-build Alternative

The No-build Alternative consists of no new roadway construction or other measures to increase capacity or to decrease demand on Route 1 in the study area other than the selected TSM/TDM measures and projects that have been identified or programmed. The No-build Alternative assumes that the existing road network would be maintained at its current level and rehabilitated or rebuilt as required to continue its current capacity.

The intersection of Route 1 and Boothbay Road would be reconstructed as part of the No-build Alternative (exhibit 2.7). Currently, drivers experience difficulty making left turns from Boothbay Road north onto Route 1 south,

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resulting in a HCL and traffic congestion on Boothbay Road approaching Route 1.

At the time the DEIS/Section 4(f) Evaluation was circulated for public review and comment in October 2007, the proposed long-term improvement to this intersection was to reconstruct it so that the left turn from Boothbay Road could be made in two steps rather than one. This could be done by providing a median separation between Route 1 south and Route 1 north at Boothbay Road. The first step would be for a driver on Boothbay Road to find a gap in traffic on Route 1 north and turn left into a protected lane of Route 1 south. The second step would be for the driver to accelerate in the protected lane and merge with the traffic on Route 1 south. By eliminating the need to find gaps in northbound and southbound Route 1 traffic at the same time, the improved intersection would provide the opportunity to take advantage of gaps in one-way traffic for vehicles to turn left safely, reducing crashes and congestion. This proposed at-grade intersection of Boothbay Road and Route 1 is no longer being considered.

To further avoid and minimize impacts to the area along Englebrekt Road, the MaineDOT evaluated and designed a proposed flyover for the Route 1/Boothbay Road intersection so that the left turn from Boothbay Road could be made in one step. This could be done by providing a flyover that connects to Boothbay Road, curves northeast, and bridges Route 1 and Cochran Road before curving west and southwest to connect with Route 1. The driver finds a gap in traffic on Route 1 south and merges with the traffic on Route 1 south.

To ensure that Englebrekt Road residents could safely turn onto Route 1 north, the MaineDOT has added to the No-Build Alternative a left turn lane west of Englebrekt Road, with a jughandle on the south side of Route 1. This would require the left turn from Englebrekt Road to Route 1 north to be performed in three steps rather than one. The first step would be for a driver on Englebrekt Road to find a gap in traffic on Route 1 south and turn right, then conduct a short weave movement and enter a left turn slot. The second step would be for the driver to find a gap in traffic on Route 1 north and turn left into the jughandle and curve south and east to a stop sign. The third step would be for the driver to find a gap in traffic and accelerate and merge with the traffic on Route 1 north.

Drivers would be permitted to turn left from Route 1 south to Boothbay Road south only at Cross Road. Left-turn lanes would be provided on both approaches on Route 1 to Cochran Road and Cross Road.

No climbing lanes would be provided on the Route 1 approaches to Cochran Road and Cross Road. This would help manage speeds through the intersections and minimize the amount of property that would need to be acquired.

The MaineDOT committed to improving this intersection and implemented short-term operational improvements in 2005; the long-term improvement of this intersection competes for funding with other roadway projects statewide. Completion of this intersection improvement is expected before 2020.

Although the No-build Alternative would not satisfy the study purpose and would not solve the needs identified, it is retained for further consideration to allow equal comparison to the build alternatives and to help decision-makers understand the ramifications of taking no action.

2.2.2 Alternative N2/N8c

Alternative N2/N8c, from the eastern limit of N2 east of Gardiner Road, would curve around the north side of a hill, turn south, and cross Route 218 (exhibit 2.8). Ramps connecting to Gardiner Road would provide access to Alternative N2/N8c in the northbound direction and from Alternative N2/N8c in the southbound direction.

Alternative N2/N8c would be constructed approximately 25 feet under Route 218. Approximately 1,650 feet of Route 218 would be reconstructed to pass over N2/N8c. Driveways connecting with this section of Route 218 would be reconstructed, and the front-yard slopes of the affected residences and businesses would be adjusted as necessary.

Alternative N2/N8c would require the construction of an approximate 4,150-foot-long bridge across the western portion of the Sheepscot River to Davis Island. At its highest point, the bridge would be approximately 50 feet above the mean high-water level. Alternative N2/N8c would pass over the railroad bridge with adequate clearance for trains to pass underneath.

Alternative N2/N8c would connect with Route 1 via an intersection near the MaineDOT maintenance facility on Davis Island. A small portion of Route 1 would be reconstructed to create the intersection. Alternative N2/

N8c would be approximately 3.2 miles long and bypass approximately 1.9 miles of Route 1.

As in the No-build Alternative, the intersection of Route 1 and Boothbay Road would be reconstructed with a fly-over ramp and jughandle.

2.2.3 Alternative N2/N2h/N2f-1

Alternative N2/N2h/N2f-1, from the eastern limit of N2 east of Gardiner Road, would continue north and east, crossing over Route 218 (exhibit 2.9). Ramps connecting to Gardiner Road would provide access to Alternative N2/N2h/N2f-1 in the northbound direction and from Alternative N2/N2h/N2f-1 in the southbound direction. Alternative N2/N2h/N2f-1 would be constructed approximately 25 feet over Route 218.

Alternative N2/N2h/N2f-1 would require the construction of an approximate 600-foot-long bridge across the northern portion of Polly Clark Cove. It follows the southern tip of Clark Point to the Sheepscot River. It would require the construction of an approximate 1,600-foot-long bridge across the Sheepscot River. Alternative N2/N2h/N2f-1 would bridge over the railroad tracks at Clark Point with adequate clearance for trains to pass underneath. At its highest point, the bridge would be approximately 45 feet above the mean high-water level.

Alternative N2/N2h/N2f-1 would require the construction of a third bridge over the inlet to a small cove in Edgecomb. This bridge would be approximately 250 feet long and 10 feet above the mean high-water level.

Alternative N2/N2h/N2f-1 would connect with Route 1 in Edgecomb at a partial interchange with Boothbay Road. Alternative N2/N2h/N2f-1 would pass over Boothbay Road approximately 15 feet above the existing roadway grade. Approximately 1,800 feet of Boothbay Road would be reconstructed. Alternative N2/N2h/N2f-1 would be approximately 4.1 miles long and bypass 2.6 miles of Route 1.

Following the circulation of the DEIS/Section 4(f) Evaluation in October 2007, the MaineDOT learned the former Race's Cabins on the southwestern side of the Route 1/Boothbay Road intersection should be considered potentially eligible for listing in the National Register of Historic Places. As originally proposed, Alternative N2/N2h/N2f-1 would have had an adverse effect on this resource. The MaineDOT redesigned the interchange at Route 1/Boothbay Road to avoid Race's Cabins. From the west, Alternative N2/N2h/N2f-1 bridges Route 1 to the west of Race's Cabins, bridges a reprofiled

Cross Road, and swings northwest to connect with Atlantic Highway and Route 1. Two slip ramps connect from N2/N2h/N2f-1 to Boothbay Road south of Race's Cabins. The first slip ramp allows north-bound drivers on Alternative N2/N2h/N2f-1 to exit onto Boothbay Road. The second slip ramp allows drivers to turn from Cross Road, accelerate and merge into traffic on N2/N2h/N2f-1 heading south.

2.2.4 Alternative N2/N2a/N2h-1

At the time the DEIS/Section 4(f) Evaluation was circulated in October 2007, this alternative was known as Alternative N2/N2a/N2h. Because it has been modified on the eastern end, it was renamed Alternative N2/N2a/N2h-1. Alternative N2/N2a/N2h is no longer being considered.

Alternative N2/N2a/N2h-1, from the eastern limit of N2 east of Gardiner Road, would continue north and east, crossing over West Alna Road and Route 218. Ramps connecting to Gardiner Road would provide access to Alternative N2/N2a/N2h-1 in the northbound direction and from Alternative N2/N2a/N2h-1 in the southbound direction. Alternative N2/N2a/N2h-1 would be constructed approximately 25 feet over Route 218 (exhibit 2.10).

Alternative N2/N2a/N2h-1 would require the construction of an approximate 500-foot-long bridge across the northern portion of Polly Clark Cove. The bridge would be approximately 70 feet above the mean high-water level. Alternative N2/N2a/N2h-1 would require an approximately 700-foot-long bridge over the Sheepscot River north of the existing steel-truss MaineDOT railroad bridge. This bridge would stand approximately 90 feet above the mean high-water level.

Alternative N2/N2a/N2h-1 would pass approximately 35 feet over the railroad bridge southeast of the Sheepscot River on a 400-foot-long bridge.

At the time the DEIS/Section 4(f) Evaluation was circulated for public review and comment in October 2007, Alternative N2/N2a/N2h would travel south and connect with Route 1 east of the intersection with Atlantic Highway. Alternative N2/N2a/N2h would cross approximately 30 feet above Route 1 and approximately 10 feet under the intersection of Boothbay Road and Cross Road. Approximately 750 feet of Boothbay Road and 700 feet of Cross Road would be reconstructed. Alternative N2/N2a/N2h is approximately 5.1 miles long and bypasses 3 miles of Route 1. The proposed intersection with Route 1 is no longer being considered.

To further avoid and minimize impacts to the area along Englebrekt Road and wetlands, the MaineDOT redesigned the interchange at Route 1 and Boothbay Road and re-named the Alternative N2/N2a/N2h-1. After crossing the Sheepscot River, Alternative N2/N2a/N2h-1 would head south, avoiding the Englebrekt Road neighborhood to the west, weave slightly to the southeast to minimize wetland impacts, and connect to Route 1.

Boothbay Road would be reconstructed to allow northbound Route 1 drivers to access Boothbay Road. Boothbay Road drivers heading into Wiscasset would access Route 1 south by turning left at a reconstructed Cross Road/Cochran Road/Route 1 intersection. Boothbay Road drivers accessing Route 1 north would turn right and accelerate up a slip ramp to merge with traffic coming from Alternative N2/N2a/N2h-1.

Route 1 south drivers heading into Wiscasset or onto Boothbay Road or Cochran Road would exit via a slip ramp to a T intersection with Cochran Road. Wiscasset-bound or Boothbay Road drivers would turn left at this intersection and either right or straight at the reconstructed Cross Road/Cochran Road/Route 1 intersection.

Northbound Boothbay Road drivers would access Alternative N2/N2a/N2h-1 from a slip ramp that bridges separately Route 1 and N2/N2a/N2h-1. The slip ramp connects with Alternative N2/N2a/N2h-1, where drivers merge with southbound traffic.

2.3 Traffic Analysis

This section identifies and quantifies the impacts, both beneficial and adverse, of the No-build Alternative and the build alternatives on the transportation system. It assesses the potential impacts on roads, transportation demand, the effectiveness of traffic diversion away from the Wiscasset Village, travel time and distance savings using speed changes and vehicle miles traveled (VMT) and vehicle hours traveled (VHT), system continuity, mobility and safety.

2.3.1 Impacts to Roadways

The No-build Alternative would continue to negatively impact the major and minor roadways in the study area. Over time, traffic volumes on Route 1 through Wiscasset and other major roadways would increase, resulting in increased delays and congestion. As traffic volumes, congestion, and delays increase, more traffic would divert to minor roadways (i.e., local roads and

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streets) seeking alternate routes to bypass the congested Wiscasset Village. Increasing traffic volumes on minor roadways would lead to increased congestion and delays to motorists traveling on the minor roadways and a reduced quality of life for residents.

The build alternatives would impact the transportation network by providing a new two-lane controlled-access roadway parallel to, and north of, Route 1 between Old Bath Road in Wiscasset and Edgecomb. The new two-lane controlled-access roadway would have a positive impact on vehicular travel flow and traffic conditions, especially on those roads or portions of roads bypassed by the new roadway. Although not quantified numerically, an additional benefit of the build alternatives would be the positive effect on Wiscasset Village's community character resulting from lower traffic volumes on Route 1. The lower volumes on Route 1 would result in fewer conflicts between vehicular traffic and pedestrians in Wiscasset Village, fewer conflicts between through-travelers and motorists pulling in and out of the on-street parking spaces on Main Street, and fewer motorists diverting their trips off of Route 1 and onto local streets to bypass congested areas.

2.3.2 Impacts to Transportation Demand

This section compares the existing and future 2030 No-build Alternative traffic volumes and demand with future 2030 traffic volumes for the build alternatives.

The No-build Alternative would continue to have a negative impact on travel demand and traffic congestion. Traffic volumes would continue to grow on Route 1, Gardiner Road, Boothbay Road, and Route 218 in the study area (exhibits 2.11 and 2.12).

Future 2030 build volumes were developed for each build alternative. An equilibrium traffic-assignment method was used for each hour of the day to determine 24-hour volumes. This method estimates the traffic volumes for the existing route and the build alternative that would balance travel times along the two routes. Speed-volume curves were developed and applied for the build alternatives to estimate hourly-traffic diversion volumes. The resulting future 2030 traffic volumes vary by build alternative: those alternatives less competitive with the existing route were less successful at diverting traffic from the existing route, whereas those alternatives that were more competitive with the existing route were more successful in diverting traffic from the existing route (exhibits 2.11 and 2.12).

Exhibit 2.11 – Projected 2030 SADTs by Alternative

Town	Location	Existing (2000)	No-build Alternative	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Wiscasset	Route 1 s/o Birch Point Road	23,700	30,000	30,000	30,000	30,000
Wiscasset	Route 1 n/o Old Bath Road	26,700	33,800	8,200	12,400	19,800
Wiscasset	Route 1 e/o Gardiner Road	24,600	31,200	3,700	7,900	15,300
Wiscasset and Edgecomb	Route 1 @ Davey Bridge ¹	26,000	33,000	5,400	9,600	17,000
Edgecomb	Route 1 @ Cod Cove	20,900	26,500	26,500	3,200	10,600
Edgecomb	Route 1 e/o Atlantic Highway	15,800	20,000	20,000	20,000	20,000
Wiscasset	Gardiner Road n/o Route 1	8,400	11,600	9,700	9,700	9,700
Wiscasset	Gardiner Road n/o Hooper Street	8,000	11,000	9,100	9,100	9,100
Wiscasset	Gardiner Road n/o Fowle Hill Road	5,100	7,000	7,000	7,000	7,000
Edgecomb	Boothbay Road s/o Route 1	8,900	11,100	11,100	11,100	11,100
Edgecomb	Boothbay Road s/o Eddy Road	9,600	12,100	12,100	12,100	12,100
Wiscasset	Route 218 n/o Route 1	1,400	1,800	1,800	1,800	1,800
Wiscasset	Route 218 n/o Hooper Street	3,200	4,400	4,400	4,400	4,400
Wiscasset	Route 218 s/o West Alna Road	2,300	3,200	3,200	3,200	3,200
Wiscasset	Bypass w/o Route 27	0	0	25,600	21,400	14,000
Wiscasset and Edgecomb	Bypass @ Sheepscot River	0	0	27,500	23,300	15,900

Note: ¹ Representative of Route 1 traffic volumes on Main Street in Wiscasset Village

Exhibit 2.12 – Change in 2030 SADTs by Alternative from 2000

Town	Location	Change from Existing	Change from No-Build		
		No-build Alternative	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Wiscasset	Route 1 s/o Birch Point Road	6,300 (27%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 1 n/o Old Bath Road	7,100 (27%)	-25,600 (-76%)	-21,400 (-63%)	-14,000 (-41%)
Wiscasset	Route 1 e/o Gardiner Road	6,600 (27%)	-27,500 (-88%)	-23,300 (-75%)	-15,900 (-51%)
Wiscasset and Edgecomb	Route 1 @ Davey Bridge ¹	7,000 (27%)	-27,600 (-84%)	-23,400 (-71%)	-16,000 (-49%)
Edgecomb	Route 1 @ Cod Cove	5,600 (27%)	0 (0%)	-23,300 (-88%)	-15,900 (-60%)
Edgecomb	Route 1 e/o Atlantic Hwy.	4,200 (27%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Gardiner Road n/o Route 1	3,200 (38%)	-1,900 (-16%)	-1,900 (-16%)	-1,900 (-16%)
Wiscasset	Gardiner Road n/o Hooper Street	3,000 (38%)	-1,900 (-17%)	-1,900 (-17%)	-1,900 (-17%)
Wiscasset	Gardiner Road n/o Fowle Hill Road	1,900 (37%)	0 (0%)	0 (0%)	0 (0%)
Edgecomb	Boothbay Road s/o Route 1	2,200 (25%)	0 (0%)	0 (0%)	0 (0%)
Edgecomb	Boothbay Road s/o Eddy Road	2,500 (26%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 218 n/o Route 1	400 (29%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 218 n/o Hooper Street	1,200 (38%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 218 s/o West Alna Road	900 (39%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Bypass w/o Route 27	0 (NA)	25,600 (NA)	21,400 (NA)	14,000 (NA)
Wiscasset and Edgecomb	Bypass @ Sheepscot River	0 (NA)	27,500 (NA)	23,300 (NA)	15,900 (NA)

Note: ¹ Representative of Route 1 traffic volumes on Main Street in Wiscasset Village

NA = not applicable

Alternative N2/N8c would divert the greatest amount of daily traffic at all times of the day from Route 1 through Wiscasset Village and onto the new roadway—followed by Alternatives N2/N2h/N2f-1, and N2/N2a/N2h-1 (exhibit 2.13) (MaineDOT, 2008c). The build alternatives would reduce SADTs on Route 1 through Wiscasset Village from about 50 percent (a reduction of 16,000 vehicles daily on the Davey Bridge with Alternative N2/N2a/N2h-1) to about 85 percent (a reduction of 27,600 vehicles daily on the Davey Bridge with Alternative N2/N8c), depending on the alternative (exhibit 2.12).

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Exhibit 2.13 – Total Traffic Volume Diverted from Davey Bridge, 2030 Summer Weekday

Traffic Diversion (in volume and percent diverted)							
Hour	2030 Summer Volume	N2/N8C (Volume %)		N2/N2h/N2f-1 (Volume %)		N2/N2a/N2h-1 (Volume %)	
12:00 AM	200	173	86.5%	13	6.5%	13	6.5%
3:00 AM	100	87	87.0%	6	6.0%	6	6.0%
6:00 AM	500	434	86.8%	250	56.0%	32	6.4%
9:00 AM	1700	1475	86.8%	1273	74.9%	775	45.6%
12:00 PM	2800	2240	80.0%	2050	73.2%	1675	59.8%
3:00 PM	2600	2150	82.7%	1950	75.0%	1520	58.5%
6:00 PM	2800	2240	80.0%	2050	73.2%	1675	59.8%
9:00 PM	800	694	86.8%	520	65.0%	51	6.4%

The build alternatives would result in shifts in DHVs (exhibits 2.14 and 2.15). Similar to the shifts in SADTs, Alternative N2/N8c would divert the greatest amount of DHVs from Route 1 through Wiscasset Village and onto the new roadway—followed by Alternatives N2/N2h/N2f-1, and N2/N2a/N2h-1. The build alternatives would reduce DHVs on Route 1 through Wiscasset Village from about 50 percent (a reduction of 1,280 VPH on the Davey Bridge with Alternative N2/N2a/N2h-1) to 85 percent (a reduction of 2,208 VPH on the Davey Bridge with Alternative N2/N8c), depending on the alternative.

The reduction in traffic volumes on Route 1 through Wiscasset Village would be a beneficial impact on traffic demand. The reduction of daily and

Exhibit 2.14 – Projected 2030 DHV by Alternative

Town	Location	Existing (2000)	No-build Alternative	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Wiscasset	Route 1 s/o Birch Point Road	1,896	2,400	2,400	2,400	2,400
Wiscasset	Route 1 n/o Old Bath Road	2,136	2,704	656	992	1,584
Wiscasset	Route 1 e/o Route 27	1,968	2,496	296	632	1,224
Wiscasset and Edgecomb	Route 1 @ Davey Bridge ¹	2,080	2,640	432	768	1,360
Edgecomb	Route 1 @ Cod Cove	1,672	2,120	2,120	256	848
Edgecomb	Route 1 e/o Atlantic Highway	1,264	1,600	1,600	1,600	1,600
Wiscasset	Gardiner Road n/o Route 1	672	928	776	776	776
Wiscasset	Gardiner Road n/o Hooper Street	640	880	728	728	728
Wiscasset	Gardiner Road n/o Fowle Hill Road	408	560	560	560	560
Edgecomb	Boothbay Road s/o Route 1	712	888	888	888	888
Edgecomb	Boothbay Road s/o Eddy Road	768	968	968	968	968
Wiscasset	Route 218 n/o Route 1	112	144	144	144	144
Wiscasset	Route 218 n/o Hooper Street	256	352	352	352	352
Wiscasset	Route 218 s/o West Alna Road	184	256	256	256	256
Wiscasset	Bypass w/o Route 27	0	0	2,048	1,712	1,120
Wiscasset and Edgecomb	Bypass @ Sheepscot River	0	0	2,200	1,864	1,272

Note: ¹ Representative of Route 1 traffic volumes on Main Street in Wiscasset Village

Exhibit 2.15 – Change in DHV by Alternative

Town	Location	Change from Existing	Change from No-Build		
		No-build Alternative	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Wiscasset	Route 1 s/o Birch Point Road	504 (27%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 1 n/o Old Bath Road	568 (27%)	-2,048 (76%)	-1,712 (-63%)	-1,120 (-41%)
Wiscasset	Route 1 e/o Route 27	528 (27%)	-2,200 (88%)	-1,864 (-75%)	-1,272 (-51%)
Wiscasset and Edgecomb	Route 1 @ Davey Bridge ¹	560 (27%)	-2,208 (84%)	-1,872 (-71%)	-1,280 (-49%)
Edgecomb	Route 1 @ Cod Cove	448 (27%)	0 (0%)	-1,864 (-88%)	-1,272 (-60%)
Edgecomb	Route 1 e/o Atlantic Highway	336 (27%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Gardiner Road n/o Route 1	256 (38%)	-152 (-16%)	-152 (-16%)	-152 (-16%)
Wiscasset	Gardiner Road n/o Hooper Street	240 (38%)	-152 (-17%)	-152 (-17%)	-152 (-17%)
Wiscasset	Gardiner Road n/o Fowle Hill Road	152 (37%)	0 (0%)	0 (0%)	0 (0%)
Edgecomb	Boothbay Road s/o Route 1	176 (25%)	0 (0%)	0 (0%)	0 (0%)
Edgecomb	Boothbay Road s/o Eddy Road	200 (26%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 218 n/o Route 1	32 (29%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 218 n/o Hooper Street	96 (38%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Route 218 s/o West Alna Road	72 (39%)	0 (0%)	0 (0%)	0 (0%)
Wiscasset	Bypass w/o Route 27	0 (NA)	2,048 (NA)	1,712 (NA)	1,120 (NA)
Wiscasset and Edgecomb	Bypass @ Sheepscot River	0 (NA)	2,200 (NA)	1,864 (NA)	1,272 (NA)

*Note: 1 Representative of Route 1 traffic volumes on Main Street in Wiscasset Village
NA = Not applicable*

peak-period traffic volumes on Route 1 and adjacent roadways in Wiscasset Village that would result from implementing the build alternatives would help satisfy the project’s needs: traffic congestion, traffic safety, and high traffic volumes threatening Wiscasset’s community character.

2.3.3 Impacts to System Continuity and Mobility

The No-build Alternative would not impact system continuity on Route 1. Over time, system continuity would further degrade with increases in traffic congestion.

The build alternatives would positively impact system continuity on Route 1 throughout the study area. The positive impacts would result from continuity in posted speeds; roadway geometrics; and adjacent character, land use, and access conditions. Proposed posted speeds for the build alternatives would be 45 mph, closely corresponding to posted speeds at the termini points for the corridor. The build alternatives would carry a similar geometric and lane configuration throughout its length. The proposed new road would bypass the portion of Route 1 that lacks continuity because of changes in roadway conditions as it transitions from a higher-speed rural and suburban highway to a low-speed urban “Main Street” and back to a higher-speed rural and suburban highway in Edgecomb.

The No-build Alternative would negatively impact mobility along Route 1 through Wiscasset. Over time, traffic congestion would continue on Route

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1 through Wiscasset Village during peak seasonal periods. Northbound and southbound backups emanating from Wiscasset Village that typically begin before 11 a.m. and continue to 6 p.m. or later under existing conditions would likely degrade and begin earlier in the morning and continue later into the evening. Route 1 northbound from the Woolwich town line through Wiscasset Village to Water Street (approaching the Davey Bridge) would operate at LOS F with a v/c ratio greater than 1.0 and an estimated operating speed of 10 mph. Southbound Route 1 from the Newcastle–Edgecomb town line to Water Street in Wiscasset would operate at LOS F with a v/c ratio greater than 1.0 and an estimated operating speed of 10 mph. The negative impact of the No-build Alternative on mobility through Wiscasset Village would result in continued negative impacts on community and economic resources.

The build alternatives would have positive impacts on mobility and congestion on Route 1, especially through Wiscasset Village. The build alternatives would result in improvement over the No-build Alternative. The improvements were measured and presented in traffic volumes, LOS, operating speeds, v/c ratios, VHT, delays, and travel time savings.

Improvements in LOS would result on four segments on Route 1 (exhibit 2.16). In the northbound direction, the segments of Route 1 from Woolwich to Old Bath Road and from Old Bath Road to Water Street would improve from LOS F to LOS E and from LOS F to LOS C, respectively, for DHVs. In the southbound direction, the segments of Route 1 from the Newcastle town line to Boothbay Road and from Boothbay Road to Water Street would improve from LOS F to LOS E for DHVs.

Operating speeds on bypassed segments of Route 1 are expected to increase with the build alternatives (exhibit 2.17). Operating speeds on Route 1 northbound from Woolwich to Old Bath Road would increase from 10 mph under existing and 2030 No-build Alternatives to 40 mph for the build alternatives. Operating speeds on existing Route 1 northbound from Old Bath Road to Water Street would increase from 10 mph under the existing and 2030 No-build Alternative to 25 mph for the build alternatives. In the southbound direction, operating speeds on Route 1 from Newcastle to Boothbay Road would increase from 10 mph under the existing conditions and the 2030 No-build Alternative to 50 mph for the build alternatives. Operating speeds on Route 1 southbound from Boothbay Road to Water Street would increase from 10 mph under existing conditions and the 2030 No-

Exhibit 2.16 – Projected LOS by Alternative

Route	Location		Direction of Traffic	2000 No-Build Alternative	2030 No-build Alternative	2030 Build Alternatives
	Town	From/To				
Route 1	Wiscasset	Woolwich Town Line to Old Bath Road	NB	F	F	E
			SB	E	E	E
Route 1	Wiscasset	Old Bath Road to Water Street	NB	F	F	C
			SB	C	C	C
Route 1	Wiscasset and Edgecomb	Water Street to Boothbay Road	NB	E	E	E
			SB	F	F	E
Route 1	Edgecomb	Boothbay Road to Newcastle Town Line	NB	C	E	E
			SB	F	F	E
Gardiner Road	Wiscasset	Wiscasset High School to Route 1	NB	E	E	E
			SB	E	E	E
Boothbay Road	Edgecomb	Route 1 to Boothbay Town Line	NB	E	E	E
			SB	E	E	E
Route 218	Wiscasset	Route 1 to Alna Town Line	NB	D	D	D
			SB	D	D	D
Bypass	Wiscasset	Route 1 to Boothbay Road	NB	not applicable	not applicable	E
			SB	not applicable	not applicable	E
Bypass	Wiscasset and Edgecomb	Route 27 to Boothbay Road	NB	not applicable	not applicable	E
			SB	not applicable	not applicable	E

Note: Shading indicates improvement in LOS over the No-build Alternative

Exhibit 2.17 – Projected Operating Speeds by Alternative

Route	Location		Direction of Traffic	2000 No-build Alternative (mph)	2030 No-build Alternative (mph)	2030 Build Alternatives (mph)
	Town	From/To				
Route 1	Wiscasset	Woolwich Town Line to Old Bath Road	NB	10	10	40
			SB	45	40	40
Route 1	Wiscasset	Old Bath Road to Water St	NB	10	10	25
			SB	25	25	25
Route 1	Wiscasset and Edgecomb	Water Street to Boothbay Road	NB	40	40	40
			SB	10	10	40
Route 1	Edgecomb	Boothbay Road to Newcastle Town Line	NB	50	50	50
			SB	10	10	50
Gardiner Road	Wiscasset	Wiscasset High School to Route 1	NB	40	40	40
			SB	40	40	40
Boothbay Road	Edgecomb	Route 1 to Boothbay Town Line	NB	50	50	50
			SB	50	50	50
Route 218	Wiscasset	Route 1 to Alna Town Line	NB	45	45	45
			SB	45	45	45
Bypass	Wiscasset	Route 1 to Boothbay Road	NB	not applicable	not applicable	45
			SB	not applicable	not applicable	45
Bypass	Wiscasset and Edgecomb	Boothbay Road to Route 1	NB	not applicable	not applicable	45
			SB	not applicable	not applicable	45

Note: Shading indicates improvement in travel speeds over No-build Alternative

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build Alternative to 40 mph for the build alternatives. The build alternatives would have operating speeds of 45 mph.

The build alternatives would positively impact v/c ratios on Route 1 through Wiscasset Village. The v/c ratios on Route 1 would be lower than the No-build Alternative but would vary by alternative, with the lowest v/c ratios experienced with Alternative N2/N8c (i.e., the alternative nearest to Route 1) and the highest experienced with Alternative N2/N2a/N2h-1 (i.e., the alternatives farthest from Route 1) (exhibit 2.18). Conversely, v/c ratios on the build alternatives would vary by alternative, with the lowest v/c ratios experienced with Alternative N2/N2a/N2h-1 and the highest experienced with Alternative N2/N8c.

VMT and VHT are indicators of system efficiency. VMT is a measure of automobile use and trip length. One vehicle traveling 1 mile constitutes one VMT. Over time, VMT is affected by factors such as population, employment rates, land development, infrastructure changes, and housing density. VHT is a measure of vehicle use and trip time. One vehicle traveling one hour constitutes one VHT. Similar to VMT, VHT is affected by population, employment, land development, infrastructure changes, and housing density. Comparing changes in VMT provides a direct measure of how the demand shifts caused by the build alternatives impact transportation efficiency. For example, an alternative that provides a shorter route would reduce VMT. Comparing changes in VHT provides a direct measure of how the demand shifts caused by the build alternatives impact transportation efficiency in terms of trip times. Alternatives that provide faster routes would reduce VHT.

The 2030 VMT and VHT were quantified for the No-build and build alternatives (exhibit 2.19). The build alternatives would have longer distances than existing travel patterns on Route 1; therefore, the VMT for each build alternative would be higher than for the 2030 future No-build Alternative. However, whereas VMT would be higher for the build alternatives compared to the 2030 No-build Alternative, VHT would be lower. The VHT is lower due to the higher operating speeds and shorter delays in Wiscasset Village. The build alternatives would result in time savings of 8,200 to 8,600 VHT per day in idling time on a summer day over the No-build Alternative by 2030. Over the course of a year, the build alternatives would result in annual time savings of more than 1 million VHT per year over the No-Build Alternative by 2030.

Exhibit 2.18 – 2030 V/C Ratios by Alternative

Route	Location		No-build	N2/N8c	N2/N2a/ N2f-1	N2/N2a/ N2h-1	Capacity
	Town	From/To					
Route 1	Wiscasset	Woolwich Town Line to Old Bath Road	0.77	0.77	0.77	0.77	3,100
Route 1	Wiscasset	Old Bath Road to Water Street	over 1.00	0.35	0.52	0.83	2,100
Route 1	Wiscasset and Edgcomb	Water Street to Route 27	over 1.00	0.23	0.40	0.72	2,400
Route 1	Edgcomb	Route 27 to Newcastle Town Line	0.51	0.51	0.51	0.51	3,100
Route 27	Wiscasset	Wiscasset High School to Route 1	0.31	0.26	0.26	0.26	2,800
Route 27	Edgcomb	Route 1 to Boothbay Town Line	0.31	0.31	0.31	0.31	3,100
Route 218	Wiscasset	Route 1 to Alna Town Line	0.11	0.11	0.11	0.11	2,300
Bypass	Wiscasset	Route 1 to Route 27	n/a	0.66	0.55	0.36	3,100
Bypass	Wiscasset and Edgcomb	Route 27 to Route 1	n/a	0.70	0.60	0.41	3,100

Note: Shading denotes improvement over No-build Alternative

Exhibit 2.19 – 2030 VMT and VHT by Alternative

VMT	No-build	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Summer Day	115,000	152,000	147,000	150,000
Annual Total	31,800,000	41,300,000	40,300,000	41,100,000
Change in Total		9,700,000	8,500,000	9,300,000
VHT	No-build	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Summer Day	19,100	10,500	10,700	10,900
Annual Total	3,070,000	1,940,000	1,980,000	2,040,000
Change in Total		-1,130,000	-1,090,000	-1,030,000

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VHT, VMT, and safety impacts can be used to extrapolate the comparative economic impacts to motorists. Because VHT represents travel times to complete all trips in the system, it can be used to estimate the value of time saved between the No-build and build alternatives. Similarly, changes in VMT can be used to estimate the value of changes in travel distance between the No-build and build alternatives. The economic value of safety impacts is shown in exhibit 2.20. Together, the impacts on VHT, VMT, and economic value of safety can be summarized in the form of overall travel benefits (exhibit 2.21). Reductions in VHT and crashes by the build alternatives would result in positive benefits whereas the increases in VMT from the build alternatives would produce negative benefits (added costs). In combination, the overall travel benefits of the build alternatives are positive and very similar.

Exhibit 2.20 – Overall Traffic Safety Impacts of Build Alternatives

Annual Impact	Existing	No-Build	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
	2005	2030	2030	2030	2030
Non-Bypass Crashes	51	66	42	34	44
Bypass Crashes			15	17	14
Total Crashes	51	66	57	51	58
Change in Crashes			-9	-15	-8
Non-Bypass Crash Costs	\$2,600,000	\$3,300,000	\$2,100,000	\$1,700,000	\$2,200,000
Bypass Crash Costs			\$600,000	\$700,000	\$600,000
Total Crash Costs	\$2,600,000	\$3,300,000	\$2,700,000	\$2,400,000	\$2,800,000
Change in Crash Costs from No-Build			-\$600,000	-\$900,000	-\$500,000

Exhibit 2.21 – Overall Travel Benefits in 2030

	No-Build	N2/N8c	N2/N2h/N2f-1	N2/N2a/N2h-1
Change in VHT		-1,130,000	-1,090,000	-1,030,000
Annual VHT Benefits		\$13,700,000	\$13,100,000	\$12,400,000
Change in VMT		9,700,000	8,500,000	9,300,000
Annual VMT Benefits		-\$1,500,000	-\$1,300,000	-\$1,400,000
Change in Number of Crashes		-9	-15	-8
Annual Safety Benefits		\$600,000	\$900,000	\$500,000
Overall Travel Benefits		\$12,800,000	\$12,700,000	\$11,500,000

On an annual basis, implementation of the build alternatives would result in overall travel benefits (measured in 2006 dollars and projected as savings) of \$11.5 million to \$12.8 million annually, by 2030.

2.3.4 Impacts to Safety Deficiencies

The No-build Alternative would not divert traffic from Route 1 and away from the HCLs. With increased traffic volumes and congestion on Route 1, the annual number of crashes is forecasted to increase from an estimated 51 crashes in 2005 to 66 crashes in 2030 (exhibit 2.20). Costs associated with the projected crashes were calculated. Due to the rise in crashes expected between 2005 and 2030, costs associated with crashes are projected to increase from \$2.6 million to \$3.3 million annually.

The No-build Alternative would not improve the intersections and roadway identified as HCLs, with one exception: the intersection of Route 1/Boothbay Road in Edgecomb. Intersection improvements planned for the Route 1/Boothbay Road intersection would improve safety and likely remove this intersection from its current HCL status. With regard to the other four HCLs, the minor improvements that would occur with normal maintenance would not result in substantial improvements in safety. The No-build Alternative would not result in shifts of traffic away from the HCLs and not reduce the crash rates at these HCLs.

Other safety problems that exist would be exacerbated by the increase in traffic volumes expected for the 2030 No-build Alternative. In Wiscasset Village, the potential for conflict between pedestrians and Route 1 through-traffic, which presents an inherent threat of personal injury and is especially magnified during the summer tourist season, would increase as traffic volumes rise. The expected increases in traffic congestion with the 2030 No-build Alternative along Route 1 during the summer would increasingly impede the movement of emergency vehicles. The high traffic volumes and the lack of adequate shoulders along some segments of the roadway would further limit the ability of emergency vehicles to quickly reach their destinations.

The build alternatives would positively impact the diversion of traffic away from the HCLs and reduce crash rates in comparison to the No-build Alternative. The build alternatives are projected to result in the reduction of 8 to 15 crashes per year on Route 1 (exhibit 2.20). Alternative N2/N2h/N2f-1 would result in the greatest reduction of crashes, reducing the number of

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crashes on Route 1 by 15 per year, as compared to the No-build Alternative. It would provide a greater reduction in crashes than other build alternatives because they would bypass more length of Route 1 than Alternative N2/N8c and attract more Route 1 traffic than Alternative N2/N2a/N2h-1. The other two build alternatives would reduce the number of crashes by 8 or 9 crashes per year as compared to the No-Build Alternative. The build alternatives would result in cost savings from the reduction in crashes of approximately \$500,000 to \$900,000 annually, as compared to the No-build Alternative.

The build alternatives would improve safety through Wiscasset Village. By removing substantial amounts of vehicular through-traffic from Route 1 through Wiscasset Village, the potential for conflicts between village pedestrian activity and Route 1 through-traffic would be reduced. The build alternatives would alleviate congestion on Route 1 and remove impediments to the movement of emergency vehicles. The 8-foot shoulders on the build alternatives would better facilitate the ability of emergency vehicles to more quickly reach their destinations. The positive impacts on safety from the build alternatives would meet the project's safety need.