Class Environmental Assessment for Provincial Transportation Facilities

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Ministry of Transportation

Ontario

To all users of the: **CLASS ENVIRONMENTAL ASSESSMENT FOR PROVINCIAL TRANSPORTATION FACILITIES**

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INTRODUCTION

CHAPTER 1

Introduction

1.1 Preface

The Environmental Assessment Act R.S.O. 1990, as amended (EA Act) provides for the preparation of Class Environmental Assessments (Class EA) for approval by the Minister of the Environment. A Class EA is an approved planning document that defines groups of projects and activities and the environmental assessment (EA) processes which the proponent commits to following for each of these undertakings. Provided the process is followed, projects and activities included under the Class EA do not require formal review and approval under the EA Act.

This Class Environmental Assessment for Provincial Transportation Facilities has been prepared by the Ministry of Transportation of Ontario (MTO). The document has been written for use by regulatory agencies, the public and other affected interests, and the proponent (see Section 1.4, *Proponents Covered by this Class EA* below).

Glossary

Throughout the document, it has been necessary to use some technical terms and acronyms. To assist the reader, a glossary has been included for easy reference (see Appendix 5).

1.2 Reasons for Using the Class EA Process

The Class EA process offers significant efficiencies and cost savings while achieving standards of environmental protection, accountability and consultation

There are a number of reasons for using the class environmental assessment process with respect to undertakings in this Class EA:

- There are significant efficiencies and cost-savings for the proponent, delivery partners, agencies, and the public in being able to follow a pre-approved, predictable EA process for a large number of projects of a similar nature.
- There are significant similarities in project study processes, with project differences being primarily due to project-specific conditions.
- MTO has successfully used the Class EA process for provincial transportation undertakings since 1979. This is the fourth generation Class EA for such undertakings. The Class EA process has been an overall success in Ontario.
- The Class EA process for provincial transportation facilities provides a similar level of environmental protection, accountability and public consultation as the individual EA process.
- Agencies and the public are concerned with how their issues are addressed and the adequacy of the EA process. They are not, on the whole, concerned with the type of EA process (Class vs. Individual).

1.3 Similarities and Differences Among Undertakings in this Class EA

This Class EA is designed to take advantage of the efficiencies offered by similarities while ensuring that the specific differences are addressed appropriately

Because the undertakings covered by this Class EA are all part of the same provincial transportation network, they share the following *similarities*:

- they are initiated from a common needs assessment process;
- the types of problems and opportunities are recurrent;
- a common set of "alternatives to" and "alternative methods" apply;
- they follow the same study process, with the same stages and phases;
- the same engineering principles are applied on an ongoing basis;
- the types of impacts and approaches to environmental protection are recurrent;
- the approaches to consultation are recurrent.

The *differences* expected among undertakings covered by this Class EA include the following:

- project-specific problems/opportunities;
- project-specific complexity, engineering requirements, environmental sensitivities, and public concerns;
- project-specific solutions;
- the consultation, documentation and "bump-up" opportunity associated with the project group;
- Group A projects deal largely with new routes, whereas Group B and C projects deal largely with existing facilities;
- The planning for Group A new freeway projects is conducted under the individual EA process, while the planning for other Group A projects and all Group B and C projects is conducted under this Class EA process.

Planning for new freeways is conducted under the individual EA process

1.4 Proponents Covered by this Class EA

A proponent is defined as a person or agency who carries or proposes to carry out an undertaking, or is the owner or person having charge, management, or control of an undertaking.

Any proponent of work on the provincial transportation system may use this Class EA

Under this Class EA the following are defined as proponents:

- the Ontario Ministry of Transportation (MTO);
- other proponents (in their own right, and under their own responsibility) of work on the Provincial Transportation system for which there is no current MTO need and/or construction commitment, and where that work is defined under the terms of this Class EA (e.g. new freeway interchange needed by a municipality or developer for access to a new development)

Irrespective of who the proponent may be, it is recognized that the undertaking may either be carried out by the proponent itself or its employees or servants; or by agents, contractors, consortia or other parties who may be retained by the proponent from time to time to effect the carrying out of the undertaking; or by another proponent who assumes responsibility for project implementation (in compliance with EA commitments).

1.5 Overview of this Class EA

Classification of Projects and Activities

The projects and activities conducted under the terms of this Class EA include the following:

- provincial transportation facility projects involving provincial highways and freeways, provincial transitways, and provincial ferryboats;
- service, maintenance, and operations facility projects to support provincial transportation facilities; and
- operation, maintenance, administration, and miscellaneous activities for provincial transportation facilities.

These projects and activities are classified into project and activity "groups" under this Class EA. This is primarily for purposes of consultation, environmental documentation, and opportunities for "bump-up" or formal EA challenge. The project and activity groups are as follows:

Projects covered by this Class EA are divided into groups for purposes of consultation, documentation, and formal EA challenge

- Group A: projects which are new facilities
- Group B: projects which are major improvements to existing facilities
- Group C: projects which are minor improvements to existing facilities
- Group D: activities which involve operation, maintenance, administration, and miscellaneous work for provincial transportation facilities

A detailed description of projects and activities that fall under each of these groups is provided in Chapter 2.

Most sections in this Class EA pertain to Group A, B and C projects, while Group D activities are dealt with specifically in Chapter 9. Where sections relate specifically to some groups and not others, this is generally indicated in the section heading and/or the text.

Principle-Based Approach

The goal of all projects and activities covered by this Class EA is to provide a safe and effective transportation system while avoiding or minimizing negative environmental effects.

To achieve this goal this document is *principle-based* rather than prescriptive in nature. This means that the Class EA defines *what must be achieved*, rather than defining precisely *how* it should be done.

This document is principle-based rather than prescriptive in nature.

The study principles cover the key elements of the Class EA process

The following principles underlie the Class EA process for Group A, B and C projects:

- transportation engineering principles (see Section 4.1);
- environmental protection principles (see Section 4.2);
- external consultation principles (see Chapter 5);
- evaluation principles that are intended to achieve the best overall balance of these principles (see Section 4.3);
- documentation principles (for some projects - see Section 6.1);
- bump-up principles (for some projects - see Section 6.2); and
- environmental clearance principles to proceed (see Chapter 8).

These principles must be applied during the study process for Group A, B and C projects as stipulated. As an increasing amount of public sector work is delivered by the private sector, this approach best allows for the protection of the environment while enabling a public sector proponent to monitor compliance and effectiveness of the process. At the same time, it reduces unnecessary red tape and allows for increased flexibility and innovation.

Group D activities have no formal study processes under this Class EA. Instead, they are subject to activity-related environmental protection and the processes that may be prescribed in other legislation. This is described in Chapter 9.

Stages

The Class EA process consists of four main stages:

The stages in this Class EA process provide for structured decision making and consultation as a transportation study progresses

- Planning;
- Preliminary Design;
- Detail Design; and
- Construction.

In addition, the Planning stage may be preceded by a Transportation Needs Assessment stage. This is an ongoing activity that is conducted outside the EA process (see Section 4.4).

For Group A new freeway projects, planning must be conducted under the individual EA process. However, this Provincial Transportation Facilities Class EA process may be applied to all subsequent stages of Group A new freeway projects (see Section 2.1). For all other Group A projects, for Group B and C projects, and for Group D activities, this Class EA applies in its entirety.

The various stages in the Class EA process are described in Chapter 3.

An overview of how the key subjects are addressed in this Class EA is provided in Appendix 6. These include transportation engineering, environmental protection, evaluation, consultation, documentation and bump-up, environmental assessment process and statutory requirements.

1.6 Project Delivery Mechanisms

Proponents covered by this Class EA may select one or a combination of delivery mechanisms in order to carry out the undertaking

The following are some examples of delivery mechanisms that may be used:

- **in-house planning and design,** where the proponent's staff deliver all aspects of project planning and/or design;
- **consultant planning and design services**, where separate consultants are retained to deliver various facets of project planning and/or design;
- **in-house construction**, where the proponent's staff undertake project construction;
- **contractor construction**, where a contractor is retained to undertake project construction;
- **in-house construction administration**, where the proponent's staff administer contractor construction;
- **consultant construction administration**, where a consultant is retained to administer contractor construction;
- **total project management (TPM**), where a single consultant delivers all aspects of project design, and in addition, may administer contractor construction;
- **design/build (DB),** where a single consortium is retained to undertake all aspects of both project design and project construction;
- **in-house maintenance**, where the proponent's staff undertake facility maintenance;
- **contractor area maintenance,** where a single contractor is retained to supervise and undertake all routine facility maintenance activities for an assigned area of the province;
- **managed outsourcing maintenance,** where a number of contractors are retained to undertake specific routine facility maintenance activities under the day to day supervision of the proponent's staff; and
- **contractor maintenance projects**, where a contractor is retained to undertake non-routine facility maintenance projects.

1.7 Statutory Requirements

1.7.1 Approval under the EA Act

Approval of this Class EA provides, in part, approval under the Ontario Environmental Assessment Act (EA Act) for the following:

- the EA approval status and description of provincial transportation facility project groups and activities;
- the environmental assessment principles for provincial transportation studies, projects and activities;
- the stages and phases for provincial transportation facility project studies;
- the study process through which the environmental assessment principles are applied to provincial transportation facility projects, and through which the requirements of the EA Act are complied with; and
- the administration of this Class EA.

1.7.2 Relationship To Other Environmental Legislation

This Class EA process is part of a mechanism by which compliance with other environmental legislation may be achieved. However, the Class EA process does not replace or exempt the formal processes of other applicable federal, provincial and municipal legislation and municipal bylaws, such as permits/approvals and the specific public/agency consultation that they may require. As much as is possible, duplication between the Class EA process and other formal approval processes is avoided.

1.7.3 Environmental Statutory Duty

Environmental statutory duty involves a combination of general, program-specific and project-specific requirements

Regardless of the project delivery mechanism selected, environmental statutory duty is imposed on proponents under this Class EA through the following:

- "General" environmental statutory duty is imposed by federal, provincial and municipal environmental acts, regulations and bylaws.
- "Program-specific" environmental statutory duty is imposed through "class/program" approvals, permits or exemptions granted to the proponent which provide broad program delivery benefits and obligations (such as this Class EA).
- "Project-specific" environmental statutory duty is imposed through project-specific approvals/permits/exemptions that are obtained, the commitments made in application for same, the conditions attached thereto, and through commitments made in environmental documentation.

The application of these proponent environmental statutory duties varies with the project stage and activity.

Areas of Environmental Statutory Duty

Environmental statutory duty on proponents under this Class EA arises in four main areas:

- environmental assessment process;
- technical environmental requirements and prohibitions;
- formal environmental approvals, permits, and exemptions; and
- reporting obligations to regulatory agencies as required by statute.

This statutory duty is carried out in many ways, some of which are listed below:

- ***Environmental assessment process:***

  The proponent shall take all reasonable steps to ensure that:
  - the project parameters which define a particular EA study process are recognized;
  - the EA study process, consultation and documentation requirements applicable to the Class EA project classification (Group A, B, C) are followed;
  - the Class EA study principles are complied with; and
  - commitments made through project-specific environmental consultation and documentation are complied with.

The proponent shall take all reasonable steps to ensure that the appropriate Class EA study process, consultation and documentation requirements are followed, and Class EA study principles are complied with.

- ***Technical environmental requirements and prohibitions:***

  The proponent shall take all reasonable steps to ensure that:
  - the existing environmental conditions relevant to the undertaking are understood, and the potential impacts of the project are recognized;
  - reasonable alternatives are considered and that appropriate project design, construction and environmental protection strategies and details are developed to address "significant environmental concerns"; and
  - commitments to project-specific design and construction solutions are implemented.

- ***Formal environmental approvals, permits, and exemptions:***

  The proponent shall take all reasonable steps to ensure that:
  - the conditions under which (primarily) design-related approvals, permits, and exemptions may apply are recognized;
  - the necessary design-related applications are submitted, and the project is permitted to proceed only if the necessary approvals are granted; and
  - commitments made in the application and any conditions imposed by the approval are complied with.

- ***Reporting/notification obligations to environmental regulatory agencies as required by statute:***

  The proponent shall take all reasonable steps to ensure that:

  – the conditions which require such reporting/notification are recognized;
  – the content and timing requirements for such reports/notifications are met; and
  – commitments made or imposed as an outcome of that reporting/notification are complied with.

The proponent shall take all reasonable steps to meet requirements for environmental technical requirements, formal environmental approvals, environmental reporting obligations, and environmental standards

Standards

Standards for meeting environmental statutory duty are imposed on the proponent through the following:

- "government approved environmental policies and guidelines" issued by the mandated environmental agencies;
- "inter-agency environmental protocols" negotiated between MTO or the proponent and the mandated environmental agencies;
- MTO or the proponent's own environmental policies, manuals, guidelines, specifications, etc.;
- commitments made and/or conditions imposed by EA process and formal environmental approvals, permits and exemptions; and
- "reasonable expectation" of environmental approaches/methodology typically applied for work of similar type or scale, under similar conditions, by proponents of similar sophistication (e.g. large municipalities, developers, industries).

1.7.4 Compliance with the EA Act

This Class EA complies with the requirements for class environmental assessments under the EA Act as shown in Exhibit 1.1.

EXHIBIT 1.1

Compliance with the EA Act

The EA Act defines requirements for class environmental assessments. This Class EA complies with Class EA and other EA requirements as follows:

EA ACT Section	**Addressed in this Class EA in Chapter or Section:**
14 (2) (1) A description of the class of undertakings to which the Class EA applies	**2.** Classification of Projects and Activities
14 (2) (2) The reasons for using a Class EA with respect to undertakings in this class	**1.2** Reasons for Using the Class EA Process
14 (2) (3) The similarities and differences to be expected among undertakings in this class	**1.3** Similarities and Differences Among Undertakings in this Class EA
14 (2) (4) The expected range of environmental effects that may result from proceeding with undertakings in this class	**4.2.2** Types of Impacts **4.2.3** Identifying Environmental Conditions and Sensitivities **App. 2** Typical Environmental Protection and Mitigating Measures
14 (2) (5) Measures that could be taken to mitigate against adverse environmental effects	**Exh.3.4** Overview of Typical Environmental Protection Activities, Decisions and Consultation for Group A, B, and C Projects **4.2** Environmental Protection Principles and Process **4.5.4** Environmental Protection in Planning **4.6.3** Environmental Protection in Preliminary Design **4.7.3** Environmental Protection in Detail Design **4.8.3** Environmental Protection in Construction **4.8.4** Environmental Monitoring in Construction **9.** Transportation Engineering and Environmental Protection for Group D Activities **App. 2** Typical Environmental Protection and Mitigating Measures

EA ACT Section	Addressed in this Class EA in Chapter or Section:
14 (2) (6) The process to be used to consult with the public and with persons who may be affected by the undertaking	**Exh.3.1** Overview of Typical Transportation Engineering Decisions and Consultation for Groups A and B Linear Facilities **Exh.3.2** Overview of Typical Transportation Engineering Decisions and Consultation for Group C Linear Facilities **Exh.3.3** Overview of Typical Transportation Engineering Decisions and Consultation for Group A, B and C Service, Maintenance and Operations Facilities **Exh.3.4** Overview of Typical Environmental Protection Activities, Decisions and Consultation for Group A, B and C Projects **Exh.3.5** Overview of Class EA Process for Group A Projects Except New Freeways **Exh.3.6** Overview of Class EA Process for Group A New Freeway Projects **Exh.3.7** Overview of Class EA Process for Group B Projects **Exh.3.8** Overview of Class EA Process for Group C Projects **5.1** The Purpose of Consultation **5.2** Consultation Principles **5.3** Timing of Consultation **5.4** Consultation Processes **5.5** Consultation for Group A Projects **5.6** Consultation for Group B Projects **5.7** Consultation for Group C Projects **6.** Documentation and Bump-up Principles and Processes - Group A, B and C Projects
14 (2) (7) The method to be used to evaluate a proposed undertaking with respect to environmental effects, mitigating measures and consultation	**4.2.3** Identifying Environmental Conditions and Sensitivities **4.3.1** Evaluation Principles **4.3.2** Evaluation Process **4.4.2** Evaluate “Alternatives To” and Select the Preferred Transportation Undertaking **4.5.3** Evaluate Planning Alternatives and Select the Preferred Planning Alternative **4.6.2** Evaluate Preliminary Design Alternatives and Select the Preferred Preliminary Design Alternative **4.7.2** Evaluate Detail Design Alternatives and Select the Preferred Detail Design Alternative **4.8.2** Generate, Evaluate, and Select the Preferred Construction Method Alternative

EA ACT Section	Addressed in this Class EA in Chapter or Section:
14 (2) (8) The method to be used to determine the final design of a proposed undertaking, based on the method used for evaluation	**1.5** Overview of This Class EA **Exh.3.1** Overview of Typical Transportation Engineering Decisions and Consultation for Groups A and B Linear Facilities **Exh.3.2** Overview of Typical Transportation Engineering Decisions and Consultation for Group C Linear Facilities **Exh.3.3** Overview of Typical Transportation Engineering Decisions and Consultation for Group A, B and C Service, Maintenance and Operations Facilities **Exh.3.5** Overview of Class EA Process for Group A Projects Except New Freeways **Exh.3.6** Overview of Class EA Process for Group A New Freeway Projects **Exh.3.7** Overview of Class EA Process for Group B Projects **Exh.3.8** Overview of Class EA Process for Group C Projects **4.1** Transportation Engineering Principles **4.4.1** Identify Transportation Problems and Opportunities **4.4.3** Develop Transportation Study Objectives and Study Area **4.5.2** Generate and Assess Planning Alternatives **4.5.5** Develop the Preferred Planning Alternative **4.6.1** Generate and Assess Preliminary Design Alternatives **4.6.4** Develop the Preferred Preliminary Design Alternative **4.7.1** Generate and Assess Detail Design Alternatives **4.7.4** Develop the Preferred Detail Design Alternative **App.1** Outline of the Technical Basis for Transportation Engineering Planning and Design Decisions
6.1 (2) (a) and 6.1 (2) (b) (i) The purpose of and rationale for the undertaking	**4.4.1** Identify Transportation Problems and Opportunities **4.4.3** Develop Transportation Study Objectives and Study Area
6.1 (2) (b) (iii) Alternatives to the undertaking (description and rationale)	**4.4.2** Evaluate “Alternatives To” and Select the Preferred Transportation Undertaking
6.1 (2) (b) (ii) Alternative methods of carrying out the undertaking (description and rationale)	**Exh 3.1** Overview of Typical Transportation Engineering Decisions and Consultation for Groups A and B Linear Facilities **Exh 3.2** Overview of Typical Transportation Engineering Decisions and Consultation for Group C Linear Facilities **Exh 3.3** Overview of Typical Transportation Engineering Decisions and Consultation for Group A, B and C Service, Maintenance and Operations Facilities **4.5.2** Generate and Assess Planning Alternatives **4.6.1** Generate and Assess Preliminary Design Alternatives **4.7.1** Generate and Assess Detail Design Alternatives **4.8.2** Generate, Evaluate, and Select the Preferred Construction Method Alternative
8 The application of mediation for some Provincial Transportation Projects	**5.4** Consultation Processes

CHAPTER 2

Classification of Projects and Activities

Projects are grouped for the purposes of consultation, documentation and bump-up

Overview

The projects and activities conducted under the terms of this Class EA include the following:

- provincial transportation facility projects involving provincial highways and freeways, provincial transitways, and provincial ferryboats;
- service, maintenance, and operations facility projects to support provincial transportation facilities; and
- operation, maintenance, administration, and miscellaneous activities for provincial transportation facilities.

The classification of undertakings into project and activity "groups" under this Class EA is primarily for purposes of consultation, environmental documentation, and opportunities for "bump-up" or formal EA challenge.

These projects and activities groups are as follows:

- Group A: new facilities
- Group B: major improvements to existing facilities
- Group C: minor improvements to existing facilities
- Group D: activities which involve operation, maintenance, administration, and miscellaneous work for provincial transportation facilities

These groups are described in detail in Sections 2.1, 2.2, 2.3 and 2.4 respectively.

For Group A new freeway projects, the application of this Class EA is as follows:

- The individual EA process applies to planning studies for new Group A freeway projects, and such studies are subject to a project-specific approval under the EA Act. The proponent may choose to extend the individual EA process to subsequent stages of the EA process. Since the Class EA and Individual EA processes provide a similar level of environmental protection, accountability, and consultation, this decision is made on the basis of project efficiencies and/or program delivery demands.
- This Provincial Transportation Facilities Class EA process may be applied to all other aspects of Group A freeway projects which are approved under the EA Act subject to compliance with this Class EA.

For all other Group A projects, and for Groups B and C projects, this Provincial Transportation Facilities Class EA applies in its entirety, and these projects are approved under the EA Act subject to compliance with this Class EA.

For the purpose of the EA Act, *Group D activities* are ancillary to transportation undertakings. They are approved under the EA Act subject to compliance with applicable environmental legislation other than the EA Act. Group D activities have no formal consultation or study processes under this Class EA; rather, they are subject to the consultation/documentation processes that may be prescribed in other legislation.

Although the Planning stage of Group A new freeway projects is conducted under the Individual EA process, it is typically similar to the planning process for other Group A projects under this Class EA.

2.1 Group A Projects: New Provincial Highways and Freeways, Transitways, and Ferryboat Connections

Group A projects include the following:

Group A projects are new provincial transportation facilities

- new provincial highways and freeways;
- new provincial transitways (separate transit facilities directly associated with a provincial highway);
- new provincial ferryboat connections/docks/terminals;
- major realignments and bypasses to existing provincial highways/freeways and transitways that do not substantially follow the existing right-of-way; and
- extensions to existing provincial highways/freeways and transitways.

NOTE:
For new provincial freeways, planning must be conducted under the Individual EA process rather than this Class EA process

2.2 Group B Projects: Major Improvements to Existing Provincial Transportation Facilities

Group B projects include the following:

Group B projects are major improvements to provincial transportation facilities

- Highway and freeway improvements over land and water that provide a significant increase in traffic capacity or cause a significant widening of the "footprint" beyond the roadbed of an existing highway/freeway, such as:

- major widening over land or water, including associated structures, such as through twinning, addition of through traffic lanes, truck climbing lanes, continuous auxiliary or continuous turning lanes (including non-continuous auxiliary or non-continuous turning lanes which overlap);
- interchange improvements with major footprint modifications;
- major alignment shifts that substantially follow the existing right-of-way;
- drainage improvements involving land and water bodies outside the right of way;
- detours that are constructed to carry traffic outside the existing roadbed over land and water, or that direct traffic to other roads;
- extraction of earth, rock and aggregate from non-commercial sites specified by the proponent or design build consortium retained by the proponent; and disposal of excess earth, rock and aggregate at non-commercial locations specified by the proponent or design build consortium retained by the proponent; and
- other analogous improvements and projects.

- Highway and freeway improvements that provide/cause a significant modification in traffic access (may also modify "footprint") to and from existing highways/freeways, or that introduce/remove municipal road access to local areas, such as:
  - modification of interchanges that introduce or eliminate moves to or from any direction;
  - opening or closing of intersections with municipal roads; introducing or eliminating municipal road access to local areas
  - conversion of king's highways to freeways;
  - new service roads;
  - new, relocated or closed interchanges;
  - new median barriers, either with or without the addition of through traffic lanes;
  - construction staging and/or detours that remove or introduce traffic access in residential or commercial areas, or causes lane closures where significant delays or traffic disruption occurs; and
  - other analogous improvements and projects;

- Improvements to existing provincial transitways and ferryboat dock/terminals such as:
  - improvements that significantly widen the "footprint" of the existing facility;
  - improvements that significantly modify highway/roadway traffic access to and from the facility; and
  - other analogous improvements and projects.

- Establishment of, or improvements to, service, maintenance and operations facilities for existing or "approved" new provincial transportation facilities, such as:

- new service facilities such as commuter parking lots, freeway service centres (food/fuel/rest rooms/parking), picnic sites, rest areas, information centres, provincial transitway stations;
- new maintenance facilities such as patrol yards, equipment repair and storage depots, material storage depots;
- new operations facilities such as traffic management centres, inspection stations, toll plazas, and transit control centres;
- improvements to service, maintenance and operations facilities that involve either property acquisition, or significant increases to traffic and/or truck layover capacity; and
- other analogous improvements and projects.

NOTES:
"Footprint" is the physical intrusion of a highway or freeway beyond the roadbed of an existing highway or freeway.

A Group B project becomes part of a Group A project if that Group A project cannot be implemented without the Group B project.

Group B projects that meet specified criteria can be "stepped down" to Group C projects (see Chapter 7).

2.3 Group C Projects: Minor Improvements to Existing Provincial Transportation Facilities

Group C projects include the following:

Group C projects are minor improvements to provincial transportation facilities

- Highway and freeway improvements over land and water that provide minor or no increase in traffic capacity or cause minor or no widening of the "footprint" beyond the roadbed of an existing highway/freeway, such as:
  - widening through non-continuous auxiliary lanes or non-continuous turning lanes;
  - interchange and intersection improvements with minor "footprint" modifications;
  - minor horizontal and vertical alignment shifts;
  - drainage improvements that do NOT involve land or water bodies outside the right-of-way and do not have major footprint impacts;
  - new noise barriers; and
  - other analogous improvements and projects.

- Highway and freeway improvements that provide/cause minor or no modification in traffic access (may also cause minor "footprint" modifications) to and from existing highways/freeways, such as:
  - improvements of interchanges that do NOT involve relocation, closing,or introduction or elimination of moves to or from any direction;

- improvements of intersections with municipal roads; and
- other analogous improvements and projects.

- Improvements to existing provincial transitways and ferryboat dock/terminals such as:
  - improvements that cause minor or no widening of the "footprint" of the existing facility;
  - improvements that provide minor or no modification of highway/freeway/roadway traffic access to and from the facility; and
  - other analogous improvements and projects.

- Improvements to service, maintenance and operations facilities for existing provincial transportation facilities that do NOT involve major footprint impacts, or significant increases to traffic and/or truck layover capacity.

- Replacement (same purpose, use and capacity at the same location) and rehabilitation of provincial transportation infrastructure, such as:
  - like for like highway and freeway reconstruction;
  - highway surface;
  - bridges and culverts (also includes bridge recoating, culvert relining and culvert sediment removal, and replacement bridges with narrower cross-section);
  - lighting and electrical systems;
  - drainage, ditch, stormsewers and, stormwater management facilities (also includes watercourse erosion "corrections");
  - traffic safety and control systems (such as guide rail and median barrier);
  - service, maintenance and operations facilities;
  - fencing;
  - noise barriers; and
  - other analogous replacement and rehabilitation projects.

- "Stepped down" Group B projects (See Chapter 7)

NOTES:
"Footprint" is the physical intrusion of the transportation facility beyond the roadbed of an existing highway or freeway.

A Group C project becomes part of a Group A or B project if that Group A or B project cannot be implemented without the Group C project.

Some construction activities necessary to complete Group C projects are defined as Group B projects, and must meet the Class EA requirements of Group B projects (e.g. highway detour through residential area needed to accommodate like-for-like bridge replacement).

2.4 GROUP D ACTIVITIES: Facility Operation, Routine Maintenance, Administration, and Miscellaneous Activities

Group D activities include provincial transportation facility operations, maintenance and administration

Group D activities include the following:

- Operation activities for provincial transportation facilities such as:
  - use of highways and freeways, transitways and ferryboats for transportation of people/goods;
  - use of maintenance, service and operations facilities as centres for facility and equipment maintenance, materials storage, service to the travelling public, and operations activities;
  - conversion of highway and freeway lanes from general purpose to special purpose and vice-versa;
  - monitoring and enforcement of vehicle and driver/operator safety standards;
  - monitoring of traffic flow and user "origin/destination";
  - collection of fees for use; and
  - other analogous facility operation activities.

- Routine maintenance activities (that do not meet the definition of Group C projects) for provincial transportation facilities and infrastructure such as:
  - highway and freeway surface, such as snow plowing, salting, sanding, pothole repair, crack filling, road sweeping;
  - bridges and culverts;
  - lighting and electrical systems;
  - ditches, stormsewers, stormwater management facilities, and other drainage facilities (including removal of beaver dams);
  - traffic safety and control systems (such as guide rail and median barrier);
  - service, maintenance and operations facilities;
  - fencing;
  - noise barriers;
  - vegetation (maintenance and control); and
  - other analogous routine maintenance activities.

- Emergency work and response activities such as:
  - transportation and environmental emergency repair work/response (Note: under severe circumstances this could include work that would otherwise be a Group B or C project);
  - traffic accident response;
  - spill response; and
  - other analogous emergency work and response.

- Facility administration activities such as:
  - proactive and reactive "corridor control" on and adjacent to provincial transportation facilities (under the Public Transportation and Highways Improvement Act), which may include the issuance of permits and licenses and the levy of charges and fees, for the facilities and undertakings of other proponents, in their own right and under their own responsibility, such as road access, entrances, drainage, grading, excavation, utilities, buildings and signing;
  - modifications to highway, freeway or roadway ownership;
  - property acquisition and disposal;
  - introduction of controlled access status to king's highways; and
  - other analogous facility management activities.

- Waste management activities for Group A, B, C and D projects

- Property management activities such as:
  - routine building and grounds maintenance;
  - upgrading of property that is not defined as Group A, B or C project work;
  - contamination cleanup;
  - demolition and removal of buildings, in advance of environmental clearance for Group A, B and C work, when those buildings are derelict and a danger to the public, or are in such poor condition that they cannot be economically tenanted;
  - well abandonment and septic system decommissioning; and
  - other analogous property management activities (except those directly associated with Group A, B or C projects).

- Pre/post construction field work activities for Group A, B and C projects, such as:
  - engineering activities such as foundation, geotechnical, soils and legal surveys;
  - environmental activities such as archaeology survey and salvage, fisheries surveys, mitigation/compensation;
  - management of right-of-way and other property contamination; and
  - other analogous preconstruction/post-construction field work.

- Extraction of earth, rock and aggregate from sites not specified by the proponent or design build consortium retained by the proponent; and disposal of excess earth, rock and aggregate at locations not specified by the proponent or design build consortium retained by the proponent.

Part II

STUDY PRINCIPLES AND PROCESSES

CHAPTER 3

Study Stages and Phases

3.1 The Group A, B and C Project Study Process

Study Stages

The Group A, B and C project study process involves a basic process that is repeated with some variation in each of the following stages:

Study stages provide for structured decision making and consultation

- **Planning** - development of the transportation plan to the design concept level of detail (see Section 4.5);
- **Preliminary Design** - development of the transportation plan to the design criteria level of detail (see Section 4.6);
- **Detail Design** - development of the transportation plan to the design implementation level of detail (see Section 4.7); and
- **Construction** - project implementation (see Section 4.8).

Study Phases

Within each of the stages, there may be a number of phases:

- **Generation and assessment** of alternatives;
- **Evaluation and selection** of the preferred alternative; and
- **Development** of the plan/design.

Environmental Protection is an element of each study stage and phase.

In addition, the Planning stage is preceded by a **Transportation Needs Assessment** stage which is part of the MTO's ongoing activities (see Section 4.4), and the Planning stage includes a phase for the *review* of transportation needs assessment.

For Group A new freeway projects, planning is conducted under the individual EA process, and this Class EA process may commence at the beginning of Preliminary Design.

The level of detail increases as the project proceeds through stages

The Group A, B and C project study process involves an increasing level of detail as the study progresses through these stages. As the names suggest, the Transportation Needs Assessment stage focuses on determining what is needed; the Planning stage focuses on developing a plan for how the project should be done; the Preliminary Design stage focuses on "roughing out" a design; the Detail Design stage is conducted to develop detailed construction documents; and the Construction stage actually implements the project.

As the project progresses, these stages provide for structured transportation engineering and environmental protection decision-making and consultation as both the available information and the financial investment become more substantial.

3.2 "Alternatives to" and "Alternative Methods"

With reference to the examination of alternatives under the EA Act, the following apply:

- Alternatives examined during the transportation needs assessment stage are "alternatives to"; (see Section 4.4.2); and
- Alternatives examined during the Planning, Preliminary Design, Detail Design, and construction stages are "alternative methods". (see Exhibits 3.1, 3.2, and 3.3)

All Group A, B, and C projects have some degree of Planning, Preliminary Design, and Detail Design prior to Construction. Project type and complexity influences the duration and intensity of each stage and the consideration of environmental protection at each stage.

Since the underlying process is the same, there is some repetition between one stage and the next. However, there are also important differences in the way the process is carried out at each successive stage.

The overall EA process for typical Group A, B and C projects, including the stages, phases within the stages and related documentation and consultation processes is illustrated in Exhibits 3.5, 3.6, 3.7, and 3.8, which appear at the end of this chapter.

3.3 Principles for Organizing and Combining Stages and Phases

Project stages may be organized to recognize project specifics

The proponent has a number of options for organizing study stages, particularly with lower complexity projects. However, the study principles for transportation engineering, environmental protection, consultation, evaluation, documentation and bump-up must all be realized, through, in part, application of the following conditions:

- When stages are combined, the essential elements of each stage must still be performed. For example, the combination of Preliminary and Detail Design of a low complexity Group B or C project does not eliminate the need to consider reasonable transportation engineering and environmental protection alternatives.
- When stages are combined, the most rigorous consultation and documentation requirements opportunities of the combined stages apply.
- The Detail Design study process and Construction implementation processes *cannot be combined* (although they may be performed by a single design-build consortium). This is because there must be the opportunity for environmental clearance to be completed prior to the commencement of Construction.

- In addition, for some Group A, B and C projects the phases within the Preliminary and Detail Design stages can be effectively combined, particularly for lower complexity projects.

A study may be divided into distinct projects

As a study proceeds, the proponent has the option of severing it into distinct projects as follows:

- each Planning study may be split into a number of Preliminary Design studies;
- each Preliminary Design study may be further split into a number of Detail Design studies; and
- each Detail Design study may be implemented by a number of Construction projects.

3.4 Overviews of: Transportation Engineering Decisions and Consultation; and Class EA Process for Group A, B and C Projects

Overviews of the **transportation engineering and environmental protection process**, and the associated consultation, as they apply for the Planning, Preliminary Design and Detail Design stages of *different groups of projects* is presented in the following exhibits:

Exhibit 3.1	Overview of Typical Transportation Engineering Decisions & Consultation - Groups A and B Linear Facilities
Exhibit 3.2	Overview of Typical Transportation Engineering Decisions & Consultation - Group C Linear Facilities
Exhibit 3.3	Overview of Typical Transportation Engineering Decisions & Consultation - Group A, B and C Service, Maintenance and Operations Facilities
Exhibit 3.4	Overview of Typical Environmental Protection Activities, Decisions & Consultation - Group A B, and C Projects

An overview of the **Class EA Process** for Group A, B and C projects, showing the linkage between transportation engineering, environmental protection, consultation, documentation and bump-up, is presented in the following exhibits:

Exhibit 3.5	Overview of Class EA Process for Group A Projects Except New Freeways
Exhibit 3.6	Overview of Class EA Process for Group A New Freeway Projects

EXHIBIT 3.1

Overview of Typical Transportation Engineering Decisions & Consultation - *GROUPS A AND B LINEAR FACILITIES*

PLANNING STAGE (Chapter 4.5) **(not applicable to new freeways)**	**PRELIMINARY DESIGN STAGE (Chapter 4.6)**	**DETAIL DESIGN STAGE (Chapter 4.7)**
Purpose: Develop plan to design concept level of detail (typically at 1:10,000 scale)	**Purpose:** Develop plan to design criteria level of detail (typically at 1:2,000 or 1:1,000 scale)	**Purpose:** Develop plan to design implementation level of detail (typically at 1:500 scale), and develop construction documentation
Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation: Facility Type: – roadway (freeway vs. highway) – transitway technology (rail vs. bus etc.) – access control Basic plan and profile (including route location for Group A projects); design speed; typical project cross-section covering elements such as: – typical right-of-way requirements – number of lanes / tracks – median width and type Need / location / type of interchanges, intersections Need / location / type of transit stations (see Exhibit 3.3) Need / location of bridges & culverts	**Typical Transportation Engineering Decisions / Alternatives / Elements, And Issues for Consultation:** Calculated horizontal and vertical alignment, design speed & typical project cross-section covering elements such as: – typical right-of-way requirements – number of lanes / tracks – median width and type – shoulder type – ditches Need / location / type of : – interchanges & intersections – bridges & culverts (including span & width) – stormwater management facilities – illumination & traffic signals – safety infrastructure Staging of major work activities Agreements in principle for road assumptions, transfers, closures, & the resolution of major rail and utility conflicts	**Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation:** Calculated horizontal and vertical alignment and segment-specific cross-section details covering elements such as: – roadway, including shoulders, median, ramps – pavement – ditches – construction staging, detours, & construction access Surveyed structure & culvert location / span / width Details of illumination, traffic signals & safety infrastructure Application of project-specific standards, and calculation of quantities for all of the above items Signed agreements for road assumptions, transfers, closures & the resolution of major rail and utility conflicts Final property requirements

Notes: Project stages can be expanded /contracted/combined based upon project specifics. Transportation engineering decisions are balanced with environmental protection decisions (See Exhibit 3.4)

EXHIBIT 3.2

Overview of Typical Transportation Engineering Decisions & Consultation - *GROUP C LINEAR FACILITIES*

PLANNING STAGE (Chapter 4.5)	**PRELIMINARY DESIGN STAGE (Chapter 4.6)**	**DETAIL DESIGN STAGE (Chapter 4.7)**
Purpose of Stage: Develop plan to design concept level of detail (typically at 1:10,000 scale)	**Purpose of Stage:** Develop plan to design criteria level of detail (typically at 1:2,000 or 1:1,000 scale)	**Purpose of Stage:** Develop plan to design implementation level of detail (typically at 1:500 scale), and develop construction documentation
Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation: Basic plan of minor improvements FOR GROUP C PROJECTS, PLANNING IS FREQUENTLY COMBINED WITH PRELIMINARY DESIGN	**Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation:** Typical project cross-section covering elements such as: – typical right-of-way requirements – auxiliary & turning lanes – median width and type – shoulder type – ditches Type of minor improvements to : – interchanges & intersections – bridges & culverts (including span & width) – stormwater management system – illumination & traffic signals – safety infrastructure Staging of major work activities Agreements in principle for the resolution of major rail and utility conflicts	**Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation:** Segment-specific cross-section details covering elements such as: – roadway, including shoulders, median, ramps – pavement – ditches – construction staging & construction access Surveyed structure & culvert location / span / width Details of illumination, traffic signals & safety infrastructure Application of project-specific standards, and calculation of quantities for all of the above items Signed agreements for the resolution of major rail and utility conflicts Final property requirements

Notes: Project stages can be expanded /contracted / combined based upon project specifics. Transportation engineering decisions are balanced with environmental protection decisions (See Exhibit 3.4)

EXHIBIT 3.3

Overview of Typical Transportation Engineering Decisions & Consultation - *GROUP A, B AND C SERVICE, MAINTENANCE AND OPERATIONS FACILITIES*

PLANNING STAGE (Chapter 4.5)	**PRELIMINARY DESIGN STAGE (Chapter 4.6)**	**DETAIL DESIGN STAGE (Chapter 4.7)**
Purpose of Stage: Develop plan to design concept level of detail (typically 1:2,000 scale)	**Purpose of Stage:** Develop plan to design criteria level of detail (typically 1:1,000 scale)	**Purpose of Stage:** Develop plan to design implementation level of detail (typically at 1:500 scale), and develop construction documentation
Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation: Need / type of facility Site location (new facility only), considering: – visibility, accessibility – availability of utilities – difficult to bypass (truck inspection station) – maximum opportunity to support transportation system with minimum disruption	**Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation:** Need / location / type of site components: – connection with transportation system (ramps, roads, shipping lanes, transitway) – docking requirements (ferry ports), platform requirements (transitway) – buildings – internal roads – parking – illumination – safety infrastructure – auxiliary facilities (storage, washrooms, phones) Initial property acquisition plan Staging of major work activities	**Typical Transportation Engineering Decisions / Alternatives / Elements, and Issues for Consultation:** Detailed and surveyed site plan for all components Building architectural drawings Application of project-specific standards, and calculation of quantities for all of the above items Final property requirements

Notes: Project stages can be expanded / contracted / combined based upon project specifics. Transportation engineering decisions are balanced with environmental protection decisions (See Exhibit 3.4)

EXHIBIT 3.4

Overview of Typical Environmental Protection Activities, Decisions & Consultation - *GROUP A, B AND C PROJECTS*

PLANNING STAGE (Chapter 4.5.4) **(not applicable to new freeways)**	**PRELIMINARY DESIGN STAGE (Chapter 4.6.3)**	**DETAIL DESIGN STAGE (Chapter 4.7.3)**
Purpose of Stage: Develop plan to design concept level of detail (typically at 1:10,000 scale)	**Purpose of Stage:** Develop plan to design criteria level of detail (typically at 1:2,000 or 1:1,000 scale)	**Purpose of Stage:** Develop plan to design implementation level of detail (typically at 1:500 scale), and develop construction documentation
Typical Environmental Protection Activities: Identify environmental constraints to project objectives Identify environmental deficiencies (eg. Contaminated properties) Develop environmental protection strategies: – avoidance / prevention through Planning alternatives – environmental design strategies – environmental remediation strategies	**Typical Environmental Protection Activities:** Identify environmental constraints to design Develop environmental design concepts Develop environmental mitigation concepts Obtain agreements in principle for formal environmental approvals and permits	**Typical Environmental Protection Activities:** Identify environmental constraints to construction Complete/modify environmental design elements Complete/modify environmental mitigation Develop environmental construction constraints Sign agreements for formal environmental approvals and permits
Typical Environmental Protection Decisions / Alternatives / Elements, And Issues for Consultation: Avoidance / Prevention of: – footprint impacts – interference impacts	**Typical Environmental Protection Decisions / Alternatives / Elements, and Issues for Consultation:** Avoidance / Prevention / Control / Mitigation of: – footprint impacts – interference impacts – traffic access modification impacts Avoidance / Prevention of: – emissions impacts – timing impacts Compensation and Enhancement concepts	**Typical Environmental Protection Decisions / Alternatives / Elements, and Issues for Consultation:** Control / Mitigation of: – footprint impacts – interference impacts – traffic access modification impacts – emissions impacts – timing impacts Compensation and Enhancement details

Notes: The actual stage in which activities occur and decisions are made varies with project specifics. The principles for environmental protection and mitigation are provided in Chapter 4.2. Typical environmental protection and mitigation measures are outlined in Appendix 2.

EXHIBIT 3.5
Overview of Class EA Process For Group A Projects (Except For New Freeways)

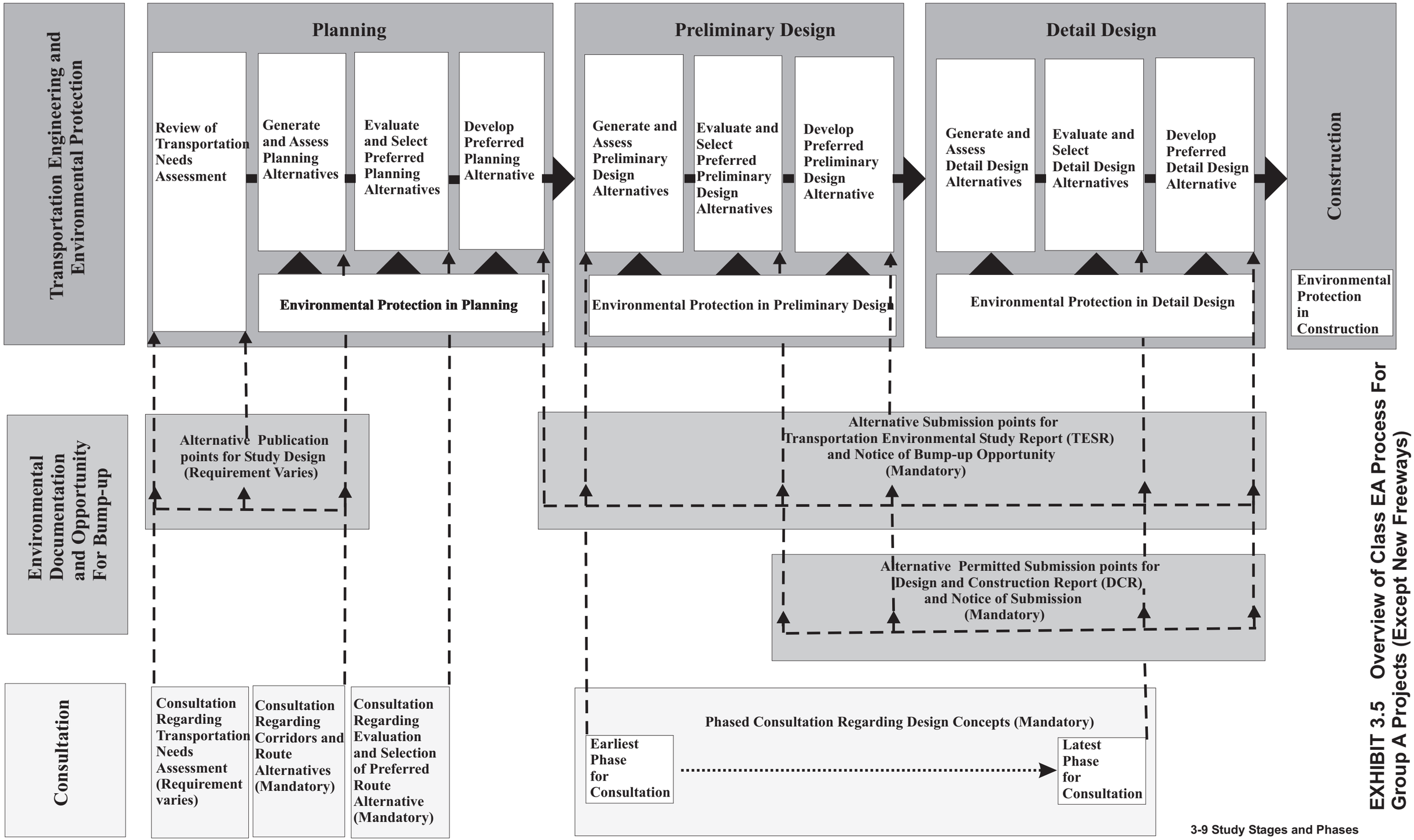


EXHIBIT 3.5 Overview of Class EA Process For Group A Projects (Except New Freeways)

EXHIBIT 3.6
Overview Of Class EA Process For Group A New Freeways

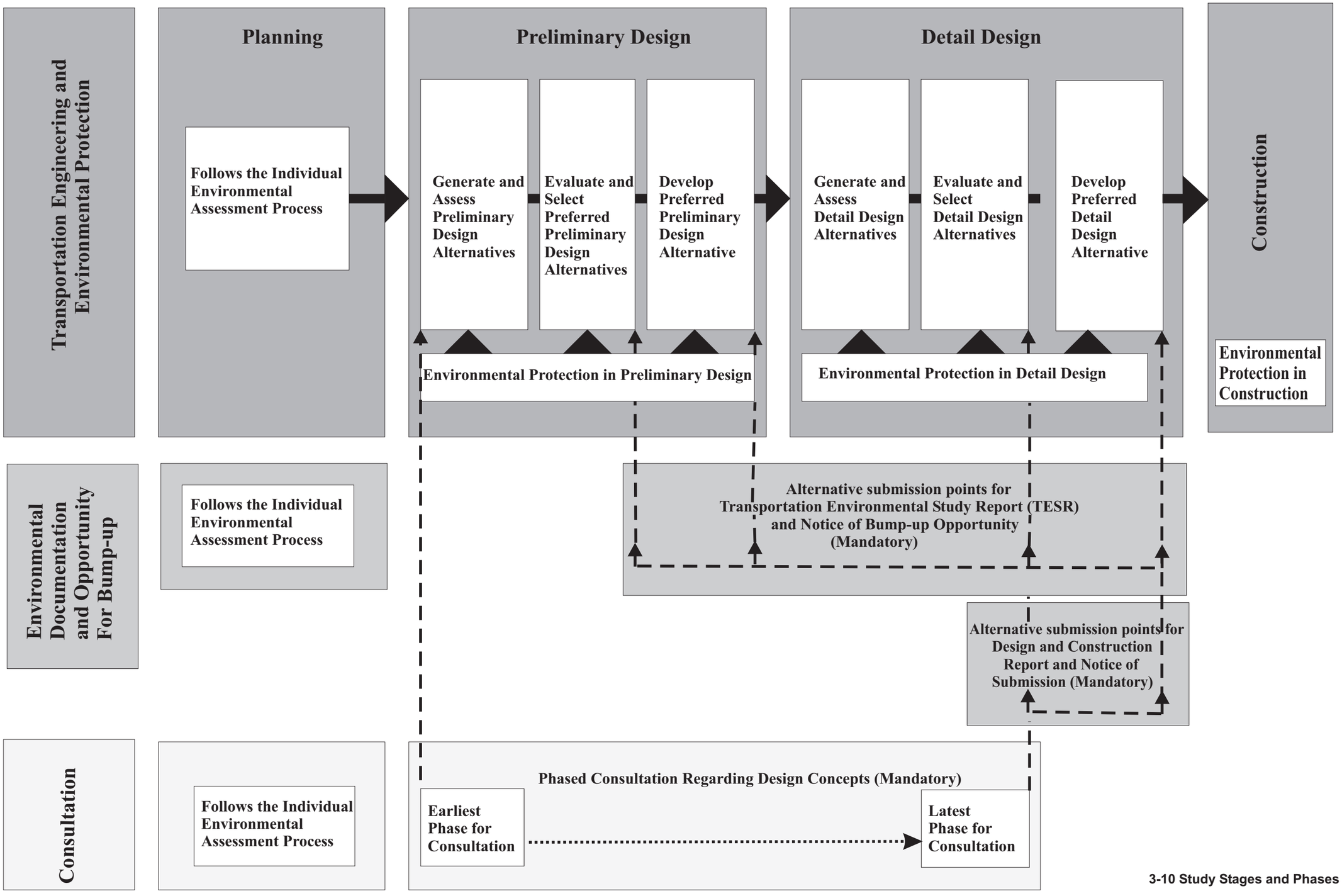
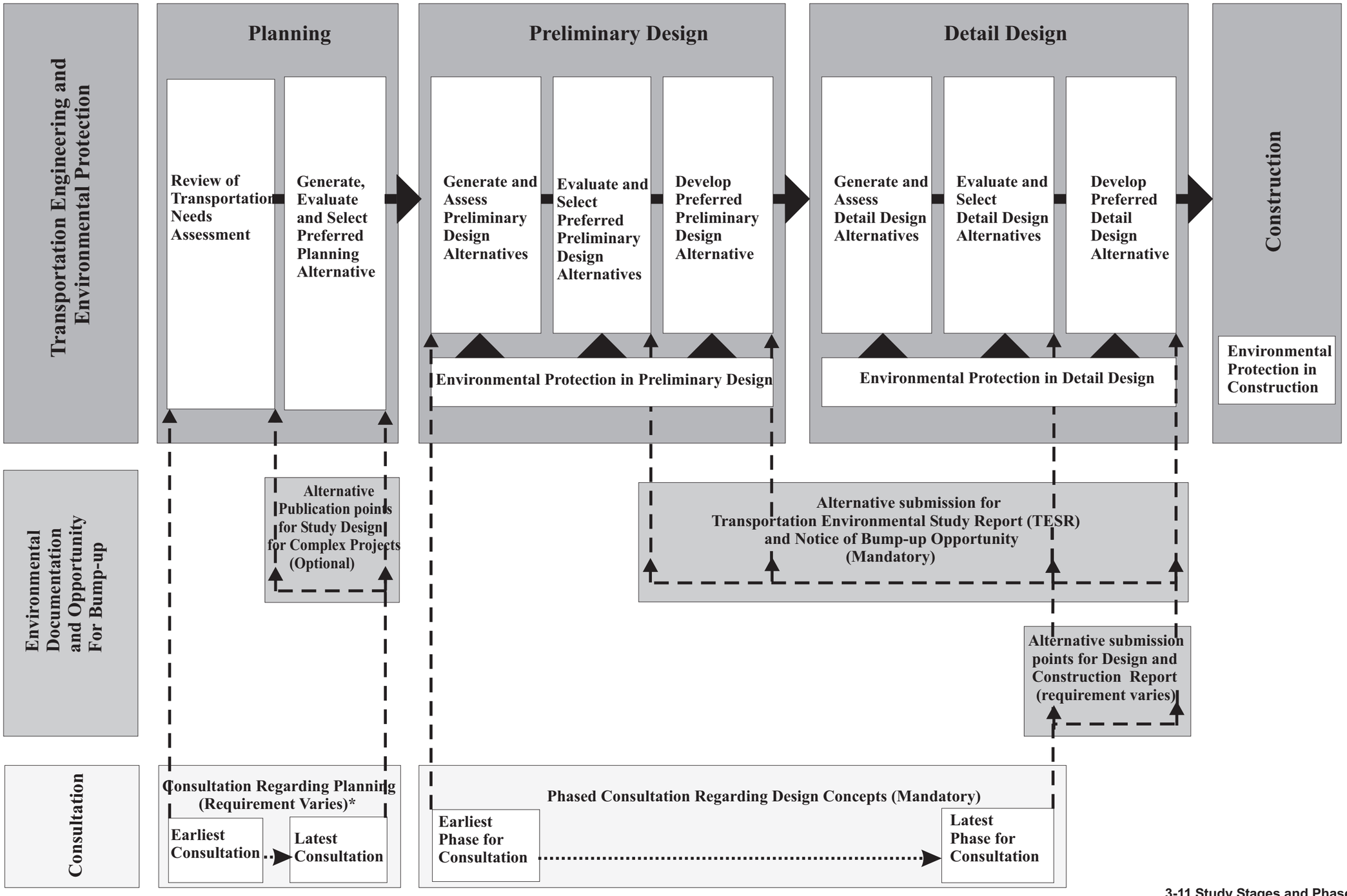


EXHIBIT 3.6 Overview Of Class EA Process For Group A New Freeways

EXHIBIT 3.7
Overview Of Class EA Process For Group B Projects



* Mandatory if a Study Design is prepared.

EXHIBIT 3.7 Overview Of Class EA Process For Group B Projects

EXHIBIT 3.8
Overview Of Class EA Process For Group C Projects

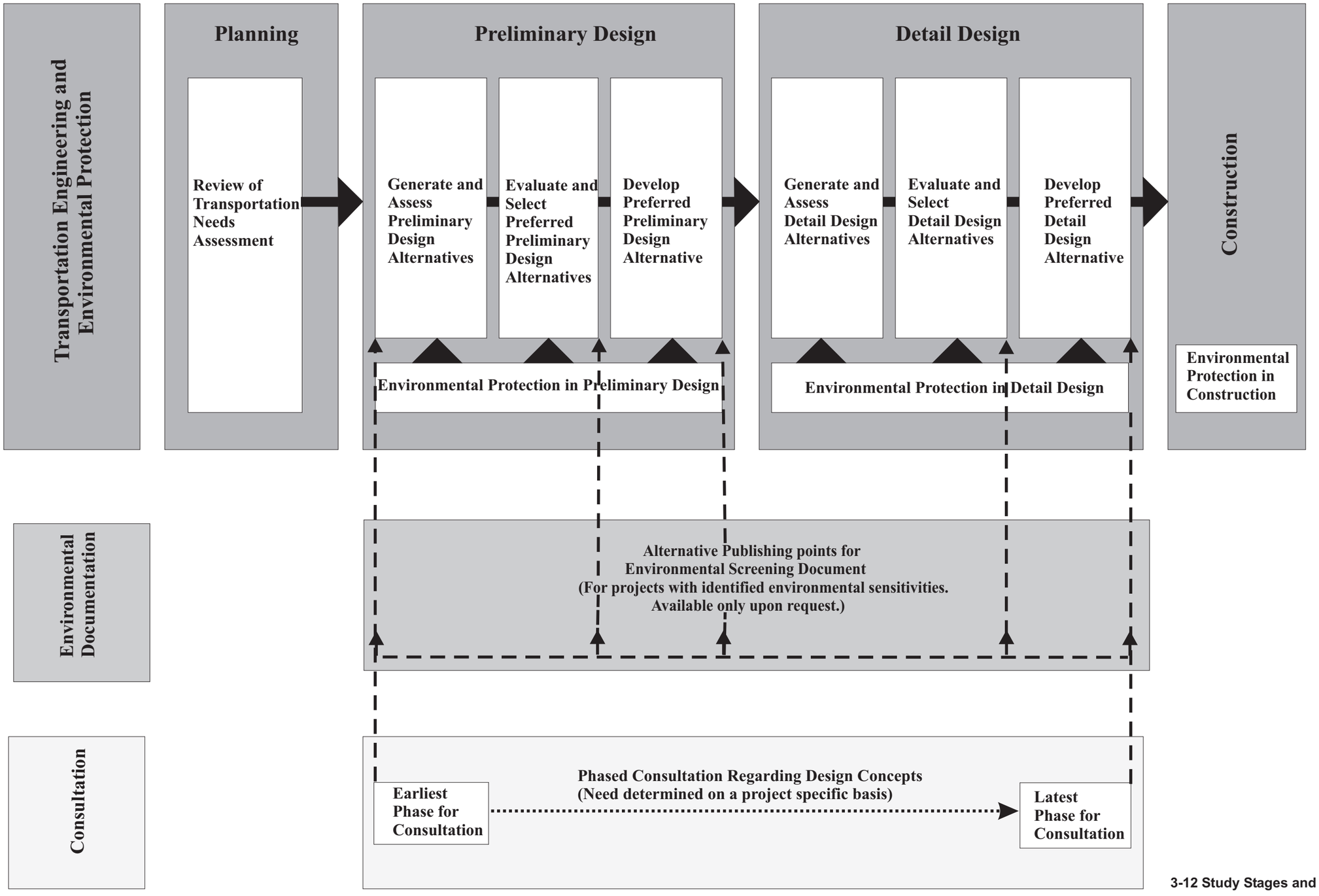


EXHIBIT 3.8 Overview Of Class EA Process For Group C Projects

CHAPTER 4

Transportation Engineering and Environmental Protection Principles and Processes

GROUP A, B AND C PROJECTS

Overview

This chapter outlines the principles and processes of transportation engineering and environmental protection for Group A, B and C projects.

These principles and processes are implemented within the framework of the study stages and phases outlined in Chapter 3 and in conjunction with the principles and processes for:

- consultation, as outlined in Chapter 5;
- documentation and bump-up, as outlined in Chapter 6;
- step-down for Group B projects, as outlined in Chapter 7; and
- environmental clearance, as outlined in Chapter 8.

4.1 Transportation Engineering Principles

GROUP A, B AND C PROJECTS

Study principles for transportation engineering provide an effective and safe transportation system

Transportation engineering planning and design decisions for provincial transportation facilities are based on the following principles:

- provide for the efficient movement of people and goods
- meet the needs of the travelling public as a whole, by maximizing opportunities for access and mobility
- address the identified transportation problems and opportunities, and maximize the opportunity to satisfy existing and future provincial travel demand
- reflect sound engineering judgement, site specific transportation engineering and/or environmental constraints, transportation demand, capacity of existing and future transportation facilities, traffic composition, trip length, population density and land development, and traffic habits of the overall transportation system users, in meeting or exceeding current provincial design standards and practices
- ensure compatibility with the existing and future provincial and municipal transportation system and system needs, and improve the level of service, safety and operation for the provincial transportation system users

- ensure consistency with other transportation facilities in the vicinity to ensure rational and predictable behaviour of users
- ensure the technical feasibility of construction, operation and maintenance
- minimize environmental impacts and the use of non-renewable natural resources such as aggregates
- minimize property requirements and impacts on adjacent properties
- minimize net energy usage of the transportation system
- avoid directing large volumes of long-distance provincial traffic through settlement areas
- maximize opportunities to make the facility Amore safe@
- in consideration of all of the above, provide the maximum benefit for the lowest cost (considering construction, maintenance and operation costs)

Related Information

Information on typical transportation engineering decisions is available in Exhibits 3.1, 3.2, and 3.3. The basis for such decisions is provided in Appendix 1

An overview of typical transportation engineering decisions on the basis of these principles for the Planning, Preliminary Design and Detail Design stages is provided in Exhibits 3.1, 3.2, and 3.3 in Chapter 3.

An outline of the technical basis for transportation engineering planning and design decisions is provided in Appendix 1.

The process by which these principles are applied in the generation and assessment of transportation engineering alternatives for each stage of a study is outlined in the following sections:

- Planning Chapter 4.5
- Preliminary Design Chapter 4.6
- Detail Design Chapter 4.7
- Construction Chapter 4.8

4.2 Environmental Protection Principles and Process

GROUP A, B AND C PROJECTS

4.2.1 Environmental Protection Principles

Environmental protection is based on the following principles:

Study principles provide for effective environmental protection

- conduct studies and/or projects with an inherent approach of avoiding or minimizing overall environmental impacts through consideration of alternatives
- identify existing environmental conditions and potential impacts relevant to the study and/or project
- meet the statutory duties and other requirements of federal and provincial environmental legislation
- meet the intent of government-approved policy and interministerial protocols
- address the Ministry of Transportation's Statement of Environmental Values
- balance environmental protection considerations with transportation engineering considerations during each stage of the study and/or project process, recognizing that safety and effectiveness of the transportation system is fundamental to such decisions
- recognize that it is seldom possible to satisfy all interests when making the tradeoffs necessary in the EA process, and that no single environmental factor is always "paramount"
- recognize that environmental mitigation measures themselves may have environmental impacts which offset their benefit
- provide mitigation effort in proportion to environmental significance and ability to reasonably mitigate
- monitor the implementation of environmental protection and mitigation measures during construction

Specific transportation projects are not the mechanism to develop or revise environmental policy.

NOTE:
The principle regarding government policies is generic in order to recognize the fact that specific government policies are subject to ongoing development and modification or cancellation.

4.2.2 Types of Impacts

Environmental impacts are determined by project type and complexity and by existing environmental conditions

Undertakings covered by this Class EA have a wide range of potential environmental impacts. These impacts are determined by the project type, size and complexity; and by the existing conditions for all aspects of the environment as it is defined in Section 1 of the Environmental Assessment Act. The potential environmental impacts can be generally categorized as follows:

- **"footprint" impacts** (to the area and its features), which are caused by physical intrusion of the transportation facility into adjacent lands, waterbodies, etc.;
- **"interference" impacts** (to the area and its features), which are caused by obstruction by the transportation facility to fish and wildlife passage, pedestrian access, water flow, light transmission, etc.;
- **"traffic access modification" impacts** (to property, neighbourhoods, commercial areas, etc.), which are caused by the closure or redirection of vehicular access to or from an area;
- **"emissions" impacts** (to air, water, soil, and utilization of same), which are caused by the release or escape from the transportation facility of noise, dust, sediment, chemicals, odours, light, etc.;
- **timing impacts** (relative to season, week, day, hour, duration), which relate to the timing of the footprint, interference, traffic access modification, and emissions impacts; and
- combinations of the above.

Environmental impacts may be caused by the physical design of the transportation facility, its construction and maintenance, and its operation and use

4.2.3 Identifying Environmental Conditions and Sensitivities

Sources of Information

Information on environmental conditions and sensitivities is gathered from a number of sources

Information on existing environmental conditions and sensitivities for a project may be gathered from sources such as the following:

- environmental inventories, databases, studies, reports, and other information held by government agencies, interest groups, and other proponents;
- environmental work conducted by other proponents in the area;
- knowledgeable members of the general public;
- owners of properties adjacent to the project; and
- field investigation and inventory conducted by the proponent.

Factors to be Addressed

A broad range of environmental factors may be addressed, depending upon project objectives and study area conditions:

A broad range of environmental factors may be addressed

- **Natural environment factors** may include wildlife, soils, ecosystem, vegetation, open space linkages, fisheries and aquatic habitat, ground water, surface water, and air quality, and as may be appropriate, the integrated assessment of same;
- **Social environment factors** may include community and recreation, aesthetics, highway and construction noise;
- **Economic environment factors** may include agriculture, commercial and industrial; and
- **Cultural environment factors** may include archaeology and heritage.

Assessing and Evaluating Environmental Impacts

Environmental impacts are assessed and evaluated based on the following:

- sensitivities identified;
- significance of expected condition changes/effects, level of effect, duration and certainty of effects;
- degree to which condition changes/effects can be mitigated (based on previous and concurrent experience); and
- degree of initial mitigation incorporated in the generation of alternatives.

4.2.4 Addressing Environmental Impacts

Environmental protection approaches range from avoidance and control to mitigation and monitoring

Approaches to Environmental Protection

A wide range of environmental protection measures are considered and utilized to address potential environmental impacts. Although project specifics have the greatest influence on their selection, the approaches to environmental protection can be generally categorized in order of *decreasing* preference, as follows:

- avoidance/prevention;
- control/mitigation (reducing the severity of environmental impacts);
- compensation (provision of "equivalent" or countervailing environmental features);
- enhancement (improvement over previous environmental conditions);
- environmental monitoring during construction; and
- combinations of the above.

Sources of Technical Information on Addressing Impacts

The technical approaches to environmental protection which may be considered on a project may be determined from sources such as:

- government environmental policy documents;
- manuals, guidelines, and standards prepared by government agencies and the proponent;

- standard environmental "good practice";
- consultation with government agencies, the public, and interest groups; and
- project-specific approaches developed by the proponent.

Related Information

Examples of typical environmental protection activities and decisions are available in Exhibit 3.4. Examples of environmental mitigation are available in Appendix 2

Exhibit 3.4 in Chapter 3 provides an overview of typical environmental protection activities and decisions for the Planning, Preliminary Design and Detail Design stages for Group A, B, and C projects.

Environmental protection and mitigation for each stage of a study is outlined in the following sections:

- Planning Section 4.5.4
- Preliminary Design Section 4.6.3
- Detail Design Section 4.7.3
- Construction Section 4.8.3

Environmental protection and mitigation for Group D activities is discussed in Chapter 9.

A broad range of potential environmental impacts and examples of environmental protection and mitigating measures that could be considered to address them during the Planning, Preliminary/Detail Design, and Construction stages of a project are provided in Appendix 2.

4.3 Evaluation Principles and Process

4.3.1 Evaluation Principles

The goal of any project carried out under this Class EA process is to satisfy the purpose of the undertaking, while striking a balance between transportation engineering and environmental protection principles. The evaluation process is established to assist the proponent in achieving this goal.

The evaluation process is based on the following guiding principles:

Study principles provide for effective evaluation

- The evaluation process must be *traceable*, *replicable*, and must be *understandable* by those who may be affected by the decisions.
- All relevant factors, including transportation engineering and environmental protection, will be given *due consideration*.
- The evaluation may be *subjective* (based on reasoned argument) or *objective* (using quantifiable data).
- For Group A projects, the proposed evaluation process in planning will be established through *consultation* with external stakeholders
- Factors may be refined from one stage of a project to the next.

4.3.2 Evaluation Process

Different evaluation approaches are appropriate for different types of projects

This Class EA does not prescribe a universal approach to evaluation, recognizing that different evaluation approaches are appropriate for different types of projects. The evaluation may be *subjective* (based on reasoned argument) or *objective* (using quantifiable data).

For Group A projects, the proposed evaluation process in planning will be a matter for consultation with external stakeholders.

Identifying Factors

As a part of the evaluation process, "factors" are used to measure the balance between transportation engineering and environmental protection

The transportation engineering factors will be project-specific and will incorporate principles of service and safety relevant to that particular project. The environmental factors will be derived from the definition of "environment" in the Environmental Assessment Act (see the Glossary in Appendix #5). The factors selected for each project will vary based on matters such as the character of the study area, the significance of effects, and the degree of concern expressed by stakeholders, including external agencies and the public. Both beneficial and detrimental environmental effects may be identified.

Considering the Factors

Weights may be assigned to factors

Efforts are made to understand the functions of the various factors and inter-relationships between factors. The environmental issues are considered in the context of the principles set out above and the guidelines discussed in Appendix #2. In order to ensure that appropriate consideration is given to the various factors and/or groups of factors, relative "weights" may be assigned to factors when a numeric evaluation process is utilized.

Refining Factors at Different Stages

The factor list may be refined as the study progresses

Factors considered at one stage of a study may not be appropriate at others.

At each decision point, the factor list may be refined by considering such matters as:

- the character of the alternatives under review
- the level of detail of the analysis
- the character of the potentially affected environment
- the types of potential effects of the alternatives
- consistency with other decision points in the process
- the purpose of the decision point
- EA process goals, objectives and principles

Indicators

Indicators are developed for each factor

In order to identify the effects on various factors, "indicators" are developed for each factor. Indicators are ways of identifying, describing, and measuring environmental impacts, costs and the level of service. Even if the same factor

is used throughout a study, the indicators may change to reflect the anticipated level of effect.

Related Information

The evaluation and selection process for each stage of a study is outlined in the following sections:

- preferred Transportation undertaking — Section 4.4.2
- preferred Planning alternative — Section 4.5.3
- preferred Preliminary Design alternative — Section 4.6.2
- preferred Detail Design alternative — Section 4.7.2
- preferred Construction alternative — Section 4.8.2

4.4 Transportation Needs Assessment Process

GROUP A, B AND C PROJECTS

Overview

The Transportation Needs Assessment process may lead to the initiation of transportation studies and/or improvements

The Transportation Needs Assessment process is part of the ongoing management and administration of the transportation system by the province and by others. It may result in a number of recommendations, including, but not restricted to, the recommendation to initiate a transportation study, to initiate major improvements, to initiate minor improvements, to initiate routine maintenance, to monitor the situation, or to do nothing. Because of this range of potential outcomes, the following provisions apply to the Transportation Needs Assessment process:

- The transportation needs assessment process is considered "research" and/or "feasibility study" work under the EA Act, and therefore is not subject to the EA process/public consultation requirements of the EA Act at the time it is conducted.
- *Where this process results in the decision to pursue Group A and/or Group B transportation studies,* the EA and public consultation processes of those studies are initiated through a review of the Transportation Needs Assessment findings, which then becomes a formal part of the study process conducted under this Class EA, or in the case of new freeway planning is conducted under the individual EA process.
- *Where this process results in the decision to pursue a Group C transportation study*, the Transportation Needs Assessment is typically not subject to public consultation, since minor improvements to existing provincial transportation facilities tend to be directly implemented and, through this Class EA, approved under the EA Act subject to environmental screening.

Transportation Needs Assessment is an ongoing process

Since the MTO is involved in work related to transportation needs assessment on an ongoing basis, the Transportation Needs Assessment process is not formally organized into phases. However, where a Group A, B, and/or C study is subsequently pursued, the Transportation Needs Assessment serves to:

- identify transportation problems and opportunities (see Section 4.4.1);
- evaluate and select reasonable "alternatives to" (see Section 4.4.2);
- develop provincial transportation facility study objectives – "the purpose of the undertaking" (see Section 4.4.3); and
- initiate the study process of the Group A, B and/or C project (see Section 4.4.4).

4.4.1 Identify Transportation Problems and Opportunities

Sources of Information

Transportation problems and opportunities are identified from one or more of the following sources:

- transportation network plans
- inventories of the provincial transportation system
- traffic, accident, service and maintenance data
- modelling/projection of future transportation demands and desires based upon planned future conditions, as articulated in official plans, etc.
- federal, provincial, and municipal agency liaison
- private industry initiatives
- other information sources and initiatives

Problems and Opportunities

Provincial transportation facility problems and opportunities include, but are not restricted to, the following:

- ***Problems (existing and future)***
  - transportation network and ancillary facility deficiencies
  - traffic capacity deficiencies
  - operational and safety deficiencies
  - infrastructure condition deficiencies
  - service and maintenance facility deficiencies

- ***Opportunities (existing and future)***
  - right-of-way designation/property protection to ensure availability of land for transportation purposes in developing areas
  - optimization of existing transportation infrastructure

- facility rehabilitation and/or preventative maintenance to avoid/delay replacement
- support of other government initiatives such as regional/economic development and tourism/resource access
- partnerships with other proponents to co-operatively address common problems and/or multiple objectives
- income generation and/or cost reduction

A variety of problems and opportunities may be addressed by a transportation study

Detailed information about these problems and/or opportunities is drawn together and articulated into "problem and opportunity statements" in order to evaluate "alternatives to" and to select the preferred transportation undertaking.

4.4.2 Evaluate "Alternatives To" and Select the Preferred Transportation Undertaking

Types of Alternatives

Provincial transportation "alternatives to" are considered to address international and/or inter-provincial and/or inter-regional long-distance, high-volume movement of people and goods, or access to remote areas

Provincial transportation alternatives assessed in specific projects will vary depending on the location, type and complexity of the project. The level of complexity usually relates to the nature of the study objectives, environmental sensitivities (natural, social, economic, cultural), and external interest or concern. "Alternatives to" which may be considered during the Transportation Needs Assessment phase include the following:

- ***The "do nothing" alternative:***

  The "do nothing" alternative maintains the status quo of transportation infrastructure and services with no significant actions being taken to either manage demand, expand infrastructure or improve operations. While the "do nothing" alternative will seldom address the problem/opportunity, its screening provides a baseline against which the effects of other alternatives can be compared. It also provides a way of determining whether any of the other "alternatives to" are worthwhile.

Provincial transportation facility "alternatives to" are addressed by this Class EA

- ***New and/or improved provincial transportation facility alternatives:***

  Provincial highway/freeway; transitway; ferry boat; and related service, maintenance and operations facility alternatives are Group A, B, and/or C projects as defined under this Class EA document (the specific group depends on whether they are new facilities or major/minor improvements to existing facilities). These are the alternatives that are usually most suitable for addressing problems/opportunities associated with international and/or inter-provincial and/or inter-regional, long distance, high volume travel, or for short and medium-distance access to remote areas. (Group D activities under this Class EA are not "alternatives to" the undertaking; rather, they are routine/ administrative/support activities).

Other "alternatives to" may not be able to address provincial transportation problems and opportunities

- ***New and/or improved air, rail, transit, and water based alternatives*** *(other than provincial transitways and/or provincial ferry boat services):*

  Air, rail, transit, and water transportation modes may be "alternatives to" addressing transportation problems/opportunities. However, where the study area has scattered travel origins and destinations and/or low traffic volumes, such alternatives are typically not a reasonable "alternative to" for addressing problems/opportunities associated with international and/or inter-provincial and/or inter-regional, long distance, high volume travel. In addition, for short and medium distances, such alternatives have lower flexibility of service, higher transportation time and material handling costs, than highways, freeways, and roads.

- ***New and/or improved municipal and private road alternatives:***

  Municipal and private roads may be "alternatives to" addressing transportation problems/opportunities. However, municipal and private roads are typically not a reasonable "alternative to" where the problems/opportunities are associated with transportation connections for international and/or inter-provincial and/or inter-regional, long distance, high volume travel. This is usually because such roads have design standards, access patterns, and functions which are incompatible with international/interprovincial/inter-regional, long distance, high volume transportation use.

- ***Transportation demand management alternative:***

  Transportation demand management alternatives reduce, shift or eliminate transportation demand to the point where there is no longer a need for improved transportation infrastructure/operation within the study area. Since this is a much broader public policy issue, it is typically not a reasonable project-specific "alternative to" for addressing transportation problems/opportunities.

Assessing Alternatives

"Alternatives to" are assessed against selection criteria

Each of these "alternatives to" is assessed against the following selection criteria:

- Does the alternative realistically address **all** of the problem/opportunity statements?
- Does the alternative, when used in combination with other alternatives, make a **significant** contribution towards realistically addressing all of the problem/opportunity statements?

Selecting the Preferred Alternative(s)

"Alternatives to" that satisfy the selection criteria are carried forward for further study

Only those alternatives which satisfy at least one of the above criteria are carried forward. More than one "alternative to" may be carried forward. For example, reasonable "alternatives to" for addressing a major capacity

deficiency may be a new highway, widening of an existing highway, or a combination of the two.

If reasonable "alternatives to" not covered by this Class EA are carried forward under other EA processes, the other EA study processes may in some instances be co-ordinated with those of a Group A, B or C study under the terms of this Class EA.

4.4.3 Develop Transportation Study Objectives and Study Area

A geographic study area is defined for the transportation study

Where it is determined that a reasonable "alternative to" meets the definition of a Group A, B or C project under this Class EA, it may be carried forward for study under the terms of this Class EA, or in the case of new freeway planning, the study would proceed as an individual EA. A preliminary geographic study area is defined that is large enough to provide for study of the reasonable "alternative to" but small enough to isolate the problems/ opportunities to be addressed.

The transportation needs assessment information is incorporated into a statement of objectives which becomes the basis and focus of subsequent study. This statement constitutes "the purpose of the undertaking" under the EA Act.

4.4.4 Study Initiation and Project Redesignation

Overall program priorities and funding will determine when a project can be carried forward. As a project progresses under the appropriate study process for a Group A, B, or C project, the scope/complexity of the proposed work may be modified to the point where the project should be redesignated to another EA Group and dealt with under that Group's process under this Class EA.

4.5 Transportation Engineering and Environmental Protection in Planning

GROUP A, B AND C PROJECTS

Overview

Planning develops a transportation plan at the design concept level of detail

The planning of Group A new freeway projects is carried out under the individual EA process. The planning of all other Group A projects, and for Group B and C projects, is carried out under the terms of this Class EA.

The purpose of the Planning stage for Group A, B and C projects is to develop a transportation plan to address the transportation needs at the concept level of detail. This is typically at a **1:10,000 scale**.

Planning decisions and alternatives are shown in Exhibits 3.1, 3.2, 3.3, and 3.4, and the Planning process is illustrated in Exhibits 3.5, 3.6, 3.7, and 3.8.

Compliance with Study Principles

Consultation is an integral component of transportation engineering and environmental protection in Planning

The Planning stage follows the transportation engineering principles, environmental protection principles, evaluation principles and processes, consultation principles and processes, documentation and bump-up principles and process, and project stages and phases principles, as outlined in Sections 4.1, 4.2 and 4.3 and Chapters 5, 6 and 3 respectively.

Planning for Group A Projects

The planning of Group A new freeway projects is carried out as an individual EA. The planning of all other Group A projects and for all Group B and C projects is carried out under the terms of this Class EA.

For Group A projects, because of the need to consider corridor and route alternatives, Planning is a detailed and comprehensive exercise which typically involves the following separate phases:

- review Transportation Needs Assessment
- generate and assess Planning alternatives
- evaluate and select the preferred Planning alternative
- develop the preferred Planning alternative

Planning for Complex Group B Projects

For complex Group B projects (e.g. twinning of an existing highway), there are usually a number of alternatives to consider in order to address the project objectives. Planning is less comprehensive than that of a Group A project, but still typically requires the following separate phases:

- review Transportation Needs Assessment
- generate, assess, evaluate and select the preferred Planning alternative (these four steps may be separated into discrete phases)

Planning for Low-Complexity Group B Projects and for Group C Projects

For low-complexity Group B projects (e.g. a new freeway median barrier) or for Group C projects, there are typically just a few or only one Planning alternative that can be considered to address the project objectives. Where these projects are initiated immediately after the Transportation Needs Assessment stage, Planning may simply take place during the latter part of the Transportation Needs Assessment. Otherwise, Planning may simply consist of a review of Transportation Needs Assessment at the beginning of the Preliminary Design stage. In general, Planning is conducted for only the portion(s) of such projects for which there are meaningful Planning alternatives.

4.5.1 Review Transportation Needs Assessment

GROUP A, B AND C PROJECTS

The Review of Transportation Needs Assessment brings that work into the Class EA process

At the initiation of Planning, the Transportation Needs Assessment work is reviewed to identify and assess the following information:

- transportation problems and opportunities
- study objectives
- reasonable "alternatives to" selected
- preliminary study area and corridors (where appropriate to the study)

This review may result in the Transportation Needs Assessment work being rejected, modified, refined, or confirmed.

In addition, the review of the Transportation Needs Assessment stage involves preliminary data gathering, analysis of environmental and transportation engineering existing conditions, and initial identification of environmental and transportation engineering constraints.

4.5.2 Generate and Assess Planning Alternatives

Sources of Information

The information to generate and assess Planning alternatives is typically obtained from the following sources:

- Transportation Needs Assessment documentation;
- transportation and environmental secondary source documentation, including the sources identified in Sections 4.4.1 and 4.2 respectively;
- transportation and environmental input through consultation with stakeholders (government agencies, the public, special interest groups, etc.); and
- field inspections and investigations, and transportation and environmental studies, as may be necessary to verify information, fill in information gaps, update information, and enhance information level of detail.

Typically, the study area "existing conditions" are gathered at an overview level, so that significant transportation engineering opportunities and significant transportation engineering and environmental constraints can be identified. The transportation information gathered covers transportation demand and network/infrastructure condition/deficiency information. The environmental information gathered covers the natural, social, economic and cultural environmental factors that are applicable to the project and study area. For Group A projects and for large and complex Group B projects, the gathering of the necessary information can be expected to require a significant amount of time and effort.

Compliance with study principles in Planning ensures a safe and effective transportation system

Compliance with Study Principles

The generation of Planning alternatives complies with the transportation engineering principles and environmental protection principles outlined in Sections 4.1 and 4.2 respectively, and the environmental protection process outlined in Section 4.5.4.

Planning Alternatives

Planning alternatives are "alternative methods" under the EA Act. Planning alternatives are considered during the generation of Planning alternatives in the following manner:

- the number of Planning alternatives considered for any given project varies with the nature of the study objectives, the type and complexity of the project, and the nature of the study area; and
- individual Planning alternatives are typically assembled into a variety of combinations for analysis and subsequent evaluation.

Principle for Generating Alternatives

Planning alternatives are generated to capitalize on transportation opportunities and avoid significant environmental features

The underlying principle for generating Planning alternatives is to capitalize on significant transportation engineering opportunities while protecting significant environmental features as much as possible.

To apply this principle, it is necessary to consider a number of possible approaches, including the examples shown below:

- ***For transportation engineering purposes:***
  - avoid a curvilinear highway if a straight highway can be achieved;
  - avoid areas of topographical extreme if flatter areas are available;
  - avoid areas of unstable soils if areas with stable soils are available;
  - avoid crossing valleys and water bodies at wide points if narrow points are available to accommodate a shorter bridge;
  - avoid intersections and private entrances to a highway if other effective access can be provided;
  - avoid areas where many road crossings or closings would be required, if areas with fewer road conflicts are available.

In generating Planning alternatives, transportation engineering and environmental protection factors are both considered

- ***For environmental protection purposes:***
  - avoid forest and wetland areas, possibly at the expense of isolated trees elsewhere;
  - avoid river and valley crossings at sensitive areas, possibly at the expense of crossing them at less sensitive areas;
  - avoid urban and commercial areas, possibly at the expense of isolated houses and businesses elsewhere;
  - avoid developed properties, usually at the expense of undeveloped properties elsewhere;
  - avoid areas of prime agricultural land and high capital investment, possibly at the expense of marginal agricultural land and investment elsewhere;

- avoid areas of multiple property disturbances if areas of less property disturbance are available.

In some cases, new information becomes available during the generation and assessment of Planning alternatives that prompts a re-evaluation of the "alternatives to" carried forward from the Transportation Needs Assessment.

Generating Planning Alternatives for Linear Facilities

To generate Planning alternatives for Group A, B and C linear facilities, the following factors may be considered:

- Facility Type:
  - roadway (freeway vs. highway)
  - transitway technology (rail vs. bus, etc.)
  - access control

- Basic plan and profile (including route location for Group A projects); design speed; typical project cross-section covering elements such as:
  - typical right-of-way requirements
  - number of lanes/tracks
  - median width and type

- Need/location/type of interchanges, intersections
- Need/location/type of transit stations
- Need/location of bridges and culverts

In generating alternative corridors (linear areas within which one or more route alternatives may be considered) and routes for Group A projects, the following may apply:

- Preliminary corridors may be identified as part of the Transportation Needs Assessment stage.
- Multiple corridors may be associated with projects which have study areas of large size and/or complexity.
- During route generation, corridors may be modified and portions of routes may be developed outside the originally-identified corridors.
- Cross-links between corridors and/or routes may be generated in order to provide the possibility of connecting the best portions of different route alternatives.
- For some Group A projects, corridor and route alternatives will include, or be co-ordinated with, improvements to portions of existing provincial transportation facilities. Such improvements may be an integral portion of a Group A project, as well as being a separate group B or C project which is justified, studied, and implemented on its own.

Generating Planning Alternatives for Service, Maintenance and Operations Facilities

In generating Planning alternatives for Group A, B and C service, maintenance and operations facilities, the following factors may be considered:

- Need/type of facility
- Site location (new facility only):
  - visibility, accessibility
  - availability of utilities
  - ease/difficulty of bypassing (truck inspection station)
  - maximum opportunity to support transportation system with minimum disruption

Assessing Planning Alternatives

Planning alternatives are assessed for both transportation engineering and environmental protection aspects

The assessment of Planning alternatives complies with the transportation engineering principles and environmental protection principles outlined in Sections 4.1 and 4.2 respectively, in conjunction with the environmental protection process and consultation principles and process outlined in Section 4.5.4 and Chapter 5 respectively.

The purpose of assessing Planning alternatives is to:

- identify significant beneficial and detrimental aspects of each Planning alternative relative to both transportation engineering and environmental protection;
- ensure that sufficient transportation engineering and environmental protection information is available to support the subsequent evaluation phase;
- obtain transportation engineering and environmental protection input through consultation with stakeholders for the subsequent evaluation phase;
- make any necessary modifications to Planning alternatives as a result of the above; and
- ensure that any alternative carried forward will be acceptable to the proponent if the evaluation phase determines it to be the preferred Planning alternative.

4.5.3 Evaluate Planning Alternatives and Select the Preferred Planning Alternative

Compliance with study principles provides for effective evaluation in Planning

Compliance with Study Principles

Evaluation and selection of Planning alternatives complies with the evaluation principles in Section 4.3 in conjunction with the transportation engineering principles, environmental protection principles, environmental protection process, and consultation principles and process outlined in Sections 4.1, 4.2 and 4.5.4 and Chapter 5 respectively.

The Purpose and Process of Evaluation

In this phase, the Planning alternatives that have been generated are subjected to a comparative evaluation to provide the basis for selection of a preferred Planning alternative. In some cases, it is determined during the evaluation phase that Planning alternatives should be modified or discarded, additional Planning alternatives should be generated, or that additional engineering and/or environmental work is necessary to support the evaluation.

For Group A projects, and for complex Group B projects, factor weightings may be utilized. On very large or complex studies, weightings may vary across a study area depending upon local conditions/sensitivities. On smaller or less complex studies, such differences are typically accounted for in the scoring/rating exercise.

Evaluating Group A Planning Alternatives

The evaluation process for Group A projects is typically complex and comprehensive. The following is an example of a typical comparative evaluation process for Group A linear facilities:

- Determine a sequence for evaluating the route alternative segments (portions of route alternatives defined by intersection points with other route alternatives).
- Develop final weightings for transportation and environmental factor groups and factors within those groups.
- Conduct a comparative analysis of transportation benefits and environmental effects for each route alternative segment based on the factors, the factor weightings and the factor indicators that were utilized to organize the factor information.
- Conduct a comparative evaluation of "paired" route segments (route segments defined by common intersection points) and aggregations of paired route segments (also having common intersection points) based on the route segment analysis. Any route alternative segment that is considered the *only viable option* in a section of a study area is excluded from the evaluation process.

Evaluating Complex Group B Planning Alternatives

For complex Group B projects and Group A ferryboat terminal projects, a similar evaluation process may be followed:

- Determine a sequence for evaluating the Planning alternatives.
- Develop weightings for transportation and environmental factor groups and factors within those groups.
- Conduct a comparative analysis of transportation benefits and environmental effects for each Planning alternative based on the factors, the factor weightings and the factor indicators that were utilized to collect study area information.
- Conduct a comparative evaluation for each Planning alternative.

Evaluating Simple Group B and Group C Planning Alternatives

For simple Group B projects and for Group C projects, the evaluation process for Planning is typically "subjective" in nature, using professional judgement.

Selecting the Technically Preferred Group A, B and C Planning Alternative

The preferred Planning alternative achieves the best overall balance of transportation objectives and environmental protection

The selection process includes the following steps:

- Alternatives that have significant detrimental environmental effects but no significant transportation engineering advantages will be screened out first.
- The remaining alternatives will be assessed to determine their ability to address the study transportation objectives and to identify their environmental impacts after reasonable mitigating measures are applied.
- The net environmental effects (i.e. after applying the conceptual mitigation measures for significant effects) will be used as a basis to compare alternatives.

The technically preferred Planning alternative is selected as the aggregate of Planning alternatives that achieves the **best overall balance** of transportation engineering objectives, individual environmental factor impacts, and overall environmental impact, including input that has been received through consultation on those issues.

This decision is made by the proponent. However, consultation with stakeholders on transportation engineering and environmental protection issues may result in the modification or even re-examination of the technically preferred alternative.

4.5.4 Environmental Protection in Planning

Compliance with Study Principles

Compliance with study principles provides for effective environmental protection in Planning

Environmental protection in Planning complies with the environmental protection principles in Section 4.2 in conjunction with the transportation engineering principles, evaluation principles and process, and consultation principles and process outlined in Sections 4.1 and 4.3 and Chapter 5 respectively. Typical environmental protection and mitigating measures in Planning are outlined in Appendix #2.

Environmental protection during Planning usually involves the following steps:

- Identify environmental features that are threatened by project objectives.
- Identify significant environmental deficiencies (e.g. contaminated property).
- Develop environmental protection strategies.

Environmental protection in Planning is primarily through avoidance

The typical strategies for environmental protection in Planning are to avoid and/or prevent footprint impacts and interference impacts. The greatest opportunity to carry out these strategies is in the generation of Planning alternatives.

Environmental Protection during Generation of Planning Alternatives

During generation of Planning alternatives, environmental protection is achieved primarily by avoiding as many areas of high environmental sensitivity as is reasonably possible with a (for most projects under this Class EA) functional linear facility. The greatest opportunity for such avoidance typically rests with route generation considerations such as those presented below:

(Note: these are illustrative only and vary with project specifics)

- ***Natural Environment***
  - minimize impacts to natural areas by either following edges of natural areas and/or crossing natural areas at the narrowest or least sensitive location
  - minimize the number of river and stream crossings
- ***Social Environment***
  - avoid interference impacts by avoiding routing through urban areas and clustered rural settlements
  - minimize direct impacts to property by following lot/concession/ field lines or existing rights-of-way
- ***Economic Environment***
  - avoid disrupting viable agricultural fields with the right-of-way by following lot, concession and field lines
  - avoid high-investment, intensive operating areas of farms and other businesses
  - minimize fragmentation of designated prime agricultural land
- ***Cultural Environment***
  - avoid registered and unregistered cemeteries which have been identified and documented
  - avoid routing through or immediately adjacent to heritage features of high and moderate significance
  - avoid known archaeological sites of extreme significance

Environmental protection in Planning is part of the generation of alternatives, selection of the preferred alternative, and development of the plan

Environmental Protection During Selection of Planning Alternative

During evaluation of alternatives and selection of the preferred Planning alternative, environmental protection measures include:

- screening out Planning alternatives that have significant environmental effects but no significant transportation engineering advantages; and

- selecting the Planning alternative which has the best overall balance between transportation engineering benefit and environmental impact minimization.

Environmental Protection during Development of Planning Alternative

During development of the preferred Planning alternative (development of the route plan for Group A projects), environmental protection measures include:

- refining the preferred Planning alternative to prevent or reduce impacts through measures such as horizontal and vertical alignment shifts; modification of interchange type; and refinement of valley, river, and wetland crossings; and

- identification of environmental work to be conducted during the subsequent Preliminary/Detail Design stages, such as the following:
  - stormwater management planning to address water quality, water quantity and erosion concerns
  - preconstruction archaeology surveys and salvage of known significant sites
  - studies of natural environmental factors such as fisheries, wetlands, wildlife and plant habitat; vulnerable, threatened and endangered species
  - studies to address protection of high investment agricultural infrastructure
  - decommissioning of contaminated property acquisitions
  - detailed noise studies in noise sensitive areas
  - structural planning studies to address watercourse and valley crossing concerns
  - development of mitigation plans for impacts on historic buildings

4.5.5 Develop the Preferred Planning Alternative

Compliance with Study Principles

Development of the preferred Planning alternative complies with the transportation engineering principles, environmental protection principles, environmental protection process, and consultation principles and process outlined in Sections 4.1, 4.2 and 4.5.4 and Chapter 5 respectively.

The Planning Package

Typical elements of the plan are outlined in Exhibits 3.1, 3.2, and 3.3

Development of the preferred Planning alternative (the route plan for Group A projects) involves refinement of the technically preferred planning alternative and the production of a Planning package. This package typically includes:

- a concept-level "mapping" of the preferred Planning alternative, typically at the 1:10,000 scale;
- a description of the major transportation engineering and environmental protection concepts;
- a description of how the preferred plan has achieved the identified transportation engineering and environmental protection objectives;
- recommendations for subsequent Preliminary Design transportation engineering and environmental protection work and for splitting the project into appropriate Preliminary Design projects.

Environmental avoidance measures are an integral part of the Planning package (See Exhibit 3.4)

The typical elements of the plan are outlined in Exhibits 3.1, 3.2, 3.3, and 3.4. During the development of the plan, these elements are refined with stakeholder input through consultation.

In some cases, it is determined that additional engineering and/or environmental work is necessary to complete the development of the preferred Planning alternative. The final Planning package should have sufficient detail to carry out the Preliminary Design without significant changes being required.

4.6 Transportation Engineering and Environmental Protection in Preliminary Design

GROUP A, B AND C PROJECTS

Overview

Preliminary Design develops a transportation plan at the design criteria level of detail

The Preliminary Design process is much like the Planning process, but is conducted on a more detailed scale. The purpose of the Preliminary Design stage of Group A, B and C projects is to develop a transportation plan to the design criteria level of detail. This is typically at a **1:2,000 or 1:1,000 scale**. If a Planning study was carried out for the project, Preliminary Design also involves the refinement and further development of that work. Transportation engineering and environmental constraints must be addressed at a level of detail that is specific enough to ensure that it is environmentally, technically and economically feasible to construct the project.

For Group A new freeway projects, Preliminary Design is the first stage that is eligible to be conducted under the terms of this Class EA. Since the Class EA and Individual EA processes provide a similar level of environmental protection, accountability and consultation, this decision is made by the proponent based on project efficiencies and program delivery demands.

Preliminary Design decisions and alternatives are shown in Exhibits 3.1, 3.2, 3.3, and 3.4, and the Preliminary Design process is illustrated in Exhibits 3.5, 3.6, 3.7, and 3.8.

Compliance with Study Principles

Consultation is an integral component of transportation engineering and environmental protection in Preliminary Design

The Preliminary Design stage follows the transportation engineering principles, environmental protection principles, evaluation principles and processes, consultation principles and processes, documentation and bump-up principles and process, and project stages and phases principles, as outlined in Sections 4.1, 4.2 and 4.3 and Chapters 5, 6 and 3 respectively.

Preliminary Design for Group A Projects and Complex Group B Projects

For Group A projects and complex Group B projects, Preliminary Design is a detailed and comprehensive exercise which typically involves the following separate phases:

- generate and assess Preliminary Design alternatives
- evaluate and select the preferred Preliminary Design alternative
- develop the preferred Preliminary Design alternative

Preliminary Design for Low-Complexity Group B Projects and for Group C Projects

For low-complexity Group B projects or for Group C projects, there may be just a few or only one Preliminary Design alternative that can be considered to address the project objectives. Where these projects are initiated immediately after the Planning stage, Preliminary Design may simply take place during the latter part of Planning. Otherwise, Preliminary Design may simply be a component of the generation of alternatives at the beginning of Detail Design. In general, Preliminary Design is conducted for only the portion(s) of such projects for which there are meaningful Preliminary Design alternatives.

4.6.1 Generate and Assess Preliminary Design Alternatives

Sources of Information

The information needed to generate and assess Preliminary Design alternatives is typically obtained from the following sources:

- Transportation Needs Assessment and Planning documentation;
- transportation and environmental secondary source documentation, including the sources identified in Sections 4.4.1 and 4.2 respectively;
- transportation and environmental input through consultation with stakeholders (government agencies, the public, special interest groups, etc.); and

- field inspections and investigations and transportation and environmental studies as may be necessary to verify information, fill in information gaps, update information, and enhance information level of detail.

Typically, the study area "existing conditions" are gathered at a level that is detailed enough to permit transportation engineering opportunities, and transportation engineering and environmental constraints to be incorporated into the Preliminary Design. The transportation information gathered may include transportation demand, network deficiencies, and infrastructure condition/deficiencies/requirements covering elements such as roadway surface, bridges and culverts, lighting and electrical systems, drainage, traffic safety and control systems, and service/maintenance/operations facilities. The environmental information gathered covers the natural, social, economic and cultural environmental factors that are applicable to the project and study area.

For Group A projects and for large and complex Group B projects, the gathering of information is typically carried out to fill in information gaps, update information and enhance the information level of detail acquired during the Planning stage. For low-complexity Group B projects and for Group C projects which have few Planning alternatives, this may be the first time that such information is gathered, since there may have been little or no Planning stage.

Compliance with study principles in Preliminary Design provides for an effective and safe transportation system

Compliance with Study Principles

The generation of Preliminary Design alternatives complies with the transportation engineering principles outlined in Section 4.1 in conjunction with the environmental protection principles and the environmental protection process outlined in Sections 4.2 and 4.6.3 respectively.

Preliminary Design Alternatives

As with Planning alternatives, Preliminary Design alternatives are "alternative methods" under the EA Act. Typical Preliminary Design alternatives are considered during the generation of Preliminary Design alternatives in the following manner:

- the number of Preliminary Design alternatives considered for any given project varies with the nature of the study objectives, the type and complexity of the project, and the nature of the study area; and
- individual Preliminary Design alternatives are typically assembled into a variety of combinations for analysis and subsequent evaluation.

Preliminary Design alternatives are generated to capitalize on transportation engineering opportunties, to avoid significant environmental features, and/or to minimize design-related environmental impacts

Principles for Generating Alternatives

There are two underlying principles for generating Preliminary Design alternatives:

- to capitalize on significant transportation engineering opportunities, and avoid significant transportation engineering and environmental constraints (as is the case with Planning); *and*
- to minimize the design-related impacts caused where significant transportation engineering and environmental constraints cannot be avoided.

Examples of the application of the first principle for both transportation engineering and environmental protection are outlined in Section 4.5.2.

To apply the second principle, it is necessary to consider a number of possible approaches, including the examples shown below:

- ***For transportation engineering purposes:***
  - keep curves in a highway to appropriate engineering standard if a straight highway cannot be achieved;
  - reduce gradients through cuts and fills if areas of steep slopes cannot be avoided;
  - develop means to cross areas of unstable soils if they cannot be avoided;
  - develop cost-effective crossing/bridge plans if a wide valley and water body crossings cannot be avoided;
  - ensure that safe and effective intersections and private entrances to a highway can be achieved where they must be provided;
  - develop cost-effective crossing solutions at areas of road conflict if such conflicts cannot be avoided.

- ***For environmental protection purposes:***
  - minimize intrusion into forest and wetland areas and consider measures to protect isolated trees elsewhere;
  - minimize intrusion into river and valley crossings when crossing at sensitive areas;
  - minimize intrusion into urban and commercial areas and consider measures to minimize impacts to isolated houses and businesses;
  - minimize intrusion into both developed and undeveloped properties;
  - minimize intrusion into areas of prime agricultural land and high capital investment.

In generating Preliminary Design alternatives, transportation engineering and environmental protection factors are both considered

In some cases, new information becomes available during the generation and assessment of Preliminary Design alternatives that prompts a re-evaluation of the technically preferred Planning alternative.

Generating Preliminary Design Alternatives for Linear Facilities

To generate Preliminary Design alternatives for Group A, B and C linear facilities, the following factors may be considered:

- Calculated horizontal and vertical alignment, design speed and typical project cross-section covering elements such as:
  - typical right-of-way requirements
  - number of lanes/tracks
  - median width and type
  - shoulder type
  - ditches

- Need/location/type of elements such as:
  - interchanges and intersections
  - bridges and culverts (including span & width)
  - stormwater management facilities
  - illumination and traffic signals
  - safety infrastructure

Generating Preliminary Design Alternatives for Service, Maintenance and Operations Facilities

In generating Preliminary Design alternatives for Group A, B and C service, maintenance and operations facilities, the need/location/type of the following site components may be considered:

- connection with transportation system (ramps, roads, shipping lanes, transitway)
- docking requirements (ferry ports), platform requirements (transitway)
- buildings
- internal roads
- parking
- illumination
- safety infrastructure
- auxiliary facilities (e.g. storage, washrooms, phones)

Assessing Preliminary Design Alternatives

Preliminary Design alternatives are assessed for both transportation engineering and environmental protection aspects

The assessment of Preliminary Design alternatives complies with the transportation engineering principles outlined in Section 4.1 in conjunction with the environmental protection principles, environmental protection process and consultation principles and process outlined in Sections 4.2 and 4.6.3 and Chapter 5 respectively. The purpose of the assessment of Preliminary Design alternatives is to:

- identify significant beneficial and detrimental aspects of each Preliminary Design alternative relative to both transportation engineering and environmental protection;

- ensure that sufficient transportation engineering and environmental protection information is available to support the subsequent evaluation phase;
- obtain transportation engineering and environmental protection input through consultation with stakeholders for the subsequent evaluation phase;
- make any necessary modifications to Preliminary Design alternatives as a result of the above; and
- ensure that any alternative carried forward will be acceptable to the proponent if the evaluation phase determines it to be the preferred Preliminary Design alternative.

4.6.2 Evaluate Preliminary Design Alternatives and Select the Preferred Preliminary Design Alternative

Compliance with study principles provides for effective evaluation in Preliminary Design

Compliance with Study Principles

Evaluation and selection of Preliminary Design alternatives complies with the evaluation principles in Section 4.3 in conjunction with the transportation engineering principles, environmental protection principles, environmental protection process, consultation principles and process outlined in Sections 4.1, 4.2 and 4.6.3 and Chapter 5 respectively.

The Purpose and Process of Evaluation

In this phase, the Preliminary Design alternatives that have been generated are subjected to a comparative evaluation to provide the basis for selection of a preferred Preliminary Design alternative. In some cases, it is determined during the evaluation phase that Preliminary Design alternatives should be modified or discarded, additional Preliminary Design alternatives should be generated, or additional engineering and/or environmental work is necessary to support the evaluation.

Evaluating Group A and Complex Group B Preliminary Design Alternatives

The following is an example of a typical evaluation process for Group A projects and complex Group B projects:

- Determine a sequence for evaluation of the Preliminary Design alternatives;
- Develop weightings for transportation and environmental factor groups and factors within those groups;
- Conduct a comparative analysis of transportation benefits and environmental effects for each Preliminary Design alternative based on the factors, the factor weightings, and the factor indicators that were utilized to organize the factor information;
- Conduct a comparative evaluation for each Preliminary Design alternative.

Evaluating Simple Group B and Group C Preliminary Design Alternatives

For simple Group B projects and for Group C projects, the evaluation process for Preliminary Design is typically "subjective" in nature, using professional judgement.

Selecting the Technically Preferred Group A, B and C Preliminary Design Alternative

The preferred Preliminary Design alternative achieves the best overall balance of transportation objectives and environmental protection

The selection process includes the following steps:

- Preliminary Design alternatives that have significant environmental effects but no significant transportation engineering advantages will be screened out first;
- Remaining alternatives will be assessed to determine their ability to address the study transportation objectives and to identify their environmental impacts after application of reasonable mitigating measures;
- The net environmental effects (i.e. after applying conceptual mitigation measures for significant effects) will be used as a basis to compare alternatives.

The technically preferred Preliminary Design alternative is selected as the aggregate of Preliminary Design alternatives that achieves the **best overall balance** of transportation engineering, individual environmental factor impacts, and overall environmental impact, including any input that has been received through consultation on those issues.

This decision is made by the proponent. However, consultation with stakeholders on transportation engineering and environmental protection issues may result in the modification or even re-examination of the technically preferred alternative.

4.6.3 Environmental Protection in Preliminary Design

Compliance with Study Principles

Compliance with study principles provides for effective environmental protection in Preliminary Design

Environmental protection in Preliminary Design complies with the environmental protection principles in Section 4.2 in conjunction with the transportation engineering principles, evaluation process, and consultation principles and process outlined in Sections 4.1 and 4.6.2 and Chapter 5 respectively. Typical environmental protection and mitigating measures in Preliminary Design are outlined in Appendix #2.

Environmental protection during Preliminary Design usually involves the following steps:

- identify environmental features that are threatened by project objectives (as with Planning); plus
- develop environmental design concepts, such as a retaining wall to preserve a row of trees;

- develop environmental mitigation concepts, such as signage to indicate a tourist area that has been bypassed; and
- obtain agreement in principle for formal environmental approvals and permits (e.g., as required for significant modification of fish habitat).

Environmental protection in Preliminary Design is through avoidance, environmental design, and environmental mitigation

The typical strategies for environmental protection in Preliminary Design are:

- to avoid/prevent footprint and interference impacts (as is the case with Planning); plus
- to control/mitigate footprint and interference impacts, where they cannot be avoided;
- to avoid/prevent/control/mitigate traffic access modification impacts;
- to avoid/prevent emissions and timing impacts; and
- to provide compensation and enhancement.

Environmental Protection during Generation of Preliminary Design Alternatives

During generation of Preliminary Design alternatives, environmental protection is achieved through:

- avoidance (as with planning, but at a higher level of detail); and
- environmental design and mitigation (as with detail design, but at a lesser level of detail).

The opportunities for avoidance typically rest with considerations such as those for environmental protection in Planning. Examples of such ***avoidance*** considerations are presented below:

(Note: these are illustrative only and vary with project specifics)

- ***Natural Environment***
  - minimize impacts to natural areas by either following edges of natural areas and/or crossing natural areas at the narrowest or least sensitive location
  - minimize the number of river and stream crossings

- ***Social Environment***
  - avoid interference impacts by avoiding routing through urban areas and clustered rural settlements
  - minimize direct impacts to property by following lot/concession/ field lines or existing rights-of-way

- ***Economic Environment***
  - avoid fragmenting viable agricultural fields with the right-of-way by following lot, concession and field lines
  - avoid high-investment, intensive operating areas of farms and other businesses

- ***Cultural Environment***
  - avoid registered and unregistered cemeteries which have been identified and documented
  - avoid routing through or immediately adjacent to heritage features of high and moderate significance
  - avoid known archaeological sites of extreme significance

Examples of ***environmental design and mitigation*** considerations are presented below:

(Note: these are illustrative only and vary with project specifics)

- ***Natural Environment***
  - reduce the impacts to natural areas by minimizing intrusion into natural areas that cannot be avoided
  - avoid placing bridge piers in the watercourse at river and stream crossings

- ***Social Environment***
  - minimize intrusion into urban areas and clustered rural settlements that cannot be avoided
  - minimize intrusion into and "buyouts" of properties that cannot be avoided

- ***Economic Environment***
  - minimize intrusion into prime agricultural fields which cannot be avoided
  - replace high-investment, intensive operating areas of farms and other businesses that are taken out

- ***Cultural Environment***
  - avoid portions of cemeteries where graves are located, if the cemetery cannot be completely avoided
  - avoid heritage buildings where a heritage area cannot be completely avoided

Environmental Protection During <u>Selection</u> of Preliminary Design Alternative

Environmental protection in Preliminary Design is part of the generation of alternatives, selection of the preferred alternative, and development of the Preliminary Design

During evaluation of alternatives and selection of the preferred Preliminary Design alternative, environmental protection measures include:

- screening out Preliminary Design alternatives that have significant environmental effects but no significant transportation engineering advantages; and
- selecting the Preliminary Design alternative which has the best overall balance between transportation engineering benefit and environmental impact minimization.

Environmental Protection During Development of Preliminary Design Alternative

During development of the preferred Preliminary Design alternative, environmental protection measures include:

- refining the preferred Preliminary Design alternative to prevent or reduce impacts through measures such as horizontal and vertical alignment shifts; modification of interchange design; and refinement of valley, river, and wetland crossings;
- identification of environmental work to be conducted during the subsequent Detail Design stage.

4.6.4 Develop the Preferred Preliminary Design Alternative

Compliance with Study Principles

Development of the technically preferred Preliminary Design alternative complies with the transportation engineering principles, environmental protection principles, environmental protection process, consultation principles and process outlined in Sections 4.1, 4.2 and 4.6.3 and Chapter 5 respectively.

The Preliminary Design Package

Typical elements of the Preliminary Design are outlined in Exhibits 3.1, 3.2, and 3.3

Development of the preferred Preliminary Design alternative involves refinement of the preferred Preliminary Design and the production of a Preliminary Design package. This package typically includes:

- engineering drawings of the preferred Preliminary Design alternative, typically at the 1:2,000 or 1:1,000 scale;
- a description of the major transportation engineering and environmental components of the design;
- a description of how the Preliminary Design has achieved the identified transportation engineering and environmental protection objectives;
- recommendations for subsequent Detail Design transportation engineering and environmental protection work and for splitting the project into appropriate Detail Design projects.

Environmental avoidance, environmental design elements and environmental mitigation measures are an integral part of the Preliminary Design package (see Exhibit 3.4)

The typical elements of the Preliminary Design are outlined in Exhibits 3.1, 3.2, 3.3, and 3.4. During the development of the Preliminary Design, these elements are refined with stakeholder input through consultation.

In some cases, it is determined that additional engineering and/or environmental work is necessary to complete the development of the preferred Preliminary Design alternative. The final Preliminary Design package should have sufficient detail to carry out the Detail Design without significant changes being required.

4.7 Transportation Engineering and Environmental Protection in Detail Design

GROUP A, B AND C PROJECTS

Overview

Detail Design develops a transportation plan at the design implementation level of detail

The Detail Design process is much like the Preliminary Design process, but it is conducted on a more detailed scale. The purpose of the Detail Design stage of Group A, B and C projects is to develop a transportation plan to a design/implementation level of detail and to develop drawings and documents for construction. This is typically at a **1:500 scale**. If a Preliminary Design study was carried out for the project, Detail Design is also the refinement and development of that work. The selected Detail Design is that which is considered to be most technically, environmentally and economically suitable for addressing the project objectives.

The selected Detail Design is that which is considered to be most technically, environmentally and economically suitable for addressing the project objectives

Detail Design decisions and alternatives are shown in Exhibits 3.1, 3.2, 3.3, and 3.4, and the Detail Design process is illustrated in Exhibits 3.5, 3.6, 3.7 and 3.8.

Compliance with Study Principles

Consultatation is an integral component of transportation engineering and environmental protection in Detail Design

The Detail Design stage follows the transportation engineering principles, environmental protection principles, evaluation principles and processes, consultation principles and processes, documentation and bump-up principles and process, and project stages and phases principles, as outlined in Sections 4.1, 4.2 and 4.3 and Chapter 5, 6 and 3 respectively.

Preparing the Detail Design for Group A, B and C Projects

Detail Design for Group A, B and C projects may involve the following separate phases:

- generate and assess Detail Design alternatives
- evaluate and select the preferred Detail Design alternative
- develop the preferred Detail Design alternative

For low-complexity Group B and Group C projects where there are few Detail Design alternatives, Detail Design may simply consist of developing the Detail Design.

4.7.1 Generate and Assess Detail Design Alternatives

GROUP A, B AND C PROJECTS

Sources of Information

The information to generate and assess Detail Design alternatives is typically obtained from the following sources:

- Transportation Needs Assessment, Planning and Preliminary Design documentation;
- transportation and environmental secondary source documentation, including the sources identified in Sections 4.4.1 and 4.2 respectively;
- transportation and environmental input through consultation with stakeholders (government agencies, the public, special interest groups, etc.); and
- field inspections and investigations and transportation and environmental studies, as may be necessary to verify information, fill in information gaps, update information, and enhance information level of detail.

Typically, the study area "existing conditions" are gathered so that transportation engineering opportunities and transportation engineering and environmental constraints can be detailed at a level to be incorporated into the Detail Design. The transportation information gathered may include infrastructure condition/deficiencies/requirements covering elements such as roadway surface, bridges and culverts, lighting and electrical systems, drainage, traffic safety and control systems. The environmental information gathered covers the natural, social, economic and cultural environmental factors that are applicable to the project and study area. For projects which had a Planning and/or Preliminary Design stage, the gathering of information is typically carried out to fill in information gaps, update information, and enhance the information level of detail acquired during the previous stages. In other projects, this may be the first time that such information is gathered.

Compliance with Study Principles

Compliance with study principles in Detail Design provides for a safe and effective transportation system

The generation of Detail Design alternatives complies with the transportation engineering principles outlined in Section 4.1 in conjunction with the environmental protection principles and environmental protection process outlined in Sections 4.2, and 4.7.3 respectively.

Detail Design Alternatives

As with Planning and Preliminary Design alternatives, Detail Design alternatives are "alternative methods" under the EA Act. Typical Detail Design alternatives are considered for any given project in the following manner:

- the number of Detail Design alternatives considered for any given project varies with the nature of the study objectives, the type and complexity of the project, and the nature of the study area; and
- individual Detail Design alternatives are typically assembled into a variety of combinations for analysis and subsequent evaluation.

Detail design alternatives are generated to capitalize on transportation opportunities, avoid significant environmental features, and/or to minimize design and construction-related environmental impacts

Principles for Generating Alternatives

There are three underlying principles for generating Detail Design alternatives:

- to capitalize on significant transportation engineering opportunities and avoid significant transportation engineering and environmental constraints (this typically would be largely accomplished during the Planning and Preliminary Design stages);
- to minimize the *design-related* impacts caused where significant transportation engineering and environmental constraints cannot be avoided (as is the case with Preliminary Design); plus
- to minimize anticipated *construction-related* impacts caused where significant transportation engineering and environmental constraints cannot be avoided.

In generating Detail Design alternatives, transportation engineering and environmental protection factors are both considered

Examples of how these three principles are applied for both transportation engineering and environmental protection are outlined in Sections 4.5.2, 4.6.1, and 4.8.3 respectively.

In some cases, new information becomes available during the generation and assessment of Detail Design alternatives that prompts a re-evaluation of the technically preferred Preliminary Design alternative.

Generating Detail Design Alternatives for Linear Facilities

In generating Detail Design alternatives for Group A, B and C linear facilities, the following factors may be considered:

- cross-section details covering elements such as:
  - roadway, including shoulders, median, ramps
  - pavement
  - ditches
  - construction staging, detours and construction access
- Surveyed structure and culvert location/span/width
- Details of illumination, traffic signals and safety infrastructure
- Application of project-specific standards, and calculation of quantities for all of the above items

Generating Detail Design Alternatives for Service, Maintenance, Operation, and Ferryboat Facilities

In generating Detail Design alternatives for Group A, B and C service, maintenance and operations facilities, and ferryboat terminals, the following factors may be considered:

- Detailed and surveyed site plan for all components
- Building architectural drawings

- Application of project-specific standards and calculation of quantities for all of the above items
- Final property requirements

Assessing Detail Design Alternatives

Detail design alternatives are assessed for both transportation engineering and environmental protection aspects

The assessment of Detail Design alternatives complies with the transportation engineering principles outlined in Section 4.1 in conjunction with the environmental protection principles, environmental protection process and consultation principles and process outlined in Sections 4.2 and 4.7.3 and Chapter 5 respectively.

The purpose of assessing Detail Design alternatives is to:

- identify significant beneficial and detrimental aspects of each Detail Design alternative relative to both transportation engineering and environmental protection;
- ensure that sufficient transportation engineering and environmental protection information is available to support the subsequent evaluation phase;
- obtain transportation engineering and environmental protection input through consultation with stakeholders for the subsequent evaluation phase;
- make any necessary modifications to Detail Design alternatives as a result of the above; and
- ensure that any alternative carried forward will be acceptable to the proponent if the evaluation phase determines it to be the preferred Detail Design alternative.

4.7.2 Evaluate Detail Design Alternatives and Select the Preferred Detail Design Alternative

Compliance with Study Principles

Compliance with study principles provides for effective evaluation in Detail Design

Evaluation and selection of Detail Design alternatives complies with the evaluation principles in Section 4.3 in conjunction with the transportation engineering principles, environmental protection principles, environmental protection process, consultation principles and process outlined in Sections 4.1, 4.2 and 4.7.3 and Chapter 5 respectively.

The Purpose and Process of Evaluation

In this phase, the Detail Design alternatives that have been generated are subjected to a comparative evaluation to provide the basis for selection of a preferred Detail Design alternative. In some cases, it is determined during the evaluation phase that Detail Design alternatives should be modified or discarded, that additional Detail Design alternatives should be generated, or that additional engineering and/or environmental work is necessary to support the evaluation. The evaluation process for Detail Design is typically "subjective" in nature, using professional judgement.

Selecting the Technically Preferred Group A, B and C Detail Design Alternative

The preferred Detail Design alternative achieves the best overall balance between transportation objectives and environmental protection

The selection process includes the following steps:

- Detail Design alternatives that have significant environmental effects but no significant transportation engineering advantages will be screened out first.
- The remaining alternatives will be assessed to determine their ability to address the study transportation objectives and to identify their environmental impacts after application of reasonable mitigating measures.
- The net environmental effects (i.e. after applying conceptual mitigation measures for significant effects) will be used as a basis to compare alternatives.

The technically preferred Detail Design alternative is selected as the aggregate of Detail Design alternatives that achieves the **best overall balance** of transportation engineering, individual environmental factor impacts, and overall environmental impact, including input that has been received through consultation on those issues.

This decision is made by the proponent. However, consultation with stakeholders on transportation engineering and environmental protection issues may result in the modification or even re-examination of the technically preferred alternative.

4.7.3 Environmental Protection in Detail Design

Compliance with Environmental Protection Principles

Compliance with study principles provides for effective environmental protection in Detail Design

Environmental protection in Detail Design complies with the environmental protection principles in Section 4.2 in conjunction with the transportation engineering principles, evaluation process, and consultation principles and process outlined in Sections 4.1 and 4.7.2 and Chapter 5 respectively. Typical environmental protection and mitigating measures in Detail Design are outlined in Appendix #2.

Environmental protection during Detail Design usually involves the following steps:

- identify environmental features that are threatened by construction;
- complete the environmental design and mitigation elements;
- develop environmental construction constraints;
- sign any required formal environmental approvals and permits.

Environmental protection in Detail Design is through environmental design, environmental mitigation, and development of environmental construction constraints

The typical strategies for environmental protection in Detail Design are:

- to mitigate footprint, interference, traffic access modification, emissions, and timing impacts; and
- to provide compensation and enhancement.

Environmental Protection during Generation of Detail Design Alternatives

During generation of Detail Design alternatives, environmental protection is achieved by minimizing environmental impacts through environmental design and mitigation elements such as those presented below:

(Note: these are illustrative only and vary with project specifics)

- ***Natural Environment***
  - reduce the impacts to natural areas by minimizing intrusion into natural areas
  - minimize intrusion of bridge piers in the watercourse at river and stream crossings

- ***Social Environment***
  - minimize intrusion into urban areas and clustered rural settlements
  - minimize intrusion into and "buyouts" of properties

- ***Economic Environment***
  - minimize intrusion into prime agricultural fields
  - replace high-investment, intensive operating areas of farms and other businesses that are taken out

- ***Cultural Environment***
  - provide design measures to minimize impacts of intrusion into cemeteries
  - document, move, or offer to interested parties, heritage buildings

Environmental Protection During Selection of Detail Design Alternative

Environmental protection in Detail Design is part of the generation of alternatives, selection of the preferred alternative, and development of the Detail Design

During evaluation of alternatives and selection of the preferred Detail Design alternative, environmental protection measures include:

- screening out Detail Design alternatives that have significant environmental effects but no significant transportation engineering advantages; and
- selecting the Detail Design alternative which has the best overall balance between transportation engineering benefit and environmental impact minimization.

Environmental Protection During Development of Detail Design Alternative

During development of the preferred Detail Design alternative, environmental protection measures include:

- refining environmental design and mitigation elements; and
- developing construction environmental requirements and constraints.

4.7.4 Develop the Preferred Detail Design Alternative

Compliance with Study Principles

Development of the technically preferred detail design alternative complies with the transportation engineering principles, environmental protection principles, environmental protection process, and consultation principles and process outlined in Sections 4.1, 4.2 and 4.7.3 and Chapter 5 respectively.

The Detail Design Package

Typical elements of the Detail Design are outlined in Exhibits 3.1, 3.2, and 3.3

Development of the preferred Detail Design alternative involves refinement of the preferred Detail Design and the production of a construction package which typically includes:

- detailed engineering drawings to support construction, typically at the 1:500 scale;
- detailed quantities and cost estimates;
- specifications and standards for transportation engineering and environmental protection components of the design and construction; and
- construction staging requirements.

The typical elements of the Detail Design are outlined in Exhibits 3.1, 3.2, 3.3, and 3.4.

During the development of the Detail Design, the transportation engineering and environmental protection elements are refined with stakeholder input through consultation.

Environmental design elements, environmental mitigation measures and environmental construction constraints are an integral part of the Detail Design package (see Exhibit 3.4)

The environmental protection component of the construction documents covers environmental requirements and constraints such as:

- control and mitigation of access, removal, and direct damage impacts;
- control and mitigation of disturbance and interference impacts;
- control and mitigation of emissions and escapes to air, water and soil;
- control and mitigation of traffic access modification impacts.

In some cases, it is determined that additional engineering and/or environmental work is necessary to complete the development of the preferred Detail Design alternative. The final Detail Design package should have sufficient detail to carry out construction without any changes being required.

4.8 Transportation Engineering and Environmental Protection in Construction

Group A, B and C Projects

4.8.1 Overview

The Construction stage is the implementation of the project. Prior to the actual implementation of Construction at any given location, preconstruction field work such as contaminated property decommissioning, archaeological salvage and a preconstruction fisheries habitat inventory are completed.

The Construction activities vary with project specifics. However, Exhibit 4.1 illustrates the flow of Construction activities that could occur on a "typical" provincial transportation project.

4.8.2 Generate, Evaluate and Select the Preferred Construction Method Alternative

A key transportation engineering and environmental protection consideration is Aconstructability@

The key consideration in considering Construction method alternatives is "constructability" B the ease and practicality of implementing the project. The most significant limitations to Construction method alternatives are construction access, management of traffic and cost. For key construction elements, the Construction method is considered during Design, so that Design alternatives that significantly increase "constructability" can be adequately considered.

4.8.3 Environmental Protection in Construction

The general principles of environmental protection are provided in Section 4.2.

Compliance with study principles provides for environmental protection in Construction

Environmental protection and mitigation during Construction involves the following steps:

- ensure conformance to the environmental requirements of the construction documents;
- provide all additional environmental elements necessary to address the Construction, including but not restricted to the following:
  - control and mitigation of access, removal, and direct damage impacts;
  - control and mitigation of disturbance and interference impacts;
  - control and mitigation of emissions and escapes to air, water and soil;
  - control and mitigation of traffic access modification impacts;
  - procurement of any formal environmental approvals, permits, exemptions, agreements and clearances required for the Construction; and
  - environmental contingency plans, as may be determined during the Class EA consultation.

Environmental protection in Construction is through a range of control and mitigation measures

- make any formal environmental reporting to environmental agencies and others as required by statute (e.g. for spills);
- address any construction-related commitments and conditions of EA process and environmental approvals, permits and exemptions;
- observe good construction environmental practice, including compliance with environmental legislation;
- anticipate and address environmental problems during construction;
- monitor the implementation of environmental protection and mitigation measures during construction;
- provide any formal construction and post-construction monitoring and reports that were committed to.

Environmental protection measures should address all aspects of construction

The aspects of Construction which should be addressed by the environmental protection and mitigating measures include the following:

- construction method, operation and equipment;
- selection and management of construction materials; management of surplus and waste materials;
- construction site area and limits; construction site access; detours and constraints on haul roads; earth, aggregate and rock borrow areas; material storage and disposal areas; equipment storage areas; construction yards;
- season; time of week; time of day; duration; and staging of the construction work, including shut-down periods.

An overview of environmental protection and mitigating measures is provided in Appendix 2.

4.8.4 Environmental Monitoring of Construction

Prior to the Construction phase of a project the proponent may collect any baseline technical information required for environmental monitoring.

Effectiveness of environmental protection measures is monitored during construction

During Construction, the proponent ensures that implementation of mitigating measures and key design features is consistent with the contract and external commitments (see *On-site Inspection* below). In addition, the proponent assesses the effectiveness of project environmental protection measures to ensure that:

- environmental protection measures are what is needed, in place when they are needed, positioned where they are needed, and are working as required;
- operations, equipment and materials are only where they are permitted, occurring/operated/placed when they are permitted, and doing what is permitted;

If deficiencies in environmental protection occur during Construction, they are corrected

- deficiencies are corrected when they are needed, by using what is needed, and doing it where it is needed; and

- information is available for the overview assessment of environmental mitigating measures.

Environmental monitoring *after* a project is completed may involve follow-up monitoring of significant measures and/or significant concerns or scientific environmental monitoring to address new technologies, specific mitigating measures and/or significant concerns (e.g. water quality monitoring).

MTO undertakes an *ongoing* evaluation of mitigating measures. The purpose of this evaluation is to determine their overall effectiveness, conditions that affect their performance, potential for technical improvements and warrants for their use. The end result is a constantly evolving knowledge base for improving the type and application of environmental mitigation used by MTO.

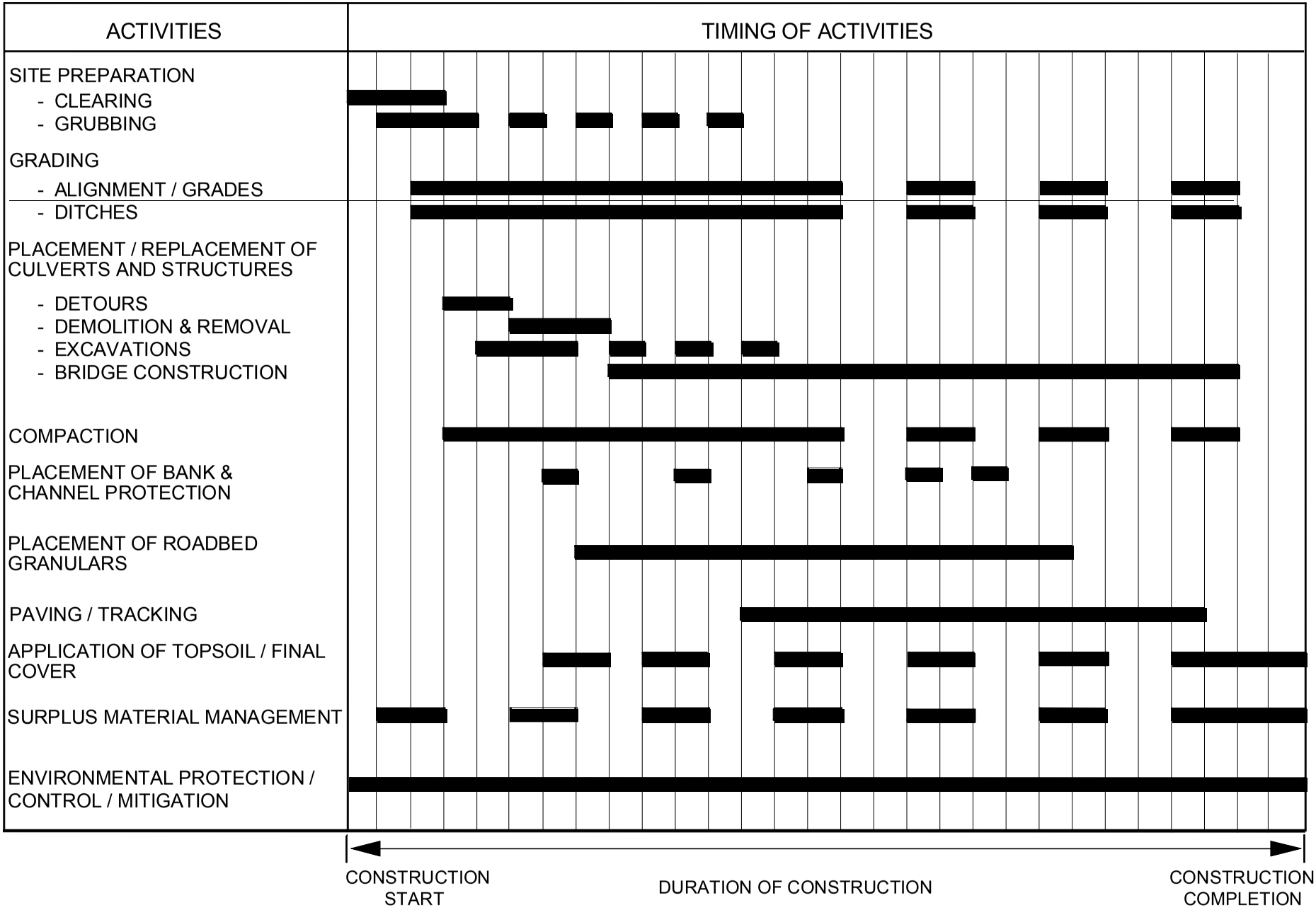
On-site Inspection

Projects under this Class EA are subject to periodic on-site inspection during Construction to ensure execution of the environmental component of the work and to deal with environmental problems that may develop

Projects under this Class EA are subject to periodic on-site inspection to ensure the execution of the environmental component of the work and to deal with environmental problems that may develop during Construction. Periodic on-site inspection is supplemented by the support of environmental specialists where projects have significant mitigating measures or concerns.

The degree of environmental specialist support is determined by the schedule of construction operations, the scale and/or innovativeness of the construction work, the sensitivity of environmental concerns and the development of any unforeseen environmental problems during Construction. If it is determined during the Design stage of a project that there are specific environmental concerns that warrant special monitoring, the environmental documentation will document commitments to a specific environmental monitoring procedure and the submission of any field monitoring reports.

EXHIBIT 4.1
Typical Construction Activities for Provincial Transportation Facilities



CHAPTER 5

Consultation Principles and Processes

GROUP A, B AND C PROJECTS

Overview

Consultation is a key element of the Class EA study process

Consultation is an integral component of the Group A, B and C study process. It occurs within the stages and phases outlined in Chapter 3; it is conducted in conjunction with the transportation engineering and environmental protection principles and process outlined in Chapter 4; and it is an element of the documentation and bump-up principles and process outlined in Chapter 6, and the step-down process outlined in Chapter 7.

Typical issues for consultation in the Planning, Preliminary Design and Detail Design stages are outlined in Exhibits 3.1, 3.2 , 3.3, and 3.4.

5.1 The Purpose of Consultation

Consultation involving external agencies (provincial, federal, municipal) and the public is an essential component of this Class EA process. Consultation plays a key role in achieving the following goals:

Consultation is used to provide and obtain information, and to identify concerns

- to identify public concerns and values
- to identify agency mandates and concerns
- to collect information about the existing environment
- to involve review agencies and the public in the development of solutions to complex environmental issues
- to provide information to agencies and the public about potential decisions and the related effects
- to provide information to agencies and the public about the Class EA process, including opportunities for formal challenge

In addition to these benefits, public consultation attempts to meet the growing expectation on the part of the public that they will be consulted regarding decisions by public authorities.

This chapter concentrates on principles and processes of consultation for Group A and Group B projects. For Group C projects, the need for consultation and the type and extent of consultation will be determined through the environmental screening process for the particular project. Experience has shown that many Group C projects may proceed successfully with little or no formal consultation. However, for those Group C projects where external stakeholders have been identified, formal consultation will be undertaken.

5.2 Consultation Principles

Study principles provide for effective consultation

The basic principles of consultation are as follows:

- External stakeholders, including external agencies and the public will be notified of the proponent's intention to carry out a study *at the beginning of the study*, before the proponent becomes committed to a particular solution.
- In all cases, the consultation plan will be developed to place emphasis on consultation with the stakeholders *most directly affected*.
- The consultation plan will provide *timely, user-friendly opportunities* for input by the public and the agencies whose mandates are most directly affected.
- Consultation will be used to assist in the identification of data requirements.
- The proponent will *constructively address* input received during the consultation process.
- During later planning and design phases, the proponent will show how the input received in earlier stages *affected the project*.
- The *amount, extent and timing of consultation* will vary according to the complexity of a specific project, the nature of the specific environmental issues, and the concerns expressed by the public and external agencies.
- For each study, *appropriate methods of notification* will be selected based on the nature of the study area, the external parties to be contacted, the stage of the study, and the issues to be addressed.
- The proponent will make *reasonable efforts to resolve concerns*. Mediation will be considered for major issues, at key decision points.

5.3 Timing of Consultation

Early consultation is critical

Early consultation improves the opportunity to resolve issues

The first contact on any study will be the Initial Notice. Consultation will take place at significant milestones during the progress of the study.

Throughout a study, any notification given to the public and potentially affected agencies and groups will stress the importance of discussing any concerns with the proponent *at the earliest possible opportunity*. The sooner an issue is brought to the proponent's attention, the better the chance that the issue may be easily resolved. As a study proceeds, decisions are made in a progressive fashion. The proponent will have reduced flexibility to incorporate changes if concerns are brought forward late in the study process.

The public will be notified of the right to request a bump-up

In addition to consultation opportunities during a study, the public must be notified when the TESR is submitted and also when a DCR is submitted (see Chapter 6). When the TESR is submitted, and where a DCR is eligible for bump-up, the public will be notified of their right to request a "bump-up" where concerns cannot be resolved (see Chapter 6).

If a Study Design is being prepared (see Chapter 6.3, and Exhibits 3.5 and 3.7), then external stakeholders will be consulted at this time regarding the appropriate consultation for subsequent stages of the project. If a Study Design is *not* prepared, then the first consultation opportunity will be during the Planning stage (See Exhibits 3.5 and 3.7). Even in the absence of a Study Design, external stakeholders will be given an opportunity to influence the consultation process for later stages of the study.

5.4 Consultation Processes

The Consultation Plan

A consultation plan is developed at study commencement

At the beginning of the study, a consultation plan will be set out. The consultation plan will identify the proposed frequency and timing of consultation, methods of notification, and key stakeholders. The plan will also identify any transportation and/or environmental issues and/or factors which may require special consultation effort.

Methods of Notification

Notification may be done through a variety of methods

In order to facilitate proper consultation, notification of consultation opportunities must be given to the external agencies and the public. Notification may be done through a variety of methods including newspaper advertisements, brochures, posters, letters, or electronic means. For each study, appropriate methods of notification will be selected based on the nature of the study area, the external parties to be contacted, the stage of the study, and the issues to be addressed. Typical content of some project notices is presented in Exhibit 5.1. Various techniques may be combined in order to improve effectiveness.

Notification is provided for the review of documents

In addition to notices which are given during a study, a Notice of Submission must be given in order to notify the public of the start of the formal 30-day public review period for both the Transportation Environmental Study Report (TESR) and the Design and Construction Report (DCR) (see Sections 6.4 and 6.5 respectively). Notification is not provided for the Environmental Screening Document (see Section 6.6).

EXHIBIT 5.1

Typical Contents of Notices for Group A and B Projects

Initial Notice	Notices During the Study	Notice of Submission
Purpose of Notice Study Area Study Description Project Group (A or B) How to Participate* Who to Contact Where Info Available Freedom of Information statement	Purpose of Notice Study Area Study Description Where We Are in Process Project Group (A or B) How to Participate Who to Contact Where Info Available Freedom of Information statement	Purpose of Notice Outline of Recommended Plan Where TESR/DCR is Available for Review Project Group (A or B) Who to Contact Bump-Up Rights Freedom of Information statement

* Includes reference to development of Study Design if applicable

The Public Information Centre

One of the consultation techniques which is most commonly used is the public information centre. A public information centre provides information and displays in an informal setting. It is typically held in a community hall or other similar facility in the general vicinity of the project. Visitors are encouraged to ask questions, share information about the study area, identify any support for and/or concerns with the project and discuss these with the project staff. Public information centres provide the following opportunities:

- there is direct, one-on-one contact between individual members of the public and project representatives;
- members of the public are able to address their individual needs for information about the project proposals;
- members of the public can ask for follow-up on matters of specific interest;
- individuals can learn about effects on their property.

Public information centres are a commonly used method of consultation to share information and identify concerns

At a public information centre proponent representatives will be on hand to explain the proposed project and to discuss public concerns. A record of attendance is kept to help the proponent determine whether the consultation program is reaching the affected public. Members of the public are encouraged to write down their comments or concerns with the project on the comment sheets which are supplied.

Comment sheets provide a convenient record of public concerns for the proponent to use in addressing concerns following the public information centre. The follow-up action may be a telephone call, a letter, a field meeting, a meeting involving several interested parties, or a combination of the above.

The number and frequency of public information centres will usually increase proportionately with the complexity or sensitivity of a project. A

Group A planning study or a Group B major reconstruction project with the potential for impact on many property owners typically requires several public information centres during the study.

On a smaller, less complex project, a single public information centre would likely be sufficient. The public information centre would be held at a stage in the process when enough information is available to make the effects of the proposal clear, yet early enough to accommodate public concerns.

Other Methods of Consultation

Meetings, newsletters, and formal presentations may be used as a means of consultation in place of, or in addition to, the public information centre

Although public information centres are a valuable means of providing for public consultation, it may be necessary or more appropriate to use other means, either on their own or possibly as a follow-up to a public information centre, in order to discuss the project or to resolve concerns.

For example, the following types of involvement are provided as appropriate:

- **Group meetings** with groups of landowners, native groups, or special interest groups (for example cottagers' associations, community associations, affected businesses) may be held from time to time;
- **Meetings with individuals,** such as affected property owners, may take place before property negotiations begin. These meetings provide an opportunity for frank discussion of specific concerns and aid in the development of appropriate solutions;
- **Newsletters** may provide special information for publication by the proponent or community associations;
- **Formal presentations** may be given to municipal councils;
- **Mediation** may be selected by the proponent, in exceptional circumstances, as an appropriate technique to resolve disputes. The proponent will consider mediation only for major issues, and only at key decision points. For example, mediation might be appropriate during development of the Study Design, or to respond to public requests for resolution of conflicting government agency mandates.

Resolving Concerns

Consultation does not guarantee consensus

Consultation plays a significant role in determining the outcome of a project. However, consultation cannot guarantee that there will be a community consensus in favour of every project. The proponent will make reasonable efforts to resolve concerns. Mediation will be considered for major issues, at key decision points. As noted in Section 4.3.2, the evaluation of alternatives is based on a comparative analysis of transportation engineering and environmental protection factors. In some cases, it will not be possible to resolve the concerns of every individual, but it will be necessary for the project to proceed in order to provide benefit for the overall community.

5.5 Consultation for Group A Projects

This Section shows how the principles of consultation (Section 5.2) are applied to Group A projects.

Group A projects are the largest and most complex of any projects within this Class EA. As one might expect, Group A projects have the most comprehensive consultation requirements. Consultation opportunities for Group A projects, with the exception of new freeways, are shown in Exhibit 3.5. Consultation opportunities for Group A new freeways are shown in Exhibit 3.6.

During Planning

The first point of consultation for Group A projects is during the review of transportation needs assessment

Consultation for Group A projects other than new freeways is *mandatory* as follows:

- during the *Review of Transportation Needs Assessment*
- during preparation and review of the *Study Design*
- during or no later than the end of Generate and *Assess Route Alternatives*
- during or no later than the end of the *Evaluating and Selecting of Route Alternatives* phase of the Planning stage

Additional *optional* opportunities may be provided depending on the complexity of a specific project, the nature of the specific environmental issues and the concerns expressed by the public and external agencies.

During Preliminary Design and/or Detail Design

Consultation for Group A projects continues at key decision points through Planning, Preliminary Design and Detail Design

During Preliminary Design and/or Detail Design, consultation on design concepts is *mandatory*. The frequency will vary depending on the staging selected for design and construction, the complexity of a specific project, the nature of the specific environmental issues and the concerns expressed by the public and external agencies.

During Review of the TESR

The timing and focus of consultation may vary depending on the stage and phase selected for submission of the Transportation Environmental Study Report (TESR) (see Section 6.4).

If the TESR is submitted at the end of the Planning phase (not applicable to new freeways), then consultation on design concepts would take place following submission of the TESR, but prior to publication of the Design and Construction Report (DCR).

If the TESR is submitted at the end of Preliminary Design, then it would be possible to undertake consultation for preliminary design issues before submission of the TESR. Further consultation would take place during Detail

Design, prior to publication of the Design and Construction Report (DCR) (see Section 6.5).

For all Group A projects, Notices of Submission will be given when the TESR and DCR are released

For all Group A projects, a Notice of Submission will be given at the time the TESR is published. This notice will announce the beginning of the 30-day public review period for the TESR, and will notify the public of their right to request a "bump-up" where concerns cannot be resolved.

For all Group A projects, a Notice of Submission will be given at the time the DCR is released for public review. This notice will announce the beginning of the 30-day public review period for the DCR, and will notify the public of the right to request a "bump-up" if applicable.

5.6 Consultation for Group B Projects

This Section shows how the principles of consultation (Section 5.2) are applied to Group B projects.

During Planning

Consultation for Group B projects typically starts at the Preliminary Design stage

For Group B projects, consultation may start in the Planning stage, as shown on Exhibit 3.7. However, since a typical Group B project is smaller and less complex than a Group A project, the first point of consultation is more likely to be during Preliminary Design.

During Preliminary Design and/or Detail Design

Consultation for Group B projects continues at key decision points through Preliminary Design and Detail Design

As noted in Exhibit 3.7, consultation is *mandatory* during the consideration of design concepts. Initial consultation will take place early in the study process so that affected parties will know that highway improvements are being considered.

Where there is a Preliminary Design phase, this consultation may take place as early as the beginning of Preliminary Design.

Where there is no Preliminary Design phase, the initial consultation will take place early in Detail Design. Additional optional opportunities will be provided depending on the staging selected for Design and Construction, the complexity of a specific project, the nature of the specific environmental issues and the concerns expressed by the public and external agencies.

Using the Step-down Process

For Group B projects which have limited environmental effects, a step-down procedure exists (see Chapter 7). The results of initial consultation may influence the proponent's decision to follow the step-down process. If the step-down process is followed, the Group B project would be reclassified to a Group C project and follow the applicable consultation requirements.

During Review of the TESR

For all Group B projects, a Notice of Submission will be given at the time the TESR is published. This notice will announce the beginning of the 30-day public review period for the TESR and will notify the public of their right to request a "bump-up" where concerns cannot be resolved.

For all Group B projects, Notices of Submission will be given when the TESR and DCR are submitted

For all Group B projects requiring publication of a DCR, a Notice of Submission will be given at the time the DCR is released for public review. This notice will announce the beginning of the 30-day public review period for the DCR.

5.7 Consultation for Group C Projects

The need for consultation on Group C projects is determined on a project-specific basis

Consultation is *optional* for Group C projects. Consultation will be undertaken in order to meet the following requirements:

- to make contacts with external agencies in order to obtain legislative or regulatory approvals
- to make contacts with external agencies for pertinent technical information
- to make contacts with adjacent property owners where work proposed is likely to have an impact on their property
- to make contacts with affected property owners where purchase of property is required

As shown in Exhibit 3.8, consultation may take place during the consideration of alternatives in Preliminary Design or Detail Design. For a Group C project which is expected to have no environmental impacts, consultation may not be necessary.

CHAPTER 6

Documentation and Bump-up Principles and Process

GROUP A, B AND C PROJECTS

Overview

Environmental documentation and the opportunity for bump-up are key elements of the Group A and B study process

The preparation of environmental documentation and the provision of an opportunity for bump-up are key elements of the Group A and B study process. Documentation is also prepared for some Group C projects. Environmental documentation and notification of bump-up opportunity reflect the stages and phases outlined in Chapter 3. Documentation also outlines the application of the transportation engineering, environmental protection, evaluation and consultation principles and processes outlined in Chapters 4 and 5.

Types of Documentation

Environmental documentation type and requirement varies with project group and time of submission

There are four basic types of environmental documentation for projects within this Class EA:

- Study Design Report (see Section 6.3)
- Transportation Environmental Study Report (TESR) (may also have an Addendum - see Section 6.4)
- Design and Construction Report (DCR) (may also have an Addendum - see Section 6.5)
- Environmental Screening Document (see Section 6.6)

These types of documentation are summarized in Exhibit 6.1.

6.1 Environmental Documentation Principles

GROUP A, B AND C PROJECTS

For Group A and Group B projects, the following documentation principles apply:

Study principles ensure effective environmental documentation

- The document **content requirements will be fulfilled**.
- Documentation will deal with **project-specific details and issues**. Information presented in this Class EA will not be repeated.
- Documentation will cover the **results of the study to date**.
- A TESR and DCR must cover **full phases**.
- Where a Study Design Report, TESR or DCR is required, an **opportunity to review the documentation and provide comments will be provided**.
- The **review period** for Study Design Reports, TESRs and DCRs will be at least 30 days.

Document Content Requirements

The content requirement for TESRs and DCRs is as follows:

- **study objectives**
- project-specific **earlier and related work**
- significant **transportation engineering issues**
- significant **environmental issues**
- transportation engineering and environmental protection **alternatives developed and evaluated**
- project-specific external **consultation**
- **changes made** as a result of external consultation
- **recommended plan** (selected transportation alternative incorporating environmental protection measures)
- commitments to **future action**, including external approvals known to be required

Submission Timing Requirements

There is a range of time permitted for submission of environmental documentation but it may occur only at the completion of certain study phases

As shown in Exhibits 3.5, 3.6 and 3.7, there is a wide range of time permitted for report submission.

TESRs and DCRs may be submitted *only* at the completion of the following phases:

- develop the preferred Planning alternative (applies only to the TESR for Group A projects except freeways)
- evaluate and select the preferred Preliminary Design alternative
- develop the Preliminary Design
- evaluate and select the preferred Detail Design alternative
- develop the Detail Design

TESRs and DCRs may *not* be submitted during or at the completion of the following phases:

- generate and assess Preliminary Design alternatives
- generate assess Detail Design alternatives

The TESR and the DCR may not be submitted in the same stage unless the DCR is functioning solely as a TESR review.

The level of detail in environmental documentation varies with the time of submission

The level of detail in a report will change with the stage of submission. Early submission may benefit both the proponent and the affected parties. This eliminates uncertainty about the location and character of future improvements, enabling affected parties to make plans knowing about proposed transportation improvements, the extent of property requirements, etc. On the other hand, a later submission will provide more detail on design decisions and mitigation measures which will be incorporated into the Construction documents.

Relationship between the TESR and DCR

The TESR is typically used for documenting Preliminary Design S the development of the transportation plan to the design criteria level of detail. The DCR is typically used for documenting Detail Design S the development of the transportation plan to the design implementation level of detail.

If the TESR is advanced to document Group A project planning, the DCR documents preliminary design.

For Group A projects other than new freeways, submission of the TESR may be advanced to document the development of the preferred Planning alternative without Preliminary Design. Under these circumstances, Preliminary Design will be documented by the DCR (rather than the TESR), and Detail Design will be addressed in one of two ways:

- the DCR may be submitted in Preliminary Design; in this case, it must provide a high level of commitment on how the Detail Design will be conducted and what it will achieve; or
- the DCR may be submitted in Detail Design so that it addresses design implementation issues as well.

The TESR for Group A new freeway projects and for Group B projects may not be advanced to document the development of the preferred Planning alternative.

If the TESR is delayed to document Detail Design, the DCR is not required

For all Group A and Group B projects, submission of the TESR (or the individual Environmental Assessment Report for some new freeway projects) may be delayed to document Detail Design. Under these conditions, the DCR is not required because the TESR or individual Environmental Assessment Report will address the design implementation issues normally documented by the DCR(a DCR may subsequently be required to document TESR review).

The details of when TESRs and DCRs are required are provided in Sections 6.4 and 6.5 respectively.

Need for an Addendum

Environmental documentation may be changed through an Addendum

If it is necessary to make significant changes to the commitments outlined in a Study Design Report, TESR or DCR, or changes to the concept of portions of the project, an Addendum may be required. Changes may come about in conditions, the development of new technology or mitigating measures, or the identification of previous unknown information or concerns.

Proposed changes are discussed with the parties most affected by the proposed changes. If all affected parties can be clearly identified and those parties agree that an Addendum is not required, then none is prepared.

When an Addendum is prepared, it documents the circumstances necessitating the change. If it is a TESR-Addendum or DCR-Addendum, the anticipated environmental effects associated with the change and the proposed mitigation are also documented. All affected parties are notified that the Addendum is available. A minimum of 30 days is allowed for affected parties to review the Addendum.

6.2 Bump-Up or EA Challenge Principles and Administration

GROUP A AND B PROJECTS

Overview

The proponent will make reasonable efforts to resolve issues

When a person brings a concern to the attention of the proponent, the proponent will respond to the concern and attempt to reach a resolution.

Bump-up functions as an appeal process

However, it is recognized that in some cases a person may not be satisfied with the decision of the proponent and may desire an appeal process. The bump-up process for Group A and B projects is intended to address this type of situation. Group C projects are not eligible for bump-up.

If the proponent is unable to resolve the concerns and does not agree the project should be reclassified to an individual environmental assessment, then the external party may make a request *to the Minister of the Environment* to determine whether or not a bump-up is required.

If the Minister agrees that a bump-up is required, the Group A or B project is redesignated to an individual environmental assessment. An individual environmental assessment report is subject to the formal review and approval process under Part II of the EA Act, including opportunities for a formal public hearing.

A Group B project which has successfully completed the process for step-down to Group C (see Chapter 7) is no longer eligible for bump-up.

There is no mechanism within this Class EA for formal hearings, as it is intended that the consultation process in this Class EA will resolve the majority of issues, and that the bump-up process removes the need for formal public hearings.

Principles for Bump-up

For Group A and Group B projects, the following principles apply:

Study principles ensure the opportunity to challenge projects

- Notice of bump-up opportunity will be provided upon formal submission of the TESR in all cases, and if applicable, upon submission of the DCR.
- The review period following the notice of bump-up opportunity will be at least 30 days in all cases.
- Environmental Clearance - Construction Start will not be issued, and the construction of physical works will not begin, until the 30 day review period is over and any bump-up requests have been dealt with.

A bump-up request must be directed to the Minister of the Environment. Bump-up requests must be made no later than the date specified in the Notice of Submission for the TESR or DCR in question

Dealing with a Bump-up Request

After receipt of a bump-up request, the following will take place:

- The Minister of the Environment will advise the proponent of receipt of the bump-up request, thereby establishing the commencement of the Minister's 45 day decision period.
- The Minister will request MTO and the concerned person(s) to provide information explaining their respective positions and further meetings may be held to attempt to resolve the issues.
- In considering a request for "bump-up", the Minister will consider the matters specified in the Environmental Assessment Act, Section 16 (4). With respect to transportation undertakings covered in this Class EA, the following matters will generally be most relevant to this consideration:
  - degree of compliance with this Class EA
  - project specific concern as opposed to a global concern
  - is it a matter of public policy better resolved in a different forum
  - ability of MTO to address the concern
  - person/party have a direct interest/impact associated with the project
  - extent and nature of public concern
  - potential for significant negative environmental effects
  - considerations of urgency
  - frivolous or vexatious nature of “bump-up” request
  - degree to which public consultation has taken place.
- The Minister will advise the requestor and the proponent of his/her decision within 45 days of receipt of the bump-up request.

The decision on a project bump-up request is made by the Minister of the Environment

6.3 STUDY DESIGN REPORT

GROUP A AND B PROJECTS

The Study Design Report is for documention of the study process that will lead to TESR submission for Group A and complex Group B projects

The Study Design Report is mandatory for Group A projects other than new freeways (for which it does not apply). The Study Design is optional for Group B projects, but it is likely to be prepared only for the largest, most complex Group B projects (e.g. the twinning of a major highway that has the potential to affect a wide range of diverse environmental features). The Study Design Report does not apply to Group C projects.

Purpose and Timing of the Study Design

The Study Design Report is prepared early in the Planning phase, in consultation with government agencies and other potentially affected parties. It outlines project *Need and Justification*, defines the *Study Area*, and discusses *Alternatives to the Undertaking*. In addition, the Study Design Report documents EA process commitments leading to TESR submission. These typically include project-specific application of Class EA principles, the consultation process which will be used during the study, and the type of documentation which will be provided.

The Study Design may be useful to:

- assist the proponent in defining the amount and extent of work required in the study
- provide a project-specific commitment to external agencies and the public regarding the amount and extent of work that will be done
- assist the proponent in meeting the requirement of the Environmental Assessment Act for preparation of a Terms of Reference, if a project bump-up request is successful (see Section 6.2)

The Study Design Report is not eligible for bump-up.

6.4 Transportation Environmental Study Report and Addendum - Documentation and Bump-up Process

GROUP A AND B PROJECTS

6.4.1 Overview

Purpose and Timing of the TESR

The Transportation Environmental Study Report (TESR) is prepared for Group A and Group B projects only.

The TESR is typically submitted to document:

- Preliminary Design, which is the development of the transportation plan to the design criteria level of detail.

The TESR is typically for documentation of Preliminary Design

The TESR submission may be advanced by the proponent to document:

- Planning, which is the development of the transportation plan to design concept level of detail (this option applies only to Group A projects other than new freeways).

The TESR submission may be delayed by the proponent to document:

- Detail Design, which is the development of the transportation plan to the design implementation level of detail;

and may include elements of:

- Construction documentation.

This range of submission timing is shown in Exhibits 3.5, 3.6, and 3.7.

The timing of submission depends on the problem and opportunity being addressed and the delivery mechanism for the project (see Section 6.1).

Early submission may occur in cases where there is considerable development pressure and the proponent wishes to identify and protect the lands required for future transportation needs while there is a reasonable opportunity to do so. This approach allows planning issues to be addressed for a logical transportation link and avoids "piecemealing" of the environmental assessment process. Also, considering a larger study area may be helpful in trying to avoid major environmental features.

Early submission may also be preferred when the proponent wishes to turn the project over to a design-build consortium.

Contents of the TESR

TESR content complies with study documentation principles

The contents of the TESR must comply with the documentation principles outlined in Section 6.1. Early submission typically documents the transportation engineering and environmental protection during Planning and/or Preliminary Design. A later submission typically provides Detail Design information, including mitigation measures which will be incorporated into the construction documents. The format and content vary with the specific nature of the project or conditions in the study area.

Sample Tables of Contents for TESRs for Group A and Group B projects are presented for illustrative purposes in Appendix #3.

Bump-up Opportunity

All TESRs are eligible for bump-up. The bump-up principles and administration outlined in Section 6.2 apply.

Need for an Addendum

If it is necessary to make significant changes to the commitments outlined in the TESR or changes to the concept of portions of the project, an Addendum may be required. The information provided in Section 6.1 applies.

The TESR may be modified through an Addendum, which provides another bump-up opportunity

Only the changes documented in the Addendum are eligible for bump-up. In the event that a bump-up request is granted, the proponent has the option of withdrawing the Addendum and implementing the project as documented in the original TESR.

If, through unforeseen circumstances, an immediate change is required to prevent environmental damage from occurring or continuing, then the change will be considered as a Group D emergency response activity. In this case, an Addendum is not required.

TESR Review

A TESR review may be required if there is a delay in project implementation

A number of conditions may arise which cause a time lag between submission of the TESR and commencement of construction. Since there are many possible reasons for a delay in project implementation, it is necessary to establish the documentation review dates discussed in Sections 6.4.2 and 6.4.3, and summarized in Exhibit 6.1.

6.4.2 TESR For Group A Projects

The requirement for TESRs for Group A projects varies

Need for a TESR

For *Group A projects other than new freeways*, the TESR is always mandatory.

For *Group A new freeway projects*:

- The TESR is *mandatory* if Environmental Assessment approval for the project was granted at the completion of Planning.
- The TESR is *not prepared* if Environmental Assessment approval for the project was granted during Preliminary Design or Detail Design.

Timing of Submission

The range of permitted TESR submission timing for Group A projects is shown in Exhibits 3.5 and 3.6.

For *Group A projects other than new freeways*, the permitted times of TESR submission fall at the completion of the following phases:

- develop the preferred Planning alternative
- evaluate and select the preferred Preliminary Design alternative
- develop the Preliminary Design
- evaluate and select the preferred Detail Design alternative
- develop the Detail Design

For *Group A new freeway projects,* the permitted times of TESR submission fall at the completion of the following phases:

- evaluate and select the preferred Preliminary Design alternative
- develop the Preliminary Design
- evaluate and select the preferred Detail Design alternative
- develop the Detail Design

TESR Bump-up Opportunity

All Group A TESRs are eligible for bump-up

All Group A TESRs are eligible for bump-up. The bump-up principles and administration outlined in Section 6.2 apply. For new freeways, the TESR bump-up does not extend to the planning approval provided by the individual environmental assessment.

TESR Review

As noted in Section 6.1, a number of circumstances may cause a delay in implementation of all or part of a project following successful completion of a TESR.

When the TESR is submitted at the end of Planning (only applies to Group A projects except new freeways), the following applies.

A ten year review of a Group A TESR is required if construction has not commenced, and the TESR was submitted at end of Planning

- For any portion of a project for which construction has not commenced within 10 years of Notice of Submission for the TESR, *and* a DCR has not been submitted within that 10 year period, the proponent must carry out a review of the not-constructed portions of the project before construction may begin.

When the TESR is submitted during Preliminary or Detail Design, the following applies:

A five year review of a Group A TESR is required if construction has not commenced, and the TESR was submitted during Preliminary or Detail Design

- For any portion of a project for which construction has not commenced within 5 years of Notice of Submission for the TESR, *and* a DCR has not been submitted within that 5 year period, the proponent must carry out a review of the not-constructed portions of the project before construction may begin.

These reviews will consider changes which have taken place since the submission of the original TESR. The changes may include new conditions in the study area, new government policies, new engineering standards or new technologies for mitigating measures.

The results of the TESR review are documented in a DCR or TESR-Addendum

If there are no changes to the original concept of the project as described in the TESR, then a DCR will be prepared to document the design decisions and the results of the ten-year or five-year review. If, however, significant changes to the project are identified through the reviews, then a TESR Addendum must be prepared. The TESR-Addendum may be combined with a DCR.

The TESR-Addendum will be made available for a 30-day public review period, and there will be a bump-up opportunity. *Only* the changes identified in the Addendum are eligible for bump-up. If the TESR-Addendum is combined with the DCR, then *both the changes identified in the Addendum and the DCR design issues* will be eligible for bump-up.

6.4.3 TESR for Group B Projects

Need for a TESR

The TESR is mandatory for all Group B projects

The TESR is mandatory for all Group B projects.

Timing of Submission

The range of permitted TESR submission timing for Group B projects is shown in Exhibit 3.7. The permitted times of TESR submission are at the completion of the following phases:

- evaluate and select the preferred Preliminary Design alternative
- develop the Preliminary Design
- evaluate and select the preferred Detail Design alternative
- develop the Detail Design

All Group B TESRs are eligible for bump-up

TESR Bump-up Opportunity

All Group B TESRs are eligible for bump-up. The bump-up principles and administration outlined in Section 6.2 apply.

A five year review of a Group B TESR is required if construction has not commenced within 5 years

TESR Review

As in the case of Group A projects, a number of circumstances may cause a delay in implementation of all or part of a Group B project following successful completion of a TESR. For any portion of a project for which construction has not commenced within *five years* of the Notice of Submission for the TESR, *and* a DCR has not been submitted within that five year period, the proponent must carry out a review of the not-constructed portions of the project before construction may begin.

This Afive year review@ will consider changes which have taken place since the submission of the original TESR. The changes may include new conditions in the study area, new government policies, new engineering standards or new technologies for mitigating measures.

The results of the TESR review are documented in a DCR or TESR-Addendum

If there are no changes to the original concept of the project as described in the TESR, then a DCR will be prepared to document the design decisions and the results of the five-year review. The DCR will be made available for a 30-day public review period, but there is no bump-up opportunity.

If significant changes to the project are identified through the five-year review, then a TESR Addendum must be prepared. The TESR-Addendum, will be made available for a 30-day public review period, including a bump-up opportunity. Only the changes identified in the Addendum are eligible for bump-up. If the TESR-Addendum is combined with the DCR, the bump-up opportunity will include the changes identified in the Addendum, as well as the DCR design issues.

6.5 Design and Construction Report and Addendum - Documentation and Bump-up Process

Group A and B Projects

6.5.1 Overview

The DCR is typically for documention of detail design

Purpose and Timing of the DCR

The Design and Construction Report (DCR) is prepared for Group A and Group B projects only.

The DCR is typically prepared and submitted to document:

- Detail Design, which is the development of the transportation plan to the design implementation level of detail;

and may include elements of:

- Construction documentation.

For Group A projects only (except new freeways), DCR preparation and submission may be advanced by the proponent to document:

- Preliminary Design, which is the development of the transportation plan to the design criteria level of detail.

Contents of the DCR

DCR content complies with study documentation principles

The contents of the DCR must comply with the documentation principles outlined in Section 6.1. A sample Table of Contents for a DCR is presented in Appendix #3. This sample is for illustrative purposes only. The format and content may change, depending on the specific nature of the project or conditions in the study area.

Bump-up Opportunity

Only Group A project DCRs are eligible for bump-up under certain circumstances

As indicated in Exhibit 6.1, the eligibility of DCRs for bump-up varies. Where the DCR is eligible for bump-up, the bump-up principles and administration outlined in Section 6.2 apply. If there is a bump-up opportunity for a DCR, this opportunity will be limited to design issues only. The original concept of the undertaking, as outlined in the original TESR, (or individual environmental assessment report for a new freeway) may not be challenged at this stage (unless the DCR is combined with a TESR-Addendum or individual environmental assessment report addendum).

Need for an Addendum

If it is necessary to make significant changes to the commitments outlined in the DCR, an Addendum may be required. If it is necessary to make significant changes to the commitments outlined in the DCR or changes to the concept of portions of the project, an Addendum may be required. The information provided in Section 6.1 applies.

The DCR may be modified through an Addendum. Only Group A project DCR-Addenda are eligible for bump-up under certain circumstances

Only the DCR-Addendum for Group A projects is eligible for bump-up (see the conditions in Section 6.5.2) and only the changes documented in the Addendum are eligible for bump-up. In the event that a bump-up request is granted, the proponent has the option of withdrawing the Addendum and implementing the project as documented in the original DCR.

If, through unforeseen circumstances, an immediate change is required to prevent environmental damage from occurring or continuing, then the change will be considered as a Group D emergency response activity. In this case, an Addendum is not required.

6.5.2 DCR for Group A Projects

The requirement for DCRs for Group A projects varies. The relationship between TESRs and DCRs is outlined in Section 6.1

Need for a DCR

For all Group A Projects:

- The DCR is mandatory if the TESR or individual Environmental Assesment Report (EAR) did not document Detail Design (i.e. if the TESR or EAR was submitted at the completion of development of the preferred Planning alternative, evaluation and selection of the preferred Preliminary Design alternative, or development of the Preliminary Design).
- The DCR is (with the exception noted immediately below) not prepared if the TESR or EAR documents Detail Design (i.e. if the TESR was submitted at the completion of the evaluation and selection of the preferred Detail Design alternative, or development of the Detail Design).
- For both of the above situations, the DCR is mandatory to document the results of a TESR review which must be conducted prior to construction if (see Section 6.4.2):
  - more than ten years have elapsed since publication of the Notice of Submission for the TESR for any Group A project (except new freeways) which was submitted at the end of Planning; or
  - more than five years have elapsed since publication of the Notice of Submission for the TESR for any Group A project which was submitted in Preliminary Design or Detail Design.

Timing of Submission

The range of permitted DCR submission for Group A projects is shown in Exhibits 3.5 and 3.6.

For *Group A* projects *other than new freeway projects*, the permitted times of DCR submission fall at the completion of the following phases:

- evaluation and selection of the preferred Preliminary Design alternative
- development of the Preliminary Design
- evaluation and selection of the preferred Detail Design alternative
- development of the Detail Design

For *Group A new freeway projects,* the permitted times of DCR submission fall at the completion of the following phases:

- evaluation and selection of Detail Design alternatives
- development of the Detail Design.

This range of timing is shown in Exhibits 3.5, 3.6, and 3.7.

The DCR for Group A projects is eligible for bump-up under certain circumstances

DCR Bump-up Opportunity

The DCR is eligible for bump-up if :

- the TESR or individual Environmental Assessment Report is submitted before completion of the development of the Preliminary Design (i.e. the transportation plan is not developed to the design criteria level of detail); and/or
- the DCR is documenting the results of a ten-year review which must be conducted prior to construction if more than ten years have elapsed since publication of the Notice of Submission for the TESR for Group A projects except new freeways (see Section 6.4.2).

The DCR bump-up does not extend to the planning approval provided by the individual EA approval for new freeways, or to the planning clearance provided by the Class EA process for new highways.

Need for a DCR Addendum

A DCR Addendum is *mandatory* under the following circumstances:

- there are significant changes to commitments which have been made in the DCR
- construction has not commenced within 10 years of Notice of Submission for the DCR

There is a 30-day bump-up opportunity for DCR Addenda if the original DCR was eligible for bump-up or if more than ten years has elapsed since publication of the Notice of Submission of DCR.

6.5.3 DCR For Group B Projects

The requirement for DCRs for Group B projects varies. The relationship between TESRS and DCRS is outlined in Section 6.1

Need for a DCR

For Group B projects:

- The DCR is *optional* (with the exception noted immediately below) if the TESR did not document detail design.
- The DCR is *mandatory* to document the results of a five-year TESR review that must be conducted prior to construction if more than five years have elapsed since publication of the Notice of Submission for the TESR.
- The DCR is (with the exception noted immediately above) *not prepared* if the TESR did document detail design**.**

Timing of Submission

The range of permitted DCR submission timing for Group B projects is shown in Exhibit 3.7. The permitted times of DCR submission fall at completion of the following phases:

- evaluation and selection of the preferred Detail Design alternative
- development of the Detail Design

The DCR for Group B projects is not eligible for bump-up

No DCR Bump-up Opportunity

The DCR for Group B projects is not eligible for bump-up.

Need for a DCR Addendum

A DCR Addendum is mandatory for significant changes to commitments which have been made in the DCR. There is no bump-up opportunity.

6.6 Environmental Screening Document

GROUP C PROJECTS

The environmental screening document is available upon request. There is no bump-up opportunity

The Environmental Screening Document is prepared for Group C projects only and is normally prepared for internal reference rather than for formal submission. It is prepared if environmental impacts are anticipated and mitigation will be considered and/or provided.

The earliest that the Environmental Screening Document may be prepared is at the commencement of generation and assessment of Preliminary Design alternatives and the latest is at completion of Detail Design. Depending upon the time of submission, the Environmental Screening Document may guide designers and contractors. In other cases, the Environmental Screening Document will report the results of investigations and the mitigation measures which have been selected. The amount and extent of this internal documentation and follow-up work will vary depending on the environmental sensitivities identified.

EXHIBIT 6.1

Summary of Environmental Documentation and Bump-up Opportunities

DOCUMENT	PROJECT CLASSIFICATION		
	Group A	**Group B**	**Group C**
Study Design Report	Mandatory. (Not applicable to new freeways) No bump-up opportunity	Optional No bump-up opportunity	NA
Transportation Environmental Study Report (TESR)	Mandatory (except for some new freeway projects (see Section 6.4.2) 30 day bump-up opportunity	Mandatory 30 day bump-up opportunity	NA
TESR Addendum	Mandatory for significant changes to TESR commitments 30 day bump-up opportunity for Addendum issues only	Mandatory for significant changes to TESR commitments 30 day bump-up opportunity for Addendum issues only	NA
Design and Construction Report (DCR)	Mandatory if EAR or TESR did not document detail design, or as a TESR review if > 10 years elapsed since Notice of Submission for TESR submitted at end of Planning, or if > 5 years elapsed since Notice of Submission for TESR submitted at end of Preliminary or Detail Design 30 day bump-up opportunity (design issues only) applies only if: a) TESR submitted before end of Preliminary Design; or b) no construction has taken place, and > 10 years elapsed since TESR	Mandatory as a TESR review for any portion of a project where construction has not commenced within 5 years of Notice of Submission for the TESR. No Bump-up opportunity. Optional for any portion of a project where construction commences within 5 years of Notice of Submission for the TESR. No Bump-up opportunity.	NA
DCR - Addendum	Mandatory for significant changes to DCR commitments. Mandatory if >10 years elapsed since Notice of Submission for the DCR. 30 day bump-up opportunity applies only if: a) original DCR was eligible for bump-up: b) >10 years elapsed since Notice of Submission for the DCR.	Mandatory for significant changes to DCR commitments No bump-up opportunity	NA
Environmental Screening Document (Available only by request)	NA	NA	Mandatory for projects with identified environmental sensitivities No bump-up opportunity

Whenever the document is submitted, it must document every phase which has gone on before it. Full phases must be documented

CHAPTER 7

Step-down Process for Group B Projects

Group B projects may be stepped down to Group C projects under some circumstances

Purpose

For some Group B projects, the study process may show that there are no significant environmental effects and that there is no benefit in preparing a TESR. For these projects, the step-down provision provides an opportunity to modify the consultation, documentation, and bump-up opportunities. In such a case, a Group B project may be changed to a Group C project using this step-down procedure. The Group B project may be stepped down at any time prior to the submission of the TESR.

Step-down After the Official Notice

If an earlier notice has been given stating that a TESR would be published, then the following procedure will apply:

- a **notice** must be issued stating that the project has been stepped down from a "B" to a "C" project
- the notice will provide a **30-day review period** during which affected parties may request the proponent to reconsider the decision and leave the project in Group B

The step-down decision includes an appeal process

If the proponent and the objector cannot agree, then the objector may ask the Minister of the Environment to rule on the request. It is the responsibility of the objector to forward the request to the Minister of Environment before the end of the 30-day review period.

Factors to be Considered

In deciding whether it is appropriate to step down a Group B project to Group C, the proponent will consider *as a minimum* the following questions:

- Are there any **significant environmental issues**?
- Are there any **significant property issues**?
- Is there a **need to provide public documentation** of any issues which have been identified?
- Is there a **likelihood of a bump-up request**?

If the answer to all of these questions is *no*, it is appropriate to step down the project to Group C status.

The decision to step down will be made by the proponent

In all cases, the decision to step down a project from Group B to Group C will be made by the proponent. It may not be delegated to a consultant, consortium, or other agent working on behalf of the proponent. The proponent's decision will be documented and will be kept on file.

After the step-down decision has been made, the project follows the class procedure for Group C projects. Consultation is optional for Group C projects and there is no formal documentation and no opportunity for bump-up.

Step-down Before the Initial Notice

In exceptional circumstances, it may be appropriate for the proponent to make the step-down decision before the initial notice is issued. In such cases, there would be no opportunity to appeal the decision. This may apply, for example, if a truck-climbing lane is proposed and only one landowner is affected, and through discussions with the landowner it has been determined that the landowner is prepared to sell the necessary property. In such cases, the limited environmental concerns will be addressed through consultation with appropriate agencies. Under these circumstances a step-down notice is not issued.

CHAPTER 8

Clearance Process
GROUP A, B AND C PROJECTS

Clearance is used to ensure that EA requirements have been met

8.1 Purpose

Environmental Clearance is the proponent's internal process of ensuring that the environmental assessment requirements have been met before construction begins. Environmental clearance is required for all Group A and B projects. Environmental Clearance for Group C projects is required only where an Environmental Screening Document was prepared (see Section 6.6).

Depending on the complexity of the project, environmental clearance may be issued at certain milestones in the process in order to allow activities of the next phase to proceed.

8.2 Types of Environmental Clearance

There are four possible types of environmental clearance:

- Environmental Clearance - Utility Relocation
- Environmental Clearance - Right-of-Way Designation
- Environmental Clearance - Property Expropriation
- Environmental Clearance - Construction Start

These types of Environmental Clearance, the permitted activities and the conditions under which clearance may be granted are outlined in Exhibit 8.1.

Early clearances may be combined with later clearances if the project schedule permits. For example, if there is no need to move utilities in advance of construction, then the Environmental Clearance - Utility Relocation could be combined with the Environmental Clearance - Construction Start.

8.3 Environmental Clearance Principles and Process

For any Environmental Clearance to be granted, the following general principles will apply:

- The study principles for transportation engineering, environmental protection, evaluation, consultation, documentation, and bump-up set out in this Class EA have been applied to the project.
- The study process set out in this Class EA has been applied.

The additional conditions which must be met for the clearances to be issued are outlined in Exhibit 8.1. The work for which the clearance applies may not take place until the environmental clearance has been issued.

EXHIBIT 8.1

Summary of Environmental Clearance

Type of Environmental Clearance	Activities Permitted	Conditions Under Which Clearance is Provided		
		Group A	**Group B**	**Group C***
Utility Relocation	Any relocation of utilities which is required in order to accommodate construction	- TESR cleared and Detail Design alternative selected and utility-related mitigation complete	- Anytime within Right-of-Way if no utility footprint impacts; or - After selection of Detail Design alternative and utility-related mitigation	- Anytime within Right-of-Way if no utility footprint impacts; or - After selection of Detail Design alternative and utility-related mitigation
Right-of-Way Designation	Designation under PTHIA** of new Right-of-Way, or modifications to existing Right-of-Way	- TESR cleared	- TESR cleared	- Completion of Preliminary Design or design concept
Property Expropriation	Initiate proceedings under Expropriations Act	- TESR cleared	- TESR cleared	- Completion of Preliminary Design or design concept
Construction Start	Physical alteration of ground, water or vegetation which may be interpreted as the beginning of construction	All of: - All design-related environmental approvals/permits/ exemptions received; and - All necessary preconstruction environmental mitigation/work completed; and - All environmental design commitments addressed and TESR Cleared and DCR Cleared	All of: - All design-related environmental approvals/permits/ exemptions received; and - All preconstruction environmental mitigation/work completed; and - All environmental design commitments addressed and TESR cleared and DCR cleared if prepared	All of - All design-related environmental approvals/permits/ exemptions received; and - All preconstruction environmental mitigation/work completed; and - All environmental design commitments addressed; and - Screening document completed if environmental sensitivities exist.

* Clearance required and given only when Environmental Screening Document prepared
**Public Transportation and Highway Improvement Act

CHAPTER 9

Transportation Engineering and Environmental Protection for Group D Activities

Overview

Group D activities are outlined in Chapter 2. They include facility operation and maintenance, emergency work and response, facility administration, waste management, property management, pre/post construction field work, and aggregate extraction.

9.1 Transportation Engineering

The transportation engineering principles outlined in Chapter 4.1 apply to Group D activities.

9.2 Environmental Protection

Environmental Protection for Facility Operation and Maintenance Activities

Since Group D activities are system-wide, the application of mitigating measures is carried out on a generic basis

Operation and maintenance activities are system-wide rather than project-specific. The assessment of the environmental sensitivities, effects and mitigating measures is therefore carried out on a *generic* basis. This approach is reflected, as appropriate, in the proponent's or MTO's policy guidelines governing such activities. Staff carrying out these activities are encouraged to advise the proponent or agent of any unusual situations where additional environmental input and/or advice are required.

Environmental Protection for Emergency Work and Response Activities

Where emergency repair work and traffic accident response is needed, effort will be made to provide effective mitigation within the time limits and resources available to effect the response.

Where spill response is required, the Environmental Protection Act places responsibility with the owner of the material at the time of the spill and the person in control at the time of the spill. However, the proponent will notify the Ministry of the Environment (MOE) if the proponent is aware of a spill and will provide initial containment response if possible. Under certain circumstances, the proponent will also respond to spills if the owner and person having control cannot be identified. If a spill is caused by the proponent, then the proponent is fully responsible for spill response.

Health and safety concerns take precedence over environmental concerns during emergency work and response.

Environmental Protection for Facility Administration Activities

Environmental impacts are not typically associated with facility administration activities; therefore screening for environmental assessment purposes is not undertaken.

Environmental Protection for Facility Waste Management Activities for Group A, B and C Projects

Hazardous, liquid and non-hazardous solid waste and excess materials associated with the construction, operation and maintenance of provincial transportation facilities must be managed in accordance with the provisions of the Environmental Protection Act (EPA) and Regulation 347, including the provisions pertaining to generation, storage, transportation and disposal. The proponent and the proponent's agents and contractors are all responsible for meeting their individual responsibilities within that generation-to-disposal continuum.

Environmental Protection for Property Management Activities

Routine maintenance and upgrading is conducted in accordance with the normal stewardship principles associated with property ownership. Contamination cleanup is conducted according to EPA provisions and provincial guidelines. Where buildings are derelict and a danger to the public, or are in such poor condition that they cannot be economically tenanted, they are screened for heritage value and any appropriate mitigation and/or documentation are undertaken. Waste materials from such demolition are managed as described above.

Environmental Protection for Pre/Post Construction Field Work Activities

Where pre/post engineering activities may cause environmental damage, screening, avoidance and mitigation may be applied (e.g. equipment access is conducted in a manner that will avoid or minimize environmental impacts). Pre/post environmental activities are undertaken as mitigation measures in themselves. Right-of-way contamination is managed according to EPA provisions and provincial guidelines.

Environmental Protection for Aggregate Extraction Activities

(includes earth or rock borrow at locations not specified by the proponent or design build consortium retained by the proponent)

Aggregates are a vital construction material required in large quantities for provincial transportation undertakings. Aggregate extraction is performed according to the Aggregate Resources Act and/or a Ministry of Transportation/Ministry of Natural Resources (MTO/MNR) protocol which details procedures for permits obtained under the Act. The Act includes operational and environmental controls and requires rehabilitation of pits and quarries. Recent amendments to the Act have also required increased public notification and consultation for aggregate permits and wayside pits.

Part III

OTHER CLASS EA PROVISIONS

CHAPTER 10

Use of this Class EA to Amend Approved Individual Environmental Assessments

The proponent may determine that it is necessary to amend an approved individual environmental assessment. This may be due to reasons such as a change in conditions, the development of new technology or mitigating measures, or the identification of previously unknown concerns.

This Class process may be used to amend an approved individual environmental assessment

This Class EA specifies the following amending process:

- Affected parties will be consulted on the proposed changes, anticipated environmental effects, proposed mitigation and the need for a Transportation Environmental Study Report (TESR). The Class EA process and the principles for transportation engineering, environmental protection, consultation, documentation, bump-up, and environmental clearance will be followed. Depending on the complexity of the proposed change and the number of stakeholders affected by the proposed change, a public information centre may be held.
- A Transportation Environmental Study Report (TESR) will be prepared to document the circumstances necessitating the change, outline the proposed change and identify the anticipated environmental effects and proposed mitigation measures. The TESR will constitute an addendum to the original individual EA and will be made available for a 30 day public review period.
- A Notice of Bump-up opportunity will be issued at the time of TESR submission.
- Only the changes noted in the TESR will be eligible for bump-up. The concept of the undertaking as outlined in the original EA may not be challenged. In the event that a bump-up is granted, the proponent has the option of withdrawing the TESR and implementing the project as documented in the original EA.

CHAPTER 11

Administration of this Class EA

11.1 Phase-in Provisions

The following phase-in procedure is provided to ease the transition from the existing Class EA process:

- Projects following the procedures specified in the Provincial Highways Class Environmental Assessment (1992), may continue to use that Class EA until planning and design have been completed, or may make a transition to the new Class, but Chapters 4.8 and 9 of the new Class EA will apply.
- Project delivery mechanisms described in this Class EA may be applied to projects initiated under previous Class EA documents.
- Projects initiated after the approval of this Class EA will comply with the requirements and procedures specified herein.
- If an ESR (Environmental Study Report) was prepared under the PHY Class EA (1992) and construction has not commenced, then the provisions for TESR addenda and DCRs in Exhibit 6.1 will apply.
- The Environmental Protection,

11.2 Amendment Formula for Class EA

This Class process can be amended by the Ministry of Transportation, the Ministry of the Environment or by other parties

Purpose

The following amendment procedure is designed to facilitate modifications to the Ministry of Transportation's (MTO) Provincial Transportation Facility Class EA to meet:

- the changing role of government;
- the changing federal, provincial and municipal, legislative and regulatory framework;
- the demand for increased efficiency and cost effectiveness in all government activities.

This Class process may require amendments for a number of reasons

The need for such modifications may arise for a number of reasons such as:

- to make improvements to the planning and design process in areas where problems have been identified or where experience indicates that such improvements are desirable;
- to clarify ambiguous or redundant areas of the Class EA document or process.

Types of Amendments

Amendments will be divided into two main categories:

Amendments can be minor or major

- **Minor Amendments:** Minor amendments are those amendments that do not substantively change this Class EA. For example, extending

this Class EA to projects that were not included but are analogous to classes of projects already covered, clarification of wording and streamlining of redundant processes would be considered to be minor amendments.

- **Major Amendments:** Major amendments are those amendments that substantively change this Class EA. For example, altering the amount of public consultation for a class of projects or introducing new processes would be considered to be major amendments.

In addition, there are two other types of amendments:

- **Amendments Proposed by the Ministry of the Environment (MOE)**
- **Amendments Proposed by Parties other than MOE or MTO**

11.2.1 Amendment Formula for Minor Amendments Proposed by MTO

The following process will be used to make minor amendments:

(1) MTO will bring the proposed amendment to the attention of the Director of the Environmental Assessment and Approvals Branch (the Director) of the Ministry of Environment (MOE), describing the amendment and a brief rationale for the amendment.

(2) Prior to making a decision on the proposed amendment, the Director may instruct MTO to consult with one or more directly affected agencies (e.g. other ministries, municipalities) and/or the affected public. A thirty (30) day review period for responses will be allowed.

(3) If no consultation is required, the Director shall make a decision within sixty (60) days of notification of the proposed amendment. If consultation is required, the Director shall make a decision within sixty (60) days after submission of the results of the consultation.

(4) Based on MTO's proposal and any comments received, the Director may determine that there are no significant environmental concerns resulting from the proposal, and approve the amendment.

If the Director believes that there are significant environmental concerns which cannot be resolved through conditions or negotiation between MTO and the concerned party, the Director may declare that the amendment can only be evaluated through the Major Amendment process.

(5) If the amendment is approved, a Notice of Amendment shall be given to all persons who made submissions and a copy of the notice shall be placed in the public record.

11.2.2 Amendment Formula for Major Amendments Proposed by MTO

The following process will be used to make major amendments:

(1) MTO will bring the proposed amendment to the attention of the Minister of the Environment (the Minister), or his delegate, describing the rationale for the amendment.

(2) Prior to making a decision about the proposed amendment, the Minister, or his delegate, may instruct MTO to conduct an approved public consultation process including notification of the public and any potentially affected agency or municipality to request comments. A 30 day review period for responses will be allowed.

(3) If no consultation is required, the Minister, or his delegate, shall make a decision within 60 days of notification of the proposed amendment. If consultation is required, the Minister, or his delegate, shall make a decision within 60 days after submission of the results of the consultation.

(4) Based on MTO's proposal and any comments received, the Minister, or his delegate, may determine that there are no significant environmental concerns resulting from the proposal and approve the amendment.

If the Minister, or his delegate, believes that there are significant environmental concerns which cannot be resolved through conditions or negotiation between MTO and the concerned party, the Minister, or his delegate, may declare that the amendment can only be evaluated through the submission and approval of a new Provincial Transportation Facility Class EA.

(5) If the amendment is approved, a Notice of Amendment shall be given to all persons who made submissions and a copy of the notice shall be placed in the public record.

11.2.3 Amendment Formula for Amendments Proposed by MOE

The following process will be used to make amendments proposed by MOE:

(1) MOE may propose amendments to the Class EA for Provincial Transportation Facilities.

(2) If the Minister finds that an amendment is necessary, MOE shall notify MTO as soon as practicable with respect to the proposed amendment. The notification shall contain a description of the rationale for the amendment and may include draft wording. MTO shall be given a reasonable opportunity to comment.

(3) After providing MTO with a reasonable opportunity to comment, MOE shall direct MTO to prepare and submit the amendment for approval.

(4) Based on MTO's submission, and after consultation with the Minister of Transportation, the Minister of the Environment may approve the amendment.

(5) If the amendment is approved, a Notice of Amendment shall be placed in the public record.

11.2.4 Amendment Formula for Amendments Proposed by Parties other than MOE or MTO

The following process will be used to make amendments proposed by parties other than MOE or MTO:

(1) MTO shall consider all requests for amendment of the Class EA for Provincial Transportation Facilities submitted by parties other than MOE.

(2) A party that proposes an amendment to the Class EA must first notify MTO. The notification shall be in writing and contain a brief description of the rationale for the amendment.

(3) MTO shall notify the party within 60 days of whether the proposed amendment is acceptable to MTO.

(4) If MTO finds the proposed amendment acceptable, MTO may:
- bring the proposed amendment forward as a Minor/Major Amendment, or
- attempt to resolve the issue by means other than by amendment (e.g. protocol, Memorandum of Understanding).

(5) If the proposed amendment is not acceptable to MTO or is otherwise unresolved, MTO shall refer it to the Director of the Environmental Assessment and Approvals Branch, MOE, for consideration. The Director may reject the proposal or follow the process outlined in Subsection 11.2.3.

11.3 Class EA Process Monitoring

The Class process will be monitored to determine its effectiveness and develop improvements as necessary

The overall goal of the monitoring program is to determine ways of making the process better while ensuring that Class EA commitments are met. The objectives are to:

- evaluate the overall effectiveness of the process described in the Class EA document;
- identify specific problems with the process; and
- suggest improvements to the process.

These objectives will be achieved through ongoing review of the application of the principles for environmental protection, consultation, evaluation, documentation and bump up.

Other proponents using this Class EA are required to provide monitoring reports

Where MTO is the proponent under this Class EA document, monitoring will be done on an overview basis. Where other proponents use this Class EA document, such use is conditional upon monitoring reports being prepared for each project and subsequently submitted to MTO's Planning and Environmental Office.

CHAPTER 12

Process for Development of and Consultation for this Class EA

12.1 Introduction

Since the approval of the first Class document in 1979, MTO has had a successful track record implementing projects through the Class process. To date, MTO has obtained a series of approved Class EA documents.

MTO has carried out over 190 projects following the most recent (1992) Class EA. During this time, comments were received from various Provincial and Federal government agencies, conservation authorities, municipalities, interest groups and the public, based on their experience with these projects.

MTO has completed a review of the 1992 Class EA to:

- determine the adequacy and effectiveness of the 1992 Class EA in carrying out the changing MTO Provincial Highways Program and continuing to meet the intent of the EA Act;
- modify the document as required;
- submit a revised document for approval; and
- comply with the new Class EA content requirements as contained in the Environmental Assessment and Consultation Improvement Act, 1996.

12.2 Study Organization

Project Team

In order to effectively evaluate and revise the 1992 Class EA, a Project Team was formed which consisted of representatives from the MTO Environmental Office and MTO Regional Environmental Units. The Project Team included:

Fred Leech	Manager, Central Region Planning and Environmental Office
Dave Wake	Supervisor, Southwestern Region Environmental Unit
Jamie Dougall	Program Manager, Environmental Office
John Slobodzian	Senior Policy Analyst, Environmental Office

Phases

The review was carried out in three phases:

Phase 1	Data Collection
Phase 2	Evaluation
Phase 3	Revision of the Class Document

Phase 1 consisted of:

- evaluation of the existing Class document against alternate methods for delivering the highway construction program (i.e. Total Project Management (TPM), Design/Build);
- review of other ministries' or agencies' Class EAs;
- review of MTO Class EA effectiveness; and
- preparation of a draft report evaluating the 1992 Class EA.

Phase 2 included the assessment of information collected; the identification of potential areas of change due to problems and/or opportunities for improvement; and the determination of the future course of action.

In Phase 3 solutions were proposed for the identified problems and/or opportunities for improvement. The 1992 Class EA document was revised and a draft was prepared. The draft was circulated to appropriate staff within MTO for review and comment.

12.3 Consultation

Consultation was a key component during the development of this Class EA

The development of this Class EA for Provincial Transportation Facilities involved considerable consultation with stakeholders outside and within MTO.

Consultation with external stakeholders was conducted following a communication plan approved by both Cabinet Office and the Premier's Office. This included consultation with a wide spectrum of stakeholders including Federal and Provincial government agencies, external groups that represent broad provincial transportation and environmental interests, native groups, and the general public. Notification of consultation opportunities was made through direct contact, newspaper notices, the MTO electronic home page, and the MOE Environmental Bill of Rights Registry.

Consultation with stakeholders internal to MTO was conducted through circulation of a draft document, as well as presentations to various functional, management, and executive committees.

APPENDICES

APPENDIX #1

OUTLINE OF THE TECHNICAL BASIS FOR TRANSPORTATION ENGINEERING PLANNING AND DESIGN DECISIONS

1. Transportation Engineering Planning and Design Decisions for Freeways and Highways

The key areas of transportation/traffic design decisions for freeways and highways are the selection of:

- freeway versus highway
- access control
- intersections and interchanges
- cross section
- horizontal and vertical alignment
- freeway/highway grade considerations

These are outlined below.

Freeway versus Highway

Most provincial highways are highways rather than freeways. Transportation/traffic factors which support a freeway include the need to accommodate very high traffic volume/demand on the fewest number of lanes (e.g. in heavily urbanized areas), need for high posted speed, need for effective separation of provincial highway traffic from high volume local road network traffic, and the need to provide a high level of service for a strategically important facility (e.g. high volume international and interprovincial connections with a high % commercial traffic).

Freeway/Highway Access Control Considerations

The access control decisions are to provide, in order of increasing access control, minor highway access control, major highway access control, special access control, staged access control, or fully controlled access. If the facility is a freeway, only fully controlled access is permitted for safety reasons. If the facility is not a freeway, transportation and traffic factors which support a higher access control include high traffic volume/demand, high average trip length, high % commercial vehicles, high posted speed, the need to protect against an increase in entrances causing the need for future widening or a new highway, and the need to protect for future facility expansion.

Freeway/Highway Intersection and Interchange Considerations

The intersection and interchange decisions are to provide at-grade intersections versus grade-separated interchanges, and to select the necessary associated design features.

At-grade intersections are most typically utilized. If the facility type is a freeway, then cross-road access is permitted only through grade separated interchanges, and private entrances are not permitted for safety reasons. If the facility is not a freeway, transportation/traffic factors which support an interchange are high traffic volumes on both roads, high posted design speed, high % commercial traffic, lower tolerance to delay of through traffic and/or cross traffic, and a history of at-grade intersection high accident rate.

At-grade intersection decisions are signalized vs. unsignalized; and whether or not to provide various design features such as turning lanes, channelizations, deceleration/acceleration lanes. Transportation/traffic factors which support a signalized intersection include a history of high delay to cross traffic, high accident rates, or a combination of both; and long distances between currently signalized intersections in heavily urbanized areas. Transportation/traffic factors which support turning lane(s) and other features include high turning volume and a high design speed differential of the intersecting roadways.

Freeway-to-freeway interchange decisions are fully directional versus directional with loops. Transportation/traffic factors which support fully directional interchanges are high traffic volumes for all moves, and high % commercial traffic. Freeway-to-non-freeway interchange decisions are whether to provide simple diamond, split diamond, rotary, or button hook design features.

Freeway/Highway Cross-section Considerations

The cross-section decisions include the number of lanes, median design, shoulder design, and urban versus rural cross-section.

The number of lanes can vary from 2 lanes (as is typical of a rural highway) to over 10 lanes (for a complex urban freeway). Transportation/traffic factors which support a higher number of lanes include high traffic volume/demand, high % commercial traffic, steep gradients (supports truck climbing lanes), high turn demand (supports left turn and auxiliary lanes), and a high accident rate history (due to passing and turns).

Median design can be either "undivided" (which is typical of most highways), or "median divided" (as is required for freeways due to safety concerns). An undivided median is most typically utilized. If the facility type is a freeway, then only median divided is permitted for safety reasons. If the facility is not a freeway, transportation/traffic factors which support a median-divided facility include high traffic volumes, high-speed posting, splined grades between opposing lanes of traffic (due to high cross-slope), serpentine alignment of a multi-lane facility, and a history of high accident rates associated with left turns. Median design may be either "open median" or "median barrier". Transportation/traffic factors which support an open median design include higher safety, lower construction cost, better snow and vehicle storage, and ability to provide for emergency vehicle U-turn. Transportation/traffic factors which support a median barrier design are inadequate open median width for safety (i.e. high cross-over accident rate) and property constraints. Shoulder design can vary from "no shoulder" to "wide shoulder". Shoulders may be gravel, partially paved or paved.

No shoulder is usually limited to an urban cross section. Transportation/traffic factors which support a wider shoulder include higher traffic volumes and number of lanes, high shoulder usage by farm vehicles and pedestrians, better snow and vehicle storage, and a history of shoulder related accidents. Transportation/traffic factors which support a paved shoulder include higher traffic volumes, higher posted speed, higher erosion resistance, and a history of high gravel shoulder maintenance need.

The cross section can be either rural or urban. The rural cross section is the most typical. Transportation/traffic factors which support a rural cross section include satisfactory drainage through ditches, adjacent rural land use, and lower construction costs. Transportation/traffic factors which support an urban cross section are the need for storm sewers, property constraints, and adjacent urban land use. When a mix of the above factors are found, an option of semi-urban cross section can be used.

Freeway/Highway Horizontal and Vertical Alignment Considerations

The horizontal and vertical alignment decisions are to meet the minimum horizontal, crest and sag curvatures that are associated with the design speed; exceed the minimum curvature associated with the design speed; or to provide curvature below the minimum for the design speed.

The standards are typically met, and may be exceeded for site-specific safety situations, construction staging requirements, or cost savings. However the provision of curvature below the minimum for the design speed may have to be considered under conditions such as extreme incremental construction costs or environmental impacts, and may be considered where there is minimal or no conflict with entrances, cross road access, signals or other stop condition.

Freeway/Highway Grade Considerations

The grade decisions are to meet grade maximums as defined by facility type, provide grades that are more gradual than the maximums as defined by facility type, or to provide grades that are steeper than the maximums as defined by facility type.

The standards are typically met, and may be more gradual for site-specific safety situations, construction staging requirements, or cost savings. However the provision of grades steeper than the maximum for the facility type may have to be considered under conditions such as extreme incremental construction costs or environmental impacts, and may be considered where there is very low truck volume or there are adequate truck climbing/passing lanes.

2. Transportation Engineering Design Decisions for Provincial Transitways

A provincial transitway is a transit facility directly associated with a provincial highway to provide the following transportation functions:

- local trips - travel between development nodes located within close proximity to each other;
- intermediate distance trips - longer commuting trips to major activity centres;
- long haul trips - long distance trips to destinations such as airports as well as inter-regional and inter-city services;
- network integration - provide direct transit connections with radial rail commuter services and with other local bus systems;
- gateway - connect major crossing freeway and arterial roads into the transit system at "change-of-mode" (gateway) stations.

The key areas of transportation/traffic design decisions for transitways are the selection of:

- transitway technology
- cross section
- horizontal and vertical alignment
- station type

These are outlined below.

Transitway Technology Considerations

The transit technology decisions include, but are not restricted to, the following:

- Busway - buses operating on a fully separated right-of -way which can be conventional or use a guidance system
- Light Rapid Transit - rail based system including street car and advanced rail technologies
- Heavy Rapid Transit - subway rail system
- Light Guideway Systems - monorails on guideways with rubber or steel wheels, levitated or suspended.

Transportation/traffic factors that influence the technology selection are passenger capacity, implementation phasing, construction and operating cost, technological compatibility and operational flexibility, and corridor/property constraints.

A heavy rapid transit (subway) has roughly twice the passenger capacity as busway technology.

A bus based technology can be implemented in stages as passenger volumes require. Implementation can start with buses in mixed traffic, followed by buses in HOV lanes on the highway, followed by buses on grade-separated transitway sections, until the entire system is completed. In contrast, the full distance of a rail-based transit facility must be constructed in its entirety before it can open.

The construction cost per kilometre is greatest for light guideway systems, followed by heavy rapid transit, light rapid transit, then busway. Because busway implementation can be staged, construction cost can be extended over a longer period. The operating cost per kilometre is greatest for heavy rapid transit, followed in order by light guideway, light rapid transit, and busway. However, in general, the per passenger peak hour cost is greatest with light rapid transit, followed by light guideway, bus, and heavy rail. The per passenger off-peak hour cost is least with bus technology.

An extension/expansion of an existing system will require technological and operational compatibility. The ability to integrate a provincial transit facility with existing transit services is important. For example, different bus operators would have the opportunity to share a busway facility. Integration with various transit routes and operators reduces the need for mode changes and trip delays.

Different transit technologies have different land requirements based on geometric design standards and facility requirements. Certain technological choices may be eliminated by corridor property constraints relative to the cross section, alignment, grade and station requirements outlined below.

Transitway Line Cross Section Considerations

The cross-section decisions include grade separation and right-of-way width.

Provincial transitway technologies should be grade separated facilities, and because of this objective, provincial transitways are most frequently associated with freeways, which have the same requirement. However, transportation/traffic factors which may support at-grade intersections include lower technology (bus is better suited than light rail which is better suited than heavy rail), low volume/low speed cross-road traffic, and the ability to signalize cross traffic to stop upon transit vehicle approach.

The width of the right-of -way varies depending on the technology. Generally a 30 meter wide right-of-way is required to accommodate the facility, with one rail or lane in each direction.

Transitway Horizontal and Vertical Alignment Considerations

The horizontal and vertical alignment decisions are how to meet the minimum horizontal, crest and sag curvatures that are associated with the transitway technology. Light rail technology can tolerate the tightest turning radii, and bus, heavy rail/light guideway systems require increasing turning radii in that order.

Provincial transitway right-of-way is typically immediately adjacent to the highway for much of its length. Transportation/traffic factors which support separation from the highway include differences in highway and transitway geometric requirements and grades, and the "footprint" influence of highway interchanges, transitway stations, parking, roadway access and gateway connections.

Transitway Grade Considerations

The grade decisions are how to meet grade maximums as defined by transitway technology. Bus technology can tolerate the steepest grades, and light rail, and heavy rail/light guideway systems require increasingly gradual grades in that order. Line grades through stations/terminals for all transit technologies must be essentially level.

Transitway Station Considerations

The types of transitway station are the following:

- Direct Service Stations - the transitway is realigned outside of the highway right-of-way to directly serve high intensity nodes;
- Interchange Stations (busway) - bus access to and from the transitway would be provided with intersecting arterial roads through the use of dedicated ramps;
- Line Haul Stations - vehicles operating on the transitway would be restricted to the transitway and not able to access the crossing arterial roads at these stations. A physical transfer would be required by passengers.

The design features that may be considered for each transitway station include the following:

- Arterial road access
- park-and-ride/kiss-and-ride lots
- bus bays for arterial transit routes - intersecting arterial bus routes would load and unload passengers in this area. In higher demand areas, dedicated stopping areas for each connecting route could be provided. This would provide a layover area and could also act as a "timed transfer" point which would allow convenient transfers between local bus services
- On-line Stations with By-pass Lanes (busway only)- transit vehicles could stop and load/unload passengers without exiting the transitway. By-pass lanes would allow through buses to avoid stopped buses. This feature is included at all busway stations
- Ramps to and from the Transitway - ramps allowing direct bus access from arterial roads to the transitway would be incorporated into all interchange stations
- Direct Freeway Access - provide a direct or convenient auto access from an adjacent freeway to park and ride and kiss and ride facilities. This allows the transitway facility to intercept potential long distance auto trips on freeways.

In addition, provincial transit stations share the planning and design decisions for service, maintenance and operations facilities outlined in the following section.

3. Transportation Engineering Planning and Design Decisions for Service, Maintenance and Operations Facilities

Service facilities include commuter parking lots, freeway service centres, picnic sites, rest areas, information centres, provincial transitway stations, ferryboat docks/terminals, etc.. Maintenance facilities include patrol yards, vehicle/equipment repair and storage depots, material storage depots, etc.. Operations facilities include traffic management/control centres, inspection stations, toll plazas, etc..

The key areas of transportation/traffic design decisions for service, maintenance and operations facilities are the selection of:

- service area
- site location
- site design

Service Area Considerations

Service area considerations include, but are not limited to, the following:

- service facility service separation should not exceed distance and "comfort" limits relative to the function and client
- maintenance facility service areas should not be larger than can be efficiently serviced from a single site (e.g. distance to limits of service area should not be excessive)
- operations facilities should serve the largest area possible (to minimize overhead)

Site Location Considerations

Site location considerations include, but are not limited to, the following:

- all facilities should have access/egress that is safe and does not interfere with traffic flow on the transportation facility it serves
- service and operations facilities should be visible and easy to get to
- operations facilities for freeways and highways should be difficult to bypass
- where possible, given service area and other siting considerations, facilities should be located where utilities are readily available

Site Design Considerations

Site design considerations include, but are not limited to the following:

- site design must be safe and efficient
- site efficiency must consider traffic demand, peak usage, variable client types (e.g. commercial vs. recreational, commuter versus long-distance, etc.)
- where service area and site location considerations can be realized, multiple facilities should share a single site where additional efficiencies can be achieved

APPENDIX #2

TYPICAL ENVIRONMENTAL PROTECTION AND MITIGATING MEASURES

Factor Areas Covered:

- Wildlife
- Soils
- Ecosystems
- Vegetation
- Greenways and Open Space Linkages
- Fisheries and Aquatic Habitat
- Ground Water
- Surface Water
- Air Quality
- Erosion and Sediment Control
- Aesthetics
- Highway & Construction Noise
- Community/Recreation
- Agriculture
- Commercial/Industrial
- Land Use
- Waste/Materials Management
- Archaeology & Heritage

NOTES:

1. *In this appendix, the boxes entitled New Route Generation/Selection Stage, provide examples of environmental protection and mitigation related to the new route component of all Group A projects. The boxes entitled Planning, Preliminary & Detail Design Stage, show examples of environmental protection and mitigation for all Group A projects after route selection and, for the planning, preliminary and detail design of projects in Groups B and C.*

2. *Examples contained in this appendix are for illustrative purposes only and, are not all inclusive. Actual mitigation measures will be applied based on project specifics.*

Factor Area: Wildlife

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Destruction of wildlife Habitat	• Protect through alternate route or, if valley crossing, use of high structure • Select route with least impact on Habitat
Barrier Effect on travel corridor	• Avoidance, as above • Select route with fewest crossings of wildlife corridors
Impact on Rare, Threatened or Endangered Species	• Protect through alternate route for known locations • Control through appropriate setback from known habitat

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Destruction of wildlife Habitat	• Protect through alignment modification • Minimize impact by following edges of habitat areas and or crossing habitat areas at narrowest location • Minimize impact on edge or any part of area using appropriate design measures
Barrier effect on travel corridors	• Protect corridors to provide wildlife access across ROW using appropriate design measures (e.g. culverts, etc.)
Wildlife-Vehicle accidents	• Same as Above • Mitigate using appropriate signage to increase driver awareness

Construction Stage	
Effect	Protection/Mitigating Measure
Intrusion into sensitive area	• Protect area using silt fence/tree protection • Protect area by prohibiting access • Prohibit/restrict open burning • Minimize tree removal

Factor Area: Soils

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Loss of Soils	• Protect through alternate route to avoid areas of specialty crop lands and class 1, 2, 3 agricultural soils and avoid areas of steep and unstable slopes • Also see "Erosion and Sediment Control" and "Agriculture"

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Loss of soils	• Minimize impacts and minimize grades using appropriate design measures • Also see "Erosion and Sediment Control" and "Agriculture"

Construction Stage	
Effect	Protection/Mitigating Measure
Loss of soils	• Mitigate through erosion control measures • Monitor erosion control measures • Also see "Erosion and Sediment Control" and "Agriculture"
Soil contamination	• See "Waste/Materials Management"

Factor Area: Ecosystems

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Severance of/encroachment on identified upland ecosystems	• Protect through alternate route • Select route with least impact
Severance of/encroachment on identified aquatic/wetland ecosystems	• Protect through alternate route • Select route with least impact

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Severance of/encroachment on identified upland ecosystems	• Minimize intrusion by use of design measures (i.e. horizontal/vertical alignments) • Mitigate with additional property acquisition and/or plantings and other design measures
Severance of/encroachment on identified aquatic/wetland ecosystems	• Minimize intrusion by use of design measures (i.e. alignments, design of structures)

Construction Stage	
Effect	Protection/Mitigating Measure
Intrusion into sensitive area	• Protect area using silt fence/tree protection • Protect area by prohibiting access

Factor Area: Vegetation

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Effects on ANSI's, ESA's, Provincially significant Wetlands, Provincially rare species, NEC "Natural Areas"	• Protect through alternate route that would avoid encroachment
Effects on cultural/heritage, social/economic landscape features	• Protect through alternate route that would avoid/minimize encroachment
Effects on woodland resource	• Protect through alternate route that would avoid/minimize encroachment

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Effects on ANSI's, ESA's, Provincially significant Wetlands, Provincially rare species	• Protect through horizontal/vertical alignments, grading and structural design that would avoid incursion • Utilize landscape planting plan to provide environmental buffer, erosion control, filter strips for water quality, fish habitat compensation, etc.
Effects on cultural/heritage, social/economic landscape features	• Minimize impact through horizontal/vertical alignments, and grading design to permit maximum retention of existing features • Utilize landscape planting plan to provide mitigation, screening and enhancement
Effects on woodland resources	• Minimize impacts through horizontal/vertical alignments, and grading design to permit maximum retention of existing resources • Utilize landscape planting plan to mitigate impact resulting from tree removal
Effects on traffic safety	• Minimize impacts through horizontal/vertical alignments, and grading design to allow maximum retention of existing vegetation and meet safety requirements • Utilize landscape planting plan to enhance traffic safety e.g. tangent screening, headlight screening, snowdrift control etc.

Vegetation(Con't)

Construction Stage	
Effect	Protection/Mitigating Measure
Effects on ANSI's, ESA's, Class I, II, III Wetlands, Provincially rare species	• Mitigate effects through enforcement of retention/protection measures, exercise careful work habits, and implementation of landscape plan
Effects on cultural/heritage landscape features	• Mitigate effects through enforcement of retention/protection measures, exercise careful work habits, and implementation of landscape plan
Effects on woodland resource	• Mitigate effects through enforcement of retention/protection measures, exercise careful work habits, and implementation of landscape plan

Factor Area: Greenways and Open Space Linkages

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Severance of Greenway or Linkage	• Protect through alternate route

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Severance of Greenway or Linkage	• Shift alignment to avoid impact • Design structure to span area • Establish alternative greenway or linkage
Noise, dust, spray, air quality	• Control through minimum distance separation (i.e. 500 m) buffer from Hwy • Design landscape buffer

Construction Stage	
Effect	Protection/Mitigating Measure
Intrusion into sensitive area	• Protect area using silt fence/tree protection • Protect area by prohibiting access
Damage area	• Restore area by repair, grading, landscaping

Factor Area: Fisheries and Aquatic Habitat

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Direct Loss of Aquatic Habitat	• Protect through alternate route to avoid critical fish habitat and sensitive water crossings or select route with the least impact on sensitive watercourses
Changes to water quality and quantity	• Protect through alternate route to avoid ground water recharge areas or select route with the least impact on ground water recharge areas

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Direct Loss of Aquatic Habitat	• Avoid loss of critical fish habitat through alternative culvert/structure types and designs • Minimize all other in-stream and floodplain habitat loss, through alternative culvert/structure types and designs • Restore disturbed vegetation and aquatic habitat features (e.g. substrate) • Minimize stream relocations and channelization • Design stream relocations and channelization in such a manner that habitat features are maintained or enhanced • Minimize changes to stream gradients • Minimize tree removals adjacent to streams • Stabilize existing unstable banks and reaches to compensate for lost or altered habitat • Enhance existing in-stream and floodplain habitat to compensate for lost or altered habitat • Enhance stream flow characteristics (e.g. flow deflectors) to compensate for lost or altered habitat • Remove existing barriers to fish passage to compensate for lost or altered habitat

Planning, Preliminary & Detail Design Stage (Con't)	
Effect	Protection/Mitigating Measure
Changes to water quality and quantity	• Storm water control through Storm water BMPs (e.g. grassed swales, extended detention ponds) • Prohibit water removal from low volume streams • design of culverts/stormwater facilities to account for groundwater upwelling areas
Inhibit fish passage	• Ensure culvert /structure design and placement permits fish passage or does not further impair fish passage

Construction Stage	
Effect	Protection/Mitigating Measure
Direct Loss of Aquatic Habitat	• Minimize work within watercourses • Minimize access to and across watercourses • Enhance existing fish habitat to compensate for lost or altered habitat (see design stage)
Indirect loss of aquatic habitat through sedimentation and debris	• Prevent sediment from entering into the watercourse • Prevent debris from entering into the watercourse • Isolate work area from watercourse • Stabilize disturbed soils • Also see "Erosion and Sediment Control"
Reduced fish productivity	• Prohibit in-stream work during critical migration, spawning, e.g. development and hatching times
Changes to water quality and quantity	• Maintain stream flow

Factor Area: Groundwater

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Impacts of groundwater quality (increased pollutants) and quantity (fluctuation on ground water levels)	• Adjust alignment to avoid areas with high groundwater table, recharge areas and wells • Review MOE groundwater charts • Obtain adequate borehole data to assess groundwater elevation

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Increased pollutants to groundwater recharge areas	• Carry out Stormwater Management Plan (Study) to minimize water quality impacts to groundwater recharge areas Incorporate recommended stormwater management practices into the design package • Avoid Infiltration measures
Increased/Decreased runoff (water quantity) to groundwater recharge areas	• Carry out Stormwater Management Study and Incorporate recommendation in design package • Reduce depth of cuts in areas of shallow ground water
Potential impacts to well water levels and quality due to the proposed design	• Identify wells of high potential for impacts due to the proposed design • Consider pre-construction monitoring (sampling) of wells

Construction Stage	
Effect	Protection/Mitigating Measure
Interference with the quality and/or quantity of water supply(wells) due to construction activities Removal of wells	• Monitor (sample) well(s) (water quantity and quality), compare with pre-construction results • Provide temporary water supply • Remove wells properly abandoned/decommissioned
Contamination of groundwater due to contractor activities (refuelling spills, etc.)	• Require equipment refuelling restrictions • Remove or contain contaminated material • Minimize disturbance of septic systems • Utilize good management practices for the establishment and abandonment of wells and septic systems • Ensure positive drainage • Conduct monitoring of problems or potential problems as necessary
Impacts to septic system/Removal of septic system	• Repair septic system and ensure septic systems removed from service are properly abandoned/decommissioned

Factor Area: Surface Water

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Increased water quantity to receiving watercourse (flood levels and erosion)	• Adjust alignment to avoid sensitive watercourse crossings (flooding and erosion) • Property acquisition/protection for stormwater management ponds(flooding and erosion) • Minimize amount of impervious area
Increase pollutants to receiving watercourse (water quality)	• Adjust alignment to avoid erodible soils • Adjust alignment to avoid sensitive watercourse crossings • Property acquisition/protection for stormwater management facilities • Maximize grassed areas (median ditches and outside ditches)

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Potential increase in upstream/downstream flood levels and erosion at watercourses	• Carry out an analysis and design of watercourse crossings (culverts and bridges) in accordance with Ministry Standards, Policies and Directives to minimize flood risk and erosion • Develop stormwater management plan (stormwater management study) to identify water quantity facilities to control peak flow (runoff). Incorporate recommendations (facilities) into design package • Identify locations requiring erosion protection and Incorporate erosion protection measures into the design package
Potential Increase of pollutants to receiving watercourses (increase imperviousness)- water quality	• Carry out a stormwater management study to identify stormwater management practices (SWMPs) to be incorporated into the design package
Potential increase in surface erosion to receiving watercourses	• Develop erosion control plan -incorporate SPs, NSSPs and drawings into contract package

Construction Stage	
Effect	Protection/Mitigating Measure
Increase runoff from construction site to receiving watercourses	• Require temporary detention basin/pond • Require contractor to have an adequate drainage conveyance system during construction • Monitor to ensure erosion protection measures installed and maintained • Also see "Erosion and Sediment Control"
Contamination of surface waters	• Remove or contain contaminated material • Clean out catch basins in storm sewer systems • Restrict equipment from entry into water • Utilize equipment refuelling setbacks from water bodies & other precautions • Stockpile setbacks from water bodies • Use enclosures on structural rehabilitation work & containment of spent blasting media • Prohibit use of hydraulic cleaning methods in sensitive areas • Prohibit stockpiling of materials in sensitive areas (e.g. within flood plain of watercourse, or other designated areas) • Direct run-off away from sensitive areas • Contain and clean-up spills quickly and effectively • Report spills quickly and accurately

Factor Area: Air Quality

New Route Generation/Selection Stage	
Effect	**Protection/Mitigating Measure**
Potential effect of long term exposure, if exceedances of current air quality standards on: - health impacts - plant and crop damage - property deterioration/cleanliness	• Control impacts through maintaining a setback of homes, schools from proposed route of between 20 to 40 m, for air quality problem areas, based on variables of topography, wind etc.

Planning, Preliminary & Detail Design Stage	
Effect	**Protection/Mitigating Measure**
Potential effect of long term exposure, if exceedances of current air quality standards on: - health impacts - plant and crop damage - property deterioration/cleanliness	• Determine need to model impact on air quality of highway improvements, based on criteria for modelling developed by MTO for traffic volume, # of lanes and atmospheric conditions to determine the need for mitigation measures • Minimize impact through appropriate design measures (depressed grade for air quality problem areas) • Improve traffic flow to reduce "stop and go" driving

Construction Stage	
Effect	**Protection/Mitigating Measure**
Short term effects of construction operations on adjacent sensitive receivers, i.e. residences, schools, hospitals, flora and fauna, etc.	• Include special provisions in contract to ensure no unnecessary idling of vehicles • Provide dust control/suppression • Locate contractors yards away from sensitive areas • Use incentive/disincentive clauses in contract to reduce the duration of construction

Factor Area: Erosion and Sediment Control

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Erosion and sedimentation	• Control erosion and sedimentation through avoiding routes with highly erodible soils

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Erosion and sedimentation	• Minimize erosion by slope modification (flattening, benching, serration) • Minimize erosion by use of retaining walls • Utilize least erodible fill material in highly sensitive locations • Implement Landscape planting plan (also see "Vegetation") • Control of runoff
Erosion and sedimentation in watercourses	• See "Fisheries and Aquatic Habitat"

Erosion and Sediment Control (Con't)

Construction Stage	
Effect	Protection/Mitigating Measure
Erosion and sedimentation	• Protect exposed surfaces with: - vegetative cover (seeding and mulching, seeding and erosion control blanket, sodding) - non-vegetative cover (gravel sheeting, rip rap, gabion baskets, concrete slope paving under structures, proprietary slope protection) - Construction constraints (operational constraints controlling duration of exposed surfaces, limiting the area permitted to be exposed at any one time, etc.) • Control run-off with: - Temporary run-off controls (interceptor berm or ditch at top of cut slope, toe-of slope drain, flow spreader, etc.) - Temporary check dams (straw, rock, sand bag) - Sediment control measures (sediment barriers, silt fence, straw bale barriers, etc.) - Sediment traps - Construction in the dry (e.g. cofferdams, temporary stream diversions, temporary culverts, caissons, etc)
Erosion and sedimentation in watercourses	• See "Fisheries and Aquatic Habitat"

Factor Area: Aesthetics

New Route Generation/Selection Stage	
Effect	**Protection/Mitigating Measure**
Effects on visual landscape and scenic resources available to motorists (views from the road)	• Conduct visual inventory and analysis to help select alternative alignment that has scenic potential and/or protects outstanding landscape features
Effects on adjacent dwellers sensitive to views of the facility	• Avoid impacts by selecting alternative alignment that has least sensitive viewer groups in the vicinity
Effects on passive recreation potential of scenic/natural adjacent sites e.g. river valley systems	• Select alignment alternative that would avoid disruption of sites with most scenic/natural features

Planning, Preliminary & Detail Design Stage	
Effect	**Protection/Mitigating Measure**
Effects on visual landscape and scenic resources available to motorists (views from the road)	• Establish horizontal/vertical alignments that would best capture scenic potential • Utilize grading design to minimize removal of aesthetic landscape features • Ensure structural/lighting design is consistent with aesthetic conditions of site
Effects on adjacent dwellers sensitive to views of the facility	• Design horizontal/vertical alignments that would least expose sensitive viewer groups to highway • Design grading to permit maximum retention of existing vegetative/visual buffer • Avoid visually intrusive structure/retaining walls designs • Provide visual screening and aesthetic enhancement through landscape design with earthwork and plantings
Effects on passive recreation potential of scenic/natural adjacent sites e.g. river valley systems	• Design horizontal/vertical alignments that would require least disruption to scenic/natural sites e.g. river crossings • Ensure structural design is visually consistent to the aesthetic conditions of site and would cause least disruption to site • Include landscape treatments to mitigate visual impact e.g. structures over scenic/natural valley sites

Aesthetics (Con't)

Construction Stage	
Effect	Protection/Mitigating Measure
Effects on visual landscape and scenic resources available to motorists (views from the road)	• Enforce retention/protection of aesthetic landscape features e.g. woodlots, valleys
Effects on adjacent dwellers sensitive to views of the facility	• Enforce retention/protection of existing visual buffer e.g. Vegetation
Effects on passive recreation potential of scenic/natural sites e.g. river valley systems	• Apply construction technique that would require the least disruption to scenic/natural features e.g. temporary access route and heavy equipment requirements in scenic valley sites • Enforce retention/protection of existing aesthetic conditions of site through careful work habits

Factor Area: Highway and Construction Noise

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Increased Highway noise levels	• Avoid residential areas/ homes • Avoid other Noise Sensitive Areas (e.g. hospitals etc.)

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Increased Highway noise levels	• Minimize impacts through adjustments to highway gradient and/or vertical alignment • Use quieter pavement type • Install noise barriers in accordance with Provincial Policy

Construction Stage	
Effect	Protection/Mitigating Measure
Construction noise disturbance	• Restrict night time operations • Require equipment to be in good repair • Require adherence to local noise by-laws • Prohibit equipment yards in Noise Sensitive Areas

Factor Area: Community/Recreation

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Severance of communities	• Protect through alternative alignment • Maintain local roads (e.g. provide underpasses/ overpasses) for delivery of community services (emergency, school bus)
Loss of homes	• Avoid through alternative route selection to bypass urban areas and clustered rural settlements to decrease the number of people affected
Loss of recreational/community facilities	• Avoid through alternative route selection

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Loss of homes	• Mitigate impacts by: - acquiring property at fair market value - considering advance purchase - providing appropriate notice period (per lease agreements) if land is in public ownership
Impacts to property	• Minimize direct impacts to property by following lot/concession/field lines or existing right-of-way • Compensate for 'injurious affection': where land is taken MTO may compensate landowners for damages resulting from both construction and use of the highway, where no land is taken, MTO is only responsible for damages resulting from construction of the highway
Loss of recreation/community facilities	• Mitigate impacts by acquiring property at fair market value
Permanently removing existing driveway/business access	• Provide new access
Disrupting character of area	• Preserve existing amenities as much as possible • Retain and/or plant vegetative buffer areas • Grade site to pleasing lines, utilize berms • Design and site structures to blend with adjacent areas

Planning, Preliminary & Detail Design Stage (Con't)	
Effect	Protection/Mitigating Measure
Permanently closing pedestrian/bicycle accesses	• Provide alternative route/access
Permanently closing driveway/business accesses	• Provide alternative access
Potential impacts on public transit routes	• Consult with transit authorities to minimize conflicts/enhance opportunities
Potential impacts on emergency response routes	• Consult with response agencies during design to minimize disruption, coordinate activities
Disruption of community infrastructure/services	• Consult with utilities (electricity/water/sewer/gas/telephone/cable) during design to minimize disruption, coordinate activities

Construction Stage	
Effect	Protection/Mitigating Measure
Dust accumulation on private property	• Provide dust control/suppression • Utilize temporary erosion control methods on staged construction
Temporarily closing driveway/business accesses	• Provide alternative access • Utilize signing and detours to minimize inconvenience for both businesses and potential customers • Minimize the time when access is affected • Stage construction to minimize inconvenience where possible and to be as responsive as possible to the needs of individual businesses.
Smoke impairing visibility/air	• Prohibit/restrict open burning in vicinity of dwellings • Prohibit open burning on days where weather conditions prevent dissipation of smoke
Temporarily closing pedestrian/bicycle routes/accesses	• Provide alternative routes/access
Disruption of residents	• Provide community relations program (e.g. provision of information on timing of construction, project schedule, contact person to deal with day-to-day issues) • Provide contractor incentives to maintain or shorten construction schedule • Schedule construction to avoid disruption of peak outdoor activities of residents
Potential impacts on public transit routes	• Maintain liaison/coordinate construction with transit authorities
Potential impacts on emergency response routes	• Maintain liaison/coordinate construction with responding agencies
Disruption of community infrastructure/services	• Maintain liaison with utilities • Consider coordinating construction and utility maintenance/upgrading to minimize disruption

Factor Area: Agriculture

New Route Generation/Selection Stage	
Effect	**Protection/Mitigating Measure**
Loss of specialty crop lands and class 1,2,3 agricultural soils	• Protect through alternative route that avoids specialty crop lands and Class 1,2,3 agricultural soils
Loss of capital improvements	• Protect through alternative route that avoids capital improvements
Fragmentation of designated prime agricultural areas	• Select alternative route that avoids fragmentation of designated prime agricultural areas

Planning, Preliminary & Detail Design Stage	
Effect	**Protection/Mitigating Measure**
Loss of specialty crop lands and class 1,2,3 agricultural soils Loss of capital improvements	• Minimize direct impacts to property by following lot/concession/field lines or existing right-of-way
Permanently removing existing access	• Provide new access
Impacts to property	• Minimize direct impacts to property by following lot/concession/field lines or existing right-of-way • Compensate for 'injurious affection': where land is taken, MTO may compensate landowners for damages resulting from both construction and use of the highway, where no land is taken, MTO is only responsible for damages resulting from construction of the highway

Construction Stage	
Effect	**Protection/Mitigating Measure**
Decrease in land productivity as a result of blocked drainage	• Repair construction damage to field tiles
Disrupting agricultural operations	• Schedule construction to avoid work during active farm operations (e.g. cultivation, harvesting etc.) • Rehabilitate areas disturbed by construction
Temporarily closing agricultural accesses	• Provide alternative access
Disrupting livestock by noise and dust	• Provide dust control/suppression, require equipment to be in good repair
Contaminants in runoff affecting crops	• Direct run-off away from sensitive areas
Injury to crops and livestock due to particulate matter in air from open burning	• Prohibit/restrict open burning during sensitive crop periods and in vicinity of livestock

Factor Area: Commercial/Industrial

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Loss of businesses	• Protect through alternate route • Avoid impacting core business areas

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Loss of businesses	• Mitigate impacts by: - acquiring property at fair market value - considering advance purchase
Impacts to property	• Minimize direct impacts to property by following lot/concession/field lines or existing right-of-way • Compensate for 'injurious affection': where land is taken, MTO may compensate landowners for damages resulting from both construction and use of the highway, where no land is taken, MTO is only responsible for damages resulting from construction of the highway
Permanently removing existing entrance/exit	• Provide alternate entrance/exit

Construction Stage	
Effect	Protection/Mitigating Measure
Disrupting business operations	• Schedule construction to avoid work during business hours/peak tourist periods • Provide signage to direct potential customers • Compensate for business losses
Temporarily closing entrance/exit	• Provide alternate entrance/exit

Factor Area: Land Use

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Conflicts with municipal development goals/objectives	• Consider municipal development goals/objectives in route selection
Re-distribution of population/employment effects	• Consider municipal/provincial development strategies
Impacts on areas designated for settlement expansion	• Consider alternative routes which facilitate areas designated for expansion
Fragmentation of designated environmentally sensitive areas	• Avoid alignments that fragment these areas

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Reduced ability to proceed with approved private developments	• Consider alternative alignments, cross-sections to minimize impacts on approved developments
Higher intensity of land use than previously existed	• Corridor control to ensure that entrances and exists on the highway remain at a safe level

Construction Stage	
Effect	Protection/Mitigating Measure
Loss of/encroachment on Environmentally sensitive areas	• Prohibit entry in/equipment storage in environmentally sensitive areas

Factor Area: Waste / Materials Management

New Route Generation/Selection Stage	
Effect (In absence of mitigation)	Protection/Mitigating Measure
Encroachment upon waste disposal sites, and contaminated or potentially contaminated property	• Screen properties to identify waste disposal sites & contaminated property; and • Avoid waste disposal sites & contaminated property

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Encroachment upon waste disposal sites and contaminated property	• Conduct field investigations as necessary to determine absence or presence of contamination and quantify and characterize contamination, e.g. Phase I & II Environmental site Assessment & remediate as necessary • Minimize encroachment through design measures (e.g. alignment shift)
Contamination of ground water	• See "Ground Water"
Contamination of surface waters	• See "Surface Water"
Contamination of R-O-W from waste disposal sites or contaminated properties	• Conduct field investigations as necessary to determine absence or presence of contamination and quantify and characterize contamination, e.g. Phase I & II Environmental site Assessment • Design drainage measures to prevent landfill leachate from mixing with Highway drainage • Design measures to prevent waste material from impacting/entering the R-O-W • Design measures to prevent construction activities from impacting site, or contacting contaminated areas • For combustible gas - design measures to prevent explosive build up in confined spaces on R-O-W
Release of asbestos or lead into the air/environment	• Testing of suspected asbestos/lead - containing substances as warranted • Controlled removal of asbestos/lead - containing materials • Proper handling & disposal of asbestos/lead waste
Generation of excess concrete; asphalt or natural wood from the R-O-W	• Incorporate/re-use excess materials into the design where possible and applicable

Construction Stage	
Effect	Protection/Mitigating Measure
Encroachment upon waste disposal sites and contaminated property	• Monitor work in vicinity of waste disposal site or contaminated property as necessary to ensure absence of contamination • Site or item specific monitoring and/or testing to identify contamination and determine viable options where necessary • Remediation of contamination in accordance with MOE's Guideline for use at contaminated sites in Ontario as necessary and feasible • Ensure good property and materials management practices to minimize negative impacts to the environment
Contamination of ground water	• See "Ground Water"
Contamination of surface waters	• See "Surface Water"

Factor Area: Archaeology & Heritage Resources

New Route Generation/Selection Stage	
Effect	Protection/Mitigating Measure
Loss of archaeological resources	• Survey to identify sites • Avoidance, through alternative route selection
Loss of heritage structures/resources	• Avoidance, through alternative route selection, minimize impacts to known heritage features of high and moderate significance
Impacts to registered and unregistered cemeteries which have been identified and documented	• Avoidance, through alternative route selection

Planning, Preliminary & Detail Design Stage	
Effect	Protection/Mitigating Measure
Loss of archaeological resources	• Pre-construction archaeological survey and salvage in consultation with heritage agencies
Loss of heritage structures/resources	• Documentation and restoration or removal of resource
Deterioration of sites or structures having archaeological or heritage value as a result of environmental changes	• Decrease harmful environmental condition changes such as vibration, altered water table, etc.

Construction Stage	
Effect	Protection/Mitigating Measure
Disturbance or destruction of archaeological/heritage resource	• Include provisions in contract to stop construction in areas where archaeological resources are discovered during construction • Protect sites by restricting access

APPENDIX #3

SAMPLES OF TABLE OF CONTENTS FOR STUDY DOCUMENTATION

A. Sample Table of Contents for a Group A project (TESR) Submitted at the Completion of Planning

B. Sample Table of Contents for a Group B project (TESR) Submitted at the Completion of Preliminary Design

1.0 Overview of Undertaking
- 1.1 Summary Description of the Undertaking
- 1.2 Purpose of Report

2.0 Outline of Environmental Assessment Process
- 2.1 Project-Specific Study Process
- 2.2 Consultation Process

3.0 Transportation Needs Assessment
- 3.1 Problem and Opportunity
- 3.2 Alternatives to the Undertaking - brief discussion

4.0 Preliminary Design
- 4.1 Description of Study Area Constraints
- 4.2 Generation and Assessment of Preliminary Design Alternatives
- 4.3 Evaluation and Selection of Preferred Alternative - ("The Recommended Plan")

5.0 Detailed Description of The Recommended Plan
- 5.1 Major Features of The Recommended Plan
- 5.2 Environmental Issues and Commitments
- 5.3 Future Consultation
- 5.4 Summary of Environmental Effects, Proposed Mitigation, Commitments to Further Work

C. Sample Table of Contents for a Group A or B Design and Construction Report (DCR) Submitted at the Completion of Detail Design

D. Sample Table of Contents for Environmental Screening Memorandum for a Group C project

APPENDIX #4

ONTARIO MINISTRY OF TRANSPORTATION - STATEMENT OF ENVIRONMENTAL VALUES (1994)

A. BACKGROUND

The Ontario Environmental Bill of Rights (EBR) was proclaimed in February 1994. The founding principles of the EBR are stated in its Preamble:

> *The people of Ontario recognize the inherent value of the natural environment.*
>
> *The people of Ontario have a right to a healthful environment.*
>
> *The people of Ontario have as a common goal the protection, conservation and restoration of the natural environment for the benefit of present and future generations.*
>
> *While the government has the primary responsibility for achieving this goal, the people should have means to ensure that it is achieved in an effective, timely, open and fair manner.*

The purposes of the Act are:

(a) to protect, conserve and, where reasonable, restore the integrity of the environment by the means provided in the Act;

(b) to provide sustainability of the environment by the means provided in the Act; and

(c) to protect the right to a healthful environment by the means provided in the Act.

These purposes include the following:

1. The prevention, reduction and elimination of the use, generation and release of pollutants that are an unreasonable threat to the integrity of the environment;

2. The protection and conservation of biological, ecological and genetic diversity;

3. The protection and conservation of natural resources, including plant life, animal life and ecological systems;

4. The encouragement of the wise management of our natural resources, including plant life, animal life and ecological systems; and

5. The identification, protection and conservation of ecologically sensitive areas or processes.

In order to fulfil these purposes the Act provides: means by which the residents of Ontario may participate in the making of environmentally significant decisions by the Government of Ontario; increased accountability of the Government of Ontario for its environmental decision-making; increased access to the courts by residents of Ontario for the protection of the environment; and enhanced protection for employees who take action in respect to environmental harm.

Statements of Environmental Values are a means for government ministries to record their commitment to the environment and be accountable for ensuring consideration of the environment in their decisions. The EBR requires a Statement of Environmental Values (SEV) from 14 government ministries.[1] The SEV explains:

> How the purposes of the EBR will be applied when decisions that might significantly affect the environment are made in the Ministry; and
>
> How consideration of the purposes of the EBR will be integrated with other considerations, including social, economic and scientific considerations, that are part of decision-making in the Ministry.

It is each Minister's responsibility to take every reasonable step to ensure that the SEV is considered whenever decisions that might significantly affect the environment are made in the Ministry.

B. STRATEGIC DIRECTIONS

The Ministry of Transportation has a long history in strategic planning and management. The Ministry's mandate, as assigned by the Government of Ontario, states that the organization should:

* *Be the provincial leader in cost effective transportation supporting the province's broader economic, social, and environmental objectives;*

* *Provide the focal point for the identification of the transportation needs of the people of Ontario; and*

* *Work with other jurisdictions and groups to address these through the effective use of road, rail, transit, air and marine transportation systems and services in accordance with the prevailing objectives of the Province of Ontario*

1The 14 ministries are: Management Board Secretariat, Ministries of Agriculture, Food and Rural Affairs, Consumer and Commercial Relations, Culture Tourism and Recreation, Economic Development and Trade, Environment and Energy, Finance, Health, Housing, Labour, Municipal Affairs, Natural Resources, Northern Development and Mines and Transportation

The Ministry has developed a mission statement to support its mandate, which is as follows:

> *"We will facilitate the mobility of people and goods, and promote the development of industries that provide transportation systems, services, and products, in ways that reflect the needs of Ontario's diverse population and support the broader economic, social and environmental objectives of the province."*

The Ministry views the environment as an integral component of its strategic directions. The Ministry believes that the strategic management and planning activities already underway in the organization, in addition to the leadership position which the Ministry has historically taken is consistent with the Act and allows it to be broadly supported and implemented within the Ministry. In particular, the Ministry's commitment to the environment is reflected in the following strategic direction statement:

> *"Implement and support activities which promote sustainable development, and are sensitive to environmental concerns as related to broader government activities."*

C. ENVIRONMENTAL VALUES AND MEASURES

The following environmental values and measures will be among the tools used by the Ministry of Transportation to apply the environmental values and measures set out in the purposes of the EBR when making decisions that might significantly affect the environment.

The Ministry is committed to providing and promoting transportation services in a way that sustains a healthful environment. The Ministry believes that harmony can be established and maintained between transportation objectives and environmental objectives.

The Ministry of Transportation will apply and integrate the purposes of the EBR along with prevailing social, economic, scientific and other considerations when conducting its business activities. These considerations will be integrated with the Ministry environmental values and measures as a foundation for transportation decision-making.

The following values and measures are a product of the Ministry's beliefs:

1. The Natural Environment

The Ministry believes that the protection of air, water, and land resources is necessary to sustain future generations and the long term survival of plants, animals and aquatic life.

To put this value into action, the following measures will be taken:

- The Ministry will seek to reduce transportation-related air emissions.
- The Ministry will seek ways to reduce transportation-related discharges of contaminants to water.
- The Ministry will continue to study ways to improve salt management practices and to minimize releases to the environment.

- The Ministry will promote the efficient and prudent use of water in its activities.
- Transportation will be planned with a view to conserving and preserving lands whenever possible and practical.
- When planning or facilitating the development of transportation in Ontario, the Ministry will seek to protect natural habitats whenever possible and practical.

1. Environmental Concerns in Decision-Making

The Ministry believes that the environment is an integral part of its activities, including policy and project development, and the operation of transportation facilities.

To put this value into action, the following measures will be taken:

- The environment will be an integral component of the transportation planning process.
- Transportation planning in Ontario will be carried out in concert with other community needs and aspirations.
- The purposes of the EBR will be integrated into strategic planning, day to day activities and long-term decision-making, in order to foster a commitment to environmental protection within both the freight and passenger transportation sectors.
- The Ministry will strive to create an environmentally skilled and informed workforce.

1. Integrated Transportation Planning

The Ministry believes that a healthy environment depends on sound planning.

To put this value into action, the following measures will be taken:

- The Ministry will promote the integration of transportation and environmental planning.
- The Ministry of Transportation will promote an integrated transportation system and the use of public transportation and other alternative forms, including non-motorized transportation options in Ontario.
- In the planning process, the environment will be considered an integral component of the economic and social fabric of the province.
- The Ministry will explore a variety of alternatives, including a range of transportation modes and options and public private partnerships, before committing to a specific course of action.
- The Ministry will consider energy efficiency when planning transportation systems.

1. Public Participation

The Ministry believes that public participation is vital to sound environmental decision-making.

To put this value into action, the following measures will be taken:

- The Ministry will encourage the public to become aware of its planning process and participate in transportation planning in Ontario.
- The Ministry will strive to create working relationships with professional, community, and advocacy groups to ensure that transportation decisions incorporate a wide level of community involvement and benefit from a range of environmental information and expertise.
- The Ministry will seek to achieve a planning process that is open to comment and scrutiny by the public, stakeholders and transportation partners.

1. First Nations and Other Aboriginal Peoples

The Ministry believes that it should understand and recognize the environmental values of First Nations and other Aboriginal peoples.

To put this value into action, the following measures will be taken:

- First Nations and other Aboriginal Peoples will be recognized as being important sources of information on the environment.
- First Nations and other Aboriginal Peoples will be consulted on issues of interest, as identified either jointly or separately, by the Ministry, First Nations or other Aboriginal Peoples.

1. Research and Development

The Ministry believes that research and development is important to the protection, enhancement and care of the environment.

To put this value into action, the following measures will be taken:

- The research and development of environmentally-compatible transportation technologies and methods will continue to be a priority of the Ministry.
- The Ministry will continue to develop environmentally-sensitive design, construction and maintenance techniques.

1. Greening

The Ministry believes in the wise use and conservation of materials in all facets of its operations.

To put this value into action, the following measures will be taken:

- The Ministry will encourage the reduction, reuse and recycling of materials in all facets of its business.
- The Ministry will be conscious of the energy efficiency of its buildings and transportation fleet.
- The Ministry will seek to ensure the environmental acceptability of new products recommended for use.
- The Ministry will give preferred status to environmentally friendly products and processes.

1. Education and Promotion

The Ministry believes that raising the awareness of its partners and the general public regarding environmental issues is an important component of environmental protection.

To put this value into action, the following measures will be taken:

- The Ministry will seek to influence its partners (federal, provincial, municipal, business, etc.) to be aware of the environment in their respective decision-making processes.
- The Ministry will continue to make the public aware of the various transportation options available to them to promote sustainability of the environment.

D. IMPLEMENTATION

In developing the above environmental values and accompanying measures, the Ministry is aware that the protection of the environment is an ongoing responsibility. The SEV will be considered when environmentally significant decisions, such as, amendments to Acts, new Acts or policies, are made.

The Ministry is committed to developing processes to monitor and track the consideration of the SEV to its decision-making, and to ensure that the purposes of the EBR are applied and integrated, along with cost and social effectiveness, in Ministry decisions. Additionally, the Ministry will participate in government reviews of environmental performance.

E. COMPLIANCE

During the first year of the application of the SEV the Ministry will evaluate, in consultation with the public, how its SEV is being used within the Ministry. This process will be completed by November, 1995 with a report to the Environmental Commissioner.
Members of the public can request further information about the Ministry of Transportation's compliance with the EBR by writing to the following address:

Provincial and Environmental Planning Office
Ministry of Transportation
301 St. Paul Street, 4th Floor
St. Catharines ON L2R 7R4
Fax: 905-704-2007

Appendix #5

GLOSSARY OF TERMS

Alternatives To

Alternative ways of solving a documented transportation deficiency or taking advantage of an opportunity.

Alternative Methods

Alternative ways of carrying out the selected alternative which may include preliminary design, detail design, construction or maintenance alternatives.

Alignment

The vertical and horizontal position of a road.

ANSI

Area of Natural or Scientific interest

BMP

Best management practice

Bump-Up

The act of requesting that an environmental assessment initiated as a class EA be required to follow the individual EA process. The change is a result of a decision by the proponent or by the Minister of Environment to require that an individual environmental assessment be conducted.

Bypass

A form of realignment in which the route is intended to go around a particular feature or collection of features.

Class Environmental Assessment Process

A planning process established for a group of projects in order to ensure compliance with the Environmental Assessment (EA) Act. The EA Act, in Section 13 makes provision for the establishment of Class Environmental Assessments.

Class Environmental Assessment Document

An individual environmental assessment report documenting a planning process which is formally submitted under the EA Act. Once the Class EA document is approved, projects covered by the class can be implemented without having to seek further approvals under the EA Act provided the Class EA process is followed.

Compensation

The replacement of natural habitat lost through implementation of a project, where implementation techniques and other measures could not alleviate the effects.

Consortium

A group of businesses or organizations allied to take on a project.

Corridor

A band of variable width between two locations. In transportation studies a corridor is a defined area where a new or improved transportation facility might be located.

DCR

Design and Construction report

Designation

Formal identification of the right-of-way for a proposed highway, through the provisions of the Public Transportation and Highway Improvement Act. This route is registered in the appropriate land registry office, so that those wishing to purchase or develop property will be aware of the intended use.

Detail Design

The final stage in the design process in which the engineering and environmental components of preliminary design are refined and details concerning, for example, property, drainage, utility relocations and quantity estimate requirements are prepared, and contract documents and drawings are produced.

EA Act

Environmental Assessment Act (as amended by S.O. 1996 c.27), RSO 1980.

Emergency Response

Activities undertaken when an abandoned material is discovered, or a spill occurs on a Provincial highway or other MTO property. For the purposes of this document, emergency response does not include other activities associated with vehicle accidents or other incidents.

Emergency Work

Construction or repair of transportation infrastructure which has been damaged as a result of an accident, natural catastrophe, or sudden facility failure, etc., that is urgently required to restore safety and use of the facility.

Environment

As defined in Section 1(c) of the EA Act (as amended by S.O. 1996 c.27), RSO 1980:

(i) air, land or water,

(ii) plant and animal life, including man,

(iii) the social, economic and cultural conditions that influence the life of man or a community,

(iv) any building structure, machine or other device or thing made by man,

(v) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of man, or

(vi) any part or combination of the foregoing and the interrelationships between any two or more of them, in or of Ontario.

Environmental Effect

A change in the existing conditions of the environment which may have either beneficial (positive) or detrimental (negative) effects.

Environmentally Sensitive Areas (ESA's)

Those areas identified by any agency or level of government which contain natural features, ecological functions or cultural, historical or visual amenities which are susceptible to disturbance from human activities and which warrant protection.

External Agencies

Include Federal departments and agencies, Provincial ministries and agencies, conservation authorities, municipalities, Crown corporations or other agencies other than MTO.

Excess Materials

Materials which are surplus to the requirements of a highway construction or maintenance operation. These materials can be managed through re-use, disposal as fill, open-burning or disposal as waste.

Freeway

Freeways are controlled access median divided highway facilities with grade separated crossings and interchanges (i.e. QEW and 400 series).

Grade Separation

A vertical separation between a road/road or road/rail crossing.

Highways

Highways are roadways under the jurisdiction of MTO including King's highways, secondary highways and tertiary roads. This includes all components within the associated right-of-way, e.g. structures, drainage works, traffic and safety devices.

Highway Facilities

Any facility associated with a provincial highway including patrol yards, truck inspection stations, winter maintenance facilities, rest areas, commuter parking lots, travel information centres and service centres.

Individual Environmental Assessment

An environmental assessment for an undertaking to which Assessment the EA Act applies and which requires formal review and approval under the Act.

Interchange

The intersection between two roadways at different levels with connecting ramps for traffic turning between them.

Median

The portion of a divided highway separating oncoming traffic (space, barrier or combination).

Mitigating Measure

A measure that is incorporated into a project to reduce, eliminate or ameliorate detrimental environmental effects.

MOE

Ontario Ministry of the Environment

MTO

Ontario Ministry of Transportation

New Route

New highway created where no highway facility existed previously.

NEC

Niagara Escarpment Commission

NSSP

Non-standard special provision. Environmental NSSP's have wording for project-specific environmental protection requirements in construction and maintenance contracts.

Patrol Yard

Facility established for the maintenance of the highway which includes buildings (office, garage), fuel tanks, storage domes for sand and salt, material stockpiles, vehicle parking and storage areas, access roads, entrances, acceleration and deceleration lanes and waste storage.

Planning

That part of the planning and design process where alternatives to the undertaking and alternative routes are identified and assessed.

Preliminary Design

That part of the planning and design process, during which various alternative solutions are examined and evaluated including consideration of environmental effects and mitigation; the recommended design solution is then developed in sufficient detail to ensure that the horizontal and vertical controls are physically compatible with the proposed site, that the requirements for lands and rights-of-way are satisfactorily identified, and that the basic design criteria or features to be contained in the design, have been fully recognized and documented in sufficient graphic detail to ensure their feasibility.

Prime Agricultural Areas

Prime agricultural areas as defined in municipal official plans and other government policy sources.

Project

A specific undertaking planned and implemented in accordance with this Class EA including all those activities necessary to solve a specific transportation problem.

Proponent

A person or agency who carries or proposes to carry out an undertaking, or is the owner or person having charge, management, or control of an undertaking.

Provincial Transportation System

Provincial highways; provincial freeways; provincial transitways (separate transit facilities directly associated with a provincial highway); provincial ferryboats; private controlled access toll highways that are not part of the King's Highway; other transportation corridors which have strategic and economic importance to the province; and the service, maintenance and operations facilities to support the above.

Public

Includes the general public, interest groups, associations, community groups, and individuals including property owners.

Realignment

Replacement or upgrading of an existing highway on a new or revised alignment.

Route Alternatives

Location alternatives within a corridor.

SP

Standard special provision. Environmental SP's have standard wording for routine environmental protection requirements in construction and maintenance contracts.

TESR

Transportation Environmental Study Report.

Transitway

A separate transit facility directly associated with a provincial highway. The transit right-of-way may be shared with a highway right-of-way.

Truck Inspection Station

Facilities include buildings, weigh scales, parking areas, ramps and storage area.

Twinning

The addition of one or more lanes to a highway facility where the new lanes are separated from the existing lanes by means of a median.

Undertaking

In keeping with the definition of the Environmental Assessment Act, a project or activity subject to this Class Environmental Assessment.

Waste

Excess materials which are disposed of at a site certified under Part V of the Environmental Protection Act.

Winter Maintenance Facility

May include a garage, fuel pumps and storage buildings, including facilities for de-icing chemicals.

APPENDIX #6

Overview of Provincial Transportation Facilities Class EA on a Subject Basis

This appendix provides an overview of how the key subjects are addressed in this Class EA. These include transportation engineering, environmental protection, evaluation, consultation, documentation and bump-up, environmental assessment process, and addressing statutory requirements.

Overview of Transportation Engineering

The Class Environmental Assessment for Provincial Transportation Facilities addresses transportation engineering through:

- the detailed *principles for transportation engineering*
- the *types of transportation problems and opportunities*
- an outline of general *transportation alternatives*
- the *basis of assessing and selecting* transportation alternatives
- an overview of the *study process for transportation engineering* on a three-stage basis identifying:
  - the purpose of the stage in the transportation study process
  - transportation engineering decisions and alternatives typically associated with the stage
  - environmental protection activities and decisions related to those transportation engineering decisions and alternatives for each stage
  - a clear link to consultation issues for those transportation engineering decisions and alternatives for each stage
- an overview of the Class EA process showing transportation engineering *linkage with environmental protection, consultation, documentation and bump-up*
- an outline of the *technical basis for transportation planning and design decisions*
- the *sources of information* for identifying transportation needs
- an emphasis on *compliance with transportation engineering principles* during each stage of the transportation study process
- the transportation engineering study *process for generation and assessment of alternatives* for each stage of the study process
- the transportation engineering study *process for evaluation and selection of preferred alternative* for each stage of the study process
- the transportation engineering study *process during development of the plan/design* for each stage of the study process
- an overview of the *construction process*

Overview of Environmental Protection

The Class Environmental Assessment for Provincial Transportation Facilities addresses environmental protection through:

- the detailed *principles for environmental protection*
- the *types of environmental impact*
- the environmental *factors to be addressed*
- the *basis of assessing and evaluating* environmental impacts
- the *general approaches and order of preference* to/for environmental protection
- an overview of the *study process for environmental protection* on a three-stage basis identifying:
  - the purpose of the stage in the transportation study process
  - environmental protection activities typically associated with the stage
  - environmental protection decisions and alternatives typically associated with the stage
- an overview of the Class EA process showing environmental *protection linkage with transportation engineering, consultation, documentation and bump-up*
- an overview of *typical measures* for environmental protection and mitigation for each of three transportation project stages on a factor-by-factor basis
- the *sources of information* on environmental conditions and sensitivities and of technical information on addressing impacts
- an emphasis on *compliance with environmental protection principles during each stage* of the transportation study process
- the environmental protection *process during generation and assessment of alternatives* of each stage of the transportation study process
- the environmental protection *process during evaluation and selection of preferred alternative* of each stage of the transportation study process
- the environmental protection *process during development of the plan/design* of each stage of the transportation study process
- the environmental protection *process during construction*
- the *aspects of construction addressed* in environmental protection
- the *environmental monitoring of construction*

Overview of Evaluation

The Class Environmental Assessment for Provincial Transportation Facilities addresses evaluation through:

- the detailed *principles for evaluation*
- identification of *evaluation approaches*
- *identifying factors*
- *assigning factor weightings*
- *refining of factors at* different stages
- *developing indicators* for each factor

- an emphasis on *compliance with evaluation principles during each stage* of the transportation study process
- the *process for evaluation and selection of preferred planning alternative*
- the *process for evaluation and selection of preferred preliminary design alternative*
- the *process for evaluation and selection of preferred detail design alternative*
- the *process for generating evaluating and selecting the preferred construction method alternative*

Overview of Consultation

The Class Environmental Assessment for Provincial Transportation Facilities addresses consultation through:

- the *purpose* of consultation
- the detailed *principles of consultation*
- the *methods of consultation*
- an overview of the *study process for consultation* on a three-stage basis identifying:
  - the purpose of the stage in the transportation study process
  - transportation engineering issues for consultation typically associated with the stage
  - environmental protection issues for consultation typically associated with the stage
- an overview of the Class EA process showing consultation *linkage with transportation engineering, environmental protection, documentation and bump-up*
- an emphasis on *compliance with consultation principles during each stage* of the transportation study process
- *the timing of consultation during each stage* of the transportation study process
- *mandatory consultation for each stage* of the transportation study process on a project-type basis

Overview of Environmental Documentation and Bump-up

The Class Environmental Assessment for Provincial Transportation Facilities addresses environmental documentation and bump-up (formal EA challenge) through:

- the *types of environmental documentation*
- the detailed *principles of documentation*
- the *relationship between some document types*
- the *document content requirements*
- the *principles of bump-up*
- the *administration of bump-up requests*
- an overview of the *study process for documentation and bump-up* on a project-group basis identifying
  - report types
  - when each report is mandatory

  - eligibility of each report for bump-up
- an overview of the Class EA process showing documentation and bump-up *linkage with transportation engineering, environmental protection, and consultation*
- an emphasis on *compliance with documentation principles for each document type*
- the *need for each document type*
- the *timing of submission* for each document type
- *eligibility for bump-up* of each document type
- *time-related post-clearance reviews* for one document type
- document addendum *process*

Overview of Environmental Assessment Process

The Class Environmental Assessment for Provincial Transportation Facilities addresses environmental assessment process through:

- a discussion on the *reasons for using the Class EA process*
- the identification of *similarities and differences among undertakings in the Class EA*
- the identification of *proponents covered* by the Class EA
- the identification of *project delivery mechanisms*
- the *classification of projects and activities into groups* for purposes of consultation, environmental documentation, and opportunity for bump-up (formal EA challenge)
- an outline of *study stages and phases*
- the *study principles and processes* for study stages and phases, transportation engineering, environmental protection, evaluation, consultation, documentation and bump-up, and project environmental clearance
- an overview of the *linkage between transportation engineering, environmental protection, consultation, documentation and bump-up*
- an overview of how the Class EA *complies with EA Act requirements for a Class EA on a section-by-section basis*

Overview of Addressing Environmental Statutory Requirements

The Class Environmental Assessment for Provincial Transportation Facilities addresses environmental statutory requirements through:

- a discussion of the Class EA *relationship to other environmental legislation*
- a recognition of *how environmental statutory duty is imposed* on proponents under the Class EA
- an outline of how the proponent *carries out statutory duty for environmental assessment process*
- an outline of how the *proponent carries out statutory duty for technical environmental requirements and prohibitions*
- an outline of how the proponent *carries out statutory duty for environmental approvals, permits and exemptions*
- an outline of how the proponent *carries out statutory duty for environmental reporting/ notification*

- an overview of how the Class EA *complies with EA Act requirements for a Class EA on a section-by-section basis*