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1.0 INTRODUCTION

This report is submitted to initiate the Environmental Assessment process for the Department of Transportation and Public Work's proposed Beaver Bank Bypass project. The project is to construct an arterial roadway from Highway 101 to the Beaver Bank Road, as indicated on Figure 1 and described in more detail in Section 3.1. The roadway is considered to be a four lane divided arterial with controlled access and is intended to alleviate current and projected congestion on the local highway network. It is approximately 10.4 km in length.

A functional analysis, an environmental screening and a public consultation have been conducted as part of the preliminary planning for the proposed roadway. Some soils investigation has also been carried out for the purpose of identifying appropriate back slopes. Results of these initial investigations are summarized in the appendices of this registration document. The proponent recognizes that this information is preliminary and in several instances will need to be investigated in much more detail as part of the Environmental Assessment.

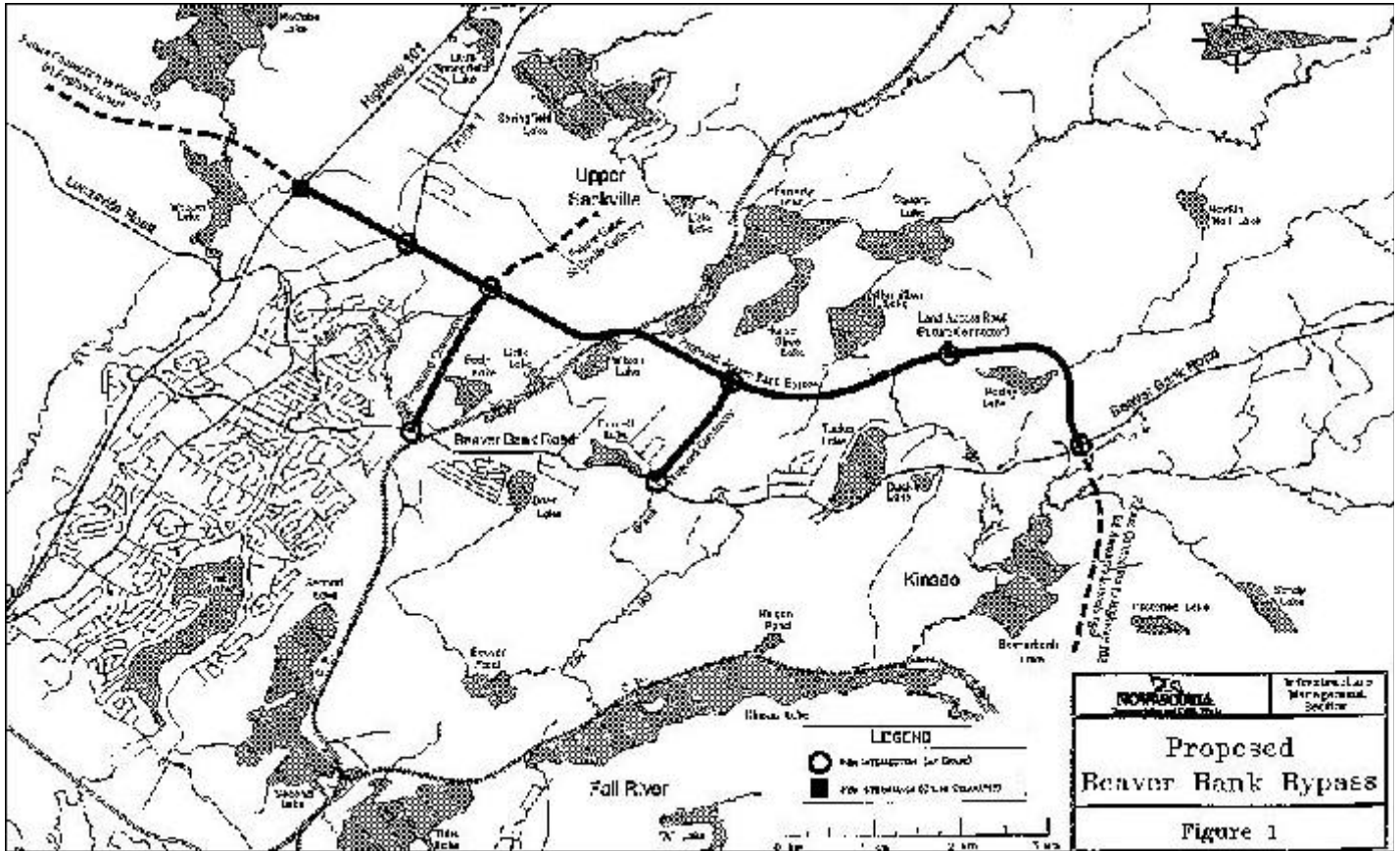
The project is expected to be funded entirely by the provincial and municipal governments without federal assistance.

2.0 PROPONENT DESCRIPTION

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Figure 1 - Proposed Beaver Bank Bypass



3.0 PROJECT DESCRIPTION

3.1 Location

The proposed Beaver Bank Bypass is located in Upper Sackville and Beaver Bank in the Halifax Regional Municipality. The Bypass roughly parallels the existing Beaver Bank Road along the west side beginning at Highway 101 approximately one kilometre west of the Lucasville Road overpass. The proposed alignment intersects Highway No. 1 east of Wilson Lake Drive and extends northward between Fenerty and Wilson Lakes and between Hamilton and Tucker Lakes. It passes around Rasley Lake to the west and north terminating on the Beaver Bank Road south of Birch Road as illustrated in Figure 1. Two connectors, one south of Feely Lake and another north of the Greenforest subdivision, join the proposed Beaver Bank Bypass to the Beaver Bank Road and form part of the proposal.

3.2 Rationale

New development in the Beaver Bank and Middle Sackville areas is increasing demands on the existing highway network, including the Beaver Bank Road and Trunk 1. The Beaver Bank Road already operates near or above design capacity during peak travel times, and further traffic increases will soon result in unacceptable congestion levels and compromise the safe operation of the road.

Previous traffic studies, including the Sackville Transportation Study (1996) and the Regional GoPlan Study (1996), identified the need for highway network improvements to address future deficiencies on the Beaver Bank Road. These studies recommended construction of a new parallel highway to reduce traffic volumes on the existing road. Widening of the Beaver Bank Road was not recommended because of the significant property damage that would occur given the presence of extensive roadside development.

The Department of Transportation and Public Works concurred with these recommendations and identified an arterial bypass road, the Beaver Bank Bypass, located and designed to alleviate traffic on the Beaver Bank Road and a section of Trunk 1. Although construction is not anticipated within the next five years, the rapid pace of development in this area requires the immediate preservation of land.

3.3 Alternatives

Alternatives to the proposal were considered and included: doing nothing, upgrading the existing Beaver Bank Road; creating a bypass east of the existing Beaver Bank Road; creating a bypass west of the Beaver Bank Road and west of Springfield, Fenerty and Square Lakes. None of the alternatives were found to be feasible as explained below.

Do Nothing

There has been a demonstrated need for a solution to the anticipated future traffic volumes on the Beaver Bank Road and in fact the many residents who live along and travel the Beaver Bank Road perceive there to be an immediate need for traffic improvements. To fail to provide for the continually increasing traffic volumes would be both imprudent and unpopular.

Upgrade Beaver Bank Road

Upgrading Beaver Bank Road to the level necessary to accommodate expected traffic volumes would entail significant property damage. This solution would not provide the additional access point to Highway 101 which would serve to alleviate traffic on sections of Trunk 1 and the Beaver Bank Connector.

Bypass East of Beaver Bank Road

Existing development prevents a feasible alignment to the east of the existing Beaver Bank Road.

Bypass West of Beaver Bank Road and Springfield, Fenerty and Square Lakes

A bypass could likely be constructed in this area. However, it would be too far from the Beaver Bank Road and contributing residential areas to alleviate the traffic problems. If built it would be greatly underutilized and the high traffic volumes on the Beaver Bank Road would remain.

3.4 Preliminary Design

The functional analysis considered the roadway to be a four lane divided arterial with controlled access and a posted speed of 80 km/h. The typical roadway cross-sections for the Beaver Bank Bypass arterial and the connectors are indicated in Figures 2 and 3 respectively. Access would be restricted to an interchange with Highway 101 and intersections at limited locations (as indicated in Figure 1) in accordance with a minimum desirable spacing of 2 km. The connecting roads would also be controlled access. The estimated cost of constructing the Beaver Bank Bypass, including the connecting roads, intersections, structures and the Highway 101 interchange, is \$20M.

The proposed horizontal alignment indicated in Figure 1 was selected given the constraints of: existing development; environmental screening information; feedback from the Public Consultation Open House; topography; and road design criteria. The proposed interchange location with Highway 101 was governed by existing development, desirable spacing with existing Exit 2 Interchange and potential for future expansion to the south between Webber and McCabe Lakes.

A 30 metre buffer zone between existing residences and the edge of road right-of-way has been allowed for at Hartland Village, Wilson Lake Estates, Greenforest Subdivision, Birch Road and wherever else it is feasible.

FIGURE 2 - Typical Cross Section

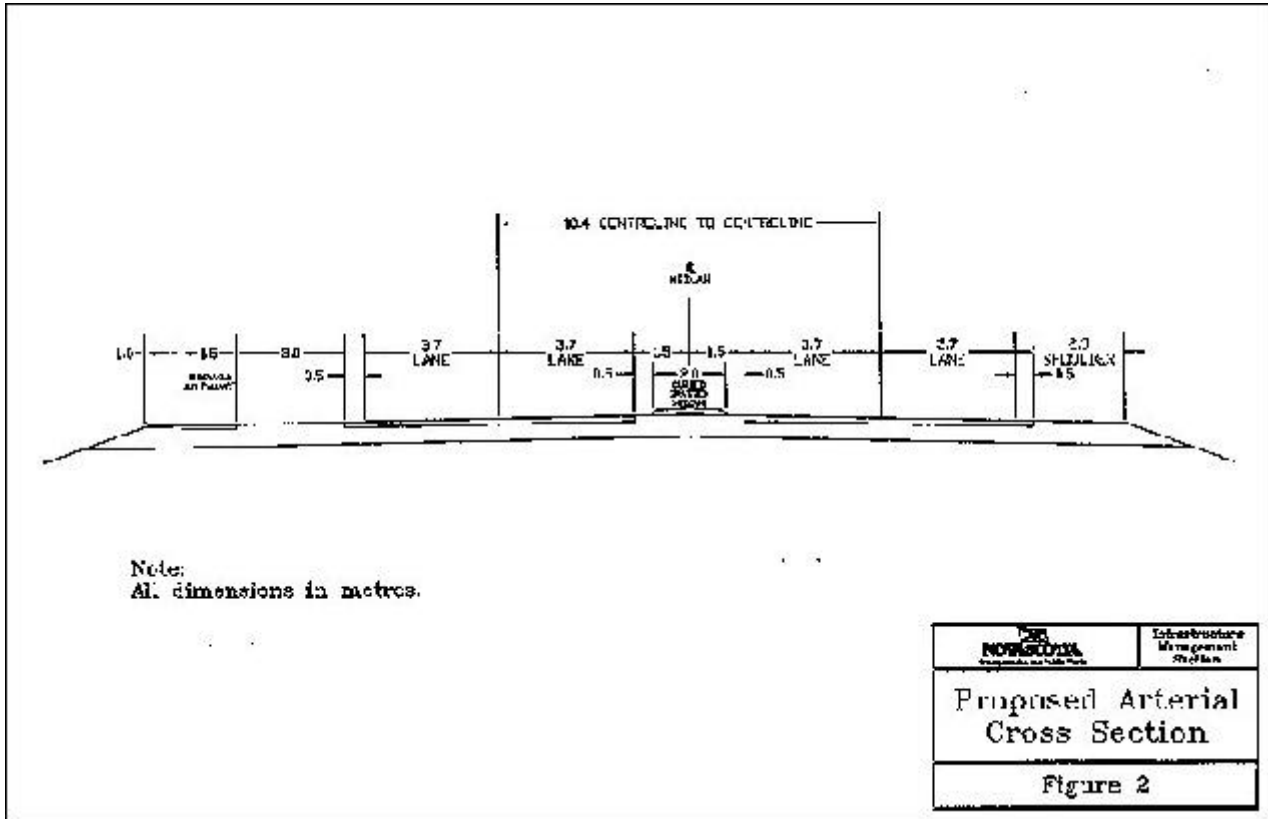
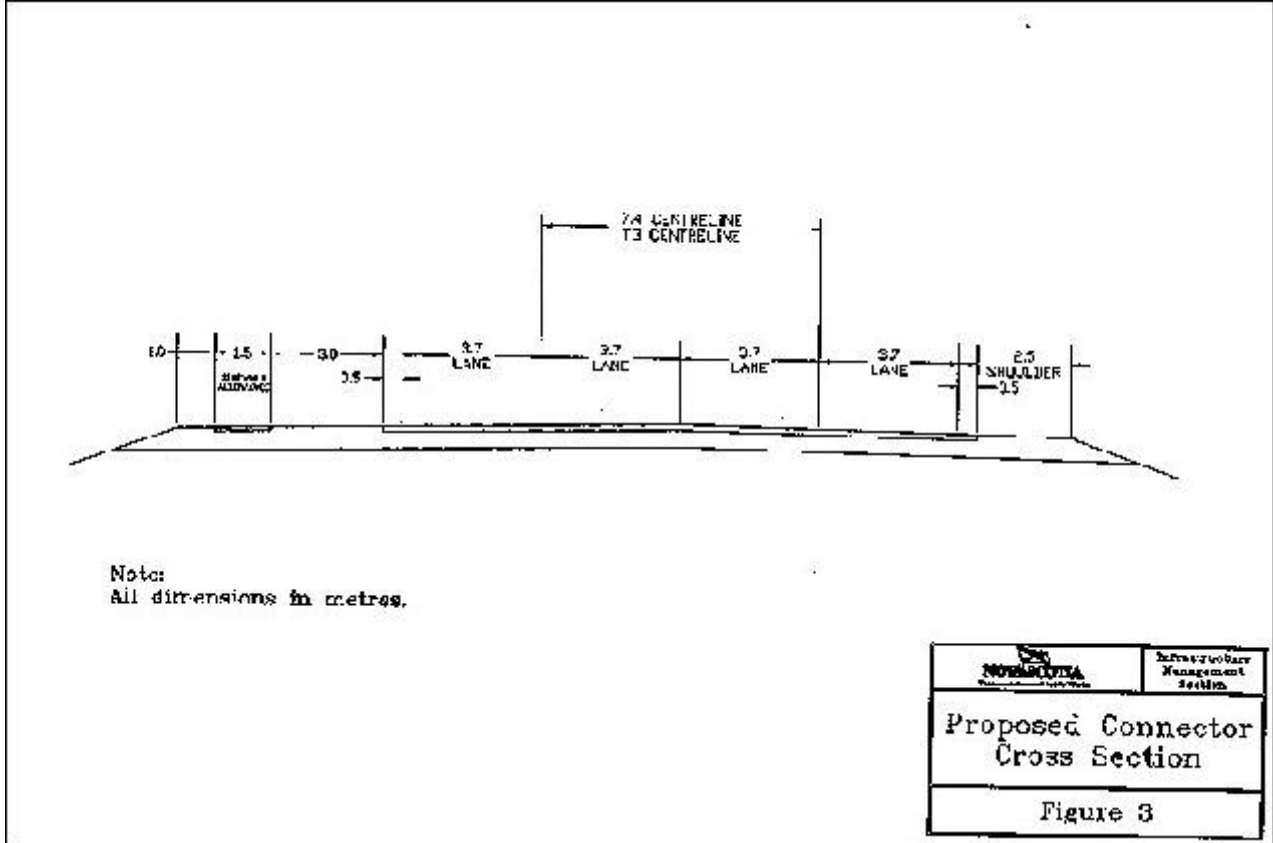


Figure 3 - Proposed Connector Cross Section



3.5 Schedule

The project is planned to proceed in phases from south to north as construction of each section becomes warranted. It is anticipated that the first section, from Highway 101 to the proposed connector at Feely Lake, will be required in the next five years. The second section, from the connector at Feely Lake to the proposed connector at the Greenforest subdivision will likely be required within ten years. The final section is expected to be warranted in 15 years.

The proposed alignment is expected to be maintained and to remain in operation indefinitely.

4.0 EXISTING ENVIRONMENT

4.1 Biophysical Environment

Geology

The proposed alignment is underlain by Halifax and Goldenville formations. The slates of the Halifax formation have acid generating potential in the Goldenville contact area.

There are no economic mineral occurrences and no current mineral staking in the project area.

Physiography

The topography is characteristic drumlin topography comprising gently rolling slopes ranging up to 20 percent.

Several lakes are within the project area and in many instances have dictated the location of the proposed alignment.

Soils

The soils of the project area are primarily of the Wolfville series consisting of loam to sandy, clayey loam soils. A geotechnical investigation was undertaken where a deep cut is anticipated along the alignment. Subsequent analysis determined appropriate back slopes and recommended additional stability measures. Summaries of this work are contained in Appendix C.

Wetlands

There are several wetlands in the project area although there are no managed wetlands in the project area. The proposed alignment aims to avoid the known wetlands. However, one wetland near Hamilton Lake, with a Golet score less than 60, may be impacted by the proposed roadway. This and all potentially impacted wetlands are to be evaluated and effects mitigated in accordance with the Nova Scotia Wetlands Directive.

Terrestrial Habitat

The proposed alignment parallels existing and proposed residential development at several locations and otherwise goes through woodlands, some of which are managed woodlots.

Abandoned powerline poles to the west of Greenforest and Barrett Woods sub-divisions have become osprey nesting sites.

The Museum of Natural History has no records of rare or significant species of plants or animals within or near the proposed project area. There are records of rare or significant plant species in areas adjacent to the project area and if suitable habitat occurs with the proposed project area, rare or significant plant species may be present.

Aquatic Habitat

Preliminary investigations show that significant fish species are present in some of the watercourses crossed by the proposed alignment.

4.2 Socioeconomic Environment

Residential Development

There is growing residential development in the Upper Sackville and Beaver Bank communities. This expansion has necessitated the early identification of a future transportation corridor.

Several proposed subdivisions are impacted by the proposed alignment. The Department of Transportation and Public Works has initiated discussions with Developers in an effort to minimize the impacts on their respective developments.

Heritage Resources and Archaeology

The proposed alignment crosses Maroon Hill in Upper Sackville. Although not designated municipally or provincially, the area has historic significance as an early Jamaican Maroon settlement. Existing development at the southern end of this project has greatly limited the possibilities for alternative routes and makes avoiding this area difficult.

There are no municipal, provincial or national historic sites in the project area. A recorded archaeological site consisting of a historic homestead and associated settlement features exists approximately one kilometre to the west of the proposed corridor. Two pre-contact isolated finds are located approximately 1.5 kilometres east of the proposed alignment.

Existing Land and Water Uses

Existing land is mainly privately owned, undeveloped woodland with some managed woodland. There are no intensive forest management areas in the project area.

There are no mink or fox farming operations in the area.

The Sackville Golf course and some areas surrounding Tucker Lake actively use surface water sources.

Recreation

The Halifax Regional Municipality has some interest in developing recreational trails in the Upper Sackville area.

Inquiry to Sport Nova Scotia confirmed that designated canoe routes and cross country ski trails will not be impacted by the proposed alignment.

Utilities

There are no conflicts with existing sanitary, storm or water infrastructure or with telecommunications towers. There is fibre optic cable along Trunk 1.

Nova Scotia Power has indicated their intent to preserve the abandoned power right-of-ways for future use. The proposed alignment parallels the right-of-way in some places and crosses each of the three lines.

Federal Lands

The project does not encroach on federal lands.

5.0 PROJECT/ENVIRONMENT INTERACTIONS

5.1 Biophysical Interactions

Geology

The project has the potential to expose acid generating slates.

Soils

Silty soils characteristic of the area will be susceptible to erosion.

Wetlands

One wetland near Hamilton Lake, with a Golet score less than 60, may be impacted by the proposed roadway.

Terrestrial Habitat

Construction noise can disrupt osprey during their nesting period. Rare or significant plants may be impacted by the proposed alignment.

Aquatic Habitat

Significant fish species could be adversely affected by the proposed alignment.

5.2 Socioeconomic Interactions

Residential Development

Some proposed residential development is impeded by the proposed alignment. However, more potential area is opened for development because of the proposed alignment.

A minimum 30 metre buffer has been identified between existing development and the proposed roadway.

The results of the functional analysis were presented at a Public Consultation Open House on February 5, 1998. Generally the public response was favourable. However, land owners directly impacted had significant concerns. A summary of the Open House is contained in Appendix B.

Transportation Network

The proposed alignment will greatly alleviate traffic on the existing Beaver Bank Road and a section of Trunk 1 in Middle Sackville. It will also provide an alternate route in and out of Beaver Bank which at present is serviced only by the Beaver Bank Road.

Heritage Resources and Archaeology

Although there are no known archaeological or heritage resources along the proposed alignment the potential exists for project interactions with archaeological resources.

6.0 MITIGATIVE MEASURES

As a minimum the following studies/investigations are required to further identify and qualify possible project/environment interactions:

- Plant survey of the corridor;
- Archaeological reconnaissance survey of the corridor;
- Aquatic study of all watercourse crossings; and

- Investigation into the location, extent and nature of acid producing bedrock and alignment design to ensure any such bedrock is not disturbed.

Environmental management and mitigation plans will be required that address the environmental issues associated with the construction and operation of the proposed roadway.

7.0 APPROVALS

Project approvals will be sought in accordance with the requirements of the following federal and provincial legislation and the regulations made pursuant to them:

- Canadian *Environmental Protection Act*;
- Canadian *Fisheries Act*;
- Canadian *Migratory Birds Conservation Act*;
- Canadian *Navigable Waters Protection Act*;
- Nova Scotia *Dangerous Goods Transportation Act*;
- Nova Scotia *Environment Act*;
- Nova Scotia *Special Places Act*; and
- Nova Scotia *Wildlife Act*.

The construction of the Beaver Bank Bypass will adhere to the most recent versions of the Department's guidelines and specifications including: Standard Specifications; Highway Design Standards; and Approval Process for Pits Containing Slates.

Relevant Nova Scotia Department of the Environment (NSDOE) guidelines and specifications include: Pit and Quarry Guidelines; Erosion and Sedimentation Control Handbook for Construction Sites; Guidelines for Sampling of Domestic Water Supplies in Conjunction with Construction of Highways; and Guideline for Environmental Noise Measurement and Assessment. In addition, the following joint provincial/federal guidelines and specifications may apply: Guidelines for Development on Slates in Nova Scotia; Environmental Construction Practice Specifications; and Environmental Protection Guidelines for the Application and Removal of Protective Coatings during Bridge Maintenance Operations.

In addition, all work will be conducted in accordance with the Nova Scotia Occupational Safety General Regulations, or the relevant legislation in force at the time of construction.

8.0 SUMMARY

The proposed Beaver Bank Bypass is viewed as an integral and necessary element of the future transportation network serving Beaver Bank and Middle Sackville. Although some adverse environmental effects are anticipated, it is assumed that through careful identification of issues and subsequent routing and design of the roadway, along with the creation of workable and effective

construction and operation plans, these adverse effects can be avoided or mitigated.

APPENDIX A - Environmental Screening Summary

The environmental screening is a preliminary identification and review of potential environmental impacts. Information obtained during the review is based primarily on existing recorded information and knowledge of staff of the Departments and organizations contacted. The study area is shown on Figure 4. Categories, contacts and associated responses are summarized below.

Screening Summary

Category	Constraint	Organization/ Department Contacted	Constraint Present (Yes/No)	Comments
Geology	Mineral Resources	Nova Scotia Department of Natural Resources (DNR)	No	
	Sand and Gravel Deposits	DNR	No	
	Mineralized Slates	DNR	Yes	potential for acid slates (see note 1)
	Shallow Bedrock	DNR	-	no specific response
	Karst Terrain	DNR	No	
	Highly Erodible Soils	DNR	-	no specific response
Terrestrial Environment	Wildlife Management Areas	DNR, Environment Canada (EC)	No	no specific response
	Ecological Reserves	DNR	No	
	Rare and Endangered Species	DNR, Nova Scotia Museum (NSM)	No	plant survey recommended
	Managed Wetlands	Ducks Unlimited	No	
	Important Habitat	DNR, EC	Yes	osprey nests (see note 2)

Category	Constraint	Organization/ Department Contacted	Constraint Present (Yes/No)	Comments
	Important Wetlands (Golet Score 65+)	DNR, EC	Yes	3 wetlands present in study area (see note 3)
	Old Growth Hardwood Stands	DNR	No	no specific response
Aquatic Environment	Significant Fish Habitat	Fisheries and Oceans Canada (FOC)	Yes	detailed aquatic survey recommended
Crown Lands	Provincial Parks	DNR	No	
	Federal Lands	Public Works Canada	No	
	Park Reserves	DNR	No	
Native Lands	Indian Reserves	Indian and Northern Affairs (INA), Union of Nova Scotia Indians (UNSI)	No	
	Native Land Claims	INA, UNSI	No	no active claims
Agriculture	Fur Farms	Nova Scotia Department of Agriculture and Marketing	No	
Forestry	Intensive Forestry Management	DNR	No	
	Woodlot Management	DNR	Yes	private woodlots
	Sugar Bush	DNR	No	
Land/Water Use	Proposed Development	Halifax Regional Municipality (HRM)	Yes	proposed residential development (see note 4)
	Airports and Navigational Aids	Transport Canada	-	no response to date

Category	Constraint	Organization/ Department Contacted	Constraint Present (Yes/No)	Comments
	Landfills/Waste Disposal Sites	Nova Scotia Department of the Environment (DOE)	No	
	Strip Mines	DNR	No	
	Underground Mines and Surface Facilities	DNR	No	
	Pits and Quarries	DNR	No	
	Advanced Mineral Exploration	DNR	No	
	Navigable Waters	FOC (Coast Guard)	-	no response to date
Recreation	Canoe Route	Sport Nova Scotia	No	
	Cross Country Ski Trails	Sport Nova Scotia	No	
	Hiking Trails	DNR	-	HRM planning for trails within study area
Water Supply	Surface Water Supply	DOE	Yes	Sackville Golf Course and Tucker Lake residents
	Groundwater Supply	DOE	Yes	individual wells
	Developed Springs	Halifax Regional Water Commission (HWRC)	No	not specifically addressed
Utilities	Power Transmission Lines	Nova Scotia Power	Yes	existing corridor to be preserved
	Municipal Services (water and sewer infrastructure)	HRM, HWRC	Yes	conflicts not anticipated
	Telecommunications Towers	Industry Canada	Yes	conflicts not anticipated

Category	Constraint	Organization/ Department Contacted	Constraint Present (Yes/No)	Comments
	Telephone Fibre Optic Cable	MT&T	Yes	fibre optic cable along Trunk 1
	Cable TV Fibre Optic Cable	Access Communications	No	
Archaeology/ Heritage	National Historic Sites	Parks Canada	No	
	Heritage Properties	Nova Scotia Department of Housing and Municipal Affairs	No	may be municipal properties
	Archaeological Sites	NSM	Yes	historic homestead on edge of study boundary; professional archaeological foot survey of centreline recommended
	Old Burial Grounds/Cemeteries	NSM	-	information not available
	Heritage Rivers	DNR	No	
	Fossil Sites	NSM	No	

Notes:

1. The proposed alignment crosses the boundary of the Goldenville and Halifax bedrock formations. This contact area has a high potential for acid generating slates. A site investigation is required to determine the location, extent and potential for acid generation. Design of the alignment to avoid the disturbance of sensitive bedrock.
2. Osprey nests are located on the poles of the abandoned powerline. Construction is to be prohibited in the area during nesting periods.
3. The three wetlands with a Golet score >65 are not impacted by the present alignment. However, one or two other wetlands may be impacted.
4. Several proposed residential developments are impacted by the proposed alignment. TPW is currently working with developers to ensure the developments are coordinated with the proposed

- alignment.
5. Wildlife fencing has been suggested by DNR.

APPENDIX B - Public Open House Summary

A Public Open House for the proposed Beaver Bank Bypass project was held February 5, 1998 and attended by approximately two hundred people. Project mapping was displayed and TPW staff were on hand to answer questions and receive concerns and comments. Questionnaires were distributed to encourage attendees to record their comments. The project was generally well received with the alleviation of traffic on the Beaver Bank Road considered the primary and important benefit. The major concerns presented were the proximity of the road to existing and future homes and the proximity of a connector to the local junior high school.

Sixty-six people returned questionnaires. A summary of the benefits and concerns recorded are tabled below.

Project Benefits

Benefit	Number of Responses
Improved traffic flow	38
Improved access to Highway 101	9
Increased safety	6
Other	2
None	7
Only for developers	3

Project Concerns

Concern	Number of Responses
Proximity to homes/noise	10
Safety at intersections of connectors and Beaver Bank Road	4
Encourage development thus straining other municipal infrastructure	3
Connector first phase of second lake connector	3
River crossings, wildlife and other environmental issues	3
Loss of right-of-way to property	2
Increased taxes	2

Concern	Number of Responses
Will not help bottleneck areas	1
New road might impede upgrades to existing road	1
New route will be under utilized if speed limit too low	1
Loss of opportunity if corridor not preserved quickly	2
Second Lake Collector should be part of the project	1

TPW staff presented a primary alignment and an alternate alignment at the Open House, reference Figure 3. Based on the public comment received at and following the Open House, TPW decided to pursue the alternate alignment which has significantly decreased property impacts.

APPENDIX C - Soil Investigation Results

Available in hard copy at the Nova Scotia Department of Environment and Labour Library