Summary of the Potential Impacts and Feasibility of the Range of Reasonable Alternatives

June 2001

Introduction

This summary provides an overview of the potential impacts and feasibility of the range of reasonable alternatives developed for satisfying the needs and purpose of the study. The U.S. Army Corps of Engineers — New England Division's Highway Methodology was used as the basis for this analyses and summary, and expanded to include land use, displacements, and overall engineering feasibility. The purpose of this matrix is to facilitate the comparison of the potential impacts and feasibility of the range of reasonable alternatives. The numbers presented in the matrix are preliminary, and will change as a result of alignment modifications, additional data collection and analyses, and public involvement and agency coordination.

The Public Advisory Committee (PAC) developed one thousand feet wide corridors in May 2001. Highway alignments based upon MDOT design criteria were subsequently developed within these corridors. The resultant preliminary impacts were calculated for each alternative by adding the area of the highway, limits of cut and fill, and a 20 meter (65 feet) buffer on each side of the alignment to determine the potential impact. The numbers and impacts are likely the "worst-case scenario," as most of the permanent impacts will be substantially less than the cut/fill plus buffer width used in the calculation of impacts.

Physical and Biological Environment

National Wetland Inventory and Hydric Soils

The U.S. Fish and Wildlife Service's National Wetland Inventory (NWI) data was used to identify wetlands based upon high altitude aerial photography.

Hydric Soils were identified from the list of hydric soils obtained from the Penobscot County and Hancock County Soil and Water Conservation Districts, the Penobscot County Soil Survey (USDA 1962), and the Hancock County Soil Survey (USDA 1999). Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop oxygen-deficient conditions near the soil surface, specifically within the root zone of plants. Hydric soils are one of the criteria used to identify wetlands.

Number of Wetlands

The number of wetlands impacted by the alternatives was identified based on the NWI data.

Water Crossings

The number of waterway crossings was derived from the perennial waterways shown on the U.S.G.S. quadrangle maps that would be crossed (by either bridge or culvert) by an alternative.

Undeveloped Wildlife Habitat

Undeveloped wildlife habitat in the study area includes forested areas, rangeland or grassland, farmland and wetlands.

Notable Wildlife Habitat

These areas were identified from information provided by the Maine Department of Inland Fisheries, local comprehensive plans, the Maine Department of Conservation, and the Maine Office of Geographic Information Systems.

Notable wildlife habitat includes deer wintering areas, habitat for threatened and endangered species, and other areas.

Deer wintering areas were identified by the Maine Department of Inland Fisheries and from local comprehensive plans.

Threatened and endangered species information was obtained from the U.S. Fish and Wildlife Service, the Maine Natural Areas Program, and the Maine Department of Inland Fisheries and Wildlife. The Endangered Species Act was passed in 1973 in an effort to stop the process of human-induced extinctions in the United States. This act provides an incentive and regulation for the protection of threatened and endangered species and the habitats that threatened and endangered species need for survival. The water stargrass is listed as a state endangered species. The American shoregrass is listed as a rare aquatic plant in Maine.

Other notable or sensitive wildlife habitats include inland waterfowl and wading bird habitats and anadromous fish areas.

Surface Area of Aquifers and High Yield Aquifers

Information on aquifers was obtained from:

- Hydrogeology and Water Quality of Significant Sand and Gravel Aquifers in parts of Aroostook, Hancock, Penobscot, Piscataquis and Waldo Counties, Maine
- Surficial Geology and Availability of Ground Water in Part of the Lower Penobscot River Basin, Maine
- United States Geological Survey
- Maine Geological Survey

The area of impacted aquifer is equal to the area of surface disturbance.

The area of high yield aquifer impacted is equal to the area of earth disturbance in areas classified as a high yield aquifer. High yield aquifers are divided into two categories: those with wells that produce 10-50 gallons per minute (gpm), and those with wells that produce over 50 gallons per minute (gpm). Within the study area, well yields are generally less than 10 gpm. A few public water supply wells exist within the study area.

Floodplains

Floodplains were identified from the Federal Emergency Management Agency's (FEMA) Digital Flood Insurance Rate Maps (FIRMs) for Penobscot and Hancock Counties.

Community Wells Directly Impacted

Community wells were identified using information from the Maine Department of Environmental Protection (MDEP) and the Maine Drinking Water Program (Department of Human Services). The Maine Drinking Water Program (Department of Human Services) identified 17 public water supply wells in the study area.

Active Farmland and Prime Farmland Soils

Farmland information was obtained from the Penobscot County Soil Survey (1962), the Hancock County Soil Survey (1999), the Brewer Comprehensive Plan (1995), the Eddington Comprehensive Plan (1981), the Holden Comprehensive Plan (1995), and satellite imagery.

Prime farmland, as defined by the U.S. Department of Agriculture (USDA), is the land that is best suited to producing food, feed, forage, and fiber and oilseed crops. It has the soil quality, growing season, and water supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. By definition, prime farmland does not need to be actively used (active farmland).

Farmland Soils of Statewide Importance

No farmland soils of statewide importance exist within the study area.

Land Use

Land Use

Land use within the study area was identified using satellite imagery, the Brewer Comprehensive Plan (1995), the Holden Comprehensive Plan (1995), and Eddington Comprehensive Plan (1981), and verified through field reconnaissance.

Displacements

Residential and commercial displacements were identified be overlaying the highway alignments on the satellite image.

Environmental Risk Sites

Information on environmental risk sites was obtained from the U.S. Environmental Protection Agency, the Maine Department of Environmental Protection petroleum spill reports, remediation sites list, and underground storage tank list. In addition, an Environmental FirstSearch Report was used, and field reconnaissance and interviews were conducted.

Cultural Resources

Archaeological Areas and Recorded Archaeological Sites

The Maine Historic Preservation Commission will identify archaeological areas following the preliminary screening of alternatives.

Two previously recorded archaeological sites exist in the study area. One of these is in Brewer, and the other is in Eddington. The exact locations of these archaeological sites are restricted.

Historic Properties Directly Impacted

Information on historic properties was obtained from the National Park Service's National Register Information System, which contains information on properties listed in or determined eligible for the National Register of Historic Places. The Penobscot Salmon Club and Pool in North Brewer, the Daniel Sargerb House, and Eddington Bend are listed on the National Register of Historical Places.

Engineering Feasibility

Design Element	Maine Department Of Transportation Highway Design Guide
Design Year	2030
Functional Classification	Limited Access Two-Lane Highway within a Four-Lane Right-of-Way
Terrain	Level
Design Speed	110km/h (70 mph)
Lane Widths	3.6m (12')
Shoulder Widths	Right 3.0m (10') Left 1.2m (4')
Cross Slopes	6.0% max. superelevation 2.1% normal 4.2% shoulder – normal
Median Width	To be determined by field conditions. Minimum 6.71m (22')
Clear Zone	Variable. Dependant on design speed, traffic volume and side slopes.
Side Slopes Cut Front of Slope Depth of Ditch Back Slope Fill 0m – 6.10m Height > 6.10m Height	 1:6 A rounded ditch section should be used unless hydraulic capacity warrants the use of a trapezoidal ditch. The depth of ditch shall be maintained 0.31m (1') below subgrade. 1:2 1:6 / 1:4 (hinged) 1:2
Minimum Stopping Sight Distance	259.08m (850')
Decision Sight Distance	335.25m (1100')
Minimum Radius	635.05m (2083.48')
Vertical Grades	3% max. 0.25% minimum desirable 0% minimum
Minimum Vertical Clearance	5.03m (16'-6") for New and Replaced Overpassing Bridges. 4.88m (16'-0") for Existing Overpassing Bridges.