Summary

Study Overview

The Federal Highway Administration (FHWA) and the Maine Department of Transportation (MDOT) have undertaken the Aroostook County Transportation Study to identify transportation corridors that will improve mobility and efficiency within northeastern Aroostook County and that will link this area and other portions of the US and Canada in order to support regional economic growth.

The Study Area is located in the northeast corner of the state and is shown in Figure S-1 (bound separately in Volume II). It is bounded on the south by I-95, on the west by Route 11 and on the north and east by the Canadian border. I-95 terminates in Houlton at the southeastern limit of the Study Area. There is no Interstate highway access to the majority of the Study Area. The Study Area is approximately 160 kilometers (100 miles) long and 40 to 100 kilometers (25 to 62 miles) wide, covering approximately 7,060 square kilometers (2,760 square miles).

This Draft Environmental Impact Statement (DEIS) has been prepared in conformance with the requirements of the Council on Environmental Quality (CEQ), National Environmental Policy Act (NEPA) regulations and with the NEPA regulations and guidance documents of the FHWA. The purpose of an EIS is to provide a full discussion of significant environmental impacts, and to inform decision-makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts. It includes consideration of the existing transportation, economic, physical and biological, and atmospheric environment, and the potential effects of alternatives considered during the study on those elements of the environment.

This DEIS has been prepared to summarize the analyses conducted to date to identify reasonable alternatives and assess their potential transportation, social, economic, and environmental impacts. It is being circulated to solicit comments from federal and state agencies, and from the public, that will assist FHWA in identifying a Preferred Corridor that will be further described in a Final Environmental Impact Statement (FEIS). The rationale for the selection of a Preferred Corridor will be documented in FHWA's Record of Decision (ROD).

Each of the corridors analyzed in this DEIS is a broad band extending from I-95 to Madawaska. Within each of these bands are several potential highway alignments. In subsequent phases of this Study, specific highway alignments within the Preferred

Corridor would be identified and analyzed. Due to the length of the Study Area, it is likely that the Preferred Corridor would be divided into several segments or phases for future analysis. NEPA compliance (which may include a FEIS, a Supplemental EIS, Environmental Assessment, or Categorical documentation) would be required for each phase.

This DEIS also provides MDOT with the decision-making tool required by Maine's Sensible Transportation Policy Act (STPA), which requires the MDOT to "evaluate the full range of reasonable transportation alternatives for significant highway construction or reconstruction projects." The STPA also encompasses transportation improvements which provide economic benefits. MDOT actions that may proceed after completion of the EIS review and issuance of the FHWA ROD may include final design, right-of-way acquisition, and construction.

Purpose of the Study

The **Purpose** of the study is to evaluate transportation alternatives that would improve the region's economy by improving transportation mobility. Aroostook County has an inadequate transportation system that limits access and mobility to, from, and within the county. Poor mobility in turn limits economic opportunity.

Specific elements of the **Need** for transportation improvements include:

- Aroostook County suffers from a long-term loss of population;
- The unemployment rate in the Study Area has been chronically higher than the state average;
- The rate of job growth has been chronically below the state average;
- There has been a lack of diverse job opportunities which would retain and attract workers;
- There is a need to improve transportation access to, from and within Aroostook County and the surrounding provinces to improve access to jobs, reduce long distances and travel times for goods to market, and address issues of transportation system continuity.

Transportation improvements that address economic and transportation needs should meet the following specific **Objectives**:

- Economic Objectives:
  - Maintain and expand the Aroostook County economy as it affects population, employment, diversification of jobs, and income;
  - Enhance the marketability of Aroostook County's existing and potential economic assets;

- ➢ Improve access to jobs and services;
- ➢ Improve connections to markets within and outside of Aroostook County including New England, Canada, and more distant areas; and
- ➢ Improve access to multi-modal (air and rail) facilities.

➤ Transportation Objectives:

- ➢ Reduce travel time to, from and within Aroostook County;
- ➢ Enhance the reliability of Aroostook County's transportation system;
- ➢ Improve traffic flow through Houlton, Mars Hill, Presque Isle, and Caribou;
- ➢ Reduce the potential for accidents;
- ➢ Provide an adequate highway geometry;
- ➢ Reduce speed differentials in developed areas, and among highway users;
- ➢ Reduce conflicts caused by the varied traffic mix;
- ➢ Provide a transportation system that can accommodate higher truck weights within Aroostook County;
- ➢ Provide better facilities for all modes of transportation;
- ➢ Improve access management along existing highways;
- ➢ Mitigate conflicts between wildlife (particularly moose and deer) and the transportation infrastructure; and
- ➢ Reduce the perception of remoteness that contributes to the perception that there are "two Maines."

Corridors Considered

The Corridor Selection phase of the Aroostook County Transportation Study, subsequent to the scoping process and identification of the transportation needs, identified a reasonable range of corridors that could potentially satisfy the Purpose and Need of the transportation study. The corridor selection process involved the Study's Public Advisory Committee (PAC) and other stakeholders within the study area, and was reviewed in a series of public meetings held in October 2000 and June 2001. This iterative process is documented in three supporting documents (*Initial Corridor Screening Technical Memorandum, DEIS Corridor Screening Analysis, June 2001,* and *Corridor Screening Results: Economic Effects, August 2001)* and included the following steps:

- ➤ Identification of a wide range of potential corridors;
- ➤ Preliminary screening to identify a reasonable range of corridors likely to meet the Study's Purpose and Need;

- Evaluation of the potential transportation, economic, and environmental consequences of each corridor;
- An intermediate screening process to eliminate those corridors that could not reasonably be expected to meet the study Purpose and Need or had high levels of potential environmental impacts;
- A regional corridor analysis that evaluated corridor elements within the northern, central, and southern sections of the Study Area to determine if combinations of segments of these corridors had the potential to better meet the Study Purpose; and
- Identification of the most effective corridors for which a detailed analysis of the potential transportation, economic, and environmental consequences would be conducted and documented in this Draft Environmental Impact Statement.

This DEIS evaluates the No-Action Alternative and four transportation corridors within the Study Area. They are Corridors H modified (Hm) and K modified (Km), carried forward from the Intermediate Screening Analysis as complete stand-alone corridors, and Composite Corridors 1 and 2, carried forward from the regional corridor analysis. For comparison purposes, the No-Action Alternative is also included in the DEIS to provide a baseline from which to assess the potential impacts of the build options. This section defines what is meant by the term *No-Action* and describes the four corridors that are evaluated in this DEIS.

Because of the scope of the study and the size of the Study Area, this DEIS examines the transportation, social, and environmental impacts of the four transportation corridors, and not specific highway alignments having a specific footprint. These corridors consist of upgrades to existing highways, new transportation corridors, and combinations of the two types. As discussed in Chapter 1, (page 1-3) the purpose of the DEIS is to determine which corridor or corridors would best serve the transportation and economic needs of the Study Area, while minimizing the potential for adverse environmental and social impacts. For comparative purposes, upgrade corridors were assumed to be 46 meters (150 feet) wide, and new location highway corridors were assumed to be 92 meters (300 feet) wide. Later studies will evaluate highway alignment alternatives within the selected corridor, as well as design features such as highway cross section, the use of at-grade versus grade-separated intersections, and bridge designs, to select a preferred alternative within the chosen corridor.

No-Action Alternative

For purposes of this DEIS, No-Action is defined as continuing MDOT's ongoing construction program with no additional extraordinary projects. MDOT's *Six-Year Transportation Improvement Plan (Six-Year Plan) for 2002-2007* lists the projects that the Department expects to fund during that period. It includes both highway reconstruction and highway bridge maintenance projects. This program of

improvements will be carried out regardless of whether or not a separate construction project arises from this EIS process. For example, if MDOT were to decide to construct a new 4-lane highway following this study, other improvements already in the Six-Year Plan would still go forward. A project that arises out of this study will not preclude other programmed improvements unless, of course, the projects involved the same segment of highway, in which case the Six-Year Plan project would likely be subsumed by the project stemming from this study.

Corridor Hm – Smyrna Mills to Madawaska

Corridor Hm consists primarily of a new location highway between I-95 at Smyrna Mills and Route 1 at Madawaska (Figure S-2). It improves connections to and from the Study Area by improving access to I-95. The total length of Corridor Hm is 159 kilometers (99 miles). Specifically, Corridor Hm comprises the following:

- A segment of new location highway between Smyrna Mills and Route 1 north of Presque Isle;
- An upgrade of Route 1 from Presque Isle to north of Caribou;
- A segment of new location highway from Route 1 north of downtown Caribou to Route 1 east of Madawaska; and
- An upgrade of Route 1 from the new highway to Madawaska.

Corridor Km – Houlton to Madawaska

Corridor Km provides a new highway connection between I-95 at Houlton and Route 1 in Madawaska (Figure S-3). The total length of the corridor would be 152 kilometers (95 miles). Corridor Km would improve access to I-95 and would bypass bottlenecks in the town centers along Route 1. Specifically, Corridor Km comprises the following:

- A segment of new location highway between I-95 in Houlton and Route 1 north of Presque Isle;
- An upgrade of Route 1 beginning north of Presque Isle and extending north through Caribou;
- A segment of new location highway between Caribou and Route 1, east of downtown Madawaska; and
- An upgrade of Route 1 from the new highway to Madawaska.

Composite Corridor 1 – Houlton to Fort Kent and Van Buren

Composite Corridor 1 provides a combination of new and upgraded highway corridors between Houlton and Fort Kent and Van Buren (Figure S-4). The total length of Composite Corridor 1 would be 224 km (140 miles). Specifically, Composite Corridor 1 comprises the following:

- An upgrade of Route 1 beginning at I-95 in Houlton and extending north to Westfield;
- Short bypasses of the town centers in Monticello, Bridgewater and Mars Hill;
- A segment of new location highway leaving Route 1 in Westfield, extending north bypassing downtown Presque Isle to the east, and reconnecting with Route 1 north of the Aroostook River in Presque Isle;
- An upgrade of Route 1 beginning in Presque Isle and extending north through Caribou, ending at Route 1A in Van Buren;
- A segment of new location east-west highway connecting Route 161 and Route 1 in Caribou;
- An upgrade of Route 161 between Caribou and Fort Kent;
- A segment of combination new highway and upgrade of local secondary roads between Route 161 in Ouellette and Route 1 in Frenchville; and
- An upgrade of Route 1 between Frenchville and Madawaska.

Composite Corridor 2 – Smyrna Mills to Fort Kent and Van Buren

Composite Corridor 2 provides a combination of new and upgraded highway corridor between I-95 at Smyrna Mills in the south, connecting to Fort Kent and Van Buren in the north (Figure S-5). The total length of Composite Corridor 2 would be 227 km (142 miles). It is the same as Composite Corridor 1 north of Route 1 in Westfield. Between Houlton and Westfield, Composite Corridor 2 follows the Corridor Hm alignment. Specifically, Composite Corridor 2 comprises the following:

- A segment of new location highway extending from I-95 in Smyrna Mills to Route 1 in Westfield;
- A segment of new location highway leaving Route 1 in Westfield, extending north bypassing downtown Presque Isle to the east, and reconnecting with Route 1 north of the Aroostook River in Presque Isle;
- An upgrade of Route 1 beginning in Presque Isle and extending north through Caribou, ending at Route 1A in Van Buren;

- A segment of new location east-west highway connecting Route 161 and Route 1 in Caribou;
- An upgrade of Route 161 between Caribou and Fort Kent;
- A segment of combination new highway and upgrade of local secondary roads between Route 161 in Ouellette and Route 1 in Frenchville; and
- An upgrade of Route 1 between Frenchville and Madawaska.

Potential Major Impacts

This section compares the potential major impacts that may occur with each corridor, and considers transportation effects, economic effects, and impacts to land use, historic resources, public parks and recreation areas, floodplains, wetlands, wildlife habitat, air quality, and noise. These areas are those considered most important and that receive the greatest attention from the federal review agencies. This DEIS considers many other areas of impact as well, including minority populations, uncontrolled petroleum and hazardous wastes, water resources, aquatic habitats, vegetation, fisheries, and endangered and threatened species. Impacts in these areas, however, are not considered critical in the state or federal review process and are not likely to be controversial. The reader should refer to the appropriate subsection of Chapter 4 for additional discussion of impacts.

This DEIS evaluates four corridors and the No-Action Alternative, rather than specific highway alignments with precise locational information. The analysis of impacts uses macro-level data and was conservatively approached to provide a comparative assessment of potential corridor impacts. All corridors were analyzed using the same methodology and at the same level of detail. Potential direct impacts along new location highway corridors were identified, using geographical information system (GIS) methods, for a 92-meter (300-foot) wide corridor, while impacts along upgrade corridor segments were identified for a 46-meter (150-foot) wide corridor. Impacts are assessed as the number of potentially affected resources and / or the area of potentially affected resources within the footprint of each corridor.

Transportation Effects

The transportation effects of each corridor on the Study Area were assessed for their ability to provide travel time and distance savings; improve transportation efficiency; improve safety; and improve mobility.

Corridor Hm provides the greatest improvement in travel distance savings, and is predicted to decrease vehicle miles traveled within the Study Area by 41,600 miles. Composite Corridor 2 would provide comparable savings. Corridor Km would

increase vehicle miles traveled by 9,900 miles in comparison to the No-Action Alternative. Each of the corridors would provide a similar travel time savings, with a reduction of 3,600 to 3,700 vehicle-hours traveled in comparison to the No-Action Alternative. Each of the corridors would improve mobility and north-south access to activity centers within the Study Area. Corridor Hm would provide the greatest travel time savings between I-95 at Sherman and Madawaska (43 minutes), with Corridor Km and Composite Corridor 2 providing slightly lower travel time reductions between I-95 and Madawaska (30 and 35 minutes, respectively).

Each of these four corridors would improve functional conflicts in town centers by reducing traffic volumes. Corridor Km and Composite Corridor 1 would provide the greatest traffic reduction in Monticello, Bridgewater, and Mars Hill, with 50 to 94 percent reductions in traffic volumes. Corridors Hm and Composite Corridor 1 would have less of a "bypass effect," with predicted reductions of 23 to 26 percent. Corridor Hm, and Composite Corridors 1 and 2 would provide the greatest benefit to Presque Isle, by diverting approximately 52 percent of the through traffic, in contrast to the substantially lower benefit of Corridor Km (26 percent). Corridors Hm and Km would provide the most benefit to downtown Caribou, by diverting (respectively) 48 and 57 percent of through traffic.

Safety improvements are accomplished by shifting traffic away from High Crash Locations (HCLs), shifting traffic to roads with higher functional classifications that are constructed with more safety features; and by reconstructing existing HCL intersections. Corridor Hm would result in the greatest shift in traffic volume away from HCLs (29 locations), while Corridors Km, Composite 1 and Composite 2 would have similar, slightly lower improvements. The two Composite Corridors would result in the greatest number of existing HCLs improved (17 and 16, respectively), and would also have the highest traffic volume shifted to better (higher classification) roads (15 and 17 percent, respectively), while Corridors Hm and Km would shift only 10 and 11 percent.

Economic Effects

The findings of the economic analysis indicate that a comparison of the four Corridors shows a relatively narrow range of impacts on the economies of Aroostook County and the State of Maine, when measured against the 2030 No-Action Alternative. Total employment impacts vary by only 80 jobs between the lowest and highest-ranking alternatives, and the remaining economic variables cluster within similarly narrow ranges. When evaluated on a county or statewide basis using aggregate measures of population, employment, income or gross regional product (GRP), there is little evidence to strongly favor one corridor to the exclusion of others.

Although they may have similar impacts in the aggregate, the Corridors could have much different impacts on some sub-regions within Aroostook County. Corridors

Hm and Km provide greater overall transportation access and time savings benefits, and thus produce marginally higher overall economic impacts. However, these same corridors tend to concentrate those economic benefits in Presque Isle, Caribou and Madawaska, to the potential detriment of other parts of the Study Area. Composite Corridors 1 and 2 are marginally less effective in providing transportation benefits to the region, but tend to spread those smaller benefits more widely over the Study Area. One obvious consequence of attempting to spread benefits to the northern portion of the Study Area is the resulting higher construction costs associated with Composite Corridors 1 and 2, which also render them less cost effective.

Land Use and Community Effects

The analysis of impacts to land use and communities included determining the amount of land within each corridor footprint, particularly in the economically and socially important categories of forest land, cultivated land, and developed land. The number of buildings within each corridor, and the number and area of active farm fields within each of the corridors were also assessed.

Each of the corridors will require the conversion of developed and undeveloped land to a transportation use. There is little overall difference among the corridors in the total amount of land needed, which ranges from 1,175 hectares (2,902 acres) to 1,376 hectares (3406 acres). Corridors Hm and Km, which traverse generally undeveloped land, would have the least impact on developed and residential land, cultivated land, and buildings. Each of these corridors contains fewer than 200 buildings. Composite Corridors 1 and 2, which are primarily upgrades of existing highways, include greater areas of cultivated and developed land, and may affect up to 1,290 buildings. Corridor Hm would also affect the least amount of active farm fields, with 103 fields comprising 167 hectares (413 acres) within its footprint. Although Corridors Km, Composite 1 and Composite 2 would affect similar areas of active farm land (204 to 271 hectares, 503 to 670 acres), Corridor Km is anticipated to have a greater effect on farm productivity and operations since it would bisect fields rather than reduce the size of fields adjacent to existing highways.

Each of the corridors has the potential to improve community cohesion and continuity by diverting through traffic from town centers. The reduction in through traffic volumes may reduce noise, improve the ability of pedestrians to cross streets, and improve the connection between neighborhoods.

Cultural Resources

All of the corridors studied have the potential to impact cultural resources, which include historic properties, archaeological sites, Traditional Cultural Properties (TCPs), and public parks and recreation areas.

Potential impacts to known Section 106 and / or Section 4(f) properties are limited to those properties and sites listed or determined eligible for listing on the National Register of Historic Places. These include four known archaeological sites eligible for listing and one historic property, the Frenchville Railroad Station and watertower. Additional Section 106 and / or Section 4(f) sites may exist in the Study Area but have either not been identified or there is insufficient information to make a determination of eligibility.

Composite Corridors 1 and 2 are the only corridors that could potentially impact an above ground resource listed, or potentially listed, on the National Register of Historic Places for which a precise location is known, the Frenchville Railroad Station and watertower located along Route 1 in Frenchville.

All four corridors have the potential to impact a known prehistoric archaeological site because they may require disturbing the ground within a 1 km (0.6 mile) known site grid. Each corridor will also pass through or near known sites along Route 1 south of Presque Isle. Potential impacts to TCPs are greatest for Corridor Km, which cross 13, 1-km (0.6-square mile) grids containing TCPs. Composite Corridor 1 has the least potential to impact TCPs.

Impacts to public parks and recreation areas regulated under Section 4(f) range from 3 to 7 per corridor. The No-Action Alternative would not result in any impacts to Section 4(f) resources. Each corridor may affect at least one Section 4(f) or 6(f) resource. Corridor Km may have the greatest potential impact. This corridor crosses two Bureau of Public Lands trails, the Houlton to Phair Valley Trail and the Aroostook Valley Trail, in 7 locations. Composite Corridor 1 is the only corridor that has the potential to impact a Section 6(f) property, the Littleton Community Park. This impact may result from the upgrade of Route 1 immediately north of Littleton center.

Floodplains

Each of the corridors may require construction within the 100-year floodplain, potentially resulting in a loss of flood storage. Composite Corridors 1 and 2 would have the least impact, with 1 to 2 new crossings of the floodplain and construction within 6 to 8 hectares (14 to 19 acres) of floodplain. Corridor Km would likely have the greatest impact, with 11 new floodplain crossings and construction within up to 19 hectares (46 acres) of floodplain, potentially affecting flood storage and flood elevations.

Wetlands

Potential impacts to wetlands include direct impacts (the loss of wetland area, functions and values) and indirect impacts (changes in water quality, hydrology, or wildlife habitat values). Composite Corridor 1 would likely have the least impact to

wetlands, with 26.9 hectares (66.4 acres) of wetland within the corridor footprint. Although these include 193 individual wetlands, the wetlands affected are mostly adjacent to the existing highway and therefore no new indirect effects would occur, and there would be limited effect on functions and values. Corridors Hm, Km, and Composite 2 would have similar effects, with the potential loss of 49 to 67 hectares (120 to 166 acres). Of these, Corridor Km includes the greatest amount of wetlands. Since each of these 3 corridors would primarily affect wetlands along new location highway segments, they would result in new indirect impacts, including fragmentation, to undisturbed wetlands.

Wildlife Habitats

The analysis of impacts to wildlife and fisheries included quantifying the amount of wildlife habitat potentially lost due to construction, the locations of work within fisheries habitats, the potential indirect effects on wildlife communities due to fragmentation and the creation of highway barriers, and the potential impacts to state-regulated wildlife resources.

Composite Corridor 1 would result in the least impact to wildlife habitat, since it includes the lowest amount of forested area (376 hectares, 930 acres), and would overall result in the least loss of natural vegetation capable of providing wildlife habitat. All of the loss of habitat associated with Composite Corridor 1 would be along existing highways (with the exception of the local bypasses and the new location highway segment south of Frenchville), areas which currently provide low-value habitat due to the proximity of the road. Corridors Hm, Km, and Composite 2 would have similar magnitude and types of impacts, with the potential loss of forest habitat ranging from 779 to 934 hectares (1,923 to 2,308 acres), mainly in undisturbed natural areas where impacts could fragment habitats and populations of wildlife.

State-regulated wildlife resources include deer wintering yards and inland waterfowl and wading bird habitats. Corridor Km would not affect any known deer wintering yards, but includes portions of a waterfowl habitat associated with Russell Brook. Composite Corridor 1 includes portions of 2 deer wintering yards along Route 161 (already affected by the proximity of the highway) and one inland waterfowl and wading bird habitat area. Corridor Hm and Composite Corridor 2 have high potential impacts, since each of these includes 2.7 hectares (6.6 acres) of an inland waterfowl and wading bird habitat area along Clark Brook in Westfield within a new location highway corridor segment.

Atmospheric Resources

This DEIS provides a preliminary assessment of the potential air quality and noise impacts of each of the corridors.

For air quality, a localized (microscale) analysis demonstrated that carbon monoxide (CO) concentrations at the most congested intersection in the Study Area were well below the National Ambient Air Quality Standards (NAAQS) for CO. Based upon this worst-case analysis, none of the corridors are expected to result in adverse local air quality impacts. The results of the microscale analysis demonstrate that, under all future conditions, predicted CO concentrations can be expected to be substantially below the NAAQS.

The noise analysis conducted for new location highway corridors evaluated potential noise impacts by calculating the distance from the edge of a new highway to where the future sound levels are expected to be substantially higher than the existing sound levels. An increase of 15 dBA (MDOT's noise impact criteria for new highway corridors) would potentially occur at distances ranging from 38 to 130 meters (125 to 425 feet) from a new location highway, generally between 60 and 92 meters (200 and 300 feet). Receptors (homes, businesses, churches, public buildings) located within 92 meters (300 feet) of new location sections of each corridor would be likely to have a noise impact.

The noise analysis also indicates that noise impacts on upgrade segments of the corridors would likely range from no impact to an increase of 5 dBA. Because a change of 3 dBA is just barely perceivable to the human ear, these increases in sound levels are not expected to be noticeable at the receptor locations along the existing highways, and would not result in noise impacts.

Potential Mitigation Measures

Following the selection of a Preferred Corridor, and completion of NEPA compliance which may include a FEIS, a supplemental EIS, Environmental Assessment, or Categorical Preferred Corridor Exclusion, and if and when funding becomes available, MDOT will initiate design of the Preferred Corridor. During these later design stages, MDOT will develop and assess alignment alternatives within the Preferred Corridor. Throughout the design process, MDOT will attempt to avoid impacts to resources wherever feasible, to minimize unavoidable impacts, and to mitigate for such impacts as cannot be avoided.

This section summarizes the Study Commitments, particularly as related to mitigation measures that will be investigated during subsequent phases of the Study. Detailed commitments will be provided in the FEIS or supplemental NEPA documents. The following sections summarize potential mitigation measures where avoidance is not feasible, and which may be employed after potential impacts have been minimized.

Land Use and Farmland

Following selection of a Preferred Corridor, and if and when funding becomes available, MDOT will undertake preliminary and final design of the Proposed Action. The design will look at avoidance and minimization of losses of cultivated and developed land, and will develop design alternatives to avoid impacts to cemeteries. When adjacent properties must be impacted or additional right-of-way must be acquired to accommodate highway construction, impacts to property would be minimized to the greatest extent practicable. Landowners will be compensated at fair market value for any property and/or structures and property owners will be assisted with relocation costs for homes and businesses that are displaced.

Specific mitigation measures will be identified in later stages of the study. Potential mitigation for indirect impacts of highways on active farms may include measures that mitigate for loss of access or reduce highway-related water pollution. Construction of new alignment highway corridors and upgrades may be designed to provide access to farm fields over or under the highway as part of the mitigation. Improvements to highway stormwater runoff quality may reduce indirect impacts to agricultural production. More specific studies will be completed at a later phase of the study, to assess impacts to farms and farm operations and identify specific mitigation measures that could be implemented.

Surface and Groundwater Quality

Potential mitigation measures may include minimizing impervious surface within recharge areas and avoiding surface water intakes and wells. Short-term mitigation may include plans to control erosion and sedimentation during construction. Long-term mitigation will address ways to improve the management and quality of highway runoff.

Erosion and sedimentation control plans are required for work that will include ground disturbance. Plans must identify potential source areas and describe what measures will be employed as erosion control, sedimentation control, temporary stormwater management measures, dust control and winter stabilization measures. In sensitive areas multiple Best Management Practices (BMPs) must be used and must include source erosion control in addition to sedimentation control to maximize protection. Erosion control plans must address in-water work at any stream crossing location.

Construction of new location highway may include measures to collect and store stormwater to minimize changes to the peak runoff rate. Stormwater collection systems will be designed to reduce the potential for erosion and provide treatment by including BMPs such as vegetated swales and sedimentation basins. New location highway construction may also be designed to reduce impacts by maintaining existing hydrologic connections with adequately sized culverts or bridges.

Aquatic Habitats

Mitigation of impact to streams would include avoidance where possible however, since these linear features cross existing highways and new location corridors, many streams and rivers can not be avoided. Potential mitigation of river and stream impacts would focus on minimizing the impacts of new or widened crossings. These measures may include:

- Crossing streams or rivers at narrow points;
- Using bridges rather than culverts to maintain channel substrate, flow, and bank characteristics where possible;
- Using retaining walls rather than fill slopes to minimize impact areas.

Additional mitigation measures also may include bank and channel restoration of crossing areas to provide naturally vegetated banks and increase channel habitat. These measures will also provide stabilization to reduce erosion and sedimentation.

The design and construction of new or upgraded highways in the vicinity of stream crossings may include more stringent measures to reduce indirect water quality impacts from highway runoff. Highway design may include measures to reduce alteration to stream hydrology and BMPs to treat stormwater runoff water quality and control flow velocities. Construction may include measures described in the MDOT BMP Manual for sensitive waterbodies, which includes the use of temporary and permanent control measures to reduce erosion and sedimentation. Greater levels of protection, and consequently more stringent mitigation measures to reduce direct and indirect impacts on aquatic habitats, water quality, and water temperatures may be undertaken for corridors that affect sensitive or salmon rivers.

Floodplains

Mitigation measures will be investigated for the alignment alternatives once the Preferred Corridor is selected. Hydraulic studies will also be completed, and bridge and culvert sizes and elevations will be designed to minimize flooding impacts. Filling in floodplains will be reduced to the extent practicable by incorporating special design features such as steep side slopes, retaining walls or bridges. Compensatory flood storage may be proposed where floodplain impacts can not be avoided.

Wetlands

The 1990 Memorandum of Agreement (MOA) between the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (ACOE) prescribes a sequential approach to wetland mitigation. This MOA requires that efforts be made to avoid and minimize wetland impacts before undertaking compensatory mitigation efforts such as restoration, creation, or enhancement.

Wetland impacts have been reduced by locating corridors to avoid major wetland systems to the greatest extent practicable. After selection of a Preferred Corridor, MDOT/FHWA will develop alignment alternatives to avoid wetland impacts, and will explore design options to minimize impacts. Design options may include modifications to the layout and the incorporation of special design features such as steep side slopes, retaining walls or bridges. Finally, wetland compensation may be proposed where wetland impacts can not be avoided. Possible strategies include wetland restoration, enhancement, and replacement. However, locating sites suitable for restoration may prove to be difficult, since there are few degraded or altered wetlands in the relatively undeveloped Study Area. Purchasing and preserving existing wetlands and surrounding habitats with high functional values may also be investigated as a potential mitigation measure.

Wildlife and Fisheries

Mitigation measures for impacts to wildlife and fisheries may include a variety of structural measures intended to prevent wildlife mortality and mitigate for fragmentation effects of a new highway facility, as well as measures to protect water quality and habitat quality.

Constructing wildlife crossings may mitigate impacts to wildlife and fisheries from highways. Wildlife crossing structures may be incorporated into the design of new highways as well as retrofit along upgraded road segments. Three types of wildlife crossing structures may potentially be considered as mitigation for impacts to wildlife habitat and may have the potential to reduce conflicts between motorists and moose or deer. Seasonal timing of construction to avoid critical breeding or migratory periods for wildlife can also minimize indirect effects on wildlife resources.

Impacts to fisheries resources can be mitigated by providing unobstructed passageways between suitable aquatic habitats and enhancing existing habitat. Oversized stream culverts or fish passage structures can be designed along upgrades and new alignments to improve passage for fish. Enhancing stream habitat is another potential mitigation for impacts to fisheries, and can be used along upgrades and new alignments. As with wildlife resources, indirect impacts to fisheries can also be minimized by seasonal timing of construction to avoid critical spawning periods. Construction impacts to aquatic resources can be minimized by the appropriate use of BMPs.

Air Quality and Noise

Air quality may be affected during construction by fugitive dust emissions, which are proportional to the amount of earth moved and the length of travel on unpaved roads. Any impacts from fugitive dust particles would be of short duration and localized. Mitigating fugitive dust emissions involves curbing or eliminating its generation. Mitigation measures that may be used in highway construction include phasing, wetting and stabilization to suppress dust generation, cleaning paved highways, and scheduling construction to minimize the amount and duration of exposed earth.

Following selection of a Preferred Corridor, and if and when funding becomes available, MDOT will initiate preliminary and final design studies. During these phases of the study, specific noise impacts will be calculated and alternatives to avoid or minimize noise impacts will be investigated. Potential noise mitigation measures may include noise walls or barriers to reduce adverse noise impacts.

Applicable Regulations, Required Coordination and Permits

Federal and state statutes and regulations require interagency and public coordination during the preparation and review of an EIS. These programs also require that certain permits and approvals be obtained prior to construction of transportation improvements.

Federal statutes and regulations that are applicable to this study include:

- National Environmental Policy Act of 1969 (NEPA) as amended, and regulations found at 40 CFR 1500-1508 and the FHWA NEPA regulations at 23 CFR 771.119-771.121
- Sections 401 and 404 of the Clean Water Act, as regulated by the U.S. Army Corps of Engineers through 33 U.S.C. 1251-1376
- Section 4(f) of the Department of Transportation Act of 1966, 49 U.S.C. 303 and 23 U.S.C. 138
- Section 6(f) of the Land and Water Conservation Fund Act of 1965, 16 U.S.C. 460
- Section 106 of the National Historic Preservation Act of 1966
- Endangered Species Act, as regulated at 50 CFR 17
- Executive Order 11990, Protection of Wetlands, May 24, 1977
- Executive Order 11988, Protection of Floodplains, May 24, 1977

- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, February 11, 1994
- U.S. Environmental Protection Agency, National Pollutant Discharge Elimination System
- Section 10 of the Rivers and Harbors Act of 1899, 33 U.S.C. 401
- Magnuson-Stevens Fishery Conservation and Management Act, 50 CFR Part 600
- Uniform Relocation Assistance and Real Policy Act of 1970, 42 U.S.C. 61.

State statutes and regulations that are applicable to this study include:

- Maine Department of Environmental Protection, Natural Resources Protection Act, 38 M.R.S.A. § 480-A et seq.
- Maine Department of Environmental Protection, Solid Waste Management Law, 38 M.R.S.A. § 1301
- Maine Department of Environmental Protection / Maine Department of Transportation, Stormwater Memorandum of Understanding
- Maine Endangered Species Act, 12 M.R.S.A. § 7751 et seq.
- Maine Land Use Regulatory Commission, 12 M.R.S.A. § 681 et seq.