

REGIONAL MUNICIPALITY OF OTTAWA-CARLETON
MUNICIPALITÉ RÉGIONALE D'OTTAWA-CARLETON

REPORT
RAPPORT

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TO/DEST. Coordinator, Transportation Committee

FROM/EXP. Planning and Development Approvals Commissioner

SUBJECT/OBJET **HIGHWAY 7 PRELIMINARY DESIGN: CARLETON PLACE
TO HIGHWAY 417 (OTTAWA QUEENSWAY)**

DEPARTMENTAL RECOMMENDATION

That the Transportation Committee recommend Council approve the Highway 7 preliminary design between Carleton Place and Highway 417 (West), as proposed by the Ministry of Transportation, Ontario (MTO).

BACKGROUND

Since 1979, the Ministry of Transportation, Ontario has completed a number of studies and carried out a number of modifications to Highway 7 between Carleton Place and Highway 417 (West).

The most recently completed study deals with the future 4-laning of this section of Highway 7.

Details of MTO proposals are to be found in the Executive Summary, attached as Annex 'A'.

MTO staff will make a presentation to Transportation Committee on 18 June 1997, dealing with their long-term plans for this important section of Provincial infrastructure.

*Approved by
Nick Tunnacliffe, MCIP, RPP*

HIGHWAY 7 EXECUTIVE PRESENTATION
PRELIMINARY DESIGN REPORT
CARLETON PLACE TO HIGHWAY 417 (OTTAWA QUEENSWAY)

TRANSPORTATION COMMITTEE
REGIONAL MUNICIPALITY OF OTTAWA-CARLETON

18 JUNE 1997

PHILIP PAWLIUK, P. ENG., AREA ENGINEER, M.T.O
STEVEN STODDARD, P. ENG., PROJECT ENGINEER, M.T.O
STEVE TAYLOR, P. ENG., PROJECT ENGINEER, T.S.H.

EXECUTIVE SUMMARY

Introduction

The Ministry of Transportation (MTO) initiated this preliminary design study of the Highway 7 corridor, from Highway 417 in the Township of West Carleton westerly to the Town of Carleton Place. The Ministry has identified a need to provide additional capacity due to the continued growth of traffic on the highway and projections that the existing 2-lane facility will not adequately accommodate future traffic demands, by early next century.

The broad goal of the study was to assess the opportunities to expand Highway 7, within the existing corridor, while proactively seeking public input in the decision-making process.

The full Preliminary Design Report (PDR) to be issued by the Ministry of Transportation this summer, presents the planning process and the preliminary design of the expanded highway in detail. This document has been divided into two components, Environmental (Chapters 1 to 7) and Engineering (Chapters 8 and 9). The Environmental component details the planning process that was followed, including a summary of the public consultation program, and the subsequent recommendation for a future 4-lane freeway alternative, interchanges at major cross roads, and service roads providing access to all adjacent landowners. The evaluation process is presented including the evaluation of Alternatives to the Undertaking (Chapter 5 of the PDR) and Alternative Methods of Carrying out the Undertaking (Chapter 6 of the PDR). The Engineering component describes the proposed preliminary design of the future freeway, addressing many of the issues identified during the public consultation program.

Study Area

The Study Area, illustrated in **Figure 1**, is approximately 24 km in length and follows the existing Highway 7 corridor. The study limits are the Highway 417/Regional Road 5 (Carp Road) interchange to the east and the Highway 15/Highway 7 intersection to the west. The Study Area is situated within the Regional Municipality of Ottawa-Carleton and the County of Lanark, and traverses through the Townships of West Carleton, Beckwith and Goulbourn.

The study area focuses on the existing Highway 7 corridor. However, in areas where significant environmental constraints were identified, or where expansion of the highway necessitates the acquisition of property, such as at future interchange locations, the study corridor was widened.

Background

The section of Highway 7 from Highway 417 to Ashton Station has been designated as a Controlled Access Highway or CAH since the early 1960's as a CAH, while the western section to Highway 15 was designated as a Special CAH in 1977. These designations have controlled development within the corridor by restricting new entrance permits other than those which existed at the time of the initial designation. These development controls were set in place in expectation of future expansion of the highway.

Since the original designations, the Ministry has proceeded to plan and design Highway 7 to facilitate future expansion. A chronology of the major planning efforts is presented below:

In 1979, the MTO initiated a planning study to widen Highway 7 to four lanes. Various alternatives were developed, and contact was made with the local municipalities. An assessment of potential property impacts was also undertaken. However, the study was terminated in 1981 due to other Ministry priorities.

In 1988, the MTO completed a study of Highway 7 from Carleton Place to Highway 417 in which several operational problems were identified. The study recommended left and right turn lanes at Dwyer Hill Road, Ashton Station Road, County Road 17, and a 5-lane cross section be built for the commercial strip at the southern limits of Carleton Place.

In November 1991, a Passing Lane Location Study for the section of Highway 7 from Marmora to Highway 417 was undertaken for MTO by A.D.I. Limited, Consulting Engineers and Planners. The major objective of the study was to assess whether passing lanes should be constructed in advance of 4-laning. This study concluded that the cost effectiveness of passing lanes was limited and, given the high traffic volumes on Highway 7, passing lanes would not provide an adequate solution to the operational problems. Therefore, it was recommended that a planning study for 4-laning should be initiated. A copy of the Passing Lane Location Study report is contained in Appendix A, of the PDR.

Following the completion of the passing lane study the Ministry completed five intersection improvements in 1993; in addition, a 1 km section was widened to five lanes south of the Town of Carleton Place to provide a continuous two-way left turn lane. These modifications to existing Highway 7 were made to improve the operation of the facility and address the short term problems identified at major intersection locations, as an interim measure, until 4-laning can be completed.

Study Purpose

The purpose of this study is to develop a Preliminary Design for Highway 7 between Highway 417 (east of the Regional Road 5 interchange) and Highway 15 at Carleton Place as a means to address the current and future travel demand.

The study was structured to address and satisfy the following factors:

- Determine the feasibility of expanding the facility along the present corridor to accommodate projected traffic growth.
- Undertake a proactive public consultation program to solicit public input as an integral part of the decision-making process.
- Undertake and document the environmental/engineering inventory within the study limits.
- Establish an alignment and cross section within the corridor and determine property requirements.
- Determine highway geometric requirements based on current MTO design standards.
- Determine the locations and configuration of intersections, interchanges, and service roads. Investigate lane balance, basic lanes, continuity and capacity requirements for Highway 7 and Highway 417.
- Identify potential environmental impacts and develop an appropriate mitigation plan.

Study Issues

During the course of the study many issues were identified. Most of these issues related to the need to improve traffic operations and reduce potentially hazardous conditions. Specific items identified during the study include:

- improve safety with respect to the elimination of unsafe passing manoeuvres which are regularly occurring as a result of driver frustration;
- increase highway capacity;
- reduce the length of platoons;

- eliminate existing conflicts between slow moving farm machinery and high speed local traffic; and
- improve safety and accessibility to existing residential properties and reduce the conflict that these driveways cause to the movement of the high speed provincial traffic.

Consultation Program

In addition to the strong support for widening the highway to improve safety, there were numerous concerns related to external agencies, community associations, interest groups and individuals. These concerns were addressed in discussions with these individuals, agencies and interest groups during the three Public Involvement Centres (PIC) and/or through supplementary meetings.

Municipal Advisory Committee

A Municipal Advisory Committee (MAC) comprised of staff and elected officials to assist the Project Team in the completion of the technical aspects of the study and to maintain a dialogue with the affected municipalities and local concerns. The Highway 7 MAC consisted of representatives from:

Townships of Beckwith, Goulbourn and West Carleton,
County of Lanark,
Regional Municipality of Ottawa-Carleton, and
Town of Carleton Place.

Municipal Advisory Committee meetings were held at key study milestones, (9 meetings during the course of the study). Committee members participated directly in decisions and recommendations prior to discussion with the general public to permit members to apprise their respective organizations.

Committee members also participated in the generation and evaluation of alternatives; the MAC evaluation activities were completed independent of the Project Team, and the results of the two were compared. This process ensured that MAC members actively participated in the decision-making process and the formulation of the study recommendations.

A recommendation of the study is for the MAC to continue to be involved in consultation during the design and future construction of the project.

Municipal Councils

The municipal councils representing the Regional Municipality of Ottawa Carleton, Town of Carleton Place, Townships of Beckwith, Goulbourn and West Carleton, were informed of the study through their respective Municipal Advisory Committee representatives and/or through a series of council/committee presentations. These presentations were held at the completion of the study to receive Council endorsements of the Long Range Plan or as informational presentations to the Councils. Additionally, Councils were invited to all advance sessions of the PIC's.

Special Interest Groups and Other Agencies

Throughout the project, a consultative approach was used with external agencies and interest groups. Each agency/group which either had information to contribute or could be affected by study proposals was contacted. Special briefing meetings were held with affected organizations throughout the study, including:

Federation of Agriculture;
Ministry of Agriculture and Food;
Ministry of Natural Resources;
Ashton and District Snowmobile Association;

Stittsville and Dwyer Hill Snowmobile Association;
Regional Cycling Advisory Group;
Canada Post Corporation;
Queensway West Community Association; and
Ashton Community Association.

These organizations were consulted during numerous stages of the study including the data collection, development of alternatives, preparation and screening of evaluation criteria, review of the assessment of alternatives and the development of appropriate mitigation plans.

This approach afforded the most effective use of the specialists available to this project.
General Public

Information on the study was disseminated to the general public through a variety of community involvement tools, including:

Public Involvement Centres;
Flyers and newsletters;
Distribution of fact sheets to specific communities;
Newspaper notices; and
Supplementary meetings with local residents, interest groups and other organizations.

Public notices and Public Involvement Centres were held at milestone events during the course of the study including:

June 1993: Study Commencement Notice (Initiation of Study mailing list);
July 1993: PIC (Introduction and Presentation of Study Approach);
March 1994: PIC (Presentation of Preliminary Analysis, Evaluation and Ranking of Alternatives); and
December 1994: PIC (Presentation of Recommended Long Range Plan).

All Public Involvement Centres were held in the Study Area at either the Carleton Place arena or the Canadian Golf and Country Club. Public Involvement Centre announcements were placed in local and regional newspapers approximately one week prior to the PIC. All registered owners and residents adjacent to the Highway 7 corridor were notified of the PIC's through flyers which were hand delivered. In addition, all residents and members of the public on the study mailing list were invited by letter to attend each PIC. This format assured that all property owners and residents in the corridor were informed of each Public Involvement Centre.

Throughout the study, a number of supplementary meetings and presentations were held with a variety of property owners, local businesses, special interest groups such as cycling advisory groups, snowmobile associations and others. It was recognized that the rural nature of the Study Area may limit the availability of some local residents, primarily farmers, to attend the scheduled PIC sessions. The purpose of these additional meetings was to allow all affected parties the opportunity to participate in the project and provide comments both on the study process and recommendations. As a result of this initiative, over 90% of the property owners residing in the Study Area were contacted and individual meetings held to discuss specific concerns or property impacts. This approach allowed consensus to be built among local residents.

In addition to the above, a series of bilingual newsletters were also distributed to residents in the Highway 7 corridor at regular intervals. The newsletters contained updates of the study including information on completed tasks and future activities.

Summary of Comments Received

It is appropriate to note that the following is a brief overview of the issues raised during the course of the study, these issues have been resolved through the pro-active participation process structure on this planning study.

Ministry of Natural Resources

The Ministry of Natural Resources indicated concern regarding the potential impact on the Class 1 Provincially Significant Wetlands, Loggerhead Shrike habitat, wildlife habitat and mortality, aquatic habitat and protection of the cool water creeks to the north and east of the Study Area. Each of these issues was considered in the evaluation of alternatives and the identification of mitigation measures.

Ministry of Agriculture and Food and Ontario Federation of Agriculture

The Ministry of Agriculture and Food and the Ontario Federation of Agriculture were primarily concerned with preserving the large dairy farms, compensation for loss of land, access to the active farms located along the highway and safety issues regarding farm vehicles and vehicular traffic.

Rideau Valley Conservation Authority

The Rideau Valley Conservation Authority indicated a concern regarding wetland and small tributaries of the Jock River. The RVCA indicated that there should be no compromise of existing conditions in terms of water quantity and quality.

Regional Municipality of Ottawa-Carleton

The Regional Municipality of Ottawa-Carleton identified concerns related to potential carpool and park and ride facilities, the need for flexibility for use of their abandoned rail corridor for a future high speed rail or transit, and bicyclist issues. The RMOC is the property owner of the abandoned railway right-of-way from Carleton Place to the City of Nepean. The section of the rail line from Ashton Station Road to the Town of Carleton Place is proposed to provide an access road for adjacent property owners.

Township of Goulbourn

The Township of Goulbourn and the residents of Country Club Village identified a desire to include a service road connection along the south side of Highway 7 between Dwyer Hill Road and Jinkinson Road. The present service road proposal extends 3 km from Dwyer Hill Road to Lot 11, Concession 11, Goulbourn Township (the eastern limit of the Canadian Golf and Country Club). The proposal provides access to adjoining properties using the existing highway. Connecting this service road to the proposed Jinkinson Road/Regional Road 36 service road was investigated and was determined to conflict with the Provincial Wetland Policy of minimizing loss of the Class 1 Huntley Complex Wetland. The extension of the service road to Jinkinson Road would also add significant additional costs to the project. As a compromise it was agreed that this proposal would not be included in the long range plan but will be shown as a possible future extension as a municipal initiative.

A second area of concern in the Township of Goulbourn involves the proposed use of Spruce Ridge Road as a service road for customers of the Capital City Speedway. The issue raised by residents on Spruce Ridge Road pertains to potential impacts because of increased traffic in front of their houses.

The alternative proposed, which was developed following PIC No. 3 as a result of comments received from the public, is a service road which will not directly pass traffic past existing houses. This proposal has the advantages of reducing loss of Class 1 Wetland and reducing community disruption.

The Township of Goulbourn requested that all new municipal roads be constructed with an asphalt wearing surface. It was agreed that the south service road servicing the Canadian Golf and Country Club and Country Club Village would be constructed to maintain the existing asphalt surface. However, the surface type for all other new Township roads will be based on MTO criteria governed by projected volumes on the roads at the time of construction.

A final concern which was raised by the Township was the locally significant Rothbourne Wetland located at the Regional Road 36 interchange. Although the Township supported the proposed interchange and service road configuration, they expressed a desire to minimize impacts to this wetland. A municipal wetland policy is being developed which should be reviewed at the detailed design stage.

Township of Beckwith

The Township of Beckwith identified the following four concerns:

- (1) Extend the Tenth Line service road to be continuous from County Road 17 to Highway 15. This extension, and the environmental impacts, will be assessed at the detail design stage.
- (2) Provide a continuous service road from County road 17 to Ashton Station Road using the Tenth Line. It was agreed that the south service road between County Road 17 and Ashton Station Road will be reviewed again at the detailed design stage. Additional construction of the Tenth Line by the Township or private developers will necessitate a review of the analysis and recommendations given in this report.
- (3) Identify the future corridor for a southerly extension of McNeely Avenue. MTO have agreed to participate in a study to assess this corridor.
- (4) Protect the commercial viability of the properties in the northeast quadrant of the County Road 17 interchange. The concerns related to exposure, property impacts, and accessibility.

Township of West Carleton

The Township of West Carleton identified concerns about the impact of increased out-of-way travel for the Karson and Kartage Konstruktion quarry vehicles and community disruption. Instead of forcing quarry vehicles to use the Carp Road interchange to access Highway 417 to go west to Highway 7, the Township expressed a desire to investigate the opportunities to provide an alternative access to the Regional Road 36 interchange. This proposal would require the construction of a new road south from Rothbourne Road. The Township of Goulbourn may participate in the further investigation of the alternative quarry route, as a municipal initiative. However, Goulbourn is on record as not supporting the use of an unopened road allowance between Lots 20 and 21, Goulbourn Township.

This issue is beyond the scope of this study and will require additional negotiations between West Carleton and Goulbourn Townships, Karson Kartage and Konstruktion and the property owners of Lots 19, 20 and 21, Concession 12, Goulbourn Township. It should be noted that the 1973 closure of Rothbourne Road at Highway 7 preceded the opening of the quarry in 1979.

Alternatives

The analysis and evaluation of alternatives was undertaken as a two-step process. Initially, alternatives to the undertaking were assessed as required under Section 5 (3) of the Environmental Assessment Act. The following alternatives to the undertaking were analyzed:

- do nothing;
- alternative modes (road, transit, rail, water, air); and
- alternative road solutions
 - traffic management,
 - diversion of traffic to other roads,
 - improvement to the existing facility by widening/twinning
 - improvement to the existing facility by adding passing lanes, and
 - new highway.

Based on this assessment, further described in Chapter 5 of the PDR, the recommendation to expand Highway 7 was carried forward.

The second step in the evaluation process was to generate and assess alternative methods of carrying out the undertaking. These alternative methods included a series of road widening options, either north or south of the existing highway, and groups of intersection/interchange alternatives at each of the major cross roads.

These alternatives were developed, analyzed, and evaluated using a systematic, traceable and detailed evaluation methodology. The analysis and evaluation activities are described in Chapter 6 of the PDR. Following this evaluation and thorough consultation with the public, adjacent property owners and interested external agencies, a technically preferred alternative was carried forward.

Based on the final refinements made to the long range plan, it is recommended that future work will require additional field reconnaissance and habitat assessments at the detail design stage for any areas where detailed assessment have not been completed as part of this project (such as service roads).

The technically preferred alternative which received strong public support included the following recommendations:

- the provision of a controlled access freeway with varying alignments north and south of the existing highway, to avoid major environmental constraints;
- interchanges at the major cross roads such as Regional Road 36, Dwyer Hill Road (Regional Road 3), Ashton Station Road, and County Road 17; and
- a realignment of the highway south of Ashton Station to avoid major property impacts.

In the final phase of the study several refinements to the technically preferred alternative were considered, including mitigation measures in areas where negative impacts were identified.

The refinements made to the technically preferred alternative were achieved through a proactive consultative process where all local property owners were involved. Briefing meetings were held on a one-on-one basis with all owners in areas where the feedback received from the public suggested considering a refinement to what was shown at the Second PIC.

The refinements carried forward were generally local in nature and related to individual property owner concerns. These changes included:

- provision of service roads to all properties that presently have access to Highway 7;

- landscaping for houses where there will be greater visual intrusion;
- recommended park and ride and carpool lot locations;
- a recommendation to utilize the abandoned railway corridor (an RMOC property) for a local Township road (resulting in a major cost savings and a more equitable requirement for property from adjacent property owners); and
- a recommended transition treatment from the 30 m median using a 15 m median to taper the freeway and lower operating speeds before entering the built-up area south of Carleton Place.

Through this review process, several improvements were made and a recommended long range plan was developed. The recommended plan is shown in **Figures 2 and 3**.

Value Planning Principles

The recommendations made in this study reflect the value system as developed by the Ministry, Study Team, Municipal Advisory Committee and general public. The value planning principles assisted the study team with the analysis and evaluation of alternatives. The public, municipalities and government agencies have indirectly endorsed these through their active participation throughout the course of the study.

It is appropriate to note that the values and principles may be reviewed over time as social values change. However, it is assumed that the value placed on safety by society will remain largely unchanged. Future value engineering exercises will have to review any proposed changes in light of these principles.

Analysis and Evaluation

This section summarizes the process that was followed to identify, analyze and evaluate alternative methods of undertaking the project. The alternatives make provision for expansion of Highway 7 to accommodate future travel demand.

The generalized evaluation flow chart is presented in **Figure 4**. This flow chart describes the technical elements in the evaluation exercise. This exercise was completed in a two step process. Technically preferred alternatives were selected and are presented in Chapter 6 of the PDR as “Technically Preferred Alternatives” for each section.

The second step considered refinements to these alternatives. These further refinements are described as the “Recommended Long Range Plan” and are documented in Chapter 7 of the PDR.

However, in addition to the technical activities, there was also continuous involvement from the public consultation workstream to supply information and feedback on alternatives, evaluation criteria and weights. These parallel processes, technical evaluation and public consultation, ensured that consensus was built among study participants.

This chapter provides an overview of the detailed evaluation process. Specifically, it presents the following:

Alternatives presented to the public and considered by the Project Team and MAC;

The results of a coarse screening of the alternatives, recommending a list of reasonable alternatives to carry forward;

An explanation of the evaluation methodology and the approach used to rate alternatives;

A summary of the alternatives selected by the Project Team and MAC as the Technically Preferred, based on the detailed evaluation; and

A review of the sensitivity testing program that was undertaken to validate the selected alternatives.

A comprehensive description of the evaluation and sensitivity testing is provided in Appendix K of the PDR.

Summary of Findings

The technical evaluation by the Project Team and MAC and the detailed sensitivity testing program produced the following recommended alternatives. These alternatives had the highest scores and were not sensitive to the weights selected, except Alternative C-4. The following alternatives, when combined, produce the Technically Preferred Alternative.

Cross Section Alternatives:

Section 1 - Alternative 13 (30 m median with service roads)

Section 2 - Alternative 13A (30 m median partially on a new alignment with service roads)

Intersection/Interchange Alternatives:

Regional Road 3 - Alternative A-4 (Parclo A-2)

Ashton Station Road (new alignment) - Alternative C-4 (Parclo A-2)

County Road 17 - Alternative D-4 (Parclo AB)

Regional Road 36 - Alternative E-2 (Diamond interchange)

Highway 417/7 - Alternative F-2 (Modified Trumpet interchange)

These alternatives were presented at PIC No. 2 for public review and ratification. The rationale for the selection of these alternatives is presented in the PDR.

Alternatives

Several alternative methods of implementing the undertaking along the Highway 7 corridor are presented in this report. These alternatives were presented to the public at the first PIC. The alternatives include two separate groups. The first group of alternatives are cross section alternatives which include various configurations for Highway 7 along the main corridor. The second group of alternatives include intersection/interchange alternatives, which are options to provide access to the major intersecting roads. Each group of alternatives is discussed in the succeeding sections.

Cross Section Alternatives

The Study Area was divided into distinct areas for the evaluation of cross section alternatives. These distinct areas are referred to as Sections 1, 2 and 3 as presented in the study design. These sections, as shown on Figure 6.2 of the PDR, are described as follows:

Section 1 from Highway 417 to the abandoned CNR crossing east of Ashton Station Road;

Section 2 from the westerly limit of Section 1 to east of McNeely Avenue; and

Section 3 from the westerly limit of Section 2 to Highway 15.

There were several advantages to dividing the Study Area into separate sections for the evaluation. These included:

characteristics of each section vary substantially and dividing the Study Area allowed for the unique environmental constraints within each section to influence the evaluation;

permitted the evaluation to be divided into mutually exclusive areas;

sections match the present "corridor control" designations in each area; and

sections coincide with a possible progression of roadway improvements from Highway 417 to Carleton Place which could allow for an increase in operating speeds and access control as the highway approaches Highway 417.

Based on the analysis and evaluation of alternatives to the undertaking (see Chapter 5 of the PDR) the preferred method of implementing the undertaking is expansion of the highway in Sections 1 and 2. Within Section 3, the recently completed operational improvements and signalization at McNeely Avenue are considered acceptable for satisfying highway operational and safety objectives within the 10 year planning horizon.

Several cross section alternatives are available for expanding Highway 7. These alternatives termed Alternatives 1 to 13A, inclusive are summarized in the PDR on Tables 6.1 and 6.2 and are shown on Figures 6.3 to 6.26. Section 6.5 of the PDR provides a detailed description of the cross section alternatives.

Intersection/Interchange Alternatives

Three separate locations for intersection/interchanges were identified as areas where alternative methods to provide access to Highway 7 would be evaluated. The locations are:

Ashton Station Road

Regional Road 3 (Dwyer Hill Road)

County Road 17

Any other crossing has either been approved for road closure or has small traffic volumes (under 200 AADT) which can be relocated to one of the above adjacent major side roads.

At Ashton Station Road two separate highway alignments were considered. On the basis of the various cross section alternatives the following alternative alignments were developed at Ashton Station Road:

existing highway alignment - Alternatives 2-13; and

a new alignment - Alternatives 12A and 13A.

Location 'B' at Ashton Station Road includes intersection/interchange alternatives on the existing alignment and location 'C' includes alternatives on the new alignment. The consideration of two alignments at Ashton Station Road necessitated the evaluation of two separate sets of intersection/interchange alternatives. The outcome of the evaluation of cross section alternatives dictated the location of the intersection/interchange on Ashton Station Road. However, the intersection/interchange evaluation was undertaken for both alignments independently, in order not to prejudge the outcome of the evaluation of cross section alternatives.

The intersection/interchange alternatives evaluated are shown in the following figures:

- Location A Regional Road 3 - Figure 6.27
- Location B Ashton Station Road - Figure 6.28
- Location C Ashton Station Road - Figure 6.29
- Location D County Road 17 - Figure 6.30

The basic options available at each location include:

- at-grade intersection (signalized or unsignalized);
- at-grade intersection (signalized or unsignalized) with restricted turning movements;
- grade separated right in/right out interchange; and
- fully controlled access interchange.

In addition to these three locations for improved access to the highway, there are also three other connections within the Study Area that will be maintained. These include:

- Highway 7/417 interchange;
- Regional Road 36 interchange; and
- McNeely Avenue signalized intersection.

At Regional Road 36 a commitment was made by the Ministry during the early 1970's to provide a future interchange with Highway 7 as part of road closing applications, in order to maintain access to the highway system for local residents. The Ministry owns the property for an interchange and has confirmed, the earlier commitment in conducting this study. The alternatives considered at this location are shown on Figure 6.31 of the PDR.

As part of the study's recommendation to carry forward the "Do Nothing" alternative in Section 1 (see chapter 5 of the PDR), it was agreed that no further modification to the signalized intersection of McNeely Avenue would be considered for the 10 year planning horizon.

At the Highway 417/7 interchange the existing interchange will be utilized for the future freeway to freeway connection. However, as part of this study several alternatives were assessed to accommodate the future interchange. These are shown in the PDR on Figures 6.32 and 6.33.

Coarse Screening of Alternatives

Before proceeding with the detailed evaluation, a coarse screening of the alternatives was performed. All the alternatives were reviewed with respect to satisfying the transportation service objectives for Highway 7. For each alternative the test of satisfying the projected travel demand for the 10 year planning horizon and meeting existing provincial safety criteria was applied. The coarse screening reviewed all of the alternatives and eliminated those alternatives which could not meet the criteria. The alternatives that were not carried forward for the detailed evaluation are described as follows:

a) 4 Lane Undivided Highway with 1 m Flush Median

Alternatives 2 and 3 incorporated a 4 lane undivided highway with a 1 m flush median. The 1 m flush median was reviewed with respect to the MTO Roadside Safety Manual and current Quality and Standards Ministry Directive B-12 dated July 21, 1992. Based on these standards, the existing MTO policy precludes the use of a narrow median where traffic volumes exceed an AADT of 20,000.

Projected 10 year traffic projections for Highway 7 exceed an A.A.D.T. of 20,000. Therefore, using the current Ministry policy guidelines, where median widths under 6 m require a median barrier, the 1 m flush median alternatives were not carried forward for a detailed evaluation.

b) High Occupancy Vehicle (HOV) Lanes

The HOV lane alternative is also not recommended to be carried forward because it will not satisfy travel demand. Using a 4-lane cross section with 2 lanes designated exclusively for HOV use and an attraction of 10-20% of all trips to the HOV lanes (20% is considered an upper estimate based on modal splits presently being achieved in the RMOC), the non-HOV lanes would be operating at capacity within the 10 year planning horizon.

The desirable HOV strategy is the development of a continuous system beginning within the urban area. Therefore, the approach of using HOV lanes in isolation, beyond the urban area of the RMOC, is not considered reasonable or systematic to implementing an HOV network.

Based on the inability of the HOV lanes to satisfy travel demand, this alternative was not recommended to be carried forward.

c) Unsignalized Intersections

Intersection alternatives were considered with respect to traffic operations, based on the traffic analysis and future projections of the volume of traffic on Highway 7 and major cross roads beyond the 10 year planning horizon. Those not meeting current Ministry guidelines were screened and not carried forward.

Following the recommendations of the traffic analysis (see Appendix B of the PDR), it is projected that the three major intersections identified will likely warrant signals based on both travel demand and the high speed traffic operations of the highway. Based on this analysis, no unsignalized intersection alternatives were carried forward.

Evaluation Approach

The guiding principles of the evaluation approach used in the study include:

proactive public contact;

meaningful public input into the decision-making process;

traceability of evaluation exercise;

flexibility to assess trade-offs;

ability to undertake sensitivity testing; and

a commitment to reconsider decisions using new information or ideas.

Several potentially contentious issues existed within the Study Area. These included, among others: three provincially significant wetland areas, locally significant wetlands, endangered species habitat, existing or planned businesses, large scale farming operations, and residential development. These sensitive issues required an evaluation approach that the public could understand, comprehend and participate in.

As presented in Chapter 3 of the PDR this project followed the requirements of the Provincial Highways Class Environmental Assessment Process. The Ministry of Environment and Energy (MOEE), which oversees the application of the Environmental Assessment Act in Ontario, has five requirements for environmental assessments¹ that are summarized as follows:

Consult with affected parties;

Consider all reasonable alternatives;

Consider all aspects of the environment;

Systematically evaluate net environmental effects; and

Provide clear, complete documentation.

All five principles were satisfied as part of this study. However, the evaluation approach utilized for the study specifically addressed the requirement to provide a systematic evaluation process.

Evaluation Methodology

This section of the report provides a general outline of the major steps followed in the evaluation exercise. This process was used for the detailed evaluation of intersection/ interchange and cross section alternatives. The description of the individual evaluations is presented in Section 6.5 of the PDR.

Based on a review of available evaluation methods this project incorporated a comprehensive process that included a formal procedure to rate alternatives. The value of this approach is that it is both traceable and flexible enough to adapt to the evaluation of substantially different sets of alternatives.

While there are numerous methods available for rating alternatives, all of which have their advantages and disadvantages, the process chosen for this study is based on the “weighted additive method”. This method focuses on the differences between alternatives, addresses the complexity of the base data collected and provides a traceable decision-making process.

The weighted additive process involves a numerical calculation to determine scores for each alternative. These scores are related to impacts through the use of mathematical relationships. Any possible subjective bias is eliminated because the evaluators do not estimate scores for alternatives.

The methodology includes the following nine steps:

- STEP 1 Development of a “long list” of evaluation criteria
- STEP 2 Public endorsement of a “short list” of evaluation criteria for each group of alternatives being considered
- STEP 3 Collection of data to relate the impacts for each criterion
- STEP 4 Establish social utility functions (these define the attractiveness of each alternative with respect to each criterion)
- STEP 5 Weighting of criteria
- STEP 6 Rating alternatives
- STEP 7 Selection of preferred alternatives
- STEP 8 Sensitivity testing
- STEP 9 Public review

The evaluation process is consistent with MTO and MOEE practices for the evaluation of alternatives. Each step is presented in the following sections.

STEP 1

Development of a ‘Long List’ of Evaluation Criteria

The initial task in the evaluation process was to develop evaluation criteria under which alternatives could be assessed. This was a two-step process which included the identification of six categories of criteria called factors, followed by the selection of a number of sub-factors for each factor.

The six factors were selected by the Project Team and MAC to describe the general division of distinct areas of the environment to be evaluated. These factors were presented to the public at PIC No. 1 and, following this consultation with the public, were accepted as describing the broad definition of the environment to be evaluated.

The six factors are:

Traffic and Transportation;

Land Use and Property;

Natural Environment;

Social and Cultural Environment;

Economic Environment; and

Cost.

STEP 2

Public Endorsement of a ‘Short List’ of Evaluation Criteria for each Group of Alternatives Being Considered

Under the six factors, sub-factors were identified to describe and measure the impact of the alternatives. The sub-factors were developed from a “long list” created by the Project Team and MAC with some being added or deleted during briefing meetings with external agencies, interest groups, community associations and the public. Following this review, a “short list” of sub-factors was chosen which best describe the impacts that were to be assessed for the specific alternatives (i.e., cross section or interchange/intersection groups of options). Where there was no measurable difference among alternatives, and it was agreed that the alternatives were generally equal with respect to a sub-factor, then that sub-factor was eliminated. For this project the “long list” was reduced from the approximately 100 criteria that are shown in Table 6.3 of the PDR to a workable number, known as the “short list”.

A benefit to dividing the evaluation criteria into two levels (factors and sub-factors) is that it prevented unbalancing of the evaluation or the perception that it was “overloaded” with more criteria under one factor such as traffic and transportation (engineering criteria). Moreover, dividing the criteria into both factors and sub-factors allowed a clear presentation to the public of weights applied to the factors and sub-factors.

One test that was used when considering whether to accept or reject a sub-factor was to question whether the sub-factor identified meaningful differences among the alternatives that were to be evaluated. The Project Team and MAC had to agree that the difference was meaningful and that the sub-factor actually described part of the “environment” that needed to be included in the decision-making process. Therefore, the selection of the sub-factors was made so that they related to the goal of the study, were comprehensive enough to describe all aspects of the environment and did not double count criteria.

STEP 3

Collection of Data to Relate the Impacts for Each Criterion

Following the selection of evaluation factors and sub-factors, measurements of the impacts were made using topographic plans, aerial photographs, field surveys, and numerical modelling. These measurements resulted in data being available for each sub-factor. The measurements are documented in Appendix K of the PDR.

STEP 4

Establish Social Utility Functions

Under each sub-factor, the attractiveness of each alternative is defined with respect to the impacts. Alternatives receive a dimensionless score between zero and one based on measurements of the base data. For example, based on the area of wetland removed, an alternative would receive a dimensionless unweighted score between zero and one. Two sample social utility functions are shown in Figure 6.34 of the PDR. The closer the score is to one the greater the preference for the alternative, or the lower the impact of the alternative on the environment. These mathematical relationships for calculating the dimensionless scores were developed in consultation with the Project Team and MAC.

STEP 5

Weighting of Criteria

The unweighted dimensionless scores between zero and one defined from the utility functions for each sub-factor did not reflect the relative importance among individual sub-factors or factors. It was recognized that many of the factors, and in turn the sub-factors, warranted greater weight because they were more important with respect to the options being considered. Therefore, the Project Team and MAC members weighted each of the factors and sub-factors.

The weights for each factor and sub-factor were determined by averaging the weights assigned by the Project Team and MAC members. These weighting exercises were undertaken independently by the two groups and then comparisons were made. Each member of the Project Team or MAC gave each factor and sub-factor a percentage weight based on their personal assessment, value judgement and professional opinion of the importance of the criterion. This included the input provided from the public and briefing meetings with interest groups and external agencies.

STEP 6

Rating of Alternatives

Scores were calculated for each alternative using the weighted additive method. The raw measurements were converted to dimensionless unweighted scores using the social utility functions. These were then weighted according to the Project Team or MAC average weights. The alternatives with the highest total score was carried forward as the technically preferred alternative.

Weighted scores, shown as “Project Team Average Weights” or “MAC Average Weights” as applicable, represent the preference of each group using average weights from each group. This approach produced a score for each alternative which could potentially vary from 0 to 100% depending on the impacts of each alternative being considered. The alternative with the highest score was identified as the “Technically Preferred Alternative”.

STEP 7

Selection of the Preferred Alternative

The selection of the Preferred Alternative is based on the ranking, or score of each alternative, within the various groupings described in PDR sections 6.1.2 and 6.1.3 and summarized as follows:

Cross Sections - Section 1

Cross Sections - Section 2

Regional Road 3 - Location ‘A’

Ashton Station Road (existing alignment) -Location ‘B’

Ashton Station Road (new alignment) - Location ‘C’

County Road 17 - Location ‘D’

Regional Road 36 - Location ‘E’ (Qualitative assessment used at this location)

Highway 417/7 - Location ‘F’ (Qualitative assessment used at this location)

Combining the alternatives having the highest score in each group produced the Technically Preferred Alternative for Highway 7.

STEP 8

Sensitivity Testing

A frequent criticism of other commonly used evaluation methods is that the outcome of the evaluation is biased by the selection of the Project Team members who establish the weights. For example, a group comprised of numerous engineers could bias the outcome towards an alternative which had strong technical merits. To address this potential pitfall two mechanisms were incorporated into the evaluation process for this project. Firstly, the Project Team and MAC, from which the weighting was derived, included a diverse group comprised of engineers, biologists, environmental planners and local residents. Secondly, to test how sensitive the outcome of the evaluation was with respect to the assigned weights (i.e., would the result have changed if different weights were selected), a comprehensive sensitivity testing program was included in the evaluation process. This sensitivity testing program resulted in greater confidence in the selection process.

STEP 9

Public Review

The evaluation process and the preliminary technically preferred alternatives were presented to the public at Public Involvement Centre No. 3 for review and comment.

Description of the Recommended Long Range Plan

Highway 7 is to be constructed as a controlled access 4-lane divided freeway. The Long Range Plan recommends an alignment that generally follows the existing Highway 7 route and is shown on **Figures 2 and 3**. The cross section of the freeway will include a 30 metre median, except between County Road 17 and McNeely Avenue where it will be narrowed to a 15 metre median to provide a transition as the highway approaches the built-up area south of Carleton Place.

The preferred alignment and the cross section improvements for the highway are a result of an analysis and evaluation process described in Chapters 6 and 7 as well as the Public Consultation Program presented in Chapter 3 of the PDR.

There will be four new interchanges located at:

Regional Road 36 (Hazeldean Road);

Regional Road 3 (Dwyer Hill Road);

Ashton Station Road; and

County Road 17.

In addition, service roads and extensions of existing township roads are proposed to provide access to all properties adjacent to the right-of-way. Extensions of township roads or the construction of new roads on unopened road allowances will require a further review of existing conditions and constraints, such as existing property agreements. This will be completed when the Ministry's Property Section negotiates for the purchase of property along the corridor.

The major components of the Recommended Long Range Plan are presented in this section of the report and are described beginning at the west end of the Study Area progressing easterly through to Highway 417. To simplify the description of improvements, Highway 7 is described operating in a west to east direction. Also, the mitigation sites are referenced with a number which corresponds with the site number on **Figures 5 and 6**.

At the western limit of the Study Area it is recommended that Highway 7 between Highway 15 and McNeely Avenue remain as a 5-lane undivided cross section to maintain access to the existing highway commercial development on both sides of the right-of-way.

Continuing east there will be a transition from the 5-lane cross section to a 4-lane divided cross section with a 15 metre median between McNeely Avenue and County Road 17. The alignment in this section includes a 90 metre right-of-way utilizing the existing highway for the eastbound lanes and widening to the north for the westbound lanes. This transition area provides the following benefits:

- allows for a gradual and noticeable transition from the 30 metre median (rural freeway cross section) to the undivided roadway in the urban area south of Carleton Place;
- allows for a transition in speed limits, 100 km/h to 80 km/h to 60 km/h;
- increases safety by introducing a progression of change in the roadway environment which will increase the driver's awareness as eastbound traffic enters the urban area;
- ensures the traffic signals at McNeely Avenue are approached safely; and
- accommodates flexibility for the long term planning for a westerly extension of the 4-lane freeway which will require a by-pass around the built up commercial area south of Carleton Place to minimize significant impacts.

The controlled access designation for Highway 7 will necessitate that all properties with existing direct access to the highway such as residential, commercial and field entrances, be removed. The Recommended Long Range Plan proposes that all adjoining properties will be provided with alternative access or a buyout of the property should be negotiated. Alternative access will be provided by a service road, or through the extension of a Township road.

Between McNeely Avenue and County Road 17 properties south of the highway will be provided access from a future Township Road located in the unopened road allowance along the Tenth Line (1). Properties in Concession 11 (north of the highway) will be provided access from a Township Road along the abandoned rail corridor, between McNeely Avenue and County Road 17 (2). This new road will provide residents with access to the Town of Carleton Place, McNeely Avenue, County Road 17 and Highway 7.

The widening of the highway between McNeely Avenue and County Road 17 will impact five residences, two of which are proposed to be relocated south to the Tenth Line (a third house on the Morrison farm may be relocated) (3) and two of which will be purchased due to loss of access (4). One commercial operation (Pond Motel) is proposed to be purchased (5), along with the undeveloped commercial properties in the southeast quadrant of the County Road 17 interchange (6).

The proposed interchange at County Road 17 is a Parclo AB configuration which includes ramps in the two west quadrants (7). The location of the interchange has been offset to the west to minimize property impacts to the existing businesses. This configuration and the proposed location combine to allow retention of the commercial development in the northeast quadrant and permits use of the existing roadway during construction. The undeveloped commercial properties in the southeast quadrant will be purchased to protect for the future opportunity to construct a free flow on-ramp. A relocated carpool lot is provided in the southwest quadrant of the interchange.

From County Road 17 easterly, the highway will widen to the preferred 100 metre right-of-way with a 30 metre centre median. The widening will take place to the south side of the highway and the existing 2 lanes will become the westbound lanes on the new freeway. Widening to the south reduces the impact to the highly productive agricultural land and active farm units on the north side, lessens property impacts and minimizes the construction cost.

At a point approximately 2.5 km east of County Road 17 in Lot 24 the alignment diverges from the existing Highway 7 route and turns southward. The benefits of this realignment include lesser property impacts, reduced visual and noise intrusion and elimination of the substandard horizontal alignment along the existing highway (8). The proposed flatter horizontal curvature provides a greater level of operating comfort and improved safety. This realignment will also allow for the retention of all existing residences and industries located on Highway 7 in the vicinity of Ashton Station Road. Finally, the new alignment will permit the construction of a full Parclo A4 interchange (9).

A future service road on the south side of the freeway will provide access to existing development between County Road 17 and Lot 24, Concession 10 (10). The final location of this Township Road is to be reviewed at the detailed design phase. An alternative location on the 10th Line may minimize property impacts should any of this road be constructed by private initiative following the completion of this study.

Similarly, properties on the north side will have access to a new Township road located in the abandoned rail corridor (11), from the Town of Carleton Place to Lot 26, Concession 11. From Lot 26, Concession 11 to Ashton Station Road, the existing Highway 7 road surface will become a municipal road providing access to existing development on the north side of the freeway (12).

Between Ashton Station Road and Dwyer Hill Road the freeway will follow the existing highway alignment. The widening will be to the south, retaining the existing roadway for the westbound lanes. Widening to the south allows for the problem of habitat on the north side, deemed suitable habitat for the endangered Loggerhead Shrike. Properties on the north side of the freeway may be provided with access by a proposed extension of Abb Road (13). Further south, Overpass Road will be closed at the highway and extended to provide a cul-de-sac. South of the freeway a new service road will provide access to existing residences from Ashton Station Road (14). In addition, a possible extension along the unopened road allowance between Concessions 10 and 11, Goulbourn Township, will be considered to provide access to Lot 3 in Concessions 10 and 11 (15).

At Dwyer Hill Road a Parclo A2 interchange (using 2 quadrants) is proposed (16), with the provision for a future expansion to an A4 (using 4 quadrants) design. A slight realignment of Dwyer Hill Road to the west provides a number of benefits to the interchange development and the surrounding land uses. This includes reduced property and visual impacts to the Campground and Trailer Park (17). The protection for a future on-ramp will require additional property. However, this requirement is beyond the planning framework of the study. Although there will be minor loss of the adjacent Class 1 Wetland this interchange configuration was supported by the Ministry of Natural Resources.

The freeway from Dwyer Hill Road to Lot 7, Concession 12, Goulbourn Township, is located north of the present right-of-way. This will allow the use of the existing highway as a Township road to provide access to the existing Highway 7 residences, to the Country Club Estates Subdivision and the Canadian Golf and Country Club. Relocating the freeway to the north results in fewer environmental impacts.

At Lot 11 the freeway alignment is reversed back to the south side of the existing highway and again utilizes the existing roadbed for the westbound lanes. This alignment extends to Lot 16 at which point it curves northward to the Regional Road 36 interchange where a right-of-way for a freeway was previously established.

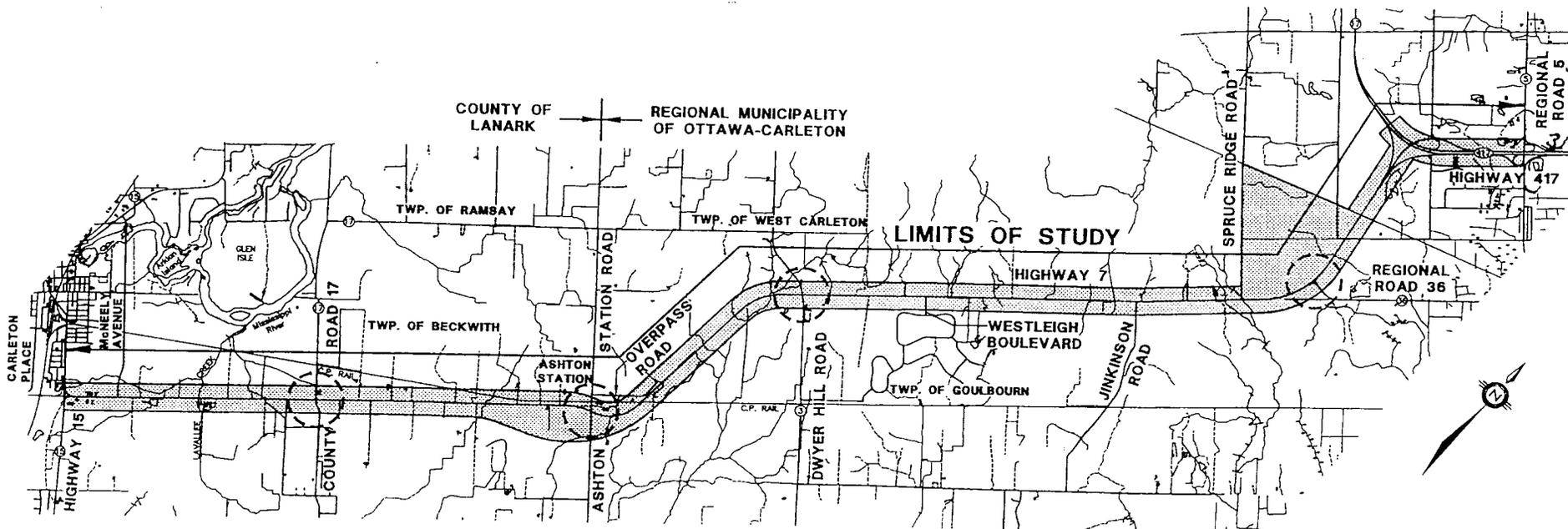
Other features of the Recommended Long Range Plan at the eastern study limits include access to adjoining

properties north of the highway by an extension of McArton Road east of Dwyer Hill Road to Lot 12, Concession 12 (18) and south of the highway, from Dwyer Hill Road to Lot 11 using the existing highway (19). The need for a northern service road will be assessed against the possibility of buyouts of land-locked property in Lots 7 to 12, Concession 12.

Jinkinson Road will be connected by a service road to Regional Road 36 (20). Part of this link will utilize a portion of the old Highway 7 alignment in Lots 17 and 18. Existing development on the north side of the highway will be accessed by a service road connected to Spruce Ridge Road (21). Both of these service roads will impact a Class 1 wetland located in Lots 15, 16 and 18, Concessions 11 and 12 (22). In addition, a future mitigation requirement will be the buyout of the Top Value Gas Station and L&L's Chipwagon (23). The final location of these service roads was selected through consultation with all landowners and municipalities.

Property for the interchange at Regional Road 36 was dedicated in 1973 as part of the Highway 417, Queensway construction. Therefore, most of the land required for this interchange has already been protected or is within the unopened road allowance along the boundary of West Carleton (Concession 5) and Goulbourn (Concession 12). The interchange at Regional Road 36 will connect Spruce Ridge Road, David Manchester Road, Jinkinson Road and Hazeldean Road to Highway 7. The type of interchange proposed is a Parclo A2 (24), with future provision for a Parclo A4 design.

From Regional Road 36 to Highway 417, the highway will be within the existing right-of-way. Two additional lanes will be located to the west of the existing highway. Rothbourne Road which has been previously approved for road closure at the highway will be formally closed at the onset of construction. Proposed improvements to the Highway 417 and Highway 7 interchange include an additional structure (25) and provision for future widening in the median of Highway 417 to provide a 6-lane cross section.



-  STUDY CORRIDOR
-  PROPOSED INTERCHANGE LOCATIONS



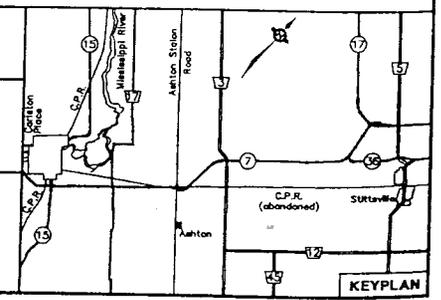
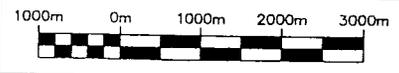
Ministry
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Figure 1

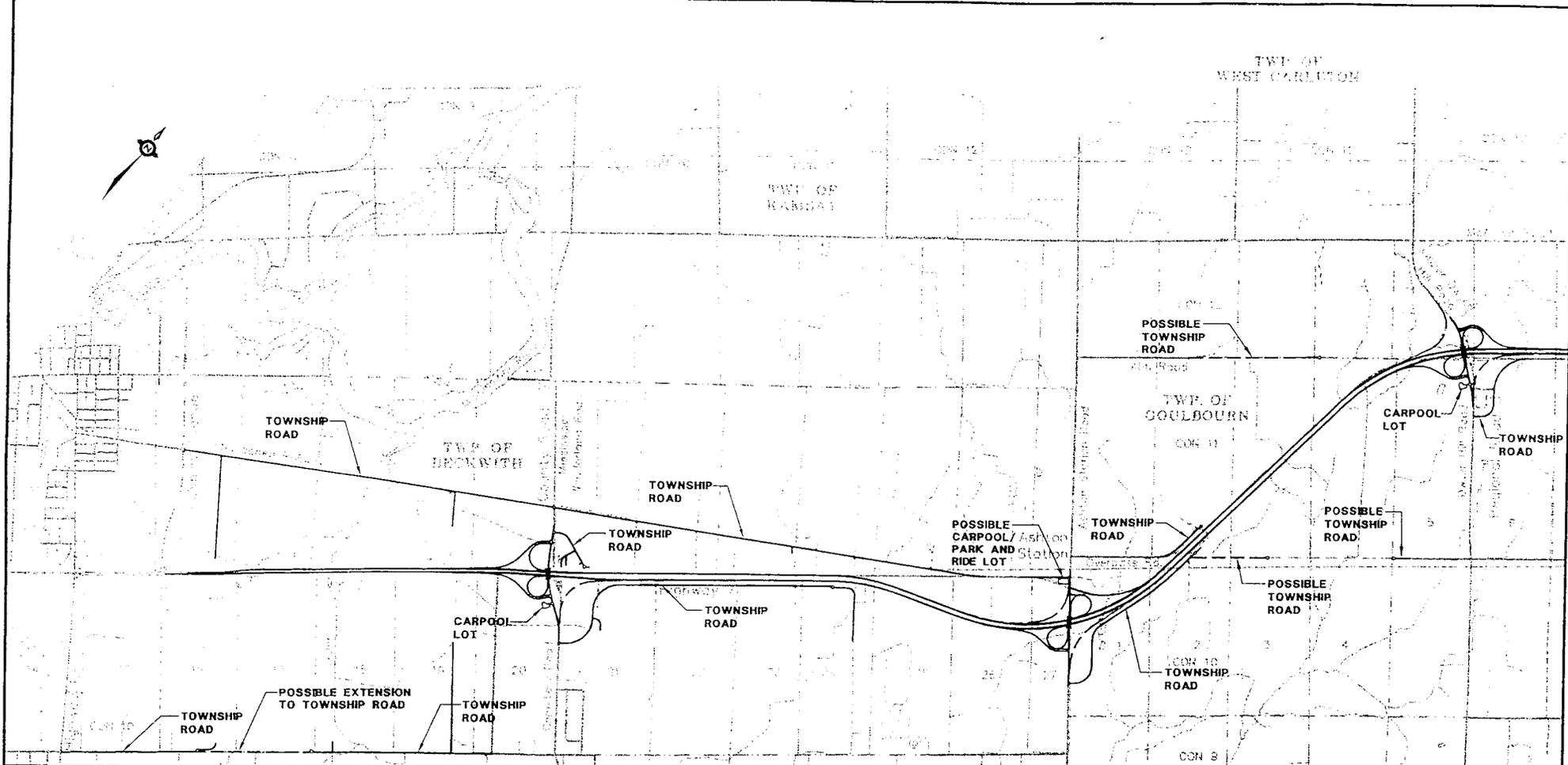
STUDY AREA

**HIGHWAY 7 PRELIMINARY DESIGN STUDY
FROM CARLETON PLACE TO HIGHWAY 417**

WP 142-78-00



KEYPLAN



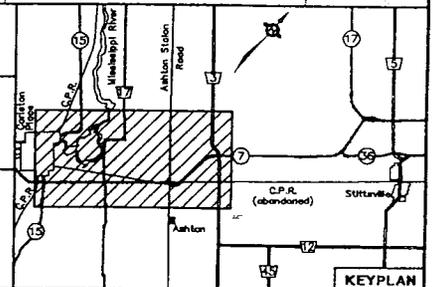
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Figure 2

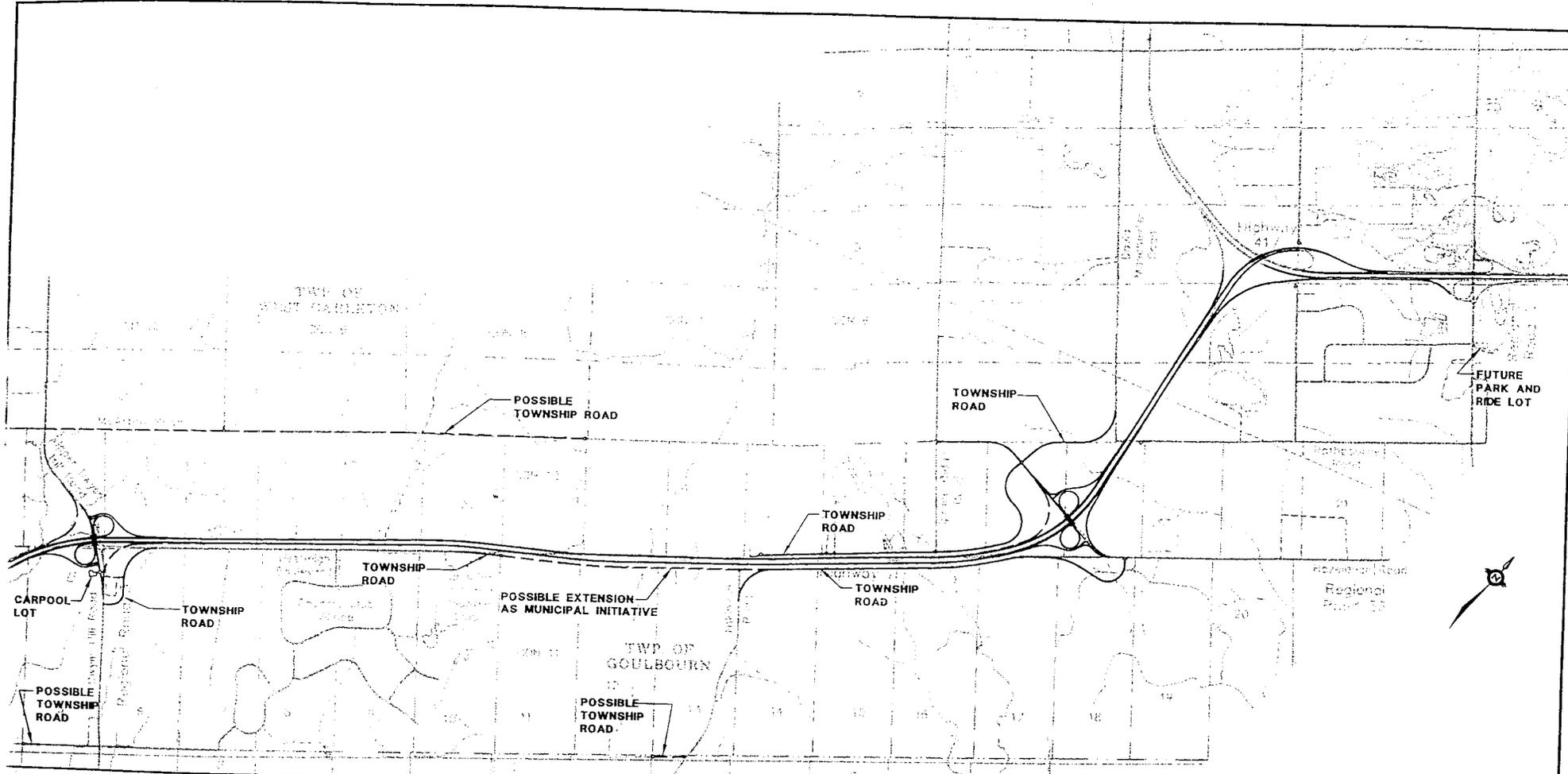
RECOMMENDED LONG RANGE PLAN

**HIGHWAY 7 PRELIMINARY DESIGN STUDY
FROM CARLETON PLACE TO HIGHWAY 417**

WP 142-78-00



DP033A-2



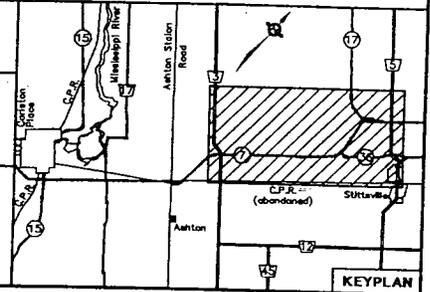
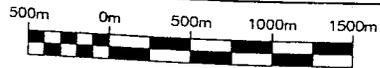
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Figure 3

RECOMMENDED LONG RANGE PLAN

**HIGHWAY 7 PRELIMINARY DESIGN STUDY
FROM CARLETON PLACE TO HIGHWAY 417**

WP 142-78-00

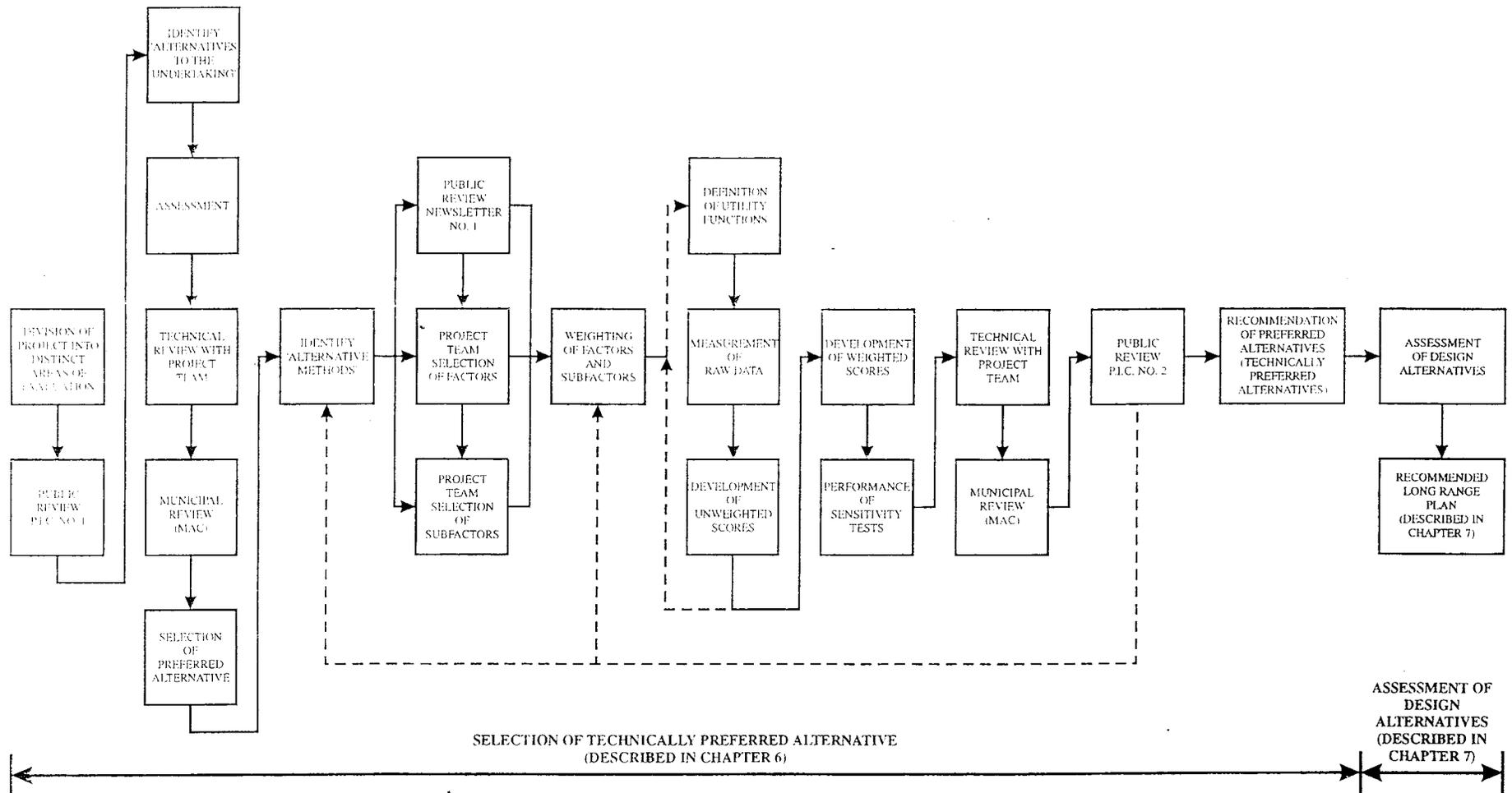


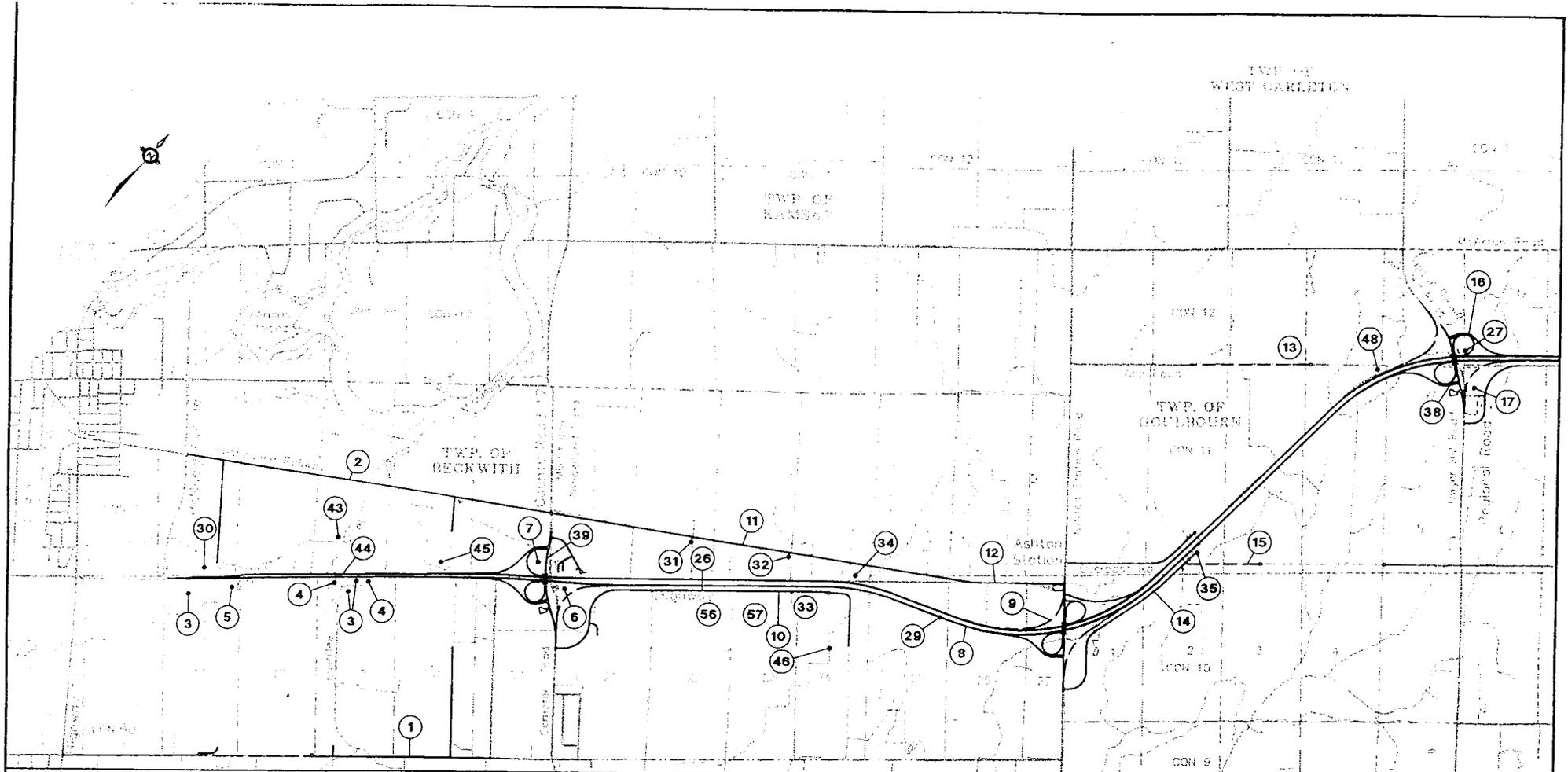
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Figure 4

Evaluation Flow Chart





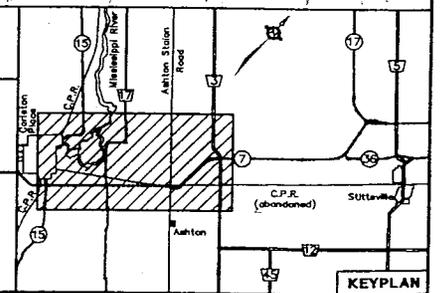
Ministry
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Figure 5

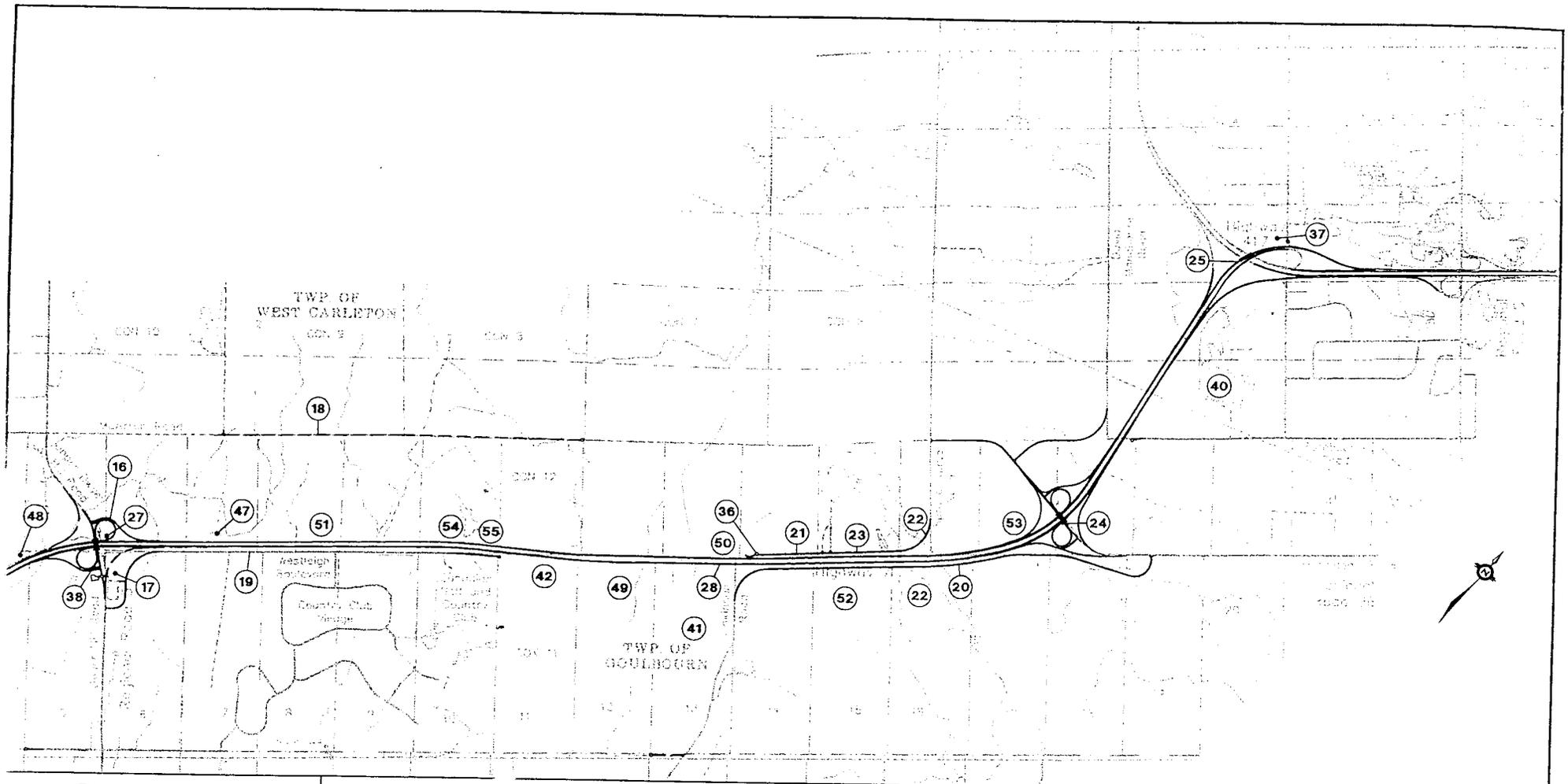
ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

**HIGHWAY 7 PRELIMINARY DESIGN STUDY
FROM CARLETON PLACE TO HIGHWAY 417**

WP 142-78-00



KEYPLAN



Ministry
of
Transportation

Figure 6

ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

**HIGHWAY 7 PRELIMINARY DESIGN STUDY
FROM CARLETON PLACE TO HIGHWAY 417**

WP 142-78-00

