

Executive Summary

Introduction

The National Environmental Policy Act of 1969 (NEPA) establishes a process that requires the preparation of detailed environmental documentation for federally-funded projects with significant anticipated environmental impacts. An Environmental Impact Statement (EIS) provides the public and federal, state and local agencies with the assurance that the Federal Highway Administration (FHWA) and the Connecticut Department of Transportation (ConnDOT) have evaluated, addressed and documented project-related environmental concerns. The United States Environmental Protection Agency (USEPA), the United States Army Corps of Engineers (ACOE), the United States Fish and Wildlife Service (USFWS), the Connecticut Department of Environmental Protection (CTDEP), and the Rhode Island Department of Transportation (RIDOT) have agreed to be cooperating or coordinating agencies for this Draft Environmental Impact Statement.

This Draft Environmental Impact Statement (Draft EIS) presents the environmental and engineering information necessary to satisfy the NEPA regulatory requirements. Detailed technical information is provided in supporting documentation that is appropriately referenced in this Draft EIS. Data summarized in this Draft EIS are provided in detail in the technical support documents and reports prepared specifically for this project. The Draft EIS contains a glossary of technical terms and acronyms. These reports and the Draft EIS are available upon request for public review at ConnDOT and at each of the public libraries within the study area. This Draft EIS evaluates the traffic benefits and impacts, natural resource impacts, economic costs, and environmental consequences associated with potential transportation improvement alternatives along the Route 2 2A, 32 and 164 corridor between Norwich and Westerly RI, and Norwich to New London, within New London County, Connecticut.

During the comment period on this document, ConnDOT and FHWA will conduct public information meetings and public hearings to solicit comments from agencies and interested parties. At the conclusion of the Draft EIS circulation period, a Final EIS will be prepared that will identify and analyze

a preferred alternative, which may be one of the alternatives examined in the Draft EIS or a different combination of elements. The Final EIS will include a time schedule for implementation of the proposed action. The Final EIS will be made available to the agencies and the public.

Project Description

The project is known as the Route 2/2A/32 Transportation Improvement Project, and is located in New London County, Connecticut. Alternatives have been identified and evaluated for transportation improvements to 22 km (14 miles) of Route 2 from Norwich south to Interstate 95 (I-95) in Stonington. ConnDOT has received approvals to widen the existing Route 2 to four lanes from I-95 south to Route 78, under a separate project. The study area roadways include Route 164 from Route 2 to Route 165 in Preston (5 km or 3.2 mi), Route 32 from Route 2A south to the Interstate 395 (I-395) Connector in Montville (8 km or 5 mi), and Route 2A from I-395 to Route 2 (8 km or 5 mi). These roads currently experience congestion and/or safety problems due to dramatic recent increases in traffic volumes, and are anticipated to operate near or over capacity in the future.

No final recommendations for a preferred alternative are made in this Draft EIS. ConnDOT is awaiting comment on its preliminary findings. During the public comment period, the regulatory agencies, the public, and other interested parties are invited to provide comments on the technical analysis presented in the Draft EIS. All additional information and relevant comments will be evaluated and considered prior to recommending a preferred alternative in the Final EIS.

Purpose and Need

The purpose of the Connecticut Route 2/2A/32 EIS project is to provide a safe and efficient transportation improvement solution to relieve traffic congestion and improve safety on the Route 2, 2A, and 32 corridors and associated state routes that intersect with Route 2. The ACOE has accepted this as its Basic Project Purpose for Section 404 purposes..

A comprehensive analysis of the need for transportation improvements demonstrated that each of these roadways has geometric (safety) deficiencies, and will operate at or over its capacity under existing or future conditions. These deficiencies will result in traffic congestion, decreases in safety, delays, and impaired access to side streets, businesses and residences along these routes. The significantly increased traffic volumes of both automobiles and buses destined to the regions's resorts conflicts with local traffic and

pedestrian movements in the commercial and village center areas of North Stonington, Preston, Poquetanuck, Norwich, and Montville.

Alternatives Considered

Six alternatives (Figure S-1) are being studied with respect to their transportation benefits, environmental and social impacts, and costs. These alternatives were developed after a lengthy public participation process and publication of a Major Investment Study (MIS) for the corridor. The alternatives considered in this Draft EIS include multi-modal approaches to transportation improvements, such as commuter rail, light rail, monorail systems, enhanced bus service, new bypass roads, and improvements to existing roads. This Draft EIS provides a complete description of each alternative, including estimated construction and operating costs. The six alternatives are:

- **Alternative A, No Action.** The No-Action alternative assumes that no transportation improvements would be undertaken by ConnDOT within the study corridors (Route 2, Route 2A, Route 32, and Route 164). This alternative assumes that transportation improvements that are currently planned or programmed would be completed, including widening Route 2 south of I-95 in Stonington and widening Route 2 between Route 214 and Route 164 in Ledyard and Preston.
- **Alternative B.** Alternative B (Rail) would provide transit services connecting New London and Norwich via heavy (commuter) rail on the existing New England Central Railroad (NECR) line along the west shore of the Thames River. The northern terminus of this service would be at the I-395 Transportation Center, located in Yantic. New stations would also be located in New London at Connecticut College, in Waterford at the end of Scotch Cap Road, in Montville at the Mohegan Sun Resort, and at the Norwich West Transportation Center. Transit services would also be provided between Norwich and Westerly via either light rail or a monorail system. Portions of the transit system would use the existing Providence & Worcester (P&W) rail right-of-way along the east shore of the Thames River in Norwich and Preston and the Amtrak right-of-way in Westerly, but would otherwise be on a new alignment. The heavy rail line would provide service at 30-minute intervals from 5 AM until midnight, 7 days a week. The transitway would provide service at 20-minute intervals, 24 hours a day, 7 days a week. New stations would be located at the Norwich East Transportation Center, the former Norwich State Hospital, Poquetanuck Village, the Foxwoods Resort, North Stonington, Exit 92 of I-95, and the Westerly Amtrak station. Shuttle buses would provide a connection between the heavy and light rail systems via the

Route 2A (Mohegan-Pequot) Bridge. Safety improvements to existing Route 2 between I-95 and Route 214 are also included in this alternative.

- **Alternative C.** This alternative includes all elements of Alternative B, but would provide full connections between the west and east sides of the Thames River. The light rail or monorail system would include a new bridge across the Thames River between the former Norwich State Hospital and the Mohegan Sun Resort. Two bridge locations are considered.
- **Alternative D.** This alternative would provide transit services between Norwich and Westerly via bus. Buses would operate on a dedicated bus transitway from the Westerly Amtrak station to Route 214 in Ledyard, and would continue to the Norwich East Transportation Center on existing Route 2. Stations would be located at Exit 92 of I-95, North Stonington, and Foxwoods, with a stop at the Fox Hill Mashantucket Pequot employee parking lot. Charter buses would also use the busway between I-95 and Foxwoods. Route 2 in North Stonington (from I-95 to Route 214) and in Norwich (from the Preston town line to the Shetucket River) would be upgraded to provide safety improvements.
- **Alternative E.** This alternative would provide improved transportation connections from I-395 in Montville by widening the Mohegan-Pequot Bridge from its existing 2 to 4 lanes, and would relocate Route 2A between Route 12 and Route 2 to a new 4-lane alignment north of Poquetanuck Village. Route 2 would be widened to 4 lanes from the new Route 2A intersection to Route 164, and from Route 214 to I-95. Route 164, from Route 2 to Route 165, would be upgraded, as would Route 32 from Route 2A south to the I-395 connector.
- **Alternative F.** This alternative would provide improved transportation connections from I-395 in Montville by widening the Mohegan-Pequot Bridge from its existing 2 to 4 lanes, and would relocate Route 2A between Route 12 and Route 2 to a new 4-lane alignment north of Poquetanuck Village. Route 2 would be widened to 4 lanes from the new Route 2A intersection to Route 164. Route 2 would be relocated to a new alignment from Route 214 to I-95, south of the existing Route 2. Route 164, from Route 2 to Route 165, would be upgraded, as would Route 32 from Route 2A south to the I-395 connector.

Transportation Effects

The transportation effects of each of the alternatives have been thoroughly evaluated and are summarized in this Draft EIS (Section 3.1). The ConnDOT statewide travel demand forecasting model was used to predict future traffic volumes on study area roadways for the year 2020.

The model uses a schematic roadway network of major and secondary roads within the state, and a detailed zone structure. All towns within the state are broken down into smaller zones. The model uses the population, household, and employment data from each zone to estimate the travel demand on a daily basis between all zones in the model. Travel demands, or trips, are then assigned to the roadway network, taking into account the roadway characteristics (i.e., capacity) and travel times to determine the most likely route a trip might take from one place to another. The model was calibrated by comparison to actual 1998 traffic volumes at selected locations.

Based on the results of the model, estimated traffic volumes were calculated for each of the area roadways, and traffic operations were assessed by calculating the volume to capacity ratio. Ridership for each of the transit alternatives (B, C, D) was estimated by determining the percent of trips that were likely to be diverted to transit, based on where the motorist originated and the time saving provided by the transit alternative.

These results are used to compare the six alternatives with respect to their effectiveness in meeting the project purpose, specifically with regard to their ability to reduce traffic congestion and improve safety on Routes 2, 2A, 32 and 164. Table S-1 provides a comparison of these alternatives with respect to each other and existing conditions.

**Table S-1
Comparison of Transportation Effects on Key Roadway Segments**

Alternative	Route 2		Route 2A	Route 164	Route 32
	North Stonington	Preston			
A* No Action	Increased traffic volumes (+10,000 vpd**), decreased operations and safety	Increased traffic volumes (+5,000 vpd), decreased operations and safety	Increased traffic volumes (+6,000 vpd), decreased operations and safety	Increased traffic volumes (+1,300 vpd)	Increased traffic volumes (+3,400 vpd)
B*** Rail and Light Rail	Slightly reduced traffic volumes (-4,000 vpd), decreased operations, some safety improvement	Slightly reduced traffic volumes (-2,600 vpd), some improvement in operations	Slightly reduced traffic volumes (-2,400 vpd), decreased operations and safety	No effect	Slightly reduced traffic volumes (-300 vpd)
C*** Rail and Light Rail	Slightly reduced traffic volumes (-4,200 vpd), decreased operations, some safety improvement	Slightly reduced traffic volumes (-2,900 vpd), some improvement in operations	Slightly reduced traffic volumes (-2,600 vpd), decreased operations and safety	No effect	Slightly reduced traffic volumes (-400 vpd)
D*** Busway	Slightly reduced traffic volumes (-4,000 vpd), decreased operations, some safety improvement	Slightly reduced traffic volumes (-2,900 vpd), some improvement in operations	No effect	No effect	No effect
E*** Route 2A Bypass	Increased traffic volumes (+5,500 vpd), improved operations, improved safety	Increased traffic volumes (+9,200 vpd), improved operations and safety	Substantial decrease in traffic volumes (-12,300 vpd), improved operations and safety	Slightly reduced traffic volumes (-1,300 vpd), improved operations and safety	Slight traffic increase (+1,900 vpd), improved safety
F*** Route 2A and Route 2 Bypass	Substantial decrease in traffic volumes (-20,700 vpd), improved operations	Increased traffic volumes (+12,100 vpd), improved operations and safety	Substantial decrease in traffic volumes (-12,900 vpd), improved operations and safety	Slight decrease in traffic volume (-1,500 vpd), improved operations and safety	Slight traffic increase (+700 vpd), improved safety

* Traffic volumes compared to existing traffic volumes.

** Vehicles per day.

*** Traffic volumes compared to 2020 No-Action traffic projections.

Alternative A

The transportation effects of the No-Action alternative (Alternative A) are described in detail in Section 1.4. Under the No-Action alternative, substantial growth in traffic volumes is expected to continue throughout the study area. On Route 2, traffic volumes are projected to exceed the capacity of the roadway through Norwich, Preston, and North Stonington. Traffic volumes are also projected to exceed the capacity of Route 2A from the Mohegan-Pequot Bridge to Route 2. Route 32 and Route 164 are expected to be approaching capacity. Operations at signalized and unsignalized intersections are projected to worsen, causing drivers to face increased delays, particularly when attempting turns to and from side streets and driveways. The traffic volume increases are also expected to result in a deterioration in safety along the study area roadways. Consequently, the No-Action alternative does not meet the project purpose and need.

Alternative B

The transportation effects of Alternative B are described in detail in Section 3.1. Alternative B would have an estimated total annual transit ridership of 4.9 million, and would result in slightly reduced traffic volumes on portions of Route 2, Route 2A, and Route 32. Traffic volumes on Route 164 are not affected by Alternative B. The traffic volume reductions cause only a marginal improvement in operations on one roadway link: Route 2 between Route 164 and Route 2A. Operations on this link are projected to improve from failing conditions, to conditions very close to capacity. Route 2A and the remaining portions of Route 2 are not expected to see any operational improvements over the No-Action alternative.

The upgrade to Route 2 is expected to result in slightly safer conditions from the addition of shoulders, the redesign of substandard segments, and the addition of turn lanes at signalized intersections.

With only marginal improvements in operations in one location, and a slight improvement in safety on Route 2, Alternative B only partially meets the project purpose and need.

Alternative C

The transportation effects of Alternative C are described in detail in Section 3.1. Overall, the transportation effects of Alternative C are nearly identical to Alternative B. Alternative C would have an estimated total annual transit ridership of 5.1 million, and would result in slightly reduced traffic volumes on Route 2, Route 2A, and Route 32. Traffic volumes on Route 164 are not affected by Alternative C. The traffic volume reductions

cause only a marginal improvement in operations on one roadway link: Route 2 between Route 164 and Route 2A. Operations on this link are projected to improve from failing conditions, to conditions very close to capacity. Route 2A and the remaining portions of Route 2 are not expected to see any operational improvements over the No-Action alternative.

The upgrade to Route 2 is expected to result in minor safety improvements on these roadways, from the addition of shoulders, the redesign of substandard segments, and the addition of turn lanes at signalized intersections.

With only marginal improvements in operations in one location, and a slight improvement in safety on Route 2, Alternative C only partially meets the project purpose and need.

Alternative D

The transportation effects of Alternative D are described in detail in Section 3.1. Alternative D would have an estimated total annual bus ridership of 3.8 million, and would reduce traffic volumes slightly on Route 2. Traffic volumes on Route 2A, Route 32, and Route 164 are not substantially affected by Alternative D. The traffic volume reductions cause only a marginal improvement in operations on two roadway links: Route 2 between Route 164 and Route 2A in Preston, and between Route 2A and Route 165 in Norwich.

Route 2 between Route 164 and Route 2A in Preston is projected to improve from failing conditions, to conditions very close to capacity. Route 2 between Route 2A and Route 165 in Norwich is projected to improve from failing conditions, to conditions below capacity (both as a result of the traffic volume decrease and the capacity increase associated with the upgrade of this link). Route 2A and the remaining portions of Route 2 are not expected to see any operational improvements over the No-Action alternative.

The upgrade to Route 2 is expected to result in slightly safer conditions from the addition of shoulders, the redesign of substandard segments, and the addition of turn lanes at signalized intersections.

With only marginal improvements in operations in two locations, and a slight improvement in safety on Route 2, Alternative D only partially meets the project purpose and need.

Alternative E

The transportation effects of Alternative E are described in detail in Section 3.1. Alternative E results in improved traffic operations on Route 2,

Route 2A, and Route 164. Traffic volumes on Route 2 through Preston and North Stonington, and on the Mohegan-Pequot Bridge are projected to increase, as traffic shifts from other roadways to the widened portions of Route 2 and Route 2A. However, operations improve from above capacity conditions under the No-Action alternative, to below or approaching capacity conditions under Alternative E.

Alternative E also results in a substantial reduction of traffic volume on Route 2A through Poquetanuck, to levels below existing conditions, and similar to volumes measured in the early 1990s. Consequently, both operations and safety are expected to improve on Route 2A. Alternative E also results in minor traffic volume reductions on Route 164, Route 214, and Route 2 between Route 2A and Route 165 in Norwich. Safety improvements are also likely on these roadways as traffic volumes and congestion decrease.

Alternative E results in a slight increase in traffic volume on Route 32 north of the I-395 Connector, because Route 32 provides easy access to Route 2A, the widened Mohegan-Pequot Bridge, and the Route 2A Bypass. Operations are expected to remain at conditions approaching capacity. Safety on Route 32 would likely be improved as a result of the upgrade.

With major improvements in operations along Route 2, Route 2A, and Route 164, and moderate improvements in safety on these roads and Route 32, Alternative E meets the project purpose and need.

Alternative F

The transportation effects of Alternative F are described in detail in Section 3.1. Alternative F results in substantial reductions of traffic volumes on Route 2 through North Stonington, and on Route 2A through Poquetanuck. In both locations, traffic volumes under Alternative F are projected to be lower than those measured under existing conditions. Consequently, operations and safety are expected to improve in both locations. Alternative F also results in minor traffic volume reductions on Route 164, Route 214, and Route 2 between Route 2A and Route 165 in Norwich. Safety improvements are also likely on these roadways as traffic volumes and congestion decrease.

Traffic volumes on the Mohegan-Pequot Bridge are projected to increase under Alternative F, as traffic shifts from other roadways to the widened bridge and the Route 2A Bypass. However, operations on the bridge improve from above capacity conditions under the No-Action alternative, to approaching capacity conditions under Alternative F.

Alternative F also results in a slight increase in traffic volumes on Route 32 north of the I-395 Connector, because Route 32 provides easy access to Route 2A, the widened Mohegan-Pequot Bridge, and the Route 2A Bypass.

Operations are expected to remain at conditions approaching capacity. Safety on Route 32 would likely be improved as a result of the upgrade.

With major improvements in operations along Route 2, Route 2A, and Route 164, and moderate improvements in safety on these roads and Route 32, Alternative F meets the project purpose and need.

Environmental Consequences

Concurrent with the development of alternatives, various types of data and features were analyzed within the study area. This Draft EIS presents an examination of existing environmental features within the study corridors, including the existing roadway corridors as well as the Route 2A Bypass, Route 2 Bypass, and Transitway corridors that were identified in the MIS. The following subject areas were investigated for this study and are discussed in Chapter 3 of the Draft EIS; socioeconomics; public parks, recreation areas, and wildlife refuges; farmlands; floodplains; surface and groundwater resources; land use; wetlands; rare species; biological diversity; historical and archaeological resources; air quality; noise; visual quality; and hazardous and contaminated sites. Potential mitigation measures are identified where appropriate. The Draft EIS also examines impacts from construction as well as secondary and cumulative impacts. Chapter 3 also identifies potential mitigation measures. Specific mitigation measures will be identified for the Proposed Action and described in the Final EIS. This analysis ensured that the potential social, natural and cultural impacts of the project, both beneficial and adverse, were considered.

Each of the alternatives studied in this Draft EIS, other than Alternative A, would result in some level of transportation benefit, and some level of adverse effect to public lands, wetlands, wildlife habitat, surface water quality, visual quality, and/or cultural resources. Each alternative would require the acquisition by ConnDOT of new rights-of-way, and would therefore displace human land uses, residents, and businesses. Noise impacts would result from most of the alternatives considered. This Draft EIS provides a summary of the analyses of impacts to these resources, and identifies potential mitigation measures, that will enable decisions to be made on the selection of a preferred alternative. Table S-2 summarizes environmental effects.

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Alternative A

The No-Action alternative (Alternative A) would have no new impacts due to construction. However, noise levels due to increasing traffic volumes would continue to exceed (or approach) FHWA criteria in several areas along roadways like Route 32 and Route 2, affecting 709 receptors. Traffic conditions will also result in the continued inefficient use of energy by vehicles utilizing the existing roadway network as it becomes even more congested in the future. Water quality problems are also expected to increase under this alternative as the pollutant load in highway runoff would increase due to higher traffic volumes in the future. The No-Action alternative would not present an opportunity for modern storm water management practices to be incorporated into the roadway network's design to mitigate for future water quality problems.

Alternative B

Impacts associated with Alternative B are largely a consequence of the construction of the 36.8-kilometer (23.5-mile) transitway and the transit stations. Alternative B would impact wetlands, wildlife habitat, regulated farmland soils, floodplains, public parks and wildlife preserves, surface and groundwater quality, scenic views, historic properties, high-sensitivity archaeological areas, and would affect residential and commercial properties. This alternative could result in noise impacts and may have other economic impacts.

Although the transitway would pass through the Pawcatuck Sole Source Aquifer (SSA) and would be near several community wells, the light rail and monorail lines would not substantially increase impervious surfaces or have an adverse effect on surface or groundwater quality. Parking structures and the use of stormwater Best Management Practices (BMPs) would reduce any water quality impacts associated with stations. An estimated 2 community wells and 20 non-community wells could potentially be impacted by construction.

Alternative B would avoid all known rare species sites and state-designated Significant Natural Communities. Construction of the transitway would encroach on 8.2 hectares (20.1 acres) of floodplain and potentially affect 27.3 hectares (67.5 acres) of regulated farmland soils. Approximately 42.5 hectares (105 acres) of wildlife habitat, primarily forested land, could be lost, including an estimated 9.3 hectares (23.0 acres) of wetlands.

The transitway would directly affect 4 public parks, wildlife refuges or recreational areas (Rose Hill Wildlife Management Area in Preston, Whitehall Park in Ledyard, and the Gingerella Sports Complex in Westerly); two of which are Section 6(f) as well as Section 4(f) resources. Effects to these areas are minor, with the exception of Whitehall Park.

Although Alternative B would provide transit users with dramatic new scenic views, the new overpasses required to cross Route 2 and Route 2A could adversely affect views of the rural landscape and the Hallville Historic District. The transitway, particularly the monorail option, could adversely affect views of the countryside from existing Route 2 in North Stonington. The removal of trees and stone walls along upgraded portions of Route 2 in North Stonington could also affect views of and from the road.

Alternative B would not result in any violations of the National Ambient Air Quality Standards (NAAQS), and would result in reductions in emissions of volatile organic compounds (VOC), carbon monoxide (CO), and oxides of nitrogen (NOx) in comparison to Alternative A. Alternative B would result in sound levels that exceed the FHWA's Noise Abatement Criteria (NAC) at 864 receptors, and would have additional noise impacts due to train warning devices at 52 grade crossings.

This alternative would affect 2 known archaeological sites, and would require further investigation of approximately 36.8 hectares (90.9 acres) of land with high and moderate archaeological sensitivity. Alternative B would cross through the Hallville and North Stonington Historic districts, and would impact 38 historic properties. Six historic structures would be directly affected.

Alternative B would require the acquisition of approximately 59 hectares (145 acres) of land, affecting 264 properties, for new right-of-way and stations. Most of this land is currently undeveloped. An estimated 17 homes and 3 businesses would be displaced by this alternative. Alternative B would be likely to divide neighborhoods in North Stonington and Preston, and would result in a minor reduction in property tax revenues within the region (\$135,500). This alternative would generate a substantial number of construction and operational jobs, with a positive regional financial impact due to construction spending estimated at \$599 million.

As many as 77 potentially hazardous or contaminated sites could be encountered with the right-of-way acquisition and construction of Alternative B. Since Alternative B is a mass transit option, future energy use would be expected to be less than for alternatives designed primarily for automobile use.

Alternative C

Impacts associated with Alternative C are the same as Alternative B except for those resulting from the construction of a rail bridge across the Thames River. The bridge would result in the loss of river substrate, and minor losses of natural upland vegetation. Two additional potentially hazardous or contaminated site would be encountered (total of 78) and there is a potential for indirect impacts to rare species (Atlantic sturgeon) habitat in the river due to construction of bridge piers, which could result in the loss of habitat and temporary habitat impacts due to turbidity. Alternative C would result in the second-highest reduction in emissions of mobile source pollutants. This alternative would require relocation of 2 additional residences, and would affect 62 hectares (151 acres) of land.

Alternative D

Impacts associated with Alternative D are largely a result of the 20.1-kilometer (12.8-mile) busway element. Alternative D would impact wetlands, wildlife habitat, regulated farmland soils, floodplains, public parks and wildlife preserves, surface and groundwater quality, scenic views, historic properties, high-sensitivity archaeological areas, and would affect residential and commercial properties. This alternative could result in noise impacts and may have other economic impacts.

Although the busway would pass through the Pawcatuck SSA and would be near several community wells, the busway would have a minimal effect on surface or groundwater quality. The busway would result in 36.8 hectares (91.4 acres) of new pavement within the SSA, but would generate fewer roadway contaminants than a typical roadway due to the reduction in traffic volumes. Parking structures and the use of stormwater BMPs would reduce any water quality impacts associated with the I-95 Transportation Center. An estimated 1 community well and 19 non-community wells are in close proximity to the alignment.

Alternative D would potentially encroach on 4.1 hectares (10.1 acres) of 100-year floodplain and affect 20.1 hectares (49.5 acres) of regulated farmland soils. This alternative would result in the loss of 24.2 hectares (59.9 acres) of wildlife habitat (primarily deciduous forest), of which 6.3 hectares (15.6 acres) are wetlands. There would be no impacts on known rare species sites, while two public parks (Gingerella Sports Complex and Milton Green Park) could be slightly impacted.

Although Alternative D would provide transit users with dramatic new scenic views, the new overpass required to cross Route 2 could adversely affect views of the rural landscape. Views of the countryside from existing

Route 2 in North Stonington could be affected by the proximity of the busway and from the removal of trees associated with upgrades to Route 2.

Alternative D would not result in any violations of the NAAQS, and would result in reductions in emissions of VOC, CO, and Nox in comparison to Alternative A. This alternative would result in sound levels above the NAC at 775 receptors.

This alternative would affect 1 known archaeological site, and would require further investigation of approximately 35 hectares (86.4 acres) of land with high and moderate archaeological sensitivity. Alternative D would affect the least amount of land with archaeological sensitivity of the Build alternatives. Alternative D would cross through the northeast portion of the North Stonington Historic District, and would affect 30 historic properties. Five historic structures would be directly impacted.

Alternative D would require the acquisition of approximately 37 hectares (90 acres) of land, affecting 225 properties, for new right-of-way and stations. Most of this land is currently undeveloped. An estimated 17 homes and 5 businesses would be displaced by this alternative. Alternative D would be likely to divide neighborhoods in North Stonington, and would result in a minor reduction in property tax revenues within the region (\$122,000). This alternative would generate a moderate number of construction and operational jobs, with a positive regional financial impact due to construction spending estimated at \$108 million.

An estimated 45 potentially hazardous or contaminated sites could be encountered under this alternative, and would affect construction. Since Alternative D is a mass transit option, future energy use would be expected to be less than for alternatives designed primarily for automobile use.

Alternative E

Impacts associated with Alternative E are largely a consequence of the Route 2A Bypass and the Route 2 Widening elements. Alternative E would impact wetlands, wildlife habitat, regulated farmland soils, floodplains, public parks and wildlife preserves, surface and groundwater quality, scenic views, historic properties, high-sensitivity archaeological areas, and would affect residential and commercial properties. This alternative could result in noise impacts and may have other economic impacts.

Although Route 2 passes through the Pawcatuck SSA the widening would have a minimal effect on surface or groundwater quality. The widening would result in 22 hectares (54.6 acres) of new pavement within the SSA, and would generate moderately increased amounts of roadway contaminants due to increased traffic volumes. The use of stormwater BMPs would reduce any

water quality impacts. An estimated 3 community wells (along Route 32) and 40 non-community wells are in close proximity to construction.

Alternative E would potentially encroach on 2.0 hectares (4.9 acres) of 100-year floodplain and affect 24.4 hectares (60.3 acres) of regulated farmland soils. This alternative would result in the loss of 14.6 hectares (36.1 acres) of wildlife habitat (primarily deciduous forest), of which 5.1 hectares (12.6 acres) are wetlands. Construction of bridge piers for the widened Mohegan-Pequot Bridge could potentially result in short-term impacts to Atlantic Sturgeon habitat in the Thames River. The widening of Route 2 could result in minor impacts to the Rose Hill and Asskekonk Swamp Wildlife Management Areas.

Although Alternative E would provide motorists with dramatic new scenic views, the new overpasses required to cross Route 2A and Middle Road could adversely affect views of the rural landscape. Views of the countryside from existing Route 2, as well as views of the roadway, in North Stonington and Preston could be affected by the removal of trees, stone walls, and structures required for the widening of Route 2.

Alternative E would not result in any violations of the NAAQS, and would result in reductions in emissions of VOC, CO, and NO_x in comparison to Alternative A. This alternative would result in the greatest reduction in the emission of mobile source pollutants. Alternative E would result in sound levels above the NAC at 793 receptors.

This alternative would affect 1 known archaeological site, and would require further investigation of approximately 45.7 hectares (112.9 acres) of land with high and moderate archaeological sensitivity. Alternative E would require work within or adjacent to the Preston City and North Stonington Historic Districts, but would not affect those resources. One National Register property may be impacted by widening Route 2. This alternative would impact 25 historic properties, and would result in the loss of 15 historic structures.

Alternative E would require the acquisition of 53 hectares (131 acres) of land for new right-of-way, affecting 242 properties. The majority of this land is currently undeveloped. An estimated 29 homes and 8 businesses would be displaced by this alternative. Alternative E would be likely to improve community cohesion in Poquetanuck Village, but would contribute to the current effect of Route 2 in dividing North Stonington. This alternative would result in the largest reduction in property tax revenues within the region (\$157,800). This alternative would generate a moderate number of construction jobs, with a positive regional financial impact due to construction spending estimated at \$69 million.

An estimated 43 potentially hazardous or contaminated sites could be encountered under this alternative, and would affect construction. Highway improvements and freer flow of traffic under this alternative would lead to future energy conservation.

Alternative F

Impacts associated with Alternative F are largely due to the Route 2A and Route 2 Bypasses. Alternative F would impact wetlands, wildlife habitat, regulated farmland soils, floodplains, public parks and wildlife preserves, surface and groundwater quality, scenic views, historic properties, high-sensitivity archaeological areas, and would affect residential and commercial properties. This alternative could result in noise impacts and may have other economic impacts.

Although the Route 2 Bypass passes through the Pawcatuck SSA and the adjacent Anguilla Aquifer, it is not expected to have a substantial effect on surface or groundwater quality. The bypass would result in 23.2 hectares (57.8 acres) of new pavement within the SSA, and would generate moderate amounts of roadway contaminants due to increased traffic volumes. The use of stormwater BMPs would reduce any water quality impacts. An estimated 3 community (along Route 32) and 24 non-community wells are located in proximity to construction.

Alternative F would potentially encroach on 2.5 hectares (6.2 acres) of 100-year floodplain and affect 20.1 hectares (49.6 acres) of regulated farmland soils. This alternative would result in the loss of 59.6 hectares (147.4 acres) of wildlife habitat (primarily deciduous forest), of which 7.3 hectares (18.0 acres) are wetlands. Construction of bridge piers for the widened Mohegan-Pequot Bridge could potentially result in short-term impacts to Atlantic Sturgeon habitat in the Thames River.

Although Alternative F would provide motorists with dramatic new scenic views, the new overpasses required to cross Route 2A, Middle Road, and Mystic Road could adversely affect views of the rural landscape. Views of the countryside from existing Route 2 as well as views of the roadway in Preston could be affected by the removal of trees, stone walls, and structures required for the widening of Route 2.

Alternative F would not result in any violations of the NAAQS, but would not result in reductions in emissions of VOC, CO, and NO_x in comparison to Alternative A. Estimated emissions due to Alternatives A and F are essentially the same, due to increased vehicle speeds associated with Alternative F. This alternative would result in sound levels above the NAC at 784 receptors.

This alternative would affect 1 known archaeological site, and would require further investigation of approximately 62.6 hectares (154.7 acres) of land with high and moderate archaeological sensitivity. Alternative F would not affect any designated National Register district or resource, but would affect two potentially-eligible districts and 14 historic properties. Seven historic structures would be lost.

Alternative F would require the acquisition of 69 hectares (169 acres) of land for new right-of-way, affecting 157 properties. The majority of this land is currently undeveloped. An estimated 30 homes and 2 businesses would be displaced by this alternative. Alternative F would be likely to improve community cohesion in Poquetanuck, but would divide neighborhoods in North Stonington along Stony Brook, Jeremy Hill and Mystic Roads. This alternative would result in a minor reduction in property tax revenues within the region (\$105,400). Alternative F would generate a moderate number of construction jobs, with a positive regional financial impact due to construction spending estimated at \$95 million. Some businesses along Route 2 would be likely to be adversely affected due to decreased traffic volumes.

An estimated 39 potentially hazardous or contaminated sites could be encountered under this alternative, and would affect construction methods or costs. Highway improvements and freer flow of traffic under this alternative would lead to future energy conservation.

Comparison of Alternatives

This section provides an overview comparison of the 6 alternatives with respect to cost, effectiveness at meeting the project purpose, and impacts to environmental, cultural and social resources

As shown in Table S-3, the estimated capital costs of the alternatives range from \$93 million for Alternative E to \$701 million for Alternative C (using the light rail option). Construction of a monorail system in Alternative B or C would increase capital costs to \$3.5 to \$3.7 billion due to the complex engineering design and the construction costs of 36.8 km (23 mi) of elevated structure. Right of way costs would range from \$0.6 to \$1.7 million, with Alternatives E and F having the highest cost. Annual operating costs would range from \$250,000 for Alternative E to \$26.7 million for Alternative B (monorail).

**Table S-3
Cost Comparison**

Alternative	Estimated Right-of-Way Acquisition and Relocation Cost (millions)	Annual Operating Cost (millions)	Capital Cost ¹ (millions)	Net Annualized Cost ² (millions)
B (light rail)	\$7.0	\$16.8	\$599	\$57.2
B (monorail)	\$7.0	\$26.7	\$3.5 billion	\$305.5
C (light rail)	\$7.0	\$15.9	\$675-701	\$63.4
C (monorail)	\$7.0	\$25.8	\$3.7 billion	\$318.2
D	\$6.1	\$4.4	\$108	\$7.2
E	\$9.3	\$0.25	\$93	\$7.6
F	\$5.5	\$0.42	\$119	\$9.7

- 1 Range of costs represents difference between costs of the north and south transit bridges options (Alternative C)
- 2 Annual cost minus revenues

Alternative E is demonstrated to be the most effective with respect to the project purpose. Alternative E would provide a substantial reduction in traffic volumes on Route 2A in Preston, resulting in improved operations and safety. This alternative would increase traffic on Route 2 in North Stonington and Preston, but the widened 4-lane roadway would operate with higher efficiency and improved safety. This alternative would also improve safety on Routes 32 and 164. Alternative E would have the lowest estimated capital (\$93 million) and annual operating costs (\$250 thousand).

Alternative E would have the fewest environmental effects. This alternative would require the least amount of new right-of-way, and would affect the least amounts of wetlands, wildlife habitat, floodplains, or public parks/wildlife refuges. Alternative E could potentially affect Atlantic sturgeon habitat in the Thames River through the construction of the widened Route 2A bridge. The widening of Route 2 could have adverse effects on visual and scenic qualities along this roadway. This alternative also provides the largest reduction in the emission of air pollutants.

Alternative F would have similar effects, but would accomplish a substantial improvement in traffic operations on Route 2 in North Stonington by diverting traffic to a new bypass, substantially reducing traffic volumes on the existing road. Alternative F would have the second-lowest estimated capital (\$119) and annual operating (\$420 thousand) costs.

The two rail transit alternatives (B and C) would attract 6,757 to 7,261 riders a day, but would have negligible effects on traffic volumes and operations on

Route 2 or other connecting state routes. These alternatives would provide a slight reduction in traffic volumes on Route 32, 2 and 2A but would not result in an improvement in operations. The upgrade of Route 2 associated with these alternatives would provide some improvement in safety in North Stonington. Costs for Alternative B or C with the light rail option are substantially less than for the monorail option, with capital costs of \$589 million and annual operating costs of \$16.8 million. Construction of a transit bridge (Alternative C) would increase capital costs by \$102 million for light rail, with negligible increases in ridership.

Alternatives B and C would result in the most substantial effects to public parks and wildlife refuges, wetlands, the number of known archaeological sites and National Register historic districts affected, and would affect the largest amount of regulated farmland soils. These alternatives provide little reduction in the emission of air pollutants, and result in the least improvement to traffic on existing roads.

Alternative D would attract an estimated 5,221 riders per day, but would have negligible effects on traffic volumes or operations on Route 2 or other connecting state routes. This alternative would provide a slight reduction in traffic volumes on Routes 32, 2, and 2A, but would not result in any improvement in operations. The upgrade of Route 2 would provide some improvement in safety. Costs of Alternative D are relatively low in comparison to the other transit alternatives, with an estimate \$108 million in capital costs and \$4.4 million in annual operating costs. Environmental effects of Alternative D are also less than for Alternatives B or C, due to the shorter length of the new Busway.

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