

## Appendix G



USFWS

*Archaeology Survey along Route 78*

# Vermont Agency of Transportation Study of Route 78



The Vermont Agency of Transportation (VTrans) initiated discussions and planning to upgrade State Route 78 between Swanton Village and the bridge from West Swanton to Alburg in 1997. A new Refuge Manager became actively involved in the planning effort in 1999 and worked with a multi-agency working group addressing wetland impacts, wildlife impacts, impacts to other habitats, impacts to cultural resources, potential for improved recreational opportunities, and so forth. The following is an excerpt from the Executive Summary of the Vermont Route 78 Collaborative Team Process:

## **Overview of the Process**

A scoping report was prepared in 1997 at the direction of the VTrans by the engineering firm Vanasse Hangen, Brustlin, Inc. to address transportation and safety needs along a 10 km segment of VT 78 in Swanton, between the Missisquoi Bay Bridge and the Swanton Village limits. Discussions about the potential project took place among a wide range of stakeholders in and after 1997. Divergent public safety and natural resource interests, however, combined with constraints unique to the project location such as the presence of historic Native American materials and artifacts, made it difficult to commit to design decisions that were likely to evolve through the permitting of the project.

In January of 2001 a collaborative process was implemented to problem-solve issues and identify design choices that would best integrate environmental, public safety, economic, and cultural preservation interests. A series of meetings was held that initially involved a very broad group of stakeholders, and then evolved to a smaller working group. Concerns, ideas and technical information were shared and discussed, and a number of innovative design choices were developed that enabled the group to come to consensus on conceptual plans for the project.

## **Participants**

Participants in the working group included representatives of the U.S. Army Corps of Engineers, VT Agency of Transportation, VT Agency of Natural Resources, Federal Highway Administration, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service New England Field Office, U.S. Fish and Wildlife Service Missisquoi National Wildlife Refuge, the VT Northwest Regional Planning Commission, the Town of Swanton, and Vanasse, Hangen, Brustlin, Inc.

## **Design Agreements**

Agreements in six areas are detailed in the May 30, 2002 Summary Record and include:

1. Roadway width
2. Roadway alignment
3. Roadway profile
4. Bridge Span for Ecological Connectivity, Wildlife Passage and Reduction of Wetland Impacts
5. Mitigation
6. Construction Considerations

## **Endorsements**

Letters endorsing the findings of the working group from agencies and groups represented in the collaborative process accompany this document.

## **Next Steps**

The Summary Record completes the collaborative process, and it marks the beginning of the next phase of the project's development. There is still much work to be done. In the coming months the conceptual plans will be completed, and the VT Agency of Transportation will begin filing permit applications with the resource agencies.

This executive summary was prepared in May 2002. The anticipated next steps have been slow in coming and little additional work has been completed on the project. It is anticipated that as funding for the project is identified, the planning effort and permit application will resume.

Further elaboration of the six design agreements alluded to above in the May 30, 2002 Summary Record follows:

Summary Record  
January 2001 – March 2002  
VT 78 Collaborative Process

## **Overview**

### Background for the Project

The Missisquoi delta wetland complex is among the largest wetland systems in the state of Vermont, and it may be the most diverse. As such, it has tremendous ecological value. Some of the more significant biological functions of the area include that it provides outstanding nesting, breeding, and migratory staging habitat for a host of migratory waterfowl species; seasonal habitat for deer; and habitat for amphibians and reptiles. It is the site of the state's largest great blue heron rookery. It also supports a number of rare, threatened, and endangered species of plants and animals. The area supports many other significant wetland-dependent ecological functions. It is also the site of one of Vermont's two national wildlife refuges, as well as an archaeologically sensitive area, the site of historic Native American settlements.

VT Route 78 runs through the Missisquoi delta, and provides a vital link on the National Highway System between Canada, New York State and Northern New England, connecting two interstate highways, I-87 in New York and I-89 in Vermont. Locally it provides a connection between the villages of Swanton and Alburg. The roadway at present is characterized by a number of documented deficiencies including clear zone/roadside hazards, pavement width relative to the roadway's functional classification and traffic (particularly truck) volume, poor pavement condition and lack of shoulders. There have been a number of severe accidents in recent years involving multiple fatalities within the project limits. Improvements to VT 78 have been designated the region's number one transportation priority, among current unmet needs.

The effects of a major state highway running through one of the state's most biologically rich wetlands systems have been profound. Most notably, these include the barrier effect that the road creates to the movement and migration of the animals, and the disruption of continuous ecological systems. They have also included the disturbance and displacement of some sensitive wetland-dependent species, such as wading birds.

At the request of resource agencies, a study was conducted in 1997 on the feasibility of improving alternative routes so that improvements to VT 78 would not be needed. Alternative routes that were studied included segments in the Province of Quebec that would involve an international border crossing, a domestic route, and a route that involved a ferry crossing. Lake Champlain presents a formidable north-south barrier, and the results of alternative route/traffic diversion studies were conclusive in determining that an effective and feasible diversion alternative does not exist that would substantially relieve traffic on VT 78.

In a broad meeting of stakeholders including state and federal resource and transportation agencies and local officials in February of 2001, and attended by the Secretaries of the Vermont Agency of Transportation and the Vermont Agency of Natural Resources, the need for the project was unequivocally affirmed. Although divergent interests presented challenges requiring innovative and integrative solutions, it was agreed that the potential existed to improve on a bad situation. Design choices needed to improve public safety while simultaneously enhancing ecosystem functions and conditions for wildlife, and preserving cultural heritage by executing the project using careful archaeological research and techniques to avoid and minimize the disturbance of artifacts and materials.

#### Scoping and Early Design Process 1997-2001

The engineering firm Vanasse Hangen Brustlin, Inc. completed the Final Scoping Report for the VT 78 project in December 1997. Discussions had taken place throughout 1997 among stakeholders including regional and transportation planners, permitting agencies, town officials, and members of the public. Extensive wetland and threatened and endangered species studies, as well as preliminary mitigation site identification by the Johnson Company conducted over the summer of 1997 informed these discussions. The project had not been able to progress to a degree of consensus, however, that would allow Agency of Transportation and the engineers to proceed in designing the project with the confidence that necessary environmental permits would be issued.

In January of 2001 a more structured, collaborative process was envisioned, and an outside facilitator, Stephanie Lahar, was engaged in order to give the project the best chance of moving forward in a timely fashion. The VT Agencies of Transportation and Natural Resources expressed support and interest in having this project model collaboration between the two agencies, as well as with other stakeholders.

#### Purpose of the 2001 Collaborative Process

The primary purpose of the process was to engage in a structured, collaborative dialogue with the intent of developing a durable consensus about conceptual plans for the project. This meant that design decisions would address integrated social, economic and environmental interests; and also that they would be informed by the most up-to-date permit requirements. A secondary purpose of the process was to build working relationships among stakeholders to improve future transportation planning.

### Participants

In several meetings of a broad group of stakeholders held February-April 2001, over 25 representatives of state and federal agencies, local and regional planning/governance entities, and public interest groups attended. Work then shifted largely to the core planning group, whose membership is described below. Results of this subgroup were to be brought back to the broad stakeholder group in May 2002. (See reference documents for a comprehensive list of participants throughout the collaborative process)

### **Evolution of the Core Planning Group**

#### Formation and Function of the Planning Group

During the initial meetings of the whole group in February, March and April 2001, a core group of state and federal agency representatives with substantial history and expertise on this and similar projects expressed an interest in sorting, prioritizing, analyzing and providing recommendations to the larger group. Two other smaller subcommittees on specific interest areas – Public Access/Public Lands and Stormwater Treatment, were also formed. The planning group expanded between the time it was established in March 2001 and Spring 2002 to include additional stakeholders. As it expanded, it became the entity through which the specific design issues of the project were discussed and resolved, and a set of agreements about the conceptual design developed. Meetings of the planning group were open and sometimes included participants who brought additional expertise and/or interests.

#### Participants

Agencies represented in the original planning group were the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the Vermont Agency of Transportation, the Vermont Agency of Natural Resources, and VHB, Inc., project designers and engineers. The original group created an inventory of design issues and a beginning sequence/pathway to consider them. As the group took on the task of problem-solving design issues and determining solutions that would meet integrated interests, core membership expanded to include the Federal Highway Administration, the U.S. Fish and Wildlife Service, the Missisquoi National Wildlife Refuge, the Vermont Northwest Regional Planning Commission, and the Town of Swanton, Vermont.

### **Design Specifications Agreed to by the Planning Group**

The agreements that follow represent the consensus of the planning group on a number of design components that involved reconciling challenges of diverse environmental, public safety, and economic interests. The components outlined below are interdependent in meeting the planning group's conclusions about the best possible integration of interests. These include improving road safety and working within constraints presented by archaeological sensitivity, railway clearances, etc.; while also restoring and improving environmental functions and quality overall. These components do not represent an exhaustive list of design choices, but cover most of the significant issues in the project identified by the planning group during its work and in project discussions prior to the collaborative process.

### Roadway Width

- The typical width will be 12' lanes, 8' shoulders of which 6' will be paved, 2' aggregate material.
- In guardrail areas, there will be 8' paved shoulders. This is a reduction to the AASHTO standard of a 10' paved shoulder in guardrail areas, and will require application for a design exception.
- Within resource areas, the typical width as specified above will be set on a reduced impact area equal to a traditionally engineered 4' shoulder (based on a 1:4 slope without guardrail). This will be accomplished by steepening slopes and using guardrail. [Exception: 1:4 slopes without guardrail may be used across the wet meadow east of Louis' Landing]
- Slopes will be steepened to a greater degree in areas of high sensitivity such as Carman's Marsh and Charcoal Creek, and will include the use of retaining walls at Charcoal Creek.
- The lane and shoulder widths will be reduced to 11' and 6', respectively, closer to the village since the speed limit is lower, as per the State Design Standards.

### Roadway Alignment

- The roadway is mostly on the existing alignment with the exception of a 1000' stretch, along which it was desirable to improve the buffer from the river.
- After study of nine different roadway alignment options for this stretch of road, the planning group determined that Alternative #8, presented by VHB and reviewed by the group on 12.06.01 is the best option.
- The roadway alignment in some areas is influenced by the close proximity of the railroad. In order to meet the minimum clear zone requirements for both the railroad and the roadway the alignment will shift away from the railroad in some areas. This will result in greater wetland fills on the northerly side of the road opposite the railroad.
- Construction phasing and traffic control will also influence the final roadway alignment in some areas. This is a result of building a portion of the new roadway off to one side while traffic uses a portion of the existing roadway.

### Roadway Profile

- The roadway profile will be raised in some areas to avoid excavating native soils in highly archaeological sensitive areas. Data from phase 1 and 2 archaeological surveys has provided a basic understanding of the locations of areas of greater sensitivity. The existing roadway occupies a sensitive area along the river and near the wildlife refuge headquarters, and is set on base layers that were determined to be quite substandard in borings that VHB obtained in 2001.

### Bridge Span for Ecological Connectivity, Wildlife Passage and Reduction of Wetland Impacts

- After consideration of a range of bridge span options, the group determined that a 500' graduated bridge that ramps up from an end height of approximately 4' to a true bridge structure of a clear height of 10' in the center section will best minimize environmental impacts.
- Bridge construction is conceptualized with 100' pile supported spans and mechanically stabilized (MSE) retaining walls along the approaches.

- The existing roadway will be removed once traffic is routed across the new bridge in order to restore the ecological connections that were lost when the road was first built.
- Fencing will be required along the roadway to direct wildlife crossings to the intended locations.
- Habitat beneath the bridge will be established to ensure maximum use by wildlife.
- In the event that AOT pursues special congressional funding for this feature of the project, U.S. Fish and Wildlife and ANR will partner in supporting this request.

#### Mitigation

- Most, if not all compensatory mitigation requirements can be met by the bridge and perforations of the roadway.
- Mitigation measures will include reducing the width of the roadway in sections, reducing side slope impacts, and moving the roadway away from the river.
- Identified archaeological impacts will be mitigated in accordance with state and federal regulations.
- A broad roadway permeability plan will also address mitigation of environmental impacts by improving fish and wildlife passage, hydrology and ecological connectivity.
- Monitoring environmental functions and impacts will be an important component of evaluating the innovative design choices of this project and ensuring that unforeseen problems are addressed.
- AOT will be responsible for monitoring the road corridor for the effectiveness of ecological restoration measures and wildlife passages.

#### Construction Considerations

- To minimize the footprint of temporary construction impacts, one lane alternating traffic will be used in critical areas.
- The construction season will be restricted to minimize impacts on wildlife, particularly nesting black terns, which are a state threatened species.

### **Natural Resource Impacts of the Project**

The project directly impacts 11 acres of wetlands, all of which can be assumed to serve water quality, wildlife habitat, recreation and other functions. Compensation for impacts, as well as potential enhancement of wetlands functions, are addressed throughout the design parameters as detailed above.

In terms of agricultural soils, it is the opinion of the VT Dept. of Agriculture that there will be no significant impact to the agriculture potential of this particular tract, nor will agriculture in the surrounding area be impacted significantly. Calculations for the U.S. Dept. of Agriculture's formula for determining the effect on prime agricultural soils also place the project as well below the threshold of significant impact.

### **Rationale for Design Choices**

Participants in the collaborative process recognized the unique value that the Missisquoi delta wetlands system has for the state of Vermont, in environmental resources, ecological functions, and

cultural heritage. There was an effort throughout the process to apply both new scientific insights and systems thinking to arrive at design solutions that could yield an overall improvement in ecological functions as well as road safety. This was at times challenging, as traditional compensation formulas tend to weigh impacts and mitigation function by function, rather than as a whole, integrated picture.

Thus, the design solution of the large bridge span serves a purpose of ecological connectivity, and was not determined solely by needs to promote wildlife movement and reduce animal mortality. The engineering constraints of the bridge force the roadway off alignment to some extent at the expense of some wetlands, yet there is likely to be an overall gain in wetlands functions.

In some cases the planning group prioritized interests to arrive at the best conceivable design solutions. For example, at a broader stakeholder's request, the planning group collected some information on parkway designs used in other locations with the intent of preserving rural character and calming traffic that included, for example, vegetated median strips. In weighing potential values of these types of designs against increased environmental impacts, the planning group chose to exclude from consideration designs that required a larger roadway footprint.

### **Pending Design Specifications**

As of the date of this summary, ANR, in coordination with the Refuge and with AOT, is completing a written road permeability proposal. This proposal outlines specifications for road perforations, e.g. locations and sizes of culverts, etc. [The basic components of this proposal were reviewed (approved?) by the planning group in May 2002.]

### **Other Design Issues to Be Addressed Collaboratively**

The work of this collaborative process was to identify and develop design recommendations on the most substantial controversial elements of this project, in order to proceed into the permitting phases of the project with reasonable confidence. There are still a number of elements of the project that need to be elaborated on a more technical, detailed level. Through the planning group's work, at least two design components were noted that can be elaborated simultaneously with the permitting phase, but that require collaborative work to reconcile some diversity of interests. These include:

- The size, location, and function of a proposed recreation path within the buffer between the off-alignment road segment and the river needs to be defined. Interests needing integration on this issue include public access, and the restoration of riparian ecology and wildlife habitat. Resource agencies including ANR, the EPA, and the U.S. Fish and Wildlife Service, as well as public entities such as the Regional Planning Commission, will need to be involved in determining the specifications of a recreation path, as well as ongoing responsibility for managing the area.
- A planting plan needs to be developed to create additional forested habitat for wildlife, particularly to compensate for the loss of amphibian habitat along the road segment that is being taken off alignment to accommodate a buffer between the road and the river. Habitat creation/restoration need to be integrated with the archaeological sensitivity of the area. A low-impact planting plan that minimizes digging can likely accommodate these interests. The AOT's Transportation Archaeologist and resource agency representatives will need to collaborate on the development of a planting plan.

### **Other Recommendations of the Planning Group and Other Subcommittees**

- Because of the uniqueness of the area and elements of the project design, monitoring this project post-construction would likely be an attractive academic research project.
- Specific suggestions for designing and maintaining a footpath, and limiting vehicle access to sensitive areas are contained in meeting notes of the Public Access subcommittee.

### **Permits That Will or May Be Required**

- Ten federal permits or waivers, including the National Environmental Policy Act of 1969 (NEPA) and Section 404 of the Clean Water Act.
- Seven state permits, including Act 250, compliance with the Vermont Wetlands Rules, and the Endangered Species Act of 1981.

These are specified in the list of federal and state permits required, and state policies and procedures that influence the project, one of the reference documents listed below.

### **Reference Documents**

- Meeting notes
- Alignment Option Diagrams
- Conceptual Project Costs Computations by VHB 1.14.02
- List of federal and state permits required and federal and state policies and procedures that influence the project
- Final Scoping Report by Vanasse Hangen Brustlin, Inc., December 1997
- Johnson Company Reports
  - ◆ “Wetland Delineation, Assessment and Mitigation Site Selection” December 1998
  - ◆ Inventory and Mitigation Recommendations for Rare, Threatened, or Endangered Species and Significant Habitat” December 1998

### **Endorsement Letters**

- US COE
- EPA
- USFWS
- FHWA
- ANR (DEC and F& W)
- AOT
- Town of Swanton
- Northwest Regional Planning Commission
- Missisquoi Refuge