Ontario
Ministry of Transportation

Environmental Assessment Report
One - Stage Submission

Highway 400 - Highway 404
Extension Link (Bradford Bypass)
W.P. 377-90-00

APPENDICES

McCORMICK RANKIN
CORPORATION

December 1997

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Travel Demand Analysis

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HIGHWAY 400 - HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) STUDY

TRAVEL DEMAND FORECASTS

McCORMICK RANKIN
November 1996

TRAVEL DEMAND AND TRAFFIC OPERATIONAL ANALYSIS

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HIGHWAY 400 - HIGHWAY 404 EXTENSION LINK
(BRADFORD BYPASS) STUDY
TRAVEL DEMAND FORECASTS

EXECUTIVE SUMMARY

The travel demand analysis for the Bradford Bypass, a proposed new east-west roadway south of Cook's Bay (Lake Simcoe), implemented a regional-scale EMME/2 computer travel demand model. Nearly two dozen alternative road network scenarios have been tested under future (2011 and 2021) population and employment conditions.

The results which emerge indicate a continuation of the dramatic growth in travel demand which has been characteristic of the study area for the past quarter century. This growth will inevitably lead to congestion on key east-west roadways linking Highway 400 and the future extension of Highway 404. Demand will significantly exceed available capacity even accounting for planned near-term improvements such as in the Highway 9 - Green Lane corridor. Traffic assignments for 2021 conditions indicate a demand for an equivalent six-lane high standard arterial road or a four-lane controlled access freeway. In the absence of such capacity being provided, existing roads such as Queensville Sideroad, Highway 88 within Bradford, and Highway 9 approaching Newmarket would be overloaded and congested.

For a hypothetical new freeway in the Bradford-Queensville corridor, Year 2021 weekday peak hour travel demand would be in the order of 2,500 - 5,500 veh/h in both directions, with average daily traffic in the 27,000 - 58,000 range. Most trips would be long distance "diagonals", using the east-west link to travel from the north along Highway 400 to the south along Highway 404 and vice versa.

1. INTRODUCTION

The Highway 400 - Highway 404 Extension Link ("Bradford Bypass") Study was initiated by the Ministry of Transportation of Ontario (MTO) as the culmination of efforts by various proponents dating back to the 1960s to improve conditions for east-west travel immediately south of Cook's Bay (Lake Simcoe). Previous MTO studies such as the Highway 89 Route Location Study (1979), the Highway 89 Extension Environmental Assessment Report (1984) and the Highway 404/89 Overview Study (1989) had established quantitative and qualitative bases for the concept of a new east-west roadway south of Cook's Bay.

It is recognized, however, that more recent developments in both land use planning forecasts (e.g. the York Region Official Plan, 1994) and travel demand forecasting techniques (using the Greater Toronto Area EMME/2 computer travel demand model with Toronto Transportation Survey (TTS) data from 1986 and 1991) point to the need to update the quantitative aspects of the Need and Justification for the Bradford Bypass proposal. Furthermore, as a greater understanding of the location and scope of both the Highway 404 Extension and the Bradford Bypass emerges over the course of the route planning work, a set of realistic alternative road networks can be postulated and tested using the EMME/2 model.

This technical background paper is intended for appending to the Bradford Bypass EA Report, and brings together all of the traffic and travel demand forecasting results of relevance to the current study. It also incorporates updated forecasts not previously available.

2. BASE CONDITIONS

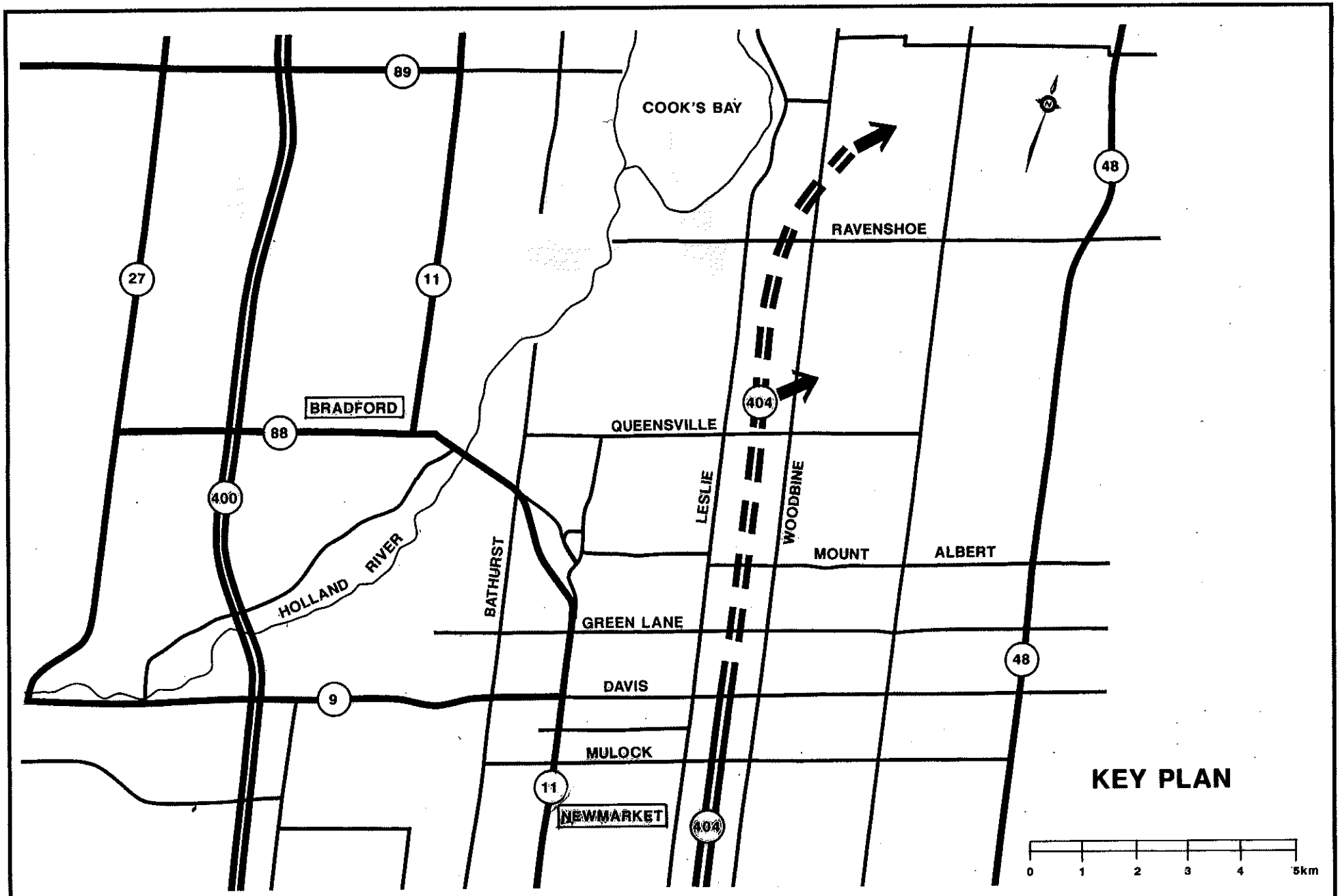
2.1 EXISTING CONDITIONS

The existing characteristics and usage of the major roadways throughout the study area are listed in Exhibit 1, below. Exhibit 2 is a key plan showing the roadways, while Exhibit 3 graphically illustrates recent average annual daily traffic (AADT) volumes on major roadways.

Exhibit 1: Roadway Volumes and Characteristics

Roadway Section		Physical Characteristics[1]	Volume (AADT)[2]
Provincial Highways			**(1992)**
400	Aurora - 9	6RFD120	52,000
	9 - 88	6RFD120	46,900
	88-89	6RFD120	49,400
404	Aurora - Mulock	4RFD120	35,100
	Mulock - Davis	4RFD120	25,400
9	400 - Bathurst	2RAU100	21,900
	Bathurst - 11	2RAU100	20,300
11	Mulock - 9	4UAU80	31,800
	9 - Green Lane	4UAU80	27,000
	Green Lane - Bathurst	4RAU100	16,000
	Bathurst - Bradford	4RAU100	23,900
	Bradford - 89	2RAU100	9,000
88	27 - 400	2RAU100	5,600
	400 - Bradford	2RAU100	9,900
Regional Roads			**(1994)**
38 (Bathurst)	Mulock - 9	2RAU80	8,540
	9 - 11	2RAU80	1,040
	11 - Queensville	2RAU80	4,950
77 (Queensville)	Bathurst - 2nd Concession	2RAU80	6,030±
	2nd Concession - Leslie	2RAU80	4,760
	Leslie - Woodbine	2RAU80	2,140
12 (Leslie)	Davis - Sharon	2RAU80	21,100 / 14,390
	Sharon - Queensville	2RAU80	9,300
	Queensville - Ravenshoe	2RAU80	10,090
8 (Woodbine)	Davis - Mt. Albert S/R	2RAU80	12,570
	Mt. Albert S/R - Queensville	2RAU80	12,050
	Queensville S/R - Ravenshoe	2RAU80	11,970
74 (Mulock)	Bathurst - 11	2RAU80	10,240
	11 - Bayview	2RAU80	20,650
31 (Davis)	11 - 404	4UAU80	21,820
- (Green Lane)	11 - 404	2RAU60	4,500

[1] No. of lanes; Rural / Urban; Freeway /Arterial; Divided / Undivided; design speed (20 km/h > posted speed)
[2] Average Annual Daily Traffic

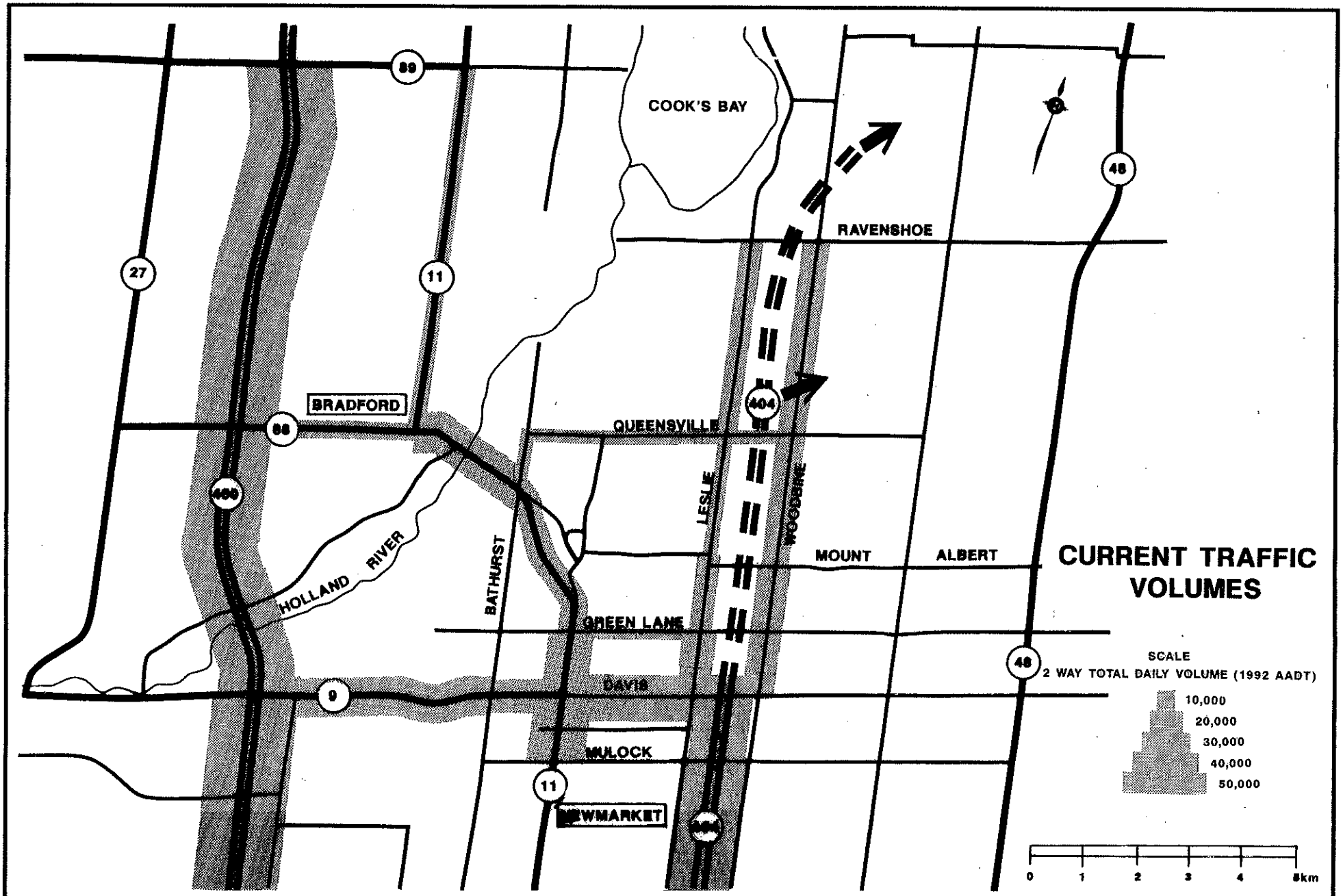


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HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

EXHIBIT
2

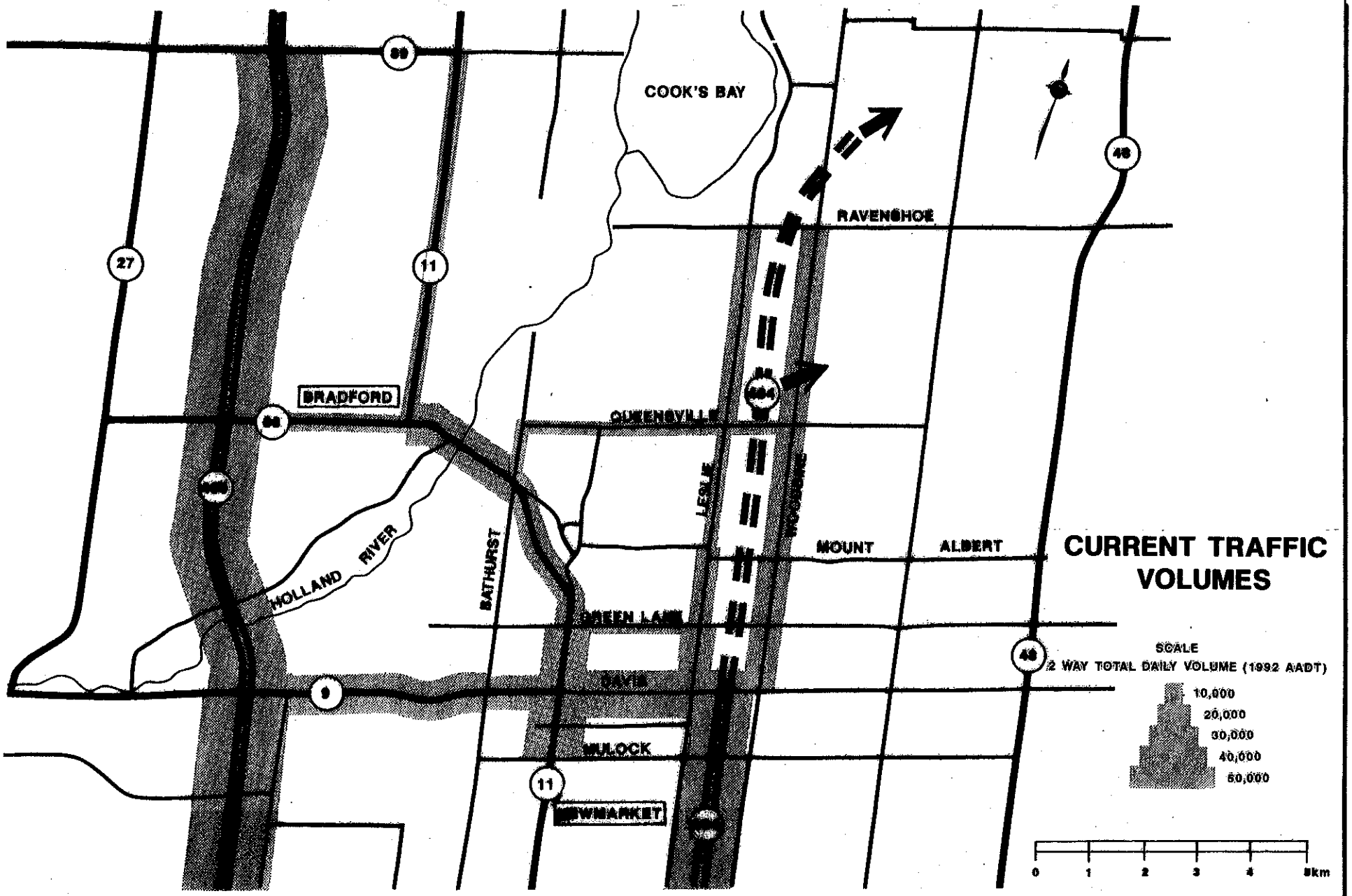


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HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

EXHIBIT
3



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HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

EXHIBIT 3

Road types have different travel demand characteristics; for example, freeway trips tend to be more concentrated in the "rush hour" than do trips on arterial roads. Some figures which illustrate this symptom follow:

Exhibit 4: Usage Characteristics

Roadway	Peak Hour Volume as % of Daily Volume	Peak Hour Directional Split	Truck Volume as % of A.M. peak Hour Volume SB/NB
Hwy 400 @ Hwy 9	12.6%[1]	77% / 23%[1]	5% / 21%[2]
Hwy 404 @ Davis Drive	9.6%[1]	78% / 22%[1]	8% / 18%[2]
Hwy 11 N. of Bradford	8.8%[3]	N/A	N/A
Hwy 88 W. of Bradford	8.2%[4]	N/A	N/A
Hwy 11 S. of Bradford	8.4%[5]	69% / 31%	N/A

Source: 1: MTO Permanent Counting station data, 1992
2: York Region Cordon Count, South York Screenline, 1991
3: Counts - July 1993
4: Counts - August 1993
5: Counts - October 1990

Seasonal and daily variations occur on all roads; for example, commuter routes tend to have reduced volumes in the summer due to vacations while recreational routes may peak on summer weekends. Thus, the AADT figures can only be used as a common reference point, in the knowledge that any particular day may have significantly higher or lower volumes. Exhibit 5 illustrates some of the key variable patterns for Bradford-area highways.

EXHIBIT 5: VARIATIONS IN DAILY TRAFFIC VOLUMES

Roadway	Location	Average Daily Traffic, 1991 (Two-Way)			
		Summer Weekday (M-F) (SWADT)	Summer Day (incl. Sat, Sun) (SADT)	Winter Day (WADT)	All Year Average (AADT)
Highway 400	Hwy 9 - 88	55,900	65,000	42,800	51,650
	Hwy 88 - Hwy 89	55,700	63,200	41,600	50,200
Highway 88	Hwy 400 - Bradford	10,800	11,000	8,600	9,750
	Hwy 400 - Hwy 27	6,100	6,100	5,000	5,550
Highway 11	York Rd 83 - Bradford	25,800	25,500	21,100	23,250
	Bradford - Hwy 89	12,000	12,400	6,500	8,900

Source: Provincial Highways Traffic Volumes, MTO, 1991

2.2 HISTORIC PATTERNS

Traffic on area roads has grown substantially over the past three decades, as the study area and surroundings have been transformed from rural communities to more urban areas fully integrated into the Greater Toronto Area economy and commutershed. Population growth, economic changes, lengthier commuter trips, increased recreational travel, and a shift from rail to road modes for goods movement have all contributed to this traffic increase. Improvements to the road network have been made in response to the increase in demand, and overall the basic road network has been stable over that period.

The following two tables and accompanying graph illustrate this growth, first in terms of population (which corresponds roughly with the demand for travel) and then in terms of traffic volumes experienced on area roadways. Volumes have increased by two to three times over the past two decades on some roadways.

EXHIBIT 6: POPULATION AND EMPLOYMENT GROWTH

Year	Simcoe County			York Region			Greater Toronto (incl. York Region)	Muskoka District
	Bradford West Gwillimbury	Barrie	Total	East Gwillimbury	Newmarket	Total		
Population								
1966	5,000	24,400	134,600	12,200	8,800	130,600	2,441,600	24,800
1976	9,100	34,100	208,100	10,600	24,500	204,400	3,203,500	34,600
1981	11,500	-	225,800	12,600	31,000	252,300	3,413,000	36,700
1986	13,100	48,000	238,500	14,600	33,200	350,600	3,623,200	37,900
1991	16,600	60,900	274,400	17,400	42,900	476,600	4,004,600	43,000
199(est.)	18,200	71,400	303,500	18,000	49,700	560,100	4,360,200	49,600
2001	(2002) 23,000	-	-	-	-	-	4,738,200	49,600
2011	-	-	361,300	26,000	-	744,200	5,917,700	-
Ultimate	-	-	361,300	25,200	-	1,000,000	6,525,600	-

Source: 1967, 1977, 1982, 1987, 1992, 1996, Municipal Directories, Highway 404/89 Overview Ch. 5; Mississauga Busway Ridership Forecasts Ex. 2.2; Town of Bradford West Gwillimbury Development Charges Study (1992).

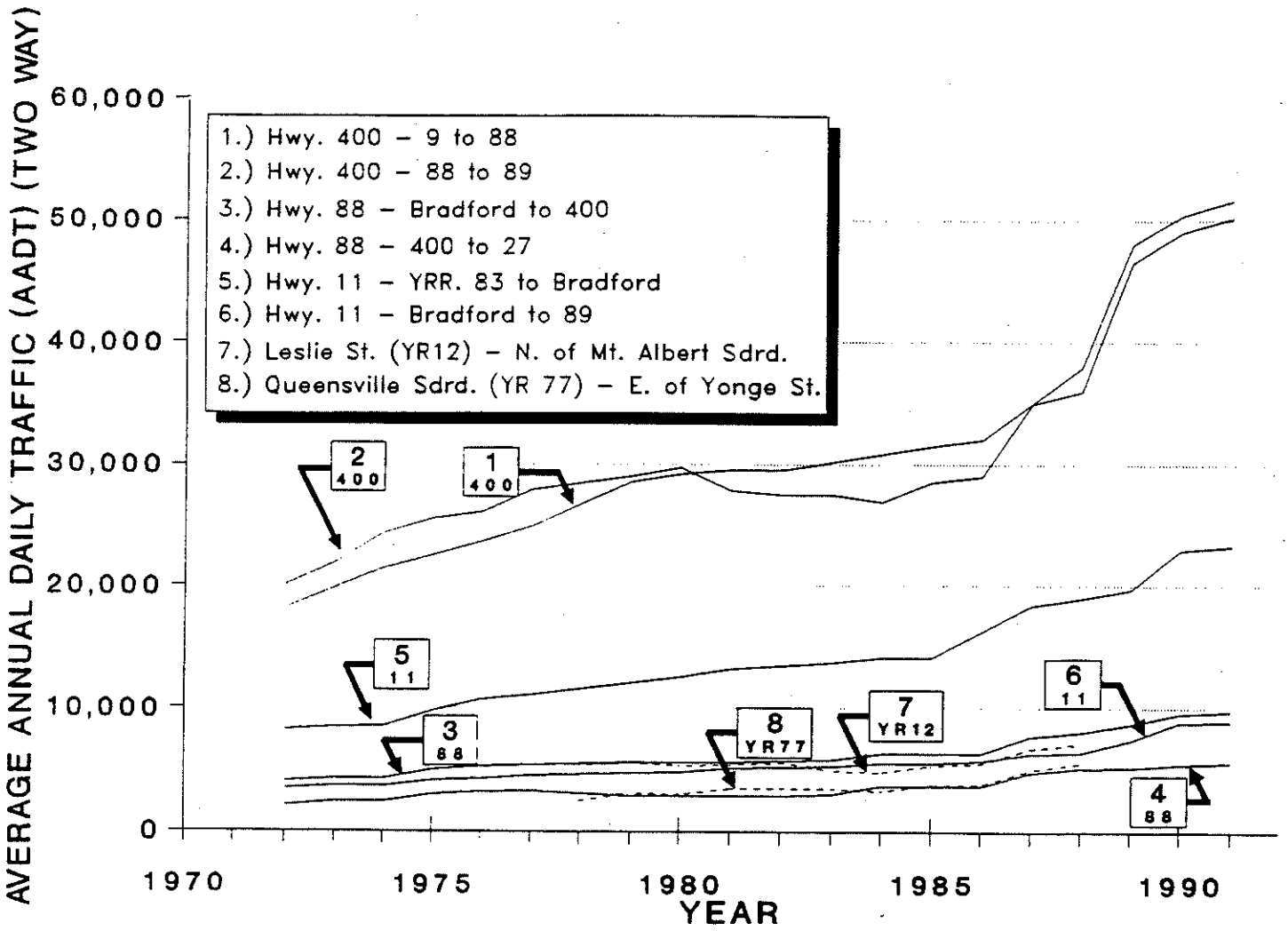
Note: Some inconsistencies may be present due to the variety of sources utilized.

EXHIBIT 7: HIGHWAY TRAFFIC GROWTH

Highway	Segment	AADT[1]					SADT[2]			
		1960	1972	1982	1992	Avg. Annual Growth Rate 1972-1992	1972	1982	1992	Avg. Annual Growth Rate 1972-1992
400	9 to 88	10,000	18,150	29,500	46,900	4.9%	27,200	33,900	57,600	3.8%
	88 to 89	9,500	20,100	27,500	49,400	4.6%	30,200	38,800	60,700	3.5%
404	S. of Davis	0	0	0	25,400	-	0	0	27,400	-
88	400-Bradford	2,700	4,050	5,700	9,900	4.6%	4,850	6,800	10,900	4.1%
11	S. of Bradford	5,200	8,200	13,400	23,900	5.5%	11,000	16,100	25,800	4.4%
	N. of Bradford	1,600	3,500	5,200	9,000	4.8%	5,150	5,500	12,500	4.5%
9	400-Newmarket	0	6,000	10,250	20,300	6.3%	7,200	11,800	21,900	5.7%

1 Average Annual Daily Traffic
2 Summer Average Daily Traffic

Source: Provincial Highway Traffic Volumes, MTO, 1960, 1972, 1982, 1992



SOURCE: **"PROVINCIAL HIGHWAYS TRAFFIC VOLUMES" 2ND "HIGHWAY 404/89 OVERVIEW" MINISTRY OF TRANSPORTATION**

AVERAGE ANNUAL DAILY TRAFFIC - 1972 TO 1992

3. TRAVEL DEMAND FORECASTS

3.1 TRAVEL DEMAND MODELLING

3.1.1 Process

In order to identify future demand, an analysis of existing travel patterns was carried out. Future demand forecasts were then projected based on land use changes and growth expectations in the Region added to existing data.

Data from the following sources was used to establish an understanding of the existing travel patterns within the study area.

- an EMME/2 computer model used by the Region of York which simulates vehicle travel demand on its road facility network on a local and interregional basis; and

- traffic data provided by the MTO and associated municipalities.

Region of York Demand Forecast Model

The region of York's computer model consists of two parts; the road facility network and an appropriate trip table. The road network facility is made up of links (roads) joined by nodes (intersections). The geometry and orientation of the links and nodes make the network look similar to what the road network would look like on a map. A trip table is a matrix of vehicle trip origin and destinations which is made up from existing land use data and an understanding of where people begin and end trips at a given time period of the day. (Trip tables are typically constructed by carrying out surveys with the public and employers.)

An area where a trip originates and where a trip ends is called a traffic zone, such as downtown Toronto or Queensville, for example. The trip table matrix was established by

using 31 zones. Therefore, the trip table is a 31 × 31 matrix and describes the number of trips from one traffic zone to all others and vice versa.

Manipulation of the model, called a traffic assignment, superimposes the trip table for a given time period on the road network and can show the totals of all trips from zone to zone on each road in the network. The resultant trips on each road are called link volumes. The assignment can also show how an individual origin and destinations would use the network, i.e. would show how a person from traffic zone 'A' would travel to traffic zone 'B' during the morning rush hour.

The model considers the available capacity on each link and the net travel time for each alternative routing before it assigns a trip to any particular route. In a case where the shortest route is already at capacity with other trips, the model searches for a "next best" route. The iterative process continues until there is a balance between demand and capacity.

The computer model also requires other significant input and consideration of other parameters. This input includes identifying attributes of roadway links which have designated speeds and assumed capacities based on the number of lanes and the road's function. With respect to the time period being considered, for computer modelling purposes, a peak hour (weekday a.m. or p.m.) is normally selected as representative of the traffic demand condition for which the road network is designed.

To forecast traffic for future years, the modelled existing traffic volumes produced using existing land use data are first compared with actual volume counts. The model may need to be calibrated to better reflect actual counted volumes. Calibration of the model may include reducing the available capacity of a roadway or increasing the speed on another (refer to Detailed Model Coding in Section 3.1.2). Following calibration, the land use data and other demographic features are forecast to a future year (usually based on Official Plan assumptions for future land use) and the model re-assigned to produce future travel demand volumes on both the existing transportation network and to the future transportation network.

3.1.2 Application

The modelling of large-scale transportation networks, particularly for future scenarios, involves significant input assumptions along with the simplification of complex and variable interactions between the different input parameters. As a consequence, model output (e.g. peak hour traffic volumes assigned to each roadway link in the network) must be treated cautiously and not taken out of context.

In the case of the model used in the current study, model input also included the consideration the following parameters:

- **Occupancy Rate**

Auto occupancy rate is assumed to be an average of 1.2 person per vehicle. This is typical of current a.m. peak conditions; occupancy tends to be higher in the p.m. peak.

- **Trucks**

The model does not include commercial (truck) traffic. Truck volumes, however, particularly on highways, are significant: 1991 counts on Highways 400 and 404 in York Region showed a.m. peak hour truck volumes as between 5% and 21% of all traffic. From an operational point of view, one large truck is equivalent to two or three cars. The trip table can be modified to account for this truck equivalency. In addition, the model's assumptions for capacity of major links can also be adjusted from the actual capacity.

- **Local Trips**

Local trips (i.e. those trips travelling within Zone 'A') do not show up in the regional-scale model; only trips crossing from one zone to any other are assigned an origin, destination and route. This is significant within urban areas and affects assignments to other roads. For example, the model may assign 800 - 900 veh/h of interzonal trips to Davis Drive in Newmarket because that is its coded capacity, whereas a portion of the

capacity is already utilized by local trips that the model doesn't recognize because they are contained entirely within the Newmarket traffic zone. Most of the interzonal trips assigned by the model to Davis Drive should therefore be assigned to alternate routes instead; this can be accomplished in the model by assigning a lower "capacity" to Davis Drive. Most highways which relieve local roads of long distance traffic would, in reality, experience greater demand than that assigned by the model.

- **Planning Horizon**

In some cases, land use, transportation network, demographic and/or travel demand information may not be available for the desired future year. For example, the modelling carried out for Bradford Bypass prior to 1995 was limited to a 2011 future time frame in order to be able to incorporate external (non-GTA) land use figures which were only available for 2011. The model results therefore do not reflect the considerable growth in York Region projected to occur beyond 2011.

Depending on the location and trip patterns of the post-2011 growth, travel demand on individual roadways could be significantly affected. In all cases, the implication would be a significant increase in peak period demand for travel over the modelled 2011 case. This is reflected in the traffic assignments carried out in 1995 using 2021 data.

York Region population is anticipated to grow by 166,000 or 18% and employment by 180,000 or 36% during the 2011 - 2021 period, which would translate into correspondingly greater rates of growth in trip generation and travel demand.

- **Detailed Model Coding**

Traffic assignment in the model is on a least-time (coded speed limits for each link), capacity constrained basis which can be insensitive to localized (non-coded) real-life congestion spots such as Highway 88 in Bradford. This can result in significant variations in traffic assignments on particular links. For example, in the 1994 traffic assignments, Highway 88 was coded as a 2 lane 80 km/h highway between Highway 400 and Highway

11. In the model, consequently, the Highway 88-11-Green Lane route becomes the major link between Highways 400 and 404 because it is more direct than the Highway 9 - Green Lane alternative which is coded at the same 80 km/h speed. In reality, the east end of Highway 88 in central Bradford has several traffic lights and intersections, has a 50 km/h speed limit, and operates in a congested manner much of the day. Traffic would therefore avoid such a route and use Highway 9 instead. In this case, the model overestimates the attractiveness of the practicality of using the arterial road system for longer distance trips. Refinements were made to the model coding (i.e. calibration of the model) prior to the 1995 set of traffic assignments in order to account for such situations within the study area, however, the level of detail of the regional network is not such that all localized congestion spots can be included. It may further be noted that local streets are not included in the model network at all.

- **Daily and Seasonal Peaking**

The trip table used in the traffic assignments is representative of an average weekday over the given time period. This masks the variations which occur between each weekday, between the different seasons, and as a result of temporary phenomena such as inclement weather or lane-blocking incidents. As an example, AADT on Highway 400 south of Highway 88 in 1992 was 46,900 (see Exhibit 7). In winter, however, average flow is 39,800, or 15% lower, while the summer volumes increase by 23% from the average to 57,600. The summer average itself is made up of weekday and weekend flows, with weekend figures being substantially higher than weekday volumes. Thus, the required capacity of a road is determined by demand levels which can be 20 - 25% or more higher than the modelled "average" figures.

The cumulative effect of all of these parameters highlights the fact that the link assignments should not be taken literally as traffic forecasts, but that they do indicate order-of-magnitude travel demand under the assumed conditions and in accordance with the modelling procedures. The most effective use of such regional-scale long-term model results is in comparing different network scenarios under constant model input assumptions.

It should also be noted that the trip tables and other key assumptions used in this study, are not necessarily identical to those employed by York Region in running the EMME/2 model for their study area. Staff of the MTO and of York Region have worked together to ensure that any such differences are rational and acceptable, but because of the different horizon years, study purposes, and levels of detail employed for the various Regional studies in the area, differences will remain in model output.

3.2 PREVIOUS TRAVEL DEMAND WORK

There have been three separate computer-modelled travel demand forecasting efforts in which the concept of a Bradford Bypass has been included. These are described briefly in this section. The relevant results of the various runs are documented in Section 4.

3.2.1 Highway 404 / 89 Overview Study

This study considered, at a corridor-level of detail, five different highway network options in the area south and east of Lake Simcoe. A traffic assignment analysis was carried out using the MTO's Micro Trips travel demand model for a 65-traffic zone structure. The analysis was done for southbound a.m. peak hour traffic and for weekend recreational trips. The assignments were for use in helping to understanding differences between alternatives but were not accurate or detailed enough to be used as "future traffic volumes" on any particular link in the network. For example, only freeways and arterials were included in the modelled network, and road capacity was coded for corridors (i.e. groups of parallel arterials) rather than for individual roadways.

The modelling effort did reveal considerable long distance southbound traffic in the Highway 11 Corridor at Bradford, and indicated that a new east-west road north of Bradford ("Highway 89") would offer significant relief to Highway 11 in the area. Because of the corridor-level scale of the modelling procedure, however, there is little else to be drawn from the Overview Study in this respect.

3.2.2 Corridor Assessment Study (Environmental Assessment Proposal) (1994)

In 1994, while preparing the Environmental Assessment Proposal (EAP) for the current study, travel demand on a set of alternative road networks was modelled using a more detailed and up-to-date set of population / employment figures. For the transportation network, York Region's EMME/2 network was used, with population / employment figures for future years provided by the Data Management Group for the Greater Toronto Area (GTA) on a 31-zone system. Because the trip table focuses on the GTA, projects such as the current one located at the periphery of the GTA must incorporate additional data for external zones such as York Region. This demographic information is included in Appendix A.

The intent of this investigation was to compare a variety of network options and alternative new east-west roadway corridors, and to establish a reasonable understanding of the level of travel demand a Bradford Bypass and the Highway 404 Extension would likely serve. While considerably more precise than the 404/89 Overview study, the figures produced in the Corridor Assessment Study still require some interpretation and, as discussed in Section 3.1.2, cannot be taken literally as "future traffic volumes" for any particular road segment. The results are effective, however, in depicting trends in traffic distribution which can be useful in studying comparative impacts between alternatives.

In all, thirteen traffic assignments were completed in spring 1994 (all for the a.m. peak hour), as follows:

List of Model Runs (I)

Scenario	Date of Run	Run No.	Forecast Year	Roadways Included[1] in Network			
				407	404 Extension	Hwy 9 / Green Lane Upgrade	400-404 Link Corridor
1	8/3/94	6	2011	6 lanes	to 48	yes - G.L. 2 lanes	Bradford
2	8/3/94	7	2011	6 lanes	no	no	no link
3	8/3/94	8	2011	6 lanes	to 48	yes - G.L. 2 lanes	no link
4	7/3/94	9	2011	6 lanes	to 48	yes - G.L. 2 lanes	Bradford
5	29/3/94	9a	1991	6 lanes	to Ravenshoe	no	Bradford
6	7/3/94	10	2011	6 lanes	to 48	no	Bradford
7	11/4/94	12	2011	6 lanes	to Ravenshoe	yes - 4 lanes	Bradford
8	29/3/94	15	2011	6 lanes	to B. Bypass	no	Bradford
9	29/3/94	16	2011	6 lanes	to Queensville	no	no link
10	29/3/94	17 (15 mod)	2011	6 lanes	to B. Bypass	no	Bradford
11	29/3/94	18	2011	6 lanes	to Ravenshoe	yes - 4 lanes	no link
12	29/3/94	19	2011	6 lanes	to Ravenshoe	no	Aurora / Newmarket
13	29/3/94	20	2011	6 lanes	to Ravenshoe	no	South Oak Ridges

1 all other roads included per York Region Official Plan

The results of the assignments for the major roads and highways under consideration are summarized on the exhibits in Appendix 'B'. The implications with respect to alternative corridors for a new freeway are addressed in the Environmental Assessment Proposal, while the results as they pertain to the Bradford Bypass are discussed in Section 4 of this paper.

3.2.3 Comparison of Newmarket and Bradford Corridors (1995)

In late 1995, the trip table was updated and revised with the most current population / employment data and traffic assignments were carried out in order to examine more closely a set of new alternatives in the Newmarket and Bradford corridors. Both arterial and freeway options for an east-west highway in each of the Highway 9 / Green Lane, Highway 9 "New", and the Bradford-Queensville corridors were modelled, using a constant network and land use scenario for all other areas. The purpose was to compare

the travel demand and travel patterns of each network option, as an input to the overall analysis of the corridors (documented in a December 1995 report).

Modelling was carried out first for a 2011 horizon year (Scenarios 14 - 22), then 2021 land use and network assumptions (Scenario 23). Scenarios 19 - 22 are slight modifications of Scenarios 15 - 18, respectively; for the latter, the new road is extended beyond Highway 404 to Woodbine Avenue in order to better model the attractiveness of Highway 404 compared to the parallel arterials. Scenario 23 assigns the 2021 trip table to the same network as in Scenario 22, in order to assess the effect of the additional demand resulting from population and employment growth in the 2011 - 2021 period.

List of Model Runs (II)

Scenario	Date of Run	Run No.	Forecast Year	Roadways Included[1] in Network			
				407	404 Extension	Hwy 9 / Green Lane Upgrade	400-404 Link Corridor
14	17/10/95	10	2011	6 lanes	to 48	yes - 4 lanes	no link
15	17/10/95	11	2011	6 lanes	to 48	yes - 4 lanes	4 lane art. N of 9/GL
16	17/10/95	12	2011	6 lanes	to 48	yes - 4 lanes	fwy N of 9/GL
17	17/10/95	13	2011	6 lanes	to 48	yes - 4 lanes	Bradford - arterial
18	17/10/95	16	2011	6 lanes	to 48	yes - 4 lanes	Bradford - fwy
19	3/11/95	11 mod	2011	6 lanes	to 48	yes - 4 lanes	4 lane art. N of 9/GL
20	3/11/95	12 mod	2011	6 lanes	to 48	yes - 4 lanes	fwy N of 9/GL
21	3/11/95	13 mod	2011	6 lanes	to 48	yes - 4 lanes	Bradford - arterial
22	3/11/95	16 mod	2011	6 lanes	to 48	yes - 4 lanes	Bradford - fwy
23	20/11/95	9	2021	6 lanes	to 48	yes - 4 lanes	Bradford - fwy

1 all other included roads per York Region Official Plan

4. TRAVEL DEMAND ON BRADFORD BYPASS

4.1 NETWORK ALTERNATIVES

Apart from the pre-1991 studies which considered certain road network scenarios, twenty-three additional EMME/2 computer model travel demand forecasts have been produced representing various alternative road networks in relation to the Highway 400 - Highway 404 Extension Link Study. As noted in Section 3.2.2, thirteen of the assignments were done in 1994, with the remainder in 1995 using updated land use data.

Appendix 'A' includes a set of EMME/2 printouts documenting the coded road characteristics (no. of lanes, vehicular capacity per lane, posted speed limit) used as input for the basic road network. The link volumes on key roadways produced by each model run are documented in Appendix 'B'.

The forecast traffic volumes were used in three ways:

- to understand overall demand patterns on the area-wide network;
- to establish the likely range of peak hour demand on a new east-west roadway in the study area; and,
- to assess the effects of different network configurations on individual road segments.

4.2 FUTURE TRAVEL DEMAND PATTERNS

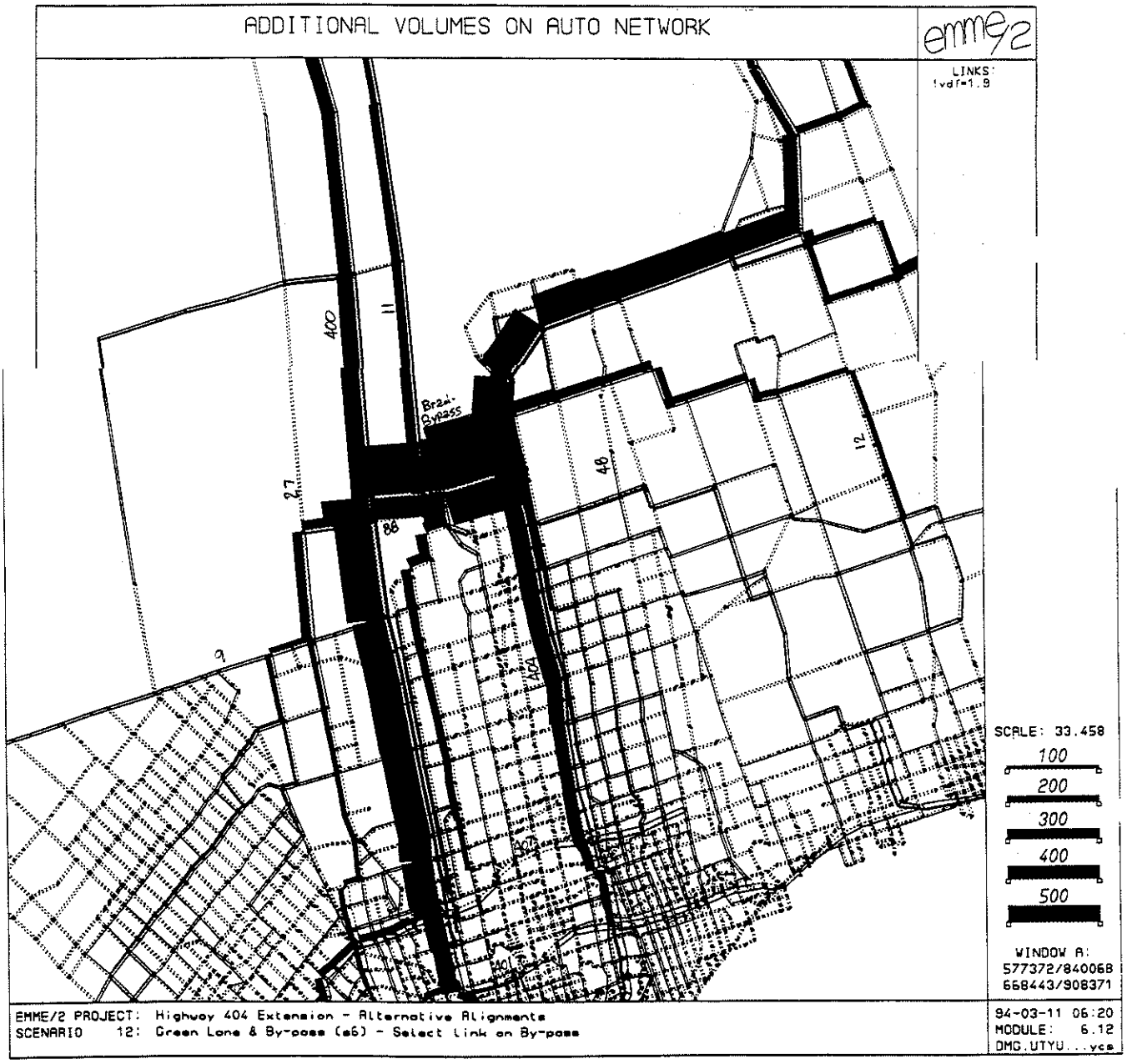
The origin-destination matrices (trip tables) in Appendix 'A' are able to produce a "desire line" map, i.e. a map which can show straight-line travel from zone to zone unconstrained by any transportation system. Exhibit 3 in Section 2 shows how the current "straight line" desires of travellers are shaped by road network characteristics such as direction, speed and other factors. If network modifications are made such that one or more of these

characteristics are changed (such as reconstruction of a road to a higher standard), the demand pattern will change accordingly so as to be closer to the "straight line" desire.

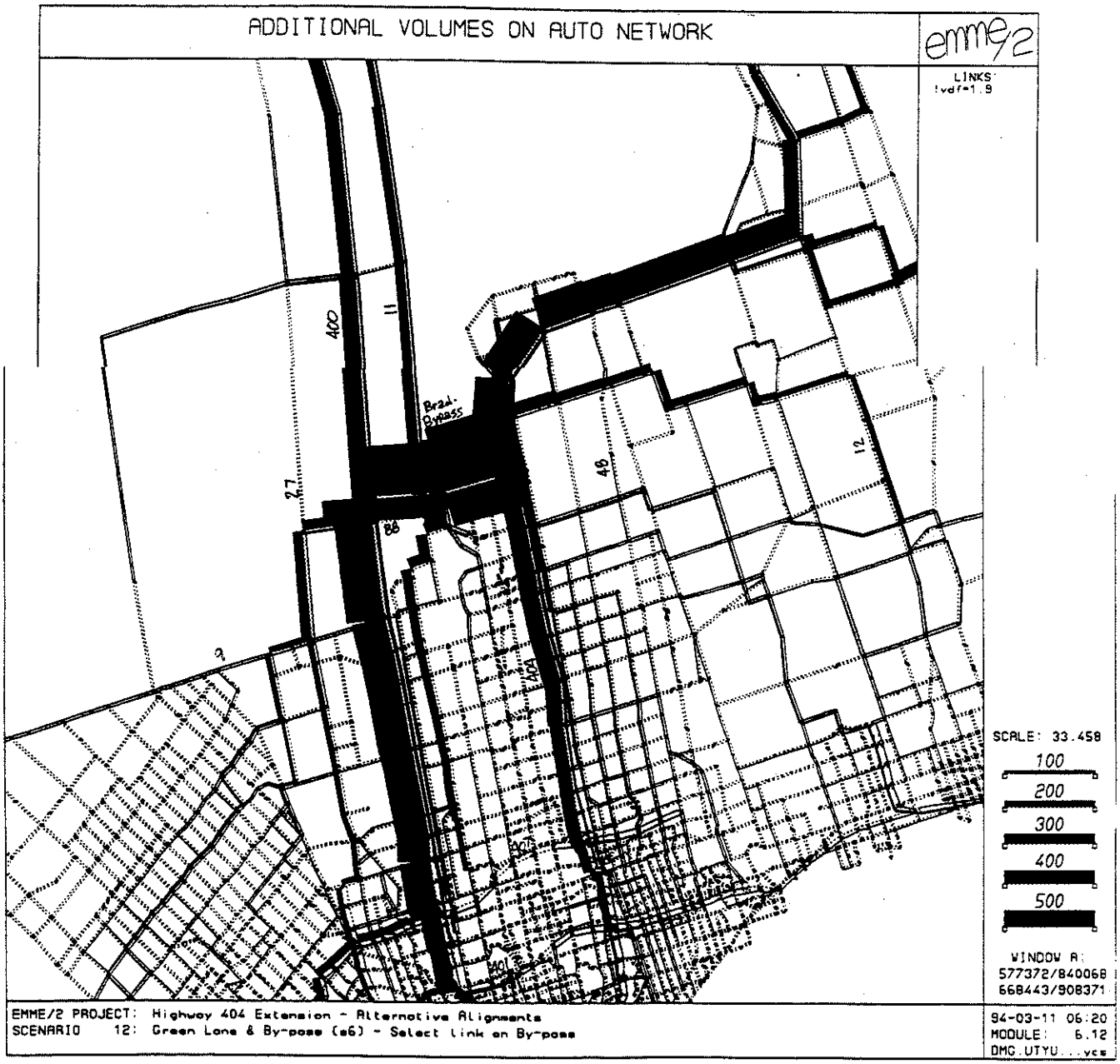
As part of the modelling process, it is possible to examine the demand patterns of users of any particular segment in the road network by way of a "select link analysis", in which each modelled trip between an origin and destination via the selected link can be traced and plotted. Similarly, if that selected link was removed from the network, those same origin-destination trips would be reassigned in the model to other routes; this gives a graphical indicator of where the traffic on the link is being drawn from.

To illustrate the demand pattern of potential users of a new east-west roadway between Highways 400 and 404, the following two Exhibits 9 and 10, have been prepared. They illustrate a select link analysis for travel via the Bradford Bypass, based on a network which includes a full extension of Highway 404 to Highway 12 and the planned upgrade of Highway 9 - Green Lane to four-lanes near Newmarket. In Exhibit 9, the role of the Bradford Bypass as a link and crossover between the parallel north-south 400 and 404 corridors is clearly evident, as is the "X" shaped pattern of long distance trips using the Bypass; the majority from Georgina to the 400 south corridor and from Barrie / Simcoe to the 404 corridor. It should be kept in mind that these are interzonal commuter trips in the 2011 a.m. peak hour, not weekend recreational or mid-day commercial / social / shopping trips. The "reach" of Bradford Bypass as far south as Highway 401 and northerly past Lake Simcoe attests to the facility's future role in serving provincial long-distance traffic.

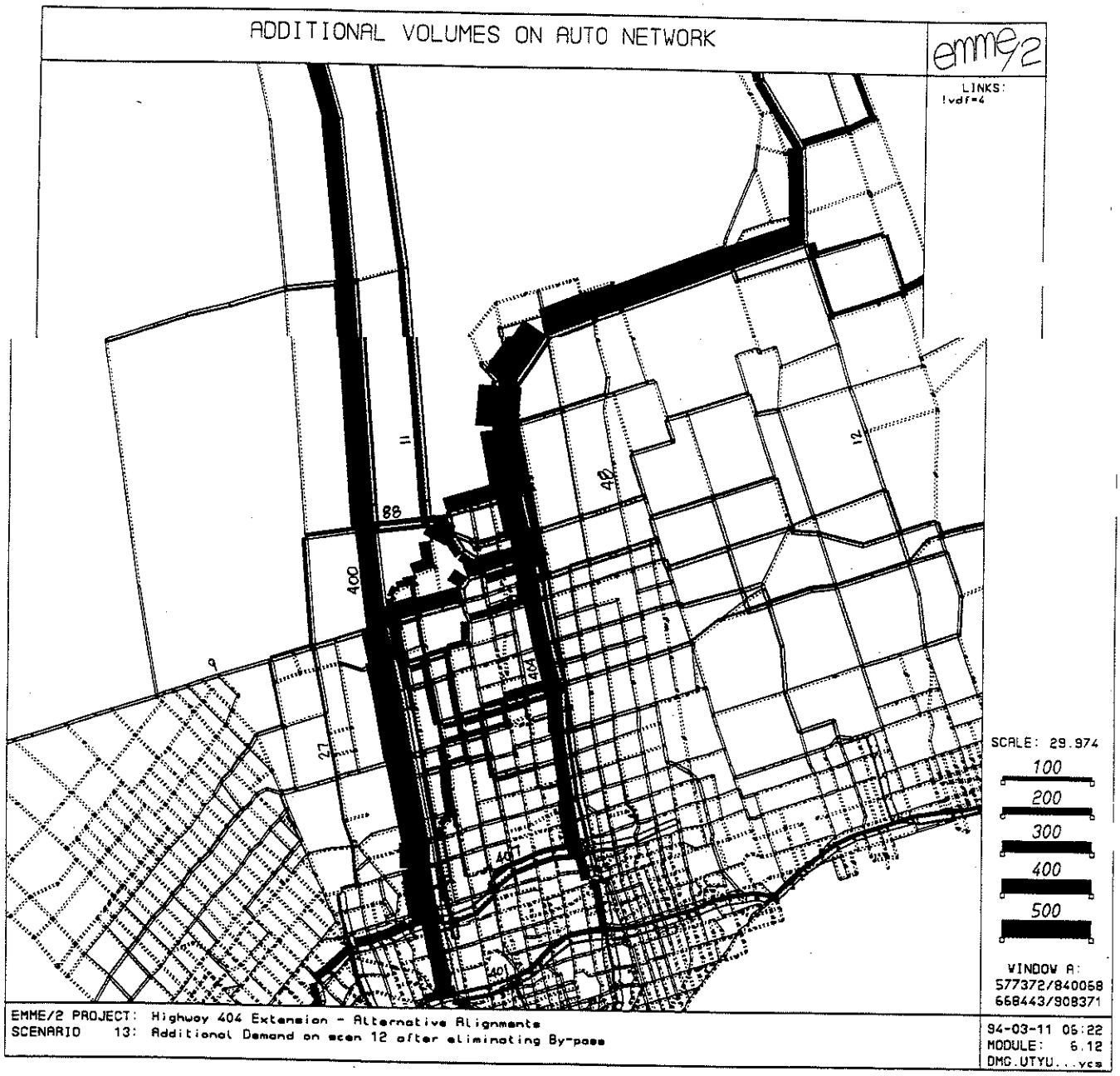
Exhibit 10 further illustrates that point, showing the additional demand which would be placed on several arterial roads within York Region if there were no Bradford Bypass to allow traffic to move freely between the Highway 400 and 404 corridors. Only a small minority of such trips can be made by the other provincial freeways 401 and 407, because they are too far south relative to the demand.



SELECT LINK ANALYSIS - BRADFORD BYPASS USERS



SELECT LINK ANALYSIS - BRADFORD BYPASS USERS



SELECT LINK ANALYSIS - ALTERNATIVE ROUTES FOR BRADFORD BYPASS USERS (WITHOUT BRADFORD BYPASS IN PLACE)

All east-west municipal roadways between Queensville Sideroad and Major Mackenzie Drive would be affected if there were no new east-west roadway in the network. The circuitous, indirect routing of such trips as they travel the arterial road grid in York is evident in Exhibit 10. Conversely, the provision of a new highway to absorb high volumes of long distance provincial traffic would allow municipal roads such as Queensville Sideroad to revert to serving only regional and local trips.

Because the 2011 trip table used for the travel demand model is the same for all modelled scenarios, the select link analysis for any scenario involving the Bradford Bypass would produce results visually similar to Exhibits 9 and 10. This information helps to confirm the role and benefits of the Bypass with respect to serving provincial traffic needs and relieving municipal roads of long-distance through traffic throughout a large area of York Region.

A more detailed understanding of the origin-destination pattern of Bypass users comes from a review of a trip assignment. Exhibit 11 shows results of the trip assignment for a point on the Bypass at the crossing of the Holland River. It identifies the number of trips using the Bypass along their "desire line" travel patterns (NW-SE, NW-NE, SW-SE, SW-NE and vice versa). Exhibit 12 shows the same trip origin and destination at the same location using the Bypass but shows the traffic zones where each trip begins and ends. Essentially, this represents a portion of the 2021 trip table. Results of the assignment are presented graphically in Exhibit 13. The directional totals from the trip table vary slightly from those shown on the route in Appendix 'B' due to rounding.

Exhibit 11: Origin-Destination Pattern of Bradford Bypass Trips

"Desire Line" Direction of Travel	Assigned Volume veh/h (2021 a.m. pk)	% of Direction Total	% of Overall Total
NW-SE	1,585	88	41
NW-NE	120	7	3
SW-SE	0	0	0
SW-NE	95	5	3
Total EB	**1800**	**100**	**47**
SE-NW	115	6	3
NE-NW	140	7	4
SE-SW	885	43	23
NE-SW	900	44	23
Total WB	**2040**	**100**	**53**
Two-Way Total	**3840**		**100**

Origin Zone \ Destination Zone		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Sum
Downtown Toronto	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3 5	3 5	-	5 5	-	-	-	-	-	-	-	11
West Metro	2	-	-	-	-	-	-	3 4	-	-	-	-	-	-	-	5 4	46 4	-	-	-	-	-	-	-	-	-	-	1 4	-	-	-	-	54
Scarborough	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2 5	8 5	1 5	4 5	-	-	-	3 5	-	-	-	18
Central Metro	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3 5	10 5	2 5	2 5	-	-	-	1 5	-	-	-	18
South Durham	5	-	63 7	-	1 7	-	-	-	-	24 7	-	-	-	-	-	-	-	326 7	58 7	12 7	-	1 8	2 5	1 5	3 5	2 5	10 7	-	-	-	-	-	503
Uxbridge-Scugog	6	4 7	8 7	-	1 7	-	-	-	-	6 7	-	-	-	-	-	-	-	18 7	3 7	1 7	-	-	-	-	-	-	-	-	-	-	-	-	41
Brock	7	11 8	15 8	-	2 8	-	-	-	-	16 8	-	-	-	-	-	-	-	5 8	-	-	-	3 8	-	-	-	-	-	-	-	-	-	-	52
Markham	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 5	9 5	-	-	-	1 5	-	-	-	11
Vaughan	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
King	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Whitchurch-Stouffville	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5 5	-	-	-	-	-	-	-	-	5
Richmond Hill	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14 8	-	-	-	-	-	-	-	-	-	14
Aurora	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6 5	-	-	-	6
Newmarket	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 5	-	-	-	-	-	-	-	1
East Gwillimbury	15	1 8	6 8	-	1 8	-	-	-	-	10 8	2 8	2 8	-	-	-	-	-	-	1 8	-	-	-	8 8	-	-	1 5	-	-	-	-	-	-	30
Georgina	16	36 8	116 8	-	21 8	-	-	-	-	153 8	46 8	46 8	-	-	-	-	-	13 8	13 8	-	-	-	3 8	8 8	-	-	-	-	-	-	-	-	409
Peel	17	-	-	-	-	-	-	1 4	-	-	-	-	-	-	-	-	-	-	-	-	9 4	-	-	-	-	-	-	2 4	-	1 4	-	-	13
Halton	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2 4	-	-	-	-	2
Hamilton	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
East Simcoe	20	3 8	15 8	-	1 8	-	-	-	-	1 8	-	-	-	-	-	-	-	11 8	2 8	1 8	-	-	77 8	1 8	18 8	5 8	1 8	-	-	-	-	-	136
North Simcoe	21	38 1	28 1	112 1	100 1	73 1	4 1	7 2	59 1	8 1	-	75 1	2 1	2 1	108 1	-	33 2	-	-	-	-	-	-	-	-	-	2 2	-	-	7 1	658
Barrie	22	86 1	64 1	77 1	77 1	4 1	-	-	23 1	32 1	-	-	5 1	11 1	48 1	9 2	7 2	15 1	-	-	1 2	-	-	-	-	-	-	-	-	2 1	463
Bradford	23	6 1	-	14 1	11 1	-	-	-	6 1	-	-	8 1	2 1	-	-	5 4	2 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
South Simcoe	24	16 1	-	40 1	74 1	8 1	6 1	-	135 1	3 1	-	6 1	27 1	10 1	98 1	31 2	14 2	-	-	-	2 2	-	-	-	-	-	2 2	-	-	3 1	475
Grey-Dufferin	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13 2	-	-	-	-	-	-	-	-	-	-	-	13
S. W. Ontario	26	-	-	-	-	-	-	2 4	-	-	-	-	-	-	-	-	2 4	-	-	-	-	-	-	-	-	-	-	3 4	-	-	-	-	7
Victoria	27	71 8	97 8	-	5 8	-	-	-	-	4 8	-	-	-	-	-	-	-	91 8	-	-	-	6 8	5 8	-	-	-	22 8	-	-	-	-	-	300
Muskoka	28	6 8	4 8	-	33 8	-	-	-	50 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
Haliburton	29	29 8	27 8	-	-	-	-	-	-	1 8	-	-	-	-	-	-	-	4 8	-	-	-	3 8	-	-	-	-	-	-	-	-	-	-	64
N. Ontario	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
E. Ontario	31	37 7	95 7	-	14 7	-	-	-	-	24 7	-	-	-	-	-	-	-	128 7	7 7	-	-	3 5	5 5	7 5	9 5	-	46 7	-	-	-	-	-	375
	Sum	343	537	243	340	85	10	14	274	280	49	88	36	22	255	50	114	612	85	13	24	24	134	25	51	8	79	12	11	1	0	12	3836

Routing Pattern Key (see Exhibit 8)	
1 NW-SE	5 SE-NW
2 NW-NE	6 NE-NW
3 SW-SE	7 SE-SW
4 SW-NE	8 NE-SW

2021 AM PEAK HOUR SELECT LINK TRIP TABLE ON BRADFORD BYPASS E. OF HWY.11 (2-WAY)

Origin Zone \ Destination Zone		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Sum
Downtown Toronto	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3 5	3 5	-	5 5	-	-	-	-	-	-	-	11
West Metro	2	-	-	-	-	-	-	3 4	-	-	-	-	-	-	-	5 4	46 4	-	-	-	-	-	-	-	-	-	-	1 4	-	-	-	-	54
Scarborough	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2 5	8 5	1 5	4 5	-	-	-	3 5	-	-	-	16
Central Metro	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3 5	10 5	2 5	2 5	-	-	-	1 5	-	-	-	18
South Durham	5	-	63 7	-	1 7	-	-	-	-	24 7	-	-	-	-	-	-	-	326 7	58 7	12 7	-	1 5	2 5	1 5	3 5	2 5	10 7	-	-	-	-	-	503
Uxbridge-Scugog	6	4 7	8 7	-	1 7	-	-	-	-	6 7	-	-	-	-	-	-	-	18 7	3 7	1 7	-	-	-	-	-	-	-	-	-	-	-	-	41
Brock	7	11 8	15 8	-	2 8	-	-	-	-	16 8	-	-	-	-	-	-	-	5 8	-	-	-	3 6	-	-	-	-	-	-	-	-	-	-	52
Markham	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 5	9 5	-	-	-	1 5	-	-	-	11
Vaughan	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
King	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Whitchurch-Stouffville	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5 5	-	-	-	-	-	-	-	-	5
Richmond Hill	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14 8	-	-	-	-	-	-	-	-	-	14
Aurora	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6 5	-	-	-	6
Newmarket	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 5	-	-	-	-	-	-	-	1
East Gwillimbury	15	1 8	6 8	-	1 8	-	-	-	-	10 8	2 8	2 8	-	-	-	-	-	-	1 8	-	-	-	6 8	-	-	1 8	-	-	-	-	-	-	30
Georgina	16	36 8	116 8	-	21 8	-	-	-	-	153 8	46 8	46 8	-	-	-	-	-	13 8	13 8	-	-	-	3 6	8 6	-	-	-	-	-	1 4	-	-	409
Peel	17	-	-	-	-	-	-	1 4	-	-	-	-	-	-	-	-	-	-	-	-	9 4	-	-	-	-	-	-	2 4	-	-	-	-	13
Halton	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2 4	-	-	-	-	2
Hamilton	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
East Simcoe	20	3 8	15 8	-	1 8	-	-	-	-	1 8	-	-	-	-	-	-	-	11 8	2 8	1 8	-	-	77 8	1 6	18 8	5 6	1 8	-	-	-	-	7 1	136
North Simcoe	21	38 1	28 1	112 1	100 1	73 1	4 1	7 2	59 1	8 1	-	75 1	2 1	2 1	108 1	-	33 2	-	-	-	-	-	-	-	-	-	-	2 2	-	-	-	2 1	658
Barrie	22	86 1	64 1	77 1	77 1	4 1	-	-	23 1	32 1	-	-	5 1	11 1	48 1	9 2	7 2	15 1	-	-	1 2	-	-	-	-	-	-	-	-	-	-	-	463
Bradford	23	6 1	-	14 1	11 1	-	-	-	6 1	-	-	8 1	2 1	-	-	5 4	2 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
South Simcoe	24	16 1	-	40 1	74 1	8 1	6 1	-	135 1	3 1	-	6 1	27 1	10 1	98 1	31 2	14 2	-	-	-	2 2	-	-	-	-	-	-	2 2	-	-	3 1	475
Grey-Dufferin	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13 2	-	-	-	-	-	-	-	-	-	-	-	13
S. W. Ontario	26	-	-	-	-	-	-	2 4	-	-	-	-	-	-	-	-	2 4	-	-	-	-	-	-	-	-	-	-	3 4	-	-	-	-	7
Victoria	27	71 8	97 8	-	5 8	-	-	-	-	4 8	-	-	-	-	-	-	-	91 8	-	-	-	6 8	5 8	-	-	-	22 8	-	-	-	-	-	300
Muskoka	28	6 8	4 8	-	33 8	-	-	-	50 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
Haliburton	29	29 8	27 8	-	-	-	-	-	-	1 8	-	-	-	-	-	-	-	4 8	-	-	-	3 8	-	-	-	-	-	-	-	-	-	-	64
N. Ontario	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
E. Ontario	31	37 7	95 7	-	14 7	-	-	-	-	24 7	-	-	-	-	-	-	-	128 7	7 7	-	-	3 5	5 5	7 5	9 5	-	46 7	-	-	-	-	-	375
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Routing Pattern Key (see Exhibit 9)

1 NW-SE	5 SE-NW
2 NW-NE	6 NE-NW
3 SW-SE	7 SE-SW
4 SW-NE	8 NE-SW

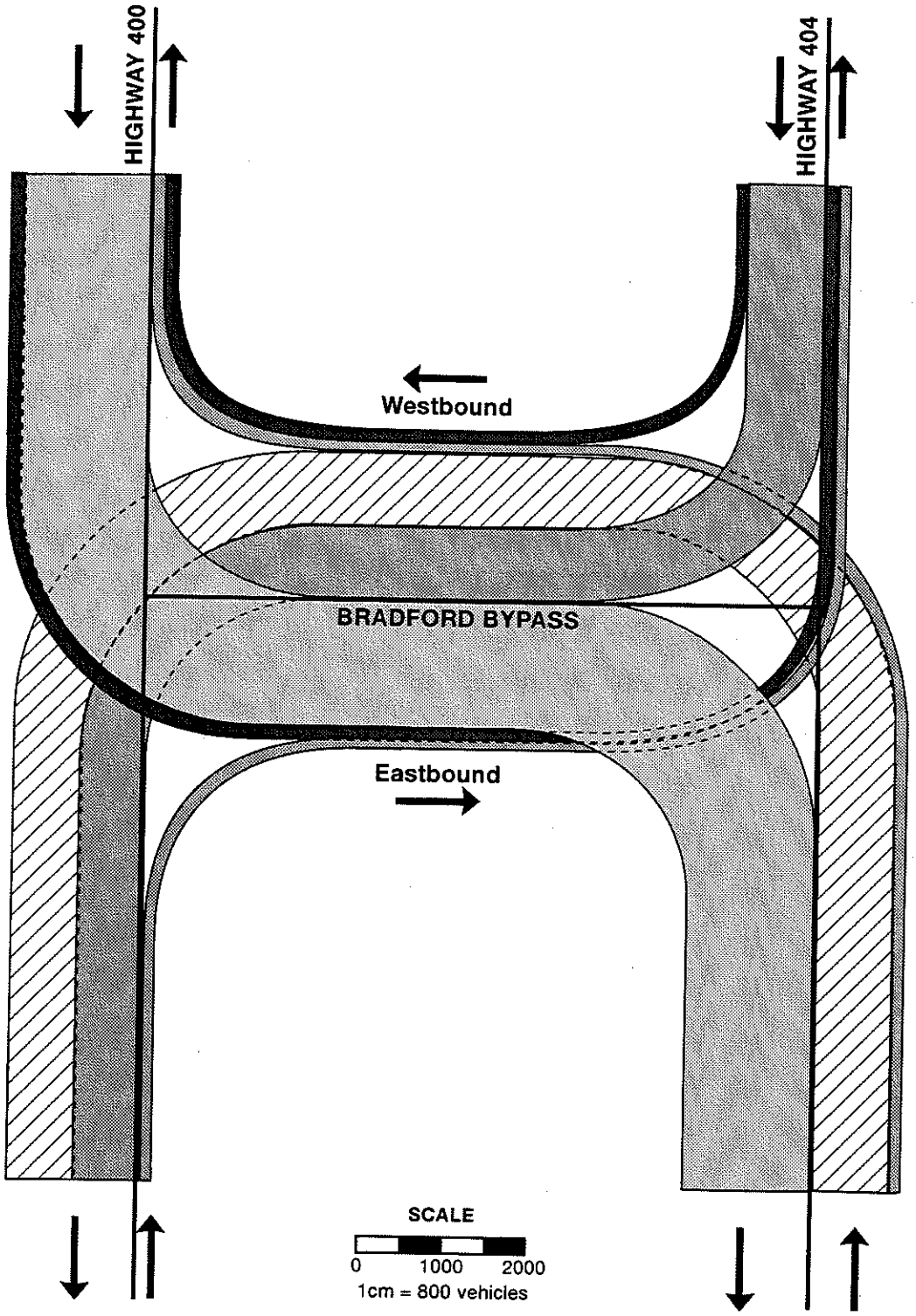
2021 AM PEAK HOUR SELECT LINK TRIP TABLE ON BRADFORD BYPASS E. OF HWY.11 (2-WAY)

Ministry of Transportation
Ontario

HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

EXHIBIT 12



2021 AM PEAK HOUR
COMMUTER TRAVEL PATTERNS ON 400 - 404 LINK

Ministry of Transportation, Ontario	**BRADFORD BYPASS :** HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377 - 90 - 00	EXHIBIT **13**

Exhibit 13 illustrates the major flow patterns for commuter traffic, whereby southbound commuters from the communities to the north of the study area (Barrie, Keswick, etc.) would use the 400-404 link to shift over to the adjacent north-south freeway corridor so as to have a better approach to their destination zones. For example, many trips originating in Simcoe County are destined to Markham or further south into the east half of Metro. Model results indicate these trips travel south on 400, east on the new link, and south on 404. The only other east-west freeway links for such long distance trips are 407 and 401, both of which are too far south and/or (as in the 2021 model) too congested to be attractive.

The one anomaly in the model assignment is the unexpectedly large size of the SE-SW a.m. peak hour move; it would appear that all other westbound links in the central GTA are being used to capacity and the model is "pushing" some excess long distance westbound trips as far north as the Bradford corridor in order to balance areawide demand and capacity. Thus a significant number of westbound trips between South Durham and Peel are assigned to the Bypass, even though in reality such a trip would be considerably out of the way. The fact that the return move from SW to SE has 0 trips assigned to it helps to confirm this model phenomenon.

The corresponding NW-NE and NE-NW a.m. peak hour movements are lower in volume, at 7% of the peak directional flow. This is the "round the lake" traffic demand which is poorly served by the existing road network. Because there is relatively little employment projected for Georgina and in part because the model relies on extrapolation of current trends for trips external to the GTA (such as in Simcoe), the modelled a.m. peak hour which focuses on commuter (home-to-work) travel is dominated by the NW-SE and NE-SW flows. The social, recreational, and non-work trips which benefit from improvements in east-west travel south of Cook's Bay would likely be more prominent during mid-day, evening and weekend periods.

Finally, the a.m. peak hour in the SE-NW and SW-NE directions, flows are relatively minor, reflecting the lack of employment opportunities to the north and the tendency for GTA residents to work within the GTA.

4.3 SCREENLINE ANALYSIS

Section 4.2 provided an overview of the travel demand patterns in the Bradford Bypass study area. In this section, a Screenline approach is used to focus on the volume of all east-west traffic in the Bradford-Newmarket area, as related to the capacity of the available roadways. First, screenlines will be used to illustrate the growth in east-west travel demand in the study area, then secondly, the results of the 23 model runs will be reviewed at the screenline level.

A screenline is an imaginary line across which all traffic in a selected area must flow. It is generally located where there are limited opportunities to cross, or, at a municipal boundary. As shown on Exhibit 18, three screenlines in the north-south direction were used in the current study to analyse traffic in the east-west direction:

West Screenline:	immediately east of Highway 400
Central Screenline:	immediately east of Yonge Street
East Screenline:	immediately west of Highway 404

The screenlines extend from Mulock Drive in Newmarket to Cook's Bay in order to capture all existing and future east-west routes in the study area. Only the modelled roadways are included in the analysis (i.e. minor / local roads across a screenline are not referred to).

The West screenline is the easiest to understand because it has only three crossing points: Highway 9, Highway 88, and the proposed Bradford Bypass. Exhibit 14 summarizes both the historical (1972-1992) and modelled future (2011, 2021) daily traffic figures at the screenline and the results are graphed on Exhibit 15.

Exhibit 14: Travel Demand and Capacity at West Screenline

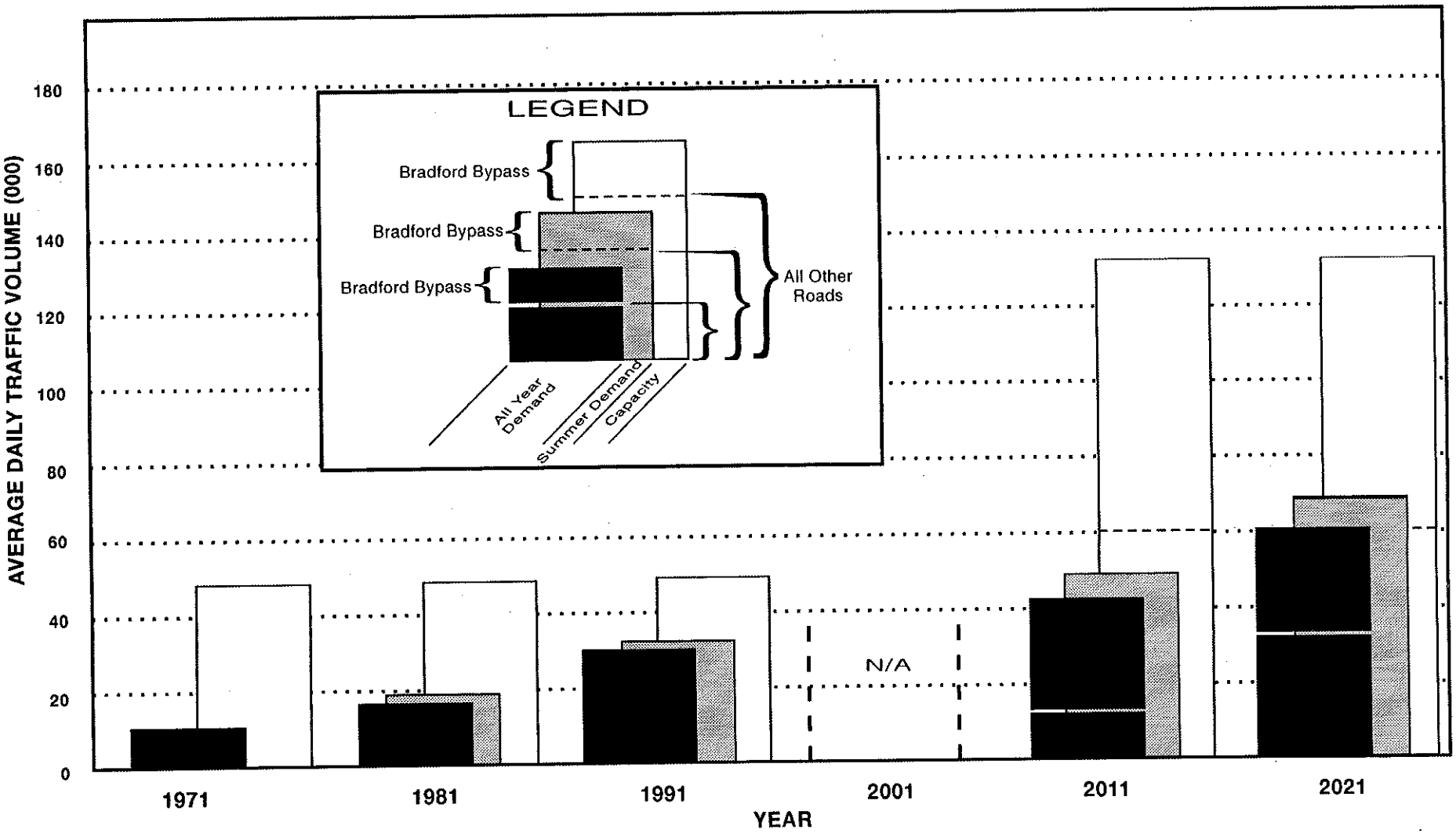
Year	Roadway									Screenline Total			AADT/Cap.	
	Highway 9			Highway 88			Bradford Bypass							
	Cap.[1]	AADT	SADT	Cap.[1]	AADT	SADT	Cap.[1]	AADT	SADT	Cap.[1]	AADT	SADT	w/o Bypass	w/Bypass
1972[5]	24000	6000	N/A	24000	4050	N/A	-	-	-	48000	10050	N/A	.21	-
1982[5]	24000	10250	11800	24000	5700	6800	-	-	-	48000	15950	18600	.33	-
1992[5]	24000	20300	21900	24000	9900	10900	-	-	-	48000	30200	32800	.63	-
2011	36000	13400[2]	14500[3]	24000	4900[2]	5400[3]	72000	23700[2]	28400[4]	132000	42000	48300	0.70	0.32
2021	36000	21900[2]	23600[3]	24000	10200[2]	11200[3]	72000	27400[2]	32900[4]	132000	59500	67700	1.0	0.45

Notes:
1. Capacity is coded as peak hour two-way hourly capacity x 10 (peak hour factor - ratio of highway AADT to peak hour volume)
2. Future AADT = modelled a.m. peak hour 2-way volume x peak hour factor x truck factor
   = 2-way AMPH x 10 x 1.1
   = 2-way AMPH volume x 11

   note: truck factor assumes average of 10% trucks
3. Future SADT on highways = SADT/AADT ratio (1992) x AADT
4. Future SADT on freeways = 1.2 x AADT (based on Highway 400 data - see Section 3.1.2)
5. Traffic volumes from annual report, "Traffic Volumes on Provincial Highways", MTO

Existing screenline data reveal significant and steady growth over the past two decades, with average daily traffic volumes tripling in the 1972 - 1992 period. This has brought demand on Highway 9 very near its practical capacity, and plans are consequently underway to widen it to four lanes. Demand on Highway 88 has not grown as fast, reflecting servicing constraints on Bradford's growth and capacity constraints (sewer and water) on Highway 88 within Bradford which reduce the route's attractiveness for through traffic.

With the planned widening of Highway 9, which will provide a capacity of 60,000 daily trips at the West screenline, the 2011 trip assignments indicate a daily demand in the 40,000 - 45,000 range. This is well below capacity and implies no need to provide further capacity improvements. However, without the Bradford Bypass the summer demand at the West screenline would exceed capacity before 2021, and the average daily demand would reach capacity a few years later. This implies the need to protect for the ability to provide for further capacity improvements in the long term. The introduction of the



Includes Roads: Highway 9, Highway 88, Bradford Bypass

EAST-WEST TRAVEL ACROSS WEST SCREENLINE (E. OF HWY. 400) 1971-2021

Ministry of Transportation Ontario

HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

EXHIBIT 15

Bradford Bypass would both provide the needed east-west capacity to 2021 and beyond and relieve Highways 9 and 88 of the burden of accommodating long distance trips, resulting in significant improvements in their operation and safety.

The Central and East screenlines include more roadways, but the analysis of the figures in Exhibits 16 and 17 reveals the same pattern of long-term east-west travel demand as 2021 travel demand significantly exceeds the available and planned road capacity. Note that only AADT figures, not SADT, are available for the Regional Roads. Exhibit 18 provides a visual summary of the AADT forecasts for all three screenlines.

Because of the local growth in trip generation (i.e. in Newmarket, Holland Landing, Sharon, Bradford, Georgina, etc.) growth in demand is even more rapid at the Central and East screenlines than at the West screenline. While planned improvements to regional roads such as Green Lane and Mulock Drive will help the network keep pace in terms of east-west capacity for a few years, the model results indicate that their practical capacity will be reached within the forecast horizon period.

The imprecision of the model shows up with Davis Drive and Mulock Drive being over capacity at the East screenline; in reality, it is likely that such excess trips would be accommodated on Green Lane - Herald Road.

Summary

Overall, the screenline analysis indicates a continued pattern of east-west travel demand growth, eventually overwhelming all of the existing east-west roadways from Mulock Drive northerly. The magnitude of the unserved demand for east-west travel in the study area (assuming all other roadways operating at capacity) particularly beyond the 2011 time frame, ranges from 0 shortfall (at capacity) at the West screenline to 16,000 AADT at the Central screenline to nearly 30,000 AADT at the East screenline. Summer volumes (and shortfalls) are higher. This magnitude of shortfall is the equivalent of a two-lane high capacity standard arterial road at the West Screenline and either a six-lane arterial or a four-lane controlled access freeway at the East. Given the physical, social and natural

Exhibit 16: Travel Demand and Capacity at Central Screenline

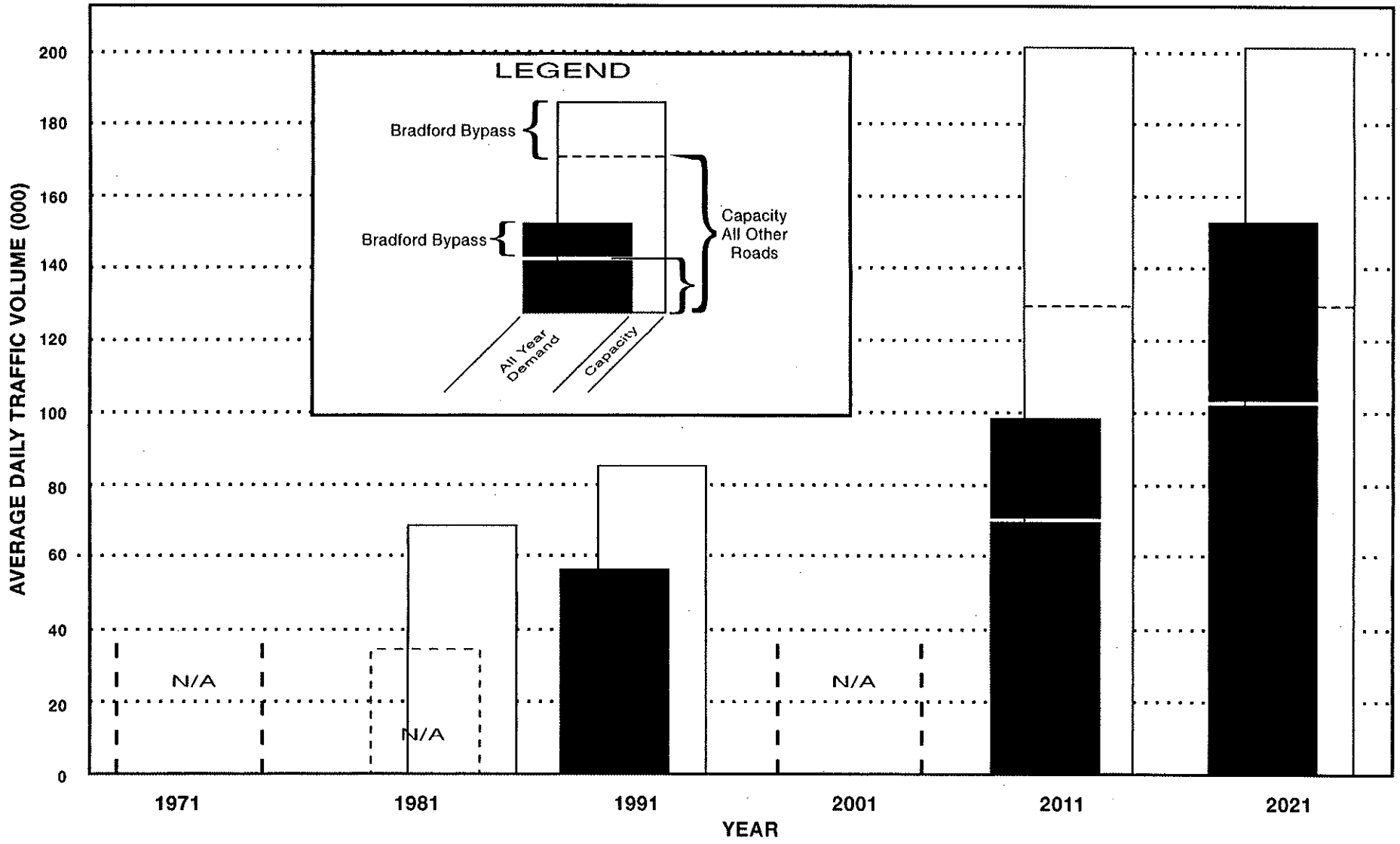
Year	Roadway												Screenline Total			
	74 - Mulock		31 - Davis		Green Lane		13 - Mt. Albert		77 - Queensville		Bradford Bypass				AADT/Cap.	
	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	w/o Bypass	w/Bypass
1981	0	0	26000	20090	9000	N/A	16000	5950	16000	N/A	-	-	67000	N/A	-	-
1991	18000	14730	26000	24650	9000	2500	16000	10080	16000	3990	-	-	85000	55950	.66	-
2011	36000	23900	26000	7900	36000	15400	16000	3450	16000	13900	72000	34100	202000	99000	0.76	0.45
2021	36000	30900	26000	23200	36000	17650	16000	12750	16000	18500	72000	43250	202000	146250	1.13	0.72

Note: all factors per Exhibit 14, except peak hour factor for arterials = 12.5

Exhibit 17: Travel Demand and Capacity at East Screenline

Year	Roadway												Screenline Total			
	74 - Mulock		31 - Davis		Herald		13 - Mt. Albert		77 - Queensville		Bradford Bypass				AADT/Cap.	
	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	Cap.	AADT	w/o Bypass	w/Bypass
1981	18000	N/A	36000	N/A	9000	N/A	16000	N/A	16000	N/A	-	-	95000	N/A	-	-
1991	18000	13730	36000	22370	9000	32000	16000	5390	16000	2120	-	-	95000	46810	.49	-
2011	36000	30600	36000	43500	36000	17650	32000	6270	16000	3450	72000	39900	228000	141400	0.91	0.62
2021	36000	37750	36000	39750	36000	23950	32000	13500	16000	10600	72000	58400	228000	184200	1.18	0.81

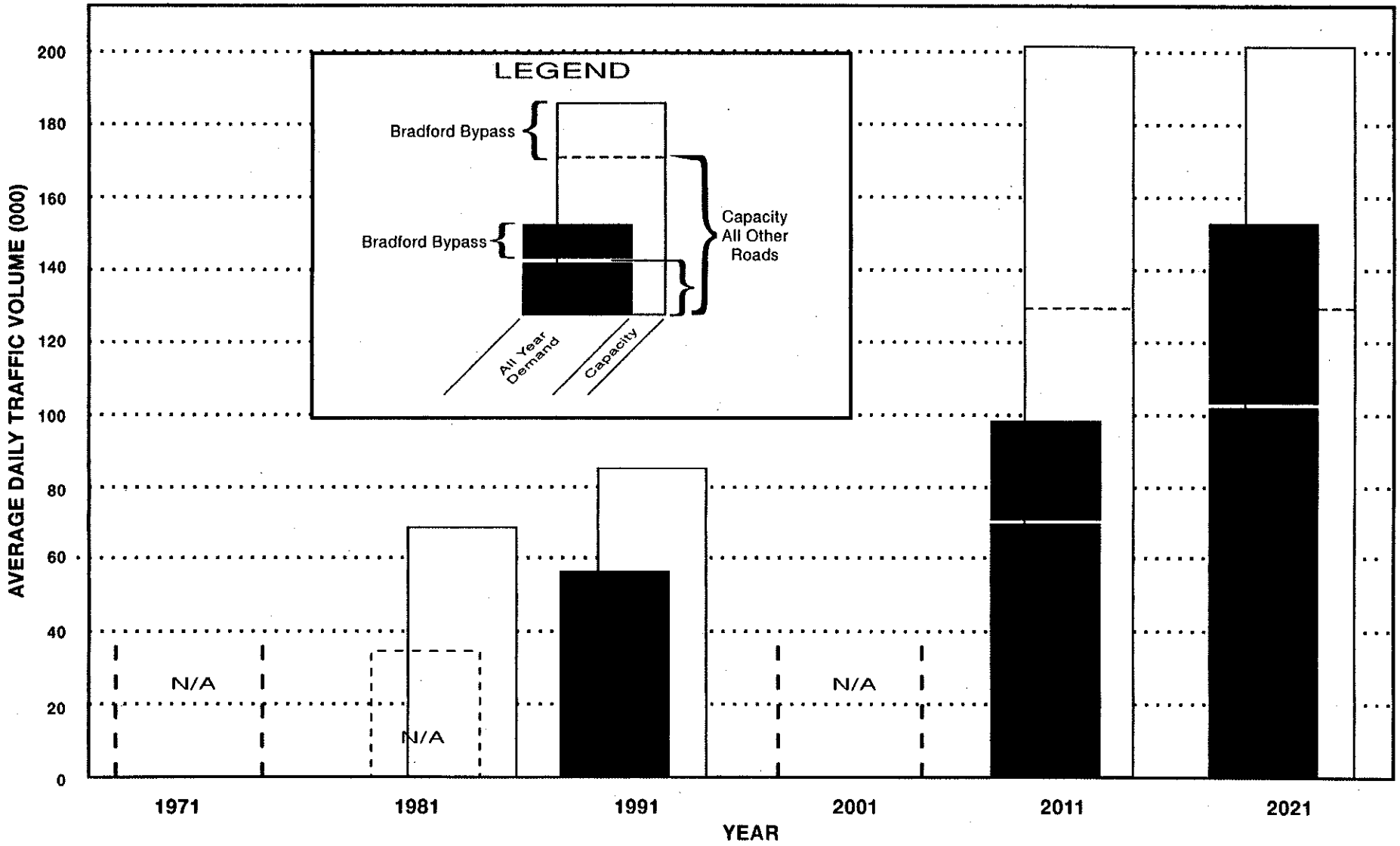
Note: all factors per Exhibit 14, except peak hour factor for arterials = 12.5



Includes Roads: Mulock Drive, Green Lane, Mount Albert, Queensville Side Road, Bradford Bypass

EAST-WEST TRAVEL ACROSS CENTRE SCREENLINE (E. OF YONGE ST.) 1971-2021

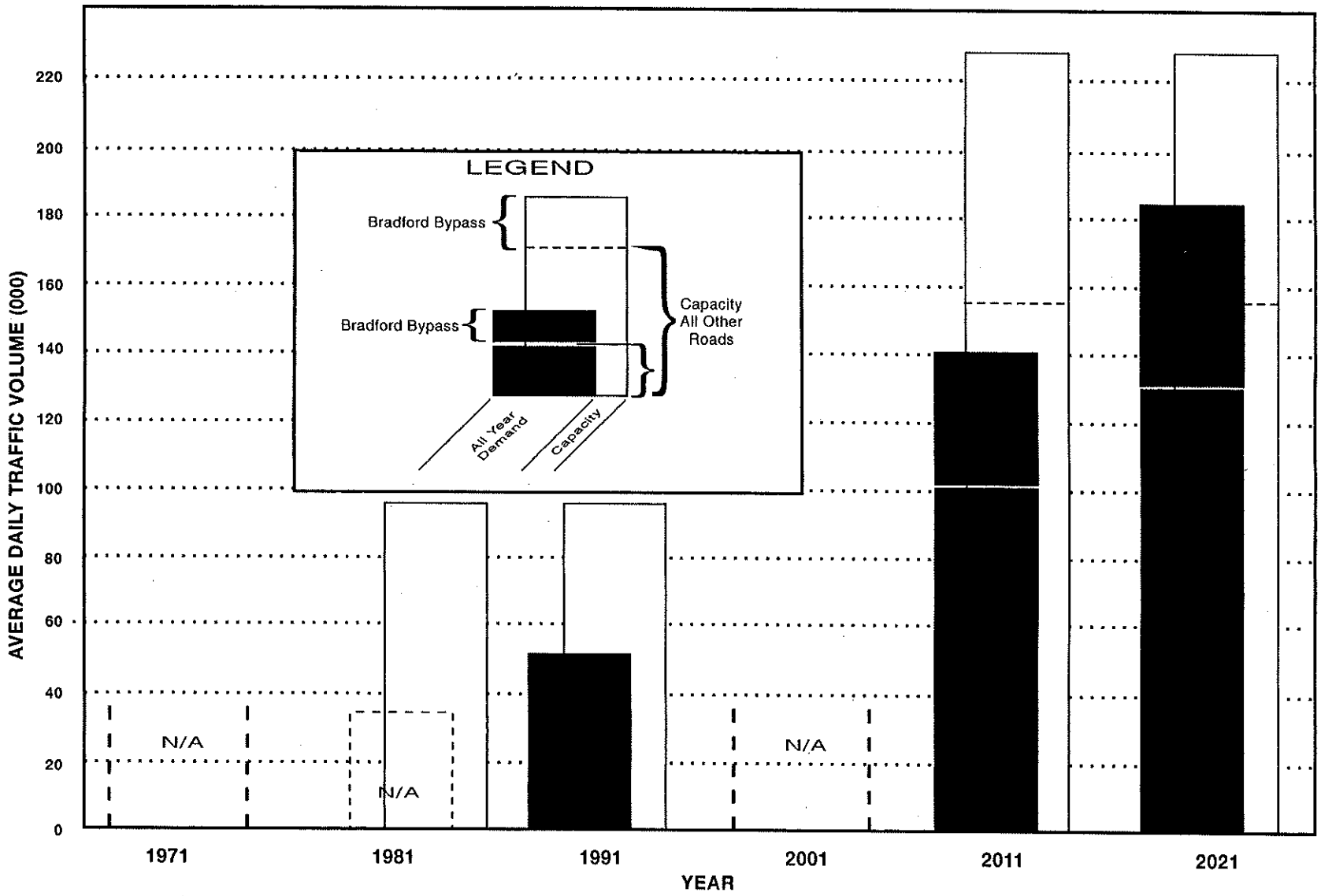
Ministry of Transportation Ontario	HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS) ENVIRONMENTAL ASSESSMENT STUDY	EXHIBIT 18



Includes Roads: Mulock Drive, Green Lane, Mount Albert, Queensville Side Road, Bradford Bypass

EAST-WEST TRAVEL ACROSS CENTRE SCREENLINE (E. OF YONGE ST.) 1971-2021

Ministry of Transportation Ontario	HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS) ENVIRONMENTAL ASSESSMENT STUDY	EXHIBIT 18



Includes Roads: Mulock Drive, Herald Road, Mount Albert, Queensville Side Road, Bradford Bypass

EAST-WEST TRAVEL ACROSS EAST SCREENLINE (W. OF HWY. 404.)
1971-2021

Ministry of Transportation
Ontario

HIGHWAY 400-404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

EXHIBIT 19

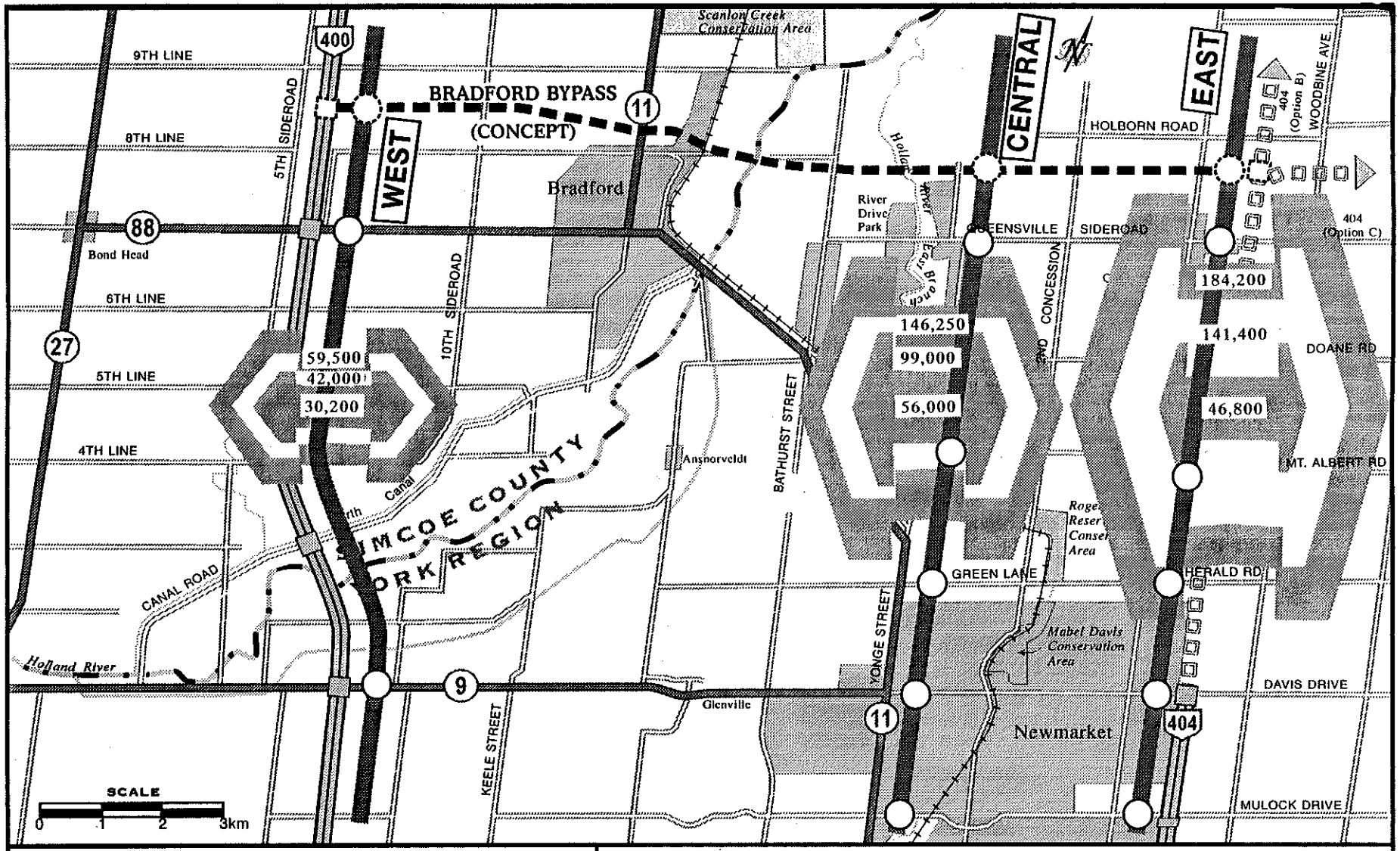


EXHIBIT 20

HIGHWAY 400 - HIGHWAY 404 LINK SCREENLINE ANALYSIS

environmental constraints in the study area, the only feasible way of providing adequate capacity to accommodate such levels of demand in the long term is to build a new roadway. In light of the magnitude of the long term demand, a four-lane freeway appears to be the appropriate type of new facility.

4.4 INTERCHANGE VOLUMES

The regional travel demand model is not meant as a detailed traffic model capable of assigning turning moves at each intersection. Nevertheless, in balancing the traffic flows between each road link in the network the model must create defacto turning move assignments, based on the modelled direction of travel between an origin zone and a destination zone. The resulting assignments can help the planner to understand the relative importance of different interchange ramps for conceptual planning purposes.

One example of such interchange volume assignments has been created as follows:

Time Horizon: 2011 AM Peak Hour

Key Assumptions:

Highway 404 Route B in place to Highway 48 Near junction with Highway 12
Highway 404 6 lanes from Woodbine to the south of study area
Bradford Bypass 4-lane controlled access freeway
Highway 9 at 4-lanes between Highway 400 and Bathurst Street
Green Lane 4-lanes from Bathurst Street and Highway 9 to Highway 404
Leslie Street 4-lanes through Keswick, 2 lanes south of Ravenshoe Road
Bradford Bypass interchange with Leslie Street included as partial to/from west only

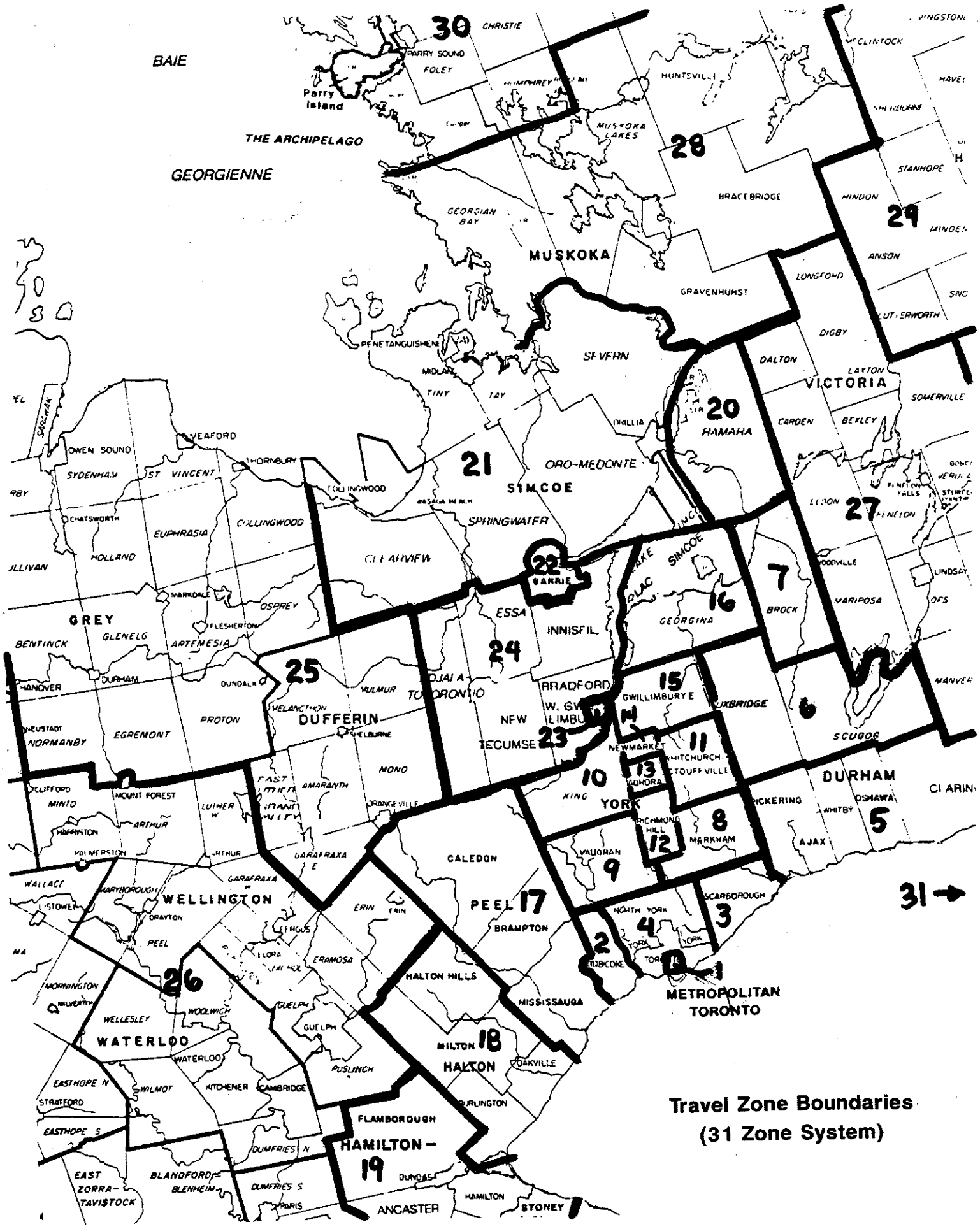
2011 Ramp Volumes on Bradford Bypass

Interchange	Directional (From - To) AM Peak Hour Vehicles (To Nearest 10)							
	E-N	E-S	W-N	W-S	S-E	S-W	N-E	N-W
Hwy 400	70	1530	n/a	n/a	150	n/a	750	n/a
Hwy 11	60	10	0	90	20	20	530	60
Bathurst Street	0	240	0	260	20	10	0	0
Second Conc.	0	0	0	0	60	0	0	0
Leslie Street	n/a	n/a	110	0	n/a	20	n/a	360
Hwy 404*	n/a	n/a	110	950	n/a	140	n/a	1290

* Analysis of Highway 404 ramp volumes indicated that approximately 60% of Bradford Bypass traffic in 2021 was from zones external to study area. Using more conservative forecasts for these zones indicated that ramp volumes at Bradford Bypass could be 30-40-% lower than assumed (based on 2021 volumes).

APPENDIX A

BASE POPULATION, EMPLOYMENT AND TRANSPORTATION NETWORK INPUT



Travel Zone Boundaries
(31 Zone System)

Population and Employment for Model Input
(46 GTA Planning Districts)

Highway 404 Extension - Population/Employment

PD	Municipality	1991 Population	1991 Employment	2001 Population	2001 Employment	2011 Population	2011 Employment	2021 Population	2021 Employment
1	Downtown	152,265	449,550	191,256	481,263	207,530	542,566	239,422	591,607
2	Parkdale - High Park	198,600	56,200	196,391	57,273	202,706	59,349	206,317	61,010
3	York	231,479	96,400	245,809	99,131	257,927	104,408	273,860	108,627
4	Midtown	187,305	106,700	193,002	109,296	201,141	114,317	210,182	118,330
5	Don Mills	110,301	63,750	111,892	65,177	116,190	67,943	119,614	70,153
6	East York	204,050	51,500	201,723	51,757	208,190	52,256	211,517	52,655
7	Etobicoke South	55,226	29,950	70,279	32,626	76,440	37,802	88,662	41,941
8	Etobicoke Centre	174,432	85,650	179,035	89,391	186,417	96,619	194,019	102,400
9	Etobicoke North	79,806	79,400	88,794	82,101	94,103	87,319	102,641	91,494
10	North York West	149,257	126,650	174,193	131,448	186,412	140,723	207,837	148,141
11	North York Centre	142,441	61,250	159,013	69,072	168,646	84,197	184,107	96,292
12	North York East	78,547	35,100	75,737	36,833	77,688	40,186	77,587	42,867
13	Scarborough West	193,891	105,100	198,894	113,960	207,069	131,084	215,437	144,787
14	Scarborough Lakeshore	65,311	11,050	62,976	10,806	64,600	10,334	64,516	9,955
15	Scarborough East	73,029	13,150	77,302	13,626	81,054	14,542	85,931	15,276
16	Scarborough North	179,780	81,000	193,695	86,238	203,881	96,361	218,345	104,461
	METRO	**2,275,720**	**1,452,400**	**2,419,991**	**1,529,998**	**2,539,994**	**1,680,006**	**2,699,994**	**1,799,996**
17	Brock	11,058	3,750	14,262	4,389	17,406	5,336	19,949	6,295
18	Uxbridge	14,090	4,200	18,889	5,090	25,148	6,002	30,788	6,802
19	Scugog	17,811	4,900	22,328	6,087	26,740	7,235	30,351	7,841
20	Pickering	68,635	24,000	121,194	36,421	193,455	69,392	252,521	98,645
21	Ajax	57,352	21,200	93,124	32,930	114,172	43,010	130,563	49,248
22	Whitby	61,280	24,850	106,072	37,619	135,858	50,682	156,437	57,819
23	Oshawa	129,341	69,500	160,649	81,126	191,626	95,686	214,170	106,258
24	Newcastle	49,480	19,000	73,495	26,347	95,599	32,675	115,218	37,095
	DURHAM	**409,047**	**171,400**	**610,013**	**230,009**	**800,004**	**310,018**	**949,997**	**370,003**
25	Georgina	29,866	6,225	39,999	9,000	50,002	13,001	65,000	15,999
26	East Gwillimbury	18,386	3,045	23,001	4,998	29,999	9,000	39,999	12,001
27	Newmarket	45,475	23,815	65,002	31,001	70,001	37,000	75,000	39,999
28	Aurora	29,447	11,650	44,000	18,000	53,000	24,000	65,000	27,999
29	Richmond Hill	80,142	34,550	135,002	65,001	180,001	95,001	200,000	110,001
30	Whitchurch-Stouffville	18,358	5,780	22,999	10,000	28,000	14,000	30,001	15,000
31	Markham	153,816	91,895	215,001	125,999	259,998	155,001	310,000	180,002
32	King	18,083	5,535	19,999	7,000	22,999	7,999	25,000	9,000
33	Vaughan	111,356	65,105	175,000	104,003	240,005	144,997	290,026	170,002
	YORK	**504,929**	**247,600**	**740,003**	**375,002**	**934,005**	**499,999**	**1,100,026**	**580,003**
34	Caledon	34,965	9,850	40,999	12,754	54,002	15,001	64,999	18,000
35	Brampton	234,437	106,900	319,999	137,253	452,001	175,000	535,002	205,000
36	Mississauga	463,394	277,000	624,997	364,999	639,994	427,995	655,003	463,002
	PEEL	**732,796**	**393,750**	**985,995**	**515,006**	**1,145,997**	**617,996**	**1,255,004**	**686,002**
37	Halton Hills	36,816	15,850	50,849	21,790	60,821	29,896	73,964	36,877
38	Milton	32,075	18,200	44,914	29,806	68,109	43,843	100,605	56,536
39	Oakville	114,670	55,600	155,306	73,064	210,864	101,576	261,114	124,561
40	Burlington	129,575	59,950	168,935	75,350	190,206	94,687	214,322	112,030
	HALTON	**313,136**	**149,600**	**420,004**	**200,010**	**530,000**	**270,002**	**650,005**	**329,994**
41	Flamborough	0	0	35,000	6,000	40,000	7,000	48,000	8,000
42	Dundas	0	0	22,000	6,500	24,000	7,500	25,000	8,000
43	Ancaster	0	0	32,000	4,500	37,000	6,500	47,000	8,200
44	Glanbrook	0	0	12,000	3,500	15,000	4,500	17,500	7,000
45	Stoney Creek	0	0	55,500	16,500	75,000	21,000	85,000	26,000
46	Hamilton	451,665	184,050	315,000	151,400	326,500	159,000	337,500	193,000
	Hamilton-Wentworth	**451,665**	**184,050**	**471,500**	**188,400**	**517,500**	**205,500**	**560,000**	**250,200**
	GTA TOTAL	**4,687,293**	**2,598,800**	**5,647,506**	**3,038,425**	**6,467,500**	**3,583,521**	**7,215,026**	**4,016,198**

3/18/94

2031 Weekday AM Peak Hour Vehicles

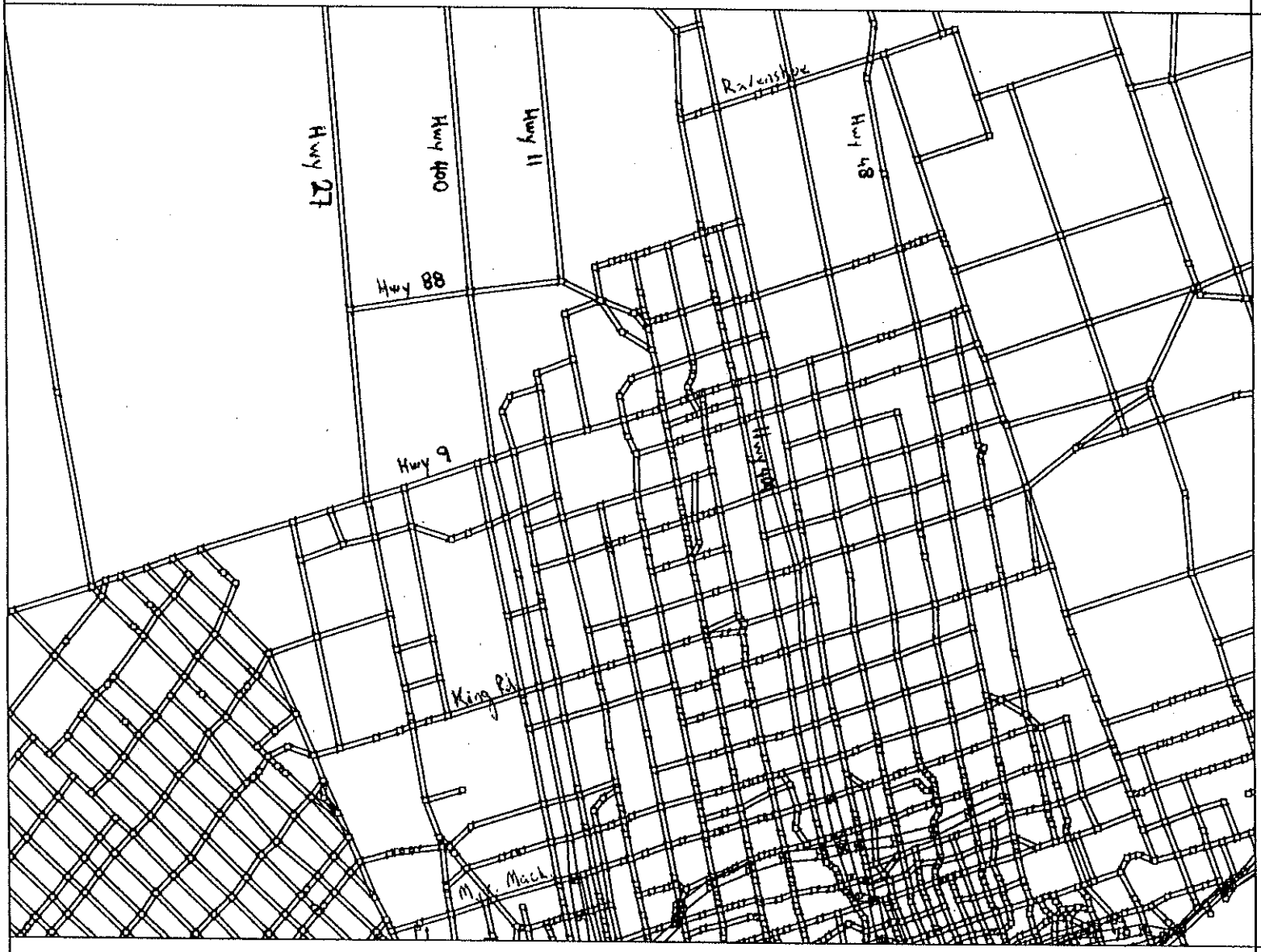
origin	destination groups 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	sum
Downtown Toronto	1	4,185	3,211	1,110	2,350	304	18	2	437	395	16	70	416	22	21	13	18	1,700	351	64	0	4	2	2	10	3	24	0	0	0	0	2	14,750
West Metro	2	9,577	51,453	2,515	7,786	296	14	7	2,359	6,363	234	100	1,130	207	253	50	71	18,018	1,491	427	0	2	6	2	15	6	57	3	5	0	0	6	103,453
Scarborough	3	4,940	4,012	26,917	12,636	1,167	39	7	5,440	608	140	47	1,537	157	255	54	76	1,765	232	28	0	2	6	4	11	3	20	2	3	0	0	11	59,919
Central Metro	4	12,598	11,334	9,867	29,949	783	19	3	4,393	2,898	62	68	2,309	230	299	39	55	5,628	445	96	0	6	9	5	5	10	52	0	4	1	0	3	78,168
South Durham	5	3,406	1,812	9,559	5,427	24,531	737	163	8,203	426	6	47	1,106	247	429	105	136	2,054	345	81	0	3	5	2	16	8	70	26	5	0	0	299	57,255
Uxbridge - Scugog	6	353	174	395	370	608	816	341	591	391	0	34	112	52	63	41	58	56	13	2	0	1	11	0	0	0	0	0	67	0	0	0	0	4,488
Brock	7	110	53	109	128	116	322	562	137	136	0	18	42	21	24	115	163	13	2	0	1	11	0	0	0	0	0	0	7	0	0	0	0	2,149
Markham	8	2,089	2,232	5,041	4,273	2,124	122	37	8,672	2,034	38	1,882	2,027	190	447	31	36	1,727	65	31	0	1	1	3	16	3	22	1	1	0	0	2	33,150
Vaughan	9	1,060	8,497	354	2,413	304	3	11	2,207	10,130	395	113	2,512	70	85	1	1	4,242	130	32	0	1	1	2	10	13	5	1	0	1	0	1	32,715
King	10	104	803	79	326	19	2	0	107	490	591	6	211	173	172	10	14	260	1	0	0	0	2	28	14	2	5	0	0	0	0	0	3,420
Whitchurch-Stouffville	11	73	68	497	257	103	24	8	1,834	48	5	367	74	189	213	35	49	73	82	0	0	0	0	27	0	0	0	0	0	0	0	0	4,006
Richmond Hill	12	1,401	1,571	1,015	2,705	1,161	167	29	3,117	3,680	177	217	5,386	531	903	50	60	882	192	7	0	0	18	1	8	11	4	0	0	0	0	0	23,256
Aurora	13	226	521	251	738	42	11	7	374	441	334	192	789	1,217	1,708	152	218	320	0	0	0	1	2	0	55	0	4	0	17	0	0	0	7,621
Newmarket	14	215	432	234	849	25	16	4	389	390	303	206	1,656	1,306	2,091	168	220	276	1	0	0	0	5	13	6	0	2	0	0	0	0	0	8,805
East Gwillimbury	15	53	123	174	162	15	39	32	185	214	41	48	337	378	524	697	1,011	10	7	0	0	0	8	43	1	4	2	1	0	0	0	0	4,107
Georgina	16	124	239	322	528	24	68	35	933	389	75	84	644	685	948	1,231	1,782	18	14	0	0	0	2	6	0	0	0	1	0	0	0	0	7,373
Peel	17	6,512	25,879	938	5,874	228	2	6	559	4,396	160	40	1,936	53	64	1	0	95,292	10,296	630	2	39	696	12	251	543	248	4	5	1	0	7	153,775
Halton	18	2,579	2,552	214	745	22	1	0	73	419	28	0	8	2	1	0	0	18,014	41,538	4,644	0	2	2	0	9	4	406	3	3	0	0	5	71,275
Hamilton	19	252	507	2	76	4	0	0	1	147	0	0	0	0	0	0	0	1,291	8,432	1,949	0	5	8	0	22	16	1,446	0	2	0	0	6	14,167
East Simcoe	20	12	30	5	13	3	0	2	3	5	0	4	0	0	6	0	1	18	3	0	0	572	114	1	21	6	2	1	5	0	0	1	828
North Simcoe	21	226	577	99	247	61	3	36	54	88	0	77	7	7	116	0	26	345	54	7	694	10,866	2,156	13	402	120	30	21	90	0	0	11	16,433
Barrie	22	175	499	75	152	4	0	0	28	181	4	0	15	38	92	27	6	254	17	2	10	151	4,573	41	418	4	14	0	8	0	0	1	6,789
Bradford	23	54	75	27	59	0	0	0	15	171	5	18	52	158	258	41	3	21	0	0	0	2	5	313	23	0	0	0	1	0	0	0	1,262
South Simcoe	24	253	1,166	39	286	9	5	0	134	515	112	10	76	42	274	50	11	800	35	0	2	31	712	238	3,120	50	23	2	0	0	0	2	8,016
Grey-Dufferin	25	205	350	105	97	0	0	0	59	250	9	49	0	0	6	0	0	1,549	86	3	14	221	26	0	67	10,198	689	0	0	0	0	4	13,985
SW Ontario	26	1,148	1,116	220	731	186	4	3	103	213	8	7	28	8	6	0	2	2,641	2,302	3,096	0	4	13	0	20	154	109,685	5	11	0	0	20	121,754
Victoria	27	350	175	331	140	1,277	168	197	161	14	0	0	74	0	0	0	10	129	0	0	3	42	4	0	0	0	29	4,950	6	3	0	340	8,401
Muskoka	28	50	70	0	164	26	0	0	57	1	0	0	1	0	0	0	0	112	0	0	9	135	0	0	95	0	36	0	5,300	11	0	5	6,011
Haliburton	29	104	51	1	1	53	0	0	1	1	0	0	1	40	0	0	0	32	0	0	1	18	0	0	0	0	0	101	32	964	0	13	1,412
N. Ontario	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. Ontario	31	564	366	341	407	2,477	17	0	87	98	0	0	33	0	0	0	0	294	12	0	0	7	4	8	7	0	99	209	2	4	0	16,916	21,952
	sum	52,978	119,930	60,058	79,669	35,971	2,619	1,514	38,111	35,551	2,643	3,702	21,418	6,003	9,262	2,891	4,010	155,835	66,145	11,097	737	12,126	8,374	785	4,563	11,137	112,975	5,403	5,500	985	0	17,664	889,674

2021 AM Peak Hour Vehicle Trips

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	sum
Downtown Toronto	1	4832	3852	1235	2413	372	16	1	529	601	10	73	468	20	18	11	15	1966	494	77	0	5	4	2	11	3	27	0	0	0	1	17056
West Metro	2	10475	53997	2681	7946	323	8	4	2874	7390	249	87	1153	212	246	40	59	20665	1750	486	0	3	7	2	12	7	63	3	3	0	0	4	110749
Scarborough	3	5066	4508	28113	12692	1363	27	0	6079	695	145	36	1444	156	246	44	65	2130	374	32	0	2	8	3	5	2	17	1	3	0	0	8	63266
Central Metro	4	13280	11543	9875	30557	836	10	0	4679	3482	66	52	2217	246	300	33	49	4242	535	111	0	5	12	6	4	11	56	0	3	0	1	1	81511
South Durham	5	4000	1963	11082	5930	30537	746	145	7876	1194	1	26	1221	277	432	104	135	2675	425	105	0	2	2	2	6	7	72	25	5	0	0	269	69284
Uxbridge - Scugog	6	450	238	481	414	711	965	403	715	511	0	18	140	60	69	37	60	71	15	3	0	0	0	0	0	0	0	7	0	0	0	9	537:
Brock	7	132	70	126	141	126	357	651	156	169	0	9	50	17	20	117	172	10	0	0	1	12	0	0	0	0	0	74	0	0	0	0	2410
Markham	8	2573	2497	5449	4580	2870	107	32	10772	3635	36	2356	2115	243	550	26	30	2016	74	39	0	0	0	2	13	2	19	0	1	0	0	1	40038
Vaughan	9	1186	9704	593	2563	460	1	11	2477	13186	301	73	3122	69	78	0	0	5897	153	39	0	0	0	0	0	10	3	0	0	0	0	0	39926
King	10	103	743	85	356	18	1	0	112	537	560	1	232	171	148	2	9	577	0	0	0	0	2	31	13	3	6	0	0	0	0	0	3710
Whitchurch-Stouffville	11	71	69	491	229	121	20	5	2217	58	2	253	74	192	200	27	42	75	101	0	0	0	0	26	0	0	0	0	0	0	0	0	4273
Richmond Hill	12	1768	1697	1000	3033	1074	177	34	3427	4735	224	178	5724	539	807	28	37	1088	213	8	0	0	24	0	3	11	4	0	0	0	0	0	25833
Aurora	13	272	598	324	957	55	4	4	449	597	441	212	1035	1549	1971	168	241	434	0	0	0	1	2	0	78	0	4	0	24	0	0	0	9420
Newmarket	14	227	426	253	960	24	2	0	393	510	337	189	1861	1414	2046	164	212	322	0	0	0	0	3	14	6	0	1	0	0	0	0	0	9364
East Gwillimbury	15	64	163	232	199	12	41	35	267	328	50	44	466	528	664	906	1282	12	11	0	0	0	11	63	1	5	3	1	0	0	0	0	5388
Georgina	16	162	312	432	421	25	76	63	485	590	100	82	876	943	1174	1560	2498	22	21	0	0	0	3	8	0	0	0	0	0	0	0	0	9553
Peel	17	6042	24230	962	5752	387	1	10	597	4645	159	33	1010	47	71	0	0	110287	12191	781	11	875	442	11	224	624	252	2	3	1	9	3	168953
Halton	18	2796	2707	215	771	20	0	0	77	463	28	0	7	0	0	0	0	24334	50941	5298	0	2	3	0	9	4	444	4	3	0	0	5	88131
Hamilton	19	240	491	2	71	3	0	0	1	838	0	0	0	0	0	0	0	1366	9525	2112	0	5	8	0	21	15	1419	0	2	0	0	6	15425
East Simcoe	20	16	39	7	15	4	0	2	4	5	0	5	0	0	7	0	2	21	4	1	0	721	155	1	27	8	2	1	6	0	0	0	1053
North Simcoe	21	297	752	140	299	73	4	45	76	106	0	85	7	8	838	0	33	432	85	10	874	13698	2948	17	520	158	40	26	112	0	0	14	20997
Barrie	22	244	607	92	175	4	0	0	32	204	5	0	16	45	101	38	7	308	26	3	12	182	5987	50	519	6	18	0	10	0	2	2	8693
Bradford	23	45	79	36	84	0	0	0	18	239	7	14	66	176	312	55	4	32	0	0	0	2	7	408	31	0	0	0	1	0	0	0	1686
South Simcoe	24	329	1358	74	377	9	6	0	176	651	145	8	89	51	313	67	14	8095	54	0	2	38	943	331	4046	42	28	2	0	0	0	3	10251
Grey-Dufferin	25	257	429	139	113	0	0	0	73	331	12	34	0	0	6	0	0	2052	126	4	17	274	34	0	78	13013	901	0	0	0	0	4	17897
SW Ontario	26	1425	1329	282	890	222	4	3	123	271	10	5	34	8	8	0	2	3473	3304	4334	0	5	17	0	25	197	139842	5	12	0	0	23	155853
Victoria	27	496	244	440	178	1551	198	252	205	30	0	0	99	0	0	0	12	175	0	0	3	55	6	0	0	0	40	6309	7	3	0	435	10736
Muskoka	28	66	86	0	210	30	0	0	67	0	0	0	0	0	0	0	0	150	0	0	11	175	0	0	46	0	49	0	6739	14	0	6	7649
Haliburton	29	150	70	0	0	61	0	0	1	1	0	0	1	61	0	0	0	8	0	0	2	24	0	0	0	0	0	129	41	1225	0	16	1790
N. Ontario	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. Ontario	31	777	479	443	527	3016	20	0	111	128	0	0	37	0	0	0	0	396	19	0	1	9	5	11	9	0	836	266	3	5	0	21609	28007
	sum	57841	125280	64586	82873	44307	2791	1700	45068	45430	2888	3873	23564	7032	9925	3427	4630	186331	80441	13443	934	15395	10633	988	5707	14128	143446	6855	6978	1248	0	22419	1034211

BASE NETWORK

emme/2



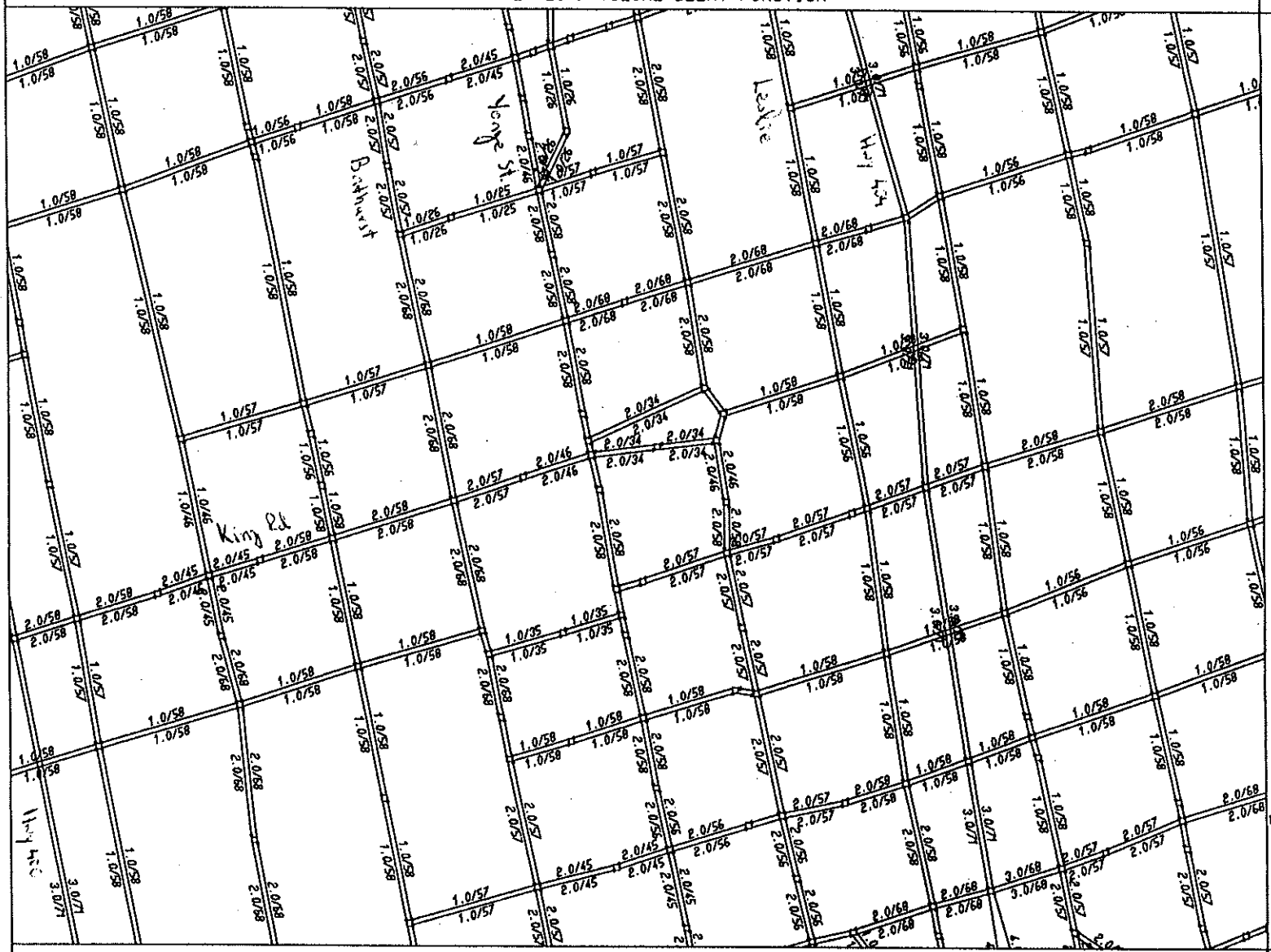
LINKS:
!vdf=1.9

WINDOW:
586667/850000
653333/900000

94-03-03 13:47
MODULE: 2.13
DMG.UTYU...mmk

BASE NETWORK

NO. OF LANES / VOLUME-DELAY FUNCTION



emme/2

LINKS:
!vdf=1.9

legend :

first number =
no. of lanes per direction
1.0 = 1
2.0 = 2
3.0 = 3

second number =
capacity index
4 = 800 veh/h/lane
5 = 900
6 = 1200
7 = 1800

third number =
free flow speed index
5 = 50 km/h
6 = 60
7 = 70
8 = 80
9 = 90
1 = 100

example :

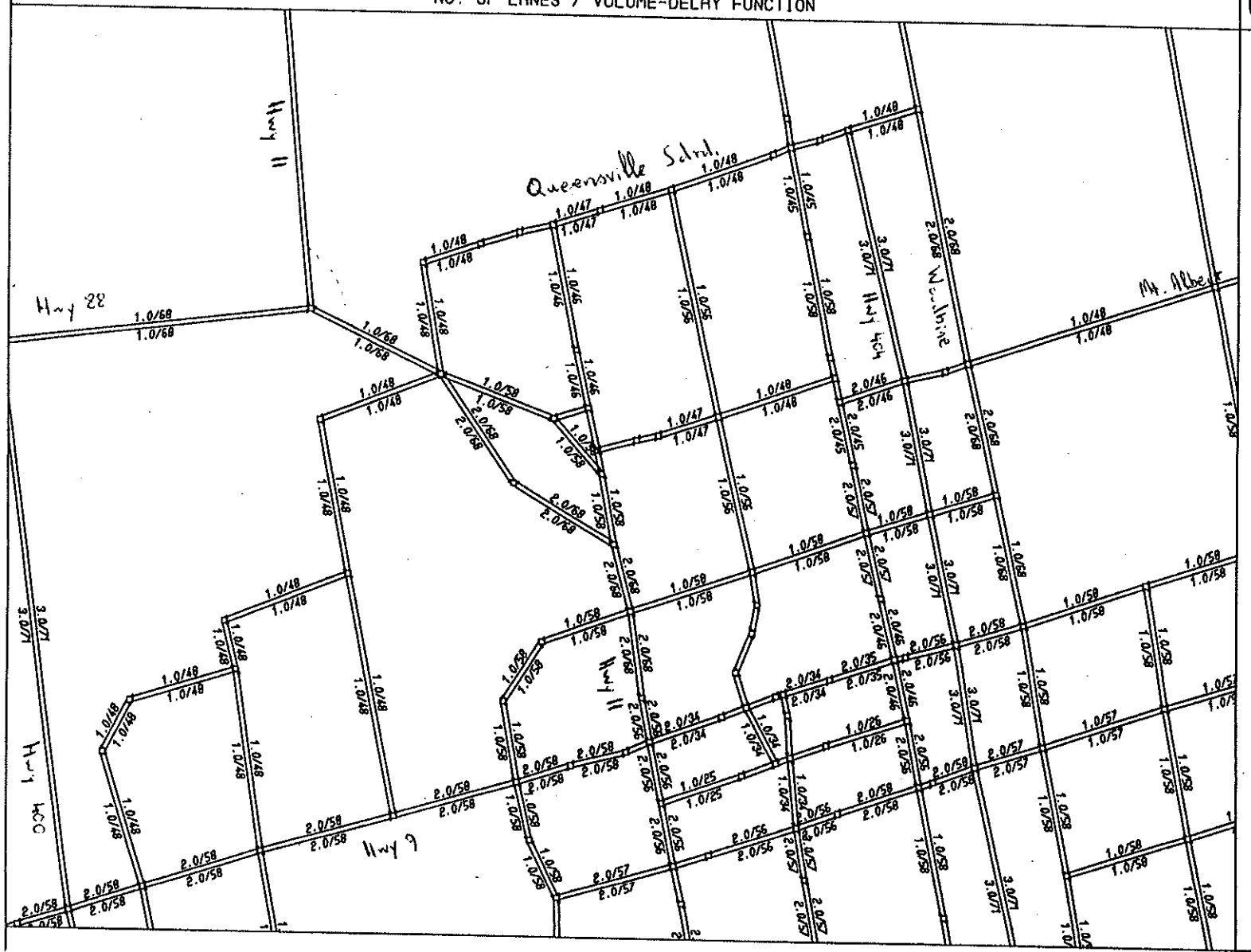
2.0/68 = a four lane road with capacity of 1200 veh/h/lane and a posted (free flow) speed of 80 km/h.

WINDOW:
615000/859000
634342/873507

94-03-03 13:40
MODULE: 2.13
DMG.UTYU...mmk

BASE NETWORK

NO. OF LANES / VOLUME-DELAY FUNCTION



emme/2

LINKS:
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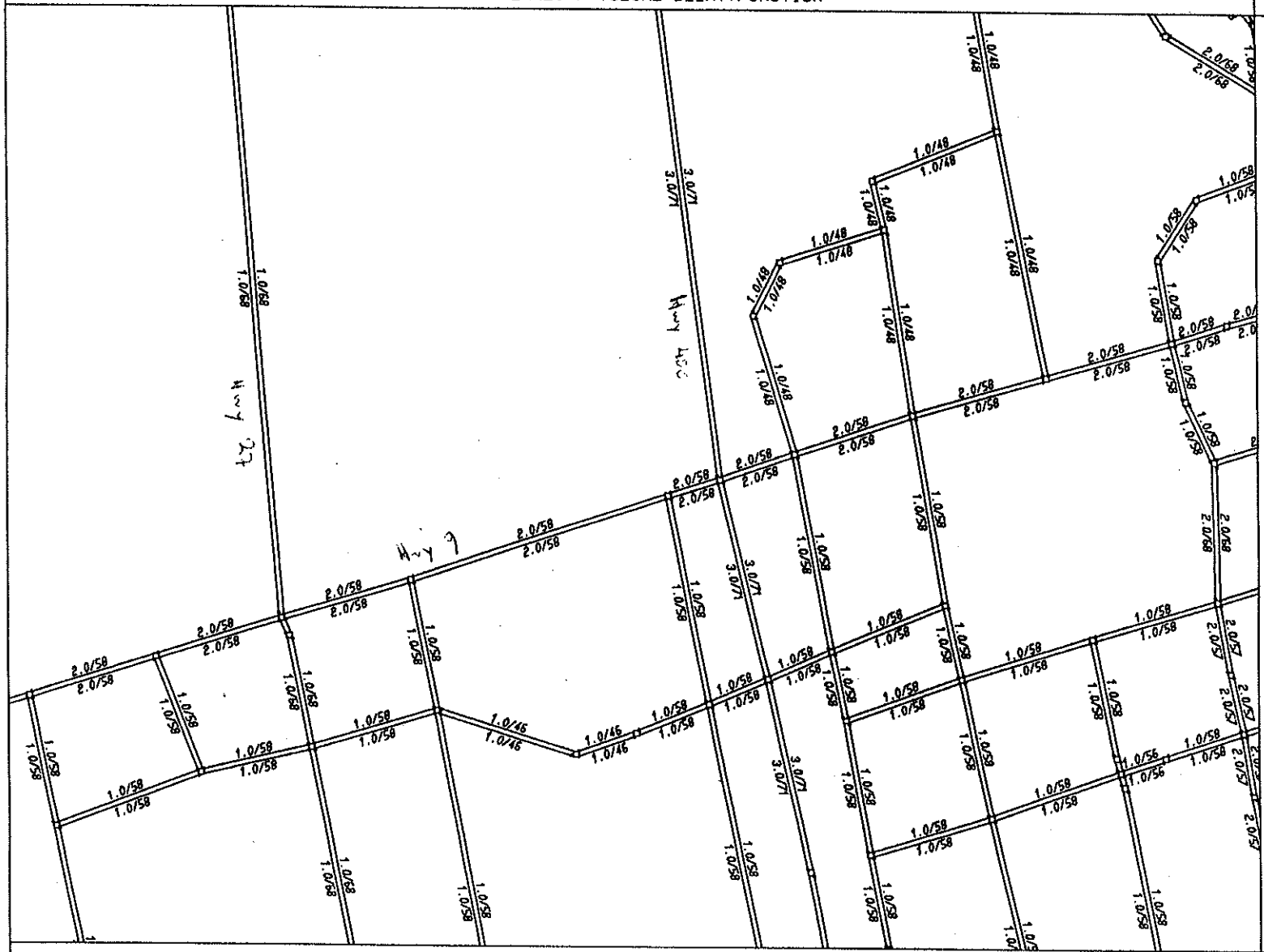
WINDOW:
611614/875654
630956/890161

94-03-03 12:04
MODULE: 2.13
DMG.UTYU...mmk

BASE NETWORK

NO. OF LANES / VOLUME-DELAY FUNCTION

emme/2



LINKS:
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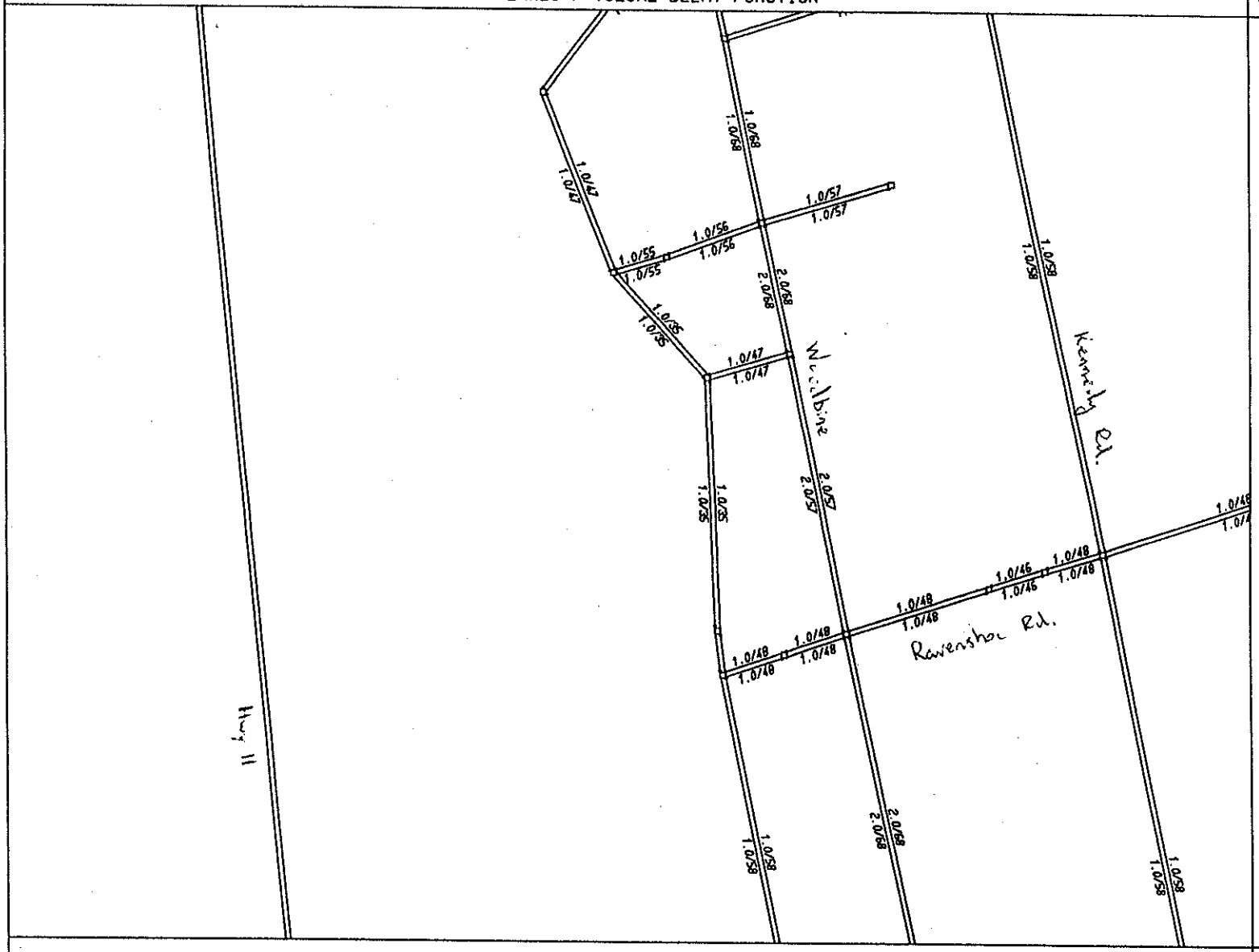
WINDOW:
601614/868654
620956/883161

94-03-03 12:14
MODULE: 2.13
DMG.UTYU...mmk

BASE NETWORK

NO. OF LANES / VOLUME-DELAY FUNCTION

emme/2



LINKS:
!vdf=1.9

WINDOW:
611614/890000
630956/904507

94-03-03 12:21
MODULE: 2.13
OMG.UTYU...mmk

APPENDIX B

TRAFFIC MODEL RESULTS

List of Model Runs (I)

Scenario	Date of Run	Run No.	Forecast Year	Roadways Included[1] in Network			
				407	404 Extension	Hwy 9 / Green Lane Upgrade	400-404 Link Corridor
1	8/3/94	6	2011	6 lanes	to 48	yes - G.L. 2 lanes	Bradford
2	8/3/94	7	2011	6 lanes	no	no	no link
3	8/3/94	8	2011	6 lanes	to 48	yes - G.L. 2 lanes	no link
4	7/3/94	9	2011	6 lanes	to 48	yes - G.L. 2 lanes	Bradford
5	29/3/94	9a	1991	6 lanes	to Ravenshoe	no	Bradford
6	7/3/94	10	2011	6 lanes	to 48	no	Bradford
7	11/4/94	12	2011	6 lanes	to Ravenshoe	yes - 4 lanes	Bradford
8	29/3/94	15	2011	6 lanes	to B. Bypass	no	Bradford
9	29/3/94	16	2011	6 lanes	to Queensville	no	no link
10	29/3/94	17 (15 mod)	2011	6 lanes	to B. Bypass	no	Bradford
11	29/3/94	18	2011	6 lanes	to Ravenshoe	yes - 4 lanes	no link
12	29/3/94	19	2011	6 lanes	to Ravenshoe	no	Aurora / Newmarket
13	29/3/94	20	2011	6 lanes	to Ravenshoe	no	South Oak Ridges

1 all other roads included per York Region Official Plan

List of Model Runs (II)

Scenario	Date of Run	Run No.	Forecast Year	Roadways Included[1] in Network			
				407	404 Extension	Hwy 9 / Green Lane Upgrade	400-404 Link Corridor
14	17/10/95	10	2011	6 lanes	to 48	yes - 4 lanes	no link
15	17/10/95	11	2011	6 lanes	to 48	yes - 4 lanes	4 lane art. N of 9/GL
16	17/10/95	12	2011	6 lanes	to 48	yes - 4 lanes	fwy N of 9/GL
17	17/10/95	13	2011	6 lanes	to 48	yes - 4 lanes	Bradford - arterial
18	17/10/95	16	2011	6 lanes	to 48	yes - 4 lanes	Bradford - fwy
19	3/11/95	11 mod	2011	6 lanes	to 48	yes - 4 lanes	4 lane art. N of 9/GL
20	3/11/95	12 mod	2011	6 lanes	to 48	yes - 4 lanes	fwy N of 9/GL
21	3/11/95	13 mod	2011	6 lanes	to 48	yes - 4 lanes	Bradford - arterial
22	3/11/95	16 mod	2011	6 lanes	to 48	yes - 4 lanes	Bradford - fwy
23	20/11/95	9	2021	6 lanes	to 48	yes - 4 lanes	Bradford - fwy

1 all other included roads per York Region Official Plan

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

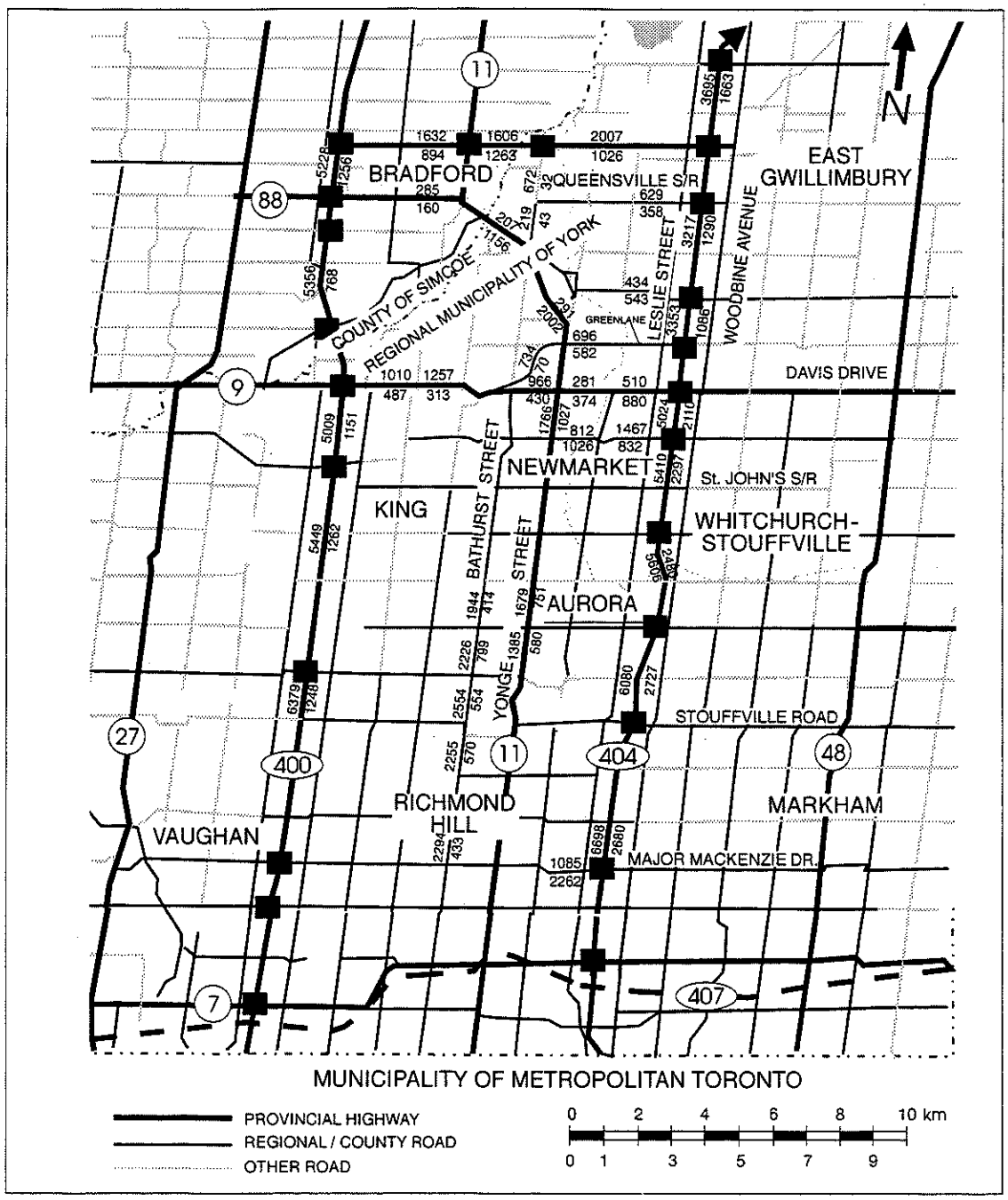
SCENARIO 1 : Bypass + 2 lane Green Lane (Run No. 6)

DATE OF RUN : 94/03/08

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Include Green Lane 2 Lanes Only
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (MAJOR ROADS) : (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

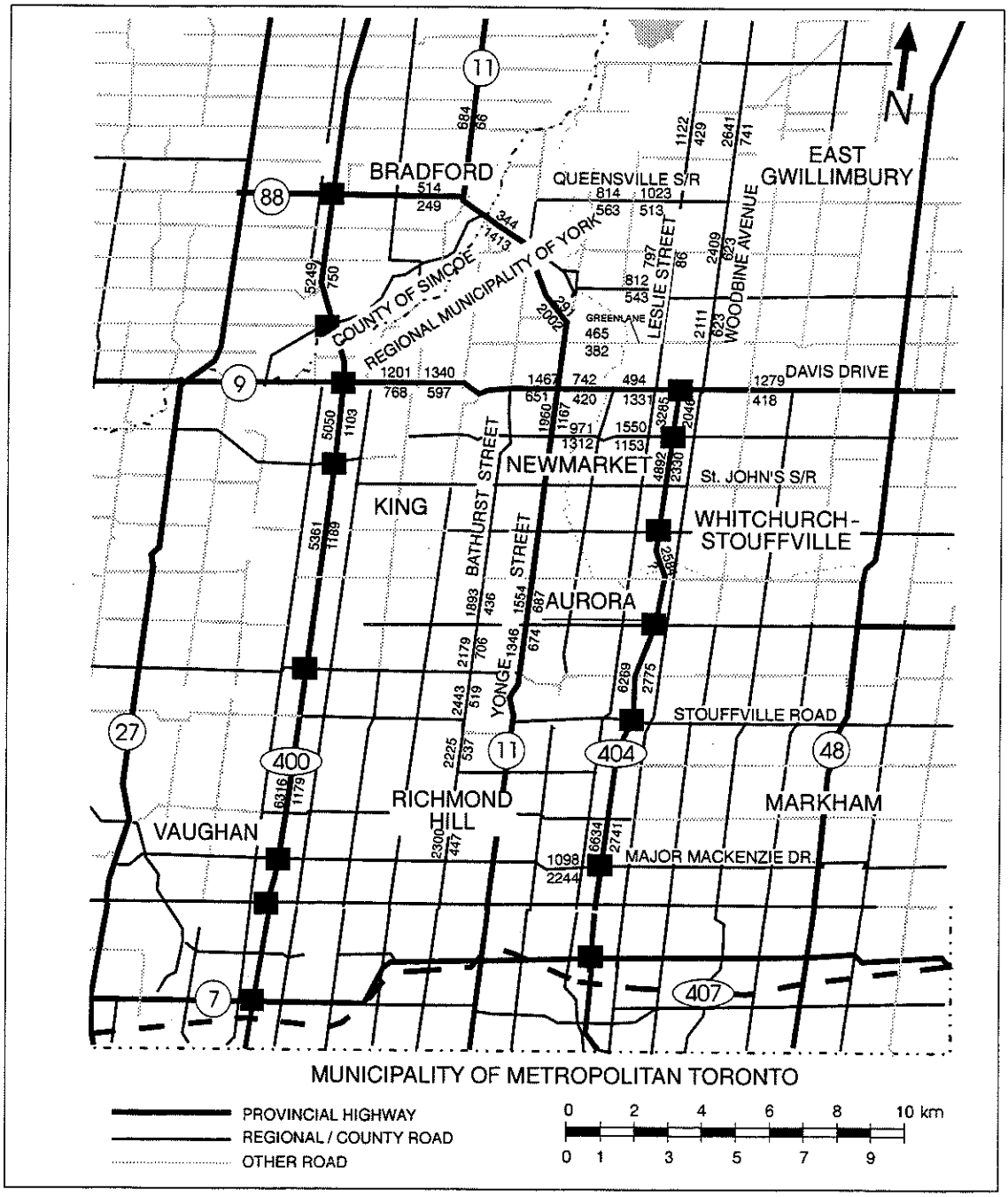
SCENARIO 2 : Do Nothing (Run No. 7)

DATE OF RUN : 94/03/08

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing (ie. 1994 conditions)
NEW ROAD LINK(S) - None
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

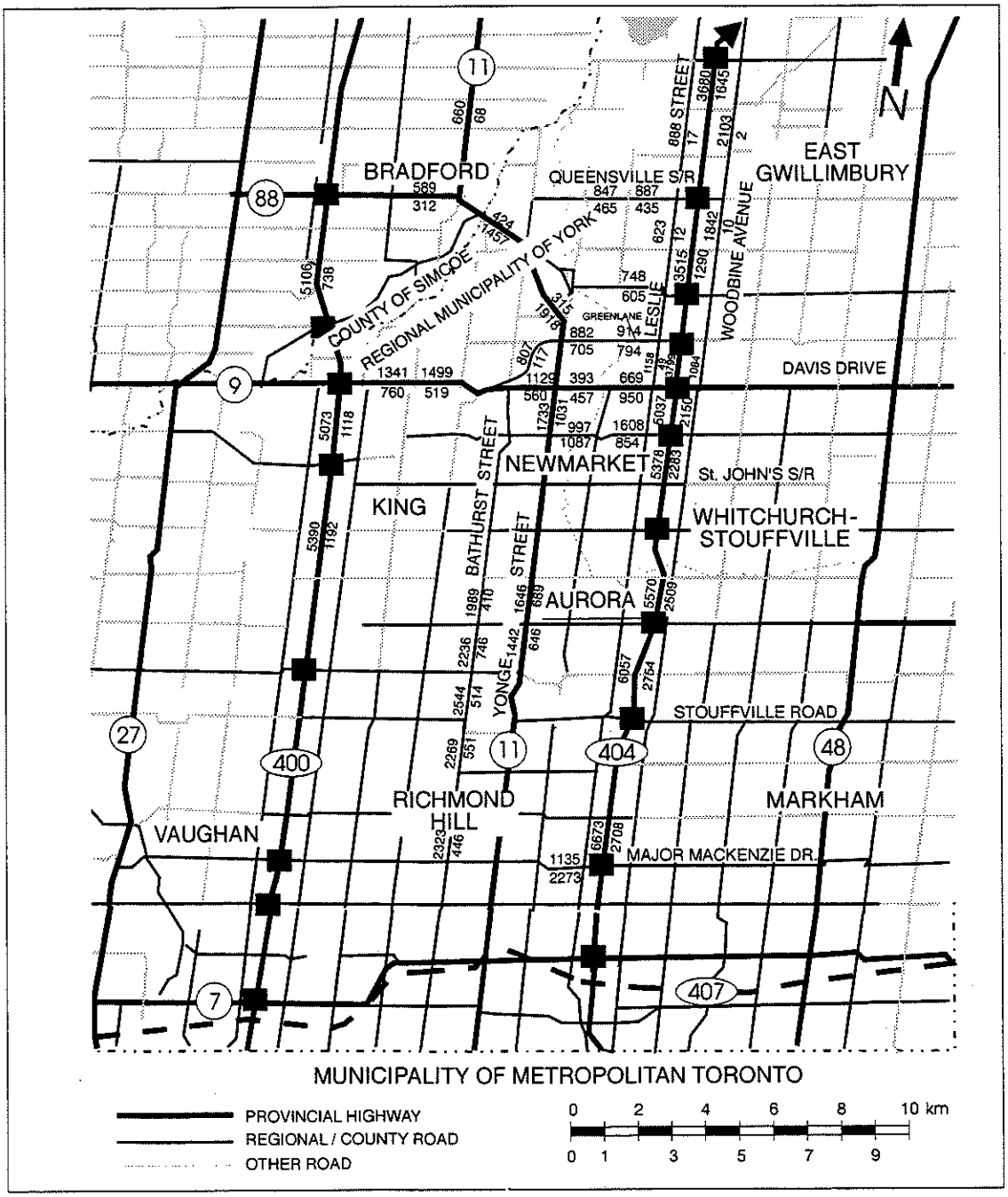
SCENARIO 3 : 2 lane Green Lane; no Bypass (Run No. 8)

DATE OF RUN : 94/03/08

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Includes; Green Lane 2 Lanes Only
NEW ROAD LINK(S) - 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

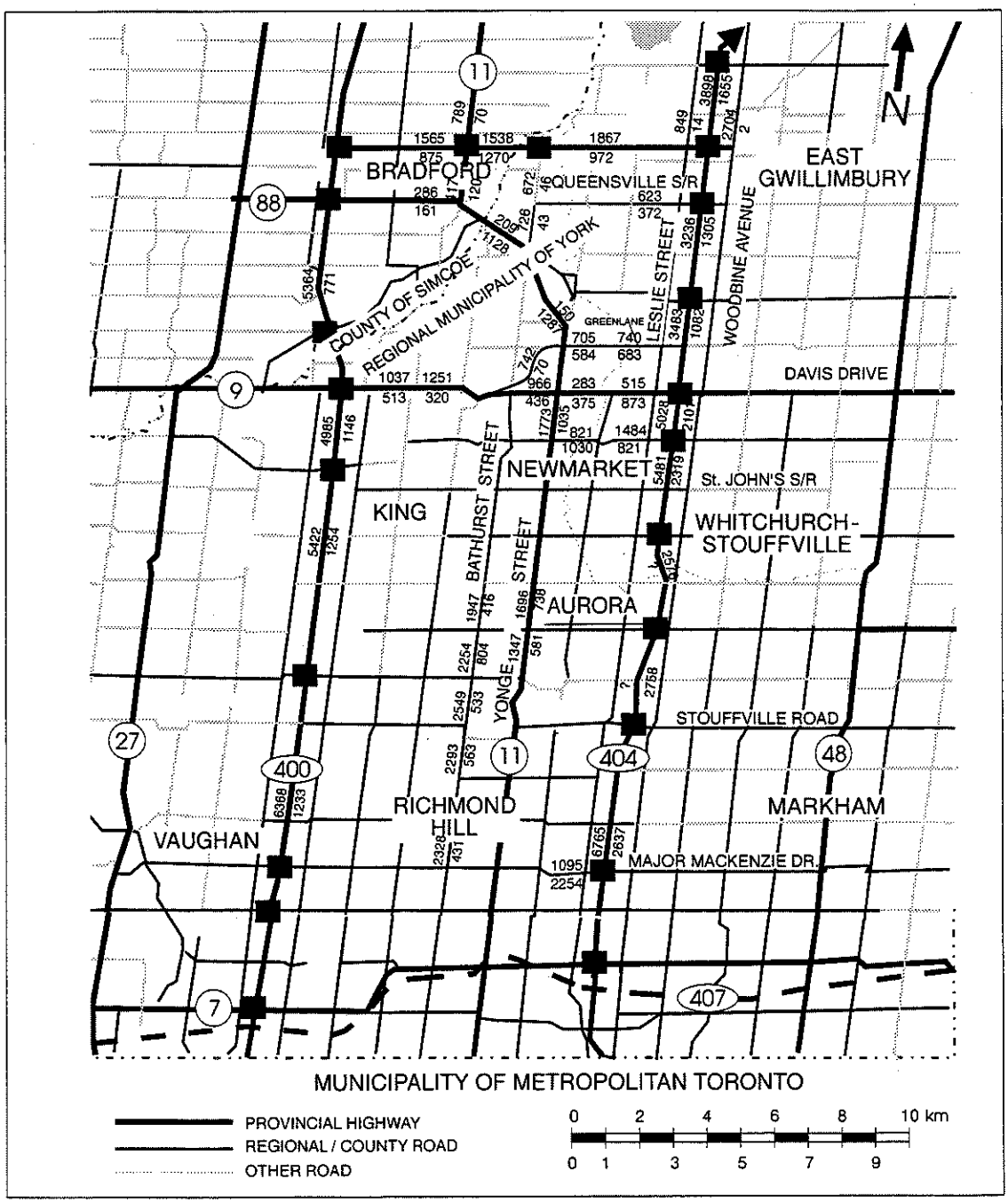
SCENARIO 4 : Bypass - Preliminary (Run No. 9)

DATE OF RUN : 94/03/07

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Includes Green Lane 2 Lanes Only
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

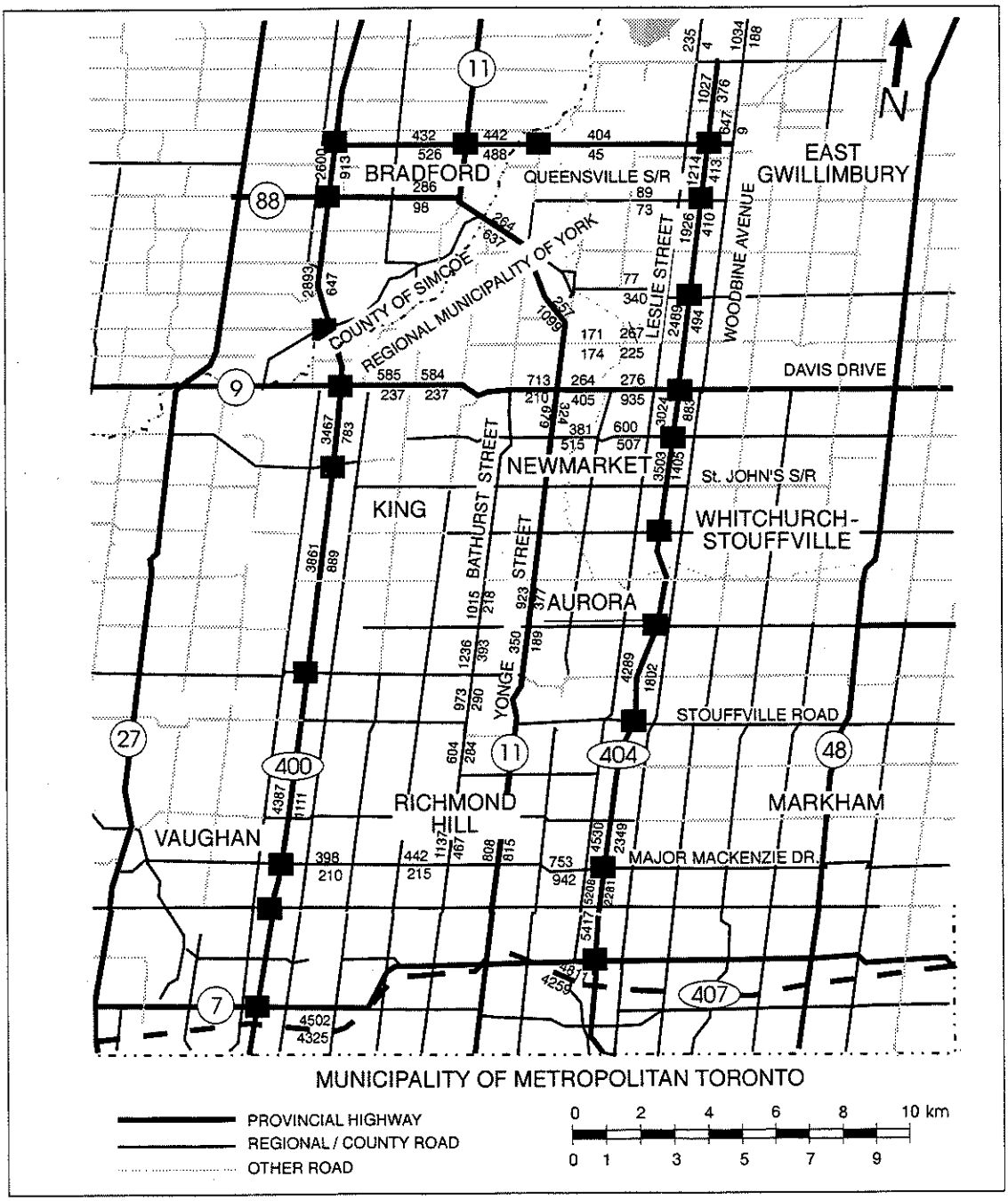
SCENARIO 5 : Bypass with 1991 demand (Run No. 9a)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 1991 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to Ravenshoe Rd.
OTHER ROADS - Existing Conditions

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

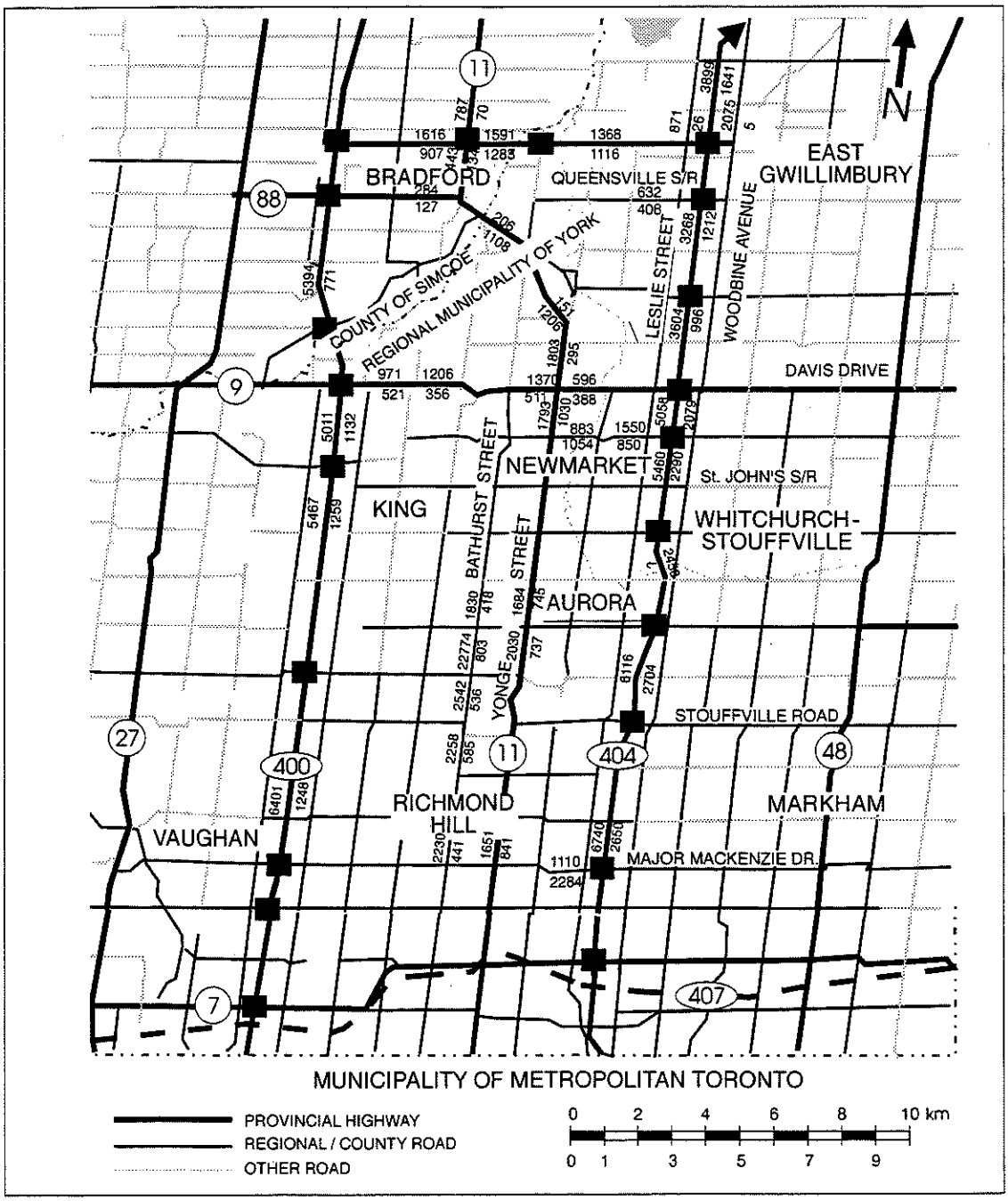
SCENARIO 6 : Bypass, No Green Lane (Run No. 10)

DATE OF RUN : 94/03/07

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - No Greenlane
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

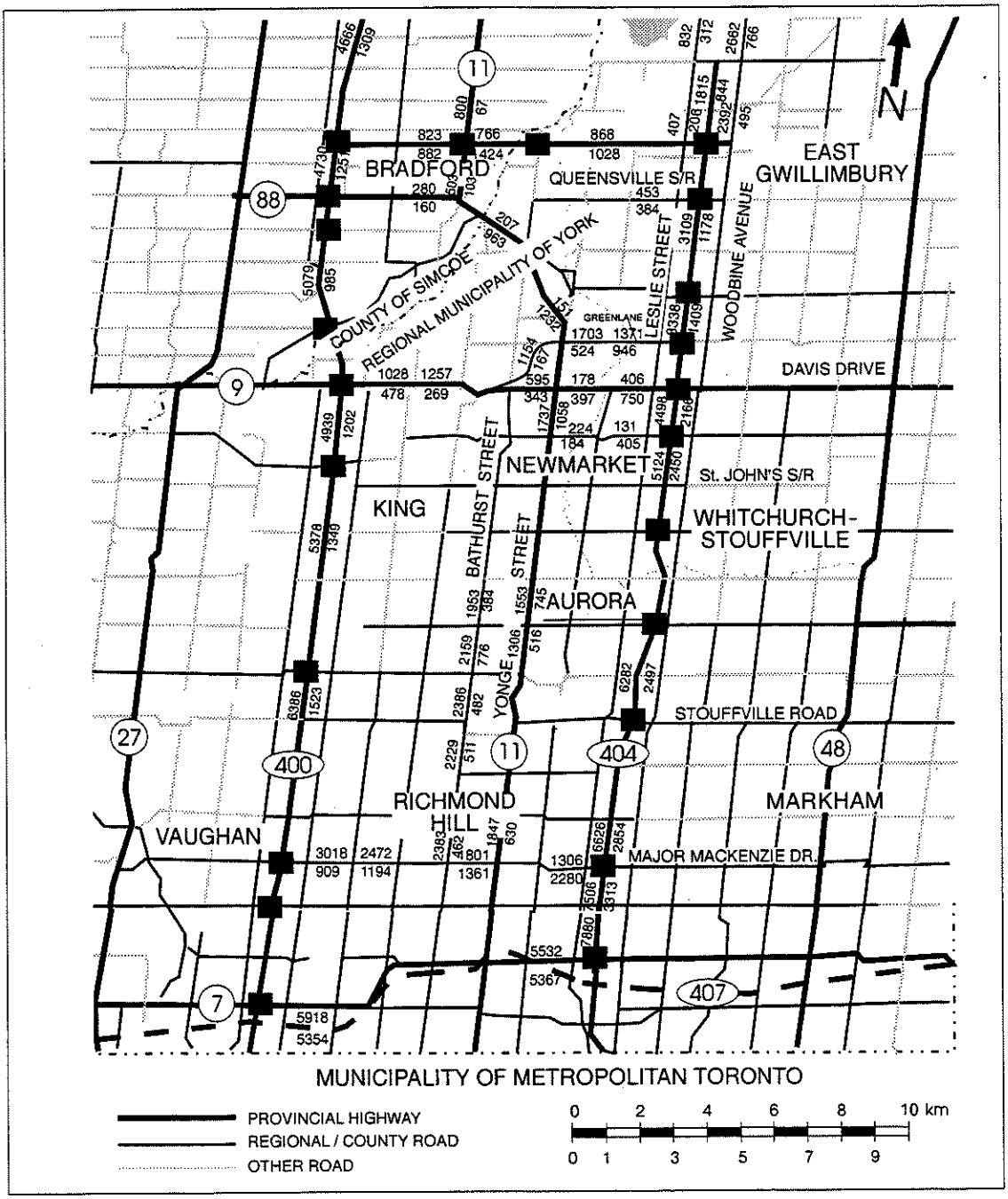
SCENARIO 7 : Bypass plus Green Lane; 404 to Keswick (Run No. 12)

DATE OF RUN : 94/04/11

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Includes Green Lane 4 Lanes
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to Ravenshoe Rd.
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

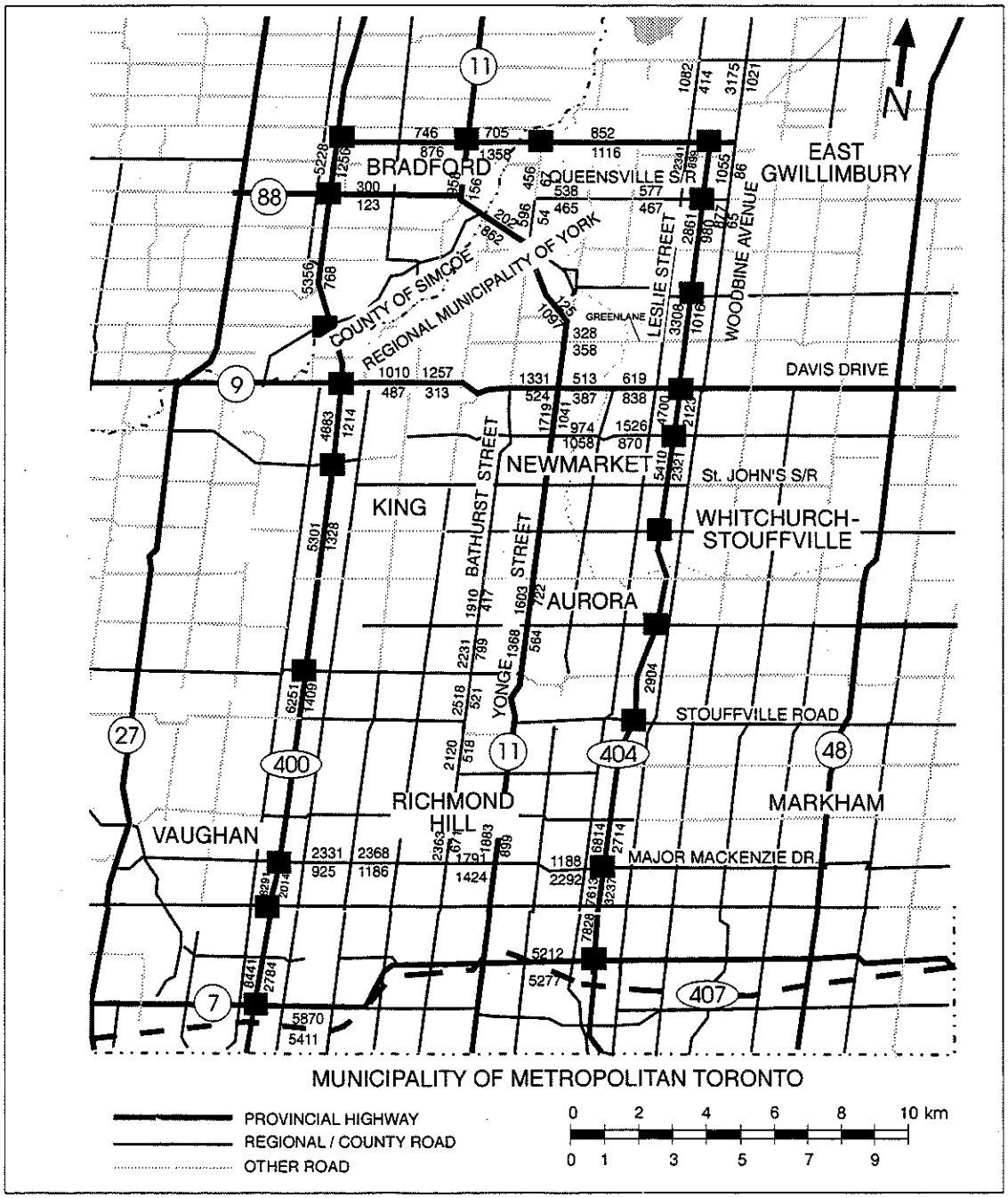
SCENARIO 8 : Bypass / 404 combination (Run No. 15)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to Bypass
OTHER ROADS - Per York Region Draft O.P.

RESULT (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

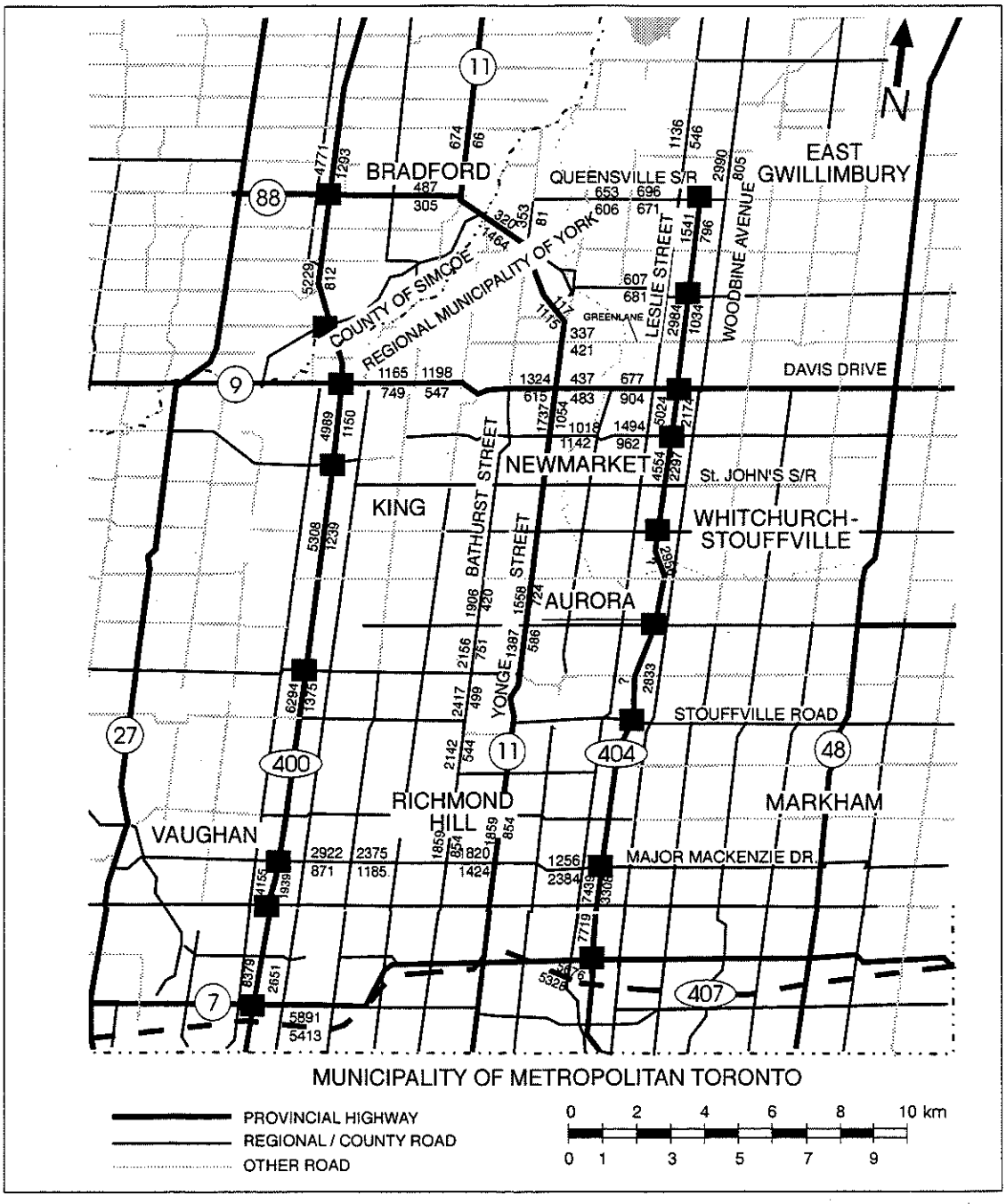
SCENARIO 9 : 404 extension to Queensivlle Sideroad only (Run No. 16)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing
NEW ROAD LINK(S) - 404 Extension to Quensville Sideroad
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

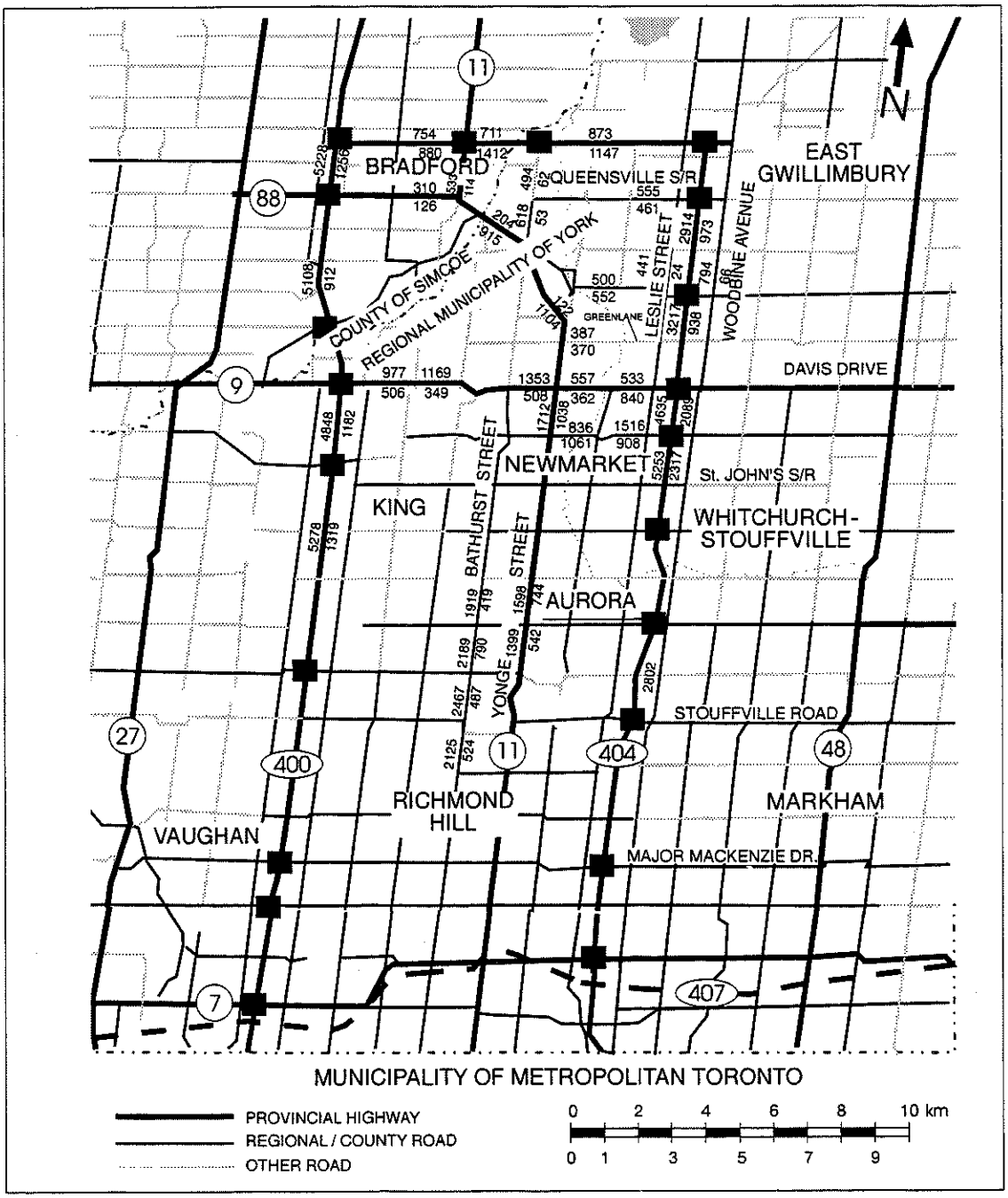
SCENARIO 10 : No Green Lane; 404 Extension to Bypass (Run 17-Similar to run 15, with modified input)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing
NEW ROAD LINK(S) - Bradford Bypass, 404 Extension to Bypass
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

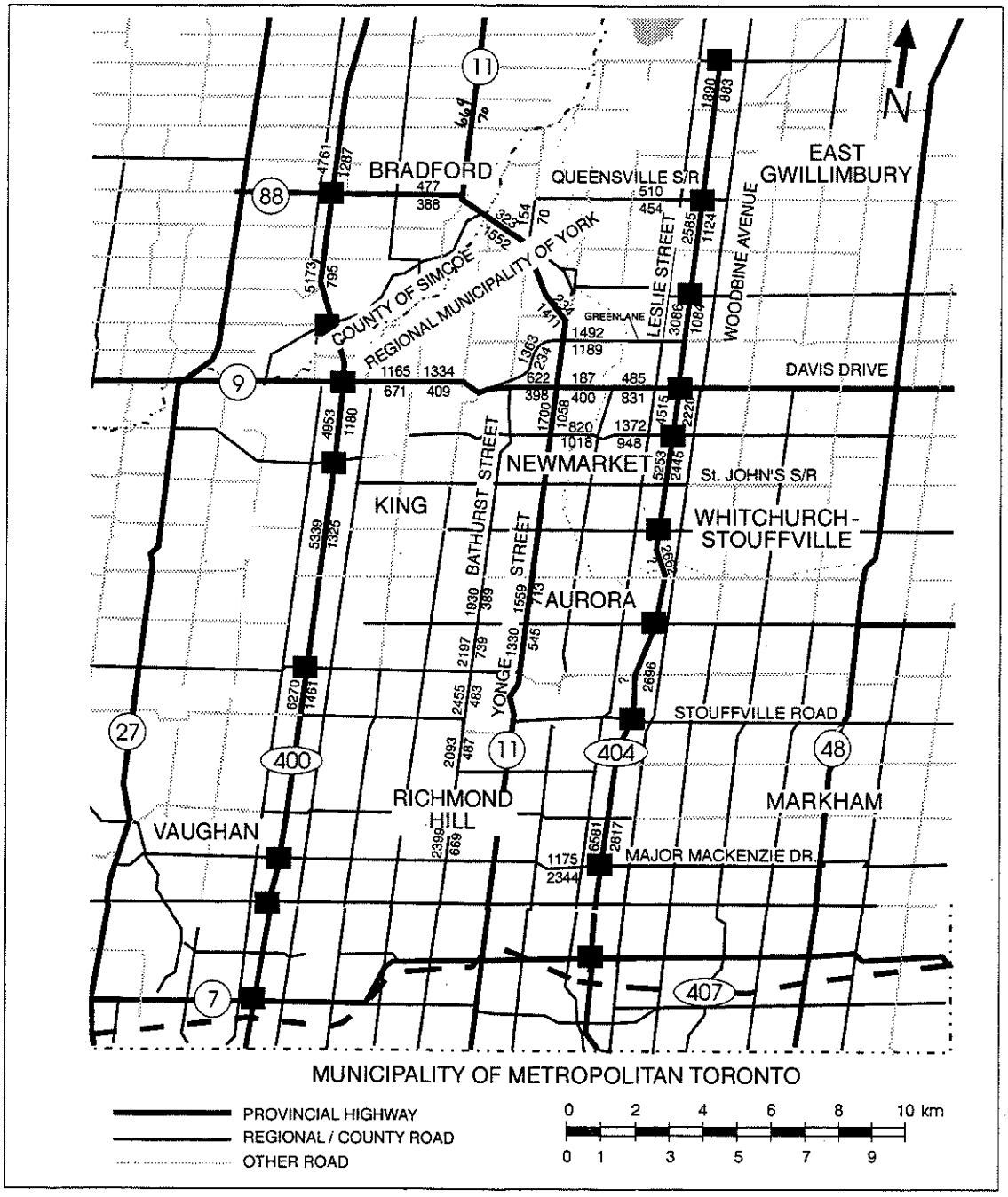
SCENARIO 11 : Green Lane only (Run No. 18)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Includes; Green Lane 4 Lanes
NEW ROAD LINK(S) - 404 Extension to Ravenshoe Rd.
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal Trips on Selected Major Roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

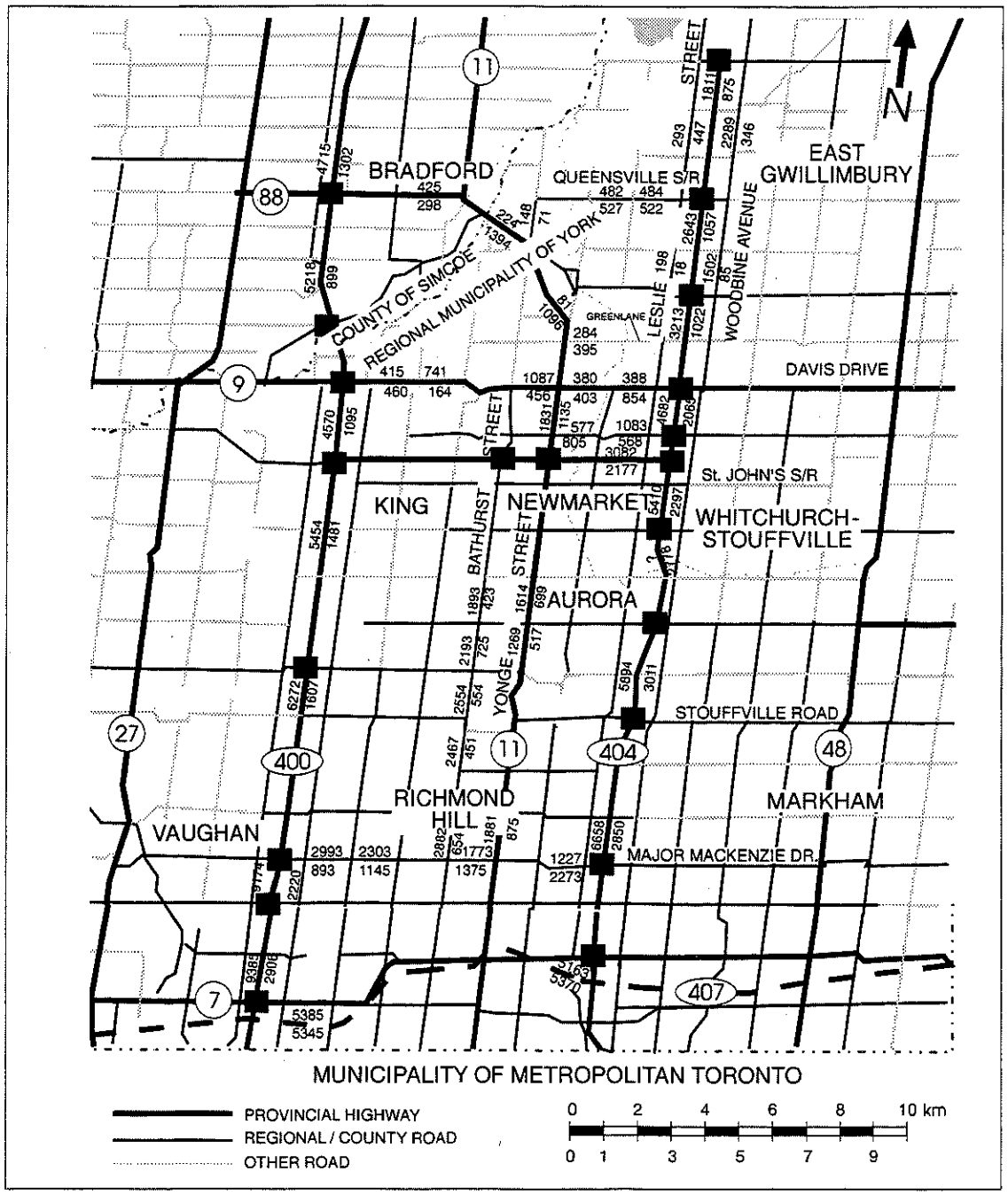
SCENARIO 12 : Aurora / Newmarket E-W Link Freeway (Run No. 19)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing
NEW ROAD LINK(S) - Aurora / Newmarket Bypass,
404 Extension to Revenshoe Rd.
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal Trips on Selected Major Roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

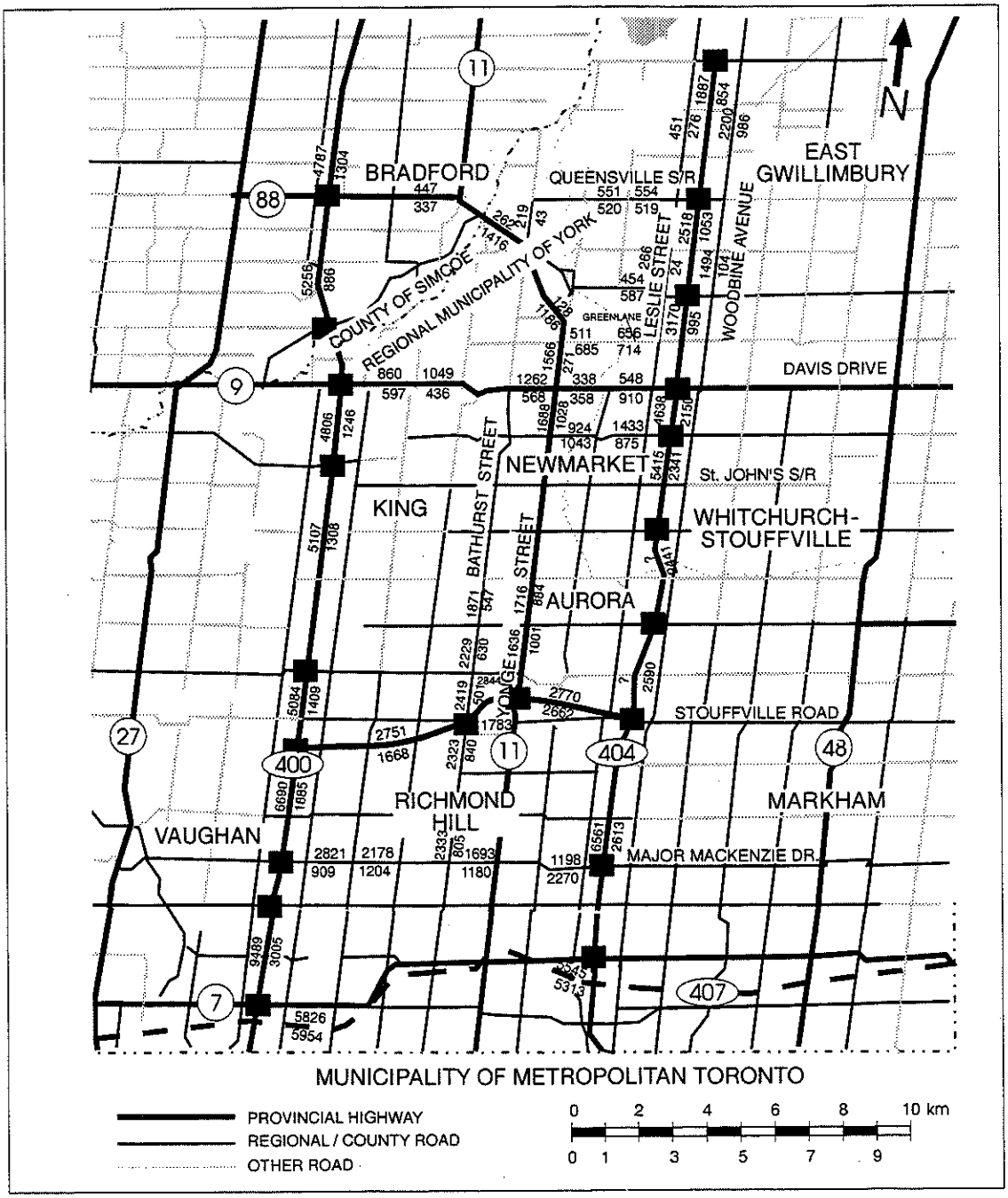
SCENARIO 13 : South Oak Ridges E-W Link Freeway (Run No. 20)

DATE OF RUN : 94/03/29

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Do Nothing
NEW ROAD LINK(S) - South Oak Ridge Freeway, 404 Extension to Ravenshoe Rd.
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal Trips on SELected Major Roads) (veh/h) :



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

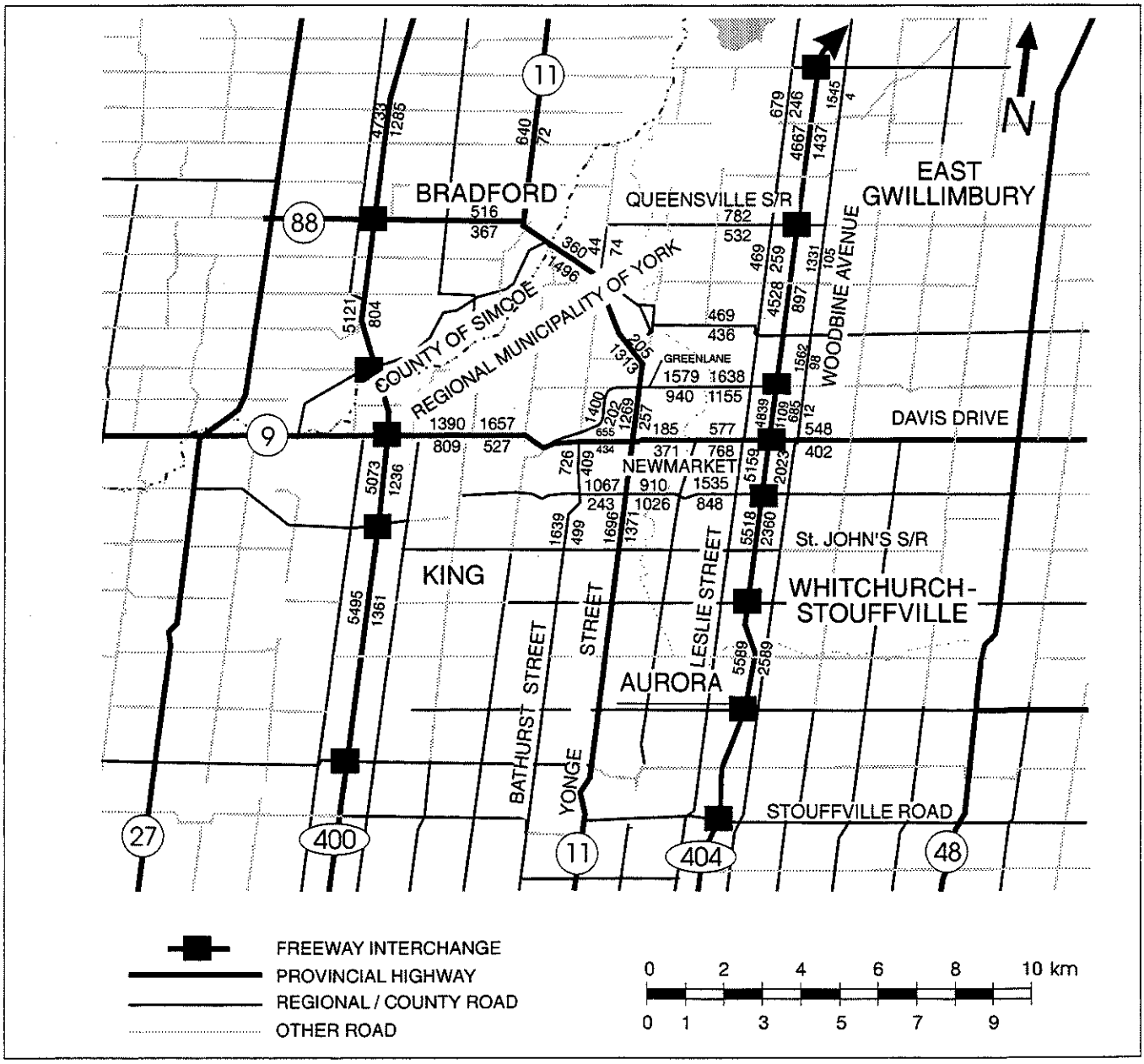
SCENARIO 14 : 9 linked to Green Lane (Run No. 10)

DATE OF RUN : 95/10/17

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Continuous 4 lane arterial (400 to 404)
NEW ROAD LINK(S) - 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

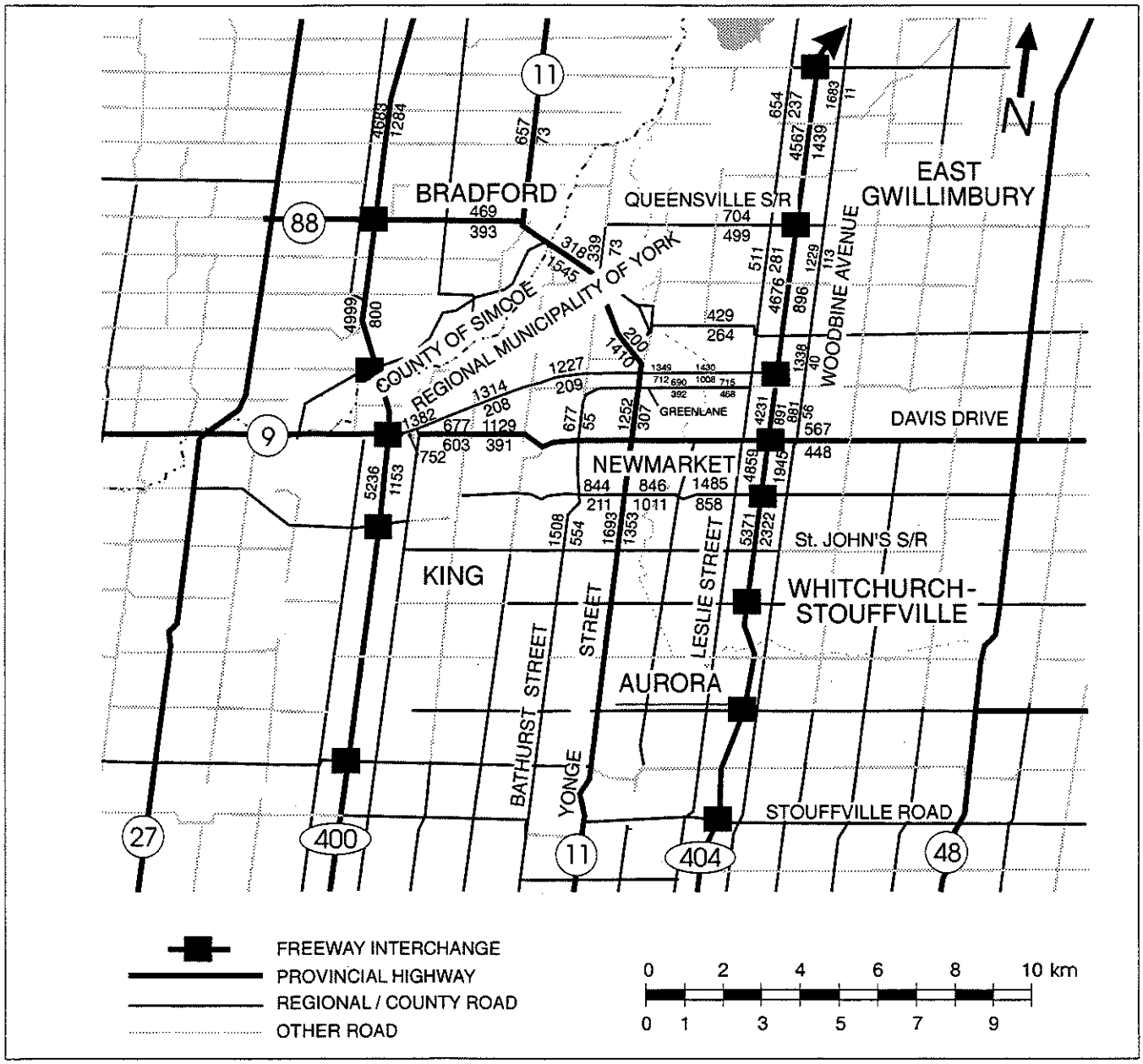
SCENARIO 15 : New 4 lane arterial north of Newmarket (Run No. 11)

DATE OF RUN : 95/10/17

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - 404 Extension to 48, New 4 lane arterial north of Hwy. 9 - Green Lane (400 to 404)
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

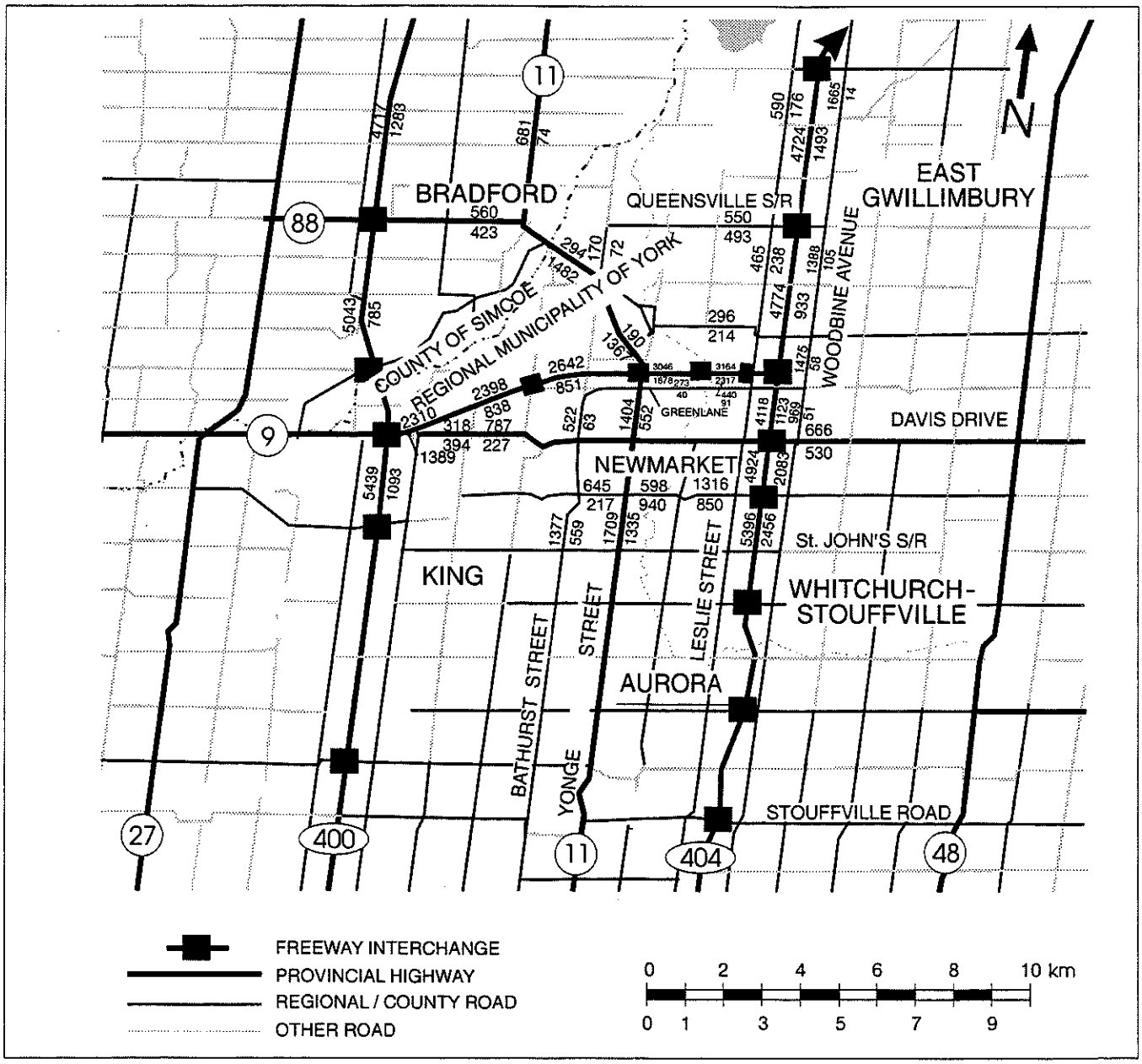
SCENARIO 16 : New 4 lane freeway north of Newmarket (Run No. 12)

DATE OF RUN : 95/10/17

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - 404 Extension to 48, new 4 lane freeway north of Hwy. 9 - Green Lane (400-404)
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

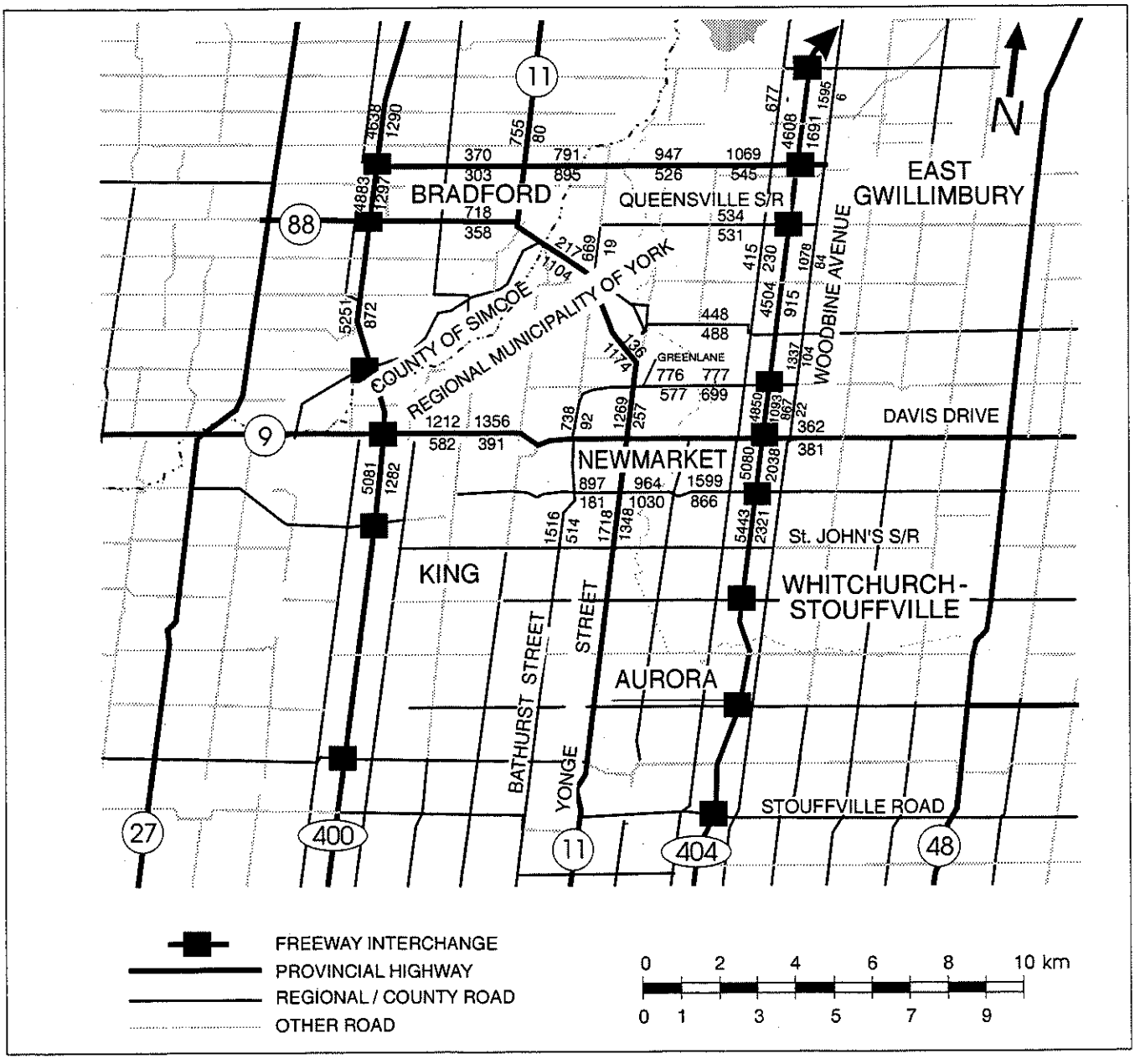
SCENARIO 17 : Bradford Bypass - arterial (Run No. 13)

DATE OF RUN : 95/10/17

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - Bradford Bypass 4 lane arterial, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

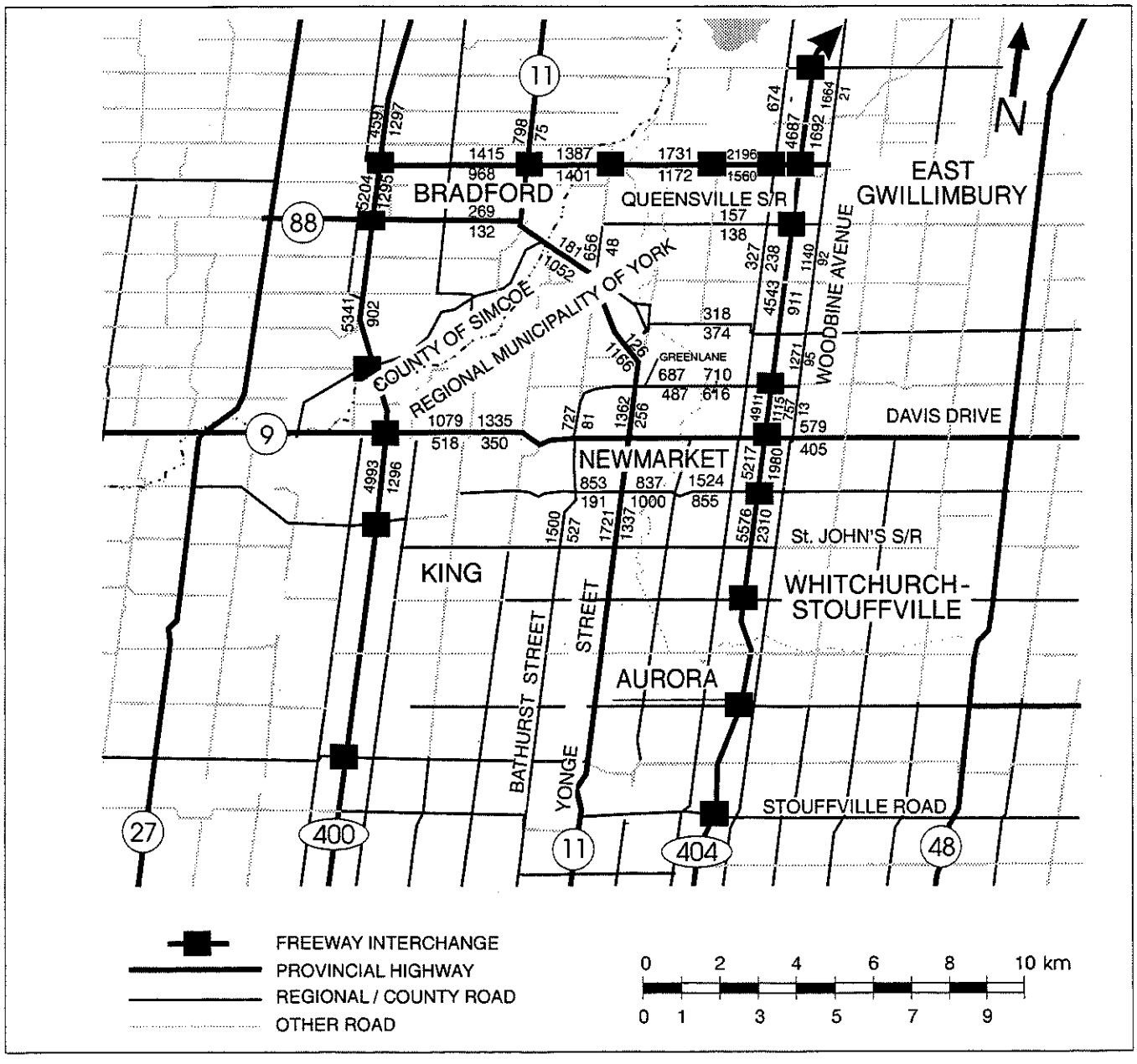
SCENARIO 18 : Bradford Bypass - freeway (Run No. 16)

DATE OF RUN : 95/10/17

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - Bradford Bypass 4 lane freeway, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

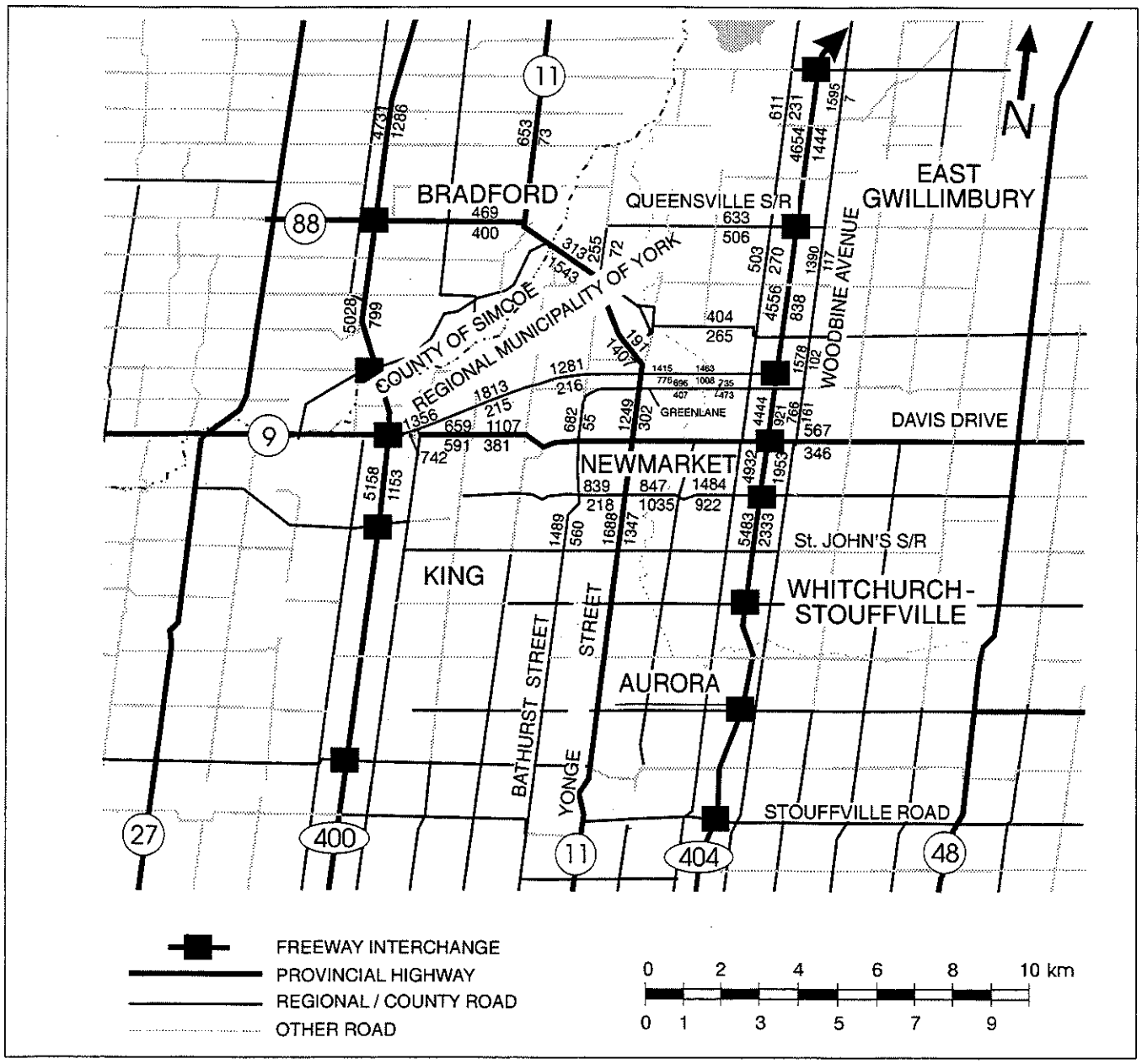
SCENARIO 19 : New 4 lane arterial north of Newmarket, 400 to Woodbine (Run No. 11)

DATE OF RUN : 95/11/03

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - 404 Extension to 48, New 4 lane arterial north of Hwy. 9 - Green Lane (400 to Woodbine)
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

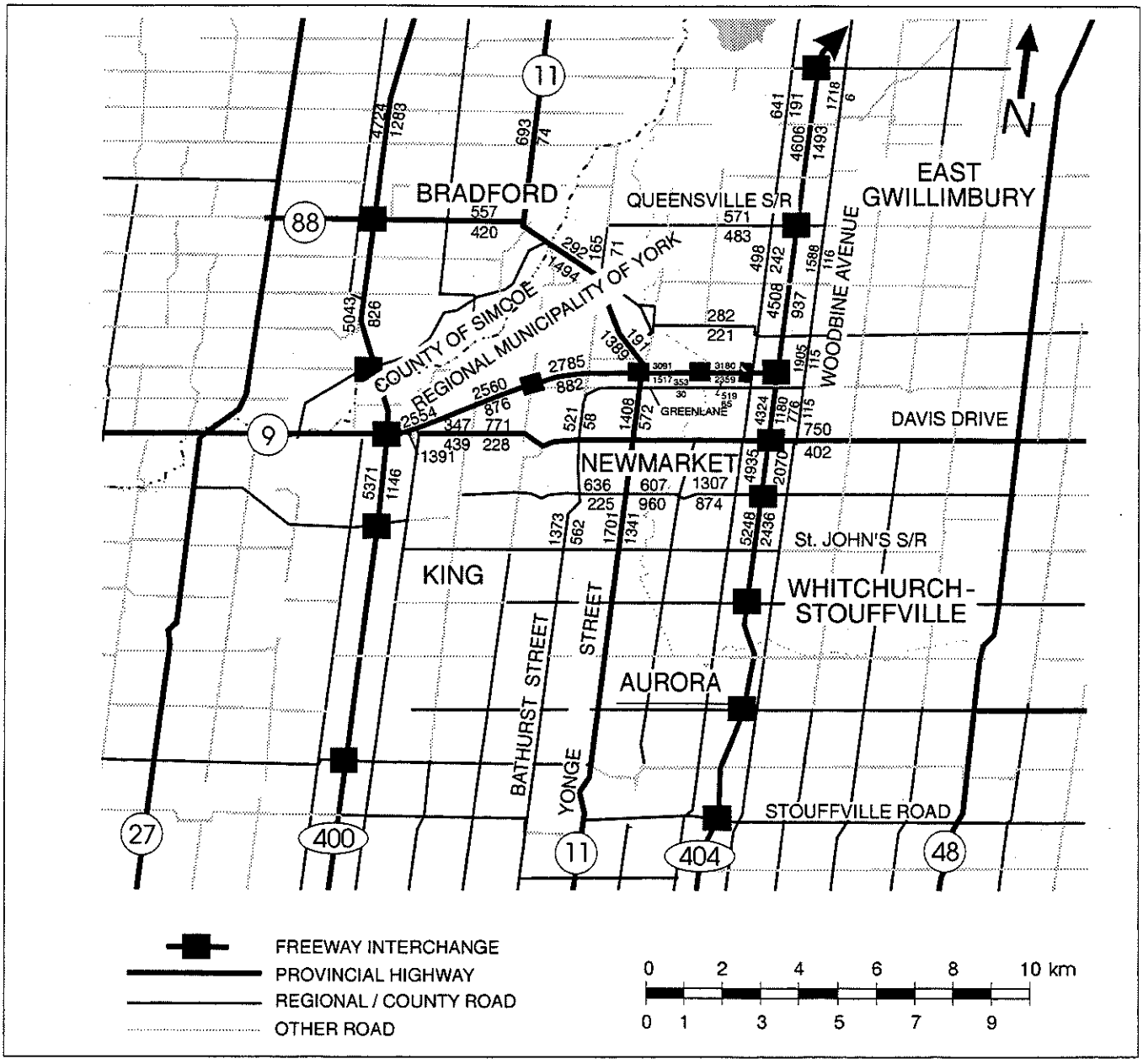
SCENARIO 20 : New 4 lane freeway north of Newmarket, 400 to Woodbine (Run No. 12)

DATE OF RUN : 95/11/03

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - 404 Extension to 48, New 4 lane freeway north of Hwy. 9 - Green Lane (400 to 404)
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

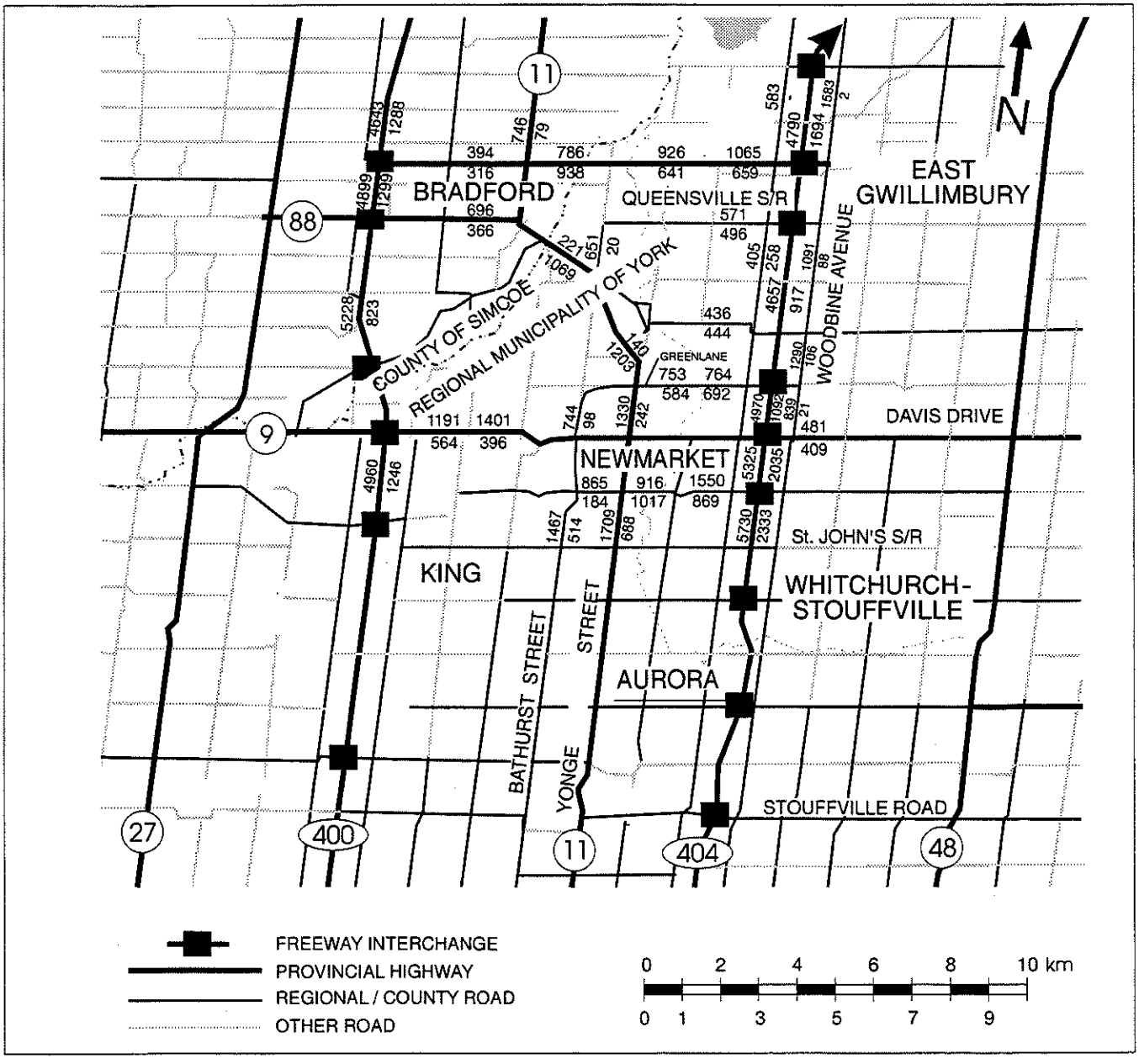
SCENARIO 21 : Bradford Bypass - arterial, 400 to Woodbine (Run No. 13)

DATE OF RUN : 95/11/03

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - Bradford Bypass 4 lane arterial, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

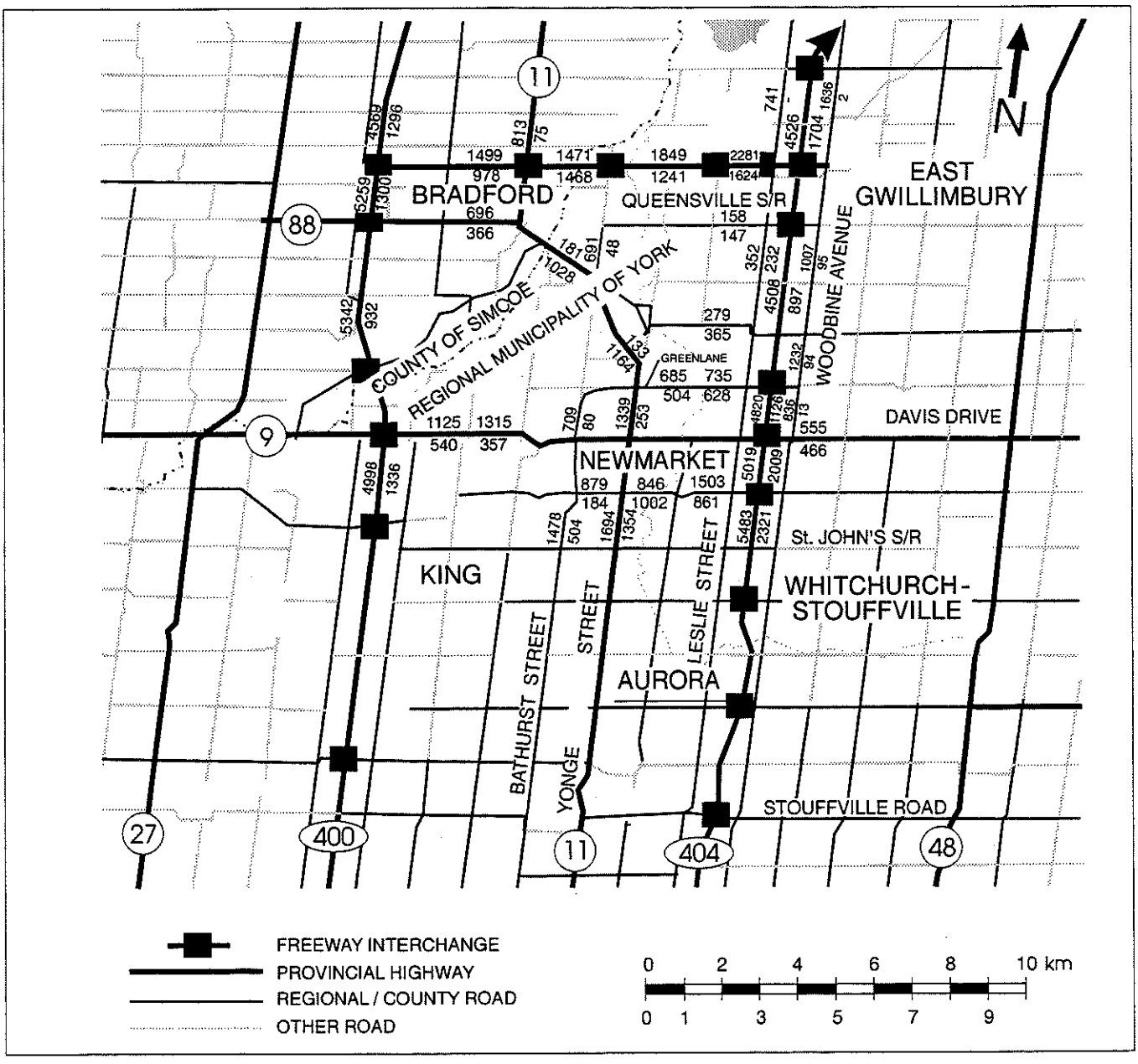
SCENARIO 22 : Bradford Bypass - freeway, 400 to Woodbine (Run No. 16)

DATE OF RUN : 95/11/03

MODEL TIME FRAME : 2011 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - Bradford Bypass 4 lane freeway, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF TRAVEL DEMAND FORECAST MODEL RUNS

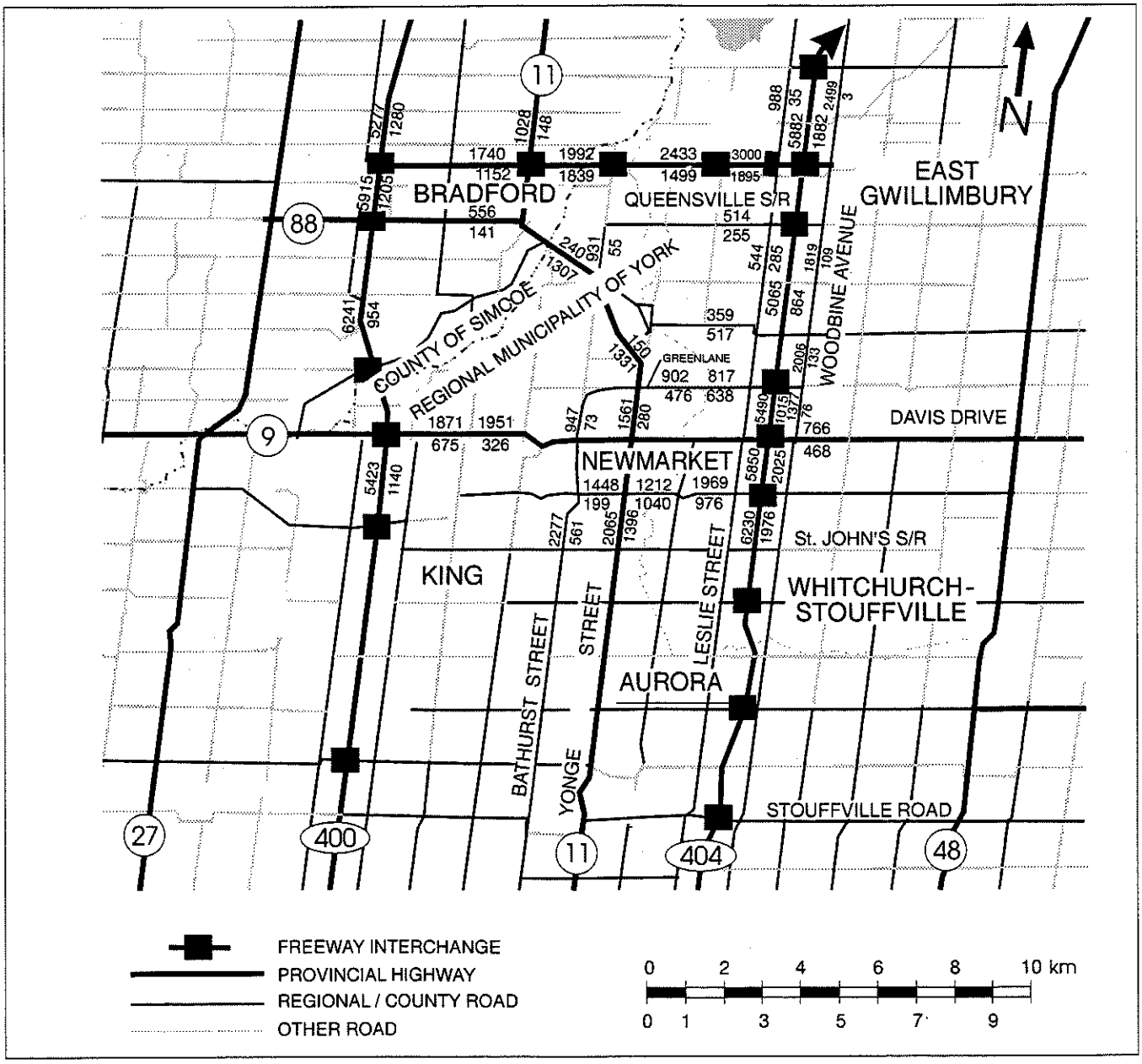
SCENARIO 23 : Bradford Bypass - freeway, 400 to Woodbine (Run No. 9)

DATE OF RUN : 95/11/20

MODEL TIME FRAME : 2021 AM Peak Hour

KEY FEATURES : HIGHWAY 407 - 6 Lanes
HIGHWAY 9 / GREEN LANE - Existing alignment at 4 lanes
NEW ROAD LINK(S) - Bradford Bypass 4 lane freeway, 404 Extension to 48
OTHER ROADS - Per York Region Draft O.P.

RESULTS (Interzonal trips on selected major roads) (veh/h)



2031 Weekday AM Peak Hour Vehicles

origin	destination groups 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	sum
Downtown Toronto	1	4,185	3,211	1,110	2,350	304	18	2	437	395	16	70	416	22	21	13	18	1,700	351	64	0	4	2	2	10	3	24	0	0	0	0	2	14,750
West Metro	2	9,577	31,453	2,515	7,786	296	14	7	3,559	6,363	254	100	1,130	207	235	50	71	10,010	3,491	427	0	2	6	2	15	6	57	3	5	0	0	6	102,453
Scarborough	3	4,940	4,012	26,917	12,834	1,167	39	7	5,440	608	140	47	1,537	157	255	54	76	1,765	332	28	0	2	6	4	11	3	20	2	3	0	0	11	59,919
Central Metro	4	12,598	11,354	8,867	29,949	789	19	3	4,593	2,899	62	68	2,309	230	299	59	55	3,628	445	96	0	6	9	5	5	10	52	9	4	1	0	3	79,168
South Durham	5	3,406	1,812	9,559	5,427	24,531	737	165	6,203	426	6	47	1,106	347	429	105	136	2,054	545	81	0	3	5	3	16	8	70	26	5	0	0	299	97,205
Uxbridge - Scugog	6	353	174	595	370	608	816	341	591	591	0	34	112	52	61	41	58	56	13	2	0	1	11	0	0	0	0	0	0	7	0	0	0	4,488
Brock	7	110	53	109	138	116	322	562	137	136	0	18	42	21	24	315	163	13	2	0	1	11	0	0	0	0	0	67	0	0	0	0	2,149
Markham	8	2,889	2,232	5,041	4,275	2,124	122	37	8,872	2,034	38	1,882	2,027	190	447	31	56	1,727	65	31	0	1	1	3	16	3	22	1	1	0	0	2	33,150
Vaughan	9	1,040	8,497	554	2,413	304	3	11	2,207	10,130	295	113	2,312	70	85	1	1	4,243	130	33	0	1	1	2	10	13	5	1	0	1	0	1	32,715
King	10	104	903	79	336	19	2	0	107	490	591	6	211	173	172	10	14	260	1	0	0	0	2	28	14	2	5	0	0	0	0	0	5,420
Whitchurch-Stouffville	11	73	68	497	237	103	24	8	1,854	48	5	367	74	189	213	35	49	73	82	0	0	0	0	27	0	0	0	0	0	0	0	0	4,006
Richmond Hill	12	1,401	1,571	1,015	2,705	1,161	167	29	5,117	3,680	177	217	5,386	531	903	30	40	882	193	7	0	0	18	1	8	11	4	0	0	0	0	0	23,256
Aurora	13	226	511	251	738	42	11	7	934	441	334	192	789	1,217	1,708	152	218	220	0	0	0	1	2	0	55	0	4	0	17	0	0	0	7,021
Newmarket	14	215	432	254	849	25	16	4	389	390	503	206	1,656	1,306	2,091	168	220	274	1	0	0	0	3	13	6	0	2	0	0	0	0	0	8,005
East Gwillimbury	15	53	123	174	162	15	39	32	385	214	41	48	357	378	534	697	1,011	10	7	0	0	0	8	43	1	4	2	1	0	0	0	0	4,187
Georgina	16	134	259	522	328	24	68	55	333	369	75	84	644	685	948	1,231	1,702	18	14	0	0	0	2	6	0	0	0	0	0	0	0	0	7,375
Peel	17	4,512	25,879	858	5,874	228	2	6	559	4,396	160	60	1,856	53	64	1	0	95,292	10,296	830	2	39	696	12	251	543	248	4	5	1	0	7	155,775
Halton	18	2,579	2,352	214	745	22	1	0	73	419	28	0	8	2	1	0	0	18,014	41,238	4,644	0	2	2	0	9	4	406	3	3	0	0	3	71,275
Hamilton	19	252	507	2	78	4	0	0	1	147	0	0	0	0	0	0	0	1,291	8,432	1,949	0	5	8	0	22	16	1,446	0	2	0	0	6	14,167
East Simcoe	20	12	50	5	15	5	0	2	3	5	0	4	0	0	6	0	1	18	3	0	0	272	114	1	21	6	2	1	5	0	0	1	838
North Simcoe	21	226	577	99	347	61	3	36	54	88	0	77	7	7	116	0	26	345	54	7	694	10,866	2,156	13	402	120	50	21	90	0	0	11	16,438
Barrie	22	175	499	75	152	4	0	0	28	181	4	0	13	38	93	27	6	254	17	2	10	151	4,573	41	418	4	14	0	0	0	0	1	6,709
Bradford	23	34	75	27	59	0	0	0	15	171	5	18	52	138	258	41	3	21	0	0	0	2	5	313	23	0	0	0	1	0	0	0	1,063
South Simcoe	24	253	1,166	59	286	9	5	0	134	515	132	10	78	42	274	50	11	800	53	0	2	31	712	258	3,120	30	23	2	0	0	0	2	8,016
Grey-Dufferin	25	205	350	105	97	0	0	0	59	250	9	49	0	0	6	0	0	1,549	66	3	14	221	26	0	67	10,198	689	0	0	0	0	4	13,985
SW Ontario	26	1,148	1,116	220	731	106	4	3	103	215	0	7	28	9	6	0	2	2,641	2,303	3,096	0	4	15	0	20	154	109,685	5	11	0	0	20	121,734
Victoria	27	350	175	351	140	1,277	168	197	161	14	0	0	74	0	0	0	10	129	0	0	3	43	4	0	8	0	29	4,990	6	3	0	340	8,001
Muskoka	28	50	70	0	164	26	0	0	57	1	0	0	1	0	0	0	0	112	0	0	0	135	0	0	35	0	36	0	5,300	11	0	5	6,011
Haliburton	29	104	51	1	1	53	0	0	1	1	0	0	1	40	0	0	0	32	0	0	1	18	0	0	0	0	0	101	32	964	0	13	1,412
N. Ontario	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. Ontario	31	544	366	341	407	2,477	17	0	87	99	0	0	33	0	0	0	9	294	12	0	0	7	4	0	7	0	99	209	2	4	0	16,916	31,852
	sum	52,978	119,950	60,858	79,669	35,971	3,619	1,514	58,111	35,551	2,643	5,702	31,418	6,003	9,262	2,891	4,010	155,855	66,145	11,097	737	13,126	8,574	785	4,563	11,137	113,973	5,403	5,500	983	0	17,664	989,674

2021 AM Peak Hour Vehicle Trips

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	sum
Downtown Toronto	1	4832	3852	1235	2413	372	16	1	529	601	10	73	468	20	18	11	15	1966	494	77	0	5	4	2	11	3	27	0	0	0	0	1	17056
West Metro	2	10475	33997	2681	7946	323	8	4	2874	7390	249	87	1153	212	246	40	59	20665	1750	486	0	3	7	2	12	7	63	3	3	0	0	4	110749
Scarborough	3	5066	4508	28115	12692	1363	27	0	6079	695	145	36	1444	156	246	44	65	2130	374	32	0	2	8	3	5	2	17	1	3	0	0	0	63266
Central Metro	4	13280	11561	9175	30557	836	10	0	4679	3482	66	52	2217	246	300	33	49	4242	535	111	0	5	12	6	4	11	56	0	3	0	0	1	81511
South Durham	5	4000	1963	11082	5950	30537	746	145	7876	1894	1	26	1221	277	432	104	135	2675	425	105	0	2	2	2	6	7	72	23	5	0	0	269	69284
Uxbridge - Scugog	6	430	238	481	414	733	965	403	715	583	0	18	140	60	69	37	60	71	15	3	0	0	0	0	0	0	0	7	0	0	0	9	5371
Brock	7	132	70	126	141	126	357	658	156	169	0	9	50	17	20	117	172	10	0	0	0	1	12	0	0	0	0	0	74	0	0	0	2410
Markham	8	2573	2497	5449	4580	2870	107	32	10772	3635	36	2356	2115	243	550	26	30	2016	74	39	0	0	0	2	13	2	19	0	1	0	0	1	40038
Vaughan	9	1186	9704	593	2563	460	1	11	2477	13186	301	73	3122	69	78	0	0	5897	153	39	0	0	0	0	0	10	3	0	0	0	0	0	39926
King	10	103	743	85	356	18	1	0	812	537	560	1	232	171	148	2	9	577	0	0	0	0	2	31	13	3	6	0	0	0	0	0	3710
Whitchurch-Stouffville	11	71	69	491	229	121	20	5	2217	58	2	253	74	192	200	27	42	75	101	0	0	0	0	26	0	0	0	0	0	0	0	0	4273
Richmond Hill	12	1768	1697	1000	3033	1074	177	34	3427	4735	224	178	5724	539	807	28	37	1088	213	8	0	0	24	0	3	11	4	0	0	0	0	0	25833
Aurora	13	272	598	324	957	55	4	4	449	597	441	212	1035	1549	1971	168	241	434	0	0	0	1	2	0	78	0	4	0	24	0	0	0	9420
Newmarket	14	227	426	253	960	24	2	0	393	510	337	189	1861	1414	2046	164	212	322	0	0	0	0	3	14	6	0	1	0	0	0	0	0	9364
East Gwillimbury	15	64	163	232	199	12	41	35	267	328	50	44	466	528	664	906	1282	12	11	0	0	0	11	63	1	5	3	1	0	0	0	0	5988
Georgina	16	162	312	432	421	25	76	63	485	590	100	82	876	943	1174	1569	2198	22	21	0	0	0	3	8	0	0	0	0	0	0	0	0	9553
Peel	17	6042	24230	962	5752	387	1	10	597	4645	659	33	1010	47	71	0	0	110287	12891	781	11	875	442	11	224	624	252	2	3	1	0	3	168953
Halton	18	2796	2707	215	771	20	0	0	72	463	28	0	7	0	0	0	0	24334	50941	5298	0	2	3	0	9	4	444	4	3	0	0	5	88131
Hamilton	19	240	491	2	71	3	0	0	1	138	0	0	0	0	0	0	0	1366	9525	2132	0	3	8	0	21	15	1419	0	2	0	0	6	15425
East Simcoe	20	16	39	7	15	4	0	2	4	5	0	5	0	0	7	0	2	21	4	1	0	721	155	1	27	8	2	1	6	0	0	0	1053
North Simcoe	21	297	752	140	299	73	4	45	76	106	0	85	7	8	138	0	33	432	85	10	874	13698	2948	17	520	158	40	26	112	0	0	14	20997
Barrie	22	244	607	92	175	4	9	0	32	204	5	0	16	45	101	38	7	308	26	3	12	182	5987	50	519	6	18	0	10	0	0	2	8693
Bradford	23	45	79	36	84	0	0	0	18	239	7	14	66	176	312	55	4	32	0	0	0	2	7	408	31	0	0	0	1	0	0	0	1616
South Simcoe	24	329	1358	74	377	9	6	0	176	651	145	8	89	51	383	67	14	1095	54	0	2	38	943	331	4046	42	28	2	0	0	0	3	10251
Grey-Dufferin	25	257	429	139	113	0	0	0	73	331	12	34	0	0	6	0	0	2052	126	4	17	274	34	0	78	13013	901	0	0	0	0	4	17897
SW Ontario	26	1425	1329	282	890	222	4	3	123	271	10	5	34	8	8	0	2	3473	3304	4334	0	5	17	0	25	197	139842	5	12	0	0	23	155853
Victoria	27	496	244	440	178	1551	198	252	205	30	0	0	99	0	0	0	12	175	0	0	3	55	6	0	0	0	40	6309	7	3	0	435	10738
Muskoka	28	66	86	0	210	30	0	0	67	0	0	0	0	0	0	0	0	150	0	0	0	11	875	0	0	46	0	49	0	6739	14	0	7649
Haliburton	29	130	70	0	0	61	0	0	1	1	0	0	1	61	0	0	0	8	0	0	2	24	0	0	0	0	0	0	129	41	1225	0	1620
N. Ontario	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E. Ontario	31	777	479	443	527	3016	20	0	113	126	0	0	37	0	0	0	0	396	39	0	1	9	5	11	9	0	836	266	3	5	0	21609	28007
	sum	57841	125280	64586	82873	44307	2791	1700	45068	45430	2886	3873	23564	7032	9925	3427	4650	186331	80441	13443	934	15395	10633	988	5707	14128	143466	6855	6978	1248	0	22419	1034211

APPENDIX B

Comparison of Alternative Routes within Bradford Corridor and Newmarket Corridor

HIGHWAY 400 - HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS)

ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

COMPARISON OF ALTERNATIVE ROUTES WITHIN NEWMARKET (HIGHWAY 9 - GREEN LANE) CORRIDOR AND BRADFORD CORRIDOR

DECEMBER, 1995

Ontario Ministry of Transportation

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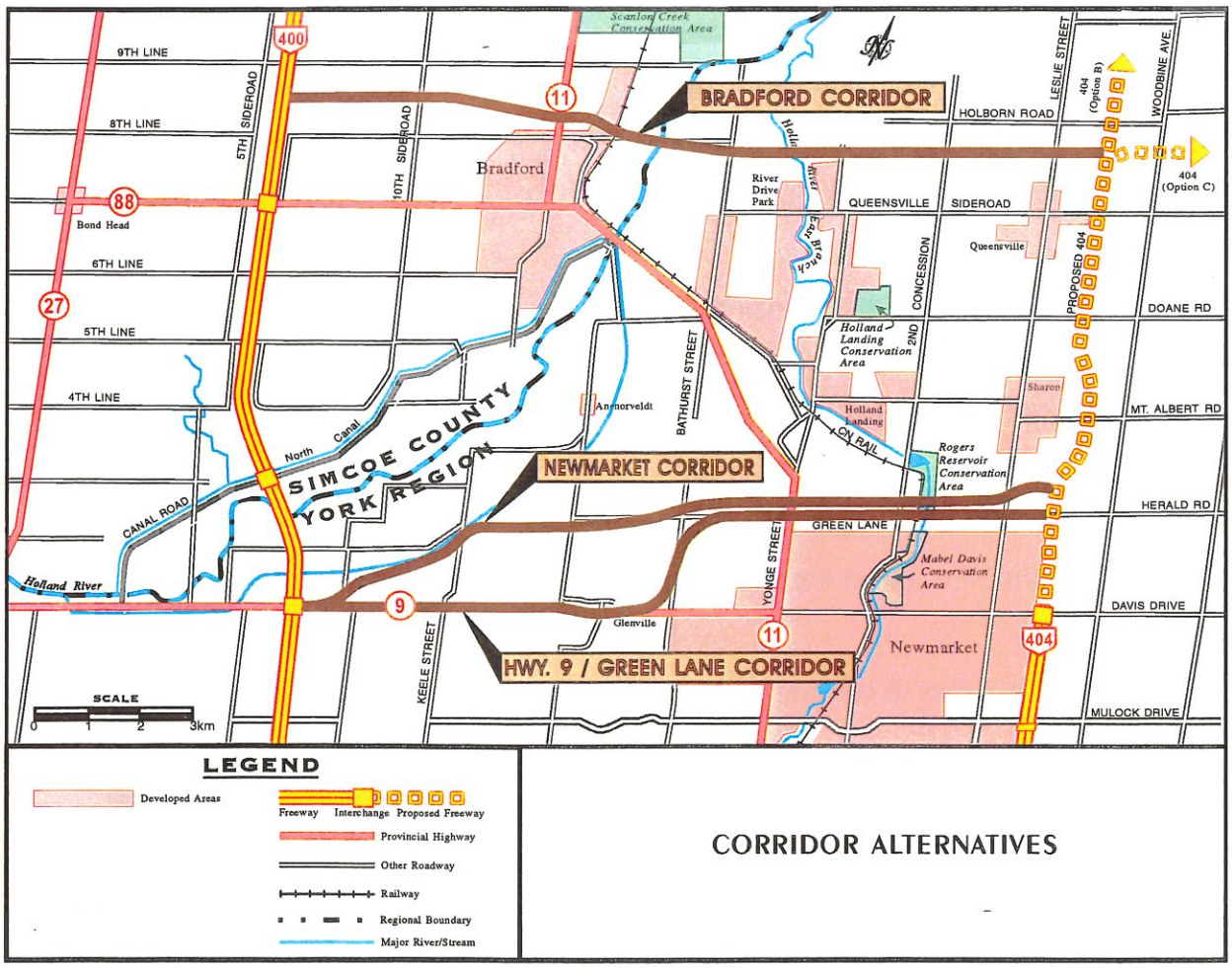
EXECUTIVE SUMMARY

Travel demand generates need for new east - west roadway ...

Long range traffic demand forecasts show the need to protect for a four lane high-standard roadway between Highway 400 and (extended) Highway 404 in northern York Region / southern Simcoe County. This demand is over and above that accommodated by the short term road improvements underway in the area, such as the four laning and linkage of Highway 9 and Green Lane.

Three corridors studied ...

Representative highway and freeway alternatives were therefore compared, using three different routes as shown on the map.



Significant constraints to new road development exist in the study area, such as the Holland Marsh, Oak Ridges Moraine, wetlands, and urban(izing) areas. These constraints largely define the available envelopes for an east - west route.

Highway 9 - Green Lane Corridor rejected ...

The Highway 9 - Green Lane corridor was set aside because, as a highway, it would not have adequate capacity for long term needs, while reconstructing it as a freeway would have a significant negative effect on the surroundings with no appreciable advantage over the other freeway options. It is for the latter reason that both the other corridors feature new alignments rather than attempting to use parts of the existing road network.

Analysis focused on Bradford and Newmarket corridors ...

For the Newmarket and Bradford corridors, the analysis focused on comparable freeway schemes, with highway options in those same corridors treated simply as construction staging opportunities (e.g. build initial roadway as two- or four-lane highway within a freeway right-of-way, then expand to full freeway operation as demand grows and funding is available).

Bradford Corridor has significant advantages ...

The analysis of the two corridors showed that the Bradford corridor would be:

- significantly better at expanding the transportation network and producing related travel benefits (the Newmarket corridor simply adds capacity to an existing network link);
- substantially easier to construct, particularly the interchanges at Highways 400 and 404;
- beneficial to both Bradford and Newmarket, to the extent that it is almost essential to the community development aspirations of Bradford;

- less widespread in its potential negative effects on residential areas, particularly as land in the Holland Landing - Sharon - Newmarket area becomes urbanized; and

- physically and environmentally feasible.

Newmarket Corridor avoids wetlands ...

The advantages of the Newmarket Corridor stem largely from the avoidance of the Holland River and associated wetlands. Given that previous work has established the viability of the Bradford corridor's river crossing concept, this issue is not significant enough to outweigh the considerable functional advantages of being in the Bradford corridor.

Recommend protection for a freeway in the Bradford Corridor ...

Overall, therefore, this analysis of the concept of a new freeway in either the Bradford or Newmarket corridor points decisively to the Bradford area as the better choice. In combination with the ongoing improvement of Highway 9 and Green Lane, the protection of a 100 m wide east - west property envelope between Highway 400 and (extended) Highway 404 north of Bradford and Queensville will provide for the optimum long range road transportation network for the area. The recommended plan will be capable of achieving all of the goals set out in the Highway 400 to Highway 404 Extension Environmental Assessment Study. Further consideration of a new freeway in the Newmarket corridor is not recommended in the context of the current study.

1. BACKGROUND

The Ministry of Transportation of Ontario's study of potential transportation improvements for east-west long distance travel south of Cook's Bay has focused on a new controlled-access roadway located immediately north of Bradford and Queensville extending between Highway 400 and a future northerly extension of Highway 404. The process which led to that corridor (referred to as the "Bradford Bypass") included confirmation of the rejection of an earlier proposed highway immediately south of Cook's Bay lined up with Ravenshoe Road (known as Highway 89 Extension) on the basis of natural environmental impacts on the Keswick Marsh, along with a broad review and screening of other corridor possibilities in the Newmarket, Aurora and Richmond Hill areas. These more southerly corridors were found to be less desirable in terms of transportation function and, in general, similar or worse with respect to impact on the social and natural environments compared to the Bradford Bypass concept and were set aside on that basis. The analysis of alternative corridors is documented in the Environmental Assessment Proposal for the Highway 400-404 Link study, published in September 1994.

With the subsequent development of specific route alternatives in the Bradford Bypass corridor some concerned residents challenged the rationale for setting aside the more southerly routes and, more specifically, promoted use of an improved Highway 9 / Green Lane corridor instead of the Bradford route.

In view of the strong interest among some members of the public in pursuing this idea (the intent being that the need for a new roadway across the Holland River in the area of River Drive Park would be eliminated if improvements were made in the Highway 9 / Green Lane corridor instead), a more detailed examination of alternatives in the Highway 9 / Green Lane corridor was undertaken. These alternatives were then compared to alternatives in the Bradford area. For ease of reference, the subject corridor may be termed the "Newmarket Corridor". This report documents the analysis undertaken.

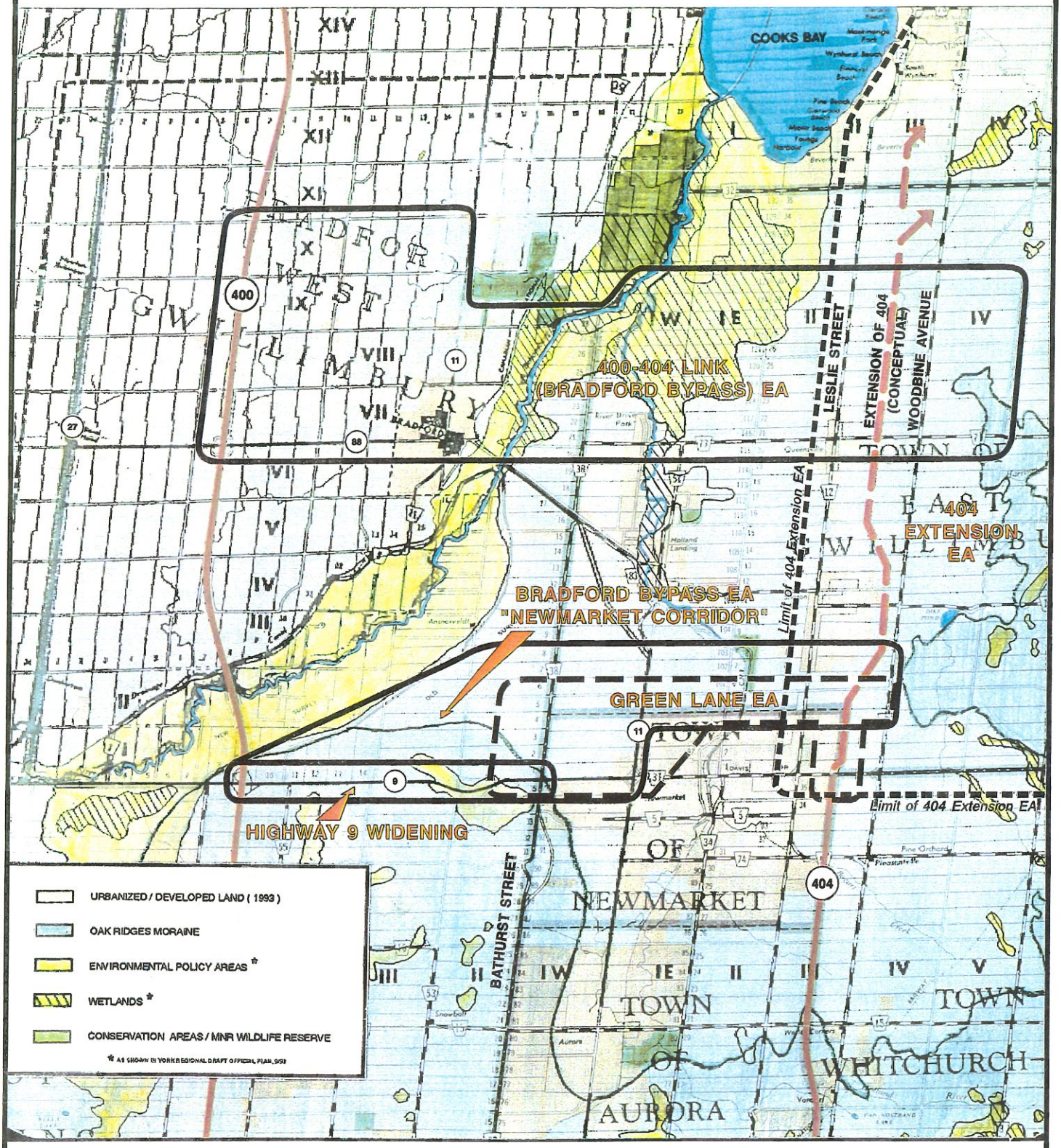
2. STUDY AREA FOR NEWMARKET CORRIDOR

In order for a full and proper comparison of alternatives to be made, both an upgrade of the existing Highway 9 - Green Lane road system and development of a new roadway in the same general vicinity are to be considered.

The area being studied near Newmarket for an east-west link between Highways 400 and 404 is therefore based on the availability of undeveloped land in and around the Highway 9 - Green Lane route (see Exhibit 1). The area is bounded on the north by the Holland Marsh farming area and by the communities of Holland Landing and Sharon. Each of these features is considered a constraint on the development of new roadway alternatives.

A combination of constraints defines the southern boundary as being Highway 9 and the urbanized portion of Newmarket: the rugged topography of the Glenville Kame area (Dufferin Street / Highway 9), the environmentally significant and sensitive Oak Ridges Moraine, regional Environmental Policy Areas, and the near-continuous band of existing and planned urban development between Bathurst Street and Bayview Avenue south of Green Lane. In light of these constraints, it is not considered reasonable to identify the area south of Highway 9 as having the potential to accommodate a new east-west highway between Highway 400 and Highway 404.

Exhibit 1 also shows the area of the concurrent Region of York Green Lane Improvement Study and the location of the Ministry of Transportation's planned widening of Highway 9.



STUDY AREAS

Ministry of Transportation
Ontario

BRADFORD BYPASS : HIGHWAY 400 TO HIGHWAY 404 EXTENSION
ROUTE LOCATION AND PRELIMINARY DESIGN STUDY
W.P. 377 - 90 - 00

EXHIBIT
1

3. BACKGROUND DOCUMENTATION AND STUDY AREA CONDITIONS

This section focuses exclusively on the Newmarket (Highway 9 - Green Lane) Corridor; the study area for the Bradford - Queensville corridor has been documented separately in the Technical Reports for the Bradford Bypass study.

3.1 INFORMATION SOURCES

The analysis of alternatives in the Highway 9 - Green Lane area is built on secondary source information, supplemented by field observation and general research, and discussion with members of the public and regional and municipal staff. Additional resources include base mapping, street maps, road and area plans, and aerial photographs. Travel demand forecast computer modelling is used to compare the different alternatives by applying common input data to the road network for each alternative. Material available through the concurrent Green Lane Corridor Class EA Study was referred to as appropriate.

The level of detail of information required to complete the analysis varies according to the measure / indicator used, but it is not the intent of this investigation to work at a preliminary design level of detail. Rather, the analysis is at a broader level of detail, so that a decision can be made at the end of the process as to whether the Highway 9 - Green Lane corridor is feasible and has sufficient merit relative to the Bradford corridor to warrant the additional fieldwork, consultation, research, and expenditure to gain more detailed information (and whether or not additional detail would alter the conclusions of a comparison between a 400 - 404 link in the Newmarket area and one in the Bradford area).

Specific documents referred to in the course of developing and analysing alternatives in the Newmarket corridor include:

Official Plans and Related Material

- Region of York Official Plan, October 1994
- Town of Newmarket Draft Official Plan, October 1994
- Town of East Gwillimbury Draft Rural Area Plan (OPA 21), August 1994
- Township of King Draft Official Plan, November 1990
- Township of King Draft Strategic Plan, September 1995
- Northwest Newmarket - Basis Document and Draft Secondary Plan, March 1995
- Town of East Gwillimbury Sharon Community Plan (OPA 55)
- Town of East Gwillimbury Draft Holland Landing - River Drive Park Community Plan (OPA 60)

Transportation Studies

- Route Location and Traffic Study for Sharon Community (Phases 1, 2 and 3), Town of East Gwillimbury, June 1994 - March 1995

- Environmental Study Report - Leslie Street from Wayne Drive to Green Lane / Herald Road, Towns of Newmarket and East Gwillimbury, February 1995

- Preliminary Design Report, Highway 9 from Weston Road to Bathurst Street, MTO, to be published 1995

- Highway 11 Study for Provincial Highway Transfer, York Region, March 1993

- Environmental Assessment Proposal, Highway 400 to Highway 404 Extension (Bradford Bypass) Environmental Assessment Study, MTO, September 1994

- Green Lane Corridor Class EA and Preliminary Design Study, York Region, in progress

- Travel Demand Modelling by Cole Sherman, 1994 and York Region, 1995.

Environmental Studies and Related Material

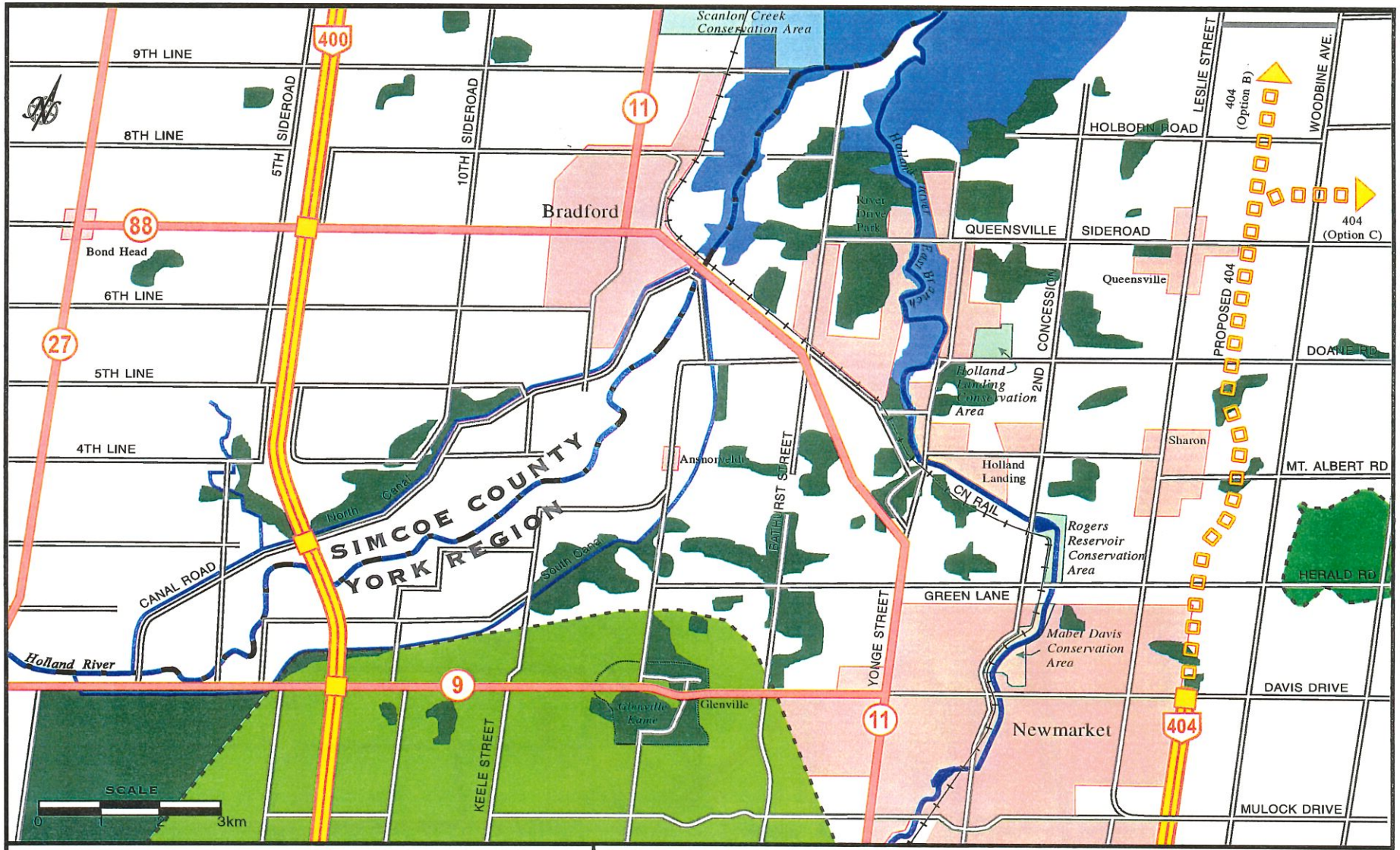
- Environmentally Significant Areas Study, South Lake Simcoe Conservation Authority, 1982

- Environmental Features Mapping, Oak Ridges Moraine Technical Working Committee, April 1993

3.2 STUDY AREA CONDITIONS

The Highway 9 - Green Lane study area is currently rural in nature, with a mix of agricultural activities and natural (woodlot) areas. Some development has occurred along Highway 9 (golf course, lot severances, etc.) and pressure for development and urbanization continues to grow, particularly east of Bathurst Street where the area abuts the urban boundary of Newmarket. While some sensitive natural areas are present, environmental concerns do not dominate the area.

A more detailed review follows, using a set of five maps to illustrate key Natural, Social, Economic (Land Use), Cultural, Transportation and Utility features.

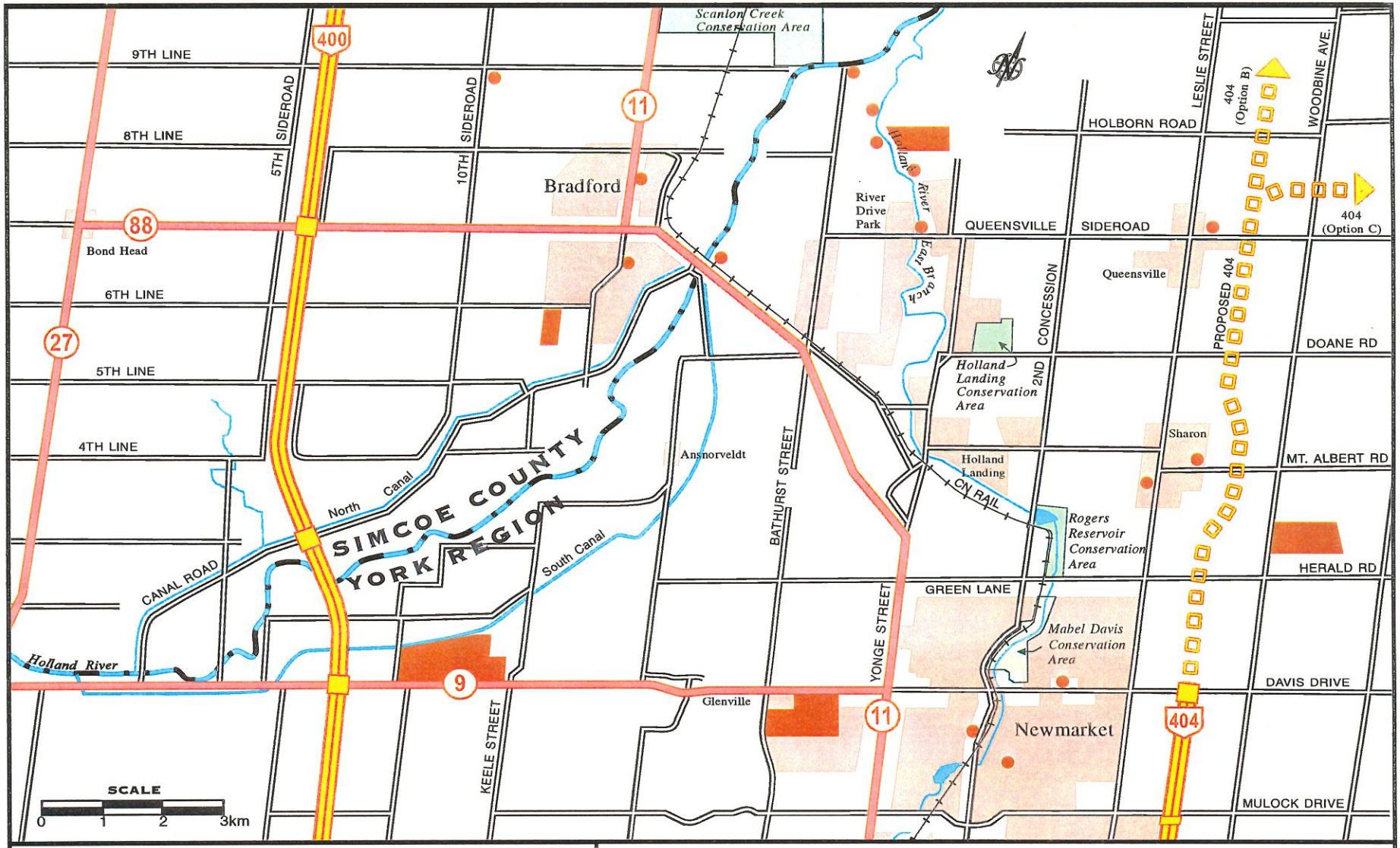


LEGEND

- Developed Areas
- Class One Wetland
- Conservation Area
- Woods
- Boundary of Oak Ridges Moraine
- Major River/Stream
- Freeway / Interchange / Proposed Freeway
- Provincial Highway
- Other Roadway
- Railway
- Regional Boundary

STUDY AREA CONDITIONS
NATURAL ENVIRONMENT

EXHIBIT 2

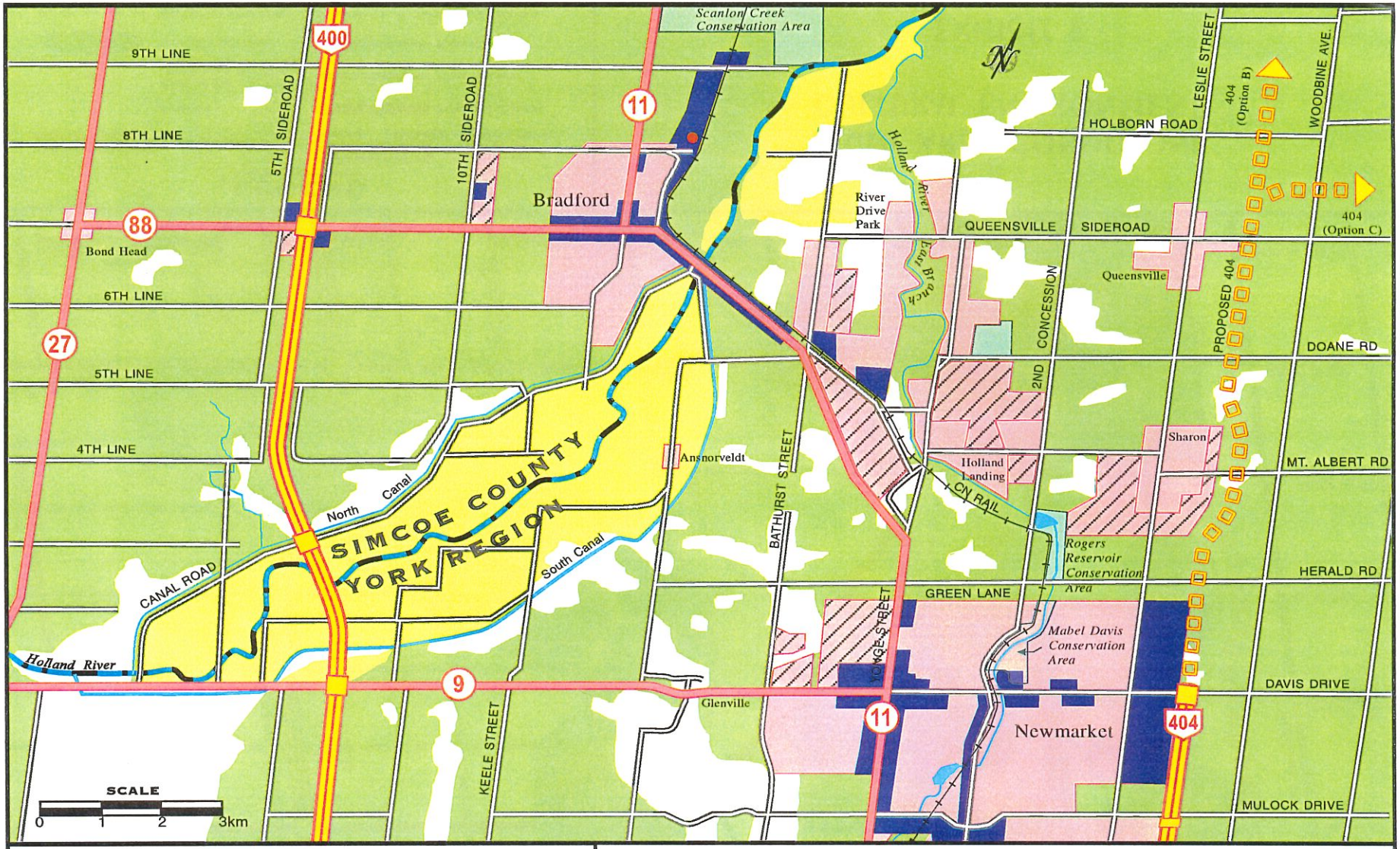


LEGEND

- Significant Recreation Centres (Golf Course, Marina, Arena, Sports/Arts Complex etc.)
- Residential land use
- Freeway / Interchange / Proposed Freeway
- Provincial Highway
- Other Roadway
- Railway
- Regional Boundary
- Major River/Stream

STUDY AREA CONDITIONS
SOCIAL ENVIRONMENT

EXHIBIT 3

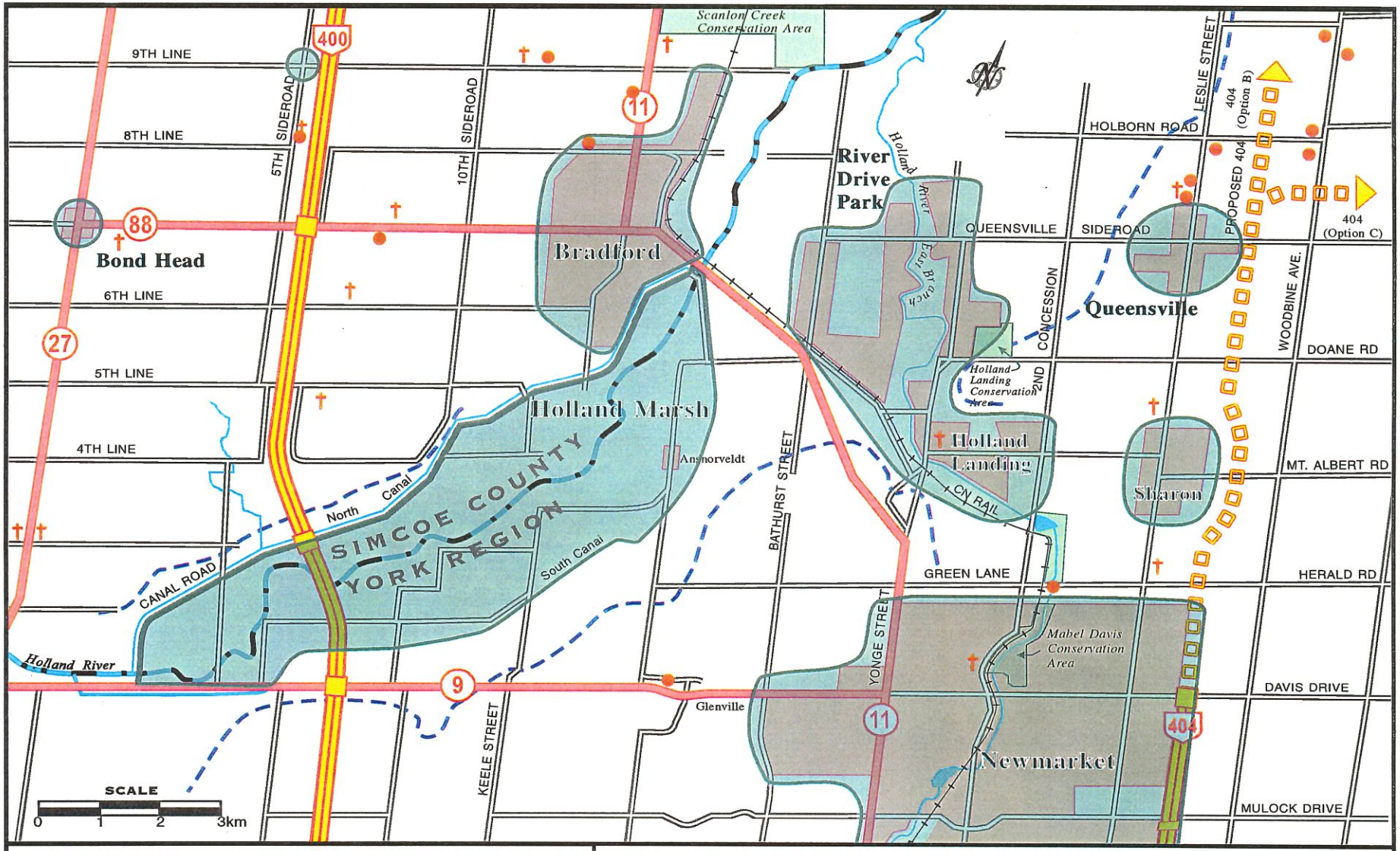


LEGEND

- Landfill site (closed 1960)
- Office/Commercial/ Industrial land use
- Residential land use
- Proposed urban development
- Specialty Agriculture (Muck Farming)
- Agriculture/Rural Residential
- Freeway / Interchange / Proposed Freeway
- Provincial Highway
- Other Roadway
- Railway
- Regional Boundary
- Major River/Stream

STUDY AREA CONDITIONS
ECONOMIC ENVIRONMENT

EXHIBIT 4

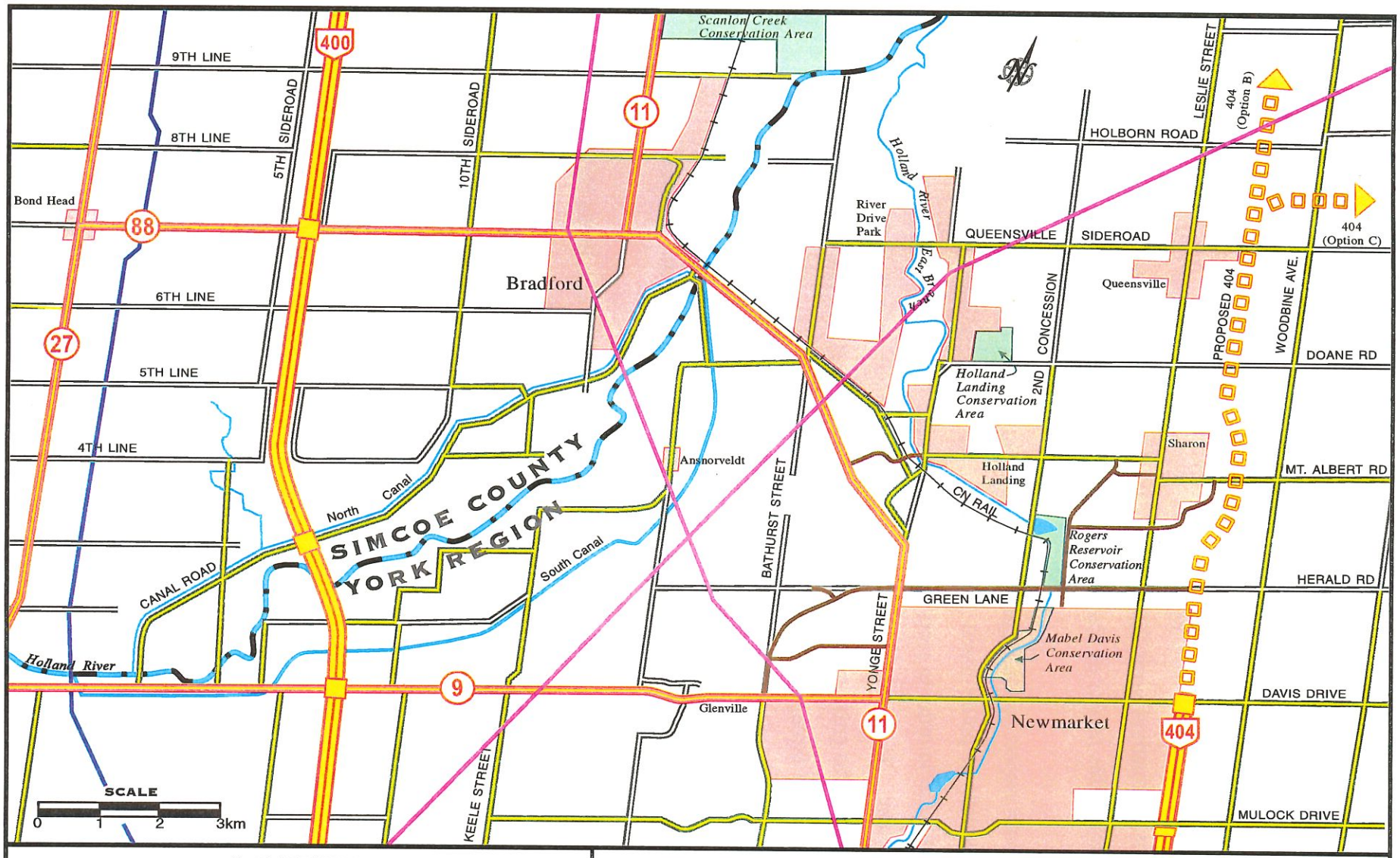


LEGEND

- Developed Areas
- Cemetery
- Heritage Site (Exceptional Significance)
- Cultural Landscapes
- Glacial Shoreline Ridge
- Freeway / Interchange / Proposed Freeway
- Provincial Highway
- Other Roadway
- Railway
- Regional Boundary
- Major River/Stream

STUDY AREA CONDITIONS
CULTURAL ENVIRONMENT

EXHIBIT 5



LEGEND

- Developed Areas
- Electric Power Lines
- Gas Pipelines
- Paved Municipal road
- Planned/Proposed Municipal Roads
- Freeway, Interchange, Proposed Freeway
- Provincial Highway
- Other Roadway
- Railway
- Regional Boundary
- Major River/Stream

STUDY AREA CONDITIONS
TRANSPORTATION AND UTILITIES

EXHIBIT 6

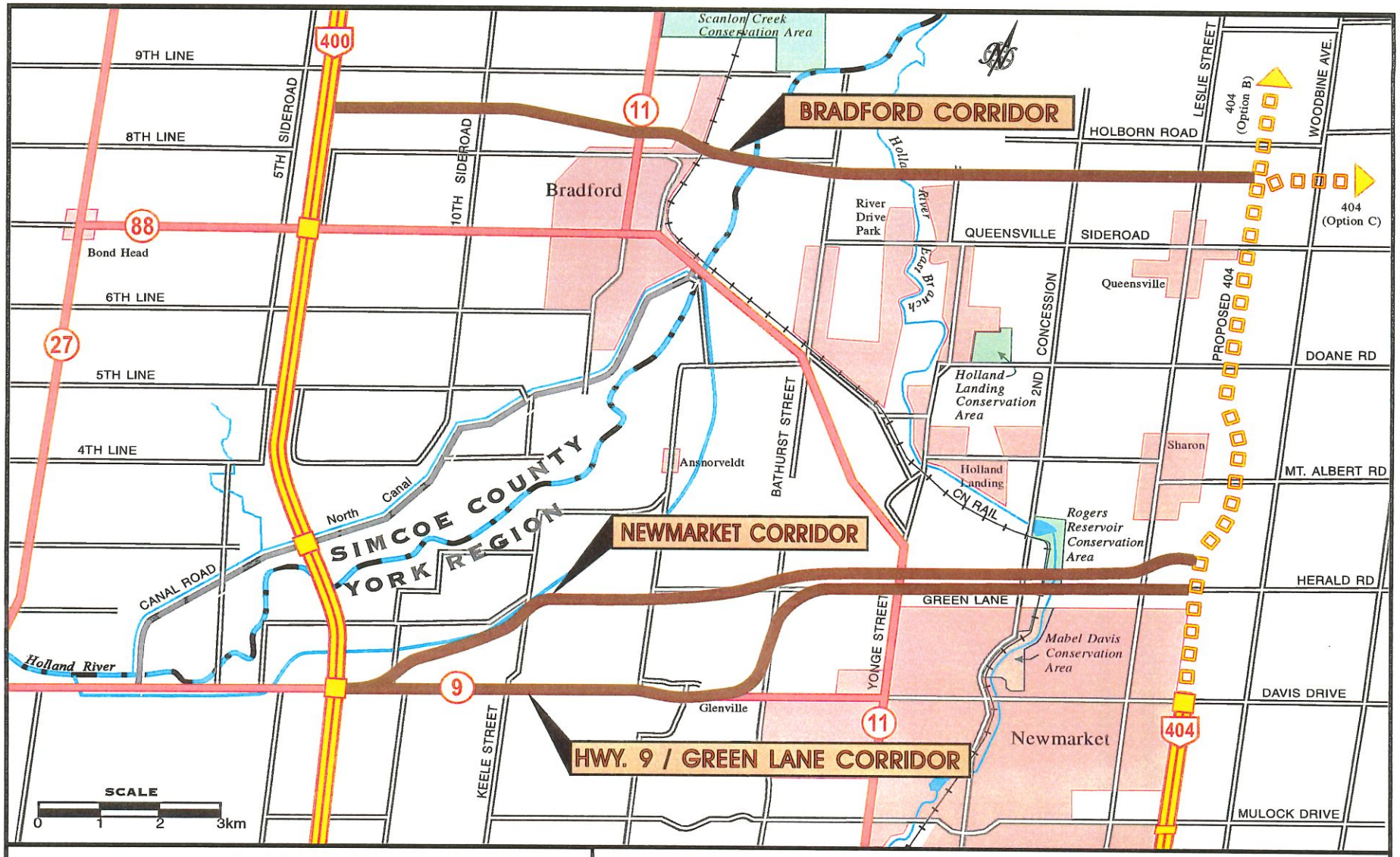
4. ROUTE GENERATION CRITERIA

The Bradford Bypass Environmental Assessment (EAP) addresses the generation of alternative routes for a 400-404 Link by referring to all of those developed in previous studies and noting that "in every case alternatives were developed with the intent of achieving functional goals while having an acceptable impact on the environment".

A second factor with respect to route generation is the presence of significant constraints, be they natural, man-made or policy-based. A basic premise is to avoid such areas as much as possible with a new road in order to reduce the risk of significant negative impact on the social or natural environment. While this principle is sometimes at odds with the desire to improve transportation service to the greatest number of people, it is not generally acceptable to construct a new multi-lane roadway through the midst of a developed area unless a corridor has previously been reserved for that purpose.

The route generation criteria used previously continue to apply in the Newmarket area.

The purpose of this investigation is to compare the concept of a 400-404 link in the Newmarket area with one in the Bradford area; it is not a detailed design study of all conceivable routes in the Highway 9 - Green Lane Corridor. Thus, only two routes need to be produced in the Newmarket area - one representing the ideal of upgrading existing Highway 9 - Green Lane route (including a link between the two in the vicinity of Bathurst Street) and a second on a representative new alignment which takes into consideration the significant constraints identified in Exhibits 2 to 6. As shown on the following Exhibit 7, this latter premise puts a new route to the north of existing Highway 9 and Green Lane, to avoid the Oak Ridges Moraine, Holland Marsh farming area, and Glenville Kame on the west and the developed part of Newmarket in the east. This does not mean that a new route could not be considered in another location within the study area; rather, it indicates that, based on current knowledge of the constraints, issues and likely impacts of a new road, a reasonable initial premise is to use a route which physically avoids major areas of sensitivity to the greatest extent possible. For the link between Highway 9 and Green Lane in the first case,



HIGHWAY 400 - HIGHWAY 404 LINK
ROUTE ALTERNATIVES FOR ANALYSIS

EXHIBIT 7

it is assumed for the sake of analysis that the route shown in the Northwest Newmarket Secondary Plan is the most reasonable concept to use of all those being considered in the Region's current Green Lane Corridor Class EA Study.

The exhibit also shows the route which best represents the concept of a new road in the Bradford Corridor, as developed in previous phases of this study.

5. ROUTE ALTERNATIVES

The Environmental Assessment Proposal for this study documents the need for an improved linkage between Highways 400 and 404 south of Lake Simcoe. The order of magnitude of the additional future travel demand will, in the long term, exceed the capacity of a two lane road. The long range demand on a single new facility (particularly if no alternative routes are put in place) will be well within the capacity range of a four lane freeway.

The Ministry of Transportation has proposed that such a link be located in the Bradford - Queensville area south of Lake Simcoe, while some suggestions have been made by the public that the Highway 9 (Newmarket) corridor could be upgraded to achieve a similar effect instead. In the latter case, there are plans already in place or underway for the upgrading of Highway 9 and of Green Lane and the linkage of the two to form a continuous basic four lane high-standard arterial roadway extending from Highway 400 to a northerly extension of Highway 404. These plans are anticipated to be realized within the next five to ten years and form a "base case" over and above which long term needs remain as noted above.

Alternative methods of accommodating the long term demand in the Highway 9 / Green Lane corridor therefore focus on the addition of a four lane roadway to the "base case", either on the existing alignment or on a new alignment.

Transforming the existing Highway 9 - Green Lane route to a controlled access fully divided freeway would require that two-way service roads be provided on each side of Highway 9 between Highway 400 and Bathurst Street in order to maintain access to all of the properties which front on the highway and would otherwise have no access. There are fewer fronting properties on the Green Lane segment of the route, but the need for property access and local movement would dictate that a parallel arterial road system be put in place on both sides of the freeway there as well. Thus a freeway in the Highway 9 - Green Lane corridor would, for the most part, be <u>in addition</u> to the currently planned upgrading of the route to four lane arterial standards, not as a replacement.

In the case of a new road alignment in the same general area, local access would be provided by Highway 9 - Green Lane and other roads, so that the design of a new route would focus on longer distance through traffic with little need for local access.

Such a roadway could be either an at-grade facility or a fully grade-separated freeway. The level of demand and the users' needs for a safe, high-standard, high-speed facility dictate that a four lane divided plan be used. The difference in capacity, operational performance, geometric design, property requirements, and access control between a freeway and an arterial highway are significant enough that they should be treated as two distinct "alternative methods" even though the same alignment would be used for either plan.

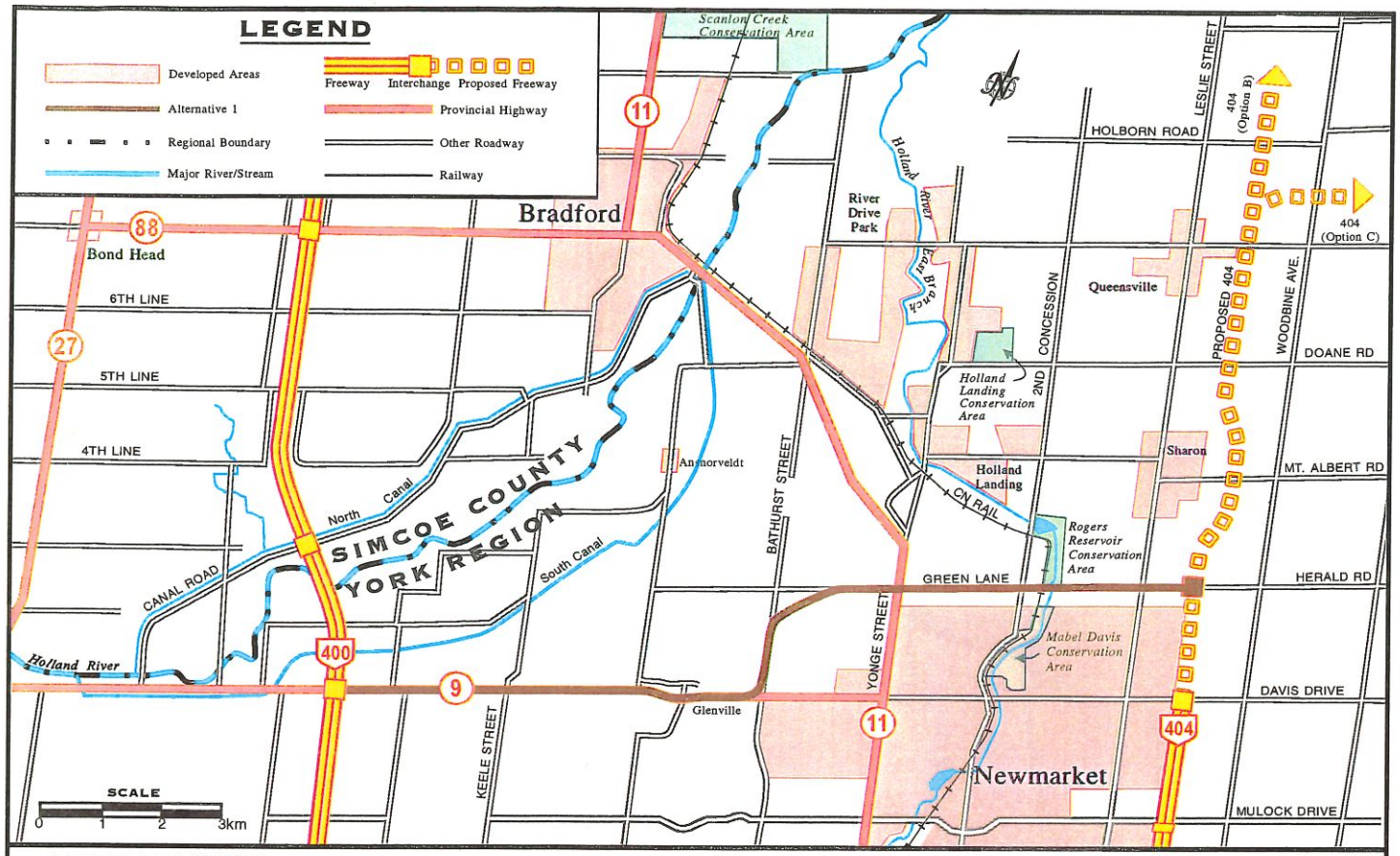
There are therefore four alternatives to be analysed in the Highway 9 - Green Lane study area:

1) Upgrade Highway 9 and Green Lane to 4 lanes and link the two near Bathurst Street (base case - to be implemented within 5 - 10 years); consider long term potential to widen to 6 lanes - see Exhibit 8.

2) Upgrade Highway 9 and Green Lane to 4 lanes in the near term (per Alternative 1) and at some point in the future reconstruct the route to freeway standards, including service roads west of Bathurst Street - see Exhibit 9.

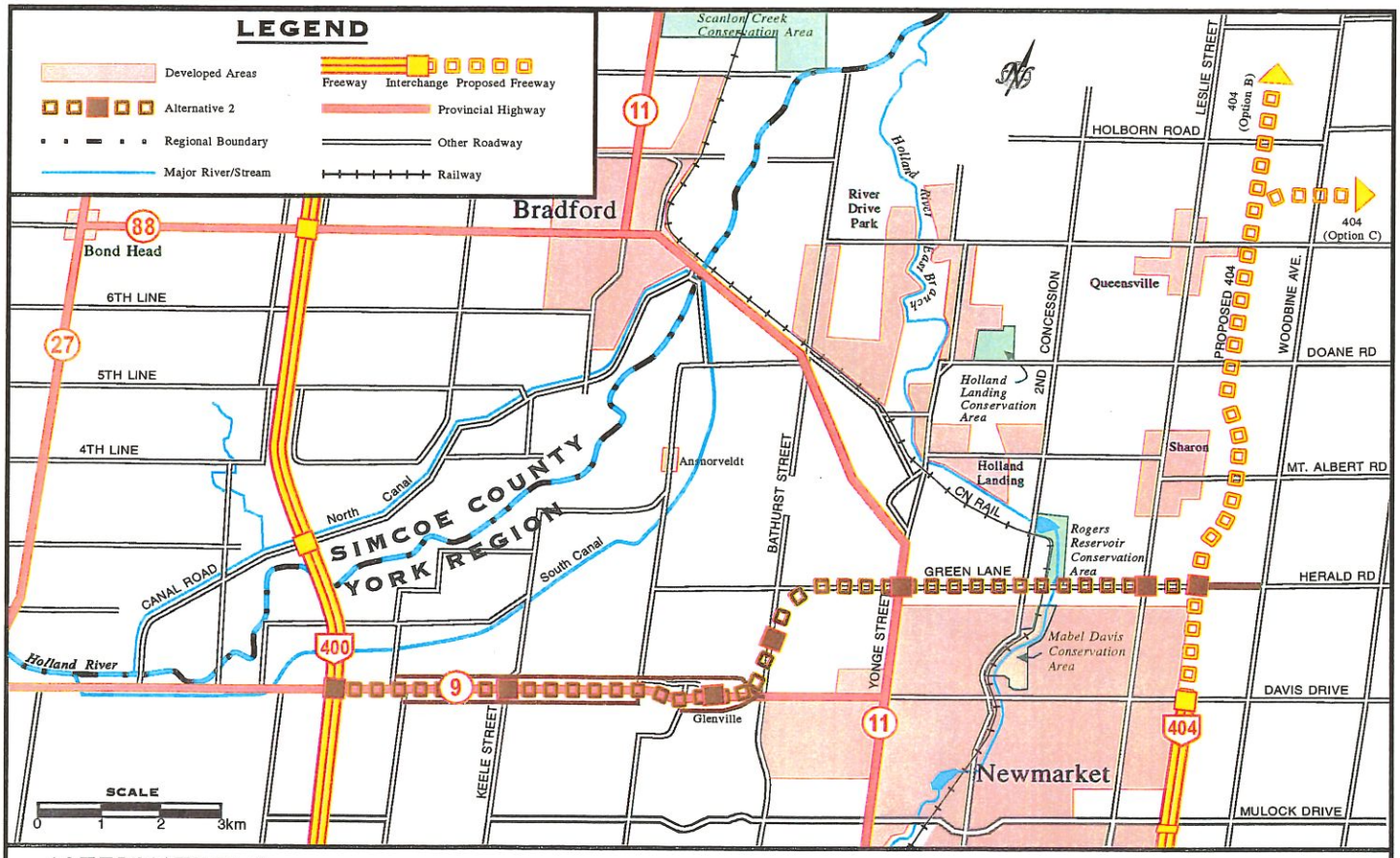
3) Upgrade Highway 9 and Green Lane to 4 lanes in the near term (per Alternative 1), plus build a new four lane high-standard arterial roadway on a new alignment north of Highway 9 - see Exhibit 10.

4) Upgrade Highway 9 and Green Lane to 4 lanes in the near term (per alternative 1), plus build a new four lane freeway on a new alignment north of Highway 9 - see Exhibit 11.



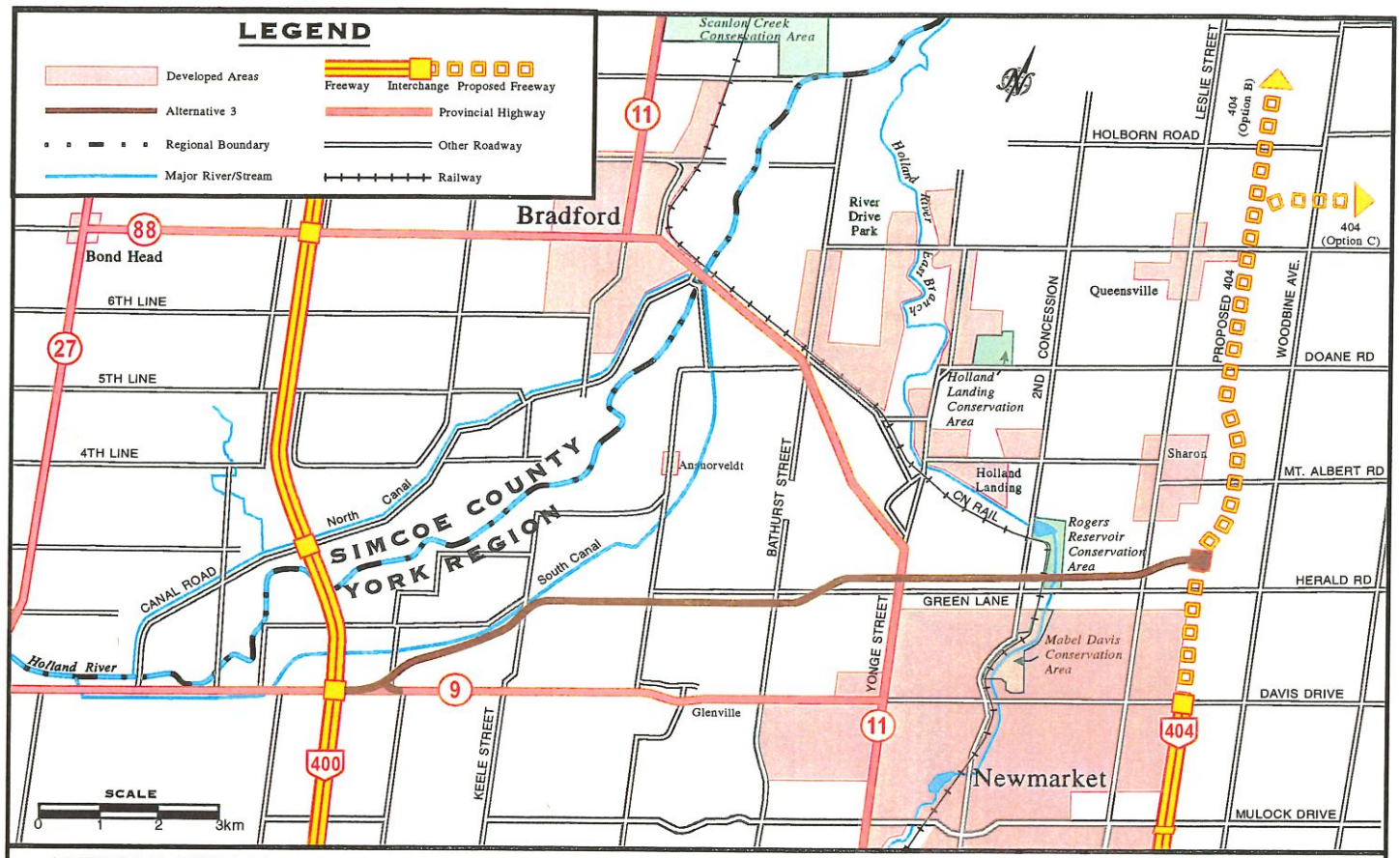
ALTERNATIVE 1
HIGHWAY 9 - GREEN LANE ARTERIAL

EXHIBIT 8



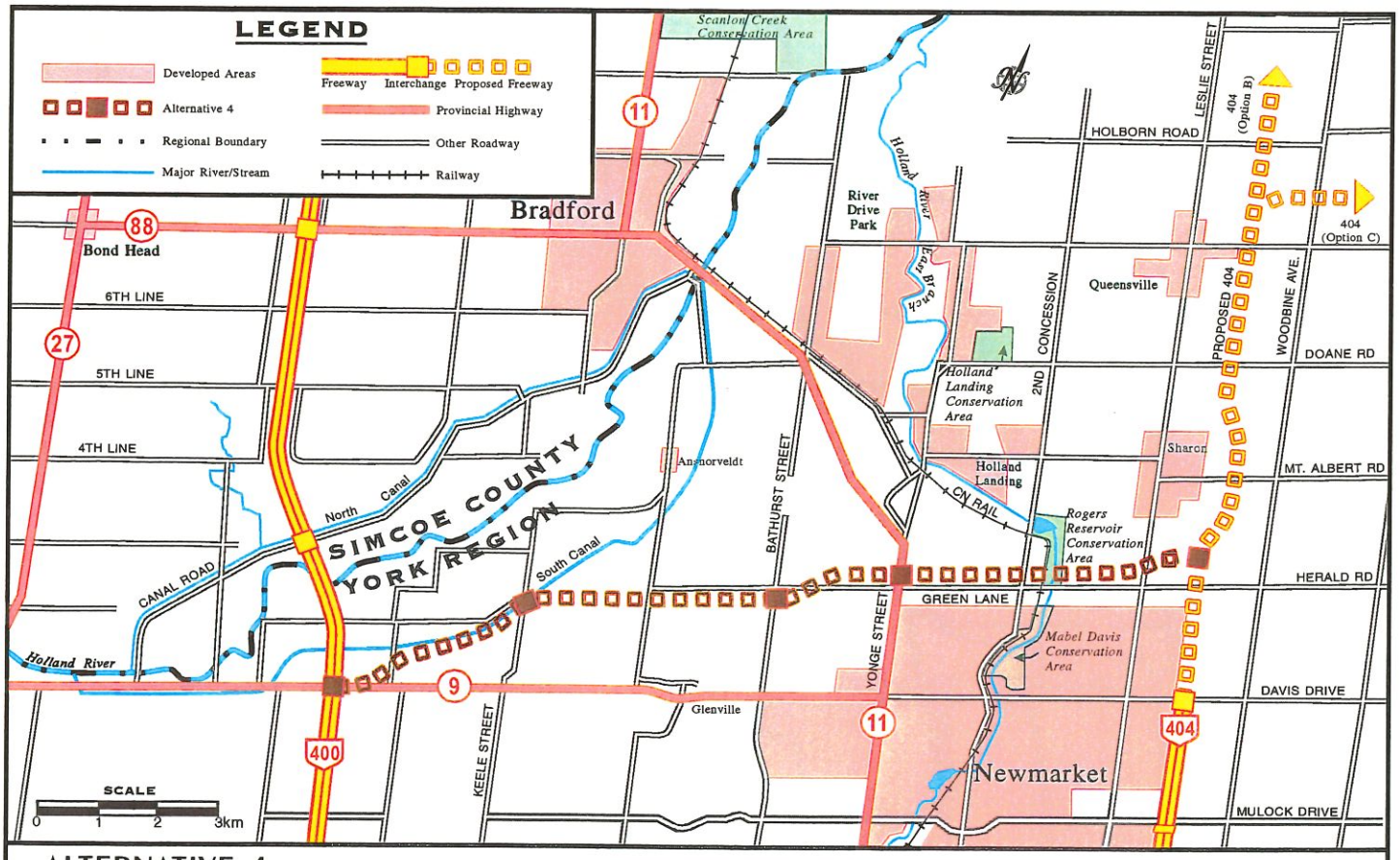
ALTERNATIVE 2
HIGHWAY 9 - GREEN LANE FREEWAY

EXHIBIT 9



ALTERNATIVE 3
NEWMARKET CORRIDOR - NEW HIGHWAY

EXHIBIT 10



ALTERNATIVE 4
NEWMARKET CORRIDOR - NEW FREEWAY

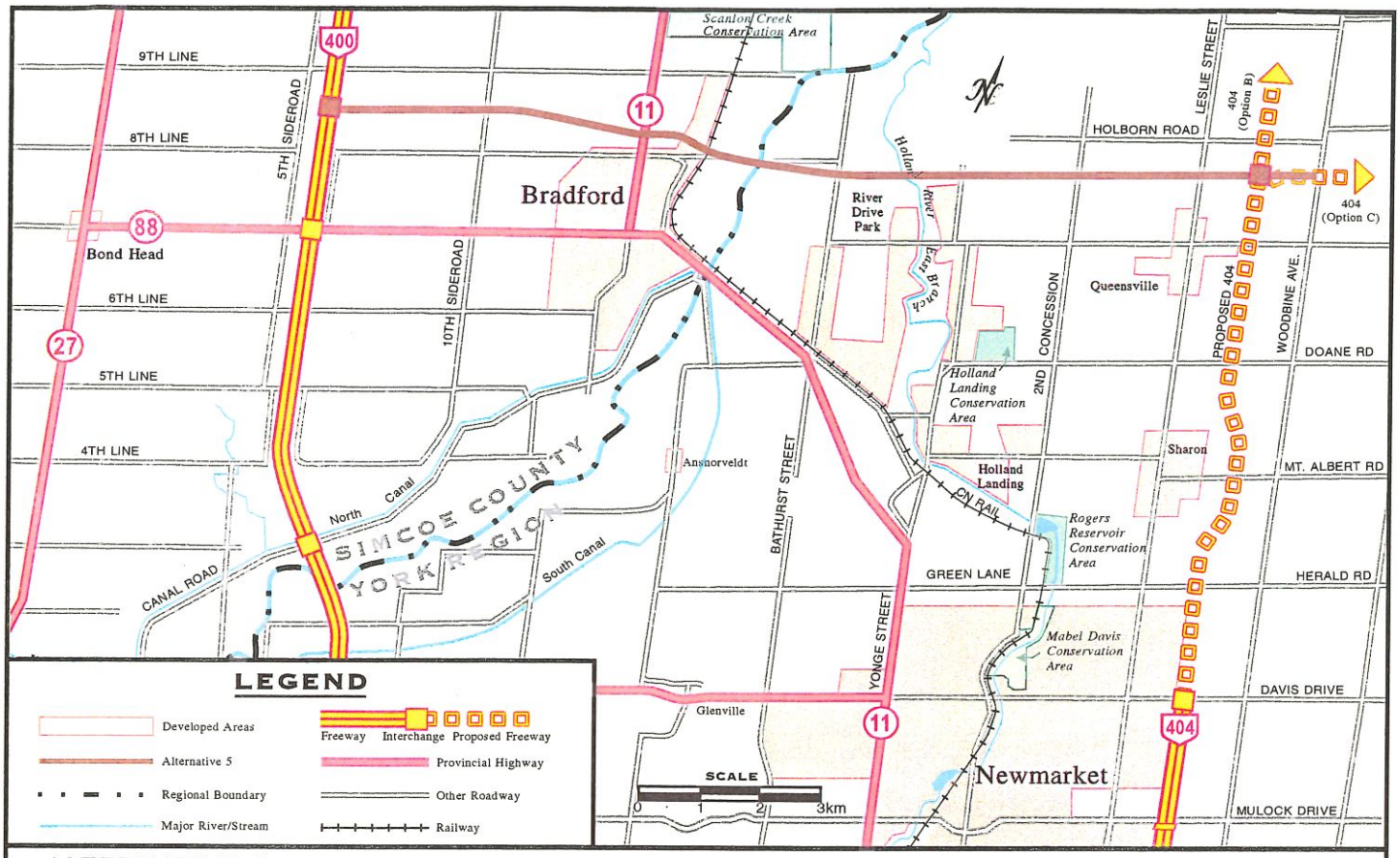
EXHIBIT 11

It must be noted that these four "alternative methods" are in addition to the two alternatives previously defined in the Bradford Bypass corridor:

5) Upgrade Highway 9 and Green Lane to 4 lanes in the near term (per Alternative 1), plus build a new four lane high-standard arterial highway on a new alignment north of Bradford - see Exhibit 12.

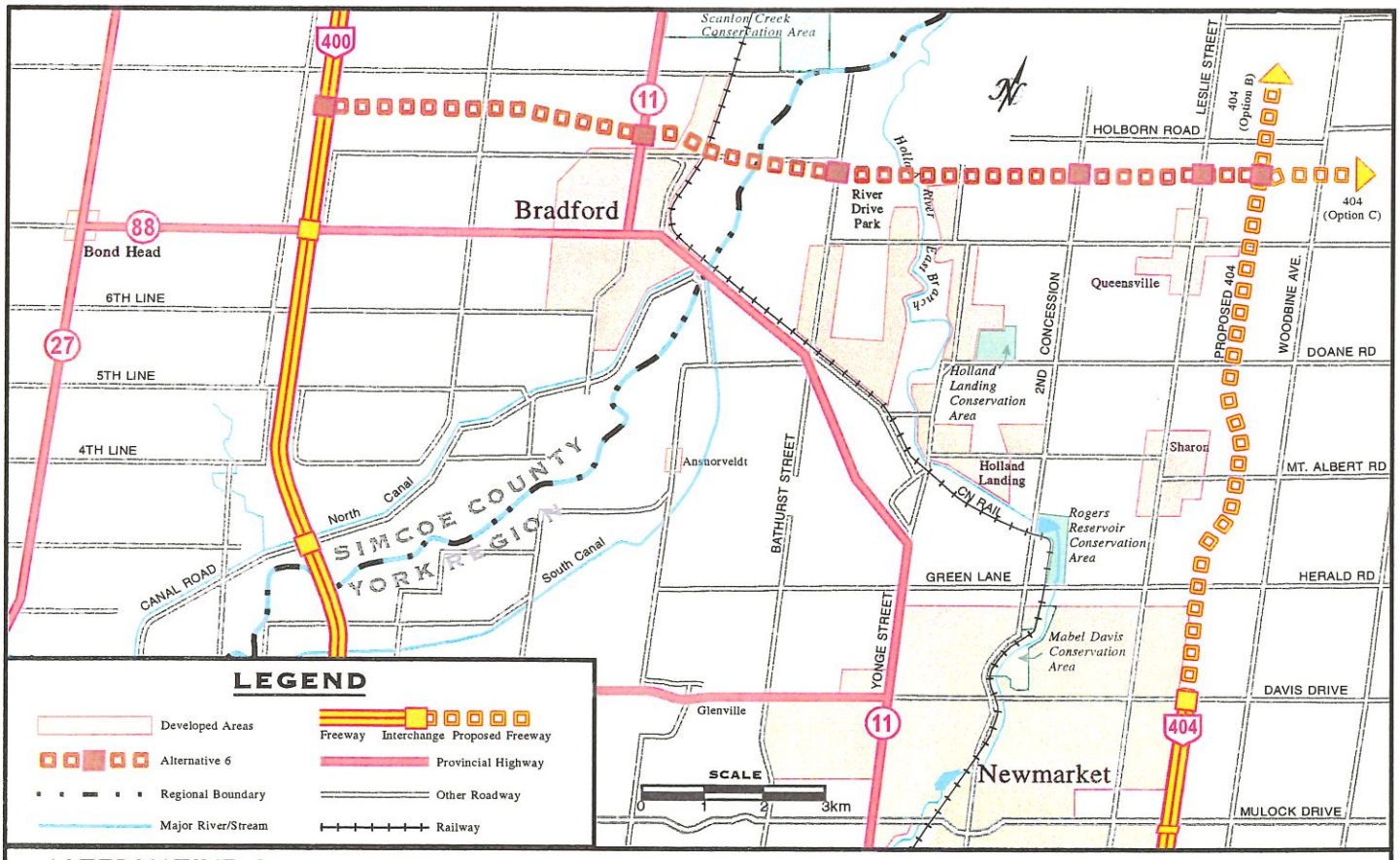
6) Upgrade Highway 9 and Green Lane to 4 lanes in the near term (per Alternative a), plus build a new four lane controlled access freeway on a new alignment north of Bradford - see Exhibit 13.

It must further be considered that an initial stage as a two-lane at-grade roadway is a viable option for each of the new road alternatives (#3, 4, 5 and 6), just as existing Highway 9 and Green Lane form the "initial two-lane stage" of alternatives 1 and 2. The two lane option is not a long term "end product", however, and is dealt with only as a staging criterion in the analysis and evaluation of the new road alternatives.



ALTERNATIVE 5
BRADFORD CORRIDOR - NEW HIGHWAY

EXHIBIT 12



ALTERNATIVE 6
BRADFORD CORRIDOR - NEW FREEWAY

EXHIBIT 13

6. ANALYSIS OF ALTERNATIVES

6.1 ANALYSIS PROCESS AND FACTORS

The evaluation process established for the Highway 400-Highway 404 Link (Bradford Bypass) EA study uses Factors, Criteria and Indicators, as documented in the September 1994 EA Proposal. Factors are broad groupings (i.e. "Natural Environment") which, taken together, provide a framework for comparing alternatives while ensuring that all aspects of the environment are considered (per the EA Act of Ontario). Criteria are sub-groupings (e.g. "vegetation") which address all of the different aspects within each factor. Indicators are specific measurable items under each criterion (e.g. "impact on high quality forest standards"), while measures are even more detailed items which help to compare alternatives (e.g. "area in hectares of Class II forest affected").

For the current investigation of representative Bradford-area and Newmarket-area route alternatives analysis according to the detailed indicators is neither practical nor necessary; only in subsequent preliminary design stages where localized alignment alternatives are being considered will the more detailed information come into play. To com,pre corridors, the analysis will be carried out only to the "criteria" level, using a specific key measure for each criterion which reflects the overall direction of the criterion. Exhibit 14 provides a list of the factors and criteria, the proposed representative measure for each of the criteria, and the basis by which the analysis is to be carried out for each of the criteria. As a matter of consistency, Exhibit 14 is identical to Exhibit 19 in the September 1994 Environmental Assessment Proposal for the overall 400 - 404 link study.

EXHIBIT 14: RATIONALE FOR COMPARATIVE RATING GUIDELINES

FACTOR / CRITERION	KEY MEASURE	BASIS	RATING GUIDELINES		
			GOOD	FAIR	POOR
1. TRANSPORTATION					
1.1 Traffic Operating Speed	Assumed posted speed	Based on design speed of alternative	100 km/h	80 km/h	<80 km/h
1.2 Traffic Volume	Range of projected demand (veh/h)	Modelled 2011 AM Peak Hour, assuming standalone facility (i.e. extended 404 but no other parallel alternatives)	high	→	low
1.3 Traffic Operations	Facility classification	Based on requirements of design type which could potentially limit or constrain operation within the corridor and on crossing and parallel roadways.	freeway	high standard arterial	low standard arterial
1.4 Safety	Number of intersections or entrances	Operational safety is optimized by eliminating potential areas of conflict, particularly turning moves. Assume basic design is safe relative to design speed.	0	1 to 20	> 20
1.5 Efficiency	Travel time from Ravenshoe / Woodbine to 400 / 407 via alternative	Efficiency assumed to be in proportion to the directness of route.	shortest (relative)	→	longest (relative)
1.6 Network Aspects	Qualitative assessment	Positive and negative impacts of the alternative on the overall continuity of the highway network.	continuous route and continuous classification	continuous route and discontinuous classification	discontinuous route and discontinuous classification
1.7 Financial	Order-of-magnitude capital cost	In general, the capital and operating / maintenance cost of the alternatives will be in proportion to its length; large structures, or extraordinary mitigation measures or property costs are to be considered.	lowest (relative)	→	highest (relative)
1.8 Construction	Qualitative assessment	Based on any unique aspects of the corridor which may result in increased time and / or complexity for construction (examples are special structures, detours, etc.)	standard construction duration / complexity and few detours	→	complex construction or several major detours
1.9 Staging	Qualitative assessment	Unique aspects of the corridor or design type which may make the alternative better suited or not as well suited to construction in stages.	project consists of upgrading of existing facilities	→	project consists of construction of all new facilities
2. NATURAL ENVIRONMENT					
2.1 Fisheries and Aquatic Habitat	Number of crossings of permanent watercourses	Potential fisheries impact assumed to be proportional to the number of river crossings.	0 - 1 crossings	2 - 5 crossings	> 5 crossings
2.2 Wildlife	Length of new route through wooded areas	Potential wildlife impact assumed to be proportional to the amount of habitat affected.	< 1.0 km	1.0 - 2.0 km	> 2.0 km
2.3 Vegetation	Length of new route through woodlots, parks, wetlands and / or conservation areas	Potential vegetation impact is concentrated in otherwise undisturbed natural areas.	< 1.0 km	1.0 - 2.0 km	> 2.0 km
2.4 Wetlands	Length of new route across Class One or ESA wetlands	Potential wetlands impact is assumed to be proportional to the length of crossing, although mitigation (structures, etc.) is feasible in many cases.	< 0.2 km	0.2 - 0.5 km	> 0.5 km
2.5 Groundwater	Length of new route within Oak Ridges Moraine	Oak Ridges Moraine has been identified as a key source for groundwater infiltration.	< 1 km	1 - 5 km	> 5 km
2.6 Surface Water	Number of significant new watercourse crossings	Impact on quantity and quality of surface water assumed to be proportional to the number of crossings.	0 crossings	1 crossing	≥ 2 crossings
2.7 Greenways and Open Space Linkages	Number of green corridors crossed or affected by alternative	Impact assumed to be proportional to the number of greenways / linkages crossed.	0 crossings	1 - 2 crossings	> 2 crossings
2.8 Soil	Length of new route across agricultural and forest land	Risk of soil loss assumed to be proportional to the length of susceptible lands crossed.	< 5 km	5 - 10 km	> 10 km

EXHIBIT 14: RATIONALE FOR COMPARATIVE RATING GUIDELINES (Cont'd)

FACTOR / CRITERION	KEY MEASURE	BASIS	RATING GUIDELINES		
			GOOD	FAIR	POOR
3. SOCIAL ENVIRONMENT					
3.1 Aesthetics	Qualitative assessment	Consideration of any unique visually appealing aspects of the corridor and surrounding areas along with the length of new route visible to established residential areas.	good views from route with few views of route	→	indifferent views from route and many views of route
3.2 Highway and Construction Noise	Length of facility within 500 m of residential areas	The number of people expected to experience adverse noise impacts is in proportion to the number of homes adjacent to the corridor.	< 1 km	1 - 3 km	> 3 km
3.3 Community / Recreation	Length of facility in developed areas	The impacts to communities and community facilities, both positive and negative, is assumed to be in proportion to the length of the alternative which passes through or near to developed areas.	< 2 km	2 - 5 km	> 5 km
4. ECONOMIC ENVIRONMENT					
4.1 Agriculture	Length of facility in agricultural areas	Potential impacts to agricultural land and operations assumed to be proportional to the length of the alternative which passes through agricultural land.	< 5 km	5 - 10 km	> 10 km
4.2 Commercial / Industrial	Number of major employment centres within 2 km of alternative	Potential effects on commercial and industrial areas are assumed to be in proportion to the proximity of the facility; this applies to both positive impacts (exposure, access, etc.) as well as negative impacts (displacement).	> 2	1 - 2	0
4.3 Special Land Use Strategies	Official Plan compatibility	Assessment of degree of compatibility or incompatibility with municipal Official Plans.	corridor identified in OP	→	corridor would utilize lands designated in OP for other uses such as development
4.4 Property Waste and Contamination	Number of waste / contaminated sites adjacent to corridor and significance of impacts	Potential impacts are generally limited to contaminated sites which are in "close" proximity to the alternative. Net impact after mitigation is considered.	0 sites	1 - 2 sites	> 2 sites
4.5 Aggregates	Length of alternative which passes through aggregate resources	Potential impacts are generally limited to aggregate resources / operations within the right-of-way.	0 km	< 0.5 km	> 0.5 km
5. CULTURAL ENVIRONMENT					
5.1 Archaeology	Number of archaeological sites adjacent to corridor	Potential impacts are generally limited to archaeological sites which are in "close" proximity to the alternative.	0 sites	1 - 5 sites	> 5 sites
5.2 Historical	Number of historical sites adjacent to corridor	Potential impacts are generally limited to historical sites which are in "close" proximity to the alternative.	0 sites	1 - 5 sites	> 5 sites
6. APPLIED ENVIRONMENTAL CONDITIONS					
6.1 Stormwater Management	Number of watercourse crossings	Need to provide extraordinary quality or quantity management of stormwater is assumed to be in proportion to the number of surface waterbodies which are likely receivers of stormwater.	0 - 1 crossing	2 - 5 crossings	> 5 crossings
6.2 Erosion and Sedimentation Control	Length of new road construction	With any construction activity, there is the potential for soil erosion and / or sedimentation; risk is assumed to be in proportion to the amount of construction required.	shortest (relative)	→	longest (relative)
6.3 Sustainable Development	Compatibility with provincial land use planning strategy	Compatibility with areawide plans re: nodal development, greenlands preservation, etc. indicate support for the sustainablity principles incorporated.	supportive	neutral	conflicting

6.2 ANALYSIS OF ALTERNATIVES

Information with respect to each alternative which reflects the criteria cited in Exhibit 14 is summarized in Exhibit 15. This information is in summary form for ease of review and comparison; the more detailed background to each of the summarized items is appended for reference (see Appendix 'A').

EXHIBIT 15: SUMMARY OF ANALYSIS OF ALTERNATIVE FREEWAY CORRIDORS

FACTOR / CRITERION		KEY MEASURE	9 / Green Lane	New Freeway - Newmarket	New Freeway - Bradford
1.	**TRANSPORTATION**				
1.1	Traffic Operating Speed	Assumed posted speed	100 km/h	100 km/h	100 km/h
1.2	Traffic Volume	Range of projected demand (avg veh/day)	3400 - 5500	3400 - 5500	2500 - 4300
1.3	Traffic Operations	Facility classification	Freeway	Freeway	Freeway
1.4	Safety	Number of intersections or entrances	22	20	23
1.5	Efficiency	Average travel time via alternative	19.8	19.7	19.4
1.6	Network Aspects	Qualitative assessment	Good continuity, poor location	Good continuity, poor location	Good continuity and location
1.7	Financial	Order-of-magnitude capital cost	5.0	4.5	5.0
1.8	Construction	Qualitative assessment	difficult to retrofit; 400 I/C a problem	400, 404 I/Cs a problem	Straight forward; foundations a concern
1.9	Staging	Qualitative assessment	Twin in segments. Service roads prereq.	Add grade separations. Twin in sections.	Add grade separations. Twin in sections.
2.	**NATURAL ENVIRONMENT**				
2.1	Fisheries and Aquatic Habitat	Number of crossings of permanent watercourses	1 major	1 major	2 major
2.2	Wildlife	Length of new route through wooded areas	3.2 km	4.8 km	4.4 km
2.3	Vegetation	Length of new route through woodlots, parks, wetlands and / or conservation areas	3.2 km	4.8 km	4.6 km
2.4	Wetlands	Length of new route across Class One or ESA wetlands	0 km	0 km	1.9 km
2.5	Groundwater	Length of new route within Oak Ridges Moraine	7.3 km	3 km	0 km
2.6	Surface Water	Number of significant new watercourse crossings	1	1	2
2.7	Greenways and Open Space Linkages	Number of green corridors crossed or affected by alternative	5	4	3
2.8	Soil	Length of new route across agricultural and forest land	13.2 km	14.2 km	13.5 km
3.	**SOCIAL ENVIRONMENT**				
3.1	Aesthetics	Qualitative assessment	poor	fair	fair
3.2	Highway and Construction Noise	Length of facility within 500 m of residential areas	12.9 km	12.3 km	11.4 km
3.3	Community / Recreation	Length of facility in developed areas	0 km	0 km	1.7 km
4.	**ECONOMIC ENVIRONMENT**				
4.1	Agriculture	Length of facility in agricultural areas	10.0 km	9.4 km	9.1 km
4.2	Commercial / Industrial	Number of major employment centres within 2 km of alternative	3	2	1
4.3	Special Land Use Strategies	Official Plan compatibility	Route shown in OP	Not shown in OP	Shown in York OP
4.4	Property Waste and Contamination	Number of waste / contaminated sites adjacent to corridor and significance of impacts	0	0 known	0
4.5	Aggregates	Length of alternative which passes through aggregate resources	0 km	> 0.5 km	0 km
5.	**CULTURAL ENVIRONMENT**				
5.1	Archaeology	Number of archaeological sites adjacent to corridor	0	0	0
5.2	Historical	Number of historical sites adjacent to corridor	2	1	2
6.	**APPLIED ENVIRONMENTAL CONDITIONS**				
6.1	Stormwater Management	Number of watercourse crossings	1	1	2
6.2	Erosion and Sedimentation Control	Length of new road construction	15.8 km	15.6 km	15.1 km
6.3	Sustainable Development	Compatibility with provincial land use planning strategy	Substantial changes to surroundings	Accommodated, not encouraged	Accommodated, not encouraged

It should be noted that the detailed information for each criterion in Appendix 'A' refers only to the specified facility, exclusive of the "base case" impacts of Alternative 1. For example, the cost (criterion 1.7) of Alternative 3 (Newmarket Corridor arterial highway) does not include the initial cost of upgrading Highway 9 - Green Lane to 4 lanes (i.e. Alternative 1), even though Alternative 3 as defined in Section 5 includes a new roadway in addition to the "base case "current plans for upgrading of the existing route. This approach was taken in order to simplify the comparison between Alternatives, by eliminating the common element (Alternative 1). The only drawback is that Alternative 1 cannot be compared directly to the others, but this is only a minor concern since Alternative 1 is screened out as a standalone option early in Section 7.1. The role of the upgraded Highway 9 - Green Lane facility in each Alternative is addressed as needed in the evaluation discussions of Section 7.

7. EVALUATION OF ALTERNATIVES

The analytic information presented in Appendix 'A' and summarized in Exhibit 15 provides a basis for "rating" the alternatives under each of the criteria noted in Exhibit 14 in Section 6. These ratings are summarized in Exhibit 16, from which some observations may be made and conclusions drawn. It may be further noted that, particularly at the 1:1000 scale level of detail of the current exercise, all of the planning considerations and implications which go into evaluating alternative concepts are not necessarily capable of being quantified or explicitly defined in a tabular form. Rather, they must be brought out in the discussion which follows.

7.1 SCREENING OF ALTERNATIVES

7.1.1 "Do Nothing" (Alternative 1)

The comparison of alternatives exhibits a classic "do nothing vs upgrade existing vs new road" situation. As is often the case, the "do nothing" option (Alternative 1) has low cost, low natural environmental impact, and little ability to fully accommodate the long term travel demand, leading to congestion and negative social and economic impacts.

Since the accommodation of travel demand (for people and goods) at a good level of speed, comfort, and safety is the main purpose of the transportation system, selecting an alternative whose main shortcoming is that it fails to do exactly that is not a reasonable proposition.

7.1.2 Arterials (Alternatives 3 and 5) vs Freeways (Alternatives 2, 4 and 6)

Considering the fact that any right-of-way protected as a result of this study will essentially be the maximum property available in perpetuity (not just to the 2021 planning horizon), and that travel demand forecasts to 2021 indicate volumes nearing the limit of four lane arterial capacity, the position is taken for the purposes of this analysis that a freeway right-of-way should be protected for, whether or not its construction is staged

EXHIBIT 16: GRAPHICAL OVERVIEW OF RATINGS OF ALTERNATIVE FREEWAY CORRIDORS

FACTOR / CRITERION	ALTERNATIVE			Significant Difference
	9 / Green Lane	New Freeway - Newmarket	New Freeway - Bradford	
1. TRANSPORTATION				
1.1 Traffic Operating Speed	○	○	○	
1.2 Traffic Volume	○	○	◦	✓
1.3 Traffic Operations	○	○	○	
1.4 Safety	•	•	•	
1.5 Efficiency	○	○	○	
1.6 Network Aspects	◦	◦	○	✓
1.7 Financial	•	•	•	
1.8 Construction	•	•	◦	✓
1.9 Staging	◦	•	•	✓
2. NATURAL ENVIRONMENT				
2.1 Fisheries and Aquatic Habitat	○	○	◦	✓
2.2 Wildlife	◦	◦	◦	
2.3 Vegetation	◦	◦	◦	
2.4 Wetlands	○	○	•	✓
2.5 Groundwater	•	◦	○	✓
2.6 Surface Water	◦	◦	•	✓
2.7 Greenways and Open Space Linkages	•	•	•	
2.8 Soil	•	•	•	
3. SOCIAL ENVIRONMENT				
3.1 Aesthetics				
3.2 Highway and Construction Noise	•	•	•	
3.3 Community / Recreation	○	○	◦	
4. ECONOMIC ENVIRONMENT				
4.1 Agriculture	◦	◦	◦	
4.2 Commercial / Industrial	○	◦	◦	✓
4.3 Special Land Use Strategies	◦	•	○	✓
4.4 Property Waste and Contamination	○	○	○	
4.5 Aggregates	○	•	○	✓
5. CULTURAL ENVIRONMENT				
5.1 Archaeology				✓
5.2 Historical	◦	◦	◦	
6. APPLIED ENVIRONMENTAL CONDITIONS				
6.1 Stormwater Management	○	○	◦	
6.2 Erosion and Sedimentation Control	•	•	•	
6.3 Sustainable Development	◦	◦	◦	

○ Good / Most Preferred ◦ Fair • Poor / Least Preferred } See Exhibit 14 for rating guidelines

as an initial two lane highway, a four lane arterial, a divided highway, or a fully controlled access freeway. This argument would place Alternative 3 as simply a potential staging option of Alternative 4, and similarly Alternative 5 as a stage of Alternative 6.

Thus a comparison of Alternatives 3 and 5 would simply be a subset of the 4 vs 6 comparison, while a comparison of an arterial in one corridor with a freeway in another would be so skewed by the functional differences between the two road classes as to be uninformative. The relevant comparison is therefore between freeway Alternatives 2, 4 and 6.

There are significant differences between the three Freeway-based Options and these warrant a more detailed review and direct comparison. The criteria highlighted in Exhibit 16 as having significant differences between the three options will be reviewed in greater detail in the following pages. Exhibit 16 also shows those criteria which are similar between the two alternatives and which will therefore not play a significant role in selecting one or the other. Such criteria will not be addressed in any greater detail in the analysis.

7.2 COMPARISON OF "SHORT LISTED" ALTERNATIVES

This section focuses on the three "new freeway" Alternatives 2, 4 and 6, using their key differences as summarized in Exhibit 16 to frame the evaluation of the two concepts.

7.2.1 Traffic Volume (Criterion 1.2)

A computer traffic model was used to test the future road network for each alternative. Using common land use and trip generation assumptions, the relative difference between each alternative was illustrated. This forecasting process was intended solely to help compare alternatives and the results are not appropriate for use as standalone forecasts. The model runs are, however, substantially updated from those referred to in the

Environmental Assessment Proposal for the Bradford Bypass study dating from mid-1994. It may be noted that a new freeway along Highway 9 - Green Lane (i.e. Alternative 2) was not explicitly modelled because the nodes and connecting links for it are virtually identical to those for Alternative 4 which had a new freeway parallel to Highway 9 - Green Lane. It may be assumed that the results for the Newmarket Corridor apply equally to either Alternative 2 or 4.

A key conclusion from the model is that the long term demand for travel between the two parallel north-south freeways Highway 400 and Highway 404 between Highway 9 Lake Simcoe will exceed the available road capacity (including the currently - planned improvements on the Highway 9 - Green Lane route) by a substantial amount - enough to warrant a freeway in the long term over and above the arterial road network.

The model results indicate that a new freeway in either the Bradford or Newmarket Corridors would carry substantial traffic volumes, and that the overall long range demand for long distance travel in either corridor is similar. One noticeable difference is in the distribution of the trips among the various roads available; the Newmarket Corridor options are assigned greater volumes than the Bradford alternative in large part because many of the trips on the Newmarket Corridor freeway are those that would otherwise have been assigned to existing Highway 9 - Green Lane. Another difference between the Newmarket and Bradford corridor demand is in trips destined to or originating from the immediate area (Newmarket, Holland Landing, East Gwillimbury) served by the Newmarket corridor and which now use the municipal road network; under Alternative 6 the model indicates that those trips would remain in the Newmarket area, using other roads such as Highway 9 - Green Lane and Highway 11. The Bradford Corridor, because of the lesser number of employment-destined trips in its immediate service area, has fewer "local" trips and accommodates long distance trips almost exclusively.

The traffic model also assigns somewhat more "Toronto bypass" type trips (e.g. Durham to Peel) to the more southerly Newmarket Corridor than to the Bradford route.

Conversely, the "round the lake" links between Barrie / Simcoe and Keswick / Georgina are served only by the Bradford corridor.

Naturally, the Bradford Route offers substantial relief to Queensville Sideroad and Highway 88, as well as to Highway 9 - Green Lane, while the Newmarket freeway relieves Highway 9 - Green Lane and Mount Albert Road. Demand for Green Lane is virtually eliminated by the parallel freeway. The Newmarket route actually increases demand slightly through downtown Bradford, as it attracts trips down Highway 11 to the Green Lane corridor. The model run for Alternative 6 indicates a substantial reduction in long distance travel through central Bradford.

Overall, therefore, the computer simulations indicate that a freeway in the Newmarket Corridor (either along Highway 9 - Green Lane or on a nearby new alignment) would attract more local traffic in addition to the basic long distance demand, while the Bradford-area freeway would produce a more even distribution of demand across the various east-west routes available. Either option would protect Davis Drive and downtown Newmarket from congestion due to long distance through traffic, but only the Bradford Corridor offers any relief to downtown Bradford.

7.2.2 Network Aspects (Criterion 1.6)

A new highway in the Bradford corridor would be of significantly greater benefit to the area's transportation network than would a new "twin" of Highway 9 - Green Lane near Newmarket. This is because of two key issues:

- Every study of an east - west road south of Lake Simcoe has, over the course of three decades, sought to improve links between the east and west sides of Lake Simcoe by skirting as closely as possible Cooks Bay. The current Highway 400 - 404 study is no different, and there is no question that a new route near Bradford would achieve that goal while a new route near Newmarket, being south of the existing link via Highway 88 and 11, would not.

- The existing road network south of Lake Simcoe is broken and incomplete, an while a new Bradford-area route would fill a gap in the grid a new freeway n or on Highway 9 - Green Lane would simply add capacity to an existing leg the network without changing the road pattern significantly. The combination of existing east - west roads in the Newmarket areas, each being upgraded in the near term (Highway 9, Green Lane, Davis Drive, Mulock Drive) forms a grid network which has no equivalent in the Bradford - Queensville corridor. As a consequence, a new highway in the Bradford corridor would be the more effective of the two at improving trip routing flexibility, reducing vehicle kilometres of travel, improving mobility for emergency services, balancing peak traffic flows (e.g. distributing north - south recreational (cottage) traffic between Highways 400 and 404), and expanding community access.

Utilization of the overall road network would be more efficient with Alternative 6, because Alternative 4 would focus travel on a single roadway to a greater extent, resulting in some facilities such as the soon-to-be-widened four lane high-standard Highway 9 - Green Lane route being essentially superseded and more pressure being put on Highway 11 through Bradford as a feeder route. With Alternative 6, the lower volume on the facility means that there would be less pressure to construct to full freeway standards initially and that the whole network infrastructure would continue to be used at levels proportional to each leg's capacity.

7.2.3 Financial (Criterion 1.7)

While the analysis does not reveal dramatic differences in construction cost between the three freeway alternatives, it is worth noting that there would likely be a greater investment required to upgrade the municipal road network if the Newmarket Corridor were chosen than if the Bradford alternative were selected. This is another outcome the network role of each corridor, in that Bradford West Gwillimbury would ultimate have to build or upgrade a downtown bypass route itself if its function were not provided by the new east-west freeway; similarly, growth in demand on Queensville Sidero

(combining local and round-the-lake and recreational traffic) would also require its widening to four lanes in the long term with either of Alternatives 2 or 4. Alternative 6, by complementing the near-term investment in improving the Highway 9 - Green Lane corridor rather than superseding it, eliminates the need to further improve the municipal road network north of Highway 9. Alternatives 2 and 4 would not eliminate such municipal road widening needs. The cost of such impacts have not been calculated, but it is evident that they would favour Alternative 6.

7.2.4 Construction (Criterion 1.8)

The key differences in terms of constructability are at the freeway-to-freeway interchanges at either end of each alternative. In this respect, either Newmarket option faces a considerably greater challenge than does the Bradford option, because both the 400 and 404 interchanges for the former are located virtually atop existing (future) interchanges, necessitating complex detours, ramp realignment, higher road and structural costs, and traffic disruption. The Bradford Bypass interchanges are located in open territory and do not face such problems.

7.2.5 Fisheries and Aquatic Habitat (Criterion 2.1), Surface Water (2.6) and Stormwater Management (6.2)

These criteria all involve the number of crossings of permanent bodies of water, and the Bradford Bypass is the lower rated of the alternatives due to its crossing of both branches of the Holland River rather than the single bridge needed for either route in the Green Lane corridor. Given the commitment of the MTO to bridge not only each watercourse but also the associated Class One Wetlands on either side and to a mitigation plan which would employ Best Management Practices to prevent bridge runoff from entering directly into fresh water, the net impact of any river crossing would be minimal under these criteria. Therefore, while the alternatives do differ, it is more a design issue that can be resolved through application of provincial standards then it is one which significantly aids choosing between corridors.

7.2.6 Wetlands (Criteria 2.4)

The Newmarket route avoids wetlands, while the Bradford Bypass must cross the wetlands associated with the Holland River. In the latter case, it has already been noted that the road would be on structure over the entire wetland, thereby contributing to the cost difference under Item 1.7 but reducing the impact on the wetland environment under the Wetlands criterion. The alternative would be to have greater wetland impact at lower cost. It should be noted that little of the affected environment consists of undisturbed wetlands (they are avoided by the Bradford Bypass), rather, most have been farmed, developed, diked or cleared at some point.

These points notwithstanding, either Newmarket-area Corridor is overall less of a concern than the Bradford Corridor under this criterion.

7.2.7 Groundwater (Criterion 2.5)

The dominant groundwater feature in the study area is the Oak Ridges Moraine, which serves as a recharge area for the headwaters of almost all of the watercourses in York Region. Alternative 2 passes directly through the Moraine for more than seven kilometres and as such poses a significant concern in this respect. The quintupling of the overall road width from today's two lane highway will lead to unavoidable impacts to recharge areas along the route.

The route of Alternative 4 has been carefully defined so as to avoid the Moraine to the greatest extent possible, but it would still pass through or at the edge of the feature for 3 km. The Bradford corridor is located well north of the Moraine, and its effects would be zero in that respect. Either new corridor would have similar localized impacts in terms of number of individual wells potentially affected. It is of note that the piled foundations of the Bradford Bypass structure across the Holland River could be in close proximity to one of the Town of Bradford West Gwillimbury's wells, but the aquifer is so deep as

to be unaffected by any construction activity and the issue would be fully addressed at the detail design stage.

7.2.8 Highway and Construction Noise (Criterion 3.2) and Community / Recreation (Criterion 3.3)

This criterion essentially reflects the proximity of the new freeway to established or planned developed areas. Alternative 2, by making use of an established road right of way, is located within earshot of many more existing and future homes than either new route alternative, and is the least desirable option under this criterion. There is little difference between Alternatives 4 and 6 in terms of direct physical impact on residential communities, since both routes are designed specifically to avoid such areas. However, this is a case where the direct use of a key measure - "length of facility within 500 m of residential areas" - masks the actual differences between alternatives.

A more detailed breakdown of the two new corridors shows the following:

Distance from New Freeway Centreline	No. of Existing Homes Within Specified Distance		No. of Planned New Homes[1] Within Specified Distance		Total	
	Alt 4	Alt 6	Alt 4	Alt 6	Alt 4	Alt 6
100 m	10	15	0	0	10	15
250 m	40	30	30	10	70	40
500 m	80	120	330	0	410	120
750 m	400	520	900	200	1300	720
1000 m	1360	900	1840	580	3200	1480

(1) calculated assuming average 15 units per hectare for serviced low density residential land use (Newmarket and Bradford) and 5 units per hectare in unserviced areas (Sharon)

The table reveals that, while alternatives 4 and 6 would be similar in terms of the number of existing homes most impacted, by the time construction actually begins in one or two decades there would be significantly more homes surrounding the Alternative 4 freeway corridor. One way of quantifying the overall comparison is to weight the numbers in proportion to their proximity to the freeway, i.e. 0 - 100 m = 5; 100 - 250 = 4 and so on down to 750 - 1000 m = 1. Existing homes would be weighted twice as heavily as new homes to reflect the more significant disruption to existing residents. Summing for each alternative in this way produces a factor of 3,400 for Alternative 4 and 1,950 for Alternative 6. Even considering only those homes within 500 m of the new route a similar ratio holds. The higher number reflects more residents likely to be concerned about proximity-related effects such as noise impact; on that basis Alternative 6 would clearly have negative impacts on fewer residents than would Alternative 4.

Aside from proximity, the actual noise level is dependent largely on the traffic volume on the major road. In this respect, the fact that Alternatives 2 and 4 would concentrate traffic on a single freeway while Alternative 6 would see demand spread more evenly among area roads would result in more noise affecting more people for the two Newmarket-area alternatives.

The impact of either route on recreational facilities is limited to a golf course on each - Cardinal in the Newmarket corridor and Silver Lakes north of River Drive Park. Cardinal could not be avoided with either Newmarket route but its extensive property would allow it to carry on as at least an 18 hole course. Silver Lakes could either be avoided (with correspondingly closer proximity to River Drive Park) or bisected by Alternative 6. The latter would skirt Albert's Marina to the south, although a Marina buy-out option is also available. The Bradford Corridor avoids all Conservation Areas while the new freeway north of Green Lane would cross the Rogers Reservoir C.A. No other public recreation facilities pose a significant concern.

7.2.9 Special Land Use Strategies (Criterion 4.3)

The relationship of each alternative to existing and planned development and rural areas is explored under this criterion, keeping in mind that Alternatives 2/4 and 6 are mutually exclusive - if there is a Newmarket area freeway there will be no Bradford Bypass and vice versa.

Since a municipal Official Plan is the most explicit definition of the desired land use strategy for an area, and the York Region Official Plan shows a new provincial highway in the Bradford Corridor and not in the Newmarket Corridor, the Bradford route has more stature in this respect. The recency of the York OP (October 1994) and the requirement that the OPs of the area municipalities comply with it adds to its significance. The land use plans currently being developed for Holland Landing and Sharon in East Gwillimbury along with northwest Newmarket all reflect the Regional OP position. No consideration has been given in any planning and development work to date at the municipal level for the possibility of upgrading the existing Highway 9 - Green Lane to a freeway design.

Simcoe County has no OP, but an update of the Bradford West Gwillimbury OP is underway (1995) in which the relationship of the Town to a future east-west highway is a key issue.

Apart from the (provincial freeway) network aspects of a 400-404 link, perhaps the key municipal issue is the relief offered to congested downtown streets by a highway bypass alternative route. In Newmarket, Davis Drive is a major bottleneck, and the Green Lane upgrading (the first stage of either Alternative 2 or 4) is intended largely to resolve that problem. In Bradford, Highways 88 and 11, as they pass through the Town, force the mixing of highway and local traffic to similarly produce congestion and negative impacts on the downtown (to the extent that a key recommendation of the 1995 CAUSE report on Bradford is that "heavy commercial and through traffic should be routed around the community"). Bradford's long-desired downtown revitalization cannot occur amidst the

prospect of perpetual congestion of Highways 11 and 88; a Bypass of Bradford is necessary in that respect, for improvements along Green Lane alone only serve to draw more, not less, traffic through downtown Bradford.

Under this criterion, therefore, a combination of upgraded Highway 9 - Green Lane and a Bradford Corridor highway is clearly more necessary and more beneficial than an equivalent Highway 9 - Green Lane plus new Newmarket-area route.

7.3 SUMMARY OF EVALUATION AND SELECTION OF PREFERRED ALTERNATIVE

All of the discussion in Section 7.2 is summarized in the following Exhibit 17, as a basis for the selection of a preferred alternative in this section.

EXHIBIT 17: SUMMARY OF COMPARISON OF CORRIDORS BY KEY CRITERIA

Key Criterion	9 / Green Lane Alternative 2	Newmarket Corridor Alternative 4	Bradford Corridor Alternative 6
(1.2) Traffic Volume	Different impacts - no preference	Different impacts - no preference	Different impacts - no preference
(1.6) Network Aspects	-	-	Preferred: expands network as well as capacity
(1.7) Financial	-		Preferred: best complements investments in municipal roads
(1.8) Construction	-	-	Preferred: interchanges more easily constructed
(2.1) Fisheries and Aquatic Habitat; (2.6) Surface Water; (6.1) Stormwater Management	Slightly preferred; fewer river crossings	Slightly Preferred: fewer river crossings	-
(2.4) Wetlands	Preferred; no wetlands	Preferred; no wetlands	
(2.5) Groundwater	-	-	Preferred: avoids Oak Ridges Moraine
(3.2) Highway and Construction Noise; (3.3) Community / Recreation	-	-	Preferred: fewer residences nearby
(4.3) Special Land Use Strategies	-	-	Preferred: supports municipal plans
(4.5) Aggregates	-	-	Preferred: no impact

Exhibit 17 highlights the tradeoffs which must be made when making a direct comparison between the Bradford and Newmarket corridors. It should also be kept in mind that the travel demand modelling showed that, in the long term, demand will exceed the upgraded Highway 9 - Green Lane capacity by an amount that could only be satisfactorily accommodated by a new four lane controlled access highway. In other words, both a new arterial (i.e. Highway 9 - Green Lane) and a new freeway (in one of the identified

corridors) need to be protected and planned for as links between Highways 400 and 404 in the northern part of York Region.

Given the substantial network advantages of Alternative 6 (Highway 9 - Green Lane four laning plus Bradford corridor) there would need to be either a compelling advantage under some other factor to one of the Newmarket-area corridors or a "fatal flaw" in the Bradford route for the recommendation to be otherwise. The analysis reveals neither.

The Provincial and Municipal levels of government are already investing heavily in upgrading the Highway 9 - Green Lane route, yet the idea of taking that work to its ultimate end (i.e. as Alternative 2, a controlled access freeway flanked by service roads) would entail total reconstruction of the corridor and significant social and environmental impact caused by the doubling in width of the required right of way through the rugged terrain of the Oak Ridges Moraine. This is why, as far back in the study as the draft Environmental Assessment Proposal in 1993, the position was taken that consideration would not be given to developing a new freeway on an existing major road alignment. Building the equivalent freeway on an adjacent route instead (i.e. Alternative 4, the Newmarket Corridor) would be less complicated and some of the negative impacts on the surroundings could be avoided, but it still involves superseding a major investment without producing a significant change in the major road network of the area.

Only the Bradford Corridor offers the desired improvement in the road network (i.e. filling a significant network gap and expanding east-west capacity, rather than simply adding capacity in an already well-served corridor) while relieving municipal roads of long distance through traffic.

The investigation of alternatives does show that there are some pros and cons of each new freeway and that each is physically and environmentally feasible. The evaluation also shows that the Bradford-area freeway would be easier to build, be of substantially greater benefit to Bradford (given that each alternative has a similar effect on Newmarket), and,

with sensitive engineering design, would have minimal negative effects on the surrounding natural and social environment.

Although either Newmarket-area alternative largely avoids the wetlands associated with the Holland River, Alternative 2 cuts directly through the environmentally significant Oak Ridges Moraine while Alternative 4 would affect substantial woodlot areas. From an overall natural environmental point of view, therefore, there are quantitative differences but no compelling advantages for either Alternatives 2 or 4 over the Bradford Corridor. With respect to Alternative 6, the need to be particularly sensitive to the potential impact on wetlands has dominated all of the previous studies of such a concept, and the MTO is working closely with the responsible authorities to ensure that water quality and aquatic resources are protected. Given that the MTO and Ministry of Natural Resources have already reached an understanding as to an acceptable physical location and associated design commitments for a new east - west crossing of the Holland River on the Bradford Corridor, the disadvantage facing the Bradford route is not a "fatal flaw". As noted above, this single disadvantage is substantially outweighed by the network and planning-level advantages of the Alternative 6 package.

On this basis, then, the best overall "package" of solutions appears to be that of Highway 9 - Green Lane four laning plus protection for a new freeway in the Bradford corridor rather than an approach which is closer to Newmarket. With the previous analysis of arterials versus freeways screening out all of the other options, an overall preference may therefore be stated for Alternative 6 - planning on the basis of protecting property for a new east-west freeway in the Bradford Corridor linking Highways 400 and 404. It may also be concluded that a new roadway in the Newmarket Corridor (either on or near the Highway 9 - Green Lane route) as represented by Alternatives 2 and 4 is less desirable overall than an equivalent new road in the Bradford Corridor and should not be pursued further as part of the Highway 400 - 404 Link Study.

APPENDIX 'A'

ANALYSIS OF ALTERNATIVE ROUTES IN NEWMARKET AND BRADFORD CORRIDORS

RATIONALE FOR COMPARATIVE RATING GUIDELINES

FACTOR / CRITERION	KEY MEASURE	BASIS	RATING GUIDELINES		
			GOOD	FAIR	POOR
1. TRANSPORTATION					
1.1 Traffic Operating Speed	Assumed posted speed	Based on design speed of alternative	100 km/h	80 km/h	<80 km/h
1.2 Traffic Volume	AADT range (projected demand)	AADT based on modelled 2011 AM Peak Hour, assuming standalone facility (i.e. extended 404 but no other parallel alternatives)	high	→	low
1.3 Traffic Operations	Facility classification	Based on requirements of design type which could potentially limit or constrain operation within the corridor and on crossing and parallel roadways.	freeway	high standard arterial	low standard arterial
1.4 Safety	Number of intersections or entrances	Operational safety is optimized by eliminating potential areas of conflict, particularly turning moves. Assume basic design is safe relative to design speed.	0	1 to 20	> 20
1.5 Efficiency	Travel time from Ravenshoe / Woodbine to 400 / 407 via alternative	Efficiency assumed to be in proportion to the directness of route.	shortest (relative)	→	longest (relative)
1.6 Network Aspects	Qualitative assessment	Positive and negative impacts of the alternative on the overall continuity of the highway network.	continuous route and continuous classification	continuous route and discontinuous classification	discontinuous route and discontinuous classification
1.7 Financial	Order-of-magnitude capital cost	In general, the capital and operating / maintenance cost of the alternatives will be in proportion to its length; large structures, or extraordinary mitigation measures or property costs are to be considered.	lowest (relative)	→	highest (relative)
1.8 Construction	Qualitative assessment	Based on any unique aspects of the corridor which may result in increased time and / or complexity for construction (examples are special structures, detours, etc.)	standard construction duration / complexity and few detours	→	complex construction or several major detours
1.9 Staging	Qualitative assessment	Unique aspects of the corridor or design type which may make the alternative better suited or not as well suited to construction in stages.	project consists of upgrading of existing facilities	→	project consists of construction of all new facilities
2. NATURAL ENVIRONMENT					
2.1 Fisheries and Aquatic Habitat	Number of crossings of permanent watercourses	Potential fisheries impact assumed to be proportional to the number of river crossings.	0 - 1 crossings	2 - 5 crossings	> 5 crossings
2.2 Wildlife	Length of new route through wooded areas	Potential wildlife impact assumed to be proportional to the amount of habitat affected.	< 1.0 km	1.0 - 2.0 km	> 2.0 km
2.3 Vegetation	Length of new route through woodlots, parks, wetlands and / or conservation areas	Potential vegetation impact is concentrated in otherwise undisturbed natural areas.	< 1.0 km	1.0 - 2.0 km	> 2.0 km
2.4 Wetlands	Length of new route across Class One or ESA wetlands	Potential wetlands impact is assumed to be proportional to the length of crossing, although mitigation (structures, etc.) is feasible in many cases.	< 0.2 km	0.2 - 0.5 km	> 0.5 km
2.5 Groundwater	Length of new route within Oak Ridges Moraine	Oak Ridges Moraine has been identified as a key source for groundwater infiltration.	< 1 km	1 - 5 km	> 5 km
2.6 Surface Water	Number of significant new watercourse crossings	Impact on quantity and quality of surface water assumed to be proportional to the number of crossings.	0 crossings	1 crossing	≥ 2 crossings
2.7 Greenways and Open Space Linkages	Number of green corridors crossed or affected by alternative	Impact assumed to be proportional to the number of greenways / linkages crossed.	0 crossings	1 - 2 crossings	> 2 crossings
2.8 Soil	Length of new route across agricultural and forest land	Risk of soil loss assumed to be proportional to the length of susceptible lands crossed.	< 5 km	5 - 10 km	> 10 km

RATIONALE FOR COMPARATIVE RATING GUIDELINES (Cont'd)

FACTOR / CRITERION	KEY MEASURE	BASIS	RATING GUIDELINES		
			GOOD	FAIR	POOR
3. SOCIAL ENVIRONMENT					
3.1 Aesthetics	Qualitative assessment	Consideration of any unique visually appealing aspects of the corridor and surrounding areas along with the length of new route visible to established residential areas.	good views from route with few views of route	→	indifferent views from route and many views of route
3.2 Highway and Construction Noise	Length of facility within 500 m of residential areas	The number of people expected to experience adverse noise impacts is in proportion to the number of homes adjacent to the corridor.	< 1 km	1 - 3 km	> 3 km
3.3 Community / Recreation	Length of facility in developed areas	The impacts to communities and community facilities, both positive and negative, is assumed to be in proportion to the length of the alternative which passes through or near to developed areas.	< 2 km	2 - 5 km	> 5 km
4. ECONOMIC ENVIRONMENT					
4.1 Agriculture	Length of facility in agricultural areas	Potential impacts to agricultural land and operations assumed to be proportional to the length of the alternative which passes through agricultural land.	< 5 km	5 - 10 km	> 10 km
4.2 Commercial / Industrial	Number of major employment centres within 2 km of alternative	Potential effects on commercial and industrial areas are assumed to be in proportion to the proximity of the facility; this applies to both positive impacts (exposure, access, etc.) as well as negative impacts (displacement).	> 2	1 - 2	0
4.3 Special Land Use Strategies	Official Plan compatibility	Assessment of degree of compatibility or incompatibility with municipal Official Plans.	corridor identified in OP	→	corridor would utilize lands designated in OP for other uses such as development
4.4 Property Waste and Contamination	Number of waste / contaminated sites adjacent to corridor and significance of impacts	Potential impacts are generally limited to contaminated sites which are in "close" proximity to the alternative. Net impact after mitigation is considered.	0 sites	1 - 2 sites	> 2 sites
4.5 Aggregates	Length of alternative which passes through aggregate resources	Potential impacts are generally limited to aggregate resources / operations within the right-of-way.	0 km	< 0.5 km	> 0.5 km
5. CULTURAL ENVIRONMENT					
5.1 Archaeology	Number of archaeological sites adjacent to corridor	Potential impacts are generally limited to archaeological sites which are in "close" proximity to the alternative.	0 sites	1 - 5 sites	> 5 sites
5.2 Historical	Number of historical sites adjacent to corridor	Potential impacts are generally limited to historical sites which are in "close" proximity to the alternative.	0 sites	1 - 5 sites	> 5 sites
6. APPLIED ENVIRONMENTAL CONDITIONS					
6.1 Stormwater Management	Number of watercourse crossings	Need to provide extraordinary quality or quantity management of stormwater is assumed to be in proportion to the number of surface waterbodies which are likely receivers of stormwater.	0 - 1 crossing	2 - 5 crossings	> 5 crossings
6.2 Erosion and Sedimentation Control	Length of new road construction	With any construction activity, there is the potential for soil erosion and / or sedimentation; risk is assumed to be in proportion to the amount of construction required.	shortest (relative)	→	longest (relative)
6.3 Sustainable Development	Compatibility with provincial land use planning strategy	Compatibility with areawide plans re: nodal development, greenlands preservation, etc. indicate support for the sustainablity principles incorporated.	supportive	neutral	conflicting

SUMMARY OF ANALYSIS OF ALTERNATIVE ROUTES

FACTOR / CRITERION	KEY MEASURE	1: Green Lane Arterial	2: 9 / Green Lane Freeway	3: New Arterial - Newmarket	4: New Freeway - Newmarket	5: New Arterial - Bradford	6: New Freeway - Bradford
1. TRANSPORTATION							
1.1 Traffic Operating Speed	Assumed posted speed	80 km/h	100 km/h	80 km/h	100 km/h	80 km/h	100 km/h
1.2 Traffic Volume	AADT range (projected demand)						
1.3 Traffic Operations	Facility classification	High Standard Arterial	Freeway	High Standard Arterial	Freeway	High Standard Arterial	Freeway
1.4 Safety	Number of intersections or entrances	52	22	17	20	15	23
1.5 Efficiency	Average travel time via alternative	24.2	19.8	23.7	19.7	23.3	19.4
1.6 Network Aspects	Qualitative assessment	Poor continuity and location	Good continuity, poor location	Fair continuity, poor location	Good continuity, poor location	Fair continuity, good location	Good continuity and location
1.7 Financial	Order-of-magnitude capital cost	1.0 (base case)	5.0	1.6	4.5	2.3	5.0
1.8 Construction	Qualitative assessment	Straight forward	difficult to retrofit; 400 I/C a problem	400, 404 I/Cs a problem	400, 404 I/Cs a problem	Straight forward; foundations a concern	Straight forward; foundations a concern
1.9 Staging	Qualitative assessment	Readily staged	Twin in segments. Service roads prereq.	Widen from 2 lanes in sections	Add grade separations. Twin in sections.	Widen from 2 lanes in sections.	Add grade separations. Twin in sections.
2. NATURAL ENVIRONMENT							
2.1 Fisheries and Aquatic Habitat	Number of crossings of permanent watercourses	1 major	1 major	1 major	1 major	2 major	2 major
2.2 Wildlife	Length of new route through wooded areas	0.5 km	3.2 km	4.8 km	4.8 km	4.4 km	4.4 km
2.3 Vegetation	Length of new route through woodlots, parks, wetlands and / or conservation areas	0.5 km	3.2 km	4.8 km	4.8 km	4.6 km	4.6 km
2.4 Wetlands	Length of new route across Class One or ESA wetlands	0 km	0 km	0 km	0 km	1.9 km	1.9 km
2.5 Groundwater	Length of new route within Oak Ridges Moraine	0 (7.7 km existing)	7.3 km	3 km	3 km	0 km	0 km
2.6 Surface Water	Number of significant new watercourse crossings	1	1	1	1	2	2
2.7 Greenways and Open Space Linkages	Number of green corridors crossed or affected by alternative	5	5	4	4	3	3
2.8 Soil	Length of new route across agricultural and forest land	n/a (existing ROW)	13.2 km	14.2 km	14.2 km	13.5 km	13.5 km

SUMMARY OF ANALYSIS OF ALTERNATIVE ROUTES (Cont'd)

FACTOR / CRITERION	KEY MEASURE	1: Green Lane Arterial	2: 9 / Green Lane Freeway	3: New Arterial - Newmarket	4: New Freeway - Newmarket	5: New Arterial - Bradford	6: New Freeway - Bradford
3. SOCIAL ENVIRONMENT							
3.1 Aesthetics	Qualitative assessment	good	poor	fair	fair	fair	fair
3.2 Highway and Construction Noise	Length of facility within 500 m of residential areas	12.9 km	12.9 km	12.3 km	12.3 km	11.4 km	11.4 km
3.3 Community / Recreation	Length of facility in developed areas	0 km	0 km	0 km	0 km	1.7 km	1.7 km
4. ECONOMIC ENVIRONMENT							
4.1 Agriculture	Length of facility in agricultural areas	n/a	10.0 km	9.4 km	9.4 km	9.1 km	9.1 km
4.2 Commercial / Industrial	Number of major employment centres within 2 km of alternative	3	3	2	2	1	1
4.3 Special Land Use Strategies	Official Plan compatibility	Shown in York OP	Route shown in OP	Not shown in OP	Not shown in OP	Route shown in OP	Shown in York OP
4.4 Property Waste and Contamination	Number of waste / contaminated sites adjacent to corridor and significance of impacts	0	0	0 known	0 known	0	0
4.5 Aggregates	Length of alternative which passes through aggregate resources	0 km	0 km	> 0.5 km	> 0.5 km	0 km	0 km
5. CULTURAL ENVIRONMENT							
5.1 Archaeology	Number of archaeological sites adjacent to corridor	0	0	0	0	0	0
5.2 Historical	Number of historical sites adjacent to corridor	2	2	1	1	2	2
6. APPLIED ENVIRONMENTAL CONDITIONS							
6.1 Stormwater Management	Number of watercourse crossings	1	1	1	1	2	2
6.2 Erosion and Sedimentation Control	Length of new road construction	1.9 km	15.8 km	15.6 km	15.6 km	15.1 km	15.1 km
6.3 Sustainable Development	Compatibility with provincial land use planning strategy	Use of existing row is compatible	Substantial changes to surroundings	Accommodated, not encouraged	Accommodated, not encouraged	Accommodated, not encouraged	Accommodated, not encouraged

GRAPHICAL OVERVIEW OF RATINGS OF ALTERNATIVE ROUTES

FACTOR / CRITERION	ALTERNATIVE					
	1: Green Lane Arterial	2: 9 / Green Lane Freeway	3: New Arterial - Newmarket	4: New Freeway - Newmarket	5: New Arterial - Bradford	6: New Freeway - Bradford
1. TRANSPORTATION						
1.1 Traffic Operating Speed	○	◯	○	◯	○	◯
1.2 Traffic Volume						
1.3 Traffic Operations	○	◯	○	◯	○	◯
1.4 Safety	•	•	○	•	○	•
1.5 Efficiency	•	◯	•	◯	•	◯
1.6 Network Aspects	•	○	○	○	○	◯
1.7 Financial	◯	•	◯	•	○	•
1.8 Construction	◯	•	○	•	○	○
1.9 Staging	◯	○	○	•	○	•
2. NATURAL ENVIRONMENT						
2.1 Fisheries and Aquatic Habitat	◯	◯	◯	◯	○	○
2.2 Wildlife	◯	○	○	○	○	○
2.3 Vegetation	◯	○	○	○	○	○
2.4 Wetlands	◯	◯	◯	◯	•	•
2.5 Groundwater	◯	•	○	○	◯	◯
2.6 Surface Water	○	○	○	○	•	•
2.7 Greenways and Open Space Linkages	•	•	•	•	•	•
2.8 Soil	◯	•	•	•	•	•
3. SOCIAL ENVIRONMENT						
3.1 Aesthetics						
3.2 Highway and Construction Noise	•	•	•	•	•	•
3.3 Community / Recreation	◯	◯	◯	◯	○	○
4. ECONOMIC ENVIRONMENT						
4.1 Agriculture	◯	○	○	○	○	○
4.2 Commercial / Industrial	◯	◯	○	○	○	○
4.3 Special Land Use Strategies	◯	○	•	•	○	◯
4.4 Property Waste and Contamination	◯	◯	◯	◯	◯	◯
4.5 Aggregates	◯	◯	•	•	◯	◯
5. CULTURAL ENVIRONMENT						
5.1 Archaeology						
5.2 Historical	○	○	○	○	○	○
6. APPLIED ENVIRONMENTAL CONDITIONS						
6.1 Stormwater Management	◯	◯	◯	◯	○	○
6.2 Erosion and Sedimentation Control	◯	•	•	•	•	•
6.3 Sustainable Development	◯	○	○	○	○	○

◯ Good / Most Preferred ○ Fair • Poor / Least Preferred } See previous Exhibit for rating guidelines

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.1 Traffic Operating Speed

Key Measure: Assumed Posted Speed

Date of Assessment: September 1995

Basis / Source:

- MTO Geometric Design Standards
- for new freeway, design speed is generally 120 km/h (posted speed 100 km/h)
- the Green Lane Preliminary Design Study encompasses a range of alternative design speeds from 80 km/h to 100 km/h

Assessment and Rating:

Alternative	Design Speed	Posted Speed	Rating
1. 9 / Green Lane Arterial	100 km/h (potentially reduced to 80 km/h in Bathurst - Yonge area)	80 km/h	fair (overall)
2. 9 / Green Lane Freeway	120 km/h	100 km/h	good
3. New Arterial - Newmarket	100 km/h	80 km/h	fair
4. New Freeway - Newmarket	120 km/h	100 km/h	good
5. New Arterial - Bradford	100 km/h	80 km/h	fair
6. New Freeway - Bradford	120 km/h	100 km/h	good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.2 Traffic Volume

Key Measure: Projected Average Daily Traffic (AADT) volume (range)

Date of Assessment: October 1995

Basis / Source: EMME/2 computer model runs by Cole Sherman Inc. of York Region network with MTO traffic interregional assignments, for the 2011 a.m. peak hour. Alternative 2 was not explicitly modelled; its Highway 9 - Green Lane freeway results are assumed to be very similar to those of Alternative 4 with its analogous facility in an adjacent right-of-way. All model results are to be used for comparative purposes only, not as definitive standalone forecasts. In part, this is because local traffic and trucks are not included in model, and the 2011 time frame does not reflect the full extent of proposed development in the area per the new York Region Official Plan. The model does show differences between alternatives using a common set of base conditions and trip generation characteristics.

Assessment and Rating:

Alternative	Volume Range (veh/h)	Yonge Street Screenline[1] (veh/h)				Rating
		EB	WB	Total	% on Alt.	
1. 9 / Green Lane - Arterial	1600 - 2800	3600	4000	7600	33	Poor
2. 9 / Green Lane - Freeway	3400 - 5500[2]	N/A	N/A	N/A	N/A	Good
3. New Arterial - Newmarket	1500 - 2800	3700	4300	8000	27	Poor
4. New Freeway - Newmarket	3400 - 5500	4300	5200	9500	53	Good
5. New Arterial - Bradford	700 - 2100	3800	4100	7900	20	Poor
6. New Freeway - Bradford	2500 - 4300	4200	4600	8800	35	Fair

(1) Screenline on east side of Yonge Street from Mulock Drive to Bradford Corridor

(2) assumed similar to Alternative 4

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.3 Traffic Operations

Key Measure: Facility Classification

Date of Assessment: September 1995

Basis / Source: Road classification criteria as defined in "Geometric Design Standards for Canadian Roads and Streets", Transportation Association of Canada

Assessment and Rating:

Alternative	Classification	Rating
1. 9 / Green Lane - Arterial	High standard arterial	Fair
2. 9 / Green Lane - Freeway	Freeway	Good
3. New Arterial - Newmarket	High standard arterial	Fair
4. New Freeway - Newmarket	Freeway	Good
5. New Arterial - Bradford	High standard arterial	Fair
6. New Freeway - Bradford	Freeway	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.4 Safety

Key Measure: Number of Intersection or Entrances

Date of Assessment: September 1995

Basis / Source:

- freeway design criterion is complete control of access, i.e. no entrances or stop conditions
- new intersection could be created on crossing roads at interchange ramp terminals
- all existing private entrances and intersections on Highway 9 would be retained under Alternative 1 but no new entrances would be allowed
- access to Alternative 2 would be limited to existing crossing roads and, in Green Lane segment, mid-block collectors per municipal Official Plans
- access to Alternative 4 would be limited to existing crossing roads

Assessment and Rating:

Alternative	Number of Intersections		Number of Entrances	Rating
	Main Line	Ramp Terminals		
1. 9 / Green Lane Arterial	11	4	37+	Poor
2. 9 / Green Lane Freeway	0	22	0	Poor
3. New Arterial - Newmarket	8	5	4?	Fair
4. New Freeway - Newmarket	0	20	0	Fair
5. New Arterial - Bradford	9	6	0	Fair
6. New Freeway - Bradford	0	23	0	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.5 Efficiency

Key Measure: Average Travel Time

Date of Assessment: September 1995

Basis / Source:

- Average of two trips: NW to SE and NE to SW via alternative
- Assumed Highway 404 extended northerly to Ravenshoe Road
- Measured length of route × speed (100 km/h on freeways, 70 km/h on arterials)
- Average operating speed on arterial segments reduced by 10 km/h from posted speed due to delays at signalized intersections and lower-speed ramp speeds at freeway interchanges

Assessment and Rating:

Alternative	NW to SE						NE to SW						Average Time (min)	Rating
	400/89 to 400/alternative		400/alternative to 404/alternative		404/alternative to 404/Davis		404/Ravenshoe to 404/Alternative		404/Alternative to 400/Alternative		400/Alternative to 400/9			
	length (km)	time (min)	length (km)	time (min)	length (km)	time (min)	length (km)	time (min)	length (km)	time (min)	length (km)	time (min)		
1. 9 / Green Lane Arterial	19.9	11.9	16.2	13.9	2.5	1.5	11.9	7.1	16.2	13.9	0	0	24.2	Poor
2. 9 / Green Lane Freeway	19.9	11.9	15.8	9.5	2.5	1.5	11.9	7.1	15.8	9.5	0	0	19.8	Good
3. New Arterial - Newmarket	19.9	11.9	15.6	13.4	2.6	1.6	11.8	7.1	15.6	13.4	0	0	23.7	Poor
4. New Freeway - Newmarket	19.9	11.9	15.6	9.4	2.6	1.6	11.8	7.1	15.6	9.4	0	0	19.7	Good
5. New Arterial - Bradford	9.3	5.6	15.2	13.0	9.4	5.6	5.0	3.0	15.2	13.0	10.6	6.4	23.3	Poor
6. New Freeway -Bradford	9.3	5.6	15.2	9.1	9.4	5.6	5.0	3.0	15.2	9.1	10.6	6.4	19.4	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.6 Network Aspects

Key Measure: Qualitative Assessment

Date of Assessment: September 1995

Basis / Source: Key network issues, as outlined in the Environmental Assessment Proposal, are:

1. Continuity of jurisdiction
2. Continuity of road classification
3. Reduction of out-of-way travel around Lake Simcoe

Assessment and Rating:

Alternative	Comment	Rating
1. 9 / Green Lane Arterial	1. Jurisdictional continuity a question mark since Green Lane is a municipal road 2. Arterial classification is different from 400 and 404 freeways 3. Location too far south to reduce out-of-way travel	Poor
2. 9 / Green Lane Freeway	1. Continuous provincial jurisdiction. 2. Continuous freeway classification. 3. Location too far south to reduce out-of-way travel.	Fair
3. New Arterial - Newmarket	1. Assume new road would be 100% provincial initiative. 2. Classification differs from that of 400 and 404. 3. Location too far south to reduce out-of-way travel.	Fair
4. New Freeway - Newmarket	1. Continuous provincial jurisdiction. 2. Continuous freeway classification. 3. Location too far south to reduce out-of-way travel.	Fair
5. New Arterial - Bradford	1. Continuous provincial jurisdiction. 2. Classification differs from 400 and 404. 3. Creates moderate reduction in out-of-way travel. Note: increases network flexibility by addressing Bradford and 9 corridors	Fair
6. New Freeway - Bradford	1. Continuous provincial jurisdiction. 2. Continuous freeway classification. 3. Creates moderate reduction in out-of-way travel. Note: increases network flexibility by addressing Bradford and 9 corridors	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.7 Financial

Key Measure: Order-of-Magnitude Capital Costs

Date of Assessment: September 1995

Basis / Source:

- Roadway and structure costs based on "Highway Construction Costs", MTO Estimating Office, April 1990
- Property costs based on current typical asking prices for advertised rural properties in the study area
- This is a comparison of relative costs between alternatives, not a design-level estimate of each alternative's actual cost, therefore a cost ratio is used (lowest alternative being assigned 1.0) rather than a dollar figure

Item	Type	Unit Cost
Roadway Construction (average terrain)	New 4 Lane Arterial	$ 2,000/m[1]
	New 4 Lane Freeway	$ 3,500/m[1]
	Widened 4 Lane Arterial (from 2)	$ 1,200/m[1]
	Widened 6 Lane Arterial (from 4)	$ 1,200/m[1]
Structure	New Grade Separation	$ 1,300/m^2 deck area
Property	Rural / Agricultural / Woodlot Land	$ 80,000/ha
	Developed Lot (Residence)	$ 200,000 ea

[1] plus $ 500/m premium for construction in rugged terrain / wetlands

Assessment and Rating:

Alternative	Cost Component						Overall Cost Ratio	Rating
	Roadway			Structure (m^2)	Property			
	New Arterial (m)	New Freeway (m)	Widening (m)		Undeveloped (ha)	Developed (ea)		
1. 9 / Green Lane Arterial	1900	-	14300	1100	7.6	-	1.0	Good
2. 9 / Green Lane Freeway	6000	15800	-	27000	155	-	5.0	Poor
3. New Arterial - Newmarket	15600[2]	-	-	1100	62.4	-	1.6	Good
4. New Freeway - Newmarket	-	15600[2]	-	23400	190	-	4.5	Poor
5. New Arterial - Bradford	15200	-	-	8800	56	11+ Marina Golf Course	2.3	Good
6. New Freeway - Bradford	-	15200	-	30400	188	11+ Marina Golf Course	5.0	Poor

[2] includes 4000 m in premium area

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.8 Construction

Key Measure: Qualitative Assessment

Date of Assessment: September 1995

Basis / Source:
- Based on professional judgement with respect to any unique aspects of the facility which may result in increased time or complexity of construction
- issues related to staging are addressed separately under Criterion 1.9

Assessment and Rating:

Alternative	Comment	Rating
1. 9 / Green Lane Arterial	Relatively straight forward widening / reconstruction.	Good
2. 9 / Green Lane Freeway	New interchange with 400 is a difficult location, considering presence of marsh, grade, parking and existing interchange. Maintaining traffic and access during reconstruction is a significant challenge. Presence of service roads constrains design / interchange layout.	Poor
3. New Arterial - Newmarket	400 and 404 interchanges are made complex in order to tie in existing road network. Most of new alignment is relatively straight forward, although varying soil conditions may pose grading challenge west of Bathurst.	Fair
4. New Freeway - Newmarket	400 I/C in difficult location (per #2), made more complex by need to tie in Highway 9. The same problem occurs at 404 with Herald Road ramps. Varying soil conditions may pose grading challenge west of Bathurst.	Poor
5. New Arterial - Bradford	Relatively straightforward new construction; most significant construction challenge is roadbed and bridge foundations in Holland River valley.	Fair
6. New Freeway - Bradford	Same as #5	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 1. Transportation

Criterion: 1.9 Staging

Key Measure: Qualitative Assessment

Date of Assessment: September 1995

Basis / Source:

- Based on professional judgement with respect to the ability to construct the facility in a staged manner such that costs may be deferred and transportation service improved incrementally
- Improvements to an existing road may generally be staged more readily and with less initial cost than construction of a new roadway, because the latter requires a major initial investment to become functional.

Assessment and Rating:

Alternative	Comments	Rating
1. 9 / Green Lane Arterial	Incremental improvements readily staged; existing roads (e.g. Yonge Street) can be used as a link between 9 and Green Lane prior to construction of new segment	Good
2. 9 / Green Lane Freeway	Can be twinned in segments. Cannot operate as freeway until service roads are in place.	Fair
3. New Arterial - Newmarket	Can be built initially as 2 lane road and later widened. Can build in sections 9-Yonge and Yonge-404.	Fair
4. New Freeway - Newmarket	Can be built initially as 2 lane road and later twinned. Can build in sections 9-Yonge and Yonge-404. Grade separations can be added over time. Entire section must be twinned at once to be effective.	Poor
5. New Arterial - Bradford	Can be built initially as 2 lane road and later widened. Hwy 11 to Bathurst section must be built in first stage.	Fair
6. New Freeway - Bradford	Can be built initially as 2 lane road and later twinned. Hwy 11 to Bathurst section must be built in first stage. Grade separations can be added over time. Entire facility must be twinned at once to be effective.	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.1 Fisheries and Aquatic Habitat

Key Measure: Number of Crossings of Permanent Watercourses

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic, 1:10,000 Ontario Base Maps, alternative plans. Minor watercourses (culverts) not included in assessment.

Assessment and Rating:

Alternative	Major Watercourses Crossed	Rating
1. 9 / Green Lane Arterial	Holland River East Branch	Good
2. 9 / Green Lane Freeway	Holland River East Branch	Good
3. New Arterial - Newmarket	Holland River East Branch	Good
4. New Freeway - Newmarket	Holland River East Branch	Good
5. New Arterial - Bradford	Holland River - Main Branch and East Branch	Fair
6. New Freeway - Bradford	Holland River - Main Branch and East Branch	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.2 Wildlife

Key Measure: Length of New Route Through Wooded Areas

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic, alternative plans

Assessment and Rating:

Alternative	Length of Wooded Area Affected		Rating
	New Route	Expand Existing Route	
1. 9 / Green Lane Arterial	0.5 km	0	Good
2. 9 / Green Lane Freeway	0.4 km	2.8 km	Fair
3. New Arterial - Newmarket	4.8 km	-	Fair
4. New Freeway - Newmarket	4.8 km	-	Fair
5. New Arterial - Bradford	4.4 km	-	Fair
6. New Freeway - Bradford	4.4 km	-	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.3 Vegetation

Key Measure: Length of New Route Through Woodlots, Parks, Wetlands and/or Conservation Areas

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic, alternative plans

Assessment and Rating:

Alternative	Length of Vegetation Zones Crossed / Affected	Rating
1. 9 / Green Lane Arterial	0.5 km	Good
2. 9 / Green Lane Freeway	3.2 km	Fair
3. New Arterial - Newmarket	4.8 km	Fair
4. New Freeway - Newmarket	4.8 km	Fair
5. New Arterial - Bradford	4.6 km	Fair
6. New Freeway - Bradford	4.6 km	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.4 Wetlands

Key Measure: Length of New Route Across Class One or ESA Wetlands

Date of Assessment: September 1995

Basis / Source: MNR mapping; York Region Official Plan

Assessment and Rating:

Alternative	Length of Wetlands Crossed	Rating
1. 9 / Green Lane Arterial	0 km	Good
2. 9 / Green Lane Freeway	0 km	Good
3. New Arterial - Newmarket	0 km	Good
4. New Freeway - Newmarket	0 km	Good
5. New Arterial - Bradford	1.9 km	Poor
6. New Freeway - Bradford	1.9 km	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.5 Groundwater

Key Measure: Length of New Route Through Oak Ridges Moraine

Date of Assessment: September 1995

Basis / Source: 1:10,000 scale aerial photomosaic; Oak Ridges Moraine boundary as shown in "Oak Ridges Moraine Technical Working Committee" base mapping, April 1993.

Assessment and Rating:

Alternative	Length of Oak Ridges Moraine Crossed	Rating
1. 9 / Green Lane Arterial	7.7 km (existing right-of-way)	Good
2. 9 / Green Lane Freeway	7.3 km (substantially expanded right-of-way)	Poor
3. New Arterial - Newmarket	3.0 km (new right-of-way - edge of O.R.M.)	Fair
4. New Freeway - Newmarket	3.0 km (new right-of-way - edge of O.R.M.)	Fair
5. New Arterial - Bradford	0 km	Good
6. New Freeway - Bradford	0 km	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.6 Surface Water

Key Measure: Number of New Crossings of Significant Watercourses

Date of Assessment: September 1995

Basis / Source: 1:10,000 scale aerial photomosaic

Assessment and Rating:

Alternative	New Watercourse Crossings	Rating
1. 9 / Green Lane Arterial	Holland River East Branch	Fair
2. 9 / Green Lane Freeway	Holland River East Branch	Fair
3. New Arterial - Newmarket	Holland River East Branch	Fair
4. New Freeway - Newmarket	Holland River East Branch	Fair
5. New Arterial - Bradford	Holland River East Branch, Main Branch	Poor
6. New Freeway - Bradford	Holland River East Branch, Main Branch	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.7 Greenways and Open Space Linkages

Key Measure: Number of Green Corridors Crossed or Affected by Alternative

Date of Assessment: September 1995

Basis / Source:
- Map 4, Regional Greenlands system, Region of York Official Plan, October 1994
- Official Plan, Town of Bradford West Gwillimbury, 1991

Assessment and Rating:

Alternative	Green Corridors Crossed	Rating
1. 9 / Green Lane Arterial	5: link east of Jane Street, Glenville Kame area, woodlot at Bathurst / Poplar Lane, creek east of Yonge, and Holland River East Branch	Poor
2. 9 / Green Lane Freeway	5: same as alt. 1	Poor
3. New Arterial - Newmarket	4: Holland Marsh fringe, Bathurst / Poplar Lane, creek east of Yonge, and Holland River East Branch	Poor
4. New Freeway - Newmarket	4: same as alt. 3	Poor
5. New Arterial - Bradford	3: Graham Creek, Holland River Main Branch, Holland River East Branch	Poor
6. New Freeway - Bradford	3: same as alt. 5	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 2. Natural Environment

Criterion: 2.8 Soil

Key Measure: Length of New Route Across Agricultural and Forest Land

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic, alternative plans

Assessment and Rating:

Alternative	Agricultural Land	Forested Land	Total	Rating
1. 9 / Green Lane Arterial	n/a	n/a	n/a	N/A
2. 9 / Green Lane Freeway	10.0 km	3.2 km	13.2 km	Poor
3. New Arterial - Newmarket	9.4 km	4.8 km	14.2 km	Poor
4. New Freeway - Newmarket	9.4 km	4.8 km	14.2 km	Poor
5. New Arterial - Bradford	9.1 km	4.4 km	13.5 km	Poor
6. New Freeway - Bradford	9.1 km	4.4 km	13.5 km	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 3. Social Environment

Criterion: 3.1 Aesthetics

Key Measure: Qualitative Assessment

Date of Assessment: September 1995

Basis / Source: field review; professional judgement

Assessment and Rating:

Alternative	Comments	Rating
1. 9 / Green Lane Arterial	Similar in location and scale to existing landscape	Good
2. 9 / Green Lane Freeway	Significant change from existing landscape; 8 lane roadway in high-visibility corridor	Poor
3. New Arterial - Newmarket	New route introduced to rural landscape	Fair
4. New Freeway - Newmarket	New route introduced to rural landscape	Fair
5. New Arterial - Bradford	New route introduced to rural landscape	Fair
6. New Freeway - Bradford	New route introduced to rural landscape	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 3. Social Environment

Criterion: 3.2 Highway and Construction Noise

Key Measure: Length of Roadway Within 500 m of Residential Areas

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic, field survey

Assessment and Rating:

Alternative	Length Within 500 m	Approx. No. of Homes Within 500 m	Rating
1. 9 / Green Lane Arterial	12.9 km	380	Poor
2. 9 / Green Lane Freeway	12.9 km	370	Poor
3. New Arterial - Newmarket	12.3 km	80	Poor
4. New Freeway - Newmarket	12.3 km	80	Poor
5. New Arterial - Bradford	11.4 km	120	Poor
6. New Freeway - Bradford	11.4 km	120	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 3. Social Environment

Criterion: 3.3 Community / Recreation

Key Measure: Length of Roadway in Developed Areas

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic

Assessment and Rating:

Alternative	Length of Roadway in Developed Areas	Community / Recreation Facilities Affected	Rating
1. 9 / Green Lane Arterial	0 km	0	Good
2. 9 / Green Lane Freeway	0 km	0	Good
3. New Arterial - Newmarket	0 km	Golf Course	Good
4. New Freeway - Newmarket	0 km	Golf Course	Good
5. New Arterial - Bradford	1.7 km	Golf Course, Marina	Fair
6. New Freeway - Bradford	1.7 km	Golf Course, Marina	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 4. Economic Environment

Criterion: 4.1 Agriculture

Key Measure: Length of Roadway in Agricultural Areas

Date of Assessment: September 1995

Basis / Source: 1:10,000 aerial photomosaic

Assessment and Rating:

Alternative	Comments	Rating
1. 9 / Green Lane Arterial	n/a	N/A
2. 9 / Green Lane Freeway	10.0 km	Fair
3. New Arterial - Newmarket	9.4 km	Fair
4. New Freeway - Newmarket	9.4 km	Fair
5. New Arterial - Bradford	9.1 km	Fair
6. New Freeway - Bradford	9.1 km	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 4. Economic Environment

Criterion: 4.2 Commercial / Industrial

Key Measure: Number of Major Employment Centres Within 2 km of Route

Date of Assessment: September 1995

Basis / Source: aerial photomosaic, York Region Official Plan, Bradford West Gwillimbury Official Plan

Assessment and Rating:

Alternative	Proximity to Major Employment Centres	Rating
1. 9 / Green Lane Arterial	3 - 9/11, downtown Newmarket, Davis / Leslie	Good
2. 9 / Green Lane Freeway	3 - 9/11, downtown Newmarket, Davis / Leslie	Good
3. New Arterial - Newmarket	2 - 9/11, Leslie Street	Fair
4. New Freeway - Newmarket	2 - 9/11, Leslie Street	Fair
5. New Arterial - Bradford	1 - Bradford	Fair
6. New Freeway - Bradford	1 - Bradford	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 4. Economic Environment

Criterion: 4.3 Special Land Use Strategies

Key Measure: Official Plan Compatibility

Date of Assessment: September 1995

Basis / Source: <listing on p. 4-5 of Official Plans>

Note that Simcoe has no OP and that the Plans of the area municipalities within York Region are obliged to reflect the Regional OP. The York OP is also the most recent approved Plan and is the only one which shows any of the east-west link alternatives under discussion. None of the other OPs make reference to any of the alternatives. The Bradford West Gwillimbury OP is currently (1995) being updated.

Assessment and Rating:

Alternative	Official Plan Compatibility	Rating
1. 9 / Green Lane Arterial	Shown as "proposed provincial highway" on Map 9 of York OP	Good
2. 9 / Green Lane Freeway	Highway, not freeway, shown on route in York OP	Fair
3. New Arterial - Newmarket	Not shown in York OP	Poor
4. New Freeway - Newmarket	Not shown in York OP	Poor
5. New Arterial - Bradford	Freeway, not highway, shown in corridor in York OP	Fair
6. New Freeway - Bradford	Shown as "provincial freeway - alignment not defined" on Map 9 of York OP	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 4. Economic Environment

Criterion: 4.4 Property Waste and Contamination

Key Measure: Number / Significance of Waste / Contaminated Sites on Route

Date of Assessment: September 1995

Basis / Source: Highway 9 Widening PDR, Green Lane Corridor Class EA / PD Study

Assessment and Rating:

Alternative	Waste / Contaminated Sites		Rating
	Number	Significance	
1. 9 / Green Lane Arterial	0	-	Good
2. 9 / Green Lane Freeway	0	-	Good
3. New Arterial - Newmarket	0 known	minor risk of encountering site	Good
4. New Freeway - Newmarket	0 known	minor risk of encountering site	Good
5. New Arterial - Bradford	0	-	Good
6. New Freeway - Bradford	0	-	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 4. Economic Environment

Criterion: 4.5 Aggregates

Key Measure: Length of Crossing of Aggregate Resource Areas

Date of Assessment: September 1995

Basis / Source: Map 7, Mineral Aggregate Resources, Region of York Official Plan, October 1984

Assessment and Rating:

Alternative	Length of Aggregate Crossings	Rating
1. 9 / Green Lane Arterial	0	Good
2. 9 / Green Lane Freeway	0	Good
3. New Arterial - Newmarket	> 0.5 km	Poor
4. New Freeway - Newmarket	> 0.5 km	Poor
5. New Arterial - Bradford	0	Good
6. New Freeway - Bradford	0	Good

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 5. Cultural Environment

Criterion: 5.1 Archaeology

Key Measure: Number of Archaeological Sites Encountered

Date of Assessment: October 1995

Basis / Source:

- Bradford Bypass Study Technical Report - Archaeological Background and Study, MTO Central Region Environmental Section, June 1994
- Pre-field study, Newmarket Corridor, MTO Central Region Environmental Section, November 1995

Assessment and Rating:

Alternative	Archaeological Sites		Rating
	Number of Sites Encountered	Potential to Encounter	
1. 9 / Green Lane Arterial	0	limited due to previous disturbance	Good
2. 9 / Green Lane Freeway	2 (1 W of 2nd Con; 1 E of Leslie)	sites near Green Lane	Fair
3. New Arterial - Newmarket	3 (2 @ 404 I/C; Leslie Cemetery)	along E. Shoreline of L. Algonquin	Poor
4. New Freeway - Newmarket	5 (2 @ 404; 2 N of Green Lane, Leslie Cemetery)	along E. Shoreline of L. Algonquin	Poor
5. New Arterial - Bradford	1 (Leslie / Queensville area)	crossing E. Shoreline of L. Algonquin	Fair
6. New Freeway - Bradford	1 (Leslie / Queensville area)	crossing E. Shoreline of L. Algonquin	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 5. Cultural Environment

Criterion: 5.2 Historical

Key Measure: Number of Historical Sites Adjacent to Route

Date of Assessment: October 1995

Basis / Source:

- Bradford Bypass Technical Report - Cultural Environment - Existing Conditions and Data Collected, MTO Central Region Environmental Section, July 1994
- Heritage Features mapping for Highway 9 (New) Corridor, Landplan Collaborative for MTO Central Region Environmental Section, October 1995

Assessment and Rating:

Alternative	Historical Sites	Rating
1. 9 / Green Lane Arterial	7 ordinary, 2 moderate, 1 exceptional	Poor
2. 9 / Green Lane Freeway	7 ordinary, 2 moderate, 1 exceptional	Poor
3. New Arterial - Newmarket	6 ordinary, 1 exceptional	Poor
4. New Freeway - Newmarket	6 ordinary, 1 exceptional	Poor
5. New Arterial - Bradford	1 west of Holland River, 1 east of Holland River	Fair
6. New Freeway - Bradford	1 west of Holland River, 1 east of Holland River	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 6. Applied Environmental Conditions

Criterion: 6.1 Stormwater Management

Key Measure: Number of Crossings of Permanent Watercourses

Date of Assessment: September 1995

Basis / Source: aerial photomosaic

Assessment and Rating:

Alternative	Watercourses Crossed	Rating
1. 9 / Green Lane Arterial	Holland River East Branch	Good
2. 9 / Green Lane Freeway	Holland River East Branch	Good
3. New Arterial - Newmarket	Holland River East Branch	Good
4. New Freeway - Newmarket	Holland River East Branch	Good
5. New Arterial - Bradford	Holland River Main Branch, East Branch	Fair
6. New Freeway - Bradford	Holland River Main Branch, East Branch	Fair

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 6. Applied Environmental Conditions

Criterion: 6.2 Erosion and Sedimentation Control

Key Measure: Length of New Road Construction

Date of Assessment: September 1995

Basis / Source: 1:10,000 scale Ontario Base Mapping

Assessment and Rating:

Alternative	Length of New Road	Rating
1. 9 / Green Lane Arterial	1.9 km	Good
2. 9 / Green Lane Freeway	15.8 km	Poor
3. New Arterial - Newmarket	15.6 km	Poor
4. New Freeway - Newmarket	15.6 km	Poor
5. New Arterial - Bradford	15.1 km	Poor
6. New Freeway - Bradford	15.1 km	Poor

ANALYSIS OF ALTERNATIVES - NEWMARKET AND BRADFORD CORRIDORS

Factor: 6. Applied Environmental Conditions

Criterion: 6.3 Sustainable Development

Key Measure: Compatibility with Provincial Land Use Planning Strategy

Date of Assessment: September 1995

Basis / Source: "Comprehensive Set of Policy Statements", Ministry of Municipal Affairs, 1995

Assessment and Rating:

Alternative	Commentary	Rating
1. 9 / Green Lane Arterial	Widenings (mostly) within existing right-of-way - compatible with land use plans	Good
2. 9 / Green Lane Freeway	Substantial widening of existing right-of-way, with impacts on surroundings; less compatible than alt. 1	Fair
3. New Arterial - Newmarket	New roadway construction accommodated, but not encouraged, by provincial policies	Fair
4. New Freeway - Newmarket	New roadway construction accommodated, but not encouraged, by provincial policies	Fair
5. New Arterial - Bradford	New roadway construction accommodated, but not encouraged, by provincial policies	Fair
6. New Freeway - Bradford	New roadway construction accommodated, but not encouraged, by provincial policies	Fair

APPENDIX C

Summaries of Public Involvement

BRADFORD BYPASS
HIGHWAY 400 TO HIGHWAY 404 EXTENSION

ENVIRONMENTAL ASSESSMENT STUDY

SUMMARY REPORT ON
FIRST ROUND OF PUBLIC INVOLVEMENT
JUNE 1993

McCORMICK RANKIN
JULY 1993

PREFACE

This report documents the content and results of the first round of public review for the Bradford Bypass Environmental Assessment Study. This report was distributed to members of the Project Team and, for the purpose of review by members of the public, copies of this report were also filed with the Clerk's offices of the Town of Bradford West Gwillimbury, King Township and the Town of East Gwillimbury, as well as at the Bradford Public Library.

Further information regarding this study can be obtained by contacting:

Mr. Steve Jacobs, P. Eng.
Senior Project Manager
Ministry of Transportation
Central Region Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Phone: (416) 235-5522
Fax: (416) 235-4382

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BRADFORD BYPASS FIRST ROUND OF PUBLIC INVOLVEMENT JUNE 1993
PUBLIC INFORMATION CENTRE DISPLAYS

ATTENDANCE REGISTERS

COMMENT SHEETS

INFOSOURCE HOTLINE MESSAGES

COMMENT SHEETS SUBMITTED AT PUBLIC INFORMATION CENTRE

MAILED/FAXED COMMENTS (TO JULY 2, 1993)

1. INTRODUCTION

The Bradford Bypass Environmental Assessment (E.A.) Study involves a comprehensive public involvement program, built around four rounds of Public Information Centres (P.I.C.s) held at key points during the study:

#1 - Environmental Assessment Proposal (E.A.P.)
#2 - Route Planning
#3 - Preferred Alternative
#4 - Preliminary Design

This report documents the first round of Public Involvement, which occurred during June, 1993 with Public Information Centres at Bradford on June 17th and at Queensville on June 22nd. The latter P.I.C. was shared with the concurrent and related Highway 404 Extension E.A. Study.

2. PURPOSE OF INFORMATION CENTRES

The intent of the first round of P.I.C.s was to allow the public to review the contents of the draft E.A.P. and provide comments on it as well as suggestions for consideration in the subsequent Route Planning phase of the study. Specifically, the public was requested to identify any issues, concerns or comments they might have regarding:

- the proposed study area
- need and justification for the study
- alternatives to the undertaking
- alternative methods of carrying out the undertaking
- study process and proposed consultation program
- the draft Environmental Assessment Proposal

3. PUBLICITY

An extensive public awareness effort was undertaken, within the limits posed by cost and difficulty in identifying all potentially interested individuals at this early stage in the study. In addition to the MTO publicity efforts, newspaper coverage of the study acted

to raise public awareness.

Specific measures were as follows:

- brochure distribution to Clerks of King, Simcoe, York, Bradford West Gwillimbury, and East Gwillimbury for distribution to municipal councillors and staff, with the remainder for the public
- brochure distribution to the Bradford Library
- notification of identified Interest Groups, Community Groups and Technical/Government Agencies
- distribution by Canada Post bulk mail service of brochures to approximately 7,300 homes and businesses (all addresses within the study area)
- Ontario Government Notices in the Toronto Star (Saturday, June 5, 1993), Bradford West Gwillimbury Times (Wednesday, June 9, 1993), and Georgina Advocate (Wednesday, June 9, 1993)
- front page newspaper articles in the Bradford West Gwillimbury Times (Wednesday, May 19, 1993 and Wednesday, June 2, 1993)
- article in the Toronto Star (Thursday, June 17, 1993)
- Infosource Hotline free local telephone service in Bradford, with recorded message re: study and P.I.C.s, as well as opportunity to record verbal comments. 24 h/day operation beginning May 29, 1993, as advertised weekly in Bradford West Gwillimbury Times newspaper and highlighted in brochures.

4. INFORMATION CENTRE CONTENTS

The first P.I.C. was held in Bradford in the Cafetorium of the Bradford District Secondary School, from 3 to 9 p.m. on Thursday, June 17, 1993. The second P.I.C. followed on Tuesday, June 22, 1993 in the Queensville Community Centre (Queensville Side Road at Leslie Street).

Large print display panels were used to describe the study, supplemented by maps and aerial photomosaics of the study area. The contents of the displays are documented in Appendix 2.

At the Queensville location, selected supplementary displays were used to allow discussion of the Highway 404 Extension study as well (the P.I.C. served as one of four P.I.C.s for the Highway 404 study, with three other locations to follow).

Comment sheets, backed with a brief questionnaire, were available at both locations.

The Information Centres were staffed by members of the Project Team, who engaged in discussion with attendees, explaining the study, responding to questions, and noting concerns or ideas that emerged.

5. PUBLIC RESPONSE

The Information Centres were well-attended, with approximately 120-150 visitors to the Bradford site and 250-300 at Queensville. All of the Queensville attendees had addresses east of the Holland River, while the Bradford session was attended almost entirely by residents west of the river.

The response may be characterized (in general) as:

- interest in the studies
- support for the proposals in concept
- concern about potential effects on property and the natural environment
- frustration at the length of time involved in building the project
- agreement with the study process and public consultation program

Based on the public response there would appear to be a positive attitude towards the studies and a great deal of interest in reviewing specific alternatives.

6. SUMMARY OF PUBLIC COMMENTS

Comments on the study have been received from three sources: mailed/faxed letters, P.I.C. verbal and written comments, and Infosource Hotline verbal comments. Copies of all of these comments up to July 20, 1993 are included in Appendix 3, for reference purposes; the originals are held at McCormick Rankin. In addition, comments made

verbally by P.I.C. attendees are not formally documented but are included in the discussion which follows.

Comments are grouped into categories and summarized for ease of reference in the following table.

CATEGORY	SUMMARY OF PUBLIC COMMENTS
Proposed Study Area	• majority agreement with the study area as shown • several comments suggesting use of the Highway 89 - Ravenshoe Road corridor as previously proposed, or at least including it in the study area so that it can be treated as a viable alternative on the same basis as other routes closer to Bradford • a few queries regarding the western study limit and the potential to consider a link with Highway 27 or further west • a few comments proposing the Highway 9 corridor as a viable alternative/preferred route • one or two comments suggesting a bridge/causeway across Cook's Bay • no concerns were noted with the eastern limit of the study area
Need and Justification for the Study	• strong and virtually unanimous agreement with the need for improved roads to relieve congestion and provide more direct travel routes • frequent comments to the effect that "it should have been done years ago" • several questions as to why the Highway 89 proposal was not pursued instead • suspicion of linkage between road proposals and Interim Waste Authority landfill site in Georgina • a few written comments expressing concern about encouragement of urban sprawl and increased auto use
Alternatives to the Undertaking	• very few comments suggesting study of non-roadway alternatives • one written comment suggesting improvement to GO Train service

CATEGORY	SUMMARY OF PUBLIC COMMENTS
Evaluation Criteria	• few comments • general satisfaction that all aspects of the environment would be considered • several queries as to the proposed "weighting" of factors and the relative importance of "human" (residential) versus "natural" (Keswick Marsh) impacts • questions as to whether protection of the marsh is "absolute" or if it can be crossed; local residents who are restricted from adding fill to their property within the Holland River floodplain perceive an inconsistency if a new highway can cross the marsh on a new fill embankment
Alternative Methods of Carrying Out the Undertaking	• focus of interest was on new routes, but a substantial interest in improvements to existing roads was noted • many questions as to the type of facility "being proposed" - highway or freeway • some suspicion of a "hidden agenda" or pre-conceived solution
Study Process and Consultation Program	• general approval of the approach being taken to the study and public involvement • several comments expressed frustration at the length of time the study will take • some were cynical of the potential for political involvement in the study and its conclusions, with particular reference to the withdrawal of the Highway 89 E.A. submission • a few queries regarding the most effective means for an individual to either support or oppose the project • significant concern among a number of rural property owners regarding the "freeze" on their land during the study process, the length of time and uncertainty such a "freeze" involves, and the MTO's approach to compensation/acquisition for affected properties • generally understood that this study is co-ordinated with, but not dependent on or directly related to the concurrent Ontario Hydro and Interim Waste Authority studies in the area

CATEGORY	SUMMARY OF PUBLIC COMMENTS
Route Planning Input	• many comments on both sides of the issue of using existing roads versus mid-concession routes; common initial impression is to use and link existing road corridors • Ravenshoe Road corridor often cited as most direct and least disruptive route across the Holland River • several suggestions to extend Highway 88 directly east to link with Queensville Road • several queries as to how definitive a constraint on routes was posed by the Scanlon Creek Conservation Area • substantial recognition that the envelope between Bradford and the Conservation area was a prime candidate for route alternative locations; several specific route ideas were discussed in that area • use of the Ontario Hydro corridor in East Gwillimbury, or use of the abandoned rail line • a balance of comments between "avoid the marsh" to avoid impacts on natural environment (vegetation, wildlife) and "use the marsh" to utilize otherwise unusable land rather than agricultural or residential property • maintain adequate clearance for boat traffic on Holland River • a great deal of concern about impact of new routes on residences and farms, particularly if existing roads are used/upgraded • a few comments encouraging consideration of possible westerly extensions (to Highway 27 or further) in the design of the western terminus • some concerns about the existing Highway 88/400 interchange design and safety issues there • a few suggestions for a joint Hydro/highway corridor • frequent disappointment at the lack of definition of alternative routes or a recommended route at the P.I.C.; common query was "where is it going to go?"

7. CONCLUSIONS

The first round of public involvement for the Bradford Bypass may be considered successful, as they were well attended by interested and generally supportive individuals who live in the study area. A sound basis has been established for further study work and a dialogue has been opened with study area residents.

Most of the questions and concerns which were raised during the public review are not unusual or unexpected by the Project Team, and will be able to be addressed or incorporated in the study as it proceeds. There are several new areas, however, which should be addressed either in the study work or in future public review periods:

- information regarding the Ministry's policy and practice regarding property protection, purchase, and compensation
- a "reasonable" potential time frame for project implementation
- a revisit of the withdrawal of the Highway 89 E.A. submission, with either a written confirmation of the commitments made at that time or inclusion of the route as an alternative in the current study
- clarification of the relationship between the Bradford Bypass concept and the Highway 9/Davids Drive/Herald Road/Green Lane corridor
- an approach to "weighting" or defining the relative importance of the various environmental evaluation criteria, particularly concerning the balancing of impact on the "human" environment versus the "natural" environment

APPENDIX 1

ADVERTISING

YOUR ROLE AND RESPONSIBILITY

As an interested and potentially affected member of the public, your input to the decisions made by the study team are extremely valuable. By attending the Public Information Centres, following the progress of the study in the media, and communicating your comments and concerns to the study team, you will be able to affect the decision making process.

At this time, your input is being sought regarding the proposed study process as outlined in the draft Environmental Assessment Proposal. As well, your suggestions for reasonable alternatives to be analyzed in the next phase of the study will be of use to the study team.

A copy of the draft Environmental Assessment Proposal is available for your review at:

Clerk's Office - Town of Bradford West Gwillimbury (11th Line)
Clerk's Office - Town of East Gwillimbury (Sharon)
Clerk's Office - Township of King (King Road)
Clerk's Office - County of Simcoe (Midhurst)
Clerk's Office - Region of York (Newmarket)
Bradford West Gwillimbury Public Library - Bradford

PUBLIC INFORMATION CENTRES

Public Information Centres have been scheduled as shown below. They will be staffed by Project Team representatives who will be available to discuss the project with you. The Environmental Assessment Proposal and its recommendations will be available for your review at these Public Information Centres. Please note that more Information Centres are planned for key times later in the study.

Thursday, June 17, 1993
3pm - 9pm
Cafetorium
Bradford District Secondary School
Hwy 88 at Professor Day Drive
Bradford, Ontario

Tuesday, June 22, 1993
3pm - 9pm
Queensville Community Centre
1590 Queensville Sideroad (east of Leslie Street)
Queensville, Ontario

ADDITIONAL INFORMATION

The Ministry would like to obtain any comments and concerns that you may have regarding the study. If you are unable to attend the Public Information Centres but would like to be added to our mailing list or to provide comments, please contact either of the following:

Mr. Steve Jacobs, P. Eng.
Senior Project Manager
Central Region
Ministry of Transportation of Ontario
4th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Tel: (416) 235-5522
Fax: (416) 235-4382

Mr. Steve Schijns, P.Eng.
McCormick Rankin Consulting Engineers
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Tel: (416) 823-8500
Fax: (416) 823-8503

If you have a touch-tone telephone, you can also hear more about the study and leave your comments on it by using the **Bradford Bypass Infosource Hot Line** at (416) 775-5858 (box number 5600).

The study is subject to the full review and approval requirements of the Environmental Assessment Act of Ontario. On completion of the study, an Environmental Assessment Report will be submitted to the Ministry of the Environment and Energy.

Comments and information regarding this study are being collected to assist the Ministry in meeting the requirements of the Environmental Assessment Act. Information regarding this study will be kept on file for use during the study and, unless otherwise requested, may be included in study documentation which is made available for public review. Names and addresses will be kept confidential.

STUDY NAME

The term "Bradford Bypass" is used solely to describe the current study in a concise, convenient way. It does not prejudge the outcome of the study nor the alternatives to be analysed. Alternatives which involve travel through Bradford will be assessed on an equal basis with those which bypass the town.

Ontario
Ministry of Transportation

BRADFORD BYPASS

ENVIRONMENTAL ASSESSMENT

Improved Transportation Link Between Highway 400 and Proposed Highway 404 Extension South of Lake Simcoe

BROCHURE NO. 1

NOTICE OF START OF STUDY AND FIRST PUBLIC INFORMATION CENTRES

JUNE 1993

ONTARIO GOVERNMENT NOTICE

NOTICE OF STUDY COMMENCEMENT AND INFORMATION CENTRES
FOR REVIEW OF THE ENVIRONMENTAL ASSESSMENT PROPOSAL

The Ministry of Transportation (MTO) has initiated a study to examine transportation improvements between Highway 400 and the proposed Highway 404 Extension, in the area south of Lake Simcoe and north of Bradford.

The proposed study area is located in the Town of Bradford West Gwillimbury (Simcoe County) and the Town of East Gwillimbury (York Region) as illustrated on the map below. The portion of the study area east of York Regional Road 12 (Leslie Street) is also under study as part of the concurrent and related Highway 404 Extension.

Insert Map

This study will address the transportation problems caused by the disjointed and discontinuous road network and will identify the long-term provincial transportation needs in the area so that any associated property requirements may be defined and protected.

The study will include a comprehensive public participation program. The planning process for the study, the proposed technical activities, and the public participation program, are outlined in an Environmental Assessment Proposal (EAP) which will be available for review at the first series of Information Centres (and at the offices of the affected municipalities). The Information Centres will allow the public and interest groups an opportunity to discuss their study concerns with members of the Project Team. All subsequent phases of the study will be based upon the information in the EAP, and your input at this time is very important.

The first in a series of four Information Centres have been arranged for:

THURSDAY, JUNE 17, 1993
3:00 p.m. to 9:00 p.m.
Cafetorium
BRADFORD DISTRICT SECONDARY SCHOOL
Highway 88 at Professor Day Drive,
Bradford, Ontario

TUESDAY, JUNE 22, 1993
3:00 p.m. to 9:00 p.m.
QUEENSVILLE COMMUNITY CENTRE
1590 Queensville Sideroad
Queensville, Ontario

This study is subject to the full review and approval requirements of the Environmental Assessment Act. At the completion of the study, an Environmental Assessment Report will be submitted to the Ministry of the Environment and Energy for approval. If after consulting with MTO, serious environmental concerns remain unresolved, a request may be made for a hearing.

Comments and information regarding this study are being collected to assist MTO in meeting the requirements of the Environmental Assessment Act. You are encouraged to contact project staff at any time if you have questions or concerns about this project. Information and comments obtained will be kept on file for use during the study and, unless otherwise requested, may be included in documentation which is made available for public review (names and addresses will be kept confidential). If you would like your name added to our mailing list please forward it, or your comments and concerns to:

Mr. Steve Jacobs, P.Eng.
Senior Project Engineer
Planning and Design Section
Ministry of Transportation
4th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Tel: (416) 235-5522
Fax: (416) 235-4382

Mr. Steve Schijns, P.Eng.
Consultant Project Manager
McCormick Rankin Consulting Engineers
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

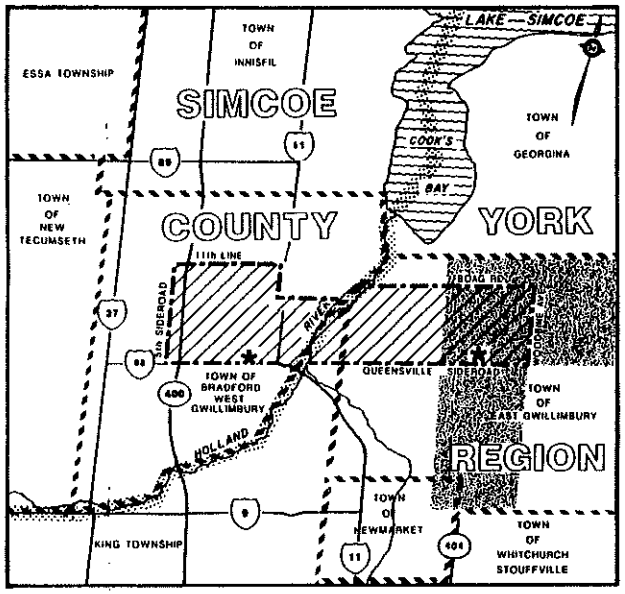
Tel: (416) 823-8500
Fax: (416) 823-8503

Touch-tone telephone users can hear more about the study and leave voice messages on it by using the "Bradford Bypass Infosource Hot Line" at (416) 775-5858 (code 5600).

INTRODUCTION

The Ministry of Transportation of Ontario (MTO) has initiated a study to identify improvements to east-west travel between Highway 400 and the proposed Highway 404 Extension, in the area south of Lake Simcoe and north of Bradford.

The proposed study area is located in the Town of Bradford West Gwillimbury (Simcoe County) and the Town of East Gwillimbury (York Region) as shown on the key map below. The portion of the study area east of York Region Road 12 (Leslie Street) is also under study as part of the concurrent and related Highway 404 Extension Study.



PURPOSE OF THE STUDY

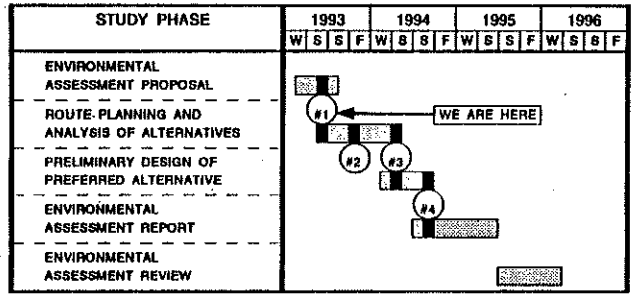
The study is intended to address the transportation problems and opportunities related to the disjointed and discontinuous road network in the area. These include:

- out-of-the-way travel around Cook's Bay (Lake Simcoe)
- increasing commuter and recreational traffic in Bradford
- diminishing opportunities to protect transportation corridors in developing areas

The study will identify the long-term provincial transportation strategy in the area so that any associated property requirements may be defined and protected. A significant opportunity to be assessed is the provision of a highway link between Highway 400 and the proposed extension of Highway 404.

STUDY SCHEDULE

Proposed study phases and schedule are shown below:



As shown above, the draft Environmental Assessment Proposal (EAP) for this project has been prepared. This document outlines the need and justification, the proposed study process, proposed technical activities, and the public participation program. Interested members of the public are encouraged to review and comment on the document and the proposed study process at the upcoming Public Information Centres.

ALTERNATIVES

A preliminary screening of a wide variety of alternatives has been carried out on the basis of their ability to resolve issues related to:

- inefficiency in roadway travel;
- local road use by long-distance traffic;
- the connection of Highway 400 and the proposed Highway 404 Extension;
- environmental impacts; and
- cost.

The alternatives which were considered in this preliminary screening were categorized as follows:

- "Do Nothing" (e.g. maintain existing system);
- Managing Demand (e.g. shift travel away from rush hour);
- "Roadway Solutions": Improving Existing Roads and/or Improving Transportation Modes which can use the Existing Roads (e.g. buses); and
- "Non-Roadway Solutions": Provision of new Facilities or Transportation Modes (e.g. rail, water, air).

As a result of the preliminary screening, the alternatives which are proposed to be carried forward for further development, and more detailed analysis and evaluation are:

- Operational Improvements on Existing Roads
- Infrastructure Improvements on Existing Roads
- Roadway Infrastructure Addition (new route)

As part of these alternatives, a new crossing of the Holland River north of Bradford and combinations of the above alternatives will be assessed.

The environmental factors that will be used in the next stage to analyse and compare the alternatives are (in no particular order):

- Transportation/Technical requirements
- Natural Environment
- Social/Health Environment
- Economic Environment
- Cultural Environment
- Applied Environmental Conditions

A complete listing of the criteria associated with these factors is included in the EAP and will be available at the Public Information Centres. (See over)

Environmental Unit
Central Region
1201 Wilson Avenue
Atrium Tower, 5th Floor
Tel. (416) 235-5542

MINISTRY OF TRANSPORTATION

MEMORANDUM

DATE: June 1, 1993

TO: Sam Atlas

RE: Ontario Government Notices - Bradford Bypass

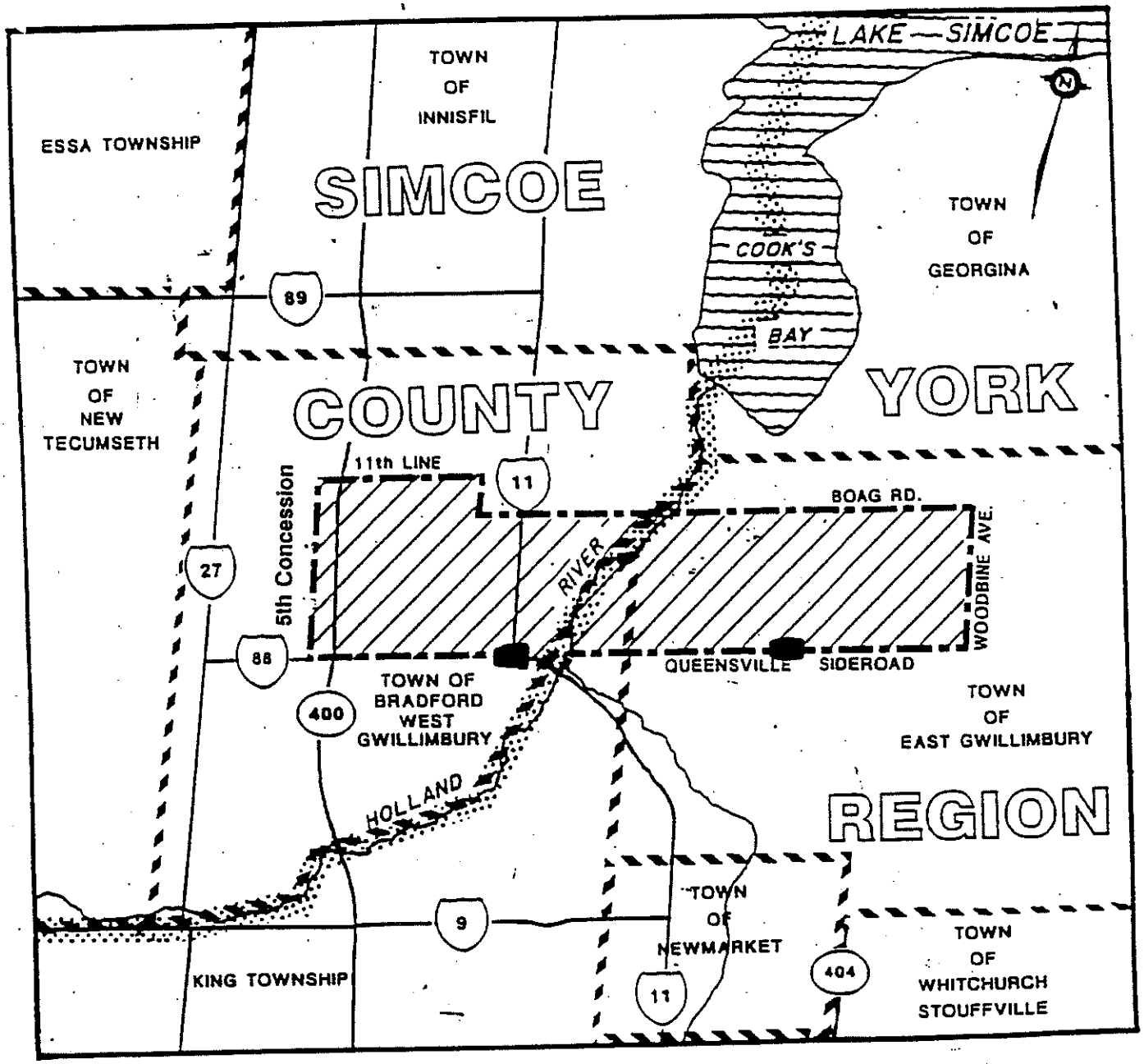
Could you please arrange for the insertion of the attached government notices in the following newspapers. Please notify me immediately if you have any problems with these insertions. Thank you in advance for your help.

Toronto Star	Saturday June 5, 1993
Bradford West Gwillimbury Times	Wednesday June 9, 1993
Georgina Advocate	Wednesday June 9, 1993

<Original signed by>

Heather Pearson
Environmental Planner

cc: S. Jacobs
T. Steele
S. Schijns, McCormick Rankin Consulting Engineers



P.I.C. LOCATIONS ●

BRADFORD BYPASS
HIGHWAY 400 TO HIGHWAY 404 EXTENSION

ENVIRONMENTAL ASSESSMENT STUDY

SUMMARY REPORT ON
SECOND ROUND OF PUBLIC INVOLVEMENT
JUNE 1994

McCORMICK RANKIN
AUGUST 1994

PREFACE

This report documents the content and results of the second round of public review for the Bradford Bypass Environmental Assessment Study. This report was distributed to members of the Project Team and, for the purpose of review by members of the public, copies of this report were also filed with the Clerk's offices of the Town of Bradford West Gwillimbury, King Township and the Town of East Gwillimbury, as well as at the Bradford Public Library.

Further information regarding this study can be obtained by contacting:

Mr. Steve Jacobs, P. Eng.
Senior Project Manager
Ministry of Transportation
Central Region Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
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Phone: (416) 235-5522
Fax: (416) 235-4382

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1. ADVERTISING
2. PUBLIC INFORMATION CENTRE DISPLAYS / INFORMATION PACKAGE
3. COMMENT SHEETS
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1. INTRODUCTION

The Bradford Bypass Environmental Assessment (EA) Study involves a comprehensive public involvement program, built around four rounds of Public Information Centres (PICs) held at key points during the study:

#1 - Environmental Assessment Proposal (EAP)
#2 - Route Planning
#3 - Preferred Alternative
#4 - Preliminary Design

This report documents the second round of Public Involvement, which occurred during June, 1994 with Public Information Centres at Queensville on June 14th and at Bradford on June 16th. The former PIC was shared with the concurrent and related Highway 404 Extension EA Study.

A presentation was also provided to the Bradford and District Chamber of Commerce on June 15, 1994 at their regularly scheduled meeting. Details of this presentation are presented in Section 4.

2. PURPOSE OF INFORMATION CENTRES

The intent of the second round of PICs was to allow the public to review and provide comments on:

- the alternative routes
- the evaluation criteria and weighting, and the proposed evaluation process
- study area constraints and impacts
- the revised Environmental Assessment Proposal

3. PUBLICITY

A brochure and newspaper advertisement were used for the purposes of public notification of the study and information centres. These are presented in Appendix 1.

Specific notification measures were as follows:

- notification of municipal councils at presentations as follows[1]:

-	King Township	May 30, 1994
-	York Region - Trans. and Env. Comm.	May 31, 1994
-	Town of East Gwillimbury	June 6, 1994
-	Town of Bradford West Gwillimbury	June 7, 1994

- notification of identified Interest Groups, Community Groups and Technical / Government Agencies by direct mail

- direct mail notification to approximately 260 identified interested members of the public (i.e. project mailing list)

- distribution by Canada Post bulk mail service of brochures to approximately 7,600 homes and businesses (all addresses within the study area)

- Ontario Government Notices in the Toronto Star (June 7, 1994), Bradford West Gwillimbury Times (June 8, 1994), Georgina Advocate (June 8, 1994), and Era Banner (June 7, 1994)

- newspaper articles in the Bradford West Gwillimbury Times (May 11, 1994 and June 8, 1994)

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[1] Through liaison with staff at Simcoe County, it was determined that a presentation to Simcoe Council would not be required at this time.

- Infosource Hotline free local telephone service in Bradford, with recorded message about the study and PICs, as well as providing an opportunity to record verbal comments (24 h/day operation since May 29, 1993, as advertised weekly in Bradford West Gwillimbury Times newspaper and highlighted in brochures); see Appendix 3.1.

4. INFORMATION CENTRE CONTENTS

The first PIC was held on Tuesday, June 14, 1994 from 3:00 p.m to 9:00 p.m. in the Queensville Community Centre (Queensville Side Road at Leslie Street). The second PIC followed in Bradford in the Cafetorium of the Bradford District Secondary School, from 3:00 to 9:00 p.m. on Thursday, June 16, 1994.

Large print display panels were used to describe the study progress to date, supplemented by maps and 1:5000 scale plans of the alternatives developed within the study area. The contents of the displays are documented in Appendix 2.

The Queensville information centre was a joint presentation with the concurrent and related Highway 404 Extension Environmental Assessment Study.

The information centres were staffed by members of the Project Team, who engaged in discussion with attendees, explaining the study, responding to questions, and noting concerns or ideas that emerged. Additionally, representatives from MTO Property Section were in attendance to discuss specific issues related to property acquisition and compensation.

An information package was available at the information centres at the request of members of the public. It is presented as Appendix 2 and generally consists of reduced versions of the displays at the information centre. A comment sheet and evaluation criteria weighting survey form were attached to the information package as well as being available individually. Sections 6 and 7 present the comments received and the results of the evaluation survey respectively.

The Project Team also provided a presentation to the Bradford and District Chamber of Commerce at the Chamber of Commerce's regularly scheduled meeting on June 15, 1994. This presentation was publicized by the Chamber of Commerce and consisted of an overview of the study results to date with a question and answer period following. The 1:5000 scale plans of the alternatives were also available for review. The main concerns of the Chamber of Commerce membership were the impacts of the proposed routes to businesses in Bradford, and opportunities for compensation.

5. PUBLIC RESPONSE

The information centres were generally well attended with approximately 290 and 160 attending the Queensville and Bradford sessions respectively. The response of the attendees can generally be characterized as:

- strong interest in the study
- significant concerns about impacts in terms of:
  - property values (and compensation)
  - noise and aesthetics (and mitigation)
  - business
  - agriculture
  - natural environment
- curiosity about timing of construction
- preference for specific alternatives
- general agreement with the proposed evaluation process

6. SUMMARY OF PUBLIC COMMENTS

Comments on the study have been received from three sources: mailed / faxed letters, PIC verbal and written comments, and Infosource Hotline verbal comments. Copies of these comments are included in Appendix 3 for reference purposes; the originals are held at McCormick Rankin. Additional comments made verbally by PIC attendees are not formally documented but are included in the discussion which follows.

The comments which were received are summarized below and have been grouped into categories for ease of reference:

CATEGORY	SUMMARY OF PUBLIC COMMENTS
Route Alternatives	• many stated preferences among the alternatives presented • additional routes brought forward by members of the public were: - through Scanlon Creek Conservation Area - north of Silver Lakes Golf Course • organic soils are very deep in the vicinity of some of the alternative Holland River crossings • additional wetland areas (unclassified) will be encountered along some mid-concession alignment alternatives • a designated environmental area exists between 8th and 9th Lines east of Highway 11 (existence and nature of this area is to be determined) • Holland River crossing alternative "L" (near the existing Highway 11 crossing) is not reasonable (geometrically) • direct access to east side of Bradford should be provided
Concerns Expressed About Impacts of Route Alternatives	• farm operations • property values and compensation (many comments / questions) • privately owned "historic" homes / farms • wetlands • Scanlon Creek Conservation Area • noise • aesthetics • ground water quality (wells) • air quality (local) • litter • loss of privacy
Study and Public Consultation Process	• not enough information presented • brochures not received / poor notification • request for workshop
Miscellaneous Comments	• both agreement and disagreement expressed with regard to need for project • encouraging employment in the area would reduce the number of commuters thereby eliminating the need for the project • many questions about timing of construction

7. EVALUATION CRITERIA WEIGHTING QUESTIONNAIRE

A questionnaire was distributed to members of the public, both at the information centres and subsequently (as an attachment to the information package), which surveyed the public's opinion with regard to the relative weighting of the evaluation criteria. A copy of the questionnaire, as well as a detailed analysis of the results, is presented in Appendix 4.

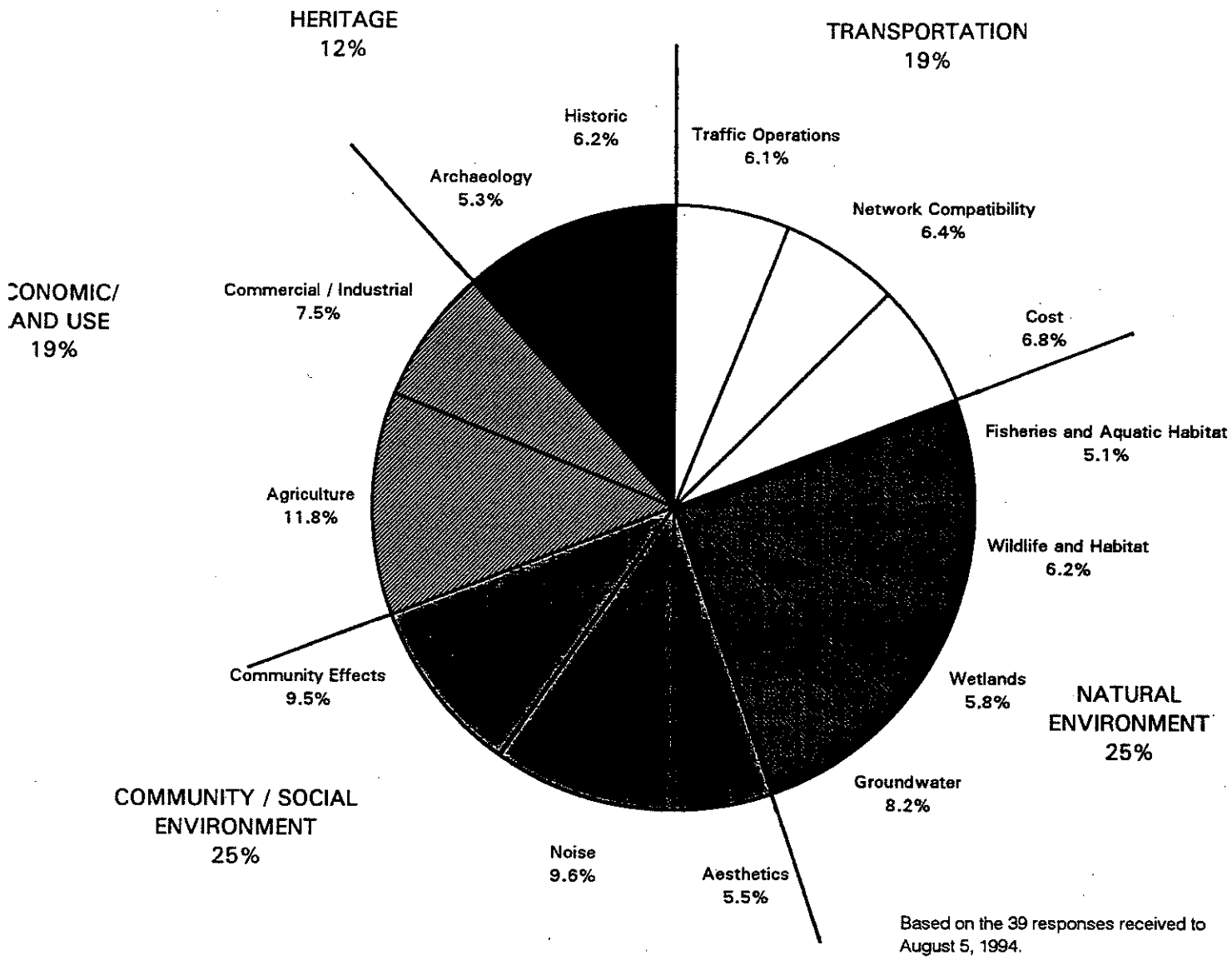
A total of 39 questionnaires were returned to the Project Team to August 5, 1994. The table and graph on Exhibits 1A and 1B summarize the results of the survey.

EXHIBIT 1A: AVERAGE FACTOR AND CRITERIA WEIGHTS

FACTOR Criteria	Factor Weight	Criteria Weight	
		Within Factors	Composite
1. TRANSPORTATION	19%		
1.1 Traffic Operation		32%	6.1%
1.2 Network Compatibility		33%	6.4%
1.3 Cost		35%	6.8%
2. NATURAL ENVIRONMENT	25%		
2.1 Fisheries and Aquatic Habitat		20%	5.1%
2.2 Wildlife and Habitat		25%	6.2%
2.3 Wetlands		23%	5.8%
2.4 Groundwater		32%	8.2%
3. COMMUNITY / SOCIAL ENVIRONMENT	25%		
3.1 Aesthetics		22%	5.5%
3.2 Noise		39%	9.6%
3.3 Community Effects		39%	9.5%
4. ECONOMIC / LAND USE	19%		
4.1 Agricultural		61%	11.8%
4.2 Commercial / Industrial		39%	7.5%
5. HERITAGE	12%		
5.1 Archaeology		46%	5.3%
5.2 Historical		54%	6.2%

Note: Based on the 39 responses received to August 5, 1994

EXHIBIT 1B: AVERAGE FACTOR AND CRITERIA WEIGHTS



Based on the 39 responses received to August 5, 1994.

8. CONCLUSIONS

The second round of public involvement for the Bradford Bypass may be considered successful because it was well attended by interested individuals who live in the study area. Most of the questions and concerns which were raised during the public review are not unusual or unexpected by the Project Team, and will be able to be addressed or incorporated in the study as it proceeds. Several new areas of concern emerged as follows and these should be addressed either in the study work or in future public review periods:

- new route alternatives brought forward
- determination of the existence, nature and impacts to the "designated environmental area" between 8th and 9th Lines and east of Highway 11
- determination of impacts to businesses in Bradford
- improved notification of future public involvement sessions
- provision of study workshops for interested members of the public (as needed)

PUBLIC INVOLVEMENT IN PLANNING THE BRADFORD BYPASS

STUDY PHASE	TIME	PUBLIC INVOLVEMENT METHOD / OPPORTUNITY	RESULTS TO DATE
Environmental Assessment Proposal	May 15, 1993	**INFOSOURCE HOTLINE** initiated. Operated by and advertised weekly in the **Bradford West Gwillimbury Times**. 24 h/day free phone-in and message service. Study update message changed regularly. Incoming messages are responded to directly by the study team.	500 calls made to the Hotline; 23 messages left on the Hotline for the study team. (to June 9 / 94)
	May 27, 1993	**DRAFT EAP** published; 90 copies distributed to Municipalities, Ministries, Interest Groups, and interested members of the public; contents presented to municipal councils and shown at first round of Public Information Centres.	Improved documentation requested for: - need and justification - location of study area - process for evaluation of alternatives No other significant concerns with EAP

JUN 1 5 1994

STUDY PHASE	TIME	PUBLIC INVOLVEMENT METHOD / OPPORTUNITY	RESULTS TO DATE
Environmental Assessment Proposal (Cont'd)	June 5,9 1993	**NOTICE OF STUDY COMMENCEMENT AND INFORMATION CENTRES** published in Toronto Star, Bradford West Gwillimbury Times, and Georgina Advocate.	
	June 12, 1993	**BROCHURE #1** distributed, announcing study start-up and first set of Public Information Centres.	7,800 brochures mailed to study area residences.
	June 17,22 1993	First series of **PUBLIC INFORMATION CENTRES** held in Bradford and Queensville	Approx. 400 area residents attended Information Centres; 30 comment sheets submitted.
Route Planning	April 20, 1994	**BROCHURE #2** distributed, announcing results of Corridor Assessment work.	7,800 brochures mailed to study area residences.
	June 5, 1994	**NOTICE OF GENERATION OF ROUTE ALTERNATIVES** published in Toronto Star, Bradford West Gwillimbury Times, and Georgina Advocate.	
	June 6, 1994	**BROCHURE #3** distributed, illustrating route alternatives and announcing the second round of Public Information Centres.	7,600 brochures mailed to study area residences, and 400 mailed to interested individuals / agencies

JUN 14 1994

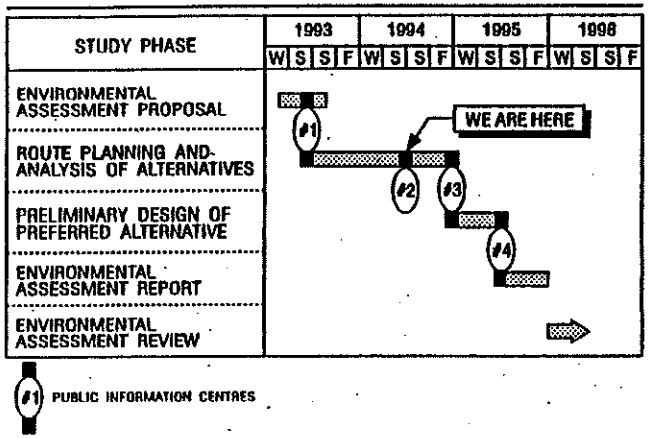
STUDY PHASE	TIME	PUBLIC INVOLVEMENT METHOD / OPPORTUNITY	RESULTS TO DATE
	June 14,16 1994	Second series of **PUBLIC INFORMATION CENTRES** held in Queensville and Bradford.	
Preferred Alternative	*Fall 1994 (?)*	***NOTICE OF SELECTION OF PREFERRED ROUTE ALTERNATIVE, Brochure #4*** *and Third series of* ***Public Information Centres.***	
Preliminary Design	*Spring 1995 (?)*	***NOTICE OF COMPLETION OF PRELIMINARY DESIGN, Brochure #5*** *and Fourth series of* ***Public Information Centres.***	
Environmental Assessment Review	*Fall 1995 (?)*	***NOTICE OF ENVIRONMENTAL ASSESSMENT REPORT SUBMISSION*** *to the Ministry of Environment and Energy and initiation of formal EA review process.*	
	At Any Time	***Additional options for public involvement and consultation will be provided, as requested by the public (e.g. meetings, workshops, etc.), to further address the options / issues / data provided at the Public Information Centres.***	

JUN 14 1994

APPENDIX 1

ADVERTISING

- **Brochure No. 3**
- **Newspaper Advertisement**



At this time, your input is being sought with regard to:

- the new route freeway alternatives
- the alternative evaluation criteria and their weighting
- study area constraints and impacts (including impacts to existing farm operations and activities)
- the revised Environmental Assessment Proposal

HOW YOU CAN PARTICIPATE

Writing:	Mr. Steve Jacobs, P. Eng. Senior Project Manager Central Region Ministry of Transportation of Ontario 3rd Floor, Atrium Tower 1201 Wilson Avenue Downsview, Ontario M3M 1J8	Mr. Steve Schijns, P. Eng. McCormick Rankin Consulting Engineers 2655 North Sheridan Way Mississauga, Ontario L5K 2P8
Phoning:	(416) 235-5522	(905) 823-8500
Faxing:	(416) 235-4382	(905) 823-8503
Leaving a message:	Bradford Bypass Infosource Hotline Telephone (905) 775-5858 (Bradford) enter information box no. 5600	
Reviewing the plans:	Public Information Centre Tuesday, June 14,1994 Queensville Community Centre	Public Information Centre Thursday, June 16,1994 Bradford District Secondary School
Filling Out an Evaluation Questionaire:	Pick up an information package at the Public Information Centre, or ask us to send you one, then fill the questionnaire telling us how you would weight the factors to be used in selecting a preferred route.	
Additional Consultation with the Study Team:	After the Public Information Centres, we are available for additional consultation at the request of individuals or groups.	

This study is subject to the review and approval requirements of the Environmental Assessment Act, as administered by the Ministry of the Environment and Energy of Ontario. Information and comments obtained during the study will be kept on file for use in carrying out the Environmental Assessment and, unless otherwise requested, may be included in documentation which is made available for public review. Names and addresses will be kept confidential.

Ministry of Transportation
Ontario

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY

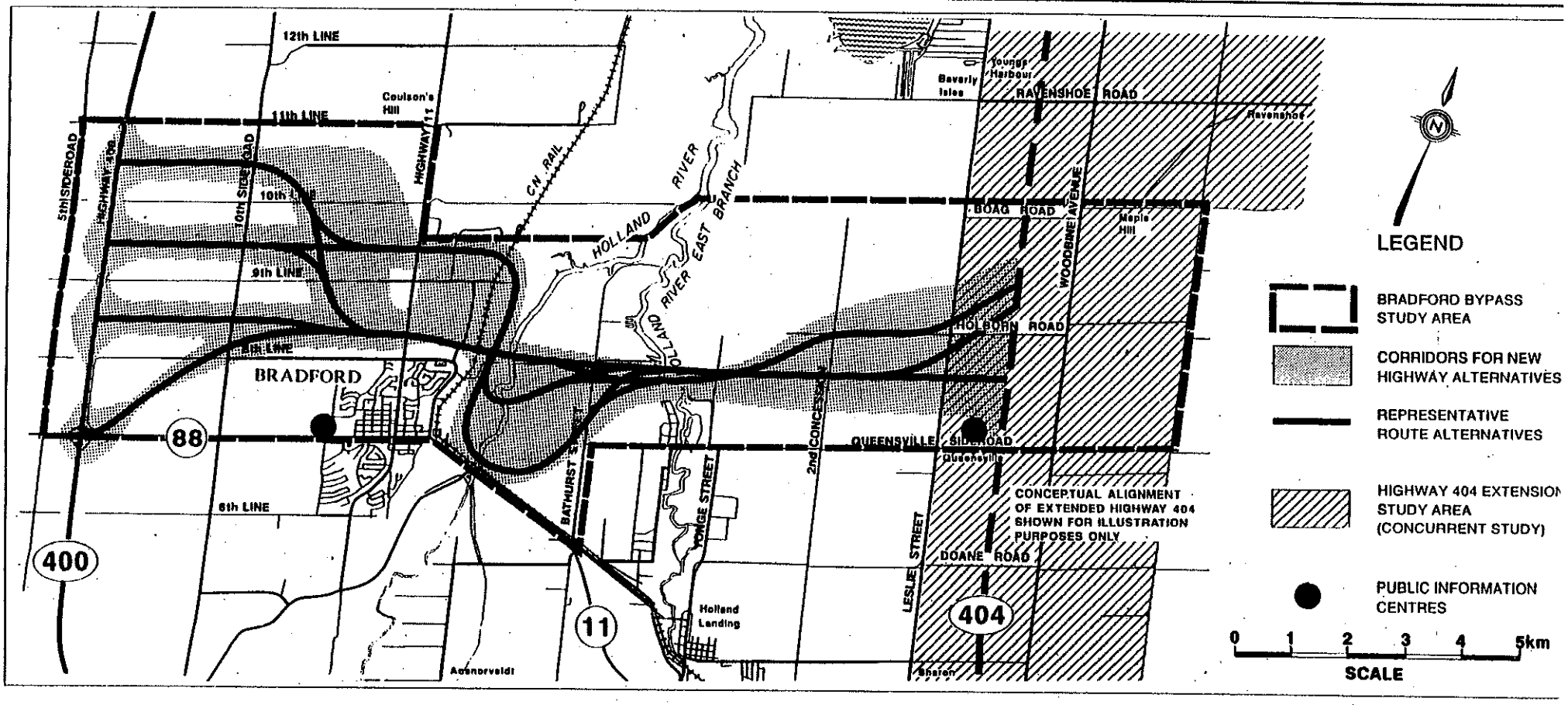
BROCHURE No. 3

NOTICE OF SECOND ROUND OF PUBLIC INVOLVEMENT

You are invited to attend the following Pul Information Centres. These have been arranged you to review the alternatives which are be considered and the proposed method of evaluati The Project Team will be in attendance to discuss project with you.

TUESDAY	THURSDAY
JUNE 14, 1994	JUNE 16, 199
3:00 to 9:00 pm	3:00 to 9:00 pr
Queensville Community Centre, 1590 Queensville Sideroad, Queensville	Bradford Distric Secondary School Cafetorium, Highway 88 and Professor Day Driv Bradford

ALTERNATIVE CORRIDORS TO BE CONSIDERED FOR A NEW HIGHWAY



SINCE THE FIRST ROUND OF REVIEW IN JUNE 1993

The proposed approach to the study was reviewed by government agencies, municipalities and the public during the first round of public review in June 1993. Approximately 400 people attended the information centres at that time and their comments focused on:

- support for the Bradford Bypass concept
- concern about property and environmental impacts
- questioning the need for the project
- suggestions for alternative routes

The project staff have worked toward addressing these concerns and on finalizing the approach to the study. They have also developed and reviewed a variety of alternatives (both routes and roadway types). Based on this work, the freeway route alternatives shown on the map above have been carried forward and assessed in detail. Opportunities for the staged construction of an ultimate freeway facility will also be analysed during the study.

WHAT HAPPENS NEXT?

After this round of public review, the Project Team wi review the comments received with regard to th alternatives, and the evaluation process and criteri weighting. An evaluation of the alternatives will the be carried out, with the review comments taken int consideration, to identify the technically preferre route. The results of this evaluation will be presente at the third round of public review later this year.

Ontario

ONTARIO GOVERNMENT NOTICE

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
NOTICE OF GENERATION OF ROUTE ALTERNATIVES AND SECOND ROUND OF INFORMATION CENTRES

The Ministry of Transportation of Ontario (MTO) is carrying out an Individual Environmental Assessment study for a highway link (the "Bradford Bypass") between Highway 400 and the proposed Highway 404 Extension, in the area south of Lake Simcoe and north of Bradford (see map). A concurrent and similar study is being carried out for the Extension of Highway 404.

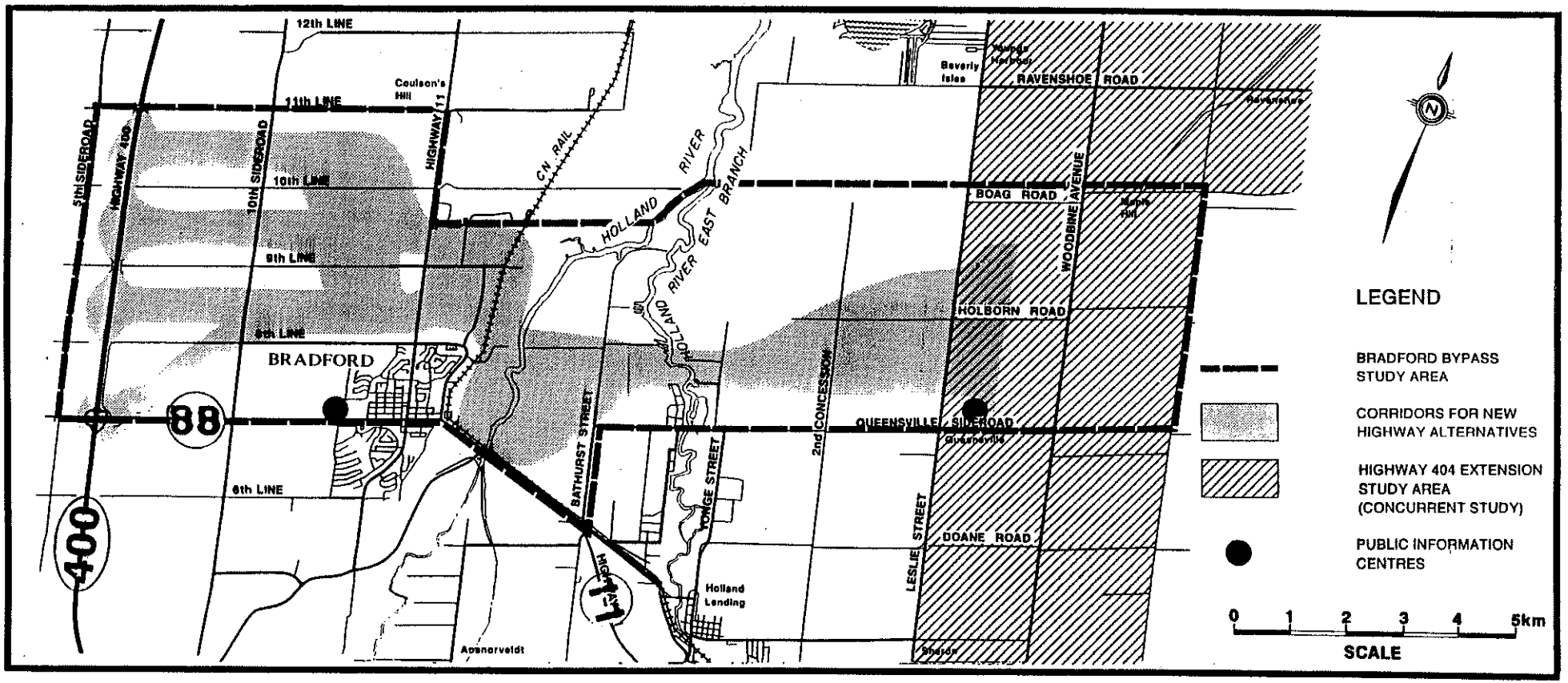
Insert Map

Alternative routes for a new highway within the study area have been developed and will soon be evaluated to determine a preferred route. The public is invited to review the alternatives and comment on them, as well as on the proposed method of evaluating alternatives. Those who live in the study area are particularly encouraged to bring relevant information to the attention of the Ministry at this time prior to the evaluation taking place.

The public is encouraged to participate in the study by:

Writing:	**Mr. Steve Jacobs, P. Eng.** Senior Project Manager Central Region Ministry of Transportation of Ontario 3rd Floor, Atrium Tower 1201 Wilson Avenue Downsview, Ontario M3M 1J8	**Mr. Steve Schijns, P.Eng.** McCormick Rankin Consulting Engineers 2655 North Sheridan Way Mississauga, Ontario L5K 2P8
Phoning:	(416) 235-5522	(905) 823-8500
Faxing:	(416) 235-4382	(905) 823-8503
Leaving a message:	Bradford Bypass Infosource Hotline Telephone (905) 775-5858 (Bradford) enter code no. 5600	
Reviewing the plans:	**Public Information Centre** Tuesday, June 14, 1994 3pm - 9pm Queensville Community Centre 1590 Queensville Sideroad (east of Leslie Street) Queensville, Ontario	**Public Information Centre** Thursday, June 16, 1994 3pm - 9pm Cafetorium Bradford District Secondary School Hwy 88 at Professor Day Drive Bradford, Ontario
Filling Out an Evaluation Questionnaire:	Pick up an information package at the Public Information Centre, or ask us to send you one, then fill in the questionnaire telling us how you would weight the factors to be used in selecting a preferred route.	
Additional Consultation with the Study Team:	After the Public Information Centres, we are available for additional consultation at the request of individuals or groups.	

This study is subject to the review and approval requirements of the Environmental Assessment Act, as administered by the Ministry of the Environment and Energy of Ontario. Information and comments obtained during the study will be kept on file for use in carrying out the Environmental Assessment and, unless otherwise requested, may be included in documentation which is made available for public review. Names and addresses will be kept confidential.


12th LINE
11th LINE
10th LINE
9th LINE
8th LINE
6th LINE
5th SIDEROAD
10th SIDEROAD
HIGHWAY 400
HIGHWAY 11
Coulson's Hill
C.N. RAIL
HOLLAND RIVER
HOLLAND RIVER EAST BRANCH
BRADFORD
88
400
BATHURST STREET
YONGE STREET
2nd CONCESSION
QUEENSVILLE SIDEROAD
HOLBORN ROAD
BOAG ROAD
RAVENSHOE ROAD
WOODBINE AVENUE
LESLIE STREET
DOANE ROAD
Beverly Isles
Holland Landing
Aspenorveldt
LEGEND
BRADFORD BYPASS STUDY AREA
CORRIDORS FOR NEW HIGHWAY ALTERNATIVES
HIGHWAY 404 EXTENSION STUDY AREA (CONCURRENT STUDY)
PUBLIC INFORMATION CENTRES
0 1 2 3 4 5km
SCALE

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS)

ENVIRONMENTAL ASSESSMENT STUDY

SUMMARY REPORT ON

THIRD ROUND OF PUBLIC INVOLVEMENT

NOVEMBER 1996

McCORMICK RANKIN

JANUARY 1997

PREFACE

This report documents the content and results of the third round of public review for the Bradford Bypass Environmental Assessment Study. This report was distributed to members of the Project Team and, for the purpose of review by members of the public, copies of this report were also filed with the Clerk's Offices of the Region of York, County of Simcoe, Town of Bradford West Gwillimbury, King Township and the Town of East Gwillimbury, as well as at the Bradford Public Library.

Further information regarding this study can be obtained by contacting:

Mr. Steve Jacobs, P. Eng.
Senior Project Manager
Ministry of Transportation
Central Region Planning Office
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Phone: (416) 235-5522
Fax: (416) 235-4382
e-mail: Jacobss@gov.on.ca

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2.0 PURPOSE OF CONSULTATION SESSIONS 1

3.0 PUBLICITY 1

4.0 CONSULTATION SESSION CONTENTS 3

5.0 PUBLIC RESPONSE 3

6.0 CONCLUSION 8

APPENDICES

APPENDIX 1 Advertising

APPENDIX 2 Public Consultation Session Displays/Information Package

APPENDIX 3 Comment Sheets

1.0 INTRODUCTION

The Bradford Bypass Environmental Assessment (EA) Study involves a comprehensive public involvement program built around three rounds of Public Consultation Sessions (PCSs) held at key points during the study:

#1 - Environmental Assessment Proposal (EAP) - June 1993
#2 - Route Planning - June 1994
#3 - Technically Preferred Route - November 1996

This report documents the third round of Public Involvement, which occurred during November 1996 with Public Consultation Sessions in Bradford on November 14 and in Queensville on November 19, 1996. The latter PCS was shared with the concurrent and related Highway 404 Extension EA Study.

2.0 PURPOSE OF CONSULTATION SESSIONS

The intent of the third round of public consultation was to provide the public with the opportunity to review and provide comments on:

- the analysis and evaluation of the various route options; and
- the Technically Preferred Route

3.0 PUBLICITY

A brochure for mailing to study area residents, businesses and interested parties and a newspaper advertisement were used for the purposes of public notification of the study and consultation sessions. These are presented in Appendix 1.

Specific notification measures were as follows:

- notification of municipal councils by letter on October 3, 1996, with presentations as follows:

-	York Region - Trans. and Env. Committee	October 16, 1996
-	King Township	October 21, 1996
-	Town of East Gwillimbury	October 21, 1996
-	Town of Bradford West Gwillimbury	October 22, 1996
-	Simcoe County - Planning Committee	November 7, 1996

- registered mail notification (brochure and letter) to affected property owners and members of the External Project Team

- addressed mail notification (brochure) to approximately 780 identified interested members of the public (i.e. project mailing list)

- distribution by Canada Post bulk mail service of brochures to approximately 8,180 homes and businesses (all addresses within the study area)

- Ontario Government Notice in the week of November 6, 1996 in the following papers: Bradford West Gwillimbury Times, The Gwillimbury Anchor, Newmarket Era-Banner, Toronto Star, Georgian Advocate

In addition to the above notification measures, the Bradford Bypass Technically Preferred Route and/or upcoming Public Consultation Sessions were mentioned in newspaper articles appearing in the Bradford West Gwillimbury Times (October 9, 1996, October 16, 1996, October 23, 1996, October 30, 1996 and November 13, 1996) and in the Newmarket Era-Banner (October 20, 1996). CKVR-TV (Barrie) conducted interviews during the November 14, 1996 PCS; airing status is unknown.

4.0 CONSULTATION SESSION CONTENTS

The first PCS was held in Bradford on Thursday, November 14, 1996 from 3:00 p.m. to 9:00 a.m. at the Bradford District Secondary School. The second PCS was held in Sharon on Tuesday, November 19, 1996 from 3:00 p.m. to 9:00 p.m. at the East Gwillimbury Civic Centre.

The Sharon Consultation Session was a joint presentation with the concurrent and related Highway 404 Extension Environmental Assessment Study.

Large print display panels were used to describe the study progress to date, supplemented by maps and 1:5000 scale plans of the Technically Preferred Route. The contents of the displays are documented in Appendix 2.

The consultation sessions were staffed by members of the Project Team, who engaged in discussion with attendees, explaining the study, responding to questions, and noting concerns or ideas that emerged. Representatives from MTO Property Section were also in attendance to discuss specific issues related to property acquisition and compensation.

An information package was made available at each Consultation Session to members of the public and is included in Appendix 2. Comment sheets were available at both PCS locations. Members of the public were encouraged to fill out and submit a comment sheet so that their comments could be documented (refer to Section 6.0).

5.0 PUBLIC RESPONSE

The PCSs were generally well attended, with approximately 200 (181 signed in) and 260 (226 signed in) attending the Bradford and Sharon sessions, respectively.

Summary of Verbal Comments

Generally, the response to the Technically Preferred Route was mixed although the majority of people recognized the need for a Highway 400-404 Link at some point in the future. Most questions/ comments related to the need for the Link and its location. Questions/comments relating to need were primarily in the context of improvements in the Highway 9/Green Lane Corridor ("Why do we need the Link when Green Lane is finished?"). Questions relating to route location were generally rooted in previous work which identified other possible corridors ("Why does the route have to be through Bradford?" " What's wrong with Highway 89/ Ravenshore Road and Highway 9/Green Lane Corridors?").

Common questions/comments heard by the Project Team related to noise and property effects and the timing of the freeway's completion. The following summarizes the verbal comments/concerns expressed by attendees at the Bradford and Sharon PCS:

- need
  - general recognition of the need for a Highway 400-404 link

- route location
  - rationale for Bradford Corridor over Highway 9/Green Lane and Highway 89/Ravenshoe Road Corridors
  - localized shifts with the corridor

- noise
  - impacts to residential areas

- property
  - expropriation
  - land values

- timing (of property purchase)
- access to severed parcels of land

- environmental concerns
  - wetland crossings
  - river crossings

- design considerations
  - access to roads without interchanges
  - interchange location at Highway 400
  - structure design
  - stormwater runoff/quality of groundwater
  - drainage

- historical issues
  - impacts to designated lands
  - impacts to lands not yet surveyed

FROGS (Forbid Roads Over Green Spaces), a local interest group opposed to the proposed location of the Bypass, had representatives attending both the Bradford and Sharon PCSs. At each location they set up an information booth outside the entrance of the PCS and spoke with people regarding the Link.

Summary of Written Comments

Written comments from the third round of public consultation have been received as follows: 1) written comment sheets received at the PCS; and 2) comment sheets and letters received after the PCS by mail, fax, or e-mail. Copies of these comments are included in Appendix 3 for reference purposes; the originals are on file at McCormick Rankin.

Comment sheets received after the PCS included a Ministry version modified by the FROGS group into a petition type format. The comment sheet was filled out with a list of typed comments and then distributed to area residents for signature before being sent to the Ministry of Transportation (see Appendix for a single example of the 60 such sheets received). The FROGS group also distributed another similar form intended to be signed and sent to the Ministry of Environment and Energy. Two of these forms were sent to the Ministry of Transportation a copy of which is included in Appendix 3. A number of comment sheets regarding the Link were received via the Highway 404 Extension EA Study held in conjunction with the Sharon PCS. These comment sheets are also included in Appendix 3.

The following is a summary of written comments received by December 31, 1996.

Number of Comment Sheets Received

1)	Bradford Bypass form:	108
	Highway 404 Extension form:	13
	FROGS petition form (modified Bradford form):	60
	FROGS petition form with additional written comments:	12
	FROGS MOEE form:	2
	TOTAL	195

2) Comment sheets noted above sent in by one person more than once (e.g. 1 FROG form and 1 Bradford form or 2 Bradford forms): 29

3) Comment sheets noted above requesting information: 21

4) Comments sheets noted above requiring specific response: 23

Summary of Comments from Bradford/Highway 404 Extension Forms (121 Total)

	# of Comments
Need Highway 400-404 Extension Link:	
• in Bradford Corridor	25
• in Highway 9/Green Lane Corridor	20
• in Highway 89/Ravenshoe Road Corridor	5
Do not need or are opposed to Highway 400-404 Extension Link:	18

Comments Relating to:

• Environmental Assessment Process	15
• Alternatives	34
• Need and Justification for Link	8
• Natural Environment protection (wetlands, wildlife)	35
• Social Environment impact (noise, lifestyles)	25
• Agriculture (loss of good farm lands)	9
• Cost	4
• Property (compensation, proximity of link)	10
• Access to Farm/Businesses	5
• Economic Considerations (businesses downtown/golf course, marina)	5
• Historical Issues	7
• Timing of Project	6
• Design Considerations (the alignment, ramp locations, structures, barriers, etc.)	19
• Traffic	2
• Water	3

Summary of Comments from FROGS Form (71 Total)

Comments relating to:

- Preservation of natural environment
- Noise levels

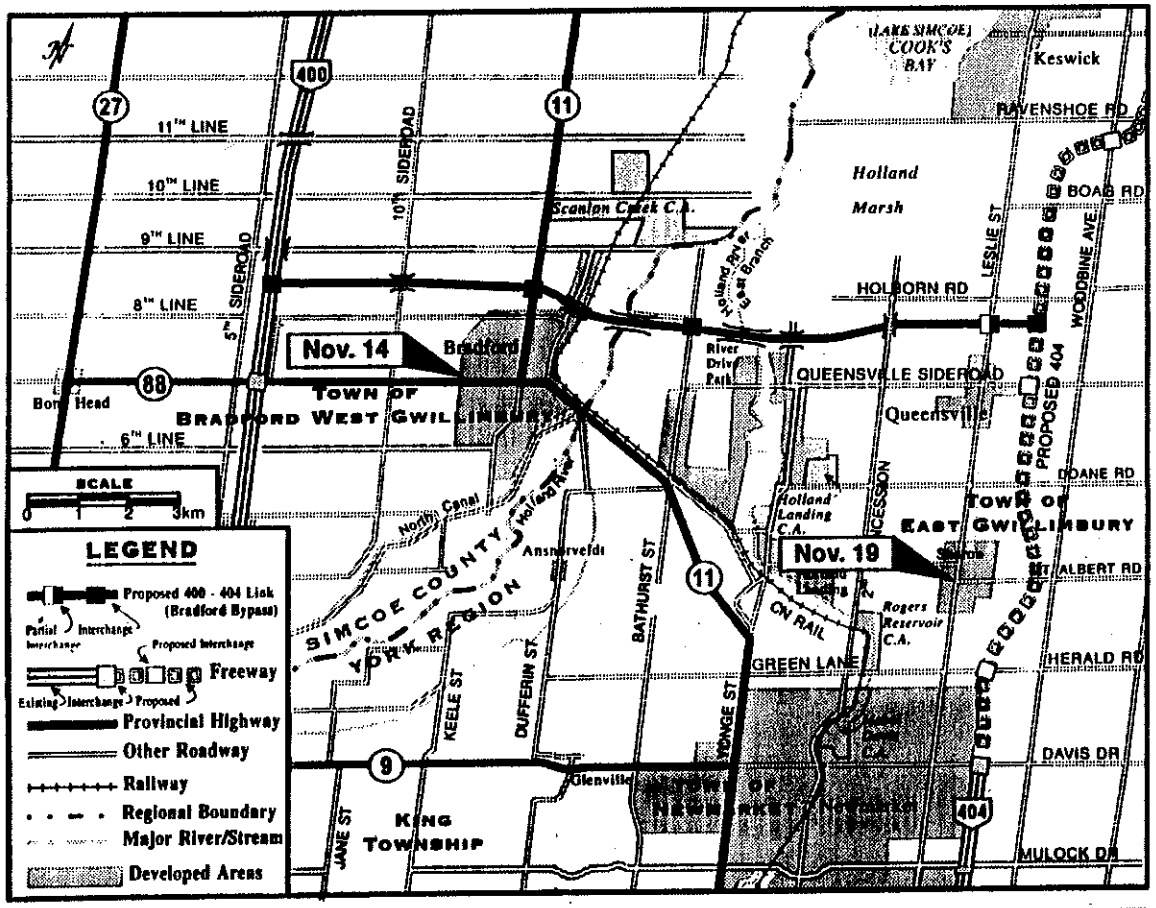
- Preservation of natural environment
- Pollution and wetlands
- Floodrisk
- Cost
- Need (only Green Lane is required)

6.0 CONCLUSION

The third and final round of public involvement for the Bradford Bypass may be considered successful because it was well attended by interested individuals who live in the study area. Most of the questions and comments received during the public review were not unusual or unexpected by the Project Team and can be addressed or incorporated into the study as it proceeds.

PUBLIC INVOLVEMENT IN PLANNING THE BRADFORD BYPASS

Study Phase	Date	Public Involvement Method / Opportunity	Results to Date
Environmental Assessment Proposal	May 15, 1993	**INFOSOURCE HOTLINE** initiated. Operated by and advertised weekly in the Bradford West Gwillimbury Times. 24 h/day free phone-in and message service. Study update message changed regularly. Incoming messages are responded to directly by the Study Team	600 calls made to the Hotline; 36 messages left on the Hotline for the Study Team. Hotline terminated in 1995.
	May 27, 1993	**DRAFT Environmental Assessment Proposal (EAP)** published; 90 copies distributed to Municipalities, Ministries, Interest Groups, and interested members of the public; contents presented to municipal councils and shown at first round of Public Information Centres.	Comments received and incorporated as appropriate into final EAP.
	June 5,9, 1993	**NOTICE OF STUDY COMMENCEMENT AND INFORMATION CENTRES** published in Toronto Star, Bradford West Gwillimbury Times and Georgina Advocate.	
	June 12, 1993	**BROCHURE #1** distributed, announcing study start-up and first set of Public Information Centres.	7,800 brochures mailed to study area residents.
	June 17,22, 1993	First Series of **PUBLIC INFORMATION CENTRES** held in Bradford and Queensville.	Approx. 400 area residents attended Information Centres; 30 comment sheets submitted.
Route Planning	April 20, 1994	**BROCHURE #2** distributed, announcing results of Corridor Assessment work.	7,800 brochures mailed to study area residents.
	June 5, 1994	**NOTICE OF GENERATION OF ROUTE ALTERNATIVES** published in Toronto Star, Bradford West Gwillimbury Times, Georgina Advocate, and Newmarket Era Banner.	
Route Planning (cont'd)	June 6, 1994	**BROCHURE #3** distributed, illustrating route alternatives and announcing the second round of Public Information Centres.	7,600 brochures mailed to study area residents, and 400 mailed to interested individuals / agencies.
	June 14,16, 1994	Second series of **PUBLIC INFORMATION CENTRES** held in Queensville and Bradford.	Approx. 450 area residents attended Information Centres; 50 comment sheets / letters received.
	July 28, 1994	Public Workshop / Meeting hosted by HEART in Bradford.	Approx. 100 Bradford West Gwillimbury residents attended.
	Sept. 2, 1994	Final EAP distributed to interested agencies and made available for public review at Clerk's offices in Simcoe, York, Bradford West Gwillimbury, King and East Gwillimbury Clerk's Office.	
	October 20, 1994	Public meeting hosted by HEART in Bradford.	Approx. 100 Bradford West Gwillimbury residents attended.
	October 27, 1994	Public meeting hosted by FROGS in River Drive Park.	Approx. 200 East Gwillimbury residents attended.
	December 16, 1994	**BROCHURE #4** distributed, with questions and answers regarding the study.	Brochures mailed to all on study mailing list (650 total).
Hwy 9 / Green Lane Alternative Analysis	December 6, 1995	Notice of Public Meeting published in Bradford West Gwillimbury Times, Georgina Advocate and Newmarket Era / Aurora Banner. Notice also distributed to study mailing list.	Notice mailed to all on study mailing list (750 total).
	December 11, 1995	Public Meeting at Sharon Arena	Approx. 100 area residents attended.
Analysis and Evaluation of Alternatives	October 31, 1996	Brochure #5 distributed, illustrating Technically Preferred Alternative and announcing the third round of Public Consultation Sessions	8,500 brochures mailed to study area residents, all on study mailing list, and interested agencies. Affected property owners notified by registered mail.
	November 1996	Notice of Public Consultation Session published in Bradford West Gwillimbury Times, the Anchor, Newmarket Era-Banner, Toronto Star, and Georgina Advocate.	



HAVE COMMENTS? NEED MORE INFORMATION?

Write to:

Mr. Steve Jacobs, P.Eng.
Senior Project Engineer
Planning Office, Central Region
Ministry of Transportation of Ontario
3rd Floor, Atrium Tower, 1201 Wilson Avenue
Downsview, Ontario, M3M 1J8

Mr. Steve Schijns, P.Eng.
McCormick Rankin Consulting Engineers
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Phone: (416) 235 - 5522 (905) 823 - 8500
Fax: (416) 235 - 4940 (905) 823 - 8503
e-mail: jacobss@gov.on.ca

To fill out a comment sheet: Drop by the Public Consultation Session and fill out the comment sheet to let us know your thoughts, comments and ideas.

For additional Consultation: We are available for additional consultation at the request of interested groups.

Highway 400 - Highway 404 Extension Link

ENVIRONMENTAL ASSESSMENT STUDY

BRADFORD BYPASS

BROCHURE # 5

NOTICE OF TECHNICALLY PREFERRED ROUTE

You are invited to attend the following Public Consultation Sessions:

Thursday November 14, 1996
3:00 p.m. - 9:00 p.m.
Bradford High School
Highway 88 at Professor Day Drive
Bradford, Ontario

or

Tuesday November 19, 1996
3:00 p.m. - 9:00 p.m.
East Gwillimbury Municipal Offices
19000 Leslie Street
Sharon, Ontario

These sessions have been arranged for you to review, discuss and provide input to the analysis and evaluation of the Technically Preferred Route.

BACKGROUND

The Bradford Bypass Environmental Assessment Study is being carried out in accordance with the Environmental Assessment Act of Ontario. This Act provides for the protection and wise management of the environment in Ontario.

The purpose of the study is to identify improvements to accommodate east-west travel between Highway 400 and the proposed Highway 404 Extension, south of Lake Simcoe.

STAGE ONE (1993-94)

The first stage on the study involved the preparation of the Environmental Assessment Proposal (EAP). The statement of problem/opportunity in the EAP focused on:

- Existing discontinuities in the road network cause inefficient travel, particularly with respect to demand for travel between the Highway 400 and Highway 404 freeway corridors.
- Traffic congestion and operational problems exist on provincial and municipal roads in the northern part of York Region.
- The existing road network cannot accommodate the future increase in demand resulting from population and employment growth in the area.
- The lack of a long term highway plan seriously affects the ability to carry out municipal plans.
- There is an opportunity to reduce the negative effects of the existing transportation system on the community (e.g., noise, congestion) and to provide community benefits (e.g., accessibility, safety).
- By protecting for long term needs now, there is an opportunity to ensure future development does not preclude the ability to implement a solution.

Copies of the EAP are available at the Bradford Library or can be obtained by contacting one of the names on the reverse. This information was reviewed with the public in 1993 and 1994.

STAGE TWO (1994-95)

The second stage of the study involved the development of alternative Bradford Bypass routes. These routes were reviewed with the public, interest groups, municipal staffs and Councils, and government agencies. Based on the input received, modifications, refinements, and additions to these routes were made. This information was reviewed with the public in 1994.

STAGE THREE (1995-96)

In the third stage of the study, each of the alternatives were analysed and evaluated for their effects on a defined set of factors. Alternatives were compared on the basis of impacts on transportation performance, land use, natural environment, social/ cultural environment and economic conditions.

As a part of this work, the consulting firm of Hemson Limited was retained to assess the impact of the project on businesses in the Bradford area. The analysis also utilized information gathered from the public at information centres, community meetings, and correspondence and conversation with interested and affected parties. Based on this analysis, the Study Team selected the route shown on the map (over) as being technically preferred.

Detailed plans were prepared for the Technically Preferred Route and several of the alternatives. This is the material to be reviewed at the November 1996 Public Consultation Sessions.

WHAT HAPPENS NEXT?

Information received during this round of consultation will be considered prior to finalizing the preferred route.

The resulting recommended route will be documented in an Environmental Assessment Report for submission to the Ministry of Environment and Energy. The public will have an opportunity to comment on this report. After submission of a final document, the Minister of Environment and Energy will initiate a formal process to decide whether to approve the undertaking. Further public notification will occur at that time.

PURPOSE OF THE PUBLIC CONSULTATION SESSIONS

This is a critical point in the study and your input can have a direct result on the final recommended route.

At this time, comment is being sought regarding:

- The analysis and evaluation of the various route options.
- The Technically Preferred Route.

The Technically Preferred Route is shown on the map on the reverse side of this brochure.

It is important to note that a final decision on the recommended route will not be made until the public has had an opportunity to comment on the evaluation. It is therefore very important that you take the time to attend the Public Consultation Session and provide the Project Team with your thoughts, comments and ideas. If you are unable to attend, your comments may be written, faxed, phoned, or e-mailed to either address on the reverse.

FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT

All comments received during the study will form part of the Environmental Assessment documentation. However, personal information associated with the comments will not be made public.

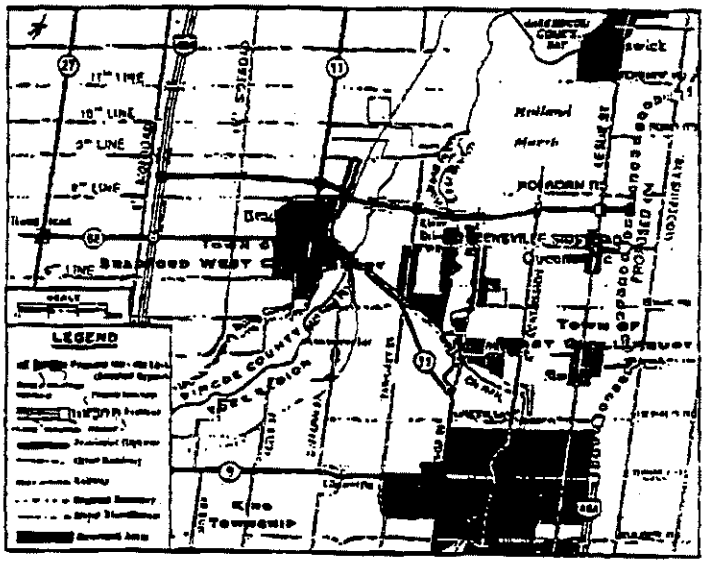
ONTARIO GOVERNMENT NOTICE

Highway 400 – Highway 404 Link ("Bradford Bypass") Environmental Assessment Study

Notice of Public Consultation Session

The Ministry of Transportation of Ontario (MTO) began an Environmental Assessment Study in 1993 for a highway link between Highway 400 and the proposed Highway 404 Extension (also under study) in the area south of Lake Simcoe and north of Bradford.

The analysis and evaluation of alternative routes for the new roadway has been completed, and a Technically Preferred Route has been identified (see map). Plans for this proposal and a summary of the analysis and evaluation process will be available for public review and comment as follows:



1. Thursday, November 14, 1996
   3:00 - 9:00 p.m.
   Bradford High School
   Highway 88 at Professor Day Drive, Bradford
2. Tuesday, November 19, 1996
   3:00 - 9:00 p.m.
   East Gwillimbury Municipal Offices
   19000 Leslie Street, Sharon
   (Joint session with Highway 404 Extension Study)

The recommended route will be finalized, with consideration given to input received during this final round of consultation. The resulting recommended route will be documented in an Environmental Assessment Report for submission to the Ministry of Environment and Energy. The public will have an opportunity to comment on this report. After submission of a final document, the Minister of Environment and Energy will initiate a formal review process to decide whether to approve the undertaking. Further public notification will occur at that time.

For additional information, please contact:

Mr. Steve Jacobs, P.Eng.
Senior Project Engineer
Planning Office, Central Region
Ministry of Transportation of Ontario
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1201 Wilson Avenue
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M3M 1J8
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Fax: (416) 235-4940
e-mail:jacobss@gov.on.ca

Mr. Steve Schijns, P.Eng.
McCormick Rankin
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Phone: (905) 823-8500
Fax: (905) 823-8503

Ontario

file (original)

McCORMICK RANKIN
CONSULTING ENGINEERS AND PLANNERS

MEMORANDUM

PROJECT: Highway 404-404 Link (Bradford Bypass) Study

OUR FILE: W.O. 2341-91

BY: S. Schijns, P. Eng.

COPY TO: S. Jacobs, T. Steele, MTO

RE: Public Meeting on December 11, 1995 in Sharon

A public meeting was arranged in order for the public to have an opportunity to review and comment on the comparison of alternatives within the Highway 9/Green Lane/Newmarket corridor and the Bradford Bypass corridor.

Publicity for the meeting took the form of a mailed notice (attachment #1) to all individuals and agencies on the study mailing list (744 total) (attachment #2) and advertisements (attachment #3) on December 6, 1995 in the: Bradford West Gwillimbury Times; Georgina Advocate; and Newmarket Era/Aurora Banner.

The attendance register was signed by 64 attendees (attachment #4), most of whom had been previously involved in the study. Actual attendance was greater than 100 people.

The meeting schedule was:

7:00 - 7:30	:	public review of displays (Attachment #5)
7:30 - 8:00	:	presentations by Project Team (Attachment #6)
8:00 - 9:00	:	moderated Question and Answer period (Attachment #7)

Comment sheets were available at the meeting and a total of 7 written submissions were received (by hand or later by mail) (Attachment #8).

Mr. C. Foster (FROGS) set up a separate display at the meeting hall entrance from which to distribute material opposing the project (Attachment #9)

Note that, under the Freedom of Information and Protection of Privacy Act, Attachments 2 and 4 and the signature portion of Attachment 9 can not be made public and are for internal records only.

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #1: Notice of Meeting

ONTARIO GOVERNMENT NOTICE

Highway 400-Highway 404 Link ("Bradford Bypass") Environmental Assessment Study

Notice of Public Meeting

The Ministry of Transportation of Ontario (MTO) began an Environmental Assessment Study in 1993 for a highway link between Highway 400 and the proposed Highway 404 Extension (also under study) in the area south of Lake Simcoe and north of Bradford.

Last year, as part of the study some members of the public asked "Why not build the new road near Newmarket along Highway 9 instead of in the Bradford corridor?" In order to answer this question, the Ministry investigated the idea of either upgrading Highway 9-Green Lane to freeway standards or locating a freeway on a new route just north of Newmarket (see map).

The review concluded that the "Bradford Bypass" corridor is the best location for a future freeway and that a freeway should not be considered further in the Newmarket area.

The public is invited to review the analysis and comparison of the Bradford Bypass and the Highway 9-Green Lane corridor alternatives and to participate in a meeting on the topic:

7:00 p.m. - 9:00 p.m., Monday, December 11, 1995
(presentation at 7:30 p.m.)
Auditorium, East Gwillimbury Community Centre
Mount Albert Road east of Leslie Street
Sharon, Ontario

It is intended that a preferred route for a new freeway in the "Bradford Bypass" corridor be presented for public review at a separate set of meetings in early 1996.

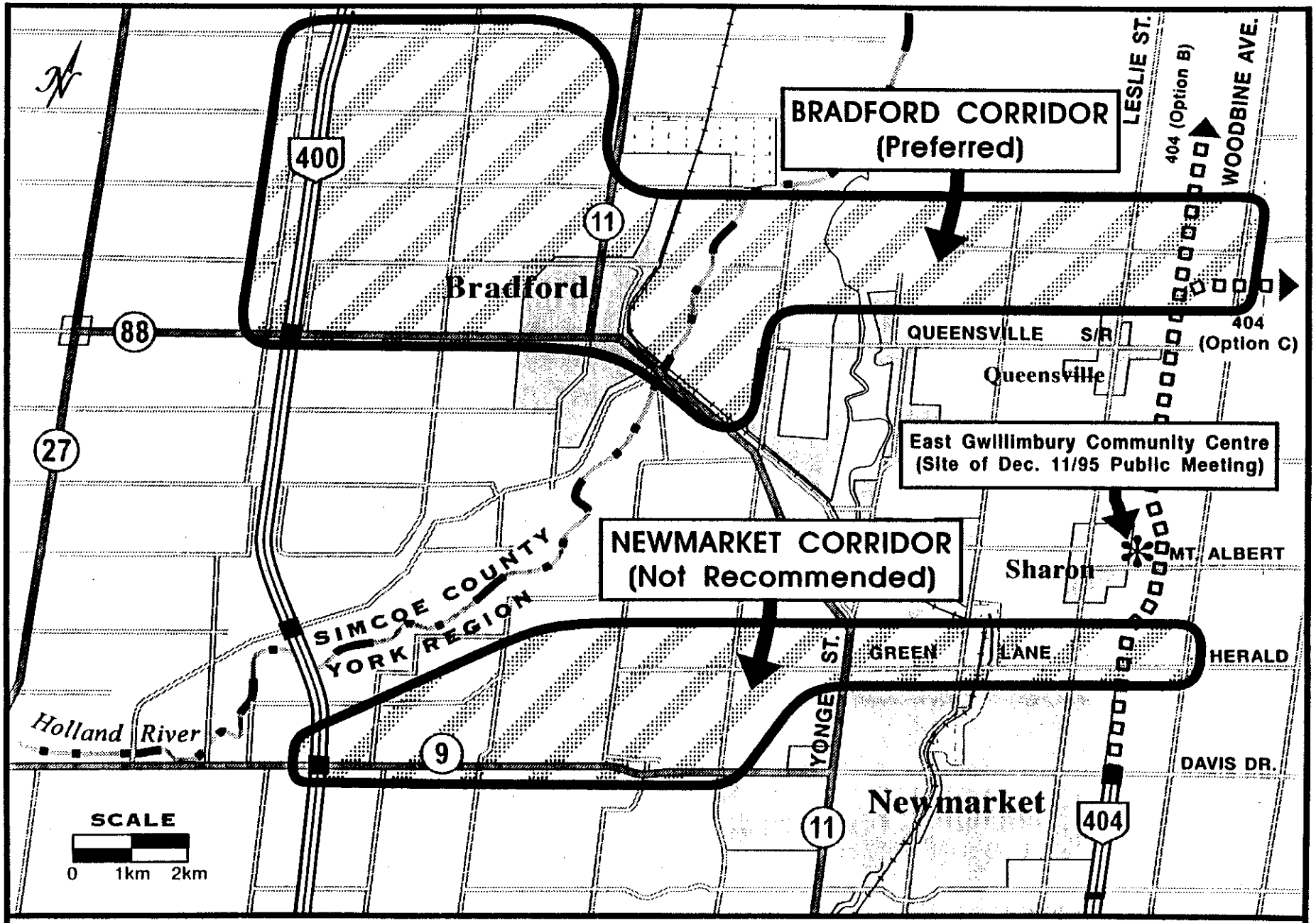
For additional information, please contact:

Mr. Steve Jacobs, P.Eng.
Senior Project Manager
Central Region
Ministry of Transportation of Ontario
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Phone: (416) 235-5522
Fax: (416) 235-4940
e-mail:jacobss2@epo.gov.on.ca

Mr. Steve Schijns, P.Eng.
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Fax: (905) 823-8503



STUDY AREAS FOR NEW HIGHWAY 400 - HIGHWAY 404 LINK

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #2
Mailing List Sent Notice of Meeting

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #3
Newspaper Advertisement

ONTARIO GOVERNMENT NOTICE

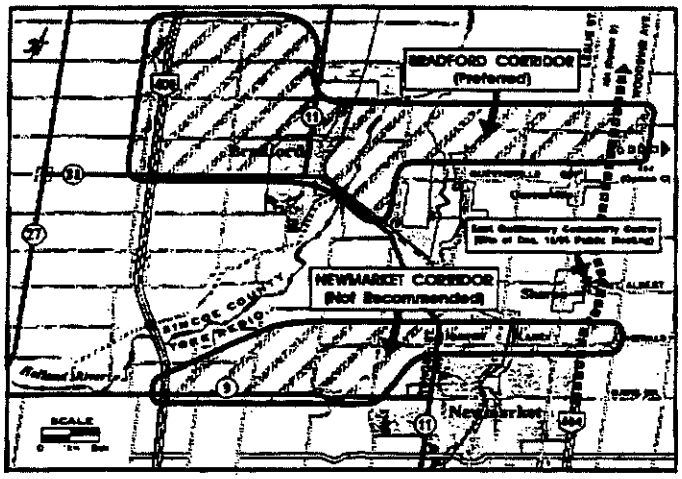
Highway 400 - Highway 404 Link ("Bradford Bypass") Environmental Assessment Study

Notice of Public Meeting

The Ministry of Transportation of Ontario (MTO) began an Environmental Assessment Study in 1993 for a highway link between Highway 400 and the proposed Highway 404 Extension (also under study) in the area south of Lake Simcoe and north of Bradford.

Last year, as part of the study some members of the public asked "Why not build the new road near Newmarket along the Highway 9 route instead of in the Bradford corridor?" In order to answer the question, the Ministry investigated the idea of either upgrading Highway 9-Green Lane to freeway standards or locating a freeway on a new route just north of Newmarket (see map).

The review concluded that the "Bradford Bypass" corridor is the best location for a future freeway and that a freeway should not be considered further in the Newmarket area.



STUDY AREAS FOR NEW HIGHWAY 400 - HIGHWAY 404 LINK

The public is invited to review the analysis and comparision of the Bradford Bypass and the Highway 9 - Green Lane corridor alternatives and to participate in a meeting on the topic:

7:00 p.m. - 9:00 p.m., Monday December 11, 1995
(presentation at 7:30 p.m.)
Auditorium, East Gwillimbury Community Centre
Mount Albert Road east of Leslie Street
Sharon, Ontario

It is intended that a preferred route for a new freeway in the "Bradford Bypass" corridor be presented for public review at a separate set of meetings in early 1996.

For additional information, please contact:

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Phone: (905) 823-8500
Fax: (905) 823-8503

Ontario

BWG Times Wed Dec 6/95

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #4
Attendance Register

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #5
List of Displays

List of Displays

Public Meeting, Dec. 11, 1995 at Sharon

1. Study Schedule

2. Map of Corridor Alternatives (407 to 88)

3. 1:10,000 Aerial photomosaic of Newmarket Corridor, with freeway alternatives on an acetate overlay

4. 1:10,000 Ontario Base Map of Bradford Corridor, with route alternatives on an acetate overlay

(note - #2 and #4 had been used at previous public meetings)

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #6
Material Presented by Project Team

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #7
Notes Taken During Question & Answer Period

Public Presentation of the results of the Comparison of Alternative Routes within Newmarket (Highway 9-Green Lane) Corridor and the Bradford Corridor

Monday, December 11, 1995
7:00 PM to 9:00 PM
Auditorium, East Gwillimbury Community Centre
Mount Albert Road east of Leslie Street
Sharon, Ontario

Notes - Question and Answer Session

Q 1. Clarification of roles - region and province.

A - Regional Municipality of York undertaking the Green Lane upgrade to meet local requirements. Ministry of Transportation carrying out 400 to 404 extension Link study to address long term provincial need.

2. Clarification requested regarding the statement that cost of the Highway 9-Green Lane would be about equal to the cost of the Bradford By-pass route.

- given the two interchanges at Highway 400/9 and Highway 404 and the difficulties of engineering throughout the rolling topography north of Highway 9 in comparison to the length of crossing the two branches of the Holland River the cost of construction will be about equal.

3. How will property value be determined?

- The current study is a Protection of Right-of-Way exercise. Compensation will be based on the Appraised Market Value of the property. The market value is based on what lands would be expected to sell for by a willing seller to a willing buyer on the open market, at the time of acquisition (after MTO receiving EA approval). There is a process for hardship case acquisition in advance of MTO receiving EA Approval anyone wanting to start this process should contact Central Region, Property Section, at (416) 235-4953, once the technical preferred route is selected .

4. How can a highway be constructed on such poor soil foundation conditions?

- There is a great deal of soil information already available and more will be collected before the preliminary design is finalized.

5. What will we see at the next meeting; this has been going on too long?

   - in the next round of public review the technically preferred route for the Bradford By-pass Corridor will be presented to the public.

6. Cost comparison Bradford Bypass vs Highway 9-Green Lane bridges over the marsh vs the reconstruction of an existing highway or a new highway on solid ground.

   - SEE ITEM 2

7. Environmental damage - Highway 9 vs Bradford Bypass

   - there are just as many environmental issues associated with the Highway 9 Green Lane corridor as there are with the Bradford By-pass. For example crossing the wetland at the narrowest point with long bridges at both crossings is not significantly different to the problems associated with the engineering throughout the rolling topography north of Highway 9. Also 400/9 interchange will be reconstructed and will impact the marsh.

8. Comment: traffic does not warrant the need for a new route
   ie Cole Sherman 413 study

   Consultant conflict of interest - Green Lane Study - Bradford By-pass.

   Pick up more traffic south of Highway 9
   drainage, new highway through forested natural areas.

9. Flooding - two river crossing causing flooding - want highway below current dyke levels

   - opening of the bridge will start at the outer edge of wetland
   - preliminary design will look at all of drainage issues

10. Has MTO looked at Tunnel option

    - cost

11. Is there going to adequate boat clearance on both crossings

    - Canadian Coast Guard has set clearance requirements at 6.70 m (22 feet) above the level of the Holland River

12. What detailed environmental assessment studies have been undertaken to date? Specific concerns with natural environmental factors, traffic accidents, drainage, stormwater treatment, salt damage, wildlife.

    - large amount of work has been carried out to date, additional field work will be carried out along technically preferred route in future selection/evaluation and preliminary design phases

13. Heritage - rationale for ranking

    - number of structures of fair condition throughout the route
    - number of structures with potential

14. Duck Unlimited, and Hunter and Anglers concerned with loss of habitat issues.

    - outside agencies have and will continue to be part of the overall public component of the study.

15. Request for the rating of the criteria from Highway 89 Study

    - will be provide to requester.

16. Concern regarding future bridges generating noise because of structural type/pavement surface etc... (clear hot summers days/nights River Drive Park impacts)

    - noise evaluation will be part of preliminary design.

17. Comment - noise impact will be important

18. What will next meeting tell us - now going to preliminary design

    - SEE ITEM 5

19 What documents are available

    - EAP draft and final
    - Environmental Technical Papers

    - overall Environmental Assessment Report will be coming

out at end of Study at time of submission to Ministry of Environment and Energy

20. Lack Traffic analysis - no Need and justification

21. Request for documentation

- SEE ITEM 19

22 Property freeze on Bradford Bypass Corridor

- will be better able to comment on after establishment of technically preferred route in spring of 1996.

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HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #8
Written Comments

HIGHWAY 400-404 LINK (BRADFORD BYPASS) STUDY
DECEMBER 11, 1995 PUBLIC MEETING

ATTACHMENT #9
Material Distributed at Meeting by FROGS

Distributed by FROG at Public Meeting Sharon Dec 11/95

F.R.O.G.S. SAYS THAT THE HARRIS GOVERNMENT ALLOWS M.T.O. TO IGNORE ONTARIO LAWS

The Ministry of Transportation for Ontario (M.T.O.) is proposing to build a four lane highway across the south Lake Simcoe basin to connect Highway 400 and the extension of Highway 404. They are calling it the Bradford By Pass. The M.T.O. has failed to establish the need for a freeway in this highly environmentally sensitive study area **F.R.O.G.S.** (Forbid Roads Over Green Spaces), an organization of concerned residents living in the vicinity of the study area, was established in response to the Bradford By Pass proposal. F.R.O.G.S. spokesman Bill Foster says "M.T.O. is spending millions of dollars on consultants, then ignoring the results." Cole Sherman, an engineering consultant who is currently conducting a similar study to extend highway 404, was hired in 1992 by M.T.O. to produce a study on east-west travel in York Region. The Cole Sherman study clearly states "It can be concluded, that if a new east-west corridor were to be implemented, it should be between Major Mackenzie Drive and the Bloomington Road. North of Bloomington Road, future travel demands are less and could be accommodated on a regional road network." Paul Jafine of F.R.O.G.S. points to another example of M.T.O. ignoring the results of a study. Gartner Lee, a highly respected environmental engineering company performed a study for the M.T.O. in 1993. Their study stated that "the area of greatest sensitivity is the Holland Marsh at the south end of Cooks Bay." The area contains "rare animal species, uncommon vegetation and almost 50 rare species of plants, many found nowhere else in York Region." "The entire area is designated as an ESA (Environmentally Sensitive Area) and the Ministry of Natural Resources has

identified this as a Class 1 Wetland." The Ministry of Natural Resources has stated that "All of the Bradford Marsh concerns that contributed to the demise of the previous studies still exist, and in fact have intensified by virtue of the Provincial Wetlands Policy Statement." Ten years ago, for environmental reasons, the MTO failed to obtain approval to build a similar road along the Ravenshoe Road corridor, north of the current study area. They are facing the same environmental issues with the Bradford Bypass. Of further concern is the fact that MTO's consulting engineers on this project have publicly acknowledged that the current proposal is more environmentally intrusive than the defeated Ravenshoe proposal. This is because the Ravenshoe proposal was only for a two lane highway while the Bradford Bypass proposal calls for a four lane controlled access freeway. F.R.O.G.S. spokesman John Corbishley claims that "the cost of building a highway on a flood plain and wetlands would be at least four times the cost on normal soil conditions." "This is not the first time M.T.O. has selected a poor site for a highway, remember the endless delays in building Highway 404 due to completed sections of the road sinking in the unstable soil." A province that has to close hospital wards due to lack of funds does not have an extra million dollars to waste on a study that is financially irresponsible, when they know in advance that the answer is no. John Corbishley believes that "we should be entitled to rely upon the province's various policies and legislation to protect our interest. Over the course of this study, we have become totally disillusioned by the flagrant disregard of these policies and laws by our government." "We are most frustrated that we must employ our own scarce personal resources and time to ensure that our interests are protected." Bill Foster believes that "the M.T.O. has failed to satisfy the

requirements of the Environmental Assessment Act. This act requires, that a proponent such as M.T.O. must not only establish the need for the project, but also consider various alternatives to the project and its location. M.T.O.'s published review of alternative locations for this highway clearly demonstrates that for all criteria other than transportation, the Highway 9 - Green Lane corridor, is the preferred corridor. Highway 9 is only five - ten kilometers south of the proposed study area. Highway 9 and Green Lane are scheduled to be upgraded to a four lane road within the next 5 years." Paul Jafine claims that M.T.O. has totally ignored Ontario's Flood Plain Planning Policy. "The proposed highway will be built across a flood plain. Ontario's policy states that site grading and the placing or dumping of fill must not be permitted." M.T.O.'s proposed Bradford By Pass will cross the Lake Simcoe Basin flood plain in an east/west direction disturbing the drainage which flows from south to north. In the event of a regional storm, this raised highway will act as a dike to retain stormwater thus increasing the flood related damages to the existing houses in the area. F.R.O.G.S. estimates that approximately 95% of the buildings in this area are already exposed to potential flooding. John Corbishley says that "we are concerned taxpayers and we are not alone in our desire to enforce the laws of this province. Many other citizen organizations such as Lakewatch, South Lake Simcoe Naturalist Club, South Lake Simcoe Wilderness Coalition, Save our Simcoe Alliance, and the Wilfred Bog Task Force are actively organizing a large number of ordinary citizens to work closely with other more knowledgeable and resourceful groups in the GTA to bring an end to this totally inappropriate expropriation of our scarce resources." Bill Foster noted that "There is no doubt that the proposed highway is

contrary to the public will at all levels. During three public meetings, each attended by over 200 people, not one person spoke in favor of the highway." In response to a M.T.O. presentation on March 7th to Newmarket council, Mayor John Cole stated "it does not make sense to have 2 parallel roads a few kilometers apart, when there is an alternative" Following a deputation presented by F.R.O.G.S. on April 18th, the town of East Gwillimbury undertook to advise M.T.O. that they are totally against the Bradford By Pass Highway. Water is a major problem in York Region. Wells are drying up at an alarming rate. Last summer, many residents in East Gwillimbury who have consistently depended upon their wells for decades suddenly found them dry. The disruption to the flow of water that a new highway would bring to the area is disturbing. Paul Jafine sums up the position of F.R.O.G.S., "The proposed location for the highway is wrong. The laws and policies of the province of Ontario are on our side. We are not tree huggers, we are only opposed to building roads in the wrong location. If Government does not stop this proposed highway, the courts will."

+ card for mailing to Minister of Transportation:

MTO'S Bradford Bypass Environmental Assessment Study is fatally flawed. Continuation of this study calls into question the integrity of all other MTO Environmental Assessments. Even before this study was commissioned, your staff knew the project would fail because: The proposal contradicts the 1992 findings of Cole Sherman; MTO's external consultants. They found there is no need for this freeway in this location. Violates Ontario's Wetlands and Flood Plain Planning Policies. Will destroy one of southern Ontario's few remaining environmentally sensitive areas. If your ministry is going to conduct an Environmental Assessment - either do it properly - or not at all. The Bradford Bypass Environmental Assessment should be aborted now!

Name:_____

Address:_____

_____

_____

McCORMICK RANKIN
CONSULTING ENGINEERS

MEMO TO FILE

RE:	Bradford Bypass Environmental Assessment Study
OUR FILE:	2341-91
PREPARED BY:	Ravi Mehta
DATE:	October 20, 1994
SUBJECT:	H.E.A.R.T. Meeting
cc.	**S. Jacobs, T. Steele, C. Kitchen, F. Leech**

Date &	October 20, 1994
Time:	7:30 - 10:00
Place:	Bradford Arena, Simcoe Street, Bradford

NOTES:

This meeting was held by the H.E.A.R.T. Committee of Bradford in order to inform the local residents of the Bradford Bypass study. McCormick Rankin and MTO were invited to attend and to present an update of the study.

Following introductions at 7:30 p.m. by Lisa Brouckxon of H.E.A.R.T., John Sutherns provided an overview of the project. He outlined the need for the bypass based on the projected doubling of population in York Region, and the need for an east-west link joining Highways 400 and 404. He indicated that there have been two public information centre sessions in the past (see attached overhead slide) as well as a workshop held by the H.E.A.R.T. committee. At these public meetings, several questions were raised which bore repeating:

- Would the Highway 9/Green Lane connection be sufficient? No, this connection is required to serve as Newmarket traffic. It is needed in addition to the Bradford Bypass.

- Why isn't Ravenshoe Road/Highway 89 route being considered? This route was considered in the original E.A. Study but was not accepted by the MOEE because of the impacts to the wetlands near Cook's Bay.

In addition to these questions, several new route options were suggested.

Mr. Sutherns reviewed the existing route options as well as ones that have been developed based on the suggestions made by the public.

Following Mr Sutherns' overview, the meeting was open for questions from the public: (note that the names were given verbally, and as such, the spelling may be incorrect).

Area Resident

Q. Will 9th Line be cut off by highway alternatives crossing it?

A. No, routes crossing 9th Line will be grade separated.

Area Resident

Q. What happens if I want to sell my house and cannot because of the impending highway?

A. In cases where it can be documented that a house is not selling because of the uncertainty surrounding the highway, the MTO may purchase the property in advance of need. (This case is called "hardship" and occurs when the MTO is causing a hardship to an individual).

Area Resident

Q. What happens if the drinking water in the aquifer below Bradford gets polluted or cut off by the highway construction?

A. A part of the detailed assessment will include a detailed study of the effects of the highway on the aquifer.

Area Resident

Q. Has the concept of tunnelling under the two rivers been considered - it may be more environmentally safe.

A. It has not been considered because of the costs involved (it would be many times more expensive) and because of the effects on the aquifer.

Area Resident

Q. On the notice, it was quite clear that it would not be possible to go from northernmost alignment to the northernmost river crossing. This option would put the route in a location that would not bother anyone.

A. The option would require a large structure on a curve which would pose an icing problem in winter, but it may be worth considering that option.

Area Resident

Q. Would the middle two alternatives cut off access to the Scanlon Creek Conservation Area?

A. An access over the highway will be provided.

Area Resident

Q. Will there be any provision for noise reduction?

A. Usually new highways are built in a manner that reduces the noise levels to the extent possible. In the SCCA area it is possible that the roadway may be in a cut section although would not be possible in the marsh areas because of the high water table.

Area Resident

Q. The new freeway will increase the noise level; will a noise wall be provided, is there any compensation?

A. A noise wall is unlikely because of the rural surroundings and the MTO only compensates for land that is required (i.e. compensation will not be made for changes in noise levels).

Area Resident

Q. If the highway is to be located at the back property lines (i.e. mid-concession) how much land is required from each property; how is the dollar value for compensation determined?

A. The right-of-way will be 100 m wide. If it is centred exaclty on mid-concession, this will require 50 m from each side. Local adjustments would however result in variation to

this even split. The compensation is determined by property value experts based on "fair market value".

Area Resident

Q. How is "fair market value" assessed?

A. Fair market value is the value of the property as if there had never been a highway proposal.

Area Resident

Q. Is there an interchange proposed for the southern loop between Bradford and Bathurst Street?

A. There is not one planned.

Area Resident

Q. What is the need for this $1.2 Million study - why do we need to do this today?

A. We need to do this study in order to protect a right-of-way for the highway. It is not intended to build the highway for a number of years, but is important to assure that the land is available.

Area Resident

Q. How long will the freeze on land be in effect for?

A. The project is being done as quickly as possible but is important to involve and consult the people who will be affected by this project. It is hoped that the preferred route will be known next year.

Area Resident

Q. When will the preferred route be known?

A. The technical assessment will be complete by early next year and the preferred route will be known by summer or fall 1995.

Q. What is the timing for expropriation?

A. Property acquisition usually starts two years before construction.

Area Resident

Q. Why not build the bypass along Ravenshoe Road, curving north to a causeway.

A. At the time of the earlier studies, the decision was made to avoid the wetlands. A causeway would cause severe environmental impacts and would be extremely expensive.

Area Resident

Q. Would the highway increase the risk of floods?

A. The highway will be designed with the regional storm guidelines. In addition, the entire river crossing and adjacent wetlands will be structured which will allow flood water to flow freely below the highway.

Area Resident

Q. Since the Ravenshoe Road E.A. did not pass, what guarantee is there of this study passing?

A. None

Area Resident

Comment: Does not like any of the routes. There are routes that do not affect people.

Area Resident

Q. Why not expand Green Lane to six lanes and do without this study?

A. When York Region's population reaches 1,000,000 people in 15 to 25 years, both Green Lane and the Bradford Bypass will be required.

Area Resident

Comment: Supports the Green Lane option.

Following the formal question/answer session, McCormick Rankin and MTO staff were available for questions and comments.

The meeting broke up at about 10:00 p.m.

The following staff were present:

MTO:	Steve Jacobs
	Terry Steele
McCormick Rankin:	John Sutherns
	Ravi Mehta

FINAL

PUBLIC MEETING

BRADFORD 404 BY-PASS

7:00 - 9:00 p.m.

THURSDAY OCTOBER 20,1994

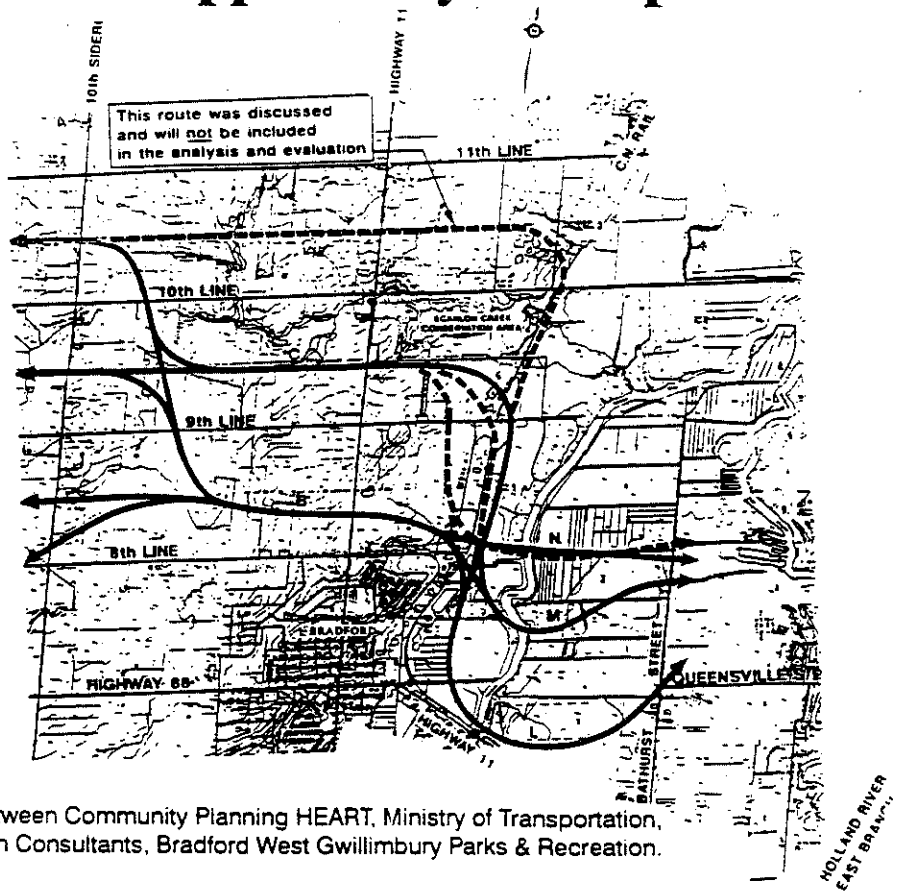
View Maps 7:00 - 7:30 p.m.

Information/Question and Answer Period 7:30 - 9:00 p.m.

BRADFORD ARENA

(Simcoe St. Upstairs)

In response to Public Involvement, several NEW ROUTE alternatives have been developed EAST OF HWY 11. This will be your final opportunity for input before Route Evaluation.



Route Alternatives previously identified
Additional Route alternatives

KEY PLAN

In cooperation between Community Planning HEART, Ministry of Transportation, McCormick Rankin Consultants, Bradford West Gwillimbury Parks & Recreation.

Public meeting on the Bradford Bypass

More than 100 people packed the Bradford Community Centre last Thursday, for what was billed as the last public meeting before consultants select a preferred route for the proposed Bradford Bypass.

For a third time, representatives of the Ministry of Transportation and McCormick Rankin consulting engineers, presented the possible corridors for a four lane, limited access Highway, that would eventually link the 400 with a future extension of the 404.

This time, there were "refinements" in the possible routes, east and north of Bradford - based, consultants said, on public input from the previous two sessions. They asked for more input, and they got it, as residents questioned the need for the Bypass, and the logic that would see the highway run through the middle of Bradford West Gwillimbury.

John Sutherns, principal engineer with McCormick Rankin, explained that routes north of Concession 11 had not been considered, because the Ministry of the Environment had already turned down a highway proposal in that area in the late 1980s, for environmental reasons.

As for a suggestion that upgrading Green Lane and Highway 9 in Newmarket would serve the same purpose, Sutherns noted that York Region does have plans to upgrade to a four lane road. "That corridor will, in fact, address the problems in and around Newmarket," Sutherns said, pointing out that the population of York Region is expected to double to 1 million, within the next twenty years. "It's needed, as well as the freeway link."

The residents raised a number of concerns in the meeting, including the "freeze" on development within the proposed transportation corridors. More than one landowner asked when the freeze would be lifted, and when negotiations with the Ministry would begin, for the purchase of properties.

Sutherns agreed that it might be difficult to sell or develop a property, until a route is announced, late in 1995.

"One of the frustrations of a process like this is that it leaves people's lives in doubt for a considerable time," he said, admitting it places "a hardship" on landowners. In the case of extreme hardship - a farmer, for example, wishing to sell in order to retire - the Ministry might step in and purchase the property, although "it's not a guarantee they will buy it."

Initial plans had called for a preferred route to be announced early in 1995, however the "open door" process being followed to ensure that "everyone has the opportunity to be involved" has delayed the process. The consultants are now hoping to find the preferred route by fall of 1995, and win approval from the Ministry of Environment and Energy within 2 to 3 years after that - but there might be no expropriation for another 10 to 20 years.

"Carry on living," Sutherns urged residents. "If you increase the value of your property, and your property will be acquired, you will be paid full market value."

Another serious concern was raised by Public Utilities Commission chair, Gary Lamb. Lamb noted that the proposed routes, on either side of the Artesian Industrial Park-

see page 2

Residents oppose Bradford Bypass

from page 1

way, could interfere with 2 new municipal wells currently being developed. The proposal calls for concrete pilons to be sunk 100' into the ground - to the same depth as the aquifer than supplies both municipal and private wells in the area.

"If you interrupt the Town's water supply, you could create major problems," he warned.

There were also concerns that the new routes, which follow Artesian Parkway north and then swing westward between the 9th and 10th Lines, would create problems of access and noise at Scanlon Creek Conservation Area, and for residents of the 9th Line.

One of those residents, Fred Dow, urged the engineers to follow the most northerly route shown - up through the eastern portion of Scanlon Creek, and then westward, between the 10th and 11th Concessions. "It's the line of least resistance to the people," said Dow. "There's people involved here besides bulrushes, flowers, wildlife, butterflies... Put the thing some place where it's not going to bother anybody."

His comments were greeted with applause, but not everybody agreed that the most northerly route was the best. A spokesperson from Scanlon Creek noted that the eastern portion of the park might not be used by people, "but for all the other reasons for the Conservation Area existing - the wildlife, water quality - the east side is just as important."

And Mikki Nanowski noted that if the interchange with highway 11 was too far north, motorists wouldn't want to drive back south, to the town of Bradford.

MINUTES OF MEETING

PROJECT: Bradford Bypass Environmental Assessment Study

MEETING: H.E.A.R.T. Committee Workshop/Public Meeting

TIME: 7:30 p.m., Thursday, July 28, 1994

LOCATION: Bradford West Gwillimbury Community Centre, 125 Simcoe Street

ATTENDEES:
S. Jacobs, MTO
T. Steele, MTO
S. Schijns, McCormick Rankin
H.E.A.R.T. Committee Members
General Public (approximately 100

AGENDA:
1. Introduction
2. Background
3. Open Questions
4. Identification of Discussion Topics
5. Organization of Discussion Groups
6. Group Work
7. Reporting of Discussion Results
8. Open Discussion/Questions
9. Summary of Discussions/Future Steps

NOTES

1. INTRODUCTION

Lisa Brouckxon of H.E.A.R.T. opened the session by introducing the speakers and noting that H.E.A.R.T. had organized the event as a means of providing an opportunity for interested area residents to participate in the Bradford Bypass study. Publicity of the meeting had been via flyer distribution (450), notice boards on Highway 88 and 11, newspaper articles/notices, and invitations to Town staff/council.

2. BACKGROUND

Steve Jacobs of MTO provided some study background, noting that the Bradford Bypass study is being carried out in co-ordination with the study of the northerly extension of Highway 404, and that Public Information Centres regarding the Bypass study had been held in Bradford in June 1993 and in June 1994.

Steve Schijns of McCormick Rankin went into more detail regarding the travel demand, alternatives considered, viable route alternatives, concerns/issues raised to date by the public, and study process. The "Information Package - Second Round of Public Review" and "Environmental Assessment Proposal" were referred to as sources of background information.

3. OPEN QUESTIONS

Several questions were asked by individuals regarding the study background, some points of view were expressed, and additional topics for work group discussion were suggested. Mr. Schijns responded to questioners seeking clarification or additional information. The questions and responses were not documented.

4. IDENTIFICATION OF DISCUSSION TOPICS

Mr. Schijns suggested that the work group discussions be focused on the following topics:

1. Pros and Cons - how to enhance pros and how to minimize cons
2. Weighting of Evaluation Criteria
3. Key Issues/Concerns
4. Route Alternatives

5. ORGANIZATION OF DISCUSSION GROUPS

The meeting broke up into several groups - five "round table" discussion groups of 5-10 people, each with a spokesperson; various individuals or small groups who reviewed and discussed the 1:5000 scale alternative route plans; and other individuals who reviewed the plans and left the meeting.

6. GROUP WORK

Messrs. Jacobs, Steele and Schijns circulated among the remaining attendees and groups as resource staff, while discussion occurred within the groups on items of interest and concern (approximately 45 minutes).

7. REPORTING OF DISCUSSION RESULTS

The spokesperson of each discussion group reported on the results of their group's work to the reassembled attendees. Several individuals then spoke. The points made were as follows:

Group 1

- the Bradford Bypass is not "needed" for Bradford residents; its need is part of the bigger picture
- the Bypass would have a negative impact because it would draw traffic away from Bradford
- a Bypass via Dissette Street and Artesian Industrial Parkway would provide a balance between diverting traffic from Bradford and attracting visitors
- some case studies of similar situations in other communities would be useful in understanding the positive and negative impacts of a bypass in both the short and long terms
- a philosophical question arises as to the wisdom of expanding the highway system ("build it and they will come") - other methods should be looked at (rail?) to reduce the need for highways
- a decision on Bradford Bypass is premature because the effect of Highway 407 on traffic demand is not yet understood; 407 may reduce the need for the Bypass, or maybe an arterial road would suffice rather than a freeway

- adequate signage and interchange lighting is needed

- visual (landscaping) and acoustic barriers are needed

- the relationship between the Bypass and Bradford's future development is a concern - H.E.A.R.T. wants to attract business to Bradford through improved access and downtown revitalization, while if the highway is too close to town it may become a barrier to development or a divisive element splitting the community

Group 2

- there are concerns with respect to the potential damage to existing wells and the impact of road salting on vegetation and ground water

- road signage is another concern

- the routes south of Ninth Line would cut off Grandview Estates; alternative routes north of the Scanlon Creek Conservation Area should be considered

Group 3

- why won't the Highway 9/Green Lane alternative corridor work?

- what is the timetable for the decision-making process - how serious is the MTO - will this project actually get built?

- has a cost estimate been developed - more information is needed

- how do we get people off the highway and into Bradford - what type of support is needed from Bradford to take advantage of this project - improved roads entering town?

- concerns about noise impact and interchange spacing

- impact of project on agricultural land, marsh and wetlands is an issue

Group 4

- is there a need for this road? It will serve outlying areas, not Bradford

- when Highway 407 and Green Lane are considered, there is no demonstrated need for the Bradford Bypass

- the general feeling of the group is that the highway is not wanted

Individuals

- the Green Lane project is not an "alternative" because York Region is going ahead with that work anyways

- there is no benefit to Bradford; the further north (the route) the better

- a 400-404 connecting link is worthwhile to plan but there are no benefits to bypassing the town

- a 2 lane highway may be alright but a 4 lane expressway would be detrimental if it is too close to town

8. OPEN DISCUSSION/QUESTIONS

A few additional questions arose regarding need, staging and availability of information.

9. SUMMARY/FUTURE STEPS

Mr. Jacobs thanked the attendees for their time and effort, and noted the following:

- the Ministry will be following up on the ideas and comments produced during the meeting through incorporation in the ongoing study work

- the evaluation of route alternatives will be the subject of a third round of Public Information Centres, anticipated in early 1995, and the Ministry remains open to participation in any meetings, workshops, or other public forums at which its presence is requested

- the Environmental Assessment Proposal and copies of the 1:5000 scale route alternative plans will be made available for public review at the Bradford Library and the Clerk's Offices of Bradford West Gwillimbury, King Township and East Gwillimbury

- copies of the displays presented at the Public Information Centres in June 1994 are available upon request

- filling out comment sheets and/or evaluation criteria weighting questionnaires is encouraged

- verbal comments or requests may be left on the Bradford Bypass "Infosource Hotline" by telephoning 775-5858 and entering code 5600 (24 hours per day local Bradford number)

Mrs. Brouckxon also thanked those who participated in the meeting.

Minutes Prepared By,

McCORMICK RANKIN

<Original signed by>

S. Schijns, P. Eng.

SS/ss

Public Community Meeting

Thursday July 28, 1994
7:30 P.M.

Regarding the 404/400 Bradford Bypass



The community is invited to share ideas about the 404/400 bypass. Steven Schijns of McCormick Rankin will act as the facilitator. Residents of Bradford West Gwillumbury and anyone else wishing to share their ideas regarding the bypass are invited to attend. Discussed will be the pros and cons of the bypass as well as alternative route proposals. Please join us for a brainstorming session at 7:30 pm on Thursday July 28, 1994 at the Bradford Arena located at 125 Simcoe Street.

Bradford West Gwillumbury Arena
125 Simcoe Street

Letters to the Editor

Plan to attend Bradford Bypass meeting, to identify potential problems

DEAR EDITOR,

On Thursday, July 28th, at 7:30 p.m. at the Bradford Arena, there will be a public meeting and brainstorming session on the pros and cons of the proposed alternate routes of the 404/400 Bradford Bypass. I strongly urge all concerned members of the community to attend this meeting as it may be the last opportunity to address concerns in a public forum before the final decision on the bypass route is made this fall.

The bypass, as well as a hydro corridor, is coming. This is an opportunity for community input to be proactive rather than reactive. Concerns such as how far north or south the bypass will come will be discussed. If it is too far south, will it put a cap on residential growth? Be too noisy?

If it connects to the 400 at Highway 88, how will increased traffic flow affect local residents commuting in the morning? Will we be getting paved service roads along the highway? How many interchanges will there be, and where will they be? Will construction start at the 400 or the 404?

When the Village of Coldwater was by-passed, the village council and local businesses identified the problem of inadequate signage and lighting, indicating the exit to their town, only after the project was complete.

If we can identify potential problems before the bypass is in place, we can request that the ministry address these concerns and incorporate the solutions into the project, rather than having to deal with them ourselves after the fact, through our municipal budget. Highway light posts and signs are very expensive, and even more expensive to instal after the fact.

This is your opportunity to have input into the growth and change of our community. A well-planned community with ideal access routes to the Toronto hub will be attractive to industry, which can potentially provide us with a much-needed corporate tax base, job opportunities for our residents and entrepreneurial opportunities.

Get involved! We hope to see you there.

And a thank you to the Husky Station for the use of their mobile sign advertising the meeting, Brian Hunter of Countrywide Huronia Realty for printing meeting notices for the R.R. #2 residents, Shoppers Drug Mart for providing the postage, the Parks & Rec. Department for use of the Arena, The Times for the press coverage; and Steven Schijns of McCormick Rankin for facilitating the evening.

Sincerely,

Lisa Brouckxon, Community Planning Committee of H.E.A.R.T

Bradford Bypass worries resident

DEAR EDITOR, 27.7.94

I recently learned of the alternate routes for the Bradford Bypass and realized how much they will change Bradford as we know it.

I have been a member of St. Paul's Coulson's Hill Anglican Church for the last 6 years.

As you may know, our church celebrated its 140th Anniversary on the 26th of June. For 140 years it has been sitting quietly and peacefully on the 11th Line off Highway 11.

And to think that on its 145th Anniversary it might be sitting not so quietly, and not so peacefully, beside a 4-lane highway, does not seem right!

I really don't want to be singing "Hosanna" while I hear the roar of transport trucks over the organ.

Sincerely,

Heather Dorward, Bradford.

Thursday, July 28

...brary. 27.7.94

H.E.A.R.T. - the Strategic Plan's Implementation team is holding a community meeting at the Arena, 7:30 p.m. to discuss the Pros and cons of the Bradford Bypass.

Also 13.7.94
20.7.94

BWG Times Aug 3/94

More questions about the Bradford By-pass

Approximately 100 people turned out for last Thursday's public meeting on the Bradford By-pass, a proposed four-lane highway that would link Highway 400 with a future extension of the 404.

Steve Jacobs of the Ministry of Transportation noted that there had been widespread acceptance of the need for an east-west route at the south end of Lake Simcoe, and generally positive response to requests for public input over the past year.

But there has also been the feeling, he said, that "it should be done in a way that is more fitting for the community, where you people get to set the agendas, you people get to choose the issues."

Organizers had hoped that Thursday's meeting would provide the opportunity for residents to "brainstorm", in small discussion groups, and debate the pros and cons of the Bypass. Instead, the first hour and a half of the meeting were taken up with questions and complaints regarding the project.

The engineers are proposing a route that will fall somewhere between Highway 88, and the 11th Concession of Bradford West Gwillimbury, running mid-Concession.

Residents wanted to know why the four-lane freeway couldn't be developed along an existing transportation route; why it couldn't be located further north near Highway 89; why it couldn't be located further south, along East Gwillimbury's Green Lane.

Steve Schijns of McCormick Rankin, engineers, told the meeting, "The damage and the problems of taking an existing Concession and upgrading to freeway status are, at this point, judged too great to pursue."

A more northerly route was explored in an earlier study, conducted in the late 1970s and early 1980s, and was shot down for environmental reasons - primarily, the impact on the Class 1 wetlands found on both sides of the Holland River.

The new study cannot "ride roughshod over an identical study area," Schijns said, explaining why the study area goes no further north than the 11th Line.

A more southerly route runs into other problems, including a larger population, more development, and the presence of the Oak Ridges Moraine, an environmentally-sensitive area of recharge for the groundwater supplies of Newmarket and other York Region communities.

Green Lane will be upgraded, Schijns said, but in response to Newmarket's growing traffic needs, and not as a means of channelling traffic to either the 400 or 404 transportation corridors.

"There simply aren't very many corridors that will do the job," Schijns said. The proposed routes through Bradford West Gwillimbury not only minimize the impact on wetlands, crossing the Holland River at the marsh's narrowest point, but provide good separation of Highway 400 and 404 traffic streams.

There was one further question: "Is there a need for this highway at all?"

"This is not the 401 - the demand is not in that order of magnitude," admitted Schijns, but he noted that there is "considerable demand" from commuter and recreational traffic which is expected to increase "dramatically" over the next ten years. And if the Ministry doesn't map out a possible traffic corridor now, he said, in ten years time the area will be so built up, a route won't be available.

Some questions remained unanswered.

When will the Bradford Bypass be built -and how much will it cost? At the moment, said Schijns, "we have no estimates."

CATEGORIES OF COMMENTS FROM PUBLIC

(First & Second Rounds of Review)

- Route Alternatives
- Impacts of Route Alternatives
- Study/Consultation Process
- Others

Overheads presented under item 2, 28.7.94

ROUTE ALTERNATIVES

- Preferences for Routes
- Additional Routes
  - Scanlon Creek Conservation Area
  - north of Silver Lakes Golf Course
- Technical Issues (wetland areas, soil conditions, etc.)
- Freeway Geometrics
- Access to/from Freeway

IMPACTS OF ROUTE ALTERNATIVES

- Agriculture
- Property Values
- Historic Buildings
- Wetlands
- Wildlife Habitat
- Scanlon Creek Cons. Area
- Bradford Businesses
- Noise
- Aesthetics
- Wells
- Air Quality
- Litter
- Privacy

STUDY/CONSULTATION PROCESS

- Not Enough Information
- Notification
- Additional Participation

MISCELLANEOUS COMMENTS

- Agreement and Disagreement with Need
- Encourage Employment in Area to Reduce Number of Commuters
- Timing of Construction

McCORMICK RANKIN
CONSULTING ENGINEERS AND PLANNERS

MEMO TO FILE

RE:	Bradford Bypass Environmental Assessment Study
OUR FILE:	2341-91
PREPARED BY:	Ravi Mehta
DATE:	November 28, 1994
SUBJECT:	FROGS Meeting
cc:	S. Jacobs, T. Steele, F. Leech, C. Kitchen, L. Wood

Date &	October 27, 1994
Time:	8:00 p.m.
Place:	River Drive Park Community Centre

NOTES:

This meeting was held by the "Forbid Roads Over Green Spaces" (FROGS) Committee as a forum for the expression of local residents' concerns regarding the Bradford Bypass study. McCormick Rankin and the MTO were invited to attend and to present an update of the study. Above 200 people attended the meeting, including five Councillors, the mayor, a representative of the local MP and several people running for municipal office.

The meeting was opened by Mark Cannata of FROGS. He outlined the format for the evening as being a half hour presentation by McCormick Rankin / MTO, a half hour presentation by FROGS and a question / answer period. The panel giving the presentation consisted of Steve Jacobs, MTO; John Sutherns, McCormick Rankin; Bill Foster, FROGS, and Stan Hatch, Black River Protection Association.

For the McCormick Rankin / MTO presentation, Mr. Sutherns provided a brief overview of the study. He indicated that several studies have indicated a need for east-west road improvements south of Lake Simcoe. He outlined the need for the Bypass based on the current transportation deficiencies and on the projected doubling of the population in York Region and the expected growth in Simcoe, Durham, etc. Background work had showed that the expansion of Highway 9 and Green Lane alone would not satisfy the future east-west travel demand in the area.

He indicated that there have been two sets of Public Information Centres (June 1993, June 1994 - see attached overhead slide) as well as a workshop hosted by HEART and a community meeting held by HEART. Since the public information sessions, several new routes have been developed to attempt to reduce impact to residential and natural environmental areas.

Presently, the Study Team is in the process of developing alternatives and is carrying out the detailed analysis of alternatives in preparation for a comparative evaluation of each route.

For FROGS, Mr. Foster provided a review of previous studies and a discussion of the history of the project to date in terms of the development of the needs and rationale for the study.

Using a series of overhead slides, he questioned the need for the study and the location of the study area. He indicated that since most of the growth was to occur in / near Newmarket, the widening of Highway 9 / Green Lane should be able to accommodate the growth.

Mr. Hatch indicated that the Black River Protection Association supported FROGS' goals to use Highway 9 and to protect the area's wells and aquifers. He questioned the assurances that will be given regarding ground water.

Following the presentations, the floor was opened for questions. Only one question was allowed per person along with one supplementary question for clarification. Unless otherwise noted, the answers (A:) were provided by Mr. Sutherns.

Unless a member of an organization, individual names are not published in order to protect the individual's right to privacy.

- **River Drive Resident**

  Q: Has an environmental study been passed?

  A: No, this study is the environmental assessment study.

  Q: Who will approve the study?

  A: After a period of public and agency review, the Minister of Environment and Energy of Ontario will determine whether or not the Ministry of Transportation's Environmental Assessment submission for the project should be approved.

- **River Drive Park Resident**

  Q: If the Bypass does not get approved, how will east-west traffic move?

  A: The future traffic demand will have to use existing roads.

- **East Gwillimbury Resident**

  Q: The Highway 89 / Ravenshoe Road project was cancelled after a change in government; is this project politically motivated and if the government changes, would this study be affected?

  A: The rationale for this project is not politically motivated. Rather, it is based on the present problems and on the future long term transportation needs.

- **River Drive Park Resident**

  Q: When will the projected doubling of population occur and where will it occur?

  A: It is difficult to give an exact date for when the doubling of York Region's population will occur but this study is considering a 20 to 25 year time frame. Population growth is anticipated throughout all of the Region's populated areas, although more growth will occur in the southern part of the region than in the north.

- **Area Resident**

  Q: It will cost lots of money to build a highway across the bog. Why not build across solid ground where it will be cheaper?

  A: It is more expensive to build across the bog, but the decision is not based solely on cost. The decision factors include transportation, social, natural and cost, and in order to reach a decision, a balance of these will have to be found.

  Q: Is cost a serious consideration?

  A: Yes.

- **Local Sod Farmer**

  Comment: This highway cuts through the best agricultural land in Ontario; you won't cut through our farm and kick us off our land.

- **Local Resident**

  Q: Is a four lane highway needed, if so, give some figures to back this up. Existing roads would be sufficient for the next 20 - 25 years.

  A: Traffic volumes do back up the need. Highway 9 already has 23,000 Annual Average Daily Traffic (AADT) and therefore needs widening now. When Newmarket's population doubles to 90,000, (as indicated under York Region Official Plan) 5 lanes will be required on Highway 9 for local trips. Because of

the need to use Highway 9 for local trips, it would not be feasible to turn it into a controlled access freeway.

- **Area Resident**

  Q: In the past, roads over muck and marsh have required excessive highway maintenance. Have any studies been done to look at this?

  A: Detailed muck depth surveys, and the development of a sound structural base will be undertaken to ensure a stable road bed. In addition, bridges will be used to cross not only the river, but the wetland areas as well.

- **River Drive Resident**

  Q: Over the last 30 years, there has been a noticed increase in the wild life being pushed out of the area, and the highway will only make matters worse. Has a study been done to look at the long term effects, and what methods are available to refute the findings?

  A: The studies are not complete yet, but will be open to public review. In addition, there will be a formal review of the entire EA process. The studies will be extensive and will be reviewed by the MOEE, MNR, Conservation Authorities, the public and others.

- **East Gwillimbury Councillor, Frank Kelly**

  Q: Who is the person that will bring forward the recommendation?

  A: Steve Jacobs is the person within the MTO responsible for the study.

  Q: People are not in favour of the study; why don't you say right now that the project is not acceptable?

  A: The project also gets a lot of support. It is a case of either proceeding with the study or losing the opportunity altogether. The instructions from the Minister are to proceed.

- **Queensville Farmer**

  Comment: Avoiding the golf course, but putting the road through a farm would cause a greater economic impact.

  Response: There are many constraints in the area and it is impossible to develop a route that is satisfactory in all respects. In response, however, to the public concern expressed, we have developed several routes through the golf course which avoids other lands. These will need to be compared during the evaluation process.

- **Area Resident**

  Q: The increase in traffic that is being discussed is to the south and is Newmarket oriented. Will Newmarket traffic use the Bypass?

  A: Newmarket traffic is less likely to use the Bypass than will other traffic between Highway 400 and Highway 404.

- **River Drive Park Resident**

  Q: How did you come up with the octopus-like routes?

  A: The various routes address the need to consider various options to cross the Holland River, and reflect the major constraints in the study area.

- **Paul Harpley, South Lake Simcoe Naturalists**

  Q: What is the major reason for the highway - is it for development in York or weekend cottage traffic?

  A: The traffic modelling indicates that the peak period users of the highway will be predominately regional commuters, with commercial vehicles, long distance travel, and cottage / tourist traffic as secondary users.

Following the question / answer session, McCormick Rankin and MTO staff were available for questions and comments. The meeting broke up at about 10:30 p.m.

The following staff were present:

MTO: Steve Jacobs
Terry Steele
Fred Leech

McCormick Rankin: John Sutherns
Steve Schijns
Laurie Wood
Ravi Mehta

Attachments:
- Overhead slide showing study phases and schedule
- FROGS flyer advertising the meeting
- Comment card provided by FROGS to be mailed to the Ministry of Transportation
- Comment sheet
- Article from the BWG Times, Nov. 9, 1994

RM/nc

STUDY PHASES AND SCHEDULE

STUDY PHASES

ENVIRONMENTAL ASSESSMENT PROPOSAL (EAP)

- Prepare EAP Document
- Gather Study Area Information
- Assess Basic Options

ROUTE PLANNING AND ANALYSIS OF ALTERNATIVES

- Inventory of Study Area Conditions
- Develop And Analyze Alternatives
- Select Preferred Alternative

PRELIMINARY DESIGN OF PREFERRED ALTERNATIVE

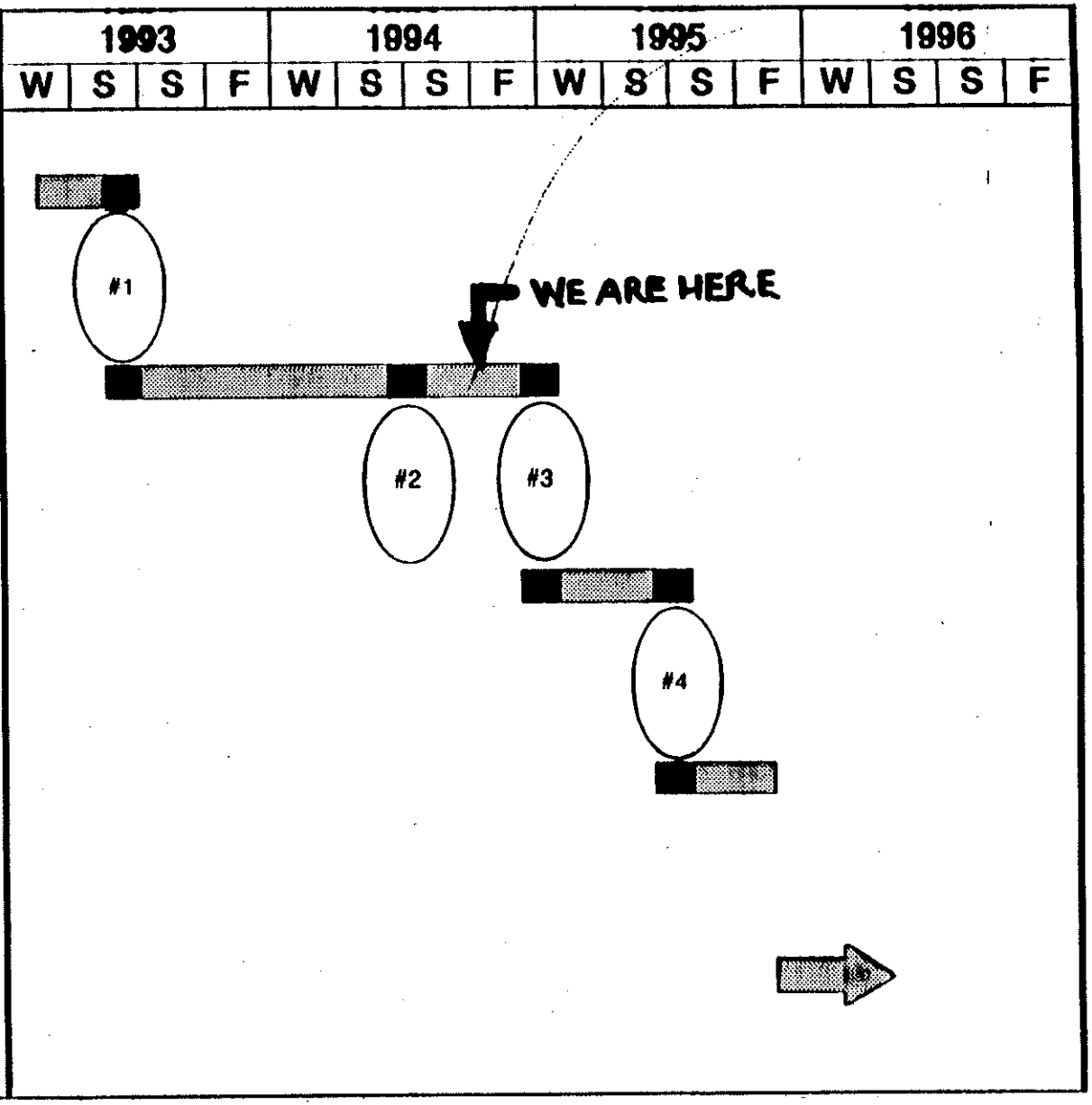
- Develop Preliminary Design For Preferred Alternative
- Define Impacts, Mitigation Measures For Preferred Alternative

ENVIRONMENTAL ASSESSMENT (EA) REPORT

- Document Study Processs In EA Report
- Agency And Government Presubmission Review of Draft EA Report
- Submission of EA Report

ENVIRONMENTAL ASSESSMENT (EA) REVIEW (BY MINISTRY OF THE ENVIRONMENT AND ENERGY)

- Concurrent Government And Public Review of EA Submission
- Public Review of Government Review

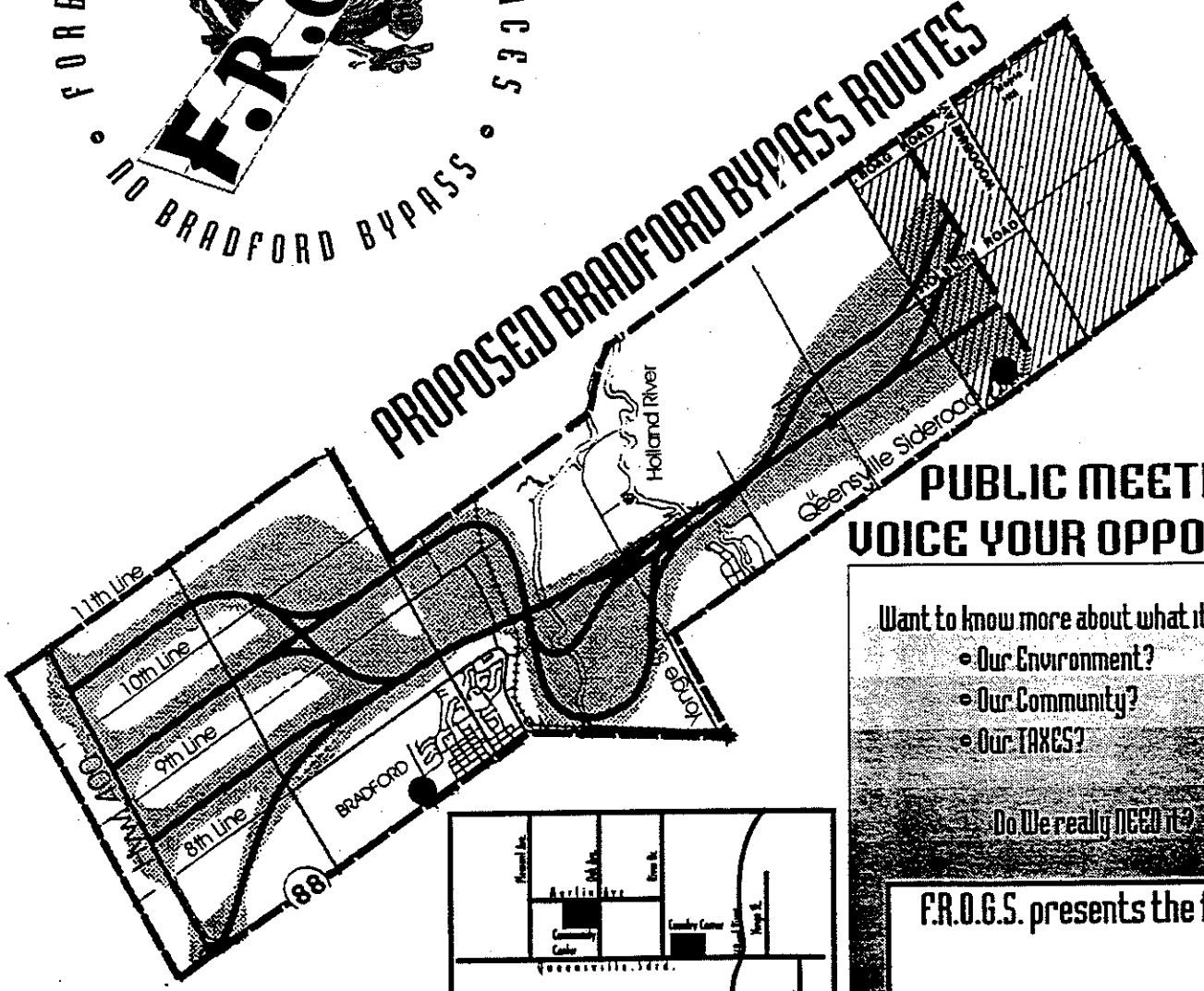


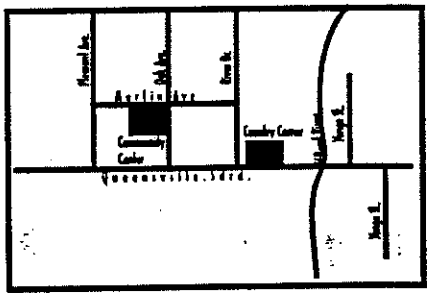
Holland Landing / River Drive Park / Queensville Rural Communities or

4 Lane Freeways?

F.R.O.G.S.

• FORBID ROADS OVER GREEN SPACES • NO BRADFORD BYPASS •





PUBLIC MEETING
VOICE YOUR OPPOSITION

Want to know more about what it will do to:

- Our Environment?
- Our Community?
- Our TAXES?

Do We really NEED it?

F.R.O.G.S. presents the facts

8:00pm October 27, 1994
River Drive Park Community Center

Representatives from Ministry of Transport and McCormick Rankin will be there

Another Study • Another Highway

W H Y ?

Dear Minister:

I am one of many concerned citizens who object to the Bradford Bypass. I believe:

- ☐ There is no proof that we need highways in both the Highway 9 and The Bradford Bypass corridors to connect 404 and 400.
- ☐ The cost of construction of this highway over a floodplain will be astronomical.
- ☐ The impact upon the enviroment is both unacceptable and irreversible.

PLEASE put a stop to this study now before it is too late!

RETURN ADDRESS

Signed _____

PLACE STAMP HERE

The Honourable Michael Farnan
Minister of Transportation
Ferguson Block, 3rd Floor
77 Wellington St. West
Toronto Ontario
M7A 1Z8

Comment Card Distributed at Meeting

COMMENT SHEET

BRADFORD BYPASS

ENVIRONMENTAL ASSESSMENT AND ROUTE LOCATION STUDY

October 27/1994
River Drive Park
Meeting Held By F.R.O.G.

GENERAL COMMENTS

The organizers of this meeting have requested that we provide this comment sheet so that you may provide us with feedback regarding the information presented at this meeting. If you require more space please use back of form.

COMMENT: _____

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_____ If you are unable to complete the form now, please mail to:

Mr. Steve Jacobs, P.Eng., Senior Project Engineer
Planning Office, Central Region, Ministry of Transportation
3rd Floor, Atrium Tower, 1201 Wilson Avenue
Downsview, Ontario M3M 1J8

. . . . . PLEASE

PRINT:

NAME: _____

ADDRESS: _____

POSTAL CODE: _____ **TELEPHONE:** _____

Comments and information regarding this study are being collected to assist the Ministry of Transportation in meeting the requirements of the Environmental Assessment Act. They will be maintained on file for use during the study and, unless otherwise requested, may be included in the documentation which is made available for public review; names and addresses will be kept confidential.

F.R.O.G.S. vow to fight Bradford Bypass

BWG Times Nov. 9, 1994

The proposed Bradford Bypass, a four-lane, limited access highway that would link Highway 400 with an extension of the 404, has been raising concerns among residents in both Bradford West Gwillimbury, and East Gwillimbury.

On the other side of the Holland River, a newly-formed group called "Forbid Roads Over Green Spaces" (F.R.O.G.S.) held an information meeting on October 27th, in the Riverside Drive area.

Attendance was standing room only, and, says Paul Jafine, "Ninety-nine percent of the people had absolutely no idea they had a highway going through their backyard."

The majority of residents at the meeting opposed the new highway, but not as a "N.I.M.B.Y." (Not In My Back Yard) response, says Jafine, who describes himself as "one of the F.R.O.G.S. on the lily pad."

"We are not against road development... Just against putting roads through unreasonable places." The proposed routes would cut through both floodplain and wetland areas, he says, both ignoring the government's own policies on wetland preservation, and threatening the aquifer that supplies communities like Bradford.

F.R.O.G.S. argues that the best east-west route would follow Green Lane, at the northern boundary of York Region, and feed into Highway 9. The route would be less disruptive, and "you're talking probably one-fifth the cost."

The Ministry of Transportation has argued that both an upgrading of Green Lane, and a more northerly Bradford Bypass route, will be needed to handle future population growth.

F.R.O.G.S. has promised to continue to fight the proposal. "We're going to continue to press," says Jafine, noting that the group has been challenging municipal candidates on the issue, "to force our elected officials to state exactly where they stand."

There are also plans to liaise more closely with the H.E.A.R.T. Committee, which organized two information meetings on the Bradford Bypass in Bradford West Gwillimbury - "and form a team of F.R.O.G.S. with H.E.A.R.T."

— -

Article from the Bradford West Gwillimbury Times, Nov. 9, 1994

APPENDIX D

Analysis Charts Used for Route Planning

The following analysis charts in this appendix provide a complete and traceable description of each route alternatives impacts (both positive and negative) with respect to the environment under the five environmental factors of:

- Transportation;
- Natural Environment;
- Social Environment;
- Economic Environment; and
- Cultural Environment

The criteria and indicators were selected for each factor to further define the alternatives' potential impacts by measuring the impacts qualitatively and quantitatively. The quantitative measurement illustrates the impacts numerically (e.g. area of high capability soil removed) while the qualitative measurement illustrates the impact subjectively (e.g. effect on future flexibility of farm operations). This approach allows for a better understanding of the "bigger picture" impacts associated with each alternative.

The quantitative analysis is straight forward, however, the qualitative indicators are subjective and based on a combination of technical facts and professional judgement. The following table identifies the indicators that were measured qualitatively and describes the methods used to measure the effects of each alternative. The analysis charts follow this table.

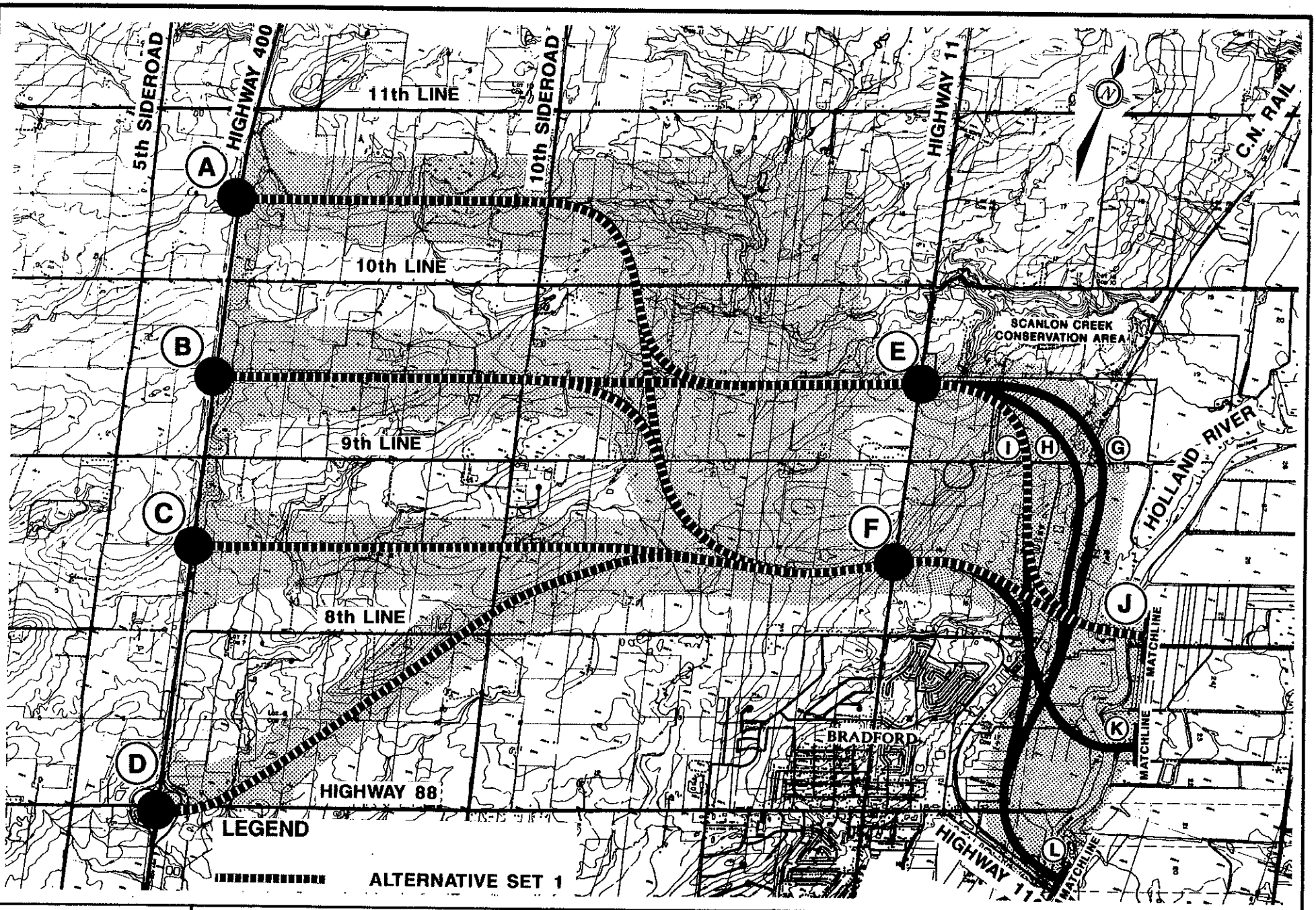
Factor/Criterion	Qualitative Indicator	Unit of Measure	Method of Measurement
1. TRANSPORTATION			
1.1 Traffic Operations	r) Climatic Conditions	Good, Fair, Poor	An assessment considering: Snow - those alternatives with greater proportion of hedgerows/woodlots and urban development are less exposed to blowing snow Ice/Fog - those alternatives with greater structure lengths would have greater risk of bridge deck freezing
1.2 Network Compatibility	a) Effect on traffic volumes on parallel/crossing roads	High, Moderate, Low No Effect	Assessment of diversion of east-west traffic based on the proximity of parallel routes compared to the Do Nothing
	b) Effect on traffic operations on parallel/crossing roads	High, Moderate, Low No Effect	Assessment of diversion of east-west traffic based on the proximity of parallel routes compared to the Do Nothing
	c) Consistency of design/operation	Good, Fair, Poor	Assessment of consistency of design (road type, interchange configuration, etc.) and operation (posted speed, traffic, etc.) between alternatives
	h) Ability to stage implementation of the Undertaking and i) upgrade as warranted by future needs	High, Moderate, Low	Assessment of ability to construct initially as a 2-lane or 4-lane highway with grade-separations and interchanges constructed later
2. NATURAL ENVIRONMENT			
2.1 Fisheries and Aquatic Habitat	a) Watercrossings or encroachments by stream order	Major, Moderate, Low (also includes number of crossings)	An assessment of impacts which reflects the degree of significance of the number of watercrossings or encroachments compared to the Do Nothing
	d) Effects on critical fish habitat (includes spawning areas and migratory runs)	Major, Moderate, Low	An assessment of impacts associated with both construction and operation of an alternative compared to the Do Nothing on critical habitat areas.
	f) Degree of interaction with groundwater (presence of highly permeable soils)	High, Moderate, Low	Assessment of the degree of impact to groundwater with respect to fisheries and aquatic habitat, if highly permeable soils are removed; compared to the Do Nothing
2.2 Wildlife	b) Encroachment on or severance of greenways and open space linkages (wildlife travel corridor)	Major, Moderate, Minor	Assessment of disruption to wildlife movement along potential or known corridors by fragmentation or removal of greenways or open space linkages
2.3 Wetlands	a) Loss of function of all wetlands within or adjacent to study area	High, Moderate, Low	Assessment of impact that each alternative has either directly or indirectly on wetland function as defined in the "Wetland Policy Statement"
	c) Degree of interaction of all wetlands with groundwater	High, Moderate, Low	Assessment of impact to wetlands considering the potential that groundwater could be intercepted by the alternative and the practicality of mitigating the effects to the wetland
2.4 Vegetation	g) Erosion control on steep slopes	High, Moderate, Low	Assessment of the erosional stability of soils for each alternative and to what degree vegetative cover is necessary on steep slopes to prevent excessive sedimentation and erosion during construction and post construction as they relate to impacts on vegetation
	h) Presence of riparian habitat	Major, Moderate, Minor	Assessment of impact to vegetation communities associated with watercourses within the study area, specifically their ability to function for flood control, stream cover and erosion and provide wildlife habitat

Factor/Criterion	Qualitative Indicator	Unit of Measure	Method of Measurement
2.5 Groundwater	b) Shallow groundwater table; potential release of contaminants into groundwater	Major, Moderate, Minor	Assessment of impacts to groundwater for each alternative that could be associated with freeway construction, maintenance and accident spills
	c) Municipal or permitted water supply well(s)	Major, Moderate, Minor (includes number of wells affected)	Assessment of the degree of impact each alternative will have based on their proximity to wells including the total number of affected wells
3. SOCIAL ENVIRONMENT			
3.1 Community Effects	a) Compatibility with municipal official plans and development proposals	High, Moderate, Low	Assessment of each alternative's compatibility with municipal official plans
	d) Overall effect on access to residential areas and rural communities	Major, Moderate, Minor	Assessment of improved access to residential areas for each alternative based on the proximity of each area to proposed interchange locations
	e) Overall degree of disruption to residential communities	Major, Moderate, Minor	Assessment of the degree to which each alternative will have on existing stable communities based on proximity to freeway, property severance, and major change of access
	f) Overall effect on major community facilities/institutions/ parks	Major, Moderate, Minor (also includes number of facilities affected)	Assessment of the degree of impact each alternative will have based on their proximity to community facilities including the total number of affected facilities
	g) Effect on municipal utility and residential sewage systems	Major, Moderate, Minor	Assessment of the degree of impact each alternative would have on the Bradford sewage treatment plant and proposed municipal well based on their proximity
	i) Overall effect on community cohesion	Major, Moderate, Minor	Assessment of the degree of impact each alternative would have on community cohesion if an alternative effectively bisects an area thought to be part of the community
	j) Overall effect on community character	Major, Moderate, Minor	Assessment of the degree of impact each alternative would have on a community's character based primarily on the alternative's proximity
	k) Overall effect on emergency response routes	Major, Moderate, Minor	Assessment of each alternative's effect on emergency response time based on access to major routes, out-of-way travel, and reduced congestion in Bradford
3.2 Aesthetics	a) Total aesthetic quality of the existing landscape in the vicinity of each route alternative	Good, Fair, Poor	Assessment of the aesthetic quality of the landscape in the area of each alternative based on the existing woodlots, watercourses, and areas of development
	b) Future aesthetic quality based on scenic views of the surrounding area from the route	Good, Fair, Poor	Assessment of the aesthetic quality of the future landscape in the area of each alternative based on the variety of and description of landscape features as they are seen from the freeway
	c) Future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	Major, Moderate, Poor (also the number of houses/ businesses included)	Assessment of the total visual impact of each alternative on sensitive viewer groups (residential and business) based on the total number of residences/business affected, their sensitivity, their proximity to the freeway and their frequency

Factor/Criterion	Qualitative Indicator	Unit of Measure	Method of Measurement
4. ECONOMIC ENVIRONMENT			
4.1 Agriculture	h) Effect on future flexibility of farm operations	High, Moderate, Low	Assessment of the degree of impact each alternative would have on a farm's viability based on the number of and degrees of accesses affected, and the affect and size of property severance
	i) Effect on farm woodlots	High, Moderate, Low	Assessment of the degree of impact an alternative will have on a farm woodlot, considered to be a farm resource, based on severance of and loss of access to the woodlot
	j) Effect on the capital investment in agricultural operations	High, Moderate, Low	Assessment of the degree of impact to farming operations with high capital investment (specialty crops, turf, or dairy operations)
	k) Significant farm operation severances	High, Moderate, Low	Assessment of the degree of impact each alternative would have on any farm operations based on the number of operations affected
	l) Significance of detrimental effects to ongoing viability of farm operations	High, Moderate, Low	Assessment of the degree of impact that each alternative will have on interference of inter-farm movement, and fragmentation and limitations to access based on the number of farm operations
	m) Significance of detrimental effects to ongoing viability of farm communities	High, Moderate, Low	Assessment of the degree of impact that each alternative will have on farm communities specifically, farm families and meeting areas
4.2 Commercial/Industrial	c) Effect on overall access to commercial areas	Major, Moderate, Minor	Assessment of each alternative's effects on existing access to commercial development whether access is improved or worsened
	d) Effect on highway exposure for commercial areas	Major, Moderate, Minor	Assessment of each alternative's ability to improve exposure of existing commercial areas
	g) Effect on overall access to industrial areas	Major, Moderate, Minor	Assessment of each alternative's effects on existing access to industrial areas whether access is improved or worsened
	h) Effect on overall travel time and distance for local manufacturers and shippers	Major, Moderate, Minor	Assessment of the savings in travel times for each alternative compared to the Do Nothing from industrial areas to major freeway connections
	j) Overall effect on regional and local economy	Major, Moderate, Minor	Assessment of the short term and long term effects on the economy based on the creation of construction jobs, the loss of tax base, and improvement in access/visibility to commercial/industrial areas
	l) Effect on area tourism/recreation	Major, Moderate, Minor	Assessment of the degree of impact each alternative will have area recreational facilities such as golf courses and marinas
	m) Significance of property waste/ contamination problems	Major, Moderate, Minor	Assessment of the degree of impact each alternative will have on landfill sites and contaminated properties based on the proximity to known sites
5. CULTURAL ENVIRONMENT			
5.1 Historical	a) Historical cultural landscapes	Major, Moderate, Minor	Assessment of the degree of impact each alternative will have on the landscape patterns of the study area. Specifically, the patterns for agriculture, community, and the Holland River marshland.

Note:

The following charts detail the results of the analysis undertaken for each of the sets of alternative route segments considered for the study. Each Alternative Set (1 through 13) is preceded by a key map which highlights the route segments considered in that set. These charts are intended to be used in conjuction with the evaluation summariews presented in Sections 4.2.3.4, 4.2.3.5, and 4.2.3.6.



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 1 :* *NORTH CROSSING – WEST SEGMENT*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.10

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1 : NORTH CROSSING - WEST SEGMENT					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120	120	120
	b) actual peak hour operating speed	km/h	100	100	100	100	100	100
	c) potential slow moving vehicles	km length >2.5%	3.4	2.7	2.4	1.8	2.3	1.4
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a	n/a	n/a
	e) design hour volume (forecast)	DHV	2530	2550	2530	2550	2580	2560
	f) peaking characteristics	-	similar	similar	similar	similar	similar	similar
	g) forecast growth trend	-	similar	similar	similar	similar	similar	similar
	h) change in traffic volume from existing	-	n/a	n/a	n/a	n/a	n/a	n/a
	i) level of service	A to F	B	B	B	B	B	B
	j) number of traffic signals	#	0	0	0	0	0	0
	k) passing opportunities	% of length	100	100	100	100	100	100
	l) travel time (weighted ; through/local)	minutes/minutes	7.7 / 10.5	7.4 / 9.2	7.7 / 10.0	7.1 / 8.5	6.7 / 9.7	7.0 / 8.3
	m) number of interchanges/intersections	#	2	2	2	2	2	2
	n) number of roadway entrances	#	0	0	0	0	0	0
	o) pedestrian movement along/ across roadway	potential	none	none	none	none	none	none
	p) fixed obstacles within right-of-way	#	0	0	0	0	0	0
	q) number of minimun design standard curves	#	3	1	1	1	0	0
	r) climatic conditions	rating	fair-good	fair-good	good	good	good	fair
	s) route length	km	9.4	8.7	9.4	8.2	7.6	8.1
	t) energy usage by a vehicle on alternative	Ml/yr	14.3	13.3	14.3	12.5	11.7	12.4
	u) effect of alternative on net energy usage on transportation system	-	similar	similar	similar	similar	similar	similar
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor-moderate (-)
	c) consistency of design/operation	rating	fair - good	fair - good	fair - good	fair - good	fair - good	fair
	d) continuity of Road Classification	-	yes	yes	yes	yes	yes	yes
	e) continuity of alignment	-	yes	yes	yes	yes	yes	yes
	f) continuity of jurisdiction	-	yes	yes	yes	yes	yes	yes
	g) length of construction period	years	2.5	2.5	2.5	2.5	2.5	2.5
	h) ability to stage implementation of the undertaking	potential	high	high	high	high	high	highest
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high	high	high

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.10

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1 : NORTH CROSSING - WEST SEGMENT					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.21	1.12	1.22	1.10	1.00	1.07
	b) operating cost	ratio	1.24	1.14	1.24	1.08	1.00	1.07
	c) maintenance cost	ratio	1.21	1.12	1.23	1.10	1.00	1.07
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	5 / major	6 / major	7 / major	5 / major	7 / major	6 / major
	b) permitted surface water intakes affected	#	0	0	0	0	0	0
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate	moderate	moderate
	e) presence of warmwater/coldwater communities	# warm / # cold	5 / 0	6 / 0	7 / 0	5 / 0	7 / 0	6 / 0
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium	low	low
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	31.3	22.9	35.4	23.3	16.2	12.3
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	moderate - major	moderate - major	moderate	moderate	minor	minor
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	15.0	12.2	15.2	12.4	9.5	6.9
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	minor	minor	minor	minor	minor	minor
	b) loss of wetland area of all wetlands within study area	ha	7.5	7.5	7.5	7.5	7.5	7.5
	c) degree of interaction of all wetlands with ground water	rating	low	low	low	low	low	low
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	17.5	17.5	17.5	17.5	17.5	17.5

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.10

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1 : NORTH CROSSING - WEST SEGMENT					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	19.2	5.3	19.4	5.5	1.2	0
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0	0	0
	c) encroachment on or severance of ESAs	ha	6.9	6.9	6.9	6.9	6.9	6.9
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0	0	0
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no	no	no
	f) encroachment on or severance of unusual vegetation units	ha	0.6	0.6	0.6	0.6	0.6	0.6
	g) erosion control on steep slopes	rating	moderate	moderate	moderate	moderate	minor - moderate	minor - moderate
	h) presence of riparian habitat	rating	minor	minor	minor	minor	minor	minor
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	1	1	1	1	0	0
	b) shallow ground water table potential release of contaminants into ground water	rating	minor	minor	minor	minor	minor	minor
	c) municipal or permitted water supply well(s)	# / rating	12 / minor	1 / minor	9 / minor	5 / minor	3 / minor	12 / minor
	d) areas of significant regrading at recharge/discharge areas	#	1	1	1	1	0	0
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0	0	0

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.10

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1 : NORTH CROSSING - WEST SEGMENT					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ
3 SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	medium - high	medium - high	medium - high	medium
	b) severance of residential neighbourhoods and rural communities	#	1	0	1	0	0	0
	c) displacement or extraordinary isolation of homes	#/#	6 / 0	4 / 0	6 / 0	4 / 0	4 / 0	7 / 0
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate	moderate	moderate
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	0 / 2	0 / 2	0 / 1	0 / 1	0 / 0	0 / 0
	g) effect on municipal utility and residential sewage systems	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	h) potential bicycle use	potential	none	none	none	none	none	none
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	moderate (-)	moderate (-)	moderate (-)	moderate (-)
	j) overall effect on community character	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	k) overall effect on emergency response routes	rating	moderate (+)	moderate (+)	moderate - major (+)	moderate - major (+)	major (+)	moderate (+)
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	fair-good	good	fair	fair - good	fair - good	fair
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair - good	good	fair - good	fair - good	fair
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	minor	minor	moderate	moderate	moderate	minor - moderate
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA	13	15	34	30	25	27
		# :11 - 15 dBA	12	5	11	7	6	14
		# : > 15 dBA	4	3	6	5	4	4
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	16	8	17	12	10	18
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season	22	33	14	25	21	31

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

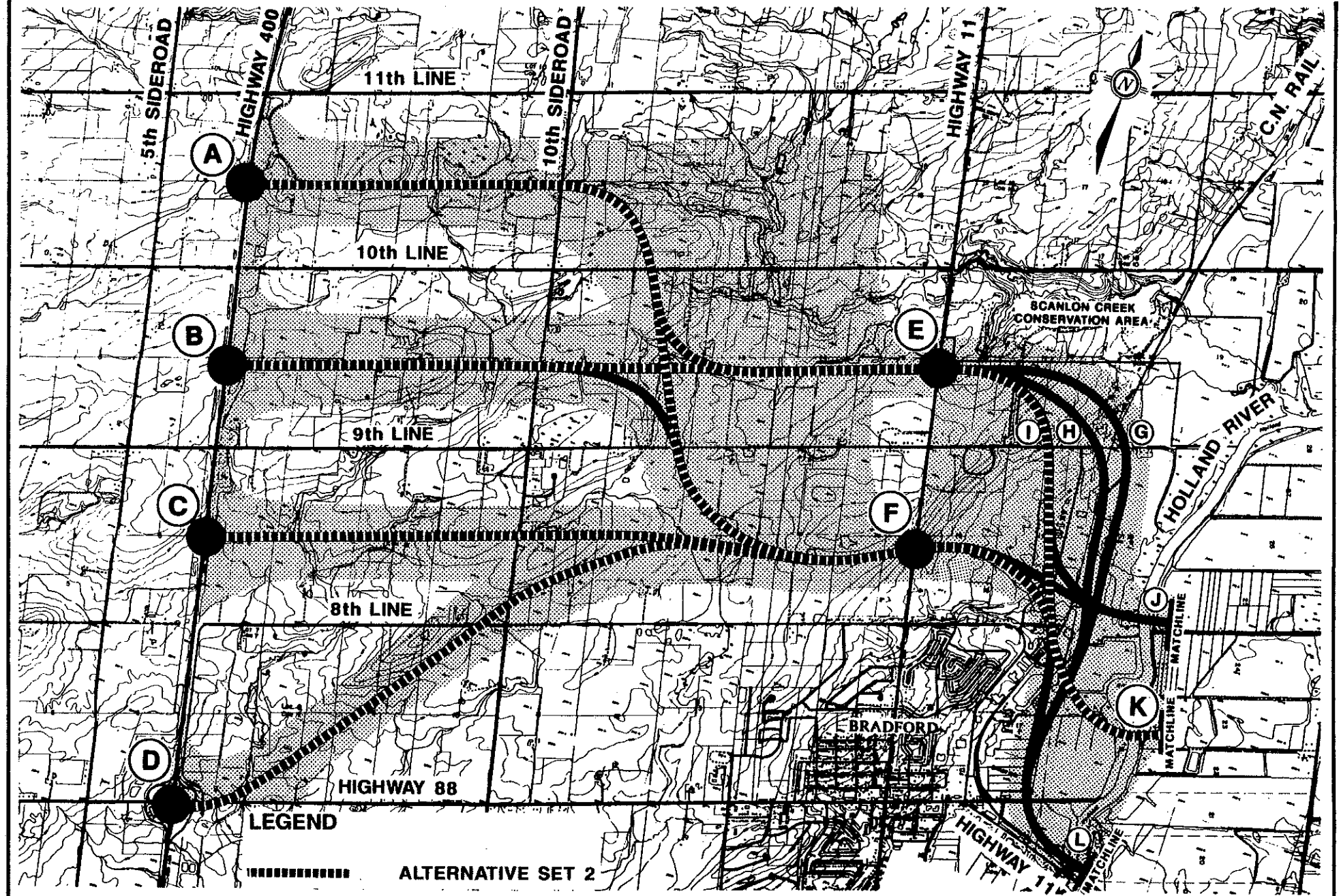
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1 : NORTH CROSSING - WEST SEGMENT					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	8.9 / 62.3	0 / 80.1	12.2 / 47.8	5.2 / 66.3	6.5 / 75.4	6.5 / 93.6
	b) loss of Class 3 and 4 agricultural land	ha	48.9	16.1	34.5	19.0	9.5	0
	c) loss of Class 5 and 6 agricultural land	ha	2.0	2.0	2.0	2.0	2.0	2.0
	d) loss of organic soil	ha	0	0	0	0	0	0
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	13.9 / 30.5 / 3	9.7 / 17.1 / 1	4.3 / 13.4 / 2	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	1.3 / 6.0 / 1	0 / 0.6 / 1	1.3 / 6.6 / 2	5.8 / 16.4 / 3	17.1 / 38.8 / 2
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	57.9 / 155.3 / 17	71.1 / 169.7 / 15	74.8 / 196.2 / 15	85.1 / 204.5 / 14	78.6 / 190.2 / 13	61.6 / 160.0 / 8
	h) effect on future flexibility of farm operations	rating	moderate	minor	moderate	moderate	minor	moderate - major
	i) effect on farm woodlots	rating	major	moderate	major	moderate	moderate	minor
	j) effect on capital investment in agricultural operations	rating	moderate	moderate	moderate	moderate	minor	moderate - major
	k) significant farm operation severances	rating	moderate	moderate	moderate	moderate	moderate	major
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	minor	moderate	moderate	minor	moderate
	m) significance of detrimental effects to ongoing viability of farm communities	rating	moderate	moderate	moderate	moderate	moderate	minor - moderate

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

94.11.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1 : NORTH CROSSING - WEST SEGMENT					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	0	0	0	3
	b) displacement of commercial businesses	#	0	0	0	0	0	0
	c) effect on overall access to commercial areas	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	d) effect on highway exposure for commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)	minor (+)	moderate (+)
	e) severance of major industrial areas	ha	4.0	4.0	2.8	2.8	2.8	2.8
	f) displacement of major industries	#	1	1	1	1	1	1
	g) effect on overall access to major industrial areas	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	major (+)
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	moderate (+)	major (+)	minor (+)	moderate (+)	major (+)	moderate (+)
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar	similar	similar
	j) overall effect on regional and local economy	rating	moderate - major (+)	moderate - major (+)	major (+)	major (+)	major (+)	moderate - major (+)
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar	similar	similar
	l) waste/contamination of properties	#	0	0	0	0	0	0
	m) significance of property waste/ contamination problems	–	minor	minor	minor	minor	minor	minor
	n) loss of high potential mineral/ aggregate deposit areas	#	2	0	2	0	0	0
	o) existing mineral/aggregate operations directly affected	#	2	0	2	0	0	0
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	0	0	0	0	0	0
	b) areas which have a high potential for archaeological sites	#	1	1	1	1	1	1
	c) severance of related archaeological sites	#	0	0	0	0	0	0
5.2 Historical	a) historical cultural landscapes	rating	minor - moderate (-)	minor (-)	minor-moderate (-)	minor-moderate (-)	minor (-)	moderate (-)
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	0 / -	0 / -	0 / -	0 / -	0 / -



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 2 :* *MIDDLE CROSSING – WEST SEGMENT*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

94.11.14

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 2 : MIDDLE CROSSING - WEST SEGMENT					
			AEK	BEK	AFK	BFK	CFK	DFK
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120	120	120
	b) actual peak hour operating speed	km/h	100	100	100	100	100	100
	c) potential slow moving vehicles	km length >2.5%	3.6	2.9	2.7	2.1	2.5	1.6
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a	n/a	n/a
	e) design hour volume (forecast)	DHV	2530	2550	2530	2550	2580	2560
	f) peaking characteristics	–	similar	similar	similar	similar	similar	similar
	g) forecast growth trend	–	similar	similar	similar	similar	similar	similar
	h) change in traffic volume from existing	–	n/a	n/a	n/a	n/a	n/a	n/a
	i) level of service	A to F	B	B	B	B	B	B
	j) number of traffic signals	#	0	0	0	0	0	0
	k) passing opportunities	% of length	100	100	100	100	100	100
	l) travel time (weighted ; through/local)	minutes/minutes	8.2 / 10.5	7.8 / 9.2	8.1 / 10.0	7.4 / 8.5	7.0 / 9.7	7.3 / 8.3
	m) number of interchanges/intersections	#	2	2	2	2	2	2
	n) number of roadway entrances	#	0	0	0	0	0	0
	o) pedestrian movement along/ across roadway	potential	none	none	none	none	none	none
	p) fixed obstacles within right-of-way	#	0	0	0	0	0	0
	q) number of minimun design standard curves	#	3	1	2	2	1	1
	r) climatic conditions	rating	fair	fair-good	fair	good	fair-good	fair
	s) route length	km	10.1	9.4	10.0	8.8	8.2	8.7
	t) energy usage by a vehicle on alternative	Ml/yr	15.3	14.4	15.2	13.4	12.7	13.4
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar	similar	similar	similar
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor-moderate (-)
	c) consistency of design/operation	rating	fair - good	fair - good	fair - good	fair - good	fair - good	fair
	d) continuity of Road Classification	–	yes	yes	yes	yes	yes	yes
	e) continuity of alignment	–	yes	yes	yes	yes	yes	yes
	f) continuity of jurisdiction	–	yes	yes	yes	yes	yes	yes
	g) length of construction period	years	2.5	2.5	2.5	2.5	2.5	2.5
	h) ability to stage implementation of the undertaking	potential	high	high	high	high	high	highest
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high	high	high

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

94.11.14

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 2 : MIDDLE CROSSING - WEST SEGMENT					
			AEK	BEK	AFK	BFK	CFK	DFK
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.20	1.12	1.20	1.09	1.00	1.05
	b) operating cost	ratio	1.23	1.15	1.22	1.07	1.00	1.06
	c) maintenance cost	ratio	1.20	1.12	1.20	1.09	1.00	1.05
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	5 / minor	6 / minor	7 / minor	5 / minor	7 / minor	6 / minor
	b) permitted surface water intakes affected	#	0	0	0	0	0	0
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no
	d) effects on critical fish habitat (includes spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate	moderate	moderate
	e) presence of warmwater/coldwater communities	# warm / # cold	5 / 0	6 / 0	12 / 0	10 / 0	12 / 0	11 / 0
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium	low	low
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	32.2	23.7	36.3	24.2	17.1	13.2
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	moderate - major	moderate	moderate - major	moderate	minor	minor
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	15.7	12.9	15.6	13.1	10.2	7.6
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	minor	minor	minor	minor	minor	minor
	b) loss of wetland area of all wetlands within study area	ha	7.6	7.6	7.6	7.6	7.6	7.6
	c) degree of interaction of all wetlands with ground water	rating	low	low	low	low	low	low
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	22.3	22.3	22.3	22.3	22.3	22.3

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

94.11.14

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 2 : MIDDLE CROSSING - WEST SEGMENT					
			AEK	BEK	AFK	BFK	CFK	DFK
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	19.2	5.3	19.4	5.5	1.2	0
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0	0	0
	c) encroachment on or severance of ESAs	ha	9.7	9.7	9.7	9.7	9.7	9.7
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0	0	0
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no	no	no
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	0	0	0
	g) erosion control on steep slopes	rating	moderate	moderate	moderate	moderate	minor - moderate	minor - moderate
	h) presence of riparian habitat	rating	minor	minor	minor	minor	minor	minor
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	1	1	1	1	0	0
	b) shallow ground water table potential release of contaminants into ground water	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate
	c) municipal or permitted water supply well(s)	# / rating	18 / minor	5 / minor	15 / minor	9 / minor	7 / minor	19 / minor
	d) areas of significant regrading at recharge/discharge areas	#	2	2	2	2	1	1
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0	0	0

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

94.11.14

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 2 : MIDDLE CROSSING - WEST SEGMENT					
			AEK	BEK	AFK	BFK	CFK	DFK
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	medium - high	medium - high	medium - high	medium
	b) severance of residential neighbourhoods and rural communities	#	1	0	1	0	0	0
	c) displacement or extraordinary isolation of homes	#/#	5 / 0	3 / 0	5 / 0	3 / 0	3 / 0	6 / 0
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate	moderate	moderate
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	0 / 2	0 / 2	0 / 1	0 / 1	0 / 0	0 / 0
	g) effect on municipal utility and residential sewage systems	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	h) potential bicycle use	potential	none	none	none	none	none	none
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	moderate (-)	moderate (-)	moderate (-)	moderate (-)
	j) overall effect on community character	rating	minor	minor	minor	minor	minor	minor
	k) overall effect on emergency response routes	rating	moderate (+)	moderate (+)	moderate - major (+)	moderate - major (+)	major (+)	moderate (+)
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	fair-good	good	fair	fair - good	fair - good	fair
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair - good	good	fair - good	fair - good	fair
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	minor	minor	moderate	moderate	moderate	minor - moderate
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA # : 11 - 15 dBA # : > 15 dBA	16 12 2	17 5 1	36 11 4	32 7 3	27 6 2	29 14 2
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	14	6	15	10	8	16
	c) noise sensitive receivers which are predicted to experience significant construction noise problems	residence - season	20	31	12	23	19	29

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

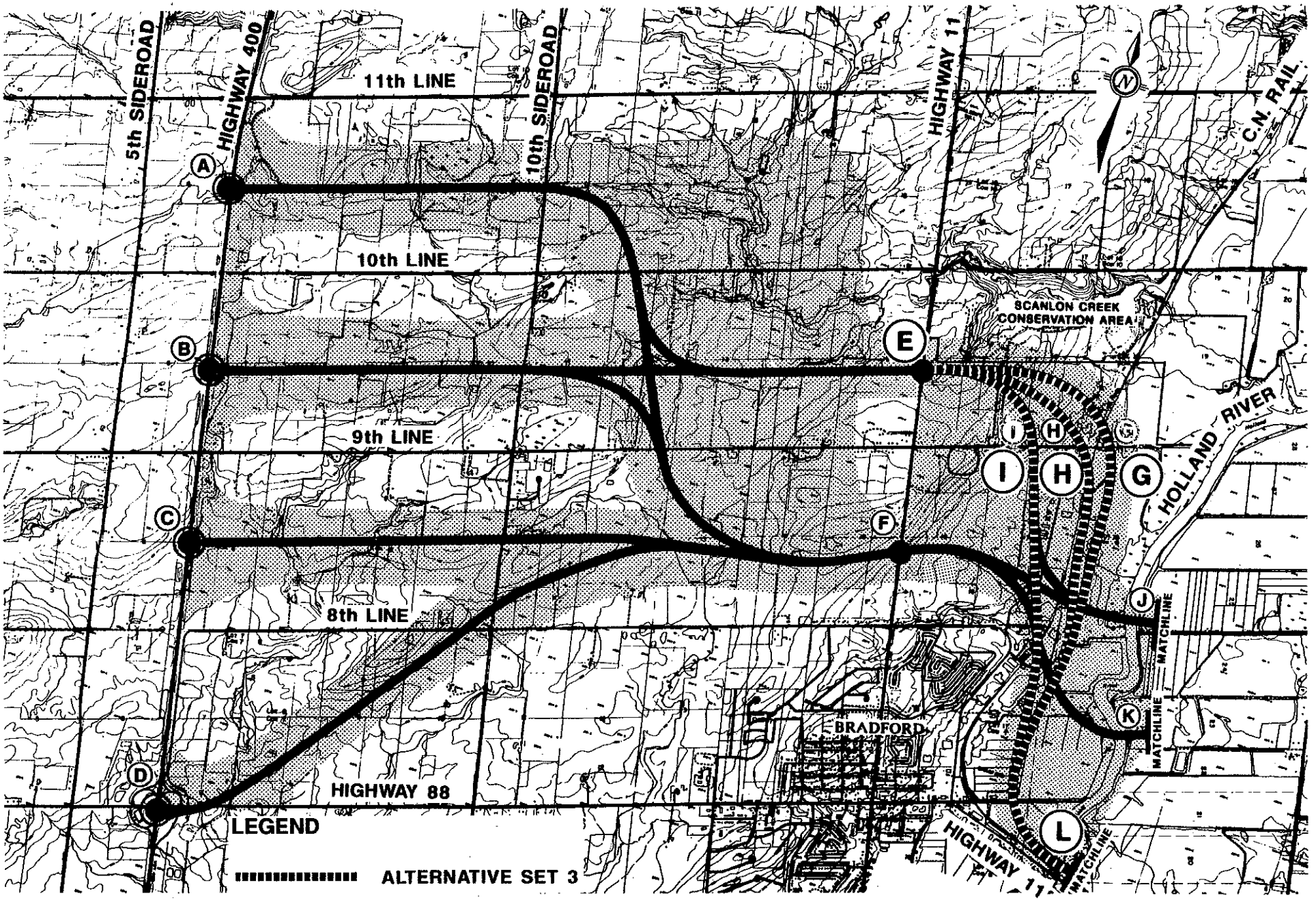
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 2 : MIDDLE CROSSING - WEST SEGMENT					
			AEK	BEK	AFK	BFK	CFK	DFK
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	7.3 / 57.5	0 / 81.0	12.2 / 48.4	5.2 / 66.9	6.5 / 75.9	6.5 / 94.1
	b) loss of Class 3 and 4 agricultural land	ha	48.9	16.1	34.5	19.0	9.5	0
	c) loss of Class 5 and 6 agricultural land	ha	0	0	0	0	0	0
	d) loss of organic soil	ha	2.1	2.1	2.1	2.1	2.1	2.1
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	16.0 / 37.9 / 4	11.7 / 24.5 / 1	6.5 / 20.8 / 3	2.1 / 7.4 / 1	2.1 / 7.4 / 1	2.1 / 7.4 / 1
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	1.3 / 6.0 / 1	0 / 0.6 / 1	1.3 / 6.6 / 2	5.8 / 16.4 / 3	17.1 / 38.8 / 2
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	57.9 / 155.3 / 17	71.1 / 169.7 / 15	74.8 / 196.2 / 15	85.1 / 204.5 / 14	78.6 / 190.2 / 13	61.6 / 160.0 / 8
	h) effect on future flexibility of farm operations	rating	moderate	minor	moderate - major	moderate	minor	major
	i) effect on farm woodlots	rating	moderate	moderate	moderate - major	moderate - major	moderate	minor
	j) effect on capital investment in agricultural operations	rating	moderate	moderate	moderate	minor	moderate	moderate
	k) significant farm operation severances	rating	moderate	minor	moderate	moderate	moderate	major
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	minor	moderate	moderate	minor - moderate	moderate
	m) significance of detrimental effects to ongoing viability of farm communities	rating	moderate	moderate	moderate	moderate	moderate	minor - moderate

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 2 : MIDDLE CROSSING - WEST SEGMENT					
			AEK	BEK	AFK	BFK	CFK	DFK
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	0	0	0	3
	b) displacement of commercial businesses	#	0	0	0	0	0	0
	c) effect on overall access to commercial areas	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	d) effect on highway exposure for commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)	minor (+)	moderate (+)
	e) severance of major industrial areas	ha	8.5	8.5	7.3	7.3	7.3	7.3
	f) displacement of major industries	#	2	2	1	1	1	1
	g) effect on overall access to major industrial areas	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	major (+)
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	moderate (+)	major (+)	minor (+)	moderate (+)	major (+)	moderate (+)
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar	similar	similar
	j) overall effect on regional and local economy	rating	moderate - major (+)	moderate - major (+)	major (+)	major (+)	major (+)	moderate - major (+)
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar	similar	similar
	l) waste/contamination of properties	#	1	1	1	1	1	1
	m) significance of property waste/ contamination problems	–	major	major	major	major	major	major
	n) loss of high potential mineral/ aggregate deposit areas	#	2	0	2	0	0	0
	o) existing mineral/aggregate operations directly affected	#	2	0	2	0	0	0
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	0	0	0	0	0	0
	b) areas which have a high potential for archaeological sites	#	1	1	1	1	1	1
	c) severance of related archaeological sites	#	0	0	0	0	0	0
5.2 Historical	a) historical cultural landscapes	rating	minor - moderate (-)	minor (-)	minor-moderate (-)	minor-moderate (-)	minor (-)	moderate (-)
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	0 / -	0 / -	0 / -	0 / -	0 / -



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 3 :* *SOUTH CROSSING – WEST SUB-SEGMENT*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 3 : SOUTH CROSSING - WEST SUBSEGMENT					
			EGL	EHL	EIL	-	-	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120			
	b) actual peak hour operating speed	km/h	100	100	100			
	c) potential slow moving vehicles	km length >2.5%	1.2	1.1	1.1			
	d) change in speed limit from existing	km/h	n/a	n/a	n/a			
	e) design hour volume (forecast)	DHV	similar	similar	similar			
	f) peaking characteristics	–	similar	similar	similar			
	g) forecast growth trend	–	similar	similar	similar			
	h) change in traffic volume from existing	–	n/a	n/a	n/a			
	i) level of service	A to F	B	B	B			
	j) number of traffic signals	#	0	0	0			
	k) passing opportunities	% of length	100	100	100			
	l) travel time	minutes	3.2	3.1	2.8			
	m) number of interchanges/intersections	#	1	1	1			
	n) number of roadway entrances	#	0	0	0			
	o) pedestrian movement along/ across roadway	potential	none	none	none			
	p) fixed obstacles within right-of-way	#	0	0	0			
	q) number of minimun design standard curves	#	0	0	0			
	r) climatic conditions	rating	fair-good	good	fair-good			
	s) route length	km	5.4	5.1	4.7			
	t) energy usage by a vehicle on alternative	Ml/yr	8.3	7.8	7.2			
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar			
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	similar	similar	similar			
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)			
	c) consistency of design/operation	rating	fair	fair	fair			
	d) continuity of Road Classification	–	yes	yes	yes			
	e) continuity of alignment	–	yes	yes	yes			
	f) continuity of jurisdiction	–	yes	yes	yes			
	g) length of construction period	years	1.5	1.5	1.5			
	h) ability to stage implementation of the undertaking	potential	high	high	high			
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high			

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 3 : SOUTH CROSSING - WEST SUBSEGMENT					
			EGL	EHL	EIL	-	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.04	1.00	1.01			
	b) operating cost	ratio	1.15	1.09	1.00			
	c) maintenance cost	ratio	1.03	1.00	1.01			
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	13 / major	14 / major	10 / major			
	b) permitted surface water intakes affected	#	0	0	0			
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no			
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate			
	e) presence of warmwater/coldwater communities	# warm / # cold	13 / 0	14 / 0	9 / 0			
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium			
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	28.7	23.0	11.6			
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	moderate	minor			
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	22.7	10.7	4.2			
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no			
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	major	moderate	minor			
	b) loss of wetland area of all wetlands within study area	ha	22.7	10.7	4.2			
	c) degree of interaction of all wetlands with ground water	rating	high	high	medium			
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	52.8	37.2	10.9			

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 3 : SOUTH CROSSING - WEST SUBSEGMENT					
			EGL	EHL	EIL	-	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	23.8	10.7	4.2			
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0			
	c) encroachment on or severance of ESAs	ha	38.3	34.9	17.2			
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0			
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no			
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0			
	g) erosion control on steep slopes	rating	moderate	moderate	moderate			
	h) presence of riparian habitat	rating	major	moderate	minor			
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0			
	b) shallow ground water table potential release of contaminants into ground water	rating	major	moderate	minor			
	c) municipal or permitted water supply well(s)	# / rating	15 / minor	13 / minor	13 / minor			
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0			
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0			

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 3 : SOUTH CROSSING - WEST SUBSEGMENT					
			EGL	EHL	EIL	-	-	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	medium			
	b) severance of residential neighbourhoods and rural communities	#	0	0	0			
	c) displacement or extraordinary isolation of homes	#/#	5 / 0	4 / 0	6 / 0			
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	moderate (+)			
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate			
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	0 / 2	0 / 2	0 / 2			
	g) effect on municipal utility and residential sewage systems	rating	moderate (-)	minor (-)	minor (-)			
	h) potential bicycle use	potential	none	none	none			
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	minor (-)			
	j) overall effect on community character	rating	minor	minor	minor			
	k) overall effect on emergency response routes	rating	moderate (+)	moderate (+)	moderate (+)			
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	fair - good	fair - good	fair			
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	fair - good	fair - good	fair			
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	fair - good	fair			
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA # :11 - 15 dBA # : > 15 dBA	23 20 6	24 18 5	31 20 5			
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	26	23	25			
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season	37	33	40			

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

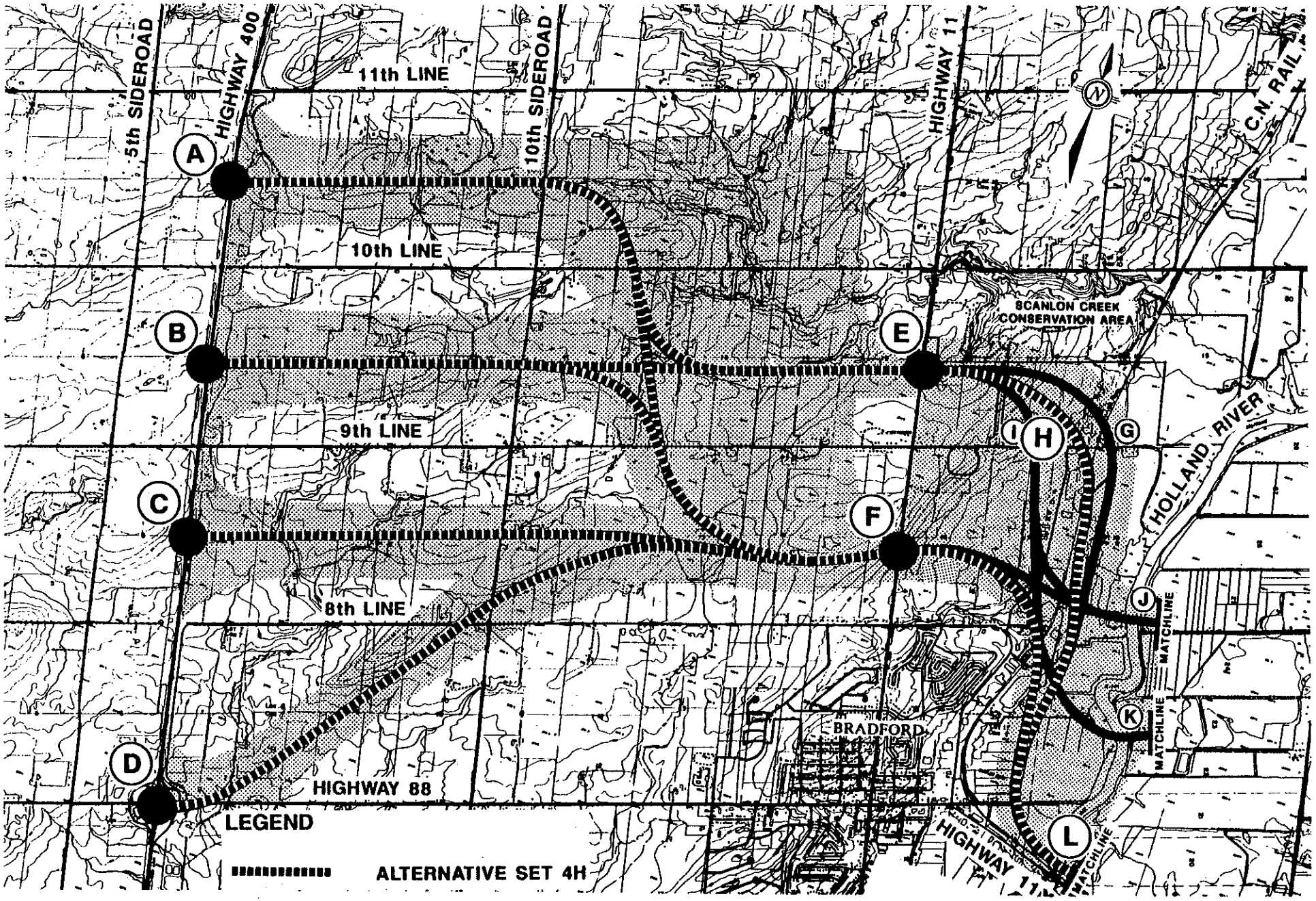
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 3 : SOUTH CROSSING - WEST SUBSEGMENT					
			EGL	EHL	EIL	-	-	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	2.5 / 23.8	2.9 / 24.9	0 / 30.6			
	b) loss of Class 3 and 4 agricultural land	ha	0	0	0			
	c) loss of Class 5 and 6 agricultural land	ha	6.6	11.9	2.8			
	d) loss of organic soil	ha	7.3	7.3	7.3			
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	10.8 / 30.7 / 2	10.8 / 30.7 / 2	10.1 / 29.8 / 2			
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0			
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	7.8 / 18.6 / 1	7.8 / 18.6 / 1	8.1 / 19.6 / 1			
	h) effect on future flexibility of farm operations	rating	moderate	moderate	moderate			
	i) effect on farm woodlots	rating	minor	minor	minor			
	j) effect on capital investment in agricultural operations	rating	major	major	major			
	k) significant farm operation severances	rating	minor	minor	minor			
	l) significance of detrimental effects to ongoing viability of farm operations	rating	minor	minor	minor			
	m) significance of detrimental effects to ongoing viability of farm communities	rating	minor	minor	minor			

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 3 : SOUTH CROSSING - WEST SUBSEGMENT					
			EGL	EHL	EIL	-	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	0			
	b) displacement of commercial businesses	#	0	0	0			
	c) effect on overall access to commercial areas	rating	moderate (+)	moderate (+)	moderate (+)			
	d) effect on highway exposure for commercial areas	rating	minor (+)	moderate (+)	major (+)			
	e) severance of major industrial areas	ha	0	0	8.5			
	f) displacement of major industries	#	0	0	2			
	g) effect on overall access to major industrial areas	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)			
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	n/a	n/a	n/a			
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar			
	j) overall effect on regional and local economy	rating	moderate - major (+)	major (+)	moderate - major (+)			
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar			
	l) waste/contamination of properties	#	0	0	1			
	m) significance of property waste/ contamination problems	–	minor	minor	major			
	n) loss of high potential mineral/ aggregate deposit areas	#	0	0	0			
	o) existing mineral/aggregate operations directly affected	#	0	0	0			
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	0	0	0			
	b) areas which have a high potential for archaeological sites	#	1	1	1			
	c) severance of related archaeological sites	#	0	0	0			
5.2 Historical	a) historical cultural landscapes	rating	minor (-)	minor (-)	minor (-)			
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	0 / -	0 / -			



Ministry of Transportation
Ontario

BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION

ROUTE LOCATION AND PRELIMINARY DESIGN STUDY

W.P. 377-90-00

FREEWAY ALTERNATIVES

ALTERNATIVE SET 4H :

SOUTH CROSSING – WEST SEGMENT

APPENDIX

D

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 4(H) SOUTH CROSSING - WEST SEGMENT (H)					
			AEL	BEL	AFL	BFL	CFL	DFL
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120	120	120
	b) actual peak hour operating speed	km/h	100	100	100	100	100	100
	c) potential slow moving vehicles	km length >2.5%	3.4	2.6	2.7	2.1	2.5	1.6
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a	n/a	n/a
	e) design hour volume (forecast)	DHV	2530	2550	2530	2550	2580	2560
	f) peaking characteristics	–	similar	similar	similar	similar	similar	similar
	g) forecast growth trend	–	similar	similar	similar	similar	similar	similar
	h) change in traffic volume from existing	–	n/a	n/a	n/a	n/a	n/a	n/a
	i) level of service	A to F	B	B	B	B	B	B
	j) number of traffic signals	#	0	0	0	0	0	0
	k) passing opportunities	% of length	100	100	100	100	100	100
	l) travel time (weighted ; through/local)	minutes/minutes	8.9 / 10.5	8.5 / 9.2	9.0 / 10.0	7.9 / 8.5	7.5 / 9.7	7.8 / 8.3
	m) number of interchanges/intersections	#	2	2	2	2	2	2
	n) number of roadway entrances	#	0	0	0	0	0	0
	o) pedestrian movement along/ across roadway	potential	none	none	none	none	none	none
	p) fixed obstacles within right-of-way	#	0	0	0	0	0	0
	q) number of minimun design standard curves	#	2	0	1	1	0	0
	r) climatic conditions	rating	fair-good	fair-good	fair-good	fair-good	fair-good	fair-good
	s) route length	km	11.3	10.6	10.8	9.6	9.0	9.5
	t) energy usage by a vehicle on alternative	Ml/yr	17.2	16.2	16.4	14.7	13.9	14.6
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar	similar	similar	similar
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor-moderate (-)
	c) consistency of design/operation	rating	fair - good	fair - good	fair - good	fair - good	fair - good	fair
	d) continuity of Road Classification	–	yes	yes	yes	yes	yes	yes
	e) continuity of alignment	–	yes	yes	yes	yes	yes	yes
	f) continuity of jurisdiction	–	yes	yes	yes	yes	yes	yes
	g) length of construction period	years	2.5	2.5	2.5	2.5	2.5	2.5
	h) ability to stage implementation of the undertaking	potential	high	high	high	high	high	highest
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high	high	high

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 4(H) : SOUTH CROSSING - WEST SEGMENT (H)					
			AEL	BEL	AFL	BFL	CFL	DFL
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.22	1.13	1.21	1.09	1.00	1.09
	b) operating cost	ratio	1.26	1.18	1.20	1.07	1.00	1.06
	c) maintenance cost	ratio	1.23	1.14	1.22	1.10	1.00	1.09
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	19 / major	20 / major	16 / major	14 / major	16 / major	15 / major
	b) permitted surface water intakes affected	#	0	0	0	0	0	0
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate	moderate	moderate
	e) presence of warmwater/coldwater communities	# warm / # cold	19 / 0	20 / 0	16 / 0	14 / 0	16 / 0	15 / 0
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium	low	low
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	43.1	34.7	36.0	23.9	16.8	12.9
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	major	moderate	moderate	minor	minor
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	18.7	15.8	15.3	12.6	9.7	7.1
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	minor	minor	minor	minor	minor	minor
	b) loss of wetland area of all wetlands within study area	ha	10.7	10.7	4.2	4.2	4.2	4.2
	c) degree of interaction of all wetlands with ground water	rating	low	low	low	low	low	low
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	37.2	37.2	10.9	10.9	10.9	10.9

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 4(H) : SOUTH CROSSING - WEST SEGMENT (H)					
			AEL	BEL	AFL	BFL	CFL	DFL
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	29.8	15.9	21.4	7.5	3.2	2.0
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0	0	0
	c) encroachment on or severance of ESAs	ha	34.9	34.9	17.2	17.2	17.2	17.2
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0	0	0
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no	no	no
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	0	0	0
	g) erosion control on steep slopes	rating	moderate	moderate	moderate	moderate	minor-moderate	minor-moderate
	h) presence of riparian habitat	rating	minor	minor	minor	minor	minor	minor
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	1	1	1	1	0	0
	b) shallow ground water table potential release of contaminants into ground water	ha	minor	minor	minor	minor	minor	minor
	c) municipal or permitted water supply well(s)	# / rating	30 / minor	17 / minor	15 / minor	9 / minor	0 / minor	19 / minor
	d) areas of significant regrading at recharge/discharge areas	#	1	1	1	1	1	1
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0	0	0

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 4(H) : SOUTH CROSSING - WEST SEGMENT (H)					
			AEL	BEL	AFL	BFL	CFL	DFL
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	medium - high	medium - high	medium - high	medium
	b) severance of residential neighbourhoods and rural communities	#	1	0	1	0	0	0
	c) displacement or extraordinary isolation of homes	#/#	7 / 0	5 / 0	9 / 0	7 / 0	7 / 0	10 / 0
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate	moderate	moderate
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	0 / 2	0 / 2	0 / 1	0 / 1	0 / 0	0 / 0
	g) effect on municipal utility and residential sewage systems	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	h) potential bicycle use	potential	none	none	none	none	none	none
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	moderate (-)	moderate (-)	moderate (-)	moderate (-)
	j) overall effect on community character	rating	minor	minor	minor	minor	minor	minor
	k) overall effect on emergency response routes	rating	moderate (+)	moderate (+)	moderate - major (+)	moderate - major (+)	major (+)	moderate (+)
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	fair - good	good	fair	fair-good	fair-good	fair
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair-good	good	fair-good	fair-good	fair
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	minor (-)	minor (-)	moderate (-)	moderate (-)	moderate (-)	minor - moderate (-)
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA	34	36	60	56	51	53
		# :11 - 15 dBA	27	20	29	24	24	32
		# : > 15 dBA	7	6	7	6	5	5
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	34	26	36	30	29	37
	c) noise sensitive receivers which are predicted to experience significant construction noise problems	residence - season	47	39	65	57	53	63

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

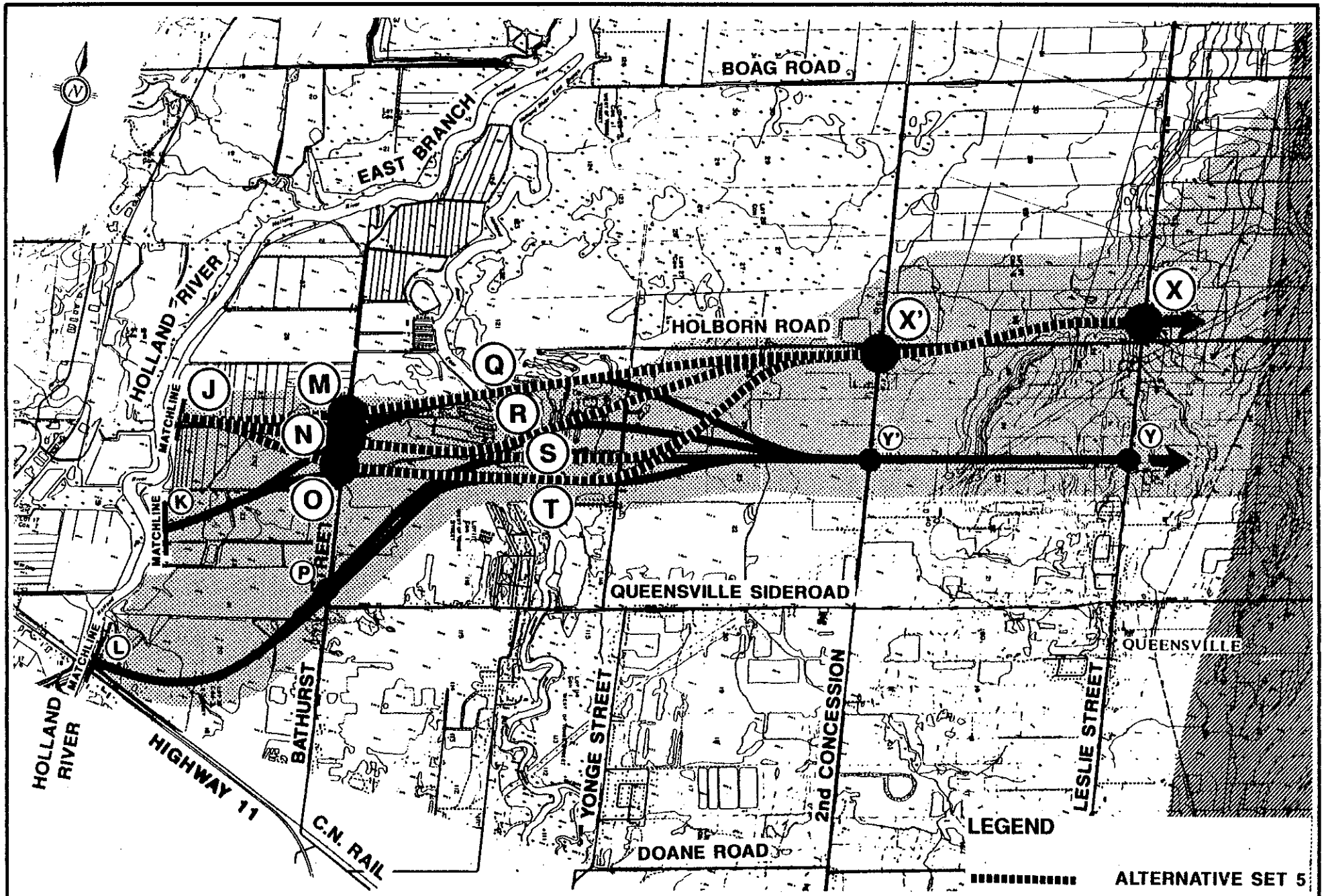
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 4(H) : SOUTH CROSSING - WEST SEGMENT (H)					
			AEL	BEL	AFL	BFL	CFL	DFL
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	10.1 / 60.4	2.9 / 83.9	12.2 / 48.4	5.2 / 66.9	6.5 / 75.9	6.5 / 94.1
	b) loss of Class 3 and 4 agricultural land	ha	31.3	16.1	34.5	19.0	9.5	0
	c) loss of Class 5 and 6 agricultural land	ha	13.9	13.9	2.8	2.8	2.8	2.8
	d) loss of organic soil	ha	7.3	7.3	7.3	7.3	7.3	7.3
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	24.6 / 61.2 / 5	20.3 / 47.8 / 3	14.5 / 43.2 / 5	10.1 / 29.8 / 3	10.1 / 29.8 / 3	10.1 / 29.8 / 3
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	1.3 / 6.0 / 1	0 / 0.6 / 1	1.3 / 6.6 / 2	5.8 / 16.4 / 3	17.1 / 38.8 / 2
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	57.6 / 154.3 / 17	70.8 / 168.7 / 15	74.8 / 196.2 / 15	85.1 / 204.5 / 14	78.6 / 190.2 / 13	61.6 / 160.0 / 8
	h) effect on future flexibility of farm operations	rating	moderate	moderate	moderate	moderate	minor	major
	i) effect on farm woodlots	rating	major	moderate	major	moderate	moderate	minor
	j) effect on capital investment in agricultural operations	rating	moderate	moderate	moderate	moderate	moderate	moderate - major
	k) significant farm operation severances	rating	moderate	moderate	moderate	moderate	moderate	major
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	moderate	moderate - major	moderate	moderate	moderate - major
	m) significance of detrimental effects to ongoing viability of farm communities	rating	moderate	moderate	moderate	moderate	moderate	minor - moderate

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 4(H) : SOUTH CROSSING - WEST SEGMENT (H)					
			AEL	BEL	AFL	BFL	CFL	DFL
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	0	0	0	3
	b) displacement of commercial businesses	#	0	0	0	0	0	0
	c) effect on overall access to commercial areas	rating	moderate (+)	moderate (+)	major (+)	major (+)	major (+)	major (+)
	d) effect on highway exposure for commercial areas	rating	moderate (+)	moderate (+)	moderate (+)	moderate (+)	moderate (+)	major (+)
	e) severance of major industrial areas	ha	0	0	7.2	7.2	7.2	7.2
	f) displacement of major industries	#	0	0	0	0	0	0
	g) effect on overall access to major industrial areas	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	major (+)
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	moderate (+)	major (+)	minor (+)	moderate (+)	major (+)	moderate (+)
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar	similar	similar
	j) overall effect on regional and local economy	rating	major (+)	major (+)	moderate - major (+)	moderate - major (+)	major (+)	moderate - major (+)
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar	similar	similar
	l) waste/contamination of properties	#	0	0	1	1	1	1
	m) significance of property waste/ contamination problems	–	minor	minor	major	major	major	major
	n) loss of high potential mineral/ aggregate deposit areas	#	2	0	2	0	0	0
	o) existing mineral/aggregate operations directly affected	#	2	0	2	0	0	0
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	0	0	0	0	0	0
	b) areas which have a high potential for archaeological sites	#	1	1	1	1	1	1
	c) severance of related archaeological sites	#	0	0	0	0	0	0
5.2 Historical	a) historical cultural landscapes	rating	minor - moderate	minor	moderate	moderate	minor - moderate	moderate - major
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	0 / -	0 / -	0 / -	0 / -	0 / -



Ministry of Transportation
Ontario

BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION

ROUTE LOCATION AND PRELIMINARY DESIGN STUDY

FREEWAY ALTERNATIVES

ALTERNATIVE SET 5 :

NORTH CROSSING – EAST SEGMENT (North)

APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5 : NORTH CROSSING - EAST SEGMENT (NORTH)					
			JQX	JRX	JSX	JTX	-	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120		
	b) actual peak hour operating speed	km/h	100	100	100	100		
	c) potential slow moving vehicles	km length >2.5%	0.1	0.1	0.1	0.1		
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a		
	e) design hour volume (forecast)	DHV	3000	3000	3000	3000		
	f) peaking characteristics	–	similar	similar	similar	similar		
	g) forecast growth trend	–	similar	similar	similar	similar		
	h) change in traffic volume from existing	–	n/a	n/a	n/a	n/a		
	i) level of service	A to F	B	B	B	B		
	j) number of traffic signals	#	0	0	0	0		
	k) passing opportunities	% of length	100	100	100	100		
	l) travel time (weighted ; through/local)	minutes/minutes	4.5 / 8.2	4.6 / 8.4	4.7 / 8.4	4.8 / 8.5		
	m) number of interchanges/intersections	#	3	3	3	3		
	n) number of roadway entrances	#	0	0	0	0		
	o) pedestrian movement along/ across roadway	potential	none	none	none	none		
	p) fixed obstacles within right-of-way	#	0	0	0	0		
	q) number of minimum design standard curves	#	0	0	0	0		
	r) climatic conditions	rating	fair-good	good	fair-good	good		
	s) route length	km	7.5	7.7	7.8	7.9		
	t) energy usage by a vehicle on alternative	Ml/yr	13.5	13.8	14.0	14.2		
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar	similar		
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	major (+)	major (+)	major (+)	major (+)		
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	c) consistency of design/operation	rating	fair	fair	fair	fair		
	d) continuity of Road Classification	–	yes	yes	yes	yes		
	e) continuity of alignment	–	yes	yes	yes	yes		
	f) continuity of jurisdiction	–	yes	yes	yes	yes		
	g) length of construction period	years	2.5	2.5	2.5	2.5		
	h) ability to stage implementation of the undertaking	potential	high	high	high	high		
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5 : NORTH CROSSING - EAST SEGMENT (NORTH)					
			JQX	JRX	JSX	JTX	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.02	1.00	1.15	1.03		
	b) operating cost	ratio	1.00	1.03	1.05	1.06		
	c) maintenance cost	ratio	1.02	1.00	1.29	1.13		
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	8 / major	9 / major	9 / major	9 / major		
	b) permitted surface water intakes affected	#	0	0	0	0		
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate		
	e) presence of warmwater/coldwater communities	# warm / # cold	8 / 0	9 / 0	9 / 0	9 / 0		
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium		
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	25.6	29.5	38.0	42.3		
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	major	major	major		
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	25.6	29.5	38.0	42.3		
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate - major	minor	minor	major		
	b) loss of wetland area of all wetlands within study area	ha	13.6	5.0	5.8	4.9		
	c) degree of interaction of all wetlands with ground water	rating	medium	low	low	low - medium		
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	23.2	11.8	11.2	12.6		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5 : NORTH CROSSING - EAST SEGMENT (NORTH)					
			JQX	JRX	JSX	JTX	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	13.9	24.5	32.7	36.2		
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0		
	c) encroachment on or severance of ESAs	ha	16.3	16.5	19.3	19.0		
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0		
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no		
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	2.8		
	g) erosion control on steep slopes	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	h) presence of riparian habitat	rating	minor	minor	minor	moderate		
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0		
	b) shallow ground water table potential release of contaminants into ground water	rating	major	major	major	major		
	c) municipal or permitted water supply well(s)	direct / indirect / rating	11/12/minor-moderate	8/11/minor	9/14/minor-moderate	12/11/minor-moderate		
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0		
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5 : NORTH CROSSING - EAST SEGMENT (NORTH)					
			JQX	JRX	JSX	JTX	-	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	high	high		
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	1 (minor)		
	c) displacement or extraordinary isolation of homes	##	5 / 0	3 / 0	5 / 0	4 / 0		
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	moderate (+)	moderate (+)		
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate		
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	1 (major)/ 0	1 (major)/ 0	1 (minor)/ 0	0 / 1		
	g) effect on municipal utility and residential sewage systems	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	h) potential bicycle use	potential	none	none	none	none		
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	j) overall effect on community character	rating	minor	minor	minor	minor		
	k) overall effect on emergency response routes	rating	major (+)	major (+)	major (+)	major (+)		
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	good	good	good	good		
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair - good	good	fair - good		
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	good	fair	fair		
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA	9	13	31	67		
		# :11 - 15 dBA	8	10	13	18		
		# : > 15 dBA	3	4	3	6		
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	11	14	16	24		
	c) noise sensitive receivers which are predicted to experience significant construction noise problems	residence - season	28	36	38	57		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

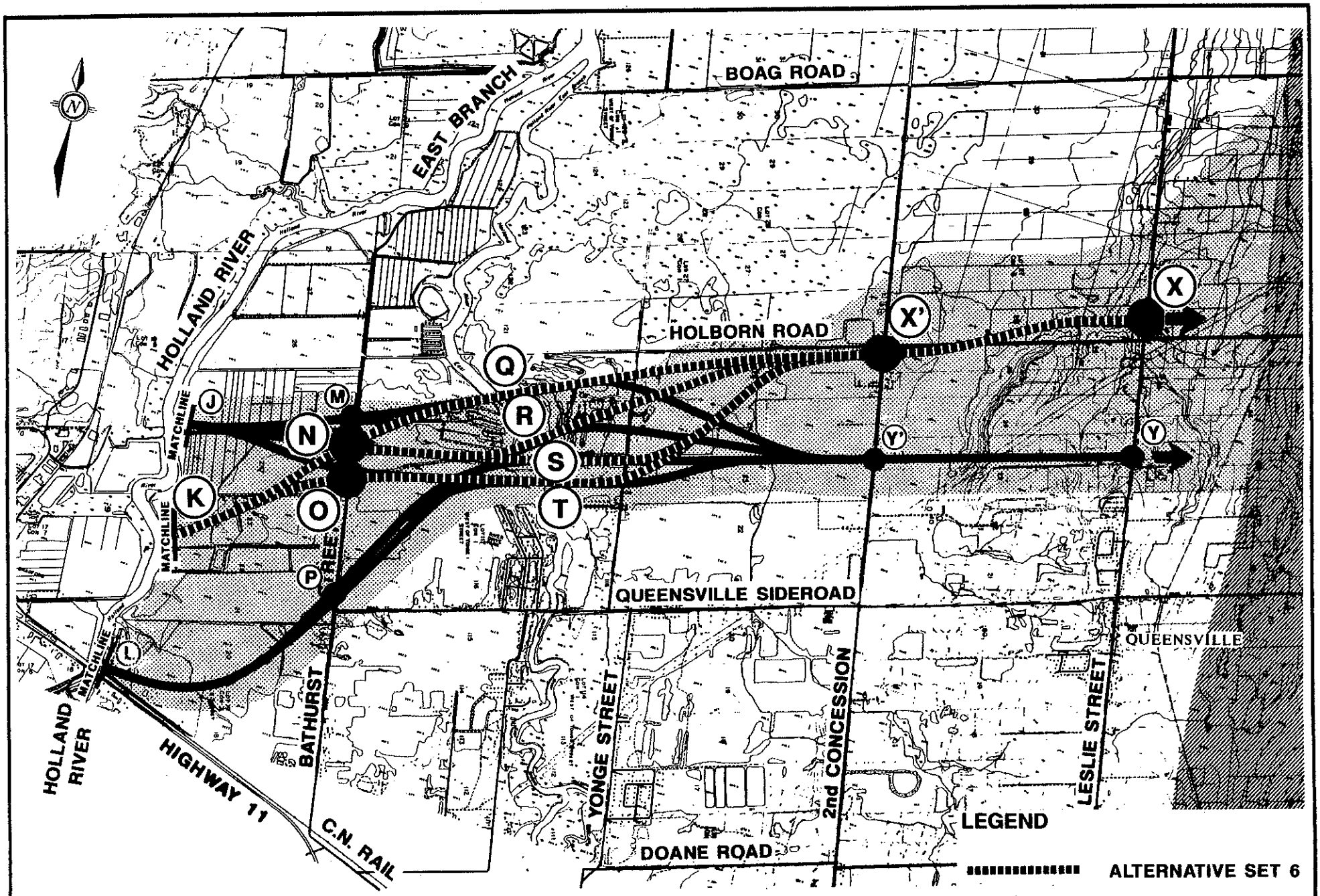
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5 : NORTH CROSSING - EAST SEGMENT (NORTH)					
			JQX	JRX	JSX	JTX	-	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	41.1 / 9.1	50.2 / 9.1	50.0 / 9.1	51.5 / 9.1		
	b) loss of Class 3 and 4 agricultural land	ha	16.7	12.4	22.4	29.5		
	c) loss of Class 5 and 6 agricultural land	ha	0	0	0	0		
	d) loss of organic soil	ha	12.8	11.8	10.8	10.7		
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	30.1 / 70.2 / 6	29.5 / 69.1 / 6	30.3 / 73.8 / 8	31.2 / 74.5 / 8		
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	20.7 / 43.7 / 1	20.7 / 43.7 / 1	20.7 / 43.7 / 1	20.7 / 43.7 / 1		
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0		
	h) effect on future flexibility of farm operations	rating	moderate	moderate	moderate	moderate		
	i) effect on farm woodlots	rating	minor	minor	minor	minor		
	j) effect on capital investment in agricultural operations	rating	moderate - major	moderate - major	moderate - major	moderate - major		
	k) significant farm operation severances	rating	moderate	moderate	moderate	moderate		
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	moderate	moderate	moderate		
	m) significance of detrimental effects to ongoing viability of farm communities	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5 : NORTH CROSSING - EAST SEGMENT (NORTH)					
			JQX	JRX	JSX	JTX	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	2.0	0	4.7	0		
	b) displacement of commercial businesses	#	1	1	0	0		
	c) effect on overall access to commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	d) effect on highway exposure for commercial areas	rating	minimal	minimal	minimal	minimal		
	e) severance of major industrial areas	ha	0	0	0	0		
	f) displacement of major industries	#	0	0	0	0		
	g) effect on overall access to major industrial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar		
	j) overall effect on regional and local economy	rating	minor (+)	minor (+)	moderate - major (+)	major (+)		
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar		
	l) waste/contamination of properties	#	0	0	0	0		
	m) significance of property waste/ contamination problems	–	none	none	none	none		
	n) loss of high potential mineral/ aggregate deposit areas	#	0	0	0	0		
	o) existing mineral/aggregate operations directly affected	#	0	0	0	0		
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	1	1	1	1		
	b) areas which have a high potential for archaeological sites	#	1	1	1	1		
	c) severance of related archaeological sites	#	1(potential)	1(potential)	1(potential)	1(potential)		
5.2 Historical	a) historical cultural landscapes	rating	minor - moderate	minor - moderate	moderate	moderate		
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	0 / -	0 / -	0 / -		



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-00-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 6 :* *MIDDLE CROSSING – EAST SEGMENT (North)*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 : MIDDLE CROSSING - EAST SEGMENT (NORTH)					
			KQX	KRX	KSX	KTX	-	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120		
	b) actual peak hour operating speed	km/h	100	100	100	100		
	c) potential slow moving vehicles	km length >2.5%	0.1	0.1	0.1	0.1		
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a		
	e) design hour volume (forecast)	DHV	3000	3000	3000	3000		
	f) peaking characteristics	–	similar	similar	similar	similar		
	g) forecast growth trend	–	similar	similar	similar	similar		
	h) change in traffic volume from existing	–	n/a	n/a	n/a	n/a		
	i) level of service	A to F	B	B	B	B		
	j) number of traffic signals	#	0	0	0	0		
	k) passing opportunities	% of length	100	100	100	100		
	l) travel time (weighted ; through/local)	minutes/minutes	4.8 / 8.7	4.8 / 8.9	4.9 / 9.0	4.9 / 9.0		
	m) number of interchanges/intersections	#	3	3	3	3		
	n) number of roadway entrances	#	0	0	0	0		
	o) pedestrian movement along/ across roadway	potential	none	none	none	none		
	p) fixed obstacles within right-of-way	#	0	0	0	0		
	q) number of minimum design standard curves	#	0	0	0	0		
	r) climatic conditions	rating	good	good	fair-good	good		
	s) route length	km	8.0	8.0	8.1	8.1		
	t) energy usage by a vehicle on alternative	Ml/yr	14.4	14.4	14.5	14.5		
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar	similar		
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	major (+)	major (+)	major (+)	major (+)		
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	c) consistency of design/operation	rating	fair	fair	fair	fair		
	d) continuity of Road Classification	–	yes	yes	yes	yes		
	e) continuity of alignment	–	yes	yes	yes	yes		
	f) continuity of jurisdiction	–	yes	yes	yes	yes		
	g) length of construction period	years	2.5	2.5	2.5	2.5		
	h) ability to stage implementation of the undertaking	potential	high	high	high	high		
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 : MIDDLE CROSSING - EAST SEGMENT (NORTH)					
			KQX	KRX	KSX	KTX	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.03	1.00	1.15	1.03		
	b) operating cost	ratio	1.00	1.00	1.01	1.01		
	c) maintenance cost	ratio	1.04	1.00	1.28	1.12		
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	8 / major	8 / major	8 / major	8 / major		
	b) permitted surface water intakes affected	#	0	0	0	0		
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate		
	e) presence of warmwater/coldwater communities	# warm / # cold	8 / 0	8 / 0	8 / 0	8 / 0		
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium		
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	34.3	36.3	36.0	49.4		
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	major	major	major		
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	34.3	36.3	36.0	49.4		
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate - major	moderate	moderate	major		
	b) loss of wetland area of all wetlands within study area	ha	9.7	3.2	3.8	4.9		
	c) degree of interaction of all wetlands with ground water	rating	moderate-major	moderate	moderate	moderate-major		
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	19.8	12.4	11.6	12.0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 : MIDDLE CROSSING - EAST SEGMENT (NORTH)					
			KQX	KRX	KSX	KTX	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	26.0	31.9	40.2	40.7		
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0		
	c) encroachment on or severance of ESAs	ha	11.4	11.6	14.4	14.2		
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0		
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no		
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	2.8		
	g) erosion control on steep slopes	rating	minor (n/a)	minor (n/a)	minor (n/a)	minor (n/a)		
	h) presence of riparian habitat	rating	minor	minor	minor	moderate		
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0		
	b) shallow ground water table potential release of contaminants into ground water	rating	major	major	major	major		
	c) municipal or permitted water supply well(s)	direct / indirect / rating	6/13/minor	6/15/minor-moderate	7/16/minor-moderate	10/16/moderate		
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0		
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 : MIDDLE CROSSING - EAST SEGMENT (NORTH)					
			KQX	KRX	KSX	KTX	-	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	high	moderate - high		
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	1 (minor)		
	c) displacement or extraordinary isolation of homes	#/#	2 / 0	2 / 0	4 / 0	5 / 0		
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	moderate (+)	moderate (+)		
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate		
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	1 (major)/ 0	1 (major)/ 0	1 (minor)/ 0	0 / 1		
	g) effect on municipal utility and residential sewage systems	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	h) potential bicycle use	potential	none	none	none	none		
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	j) overall effect on community character	rating	minor	minor	minor	minor		
	k) overall effect on emergency response routes	rating	major (+)	major (+)	major (+)	major (+)		
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	good	good	good	good		
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair - good	good	fair - good		
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	good	fair	fair		
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA	11	15	33	68		
		# :11 - 15 dBA	8	9	12	19		
		# : > 15 dBA	4	5	5	4		
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	12	14	17	23		
	c) noise sensitive receivers which are predicted to experience significant construction noise problems	residence - season	32	36	38	57		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

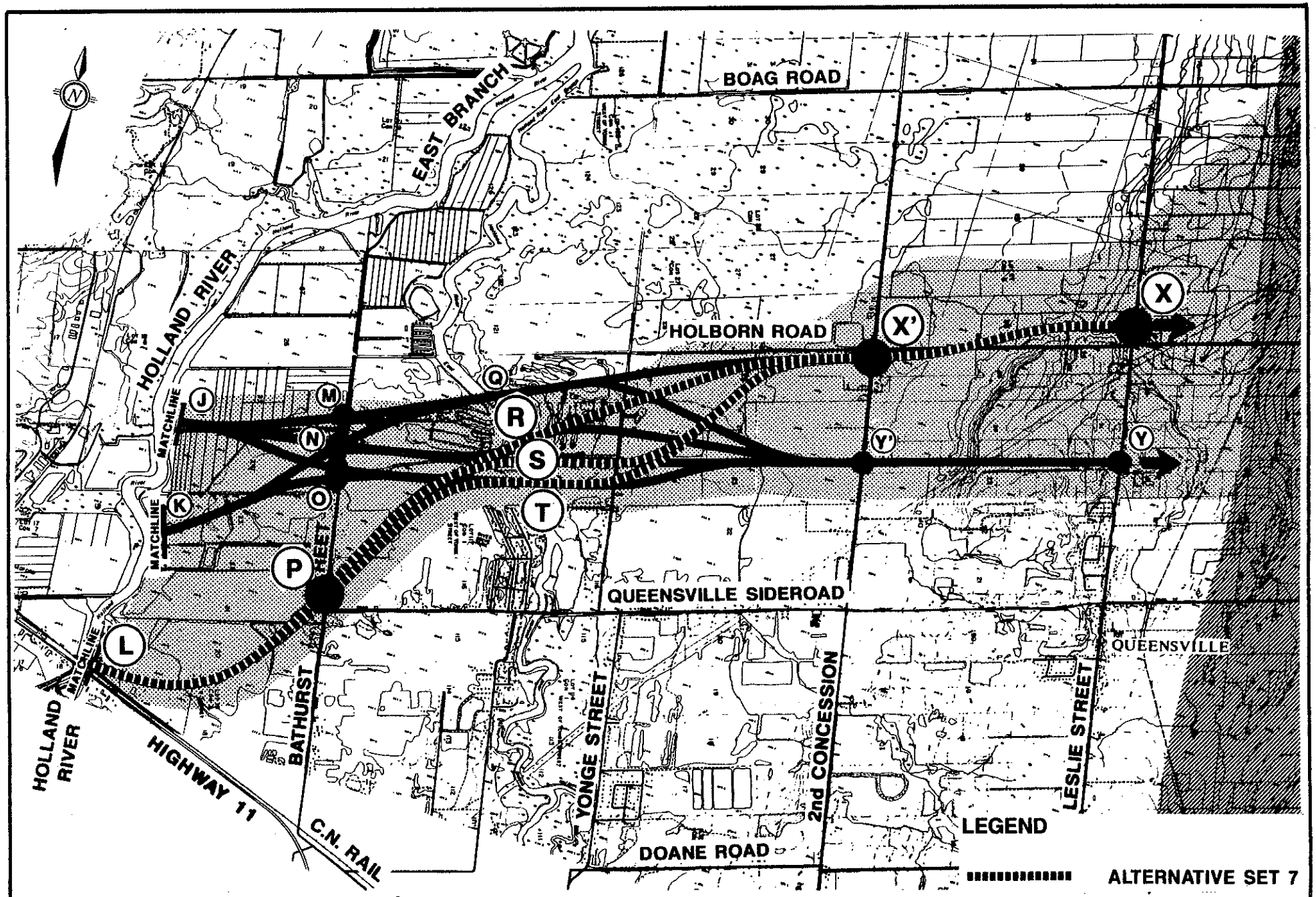
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 : MIDDLE CROSSING - EAST SEGMENT (NORTH)					
			KQX	KRX	KSX	KTX	-	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	44.4 / 9.1	53.8 / 9.1	53.6 / 9.1	57.8 / 9.1		
	b) loss of Class 3 and 4 agricultural land	ha	24.2	16.1	26.1	31.4		
	c) loss of Class 5 and 6 agricultural land	ha	0	0	0	0		
	d) loss of organic soil	ha	7.7	6.9	6.0	6.0		
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	26.5/55.4/4	26.5/55.4/4	26.5/55.4/4	26.5/55.4/4		
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	20.7 / 43.7 / 1	20.7 / 43.7 / 1	20.7 / 43.7 / 1	20.7 / 43.7 / 1		
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0	0 / 0 / 0		
	h) effect on future flexibility of farm operations	rating	minor	minor	minor - moderate	minor - moderate		
	i) effect on farm woodlots	rating	minor	minor	minor	minor		
	j) effect on capital investment in agricultural operations	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate		
	k) significant farm operation severances	rating	moderate	moderate	moderate	moderate		
	l) significance of detrimental effects to ongoing viability of farm operations	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate		
	m) significance of detrimental effects to ongoing viability of farm communities	rating	minor	minor	minor	minor		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 - MIDDLE CROSSING - EAST SEGMENT (NORTH)					
			KQX	KRX	KSX	KTX	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	2.0	0	4.7	0		
	b) displacement of commercial businesses	#	1	1	0	0		
	c) effect on overall access to commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	d) effect on highway exposure for commercial areas	rating	none	none	none	none		
	e) severance of major industrial areas	ha	0	0	0	0		
	f) displacement of major industries	#	0	0	0	0		
	g) effect on overall access to major industrial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar		
	j) overall effect on regional and local economy	rating	minor (+)	minor (+)	moderate - major (+)	major (+)		
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar		
	l) waste/contamination of properties	#	0	0	0	0		
	m) significance of property waste/ contamination problems	–	none	none	none	none		
	n) loss of high potential mineral/ aggregate deposit areas	#	0	0	0	0		
	o) existing mineral/aggregate operations directly affected	#	0	0	0	0		
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	0	0	0	0		
	b) areas which have a high potential for archaeological sites	#	1	1	1	1		
	c) severance of related archaeological sites	#	1(potential)	1(potential)	1(potential)	1(potential)		
5.2 Historical	a) historical cultural landscapes	rating	minor - moderate	minor - moderate	moderate	moderate		
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	0 / -	0 / -	0 / -		



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 7 :* *SOUTH CROSSING – EAST SEGMENT (North)*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT		ALTERNATIVE SET 7 : SOUTH CROSSING - EAST SEGMENT (NORTH)				
				LRX	LSX	LTX	-	-
1 TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h		120	120	120		
	b) actual peak hour operating speed	km/h		100	100	100		
	c) potential slow moving vehicles	km length >2.5%		0.1	0.1	0.1		
	d) change in speed limit from existing	km/h		n/a	n/a	n/a		
	e) design hour volume (forecast)	DHV		3000	3000	3000		
	f) peaking characteristics	_		similar	similar	similar		
	g) forecast growth trend	_		similar	similar	similar		
	h) change in traffic volume from existing	_		n/a	n/a	n/a		
	i) level of service	A to F		B	B	B		
	j) number of traffic signals	#		0	0	0		
	k) passing opportunities	% of length		100	100	100		
	l) travel time (weighted ; through/local)	minutes/minutes		5.5 / 9.3	5.5 / 9.3	5.5 / 9.3		
	m) number of interchanges/intersections	#		3	3	3		
	n) number of roadway entrances	#		0	0	0		
	o) pedestrian movement along/ across roadway	potential		none	none	none		
	p) fixed obstacles within right-of-way	#		0	0	0		
	q) number of minimum design standard curves	#		0	0	0		
	r) climatic conditions	rating		good	fair-good	good		
	s) route length	km		9.1	9.2	9.2		
	t) energy usage by a vehicle on alternative	Ml/yr		16.3	16.5	16.5		
	u) effect of alternative on net energy usage on transportation system	_		similar	similar	similar		
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating		major (+)	major (+)	major (+)		
	b) effect on traffic operations on parallel/crossing roads	rating		minor (-)	minor (-)	minor (-)		
	c) consistency of design/operation	rating		fair	fair	fair		
	d) continuity of Road Classification	_		yes	yes	yes		
	e) continuity of alignment	_		yes	yes	yes		
	f) continuity of jurisdiction	_		yes	yes	yes		
	g) length of construction period	years		2.5	2.5	2.5		
	h) ability to stage implementation of the undertaking	potential		high	high	high		
	i) ability to upgrade undertaking as warranted by future needs	potential		high	high	high		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 7 : SOUTH CROSSING - EAST SEGMENT (NORTH)					
				LRX	LSX	LTX	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio		1.00	1.13	1.02		
	b) operating cost	ratio		1.00	1.01	1.01		
	c) maintenance cost	ratio		1.00	1.25	1.10		
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating		11 / major	11 / major	11 / major		
	b) permitted surface water intakes affected	#		0	0	0		
	c) presence of species at risk (rare or endangered)	yes / no		no	no	no		
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating		moderate	moderate	moderate		
	e) presence of warmwater/coldwater communities	# warm / # cold		11 / 0	11 / 0	11 / 0		
	f) degree of interaction with ground water (presence of highly permeable soil)	rating		medium	medium	medium		
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha		36.8	45.6	47.2		
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating		major	major	major		
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha		36.8	45.6	47.2		
	d) presence of species at risk (rare or endangered)	yes / no		no	no	no		
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating		minor	moderate	major		
	b) loss of wetland area of all wetlands within study area	ha		3.2	3.9	4.9		
	c) degree of interaction of all wetlands with ground water	rating		low	low	low - medium		
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha		10.8	10.0	10.3		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 7 : SOUTH CROSSING - EAST SEGMENT (NORTH)					
				LRX	LSX	LTX	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha		32.6	40.9	42.5		
	b) encroachment on or severance of Life Science ANSIs	ha		0	0	0		
	c) encroachment on or severance of ESAs	ha		10.3	3.1	12.8		
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha		0	0	0		
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no		no	no	no		
	f) encroachment on or severance of unusual vegetation units	ha		0	0	2.8		
	g) erosion control on steep slopes	rating		minor	minor	minor		
	h) presence of riparian habitat	rating		minor	minor	moderate		
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#		0	0	0		
	b) shallow ground water table potential release of contaminants into ground water	rating		major	major	major		
	c) municipal or permitted water supply well(s)	direct / indirect / rating		8 / 19 / moderate	9 / 18 / moderate	12 / 17 / moderate		
	d) areas of significant regrading at recharge/discharge areas	#		0	0	0		
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha		0	0	0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 7 : SOUTH CROSSING - EAST SEGMENT (NORTH)					
				LRX	LSX	LTX	-	-
3 - SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating		high	high	moderate - high		
	b) severance of residential neighbourhoods and rural communities	#		0	0	1 (minor)		
	c) displacement or extraordinary isolation of homes	#/#		2 / 0	4 / 0	5 / 0		
	d) overall effect on access to residential areas and rural communities	rating		moderate	moderate	moderate		
	e) overall degree of disruption to residential communities	rating		moderate	moderate	moderate		
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge		1 (major)/ 0	1 (minor)/ 0	0 / 1		
	g) effect on municipal utility and residential sewage systems	rating		minor (-)	minor (-)	minor (-)		
	h) potential bicycle use	potential		none	none	none		
	i) overall effect on community cohesion	rating		minor (-)	minor (-)	minor (-)		
	j) overall effect on community character	rating		minor	minor	minor		
	k) overall effect on emergency response routes	rating		major (+)	major (+)	major (+)		
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating		good	good	good		
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating		fair - good	good	fair - good		
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating		good	fair	fair		
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA # :11 - 15 dBA # : > 15 dBA		24 16 4	37 18 5	70 24 5		
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#		20	23	29		
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season		60	62	78		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

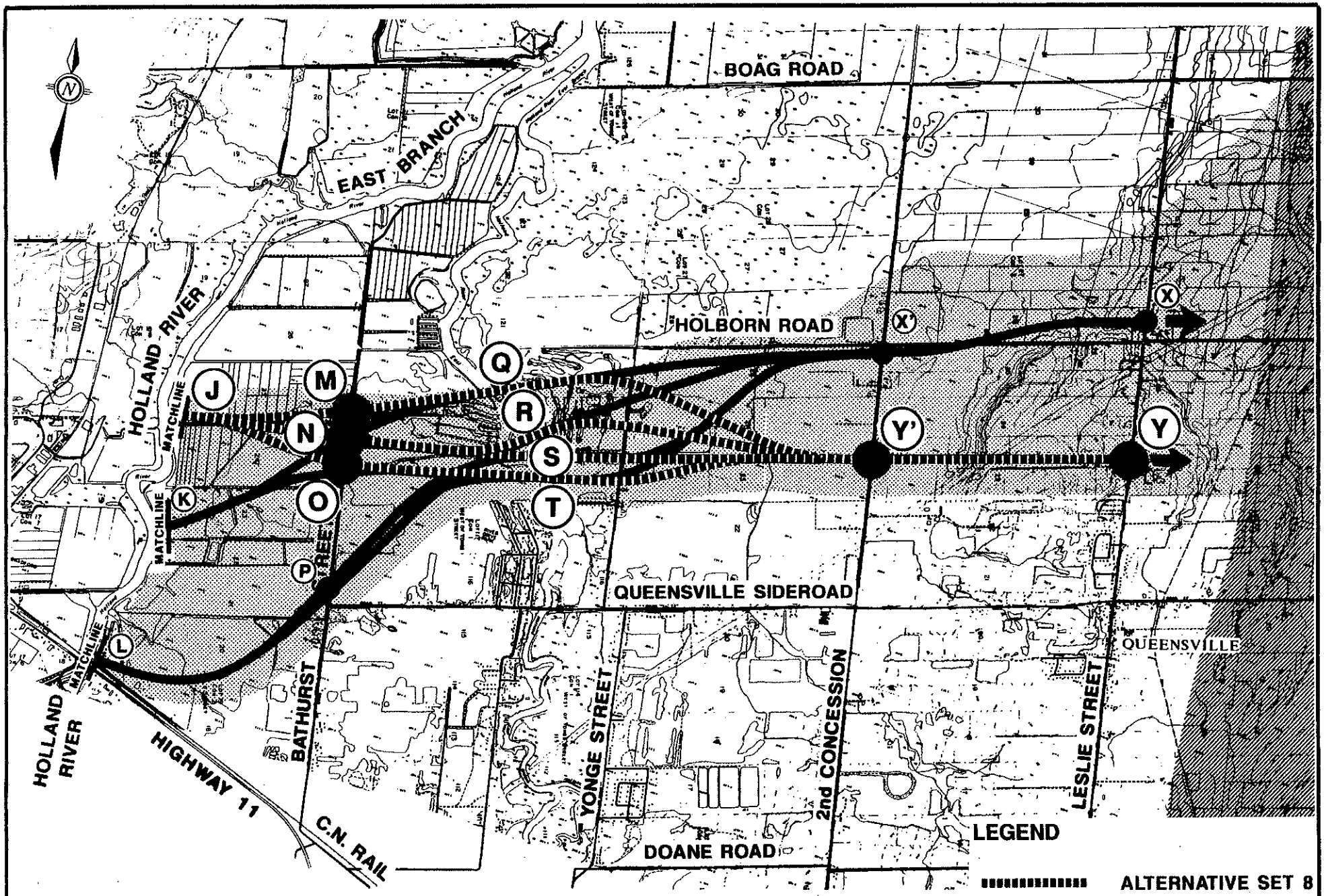
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FACTOR / CRITERION	INDICATOR	UNIT		ALTERNATIVE SET 7 : SOUTH CROSSING - EAST SEGMENT (NORTH)				
				LRX	LSX	LTX	-	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha		76.7 / 9.1	76.0 / 9.1	77.8 / 9.1		
	b) loss of Class 3 and 4 agricultural land	ha		5.8	15.2	20.1		
	c) loss of Class 5 and 6 agricultural land	ha		0	0	0		
	d) loss of organic soil	ha		5.5	4.6	4.6		
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #		35.4 / 80.1 / 4	36.2 / 88.5 / 6	37.2 / 92.4 / 6		
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #		20.7 / 43.7 / 1	20.7 / 43.7 / 1	20.7 / 43.7 / 1		
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #		0 / 0 / 0	0 / 0 / 0	0 / 0 / 0		
	h) effect on future flexibility of farm operations	rating		minor	minor	minor		
	i) effect on farm woodlots	rating		minor	minor	minor		
	j) effect on capital investment in agricultural operations	rating		moderate	moderate	moderate		
	k) significant farm operation severances	rating		moderate	moderate	moderate		
	l) significance of detrimental effects to ongoing viabilty of farm operations	rating		minor - moderate	minor - moderate	minor - moderate		
	m) significance of detrimental effects to ongoing viability of farm communities	rating		minor	minor	minor		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 7 : SOUTH CROSSING - EAST SEGMENT (NORTH)					
				LRX	LSX	LTX	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha		0	4.7	0		
	b) displacement of commercial businesses	#		1	0	0		
	c) effect on overall access to commercial areas	rating		minor	minor	minor		
	d) effect on highway exposure for commercial areas	rating		none	none	none		
	e) severance of major industrial areas	ha		0	0	0		
	f) displacement of major industries	#		0	0	0		
	g) effect on overall access to major industrial areas	rating		minor (+)	minor (+)	minor (+)		
	h) effect on overall travel time and distance for local manufacturers and shippers	rating		minor (-)	minor (-)	minor (-)		
	i) effects on regional distribution of manufacturing	rating		similar	similar	similar		
	j) overall effect on regional and local economy	rating		minor (+)	moderate - major (+)	major (+)		
	k) significance of overlap with any federal/provincial land use plans and policies	rating		similar	similar	similar		
	l) waste/contamination of properties	#		0	0	0		
	m) significance of property waste/ contamination problems	–		none	none	none		
	n) loss of high potential mineral/ aggregate deposit areas	#		0	0	0		
	o) existing mineral/aggregate operations directly affected	#		0	0	0		
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#		1	1	1		
	b) areas which have a high potential for archaeological sites	#		1	1	1		
	c) severance of related archaeological sites	#		1(potential)	1(potential)	1(potential)		
5.2 Historical	a) historical cultural landscapes	rating		minor - moderate	moderate	moderate		
	b) sites of architectural and/or historical significance directly affected	# / rating		0 / -	0 / -	0 / -		



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 8 :* *NORTH CROSSING – EAST SEGMENT (South)*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 8 : NORTH CROSSING - EAST SEGMENT (SOUTH)					
			JQY	JRY	JSY	JTY	-	-
1 TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120		
	b) actual peak hour operating speed	km/h	100	100	100	100		
	c) potential slow moving vehicles	km length >2.5%	0.2	0.2	0.2	0.2		
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a		
	e) design hour volume (forecast)	DHV	3000	3000	3000	3000		
	f) peaking characteristics	-	similar	similar	similar	similar		
	g) forecast growth trend	-	similar	similar	similar	similar		
	h) change in traffic volume from existing	-	n/a	n/a	n/a	n/a		
	i) level of service	A to F	B	B	B	B		
	j) number of traffic signals	#	0	0	0	0		
	k) passing opportunities	% of length	100	100	100	100		
	l) travel time (weighted ; through/local)	minutes/minutes	4.6 / 8.3	4.5 / 8.3	4.5 / 8.3	4.5 / 8.3		
	m) number of interchanges/intersections	#	3	3	3	3		
	n) number of roadway entrances	#	0	0	0	0		
	o) pedestrian movement along/ across roadway	potential	none	none	none	none		
	p) fixed obstacles within right-of-way	#	0	0	0	0		
	q) number of minimum design standard curves	#	0	0	0	0		
	r) climatic conditions	rating	good	good	fair-good	fair-good		
	s) route length	km	7.6	7.6	7.5	7.6		
	t) energy usage by a vehicle on alternative	Ml/yr	13.7	13.7	13.5	13.7		
	u) effect of alternative on net energy usage on transportation system	-	similar	similar	similar	similar		
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	major (+)	major (+)	major (+)	major (+)		
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	c) consistency of design/operation	rating	fair	fair	fair	fair		
	d) continuity of Road Classification	-	yes	yes	yes	yes		
	e) continuity of alignment	-	yes	yes	yes	yes		
	f) continuity of jurisdiction	-	yes	yes	yes	yes		
	g) length of construction period	years	2.5	2.5	2.5	2.5		
	h) ability to stage implementation of the undertaking	potential	high	high	high	high		
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 8 : NORTH CROSSING - EAST SEGMENT (SOUTH)					
			JQY	JRY	JSY	JTY	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.04	1.00	1.13	1.01		
	b) operating cost	ratio	1.01	1.01	1.00	1.01		
	c) maintenance cost	ratio	1.04	1.00	1.27	1.11		
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	6 / major	7 / major	7 / major	7 / major		
	b) permitted surface water intakes affected	#	0	0	0	0		
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate		
	e) presence of warmwater/coldwater communities	# warm / # cold	6 / 0	7 / 0	7 / 0	7 / 0		
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium		
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	26.2	27.6	31.1	33.6		
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	major	major	major		
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	26.2	27.6	31.1	33.6		
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate - major	minor	minor	major		
	b) loss of wetland area of all wetlands within study area	ha	11.7	5.0	5.8	4.9		
	c) degree of interaction of all wetlands with ground water	rating	medium	low	low	low - medium		
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	21.4	8.9	11.2	12.6		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 8 - NORTH CROSSING - EAST SEGMENT (SOUTH)					
			JQY	JRY	JSY	JTY	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	16.5	22.8	26.2	27.9		
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0		
	c) encroachment on or severance of ESAs	ha	15.1	13.0	10.9	8.8		
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0		
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no		
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	2.8		
	g) erosion control on steep slopes	rating	minor	minor	minor	minor		
	h) presence of riparian habitat	rating	minor	minor	minor	moderate		
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0		
	b) shallow ground water table potential release of contaminants into ground water	rating	major	major	major	major		
	c) municipal or permitted water supply well(s)	direct / indirect / rating	17 / 11 / moderate	16 / 10 / moderate	16 / 11 / moderate	19 / 10 / moderate		
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0		
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 8 : NORTH CROSSING + EAST SEGMENT (SOUTH)					
			JQY	JRY	JSY	JTY	-	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibilty with municipal official plans and development proposals	rating	high	high	high	moderate - high		
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	1 (minor)		
	c) displacement or extraordinary isolation of homes	#/#	11 / 0	9 / 1	11 / 0	11 / 0		
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	moderate (+)	moderate (+)		
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate		
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	1 (major)/ 0	1 (major)/ 0	1 (minor)/ 0	0 / 1		
	g) effect on municipal utility and residential sewage systems	rating	minor	minor	minor	minor		
	h) potential bicycle use	potential	none	none	none	none		
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	j) overall effect on community character	rating	minor	minor	minor	minor		
	k) overall effect on emergency response routes	rating	major (+)	major (+)	major (+)	major (+)		
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	good	good	good	good		
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair - good	good	fair - good		
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	good	fair	fair		
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA # :11 - 15 dBA # : > 15 dBA	11 3 3	13 8 3	31 9 2	65 14 5		
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	6	11	11	19		
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season	11	19	20	39		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

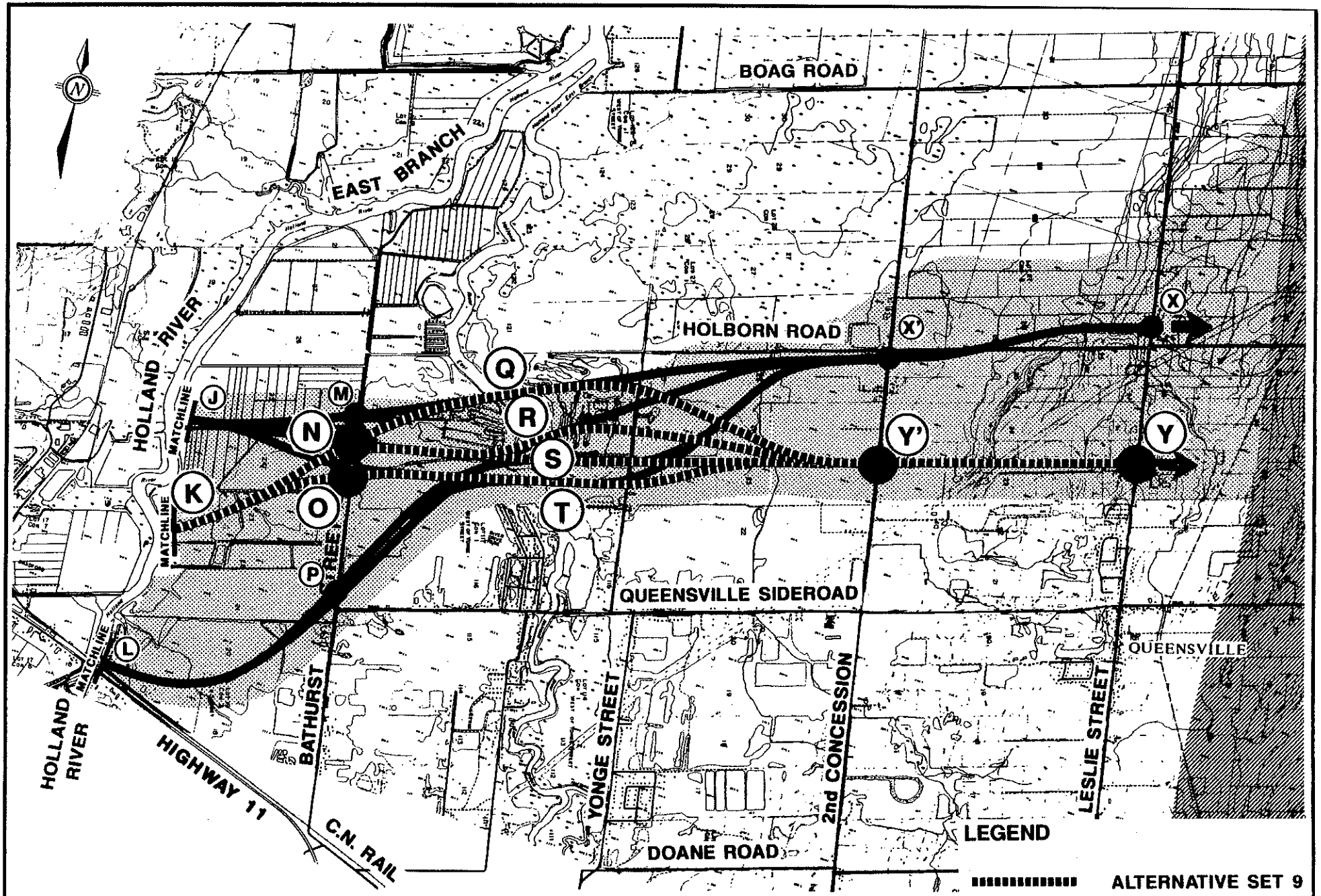
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 8 - NORTH CROSSING - EAST SEGMENT (SOUTH)					
			JQY	JRY	JSY	JTY	-	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	24.2 / 19.0	32.3 / 19.0	32.9 / 19.0	32.9 / 19.0		
	b) loss of Class 3 and 4 agricultural land	ha	22.7	18.4	23.5	29.8		
	c) loss of Class 5 and 6 agricultural land	ha	0	0	0	0		
	d) loss of organic soil	ha	8.2	7.5	6.6	6.5		
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	21.7 / 60 / 5	22.5 / 61.2 / 5	24.3 / 71.8 / 5	26.7 / 72.6 / 5		
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	3.5 / 21.1 / 1	3.5 / 21.1 / 1	3.5 / 21.1 / 1	3.5 / 21.1 / 1		
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	32.4 / 43.5 / 1	32.4 / 43.5 / 1	32.4 / 43.5 / 1	32.4 / 43.5 / 1		
	h) effect on future flexibility of farm operations	rating	moderate	moderate	moderate	moderate		
	i) effect on farm woodlots	rating	minor	minor	minor	minor		
	j) effect on capital investment in agricultural operations	rating	moderate - major	moderate - major	moderate - major	moderate - major		
	k) significant farm operation severances	rating	minor - moderate	minor - moderate	minor	minor		
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	moderate	moderate	moderate		
	m) significance of detrimental effects to ongoing viability of farm communities	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 6 : NORTH CROSSING - EAST SEGMENT (SOUTH)					
			JQY	JRY	JSY	JTY	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	2.0	0	4.7	0		
	b) displacement of commercial businesses	#	1	1	0	0		
	c) effect on overall access to commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	d) effect on highway exposure for commercial areas	rating	none	none	none	none		
	e) severance of major industrial areas	ha	0	0	0	0		
	f) displacement of major industries	#	0	0	0	0		
	g) effect on overall access to major industrial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	minor	minor	minor	minor		
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar		
	j) overall effect on regional and local economy	rating	minor (+)	minor (+)	moderate - major (+)	major (+)		
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar		
	l) waste/contamination of properties	#	0	0	0	0		
	m) significance of property waste/ contamination problems	–	none	none	none	none		
	n) loss of high potential mineral/ aggregate deposit areas	#	1	1	1	1		
	o) existing mineral/aggregate operations directly affected	#	0	0	0	0		
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	1 (potential)	1 (potential)	1 (potential)	1 (potential)		
	b) areas which have a high potential for archaeological sites	#	1	1	1	1		
	c) severance of related archaeological sites	#	0	0	0	0		
5.2 Historical	a) historical cultural landscapes	rating	moderate	minor - moderate	moderate	minor - moderate		
	b) sites of architectural and/or historical significance directly affected	# / rating	1 (potential)	1 (potential)	1 (potential)	1 (potential)		



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 9 :* *MIDDLE CROSSING – EAST SEGMENT (South)*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 9 : MIDDLE CROSSING - EAST SEGMENT (SOUTH)					
			KQY	KRY	KSY	KTY	-	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120		
	b) actual peak hour operating speed	km/h	100	100	100	100		
	c) potential slow moving vehicles	km length >2.5%	0.2	0.2	0.2	0.2		
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a		
	e) design hour volume (forecast)	DHV	3000	3000	3000	3000		
	f) peaking characteristics	-	similar	similar	similar	similar		
	g) forecast growth trend	-	similar	similar	similar	similar		
	h) change in traffic volume from existing	-	n/a	n/a	n/a	n/a		
	i) level of service	A to F	B	B	B	B		
	j) number of traffic signals	#	0	0	0	0		
	k) passing opportunities	% of length	100	100	100	100		
	l) travel time (weighted ; through/local)	minutes/minutes	4.7 / 8.8	4.7 / 8.8	4.6 / 8.8	4.6 / 8.8		
	m) number of interchanges/intersections	#	3	3	3	3		
	n) number of roadway entrances	#	0	0	0	0		
	o) pedestrian movement along/ across roadway	potential	none	none	none	none		
	p) fixed obstacles within right-of-way	#	0	0	0	0		
	q) number of minimum design standard curves	#	0	0	0	0		
	r) climatic conditions	rating	good	good	fair-good	good		
	s) route length	km	7.9	7.8	7.7	7.7		
	t) energy usage by a vehicle on alternative	Ml/yr	14.2	14.0	13.8	13.8		
	u) effect of alternative on net energy usage on transportation system	-	similar	similar	similar	similar		
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	major (+)	major (+)	major (+)	major (+)		
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	c) consistency of design/operation	rating	fair	fair	fair	fair		
	d) continuity of Road Classification	-	yes	yes	yes	yes		
	e) continuity of alignment	-	yes	yes	yes	yes		
	f) continuity of jurisdiction	-	yes	yes	yes	yes		
	g) length of construction period	years	2.5	2.5	2.5	2.5		
	h) ability to stage implementation of the undertaking	potential	high	high	high	high		
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 9 : MIDDLE CROSSING - EAST SEGMENT (SOUTH)					
			KQY	KRY	KSY	KTY	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.04	1.00	1.13	1.01		
	b) operating cost	ratio	1.03	1.01	1.00	1.00		
	c) maintenance cost	ratio	1.05	1.00	1.27	1.10		
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	6 / major	6 / major	6 / major	6 / major		
	b) permitted surface water intakes affected	#	0	0	0	0		
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate		
	e) presence of warmwater/coldwater communities	# warm / # cold	6 / 0	6 / 0	6 / 0	6 / 0		
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium		
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	35.0	34.4	38.0	40.7		
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	major	major	major		
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	35.0	34.4	38.0	40.7		
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no		
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate	minor - moderate	minor - moderate	major		
	b) loss of wetland area of all wetlands within study area	ha	7.9	3.2	3.9	4.9		
	c) degree of interaction of all wetlands with ground water	rating	medium - high	low - medium	low	low		
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	16.8	9.6	11.6	12.0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 9 : MIDDLE CROSSING - EAST SEGMENT (SOUTH)					
			KQY	KRY	KSY	KTY	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	28.6	30.2	33.7	32.4		
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0		
	c) encroachment on or severance of ESAs	ha	10.3	8.1	6.0	4.0		
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0		
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no		
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	2.8		
	g) erosion control on steep slopes	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	h) presence of riparian habitat	rating	minor	minor	minor	moderate		
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0		
	b) shallow ground water table potential release of contaminants into ground water	rating	major	major	major	major		
	c) municipal or permitted water supply well(s)	direct / indirect / rating	13/11/minor-moderate	13/13/moderate	14/13/moderate	17/13/moderate		
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0		
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 9 : MIDDLE CROSSING - EAST SEGMENT (SOUTH)					
			KQY	KRY	KSY	KTY	-	-
3 SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	high	high	high	moderate - high		
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	1 (minor)		
	c) displacement or extraordinary isolation of homes	#/#	8 / 0	8 / 1	10 / 0	11 / 0		
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	moderate (+)	moderate (+)		
	e) overall degree of disruption to residential communities	rating	moderate	moderate	moderate	moderate		
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	1 (major)/ 0	1 (major)/ 0	1 (minor)/ 0	0 / 1		
	g) effect on municipal utility and residential sewage systems	rating	minor	minor	minor	minor		
	h) potential bicycle use	potential	none	none	none	none		
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	minor (-)	minor (-)		
	j) overall effect on community character	rating	minor	minor	minor	minor		
	k) overall effect on emergency response routes	rating	major (+)	major (+)	major (+)	major (+)		
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	good	good	good	good		
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair - good	good	fair - good		
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	good	fair	fair		
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA # :11 - 15 dBA # : > 15 dBA	13 3 4	15 7 4	33 8 4	66 15 3		
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	7	11	12	18		
	c) noise sensitive receivers which are predicted to experience significant construction noise problems	residence - season	15	19	20	35		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

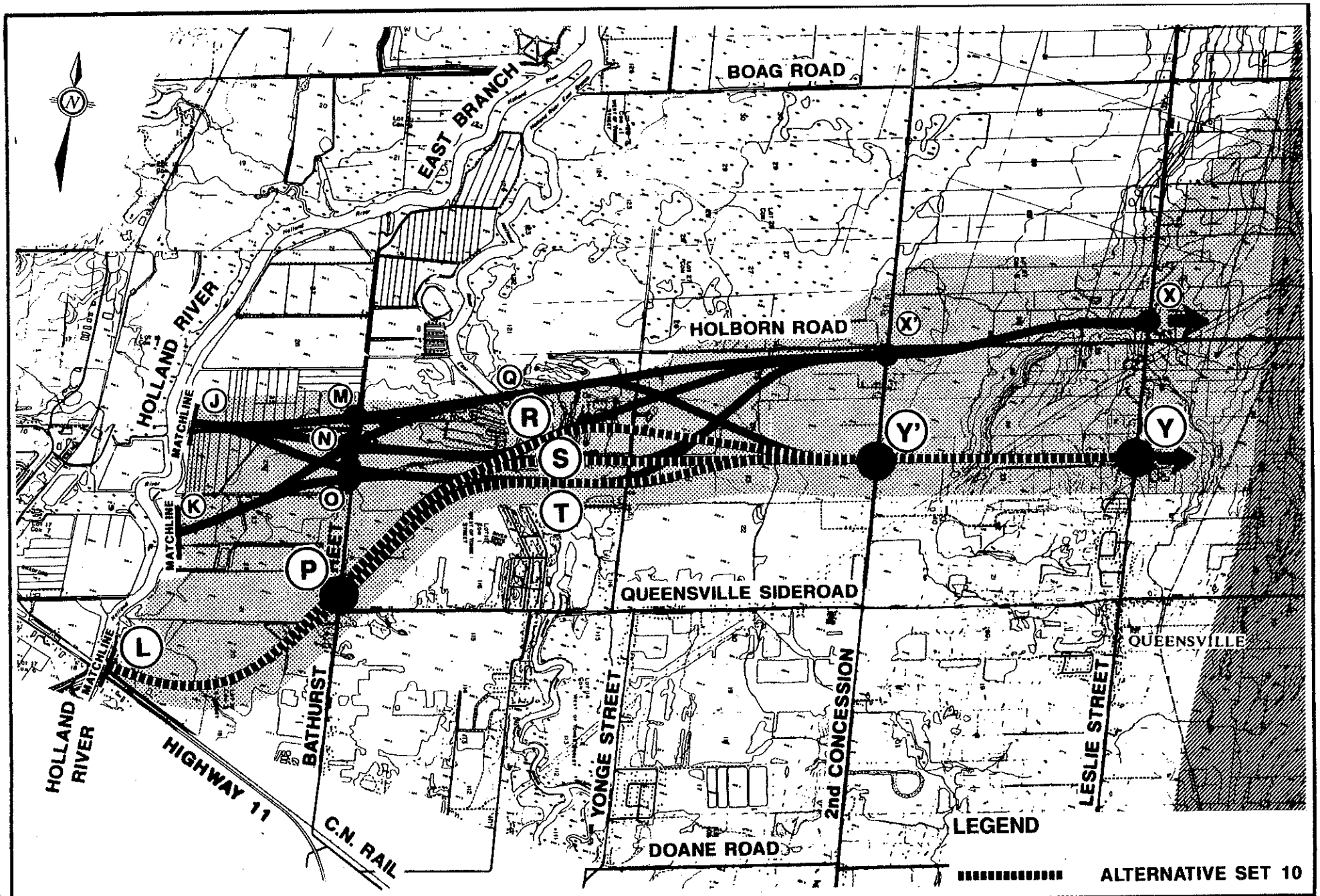
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 9 / MIDDLE CROSSING - EAST SEGMENT (SOUTH)					
			KQY	KRY	KSY	KTY	-	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	27.3 / 19.0	35.9 / 19.0	36.5 / 19.0	40.8 / 19.0		
	b) loss of Class 3 and 4 agricultural land	ha	30.4	22.8	27.2	30.3		
	c) loss of Class 5 and 6 agricultural land	ha	0	0	0	0		
	d) loss of organic soil	ha	4.2	2.6	1.7	1.7		
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	18.1 / 45.2 / 3	19.5 / 47.5 / 3	21.2 / 58.1 / 3	23.8 / 62.2 / 3		
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	3.4 / 21.1 / 1	3.4 / 21.1 / 1	3.4 / 21.1 / 1	3.4 / 21.1 / 1		
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	32.4 / 43.4 / 1	32.4 / 43.4 / 1	32.4 / 43.4 / 1	32.4 / 43.4 / 1		
	h) effect on future flexibility of farm operations	rating	minor	minor	minor	minor		
	i) effect on farm woodlots	rating	minor	minor	minor	minor		
	j) effect on capital investment in agricultural operations	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate		
	k) significant farm operation severances	rating	minor - moderate	minor - moderate	minor	minor		
	l) significance of detrimental effects to ongoing viability of farm operations	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate		
	m) significance of detrimental effects to ongoing viability of farm communities	rating	minor	minor	minor	minor		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.26

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 9 : MIDDLE CROSSING - EAST SEGMENT (SOUTH)					
			KQY	KRY	KSY	KTY	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	2.0	0	4.7	0		
	b) displacement of commercial businesses	#	1	1	0	0		
	c) effect on overall access to commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	d) effect on highway exposure for commercial areas	rating	none	none	none	none		
	e) severance of major industrial areas	ha	0	0	0	0		
	f) displacement of major industries	#	0	0	0	0		
	g) effect on overall access to major industrial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)		
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	minor	minor	minor	minor		
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar		
	j) overall effect on regional and local economy	rating	minor (+)	minor (+)	moderate - major (+)	major (+)		
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar		
	l) waste/contamination of properties	#	0	0	0	0		
	m) significance of property waste/ contamination problems	–	none	none	none	none		
	n) loss of high potential mineral/ aggregate deposit areas	#	1	1	1	1		
	o) existing mineral/aggregate operations directly affected	#	0	0	0	0		
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	1 (potential)	1 (potential)	1 (potential)	1 (potential)		
	b) areas which have a high potential for archaeological sites	#	1	1	1	1		
	c) severance of related archaeological sites	#	0	0	0	0		
5.2 Historical	a) historical cultural landscapes	rating	minor - moderate	minor - moderate	moderate	minor - moderate		
	b) sites of architectural and/or historical significance directly affected	# / rating	1 (potential)	1 (potential)	1 (potential)	1 (potential)		



Ministry of Transportation Ontario	BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 10 :* *SOUTH CROSSING – EAST SEGMENT (South)*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10 : SOUTH CROSSING - EAST SEGMENT (SOUTH)					
				LRY	LSY	LTY	-	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h		120	120	120		
	b) actual peak hour operating speed	km/h		100	100	100		
	c) potential slow moving vehicles	km length >2.5%		0.2	0.2	0.2		
	d) change in speed limit from existing	km/h		n/a	n/a	n/a		
	e) design hour volume (forecast)	DHV		3000	3000	3000		
	f) peaking characteristics	–		similar	similar	similar		
	g) forecast growth trend	–		similar	similar	similar		
	h) change in traffic volume from existing	–		n/a	n/a	n/a		
	i) level of service	A to F		B	B	B		
	j) number of traffic signals	#		0	0	0		
	k) passing opportunities	% of length		100	100	100		
	l) travel time (weighted ; through/local)	minutes/minutes		5.3 / 9.9	5.3 / 9.9	5.3 / 9.9		
	m) number of interchanges/intersections	#		3	3	3		
	n) number of roadway entrances	#		0	0	0		
	o) pedestrian movement along/ across roadway	potential		none	none	none		
	p) fixed obstacles within right-of-way	#		0	0	0		
	q) number of minimum design standard curves	#		0	0	0		
	r) climatic conditions	rating		good	fair-good	good		
	s) route length	km		8.8	8.8	8.8		
	t) energy usage by a vehicle on alternative	Ml/yr		15.8	15.8	15.8		
	u) effect of alternative on net energy usage on transportation system	–		similar	similar	similar		
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating		major (+)	major (+)	major (+)		
	b) effect on traffic operations on parallel/crossing roads	rating		minor (-)	minor (-)	minor (-)		
	c) consistency of design/operation	rating		fair	fair	fair		
	d) continuity of Road Classification	–		yes	yes	yes		
	e) continuity of alignment	–		yes	yes	yes		
	f) continuity of jurisdiction	–		yes	yes	yes		
	g) length of construction period	years		2.5	2.5	2.5		
	h) ability to stage implementation of the undertaking	potential		high	high	high		
	i) ability to upgrade undertaking as warranted by future needs	potential		high	high	high		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10 : SOUTH CROSSING - EAST SEGMENT (SOUTH)					
				LRY	LSY	LTY	-	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio		1.00	1.12	1.02		
	b) operating cost	ratio		1.00	1.00	1.00		
	c) maintenance cost	ratio		1.00	1.24	1.10		
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating		9 / major	9 / major	9 / major		
	b) permitted surface water intakes affected	#		0	0	0		
	c) presence of species at risk (rare or endangered)	yes / no		no	no	no		
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating		moderate	moderate	moderate		
	e) presence of warmwater/coldwater communities	# warm / # cold		9 / 0	9 / 0	9 / 0		
	f) degree of interaction with ground water (presence of highly permeable soil)	rating		medium	medium	medium		
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha		34.9	38.4	38.5		
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating		major	major	major		
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha		34.9	38.4	38.5		
	d) presence of species at risk (rare or endangered)	yes / no		no	no	no		
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating		minor	moderate	major		
	b) loss of wetland area of all wetlands within study area	ha		3.2	3.8	4.9		
	c) degree of interaction of all wetlands with ground water	rating		low	low	low - medium		
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha		7.3	10.0	10.3		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10 : SOUTH CROSSING - EAST SEGMENT (SOUTH)					
				LRY	LSY	LTY	-	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha		30.9	34.4	34.2		
	b) encroachment on or severance of Life Science ANSIs	ha		0	0	0		
	c) encroachment on or severance of ESAs	ha		6.7	4.7	2.6		
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha		0	0	0		
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no		no	no	no		
	f) encroachment on or severance of unusual vegetation units	ha		0	0	2.8		
	g) erosion control on steep slopes	rating		minor	minor	minor		
	h) presence of riparian habitat	rating		minor	minor	moderate		
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#		0	0	0		
	b) shallow ground water table potential release of contaminants into ground water	rating		major	major	major		
	c) municipal or permitted water supply well(s)	direct / indirect / rating		15 / 17 / moderate	16 /15 / moderate	19 / 17 / moderate		
	d) areas of significant regrading at recharge/discharge areas	#		0	0	0		
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha		0	0	0		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10 : SOUTH CROSSING - EAST SEGMENT (SOUTH)					
				LRY	LSY	LTY	-	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating		high	high	moderate - high		
	b) severance of residential neighbourhoods and rural communities	#		0	0	1 (minor)		
	c) displacement or extraordinary isolation of homes	#/#		8 / 1	10 / 1	11 / 0		
	d) overall effect on access to residential areas and rural communities	rating		moderate (+)	moderate (+)	moderate (+)		
	e) overall degree of disruption to residential communities	rating		moderate	moderate	moderate		
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge		1 (major)/ 0	1 (minor)/ 0	0 / 1		
	g) effect on municipal utility and residential sewage systems	rating		minor	minor	minor		
	h) potential bicycle use	potential		none	none	none		
	i) overall effect on community cohesion	rating		minor (-)	minor (-)	minor (-)		
	j) overall effect on community character	rating		minor	minor	minor		
	k) overall effect on emergency response routes	rating		major (+)	major (+)	major (+)		
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating		good	good	good		
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating		fair - good	good	fair - good		
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating		good	fair	fair		
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA # :11 - 15 dBA # : > 15 dBA		23 13 4	37 14 4	71 21 4		
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#		17	18	25		
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season		43	44	60		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

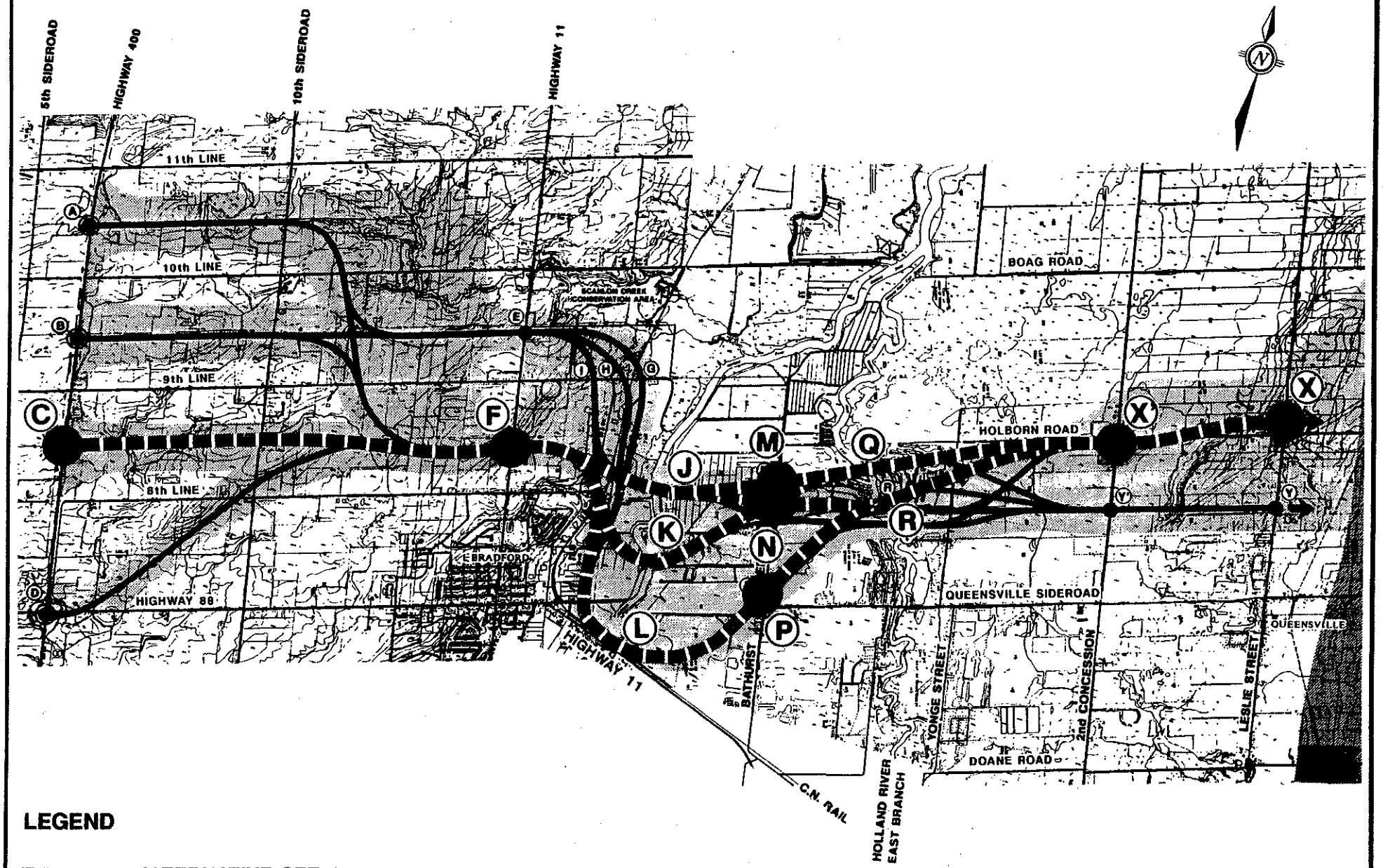
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FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10 : SOUTH CROSSING - EAST SEGMENT (SOUTH)					
				LRY	LSY	LTY	-	-
4 ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha		58.9 / 19.0	58.9 / 19.0	60.8 / 19.0		
	b) loss of Class 3 and 4 agricultural land	ha		11.8	16.9	11.7		
	c) loss of Class 5 and 6 agricultural land	ha		0	0	0		
	d) loss of organic soil	ha		1.3	0.3	0.3		
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #		28.4 / 73.6 / 3	30.2 / 86.4 / 3	32.7 / 90.6 / 3		
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #		3.5 / 21.5 / 1	3.5 / 21.5 / 1	3.5 / 21.5 / 1		
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #		32.4 / 43.4 / 1	32.4 / 43.4 / 1	32.4 / 43.4 / 1		
	h) effect on future flexibility of farm operations	rating		moderate	moderate	moderate		
	i) effect on farm woodlots	rating		minor	minor	minor		
	j) effect on capital investment in agricultural operations	rating		moderate	moderate	moderate		
	k) significant farm operation severances	rating		minor - moderate	minor	minor		
	l) significance of detrimental effects to ongoing viability of farm operations	rating		minor - moderate	minor - moderate	minor - moderate		
	m) significance of detrimental effects to ongoing viability of farm communities	rating		minor	minor	minor		

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10 : SOUTH CROSSING - EAST SEGMENT (SOUTH)					
				LRY	LSY	LTY	-	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha		0	4.7	0		
	b) displacement of commercial businesses	#		1	0	0		
	c) effect on overall access to commercial areas	rating		minor (+)	minor (+)	minor (+)		
	d) effect on highway exposure for commercial areas	rating		none	none	none		
	e) severance of major industrial areas	ha		0	0	0		
	f) displacement of major industries	#		0	0	0		
	g) effect on overall access to major industrial areas	rating		minor (+)	minor (+)	minor (+)		
	h) effect on overall travel time and distance for local manufacturers and shippers	rating		minor	minor	minor		
	i) effects on regional distribution of manufacturing	rating		similar	similar	similar		
	j) overall effect on regional and local economy	rating		minor (+)	moderate - major (+)	major (+)		
	k) significance of overlap with any federal/provincial land use plans and policies	rating		similar	similar	similar		
	l) waste/contamination of properties	#		0	0	0		
	m) significance of property waste/ contamination problems	–		none	none	none		
	n) loss of high potential mineral/ aggregate deposit areas	#		1	1	1		
	o) existing mineral/aggregate operations directly affected	#		0	0	0		
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#		1 (potential)	1 (potential)	1 (potential)		
	b) areas which have a high potential for archaeological sites	#		1	1	1		
	c) severance of related archaeological sites	#		0	0	0		
5.2 Historical	a) historical cultural landscapes	rating		minor - moderate	moderate	moderate		
	b) sites of architectural and/or historical significance directly affected	# / rating		1 (potential)	1 (potential)	1 (potential)		



LEGEND

ALTERNATIVE SET 11

Ministry of Transportation Ontario	**BRADFORD BYPASS:** HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	***FREEWAY ALTERNATIVES*** ***ALTERNATIVE SET 11 :*** ***ALTERNATIVES CARRIED FORWARD (NORTH)***

APPENDIX D

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 11 : ALTERNATIVES CARRIED FORWARD (NORTH)					
			CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120	120	
	b) actual peak hour operating speed	km/h	100	100	100	100	100	
	c) potential slow moving vehicles	km length >2.5%	2.4	2.4	2.6	2.6	2.6	
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a	n/a	
	e) design hour volume (forecast)	DHV	2500 - 3000	2500 - 3000	2500 - 3000	2500 - 3000	2500 - 3000	
	f) peaking characteristics	–	similar	similar	similar	similar	similar	
	g) forecast growth trend	–	similar	similar	similar	similar	similar	
	h) change in traffic volume from existing	–	n/a	n/a	n/a	n/a	n/a	
	i) level of service	A to F	B	B	B	B	B	
	j) number of traffic signals	#	0	0	0	0	0	
	k) passing opportunities	% of length	100	100	100	100	100	
	l) travel time (weighted ; through/local)	minutes/minutes	11.2 / 8.95	11.3 / 9.05	11.8 / 9.20	11.8 / 9.30	13.0 / 9.50	
	m) number of interchanges/intersections	#	5	5	5	5	5	
	n) number of roadway entrances	#	0	0	0	0	0	
	o) pedestrian movement along/ across roadway	potential	none	none	none	none	none	
	p) fixed obstacles within right-of-way	#	0	0	0	0	0	
	q) number of minimun design standard curves	#	0	0	2	2	1	
	r) climatic conditions	rating	similar	similar	similar	similar	similar	
	s) route length	km	15.1	15.3	16.2	16.2	18.1	
	t) energy usage by a vehicle on alternative		25.2	25.5	27.1	27.1	30.2	
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar	similar	similar	
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	major (+)	major (+)	major (+)	major (+)	major (+)	
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	
	c) consistency of design/operation	rating	fair	fair	fair	fair	fair	
	d) continuity of Road Classification	–	yes	yes	yes	yes	yes	
	e) continuity of alignment	–	yes	yes	yes	yes	yes	
	f) continuity of jurisdiction	–	yes	yes	yes	yes	yes	
	g) length of construction period	years	2.5	2.5	2.5	2.5	2.5	
	h) ability to stage implementation of the undertaking	potential	high	high	high	high	high	
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high	high	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 11 : ALTERNATIVES CARRIED FORWARD (NORTH)					
			CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.03	1.00	1.14	1.11	1.14	
	b) operating cost	ratio	1.00	1.01	1.07	1.07	1.19	
	c) maintenance cost	ratio	1.01	1.00	1.14	1.13	1.15	
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	15 / major	15 / major	20 / major	20 / major	27 / major	
	b) permitted surface water intakes affected	#	0	0	0	0	0	
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate	moderate	
	e) presence of warmwater/coldwater communities	# warm / # cold	15 / 0	16 / 0	20 / 0	20 / 0	27 / 0	
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	minor - moderate	minor - moderate	moderate	moderate	minor - moderate	
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	41.7	45.7	51.4	53.4	53.6	
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	moderate - major	moderate - major	moderate - major	moderate - major	moderate - major	
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	35.0	39.0	44.5	46.5	46.5	
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate - major	minor	moderate - major	minor - moderate	minor	
	b) loss of wetland area of all wetlands within study area	ha	18.7	10.1	17.3	10.8	7.4	
	c) degree of interaction of all wetlands with ground water	rating	minor - moderate	minor	moderate - major	minor - moderate	minor	
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	29.6	18.1	31.4	24.0	20.2	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 11 : ALTERNATIVES CARRIED FORWARD (NORTH)					
			CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	15.1	25.6	27.2	33.1	35.8	
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0	0	
	c) encroachment on or severance of ESAs	ha	23.2	23.4	21.1	21.3	27.5	
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0	0	
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no	no	
	f) encroachment on or severance of unusual vegetation units	ha	0.6	0.6	0	0	0	
	g) erosion control on steep slopes	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate	
	h) presence of riparian habitat	rating	minor	minor	minor	minor	minor	
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0	0	
	b) shallow ground water table potential release of contaminants into ground water	rating	moderate - major	moderate - major	moderate - major	moderate - major	moderate - major	
	c) municipal or permitted water supply well(s)	direct / indirect / rating	14 / 17 / moderate	11 / 16 / moderate	9 / 18 / moderate	9 / 20 / moderate	15 / 36 / moderate	
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0	0	
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0	0	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 11 : ALTERNATIVES CARRIED FORWARD (NORTH)					
			CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibilty with municipal official plans and development proposals	rating	medium - high	medium - high	medium	medium	medium	
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	0	0	
	c) displacement or extraordinary isolation of homes	#/#	11/0	7/0	7/0	5/0	9/0	
	d) overall effect on access to residential areas and rural communities	rating	moderate - major	moderate - major	moderate - major	moderate - major	major	
	e) overall degree of disruption to residential communities	rating	moderate	moderate - major	moderate	moderate - major	moderate	
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	1/0	1/0	1/0	1/0	1/0	
	g) effect on municipal utility and residential sewage systems	rating	minor (well)	minor (well)	minor (stp)	minor (stp)	minor (stp)	
	h) potential bicycle use	potential	none	none	none	none	none	
	i) overall effect on community cohesion	rating	moderate (-)	moderate (-)	moderate (-)	moderate (-)	moderate (-)	
	j) overall effect on community character	rating	minor	minor	minor	minor	minor	
	k) overall effect on emergency response routes	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	major (+)	
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	good	good	fair-good	fair-good	fair-good	
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair-good	good	fair-good	fair-good	
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	good	fair-good	fair-good	fair-good	
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA	31	36	34	39	78	
		# :11 - 15 dBA	12	14	12	13	44	
		# : > 15 dBA	4	6	5	7	9	
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	16	20	17	20	53	
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season	43	51	47	51	113	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

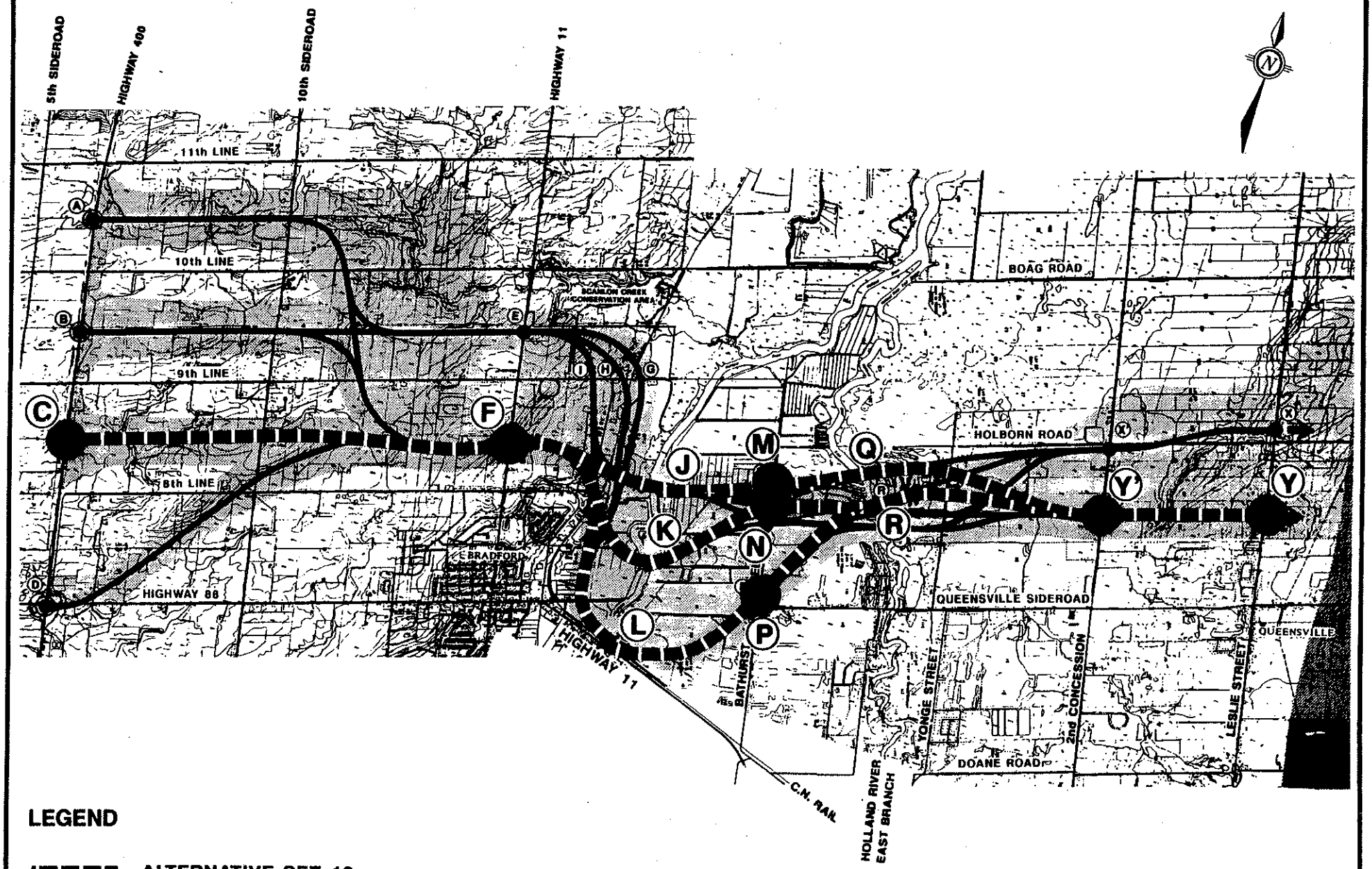
95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 11 : ALTERNATIVES CARRIED FORWARD (NORTH)					
			CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	49.1 / 91.3	58.2 / 91.3	52.4 / 90.5	61.8 / 90.5	84.7 / 90.5	
	b) loss of Class 3 and 4 agricultural land	ha	26.7	22.4	34.2	26.7	16.8	
	c) loss of Class 5 and 6 agricultural land	ha	1.95	1.95	0	0	4.8	
	d) loss of organic soil	ha	12.6	11.8	10.1	9.3	12.8	
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	30.1 / 70.2 / 6	29.5 / 69.1 / 6	28.6 / 62.8 / 5	28.6 / 62.8 / 5	45.5 / 109.9 / 7	
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	26.5 / 60.1 / 4	26.5 / 60.1 / 4	26.5 / 60.1 / 4	26.5 / 60.1 / 4	26.5 / 60.1 / 4	
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	78.6 / 190.2 / 13	78.6 / 190.2 / 13	78.6 / 190.2 / 13	78.6 / 190.2 / 13	78.6 / 190.2 / 13	
	h) effect on future flexibility of farm operations	rating	minor - moderate	minor - moderate	minor	minor	minor	
	i) effect on farm woodlots	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor	
	j) effect on capital investment in agricultural operations	rating	moderate - major	moderate - major	minor - moderate	minor - moderate	moderate	
	k) significant farm operation severances	rating	moderate	moderate	moderate	moderate	moderate	
	l) significance of detrimental effects to ongoing viabilty of farm operations	rating	moderate	moderate	minor - moderate	minor - moderate	moderate	
	m) significance of detrimental effects to ongoing viabilty of farm communities	rating	moderate	moderate	moderate	minor - moderate	minor - moderate	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 11 - ALTERNATIVES CARRIED FORWARD (NORTH)					
			CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	0	0	0	
	b) displacement of commercial businesses	#	2	1	2	1	1	
	c) effect on overall access to commercial areas	rating	major (+)	major (+)	major (+)	major (+)	major (+)	
	d) effect on highway exposure for commercial areas	rating	minor (+)	minor (+)	minor - moderate (+)	minor - moderate (+)	moderate (+)	
	e) severance of major industrial areas	ha	2.8	2.8	7.3	7.3	7.2	
	f) displacement of major industries	#	1	1	1	1	1	
	g) effect on overall access to major industrial areas	rating	major (+)	major (+)	major (+)	major (+)	major (+)	
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	major (+)	major (+)	moderate (+)	moderate (+)	minor (+)	
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar	similar	
	j) overall effect on regional and local economy	rating	major (+)	major (+)	major (+)	moderate - major (+)	moderate - major (+)	
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar	similar	
	l) waste/contamination of properties	#	0	0	1	1	1	
	m) significance of property waste/ contamination problems	–	minor (-)	minor (-)	major (-)	major (-)	major (-)	
	n) loss of high potential mineral/ aggregate deposit areas	#	0	0	0	0	0	
	o) existing mineral/aggregate operations directly affected	#	0	0	0	0	0	
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	1	1	1	1	1	
	b) areas which have a high potential for archaeological sites	#	2	2	2	2	2	
	c) severance of related archaeological sites	#	1(potential)	1(potential)	1(potential)	1(potential)	1(potential)	
5.2 Historical	a) historical cultural landscapes	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor - moderate (-)	
	b) sites of architectural and/or historical significance directly affected	# / rating	0	0	0	0	0	



LEGEND

ALTERNATIVE SET 12

Ministry of Transportation Ontario	**BRADFORD BYPASS:** HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	*FREEWAY ALTERNATIVES* *ALTERNATIVE SET 12 :* *ALTERNATIVES CARRIED FORWARD (SOUTH)*	APPENDIX **D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 12 : ALTERNATIVES CARRIED FORWARD (SOUTH)					
			CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	-
1. TRANSPORTATION								
1.1. Traffic Operations	a) roadway design speed	km/h	120	120	120	120	120	
	b) actual peak hour operating speed	km/h	100	100	100	100	100	
	c) potential slow moving vehicles	km length >2.5%	2.5	2.5	2.7	2.7	2.7	
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a	n/a	
	e) design hour volume (forecast)	DHV	2500 - 3000	2500 - 3000	2500 - 3000	2500 - 3000	2500 - 3000	
	f) peaking characteristics	–	similar	similar	similar	similar	similar	
	g) forecast growth trend	–	similar	similar	similar	similar	similar	
	h) change in traffic volume from existing	–	n/a	n/a	n/a	n/a	n/a	
	i) level of service	A to F	B	B	B	B	B	
	j) number of traffic signals	#	0	0	0	0	0	
	k) passing opportunities	% of length	100	100	100	100	100	
	l) travel time (weighted ; through/local)	minutes/minutes	11.3 / 9.0	11.2 / 9.0	11.7 / 9.25	11.7 / 9.25	12.8 / 9.45	
	m) number of interchanges/intersections	#	5	5	5	5	5	
	n) number of roadway entrances	#	0	0	0	0	0	
	o) pedestrian movement along/ across roadway	potential	none	none	none	none	none	
	p) fixed obstacles within right-of-way	#	0	0	0	0	0	
	q) number of minimun design standard curves	#	0	0	2	2	1	
	r) climatic conditions	-	similar	similar	similar	similar	similar	
	s) route length	km	15.2	15.2	16.1	16.0	17.8	
	t) energy usage by a vehicle on alternative	Ml/yr	25.4	25.4	26.9	26.7	29.7	
	u) effect of alternative on net energy usage on transportation system	–	similar	similar	similar	similar	similar	
1.2 Network Compatibility	a) effect on traffic volumes on parallel/crossing roads	rating	major (+)	major (+)	major (+)	major (+)	major (+)	
	b) effect on traffic operations on parallel/crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	
	c) consistency of design/operation	rating	fair	fair	fair	fair	fair	
	d) continuity of Road Classification	–	yes	yes	yes	yes	yes	
	e) continuity of alignment	–	yes	yes	yes	yes	yes	
	f) continuity of jurisdiction	–	yes	yes	yes	yes	yes	
	g) length of construction period	years	2.5	2.5	2.5	2.5	2.5	
	h) ability to stage implementation of the undertaking	potential	high	high	high	high	high	
	i) ability to upgrade undertaking as warranted by future needs	potential	high	high	high	high	high	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 12 : ALTERNATIVES CARRIED FORWARD (SOUTH)					
			CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	-
1. TRANSPORTATION (cont'd)								
1.3 Cost	a) contruction cost	ratio	1.04	1.00	1.14	1.10	1.13	
	b) operating cost	ratio	1.00	1.00	1.06	1.05	1.17	
	c) maintenance cost	ratio	1.02	1.00	1.14	1.12	1.14	
2. NATURAL ENVIRONMENT								
2.1 Fisheries and Aquatic Habitat	a) water crossings or encroachments by stream order (lakes, rivers/streams, wetlands)	# / rating	13 / major	14 / major	18 / major	18 / major	25 / major	
	b) permitted surface water intakes affected	#	0	0	0	0	0	
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	
	d) effects on critical fish habitat (incl. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate	moderate	
	e) presence of warmwater/coldwater communities	# warm / # cold	13 / 0	14 / 0	18 / 0	18 / 0	25 / 0	
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	minor - moderate	minor - moderate	moderate	moderate	minor - moderate	
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	42.3	43.8	52.0	51.4	51.7	
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	moderate - major	moderate - major	moderate - major	moderate - major	moderate - major	
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	35.6	37.1	45.1	44.6	44.6	
	d) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate - major	minor	minor - moderate	minor - moderate	minor	
	b) loss of wetland area of all wetlands within study area	ha	16.9	10.1	15.5	10.8	7.4	
	c) degree of interaction of all wetlands with ground water	rating	minor - moderate	minor	moderate	minor - moderate	minor	
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	27.7	15.3	28.4	21.1	16.6	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 12 - ALTERNATIVES CARRIED FORWARD (SOUTH)					
			CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	-
2. NATURAL ENVIRONMENT (cont'd)								
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	17.7	24.0	29.8	31.4	34.1	
	b) encroachment on or severance of Life Science ANSIs	ha	0	0	0	0	0	
	c) encroachment on or severance of ESAs	ha	22.0	20.0	20.0	17.8	24.0	
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0	0	
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no	no	
	f) encroachment on or severance of unusual vegetation units	ha	0.6	0.6	0	0	0	
	g) erosion control on steep slopes	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate	
	h) presence of riparian habitat	rating	minor	minor	minor	minor	minor	
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0	0	
	b) shallow ground water table potential release of contaminants into ground water	rating	moderate - major	moderate - major	moderate - major	moderate - major	moderate - major	
	c) municipal or permitted water supply well(s)	direct / indirect / rating	20 / 16 / moderate	19 / 15 / moderate	16 / 16 / moderate	16 / 18 / moderate	22 / 34 / moderate	
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0	0	
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0	0	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.11

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 12 : ALTERNATIVES CARRIED FORWARD (SOUTH)					
			CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	-
3. SOCIAL ENVIRONMENT								
3.1 Community Effects	a) compatibility with municipal official plans and development proposals	rating	medium - high	medium - high	medium	medium	medium	
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	0	0	
	c) displacement or extraordinary isolation of homes	#/#	17 / 0	13 / 1	13 / 0	11 / 1	15 / 1	
	d) overall effect on access to residential areas and rural communities	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	major (+)	
	e) overall degree of disruption to residential communities	rating	moderate	moderate - major	moderate	moderate - major	major	
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	1 / 0	1 / 0	1 / 0	1 / 0	1 / 0	
	g) effect on municipal utility and residential sewage systems	rating	minor (well)	minor (well)	minor (stp)	minor (stp)	minor (stp)	
	h) potential bicycle use	potential	none	none	none	none	none	
	i) overall effect on community cohesion	rating	moderate (-)	moderate (-)	moderate (-)	moderate (-)	moderate (-)	
	j) overall effect on community character	rating	minor	minor	minor	minor	minor	
	k) overall effect on emergency response routes	rating	moderate - major (+)	moderate - major (+)	moderate - major (+)	moderate - major (+)	major (+)	
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	good	good	fair-good	fair-good	fair-good	
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	fair-good	good	fair-good	fair-good	
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups	rating	good	good	fair-good	fair-good	fair-good	
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion	# : 6 - 10 dBA	33	36	36	39	77	
		# :11 - 15 dBA	7	12	7	11	41	
		# : > 15 dBA	4	5	5	6	9	
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	11	17	12	17	50	
	c) noise sensitve receivers which are predicted to experience significant construction noise problems	residence - season	26	34	30	34	96	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

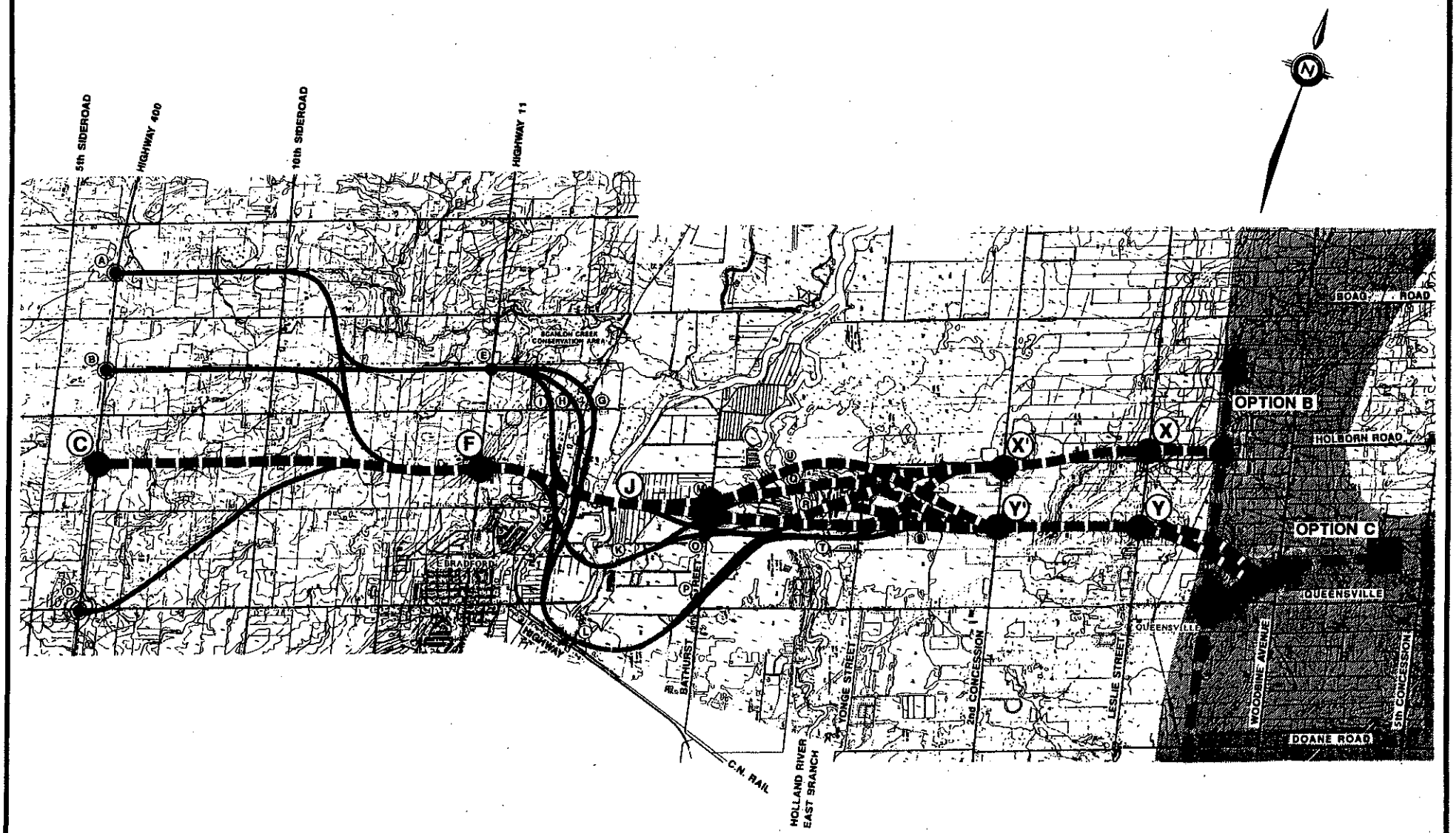
95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 12 : ALTERNATIVES CARRIED FORWARD (SOUTH)					
			CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	-
4. ECONOMIC ENVIRONMENT								
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	32.2 / 101.2	40.3 / 101.2	35.3 / 100.4	43.9 / 100.4	66.9 / 100.4	
	b) loss of Class 3 and 4 agricultural land	ha	32.7	28.4	40.4	32.8	21.8	
	c) loss of Class 5 and 6 agricultural land	ha	2.0	2.0	0	0	4.8	
	d) loss of organic soil	ha	8.2	7.5	6.6	5.0	8.6	
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	21.7 / 60.0 / 5	22.5 / 61.2 / 5	20.2 / 52.6 / 4	21.6 / 54.9 / 4	38.5 / 103.4 / 6	
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	9.3 / 37.5 / 4	9.3 / 37.5 / 4	9.3 / 37.5 / 4	9.3 / 37.5 / 4	9.3 / 37.5 / 4	
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	111.0 / 233.7 / 14	111.0 / 233.7 / 14	111.0 / 233.7 / 14	111.0 / 233.7 / 14	111.0 / 233.7 / 14	
	h) effect on future flexibility of farm operations	rating	minor - moderate	minor - moderate	minor	minor	minor - moderate	
	i) effect on farm woodlots	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor	
	j) effect on capital investment in agricultural operations	rating	moderate - major	moderate - major	minor - moderate	minor - moderate	moderate	
	k) significant farm operation severances	rating	moderate	moderate	moderate	moderate	moderate	
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	moderate	minor - moderate	minor - moderate	moderate	
	m) significance of detrimental effects to ongoing viability of farm communities	rating	moderate	moderate	minor - moderate	minor - moderate	minor - moderate	

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

95.01.27

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 12 : ALTERNATIVES CARRIED FORWARD (SOUTH)					
			CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	-
4. ECONOMIC ENVIRONMENT (cont'd)								
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	0	0	0	
	b) displacement of commercial businesses	#	2	1	2	1	1	
	c) effect on overall access to commercial areas	rating	major (+)	major (+)	major (+)	major (+)	major (+)	
	d) effect on highway exposure for commercial areas	rating	minor (+)	minor (+)	minor - moderate (+)	minor - moderate (+)	moderate (+)	
	e) severance of major industrial areas	ha	2.8	2.8	7.3	7.3	7.2	
	f) displacement of major industries	#	1	1	1	1	1	
	g) effect on overall access to major industrial areas	rating	major (+)	major (+)	major (+)	major (+)	major (+)	
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	major (+)	major (+)	moderate (+)	moderate (+)	minor (+)	
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar	similar	
	j) overall effect on regional and local economy	rating	major (+)	major (+)	major (+)	moderate - major (+)	moderate - major (+)	
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar	similar	
	l) waste/contamination of properties	#	0	0	1	1	1	
	m) significance of property waste/ contamination problems	–	minor (-)	minor (-)	major (-)	major (-)	major (-)	
	n) loss of high potential mineral/ aggregate deposit areas	#	1	1	1	1	1	
	o) existing mineral/aggregate operations directly affected	#	0	0	0	0	0	
5. CULTURAL ENVIRONMENT								
5.1 Archaeological	a) significant archaeological sites directly affected	#	1	1	1	1	1	
	b) areas which have a high potential for archaeological sites	#	2	2	2	2	2	
	c) severance of related archaeological sites	#	1(potential)	1(potential)	1(potential)	1(potential)	1(potential)	
5.2 Historical	a) historical cultural landscapes	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor - moderate (-)	
	b) sites of architectural and/or historical significance directly affected	# / rating	1(potential)	1(potential)	1(potential)	1(potential)	1(potential)	



LEGEND

ALTERNATIVE SET 13

Ministry of Transportation Ontario	**BRADFORD BYPASS:** HIGHWAY 400 TO HIGHWAY 404 EXTENSION ROUTE LOCATION AND PRELIMINARY DESIGN STUDY W.P. 377-90-00	***FREEWAY ALTERNATIVES*** ***ALTERNATIVE SET 13 :*** ***ALTERNATIVES CARRIED FORWARD (SOUTH)***	**APPENDIX D**

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

96.02.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 13 NORTH CROSSING - EAST SEGMENT (NORTH)						
			JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
1. TRANSPORTATION									
1.1. Traffic Operations	a roadway design speed	km/h	120	120	120	120	120	120	120
	b) actual peak hour operating speed	km/h	100	100	100	100	100	100	100
	c) potential slow moving vehicles	km length >2.5%	0.1	0.2	0.1	0.2	0.1	0.2	0.2
	d) change in speed limit from existing	km/h	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	e) design hour volume (forecast)	DHV	3000	3000	3000	3000	3000	3000	3000
	f) peaking	-	similar	similar	similar	similar	similar	similar	similar
	g) forecast growth trend	-	similar	similar	similar	similar	similar	similar	similar
	h) change in traffic volume from existing	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	i) level of service	A to F	B	B	B	B	B	B	B
	j) number of traffic signals	#	0	0	0	0	0	0	0
	k) passing opportunities	% of length	100	100	100	100	100	100	100
	l) travel time (weighted ; through/ local)	minutes/minutes	4.5 / 8.2	4.6 / 8.3	4.6 / 8.4	4.5 / 8.3	4.6 / 8.4	4.5 / 8.3	4.5 / 8.3
	m) number of interchanges/ intersections	#	3	3	3	3	3	3	3
	n) number of roadway entrances	#	0	0	0	0	0	0	0
	o) pedestrian movement along/ across roadway	potential	none	none	none	none	none	none	none
	p) fixed obstacles within right-of-way	#	0	0	0	0	0	0	0
	q) number of minimum design standard curves	#	0	0	0	0	0	0	0
	r) climatic conditions	rating	fair-good	fair-good	good	good	good	good	good
	s) route length	km	10.26	9.11	9.06	8.76	9.08	8.66	8.86
	t) energy usage by a vehicle on alternatives	ratio	13.5	13.7	13.8	13.7	13.8	13.5	13.5
	u) effect of alternatives on net energy usage on transportation system	-	similar	similar	similar	similar	similar	similar	similar
1.2 Network Compatibility	a) effect on traffic volumes on parallel/ crossing roads	rating	major (+)	major (+)	major (+)	major (+)	major (+)	major (+)	major (+)
	b) effect on traffic operations on parallel/ crossing roads	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	c) consistency of design/ operation	rating	fair	fair	good	fair	good	fair	fair
	d) continuity of road classification	-	yes	yes	yes	yes	yes	yes	yes
	e) continuity of alignment	-	yes	yes	yes	yes	yes	yes	yes
	f) continuity of jurisdiction	-	yes	yes	yes	yes	yes	yes	yes
	g) length of construction period	years	2.5	2.5	2.5	2.5	2.5	2.5	2.5
	h) ability to stage implementation of the undertaking	potential	high	high	high	high	high	high	high
	i) ability to upgrade undertaking as warranted by future	potential	high	high	high	high	high	high	high

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

96.02.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 13 NORTH CROSSING - EAST SEGMENT (NORTH)						
			JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
1. TRANSPORTATION (cont'd)									
1.3 Cost	a) contruction and property cost	ratio	1.18	1.09	1.04	1.08	1.00	1.00	1.14
	b) operating cost	ratio	1.18	1.05	1.05	1.01	1.05	1.00	1.02
	c) maintenance cost	ratio	1.02	1.00	1.03	1.16	1.16	1.15	1.35
2. NATURAL ENVIRONMENT									
2.1 Fisheries and Aquatic Habitat	a) water crossing or encroachments by stream order (lakes, rivers/ streams, wetlands)	# / rating	8 / major	6 / major	9 / major	7 / major	7 / major	7 / major	7 / major
	b) permitted surface water intakes affected	#	0	0	0	0	0	0	0
	c) presence of species at risk (rare or endangered)	yes / no	no	no	no	no	no	no	no
	d) effects on critical fish habitat (inc. spawning areas, migratory runs)	rating	moderate	moderate	moderate	moderate	moderate	moderate	moderate-high
	e) presence of warmwater/ coldwater communities	# warm / # cold	8 / 0	6 / 0	9 / 0	7 / 0	7 / 0	7 / 0	7 / 0
	f) degree of interaction with ground water (presence of highly permeable soil)	rating	medium	medium	medium	medium	medium	medium	medium-high
2.2 Wildlife	a) encroachment on or severance of forested vegetation or non-forested successional areas	ha	27.6	21.1	38.1	30.3	31.1	27.6	29.5
	b) encroachment on or severance of greenways and open space linkages (wildlife travel corridors)	rating	major	major	major	major	major	major	major
	c) encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)	ha	16.9	10.9	36.4	18.0	16.7	7.5	38.9
	d) presence of species at risk (rare or endangered)	yes / no	no	no	yes	yes	no	yes	no
2.3 Wetlands	a) loss of function (biological, hydrological, special features) of all wetlands within or adjacent to study area	rating	moderate	minor-moderate	minor	minor	minor	minor	moderate-high
	b) loss of wetland area of all wetlands within study area	ha	12.1	4.6	6.4	1.6	5.8	3.9	17.8
	c) degree of interaction of all wetlands with ground water	rating	medium	medium	low	low	low	low	medium-high
	d) encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetland areas	ha	24.9	14.1	19.7	6.4	11.2	8.1	26.0

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

96.02.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 13 NORTH CROSSING - EAST SEGMENT (NORTH)						
			JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
2. NATURAL ENVIRONMENT (cont'd)									
2.4 Vegetation	a) encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)	ha	15.3	16.8	30.5	29.2	22.8	24.6	14.5
	b) encroachment on or severance of Life Science ANSIs	ha	5.9	0	5.9	0	0	0	0
	c) encroachment on or severance of ESAs	ha	25	16.2	24.1	15.8	13.0	8.9	20.8
	d) encroachment on or severance of Oak Ridge Moraine Planning Area forests	ha	0	0	0	0	0	0	0
	e) presence of significant species or specimens at risk (rare or endangered species)	yes / no	no	no	no	no	no	no	no
	f) encroachment on or severance of unusual vegetation units	ha	0	0	0	0	0	0	0
	g) erosion control on steep slopes	rating	minor (-)	moderate (-)	minor (-)	modetate (-)	minor	moderate (-)	moderate (-)
	h) presence of riparian habitat	rating	minor	minor	minor	minor	minor	minor	minor
2.5 Ground Water	a) ground water recharge underlain by highly permeable soil and unconfined aquifer	#	0	0	0	0	0	0	0
	b) shallow ground water table potential release of contaminants into ground water	rating	major	major	major	major	major	major	major
	c) municipal or permitted water supply well(s)	direct/indirect / rating	14 / minor	18 / minor	10 / minor	14 / minor	20 / minor	17 / minor	12 / minor
	d) areas of significant regrading at recharge/discharge areas	#	0	0	0	0	0	0	0
2.6 Geology	a) encroachment on or severance of Earth Science ANSIs	ha	0	0	0	0	0	0	0

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

96.02.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 13: NORTH CROSSING - EAST SEGMENT (NORTH)						
			JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
3. SOCIAL ENVIRONMENT									
3.1 Community Effects	a) compatibilty with municipal official plans and development proposals	rating	high	high	high	high	high	high	high
	b) severance of residential neighbourhoods and rural communities	#	0	0	0	0	0	0	0
	c) displacement or extraordinary isolation of homes	#/#	12 / 0	13 / 0	8 / 0	13 / 0	11/ 1	13 / 1	13 / 0
	d) overall effect on access to residential areas and rural communities	rating	moderate (+)	moderate (+)	moderate (+)	moderate (+)	moderate (+)	moderate (-)	moderate (+)
	e) overall degree of disruption to residential communities	rating	minor (+)	neutral	neutral	minor (-)	neutral	minor (-)	neutral
	f) overall effect on major community facilities/institutions/parks	# within r.o.w. / # outside row but within 250m of r.o.w. edge	2 major/ 0	2 major/ 0	2 moderate-major / 0	2 moderate-major / 0	2 minor-moderate/ 0	2 minor-moderate / 0	2 minor/ 0
	g) effect on municipal utility and residential sewage systems	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	h) potential bicycle use	potential	none	none	none	none	none	none	none
	i) overall effect on community cohesion	rating	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)	minor (-)
	j) overall effect on community character	rating	minor	minor	minor	minor	minor	minor	minor
	k) overall effect on emergency response routes	rating	major (+)	major (+)	major (+)	major (+)	major (+)	major (+)	major (+)
3.2 Aesthetics	a) total aesthetic quality of the existing landscape in the vicinity of each route alternative	rating	minor	minor	minor	minor	minor	minor	minor
	b) future aesthetic quality based on scenic views of the surrounding area from the route	rating	good	good	fair - good	good	fair-good	good	good
	c) future aesthetic quality based on negative views of the route from areas of sensitive viewer groups/ # of residences with view of highway	rating / #	minor / 27 - 32	minor / 55 - 60	minor / 30 - 35	minor / 50 - 55	minor / 30 - 35	moderate / 48 - 52	minor / 50 - 55
3.3 Noise	a) noise sensitive receivers which are predicted to experience increases in sound levels 5 dBA above existing ambient conditions, 10 years after project completion assuming 30,000 AADT	#	27	54	61	95	64	88	42
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55 dBA, 10 years after project completion	#	19	7	13	11	18	13	4
	c) noise sensitive receivers which are predicted to experience significant construction noise problems	residence - season	49	42	51	43	59	56	27

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

96.02.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 13 / NORTH CROSSING - EAST SEGMENT (NORTH)						
			JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
4. ECONOMIC ENVIRONMENT									
4.1 Agriculture	a) loss of Class 1 and 2 agricultural land/ loss of Class 1 Complexes	ha / ha	33.4 / 5.9	22.4 / 20.6	39.3 / 6.0	27.7 / 20.1	32.9 / 19.0	22.4 / 19.4	21.7 / 20.1
	b) loss of Class 3 and 4 agricultural land	ha	11.4	13.6	16.3	18.9	23.5	32.4	7.6
	c) loss of Class 5 and 6 agricultural land	ha	0	0	0	0	0	0	0
	d) loss of organic soil	ha	11.4	12.7	5.8	11.25	11.7	8.5	7.7
	e) specialty crop operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	14.2 / 35.0 / 6	19.0 / 37.2 / 5	16.1 / 29.9 / 6	18.5 / 36.4 / 5	28.0 / 40.9 / 10	29.6 / 45.4 / 6	20.2 / 35.1 / 5
	f) dairy / livestock operations affected: (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	0 / 0 / 0	3.0 / 6.1 / 1	0 / 0 / 0	2.2 / 6.0 / 1	8.4 / 16.1 / 3	32.8 / 29.1 / 4	3.0 / 2.5 / 1
	g) field crop operations affected : (area directly impacted / total area potentially impacted / number of properties)	ha / ha / #	21.7 / 29.4/ 1	21.8 / 32.2 / 1	18.9 / 17.45 / 1	22.4 / 30.4 / 1	53.3 / 64.1 / 10	32.8 / 41.5 / 6	26.9 / 36.2 / 1
	h) effect on future flexibility of farm operations	rating	moderate	moderate - high	moderate	moderate - high	moderate	moderate	moderate - high
	i) effect on farm woodlots	rating	minor	minor	minor	minor	minor	minor	minor
	j) effect on capital investment in agricultural operations	rating	moderate	moderate - major	moderate - major	moderate - major	moderate - major	moderate	major
	k) significant farm operation severances	rating	low - moderate	moderate	moderate	moderate	minor	moderate	moderate
	l) significance of detrimental effects to ongoing viability of farm operations	rating	moderate	moderate	moderate	moderate	moderate	moderate	moderate
	m) significance of detrimental effects to ongoing viability of farm communities	rating	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate	minor - moderate

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY
SUMMARY OF ANALYSIS

96.02.13

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 13 : NORTH CROSSING - EAST SEGMENT (NORTH)						
			JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
4. ECONOMIC ENVIRONMENT (cont'd)									
4.2 Commercial/Industrial	a) severance of commercial areas	ha	0	0	11	11	22	22	0
	b) displacement of commercial businesses	#	2	2	1	1	0	0	0
	c) effect on overall access to commercial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)	minor-moderate (+)	minor-moderate (+)	minor-moderate (+)
	d) effect on highway exposure for commercial areas	rating	none	none	minor (+)	minor (+)	moderate (+)	moderate (+)	moderate (+)
	e) severance of major industrial areas	ha	0	0	0	0	0	0	0
	f) displacement of major industries	#	0	0	0	0	0	0	0
	g) effect on overall access to major industrial areas	rating	minor (+)	minor (+)	minor (+)	minor (+)	minor (+)	minor (+)	minor (+)
	h) effect on overall travel time and distance for local manufacturers and shippers	rating	minor (+)	minor	minor (+)	minor	minor (+)	minor	minor
	i) effects on regional distribution of manufacturing	rating	similar	similar	similar	similar	similar	similar	similar
	j) overall effect on regional and local economy	rating	moderate (+)	minor (+)	minor (+)	minor (+)	moderate (+)	moderate (+)	minor (+)
	k) significance of overlap with any federal/provincial land use plans and policies	rating	similar	similar	similar	similar	similar	similar	similar
	l) effect on area recreation/tourism	rating	major (-)	major (-)	moderate (-)	moderate (-)	moderate (+)	moderate (+)	moderate (+)
	m) waste/contamination or properties	#	0	0	0	0	0	0	0
	n) significance of property waste/ contamination problems	--	none	none	none	none	none	none	none
	o) loss of high potential mineral/ aggregate deposit areas	#	0	1	0	1	1	1	1
	p) existing mineral/aggregate operations directly affected	#	0	0	0	0	0	0	0
5. CULTURAL ENVIRONMENT									
5.1 Archaeological	a) significant archaeological sites directly affected	#	1	1 (potential)	1	1 (potential)	1 (potential)	1 (potential)	1 (potential)
	b) areas which have a high potential for archaeological sites	#	1	1	1	1	1	1	1
	c) severance of related archaeological sites	#	1(potential)	0	1(potential)	0	0	0	0
5.2 Historical	a) historical cultural landscapes	rating	moderate	moderate	moderate	minor - moderate	moderate	minor-moderate	moderate-major
	b) sites of architectural and/or historical significance directly affected	# / rating	0 / -	1 (potential)	0 / -	1 (potential)	1 (potential)	1 (potential)	1 (potential)

APPENDIX E

Selected Correspondence Minutes from Meetings and Newspaper Articles

Ontario

COPY

Ministry of Natural Resources | Ministère des Richesses naturelles

P.O. Box 7400
10401 Dufferin St.
Maple, Ontario
L6A 1S9

Our Ref: 8538.8.520.Y

December 3, 1996

DEC 12 1996

Environmental Section
Central Region
Ministry of Transportation
Atrium Tower, 5th Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Attention: Terry Steele

Dear Sirs:

SUBJECT: Alignment of Bradford By-pass - East Holland River

Thank you for meeting staff of this office on site on November 12, 1996, and for providing the four geometric designs sent to us by McCormick Rankin resulting from that field meeting.

We have reviewed the four presented concepts and have ranked them in order according to the resource principles of MNR.

The concept most desired by MNR is "Concept D". Our reasons for ranking this option high is that: \ renamed Concept C

1. It follows to the greatest extent possible the areas previously disturbed.

2. It takes the alignment north on the west side of Bathurst Street which ensures that the wetland area south of the existing Trussler Road right of way will be least disturbed.

3. It presents the least disturbance to forest and wetland habitat.

4. The span water course crossings will minimize disturbance to the river channel and productive wetland margins. However, the requirement for mitigation or compensation will be determined under the Federal Fisheries Act and through the MTO/MNR Fisheries Accord at the detailed design stage.

.../2

We hope these comments are of value, and we look forward to continuing to work with you on this project. We are also attaching a copy of Concept D.

Yours truly,

<Original signed by>

T.C. Smith
Area Supervisor, York/Metro
Greater Toronto Area District, Maple

CT:IB/sb

Attachment.

cc: McCormick Rankin, 2655 North Sheridan Way, Mississauga, Ont. L5K 2P8, Attn: Steve Schijns
Ecoplans Ltd., 81 Hollinger Cres, Kitchener, Ont. N2K 2Y8, Attn: Cam Kitchen

Ministry of Citizenship, Culture and Recreation

77 Bloor St W
Toronto ON M7A 2R9

Ministère des Affaires civiques, de la Culture et des Loisirs

77 rue Bloor O
Toronto ON M7A 2R9

Ontario

Cultural Programs Branch
Archaeology and Heritage Planning Unit
Tel: (416) 314-7146 Fax: (416) 314-7175

MINISTRY OF TRANSPORTATION
RECEIVED
NOV 26 1996
PLANNING OFFICE
CENTRAL REGION

20 November 1996

Steve Jacobs
Senior Project Manager
Planning Office, Central Region
Ministry of Transportation of Ontario
3rd Floor, Atrium Tower
1201 Wilson Avenue
Downsview ON M3M 1J8

RE: Highway 400 - Highway 404 Extension Link, Bradford Bypass

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This office has previously indicated its concerns for cultural heritage resources that may be impacted by this project by letters of August 22, 1994, and April 23, 1996. Further review based on information concerning the preferred alternative has emphasised the high potential of this project for impacting cultural heritage resources.

Using the available heritage databases and mapping in this office, and following consultation with several parties, including several professional archaeologists, and based on the information received, it has been determined that this project has the potential to cause impacts to cultural heritage resources. This determination is based on the crossing of the Lake Algonquin strandline at two or more points, the proximity of the corridor to several reported archaeological sites from the late eighteenth and early nineteenth century, the crossing of the Holland River and East Holland River and several minor watercourses, topography suitable for settlement, and a lack of modern disturbances.

In general, the area around and along the lower reaches of the Holland River was the scene of much activity in the late eighteenth and early nineteenth centuries, including visits by Governor Simcoe, activities associated with the War of 1812, and activities associated with First Nations occupation of the area including cemeteries and gift giving sites. The Holland Marsh represents an embayment of glacial Lake Algonquin and as such is an area of high potential for the recovery of evidence concerning the earliest

42-054

human occupation (11,000 year before present) of the province by PaleoIndian peoples. This area has been a focus of travel and transportation including the terminus of the prehistoric and early historic Rouge Portage, the terminus of the original Yonge Street, and the site of a great deal of early historic shipping activity between Holland Landing and the mouth of the Holland River.

Given the generally high potential of the area around the lower reaches of the Holland River, and thus the high potential for impacts to cultural heritage resources to be caused by this project, this Ministry recommends that archaeological assessment for this project take place as soon as practicable. Documenting any archaeological sites that may be present as soon as possible will permit a greater range of mitigative options to be considered. Such early documentation will further prevent any emergencies arising around the discovery of any highly signficant site(s) shortly before the commencement of construction. It is expected that such an initiative and any further archaeological work will as usual comply with the policies and procedures contained in A Protocol for Dealing with Archaeological Concerns on Ministry of Transportation Undertakings.

It is recommended that any archaeological assessment include thorough and comprehensive background research regarding the cultural heritage resources along the proposed corridor. This will necessarily include consultation regarding any undocumented sites or related information with the numerous researchers that have worked in the area over the past several decades. Extensive historical archival research will be necessary to identify any potential locations for early historical archaeological sites.

Should you wish to discuss this matter further, please do not hesitate to contact me.

Sincerely,

<Original signed by>

Malcolm Horne
Heritage Planner

c. Steve Schijns, McCormick Rankin, 2655 North Sheridan Way, Mississauga ON L5K 2P8
David LaDell, 20866 Yonge Street, R.R. #1, Newmarket ON L3Y 4V8

MINUTES OF MEETING

HIGHWAY 400 - HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) EA STUDY

Time: 9:00 a.m., Friday, November 1, 1996

Place: Lake Simcoe Region Conservation Authority Offices, Newmarket

Attendees:

Mike Walters	LSRCA
Reinie Bos	LSRCA
Tom Hogenbirk	LSRCA
Steve Jacobs	MTO Planning Office
Heather Pearson	MTO Environmental
Len Kozachuck	Cole Sherman (part time)
Deborah Martin-Downs	Gartner Lee (part time)
Steve Schijns	McCormick Rankin
Tim Mereu	McCormick Rankin

Purpose: Review of Technically Preferred Routes for 404 Extension and Bradford Bypass.

Discussion:

Mr. Jacobs outlined the study process and schedule, noting that the plans had already been presented to most Councils and that public consultation sessions were schedule for the next four weeks. Presubmission review and submission of both EAs is anticipated by mid 1997.

Mr. Kozachuck presented the 404 Extension plans (related discussion not minuted here).

Mr. Schijns recapped the analysis of alternative routes for the Bradford Bypass, highlighting the constraints associated with the two crossings of the Holland River. Mr. Mereu described his analysis of the hydrologic impact of various structure lengths, noting that the unusual flow regime of the Holland Marsh area under regulatory flood conditions was difficult to model, precisely using traditional (i.e. HEC-2) programs. A range of spans, depending on the model used and on the level of acceptance backwater increase, was calculated.

LSRCA staff noted that, for EA purposes, it would be most appropriate to work on the basis of zero increase in upstream flood level, or at least zero increase in the associated impacts (i.e. expansion

of the flooded area to affect additional homes than would otherwise be impacted by a regional flood). It was agreed that, because of the complexity of the situation, a detailed hydrologic study would be needed at the time of detail design in order to avoid either over- or under-sizing the structures. The basic principle to be committed to in the EA would be that "all road crossings are to be capable of passing the peak flow generated by a Regional storm without impacting upstream development".

Mr. Mereu noted that, because of the magnitude of the flood flows, provision of additional spans/culverts across the roadway at intermediate points would be ineffective in reducing flood levels. It was also noted that in the event of a Regional flood, most upstream roads (Highway 11, Queensville Sideroad, etc.) would be flooded, leaving the Bypass as a key unsevered east-west link.

Mr. Jacobs discussed the fact that some additional property could be acquired in the process of preparing the route plan; if not needed for highway purposes it would be allowed to revert to wetland.

With respect to quality control of highway runoff, it was agreed that commitment to current Best Management Practices might be inappropriate for such a (potentially) long-term project. Rather, a commitment to applying the "best practices of the day" at the detail design stage was agreed upon.

Conservation Authority staff requested:

- study information package, as distributed to the public
- route evaluation summary report
- digitally mapped route plan to apply to their own base)
- brochure #5 advertising the upcoming PCSs

It was agreed that LSRCA staff would be provided with a presubmission draft of the EA report as soon as it is available, rather than awaiting simultaneous presubmission review with the 404 study report.

Minutes prepared by,

McCORMICK RANKIN

<Original signed by>

Steve Schijns, P. Eng.

SS/sl
cc: Attendees
T. Steele, MTO

Ministry of Citizenship, Culture and Recreation
77 Bloor St W
Toronto ON M7A 2R9

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77 rue Bloor O
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Ontario

Cultural Programs Branch
Archaeology and Heritage Planning Unit
Tel: (416) 314-7146 Fax: (416) 314-7175

23 April 1996

APR 2 6 1996

S. Schijns
McCormick Rankin
2655 North Sheridan Way
Mississauga ON L5K 2P8

RE: Environmental Assessment Study, Highway 400 - Highway 404 Link, Bradford Bypass

---

A principal concern of this office is the adverse effects that undertakings such as the above mentioned may have on cultural heritage resources. If a preferred alternative is determined to have the potential to have an impact on cultural heritage resources, then this office would recommend that a cultural heritage resource assessment be prepared as part of the Environmental Assessment. If any significant cultural heritage features are identified, then any negative impacts would have to be mitigated by either avoidance or documentation.

Using the available heritage databases and mapping in this office, it has been determined that the preferred alternative, as indicated in your letter of February 27, 1996, has a high potential for causing impacts to cultural heritage resources. This determination is based on the crossing of several watercourses, proximity to wetlands, soils, topography suitable for settlement, and an absence of modern land disturbance. There are no registered archaeological sites within the proposed corridor. However, this does not affect the determination of potential since there has been very little documented archaeological work in this area.

Consequently, this Ministry recommends, subsequent to the acceptance of the preferred alternative, that the proponent carry out a cultural heritage resource assessment of the areas to be impacted by any construction activities and mitigate, through avoidance or documentation, adverse impacts to any significant cultural heritage resources found. No demolition, grading, filling, or any form of soil disturbances, should take place on the subject property prior to the issuance of a letter from the Ministry of

42-054

Citizenship, Culture and Recreation indicating that all heritage resource concerns have met licensing and resource conservation requirements.

We regret any inconvenience caused by the delay in our comments. Should you wish to discuss this matter further, please do not hesitate to contact me.

Sincerely,

<Original signed by>

Malcolm Horne
Heritage Planner

c. Steve Jacobs, Senior Project Manager, Planning Office, Central Region, Ministry of Transportation, 3rd Floor, Atrium Tower, Downsview ON M3M 1J8

Lake Simcoe Region Conservation Authority

120 BAYVIEW PARKWAY, BOX 282, NEWMARKET, ONT. L3Y 4X1

CHAIRMAN: MS. M. PEARCE
VICE-CHAIRMAN: MS. B.L. VANDERPOST
C.A.O.: MS. D. GAYLE WOOD
SEC.-TREASURER: MS. M.E. HUNTER

TELEPHONE: NEWMARKET (905) 895-1281
OAK RIDGES (905) 773-6482
FAX (905) 853-5881

Via Facsimile Only

March 12, 1996

Mr. Stephen Schijns, P. Eng.
McCormick Rankin
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Sir:

Re: Bradford Bypass - February 20, 1996 Meeting

I have reviewed the copy of the draft minutes for the above mentioned meeting and ask that you revise the section dealing with Authority concerns to reflect the following:

1) The flood plain of the Holland River **in the vicinity of the Holland Marsh** is quite broad and therefore flood proofing methods are given consideration in reviewing permit applications in this area.

2) This policy is generally applied to existing lots of record. Creation of new lots within the flood plain is not permitted unless a portion of the lot is above the regulatory flood level and this portion is large enough to support construction of the proposed building(s) and services.

3) Each permit application is reviewed on its own merits. Safe access, depth of flooding and flow velocities are all important considerations within the review process.

Should you have any questions regarding the above, please do not hesitate to contact the undersigned.

Yours truly,

<Original signed by>

Tom Hogenbirk, P.Eng.
Conservation Engineer

/ak

ACAO

HIGHWAY 400 - 404 LINK (BRADFORD BYPASS) EA STUDY

MINUTES OF MEETING

EXTERNAL TEAM MEETING NO. 4

TIME: 1:30 p.m., Tuesday February 20, 1996

LOCATION: 3rd Floor Boardroom, Atrium Tower, MTO Downsview

ATTENDEES:

Steve Jacobs	-	MTO Central Region Planning Office
Rinaldo Rossi	-	MTO Central Region Planning Office
Terry Steele	-	MTO Central Region Environmental Section
Tracy Smith	-	OMNR GTA District Office (Area Supervisor, York North)
Roy Alkema	-	OMNR- Midhurst District Office (Resource Planner)
Sharon Johnston		OMAFRA - Land Use Planning Branch (District Manager, Central Ontario)
Victor Doyle	-	OMMAH - Plans Administration Branch (Planner, Central and Southwest)
Tom Hogenbirk	-	Lake Simcoe Region Conservation Authority
Cam Kitchen	-	Ecoplans
John Sutherns	-	McCormick Rankin
Stephen Schijns	-	McCormick Rankin

PURPOSE: Review of Technically Preferred Route and initiation of Preliminary Design phase of study.

Mr. Jacobs introduced Mr. Schijns, who reviewed a large scale plan of the route alternatives (attachment A). The following key points were noted:

- study underway since 1993
- Environmental Assessment Proposal (draft 1993, final 1994) set out study process, study area, need and justification, and evaluation criteria.
- alternative corridors were considered, most recently focusing on Highway 9 - Green lane near Newmarket; Bradford corridor confirmed as most appropriate for protection of right-of-way (100m) for a four lane rural freeway between Highway 400 and a planned northerly extension of Highway 404
- consideration would be given to implementing the freeway with an initial two lane stage within the right-of-way
- Significant study area constraints affecting route development and evaluation include:

    - developed areas (Bradford, River Drive Park, Queensville)
    - settlement pattern (concession road grid, rural lot lines, rural subdivisions)
    - Class One wetlands (associated with both branches of the Holland River)
    - vegetation (woodlots)
    - agriculture (muck farming near Bathurst Street, turf farms near Second Concession, mixed farming elsewhere)
    - physiography (glacial Lake Algonquin Shoreline, rolling topography west of Highway 11)
    - recreational development (marinas, Silver Lakes Golf Course)
    - interchanges (400, 11, Bathurst, Leslie, 404)

- Route alternatives were evaluated in groups, using criteria defined in Environmental Assessment Proposal. The evaluation reflected trade-offs among transportation, natural environment, social and economic factors.

- Five evaluation results were produced for each group:

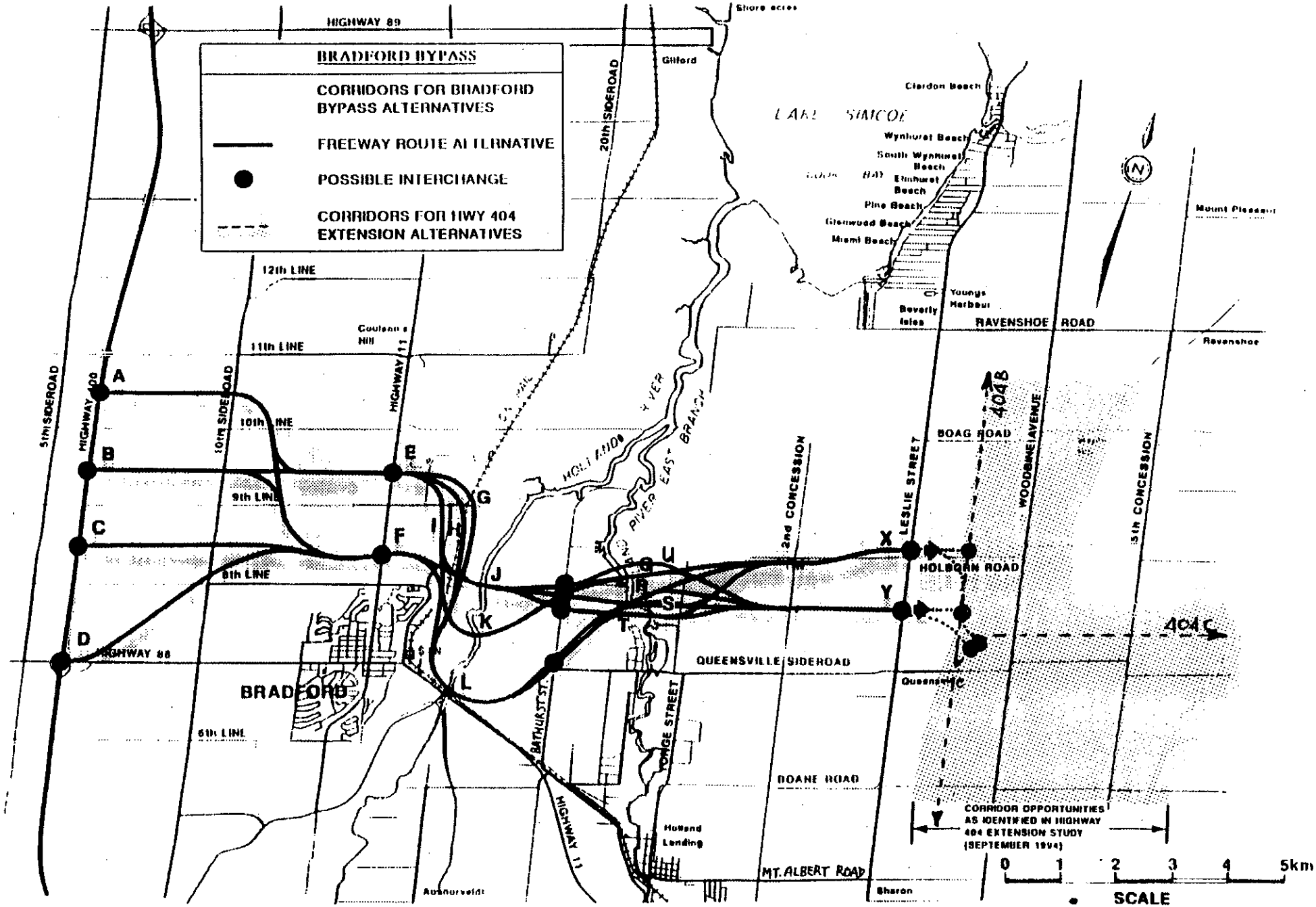
    - using criteria weights provided by the public (sample of 50 questionnaires returned during 1994) and relative and absolute numeric scores defined by the Project Team.

    - using criteria weights assigned (independently from the public) by the Project Team and both relative and absolute numeric scores defined by the Project Team.

    - "stated preference" qualitative judgement by Project Team members (independent of numeric weighting - scoring results)

- The "Technically Preferred Alternative" determined by the Project Team is CFJSY (see Attachment A), connecting to either of the two Highway 404 options east of Queensville. This preference will be presented for review by municipalities, agencies and the public, and may change as a consequence of such input. A final route decision will be made only following completion of the Third round of public review, anticipated for late spring 1996.

- Preliminary Design will proceed on the preferred route (subject to confirmation), the intent being to have a fourth and final review period in fall 1996 at which the plan for which approval will be sought will be discussed with interested parties (see schedule, Attachment B).

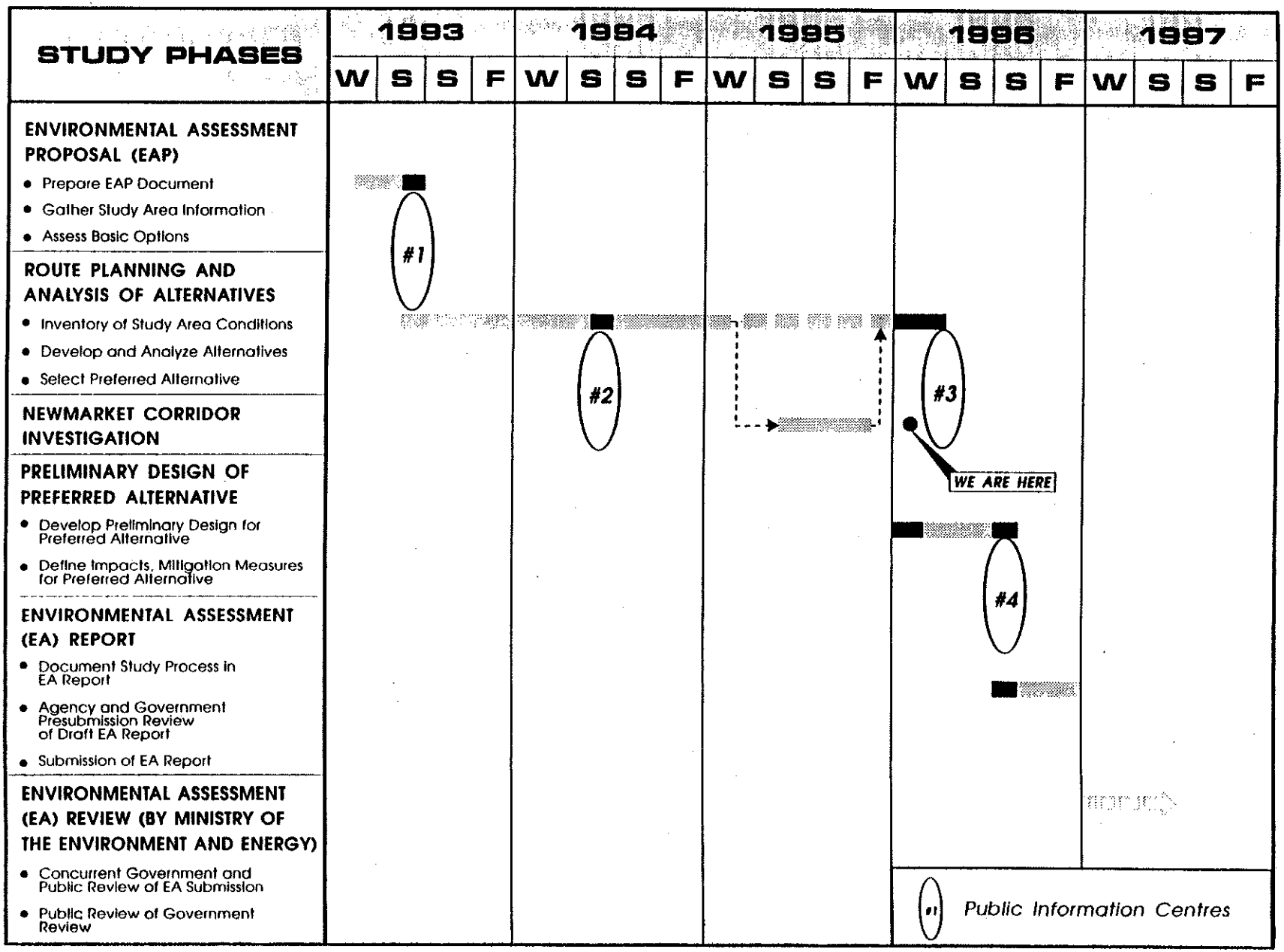


ROUTE ALTERNATIVES

ATTACHMENT A

HIGHWAY 400-HIGHWAY 404 LINK STUDY
STUDY PHASES AND SCHEDULE

ATTACHMENT B
EXTERNAL TEAM MEETING
FEB. 20, 1996



- Filing of the Environmental Assessment Report for approval would follow, in sync with the parallel Highway 404 Extension EA report.

- preliminary scale plans of the preferred alternative are available for review by External Agencies.

Following the presentation, discussion focused on questions and issues raised by the attendees as follows:

Ministry of Natural Resources - GTA District (Tracy Smith)

- the crossing of the Main Branch of the Holland River appears to be consistent with previous MTO commitments to crossing wetlands only in areas of previous disturbance and on structure

- an understanding of the number, size and location of severed properties with potential for the reversion to wetland would be appreciated

- the proposed Bathurst Street interchange appeared to be new (S. Schijns noted that an interchange had always been shown at that location, including on plans previously reviewed by MNR)

- scale plan of technically preferred route to be provided to MNR for review and comment

Ministry of Natural Resources - Midhurst District (Roy Alkema)

- preferred route appears to be logical and reasonable

Ministry of Agriculture, Food and Rural Affairs (Sharon Johnston)

(Mr. Kitchen reviewed agricultural issues, noting that west of the Holland River, the preferred route passed generally along the back lot line of large cash crop and investor-owned properties. Between the Holland River branches the vegetable farming was on sandy soils, not "black soil", while turf farming dominated between Yonge Street and the old beach ridge to the east. Above the ridge, mixed farming occurs, with some ownership by numbered companies).

- the preferred route largely avoids marsh farming and respects the back lot lines, therefore there should be no problems from an agricultural perspective provided mitigation is in place.

Ministry of Municipal Affairs and Housing (Victor Doyle)

- Do the Bradford Bypass and Highway 404 extension studies use the same evaluation criteria and weights ?
  (Mr. Schijns reported that the criteria are identical, as defined in the Environmental Assessment Proposals for each project; the weights may differ somewhat in order to reflect different concerns and issues affecting the two study areas)

- Why were other corridors looked at? (Alternative corridors were assessed to both reflect the requirement of the EA Act that "all reasonable alternatives be considered", and to reflect public input).

- Why rule out the Highway 9 - Green Lane corridor ? (Bradford corridor preferred for a freeway in terms of highway network expansion, ease of construction, relationship to municipal land use plans and avoidance of residential areas; Highway 9 - Green lane upgrading is needed for local access and traffic relief but cannot accommodate local and long distance travel demand in the long term. The Corridor Comparison Study (December 1995) can be referred to on this topic).

- What are the major origins and destinations served by the proposed new road ? (Traffic modelling indicates commuter travel demand being primarily from Barrie and other origins north on Highways 400 and 11 crossing over to the 404 corridor, for distribution to employment areas in Newmarket, Aurora, Richmond Hill and Markham, and conversely from the south shore of Lake Simcoe (Keswick, Pefferlaw etc.) and beyond crossing to Highway 400 and moving south as far as Metro Toronto. Local motorists such as those in Bradford and Holland Landing would also use the facility. Although not modelled with detail due to lack of reliable data, recreational trips would also be attracted to the route as being the only continuous high-standard roadway linking the two north-south freeways north of Highway 407).

- What is timing of property acquisition ? (Upon approval of the EA, the right of way would be designated for future roadway needs, but actual acquisition of the necessary property would not normally occur until two or three years prior to construction.
  There is currently no schedule for construction).

- What are the municipal perspectives on the proposal ? (York - supportive, per O.P ; Simcoe - no position; defer to local municipality; Bradford West Gwillimbury - both interested and concerned, with general support (can be reflected in imminent O.P. update); King - no position, only small portion of township crossed; East Gwillimbury - accepting of principle but concerned about social impacts).

Lake Simcoe Regional Conservation Authority (Tom Hogenbirk)

- main concern is flood control; they will be looking for calculations/modelling to demonstrate no adverse effect on floodlands (Analysis will be undertaken during the Preliminary Design Stage and reviewed with the Authority)

- the Holland River flood plain in the vicinity of the Holland Marsh is quite broad, therefore, floodproofing (e.g. minimum sill elevations) is given consideration in reviewing permit applications rather than prohibiting all development in the area. Creation of new lots entirely within the floodplain is not permitted. Other considerations include access, flooding depth and flow velocity.

Minutes prepared by

McCormick Rankin

<Original signed by>

S. Schijns, P. Eng.

SS:jlh

McCORMICK RANKIN
CONSULTING ENGINEERS AND PLANNERS

PROJECT: Highway 400/404 Link (Bradford Bypass) EA Study

OUR FILE: W.O. 2341-91

DATE: December 8, 1995

FROM: Steve Schijns

RE: Meeting with Glenn Higgins, MOEE EA Reviewer

COPY TO: S. Jacobs, T. Steele

A meeting was held with G. Higgins, attended by S. Jacobs, T. Steele, R. Rossi and P. Reynolds of MTO and S. Schijns and J. Sutherns of McCormick Rankin. The reason for the meeting was to provide MOEE with an opportunity to comment on the study process followed to date, including the review of alternatives such as the Newmarket corridor.

Mr. Higgins confirmed that the study process used to date appeared satisfactory and in conformity with the EA Act. Potential changes in the EA administrative process were discussed. It was suggested that a letter to Environment Canada (Tom Hewitt/Keith Grady) requesting confirmation of the project's status under EARP/CEAFA be sent. Mr. Steele will do this.

Explaining issues such as affordability and the relationship with new Highway 407 were suggested as part of the EA report. Mr. Higgins noted that the final EA report would ideally be a very brief (eg. 20 pages) outline of how the proponent followed the planning process, with related material appended.

Canadian Coast Guard / Garde côtière canadienne

Fax. 905-823-8503

P.O. Box 1000,
Prescott, Ontario.
K0E 1T0

Your file / Votre référence

Our file / Notre référence
8200-95-6021

April 7 1995

ENTERED EDP
ON 12/96

McCormick Rankin,
2655 North Sheridan Way,
Mississauga, Ontario.
L5K 2P8

Attn: Mr. Steve Schijns, P. Eng.

Dear Mr. Steve Schijns:

Re: Proposed Bradford Bypass Bridge

Reference is made to your letter of December 21, 1994 and our subsequent conversations concerning the above.

After meeting with the large marina operators on the river and measuring the height of numerous customers vessels, I can advise that the proposed vertical clearance of 22.5' above water level 718.83' GSC (as per our letter of October 27, 1977 to Ministry of Transportation, Ontario) is still considered acceptable for this location. The horizontal clearance should be increased to a minimum of 65' from our earlier recommendations. This is due to the increased traffic and the increasing beam of the vessels.

Please keep my office informed of the design and environmental assessment as this project proceeds.

You will note that formal approval under the Navigable Waters Protection Act is required for this bridge.

If you have any questions, please call me at (613) 925-2865 ext. 255.

Yours truly,

<Original signed by>

A. Robertson,
NWP Officer,
Canadian Coast Guard,
Prescott, Base.

cc. EMAP

NOTES OF MEETING

BRADFORD BYPASS

Our File: W.O. 2341-91

Time & 9:00 a.m., Thursday, February 2, 1995

Place: MTO Downsview

Present:	Chuck Penstone	Silver Lakes Golf Club
	Brian Plazek	Consultant to Silver Lakes and Affected Property Owner
	Steve Jacobs	MTO
	John Hughes	Hemson
	Cam Kitchen	Ecoplans
	Tim Mereu	McCormick Rankin
	John Sutherns	McCormick Rankin

Purpose: To discuss the effects of the presently identified Bradford Bypass alternatives on Mr. Penstone's and Mr. Plazek's properties.

NOTES OF MEETING:

Mr. Plazek and Mr. Penstone described their property using three panels:

- overview panel - attached in reduced form
- enlargement of Mr. Plazek's property
- aerial oblique photo of both properties

The following aspects of the two properties were noted:

- Mr. Penstone owns the Silver Lake Golf and Country Club.
  - property was purchased in late 1960s
  - plan approved at that time for combination of houses and golf course but not implemented due to fiscal constraints
  - started work on the present plan in 1988 and wanted both houses and golf course but houses not permitted (land abutting Yonge Street not developed for golf course in case housing approval becomes available in future)

- "$2.5 million invested" and "$7-8 million spent" on the course (not specifically stated but presume that the $2.5 million is Mr. Penstone's own capital and the balance is loans)

- the course is built on 155 acres of a 250 acre parcel: the river frontage and a large section at the northwest corner of the parcel were excluded from development by MNR/LSCA

- golf course seen as long term plan (Mr. Penstone referred to St. Andrews as an example of his long term aspirations). Mr. Penstone is 67 and sees his family taking over in the future. He referred to 4 daughters, two of whom work on the course (the office manager and the public relations officer).

- anticipated public use until 2,000± when the course may go private

- 75 annual fee members ($2,000/annum) are registered at the present

- golfers are distributed approximately 50% Metro (Highway 404 a big plus) and 50% local

- Mr. Penstone uses local contractors to the greatest extent possible and has injected $1.5 million into local businesses

- the club has 4 full time employees and employs approximately 40 part time staff - largely students at $10±/hour

- the existing club house is 7,000 square feet and was built with the possibility of adding a further 7-9,000 square feet at some future date

- Mr. Penstone carries out an active mosquito spraying plan

- the course is an 18 hole, 6900 yard course with a 72 par

- the course was designed to be walked but carts are available

- Mr. Penstone anticipates that the course could accommodate 6-700 members and he estimated that if it were a private club, typical fees could be $15,000 equity plus $2,000 annual fee

- Mr. Plazek owns the parcel of land abutting the south of the golf course.

  - the west half of the property is 100 metres wide (north to south) and the east half provides sufficient width for a driveway to Yonge Street

  - there is a house (1,800 square feet) near the river which is occupied by the golf course's greens superintendent (no residential accommodation is permitted on the golf course)

  - Mr. Plazek has approval from the Conservation Authority to use the existing house for office and club house purposes. He also has Authority approval to replace the existing house with a new one, set closer to Yonge Street.

  - Mr. Plazek also has approval from MNR to dredge for a dock (12 berth) and marina access to his property from the Holland River

  - Mr. Plazek indicated the concept of a joint development of his and Mr. Penstone's property so that the golf course could gain river access. As part of the joint venture Mr. Plazek also indicated the possibility of a mini-putt and an enlarged pond on his property.

Mr. Plazek observed that it was not the intention to fight the highway but rather to work with it. He reviewed a plan (reduced copy attached) that illustrated a modified version of alternative S - modified to reduce the impacts on the river crossing by requiring a small section of the southwest corner of the golf course. Mr. Plazek presented four overhead slides (copies attached) that compared the modified S with alternative R (referred as Q and R on the attachments), in terms of natural, social and economic effects as well as cost differences.

Discussion of the project included the following items:

- Mr. Penstone is strongly opposed to any route that would take his golf course out of operation. He does not believe that there is a comparable parcel of land for golf course development in the area. He believes that there is space on his property to re-orient some holes if a partial taking is required. He would like to see the highway either at the south or the north side of his property and could work towards a revised course layout if partial takings were required by either a north side or south side option.

- Mr. Penstone noted that he would like to work towards a mutually satisfactory solution. He also noted that he has written to several politicians expressing his concerns and has also spoken to the mayor who advised Mr. Penstone that he had no knowledge of the fact that there were proposals to remove the golf course.

- Mr. Plazek noted that alternative S would completely remove his property. He also noted that although alternative R would not physically require his property, it would undoubtedly result in backwater effects on his property that would make it unviable.

- It was noted that no hydraulic calculations have been carried out for the effects of the highway on the floodplain. In general terms Mr. Plazek noted that the Hurricane Hazel storm would result in approximately 5' of water above the typical elevation of the golf course and his property.

- It was noted that there is very little peat on the golf course lands except adjacent to the river.

- The effects of noise on golf course operations was discussed and it was observed that there are many locations where golf courses and roadways co-exist. Glen Abbey was cited as an example.

- It was agreed that Mr. Penstone would meet with Mr. Hughes to further discuss the economic implications of the highway on the golf course.

In conclusion, it was agreed that the Ministry would reflect the information provided in their evaluation and would maintain dialogue as the project proceeds.

Minutes Prepared By,

McCORMICK RANKIN

<Original signed by>

John S. Sutherns, P. Eng.

JSS/ss

cc: S Jacobs
T. Steele
C. Kitchen
J. Hughes


Highland
Branch
STRINE
DIVIDE
WEST OF YONGE STREET
ROAD
QUEENSVILLE

COMPARISON OF ALTERNATIVE ROAD ALIGNMENTS
BRADFORD BYPASS

CRITERIA		ROAD ALIGNMENT	
		S	Q & R
A)	SOCIAL IMPACTS		
(i)	Businesses Lost	Nil	18 Hole Golf Course
(ii)	Lost Employment - Permanent - Temporary	 Nil Nil	 5 20-25
(iii)	Permanent Dwellings Impacted Upon - Within Alignment - Adjacent to	 2 3	 NIL 2
(iv)	Town Lost Yearly Revenue (Taxes) - Golf Course - Residential Dwellings	 Nil $7,000	 $50,000 $3,000
(v)	Tourist Revenue to Community - Loss of one of few tourist attractions in area	Would improve with time	Immediate Loss
(vi)	Mosquito Control Problem	Improve with time	Worsen with time
(vii)	Flood Hazard Benefits	Remove 2 dwellings from Floodplain. Potentially 5 structures could be removed from floodplain.	Nil
(viii)	Impact on future development	Low Town supports Queensville Plan. Needs recreational attractions to support plan.	High Removal of a top class facility makes the sale of such a proposal less attractive.

COMPARISON OF ALTERNATIVE ROAD ALIGNMENTS
BRADFORD BYPASS

CRITERIA	ROAD ALIGNMENT	
	S	Q & R
B) ENVIRONMENT IMPACTS		
(i) East of Yonge Street		
• Landuse affected	- Route traverses agricultural land (eg. sod farm) and a small woodlot.	- Route traverses environmentally sensitive area
• ESA (Reclassification will increase level of significance of area designated "forest".	- Route follows permeter of ESA	- ESA split into two separate units.
• Groundwater	Minimal impact on shallow groundwater system.	- Road would intercept shallow and possibly deep groundwater system regime.
• Wildlife Habitat	- Low Impact	- High Impacts Lost habitat and noise pollution
• Wildlife Corridors	- Low, minimal impact on forested area	- High, large ESA isolated due to road barrier
• Overall impact on Ecological condition of ESA	- Low	- High
(ii) West of Yonge Street • Landuse affected.	- Residential lots (2), golf course operation (Minor Impact) and approved golf course development plan on Plazek property. It is noted that the proposed road would follow an existing road alignment.	- Existing Golf course and approved golf course development plan on Plazek property.

COMPARISON OF ALTERNATIVE ROAD ALIGNMENTS
BRADFORD BYPASS

CRITERIA	ROAD ALIGNMENT	
	S	Q & R
C) ECONOMIC		
(i) Purchases Required - Residential - Golf Course	2 - One hole to be replaced with minor changes to others. - Loss of approved development plans (Private Club house, new residential dwelling, docking facilities and mini putt on Plazek property)	Nil - Complete buyout including loss of approved plan for private club house, residential dwelling, docking facilities and mini putt on Plazek property.
(ii) Required Structures • Yonge Street	- Overpass or ongrade access to Yonge Street.	- Ongrade access.
• Crossing of Holland River	- Crossing at bend.	- Crossing at bend
	Note: Both river crossings are similar in detail.	

COMPARISON OF ALTERNATIVE ROAD ALIGNMENTS
BRADFORD BYPASS

CRITERIA	ROAD ALIGNMENT	
	S	Q & R
D) COST COMPARISON • Required Acquisitions Residential (Within Alignment)	800,000	–
• Golf Course Operation (Existing and planned)	2,000,000	$40,000,000 - $50,000,000
• Required Structures • Yonge Street Crossing • Holland River Crossing	1,000,000 3,000,000	300,000 3,000,000
Total	6,800,000	$43,300,000 - $53,300,000

Note: If all residential dwellings adjacent to the proposed alignment S was purchased (to minimize social impacts) then the added cost would be $1,200,000. These structures could however be resold to recover the loss.

Conclusions:

(1) From social, enviromental, hydraulic and economic viewpoints, Alignment S represents the preferred alternative. The loss of a golf course such as that being proposed for Alignments Q and T will have a long term impact on the Town of East Gwillimbury.

(2) With Alignment S two of the key landowners are willing to enter into fair negotiations with MTO. As the point of crossing the Holland River is a critical factor in identifying the preferred alignment our expressed willingness to negotiate will help to expedite and ensure completion of the Bradford bypass project.

MINUTES OF MEETING

Project:	Bradford Bypass Environmental Assessment Study	
Our File:	W.O. 2341-91	
Time:	1:30 p.m., Tuesday, January 10, 1995	
Place:	MNR offices, 10401 Dufferin Street, Maple, Ontario	
Attendees:	Steve Jacobs	MTO, Central Region Planning
	Terry Steele	MTO, Central Region Environmental
	Tracy Smith	MNR, York North Area Supervisor
	Ian Buchanan	MNR, York North Area Biologist
	Kevin Reese	MNR, York North Area Forester
	Steve Schijns	McCormick Rankin
	Laurie Wood	Ecoplans
Purpose:	MNR Review of Preferred Route recommendation, as part of third round of review.	

DISCUSSION:

Mr. Jacobs opened with a summary of the study progress to date, noting that alternative Bradford Bypass routes had been developed on the principles defined in previous MNR discussions. Mr. Smith agreed that the alternatives shown (plan attached) were valid in that respect.

Mr. Jacobs stated that it was intended to present the evaluation process and the Project Team's preferred route to agencies, municipalities and the public over the next two months, then to move into preliminary design and EA submission for the recommended route. It was noted that a comprehensive public involvement program had been carried out, and that study area residents were aware of the project. Two community groups - H.E.A.R.T. in Bradford and F.R.O.G.S. in River Drive Park had hosted public meetings on the topic.

Mr. Schijns then discussed the constraints, alternatives, evaluations and recommendations, concluding with a segment-by-segment rationale for route C-F-J-R being the preferred plan. At the east end, the selection of a route via X or Y is deferred pending definition of route alternatives for the Highway 404 Extension. The documentation of the evaluation process, when completed, will be provided to MNR.

Discussion focused on the two crossings of the Holland River. While from a wetlands point of view Mr. Buchanan preferred crossing K which skirted the wetlands associated with the Holland River, and Mr. Smith preferred the southern most crossing L, they recognized the drawbacks of each and accepted the rationale for crossing J as a preferred route. Similarly, no concerns were expressed with crossing R of the Holland River East Branch. Examples of areas which could conceivably revert to wetland function following highway construction include several portions of the Silver Lakes Golf Course and the Bradford Business Park.

It was agreed that the definition of the wetland boundary and hence bridge abutments for both crossings would need closer study and field review as part of the Preliminary Design stage; MNR staff are to be involved in that work by the consultants. Mr. Smith noted that the river crossings were largely in areas of previous disturbance and were justifiable in terms of MNR's Wetlands Policy.

At Mr. Smith's request, Mr. Schijns agreed to make the 1:5000 scale display panels available for MNR's internal review; MNR is to contact McCormick Rankin in advance when needed.

Mr. Jacobs stated that no further MNR input was required at this time, but that further discussions would occur as part of the Preliminary Design phase of the study, following the public review period in February.

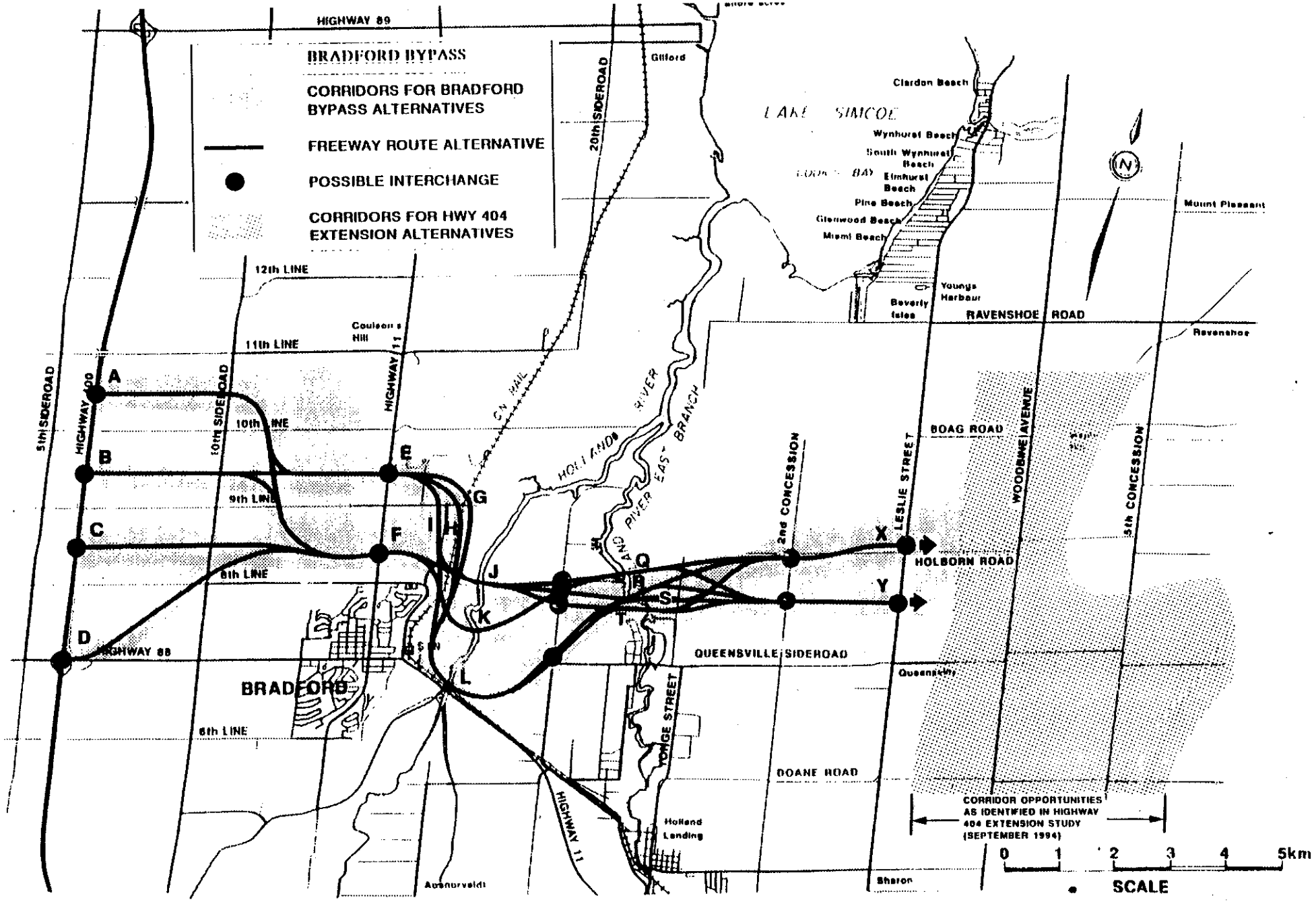
Minutes Prepared By,

McCORMICK RANKIN

<Original signed by>

S. Schijns, P. Eng.

SS/ss
cc: attendees
Chris Tschirhart, MNR
Glen Hooper, MNR



ROUTE ALTERNATIVES

ATTACHMENT B

McCORMICK RANKIN
CONSULTING ENGINEERS

MEMO TO FILE

PROJECT: Bradford Bypass

OUR FILE: W.O. 2341-91

DATE: November 30, 1994

PREPARED BY: S. Schijns

CC: S. Jacobs, MTO
T. Steele, MTO

RE: Meeting with owners/operators of Albert's Marina, Bathurst Street

---

Messrs. Schijns and Jacobs met Richard and Bob Wyszatko to discuss the impact of the Bypass route alternatives on the Marina. They were aware of the study but had not participated directly to date.

The Marina is a family business, begun with the purchase of land by their father in the 1950s. In season, 250-350 boats dock at the Marina, along with some transient use. An equivalent amount of ground boat storage space is required in the winter. Some boats are live-aboard, while other owners stay in campers or trailers on site; most users stay at the marina throughout the weekend in summer, essentially acting as a "floating campground". In this sense it is distinct from urban marinas where there is no camping. There is a restaurant, clubhouse, retail operation (new and used boats) workshops and storage building on site, and the families live on site above the office. There are 4 family members employed full-time and another 4-8 in the various jobs on site. Peak seasonal employment rises to 15-20 persons.

Further growth opportunities include a larger permanent trailer park (in the cleared areas stretching to Bathurst Street), additional docking space (up to the 700-1000 boat capacity of the site), a shift of the retail operation out to the Bathurst Street frontage, possible motel/townhouse units, and additional recreational facilities (mini-golf, etc.). Richard stated that municipal permits to make such improvements had not been forthcoming despite their requests.

A property price of $2-2.5 million could be inferred from the fact that the Trent-Holland Marina nearby recently sold under power of sale for $800,000. Albert's Marina is a significantly larger and more viable operation.

Comments on the alternative routes focused on the impact on the property, its operations, and its potential development. Both Richard and Bob were of the view that Route Q would put the Marina out of business, due to the property impact, the effect on the vital north channel, and the proximity to boaters who wished to camp overnight as well as to the permanent residents of the property. A slight shift to the north (into the wetlands, if it were possible) would not mitigate the impact and would be unacceptable to them. Additional concerns were the retention of access from Bathurst Street and the provision of adequate vertical clearance (greater than the Coast Guard - designated minimum of 22') to accommodate large motor cruisers on the Holland River itself.

The need and justification for the Bypass was fully supported, and a preference for Route T was given, on the basis that it avoided both the Marina and the Golf Course and recognized their significant contribution to the local economy and tax base. The brothers had strong reservations about Routes R and S but recognized that the Marina would remain functional and intact, although its development potential could be affected.

Albert's Marina

CONVERTIBLE BOAT TOPS

21019 Bathurst Street North
River Drive Park
Ontario L9N 1A8

TEL: (905) 836-4125
FAX: (905) 836-4125

SS:lva

WOODBINE AVENUE
QUEENSVILLE
LESLIE STREET
2nd CONCESSION
YONGE STREET
RIVER
CH
BATHURST
HIGHWAY 11
MATCHLINE
MATCHLINE
MATCHLINE
HOLLAND
RIVER
th LINE
X
Y
L
K
M
N
O
P
Q
R
S
T

Ministry of Agriculture and Food
Ministère de l'Agriculture et de l'Alimentation
Ontario

LAND USE PLANNING BRANCH

322 Kent Street West
Lindsay, Ontario
K9V 2Z9
(705) 324-6125
Fax (705) 324-1638

McC. Rec'd.

October 18, 1994.

ENTERED EDP
11/22/94

Terry Steele
Environmental Planner
Ministry of Transportation
"Atrium Tower", 5th Floor
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Steele:

Re: Draft Report, August 1994
Natural Environment-Existing Conditions and Data Sources
Bradford Bypass Highway 400 to Highway 404 Extension

In reply to your letter of September 14, 1994 to Sharon Johnston, the Ministry of Agriculture and Food has had an opportunity to review the above report and have the following comments on the proposed data that would be used to evaluate agricultural impacts.

This technical report provides soil capability mapping, 1992 agricultural land use mapping compiled by Ontario Hydro as well as an extensive description of the soils. The report correctly indicates that organic soils are not classified by the Canada Land Inventory system and that there are extensive speciality crop farms within the study area. These speciality crop areas should have appropriate weighting to reflect their productivity and the level of capital investment in these farm areas.

The Bradford Bypass study is being conducted concurrently with the Highway 404 Extension study. That study will incorporate a number agricultural indicators. The Ontario Ministry of Agriculture, Food and Rural Affairs recommends that identical agricultural criteria be used in both studies. For this reason, staff recommend the agricultural data indicators currently being developed for your Ministry for the Highway 404 Extension be employed in this study.

Ontario, there's no taste like home
Un bon goût de chez nous
FOOD LAND ONTARIO

An item of primary relevance are the official plan designations of the affected municipalities. The process should attempt to locate corridors outside Agriculture designations or reduce the agricultural impact of corridors located partially in an agricultural designation. Those impacts will include loss of the physical resource, loss of farm investment, fragmentation, resulting changes in farming patterns due to access.

A secondary level evaluation can measure the impact of potential roadways on existing agricultural operations that are located in a non-agricultural designation.

If you have any questions or would like to discuss the matter further, please contact me at the above address.

Yours truly,

<Original signed by>

Dale Toombs
Land Use Specialist

cc: Sharon Johnston, District Manager

400-404.DT

Simcoe County District Health Unit
25 King Street South, COOKSTOWN, Ontario, LOL 1L0

P. O. Box 24 (705)458-1103

January 25, 1994

McCormick Rankin
2655 North Sheridan Way
MISSISSAUGA, Ontario
L5K 2P8

FEB - 2 '94

Attention: Steve Schijns.

Dear Mr. Schijns:

Re: Bradford Bypass Environmental Assessment Study

The Initial Draft Environmental Assessment Proposal for the Bradford Bypass has been reviewed.

Primary concerns of this Agency include the impact of road widening on wells and sewage disposal systems.

Concerns regarding the natural environment including wet lands, groundwater and surface water would have to be addressed by the appropriate agencies.

We would appreciate being kept informed of the review process.

You may forward any correspondence to my attention.

Should there be any questions, do not hesitate to call.

Yours truly,

<Original signed by>

Bill Kemeny, C.P.H.I.(C).,
Public Health Inspector
Environmental Health Services
COOKSTOWN.

cc: to file

:lt

MINUTES OF MEETING

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY

Time: 9:00, Thursday, December 16, 1993

Place: Ministry of Natural Resources' Office, Maple

Attendees:

Tracy Smith	MNR
Chris Tschirhart	MNR
Glen Hooper	MNR
Ian Buchanan	MNR
Sharon Johnston	OMAF
Steve Jacobs	MTO
Fred Leech	MTO
Terry Steele	MTO
Steve Schijns	McCormick Rankin

Purpose: Follow up to proposed definition of study area boundaries as outlined in MNR letter of October 28, 1993.

DISCUSSION

Mr. Leech recapped the developments which led to the definition proposed by MNR of the study area for roadway alternatives in their letter of October 28, 1993. Mr. Schijns highlighted some of the constraints posed on developing reasonable alternatives through the narrow "throat" in the CN Rail / Eighth Line vicinity, chief among them being the presence of a closed sanitary landfill site on the north side of Eighth Line and the municipal sewage treatment plant to the east of the tracks (currently amidst EA preparation for a doubling of its capacity).

Mr. Leech requested that MNR staff consider accepting an enlargement of the "throat" area so that an alternative east-west crossing of the Holland River in roughly the Eighth Line - Hochreiter Road axis could remain under consideration. Alternatively, a defensible rationale for the definition of the study area as outlined by MNR would be needed for inclusion in the EA report.

Mr. Smith reiterated MNR's concerns about the potential impact on the wetlands of any roadway, including that of an elevated roadway. Mr. Hooper highlighted the fragmentation of wetlands as a concern. In response to MNR's request for a more detailed understanding of the condition of the affected portion of the study area (i.e. south of Eighth Line corridor), it was noted that Ecoplans had reviewed the area and had presented the available information at the previous meeting, and that MNR staff would be welcome to join Ecoplans staff on future field assessments of the area. MNR will be notified in advance of scheduled field visits.

Ms. Johnston stated that the study area as originally defined (i.e. with a northern limit at approximately the Holborn Road right-of-way) was acceptable to OMAF, and that they would have no concerns with the study area revisions proposed by Mr. Leech. It was further noted that, with the organic soils becoming depleted south of Hochreiter Road, agriculture in that area was changing from muck farming towards more traditional crops and practices.

Mr. Leech reminded the attendees of the MTO's willingness to consider property acquisition for the purposes of reverting to or improving as wetland function, as part of the mitigation measures associated with a new road crossing. Ms. Johnston stated that it would be preferable, if that occurred, that productive agricultural land not be acquired for that purpose. Mr. Smith expressed MNR's continuing interest in the MTO approach.

In consideration of the above, and after some discussion, Mr. Smith and the MNR staff agreed that the study area for reasonable roadway alternatives as outlined in the letter of October 28, 1993 would be revised to allow consideration of alternatives in the Eighth Line - Hochreiter Road corridor, and that this would be documented in a letter to MTO early in January. (It was recognized and agreed that the analysis of impact of alternatives would extend in the order of one half concession beyond the limits of the actual area of reasonable route alternatives.)

Mr. Schijns noted that there would be continuing review with MNR as alternatives are developed and assessed in the Holland River area over the course of the study, and Mr. Leech committed to ensuring that any plans taken to the public would be reviewed with MNR staff in advance.

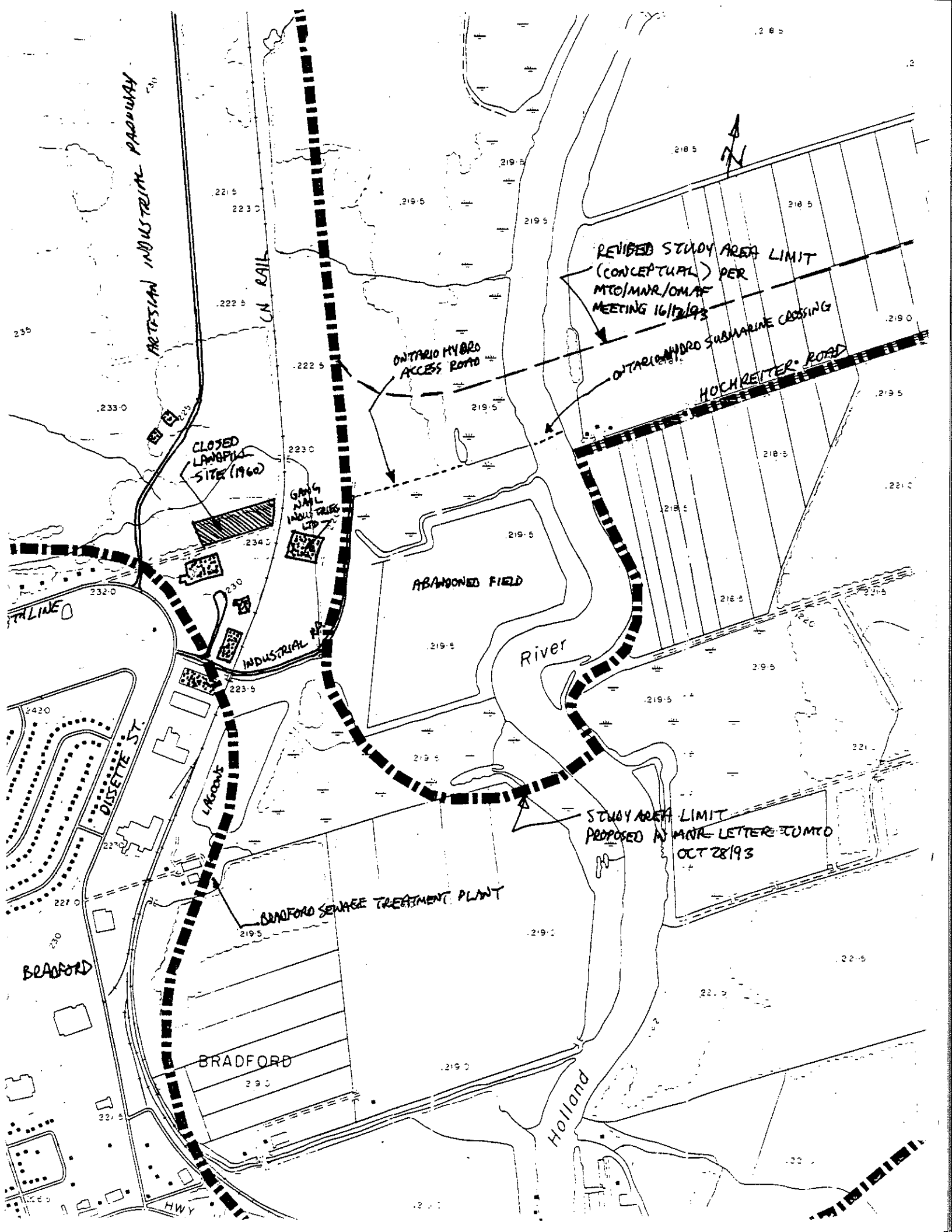
Mr. Smith retained McCormick Rankin's 1:10,000 study area display plan for use in internal presentations; the Consultant is to be notified when it can be returned.

Minutes prepared by:

<Original signed by>

S. Schijns, P. Eng.
McCORMICK RANKIN

SS/nc
cc: All Attending
Dr. C. Kitchen - Ecoplans Ltd.


ARTESIAN INDUSTRIAL PARKWAY
CN RAIL
REVISED STUDY AREA LIMIT (CONCEPTUAL) PER MTO/MNR/OMAF MEETING 16/12/93
ONTARIO HYDRO ACCESS ROAD
ONTARIO HYDRO SUBMARINE CROSSING
HOCHREITER ROAD
CLOSED LANDFILL SITE (1960)
GANG NAIL INDUSTRIES LTD
ABANDONED FIELD
INDUSTRIAL RD
River
DISSETTE ST.
LAGOONS
STUDY AREA LIMIT PROPOSED IN MNR LETTER TO MTO OCT 28/93
BRADFORD SEWAGE TREATMENT PLANT
BRADFORD
BRADFORD
Holland
HWY

McCORMICK RANKIN
CONSULTING ENGINEERS

MEMO TO FILE

PROJECT: Bradford Bypass Environmental Assessment

OUR FILE: W.O. 2341-91

DATE: Thursday, November 4, 1993

RE: Meeting with Sharon Johnston, District Manager, Central Ontario, Land Use Planning Branch, OMAF (10:00 a.m., 4/11/93)

BY: Steve Schijns, McCormick Rankin

CC: Steve Jacobs, MTO
Fred Leech, MTO
Cam Kitchen, Ecoplans

All of the above noted met to review the Bradford Bypass study at MTO's request. The background, rationale, needs, and constraints which have led to the study area currently identified in the Holland Marsh area were reviewed, with particular attention to MNR's position regarding intrusion on Class One wetlands. The potential for any new route to affect agricultural lands was noted. Ms. Johnston supported the draft EAP as written, and did not envision OMAF as being "absolute" or definitive when it came to taking agricultural land; a "least impact" approach, once the need and justification had been established, was the standard OMAF position. The idea of acquiring "extra" land (possibly agricultural) for reversion to wetland function, as part of the overall project, was broached by MTO; OMAF has not had that issue arise before, and will consider it.

Ms. Johnston will review the situation with field staff in the Marsh area, and a second meeting, to include MNR staff, was arranged for the morning of Monday, November 29, 1993.

SS/ss

Ministry of Natural Resources
Ontario

Ministère des Richesses naturelles

P.O. Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

October 28, 1993

Mr. Fred Leach
Ministry of Transportation
Environmental Planning and Design
Area 1 Central Region
4th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Dear Mr. Leach:

SUBJECT: Route Planning and Study Area Selection
Environmental Assessment Studies for the
Bradford By-Pass

I am writing in response to our October 14, 1993 meeting where you asked us to review the proposed study area for the Bradford by-pass in the vicinity of the Holland Marsh. As you requested, we have reviewed the material which you left with us and have refined the boundaries of the study area to reflect our program concerns.

To best illustrate our position, I am attaching an OBM mosaic with our refined boundary plotted on it. You will note that we have eliminated some of the proposed study area and added others. We have done so based on the principals to which we agreed in our meeting. For example – we do not feel that the two crossings of the Holland river on the west side of the study area could be done without significant loss of wetland values regardless of the construction techniques applied.

Our position was that we could accept some additional disturbance in existing disturbed areas and that we may be able to get some net gain through the judicious use of acquired property. Without the ability to foresee all the possibilities with respect to acquired property, we have applied these principles and recommend the attached study area.

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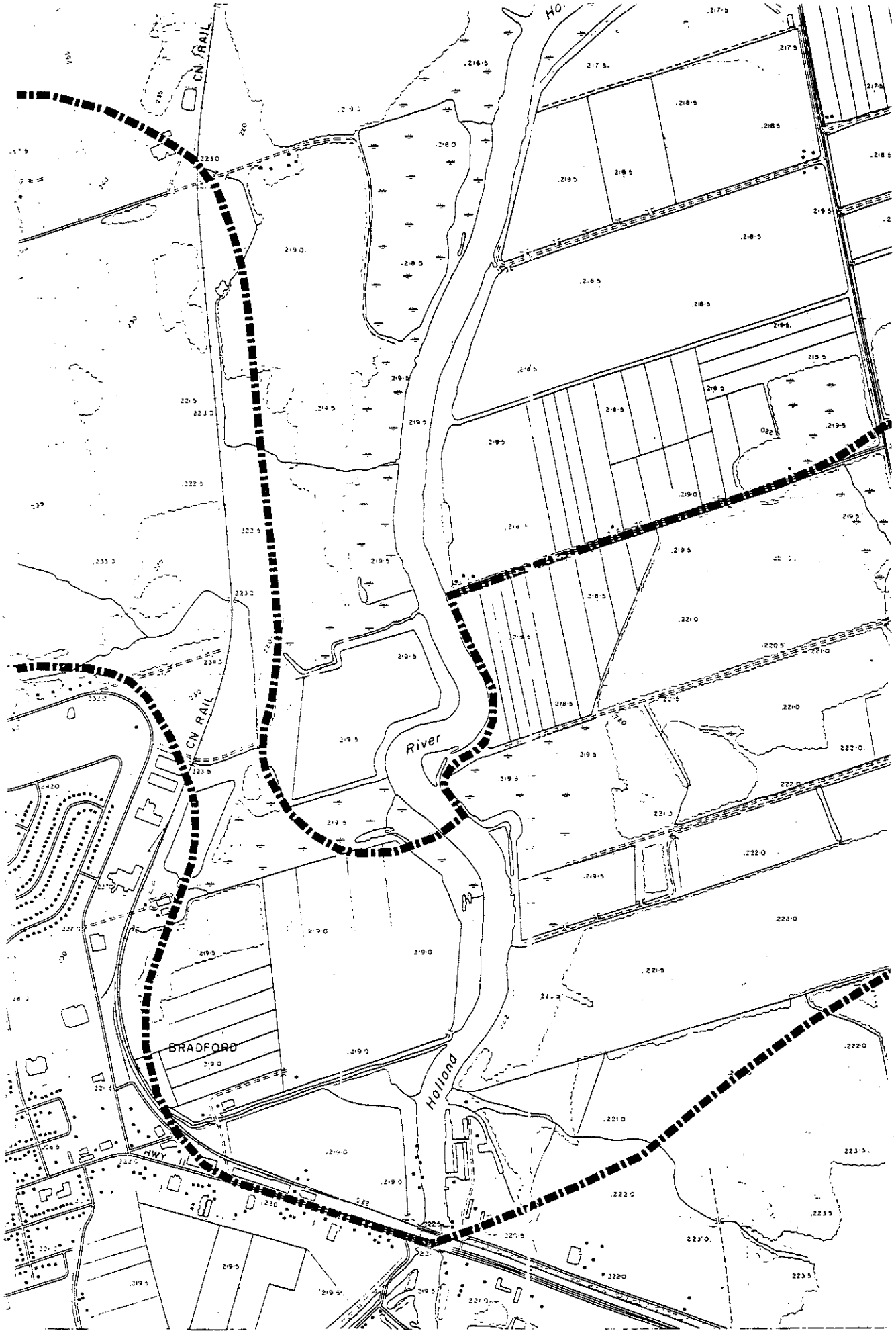
I would be happy to sit down with you explain fully why we have recommended this particular study area. Please contact me should such a meeting be required.

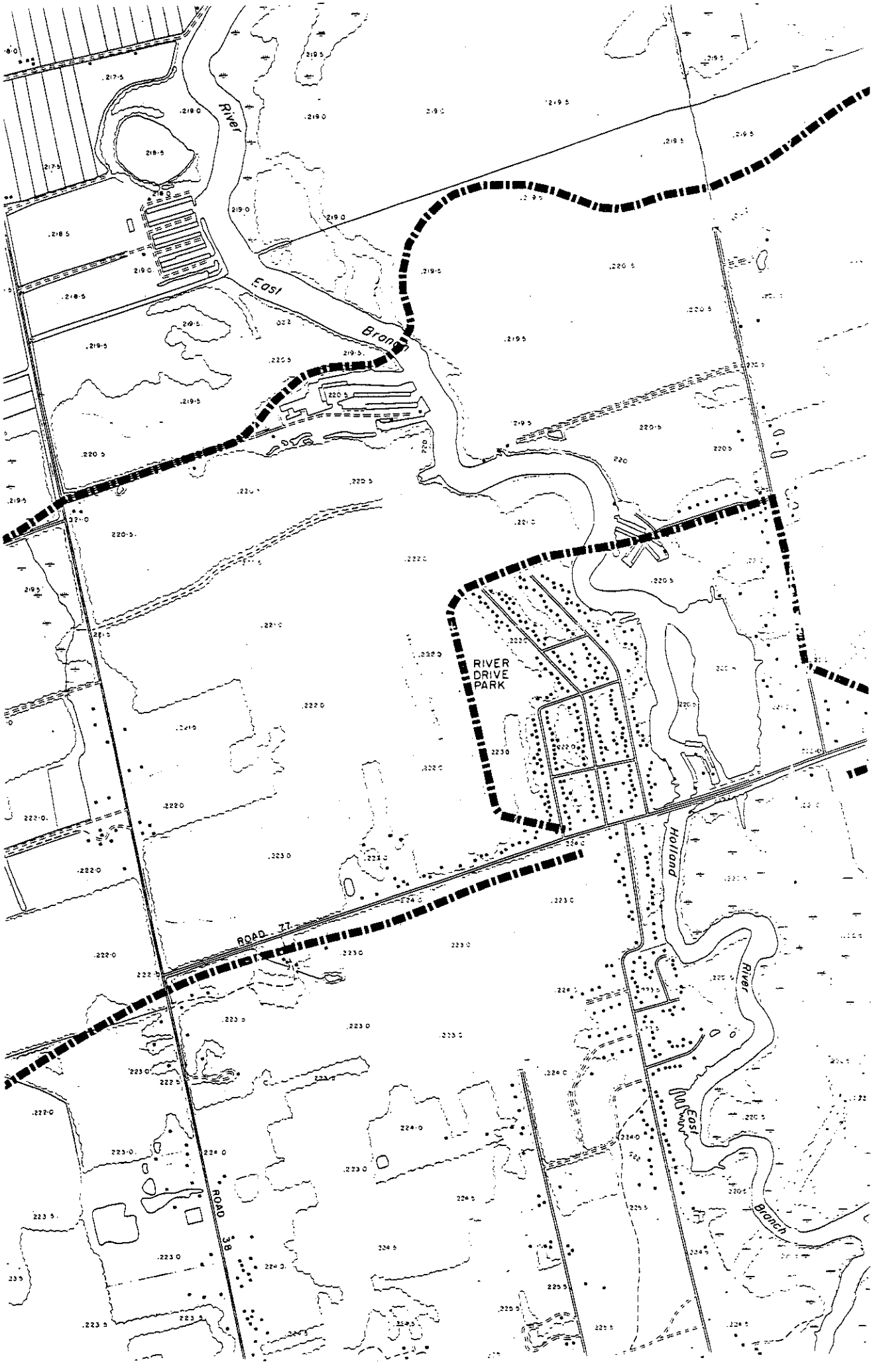
Yours sincerely,

<Original signed by>

T.C. Smith
Supervisor
York North Area Team
Greater Toronto Area District, Maple

Tel: (416) 832-7239
FAX: (416) 832-7294


CN RAIL
CN RAIL
River
BRADFORD
Holland
HWY


River
East
Branch
RIVER
DRIVE
PARK
Holland
ROAD 77
ROAD 38
River
East
Branch

MINUTES OF MEETING

BRADFORD BYPASS ENVIRONMENTAL ASSESSMENT STUDY

Time: 1:00 p.m., Thursday, October 14, 1993

Location: MNR offices, 10401 Dufferin Street, Maple

Attendees:

Tracy Smith	MNR - Area Supervisor (North York)
Chris Tschirhart	MNR - Planner
Glen Hooper	MNR - Ecologist
Ian Buchanan	MNR - Biologist
Steve Jacobs	MTO - Planning and Design
Fred Leech	MTO - Planning and Design-Environmental Unit
Terry Steele	MTO - Planning and Design-Environmental Unit
Heather Pearson	MTO - Planning and Design-Environmental Unit
Cam Kitchen	Ecoplans Ltd.
John Sutherns	McCormick Rankin
Steve Schijns	McCormick Rankin

Purpose: To reach interministerial agreement on reasonable study area boundaries in the vicinity of the Holland Marsh.

Discussion:

Mr. Leech reviewed the background to the current discussion, noting that MTO/MNR meetings had been held in June and August 1993 during which the wetland-related issues had been highlighted. The attached note dated 1993 09 07 summarizes the developments to date and the MTO's proposed position regarding the crossing of the wetlands. Mr. Leech noted that MTO Senior Management has endorsed the approach outlined in the memorandum, pending concurrence by MNR. He indicated that the proposed structure/land acquisition position is intended to meet the mandates of both Ministries. Satisfactory resolution of the issue will determine study viability (i.e. OK to continue) and study boundaries.

Mr. Kitchen provided an overview of the field work Ecoplans has carried out in the study area, and highlighted the areas of significant disturbance and/or marginal wetland. The results were that reasonable alternatives from a minimum wetland disturbance point of view appear to exist in the band broadly defined by the Holborn Road allowance as a northern limit and the existing Highway 11 - Queensville Sideroad as a southern boundary. To the north of that area, the large contiguous blocks of undisturbed Class One Wetland do not support reasonable alternatives.

Mr. Tschirhart sought assurance that existing Queensville Sideroad would be assessed on an equal basis with "new route" alternatives; Mr. Sutherns agreed that that would be the approach.

J. Sutherns gave a brief review of need and justification and how the original study area was determined.

Mr. Sutherns continued with a 1:10,000 scale plan showing a revised study area, four conceptual routes within that area, and major constraints on the development of alternatives (community/ residential area, wetlands, agricultural operations, woodlots, marinas, golf course, property lines, etc.). In order to clearly understand the implications of a typical crossing, three structural concepts were introduced: embankment/short bridge; long steel girder bridge; and long cantilever segmental bridge. The embankment approach is not intended to be pursued by MTO, rather a structural approach to crossing the wetlands is preferred. MTO staff are of the opinion that such an approach would be capable of resolving many of MNR's concerns regarding wetland impact.

Mr. Kitchen reviewed the existing field conditions for the representative "worst case" alignment alternatives, and the construction access requirements were shown at a 1:2,000 scale. Mr. Kitchen noted that, at this stage in the study, only available secondary source information, supplemented by reconnaissance - level field work, was being used; more detailed field investigation would await a decision on study area definition and study viability.

Mr. Hooper noted that the available MNR wetland mapping may not be current and comprehensive; there could be additional areas of wetland not shown on the MNR plans. Mr. Kitchen stated that more detailed field work would pick up any such areas in due course. Mr. Kitchen emphasized that wetlands were only one aspect of the situation, and that other considerations (e.g. woodlots, agricultural operations, transportation function, land use, etc.) would also act to define or influence the study area definition and the alternatives considered.

Mr. Leech added that the Bradford Bypass study was being carried out independently of the concurrent Ontario Hydro transmission line project, and that the location of the latter would not be a significant factor in affecting Bypass alternatives and recommendations. Liaison with Ontario Hydro is being maintained, however. Mr. Leech also emphasized the willingness of the MTO to acquire property over and above that required for a highway right-of-way, with the intent of turning the excess property back to MNR for additional wetland use. Finally, Mr. Leech noted that any change to, or definition of, the study area would require sound justification for the location of the revised boundaries.

Questions and discussion followed, and Mr. Smith concluded by stating that MNR staff would form a position on this issue and inform the MTO in writing within two weeks (October 28, 1993).

Mr. Leech indicated that if MTO and MNR concur, OMAF would be approached for agreement before proceeding further with the study.

Minutes Prepared By,

McCORMICK RANKIN

<Original signed by>

S. Schijns, P. Eng.

SS/ss

93 09 07

REGARDING PROPOSED MTO CROSSING OF BRADFORD MARSH

MNR INITIAL POSITION

The MNR first position was that "there is absolutely no way that MTO can cross the Bradford Marsh with proposed highway improvements". MNR indicated that the Bradford Marsh is the most significant wetland in S. Ontario, and is about to be designated as one of the key wetlands in eastern North America."

MTO FIRST RESPONSE & MNR REACTION

MTO found this position is unacceptable, as it would prevent MTO from even twinning the current Hwy 11 crossing of the Marsh.

It was the MTO position that given the current disturbance at the Hwy 11 crossing, MTO would be successful in demonstrating, through the "Provincial Wetland Policy Implementation Guideline" "Environmental Impact Statement (EIS)" process that twinning of the current Hwy 11 crossing would not cause a loss of hydrological, biological, or recreational function, and would therefore be in compliance with the policy.

MNR agreed that MTO would probably be successful with this approach.

It was the MTO position that, following this logic, any crossing of the marsh which is, on the whole, on established transportation corridors and abutting lands as might be necessary, would be acceptable provided it:

(a) ensured satisfactory highway connections meeting engineering standards; and

(b) adequately addressed provincial wetland policy statement Environmental Impact Statement (EIS) requirements

On a preliminary basis, without commitment, MNR agreed to the above position.

MTO and MNR agreed that MTO would further develop this position for MNR/MTO discussion.

.....2

POST MEETING DEVELOPMENT OF MTO POSITION

Any crossing of the marsh which is, on the whole, **on areas of significant disturbance** (and abutting lands as might be necessary) would be acceptable provided it:

(a) ensured satisfactory highway connections meeting engineering standards; and

(b) adequately addressed "Provincial Wetland Policy Statement" "Environmental Impact Statement (EIS)" requirements

IMPLICATIONS OF MTO POSITION

In order to meet Provincial Wetland Policy Statement EIS requirements, it is likely that this approach would require:

(a) **construction of lengthy structures** with sufficient clearance in order to minimize intrusion into the wetland (ie essentially "walk" over it);

(b) **creative construction methods** in order to minimize construction intrusion/impacts into/on the wetland;

(c) **acquisition of extra disturbed lands** (eg the entire property rather than just that portion required for MTO ROW) in order that such lands can be "re-naturalized" to provide wetland function and thereby mitigate the effects of the highway crossing; and

(d) **written endorsement of MTO and MNR senior management** of both the position and the implications of the position.

ASSUMPTIONS

The Class 1 wetland boundary is as defined by MNR on Ontario Base Maps

Ontario

Ministry of Agriculture and Food

Ministère de l'Agriculture et de l'Alimentation

Legislative Buildings
Queen's Park
Toronto, Ontario
M7A 2B2

Hôtel du gouvernement
Queen's Park
Toronto (Ontario)

Land Use Planning Branch

326-3600

October 19, 1993 (Tuesday)

Steve Jacobs
Ministry of Transportation
Planning and Design
Area 1, Central Region
4th Floor, Atrium Tower
1201 Wilson, Avenue
Downsview, Ontario
M3M 1J8

Dear Mr Jacobs:

RE: Environmental Assessment Studies for:

- HWY 404 Extension from Davis Drive to North Junction Highway 7/12
- Bradford Bypass from Hwy 400 to Hwy 404 Extension

Staff of this Ministry have completed a review of the above-noted proposals. Consideration has been given to the matter in terms of the goals and objectives of this Ministry and the criteria and policies contained in the Food Land Guidelines, which is the provincial policy on planning for agriculture.

I am attaching a copy of the Agricultural Assessment Requirements for Major Projects. This guide outlines the areas of concern for this Ministry.

With respect to the two proposals, there is only once specific concern at this time. The Preliminary Listing of Issue/Concerns (Natural Environment, subsection soil) should contain a specific listing for Speciality Crops, particularly the Holland Marsh soils. This should be evaluated in terms of loss of specialty crop soil in the same way that the studies propose to evaluate the loss of Class 1 soil.

The Ministry of Agriculture and Food would like to continue to be involved in both projects, in particular, the weighting and ranking of criteria within both study areas. I will make myself available to you for any meetings you may be having on this issue between now and the New Year. After January, Heather Gariepy, Land Use Specialist in Newmarket will be participating in these projects.

If you have any questions regarding the assessment, please do not hesitate to call.

Yours truly,

<Original signed by>

Sharon Johnston
District Manager

cc: Trish Grant

Ministry of Natural Resources
Ontario
Ministère des Richesses naturelles

P. O. Box 7400
10401 Dufferin Street
Maple, Ontario
L6A 1S9

Our Ref:8538.8.521.YS

August 12, 1993

Ministry of Transportation Ontario
Planning and Design, Area 1 - Central Region
4th Floor, Atrium Tower
1201 Wilson Avenue
Downsview, Ontario
M3M 1J8

Attention: Steve Jacobs

Dear Sirs:

SUBJECT: Route Planning and Environmental Assessment Studies
for Highway 404, extension from Davis Drive (Newmarket)
to North Junction Highway 7/12

Staff of the Ministry of Natural Resources have now reviewed the above proposal and have the following concerns. Note that these comments are on the 404 extension portion of this project. We are commenting separately on the Bradford By-pass portion of the project, which intersects the provincially significant Holland Marsh Wetland.

Large Scale Concerns

This is a major undertaking which will intersect or cross many major areas of resource concerns within this District. The proposed study area encompasses major watercourses and river basins which contribute to the Lake Simcoe watershed, an important fishery resource in Ontario. Secondly, the proposed study area crosses four major linear wetland systems, two of which are provincially significant. The impact of a provincial linear road system on the natural vegetative corridors are well established in the study area.

It is the position of this Ministry that this project should not proceed until all alternatives to this undertaking are fully explored. We fully support section 7.2 of the initial draft paper regarding Generation of Alternative Methods, and the use of constraint mapping for this exercise. This office has extensive vegetation, wetland and wildlife information within the study area that we can make available to your Ministry and your consultants.

MNR will fully expect that the Fisheries Accord regarding route selection and analysis of fish habitat will be utilized in this project. It is also our understanding that our two ministries are formulating a similar accord on wetland. To date this has not been finalized, but given the life span of this project we expect that it will be finalized in time.

Detailed Construction Concerns

There are a number of stream and river crossings related to this project. All of these streams are coldwater fishery streams that contribute to the Lake Simcoe system. MNR is concerned that, unless proper erosion and sediment controls and stormwater management techniques are used on site, especially during construction, this project could negatively impact the nearby tributaries and the downstream resources. During construction, there is a very high potential for sediment to be carried from the site in stormwater flows. This is of concern to our fisheries program should sediment laden stormwater be allowed to enter nearby watercourses or storm sewers which discharge to watercourses. Sediment laden stormwater may result in negative impact on the quality of the receiving waters as it relates to fish and their habitat.

Accordingly, the Ministry of Natural Resources requires the proponent to carry out the following with respect to this development:

1) The exposed area should be kept to a minimum at all times to minimize the potential for erosion;

2) Exposed surfaces should be re-stabilized and re-vegetated as soon as possible;

3) Appropriate sediment control devices or structures should be used during construction to retain sediment on the site. If necessary, temporary sediment ponds should be used to provide the detention time required for sufficient dewatering;

4) Appropriate stormwater management techniques must be employed, both during and after construction, to minimize the amount of sediment laden stormwater entering nearby watercourses or storm sewers which discharge to watercourses. (and to provide water quality treatment of stormwater after construction.)

5) Erosion and sedimentation control measures as outlined in the Ministry of Transport Ontario's Erosion and Sedimentation Control, Drainage Manual, Chapter F, and Ministry of Natural Resources Technical Guidelines for Erosion and Sediment Control (1989); and,

6) A recent Fisheries Management Plan for the Maple District has identified strategies and tactics for ensuring that development proposals and construction projects are compatible with the long term maintenance of this resource. These tactics include implementing the Federal Department of Fisheries and Oceans Policy for the management of fish habitat, including the principles of net gain/no net loss of fish habitat; and ensuring the establishment of urban stormwater management systems which are appropriate to the sensitivity of the receiving waterbody. Methods of achieving Ministry objectives in environmental assessment projects include documenting fish habitat present in the area, defining impacts upon fish habitat, and applying mitigative techniques such as construction windows and sedimentation and erosion control. In cases where harmful habitat alteration cannot be avoided through mitigation techniques, the proponent should specify how habitat loss will be compensated to satisfy Federal Fisheries legislation and policy.

7) That in-stream works may only be permitted after a thorough analysis of alternatives to the crossing is completed and reviewed by this ministry in accordance with the accord between our two ministries.

We are therefore asking for a meeting with you and your staff to refine the process by which alternatives within the undertaking can be evaluated. Please advise us of your decision. Should you have any questions, please contact **Mr. Tracy Smith** (416-832-7239) at this office.

Yours sincerely,

<Original signed by>

T. C. Smith
Area Supervisor - York North
Maple District

CT/js

cc: Lake Simcoe Conservation Authority - Attn: Planning Dept.

McCORMICK RANKIN
CONSULTING ENGINEERS

MINUTES OF MEETING

PROJECT: Highway 404 Extension EA Study
Bradford Bypass EA Study

TIME: 1:00 p.m., Thursday, July 27, 1993

LOCATION: Lake Simcoe Region Conservation Authority Offices
120 Bayview Parkway, Newmarket, Ontario

PURPOSE: Introduction of studies and review of draft Environmental Assessment Proposals (EAPs)

ATTENDEES:

Steve Jacobs	MTO - Central Region Planning and Design (Project Manager)
Heather Pearson	MTO - Central Region Planning and Design (Env. Planner - 404)
Terry Steele	MTO - Central Region Planning and Design (Env. Planner - Bradford)
Michael Walters	LSRCA - Supervisor, Environmental Services
Murray Kinnibungh	LSRCA
Dan Frank	LSRCA
Robert Orland	LSRCA
Basil Noeks	LSRCA
Larry Wickett	LSRCA
Chris Ricketts	Cole Sherman (Project Manager - 404)
Paul Neals	Gartner Lee (Env. Planner - 404)
Steve Schijns	McCormick Rankin (Project Manager - Bradford)
Cameron Kitchen	Ecoplans (Env. Planner - Bradford)

COPY OF MINUTES TO:

Mark Peacock	Nottawasaga Valley Conservation Authority

PROCEEDINGS: **ACTION BY**

Discussion

Mr. Jacobs provided an overview of the studies, the study areas, their background, need and justification, and the draft EAP. Mr. Walters indicated that LSRCA would review the draft EAP and provide written comments to MTO. General points of discussion which were raised included:

- Are the MTO studies being coordinated with each other and with Ontario Hydro? The two MTO studies are identical in terms of process and time frame, and a physical connection between the two corridors is a key objective. Both studies (the Bradford project to a greater degree) are utilizing the Ontario Hydro digitized mapping and database, and the study team is in regular contact with Ontario Hydro GTA Reinforcement Study staff to ensure coordination. This does not necessarily mean that a new highway and a new hydro line would share a corridor, as divergent goals and constraints may dictate otherwise. Mr. Walters will consider providing the areawide digital database developed by Bell Ontario for the Lake Simcoe area to the MTO for integration with the MTO study information.

- What is timing? Route Alternatives and evaluation process are to be reviewed with the public at the start of 1994, with a preferred route identified by fall 1994. Preliminary Design and EA submission would follow. No time frame has been announced for construction and Mr. Jacobs is of the view that both projects are long term (20-30 years).

- Either the Highway 89 Extension route previously recommended or a bridge/causeway across Cook's Bay would appear to have some merit; are they being considered? The causeway concept was set aside in the earlier study as being too costly, and in light of the withdrawal by the MTO of the Highway 89 EA submission in 1986, it is not intended to attempt to re-visit the Highway 89 corridor. However, the study team is assessing different ways of relating the Highway 89 study recommendations to the current Bradford Bypass work.

- The agricultural land immediately south of Cook's Bay on the Highway 89 route is becoming "worked out" and of reduced agricultural value; could that be considered in re-assessing the Highway 89 alternative? As noted above, the Highway 89 option is not considered a viable route in light of the Minister's 1986 commitment.

- Is the Highway 404 Extension dependent on the Bradford Bypass? The opposite case applies. It is the MTO's intention to avoid termination of a provincial highway at a municipal road, and to link the two projects together.

PROCEEDINGS: **ACTION BY**

- How will evaluation criteria be weighted? The study team is considering various options, and a strategy will be outlined in the final version of the EAP. Any suggestions, including a weighting of the evaluation factors from the LSRCA's point of view, would be of value in this project.

- What are the plans for the Scanlon Creek Conservation Area? Is property impact precluded or, through mitigation measures such as property transfers, can routes which affect the area be considered viable? The "core" area of the Conservation Area, between 8th and 9th Line and between Highway 11 and the CN Railline, is of local significance, while other areas to the north and east are kept in a more natural state. LSRCA comments would respond to alternative routes as they are developed in the future.

- Is there a list of interest groups which LSRCA deals with? LSRCA will provide MTO with contacts of relevance to the studies.

- What is the rationale for the study area limits? The rationale is outlined in the draft EAP, but input as to the appropriateness of the limits shown is being sought prior to the finalization of the EAP.

Mr. Jacobs noted that the Nottawasaga Valley Conservation Authority had expressed an interest in the study, but since it was only marginally affected, would consider coordinating its review and comments with the LSRCA position. Mark Peacock is the NVCA contact in this regard.

Minutes Prepared By:

McCORMICK RANKIN

<Original signed by>

S. Schijns, P. Eng.

SS:lva

MTO responds to Bradford Bypass query

A letter sent to the Ministry of Transportation by Lisa Brouckxon, chair of the Community Planning subcommittee of H.E.A.R.T., raised questions regarding the future "Bradford Bypass." Brouckxon finally received a reply on February 14th - and the news may not be good for Bradford residents.

In response to Brouckxon's queries of November 28th, 1996, Senior Project Manager Steve Jacobs replied that the MTO would not be constructing any necessary service roads or noise barriers, as part of the Highway 400-404 extension. The need for service roads, he wrote, "will result from any future land development and therefore provision of service roads is a municipal undertaking." Lands south of the technically preferred route, he said, would have access via the existing 8th Line.

Jacobs also noted, "Lands approved for development after the approval of an Environmental Assessment become the responsibility of the developer and the municipality for noise attenuation." He suggested that surplus earth material from highway construction could be placed at the edge of the right-of-way if land-owners requested it, but added that "it is doubtful that a significant amount of material will be available, because most of the road will be placed on fill, with few earth cuts."

As for a request for improved signage, to ensure that the "Bradford Bypass" doesn't encourage motorists to by-pass Bradford, Jacobs responded, "The Ministry will apply Highway signing standards that are in effect at the time of construction." The Ministry's policy is currently under review, and may affect the promotion of individual communities, he said.

Brouckxon also requested a copy of the Hemson report on the economic impact of a Highway 400-404 extension constructed just north of Bradford, and was told, "The Hemson report is still being completed and will be forwarded to you as soon as it is available."

"I'm frustrated," Brouckxon admitted later. "I would be interested to see Council respond to this."

She noted that in these times of fiscal restraint, it might be "unrealistic" to ask for additional Ministry funding to be set aside for a project that might not be built for 10 to 20 years, "but I think it's important to put it in writing now, and it's in the Ministry files, so that when the Highway does come through there'll be a history."

Brouckxon suggested that the information could have a "direct influence on the Official Plan... How will that affect development, and how will we deal with that, now that we know where the Ministry stands?" She also suggested the municipality might pass a by-law requiring ministry restrictions to be included on title in sales of property adjacent to the preferred route.

"I'm glad that they (the Ministry) responded, and I'll be forwarding this response both to Council and to the Planning Office."



Councillor D
Enforcemen
By-law offic

Salary Negotiations

Elementary and secondary teachers with the Simcoe County Board of Education have been without a contract since August 31, 1996. Negotiations have been ongoing.

On February 17th, the Education Relations Commission released its Fact-Finder Report on the negotiations. Daniel Gold, author of the report, stated, "The solutions need to weigh the reasonable expectations on both sides with the pedagogical objectives of the school system. From that perspective, we can look at the proposals that have been put forward."

The report states that "the Board cannot expect teachers to assume cost burdens such as capital financing, nor can the Board expect a disproportionate share of the deficit to come from the collective agreement."

In turn, "the teachers cannot expect to be treated better than other groups within the Board and they are unlikely to be able to maintain their collective agreement unchanged or even prevent some reduction. Both parties will have to be flexible in their approach to negotiations if an accommodation on the issues in the dispute is to be reached."

Both the chair of the SCBE, Lynda Murtha, and the unions have agreed to consider the report, in the ongoing negotiations.

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FACSIMILE TRANSMISSION

TO: MTO Central Region Planning Office

ATTENTION: Steve Jacobs

No. of sheets transmitted: 1 including this sheet. MAIL: YES ..... NO X

FROM: Steve Sebijas DATE: Dec 31/96

W.O. NO: 2341 PROJECT: Bradford Bypass

MESSAGE:

H.E.A.R.T. comments on Bradford Bypass

Bus Times Dec. 18 '96

DEAR EDITOR, .
Open letter to Steve Jacobs, P. Engineer, MTO

The Strategic Plan Implementation Committee, known as H.E.A.R.T., has had a follow-up meeting to your Public Information session held mid-November, here in Bradford West Gwillimbury.

There are a number of concerns regarding the 400-404 Link which were put forward by various committee members, and supported unanimously by all committee chairs to be put forward to you. They are as follows (in no specific order):

. The name "Bradford Bypass" is perceived to have negative connotation; Bradford Link has a much more positive reception.

. There will be a need for a service road around the highway, which would otherwise be unnecessary for the municipality to build. Therefore, would this be budgeted as an expense of the highway for the MTO to absorb? (This was identified in the C.A.U.S.E. Study).

. The prevailing northwesterly winds blowing into town would greatly amplify the sound pollution, winter road spray. Would this be taken into consideration to create a buffer of land elevation, reclamation of soughs, planting of evergreen trees and a noise barrier (over and above the MTO standards), at the expense of the MTO?

. Many businesses in Bradford West Gwillimbury are dependent on cottage traffic during the summer months to sustain them through the year. It is of great concern to these specific businesses that this traffic will be lost when the Link is built. Will there be any compensation made in the way of allowing highway signage and extra lighting at #11 exit? (Community Identity signage - not just Highway signage.)

Thank you for addressing our concerns. We look forward to your response, at your earliest convenience.

Once again, we request three copies of the Hemson Report (on economic impact of the Bradford Bypass) which was completed but unavailable for distribution on the information night.

Sincerely,

Lisa Brouckxon, Community Planning (H.E.A.R.T.)

Opposed to Bradford Bypass

DEAR PEOPLE,

I think the idea to put the Bradford Bypass in is not a good idea. I'm 10 years old. I have lived on Old Yonge Street all my life. The Bradford Bypass is going to hurt the animals that live there. They will wreck a good place to see beavers, deer, foxes, weasels, blue heron, and lots of other animals.

My family and I have spend many hours exploring and enjoying the scenery. I have learned about nature, wild life and ecology. I have seen beavers, deer, foxes, weasels and many more animals up close.

Do you want to destroy their natural home? And their lives? Do you want to take a special place from all the kids on our street?

Signed,

Beverlianne DelBrocco, Newmarket.

FAX TO NO: 416-235-4496

November 20, 1996 20 Pages 70¢ + 5¢ G.S.T.

Bradford Times p.1

Bradford Bypass consultation

The crowds were steady at the Bradford Bypass public consultation session, held Thursday, November 14th at Bradford District High School.

Residents came to discuss the preferred route selected by consultants McCormick Rankin, examine the detailed maps to see how the proposed transportation corridor would affect them or their property, and file their comments.

The route, released last month, would run westward from a northern extension of the 404, north of the Queensville Sideroad and across the Holland River, cutting through Bradford West Gwillimbury before joining up with Highway 400.

In Bradford West Gwillimbury, the corridor would pass just north of Bradford, and then run between the 8th and 9th Lines. Two interchanges are planned in the municipality, one at Highway 11, and the other at the 400.

The consultants have indicated that 28 agriculturally-zoned properties would be affected along the corridor, losing some land to the Ministry of Transportation easement. A total of 10 residential properties would be directly affected - five eventually

see page 2



Residents attended Public Consultation session on the Bradford Bypass last Thurs.

Commenting on the Bradford Bypass

from page 1

demolished to make room for a new highway - and 6 Commercial/Industrial properties are affected by the route, including 4 on the Artesian Parkway.

Those are only properties which will lose some land to establish a transportation corridor; other properties could be affected to some degree by proximity to the proposed highway, noted Gavin Norman, consultant with McCormick Rankin.

Concerns expressed by the public ranged from loss of wetlands, to the noise that could be generated by a multi-lane highway just north of an urban centre. "There were people who were against it, but... it was not that they didn't agree that it should be built," Norman said, adding that most people saw a need for an east-west link, but felt that the highway should be built in some other location.

Among those present were representatives of F.R.O.G.S. (Forbid Roads Over Green Spaces), a group centred in East Gwillimbury, and Holland Landing. They set up tables in the foyer at the High School, and urged reconsideration of the Green Lane-Highway 9 transportation corridor as the route for a 400-404 link.

It's an option that consultants have rejected, arguing that Green Lane is a "local improvement" route, to service Newmarket and area, and that it is not northerly enough to meet the same transportation needs as a Bradford Bypass.

But nothing is settled, as yet. The consultants must incorporate the comments of residents from the Bradford meeting, and a second meeting in Sharon last night, and send their recommendations to the Ministry of Transportation for review.

Any route finally selected will probably require a full Environmental Assessment hearing. F.R.O.G.S. has already requested a "bump-up" of the Class Environmental Assessment for the Green Lane Corridor, asking that Green Lane be considered as an alternative to a Bradford Bypass.

Should the Bradford Bypass route be designated a transportation route, it may be more than a decade before it is built - or built to its proposed final configuration as a four-lane divided freeway, Norman said. He suggested that the Bypass could initially be built as a 2-lane highway.

Return of the F.R.O.G.S.

F.R.O.G.S. (Forbid Roads Over Green Spaces) is a grassroots protest group that has been "quiescent" for the last six months. Established to oppose a Bradford Bypass-404 Extension link-up that would run through York Region and Bradford West Gwillimbury, members have been waiting for the preferred route to be announced.

Now that the preferred route is public knowledge, F.R.O.G.S. are back.

The members claim that the MTO has "failed to establish the need for a freeway in this highly environmentally sensitive study area", and that the Ministry is ignoring its own consulting studies, which suggest that an east-west corridor is needed between Major Mackenzie Drive and the Bloomington Road, not further north.

Rather than a new multi-lane highway cutting through an environmentally sensitive wetland, F.R.O.G.S. would like to see the Green Lane/Highway 9 corridor developed as a freeway, to link the 404 and Highway 400.

The "preferred route" is in "absolutely the wrong place", said F.R.O.G.S. member, Paul Jafine.

Public meeting on Bradford Bypass route

Nov. 13/96 Bradford Times p.1

Those interested in learning more about the preferred route for a Bradford Bypass multi-lane highway that would eventually link an extension of Highway 404 with Highway 400, should circle November 14th on their calendar.

That's the date of the next Public Consultation session on the Bradford Bypass. From 3 p.m. to 9 p.m., residents are invited to drop in to Bradford District High School, Highway 88 at Professor Day Drive, learn more about the process and comment on the identified route.

As part of an assessment process that began in 1993, the Ministry of Transportation and McCormick Rankin Consulting Engineers have proposed a route that runs between the 8th and 9th Lines of Bradford West Gwillimbury. Although no actual construction can be expected for at least a decade, a corridor along the route, if approved, would be reserved for transportation purposes.

Professional engineer Steve Schijns has indicated that the proposed "preferred route" is "written on paper", not in stone, and may change, depending on input received from the public at the meeting in Bradford and a second consultation planned for the East Gwillimbury Municipal Offices on November 19th.

All comments received during the consultation session will be considered, before the route is finalized. The recommended route must also receive approval from the Ministry of Environment and Energy, through an Environmental Assessment

For a "sneak preview" of the proposed Bypass route, stop by the Bradford Library.

Ready For Winter

Bradford Bypass route raises questions

A survey of downtown Bradford businesses concluded that a Bradford Bypass, a four-lane highway linking a future extension of Highway 404 with Highway 400, would not necessarily have a negative impact on commerce.

The preferred technical route for the Bypass has been identified, just north of Bradford between the 8th and 9th Lines, with interchanges planned at Highway 11, and the 400. It would likely shift both tourist and heavy truck traffic away from the centre of town.

The survey, which received approximately 100 responses and which was requested by the Town's H.E.A.R.T. Committee, suggested at least 80% of business downtown is local in nature, generated within Bradford West Gwillimbury.

"This is not a highway dependent community," consulting engineer Steve Schijns, with McCormick Rankin, told Council last week.

Mikki Nanowski, chair of the Downtown Revitalization Committee, took exception to the comment. She said she had not received a copy of the survey results, but argued, "If you don't have traffic, you don't have any kind of customer base."

Nanowski questioned whether the survey had included highway-dependent businesses, such as Bak's Market, Oak Ridges Market, and donut shops, like Tim Hortons and Coffee Time.

Council also raised some concerns, during the presentation by consultants.

Councillor Gary Lamb was concerned that the new Highway, when built, would create problems of noise pollution for residents in Bradford, and asked what mitigating measures the Ministry of Transportation would take to reduce the visual and sound impact of a new highway.

Schijns replied that grading and vegetation would be used to help create a buffer.

Lamb then requested that a service road be built, to allow for industrial traffic from the Artesian Parkway to reach the new interchanges, without going through residential areas on town roads. He said that if the Town was going to be expected to "punch up our municipal road system" to provide access to the interchanges, the Town should receive additional provincial funding.

He was told that the MTO is "not in a position to be planning municipal roads", and that a request for provincial monies for access routes "really isn't part of this project or process."

A public meeting on the Bypass route is planned for Nov. 14, at Bradford H.S.

Transportation Tomorrow Survey

Fifteen regional, county and local municipal governments are participating in a major travel survey of more than 163,000 households, designed to help municipalities meet their future needs for roads and transit services.

The Transportation Tomorrow Survey '96 will examine the travel habits and preferences of residents of the Greater Toronto Area (GTA), as far as St. Catharines and Barrie. The County of Simcoe and York Region are to be included in the study.

Randomly selected households will be contacted by telephone. Questions will include type of building (house or apartment), number of people, number of vehicles available for personal use, age of residents, driver's licenses, locations of work or school, and information on travel by residents over the age of 11, during the preceding day.

Survey-takers will be calling between 6 and 9:45 p.m. during the week, or between 10 a.m. and 5 p.m. on Saturdays. All information will be strictly confidential. For more information, call the Ministry of Transportation at 1-800-268-4686.

Approximately 1 household in 20 will be approached over the next week or so.

The last Transportation Tomorrow Survey was carried out in 1991.

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FACSIMILE TRANSMISSION

TO: MTO Central Region

ATTENTION: Steve Jacobs / Terry Steele

No. of sheets transmitted: 1 including this sheet. MAIL: YES ..... NO ✓

FROM: Steve Schijns DATE: 28/10/96

W.O. NO: 2341 PROJECT: Bradford

MESSAGE: Page 1, BWG Times, Wed. Oct 23/96

Bradford Bypass route

Steve Schijns, engineer with McCormick Rankin, appeared before Committee of the Whole last night, to formally present the "preferred route" of the Bradford Bypass. He said that the route, between the 8th and 9th Lines of Bradford West Gwillimbury, was selected as "striking a balance" between environmental concerns, and the need to avoid the built-up areas "as much as we could."

He noted that the current study seeks to designate the route as a provincial transportation corridor for a future freeway, but added "there's no commitment, there's no timing to that." Schijns told Council that the Bypass would not be built before the Highway 404 extension was completed - and that construction could take 10 to 20 years.

A Public Open House is planned for November 14th at Bradford District High School to present the proposal and seek public input. Schijns said that the route could change, if there is a public outcry. "It's not carved in stone, it's carved in paper."

FAX TO NO: 416 235 4940 / 416 325 8070

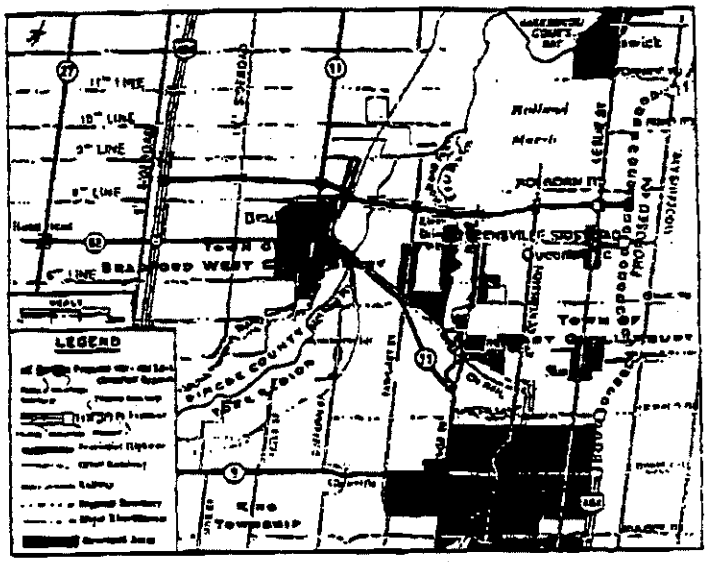
ONTARIO GOVERNMENT NOTICE

Highway 400 – Highway 404 Link ("Bradford Bypass") Environmental Assessment Study

Notice of Public Consultation Session

The Ministry of Transportation of Ontario (MTO) began an Environmental Assessment Study in 1993 for a highway link between Highway 400 and the proposed Highway 404 Extension (also under study) in the area south of Lake Simcoe and north of Bradford.

The analysis and evaluation of alternative routes for the new roadway has been completed, and a Technically Preferred Route has been identified (see map). Plans for this proposal and a summary of the analysis and evaluation process will be available for public review and comment as follows:



1. Thursday, November 14, 1996
   3:00 - 9:00 p.m.
   Bradford High School
   Highway 88 at Professor Day Drive, Bradford
2. Tuesday, November 19, 1996
   3:00 - 9:00 p.m.
   East Gwillimbury Municipal Offices
   19000 Leslie Street, Sharon
   (Joint session with Highway 404 Extension Study)

The recommended route will be finalized, with consideration given to input received during this final round of consultation. The resulting recommended route will be documented in an Environmental Assessment Report for submission to the Ministry of Environment and Energy. The public will have an opportunity to comment on this report. After submission of a final document, the Minister of Environment and Energy will initiate a formal review process to decide whether to approve the undertaking. Further public notification will occur at that time.

For additional information, please contact:

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Ministry of Transportation of Ontario
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Phone: (905) 823-8500
Fax: (905) 823-8503

Ontario

Province decides where 404 will go, but not when

BY LISA QUEEN
Staff Writer

The routes for the Hwy. 404 extension and Bradford bypass have been chosen — now it's just a question of how long it will take before construction begins.

The highway will run north from Davis Drive in Newmarket, swinging east of Sharon and Queensville up to Ravenshoe Road, where it jogs further east as it passes Keswick.

It veers northeast from there, just south of Sutton, then continues east just north of Pefferlaw. As it leaves Georgina, the route runs north, east of Lake Simcoe.

The extension will cost $215 million to construct.

An interchange on Hwy. 404 for the Bradford bypass will be built about halfway between Queensville Sideroad and Holborn Road.

The bypass, a $100-million project, will proceed west to Yonge, where it will bend slightly northwest to Bathurst Street north of River Drive Park.

After crossing the Holland River and the CN Rail line, the road will jog north of Bradford and then run west between the 8th and 9th lines to Hwy. 400.

The Transportation Ministry and its consultants are holding public meetings in the next few weeks to get residents' reactions to the routes.



WHEELER

But the projects have already received a lukewarm response from York Region's transportation committee.

Although councillors and officials are pleased the routes have finally been selected, they wonder how many more years will pass before they see new pavement.

Steve Jacobs, a senior engineer with the ministry, said he can't see construction beginning before 1999 at the earliest, a statement that irritated committee chairperson, Georgina Councillor Danny Wheeler.

"I guess the committee is having trouble accepting that decision," he said.

Newmarket Mayor John Cole pointed out Leslie Street and Woodbine Avenue are already bursting at the seams with traffic coming from new subdivisions in Georgina.

He said it makes no sense for the region to spend millions on massive upgrades to Leslie and Woodbine with a 404 extension planned for the future.

"We're caught in the middle and we've got the problems now," he said. "I know you don't want to be pinned down but we've got a problem now."

Not only are current motorists crowding the roads, but thousands more are expected with increased development in Georgina and East Gwillimbury.

East Gwillimbury Mayor Jim Mortson told The Era-Banner the planned 30,000-person mini-city of Queensville hinges on the extension of the 404.

"(Transportation Minister) Al Palladini said an extension beyond Herald Road wasn't a priority. That really upsets me," Mortson said. "I'll be darned if we're going to be putting in new homes if we can't get the people in and out."

Mortson said he has already sent a letter to Palladini saying the town would consider all funding alternatives to have the road built, including making it a toll road.

"We have to look at different ways financing things today," Mortson said. "If people want a road (to get to Queensville), they should pay for it."

But Queensville Properties spokesperson Al Duffy argues Hwy. 404 doesn't have to be in place before the new mini-city is built.

"If we build, the highway will come. It's just a matter of time," Duffy said. "They didn't build Hwy. 407 until Hwy. 401 was running at 120-per cent capacity. That's the province's job — they'll build the road."

— with files from Rick Vanderlinde

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TO: MTO Central Region Planning Office

ATTENTION: Steve Jacobs 3rd floor

No. of sheets transmitted: 1 including this sheet. MAIL: YES ..... NO ✓

FROM: Steve Schijns DATE: Oct 16/96

W.O. NO: 2341 PROJECT: Bradford

MESSAGE: Recent article. Is Oct. 28th date correct?
Please give a copy to Terry.

Bradford West Gwillimbury Times, Wednesday, October 9, 1996 Page 2

Bradford Bypass preferred route

After a year of delays, the Bradford Bypass Project is finally ready to identify a preferred route for a highway that would link the 404 Extension with Highway 400.

Development in Bradford West Gwillimbury, immediately north of Bradford, has been on hold while engineers and consultants with the Ministry of Transportation looked for a route that would cut through the municipality, providing an east-west link.

Now, according to Steve Jacobs of the MTO's Planning Office, the decision has been made. The information will be made public to York Region Council on October 16th. The Ministry has also asked to appear before Bradford West Gwillimbury Council on October 28th, to announce the preferred route.

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Bradford West Gwillimbury TIME

Vol. 6 No.42 Wednesday, October 16, 1996

Bradford Bypass preferred route

After months of analysis based on assessment of transportation benefits, environmental and human impact, the Ministry of Transportation today released the preferred route for the Bradford Bypass.

The preferred route for the link between the proposed Highway 404 Extension and Highway 400 lies just north of the Queensville Sideroad in East Gwillimbury - and between the 8th and 9th Lines of Bradford West Gwillimbury.

The Ministry is proposing a new bridge across the Holland River due east of the 8th Line. The Bypass would then swing north to a point midway between the 8th and 9th, before connecting with the 400 (see map on page 2.)

Two interchanges are planned in Bradford West Gwillimbury, one at Highway 11, and the second at Highway 400.

The preferred routes are based on recent Environmental Assessment Studies carried out by the Ministry which have identified lands that will be required for the proposed new highways. The MTO plans to protect these lands from development, to ensure that they will be available for future highway construction.

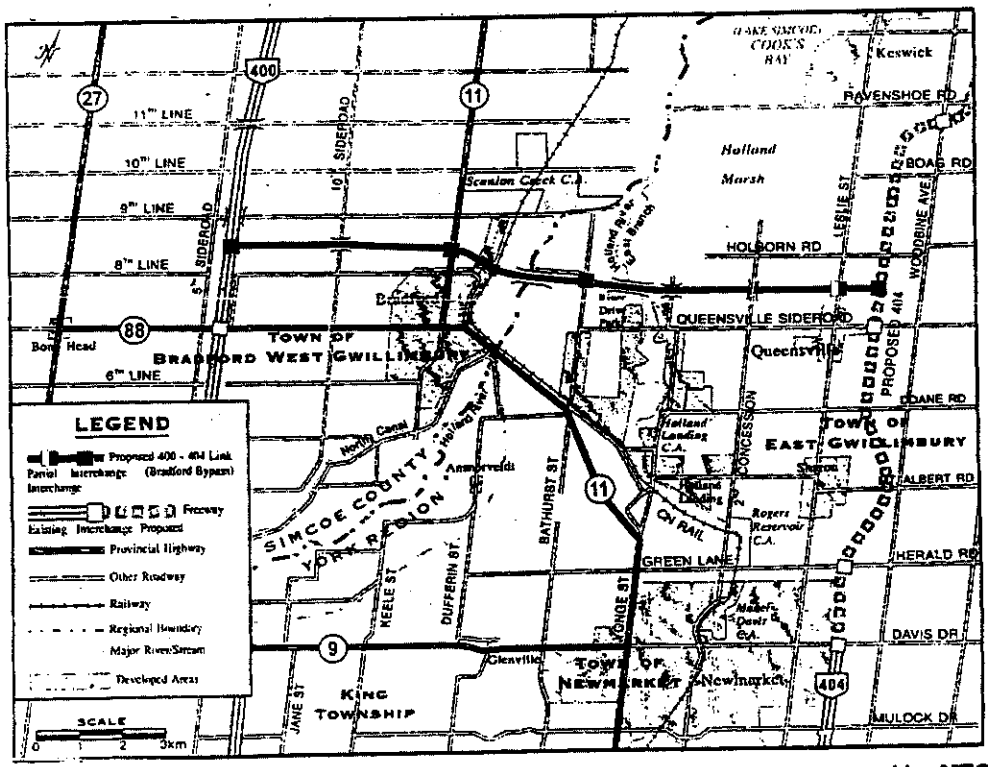
The Ministry has begun public consultation on the

see page 2

Bypass...

from page 1

preferred routes, with municipal council presentations planned for this month, and a series of public sessions in November. The input received will be used to finalize a route, and prepare Environmental Assessment reports to be submitted to the Ministry of Environment and Energy.



Highway 400-404 link (Bradford Bypass) technically preferred route, proposed by MTO

Green Lane "not suitable"

It's now official. The Ontario Ministry of Transportation has dropped Green Lane/Highway 9 as a possible corridor for a new freeway connecting Highway 400 and a proposed extension of the 404.

Instead, the Ministry has decided to concentrate on the "Bradford Bypass", a corridor that lies between the 7th and 11th Lines of Bradford West Gwillimbury, and runs through East Gwillimbury, just north of the Queensville Sideroad.

The MTO investigated upgrading Green Lane to freeway status after a number of residents made the suggestion, during last year's series of public meetings. After a "complete review, using the complete criteria that we've used and continue to use," which covered everything from impact on the environment to improved traffic flow, it was decided that the Green Lane corridor was not suitable.

Steve Jacobs, Senior Project Manager with the MTO, said that the review actually compared three possible routes - the existing Green Lane; a route just to the north of Green Lane; and the Bradford Bypass.

Using the existing road and widening it, Jacobs said, "You wipe out almost every house fronting on Highway 9" - some 40 to 50 homes - and create a nightmare of service roads for access.

"The interchanges were extremely difficult, with roads like Dufferin and Keele, and even Bathurst," he said, pointing to the rough terrain and offset roads.

The route just to the north of Green Lane was seen as a better alternative - but that, too, had serious limitations, in the view of the Ministry.

"It doesn't give you a network improvement" to simply run one road parallel to an existing route, Jacobs explained.

It also creates problems with the interchange at Highway 400, bringing both a freeway and Highway 9 into the north-south route. "It's not impossible from an engineering feat, but it's extremely complex and extremely expensive," and would have a greater impact on the Holland Marsh, he said.

York Region's plans also influenced the MTO decision. There are more approved and planned subdivisions, and a larger population, adjacent to the Green Lane Routes; therefore, the impact of a new highway is seen as being greater. And the Region's Official Plan calls for an upgrading of Green Lane, but not to freeway status.

As a result of the Ministry's review, Jacobs said, "It's the Bradford Bypass we're interested in." The MTO is hoping to proceed with that study as quickly as possible and announce a preferred

see page 2

Bradford West Gwillimbury Times, Wednesday, December 6, 1995 F

Bradford Bypass preferred

from page 1

route within the Bypass corridor "fairly early in the new year."

A public meeting to discuss the Green Lane decision has been scheduled for Monday, December 11th, 7 to 9 p.m. at the East Gwillimbury Community Centre, in Sharon.

A meeting will be scheduled for the Bradford West Gwillimbury area, once a preferred route has been selected - but actual construction, of both the 404 extension and the Highway 400 to 404 connection, are currently on hold.

ONTARIO GOVERNMENT NOTICE

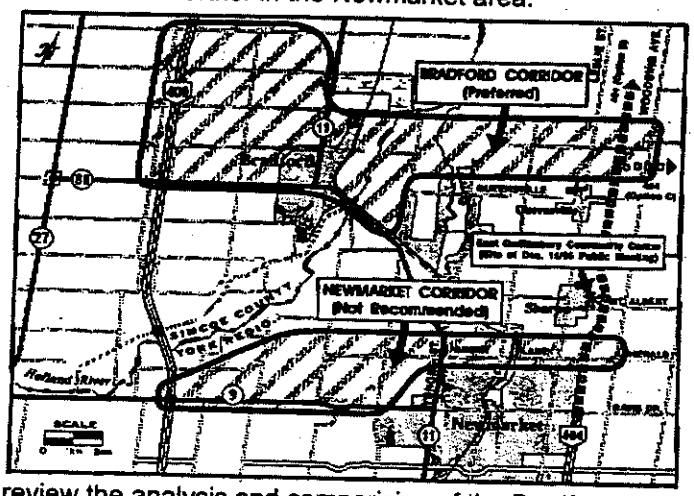
Highway 400 - Highway 404 Link ("Bradford Bypass") Environmental Assessment Study

Notice of Public Meeting

The Ministry of Transportation of Ontario (MTO) began an Environmental Assessment Study in 1993 for a highway link between Highway 400 and the proposed Highway 404 Extension (also under study) in the area south of Lake Simcoe and north of Bradford.

Last year, as part of the study some members of the public asked "Why not build the new road near Newmarket along the Highway 9 route instead of in the Bradford corridor?" In order to answer the question, the Ministry investigated the idea of either upgrading Highway 9-Green Lane to freeway standards or locating a freeway on a new route just north of Newmarket (see map).

The review concluded that the "Bradford Bypass" corridor is the best location for a future freeway and that a freeway should not be considered further in the Newmarket area.



STUDY AREAS FOR NEW HIGHWAY 400 - HIGHWAY 404 LINK

The public is invited to review the analysis and comparision of the Bradford Bypass and the Highway 9 - Green Lane corridor alternatives and to participate in a meeting on the topic:

7:00 p.m. - 9:00 p.m., Monday December 11, 1995
(presentation at 7:30 p.m.)
Auditorium, East Gwillimbury Community Centre
Mount Albert Road east of Leslie Street
Sharon, Ontario

It is intended that a preferred route for a new freeway in the "Bradford Bypass" corridor be presented for public review at a separate set of meetings in early 1996.

For additional information, please contact:

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Ontario

BWG Times Wed Dec 6/95

Hopes rise for 404 extension

July 1/95

Tory win has region lobbying at Queen's Park

BY LISA QUEEN
Staff Writer

York Region politicians pushing to extend Hwy. 404 are hoping to find a sympathetic ear from Ontario's new transportation minister.

The region is trusting that longtime Vaughan resident Al Palladini will understand the need to extend the highway more than previous ministers have.

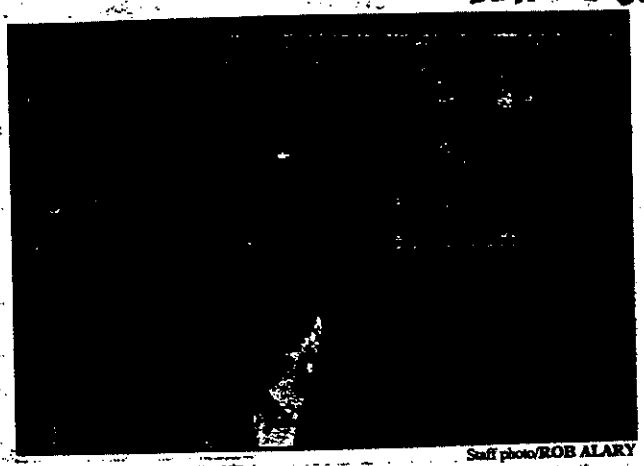
In fact, council is hoping the Tory blue region will carry a lot of weight at Mike Harris' Queen's Park.

The region is setting up a committee to lobby the province on a variety of York concerns, from planning to public transit.

But council isn't waiting for the committee, comprised of regional acting chief administrator Alan Wells and CAOs from local municipalities, to be established before getting its irons in the fire.

Wells, transportation commissioner Kees Schipper, Newmarket Mayor John Cole, East Gwillimbury Mayor Jim Mortson and Georgina Mayor Rob Grossi are looking to set up a meeting

• See 404, page A5



Staff photo/ROB ALARY

Transportation commissioner Kees Schipper

404/from page A1

with Palladini some time in the next month to discuss the extension of Hwy. 404.

"We want to relate to him how important the extension (to Green Lane) is for the region and the growth planned for the northern part of the region," Schipper said. "I'm encouraged the minister of transportation is from the Region of York."



PALLADINI

Despite indications from the Tories that massive cuts are coming — including 20,000 civil service jobs, two subways in Toronto and the completion of Hwy. 407 — York officials are hoping the 404 will proceed.

They're encouraged by a change of heart at the ministry about three weeks ago, when the province agreed to fold the $20-million reconstruction of Green Lane and the $15-million extension of Hwy. 404 into one environmental assessment.

The former NDP government had refused to consider extending the road in sections, insisting it would only look at constructing the entire stretch north into cottage country.

That would have delayed construction to Green Lane for years, possibly decades.

▶ 'I'm hoping we'll have a person more in tune with the trials and tribulations of commuters than the former minister was.'

— Rob Grossi, Georgina mayor

"It was very positive news when we got that. It's a real positive step forward," Schipper said.

Georgina Mayor Rob Grossi agreed.

LITTLE VICTORY

"That was a little victory. We're crawling a little farther north," he said, adding the fact Palladini is a car salesman might help the region sell the need for a highway expansion.

"I'm sure Mr. Palladini is well aware of transportation issues in York Region since he has been a major car seller, a major businessman," Grossi said.

"I'm hoping we'll have a person more in tune with the trials and tribulations of commuters than the former minister was.

"I think there's a realization for a balance between public transportation and the reality of personal vehicles."

22-2-95 Page 1

Economic impact study

As a result of the concerns expressed by residents during public meetings on the Bradford Bypass-404 extension, the Ministry of Transportation has agreed to undertake an economic impact study.

The study will inventory Bradford's commercial operations, their relation to the existing highways (11 and 88), and document the economic effects and opportunities created by the Bypass - a proposed four lane, limited access highway that would link a future extension of the 404 with Highway 400.

Interviews with both business and municipal representatives are planned, and all owners/operators along 11 and 88 will be contacted. The study will seek to determine the estimated share of employment and municipal taxes that rely on exposure to the Highways, and look at case studies of the effects of similar Bypasses on other communities.

The study will also seek to identify signage and access improvements that could support existing commercial establishments.

Hemson Consulting Ltd. has been retained by the Ministry to carry out the impact study.

A preferred route for the proposed Bypass is expected to be announced this spring.

from Bradford West Gwillimbury Times
22-2-95 Page One

H.E.A.R.T. Community Planning Committee responds to F.R.O.G.S.

DEAR EDITOR,

In response to the letter, "F.R.O.G.S. Vow to Fight Bradford Bypass", published November 9th, I would like to make it clear that H.E.A.R.T. is neither for nor against the Bradford Bypass.

The intent of the two public meetings organized by the Community Planning Committee was to provide information about the proposed routes from the Ministry to the residents of Bradford West Gwillimbury, and to provide the Ministry and the Consultants with information and input from the residents. If we can identify potential problems before the Bypass is in place, we can request that the Ministry address these concerns and incorporate the solutions into the project, rather than having to deal with them ourselves after the fact, through our municipal budget.

We were hoping to provide a forum for residents to be proactive rather than reactive - to respond to the proposed routes before a freeze on development or actual construction has commenced. As a direct result of the public's input, the consulting firm, McCormick Rankin, and the Ministry of Transportation came back to our community with new variations of the proposed routes.

The following suggestions were made by residents during the first public meeting:

. The Bypass may not be "needed" specifically for Bradford residents; its need is part of a bigger picture.

. The Bypass may have a negative impact, in that it may divert traffic away from Bradford.

. A Bypass via Dissette Street and *Artesian Parkway would provide a* balance between diverting traffic away from Bradford, and attracting visitors.

. Case studies of similar situations in other communities would be useful in understanding the positive and negative impacts of the Bypass in both long and short terms.

. A philosophical question arises as to the wisdom of expanding highway systems, rather than looking at alternatives, like rail, to reduce the need for highways.

. A decision on the 404 may be premature, because the effects of the 407 may reduce the need for the Bypass, or maybe an arterial road would suffice, rather than a freeway.

. Adequate interchange signage and lighting are needed.

. Visual landscaping and acoustic barriers are needed.

. The relationship between the Bypass and Bradford's future development is of concern. H.E.A.R.T. wants to attract business to town through improved access and downtown revitalization; but if the highway is too close to town it may become a barrier to development, or a divisive element splitting the community.

. There are concerns with respect to the potential damage to existing wells and the impact of road salting on vegetation and ground water.

. Why won't the Highway 9/Green Lane route work?

. What is the time line of this decision-making, and how serious is the MTO?

. Has a cost estimate been developed?

. How do we get people off the highway and into Bradford? What support is needed from Bradford to take advantage of this project, and result in improved roads entering town?

. There are concerns about noise impact, and interchange spacing.

. The impact of the project on wetlands, marsh and agricultural land is an issue.

. The Public Utilities Commission is currently investigating potential wells which are directly adjacent to *some of the alternate routes.*

Many residents in the RR 2 area will be directly affected by the various proposed routes. Understandably, they do not want this project to go through their living rooms or even adjacent to their properties.

As to Forbid Roads Over Green Spaces (F.R.O.G.S.), Joe Matys, chairperson of H.E.A.R.T., has since spoken to Paul Jafine and given the background of H.E.A.R.T. and the Strategic Plan for Bradford West Gwillimbury, and explained that we are not in a position to "form a team of F.R.O.G.S. with H.E.A.R.T."

It is the objective of the Community Planning Committee to establish land use policies, improve opportunities for public awareness and involvement in the planning process. In 1995, we will support and encourage community participation in the development of the Official Plan for Bradford West Gwillimbury.

Ideally, we will know the final route selection for the 404-Bradford Bypass when we commence updating the Official Plan, so as to plan proper land zoning and development to deal with it most effectively.

The response of residents to the two public meetings (100+) shows that the public is interested and concerned about the growth and development of our community. I look forward to meeting more of the community in the Official Plan Workshops in 1995.

Sincerely,

Lisa Brouckxon, Community Planning Committee Chair.

F.R.O.G.S. vow to fight Bradford Bypass

BWG Times Nov. 9, 1994

The proposed Bradford Bypass, a four-lane, limited access highway that would link Highway 400 with an extension of the 404, has been raising concerns among residents in both Bradford West Gwillimbury, and East Gwillimbury.

On the other side of the Holland River, a newly-formed group called "Forbid Roads Over Green Spaces" (F.R.O.G.S.) held an information meeting on October 27th, in the Riverside Drive area.

Attendance was standing room only, and, says Paul Jafine, "Ninety-nine percent of the people had absolutely no idea they had a highway going through their backyard."

The majority of residents at the meeting opposed the new highway, but not as a "N.I.M.B.Y." (Not In My Back Yard) response, says Jafine, who describes himself as "one of the F.R.O.G.S. on the lily pad."

"We are not against road development.. Just against putting roads through unreasonable places." The proposed routes would cut through both floodplain and wetland areas, he says, both ignoring the government's own policies on wetland preservation, and threatening the aquifer that supplies communities like Bradford.

F.R.O.G.S. argues that the best east-west route would follow Green Lane, at the northern boundary of York Region, and feed into Highway 9. The route would be less disruptive, and "you're talking probably one-fifth the cost."

The Ministry of Transportation has argued that both an upgrading of Green Lane, and a more northerly Bradford Bypass route, will be needed to handle future population growth.

F.R.O.G.S. has promised to continue to fight the proposal. "We're going to continue to press," says Jafine, noting that the group has been challenging municipal candidates on the issue, "to force our elected officials to state exactly where they stand."

There are also plans to liaise more closely with the H.E.A.R.T. Committee, which organized two information meetings on the Bradford Bypass in Bradford West Gwillimbury - "and form a team of F.R.O.G.S. with H.E.A.R.T."

Public meeting on the Bradford Bypass

More than 100 people packed the Bradford Community Centre last Thursday, for what was billed as the last public meeting before consultants select a preferred route for the proposed Bradford Bypass.

For a third time, representatives of the Ministry of Transportation and McCormick Rankin consulting engineers, presented the possible corridors for a four lane, limited access Highway, that would eventually link the 400 with a future extension of the 404.

This time, there were "refinements" in the possible routes, east and north of Bradford - based, consultants said, on public input from the previous two sessions. They asked for more input, and they got it, as residents questioned the need for the Bypass, and the logic that would see the highway run through the middle of Bradford West Gwillimbury.

John Sutherns, principal engineer with McCormick Rankin, explained that routes north of Concession 11 had not been considered, because the Ministry of the Environment had already turned down a highway proposal in that area in the late 1980s, for environmental reasons.

As for a suggestion that upgrading Green Lane and Highway 9 in Newmarket would serve the same purpose, Sutherns noted that York Region does have plans to upgrade to a four lane road. "That corridor will, in fact, address the problems in and around Newmarket," Sutherns said, pointing out that the population of York Region is expected to double to 1 million, within the next twenty years. "It's needed, as well as the freeway link."

The residents raised a number of concerns in the meeting, including the "freeze" on development within the proposed transportation corridors. More than one landowner asked when the freeze would be lifted, and when negotiations with the Ministry would begin, for the purchase of properties.

Sutherns agreed that it might be difficult to sell or develop a property, until a route is announced, late in 1995.

"One of the frustrations of a process like this is that it leaves people's lives in doubt for a considerable time," he said, admitting it places "a hardship" on landowners. In the case of extreme hardship - a farmer, for example, wishing to sell in order to retire - the Ministry might step in and purchase the property, although "it's not a guarantee they will buy it."

Initial plans had called for a preferred route to be announced early in 1995, however the "open door" process being followed to ensure that "everyone has the opportunity to be involved" has delayed the process. The consultants are now hoping to find the preferred route by fall of 1995, and win approval from the Ministry of Environment and Energy within 2 to 3 years after that - but there might be no expropriation for another 10 to 20 years.

"Carry on living," Sutherns urged residents. "If you increase the value of your property, and your property will be acquired, you will be paid full market value."

Another serious concern was raised by Public Utilities Commission chair, Gary Lamb. Lamb noted that the proposed routes, on either side of the Artesian Industrial Park-

see page 2

Residents oppose Bradford Bypass

from page 1

way, could interfere with 2 new municipal wells currently being developed. The proposal calls for concrete pilons to be sunk 100' into the ground - to the same depth as the aquifer than supplies both municipal and private wells in the area.

"If you interrupt the Town's water supply, you could create major problems," he warned.

There were also concerns that the new routes, which follow Artesian Parkway north and then swing westward between the 9th and 10th Lines, would create problems of access and noise at Scanlon Creek Conservation Area, and for residents of the 9th Line.

One of those residents, Fred Dow, urged the engineers to follow the most northerly route shown - up through the eastern portion of Scanlon Creek, and then westward, between the 10th and 11th Concessions. "It's the line of least resistance to the people," said Dow. "There's people involved here besides bulrushes, flowers, wildlife, butterflies... Put the thing some place where it's not going to bother anybody."

His comments were greeted with applause, but not everybody agreed that the most northerly route was the best. A spokesperson from Scanlon Creek noted that the eastern portion of the park might not be used by people, "but for all the other reasons for the Conservation Area existing - the wildlife, water quality - the east side is just as important."

And Mikki Nanowski noted that if the interchange with highway 11 was too far north, motorists wouldn't want to drive back south, to the town of Bradford.

Bradford West Gwillimbury Times
Oct. 19, 1994

New routes for Bradford Bypass

On Thursday, October 20th, H.E.A.R.T.'s Community Planning Committee will be hosting a final public meeting to discuss the Bradford Bypass, the proposed four-lane highway that will, some day, link an extension of the 404 with the Highway 400.

The meeting is to be held at the Bradford Arena, from 7 to 9 p.m., and residents will have an opportunity to review several new route alternatives that have been developed east of Highway 11.

Representatives of the Ministry of Transportation and of McCormick Rankin Consultants will be present. This is the final opportunity to have some input into the route selection process, before the formal Route Evaluation takes place.

Letters to the Editor

F.R.O.G.S. oppose Bypass through wetlands

DEAR EDITOR,

The Ministry of Transportation Ontario is proposing a four-lane bypass highway in order to connect the extension of Highway 404 to Highway 400. Our concern is that the proposed area is environmentally sensitive.

We, as residents of this proposed area, feel that there is not a necessity for such a highway. Cost of such a project seems unnecessary. Why would they want to build a highway through a floodplain? This would seem to us to be a very expensive venture, since it would require footings that would extend very deeply into the ground.

Most of all, there is the environmental impact. The area is considered wetland. As residents of this area, we understand its sensitivity. We have become custodians of this very fragile ecosystem. This area also has an historical significance. During the War of 1812, the Holland River was used as a mode of transportation.

This area contains a vast variety of flora and fauna. There is an abundance of plants, deer, ducks, geese, blue and green herons and birds of many kinds, like orioles cardinals, woodpeckers, etc., ditches that provide spawning for Northern Pike...

The Town of Newmarket is on record requesting that this road be located just north of the town on a pre-existing road, called Green Lane.

Signed,

Sue Jones, for The F.R.O.G.S. - Forbid Roads Over Green Spaces.

New meeting planned for Bradford Bypass

Consultants with McCormick Rankin Consulting Engineers and the Ministry of Transportation came before Committee of the Whole last night, to present several new alternatives for the route the Bradford Bypass will take as it skirts the town of Bradford. The Bypass is being proposed as a link between Highway 400, and a yet-to-be-built extension of Highway 404.

Steve Jacobs, M.T.O., indicated that public input from two Open Houses held earlier this year in Bradford and Queensville, and a meeting organized by the H.E.A.R.T. Committee, had resulted in "some additional road alternatives in the areas east of Highway 11."

As Steve Schijns, with McCormick Rankin, noted, "Most people would prefer to see the road (a four-lane highway, and 100 metre right-of-way) far enough away (from Bradford) that any negative impact... is reduced."

Working within the constraints of Class 1 Wetlands, Class A agricultural land, Scanlon Creek Conservation Area, and the various industrial and residential developments, the consultants now suggest that the highway could be build on one side or the other of the Artesian Industrial Parkway, then cut between the 9th and 10th Lines, to link up with the 400.

Schijns called the suggestions "reasonable and viable options."

Residents will have a chance to agree or disagree. Another public meeting has been arranged for October 20th at the Bradford Arena, when the options will be presented.

Consultants have promised to come up with a "preferred route" early in the new year, "leading to a further round of public review." Until then, properties within the proposed transportation corridors are all under a development freeze.

The MTO suggests that the Bypass may not be constructed for at least ten years.

First Page
Bradford West Gwillimbury Times
Wed., Oct. 5, 1994

EAP for Bradford Bypass

The Ministry of Transportation has released the final Environmental Assessment Proposal for the proposed Bradford Bypass, which would link Highway 400 with Highway 404 south of Lake Simcoe. The 100 page document is the result of a series of public consultations, and months of work by engineering and environmental staff and consultants.

Although the Bypass is not likely to be built within the next 10 years, the Ministry is proceeding with the planning process, to ensure that the land needed is protected from other development.

The EAP is available for public viewing at the Bradford West Gwillimbury municipal offices, and the Bradford Public Library. Plans of the alternative routes are also available at the Library.

ONTARIO GOVERNMENT NOTICE

The Ministry of Transportation has completed the final Environmental Asessment Proposal (EAP) for the proposed Bradford Bypass.

The EAP was developed in consultation with government agencies, municipalities, interest groups and members of the public. At the completion of the study, an Environmental Assessment Report, documenting the entire study, will be made available for public review and comment.

The EAP is available for public viewing at the following locations:

* Bradford-West Gwillimbury Municipal Offices;
* Public Library in Bradford;
* East Gwillimbury Municipal Offices;
* King Township Municipal Offices;
* York Region Municipal Offices (in Newmarket); and
* Simcoe County Municipal Offices (in Midhurst).

Plans of alternate routes are available for public viewing at the Bradford Public Library and the East Gwillimbury Municipal Offices.

As part of the ministry commitment to continue to provide public input to the process, future public information centres will provide formal opportunities to review and comment on the progress of the study.

If you have questions or comments at this time, please direct them to:

Mr. Steve Jacobs, P. Eng.
Senior Project Engineer
Central Region
Ministry of Transportation
of Ontario
3rd Floor, Atrium Tower
1201 Wilson Ave.
Downsview, Ontario
M3M 1J8

Mr. Steve Schnijns, P. Eng.
McCormick Rankin
Consulting Engineers
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Ontario

BWG Times
Sept. 7, 1994

Residents comment on proposed Bradford By-pass highway

The H.E.A.R.T. Workshop on the Bradford By-Pass, held on Thursday, July 28th at the Bradford West Gwillimbury Community Centre, produced a number of recommendations from the hundred or so residents who participated.

Among the points raised:

. The Bradford Bypass, a four lane freeway linking the 400 and a proposed extension to the 404, is not needed for Bradford residents, but is part of a bigger picture.

. A Bypass via Dissette Street and the Artesian Industrial Parkway would provide a balance between diverting traffic from Bradford, and attracting visitors.

. A decision on the Bypass could be premature, because the effect of the 407, Ontario's new toll highway, on traffic patterns is not yet known. The 407 may reduce the need for another east-west route.

Residents worried that inadequate signage, and lack of visual and acoustical barriers could increase the negative impact of the Bypass. There were also concerns regarding the impact of road salt on ground water and wells, and loss of agricultural and environmentally sensitive lands.

Steve Jacobs of the Ministry of Transportation told the residents that the Ministry would be following up on the ideas and comments produced during the meeting. An evaluation of route alternatives will be the subject of a third round of Public Information Centres, scheduled for early in 1995.

In the meantime, the Environmental Assessment Proposal, and copies of the route alternative plans will be available for public viewing at the Bradford Library, and the Clerk's offices of Bradford West Gwillimbury, East Gwillimbury and King Township.

Residents are encouraged to send in their comments, in writing, or leave verbal comments on the Bradford Bypass Infosource Hotline, by telephoning 775-5858, and entering code 5600.

New water tower?

The Bradford West Gwillimbury Public Utilities Commission is moving ahead with the Class Environmental Assessment planning process for a second water tower in the vicinity of Bradford. The water tower would provide additional storage to service new development and growth in the municipality, and provide an alternative water source should the old tower require major repairs.

The PUC has identified three possibilities - do nothing; allow growth based on reduced water storage; or construct a new tower. The preferred solution will be selected after Review Agency comments, and public input, have been received.

The PUC has scheduled a public Open House on August 15th, between the hours of 3 p.m. and 5:30 p.m., and 7 p.m. to 9 p.m., at the Council Chambers in Bradford. Residents who attend will be asked to fill out a questionnaire, to assist the PUC in selecting the best option.

Infrastructure grant talks continue...

Tuesday was the deadline for response from potential partners in the Town's new infrastructure projects, extending water and sewage pipelines through use of Joint Infrastructure grant monies.

Councillor Peter Dykie indicated that there had been positive input, especially from developers along Highway 88.

Response from the Artesian Industrial Parkway has been complicated by the number of individual landowners involved, he said. He was hopeful of putting together a report and recommendations by August 22nd.

BWG Times Aug 3/94

More questions about the Bradford By-pass

Approximately 100 people turned out for last Thursday's public meeting on the Bradford Bypass, a proposed four-lane highway that would link Highway 400 with a future extension of the 404.

Steve Jacobs of the Ministry of Transportation noted that there had been widespread acceptance of the need for an east-west route at the south end of Lake Simcoe, and generally positive response to requests for public input over the past year.

But there has also been the feeling, he said, that "it should be done in a way that is more fitting for the community, where you people get to set the agendas, you people get to choose the issues."

Organizers had hoped that Thursday's meeting would provide the opportunity for residents to "brainstorm", in small discussion groups, and debate the pros and cons of the Bypass. Instead, the first hour and a half of the meeting were taken up with questions and complaints regarding the project.

The engineers are proposing a route that will fall somewhere between Highway 88, and the 11th Concession of Bradford West Gwillimbury, running mid-Concession.

Residents wanted to know why the four-lane freeway couldn't be developed along an existing transportation route; why it couldn't be located further north near Highway 89; why it couldn't be located further south, along East Gwillimbury's Green Lane.

Steve Schijns of McCormick Rankin, engineers, told the meeting, "The damage and the problems of taking an existing Concession and upgrading to freeway status are, at this point, judged too great to pursue."

A more northerly route was explored in an earlier study, conducted in the late 1970s and early 1980s, and was shot down for environmental reasons - primarily, the impact on the Class 1 wetlands found on both sides of the Holland River.

The new study cannot "ride roughshod over an identical study area," Schijns said, explaining why the study area goes no further north than the 11th Line.

A more southerly route runs into other problems, including a larger population, more development, and the presence of the Oak Ridges Moraine, an environmentally-sensitive area of recharge for the groundwater supplies of Newmarket and other York Region communities.

Green Lane will be upgraded, Schijns said, but in response to Newmarket's growing traffic needs, and not as a means of channelling traffic to either the 400 or 404 transportation corridors.

"There simply aren't very many corridors that will do the job," Schijns said. The proposed routes through Bradford West Gwillimbury not only minimize the impact on wetlands, crossing the Holland River at the marsh's narrowest point, but provide good separation of Highway 400 and 404 traffic streams.

There was one further question: "Is there a need for this highway at all?"

"This is not the 401 - the demand is not in that order of magnitude," admitted Schijns, but he noted that there is "considerable demand" from commuter and recreational traffic which is expected to increase "dramatically" over the next ten years. And if the Ministry doesn't map out a possible traffic corridor now, he said, in ten years time the area will be so built up, a route won't be available.

Some questions remained unanswered.

When will the Bradford Bypass be built -and how much will it cost? At the moment, said Schijns, "we have no estimates."

Letters to the Editor

Plan to attend Bradford Bypass meeting, to identify potential problems

DEAR EDITOR,

On Thursday, July 28th, at 7:30 p.m. at the Bradford Arena, there will be a public meeting and brainstorming session on the pros and cons of the proposed alternate routes of the 404/400 Bradford Bypass. I strongly urge all concerned members of the community to attend this meeting as it may be the last opportunity to address concerns in a public forum before the final decision on the bypass route is made this fall.

The bypass, as well as a hydro corridor, is coming. This is an opportunity for community input to be proactive rather than reactive. Concerns such as how far north or south the bypass will come will be discussed. If it is too far south, will it put a cap on residential growth? Be too noisy?

If it connects to the 400 at Highway 88, how will increased traffic flow affect local residents commuting in the morning? Will we be getting paved service roads along the highway? How many interchanges will there be, and where will they be? Will construction start at the 400 or the 404?

When the Village of Coldwater was by-passed, the village council and local businesses identified the problem of inadequate signage and lighting, indicating the exit to their town, only after the project was complete.

If we can identify potential problems before the bypass is in place, we can request that the ministry address these concerns and incorporate the solutions into the project, rather than having to deal with them ourselves after the fact, through our municipal budget. Highway light posts and signs are very expensive, and even more expensive to instal after the fact.

This is your opportunity to have input into the growth and change of our community. A well-planned community with ideal access routes to the Toronto hub will be attractive to industry, which can potentially provide us with a much-needed corporate tax base, job opportunities for our residents and entrepreneurial opportunities.

Get involved! We hope to see you there.

And a thank you to the Husky Station for the use of their mobile sign advertising the meeting, Brian Hunter of Countrywide Huronia Realty for printing meeting notices for the R.R. #2 residents, Shoppers Drug Mart for providing the postage, the Parks & Rec. Department for use of the Arena, The Times for the press coverage, and Steven Schijns of McCormick Rankin for facilitating the evening.

Sincerely,

Lisa Brouckxon, Community Planning Committee of H.E.A.R.T.

Bradford Bypass worries resident

DEAR EDITOR, 27.7.94

I recently learned of the alternate routes for the Bradford Bypass and realized how much they will change Bradford as we know it.

I have been a member of St. Paul's Coulson's Hill Anglican Church for the last 6 years.

As you may know, our church celebrated its 140th Anniversary on the 26th of June. For 140 years it has been sitting quietly and peacefully on the 11th Line off Highway 11.

And to think that on its 145th Anniversary it might be sitting not so quietly, and not so peacefully, beside a 4-lane highway, does not seem right!

I really don't want to be singing "Hosanna" while I hear the roar of transport trucks over the organ.

Sincerely,

Heather Dorward, Bradford.

Thursday, July 28

Library. 27.7.94

H.E.A.R.T. - the Strategic Plan's Implementation team is holding a community meeting at the Arena, 7:30 p.m. to discuss the Pros and cons of the Bradford Bypass.

Also 13.7.94
20.7.94

Letters to the Editor

Setting the record straight on the Bradford Bypass

BWG Times July 6/94

DEAR EDITOR,

There are two items in the June 22nd edition of The Times regarding the Bradford Bypass Study - "Highway Routes identified" on page one, and a Letter to the Editor - "Resident Questions Bradford Bypass Guarantees", and it is necessary to correct some of the impressions which may have been left by both stories.

Regarding the timing of the negotiations for property cited in the first story, Ministry of Transportation practice is not to acquire property until two or three years before construction. There is currently no construction schedule in place, since the planning for the Bypass is not yet complete.

In regard to the Letter to the Editor, our discussions with Bradford's business people have highlighted both the significant potential benefits and drawbacks associated with the Bypass. The economic effects of additional visibility, improved access, and reduction of congestion in the town must be balanced against effects on business which currently rely on long distance traffic for their livelihood.

These concerns are being taken seriously in carrying out the study, and the constructive input of Bradford's business community to the Bypass study is welcome.

The letter writer is overstating the case when referring to any "guarantees", explicit or implied, regarding the economic impact of the future Bypass on Bradford. It is clearly in everyone's best interests to work towards enhancing the town's economic health, and it is anticipated that the net effect of the By-ass will be positive for Bradford's business community.

However, there are no "guarantees" that can be made regarding Bradford's economic performance with or without the Bypass, and to state that some sort of personal guarantee has been made to that effect is inaccurate.

Yours truly,

Steve Jacobs, Senior Project Manager.

Thursday, July 28

BWG Times 13-7-94

CERAMIC DINOSAUR - with Sandy Villemaire. Paint a ceramic shelf dinosaur. 1 - 3 p.m. (10 a.m. - 12 noon) Pre-registration with fee is required. Fee: $6. Bradford Public Library.

H.E.A.R.T. - the Strategic Plan's Implementation team is holding a community meeting at the Arena, 7:30 p.m. to discuss the Pros and cons of the Bradford Bypass.

20-7-94

Public meeting on Bradford Bypass

The community is invited to share ideas regarding the Bradford Bypass highway project, on July 28th, 7:30 p.m. at the Bradford Community Centre, 125 Simcoe St.

Steve Schijns of McCormick Rankin, engineers, will act as facilitator, in discussing the pros and cons, and alternative routes.

page 1

Highway routes identified

Last year, at the Ministry of Transportation Open House and information meeting regarding the Bradford By-Pass, the possibility of a four-lane highway cutting across the Bradford West Gwillimbury countryside seemed remote.

Last Thursday, the MTQ and consulting engineers returned to Bradford to outline the possible transportation corridors for the Highway 404 extension and link to the 400, and residents became aware that they could have a freeway within hearing distance of homes and parks.

Steve Schijns of the Ministry noted that "there is considerable support for the overall project", designed to accommodate future growth in the regions north of Toronto. Existing routes carry between 5,000 and 10,000 vehicles each day; those numbers are expected to increase to 20,000 to 30,000 with the next decade. Schijns noted that as the Bradford Bypass routes are narrowed down, however, "The concerns get a little more personal."

There was a great deal of interest in the maps which showed potential transportation corridors and interchanges in Bradford West Gwillimbury. Where the new freeway cuts across the Holland River, there are two possible paths - one slicing through or adjacent to the Artesian Industrial Parkway, between the 8th and 9th Lines, and one just south of, but not through, Scanlon Creek Conservation Area.

"We've always treated Scanlon Creek as a "no go" and that hasn't changed," said Schijns.

Members of the Friends of Scanlon Creek, on hand to view the proposed routes, expressed their reservations. "We're very concerned about the effect of the airborne pollution," and the effect on wildlife, said Krystyna Tanner. "We have worked so hard to keep Scanlon Creek open." She added that the group will be working with the Lake Simcoe Regional Conservation Authority on a joint response.

Some impact on the wetlands along the Holland River is predicted, but the Ministry has opted to build an elevated causeway on steel or concrete girders across the area - rather than the traditional embankments - in an effort to reduce the impact.

There was talk of the potential impact on family farms, and on the Town of Bradford itself. The bypass would provide motorists with a means of avoiding the town entirely, on their way through Bradford West Gwillimbury.

The Ministry and its consultants will be reviewing the routes, and looking at relative costs, during the summer and fall. Questionnaires asking residents to rate the relative value of farmland, wetlands, residential and industrial areas, will

see page 2

Bradford West Gwillimbury Times, Wednesday, June 22, 1994

Bradford By-pass

from page 1

also be used to evaluate the proposed corridors.

Noted Schijns, "The squeaky wheel gets the grease."

A preferred route is expected to be announced later in the fall. At that time, the development freeze in effect on the proposed corridors will be lifted on all but the final route, and negotiations for compensation will begin with affected landowners.

Some members of the Bradford & District Chamber of Commerce have also asked for compensation for the town, which could end up isolated from the main flow of traffic. Past President Mikki Nanowski called for a "trade-off", suggesting that the Ministry should fund a museum in town that could attract some of the tourist traffic that might otherwise be lost.

Actual construction is not expected to begin for years; at the moment there is no money in MTO's budget for the by-pass. But Ministry staff felt it was important to map out the route now, before further development complicates the choice.

Letters to the Editor

Resident questions Bradford Bypass "guarantees"

DEAR EDITOR,

RE: the proposed Bradford Bypass.

On June 15th, there was an important meeting called for the Bradford West Gwillimbury Chamber of Commerce and advertised in the Bradford West Gwillimbury Times. The Bradford Bypass would be the first item on the agenda.

Although I am not a member, I thought there would be little objection to my attendance.

This first item was presented by a person named Steve (Schijns), a representative of the Ministry of Transportation. He was offering for consideration a choice of four possible routes. All of these routes bypassed the town.

One Chamber of Commerce member was deeply concerned about the rerouting of traffic flow around the town. This person felt much business could be lost. Perhaps, she said, "Bradford might even become a ghost town."

Bradford's economic health, especially in the downtown area, as I understand it is less than optimal. Would a change in traffic pattern be the final coup de grace?

Steve noted her concerns about Bradford's future. In order to allay any fears, Steve actually guaranteed that Bradford would not suffer because of the Ministry's plans.

I wondered to myself what kind of power Steve would need to make this type of assurance. For my part, I think the merchants of Bradford should be concerned about real business losses. Especially at risk could be service stations, roadside vegetable, grocery and garden retailers.

Perhaps Steve should count the transients that stop and shop in Bradford at present. On some of the shopping forays with my wife, I know I have! Will they still be shopping here after the bypass? If not, how will Steve and his guarantee help Bradford then?

Will anyone remember Steve's guarantee?... and even if they do, will it mean anything or change anything?

Signed,

--- Glenn Traviss, Bradford West Gwillimbury.

BWG Times 22.6.94

Bradford By-pass public meetings

The Ministry of Transportation and their engineers have been proceeding with their studies of the Bradford By-Pass, the proposed freeway that would link Highways 400 and 404.

Preliminary work has identified three alternative routes through Bradford West Gwillimbury, between the 8th and 9th, 9th and 10th, and 10th and 11th Lines.

"They tend to be mid-Concession, running along the back lot lines," noted John Sutherns, of McCormick Rankin. The location, he said, tends to "keep farm operations intact."

Residents will be able to view the proposals on June 16th, 3 to 9 p.m., at Bradford District High School. The engineers hope to have a preferred route identified by the fall.

Mod-Aire lobbies for sewers at industrial park

Mod-Aire Vice President Brian Corbett was in Council on Monday night, to recommend that the infrastructure funding be used to extend sanitary sewers to the company's industrial park on the Middletown Sideroad.

Corbett pointed out the property already has water for firefighting purposes, and is close to Highway 400, a major transportation route. "We do have a site that we do think is suitable to be considered."

He also told Councillors that Mod-Aire was still interested in a joint venture with the municipality, whereby the company would pay servicing and marketing costs if the Town purchased the land. The Town and Mod-Aire would then split any subsequent profits, creating a fully serviced industrial park on a "no cost, no risk basis to the municipality."

Councillor John Gabriel noted that it could cost $1 million dollars to run the sewer line out to the 10th Sideroad, two-thirds of which would be covered by the infrastructure funding available. "Are you saying the other one-third will be covered by Mod-Aire?" he asked.

"In terms of paying our way - just as we did with the Public Utilities Commission, in terms of the water, we would pay our way in terms of the sewers," replied Corbett, adding that other users of the line would also be expected to pay a share. Mod-Aire and Reagens Plastics paid 75% of the cost of the water pipeline to the Middletown industrial park. The remaining 25% was paid by the PUC, but will be recovered from future hook-ups to the line.

Bradford By-pass meetings

The Ministry of Transportation is currently finalizing data collection for the proposed Highway 404 extension, and the connection between Highways 400 and 404 (the Bradford Bypass).

A re-evaluation of population figures and development patterns has led to a revision of the study area east of Lake Simcoe. The Project Team has concluded that there is high travel demand from the south shore area of the Lake, and that a road closer to Lake Simcoe than originally proposed will better serve the needs.

There have been no revisions to the Bradford Bypass corridor study area, which lies between Highway 88 and the 11th Concession in Bradford West Gwillimbury.

A series of Public Information Centres are planned for late June 1994, at which the route alternatives and corresponding interchange locations will be presented.

A mile of pennies

Calling all hoarders...

The Killarney Beach Lions Club has launched a fundraising drive to collect a "mile of pennies" - an estimated 84,480 pennies - for the Salvation Army.

So dig up those collection jars and penny socks, and get those coins back into circulation for a good cause. Call Ron at 456-3931.

ighway study holds Information Centre

ne thing is clear. The proposed hway corridor between the 404 nsion and Highway 400 will y go ahead if environmental cerns can be addressed.

n east-west transportation cor- r through Bradford West Gwil- bury was first proposed in 1979, again in 1984, but in both cases foul of the Ministry of the En- nment. The preferred route in se studies - a straight line drawn he vicinity of Highway 89 - was ed down, because it cut through h the Keswick and Innisfil shes.

he current proposal will not be king at the Highway 89 route. vo past studies have already wn that's not feasible," said in Rodger, of McCormack lkin, consulting engineers in- ved in what has been dubbed the dford By-Pass Study.

stead, engineers are looking for ute far to the south, between the and 11th Concessions of Brad- l West Gwillimbury. A second ssing of the Holland River is proposed, between the 7th and Lines.

Rodger was speaking at the first several public information cen- , held to explain both the scope he project, and the study proc- . The engineers manned dis- ys at Bradford District High School from 3 p.m. until 9 p.m. on June 17th, addressing the concerns of residents who came from as far away as Holland Landing and Queensville.

Interest was high in the Constraints Map, a huge aerial photograph showing every land use, environmentally sensitive area, and even individual homes within the study area.

Questions to the engineers ranged from, "Should I sell my home?", and "Can I go ahead with a proposed development?", to "When will the Ministry of Transportation identify the preferred route?"

"We haven't identified any specific alternatives yet," said Rodger, indicating that the study would look at the options of upgrading existing routes, "managing" traffic demands, building a new transportation line, or some combination of the three.

Even the name "Bradford Bypass" is somewhat misleading, since the Ministry at this stage is not committed to by-passing the town. "Alternatives which involve travel through Bradford will be as-

see page 2

Bradford Bypass study info centre

from page 1

sessed on an equal basis with those which bypass the town," an information pamphlet claims.

The study will even consider the option of maintaining the status quo, although Rodger admitted that would not address existing problems of increasing demandand congestion, and the lack of a direct route around Lake Simcoe, which are cited as the reasons for the proposal.

The planners were looking for public input at the information ce tre. They hope to identify sever possible routes by the early spri of 1994, narrowing the choice to single preferred route, assessed its technical merits, by the fall the year. An environmental asses ment report should be ready f submission to the Ministry of t Environment by the winter of 199

The MTO has asked for a free on all development within the stud area, at least until the choice h been narrowed down to the recon mended routes. "We have no leg right to stop severances, plans subdivision, etc.," admitted Seni Project Manager Steve Jacob "We ask the municipality to act our behalf. This freeze is up to t discretion... of the local council."

Once the possible routes are ide tified, by early 1994, most of t study area will be freed from t freeze, he said. Actual constru tion, though, may not take place f several years. If and when the pr posal passes the environmental a sessment, the highway could completed within 5 to 10 years, "a lot of that depends on fundin

Bradford West Gwillimbury Times
June 23, 1993

Bradford By-pass study

Traffic on Highway 400 has increased from approximately 26,000 vehicles per day, in 1985, to over 50,000 last year. Highway 11 traffic into Bradford has also gone up, from about 12,000 per day, to well over 20,000.

Partly to reduce the congestion, and partly to provide a direct highway link between the 400 and the proposed Highway 404 extension, the Ministry of Transportation is looking at a new east-west highway through Bradford West Gwillimbury.

MTO staff were in Committee of the Whole last night, to describe the project and the progress of the study. The area being considered for a possible route lies between the 8th and 11th Concessions, narrowing in the vicinity of the Holland River.

A new crossing of the river, north of Bradford, is planned.

see page 20

Page 1

Bradford By-pass in early stages

from page 1

Councillors were told that the proposal is now in the process of establishing an Environmental Assessment - but were reminded that an east-west link has come before the Ministry of the Environment before. First suggested in 1969, several attempts have been made to bring the transportation corridor through the approvals procedure, only to fail, because the impact on the environment was seen as unacceptable.

The current study, said Steve Schijns, engineer with McCormick Rankin, is looking for a preferred route that would be "acceptable in terms of the environment, and acceptable in terms of cost, and acceptable in terms of the community."

Although the study is called the "Bradford By-Pass", Schijns said, "Excuse the name, if it rubs anybody the wrong way... but we couldn't come up with any better name than that right now."

He noted that the preliminary report states the term "is used solely to describe the current study in a concise, convenient way. It does not prejudge the outcome of the study nor the alternatives to be analyzed. Alternatives which involve travel through Bradford will be assessed on an equal basis with those which bypass the town."

However, he added that as far as long distance traffic is concerned, it is "preferable from a provincial point of view, to not go through downtowns."

At this stage in the proposal, input is being sought from both the public and other agencies affected, including Ontario Hydro which has plans for an east-west corridor of its own.

The public have the opportunity to comment on the InfoSource Hotline (using a touch-tone phone to call 775-5858, box #5600), and also at the first of several Public Information Centres planned for Thursday, June 17th, from 3 to 9 p.m. at Bradford District High School in Bradford, and at the Queensville Community Centre, on Tuesday, June 22nd.

The Informational meetings will present a review of the work done to date, and give residents and businesses a chance to respond. "The idea is to get comments up front, right at the start of the study," said Schijns.

The Ministry hopes to have a preliminary design of a preferred alternative route prepared by the summer of 1994, and an environmental assessment report completed by Spring, 1995. But actual construction, if approved, could take another five to ten years.

"The decision to actually build is really subject to the Ministry, and funding demand," said Schijns.

Bradford West Gwillimbury Times
Wed. June 2, 1993

McCormick Rankin Co.
c/o Steve Schijns
2655 North Sheridan Way
Mississauga, Ont L5K 2P8

willimbury's Community Newspaper

Your Homes section see pages 11, 12 and 13 INFOsource page 22

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Bradford West Gwi
TIM
Vol. 3 No. 20 Wednesday, May 19, 1993

New East - West highway planned

The Ministry of Transportation Ontario appears to be moving ahead with plans to build an east-west highway through Bradford West Gwillimbury - and is looking for comments from local residents.

The Ministry wants to create a link between Highway 400, and the proposed northern extension of Highway 404. The new roadway would provide motorists with an alternative to making the long trip around Cook's Bay, and create a by-pass around downtown Bradford for through traffic.

The study area for the "Bradford By-pass" extends from Kennedy Road in the east to the 5th Sideroad of Bradford West Gwillimbury, and north from Highway 88 to the 11th Concession. Among the options being considered are improvements to existing roads, and the construction of a new highway, including a crossing of the Holland River just north of Bradford.

The MTO first notified the municipality of its plans two years ago, and requested a freeze on all development within the study area.

Now, the Ministry has set up a "Bradford By-Pass InfoSOURCE Hotline, and scheduled two public informational meetings during the month of June, to gather public input.

The Hotline can be reached by any resident with a touch-tone phone. Call the InfoSource, at 775-5858, and dial box number 5600 for information on Ministry plans, and the opportunity to leave a message. There is no charge for local calls.

An Information Centre will be held in Bradford on Thursday, June 17th, from 3 to 9 p.m. at Bradford District High School. A second Centre is planned for Queensville on June 22nd, from 3 to 9 p.m. at the Queensville Community Centre.

APPENDIX F

Hydraulic Assessment of Holland River Crossings

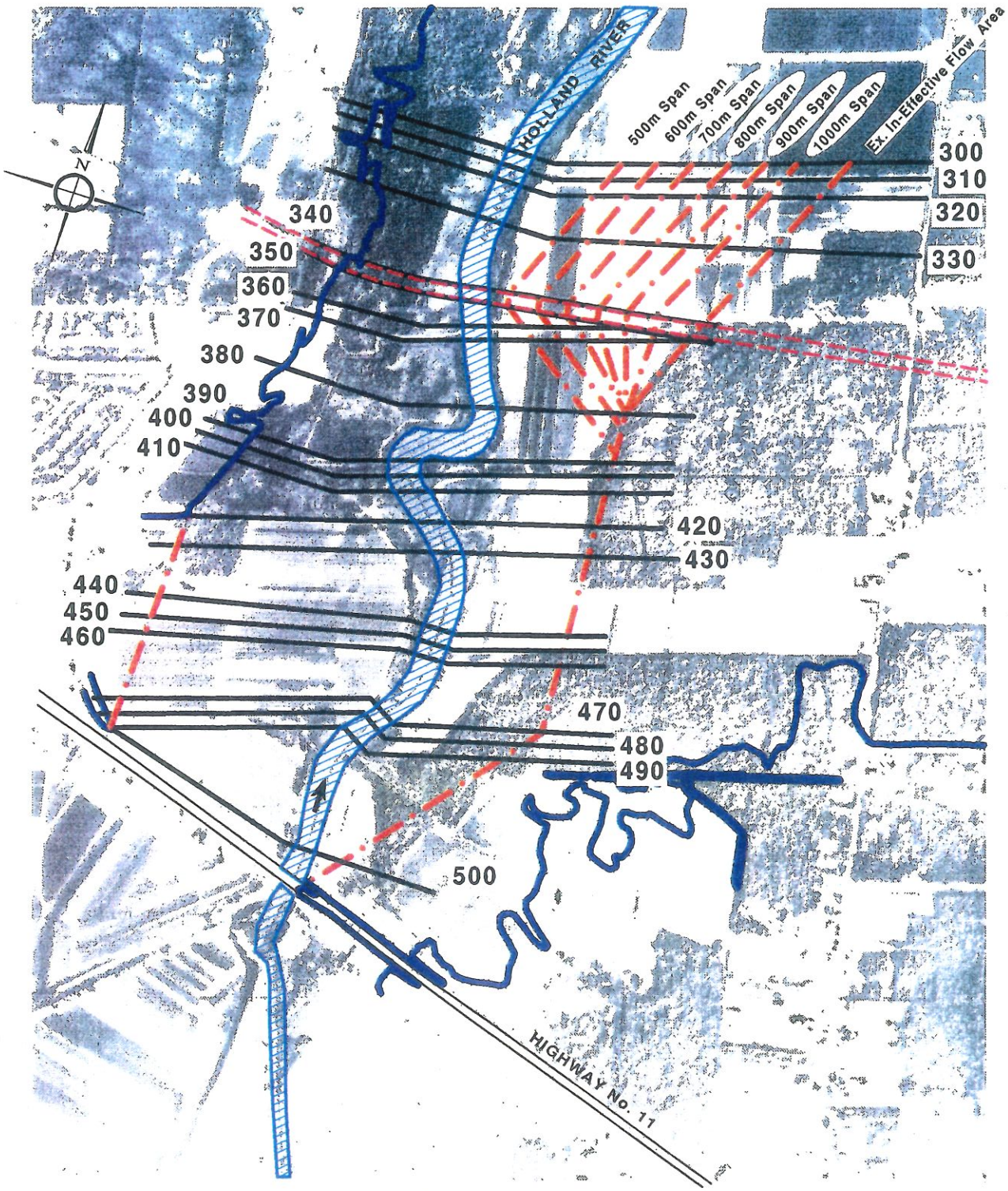
HYDRAULIC ASSESSMENT OF PROPOSED STRUCTURES ACROSS THE HOLLAND RIVER FLOOD PLAIN

The Bradford By-Pass will cross the Holland River upstream (south) of the confluence of the Holland River and the East Holland River. The width of the Regulatory floodplain at this point exceeds 4.0 km. Flood depths and velocities are both low. The crossing will primarily consist of fill to raise the roadbed above the Regulatory flood elevation, with bridges placed at each of the two river crossings. A hydraulic analysis was completed to determine the potential impact of the By-Pass on upstream flood elevations.

To assess impacts on flood elevations, HEC2 hydraulic models were set up for both the Holland River and the East Holland River. Exhibit 1 and Exhibit 2 illustrate the cross-sections used in the analysis. Data was generated from the best available mapping including the 1:5000 Flood Plain Maps provided by the Lake Simcoe Region Conservation Authority. Where possible cross-sections correspond to the sections illustrated on the mapping. Starting flood elevations were based on the downstream Regulatory flood elevations illustrated on the Flood Plain mapping. The Regulatory flood flows were set at 460 m^3/s for the Holland River and 944 m^3/s for the East Holland River.

The hydraulic analysis was completed for alternative bridge spans, ranging from 500 metres to 1000 metres. Table 1 and Table 2 summarize the calculated flood elevations at each cross-section. The expected increase in upstream flood elevations for a range of bridge spans is plotted on Exhibit 3. As illustrated, the increase for the East Holland River ranges from zero for a 1100 metres span to 0.16 metres for a 500 metre structure. The increase for the Holland River ranges from zero for a 900 metre structure to 0.12 metres for a 500 metre span.

The completed analysis provides a preliminary assessment of potential increases in flood elevations. However, a more comprehensive analysis will be required as part of subsequent design phases to ensure the structures are sized appropriately. As part of those future studies, alternatives may also be considered to improve hydraulic performance of the flood plan such that there is no net effect on flood risk as a consequence of the construction of the Bradford By-Pass. These alternatives include but are not limited to: adding culverts at intermediate points to improve conveyance, alterations to vegetation adjacent to the structures to reduce resistance, and localized grading to improve capacity.



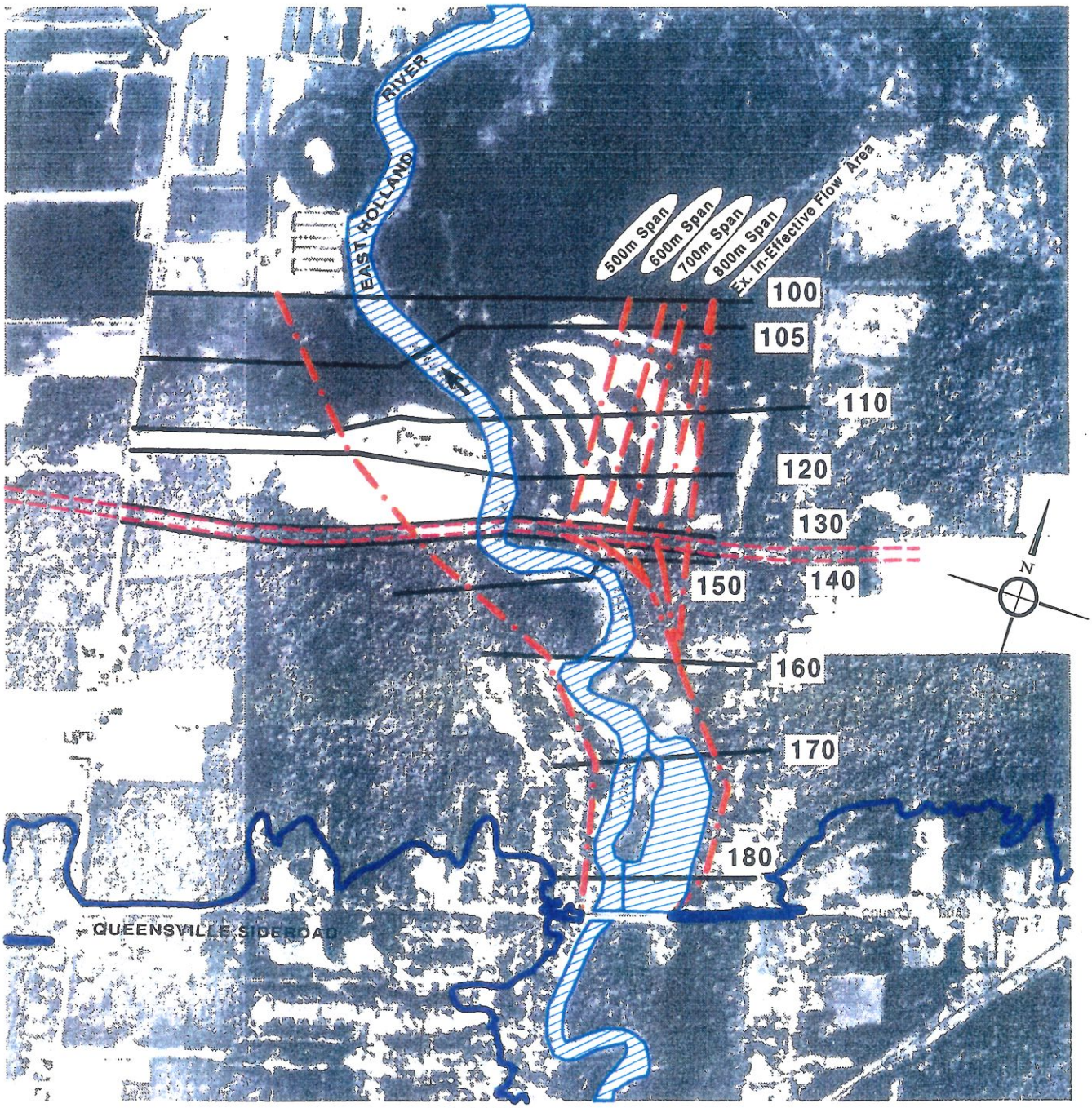
LEGEND

- PROPOSED ROAD ALIGNMENT
- ENCROACHMENT FOR ALTERNATIVE BRIDGE SPANS
- REGULATORY FLOODLINE
- 500 CROSS-SECTION

SCALE=1:20,000

BRADFORD BY-PASS	HYDRAULIC MODEL SETUP HOLLAND RIVER	EXHIBIT 1

BRAD-H1.TCW



LEGEND

PROPOSED ROAD ALIGNMENT

ENCROACHMENT FOR ALTERNATIVE BRIDGE SPANS

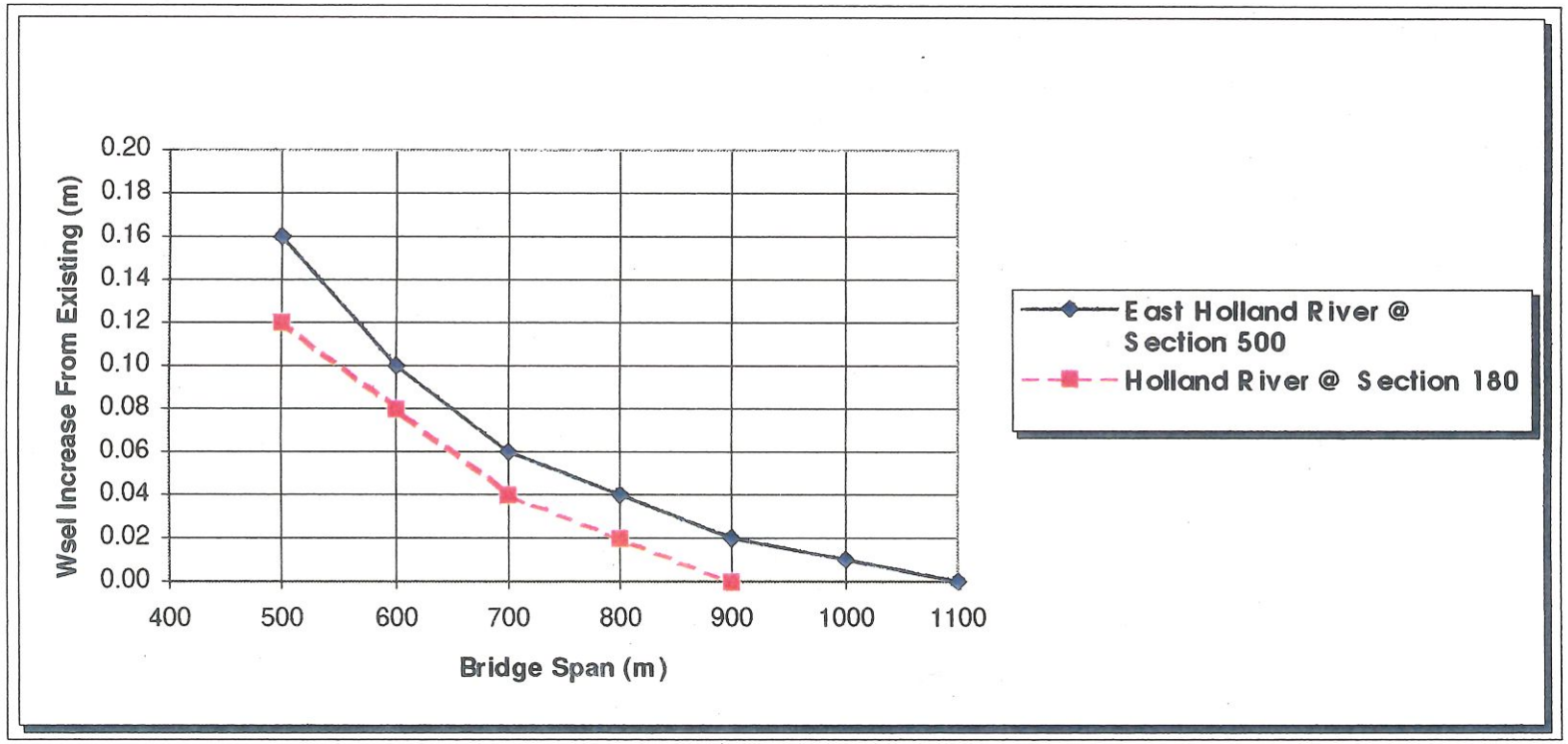
REGULATORY FLOODLINE

100 CROSS-SECTION

SCALE=1:20,000

BRADFORD BY-PASS	HYDRAULIC MODEL SETUP EAST HOLLAND RIVER	EXHIBIT 2

BRAD-H2 TCW



BRADFORD BY-PASS	INCREASE IN REGULATORY WATER LEVELS	EXHIBIT 3

BRAD-WL.TCW

Table 1
Summary of Regulatory Flood Elevations
East Holland River

River Station	Existing	Bridge Span (m)			
		500	600	700	800
100	221.00	221.00	221.00	221.00	221.00
105	221.03	221.04	221.04	221.03	221.03
110	221.07	221.10	221.08	221.08	221.07
120	221.14	221.18	221.16	221.15	221.14
130	221.19	221.26	221.23	221.21	221.20
140	221.20	221.26	221.24	221.22	221.21
150	221.32	221.49	221.42	221.37	221.35
160	221.43	221.59	221.53	221.48	221.46
170	221.57	221.71	221.66	221.62	221.59
180	221.66	221.78	221.74	221.70	221.68

Table 2
Summary of Regulatory Flood Elevations
Holland River

River Station	Existing	Bridge Span (m)					
		500	600	700	800	900	1000
300	220.57	220.57	220.57	220.57	220.57	220.57	220.57
310	220.54	220.56	220.55	220.55	220.54	220.54	220.54
320	220.60	220.61	220.61	220.61	220.60	220.60	220.60
330	220.60	220.63	220.62	220.62	220.61	220.61	220.61
340	220.61	220.69	220.66	220.64	220.63	220.62	220.62
350	220.61	220.71	220.67	220.65	220.63	220.63	220.62
360	220.61	220.74	220.69	220.66	220.64	220.63	220.62
370	220.62	220.77	220.71	220.68	220.66	220.64	220.63
380	220.64	220.82	220.75	220.71	220.68	220.66	220.65
390	220.66	220.84	220.77	220.72	220.70	220.68	220.67
400	220.66	220.84	220.77	220.73	220.70	220.68	220.67
410	220.67	220.85	220.78	220.73	220.71	220.69	220.68
420	220.67	220.85	220.78	220.74	220.71	220.70	220.68
430	220.68	220.85	220.78	220.74	220.72	220.70	220.69
440	220.68	220.86	220.79	220.75	220.72	220.71	220.70
450	220.68	220.86	220.79	220.75	220.72	220.71	220.70
460	220.69	220.86	220.79	220.75	220.73	220.71	220.70
470	220.69	220.86	220.79	220.75	220.73	220.71	220.70
480	220.69	220.86	220.79	220.75	220.73	220.71	220.70
490	220.70	220.87	220.80	220.76	220.74	220.72	220.71
500	220.72	220.88	220.82	220.78	220.76	220.74	220.73

APPENDIX G

Natural Environment and Agriculture Biophysical Assessment

NATURAL ENVIRONMENT AND AGRICULTURE BIOPHYSICAL ASSESSMENT

400 - 404 EXTENSION LINK

September 1997

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1.0 INTRODUCTION

In 1991, Ecoplans Limited (Ecoplans) was retained as part of the study team to prepare an Environmental Assessment for a proposed Highway 400 to Highway 404 Link. The study has been referred to as the Bradford Bypass throughout the study period but is now formally known as the "400 to 404 Link Environmental Assessment".

In 1994, the initial data collection phases were documented in a report entitled "*Technical Report - Natural Environment*". Agricultural issues were covered in a second Technical report entitled "*Technical Report - Economic Environment*". The purpose of the Technical Report was to document the existing conditions within the study area for the proposed Link. It was one of several reports prepared at that point in the assessment process. It is not proposed to replicate the 1994 Technical Report in this current document, although several tables and figures from the report has been included herein.

The data collected during this initial phase assisted in the development of potential alternative alignments and the screening of alignments which were less desirable or unacceptable from a natural environment perspective. The data collection process for both the Technical Report stage and the more detailed assessment described herein was guided by the Ministry of Transportation Ontario (MTO) *Guidelines for Factor Specific Environmental Services - Group A Projects Route Location and Preliminary Design Studies* (1993).

In the 1994 Technical Report, the characteristics of the natural environment were described based on a review of existing information sources and reconnaissance level field assessment. As part of the collection and analysis process, it was possible to identify a number of environmentally sensitive areas/issues. Environmentally sensitive areas/issues are defined for our purposes as follows:

> *"Areas/issues of the natural, cultural, economic and social environment for which the reviewing ministries/agencies/public require detail relative to specific environmental impacts and commitment to mitigation. This information is necessary to facilitate decision-making relative to the acceptance of the environmental assessment and approval of the undertaking".*

Table 1 taken from the 1994 Technical Report provides a summary of the areas/issues identified at this early phase of the environmental assessment.

TABLE 1

Summary of Environmentally Sensitive Areas/Issues
Taken from Technical Report - Natural Environment (Ecoplans 1994)

Feature	Environmentally Sensitive Area/Issue
Geology	• No Environmentally Sensitive Areas/Issues were identified in the study area.
Climate	• No Environmentally Sensitive Areas/Issues were identified under this subject heading.
Groundwater	• Potential interference and contamination of well and shallow groundwater are identified as Environmentally Sensitive Issues. • Potential disruption of the shallow groundwater flow regime in the study area between the two branches of the Holland River was considered an Environmentally Sensitive Area.
Surface Water	• Potential impacts affecting surface water quality and quantity are Environmentally Sensitive Areas/Issues, particularly as they relate to wetland protection and fisheries.
Aquatic Resources - Fisheries	• The potential impact to fish habitat is an Environmentally Sensitive Area/Issue throughout the study area. A primary focus must be the Holland River system and its tributary streams, many of which provide important spawning habitat.
Soil and Agricultural Capability	• The potential impacts on high capability soils and agricultural land are Environmentally Sensitive Areas/Issues throughout the study area. • The potential impact on the specialty crop and turf in the central section of the study area is an Environmentally Sensitive Area/Issue. The Ontario Ministry of Agriculture, Food and Rural Affairs has identified this issue as being of concern.
Wetlands	• The proposed Link must cross components of the Holland Marsh Wetland Complex - a Class 1, Provincially Significant Wetland (PSW). The MTO study team, the Ministry of Natural Resources, Lake Simcoe Conservation Authority and others have identified wetlands as an Environmentally Sensitive Area/Issue.
Wildlife	• The Holland River corridor, the Holland Marsh Wildlife Management Area, forest fragmentation and corridor interruption collectively have been identified as an Environmentally Significant Area/Issue. This area of concern overlaps with the wetland and natural vegetation areas/issues.
Natural Vegetation	• In the wetland area, the fen wetland components are considered an Environmentally Sensitive Area/Issue. • Elsewhere, the potential impacts (fragmentation) on large woodland blocks and natural corridors are considered Environmentally Sensitive Areas/Issues.
Policy Areas	• Due to study area boundary refinements, potential impacts to established policy areas (other than wetlands) were avoided. • No Environmentally Sensitive Areas/Issues were identified.

The compilation of information in the Technical Report was based primarily on existing information collected from a wide variety of published and unpublished reports, articles, maps, agency files, among others. Interpretation of the background data was refined by detailed aerial photograph interpretation and field visits particularly in the Central Section of the study area between and adjacent to the branches of the Holland River.

The original study area was approximately 20 kilometres in length and at its widest point, 5.5 km in width. The preliminary assessment also extended beyond the study area limits to include secondary impact zones where activities within the study area might have an indirect effect. The general study area is shown on Plate 1 also taken from the Technical Report. The natural resource features of the larger study area are shown on Exhibit 8a and 8b taken from the 1994 report (Appendix 1).

After the completion of the Technical Reports, alternative alignments were identified. The process is described in the main EA document. The natural environment indicators and criteria used in the evaluation were based on the data collected and documented in the Technical Report.

However, the process was a dynamic one with new information and insights coming to light over the relatively long study process. Also the environmental policy framework within which the team was working, was also evolving during the same period. Both the Planning Act and the Ontario Wetland Policy were revised during the course of the study. As new issues or new alignment alternatives were identified, additional field work and reviews were undertaken to assist in the decision making process. Examples of locations where additional detailed field work was justified were the river and wetland crossing sites, specialty crop lands, the Silverlakes Golf Course and Albert's Marina complex.

The purpose of this second technical report is to document the results of the evaluation of the Recommended Plan and the more detailed research and field studies with respect to the natural environment and agricultural features associated with the selected Recommended Plan.

As noted above, the 1994 Technical Reports identified a number of Environmentally Sensitive Areas/Issues. As the study proceeded to the selection of a Technically Preferred Alternative and ultimately to the Recommended Plan (Plate 1), many of the Areas/Issues identified at the study area level remained pertinent at the concept design level of assessment. Agriculture, wetlands, fisheries, river crossings etc. remained prominent as significant areas/issues affecting the Recommended Plan and its refinements.

However, as the study proceeded, the focus of the natural environment and agricultural review became more focused on the Environmentally Significant Areas/Issues in the central section of the Recommended Plan.

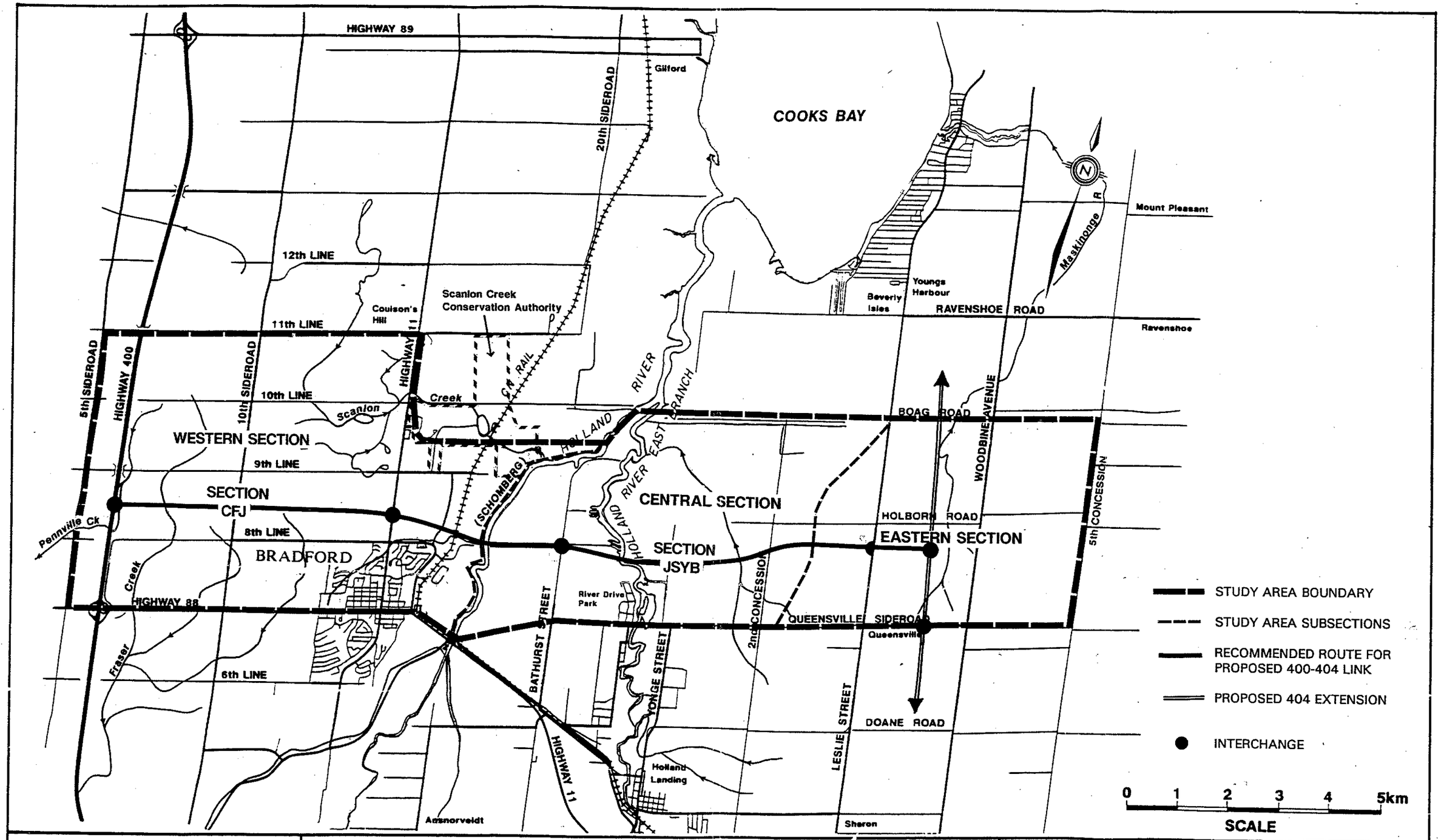
The area between and adjacent to the two branches of the Holland River contains major wetlands, woodlands, wildlife habitat and specialty crop agriculture.

This report will identify the natural environmental net effects of the proposed 400-404 Link undertaking. Cumulative effects will also be addressed. This technical report was initially conceived as a Technical Appendix. As a result, the style and format reflect an appendix style of presentation rather than a free standing report.

The report is divided into three main sections as follows:

- Section 1.0 Introduction.
- Section 2.0 This section describes the evaluation criteria used during the evaluation process and the results of the evaluation as they pertain to the Recommended Plan.
- Section 3.0 This section presents the more detailed field and research data collected for the natural environment and agricultural features affected by the Recommended Plan.

A discussion of mitigation and commitments to further work is provided in Section 5.4 of the EA document.



Ministry of Transportation / Ministère des Transports
Ontario

BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION
ROUTE LOCATION AND PRELIMINARY DESIGN STUDY
W.P. 377-90-00

Study Area and Sub-sections

PLATE 1

(TAKEN FROM ECOPLANS 1994 TECHNICAL REPORT - NATURAL ENVIRONMENT)

2.0 ANALYSIS AND EVALUATION OF RECOMMENDED PLAN

In preparation for the evaluation of the alternative alignments, the Environmental Areas/Issues identified during the development of the Environmental Assessment Proposal (EAP) were translated and refined into a number of environmental evaluation criteria and indicators that were used to determine the relative merits of the alternative alignments and ultimately led to the selection of a Recommended Plan.

A combination of both quantitative and qualitative measures was developed. Similar criteria were developed for other components of the study process (i.e. traffic, safety, service); these criteria as well as the overall evaluation process are described in greater detail in the main EA document. The criteria refer to those identified in the Environmental Assessment Proposal (Exhibit 18). The selection of criteria and indicators is based on guidelines provided by MTO Central Region for *Factor-Specific Environmental Services - Group A Projects - Route Location and Preliminary Design Studies* and other current published documents such as *Aquatic Habitat Mitigation and Compensation Manual* (MNR 1994), and *Ontario Wetland Evaluation System* (MNR 1993).

The criteria used in this current evaluation of the Recommended Plan for the 400 - 404 Link have been subjected to a refinement process allowing use of the same criteria in the environmental assessment of the proposed Highway 404 Extension study. The Highway 404 Extension study area is considerably larger than the 400-404 Link study area and consequently, the criteria may be interpreted in a slightly different manner. The following sections describe what each natural environment and agricultural resource indicator represents for the 400-404 Link Environmental Assessment study, the manner in which it was measured, and the results of the evaluation for each section of the Recommended Plan.

Due to the nature of the overall study process (i.e. determining the connection point with the proposed Highway 404 extension) and the difference in physical and natural features in the west (rolling topography) and central/east (river crossings, specialty agriculture) sections of the study area, the analysis was completed in two distinct units. The western section includes the evaluation of alternatives from a connection to Highway 400 in the west to the east side of the main branch of the Holland River. The eastern section extends from the east side of the Holland River, includes the crossing of the East Branch of the Holland River, and extends to a proposed connection with Highway 404 in the east. The Recommended Plan is designated as "CFJ" in the west and "JSYB" in the east (see Plate 1).

Throughout the following sections, the Recommended Plan will be referenced as the **R.P.** It should be noted that the measurements presented in the following sections represent those related to the final selection of the R.P. including all minor revisions and design modifications and may not coincide directly with any single evaluation table located in the main EA document.

After the selection process, leading to a preferred alternative was completed, further detailed field assessments were initiated to better evaluate specific impacts, make refinements where appropriate and make adequate mitigation recommendations. Section 3.0 of this report details these field assessments as well making commitments to further research to be included at the detail design study phase.

2.1 Factor 2 - Natural Environment

The following criteria and indicators were selected to allow measurement of potential impacts to selected components of the natural environment by the proposed facility. It should be emphasized however, that although they are represented as individual measures in this evaluation, the natural environment is a dynamic integrated system and impacts to one component of the system will not be necessarily be restricted to that particular component.

Every effort has been made to not only illustrate the potential effects in a numerical fashion (i.e. area of wetland removed) but also to illustrate in a qualitative manner the degree of impact associated with the quantitative measure. The level of impact/effect is determined based on the assumption that mitigation measures have been implemented and we are dealing with a "net effect". This allows a better understanding of the "Bigger Picture" impacts associated with each alternative.

2.1.1 Criterion: 2.1 Fisheries - Aquatic Habitat

This set of indicators examines the impact of the **R. P.** on surface water quantity, quality, fish species and aquatic habitat.

Indicator 2.1 a) **Water Crossings or Encroachments by Stream Order (lakes, rivers/streams, wetlands)**

This indicator is measured both quantitatively and qualitatively. The quantitative measure is represented by a direct count of the number of waterbodies that the **R.P.** will affect. Ditches in agricultural fields were not considered as contiguous with the surface water drainage network and were therefore not included in the stream count. However, ditches circling the perimeter of a field are generally connected to the surface water regime and were counted as aquatic features. A qualitative measure was also applied to reflect the degree of significance of the number of watercourse crossings or encroachments.

Major: Requires one or more new river encroachments and/or crossing. Stream crossings include new disturbances to permanent systems. Mitigation may be difficult.

Mod: May require a river crossing but at an existing site or requires crossing or modification to permanent streams or ponds. Mitigation is feasible.

Minor: No river crossing required. **R.P.** may require new crossings of minor permanent streams or ponds or requires only modifications (widening) of existing crossings. Mitigation is feasible.

Recommended Plan Section	Measure	Comments
CFJ	7/Major	1 New River Crossing (Holland River)
JSYB	14/Major	1 New River Crossing (Holland River East Branch)

Indicator 2.1 b) Permitted Surface Water Intakes Affected

This indicator is a direct count of the number of active water withdrawal permits potentially affected by the **R.P.** Effects may include removal, relocation, reduced water availability or contamination potential (i.e. runoff).

Recommended Plan Section	Measure	Comments
CFJ	0	MOEE reported that there are no active withdrawal permits within the study area.
JSYB	0	As above

Indicator 2.1 c) Presence of species at risk (rare or endangered)

Those species identified by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as vulnerable, threatened or endangered species will be indicated by "present" or "not present" based on available background information supplemented by field observation and surveys to investigate potential presence of such species and type of habitat present.

Recommended Plan Section	Measure	Comments
CFJ	Not Present	COSEWIC listed species not reported for area.
JSYB	Not Present	

Indicator 2.1 d) **Areas of critical fish habitat (includes spawning areas, migratory runs)**

Critical fish habitat is defined as limiting to the overall productive capacity of the watercourse/waterbody (i.e. if these areas are harmfully altered, the productive capacity would be expected to decrease). These habitat areas are supported by specific attributes related to cover, groundwater discharge, substrate character, depth and velocity necessary for spawning and subsequent incubation or rearing of fish (e.g. spawning or nursery areas with specific physical, biological attributes, highly productive feeding areas). Impact was assessed by evaluating the potential impact associated with construction (crossings by access roads, pier location, erosion potential) and by the operation of the facility (salt and sediment).

The impact is summarized by degree of potential detrimental effects summarized as follows:

Major: **R.P.** affects critical habitat area(s) which cannot or will be difficult to mitigate or compensated for based on Department of Fisheries and Oceans "no net loss" policy.

Mod: **R.P.** affects critical habitat components(s) but effects are mitigatable or compensation is feasible.

Minor: Minor habitat components may be affected by the **R.P.** but effects are easily mitigated or compensated.

Recommended Plan Section	Measure	Comments
CFJ	Moderate	Both sections of the **R.P.** do affect significant fisheries habitat - but impacts can be mitigated or compensated.
JSYB	Moderate	

Indicator 2.1 e) **Presence of warmwater/coldwater communities**

This indicator is a direct count of the number of warmwater and coldwater communities potentially affected by the **R.P.** by habitat removal or alteration based on background information supplemented with detailed field investigations.

The following definitions were used in the evaluation:

Coldwater Community: A stream that possesses the physical characteristics capable of supporting coldwater species such as trout or salmon. Coldwater streams usually have sufficient groundwater discharge to maintain year round flow and relatively low water temperatures. A watercourse that presently or potentially supports coldwater species is counted as one coldwater community for each crossing, encroachment or paralleling within a MNR recommended 30 metre buffer area adjacent to the stream.

Warmwater Community: A stream that does not possess the physical habitat characteristics capable of supporting coldwater species (salmonids). Fish species commonly designated as warmwater species include Smallmouth Bass, Largemouth Bass, Rock Bass, Sunfish, Crappie, Bullhead, Carp, Northern Pike, Walleye and Yellow Perch. Common warmwater baitfish include Blacknose Dace, Creek Chub, Common Shiner and Bluntnose Minnow. A permanent or intermittent watercourse that potentially supports a fish community of typical warmwater species is counted as one warmwater community for each time the **R. P.** crosses, encroaches upon or parallels the stream. The 30 meter buffer recommended by MNR was also used for the warmwater assessment.

*** Note: All watercourses are assumed to have at least the potential to support baitfish.**

Recommended Plan Section	Measure	Comments
CFJ	7 Warm/ 0 Cold	General drainage pattern is south to north along the **R.P.** Coldwater systems were not present in the study area.
JSYB	14 Warm/ 0 Cold	

Indicator 2.1 f) Degree of interaction with groundwater (presence of highly permeable soils)

This indicator represents the degree of potential impact to groundwater discharge/recharge zones with respect to fisheries and aquatic habitat. Existing soils and geology reports were used and confirmed by reconnaissance level field investigation. The following qualitative measures were used.

Major: **R.P.** will require removal of highly permeable soils or known recharge or discharge area(s). Removal potentially affects groundwater movement and/or potentially affects supply to downstream aquatic communities or increases the risk of contamination. High degree of mitigation is required or is not practicable.

Mod: **R.P.** will require removal of highly permeable soils but does not directly affect known recharge or discharge areas. Mitigation may be required to protect downstream aquatic communities.

Minor: **R.P.** does not require removal of highly permeable soils or removal will not affect surface water or groundwater systems. Residual impacts are easily mitigated.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Ground water found at depth
JSYB	Moderate	Permeable soil deposits with shallow perched groundwater table associated with the area between the river branches. Farm practices designed to lower the water table using a network of ditched and pumps. Potential damming effect of facility a potential concern.

2.1.2 Criterion: 2.2 Wildlife

This set of indicators examines the impact the **R.P.** will potentially have on wildlife species and habitat. The terrestrial wildlife component is evaluated by indirect indicators such as disruption and fragmentation of potential habitat and integrating the concept of wildlife corridor movements.

Indicator 2.2 a) **Encroachment on or severance of forested vegetation or non-forested successional areas.**

Measures the <u>total</u> potential impact to wildlife habitat. Reported in hectares. All vegetation communities are considered potential wildlife habitat for this indicator.

Recommended Plan Section	Measure	Comments
CFJ	16.2 ha	Generally affects small fragmented woodlands and old field systems in agricultural landscape.
JSYB	23.2 ha	**R.P.** affects northern disturbed edge of Holland River woodland and removes component of beach ridge cedar woodland.

Indicator 2.2 b) **Encroachment on or severance of greenways and open space linkages (wildlife travel corridors)**

This indicator qualitatively measures the potential of disruption to wildlife movement along potential or identified corridors by fragmentation or removal using the following:

Major: The encroachment on or severance of greenways or open space linkages is unavoidable and mitigation is not practicable.

Mod: The encroachment on or severance of greenways or open space linkages is likely but mitigation is feasible.

Minor: The encroachment on or severance of greenways or open space linkages is not likely or is an existing condition. Residual impacts are easily mitigated.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Minor stream valleys supporting discontinuous vegetation. Open span bridge structure will maintain river corridor function at Holland River.
JSYB	Major	Central woodlands and eastern beach ridge will be affected. Impacts minimized by following existing openings and disturbed areas. Also, bridge structure will permit continued corridor use along East Holland River.

Indicator 2.2 c) **Encroachment on or severance of significant wildlife habitat (waterfowl areas, deer yards, heronries)**

This indicator measures in hectares the quantity of potential significant wildlife habitat (ie. waterfowl areas, deer wintering areas, large diverse woodland blocks, heronries) that will be directly affected by the **R.P.** or located within 50 metres of proposed right-of-way. It is also measured qualitatively to represent the significance of the impact.

Major: **R.P.** causes major severance/fragmentation or isolation of large contiguous blocks of potential wildlife habitat (> 10 ha) to the point where its functional role may be directly or indirectly threatened. Mitigation is difficult or not practicable.

Mod: Moderate impact to significant wildlife habitat in terms of severance, fragmentation and isolation. However, functional role is not threatened. Woodland blocks (5-10 ha) may be isolated, habitat diversity is moderate.

Minor: Impacts to potential wildlife habitat areas are easily mitigated or disturbance may be existing condition. Includes edge effects, small isolated woodlots (< 5 ha) and/or habitat diversity is low.

Recommended Plan Section	Measure	Comments
CFJ	9.5 ha/Minor	None were identified.
JSYB	23.2 ha/Major	Fragmentation of beach ridge community > 10 ha. Central woodlands fragmentation minimized by following existing roads or areas of earlier disturbance.

Indicator 2.2 d) Presence of species at risk (rare or endangered)

The presence of species identified by COSEWIC as vulnerable, threatened or endangered or are identified as significant regionally or provincially is determined through available background information and field work. The indicator is assessed by "present" or "not present".

Recommended Plan Section	Measure	Comments
CFJ	Not Present	None recorded or observed.
JSYB	Present	During the refinement process for the **R.P.** ,the presence of two vulnerable species (Nationally and Provincially) (Louisiana Water thrush and Red-shouldered Hawk) were observed during detailed field investigations. However, their presence was common to all of the alignment refinements considered and did not allow for selection of a "better" alternative. Impact to wildlife habitat was minimized by following existing roads or disturbed areas.

2.1.3 Criterion 2.3 Wetlands

This set of indicators examines the potential impact the **R.P.** will have on wetland resources.

Indicator 2.3 a) **Loss of function (biological, hydrological, special features) of all wetlands within or adjacent to the study area**

This indicator measures the potential direct or indirect effect of the **R.P.** on wetland function as defined in the "Wetland Policy Statement".These functions include aquifer recharge zones, fish/wildlife habitat and production areas, flood protection, toxic buffers and water storage. Function can also include cultural factors such as recreation and education or production value (i.e. building materials).

The potential effect is measured qualitatively as follows:

Major: Potential for impact is high. Wetland area loss and loss of function will likely occur within or adjacent to the study area and mitigation is not practicable.

Mod: Potential for impact is likely within or adjacent to the study area but wetland area and function loss can be mitigated.

Minor: Potential for impact is low. Wetland area and function would not likely be affected.

Recommended Plan Section	Measure	Comments
CFJ	Moderate	Disturbed wetland adjacent to Holland River will have temporary construction impact. One small unevaluated wetland area severed by alignment.
JSYB	Moderate	All alternative alignments had PSW effects. Where possible, **R.P.** follows existing openings or disturbed wetland areas. Facility will be on elevated structure in designated P.S.W.

Indicator 2.3 b) **Loss of wetland area of all wetlands within the study area.**

This indicator measures the impact of the **R.P.** on total wetland area. It considers both un-evaluated and evaluated wetland areas. If an area included in original MNR evaluation has since been totally removed by development (i.e marina, golf course), it was not included. In the instance where a section of functional wetland area would be severed from the main wetland complex, the entire severed section is measured if wetland function would no longer continue in the severed section.

Recommended Plan Section	Measure	Comments
CFJ	7.5 ha	Majority of impact located on west bank of Holland River in an area of disturbed shrub thicket swamp. Small unevaluated wetland areas severed or removed
JSYB	2.0 ha	**R.P.** is almost entirely in area of previously disturbed or removed wetland.

Indicator 2.3 c) **Degree of interaction of all wetlands with groundwater**

This indicator measures qualitatively the potential for groundwater impacts when in association with wetlands.

Major: Groundwater at or near the surface or will be intercepted leading to change in wetland hydrological regime. Mitigation is not practicable.

Mod: Groundwater is near the surface or will be intercepted but impacts are mitigatable.

Minor: Groundwater is at depth and impacts are unlikely. Residual impacts are easily mitigated.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Groundwater is at depth.
JSYB	Moderate	Design highway structure to facilitate shallow drainage, avoid damming or ponding effects. Maintain permeable highway base.

Indicator 2.3 d) **Encroachment on (within 120 m) or severance of Class 1-3 (Provincially Significant) wetlands**

This indicator measures the area of evaluated provincially significant wetlands potentially impacted by the **R.P.** This measure is also included in Indicator 2.3 b) but now serves to identify the provincially significant proportion of that measurement. Background information was supplemented by detailed field investigation, where access was permitted, to confirm wetland presence, boundaries and type. In the instance where a section of wetland would be severed from the main wetland area, the whole severed section is included if the function of that section would no longer continue.

Areas which have been cleared and converted from wetland are not included in the calculation. Cleared lands include the sections of wetland surrounding Alberts Marina on the East Branch of the Holland River and the Silverlakes Golf Course. The areas that have been cleared and/or channelized and no longer contribute to the surrounding wetland function, are not included in measurements of wetland area impacted.

Recommended Plan Section	Measure	Comments
CFJ	7.5 ha	Both sections must encroach and sever sections of P.S.W. It was not possible to avoid all impacts. Area was minimized by following existing disturbed or cleared sections of wetlands. Commitment was made to place facility on elevated structure through P.S.W.
JSYB	2.0 ha	

2.1.4 Criterion: 2.4 Vegetation

Examines the potential impact of the **R.P.** on vegetation units and individual specimens. Background information was augmented with field data collection and detailed inventories where appropriate.

Indicator 2.4 a) **Encroachment on or severance of high quality forest stands (based on dominant species, age, size, shape)**

This indicator quantitatively measures the potential impact on the significant vegetation resources associated with the **R.P.** Vegetation communities were evaluated and assigned a quality rating based on dominant species, age, and habitat diversity. A high quality, significant woodland community is defined as late successional community (or older) and composed of native species with low levels of disturbance. The area potentially impacted is reported in hectares. Edge effects are noted if vegetation unit is present within 50 metres of right-of-way.

Recommended Plan Section	Measure	Comments
CFJ	1.2 ha	Only small wooded areas are present. Not of high quality.
JSYB	20.9 ha	Effects components of the Holland River woodland complex. Mainly edge effects. Efforts were made to route facility in existing openings, lower quality units and disturbed sections.

Indicator 2.4 b) **Encroachment on or severance of Life Science ANSIs**

Areas of Natural and Scientific Interest (ANSI) - Life Science areas are identified using the Ministry of Natural Resource's Land Use Guidelines and Life Science Inventory for the Ontario Nature Reserves Program. The area of impact is measured and reported in hectares. It is noted that a mapping scale shift is always a source of error, however, the error is consistent across all evaluated alternatives.

Recommended Plan Section	Measure	Comments
CFJ	0	Holland River Marsh ANSI is north of study area.
JSYB	0	

Indicator 2.4 c) **Encroachment on or severance of ESAs**

Environmentally Significant Areas (ESAs) are identified using information provided by the Lake Simcoe Conservation Authority. The comment concerning scale shift also applies to this indicator. ESA boundaries were refined based on field investigations and the applications of Lake Simcoe Conservation Authority criteria.

Recommended Plan Section	Measure	Comments
CFJ	6.9 ha	Due to the configuration of the ESA, it was not possible to avoid this feature. The impact does not affect the status or designation of the ESA.
JSYB	10.3 ha	

Indicator 2.4 d) **Encroachment on or severance of Oak Ridges Moraine Planning area forest.**

The boundaries of the Oak Ridges Planning area are identified using the York Region Official Plan (1994). Scale shift inconsistencies were relative for all alternatives. The area of impact is reported in hectares.

Recommended Plan Section	Measure	Comments
CFJ	0	Oak Ridges Moraine is one concession to the east of study area.
JSYB	0	

Indicator 2.4 e) **Presence of significant species or specimens at risk (rare or endangered)**

The presence of species identified by COSEWIC as vulnerable, threatened or endangered or are identified as significant regionally or provincially is determined through available background information. Secondary source information was complimented with detailed field investigations. The indicator is assessed by "present" or "not present".

Recommended Plan Section	Measure	Comments
CFJ	Not Present	COSEWIC listed species not reported for area.
JSYB	Not Present	

Indicator 2.4 f) **Encroachment on or severance of unusual vegetation units**

The only vegetation units that could be considered unusual within the study area relate to the presence of fen type wetland communities within the Holland Marsh wetland complex. This measure represents the potential impact (hectares) of the **R.P.** on fen wetland communities. Field investigations (1994) noted the degradation of some previously mapped fen areas. The following measure includes only confirmed fen communities.

Recommended Plan Section	Measure	Comments
CFJ	0.6 ha	Small area of fen were noted on the west bank of the Holland River. This area showed some degree of degradation.
JSYB	0	A fen area lies upstream of the **R.P.** at the crossing of the Holland River East Branch, however, should not be impacted with adequate mitigation.

Indicator 2.4 g) Erosion control on steep slopes

This indicator assesses the erosional susceptibility of soils and to what degree vegetative cover is necessary on steep slopes to prevent excessive sedimentation and erosion during construction and post-construction stages as they relate to natural vegetation and/or fisheries impacts.

The following qualitative rating system was applied in evaluating this indicator:

Major: Erosion potential is high (sandy) on steep slopes and will require a high degree of mitigation to protect vegetation and/or fisheries habitat.

Mod: Moderate erosion potential. Mitigation is required but fisheries habitat will not be affected.

Minor: Soils have low erosion potential (clays) or are adequately wet so that erosion is not generally an issue. Residual construction related impacts are easily mitigated.

Recommended Plan Section	Measure	Comments
CFJ	Minor - Moderate	Relates to steep slopes associated with drumlin features west of the Holland River and steep slopes with silty clay soils.
JSYB	Moderate	Based on the crossing of the beach ridge feature near the eastern end of the **R.P.** where cut and fill will be required.

Indicator 2.4 h) Presence of riparian habitat

This indicator measures the potential impacts to vegetation communities associated with watercourses within the study area. Riparian vegetation functions in flood control, stream cover, erosion control and provides wildlife habitat. It is measured qualitatively based on species composition, maturity and density using the following:

Major: Riparian vegetation is composed of mid to late successional native species and is found in sufficient density to serve buffer and cover functions. Impacts to riparian vegetation are such that its function will no longer continue. Mitigation is not practicable.

Mod: Riparian vegetation is composed of early successional material and serves a moderate function in buffer and cover. Impact are expected but mitigation is possible.

Minor: Riparian vegetation, if present, is sparse and/or early successional species such that they perform little or no protective function. Residual impacts are easily mitigated.

Recommended Plan Section	Measure	Comments
CFJ	Minor	The riparian buffer will be restored following construction. Function will be restored or enhanced.
JSYB	Minor	

2.1.5 Criterion: 2.5 Groundwater

This set of indicators measures the potential impact on commercial and domestic water supplies. Groundwater data for the general study area are not well developed, however, secondary sources such as soils reports, and York Region groundwater resources data were reviewed to identify specifically:

1) areas of high water table,
2) areas of groundwater recharge and discharges,
3) areas of high groundwater overburden permeability, and
4) locations and usage of large volume wells.

Indicator 2.5 a) Groundwater recharge underlain by highly permeable soil and unconfined aquifer

This indicator assesses the potential impacts of obstruction to groundwater recharge and discharge areas. Recharge areas are associated with permeable surface areas although most land areas will recharge groundwater to some extent. Discharge areas are commonly associated with wetland and major and permanent watercourses.

Recommended Plan Section	Measure	Comments
CFJ	0	Groundwater generally found at depth - Alliston Aquifer.
JSYB	1	Recharge area associated with Holland Marsh ESA and specialty crop agricultural land. Some discharge noted along base of beach ridge feature.

Indicator 2.5 b) **Shallow groundwater table potential release of contaminants into groundwater**

This indicator assesses the potential impacts associated with groundwater contamination with freeway construction, maintenance and accidental spills. It is measured by a qualified rating of Major, Moderate or Minor potential to contaminate unconfined groundwater resource.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Groundwater found at depth.
JSYB	Major	Sandy soil deposits associated with Holland River lowland and specialty crop lands. Area of intensive agriculture is area of existing, ongoing contamination.

Indicator 2.5 c) **Municipal or permitted water supply (wells)**

This indicator measures the number of wells within the proposed right-of-way and those within a 100 metre potential impact zone of the facility. It is assumed that each rural dwelling will have at least one well associated with it even if a specific well record does not exist. It is acknowledged that many farms, particularly those raising livestock probably have 2 or more wells. Areas within established urban envelopes are not included (i.e. Bradford). A qualitative measure is also applied as follows:

Major: Large number (>75) of potential well locations within 100 metres of the centre line of proposed facility and/or affects urban water sources.

Mod: Moderate number of wells (25-75) within 100 metres of centre line of facility.

Minor: Few wells (<25) within potential impact zone.

Recommended Plan Section	Direct	Indirect	Qualitative	Comments
CFJ	3	5	Minor	Avoids Bradford municipal well.
JSYB	6	10	Minor	N/A

Indicator 2.5 d) **Indicator Areas of significant regrading at recharge/discharge areas**

Areas of deep road cuts in proximity to wells or recharge /discharge areas could influence both water quality (salinity) and quantity. This indicator measures the potential impact of regrading to groundwater resources by counting the number of cuts potentially required that could impact groundwater recharge, discharge or private wells. This indicator is a subset of the previous three indicators.

Recommended Plan Section	Measure	Comments
CFJ	0	No areas identified
JSYB	0	No areas identified

2.1.6 Criterion: 2.6 Geology

This set of indicators measures the potential impact on significant geological landforms.

Indicator 2.6 a) **Encroachment on or severance of Earth Science ANSIs**

Earth Science Areas of Natural and Scientific Interest (ANSI) are identified using the Ministry of Natural Resource Land Use Guidelines and ANSI reports. Area of potential impact is measured in hectares.

Recommended Plan Section	Measure	Comments
CFJ	0	None affected
JSYB	0	Oak Ridges Moraine is not affected by the **R.P.**

2.2 Factor 4 - Economic Environment

2.2.1 Criterion: 4.1 Agriculture

This set of indicators measures the potential impact of the **R.P.** on farming operations and employment. The indicators are numbered as they are found in the alternative evaluation process.

Agricultural land uses were identified using Ontario Hydro database information, Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Land Use Systems mapping and windshield surveys. This section of the evaluation identifies areas of high capability soils as well as considering the total area of land currently involved in agricultural production regardless of its' suitability.

Indicator 4.1 a) **Loss of Class 1 and 2 agricultural land**

b) **Loss of Class 3 and 4 agricultural land**

c) **Loss of Class 5 and 6 agricultural land**

Canada Land Inventory (CLI) mapping (1:50,000) was used to identify agricultural capability ratings of mineral soils. At the time of the original evaluation, Class 1 to 4 soils were considered by OMAFRA to be prime agricultural lands. Since then, the Comprehensive Set of Policy Statements (1995) and the Provincial Policy Statement (1996) restrict prime agricultural lands to Class 1, 2 and 3. A scale shift from 1:50,000 to 1:5000 will introduce some error, however, such errors were common to all alternatives evaluated.

Areal measurements of each class grouping were recorded in hectares removed. Classes and class complexes are included in majority class (i.e. $1^{6}3t^{4}$ and $1^{8}4t^{2}$ are included in indicator 4.1 a) but are recorded as a separate measurement. The Bradford urban area is not included in the areal calculations as it is no longer available for agricultural use and is in many cases disturbed where not developed.

4.1 a) Loss of Class 1 and 2 agricultural land*

Recommended Plan Section	Class 1 & 2	Class 1 Complexes	Comments
CFJ	6.5 ha	75.4 ha	Based on the distribution of high capability soils, it was not possible to avoid prime agricultural areas.
JSYB	19.1 ha	40.07 ha	

Recommended Plan Section	Measure	Comments
CFJ	9.5 ha	See comment for Class 1 & 2.
JSYB	39.8 ha	

* **Note: At the time of writing, prime agricultural lands are considered to include Class 1 to 3. Pre-1995, Class 1 to 4 were considered prime agricultural lands.**

4.1 c) Loss of Class 5 and 6 agricultural land

Recommended Plan Section	Measure	Comments
CFJ	2.0 ha	Low capability soils have a limited distribution along the **R.P.**
JSYB	0	

Indicator 4.1 d) Loss of organic soil

Organic soils are not classified under the same CLI system as mineral soils. This indicator represents the loss of organic or specialty crop soils that may or may not be currently used for agricultural purposes. The measure is recorded in hectares of organic soil removed from potential use.

Recommended Plan Section	Measure	Comments
CFJ	0	No organic soils were noted along the **R.P.**
JSYB	9.3 ha	Organic soils were associated with the Holland Marsh wetland complex. Relatively shallow deposits were noted where the **R.P.** lies along the fringe of the wetland.

Indicator 4.1 e) Specialty crop operations affected

This indicator measures the number of individual specialty crop operations that will be affected by the **R.P.** OMAFRA defines speciality crops as including the following:

Extensive Field Vegetables: Large fields of cucumbers, broccoli, tomatoes peas etc. Includes associated fallow or plough down crops.

Market Garden/Truck Farms: Small intensive plots of lettuce, onions, carrots, celery etc. In general, these operations are less than 12.2 hectares in size.

Nursery: Intensive production of trees, shrubs, vines or flowers for transplant or sale. Includes associated fallow or plough-down crops.

Turf: Large fields used exclusively for the production of high quality sod used for landscaping.

Impact is defined in two ways for this indicator. Direct impact is defined as that area, measured in hectares, directly removed by the **R.P.** The total area, which includes an indirect impact areal measurement of the area within 100 metres of the right-of-way, in conjunction with the area removed directly, is recorded as a separate measurement (hectares).

This indicator is also summarized by the total number of operations affected based on current ownership and leasing arrangements.

Recommended Plan Section	Direct	Total (Direct + Indirect)	# Properties	Comments
CFJ	0	0	0	None identified
JSYB	34.1 ha	95.5 ha	7	8.07 ha of the specialty crop land is in vegetable production. The remainder is in turf production.

Indicator 4.1 f) Dairy/livestock operations affected

This indicator is measured by a direct count of separate operations impacted by the **R.P.** As well, separate areal measurements of direct and indirect (within 100 metres) impacts of land potentially impacted or lost from production. It is acknowledged that the majority of livestock operation will also include field crop areas. To avoid duplication during the evaluation, it is assumed that these crop areas are used exclusively for the associated livestock and the land is not included in Indicator 4.1 g).

Recommended Plan Section	Direct	Total (Direct + Indirect)	# Properties	Comments
CFJ	5.8 ha	16.4 ha	3	Minor direct loss of dairy land.
JSYB	3.0 ha	14.1 ha	3	Minor direct loss of dairy/livestock land.

Indicator 4.1 g) Field crop operations affected

This indicator measures the number of individual field crop operations, that do not include livestock, potentially affected by the **R.P.** As well, separate measurements of direct and indirect (within 100 metres) impacts of land potentially affected or lost from production are recorded.

OMAFRA (1988) defines field crop operations as including the following:

Continuous Row Crops: Single intensive crop type, i.e. corn or beans. Also includes any combination of corn, white beans, soybeans, etc. in rotation. The entire area except for topographically limited portions and non-systems use must be row crop. Corn dryers and elevator storage systems are good indicators. Often barns are absent, except for a machine shed(s). There must be no grain crops or hay. Usually very large fields often with no fence boundaries.

Corn System: A rotation system in which corn and/or beans occupy more than 40%, but less than 100% of the area. The remainder is composed of grain and hay. A small proportion (less than 10%) may be pasture. Usually silos and corn crops are good indicators of this system. There may also be a complex of barns which indicated feeding of dairy, beef or hogs.

Mixed System: A rotational system composed of grain, corn, or beans and hay roughly in equal proportions. No crop dominates the system and fields are generally small. Barns are usually older types and silos are smaller and less numerous. Tends to be associated with a traditional farming system. Sod crops cover more than 20% of the area. Corn and beans together occupy less than 40% of the area.

Grain System: A combination of sod crops and grains in which grain is predominant, occupying more than 85% of the area and in some cases, as much as 100%. The field sizes are usually large with fences often absent. A lower intensity cash cropping system. There are no row crops; good quality hay or pasture may compose up to 15% of the area.

Hay System: A rotational system in which good quality hay and pasture predominate. Very small amounts of corn may be present, typically less than 5 acres. Hay must be the largest proportion of the system.

Pasture System: Sod crops constitute the whole area with little or no rotation. Poor quality weedy hay and/or pasture cover more than 50% of the area. Associated with extensive or unconfined grazing of livestock. There should be minimal evidence of recent cultivation.

Grazing System: Native grass pasture where topography precludes the use of machinery. Usually on poorer land where slopes, river valleys, rock outcrops or shallow soils occur. Most often seen in association with another system.

Recommended Plan Section	Direct	Total (Direct + Indirect)	# Properties	Comments
CFJ	78.6 ha	190.2 ha	13	Predominantly agriculturally land use in the west section
JSYB	32.8 ha	72.6 ha	5	Located mainly to east of beach ridge feature

Indicator 4.1 h) Effect on future flexibility of farm operations

This indicator measures individual farm effects resulting from limitations of access or effect on farm operation. The number represents the number of farm properties affected by the **R.P.**, not the number of individual effects (i.e. each farms may have more than one access and therefore may be affected in more than one way).

To qualify this indicator, impacts may include ability to move equipment between buildings and fields as well as between various fields off of the farm. Impacts could result in no access, limited access, new access and/or reduced access. Therefore, the total number of impacts could exceed the number of farm properties affected.

The degree of impact to access was rated based on the following definitions:

No Access: Occurs when the existing access to a property no longer exists and cannot be replaced.

Limited Access: Related to a loss of some frontage including the existing driveway as a result of a new limited facility.

New Access: Occurs when the existing access is removed but a new access is possible from a sideroad or service road.

The degree of impacts was evaluated using the following system:

Major: Limited or no access on existing property frontage and mitigation is difficult or not practicable. Severed part of farm not readily accessible from farm buildings or small or awkward shape.

Mod: Some division of property, but access and continued operation possible.

Minor: Little or no loss of property access. Farm fields retain reasonable size and shape.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Majority of **R.P.** follows rear lot lines and is not affecting access.
JSYB	Moderate-Major	Sections of **R.P.** cut across fabric of land ownership creating access and use difficulties.

Indicator 4.1 i) Effect on farm woodlots

Aerial photographs and field reconnaissance were used to assess the potential impact of the **R.P.** on farm woodlots. These areas can provide the owner with a source of timber, fuel, fence posts and possible valuable materials for market. The indicator qualitatively assesses the potential impacts using the following:

Major: Major fragmentation, the majority or a large portion of the woodlot will no longer be accessible or will be removed by the **R.P.**

Mod: Minor fragmentation, woodlot remains functional and accessible.

Minor: Edge effects only, woodlot remains functional and accessible or no impacts are expected.

Recommended Plan Section	Measure	Comments
CFJ	Moderate	Alignment along or near rear lot lines will affect farm woodlots, most quite small.
JSYB	Minor	Woodlands are not generally associated with farm operations.

Indicator 4.1 j) Effect on capital investments in agricultural operation.

The potential for effects on capital investments in agricultural operations is measured qualitatively by using the following:

Major: Alignment severely affects high capital investment operation. Includes specialty crops, turf or dairy operations. Operation may be lost and mitigation is not practicable.

Mod: Alignment affects operation(s) of high capital investment but effects may be mitigated. No operations are likely to cease functioning.

Minor: There are no high capital investment operations affected or residual effects are easily mitigated.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Rear lot line location minimizes impact to capital investment operations.
JSYB	Moderate-Major	Several turf operation and vegetable operations are affected by **R.P.**

Indicator 4.1 k) Significant farm operation severances

This indicator is based on the number of farm property severances where farm fragmentation occurs as a result of the proposed alignment. A divided property is considered to be one where the alignment crosses a farm operation leaving land parcels on both sides of the proposed route. This is not the total number of fragmented parcels. A farm operation is defined as a property or a group of properties actively farmed by one family, the land may be leased or owned.

Degree of impact (fragmentation) is qualitatively assessed using the following:

Major: More than 10 properties are divided, includes fragmented lands less than 10 hectares in size.
Mod: 3 - 10 properties divided, includes fragmented lands less than 10 hectares in size.
Minor: 2 or less properties divided, no fragmented lands less than 10 hectares.

Recommended Plan Section	Measure	Comments
CFJ	Moderate	Farm operations are found on both sides of property line (i.e. farmer leasing several properties).
JSYB	Moderate	Several turf and vegetable operations affected

Indicator 4.1 l) Significance of detrimental effects to on-going viability of farm operation.

This indicator is concerned with the combined potential effects of inter-farm movement, degree of fragmentation and access limitations.

The indicator is measured qualitatively using the following:

Major: More than 10 farm operations are affected to the extent that farm viability may be compromised.

Mod: 3 to 10 farm operations may be affected to the extent that farm viability may be compromised.

Minor: 0 to 2 farm operation may be affected to the extent that the farm viability may be compromised.

Recommended Plan Section	Measure	Comments
CFJ	Minor	Rear lot location of **R.P.** minimizes impacts.
JSYB	Moderate	The **R.P.** cuts across land ownership fabric creating potential for loss of viability.

Indicator 4.1 m) Significant detrimental effects of on-going viability of farm communities

The potential for farm community disruption is rated qualitatively based on two considerations. The first is roadway design where existing travel routes may have to be modified. The second relates to the following characteristics of farm communities:

- farm families with common interest;
- meeting areas; and
- neighbours (awareness of each other and interaction).

The indicator is measured using the following system:

Major: The **R.P.** passes through an area where existing farm settlement remains intact as indicated by farm ownership and active farming. Access to community may be restricted.

Mod: The **R.P.** is located in area where urban pressures are already in evidence as indicated by rural residential development, non-owner operated farms and good access will be maintained to remaining community.

Minor: The **R.P.** will have minimal impact on farm community because it is located in a non-farm area, along existing major highway or predominantly non-owner operated farm area.

Recommended Plan Section	Measure	Comments
CFJ	Moderate	Some separation of farm community. Corporate ownership has already disrupted farm community, but are still actively farmed.
JSYB	Minor-Moderate	Turf operations not part of local farm community, oriented to Toronto market. Vegetable operations part of established farming district.

2.3 Summary

In the preceding paragraphs, we have assessed the Recommended Plan against the same indicators and criteria that were used in the earlier evaluation phases.

With a linear corridor approximately 16.2 kilometres in length, running through a diverse cultural and complex natural heritage landscape, it is not possible to avoid all impacts. The study team has taken great effort to avoid impacts by routing the facility in less sensitive locations and by committing to undertake specific mitigation measures when the facility is built. Other reductions in impact will result from the design of the facility such as the commitment to construct the facility as an elevated structure over the designated P.S.W. adjacent to the two branches of the Holland River.

3.0 DESCRIPTION OF RECOMMENDED PLAN

3.1 Natural Environment

In the following sections, the components of the natural heritage resource base affected by the Recommended Plan (**R.P.**) will be described. In reading the material, it must be remembered that the physical and biological environment do not fit neatly into the topic areas noted in the text. The physical and biological environment are integrated spatially and functionally. For example, the wildlife populations along the **R.P.** are closely related to areas of natural vegetation while vegetation itself is closely related to surficial geology, soils and drainage conditions. Reference should be made to Plates 2.1 to 2.5, at the end of Section 3.1 while reading this material to locate specific features along the **R.P.** as they are discussed in the following sections.

The sequence of the natural heritage features descriptions is in the same order as the criteria and indicators described in the previous section. There is also some repetition as we may be discussing the same natural heritage feature under several different resource headings. For example, vegetation, woodlands and wildlife generally refer to the same areas.

The format also makes it difficult to inject the ecological and functional understanding into the description. However, these overriding principles were important in the evaluation of alternatives and in the refinement of the **R.P.**

Under each resource heading, the natural heritage will be described under 3 categories as follows:

Description: Features will be identified by the chainage location along the **R.P.** beginning in the west at the proposed interchange with Highway 400.

Issues: Environmentally Sensitive Areas/Issues initially identified in the 1994 Technical Report are expanded upon as they related to the **R.P.**

Identified Effects: Specific quantitative and qualitative net effects to individual features are discussed.

Proposed mitigation measures and commitments to further work are detailed in Section 5.4.2 of the main EA document.

3.1.1 Fisheries and Aquatic Habitat

Description: The aquatic features within the overall 400 to 404 Link study were discussed in general in the Technical Report (Ecoplans 1994). In that report, broad descriptions of the aquatic features were based on a review of background technical documents and a reconnaissance level field review of the entire study area.

This section of the report describes the aquatic habitat characteristics of each aquatic feature encountered by the **R.P.** Crossing locations were assessed on July 25, September 30 and October 1, 1996 in accordance with the procedure outlined in *A Fisheries Protocol* (MNR, MTO 1993). Photographs and habitat maps are on file at Ecoplans Limited. The following text describes aquatic features crossed by the **R.P.** using chainage measurements from west (proposed Interchange with Highway 400) to east (proposed Interchange with Highway 404). Aquatic features described in the text correspond to those shown on Plates 2.1 - 2.5. To avoid repetition, many features of the surface water component have also been included in this section.

Additional site specific habitat descriptions are found in Appendix 2.

Section CFJ - Highway 400 to the Holland River West Branch

Chainage 10+950: Tributary to Pennville Creek

This watercourse enters the **R.P.** right-of-way at the proposed Highway 400 interchange, and due to the configuration of the interchange, will be crossed a total of five times by the various interchange ramps.

From Ninth Line, the tributary flows south through pasture land, and swings westerly to enter the Highway 400 right-of-way. The creek flows parallel to Highway 400 within the right-of-way for approximately 325 m, then cuts southwest under Highway 400 and continues as a straightened channel through cropland west of Highway 400.

The pastured portion of the creek channel that will be crossed by the E-N ramp of the interchange is characterized by a hardpan clay bed, with narrow riffle/run zones and slightly wider pool sections measuring up to 1.0 m across. Bed substrates are predominantly cobble and gravel, however some riffle sections are incised and exposed clay shelves characterize the creek bottom.

Creek banks are fairly stable and well grassed, suggesting that pasturing has not been as intensive in recent years. Creek sections within the Highway 400 right-of-way are also stable and well vegetated. Overhead cover and stream shading is lacking through most of the creek length.

Large schools of baitfish, including young of the year (YOY), were observed throughout the reaches between the proposed E-N and N-E ramps. In comparison to downstream areas, habitat conditions through these reaches are more diverse, with a greater amount of gravel riffles and deeper pools up to 40 cm deep.

Downstream of the proposed N-E ramps, creek flow rates become more uniform, and the channel is choked with cattail. The bottom substrate is primarily silt, trapped by the thick vegetative growth within the flow channel. The section of creek within the Highway 400 right-of-way appears to have been ditched during the construction of the Highway 400 road embankment.

Chainage 11 + 400: Fraser Creek

From Ninth Line to the north edge of the **R.P.** right-of-way, Fraser Creek flows southwesterly through a wide, disturbed riparian corridor. At the north edge of the **R.P.** right-of-way, the creek swings southerly, emerges from the wooded riparian zone and flows through intensively pastured floodplain. The proposed crossing is within the southern portion of the wooded riparian zone.

Summer water levels are extremely shallow in gravel and cobble riffle zones, and rarely exceed 20 cm depths in pools. Coarse substrates are covered by silt and detritus deposits in pools and slower flowing flats.

Within the wooded riparian zone, shading from overhead canopy cover reduces the establishment of stabilizing understorey vegetation, and creek banks are susceptible to severe erosion, particularly on outside bends of meanders. Bank vegetation is thicker in the open, pastured reaches downstream of the proposed right-of-way, but pasturing activity has caused slumping banks and a widened, shallow and slow flowing channel has developed.

During July 1996 surveys, occasional baitfish were observed in slightly deeper pool zones. Spring flows apparently attract migrant northern pike and white sucker (local resident pers. comm.). Flows in late summer (August) tend to become discontinuous, and do not offer ideal habitat for larger adult fish.

Chainage 12+100: Fraser Creek Tributary

Immediately upstream of the **R.P.** right-of-way limits a small incised channel conveys intermittent flow through a reed canary grass meadow. The creek channel meanders through a section of a small hardwood woodlot and continues westerly along a narrow riparian strip. The tributary eventually joins the main branch of Fraser Creek in a cattle pasture.

Through the proposed crossing zone, creek flow is slow and shallow through silt-bottomed pools and minor gravel riffles. Creek banks are stable and well-vegetated by understorey growth. No fish were observed in this small tributary, however pike and suckers that are reported to migrate up the main branch of Fraser Creek may move up this tributary as well during spring spawning runs.

Chainage 13+100: Pond P1

This feature is an old cattle slough or stock pond in former pasture land, and is located within the northern edge of the **R.P.** right-of-way.

The pond is shallow (~0.5 m deep) and has a soft mud bottom. Rooted aquatic macrophytes are not well represented, however dense filamentous algae is established throughout the pond. A thick growth of duckweed blanketed the pond surface during field investigations. No fish were present in the pond.

Chainage 14+900: White Cedar Swamp

The mapping of this drainage does not reflect the field conditions. A minor, shallow swale depression is evident within the white cedar swamp, but only conveys ephemeral drainage during the spring runoff period. Runoff flow is conveyed to an agricultural drain that flows south to Eighth Line. The swale - drain connection is abrupt, with an approximate 1.0 m difference in bed elevations between the swale and the drain.

Water was not present in the swale during field investigations. While baitfish are present in the agricultural drain, seasonal recolonization of the swale during high flow is impossible due to the bed elevation barrier at the confluence of the swale and drain.

Chainage 16+250: Highway 11 Drain

Seasonal drainage at this location is marked by a narrow cattail swale through cropland. The drainage ditch does not support fish habitat.

Chainage 16+750: Cultivated Waterways

Both of these mapped drainages may support spring run-off drainage, however they are cultivated for the remainder of the year. They do not constitute fish habitat.

Chainage 18+000: Holland River West Branch

The west branch of the Holland River flows south to north through the proposed crossing zone. Flow rates are extremely slow and surface flow is imperceptible.

The west side of the river is characterized by a low level floodplain shrub and forest zone and a wide cattail marsh zone adjacent to the river. East of the river, a narrow band of cattail extends along the floodplain margin, and ends abruptly at earth dykes protecting farmland east of the river.

Bottom conditions were obscured from view by midwater algal blooms. Nutrient enrichment from agricultural runoff contributes to algal growth, and still water areas along the cattail shoreline zones are blanketed with thick growths of duckweed. Given the nature of soils in the area and sediment contributions from agricultural runoff, the bottom is expected to be primarily silt, with some large woody debris (snags, sunken logs) providing instream cover. Shoreline deposition zones consist of deep muck and silt that supports thick cattail growth, encouraging further deposition.

The low level river banks are extremely stable, and river flow velocities are slow enough that erosion does not occur. The fringe of cattails promotes shoreline stillwater areas, further increasing bank stability. Overhead cover is absent, owing to the width of the river and marsh floodplain fringe.

The river supports a diverse assemblage of warmwater sport and baitfish, and also serves as a migratory corridor for spawning fish. Most notable of these is the northern pike which also utilizes the cattail fringe and seasonally inundated grassy floodplain zones as spawning and nursery habitat.

Section JSYB: Holland River West Branch to the Proposed Highway 404 Extension

Between the two rivers there is an extensive network of field and field edge drainage ditches designed to lower water levels in the agricultural fields and permit muck farming activities. Some of the roadside ditches may provide spawning or migratory habitat in the spring if they are directly connected to the river. In most cases, these roadside ditches would provide only seasonal habitat, as water levels usually drop or dry up completely as the dry summer period progresses.

Chainage 20+750: Holland River East Branch

The east branch of the Holland River flows from south to north through the crossing zone, however a westerly flowing meander bend occurs immediately upstream of the proposed **R.P.** crossing point.

The west bank of the East Branch has been disturbed by the construction of a marina. The west shoreline is characterized by stable banks and a sandy littoral shelf that extends approximately 2 m out from the river bank. Boat wakes washing over this shelf tend to raise silt fines and detritus from the shelf bottom, creating pulses of turbidity along the shoreline during the boating season.

A small inlet bay upstream (south) of the proposed crossing point typifies quiet, backwater habitat conditions, and the presence of large woody debris and littoral vegetation within this inlet indicates that quality habitat is available for species such as bass and pike.

The east bank of the river consists of a cattail fringe shoreline approximately 10-15 m in width, and treed areas associated with the Silver Lakes Golf Course and a permanent residence with driveway access to Yonge Street. The east approach will extend along part of the disturbed driveway section.

Similar to the west branch, river bottom conditions are not visible except in the sandy/silty shallow littoral zones of the river margin. A sandy or silty substrate is expected, with large woody debris providing instream habitat structure.

Overhead cover is minimal, however, some river shading is provided during late afternoon and evening when larger trees on the west bank cast their shadows over the west side of the river.

Cattail and rush communities along the east river margin may provide some spawning habitat and nursery cover, but the west bank lacks such cover. Shore fishing activity was noted on the west bank but the fishermen are likely attracted there due to the ease of access rather than catch producing habitat. Similar to the west branch of the Holland River, the east branch supports a variety of warmwater sport species, including various species of Bass, Northern Pike and Yellow Perch.

Chainage 21+000: SilverLakes Ponds

A series of ponds have been constructed as part of the golf course design on the SilverLakes Golf Course, located in the floodplain east of the Holland River East Branch. All of the golf course ponds support fish habitat.

Pond P2 is a small, hypereutrophic pond that supports luxuriant growth of milfoil and duckweed. The pond is not connected to the Holland River or the other golf course ponds, however fish could access the pond directly from the river if the floodplain bar is breached by high water during flood conditions. Numerous frogs and turtles inhabit the pond. Given the thick macrophyte growth and the isolation of this pond from mixing with fresh water during most of the year, dissolved oxygen levels may fluctuate dramatically on a daily basis.

Pond P3 is joined to all other ponds to the north by narrow, but deep connecting channels. Clear water in the littoral zone of the pond allows sunlight to promote good growths of pond lily, milfoil and Potamogeton spp. The littoral zone vegetation provides cover for fish species inhabiting the pond, including Smallmouth Bass, Carp and Sunfish. The pond is also connected directly to the Holland River by a CSP (corrugated steel pipe) that allows movement of fish between the two waterbodies. A second CSP conveys overflow to a drainage ditch along the residential driveway adjacent to the south edge of the golf course. This ditch is also connected to Pond P4 by a culvert beneath the driveway.

Pond P4 is approximately 40 m x 20 m in size and is surrounded by shrub willow, cattail and emergent aquatic macrophytes. Fish inhabit the pond (local resident pers. comm.), and can move between P4, the driveway ditch and P3 through culvert and CSP connectors when water levels are sufficiently high to allow overflow movement between these aquatic features.

Chainage 23+000: Sod Farm Swale

This drainage swale conveys seasonal runoff from a surrounding sod farm. Depending on the degree of spring flooding that occurs each year, portions of the swale are cultivated for sod production. A large part of the swale has been straightened and manipulated, probably using a v-ditch implement, to improve drainage of the sod fields. Wider portions of the swale are depressions that remain saturated for a greater period of time and support reed canary grass for most of the year.

While pike could probably migrate up this swale from the swamp fringe along the Holland River East Branch, the yearly variance in disturbance along the length of the swale influences the availability of habitat. The swale does not support suitable habitat in the area of the proposed crossing due to disturbance associated with ditching and cultivation, and the ephemeral nature of flow.

Chainage 25+700: Leslie Street Swales

A series of swale features are crossed by the **R.P.** on either side of Leslie Street. Swales to the west of Leslie Street are generally ditched, grass-lined waterways that have been impacted by pasturing or cultivation. Swales to the east of Leslie Street are wide grassed waterways through cropland. All of these features support ephemeral flow, during spring runoff or following severe storm events. All drainage from this area of Leslie Street eventually converges in the northeast quadrant of the Leslie Street - Holborn Road intersection. At this location, the watercourse has been severely impacted by grazing activity, and the widened, shallow channel is generally dry during the summer period.

These agricultural drainages are degraded, seasonally flowing features, and do not support viable fish habitat.

Chainage 27 + 000: Southwest Ramp - Highway 404 Interchange - Maskinonge River

In the vicinity of Holborn Road and for most of its length upstream, the Maskinonge River has been altered or straightened to facilitate improved drainage through agricultural lands. At the proposed **R.P.** interchange with the proposed Highway 404 Extension, the tributary has been straightened (ditched) over a length of approximately 300 m.

The Maskinonge River flows through a shallow channel with fairly stable, well-vegetated banks. Bottom substrates are primarily silt, however swifter flowing reaches contain some gravel and cobble. Instream cover is generally deficient, likely due to removal during ditching and alteration, and the general lack of riparian trees that normally contribute large woody debris to a river system.

In the lower reaches near Lake Simcoe, the river supports warmwater sportfish species such as northern pike and largemouth bass. Near the **R.P.** however, the river is narrow and shallow, and lacks quality habitat to support such species. Upper reaches are populated by warmwater baitfish.

The upper reaches of the Maskinonge River are located in the eastern section of the study area. The Maskinonge River is a moderately polluted, permanent warmwater stream. Previous studies (MTO 1984) indicated that the Maskinonge River was high in nutrient content (nitrogen and phosphorous). Total coliform levels indicate that the water was unsuitable for swimming and bathing. Much of the watershed is under agricultural production.

Several of the smaller tributaries to the Maskinonge River are simple grassed swales and waterways that convey agricultural runoff to the main branch of the river.

The positioning of the **R.P.**- Highway 404 interchange, will require a minor realignment of a previously channelized section of the tributary. The realignment may represent an opportunity to return the river channel to a more natural configuration with improved habitat quality.

Summary

The majority of the watercourses along the **R.P.** are relatively minor systems that support warmwater baitfish communities. In a number of cases, watercourses crossed by the **R.P.** do not provide viable fish habitat. Some of the intermittent streams and ditches do, however, support migration and spawning of Northern Pike during spring high water periods. Both branches of the Holland River support viable warmwater sport fisheries, and are considered the most important fishery and aquatic habitat resources along the **R.P.** Watercourse locations, flow type and community characteristics are briefly summarized in Table 2. Appendix 2 contains more detailed notes with respect to each aquatic feature.

Issues:

- The Fisheries Act requires that there be a "no net loss of habitat" associated with an undertaking. The policy also recommends that enhancement of fish habitat be undertaken if possible.
- The protection and/or maintenance of fish habitat conditions will be required during and following construction.
- Protection/maintenance of aquatic habitat in the branches of the Holland River is a high profile issue due to the value of the sportfishery.
- The seasonal use of ditches and minor watercourses as spring spawning tributaries will need to be considered in the detail design. (ie. maintenance of movement corridors).

TABLE 2

Summary of Fish Habitat Conditions
Recommended Plan for the 400 to 404 Link

Crossing Location	Name	Flow characteristics	Description	Habitat Type
10+950	Penville Creek	Intermittent	warmwater/ baitfish	2
11+400	Fraser Creek	Permanent/ Intermittent	warmwater/ baitfish	2
12+100	Fraser Creek	Intermittent	warmwater/ baitfish	2
13+100	Pond (P1)	Permanent	warmwater/ baitfish	3
14+900	White Cedar Swamp	Ephemeral	none	-
16+250	Highway 11 Drainage	Ephemeral	none	3
16+750	Field Swales	Ephemeral	none	3
18+000	Holland River	Permanent	warmwater/ sport fish	2
20+750	Holland River - East Branch	Permanent	warmwater / sport fish	2
21+000	SilverLakes Ponds	Permanent	warmwater	3
23+000	Drainage channel sod farm	Ephemeral /Intermittent	none	-
25+700	Leslie Street Swales	Ephemeral	none	-
26+650	Maskinonge River	Permanent	warmwater/ baitfish	2

Identified Effects: The **R.P.** will require the crossing of 13 watercourses along the 15.3 km length of the Link. There are two major river crossings; the Holland River and the Holland River East Branch. The remaining crossings are relatively minor, being an array of small warmwater streams, seasonal swales and ditches, some of which support warmwater baitfish communities.

Long span bridges are planned to carry the **R.P.** across both branches of the Holland River. Other stream crossings will use appropriately designed culverts. The Stormwater Management aspect of surface water systems is discussed in more detail in Section 5.4.6.1 of the main EA document.

The **R.P.** extends east-west and will cross several warmwater streams including two branches of the Holland River where there is the potential for a loss of wetland area that may provide spawning habitat. Short-term disturbances will be associated with localized dredging and installation of the piers to support the bridge structure, and will included suspension of bottom sediments and disturbance to the river bottom. The majority of drainage channels drain south to north. Within the two affected watersheds (Holland River and Maskinonge River), a number of smaller streams and agricultural drains that provide or may provide habitat for migratory warmwater species and/or resident baitfish populations will be affected. Key concerns during construction are the introduction of sediment, habitat disturbance and alteration of the stream banks and bed during structure placement.

The issue of maintaining navigability along both branches of the Holland River is addressed in Section 5.4.3.3 of the main EA document (Community Recreation).

3.1.2 Wildlife

Description: The wildlife habitat area and potential corridors for the study area were described in Section 8.0 of the Technical Report (1994). The habitat areas were plotted on Exhibits 7a and 7b.

It was noted in the earlier report that the west and far east sections of the study area are predominantly in agricultural land uses with only small areas of natural vegetation to support wildlife and to encourage movement from one area to another. The main wildlife habitat area is located mainly between the two branches of the Holland River, but extends to include the west side of the Holland River and the east side of the East Branch. The central area provides major woodland habitat, wetland habitat and aquatic habitat for the support of a diverse array of wildlife species.

The specific conditions as they relate to wildlife for the **R.P.** will be described in the following sections using chainage to identify specific locations. Wildlife habitat areas are illustrated in Figure 2 (plates 1-5). As the **R.P.** was being finalized, additional wildlife surveys were completed. The approach and findings from these surveys are attached as Appendix 3. Observations were recorded for birds, mammals and herpetofauna. The primary focus was the central section of the Link but other locations of potential wildlife habitat were also surveyed and received good coverage.

In terms of overall diversity, the central section was the most significant. This characteristic is reflected in the following summary taken from the breeding bird surveys.

TABLE 3

400 to 404 Link - Recommended Plan
Bird Species Summary

Observation Code	Highway 400 to Industrial Dr.	West Holland River Crossing	Holland Forest & East River Crossing	2nd Concession to Highway 404
O	39	47	63	39
X	6	13	9	3
M			9	
Total # Species	45	60	81	42

O - Observed on site, possible breeder, X - Observed off site or flying over, M - Migrant

Section CFJ - Highway 400 to the Holland River West Branch

General Comments:

The wildlife communities in this section of the **R.P.** consist mainly of habitat generalist species occupying the scattered remnant habitat areas. There are also a number of species with an affinity for the more open habitat found in this section. Examples of these open area species include the Northern Harrier, Savannah Sparrow and Vesper Sparrow.

The landscape in this section can be best described as an agricultural mosaic with no significant natural linkages to the south and with no significant natural core areas being present.

No vulnerable, threatened or endangered (VTE) species were observed in this section of the **R.P.**

Several areas were noted along this section that support some level of wildlife activity.

Chainage 11 + 500: Fraser Creek

The valley associated with this small watercourse supports a mosaic of habitat areas including open fields (agricultural fields), a stream corridor and fragmented deciduous woodlands. The more natural undisturbed elements are located to the north of the **R.P.** The potential for wildlife habitat decreases to the south as the stream valley loses definition and natural vegetation cover becomes pasture.

Five to ten deer were observed using the mosaic of fields, fragmented woodlands and stream valley. The **R.P.** would cause a minor truncation of the minor valley corridor removing the southern end of the floodplain woodland area.

Chainage 13+250 to 13+480: Deciduous Woodland

The **R.P.** will remove the southern extension of this deciduous woodland (approximately 2 ha). In the past, sections of the woodland have been grazed by cattle. As a result, the woodlot only has a canopy of mature trees and spring flowering plants. There are very few saplings or young trees and late season ground flora remaining. Visually, the sub-canopy area is quite open.

The woodlot provides limited habitat for wildlife due to the trampling and grazing; consequently few species were observed.

Chainage 14+750 to 15+000: Successional /Old Field Area

The **R.P.** dissects this area that consists predominantly of early to late successional plant material associated with a minor stream valley. The successional area is composed of a mosaic of habitats including meadow marsh, riparian vegetation, groves of mature deciduous trees and immature closed canopy white cedar.

The area supports a range of fauna species. Forest dependant species such as the Great-crested Flycatcher, Eastern Wood Peewee, Rose-breasted Grosbeak and Baltimore Oriole were observed in this area. Habitats for a number of amphibian species were also present.

The **R.P.** will remove the central section of this area severing two areas of this habitat type, one north and one south of the alignment.

At present, this habitat area is only weakly connected to other habitat areas. The severed areas will continue to support wildlife and will continue to mature.

Chainage 15+400 to 15+650: Successional Shrub Thicket

This community is a small successional area containing both early and late successional elements. The majority of this unit will be removed leaving a small area of early successional growth north of the alignment.

The habitat has little appeal for wildlife given its isolated location, small size and successional stage.

Chainage 17+500 to 18+100: CN Right-Of-Way to Holland River Main (West) Branch

There are four distinct habitat types between the CN right-of-way and the open water section of the Holland River. This habitat area supports an assemblage of breeding bird species and other wildlife species.

The habitat areas are as follows:		Species
• Shrub Thicket	-	Red-winged Blackbird, White-throated Sparrow
• Shrub Thicket Swamp	-	White-throated Sparrow, Nashville Warbler, Yellow Warbler
• Tree Swamp	-	Veery, Northern Water thrush, Rose-breasted Grosbeak
• Meadow Marsh/Fen (both banks)	-	Swamp Sparrow, Sedge Wren, Marsh Wren

An extensive area of this habitat zone has been disturbed in the past. The shrub thicket and shrub thicket swamp were cleared 20 to 30 years ago as part of an industrial park proposal. The woody debris was left on site. However, the shrub thicket and shrub thick swamp areas are regenerating quickly. The tree swamp and meadow marsh/fen are found in proximity to the waters edge.

A municipal well, an access road and power line are also located in close proximity to the **R.P.** creating additional openings in the wildlife area.

Amphibians were abundant throughout this area, especially Wood Frogs and Spring Peepers. Habitat for amphibians is well represented both north and south of the **R.P.**

A number of mammal species were observed in the area including White-tailed Deer, Groundhog, Muskrat, Beaver and Mink.

Approximately 7 ha of these habitat types may be affected. However, through much of this area, the **R.P.** will be on an elevated structure (bridge). Therefore, the continuity of these habitat types can be maintained under the facility in the post-construction period. Some disturbance can be expected during construction of an access road to the pier location during bridge construction. However, extensive areas of the habitat zone will be maintained and the disturbed area can be restored.

Chainage 18+100 to 18+200: West Holland River (east bank)

The river flows north through this section of the **R.P.** The river and adjacent marsh and swamp provide breeding, feeding and resting habitat for a range of aquatic birds and aquatic animals. The river and adjacent lands act as a corridor for the above noted species groups.

Section JSYB - Holland River West Branch to the Proposed Highway 404 Extension

General Comments

This section of the **R.P.** contains a variety of habitat conditions. Within this section are areas of intensive agriculture such as the vegetable growing area east of the main branch of the Holland River and the extensive turf farming operations between Yonge Street and the beach ridge to the east of 2nd Concession. A different form of agriculture including cash crop and livestock is found east of the beach ridge to the connection with the proposed Highway 404 Extension. Natural habitat areas are limited in these agricultural zones. The array of wildlife species are limited to those capable of persisting in an agriculturally dominant landscape with only small residual patches of habitat - mainly open area or edge related species.

As noted earlier, the primary wildlife habitat area is located along the shoreline of the two branches of the Holland River and the large, relatively undisturbed woodlands and wetlands found between and northwest of the east branch.

Chainage 18+800 to 20+750: Holland River/Bradford Forest

Between the two branches of the Holland River the **R.P.** parallels the northern edge of two large woodland blocks lying west and east of Bathurst Street. The **R.P.** will require the removal of the northern edge of these woodlands. However, the majority of the impact (removal) will occur in already disturbed areas and edge features associated with Hochreiter Road and Albert's Marina. The habitat includes late successional to mature upland and lowland deciduous forest.

This section is a major wildlife habitat area. It is distinguished by the following characteristics:

- The integrity of the forested block is demonstrated by the presence of numerous woodland raptors including Red-shouldered Hawk, Broad-winged Hawk, Sharp-shinned Hawk and Cooper's Hawk.

- A full suite of forest interior/area sensitive bird species were recorded including Yellow-bellied Sapsucker, Winter Wren, Wood Thrush, Veery, Northern Water Thrush, Canada Warbler, Black and White Warbler, Ovenbird and Scarlet Tanager.

- Amphibians (especially Wood Frogs) and good amphibian habitat are abundant throughout the forested area.

- Two provincially and nationally vulnerable species, the Red-shouldered Hawk and Louisiana Water Thrush were recorded within the forested block near the crossing location of the East Holland River.

The woodland block is functionally connected to the wetlands and woodlands to the east of the river and may be viewed as one habitat area.

Chainage 20+750 to 20+850: Holland River East Branch

The river flows north through this section of the **R.P.** The river provides breeding, feeding and resting habitat for a range of aquatic birds and aquatic animals. The river also acts as a corridor for the above noted wildlife species.

Chainage 12+300 to 21+750: Silver Maple Swamp

The **R.P.** will remove the northern edge of this mature deciduous forest system. There was standing water at the time of the spring survey. Silver maple trees up to 90 cm D.B.H. (Diameter at Breast Height) were observed.

Although not large in size, forest interior species were observed including Scarlet Tanager, Wood Thrush, Ovenbird and Yellow-bellied Sapsucker. Their presence may be related to the adjacent large blocks of woodland. Wood Frogs and amphibian habitat are abundant.

Chainage 21+770 to 22+050: Woodland East of Yonge Street

The majority of this immature mixed broadleaf stand is in the size range between 15 and 25 cm D.B.H. Forest interior species were also observed in this woodland. Their presence is likely explained by the large area of regional forest that is present to the west and north. Species include Ovenbird, Canada Warbler, Black and White Warbler and Veery.

The woodland area is a southern extension of a much larger section of the deciduous forest and wetland block north of the alignment. These areas will not be affected by the **R.P.** A small 2 to 3 hectare block of trees will remain south of the **R.P.** It is unlikely that interior species will persist in the severed fragment but the woody vegetation will persist.

Chainage 24+600 to 24+800: Beach Ridge

At the base of the prominent west facing slope are wet mesic successional forest and swamp. Along the rim and upper slope are a mature deciduous forest (at the northern limit), successional white cedar forest and patches of poplar dominant forest patches. Numerous seepage areas and areas with dense undergrowth are present at the base of the slope feature.

There is a diverse breeding bird community present. This may be due to the heterogeneous habitat present and its proximity to the large regional forest to the west.

The area has been described as a corridor connecting this wooded area to several woodland areas to the northwest of the community of Queensville. The feature is currently traversed by an Ontario Hydro corridor. The natural vegetation community extends north of the proposed crossing location approximately 300 m to Holborn Road.

Chainage 25+650, 25+700, 25+250

Three minor tributaries are crossed by the **R.P.** They consist of minor drainage channels and bands of riparian vegetation. Their wildlife habitat value and corridor function are minimal.

<u>Issues</u>

- Wildlife and wildlife habitat remains an Environmentally Sensitive Area/Issue.

- The **R.P.** affects a number of areas that currently provide wildlife habitat. There will be an unavoidable loss of habitat where the **R.P.** traverses an area supporting wildlife. However, the majority of the impact locations are associated with common habitat types supporting generalist species.

- An attempt has been made to minimize fragmentation by routing the R.P. through existing disturbed areas or existing clearings.

- Highway facilities may be less permeable to wildlife passage than the existing condition. Maintain corridor connections.

- Species of concern may be affected by the alignment.

- The introduction of a highway may lead to an increase in mortality in the wildlife community.

Identified Effects: The **R.P.** will lead to the removal of approximately 39 hectares of wildlife habitat. The quality of the habitat is variable ranging from early to late succession old field, to disturbed deciduous woodland and blocks of undisturbed woodlands. No habitat type will totally be removed from the local area as a result of the **R.P.**, so representation will be maintained. In all cases, sections of the affected habitat areas will be retained outside the right-of-way.

Fragmentation of large woodland areas has been minimized by routing the facility along existing openings (Hochreiter Road) and existing disturbed habitat areas such as Albert's Marina and the west floodplain area of the Holland River.

The corridor function of the two river branches and associated natural areas (woodlands and wetlands) could be affected. The proponent has made a commitment that the crossing of the two rivers and associated P.S.W. will be on a structure allowing movement under the facility.

Less significant corridors such as the small stream valleys will be assessed for their functional role as corridors at detail design. Appropriate structures will be developed at that time.

Mortality associated with the proposed highway can be expected.

3.1.3 Wetlands

Description: The major wetland feature within the study area, the Holland Marsh provincially significant wetland (PSW) complex, was described in Section 7.0 of the Technical Report (1994). The limits of the PSW, as identified by the MNR, were shown on Exhibit 6 of the Technical Report (1994) has been reproduced and appears in Appendix 4.

Within the **R.P.** area, the Holland Marsh PSW is mainly confined to zones along the two branches of the Holland River. North of the study area, there is an expansive area of the PSW to the east of the Holland River East Branch.

Elsewhere within the **R.P.** area there are also several small isolated, unevaluated wetlands associated with minor drainage ways or seepage areas.

Fairly detailed surveys of wetland vegetation and flora were focused on the Holland Marsh PSW. The other wetlands within the **R.P.** area were also examined in the field. Community descriptions and lists of significant taxa were compiled for the wetlands examined during this study. The details of these surveys are presented in Appendix 5.

The more detailed notes on wetlands affected by the **R.P.** that follow are presented in two sections, from west to east: namely, Section CFJ (Highway 400 to Holland River West Branch) and Section JSYB (Holland River West Branch to the with Highway 404 extension). In the following paragraphs, a distinction is made between provincially significant wetlands and other unevaluated wetlands.

Some of the wetland areas correspond to areas described under the wildlife and vegetation sections leading to some repetition.

Section CFJ - Highway 400 to the Holland River West Branch

Chainage 13+250 to 13+480: Mixed Swamp located north of the R.P.

The **R.P.** will remove 2.0 ha of deciduous forest that is presently being grazed (see notes in Section 3.1.4). There is an area of mixed conifer-deciduous swamp located between 10 and 30 m north of the right-of-way at its closest point. This swamp system covers approximately 5.5 ha, most of which is located more than 125 m away from the right-of-way. This wetland has not been evaluated.

Chainage 14+900: Narrow Band of Mixed Swamp within Mixed Successional Forest

The **R.P.** will remove a 100 x 50 m section of a narrow, mixed conifer-deciduous swamp dominated by Eastern White Cedar (*Thuja occidentalis*). This wetland has not been evaluated.

Chainage 16+250: Small Cattail Marsh

The **R.P.** will remove a small, disturbed, 0.24 ha cattail marsh that has formed along a swale on abandoned agricultural land east of Regional Road 4. This wetland is too small, disturbed and isolated to be evaluated.

Chainage 16+300: Mixed Swamp on Slope

The **R.P.** (interchange ramp) will remove approximately 1.0 ha of mixed conifer-deciduous swamp dominated by Eastern White Cedar. This wetland is located on a slope and it is apparently maintained by seepage. This wetland has not been evaluated.

Chainage 17+500: Thicket Swamp

The **R.P.** will remove approximately 0.7 ha of thicket swamp along the northern edge of this feature. This is a regenerating community covering approximately 3.0 ha that is surrounded by industrial development associated with Artesian Industrial Parkway, the CN rail line and 8th Line/Dissette Street. This wetland has apparently not been evaluated.

Chainage 17+700 to 17+920: Deciduous Swamp - Holland Marsh PSW

The **R.P.** will cross approximately 220 m of this Trembling Aspen (*Populus tremuloides*) dominated community. This area is regenerating following clearing 20 to 30 years ago.

Chainage 17+920 to 18+060: Disturbed Fen/Marsh - Holland Marsh PSW

The **R.P.** will cross approximately 140 m of the area mapped as fen in the Wetland Evaluation Record (WER) for the Holland Marsh PSW. This area is a mosaic of remnant sedge fen and cattail marsh (mapped as F2). Ditching and other alterations in the wetlands to the south of this location and the proximity to a municipal snow dump may have affected this community which was, in all likelihood, formerly a less disturbed fen community.

The remnant sedge fen is dominated by a mix of sedges (*Carex aquatilis, C. lasiocarpa, C. stricta*) and Canada Bluejoint (*Calamagrostis canadensis*) with a few fen 'indicator' species present (based on Riley 1989): namely, Marsh-bellflower (*Campanula uliginosa*), Water Horsetail (*Equisetum fluviatile*), Hoary Willow (*Salix candida*) and Rush Aster (*Aster borealis*)

The marsh areas support a mix of cattails (*Typha angustifolia, T. latifolia*), Lake Sedge (*Carex lacustris*), Beaked Sedge (*Carex utriculata*), Sweet-flag (*Acorus americanus*) and Water Plantain (*Alisma plantago-aquatica*).

Chainage 18+180 - Disturbed Fen/Marsh: Holland Marsh PSW

The **R.P.** will cross approximately 30 to 40 m of wetland on the east side of the Holland River West Branch. The wetland forms a fringe along the east bank of the Holland River. The wetland is similar to the disturbed fen/marsh described above (mapped as F2).

Section JSYB - Holland River West Branch to the Proposed Highway 404 Extension

Chainage 20+900 - Deciduous Swamp: Holland Marsh PSW

The **R.P.** will cross approximately 40 to 90 m of wetland on the east side of the Holland River East Branch. This wetland area is a fairly open, immature Red Maple (*Acer rubrum*) dominated swamp with Yellow Birch (*Betula alleghaniensis*), Black Ash (*Fraxinus nigra*) and Speckled Alder (*Alnus incana* spp. *rugosa*). This area has likely been affected by changes in the moisture regime due to the construction of the SilverLakes Golf Course.

Chainage 20+950 to 21+200: Open and Treed Fen located south of the Recommended Plan - Holland Marsh PSW

In terms of community type, level of disturbance and floristic composition, the most significant vegetation feature within the study area was an open fen located on the west side of the Holland River East Branch (mapped as F3). This is a sedge dominated community, with many of the sedge species being fen indicator species (e.g. *Carex buxbaumii, C. lasiocarpa, C. sartwellii*). A number of plant taxa recorded from this community are fen indicators and/or rare in York-Metro (Varga et al. 1986, cited in Riley 1989; Riley 1989): Bog-rosemary (*Andromeda glaucophylla*), Marsh-bellflower (*Campanula uliginosa*), Water Horsetail (*Equisetum fluviatile*), Hoary Willow (*Salix candida*), Rush Aster (*Aster borealis*), Buxbaum's Sedge (*Carex buxbaumii*), Sartwell's Sedge (*Carex sartwellii*), Downy Willow-herb (*Epilobium strictum*), Dwarf Birch (*Betula pumila* ssp. *glandulifera*) and Muhly Grass (*Muhlenbergia glomerata*).

At the closest point, the **R.P.** area comes within 80 m of this open fen, across the Holland River East Branch. On the west side of the Holland River West Branch, the **R.P.** area is located some 250 m from this community. The facility will be on an elevated structure adjacent to this area.

Chainage 21+430: Deciduous Swamp

The **R.P.** will remove the northern portion (0.2 ha) of a small (0.7 ha), narrow band of mature Silver Maple (*Acer saccharinum*) dominated swamp. A small population of Daisy-leaved Grape Fern (*Botrychium matricariifolium*), considered rare in the Regional Municipalities of York and Metropolitan Toronto (Varga et al. 1986, as cited in Riley 1989), was recorded from hummocks within this swamp community. This population of Daisy-leaved Grape Fern will at least partially be affected by the **R.P.** This wetland has not been evaluated.

Issues: Crossing of the Holland Marsh provincially significant wetland complex. Early in the study, the key environmental concern centered on the potential impacts of a new crossing of the Holland Marsh complex.

Recognizing that it was not possible to avoid all impacts, discussions with MTO and MNR scoped the consideration of alternatives to those that:

- cross only narrow sections of the Holland Marsh wetland complex;
- utilize portions of the designated wetlands that have been previously disturbed; and
- use an elevated structure on piers rather than an earth fill embankment to cross the designated wetland.

Fens are the most sensitive wetland types along the proposed **R.P.**, being dependent on the shallow lateral movement of groundwater. Thus, some emphasis will be placed on minimizing backwater effects and maintaining groundwater flows and patterns, thereby minimizing longer term effects on the wetland.

Identified Effects: The **R.P.** encompasses the three characteristics noted above, thereby minimizing potential impacts upon wetland function and loss of wetland area. Of the 9.5 ha of PSW crossed by the **R.P.**, 0.6 ha is disturbed fen, the remaining 8.9 ha is composed of marsh and swamp community types. These figures refer to the total land area taken by the 100 m right-of-way to be designated for the route. In fact, the direct physical impacts will be significantly less and will be limited to the construction of widely separated bridge piers. The access right-of-way and other disturbed areas will be restored.

3.1.4 Vegetation

Description: Wetland vegetation in proximity to the **R.P.** area has been described in the preceding section. Non-wetland (i.e. terrestrial or upland) vegetation is described in the following paragraphs. Some description has been provided earlier in the wildlife section.

The largest blocks of natural vegetation within the study area occur in association with the Holland Marsh PSW in the central portion of the study area. Elsewhere, the natural vegetation is primarily restricted to small, isolated woodlots and areas of old fields and shrub thickets, although the latter areas have developed on abandoned agricultural land and are of anthropogenic origin.

Fairly detailed surveys of vegetation and flora were focused on the Holland Marsh PSW and adjacent terrestrial features. The other woodlots within the **R.P.** area were also examined in the field. Community descriptions and lists of significant taxa were compiled for the terrestrial vegetation examined during this study. The details of these surveys are presented in Appendix 5.

The more detailed notes on terrestrial vegetation affected by the **R.P.** that follow are presented in two sections, from west to east: namely, Section CFJ (west of the Holland River West Branch) and Section JSYB (Holland River West Branch to the proposed Highway 404 extension).

Section CFJ - Highway 400 to the Holland River West Branch

Chainage 11+320 to 11+520: Deciduous Forest - Successional

The **R.P.** will remove the southern half of a narrow, riparian deciduous forest dominated by Crack Willow (*Salix* X *rubens*).

Chainage 12+085 to 12+170 - Deciduous Forest

The **R.P.** will remove a small (approximately 1.1 ha) woodlot comprised of a mixed-aged stand of White Ash (*Fraxinus americana*), Basswood (*Tilia americana*), Beech (*Fagus grandifolia*) and Ironwood (*Ostrya virginiana*).

Chainage 12+200 to 12+325: Conifer Forest located north of the Recommended Plan

The **R.P.** area will directly abut the southern edge of a small, immature conifer forest dominated by Eastern White Cedar (*Thuja occidentalis*).

Chainage 13+255 to 13+420: Deciduous Forest

The **R.P.** will remove 2.0 ha of deciduous forest that is presently being grazed. This is a mature Sugar Maple (*Acer saccharum* ssp. *saccharum*) dominated stand.

Chainage 14+670 to 14+960: Shrub Thicket and Mixed Forest (successional)

The **R.P.** will remove a 1.25 ha crescent-shaped shrub thicket community dominated by Eastern White Cedar, as well as approximately 0.9 ha of immature, mixed conifer-deciduous forest dominated by Eastern White Cedar, poplars (*Populus* spp.), Basswood, Balsam Fir (*Abies balsamea*) and White Pine (*Pinus strobus*).

At 14+900, the **R.P.** will also remove a 50 m wide band of a narrow, mixed conifer-deciduous swamp dominated by Eastern White Cedar. This will leave a 4.25 ha forest, shrub thicket and swamp fragment to the north of the **R.P.** and a 5.4 ha forest and swamp fragment to the south of the **R.P.**

Chainage 15+360 to 15+760: Old Field and Shrub Thicket

In this area, the **R.P.** will remove 4.0 ha of old field and shrub thicket habitat.

Chainage 16+850 to 17+200: Old Field and Shrub Thicket

In this area, the **R.P.** will remove 3.5 ha of old field and shrub thicket habitat.

Chainage 17+540 to 17+700: Old Field and Shrub Thicket

In this area, the **R.P.** will remove 1.6 ha of old field and shrub thicket habitat.

Section JSYB - Holland River West Branch to the Proposed Highway 404 Extension

Chainage 18+840 to 19+560: Mixed Forest

In this vicinity, the **R.P.** will affect forest edges to the north and south of Hochreiter Road. To the north, including the realignment of Hochreiter Road, the **R.P.** will remove a 70 m wide band of mixed forest at the widest point. To the south, the **R.P.** will remove up to a 120 m band of mixed forest at the widest point (just west of Bathurst Street).

The mixed conifer-deciduous forests in this area support a diverse mix of tree species, including Eastern White Cedar, Balsam Fir, White Pine, White Spruce (*Picea glauca*), Red Maple (*Acer rubrum*), Trembling Aspen (*Populus tremuloides*), Balsam Poplar (*Populus tremuloides*), White Birch (*Betula papyrifera*), Yellow Birch (*Betula alleghaniensis*), White Ash (*Fraxinus americana*) and Green Ash (*Fraxinus pennsylvanica*). These forests are variable in age and some areas are quite open. The moisture regime is generally wet-mesic, with some evidence of vernal (temporary) pooling.

Chainage 19+590 to 20+670: Mixed Forest

In this vicinity, the **R.P.** will affect the northern edge of a large block of forest that extends further south. Most of this encroachment will be restricted to areas previously disturbed by the marina construction and existing adjacent residences.

The forest community here is similar to that described to the west of Bathhurst Street, except that it is more mature and deciduous tree species occur more frequently.

Chainage 21+320 to 21+560: Deciduous Forest - East of the Holland River East Branch

In this vicinity, the **R.P.** will affect the northern edge of a block of forest that extends further south. Encroachment into this forest will extend up to 80 m.

This deciduous forest is comprised of a mix of Green Ash, Balsam Poplar, White Birch, White Elm, Red Maple and Balsam Fir. Small swamp pockets with Black Ash (*Fraxinus americana*) occur here but are too small to map. The moisture regime is generally wet-mesic and the ground flora is quite rich in this area.

Chainage 21+560 to 21+750: Deciduous Forest

The vegetation affected here is similar to that described above except that there is an existing residence in a forest gap and, consequently, it is somewhat more disturbed.

Chainage 21+780 to 22+030: Deciduous Forest

The **R.P.** will remove 2.5 ha of deciduous forest, leaving a 1.75 ha forest fragment to the south, separated from a larger block of upland and wetland vegetation to the north.

The forest in this area is comprised of a mix of Balsam Poplar, Trembling Aspen, Red Maple, Green Ash and Balsam Fir. Close to Yonge Street, there are clusters of Red Oak (*Quercus rubra*). There are some small swamp pockets with Black Ash that are too small to map. Except in the swamp pockets, the moisture regime is generally wet-mesic.

Chainage 22+030 to 22+500: Deciduous Forest - North of the Recommended Plan

The **R.P.** abuts the southern edge of a large block of upland and wetland vegetation.

Chainage 24+540 to 24+870: Deciduous Forest/Conifer Forest

The R.P. will remove approximately 2.5 ha of forest on a prominent west-facing slope.

The lower half of the slope is a successional deciduous forest dominated by Trembling Aspen and the upper half of the slope is a conifer forest dominated by Eastern White Cedar. A small block between the **R.P.** and the Ontario Hydro corridor will be severed.

Chainage 26+800: Northwest Corner of Interchange with Proposed Highway 404 Extension

Adjacent to the intersection with the Proposed Highway 404 Extension, two small woodlots are affected by the **R.P.** The larger of the two woodlots, located immediately to the south of Holborne Road, will be affected at its eastern end by ramps from the Proposed Highway 404 Extension. The smaller, triangular-shaped woodlot will likely be eliminated by the proposed Highway 404 and the connecting ramps.

Both woodlots are fairly mature and dominated by Sugar Maple.

Issues: Removal and/or disturbance of vegetation and flora, along with fragmentation of large woodland blocks.

Identified Effects: An important element of the process to select the **R.P.** was to minimize impacts on large blocks of natural vegetation (both upland and low wetland) and, consequently to minimize impacts on the wildlife habitat associated with these areas. Where possible, these larger blocks of vegetation were avoided. However, over the approximately 15.3 km route of the **R.P.**, some impacts were unavoidable. Specifically, 22.1 ha of higher quality woodlands will be removed. The boundary of the Holland Marsh Environmentally Significant Area (ESA A16, C1) overlaps areas measured in various sections of the evaluation (i.e. organic soils, significant vegetation communities, wetland, wildlife habitat). The total area of ESA affected by the Recommended Plan is 17.2 ha.

3.1.5 Groundwater

Description: The groundwater resources of the general study area are described in Section 4.2 of the 1994 Technical Report.

The local wells generally utilize groundwater bearing strata associated with the Alliston Aquifer Complex. The depth of the wells is variable but generally range from 16 to 25 m. There is frequently an overlying silt or clay layer between the water bearing strata and the surface that acts as an aquitard. The susceptibility to contamination of the wells is rated generally as low due to the overlying clay/silt deposits.

The depth to the water bearing strata along the **R.P.** indicates that water well interference due to road cuts is unlikely.

In the central section, there is an unconfined shallow water table. This is susceptible to contamination given the sandy nature of the soils and the shallow depth of the water table. An extensive network of ditches and dykes has been built to control water levels in this area.

Issues: Potential well impacts and contamination of /or interference with groundwater resources. Shallow groundwater interference in central lowland area. Road construction in the central section has the potential to disrupt local flow patterns causing upstream ponding and downstream groundwater depression adjacent to the proposed facility.

Identified Effects: Rural homes and businesses along the **R.P.** currently utilize private wells; 24 domestic wells are potentially affected either directly (removal) or indirectly (potential interference) by the **R.P.** In the area of sandy soils associated with the Holland River, the shallow perched groundwater system is susceptible to contamination and or interference. The Bradford municipal well west of the Holland River will be avoided and otherwise unaffected by the **R.P.** The municipal well is fed by a deep aquifer well below the depth of potential impacts associated with construction of the **R.P.**

3.1.6 Greenways and Open Space Linkages

Description: Natural corridors are more or less elongate, naturally-vegetated features that link or border larger natural areas. Corridors provide pathways for animals requiring a variety of habitats to complete their life cycles and allow for the movement and reproductive interchange between populations of plants and animals (Riley and Mohr 1994).

The **R.P.** for the 400 to 404 Link is an east-west route traversing a landscape in which the main natural features are on a north-south axis in the central part of the **R.P.**, namely, the two branches of the Holland River and the associated wetlands and upland forest. Other potential minor corridor features are associated with the beach ridge feature to the east and the various smaller stream systems found along the **R.P.** (i.e. Fraser Creek, Maskinonge River).

Issues: Minimize the disruption to existing greenways/natural corridors. In the central woodland area, the issue is related as much to the fragmentation of large natural areas as it is to the disruption of natural corridors.

Identified Effects: Where possible, the **R.P.** skirts the edges of contiguous forest blocks or follows existing gaps in the forest. Between the CN rail line and Yonge Street, an area that is predominantly naturally vegetated, the route will be on a pier structure for more than one quarter of its length, thereby providing opportunities to maintain the natural corridor function. Similarly, where the **R.P.** crosses both branches of the Holland River and its associated wetlands it will be on an elevated structure. The sections of the **R.P.** that will be on a structure provide important opportunities for the maintenance of the key natural features within the study area.

3.1.7 Geology and Physiography

Description: The geology and physiography of the general study area are described in Section 2.0 of the Technical Report. The physiographic features are illustrated on Exhibit 2 in the 1994 Technical Report.

Bedrock is not a consideration for the **R.P.** It is found at depth throughout the length of the proposed facility. Overburden depths range from 50 to 150 m.

The **R.P.** traverses three physiographic regions; the Schomberg Clay Plains, Simcoe Lowlands and Peterborough Drumlin Field. The Schomberg Clay Plains and Simcoe Lowlands are relatively flat landscape features. The Peterborough Drumlin Field has a more rolling to steeply rolling landscape character. The Simcoe lowlands and the centrally located component of the Schomberg Clay Plain are defined in the east by a ridge feature (beach ridge) which the **R.P.** must cross. The **R.P.** also crosses or is in close proximity to two drumlin features west of the Holland River creating some slope constraints, particularly in the vicinity of the proposed interchange with former Highway 11. A second drumlin feature is located where the **R.P.** crosses the 10th Side road.

Issues: Physiography is an issue only as it relates to slope constraints associated with the drumlins and the ridge features that define the central Simcoe Lowlands and Schomberg Clay Plains.

Deep organic or saturated soils (unstable) may be encountered in the central section adjacent to the river branches.

Bedrock constraints are not an issue.

Identified Effects: As the R.P. is built, grading will be required to accommodate the slope conditions. Special construction techniques may be required if deep organic or unstable soil conditions are encountered.

3.1.8 Summary

The preceding sections have described the physical and natural resource features along the **R.P.** Throughout the long process, many of the environmentally significant area/issues have been avoided or the impact potentially resolved through proposed mitigation measures.

The main area where residual concerns are most apparent is the area between the CN right-of-way to the west of the Holland River and the limit of the woodland vegetation to the east of Yonge Street, east of the east branch of the Holland River. Even with the use of existing disturbed areas and existing right-of-way, there will be some residual impact on the provincially significant wetland, some loss of woodland habitat and loss of specialty crop farmland. This is unavoidable even with mitigation. However, from an environmental perspective, the **R.P.** remains the best option for routing the 400 to 404 Link through this complex natural heritage area.

Table 4 provides a summary of the Environmental Areas/Issues associated with the **R.P.**. The area and nature of the issue is identified. An indication of the relative significance of the features is also noted. Mitigation measures relevant to these terrestrial, wetland, and aquatic systems are detailed in Section 5.4 of the EA document. Agriculture is a common element throughout the length of the **R.P.**. Agricultural issues have only been highlighted in the specialty crop areas. Natural Heritage Features are highlighted on Figure 2 (Plates 1-5).

TABLE 4

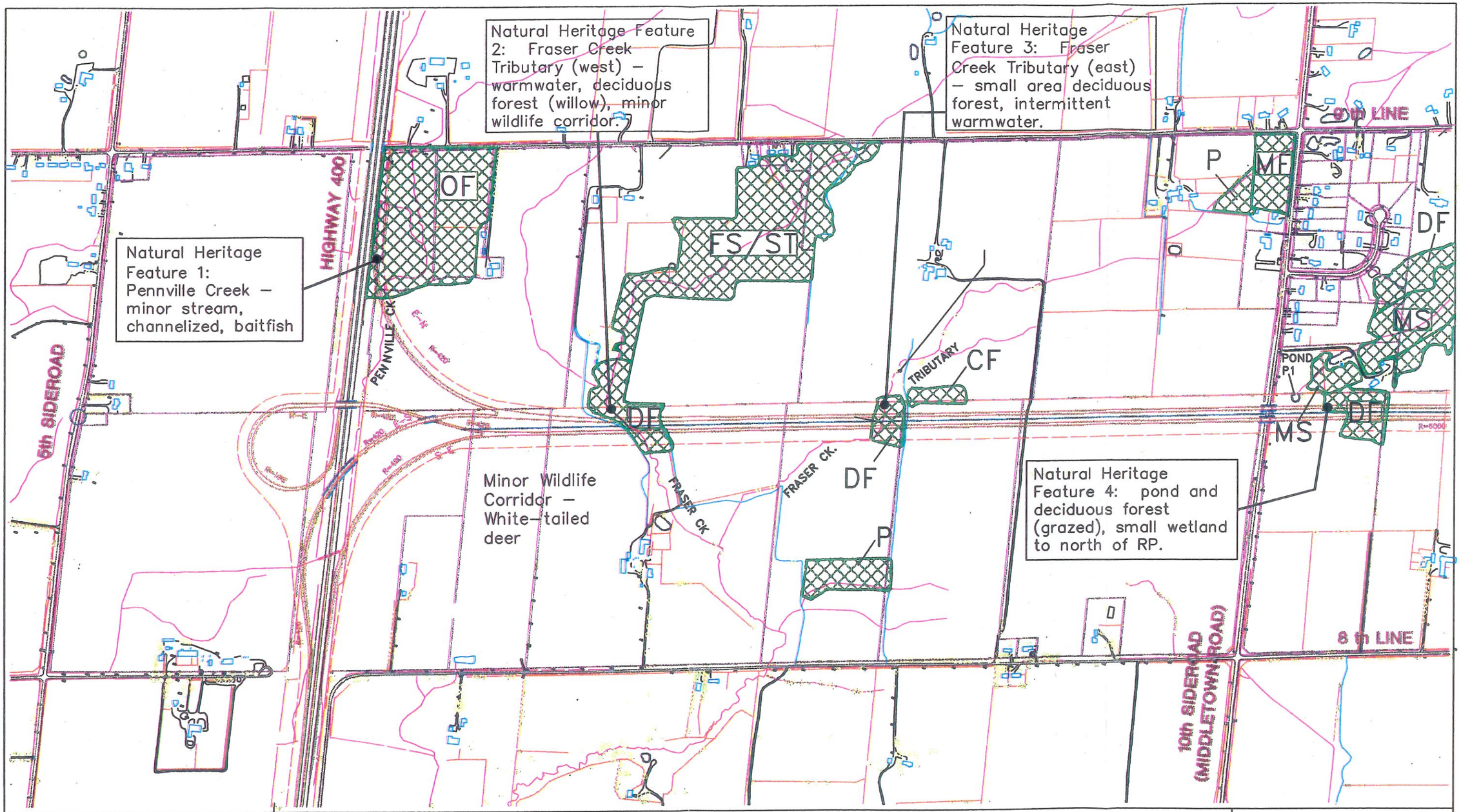
Natural Heritage Features Summary
400-404 Link Recommended Plan

Natural Heritage Features	Existing Conditions	Issue Concern
1 10+720	• Pennville Creek: small warmwater baitfish aquatic system, currently channelized as ditch in Highway 400 right-of-way. • Low wildlife potential oldfield/pasture lands.	• channel realignment at 400 Link interchange. • protection of baitfish community. • channel relocation restoration.
2 11+450 to 11+570	• Fraser Creek: warmwater baitfish, reported pike/white sucker spring runs • deciduous forest - floodplain - crack willow.	• minor stream crossing with baitfish. • protection of spring migration. • removal of small area of deciduous floodplain crack willow. • minor wildlife corridor - small herd of deer observed.
3 12+100 to 12+200	• Deciduous Forest: white ash, Basswood Beech; Ironwood - submature. • minor wildlife significance. • east tributary of Fraser Creek-no fish observed intermittent.	• small isolated woodland will be removed. • low significance.
4 13+255 to 13+420	• Deciduous Woodland: southern extension of larger woodland. • mature sugar maple but disturbed by history of cattle pasturage. • wetland (swamp) located north of **R.P.** buffered by 20 to 30 metres setback. • relatively steep slopes associated with drumlin.	• removal of 2 ha of pastured deciduous trees. • potential impact to off-site swamp. • erosion and sedimentation control. • low wildlife impact given structure of woodlot.
5 14+670 to 14+960	• Shrub Thicket and Mixed Forest (Successional) • depressional areas between drumlin features. • crescent shaped successional system with strip of swam in middle. • not fish habitat. • small isolated habitat - generalist species.	• removes 1:25 ha of shrub thicket and remove .9 ha of immature conifer deciduous forest. • removes .5 ha of conifer deciduous swamp. • **R.P.** severs system leaving 4.25 ha to north 5.4 ha to south.
6 15+360 to 15+760	• Oldfield and Shrub Thicket • habitat for common field/edge species.	• removal of 4 ha of habitat.
7 16+200 to 16+420	• Cattail Marsh - Mixed Swamp • small cattail marsh associated with Highway 4 drainage ditch. • mixed swamp sustained by seepage along drumlin slope.	• loss of < .5 ha mixed swamp.
8 16+850 to 7+700	• Oldfield Shrub Thicket • Shrub Thicket Swamp • successional slope area-west slope of Simcoe Lowlands. • local wildlife habitat.	• removal of 5 ha of successional material. • low significance.
9 17+700 to 17+920	• Deciduous Swamp • Holland Marsh • PSW • components of the Holland Marsh	• loss of wetland area and function. • routed through previously disturbed wetland.

TABLE 4

Natural Heritage Features Summary
400-404 Link Recommended Plan

Natural Heritage Features	Existing Conditions	Issue Concern
9 17+920 to 18+060	• Disturbed Fen Marsh • PSW • 3 habitat types affected.	• major concern by all agencies. • post-construction restoration.
9 18+180	• Disturbed Fen Marsh (similar to above).	• R.P. will cross 30 to 40 m of wetland east side of Holland River.
10 18+200 to 19+100	• Specialty Crop Area • specialty crop area growing vegetable. • water table lowered by extensive network of ditches.	• loss of agricultural land. • damming affect of facility on shallow groundwater. • potential contamination.
11 18+840 to 19+560	• Mixed Forest • Holland River Forest Block • diverse woodland block extending south both side of Bathurst Street. • diverse wildlife habitat. • supports two vulnerable species. • major river based corridor.	• loss of habitat. • fragmentation. • disruption of wildlife habitat. • disruption of species of interest. • disruption of corridor. • routing through existing clearings, disturbed areas/edges. • long bridge span will provide movement opportunities.
12 21+320 to 22+000	• Deciduous SilverLakes Golf Course • R.P. parallels south edge of golf course. • small swamp unit. • golf facility will be affected.	• loss of woodland habitat. • impacts to golf course. • large woodland block maintained north of R.P.
13 22+000 to 24+500	• Specialty Crop-Turf • flat area supporting turf production. • network of drains to control water levels.	• loss of agricultural land. • damming affect of facility on shallow groundwater. • potential contamination.
14 24+500 to 24+850	• Beach Ridge • wooded west facing slope of beach ridge. • deciduous forest swamp/deciduous forest. • seepage areas along slope.	• loss of habitat. • loss of corridor.
15 26+500 to 27+100	• Deciduous Woodlands • Maskinonge River tributary • minor drainage swales - not fish habitat. • small deciduous woodland block. • Maskinonge Trails may need to be realigned. • warmwater baitfish.	• minor loss of small woodland.



HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK
(BRADFORD BYPASS) ROUTE LOCATION
AND ENVIRONMENTAL ASSESSMENT STUDY
Natural Features

1459\plate1.dwg

WETLAND AND TERRESTRIAL VEGETATON

WETLAND

- M Marsh/Meadow Marsh
- F Fen
- TS Thicket Swamp
- DS Deciduous Swamp
- MS Mixed Conifer–Deciduous Swamp

TERRESTRIAL

- DF Deciduous Forest (DFS – Successional)
- MF Mixed Conifer–Deciduous Forest (MFS – Successional)
- CF Conifer Forest (CFS – Successional)

ANTHROPOGENIC

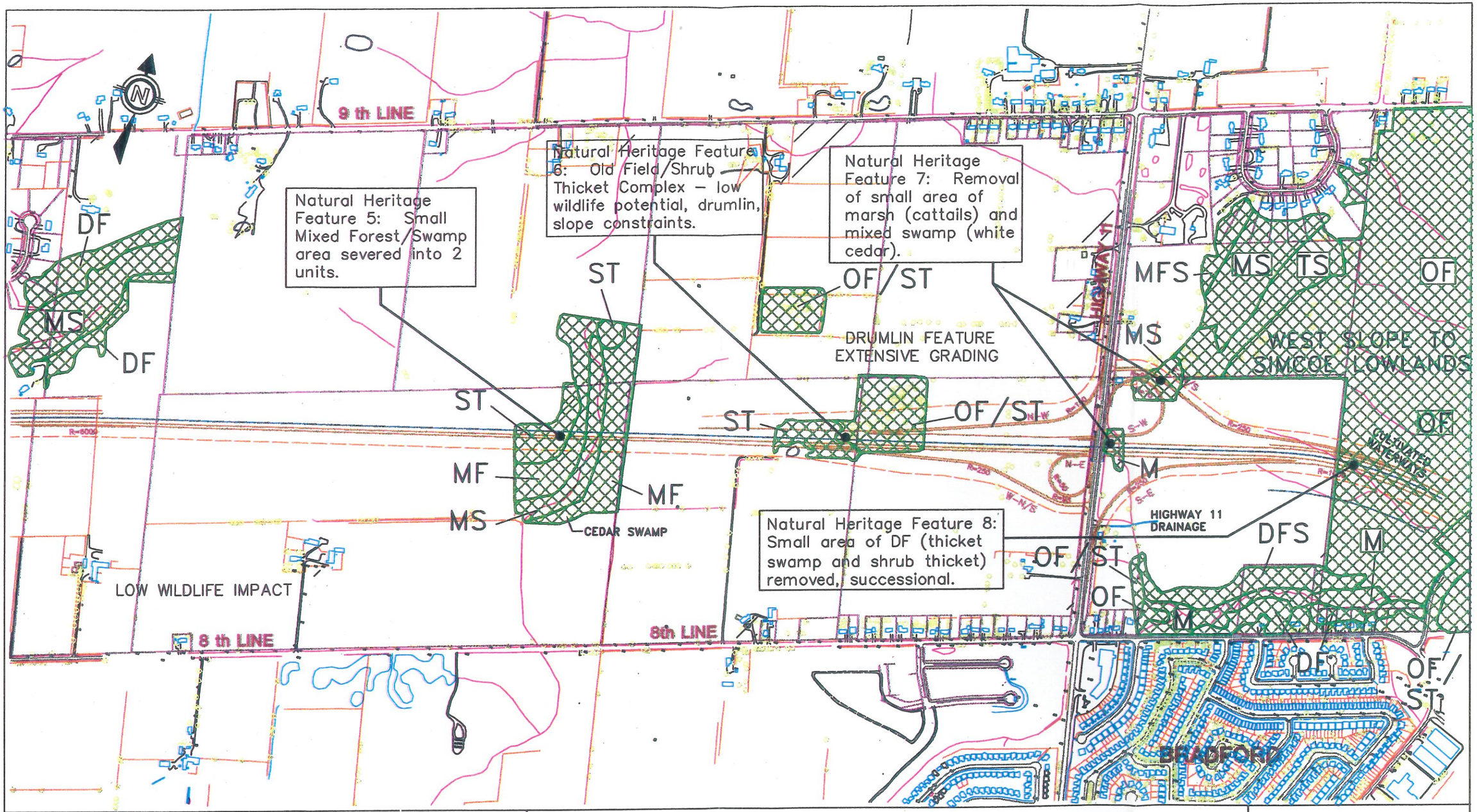
- OF Old Field
- ST Shrub Thicket
- P Plantation

ecoplans LIMITED
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phone: (519) 741-8880 fax: (519) 741-8884

SCALE 1:10,000

PROJECT No. 91–1459

PLATE No. 2.1



HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Natural Features

1459\plate3-2.dwg

WETLAND AND TERRESTRIAL VEGETATION

WETLAND

- M Marsh/Meadow Marsh
- F Fen
- TS Thicket Swamp
- DS Deciduous Swamp
- MS Mixed Conifer–Deciduous Swamp

TERRESTRIAL

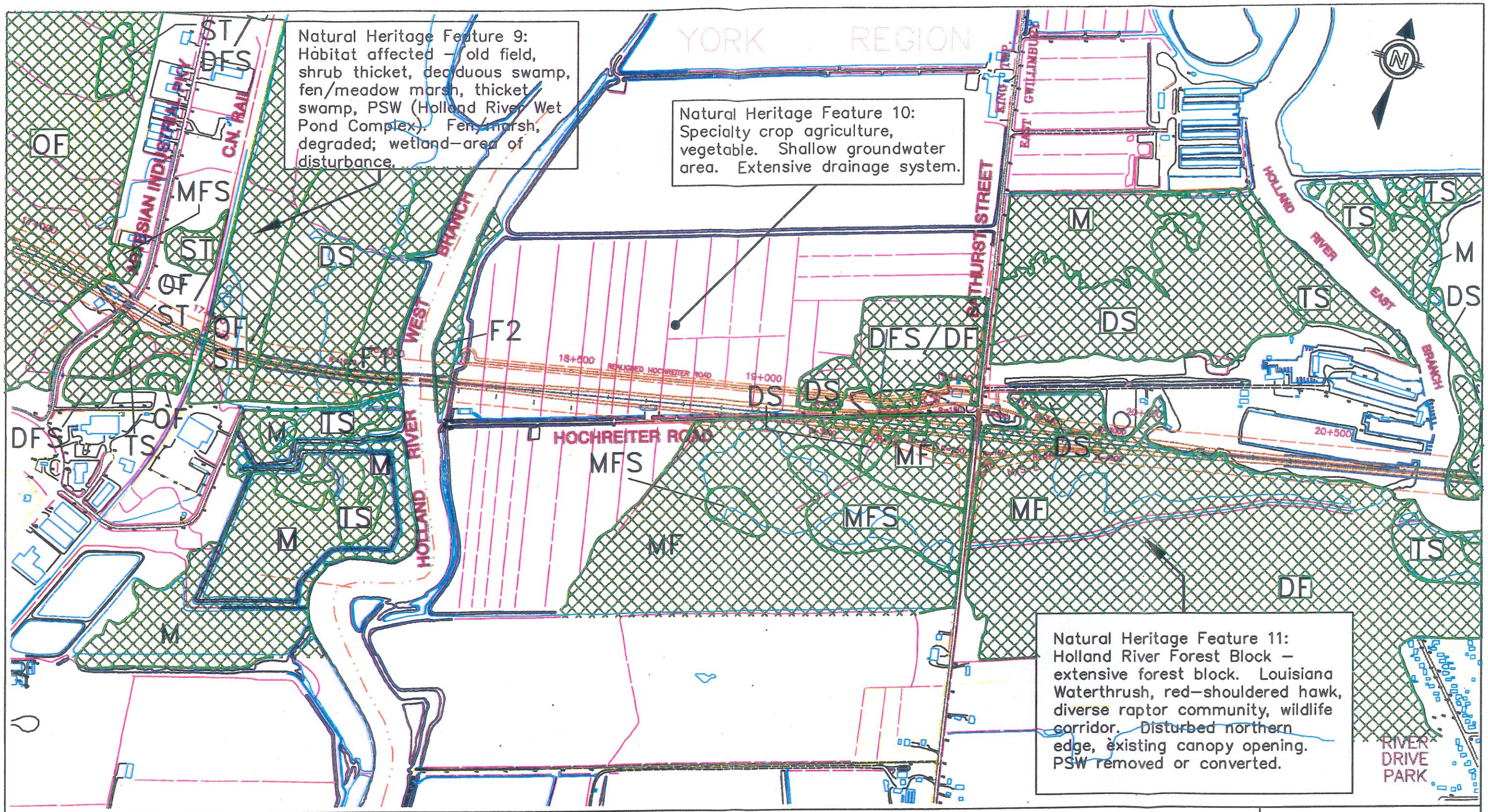
- DF Deciduous Forest (DFS – Successional)
- MF Mixed Conifer–Deciduous Forest (MFS – Successional)
- CF Conifer Forest (CFS – Successional)

ANTHROPOGENIC

- OF Old Field
- ST Shrub Thicket
- P Plantation

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SCALE	PLATE No.
1:10,000	2.2
PROJECT No. 91–1459	



HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK
(BRADFORD BYPASS) ROUTE LOCATION
AND ENVIRONMENTAL ASSESSMENT STUDY

WETLAND AND TERRESTRIAL VEGETATION

WETLAND

- M Marsh/Meadow Marsh
- F Fen
- TS Thicket Swamp
- DS Deciduous Swamp
- MS Mixed Conifer–Deciduous Swamp

TERRESTRIAL

- DF Deciduous Forest (DFS – Successional)
- MF Mixed Conifer–Deciduous Forest (MFS – Successional)
- CF Conifer Forest (CFS – Successional)

ANTHROPOGENIC

- OF Old Field
- ST Shrub Thicket
- P Plantation

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SCALE 1:10,000

PROJECT No. 91–1459

PLATE No. 2.3

1459\plate3-3.dwg

YORK REGION

Natural Heritge Feature 12: Silverlakes Golf Course. Woodland impacts, habitat removal. Affects south section of Golf Course, golf course ponds.

Natural Heritage Feature 13: Specialty Crop Area. Extensive turf production area, some vegetable.

HOLBORN ROAD

2nd CONCESSION ROAD

YONGE STREET

HOLLAND RIVER

SILVERLAKES GOLF COURSE

POND P3

POND P2

POND P4

EAST BR. HOLLAND RIVER

SOD FARM DRAINAGE

RIVER DRIVE PARK

TS M DS ST F3 F4 DF MS CF OF/ST DFS

21+500 22+000 22+500 23+000 23+500 24+000 24+500 R=2000

1459\plate3-4.dwg

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK
(BRADFORD BYPASS) ROUTE LOCATION
AND ENVIRONMENTAL ASSESSMENT STUDY

WETLAND AND TERRESTRIAL VEGETATON

WETLAND

- M Marsh/Meadow Marsh
- F Fen
- TS Thicket Swamp
- DS Deciduous Swamp
- MS Mixed Conifer–Deciduous Swamp

TERRESTRIAL

- DF Deciduous Forest (DFS – Successional)
- MF Mixed Conifer–Deciduous Forest (MFS – Successional)
- CF Conifer Forest (CFS – Successional)

ANTHROPOGENIC

- OF Old Field
- ST Shrub Thicket
- P Plantation

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SCALE 1:10,000

PLATE No. 2.4

PROJECT No. 91–1459

Natural Heritage Feature 14: Beach ridge–east slope to Simcoe Lowlands. Wooded west–facing slope. Good wildlife (birds) diversity. Severs section of slope woodlands–deciduous forest/swamp.

Natural Heritage Feature 15: Small deciduous forest units affected. Minor field drains and channelized section of Maskinonge River tributary will require alteration.

HOLBORN ROAD

LESLIE STREET

LESLIE STREET SWALES

WOODBINE AVENUE

HIGHWAY 404 EXTENSION (PROPOSED)

MASKINONGE RIVER

24+500 25+000 25+500 26+000 26+500

DF DFS CF DS TS OF/ST MFS

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Natural Features

WETLAND AND TERRESTRIAL VEGETATON

WETLAND

- M Marsh/Meadow Marsh
- F Fen
- TS Thicket Swamp
- DS Deciduous Swamp
- MS Mixed Conifer–Deciduous Swamp

TERRESTRIAL

- DF Deciduous Forest (DFS – Successional)
- MF Mixed Conifer–Deciduous Forest (MFS – Successional)
- CF Conifer Forest (CFS – Successional)

ANTHROPOGENIC

- OF Old Field
- ST Shrub Thicket
- P Plantation

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PLATE No. 2.5

PROJECT No. 91–1459

1459\plate3–5.dwg

3.2 Economic Environment - Agriculture

3.2.1 Soils and Potential Capability

Description: The surficial soil materials found along the Recommended Plan have been generally described at a study area scale in the 1994 Technical Report (Section 6.2).

Mineral soils in Canada are classified using the Soil Capability Classification System for Agriculture for production of common field crops as part of the Canada Land Inventory (CLI) program. The majority of the Recommended Plan is occupied by Class 1 to Class 4 soil types. A full description of soil capability classes and subclasses used in this system is included as Appendix 6.

In the segments of the study area to the west of the Holland River basin and east of the beach ridge formation, the soils are consistently high capability loam, sandy loam or silty clay loam (Class 1, 2, 3, 4); there are no distinct areas of lower capability soils where an alternative alignments would have had a lesser impact. Current policies (Ministry of Municipal Affairs 1996, 1997) have shifted the emphasis to Class 1, 2 and 3 (i.e. excluding Class 4) as prime agricultural lands. However, to maintain consistency throughout the study and the evaluation process, Class 4 has remained a component of the definition of high capability lands.

Between the river branches, soil types include poorly drained sandy soil (Class 4) and organic soils, both with excessive water limitations. An underlying clay layer is evident within the plough layer in some locations indicating that the depth of the organic deposits is being depleted. Organic, or muck soils, are not included under the current CLI classification system therefore, they do not have a potential production capability assigned. However, these soils are used extensively for specialty crop (black soil) farming throughout the Lake Simcoe and Holland Marsh basin and are well known for their specialty crop production potential.

Plates 3.1 to 3.5 illustrate the soil series identified along the alignment of the **R.P.** as well as its respective potential capability. Table 5 summarizes the physical characteristics and potential for construction related erosion impacts.

Issues: Minimizing the areas of high capability mineral soils (Class 1, 2, 3, 4) and specialty crop (organic/ muck) soils required for construction of the Recommended Plan. Due to the general high capability of soils throughout the study area, the most effective method of minimizing loss of high capability lands has been to minimize the overall length required for the proposed facility.

TABLE 5

Soil Types and Physical Characteristics Along the Recommended Plan of the Proposed 400 - 404 Link

Soil Type	Agricultural Capability (See Appendix 6)	Topography	Drainage	Erosion Susceptibility
Mineral Soils				
Bondhead loam and sandy loam	$1^{8}4t^{2}$	smooth, moderately to steeply sloping	good	moderate to high on steep slopes
Brighton sandy loam	Class 2f	smooth, very gently sloping	good	high wind erosion if unprotected
Gilford gravelly sandy loam	4W	level to depressional	poor	low
Granby sandy loam	4W	level	poor	low
Lyons loam	3W	smooth, very gently sloping	poor	low
Sargent gravelly sandy loam	3fM	smooth, gently sloping	good	low
Schomberg clay loam and silty clay loam	$1^{6}3t^{4}$	smooth, moderately to steeply sloping	good	high sheet erosion potential
Simcoe silt loam and silty clay loam	3W and 4W	smooth, very gently sloping	poor	low
Smithfield silty clay loam	1	smooth, gently sloping	imperfect	low
Tecumseth sandy loam	2f	smooth, very gently sloping	imperfect	low when protected
Waseon sandy loam	3W	smooth, very gently sloping	poor	low
Other Soil Types				
Organic (Muck)	High	depressional	very poor	low
Bottom Land (recent alluvial)	Variable	variable	variable	variable

Identified Effects: The **R.P.** will require the removal of 190.37 ha of high capability mineral soils from potential agricultural use.

An area of previous disturbance is utilized between the river branches (Hochreiter Road) thereby minimizing, although not eliminating, the requirement for organic soil removal; 9.3 ha of organic (muck) deposits are removed by the **R.P.**.

3.2.2 Agriculture

Description: The above section (Section 3.2.1 - Soils and Potential Capability) focused on the impacts related to the physical potential for agricultural production based on soil characteristics. This section deals with the potential social and economic impacts associated with the agricultural community and the **R.P.** alignment.

Figure 3 (plates 1-5) at the end of this section illustrates the current agricultural land use along the **R.P.** for the 1996 growing season and Table 6 details the individual property impacts and related issues. The following discussion describes the general nature of agriculture, current farming practices as well as expected agricultural community effects as a result of construction and operation of the proposed facility.

Section CFJ - Highway 400 to the Holland River West Branch

Chainage 11+230 Interchange at Highway 400

Five field crop properties are affected at the proposed interchange location. Production area losses are limited to edges and/or removal of corner areas of the individual properties. All properties will remain viable in size and access allowing for continuation of current farming practices.

Chainage 11+230 to 11+880

The livestock property (horses) to the north of the **R.P.** will likely experience edge effects during construction. The animals are currently housed at the north west corner of the property and would not be affected by the construction or the operation of the proposed facility. Common field crops are produced adjacent to the **R.P.** alignment; impacts will be minor.

The field crop property to the south of the **R.P.** will be impacted by direct removal of 100 m along the entire rear lot line for the right-of-way. This removal will not compromise the ability of the operator to continue current farming practices (i.e. viability is maintained), however, the land area available will be reduced.

Chainage 11+880 to 12+500

Three field crop operations are affected by this section of the **R.P.**. Impacts will include edge effects or lot line removals. Each property will remain viable in size and access as farming operations.

Chainage 12+500 to 13+100

A beef cattle operation is located on the north side of the **R.P.** at this location. The operation may experience edge effects during construction, however, the livestock are housed at the north end of the property and would not be directly affected by the construction or operation of the proposed facility.

Chainage 12+470 to 13+415

Two field crop operations will be affected by land acquisition along the rear lot lines. Both operations will remain viable in size and accessibility.

Chainage 13+415 to 13+730

Rear lot line removal will be required on this dairy operation. The area required for removal is currently used for production of common field crops. This is one of the smaller farms in the study area, however, the majority of the property will remain intact and will likely remain viable in size.

Chainage 13+730 to 16+845

Four field crop properties are severed through this section of the **R.P.**. On each property, a parcel of inaccessible land will be isolated from the main body of the property. However, three of these properties are currently corporately owned and therefore, long term agricultural use may not be forecasted by the current owners. The soils are of a consistently high capability but the proximity of the urban boundary of Bradford and associated development pressures are likely influencing the current ownership patterns. The fourth property is currently owned and operated as an independent field crop operation.

Section JSYB - Holland River West Branch to the Proposed Highway 404 Extension Interchange

Chainage 18+220 to 19+140

Four vegetable producing properties (specialty crop) are affected by the **R.P.** in this section. Properties tend to be owned in smaller parcels in this section of the study area due to the intensive form of agriculture being practised. The properties on the north side of Hochrieter Road will be reduced in size by the area required by the **R.P.**. Plans for access are included in the proposal and parcels will remain

viable for continued production however, at a smaller scale than present. The properties on the south side of Hochreiter Road will remain intact with edge impact potential only at the woodlot edge. An extensive network of drainage channels and dykes has been constructed in this area to alleviate inadequate drainage conditions. The function of the drainage system will be maintained and investigated further in the detail design phase of the project.

Chainage 22+025 to 23+810

This section of the study contains an extensive turf production area. The Belhaven Sod Farm will be affected by the 100 metre right-of-way along the northern lot line affecting approximately 9.1 ha. The property will remain intact and access will not be affected.

The Evans Turf farm was producing vegetables in the 1996 growing season. The **R.P.** will sever the property into two parcels. Access will be restored to both sections; they are both large enough to permit continued agricultural use.

Chainage 23+800 to 25+900

Two farms are affected in this section. Both farms currently produce turf to the west of the beach ridge that bisects each property with field crops to the east of the ridge. The farm to the north is affected by minor edge effects at two locations: access re-establishment will be required at 2nd Concession Road and lot line effects at Leslie Street are apparent.

A 100 metre easement from 2nd Concession Road extending to Leslie Street will be required on the Pick property. Access re-location will be required at both 2nd Concession Road and at Leslie Street due to the ridge feature. A 1.6 ha parcel will be severed from the main body of the property in the northwest corner.

Chainage 25+900 to Interchange at Highway 404 Extension

Five agricultural properties are affected by the **R.P.** in this section. A corporately owned property currently involved in cash crop production will be affected by the removal of 14.7 ha and a severance of a 4.0 ha parcel along the southern lot line. A horse/field crop operation will be affected by removal of 3.7 ha in the northeast corner that is required for an interchange. The property will remain viable in size and will retain access. The three remaining properties are located on the east side of the interchange. All three currently produce common field crops and impacts are limited to the rear lot line leaving each property viable for continued operation.

Issues: Agriculture was identified as an Environmentally Sensitive Area/Issue early in study process. It is the predominant land use in the study area affected by the **R.P.**. The significance of the agricultural industry with respect to the local economy was an integral component of the route selection process. The evaluation criteria emphasized the importance of minimizing land parcel severances, maintaining access to properties and continued viability of farming operations and farm community activities.

Identified Effects: The western section of the study area is dominated by field crop and mixed farming operations. Thirteen field crop and 3 livestock farming properties are affected by the proposed facility. Two of the livestock operations will experience minor impacts only in the form of possible edge disruption during construction. The third livestock farm will be affected by a severance through the field crop area of the farm. The field crop land use in this section is largely influenced by a relatively few (3) large operators leasing the majority of properties west of the Holland River for the production of common field crops. The location of the **R.P.** will directly impact the ability of some of these operators to move equipment and product freely between some of these properties. However, alternative access routes will be investigated as part of the detail design.

The central section (between the Holland River branches) is dominated by vegetable (specialty crop) production. East of the Holland River East Branch is an extensive area of turf production, also a specialty crop type, occupying an area of flat sandy soils that extends to a ridge formation east of 2nd Concession Road. East of the ridge, field crop and mixed farming practices again dominate the landscape. A total of 7 specialty crop, 3 livestock and 5 field crop operations are directly affected by the proposed **R.P.** in the east and central sections.

The total land area currently in active agricultureal production that is directly impacted by the proposed facility is 84.4 ha in the western section (CFJ) and 69.9 ha in the east and central section (JSYB) totalling 154.3 ha.

TABLE 6

Summary of Agricultural Impacts, Issues and Mitigation
for Agricultural Properties Affected by the Recommended Plan

Property Owner * [1]		Location Chainage	Nature of Agricultural Operation	Nature of Impact/Issues
Recommended Plan Section CFJ (Highway 400 to Holland River)				
Sadlon	1	Highway 400 Interchange - Northwest Corner	Field Crop [2]	Edge Effects ≃ 0.6 ha
Hughes	2	Highway 400 Interchange Southwest Corner	Field Crop	Loss of ≃4.9 ha for Interchange
Cosgrove, Sullivan	3	Highway 400 Interchange to 11 + 270 (Northeast Corner)	Field Crop	Loss of ≃5.2 ha for Interchange
Lanno	4	Highway 400 Interchange to 11 + 130 (Southeast Corner)	Field Crop	Loss of ≃ 5.4 ha for Interchange
Ventura, Zahavy	5	11 + 130 to 11 + 300	Field Crop	Loss of ≃ 2.1 ha
Blake	6	11 + 270 to 11 + 880	Horses, Field Crop	Edge Effects ≃ 615 m
Harrison	7	11 + 300 to 11 + 850	Field Crop	Edge Removal ≃ 6.2 ha
Lanthier	8	11 + 880 to 12 + 500	Field Crop	Edge Effects ≃610 m
Harrison	9	11 + 850 to 12 + 160	Field Crop	Edge Removal ≃ 3.1 ha
Lanthier	10	12 + 160 to 12 + 470	Field Crop	Edge Removal ≃ 3.0 ha
Henderson	11	12 + 500 to 13 + 100 (Middletown Road)	Cattle - Beef/ Field Crop	Edge Effects ≃ 600 m
Lanthier	12	12 + 470 to 13 + 100 (Middletown Road)	Field Crop	Edge Removal ≃ 6.5 ha
Argent / Naylor	13	13 + 130 to 13 + 415	Field Crop	Edge Removal ≃ 3.0 ha
Vanderpost	14	13 + 415 to 13 + 730	Cattle - Dairy / Field Crop	Edge Removal ≃ 4.7 ha
Brinkos	15	13 + 440 to 13 + 510	Field Crop	Edge Effects ≃ 70 m
832695 Ontario Limited	16	13 + 730 to 14 + 960	Field Crop	Removal of ≃ 12.6 ha plus severance of ≃ 5.5 ha
Hammond	17	14 + 960 to 15 + 575	Field Crop	Removal of ≃ 7.1 ha plus severance of ≃ 5.7 ha
Charter Construction et. al	18	15 + 575 to 16 + 185 (Interchange at former Highway 11 - west)	Field Crop	Removal of ≃14.2 has plus severance of ≃ 3.3 ha
Carbee Holdings et. al	19	16 + 220 to 16 + 845 (Interchange at former Highway 11 - east)		Removal of ≃10.7 ha plus severance of ≃ 5.2 ha

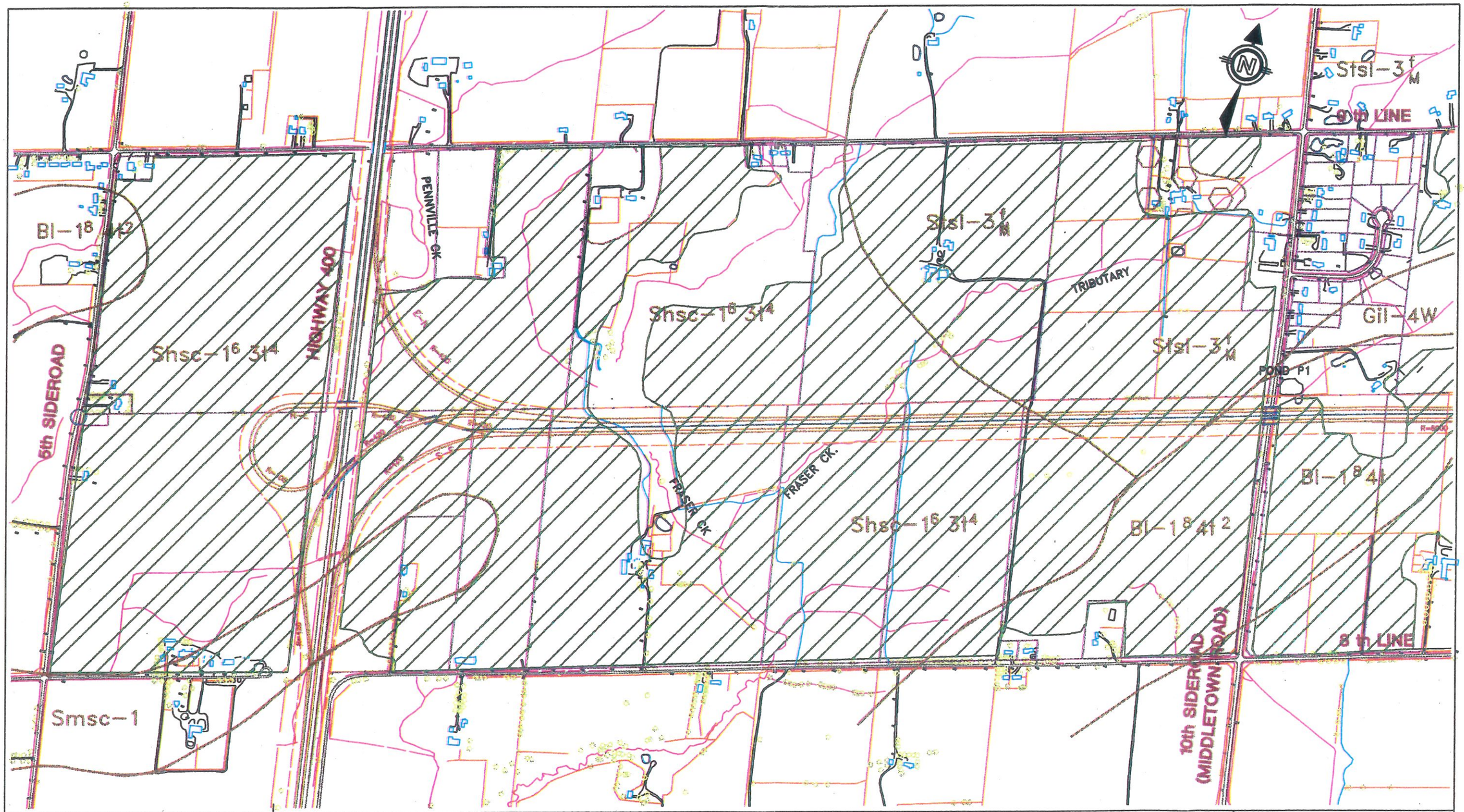
1. The current landowner has not been identified to ensure privacy. Also land transactions could lead to significant changes in the landownership situation.
2. Crop Types are based on 1996 Reconnaissance Survey.

TABLE 6

Summary of Agricultural Impacts, Issues and Mitigation
for Agricultural Properties Affected by the Recommended Plan

Property Owner * [1]		Location Chainage	Nature of Agricultural Operation	Nature of Impact/Issues
Recommended Plan Section JSYB - Holland River to Connection with Proposed Extension of Highway 404				
Marques	20	18 + 220 to 18 + 555	Specialty Crop - Vegetables	Removal of ≃ 3.9 ha plus severance of ≃ 1.1 ha
Vanes	21	18 + 555 to 18 + 775	Specialty Crop - Vegetables	Removal of ≃ 2.3 ha plus severance of ≃ 0.1 ha
778733 Ontario Limited	22	18 + 870	Specialty Crop - Vegetables	Agricultural effects - edge effects only
293549 Ontario Limited	23	18 + 775 to 19 + 140	Specialty Crop - Vegetables	Removal of ≃ 2.9 ha
Belhaven Sod Farm	24	22 + 720 to 22 + 960	Specialty Crop - Turf	Edge Removal of ≃ 9.1 ha
Evans Turf Farm	25	22 + 650 to 23 + 810	Specialty Crop - Vegetables	Removal of ≃ 9.0 ha plus severance of ≃ 6.9 ha
Wright	26	23 + 810 and 25 + 500 to 25 + 880	Specialty Crop - Turf and Field Crop	Edge Removal of ≃0.9 ha
Pick	27	23 + 810 to 25 + 880	Specialty Crop - Turf and Field Crop	Removal of ≃ 23.6 ha plus severance of ≃ 1.6 ha
941928 Ontario Limited	28	25 + 910 to N-W and W-S ramps of Interchange at Proposed Highway 404	Field Crop	Removal of ≃14.7 ha plus severance of ≃ 4.0 ha
Mortson	29	W-N ramp of proposed interchange with Highway 404	Field Crop	Edge Removal of ≃ 0.9 ha
Brouwer	30	W-N ramp of proposed 404 Interchange	Field Crop	Edge Removal of ≃ 3.1 ha from western limit of property
957037 Ontario Limited	31	S-W ramp of proposed 404 Interchange	Field Crop	Removal of ≃ 4.0 ha from northwest corner of property
834713 Ontario Limited	32	W-S ramp of proposed 404 Interchange	Horses / Field Crop	Removal of ≃ 3.7 ha from northeast corner of property

1. The current landowner has not been identified to ensure privacy. Also land transactions could lead to significant changes in the landownership situation.
2. Crop Types are based on 1996 Reconnaissance Survey.



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HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Soils and Agricultural Land Use

LAND USE

- Specialty Crop – Vegetable
- Specialty Crop – Turf
- Field Crops (beans, corn, wheat, hay)
- Livestock

SOILS

Bl	Bondhead Loam
Bs	Bondhead Sandy Loam
Brsl	Brighton Sandy Loam
Gll	Gilford Sandy Loam
Gsl	Granby Sandy Loam
Ll	Lyons Loam
Stsl	Sargent Gravelly Sandy Loam
Shc	Schomberg Clay Loam
Shsc	Schomberg Silty Clay Loam
Sls	Simcoe Silt Loam
Slsc	Simcoe Silty Clay Loam
Smsc	Smithfield Silty Clay Loam
Tsl	Tecumseth Sandy Loam
Wss	Wasson Sandy Loam
Organic	Black Soils – Muck
B.L.	Bottom Land – recent alluvial
$1^B 4t^2$	Potential Capability – see Appendix 4 for details

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Smsc–1

Shsc–1^6 $3t^4$

9 th LINE

Stsl–3^1_M

Shsc–1^6 $3t^4$

Bl–1^8 4^2_T

Gil–4W

Bl–1^8 $4t^2$

HIGHWAY 400

Bl–1^8 4^2_T

Bl–1^8 4^2_T

Smsc–1

CEDAR SWAMP

Shsc–1^6 $3t^4$

CULTIVATED WATERWAYS

8 th LINE

8th LINE

BRADFORD

Smsc–1

1459\plate3-2.dwg

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Soils and Agricultural Land Use

LAND USE

- Specialty Crop – Vegetable
- Specialty Crop – Turf
- Field Crops (beans, corn, wheat, hay)
- Livestock

SOILS

Bl	Bondhead Loam
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Gsl	Granby Sandy Loam
Ll	Lyons Loam
Stsl	Sargent Gravelly Sandy Loam
SHc	Schomberg Clay Loam
Shsc	Schomberg Silty Clay Loam
Sle	Simcoe Silt Loam
Slsc	Simcoe Silty Clay Loam
Smsc	Smithfield Silty Clay Loam
Tsl	Tecumseth Sandy Loam
Wss	Wasson Sandy Loam
Organic	Black Soils – Muck
B.L.	Bottom Land – recent alluvial
1^8 $4t^2$	Potential Capability – see Appendix 4 for details

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PROJECT No. 91–1459

PLATE No. 3.2

YORK REGION

ORGANIC

BI–1^{8} 4$^{2}_{1}$

Gsl–4w

Gsl–5w

Li–3W

Gsl–5w

Gsl–4w

Tsl–2f

B.L.

B.L.

KING TWP.

KING TWP.

EAST GWILLIMBURY

ARTESIAN INDUSTRIAL PKY.

C.N. RAIL

WEST HOLLAND RIVER

ORGANIC

BRANCH

BATHURST STREET

HOLLAND RIVER EAST BRANCH

HOCHREITER ROAD

RELOCATED HOCHREITER ROAD

17+000

17+500

18+000

18+500

19+000

19+500

20+000

20+500

R=1800

R=4000

R=3000

R=340

R=250

R=150

N/S-E

E-N/S

N-N/S

MUNICIPAL WELL

RIVER DRIVE PARK

N

1459\plate3-3.dwg

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Soils and Agricultural Land Use

LAND USE

- Specialty Crop – Vegetable
- Specialty Crop – Turf
- Field Crops (beans, corn, wheat, hay)
- Livestock

SOILS

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Slsc	Simcoe Silty Clay Loam
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Tsl	Tecumseth Sandy Loam
Wss	Wasson Sandy Loam
Organic	Black Soils – Muck
B.L.	Bottom Land – recent alluvial
$1^{0}4^{2}$	Potential Capability – see Appendix 4 for details

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PROJECT No. 91–1459	

YORK REGION

HOLBORN ROAD

2nd CONCESSION ROAD

YONGE STREET

ORGANIC

B.L.

SILVERLAKES GOLF COURSE

TANNERY CREEK

EAST RIVER

RIVER DRIVE PARK

Gsl–4w

Sts–2w

Sis–2w

Was–3w

Tsl–2f

Bs–1^{8}4^{2}T

21+000

21+500

22+000

22+500

23+000

23+500

24+500

R=2200

R=2000

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Soils and Agricultural Land Use

LAND USE

- Specialty Crop – Vegetable
- Specialty Crop – Turf
- Field Crops (beans, corn, wheat, hay)
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Slsc	Simcoe Silty Clay Loam
Smsc	Smithfield Silty Clay Loam
Tsl	Tecumseth Sandy Loam
Was	Wasaga Sandy Loam
Organic	Black Soils – Muck
B.L.	Bottom Land – recent alluvial
1^{8}4^{2}	Potential Capability – see Appendix 4 for details

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PLATE No. 3.4

PROJECT No. 91–1459

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HOLBORN ROAD

LESLIE STREET

WOODBINE AVENUE

HIGHWAY 404 EXTENSION (PROPOSED)

MASKINONGE RIVER

Sis–2w

Bs–1[8] 4[2]T

Bl–1[8] 4[2]T

Brsl–2[F]M

Shc–1[0] 3[4]T

B.L.

25+000

25+500

26+000

26+500

N/S–16

N–W

S–W

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK (BRADFORD BYPASS) ROUTE LOCATION AND ENVIRONMENTAL ASSESSMENT STUDY

Soils and Agricultural Land Use

LAND USE

- Specialty Crop – Vegetable
- Specialty Crop – Turf
- Field Crops (beans, corn, wheat, hay)
- Livestock

SOILS

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Brsl	Brighton Sandy Loam	Shsc	Schomberg Silty Clay Loam
Cll	Clifford Sandy Loam	Sis	Simcoe Silt Loam
Cal	Granby Sandy Loam	Slsc	Simcoe Silty Clay Loam
Ll	Lyons Loam	Smsc	Smithfield Silty Clay Loam
		Tel	Tecumseth Sandy Loam
		Wse	Wasaga Sandy Loam
		Organic	Black Soils – Muck
		B.L.	Bottom Land – recent alluvial
		1[0] 4[2]	Potential Capability – see Appendix 4 for details

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PLATE No. 3.5

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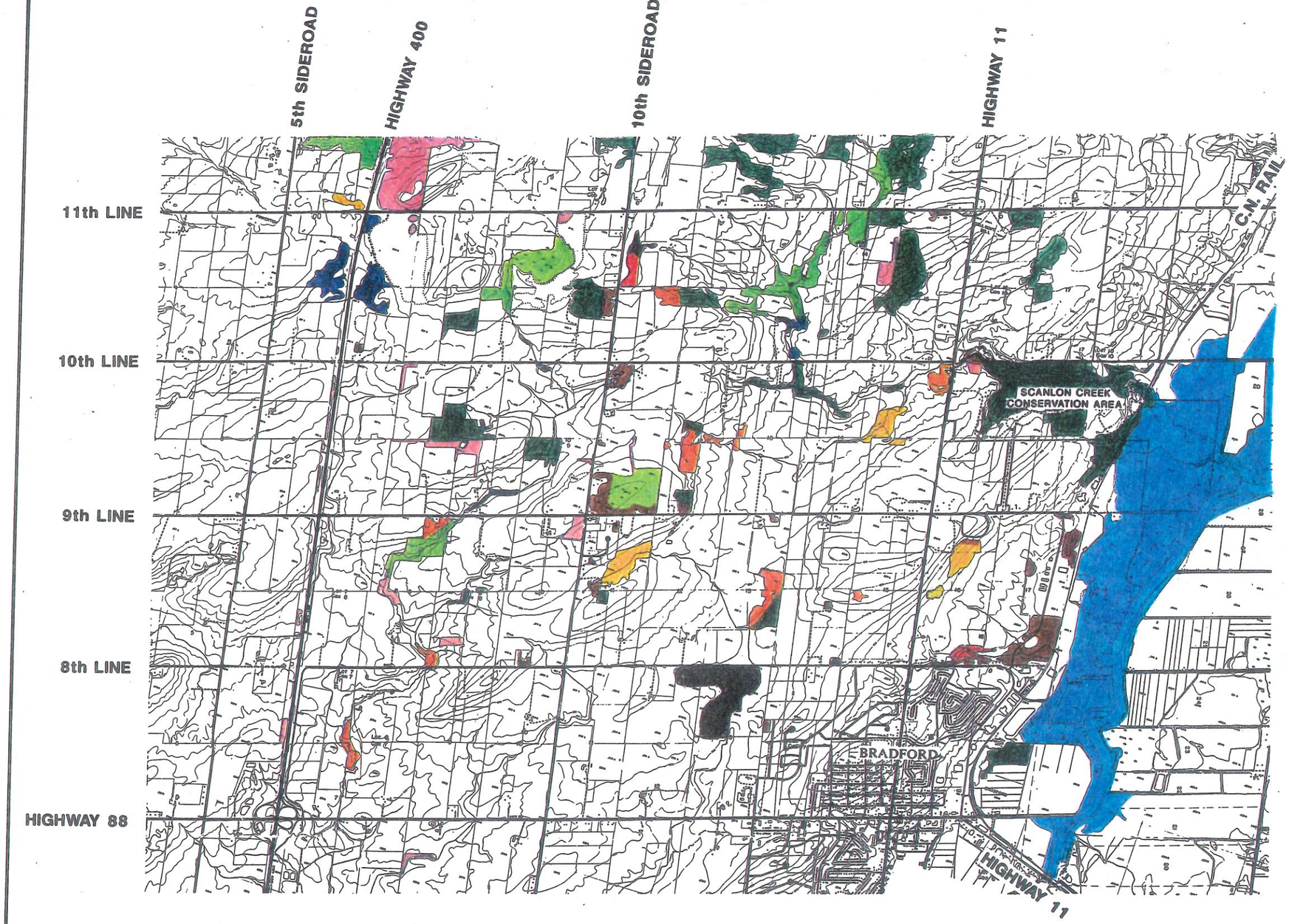
* Refer to this report for a complete listing of study references.

APPENDICES

- APPENDIX 1 - Study Area Natural Features from 1994 Technical Report
- APPENDIX 2 - Fisheries Habitat Assessment Data
- APPENDIX 3 - Wildlife Data
- APPENDIX 4 - Wetlands Map from 1994 Technical Report
- APPENDIX 5 - Vegetation and Wetlands Data
- APPENDIX 6 - CLI Classification System

APPENDIX 1

STUDY AREA NATURAL FEATURES FROM 1994 TECHNICAL REPORT



Significant Vegetation Communities

- Broadleaf Upland Woods
- Mixed Upland Woods
- Coniferous Upland Woods
- Broadleaf Swamp
- Mixed Swamp
- Coniferous Swamp

Other Vegetation Communities

- Plantations
- Disturbed (Residential/Industrial)
- Thicket Swamp
- Successional (immature, open)
- Old Field

- Class 1 Wetland (See Figure 6)

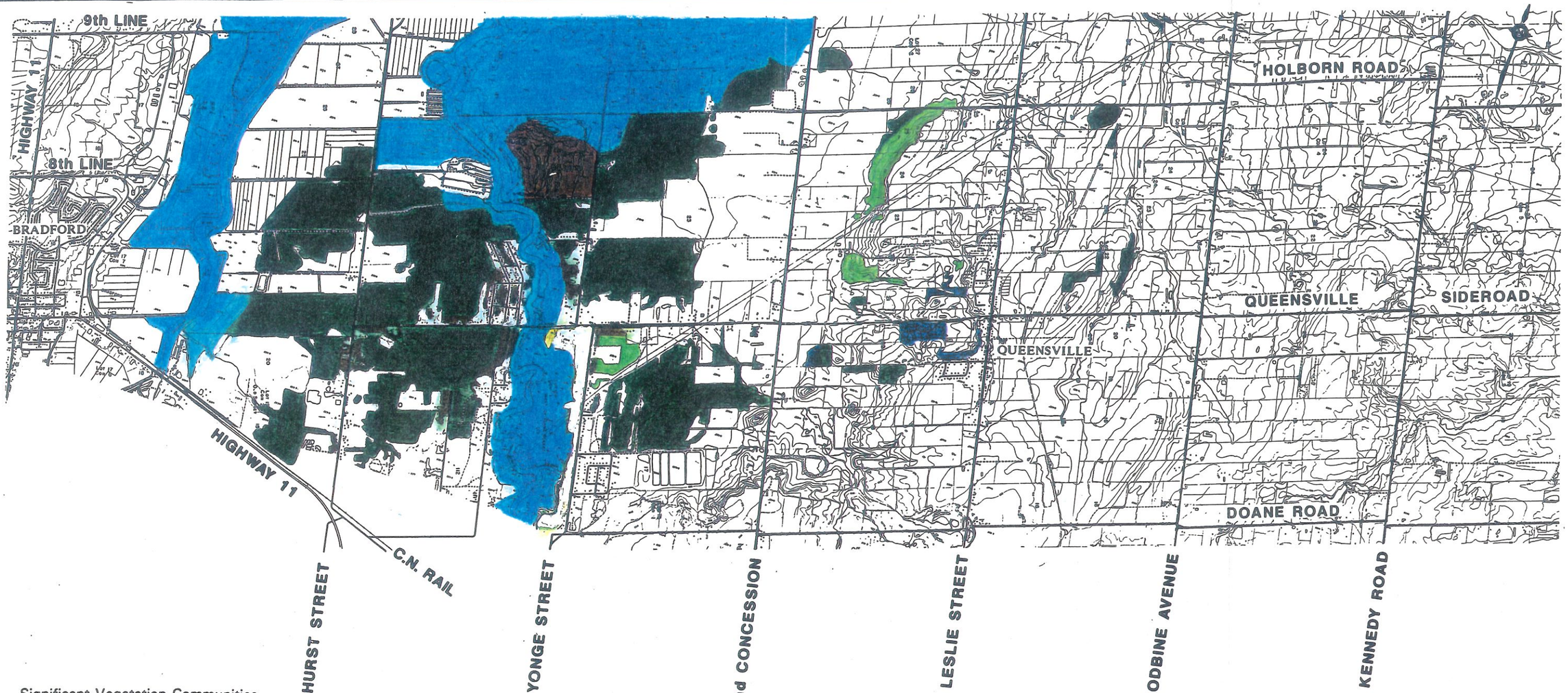
0 0.5km 1.0km 1.5km

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BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION
ROUTE LOCATION AND PRELIMINARY DESIGN STUDY
W.P. 377-90-00

Vegetation Features
Western Section

EXHIBIT
8a



Significant Vegetation Communities

- Broadleaf Upland Woods
- Mixed Upland Woods
- Coniferous Upland Woods
- Broadleaf Swamp
- Mixed Swamp
- Coniferous Swamp

Other Vegetation Communities

- Plantations - two
- Disturbed (Residential/Industrial)
- Thicket Swamp
- Successional (immature, open)
- Old Field

- Class 1 Wetland (See Figure 6)

SCALE
0 0.5km 1.0km 1.5km

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ROUTE LOCATION AND PRELIMINARY DESIGN STUDY
W.P. 377-90-00

Vegetation Features
Central and Eastern Section

EXHIBIT
8b

APPENDIX 2

FISHERIES HABITAT

Highway 400 to 404 Extension Link
Fisheries Habitat Assessment Data Summary

Station	Name	Width	Depth	Flow Character	Fish Community	Habitat Notes
10+950	Pennville Creek	0.75-1.0 m BF 2.0 m	10-20 cm BF 1.25 m	permanent, with discontinuous flow in summer	warmwater baitfish	• cobble and gravel over clay bed • very shallow flats and minor riffles; 20 cm deep pools • no overhead cover; grass/herbaceous riparian zone • channel has been straightened along Highway 400 ROW
11+400	Fraser Creek	0.5 - 1.5 m BF 3.0 m	5 - 10 cm BF 1.0 m	permanent, with discontinuous flow in summer	warmwater baitfish pike, white sucker during spring runs (resident pers. comm.)	• cobble and gravel over clay bed; silt deposition in pools • extensive erosion of outside banks, particularly through wooded section of valley • dense overhead cover in wooded zone; open pasture downstream of RP row • pastured portion of creek is heavily impacted with slumping banks, erosion and sedimentation
12+100	Fraser Creek	0.75 m BF 2.5 m	10 cm BF 0.5 m	intermittent	none observed pike, white sucker may move up from other branch	• drainage originates in a reed canary grass meadow north of RP row • substrate mainly small cobble, some gravel and silt in pools and depositional areas • minor flow during time of field investigation, however undercut banks and bank erosion suggest flashy high flow periods • portion of tributary near confluence with main branch is heavily impacted by pasturing
13+100	Pond (P1)	15 x 20 m	50-75 cm	permanent; water level drops considerably in summer	none observed	• pond is situated in old pasture, and may be an old slough; banks are slumping and rutted • silty mud bottom • thick growth of filamentous algae; coated with duckweed • pond freezes over in winter and is highly eutrophic; poor fish habitat
14+900	White Cedar Swamp	n/a	n/a	emphemeral	none	• minor ephemeral drainage conveyed to agricultural drain south of swamp • approximate 1 m drop at junction with drain; no possibility of temporary colonization by baitfish in drain • branch to west has been buried as a tile drain

BF - Bankfull - Dimensions during high flow periods

Highway 400 to 404 Extension Link
Fisheries Habitat Assessment Data Summary

Station	Name	Width	Depth	Flow Character	Fish Community	Habitat Notes
16+250	Highway 11 Drainage	2.0 m wide cattail swath	swale depression	ephemeral	none	• cattail swale through cash crop land • conveys spring runoff, major runoff events from Highway and nearby woodlot • no fish habitat
16+750	Field Swales	n/a	n/a	ephemeral	none	• discontinuous reed canary grass swales that are cultivated to east of hedgerow • no fish habitat
18+000	Holland River West Branch	100 m		permanent	warmwater sportfish and migratory species	• west bank is relatively undisturbed, cattail floodplain; east bank consists of a narrower fringe of cattail along dyke system and agricultural land • pumping station at end of roadway south of RP row • ditches surrounding agricultural land are hypereutrophic; contribute enriched runoff to Holland River • water is turbid; no emergent or floating macrophytes in central river • duckweed and macrophyte growth is thick along river margin
20+750	Holland River East Branch	80 - 90 m		permanent	warmwater sportfish and migratory species	• west bank disturbed by marina construction and access driveway; east bank is narrow fringe of cattail abutting golf course property • sandy littoral shelf on west bank supports macrophyte growth • turbid water; boat wakes disturb silt and detritus along shoreline • no emergent or floating macrophytes in central area of river • backwater inlet south of marina may provide best habitat in terms of cover and low disturbance from boat traffic
21+000	Silver Lakes Ponds	P2 30x15m P3 120x30 P4 40x20m	P2 1.5 m P3 2.0 m P4 2.0 m	permanent, constructed features	all support fish: bass and sunfish observed in P3 and P4	• all ponds created as part of golf course landscape design • P3 and P4 connected to each other and Holland river by overflow pipes • mud bottoms • P2 and P4 are highly eutrophic; thick growths of macrophytes, duckweed and filamentous algae • P3 supports macrophyte growth, but may be controlled during golf course maintenance

BF - Bankfull - Dimensions during high flow periods

Highway 400 to 404 Extension Link
Fisheries Habitat Assessment Data Summary

Station	Name	Width	Depth	Flow Character	Fish Community	Habitat Notes
23+000	Sod Farm Swale	20 - 30 m wide meadow marsh swale	n/a	ephemeral	none	• seasonally flooded low area in middle of sod field • supports reed canary grass and other vegetation associated with wet conditions • no fish habitat; connecting swales are cultivated and sodded
25+700	Leslie Street Swales	meadow marsh swales in crop and pasture land	n/a	ephemeral	none observed; low habitat potential	• series of ephemerally flowing swales surrounded by crop and pastureland • swales to west of Leslie Street are vegetated depressions that convey spring runoff; no fish habitat • swale immediately east of Leslie is drainage path colonized by old field species; no fish habitat • easternmost swale has wide vegetated buffer, indicating seasonal inundation that precludes cultivation
26+650	Maskinonge River swale at proposed 404 extension W-S ramp	0.5 m wide at interchange loop	5-10 cm	permanent; may experience discontinuous flow periods in summer swale is intermittent	warmwater baitfish may support warmwater migrants (pike, sucker)	• portion affected by interchange loop has been previously altered/straightened to facilitate drainage of farmland • impacted by pasturing in vicinity of Holborn Rd. and upstream • nutrient enrichment encourages growth of filamentous algae • habitat quality is marginal - more suited to common baitfish species • silt deposition in pools and quiet margins; swifter areas contain some cobble • minor tributary crossed by proposes Highway 404 and W-S ramp is poorly defined grass swale

BF - Bankfull - Dimensions during high flow periods

APPENDIX 3

WILDLIFE DATA

ecoplans Limited

MEMORANDUM

TO:	File (Bradford Bypass)	**DATE:**	June 18, 1997
FROM:	Steve Wilcox	**PROJECT NO.:**	91-1459
SUBJECT:	Wildlife Field Surveys		

Approach

Wildlife surveys were completed in the study area on eight dates between early April and mid July in 1995 and on four dates between mid April and mid June in 1996. Many of these surveys were tied in with other surveys in the area in order to maximize coverage of the study area during ideal field season times. The majority of the field time was spent within the extensive forested areas in the central part of the study area. Other areas within the study corridor also received good coverage. The majority of the surveys were completed during the early morning hours and they were scheduled over the entire spring season to correspond to different species activity periods. Specific surveys were completed for calling amphibians, raptors and breeding birds. During all surveys incidental observations of mammals (sightings, tracks, scat, calls) and herpetofauna (sightings, calls) were recorded.

Amphibians were surveyed using both call-count and visual search surveys. The call-count surveys were completed in accordance with standard Canadian Wildlife Service protocol. In addition, all areas with potential to support breeding amphibians were visually inspected to assess habitat quality and to look for signs of breeding activity (individuals, egg masses, spermatophore clusters, etc.).

The raptor surveys involved alternate broadcasts of Red-shouldered Hawk and Cooper's Hawk calls at approximately 250 metre intervals along transects throughout the extensive woodland areas in the central portion of the study area. The broadcasts involved a pre-recorded tape of 20-second intervals of Red-shouldered or Cooper's Hawk calls interspersed with 40-second periods of silence over a period of five minutes followed by a two minute period of silence.

Breeding birds were surveyed using both unlimited distance point count and transect surveys. The point count stations were established throughout the woodland areas along the study corridor. All species observed during a ten minute period were recorded. Transect surveys were then subsequently completed throughout the habitats in an effort to document any species not recorded during the point counts. Roadside surveys were also completed in the more open areas along the proposed route.

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Results

Table 1: Breeding Bird Observations

Breeding bird observations were recorded on May 19, June 7, 21, 28, and July 4, 1995. Additional observations were also recorded on May 1, June 5 and June 11, 1996. Observations were recorded relative to four broad areas: Highway 400 to Industrial Road (CFJ); West Holland River Crossing (JSYB); Holland Forest and East River Crossing (JSYB); and 2nd Concession Road to Highway 404 (JSYB).

Species[1]	CFJ	JSYB		
	Hwy 400 to Industrial Rd.	West Holland River Crossing	Holland Forest and East River Crossing	2nd Concession Rd. to Hwy 404
Great Blue Heron	X	X		X
Canada Goose	O	O	X	O
Wood Duck		O	O	
Green-winged Teal		X		
American Black Duck		O		
Mallard	X	O	O	
Blue-winged Teal		O		
Common Merganser		X		
Turkey Vulture	X		X	
Northern Harrier	O			
Sharp-shinned Hawk			O	
Cooper's Hawk			O	
Red-shouldered Hawk			O	
Broad-winged Hawk			O	
Red-tailed Hawk	O	X		O
American Kestrel	O			

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Species[1]	CFJ	JSYB		
	Hwy 400 to Industrial Rd.	West Holland River Crossing	Holland Forest and East River Crossing	2nd Concession Rd. to Hwy 404
Ruffed Grouse			O	
Virginia Rail			O	
Sora			O	
Killdeer	O	O	X	O
Common Snipe		O		
American Woodcock		O	O	
Ring-billed Gull	X	X	X	
Herring Gull		X	X	
Caspian Tern		X		
Rock Dove	O	X		O
Mourning Dove	O	O	O	O
Black-billed Cuckoo			O	
Common Nighthawk		X		
Belted Kingfisher		X	X	
Yellow-bellied Sapsucker			O	
Downy Woodpecker	O	O	O	O
Hairy Woodpecker			O	O
Northern Flicker	O	O	O	O
Pileated Woodpecker			O	
Eastern Wood-Peewee	O	O	O	
Alder Flycatcher		O	O	

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Species[1]	CFJ	JSYB		
	Hwy 400 to Industrial Rd.	West Holland River Crossing	Holland Forest and East River Crossing	2nd Concession Rd. to Hwy 404
Willow Flycatcher		O		
Least Flycatcher			O	
Eastern Phoebe			O	
Great Crested Flycatcher	O	O	O	O
Eastern Kingbird	O	O		O
Horned Lark	O			O
Tree Swallow	X	O	X	O
Barn Swallow	X	X	O	X
Blue Jay	O	O	O	O
American Crow	O	O	O	O
Black-capped Chickadee	O	O	O	O
Red-breasted Nuthatch			O	
White-breasted Nuthatch			O	
Brown Creeper			O	
House Wren	O	O	O	O
Winter Wren			O	
Sedge Wren		O		
Marsh Wren		O		
Golden-crowned Kinglet			M	
Ruby-crowned Kinglet			M	
Veery		O	O	

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Species[1]	CFJ	JSYB		
	Hwy 400 to Industrial Rd.	West Holland River Crossing	Holland Forest and East River Crossing	2nd Concession Rd. to Hwy 404
Wood Thrush		O	O	
American Robin	O	O	O	O
Gray Catbird	O	O	O	O
European Starling	O	O	O	O
Warbling Vireo	O	O	O	
Red-eyed Vireo	O		O	O
Golden-winged Warbler			O	
Nashville Warbler		O	O	O
Yellow Warbler	O	O	O	O
Chestnut-sided Warbler		O	O	O
Magnolia Warbler			M	
Black-throated Green Warbler			M	
Blackburnian Warbler			M	
Bay-breasted Warbler			M	
Black-and-white Warbler			O	O
American Redstart		O	O	
Ovenbird		O	O	
Northern Waterthrush		O	O	
Lousiana Waterthrush			O	
Mourning Warbler		O	O	O
Common Yellowthroat		O	O	O

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Species[1]	CFJ	JSYB		
	Hwy 400 to Industrial Rd.	West Holland River Crossing	Holland Forest and East River Crossing	2nd Concession Rd. to Hwy 404
Canada Warbler			O	
Scarlet Tanager			O	
Northern Cardinal	O	O	O	O
Rose-breasted Grosbeak	O	O	O	O
Indigo Bunting	O	O	O	O
American Tree Sparrow			M	
Chipping Sparrow	O		O	
Field Sparrow		O		O
Vesper Sparrow	O			O
Savannah Sparrow	O			O
Song Sparrow	O	O	O	O
Swamp Sparrow		O	O	
White-throated Sparrow		O	O	
Dark-eyed Junco			M	
Bobolink	O			O
Red-winged Blackbird	O	O	O	O
Eastern Meadowlark	O			O
Common Grackle	O	O	O	O
Brown-headed Cowbird	O	O	O	O
Northern Oriole	O		O	O
Purple Finch			M	

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Species[1]	CFJ	JSYB		
	Hwy 400 to Industrial Rd.	West Holland River Crossing	Holland Forest and East River Crossing	2nd Concession Rd. to Hwy 404
House Finch	O	X	X	X
American Goldfinch	O	X	X	
House Sparrow	O		O	
Total O	39	47	63	39
Total X	6	13	9	3
Total M			9	
Total # of Species: 103 (O - 85) (X - 9) (M - 9)				

O Observed on-site, possibly breeding
X Observed off-site or flying over
M Migrants
1 Nomenclature of birds and the order in which they are presented follow the sixth edition of the American Ornithologists' checklist of North American Birds (A.O.U., 1983) and its associated supplements.

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Table 2: Mammal Records:

In addition to the observations recorded by Ecoplans, records from the Ontario Mammal Atlas (Dobbyn, 1994) have been included for the 10 by 10 km squares which the alignment traverses.

Ecoplans Observations

Myotis sp. (probably Little Brown Bat)
White-footed Mouse
Eastern Cottontail
Snowshoe Hare
Eastern Chipmunk
Woodchuck
Gray Squirrel
Red Squirrel
Beaver
Meadow Vole
Stripped Skunk
Muskrat
Porcupine
Coyote
Red Fox
Raccoon
Mink
White-tailed Deer

Additional Records from the Vicinity

Common Shrew
Northern Short-tailed Shrew
Northern Long-eared Bat
Big Brown Bat
Eastern Red Bat
European Hare
Northern Flying Squirrel
Meadow Jumping Mouse

Table 3: Herpetofauna Records
In addition to observations recorded by Ecoplans, records from the Ontario Herpetofauna database have been included for the 10 by 10 km squares which the alignment traverses.

Ecoplans Observations

American Toad
Spring Peeper
Gray Treefrog
Midland Chorus Frog
Wood Frog
Leopard Frog
Green Frog
Snapping Turtle
Midland Painted Turtle
Eastern Garter Snake

Additional Records from the Area

Map Turtle
Eastern Ribbon Snake

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Summary

Highway 400 to Industrial Road

- Wildlife communities in this section consisted mostly of habitat generalist wildlife species, as well as a few species with affinities for open areas (e.g., Northern Harrier, Savannah Sparrow, Vesper Sparrow).
- The landscape in this section can best be described as an agricultural mosaic with no significant natural linkages to the south and no significant natural core areas being present.
- No vulnerable, threatened, or endangered species were observed in this section of the corridor.
- Several White-tailed Deer (between 5 and 10) appear to be using the mosaic of habitats immediately east of Highway 400 (agricultural fields, stream corridors, fragmented woodlots).

West Holland River Crossing

- The three habitat types between the river edge and the CNR railway support distinct assemblages of breeding bird species:

meadow marsh / fen	- Swamp Sparrow, Sedge Wren, Marsh Wren
swamp	- Veery, Northern Waterthrush, Rose-breasted Grosbeak
shrub thicket swamp	- White-throated Sparrow, Nashville Warbler, Yellow Warbler

- Amphibians were abundant throughout this area, especially Wood Frogs and Spring Peepers.
- Semi-aquatic mammal species such as Beaver, Muskrat and Mink were observed along the river

Holland River Forest

- Two provincially and nationally vulnerable species, Red-shouldered Hawk and Louisiana Waterthrush were recorded within the large forested block near the crossing location of the East Holland River.
- The integrity of the forested block is demonstrated by the presence of numerous woodland raptors including: Red-shouldered Hawk, Broad-winged Hawk, Sharp-shinned Hawk, and Cooper's Hawk.
- A full suite of forest interior / area sensitive bird species were recorded, including: Yellow-bellied Sapsucker, Winter Wren, Wood Thrush, Veery, Northern Waterthrush, Canada Warbler, Black-and-White Warbler, Ovenbird, and Scarlet Tanager.
- Amphibians are abundant throughout the forested area (especially Wood Frogs).

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2nd Concession Road to Highway 404

- A diverse breeding bird community is present in the natural areas along the west facing slope including forest interior species such as Ovenbird, Canada Warbler, Black-and-White Warbler, and Veery. Their presence can likely be explained by the heterogenous habitat and proximity to large forested blocks to the west.

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ecoplans limited

MEMORANDUM

TO:	File (Bradford Bypass)	**DATE:**	June 21, 1997
FROM:	Steve Wilcox	**PROJECT NO.:**	91-1459
SUBJECT:	Site Visit to Mr. Willard Peterson's Property and Adjacent Lands		

I was directed by Ms. Laurie Wood and Dr. Cameron Kitchen to contact Mr. Willard Peterson to arrange a visit to his property during the spring of 1997. I was to provide him with information about the biological resources on his property as well as on adjacent lands. Apparently Mr. Peterson initially contacted Ms. Wood and Dr. Kitchen at one of the Public Information Centres held during the winter of 1997.

I first contacted Mr. Peterson on April 24, 1997. Among other things, he was concerned about the amphibian populations on his property. He noted that he was especially concerned about the rare "tree toad" that used his pond. From his description I concluded it was most likely Gray Treefrog (*Hyla versicolor*) which is common throughout southern Ontario. He also expressed concern about Turkey Vultures and other bird species. We agreed that I would re-contact sometime near the end of May to arrange a visit to his property when the tree frogs were most likely to be actively calling.

I met with Mr. Peterson on June 5, 1997 and spent approximately 3 hours with him. Mr. Peterson was very interested in biology and during the course of the visit I spent the majority of my time teaching him the names of plants and animals, especially bird songs. Amphibians were singing and we confirmed that his "tree toads" were indeed Gray Treefrogs. I brought several wildlife reference books along and left copies of several sections for his future reference.

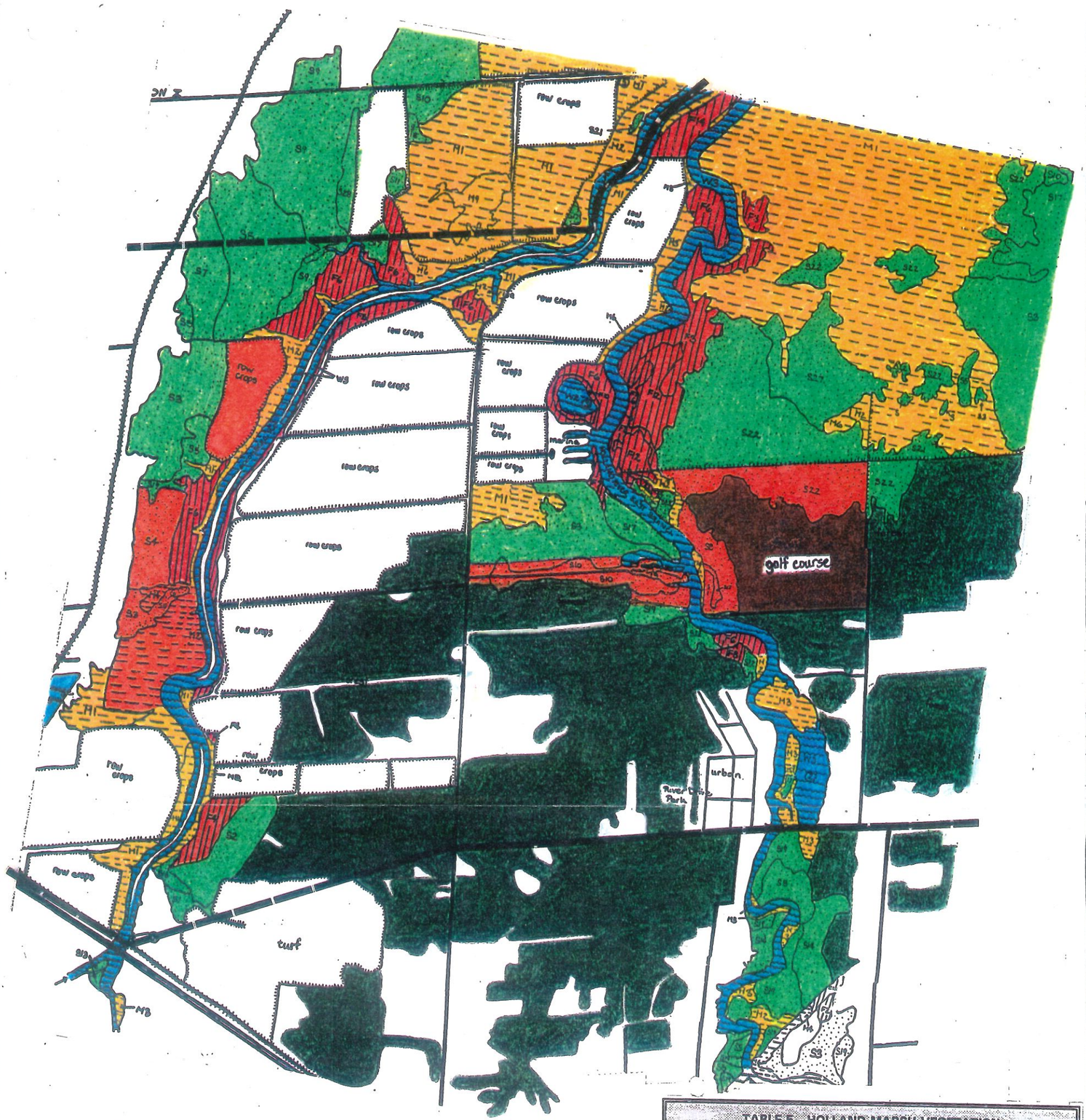
Mr. Peterson was very keen on knowing what rare species might be found in the area and on looking for these species. I provided him with this information and during the time I spent with Mr. Peterson we found nothing other than species that are common throughout the area.

Mr. Peterson took me to the sight where he is convinced that Fort Gwillimbury once stood. He was quite enthusiastic and talked at great length about the opportunities and implications of what he called a "National Historic Site". I offered no comment. He indicated that once he finished his school year (he is a history teacher) he would be devoting his time to "fighting" the highway and would be arguing from both a cultural and natural history perspective.

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APPENDIX 4

WETLANDS MAP FROM 1994 TECHNICAL REPORT



Wetland Types:

- Swamp
- Fen
- Marsh
- Open Water Marsh

Other:

- Golf Course
- Forest
- Disturbed Wetland

TABLE 5 - HOLLAND MARSH VEGETATION COMMUNITIES AND DESCRIPTION		
	Code	Description
One Vegetation Form	M1	(re) - Typha sp.
Two Vegetation Forms	S4	(h) - Populus tremuloides (ne) - grasses and sedges
	F6	(ne) - grasses and sedges (m) - mosses
	S19	(ts) - A. rugosa (gc) - Impatiens capensis
	S17	(ts) - A. rugosa/Salix spp. (ne) - grasses and sedges
Three Vegetation Forms	M2	(gc) - herbs (ne) - sedges and grasses (re) - Typha sp.
	S10	(h) - F. nigra/P.tremuloides (ts) - Salix sp./A. rugosa (ne) - grasses and sedges
	S22	(ts) - A. rugosa (gc) - I. capensis (ne) - sedges and grasses
	S1	(h) - F. nigra (gc) - herbs (ne) - grasses and sedges

Ministry of Transportation / Ministère des Transports
Ontario

Study Area Boundary

BRADFORD BYPASS: HIGHWAY 400 TO HIGHWAY 404 EXTENSION
ROUTE LOCATION AND PRELIMINARY DESIGN STUDY
W.P. 377-90-00

Holland Marsh
MNR Wetland Mapping

EXHIBIT
6

APPENDIX 5

VEGETATION AND WETLANDS DATA

APPENDIX 5

APPENDIX 5: VEGETATION AND FLORA - 400-404 LINK RECOMMENDED PLAN

This appendix comprises a tabular summary of vegetation features along the 400-404 Link Recommended Plan and a working vascular plant checklist.

Chainage	Unit	Community Type	Notes
Section CFJ - Highway 400 to the Holland River West Branch			
11+320 to 11+520	DF	Deciduous Forest - Successional	•the Recommended Plan will remove the southern half of a narrow, riparian deciduous forest dominated by Crack Willow (*Salix* x *rubens*).
12+085 to 12+170	DF	Deciduous Forest	•the Recommended Plan will remove a small (1.1 ha approx.) woodlot. •this unit is a mixed-aged stand of White Ash, Basswood, Beech and Ironwood.
12+200 to 12+325	CF	Conifer Forest	•the Recommended Plan will directly abut the southern edge of a small, immature conifer forest dominated by Eastern White Cedar.
13+255 to 13+420	DF	Deciduous Forest	•the Recommended Plan will remove 2.0 ha of deciduous forest that is presently being grazed. •this is a mature Sugar Maple dominated stand.
13+250 to 13+480	MS	Mixed Conifer-Deciduous Swamp	•this mixed conifer-deciduous swamp is located 10 to 30 m north of the Recommended Plan at its closest point, mainly located more than 125 m away. •this is an unevaluated wetland. •approximately 5.5 ha in size.
14+670 to 14+960	ST / MF	Shrub Thicket and Mixed Conifer-Deciduous Forest	•the shrub thicket and mixed forest units described here are contiguous with the mixed swamp unit described at 14+900, which is a narrow, north-south oriented wetland (total size of shrub thickets, mixed forest and mixed swamp = 11.8 ha). •the Recommended Plan will remove a crescent-shaped shrub thicket community dominated by Eastern White Cedar, as well as approximately 0.9 ha of immature, mixed conifer-deciduous forest. •the mixed conifer-deciduous forest is dominated by a mix of Eastern White Cedar, poplars, Basswood, Balsam Fir and White Pine. •the Recommended Plan will leave a 4.25 ha forest, shrub thicket and swamp fragment to the north and a 5.4 ha forest and swamp fragment to the south.
14+900	MS	Mixed Conifer-Deciduous Swamp	•the Recommended Plan will remove a 100 x 50 m section of this unit. •a narrow, mixed conifer-deciduous swamp located within a larger block of mixed forest and shrub thickets •dominated by Eastern White Cedar. •a small, vernally flooded pond is located within this unit, immediately north of the Recommended Plan. The pond dries up by mid to late summer. •this is an unevaluated wetland.
15+360 to 15+760	OF / ST	Old Field and Shrub Thicket	•in this area, the Recommended Plan will remove 4.0 ha of old field and shrub thicket habitat.

Chainage	Unit	Community Type	Notes
16+250	M	Marsh	•the Recommended Plan will remove this 0.24 ha unit. •small, disturbed marsh dominated by Common Cattail that has formed along a swale on abandoned agricultural land. •the wetland is too small, disturbed and isolated to be evaluated.
16+300	MS	Mixed Conifer-Deciduous Swamp	•the Recommended plan will remove approximately 1.0 ha of this unit. •this mixed conifer-deciduous swamp is located on a slope, apparently maintained by seepage. •dominated by Eastern White Cedar. •this is an unevaluated wetland.
16+850 to 17+200	OF / ST	Old Field and Shrub Thicket	•in this area, the Recommended Plan will remove 3.5 ha of old field and shrub thicket habitat.
17+500	TS	Thicket Swamp	•the Recommended Plan will remove approximately 0.7 ha of this unit. •this a regenerating community covering approximately 3.0 ha that is surrounded by industrial development associated with Artesian Industrial Parkway, the CN rail line and 8th Line/Dissette Street. •apparently this is an unevaluated wetland.
17+540 to 17+700	OF / ST	Old Field and Shrub Thicket	•in this area, the Recommended Plan will remove 1.6 ha of old field and shrub thicket habitat.
17+700 to 17+920	DS	Deciduous Swamp (Holland Marsh PSW)	•the Recommended Plan will cross 220 m of this Trembling Aspen dominated community.
17+920 to 18+060	F1	Disturbed Fen/Marsh (Holland Marsh PSW)	•the Recommended Plan will cross approximately 140 m of the area mapped as fen in the Wetland Evaluation Record (WER) for the Holland Marsh PSW. •this area is a mosaic of remnant sedge fen and cattail marsh. •ditching and other alterations to wetlands to the south of this location and the proximity to a municipal snow dump may have affected this community which was, in all likelihood, formerly a less disturbed fen community. •the remnant sedge fen is dominated by a mix of sedges (*Carex aquatilis, C. lasiocarpa, C. stricta*) and Canada Bluejoint (*Calamagrostis canadensis*) with a few fen 'indicators' present (based on Riley 1989): namely, Marsh-bellflower (*Campanula uliginosa*), Water Horsetail (*Equisetum fluviatile*), Hoary Willow (*Salix candida*) and Rush Aster (*Aster borealis*). •the marsh areas support a mix of cattails (*Typha angustifolia, T. latifolia*), Lake Sedge (*Carex lacustris*), Sweet-flag (*Acorus americanus*) and Water-plantain (*Alisma plantago-aquatica*).

Chainage	Unit	Community Type	Notes
Section JSYB - Holland River West Branch to the Proposed Link with Highway 404 Extension			
18+180	F2	Disturbed Fen/Marsh (Holland Marsh PSW)	•the Recommended Plan will cross 30 to 40 m of this wetland on the east side of the Holland River West Branch. The wetland is similar to the disturbed fen/marsh described at chainage 17+920 to 18+060. •the wetland is dominated by Narrow-leaved Cattail (*Typha angustifolia*), with small pockets of remnant fen vegetation being evident.
18+840 to 19+560	DF, MF	Deciduous Forest, Mixed Conifer-Deciduous Forest	•the Recommended Plan will affect forest edges to the north and south of Hochreiter Road. To the north, including the realignment of Hochreiter Road, the Recommended Plan will remove a 70 m wide band of deciduous swamp and forest at the widest point (just west of Bathurst Street). •the mixed forest in this area supports a diverse mix of tree species, including Eastern White Cedar, Balsam Fir, White Pine, White Spruce, Red Maple, Trembling Aspen, Balsam Poplar, White Birch, Yellow Birch, White Ash and Green Ash. •these forests are variable in age and some areas are quite open. •the moisture regime is generally moist to fresh (i.e. wet-mesic), with some evidence of vernal pooling.
19+400+	DS	Deciduous Swamp	•the Recommended Plan will remove a small soft maple (*Acer saccharinum, A. saccharinum* x *A. rubrum*) dominated swamp on the south side of Hochreiter Road.
19+590 to 20+670	MF	Mixed Conifer-Deciduous Forest	•the Recommended Plan will affect the northern edge of a large block of forest that extends further south. •most of the encroachment will be limited to areas previously disturbed by the marina construction and adjacent to existing residences. •the forest community here is similar to that described to the west of Bathurst Street (18+840 to 19+560), except that it is more mature and deciduous tree species occur more frequently.
20+900	DS	Deciduous Swamp (Holland River PSW)	•the Recommended Plan will cross approximately 40 to 90 m of wetland on the east side of the Holland River East Branch. •this wetland area is a fairly open, immature Red Maple dominated swamp with Yellow Birch, Black Ash and Speckled Alder. •this wetland has likely been affected by the changes in the local moisture regime due to the nearby construction of a golf course.
20+950 to 21+200	F3	Graminoid Fen (Holland River PSW)	•at the closest point, the Recommended Plan area comes within 80 m of this graminoid fen, across the Holland River West Branch. •On the west side of the Holland River West Branch, the Recommended Plan area is located some 250 m away from this community. •in terms of community type, level of disturbance and floristic composition, this unit is the most significant vegetation feature within the study area. •this is a sedge dominated community, with many of the sedge species being fen indicator species (e.g. *Carex buxbaumii, C. lasiocarpa, C. sartwellii*). A number of plant taxa recorded from this community are fen indicators and/or rare in York-Metro (Varga et al. 1986, cited in Riley 1989; Riley 1989): including, Bog-rosemary (*Andromeda glaucophylla*), Marsh-bellflower (*Campanula uliginosa*), Water Horsetail (*Equisetum fluviatile*), Hoary Willow (*Salix candida*), Rush Aster (*Aster borealis*), Buxbaum's Sedge (*Carex buxbaumii*), Sartwell's Sedge (*Carex sartwellii*), Downy Willow-herb (*Epilobium strictum*), Dwarf Birch (*Betula pumila* ssp. *glandulifera*) and Muhly Grass (*Muhlenbergia glomerata*).

Chainage	Unit	Community Type	Notes
21+320 to 21+560	DF	Deciduous Forest	•the Recommended Plan will affect the northern edge of a block of forest that extends further south. Encroachment into this forest will extend up to 80 m. •this deciduous forest is comprised of a mix of Green Ash, Balsam Poplar, White Birch, White Elm, Red Maple and Balsam Fir. •small swamp pockets with Black Ash occur here but are too small to map. •overall, the moisture regime is moist to fresh (i.e. wet-mesic) and the ground flora is quite rich.
21+430	DS	Deciduous Swamp	•the Recommended Plan will remove the northern portion (0.2 ha) of a small (0.7 ha), narrow band of mature Silver Maple dominated swamp. •a small population of Daisy-leaved Grape-fern (*Botrychium matricariifolium*), considered rare in York-Metro (Varga et al. 1986, cited in Riley 1989), was recorded from hummocks in this swamp community. •this population of Daisy-leaved Grape-fern will at least be partially affected by the Recommended Plan. •this wetland has not been evaluated.
21+560 to 21+750	DF	Deciduous Forest	•the vegetation here is similar to the deciduous forest at 13+320 to 21+560, except that there is an existing residence in a forest gap and, consequently, it is somewhat more disturbed.
21+780 to 22+030	DF	Deciduous Forest	•the Recommended Plan will remove 2.5 ha of deciduous forest, leaving a 1.75 ha forest fragment to the south, separated from a larger block of upland and wetland vegetation to the north. •the forest in this area is comprised of a mix of Balsam Poplar, Trembling Aspen, Red Maple, Green Ash and Balsam Fir. Close to Yonge Street, there are clusters of Red Oak. There are some small swamp pockets with Black Ash that are too small to map. Except in the swamp pockets, the moisture regime is generally moist to fresh (i.e. wet-mesic).
22+030 to 22+500	DF	Deciduous Forest	•the Recommended Plan abuts the southern edge of a large block of upland and wetland vegetation.
24+540 to 24+870	DF/ CF	Deciduous Forest / Conifer Forest	•the Recommended Plan will remove approximately 2.5 ha of forest on a prominent west-facing slope. •the lower half of the slope is a successional deciduous forest dominated by Trembling Aspen and the upper half of the slope is a conifer forest dominated by Eastern White Cedar.
_____	DF	Deciduous Forest	•adjacent to the intersection with the Proposed Highway 404 Extension, two small woodlots are affected by the Recommended Plan. •the larger of the two woodlots, located immediately south of Holborne Road, will be affected at its eastern end by ramps from the Proposed Highway 404 Extension. •the smaller, triangular-shaped woodlot will likely be eliminated by the Proposed Highway 404 and the connecting ramps. •both woodlots are fairly mature and dominated by Sugar Maple.

The following is a working vascular plant checklist generated from field observations and collections made between 1993 and 1997 from along the 400-404 Link Recommended Plan. To date, a total of 452 vascular plant taxa have been recorded, of which 99 taxa or 21.9% of the flora are considered introduced and non-native. Introduced species are denoted in the checklist with the letter 'I'. Nomenclature follows Morton and Venn (1990), with a few exceptions. Substantiating voucher specimens of significant and/or taxonomically complex taxa will be deposited at the Erindale Campus Herbarium, University of Toronto (TRTE).

The following broad community types are denoted below as follows:

Aquatic and Wetland

M Marsh (including submergent vegetation and meadow marsh communities)
F Graminoid Fen (F1 = chainage 17+920 to 18+060, F2 = 18+180, F3 = 20+950 to 21+200 and south of the Recommended Plan)
TS Thicket Swamp
S Swamp (deciduous and mixed types)

Terrestrial (including anthropogenic communities)

F Forest (deciduous, conifer and mixed)
OF Old Field and Shrub Thicket, also applied to other disturbed areas.

Observations from particular sections of the Recommended Plan are denoted as follows:

W - Section CFJ - Highway 400 to the Holland River West Branch

C - Portion of Section JSYB between the Holland River West Branch and the Holland River East Branch

E - Portion of Section JSYB between the Holland River East Branch and the Proposed Link with Highway 404 Extension

WORKING VASCULAR PLANT CHECKLIST

	Scientific Name	Common Name	UNIT	SECTION
	Abies balsamea	Balsam Fir	S,F	W,C,E
	Acalypha virginica	Three-seeded Mercury	OF	W,C,E
	Acer negundo	Manitoba Maple	F,OF	W,C,E
	Acer rubrum	Red Maple	TS,S,F	W,C,E
	Acer saccharinum	Silver Maple	S	W,C,E
	Acer saccharum saccharum	Sugar Maple	F,OF	W,C,E
I/N	Achillea millefolium	Yarrow	OF	W,C,E
I	Acinos arvensis	Basil Balm	OF	W,C,E
	Acorus americanus	Sweet Flag	FE1	W
	Actaea pachypoda	White Baneberry	F	W,C,E
	Actaea rubra	Red Baneberry	F	W,C,E
	Agrimonia gryposepala	Yellow Agrimony	F	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
I	Agrostis gigantea	Redtop	M,OF	W,C,E
	Agrostis scabra	Ticklegrass	M,FE,TS,S	W,C,E
	Agrostis stolonifera	Creeping Bent Grass	M,TS,S	W,C,E
	Alisma plantago-aquatica	Water-plantain	M,TS,S	W,C,E
I	Alliaria petiolata	Garlic Mustard	F	W,C,E
	Allium tricoccum	Wild Leek	F	W,C,E
	Alnus incana rugosa	Speckled Alder	M,TS,S	W,C,E
I	Amaranthus powellii	Green Pigweed	OF	W,C,E
	Ambrosia artemisiifolia	Common Ragweed	OF	W,C,E
	Amelanchier arborea	Juneberry	F	W,C
	Amelanchier laevis	Smooth Juneberry	S	C,E
	Amelanchier sanguinea	Dwarf Juneberry	S,F	C
	Amphicarpaea bracteata	Hog-peanut	F	W,C,E
I	Anagallis arvensis	Scarlet Pimpernel	OF	W,C,E
	Andromeda polifolia glaucophylla	Bog-rosemary	FE3	C
	Anemone canadensis	Canada Anemone	M,OF	W,C,E
	Anemone virginiana	Thimbleweed	F,OF	W,C,E
I	Anthemis cotula	Stinking Mayweed	OF	W,C,E
	Apios americana	Groundnut	M,TS	W,C
	Apocynum androsaemifolium androsaemifolium	Spreading Dogbane	F,OF	W,C,E
	Apocynum cannabinum	Indian Hemp	F,OF	W,C,E
	Aquilegia canadensis	Wild Columbine	F	C,E
	Aralia nudicaulis	Wild Sarsaparilla	S,F	W,C,E
	Aralia racemosa racemosa	Spikenard	S,F	W,C,E
I	Arctium lappa	Great Burdock	OF	W,C,E
I	Arctium minus	Common Burdock	OF	W,C,E
I	Arenaria serpyllifolia	Thyme-leaved Sandwort	OF	W,E
	Arisaema triphyllum triphyllum	Jack-in-the-pulpit	S,F	W,C,E
	Asarum canadense	Wild Ginger	F	W,C,E
	Asclepias incarnata incarnata	Swamp Milkweed	M,FE,TS,S	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Asclepias syriaca	Common Milkweed	OF	W,C,E
I	Asparagus officinalis	Garden Asparagus	OF	W,C,E
	Aster borealis	Rush Aster	FE	W,C
	Aster cordifolius	Heart-leaved Aster	F,OF	W,C,E
	Aster ericoides	Heath Aster	OF	W,C,E
	Aster lanceolatus	Tall White Aster	M,S,OF	W,C,E
	Aster lateriflorus	One-sided Aster	S,F	W,C,E
	Aster macrophyllus	Large-leaved Aster	S,F	W,C,E
	Aster novae-angliae	New England Aster	M,OF	W,C,E
	Aster puniceus	Purple-stemmed Aster	M,TS,S	W,C,E
	Athyrium filix-femina angustum	Northeastern Lady Fern	S,F	W,C,E
I	Barbarea vulgaris	Yellow Rocket	OF	W,C,E
I	Berberis thunbergii	Japanese Barberry	F	C
	Betula alleghaniensis	Yellow Birch	S,F	W,C,E
	Betula papyrifera	White Birch	S,F,OF	W,C,E
	Betula pumila	Swamp Birch	FE3	C
	Bidens cernua	Nodding Beggar-ticks	M,FE,TS,S	W,C,E
	Bidens frondosa	Devil's Beggar-ticks	M,FE,TS,S,OF	W,C,E
	Boehmeria cylindrica	False Nettle	S	W,C,E
	Botrychium matricariaefolium	Daisy-leaved Grape Fern	S	E
	Botrychium virginianum	Rattlesnake Fern	S,F	W,C,E
	Bromus ciliatus	Fringed Brome Grass	M,FE	C
	Calamagrostis canadensis	Canada Blue-joint	M,FE,TS,S	W,C,E
	Calla palustris	Wild Calla	TS,S	C,E
	Caltha palustris palustris	Marsh-marigold	M,TS,S	W,C,E
	Calystegia sepium	Hedge Bindweed	OF	W,C,E
	Campanula aparinoides	Marsh-bellflower	FE1	W
I	Campanula rapunculoides	Creeping Bellflower	OF	W
I	Capsella bursa-pastoris	Shepherd's-purse	OF	W,C,E
	Cardamine concatenata	Cutleaf Toothwort	F	C

	Scientific Name	Common Name	UNIT	SECTION
	Cardamine diphylla	Twin-leaved Toothwort	F	W,C,E
	Cardamine pensylvanica	Pennsylvania Bitter Cress	S	W,C,E
	Carex albursina	White-bear Sedge	F	W,C,E
	Carex aquatilis	Aquatic Sedge	FE	W,C,E
	Carex blanda	Smooth Sedge	F	W,C,E
	Carex brunnescens brunnescens	Brownish Sedge	TS,S	C,E
	Carex buxbaumii	Sedge	FE3	C
	Carex chordorrhiza	Cord-rooted Sedge	FE3	C
	Carex communis	Cor mon Sedge	F	W,C,E
	Carex comosa	Bristly Sedge	S	W,C,E
	Carex crinita	Fringed Sedge	S	C,E
	Carex deweyana	Dewey's Sedge	S,F	W,C,E
	Carex disperma	Two-seeded Sedge	S	W,C,E
	Carex echinata echinata	Prickly Sedge	FE3	C
	Carex gracillima	Filiform Sedge	S,F	W,C,E
	Carex granularis	Granular Sedge	F,OF	W,C,E
	Carex hirtifolia	Hairy Sedge	F	W,C,E
	Carex hystericina	Porcupine Sedge	M,FE,TS,S	W,C,E
	Carex interior	Inland Sedge	M,FE,TS,S	W,C,E
	Carex intumescens	Bladder Sedge	S,F	W,C,E
	Carex lacustris	Lake Sedge	M,TS,S	W,C,E
	Carex lanuginosa	Woolly Sedge	M,TS	W,C
	Carex lasiocarpa	Hairy-fruited Sedge	FE	W,C
	Carex laxiflora	Distant-flowered Sedge	F	W,C,E
	Carex leptalea leptalea	Bristle-stalked Sedge	TS,S	C,E
	Carex leptonervia	Finely-nerved Sedge	F	C
	Carex lupulina	Hop Sedge	S	C,E
	Carex peckii	Peck's Sedge	F	C
	Carex pedunculata	Peduncled Sedge	F	W,C,E
	Carex pensylvanica	Pennsylvania Sedge	F	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Carex projecta	Spreading Sedge	M	W,C
	Carex pseudo-cyperus	Cyperus-like Sedge	TS;S	W,C,E
	Carex radiata	Sedge	S,F	W,C,E
	Carex retrorsa	Retrorse Sedge	M,FE,TS,S	W,C,E
	Carex rosea	Sedge	F	W,C,E
	Carex sartwellii	Sedge	FE3	C
	Carex scabrata	Rough Sedge	S	C,E
	Carex sparganioides	Bur-reed Sedge	F	E
	Carex stipata	Awl-fruited Sedge	M,TS,S	W,C,E
	Carex stricta	Tussock Sedge	M,FE,TS,S	W,C,E
	Carex tenera	Slender Sedge	M	W,C,E
	Carex utriculata	Beaked Sedge	M,FE	W,C
	Carex vulpinoidea	Fox Sedge	M,TS,S	W,C,E
	Carex woodii	Wood's Sedge	F	C,E
	Carya cordiformis	Bitternut Hickory	F	W,C,E
	Caulophyllum thalictroides	Blue Cohosh	F	W,C,E
	Celastrus scandens	Climbing Bittersweet	F,OF	W,C,E
I	Centaurea maculosa	Spotted Knapweed	OF	W,C,E
I	Cerastium fontanum triviale	Mouse-eared Chickweed	OF	W,C,E
	Ceratophyllum demersum	Common Coontail	M	C
I	Chamaesyce maculata	Hairy-fruited Spurge	OF	C
I	Chelidonium majus	Greater Celandine	F	W,E
	Chelone glabra	Turtlehead	M,FE,TS,S	W,C,E
I	Chenopodium album	Lamb's-quarters	OF	W,C,E
	Chenopodium simplex	Maple-leaved Goosefoot	F,OF	C,E
I	Chrysanthemum leucanthemum	Ox-eye Daisy	OF	W,C,E
I	Cichorium intybus	Chicory	OF	AC
	Cicuta bulbifera	Bulbous Water-hemlock	M,FE,TS,S	W,C,E
	Cicuta maculata	Spotted Water-hemlock	M,FE,TS,S	W,C,E
	Cinna arundinacea	Stout Wood Grass	F	C,E

	Scientific Name	Common Name	UNIT	SECTION
	Cinna latifolia	Nodding Wood Grass	S	C,E
	Circaea alpina	Small Enchanter's Nightshade	S,F	W,C,E
	Circaea lutetiana canadensis	Enchanter's Nightshade	S,F	W,C,E
I	Cirsium arvense	Canada Thistle	OF	W,C,E
	Cirsium muticum	Swamp Thistle	M	W
I	Cirsium vulgare	Bull Thistle	OF	W,C,E
	Claytonia caroliniana	Broad-leaved Spring Beauty	F	C,E
	Claytonia virginica	Narrow-leaved Spring Beauty	F	C,E
	Clematis virginiana	Virgin's-bower	M,OF	W,E
	Clintonia borealis	Bluebead-lily	S,F	W,C
I	Convolvulus arvensis	Field Bindweed	OF	W,C,E
	Conyza canadensis	Horseweed	OF	W,C,E
	Coptis trifolia groenlandica	Gold-thread	S,F	W,C,E
	Cornus alternifolia	Alternate-leaved Dogwood	F	W,C,E
	Cornus amomum obliqua	Silky Dogwood	M,FE,TS	W,C,E
	Cornus foemina racemosa	Grey Dogwood	OF	W,C,E
	Cornus rugosa	Round-leaved Dogwood	F	C,E
	Cornus stolonifera	Red-osier Dogwood	M,TS,S	W,C,E
	Corylus cornuta	Beaked Hazel	F	C,E
I	Crataegus monogyna	English Hawthorn	F,OF	W,C,E
	Crataegus punctata	Dotted Hawthorn	F,OF	W,C,E
I	Crepis tectorum	Narrow Hawk's-beard	OF	E
	Cryptotaenia canadensis	Honewort	F	C,E
	Cuscuta gronovii	Swamp Dodder	S	W,C,E
I	Cynoglossum officinale	Hound's-tongue	F,OF	W,E
	Cyperus esculentus	Yellow Nut Grass	OF	W,C
	Cypripedium calceolus	Yellow Lady's-slipper	S,F	C,E
	Cystopteris bulbifera	Bulblet Fern	S,F	W,C,E
I	Daucus carota	Queen Anne's Lace	OF	W,C,E
	Decodon verticillatus	Water-willow	M,FE	C

	Scientific Name	Common Name	UNIT	SECTION
	Desmodium canadense	Showy Tick-trefoil	OF	C,E
	Desmodium glutinosum	Pointed-leaved Tick-trefoil	F	C
I	Dianthus armeria	Deptford Pink	OF	W,C,E
	Diervilla lonicera	Bush-honeysuckle	F	W,C,E
I	Dipsacus fullonum sylvestris	Teasel	OF	W,C,E
	Dirca palustris	Leatherwood	F	E
	Dryopteris carthusiana	Spinulose Wood Fern	S,F	W,C,E
	Dryopteris clintoniana	Clinton's Wood Fern	S,F	C,E
	Dryopteris cristata	Crested Wood Fern	S,F	C,E
	Echinocystis lobata	Wild Cucumber	TS,OF	W,C,E
I	Echium vulgare	Blueweed	OF	W,C,E
	Eleocharis acicularis	Needle Spike-rush	M	W,C,E
	Eleocharis erythropoda	Red-based Spike-rush	M	W,C,E
	Eleocharis obtusa	Blunt Spike-rush	M	W,C,E
	Eleocharis smallii	Small's Spike-rush	M	W,C,E
	Eleocharis tenuis	Elliptic Spike-rush	FE	C
	Epifagus virginiana	Beech-drops	F	W
	Epilobium angustifolium	Fireweed	OF	W,C,E
	Epilobium ciliatum ciliatum	Sticky Willow-herb	FE,TS,S	W,C,E
I	Epilobium hirsutum	Great Hairy Willow-herb	M,TS	W,C,E
	Epilobium leptophyllum	Narrow-leaved Willow-herb	M,FE,TS	W,C,E
	Epilobium strictum	Downy Willow-herb	FE3	C
I	Epipactis helleborine	Helleborine	S,F	W,C,E
	Equisetum arvense	Field Horsetail	M,FE,TS,S,F	W,C,E
	Equisetum fluviatile	Water Horsetail	M,FE,TS,S	W,C,E
	Equisetum pratense	Meadow Horsetail	S	C
	Erigeron annuus	Annual Fleabane	OF	W,C,E
	Erigeron philadelphicus philadelphicus	Philadelphia Fleabane	S,F,OF	W,C,E
I	Erysimum cheiranthoides cheiranthoides	Wormseed Mustard	OF	W,C,E
	Erythronium americanum americanum	Yellow Trout-lily	F	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Euonymus obovata	Running Strawberry-bush	S,F	W,C,E
	Eupatorium maculatum	Spotted Joe-Pye-weed	M,FE,TS,S	W,C,E
	Eupatorium perfoliatum	Boneset	M,FE,TS,S	W,C,E
	Eupatorium rugosum	White Snakeroot	F	W,C,E
I	Euphorbia cyparissias	Cypress Spurge	OF	W,C,E
I	Euphorbia esula	Leafy Spurge	OF	W,C,E
	Fagus grandifolia	American Beech	F	W,C,E
I	Festuca arundinacea	Tall Fescue	M	W
	Fragaria vesca americana	Woodland Strawberry	F	W,C,E
	Fragaria virginiana	Field Strawberry	OF	W,C,E
	Fraxinus americana	White Ash	F,OF	W,C,E
	Fraxinus nigra	Black Ash	S,F	W,C,E
	Fraxinus pennsylvanica	Red Ash, Green Ash	S,F	W,C,E
	Galium aparine	Cleavers	F	W,C,E
	Galium asprellum	Rough Bedstraw	TS,S	W,C,E
	Galium palustre	Marsh Bedstraw	M,FE,TS,S	W,C,E
	Galium trifidum trifidum	Pasture Bedstraw	FE	W,C
	Galium triflorum	Sweet-scented Bedstraw	S,F	W,C,E
I	Galium verum	Yellow Besdtraw	OF	W,C,E
	Geranium maculatum	Wild Geranium	F	C,E
I	Geranium robertianum	Herb Robert	S,F	W,C,E
	Geum aleppicum	Yellow Avens	F	W,C,E
	Geum canadense	White Avens	S,F	W,C,E
	Geum rivale	Water Avens	S	C
I	Glechoma hederacea	Ground-ivy	F	W,C,E
	Glyceria grandis	Tall Manna Grass	M,TS,S	W,C,E
	Glyceria striata	Fowl Manna Grass	M,FE,TS,S,F	W,C,E
	Hackelia virginiana	Stickseed	F	W,E
	Hepatica acutiloba	Sharped-lobed Hepatica	F	C,E
I	Hesperis matronalis	Dame's Rocket	S,F	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
I	Hieracium aurantiacum	Orange Hawkweed	OF	W,C,E
I	Hieracium pilosella	Mouse-ear Hawkweed	OF	W,C,E
I	Hieracium piloselloides	King Devil Hawkweed	OF	W,C,E
	Hydrocotyle americana	Water-pennywort	S,F	W,C,E
	Hydrophyllum virginianum	Virginia Waterleaf	F	W,C,E
	Hypericum perforatum	Common St. John's-wort	OF	W,C,E
	Ilex verticillata	Winterberry	TS,S	W,C,E
	Impatiens capensis	Spotted Touch-me-not	M,FE,TS,S,F	W,C,E
I	Inula helenium	Elecampane	M,OF	W,C,E
	Iris versicolor	Wild Blue Flag	M,FE,TS	W,C,E
	Juglans cinerea	Butternut	F,OF	C,E
	Juncus articulatus	Jointed Rush	M,OF	W,C,E
	Juncus bufonius	Toad Rush	F	W,C,E
	Juncus dudleyi	Dudley's Rush	M,F,OF	W,C,E
	Juncus effusus solutus	Common Rush	M	W,C,E
	Juncus nodosus	Rush	M,OF	W,C,E
	Juncus tenuis	Path Rush	F	W,C,E
	Lactuca biennis	Tall Blue Lettuce	F	C
I	Lactuca serriola	Prickly Lettuce	OF	W,C,E
	Laportea canadensis	Wood Nettle	S,F	W,C,E
I	Lapsana communis	Nipplewort	OF	E
	Larix laricina	Tamarack	M,FE,S	W,C,E
	Lathyrus palustris	Marsh Pea	FE3	C
	Leersia oryzoides	Rice Cut Grass	M,S	W,C,E
	Lemna minor	Common Duckweed	M	W,C,E
	Lemna trisulca	Star Duckweed	M	W,C
I	Leonurus cardiaca cardiaca	Motherwort	F,OF	W,C,E
I	Lepidium campestre	Field Pepper-grass	OF	C,E
	Lepidium densiflorum	Common Pepper-grass	OF	W,C,E
	Lilium michiganense	Michigan Lily	S,F	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
I	Linaria vulgaris	Butter-and-eggs	OF	W,C,E
	Linnaea borealis longiflora	Twinflower	S	C
	Liparis loeselii	Loesel's Twayblade	S,F	C,E
	Lobelia inflata	Indian-tobacco	F	E
	Lobelia siphilitica	Great Blue Lobelia	F	E
	Lonicera dioica	Wild Honeysuckle	S,F	W,C,E
I	Lonicera tatarica	Tartarian Honeysuckle	F	W,C,E
I	Lotus corniculatus	Birdfoot Trefoil	OF	W,C,E
	Ludwigia palustris	Water-purslane	M	W,C
	Lycopus americanus	American Water-horehound	M,FE,TS,S,F	W,C,E
	Lycopus uniflorus	Water-horehound	M,FE,TS,S,F	W,C
	Lysimachia ciliata	Fringed Loosestrife	S,F	W,C,E
I	Lysimachia nummularia	Moneywort	TS,S	C,E
	Lysimachia terrestris	Swamp Candles	TS,S	C
	Lysimachia thyrsiflora	Tufted Loosestrife	M,FE,TS,S	W,C,E
I	Lythrum salicaria	Purple Loosestrife	M,FE,TS,S	W,C,E
	Maianthemum canadense	Wild Lily-of-the-valley	S,F	W,C,E
	Maianthemum racemosum racemosum	Tall False Solomon's-seal	F	W,C,E
	Maianthemum stellatum	Starry False Solomon's-seal	S,F	W,C,E
I	Malus pumila	Apple	F,OF	W,C,E
	Matteuccia struthiopteris	American Ostrich Fern	S,F	W,C,E
I	Medicago lupulina	Black Medick	OF	W,C,E
I	Medicago sativa	Alfalfa	OF	W,C,E
I	Melilotus alba	White Sweet-clover	OF	W,C,E
I	Melilotus officinalis	Yellow Sweet-clover	OF	W,C,E
	Mentha arvensis borealis	Common Mint	M,TS	W,C,E
	Mimulus ringens	Square-stemmed Monkeyflower	M,FE,TS,S	W,C,E
	Mitchella repens	Partridge-berry	F	C,E
	Mitella diphylla	Bishop's Cap	S	C,E
	Monarda fistulosa	Wild Bergamot	OF	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Muhlenbergia glomerata	Marsh Wild-timothy	FE3	C
	Muhlenbergia mexicana	Satin Grass	M,FE,TS,S,F	W,C,E
	Myosotis laxa	Smaller Forget-me-not	S,F	W,C,E
I	Myosotis scorpioides	True Forget-me-not	S	W,C,E
I	Nasturtium microphyllum	Water Cress	M,TS,S	W,C,E
I	Nepeta cataria	Catnip	OF	W,C,E
	Nuphar variegatum	Bullhead Lily	M	C
	Nymphaea odorata	Fragrant Water-lily	M	C
	Oenothera biennis	Hairy Yellow Evening-primrose	OF	W,C,E
	Onoclea sensibilis	Sensitive Fern	TS,S,F	W,C,E
	Osmorhiza claytonii	Sweet-cicely	F	W,C,E
	Osmunda cinnamomea	Cinnamon Fern	TS,S	C,E
	Osmunda regalis	American Royal Fern	TS,S	C,E
	Ostrya virginiana	Ironwood	F	W,C,E
	Oxalis stricta	Common Wood-sorrel	F,OF	W,C,E
	Parthenocissus inserta	Virginia Creeper	S,F	W,C,E
	Penthorum sedoides	Ditch Stonecrop	M,TS,OF	W,C,E
	Phalaris arundinacea	Reed Canary Grass	M,OF	W,C,E
	Phegopteris connectilis	Northern Beech Fern	F	C,E
	Phlox divaricata	Blue Phlox	F	C,E
	Phryma leptostachya	Lopseed	F	W,C,E
	Physalis heterophylla	Clammy Ground-cherry	OF	E
I/ N	Picea glauca	White Spruce	F	W,C,E
	Pilea pumila	Clearweed	TS,S,F	W,C,E
	Pinus strobus	White Pine	S,F,OF	W,C,E
I	Plantago lanceolata	English Plantain	OF	W,C,E
I	Plantago major	Broad-leaved Plantain	OF	W,C,E
	Plantago rugelii	Rugel's Plantain	OF	W,C,E
	Platanthera hyperborea	Tall Northern Green Orchid	S,F	C,E

	Scientific Name	Common Name	UNIT	SECTION
	Polygala paucifolia	Fringed Polygala	S,F	C,E
	Polygonatum pubescens	Solomon's-seal	S,F	W,C,E
	Polygonum amphibium	Water Smartweed	M,FE,TS	W,C,E
I	Polygonum hydropiper	Marshpepper Smartweed	M,S	C,E
	Polygonum lapathifolium	Nodding Smartweed	M,S	W,C,E
I	Polygonum persicaria	Lady's Thumb	M,OF	W,C,E
	Populus balsamifera	Balsam Poplar	S,F,OF	W,C,E
	Populus grandidentata	Large-toothed Aspen	F	C,E
	Populus tremuloides	Trembling Aspen	S,F,OF	W,C,E
	Potentilla anserina anserina	Silverweed	M,OF	W,C,E
I/ N	Potentilla norvegica	Rough Cinquefoil	OF	W,C,E
	Potentilla palustris	Marsh Cinquefoil	M,F,TS	W,C,E
I	Potentilla recta	Rough-fruited Cinquefoil	OF	W,C,E
	Prenanthes alba	White Lettuce	F	W,C,E
	Prenanthes altissima	Tall White Lettuce	S	C,E
I/ N	Prunella vulgaris	Heal-all	F,OF	W,C,E
I	Prunella vulgaris vulgaris	Heal-all	S,F	W,C,E
	Prunus pensylvanica	Pin Cherry	OF	W,C,E
	Prunus serotina	Wild Black Cherry	F	W,C,E
	Prunus virginiana virginiana	Chokecherry	S,F,OF	W,C,E
	Pteridium aquilinum	Eastern Bracken Fern	F	W,C,E
	Pyrola asarifolia	Pink Pyrola	F	C,E
	Quercus alba	White Oak	F	E
	Quercus macrocarpa	Bur Oak	F,OF	W,C,E
	Quercus rubra	Red Oak	F	W,C,E
	Ranunculus abortivus	Small-flowered Buttercup	F	W,C,E
I	Ranunculus acris	Tall Buttercup	S,F	W,C,E
	Ranunculus flabellaris	Yellow Water Buttercup	TS	C
	Ranunculus hispidus var. caricetorum	Swamp Buttercup	TS,S	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Ranunculus recurvatus	Hooked Buttercup	F	C,E
	Ranunculus sceleratus	Cursed Crowfoot	S,OF	W,C,E
I	Rhamnus cathartica	Common Buckthorn	S,F,OF	W,C,E
I	Rhamnus frangula	Alder Buckthorn	TS	W,C,E
	Rhus radicans negundo	Climbing Poison-ivy	S	W,C,E
	Rhus radicans rydbergii	Rydberg's Poison-ivy	S,F	W,C,E
	Rhus typhina	Staghorn Sumac	OF	W,C,E
	Ribes americanum	Wild Black Currant	S,F	W,C,E
	Ribes cynosbati	Prickly Gooseberry	S,F	W,C,E
	Ribes triste	Swamp Red Currant	TS,S	C,E
	Rorippa palustris	Marsh Yellow Cress	M,TS	W,C
	Rosa blanda	Smooth Wild Rose	OF	W,C,E
	Rubus allegheniensis	Common Blackberry	F,OF	W,C,E
	Rubus idaeus melanolasius	Wild Red Raspberry	S,F,OF	W,C,E
	Rubus occidentalis	Black Raspberry	F,OF	W,C,E
	Rubus odoratus	Purple-flowering Raspberry	F	C,E
	Rubus pubescens	Dwarf Raspberry	TS,S,F	W,C,E
	Rudbeckia hirta	Black-eyed Susan	OF	W,C,E
I	Rumex crispus	Curly Dock	M,OF	W,C,E
I	Rumex obtusifolius obtusifolius	Bitter Dock	M	C,E
	Rumex orbiculatus	Great Water Dock	M	C
I	Salix alba	White Willow	S	W,C,E
	Salix amygdaloides	Peach-leaved Willow	TS,S	W,C,E
	Salix bebbiana	Bebb's Willow	TS,S	W,C,E
	Salix candida	Sage-leaved Willow	FE1,FE3	W,C
	Salix discolor	Pussy Willow	M,FE,TS,S	W,C,E
	Salix eriocephala	Heart-leaved Willow	M,FE,TS	W,C,E
	Salix exigua	Sandbar Willow	M,TS	W,C,E
	Salix lucida	Shining Willow	TS	W,C,E
	Salix pedicellaris	Bog Willow	FE3	C

	Scientific Name	Common Name	UNIT	SECTION
	Salix petiolaris	Slender Willow	M,FE,TS	W,C,E
I	Salix x rubens	Crack Willow	S,F	W,C,E
	Sambucus canadensis	Common Elder	M,S,F	W,C,E
	Sambucus racemosa pubens	Red-berried Elder	F	W,C,E
	Sanguinaria canadensis	Bloodroot	F	W,C,E
	Sanicula marilandica	Common Black Snakeroot	F	C,E
I	Saponaria officinalis	Bouncing-bet	OF	W,C,E
	Scirpus atrovirens	Black Bulrush	M,OF	W,C,E
	Scirpus cyperinus	Wool-grass	M	W,C,E
	Scirpus validus	Softstem Bulrush	M,OF	W,C,E
	Scutellaria galericulata	Common Skullcap	M,TS,S	W,C,E
	Scutellaria lateriflora	Mad-dog Skullcap	M,TS,S	W,C,E
I	Senecio vulgaris	Common Groundsel	OF	W,C,E
I	Silene latifolia	White Cockle	OF	C,E
I	Silene vulgaris	Bladder Campion	OF	W,C,E
	Sisyrinchium montanum	Little Blue-eyed Grass	OF	W,C,E
	Sium suave	Water-parsnip	M,TS,S	W,C,E
	Smilax herbacea	Carrion-flower	F	W,C,E
	Smilax hispida	Bristly Greenbrier	F	W,C,E
I	Solanum dulcamara	Climbing Nightshade	M,TS,S,F	W,C,E
	Solanum ptycanthum	Eastern Black Nightshade	OF	W
	Solidago altissima	Tall Goldenrod	OF	W,C,E
	Solidago caesia	Blue-stem Goldenrod	F	W,C,E
	Solidago canadensis	Canada Goldenrod	M,OF	W,C,E
	Solidago flexicaulis	Zig-zag Goldenrod	F	W,C,E
	Solidago juncea	Early Goldenrod	OF	W,C,E
	Solidago nemoralis nemoralis	Gray Goldenrod	OF	W,C,E
	Solidago rugosa rugosa	Rough Goldenrod	S,F	W,C,E
	Solidago uliginosa	Bog Goldenrod	FE	C
I	Sorbus aucuparia	European Mountain-ash	F	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Sparganium emersum emersum	Green-fruited Bur-reed	M	W,C,E
	Sparganium eurycarpum	Giant Bur-reed	M	W,C,E
	Sphenophol..s intermedia	Slender Wedge Grass	S,F	W,C,E
	Spiraea alba	Meadowsweet	M,FE,TS,S	W,C,E
I	Stachys palustris	Marsh Hedge-nettle	M	W,C
I	Stellaria graminea	Grass-leaved Stitchwort	M	W,E
	Stellaria longifolia	Long-leaved Chickweed	M	E
	Streptopus roseus	Rose-twisted Stalk	S,F	W,C,E
I	Syringa vulgaris	Common Lilac	OF	C,E
I	Taraxacum officinale	Common Dandelion	OF	W,C,E
	Taxus canadensis	American Yew	S,F	W,C,E
	Thalictrum dioicum	Early Meadow-rue	F	W,C,E
	Thalictrum pubescens	Tall Meadow-rue	S,F	W,C,E
	Thelypteris palustris	Marsh Fern	M,FE,TS,S	W,C,E
I	Thlaspi arvense	Penny Grass	OF	W,E
	Thuja occidentalis	White Cedar	TS,S,F,OF	W,C,E
	Tiarella cordifolia	Foamflower	S,F	W,C,E
	Tilia americana	American Basswood	S,F	W,C,E
	Triadenum fraseri	Marsh St. John's Wort	M,FE	W,C
	Trientalis borealis borealis	Starflower	S,F	W,C,E
I	Trifolium hybridum elegans	Alsike Clover	OF	W,C,E
I	Trifolium pratense	Red Clover	OF	W,C,E
I	Trifolium repens	White Clover	OF	W,C,E
	Trillium erectum	Purple Trillium	F	W,C,E
	Trillium grandiflorum	White Trillium	F	W,C,E
	Tsuga canadensis	Eastern Hemlock	S,F	W,C,E
I	Tussilago farfara	Coltsfoot	M,OF	W,C,E
	Typha angustifolia	Narrow-leaved Cattail	M,TS	W,C,E
	Typha latifolia	Common Cattail	M,TS,S	W,C,E
	Ulmus americana	White Elm	S,F,OF	W,C,E

	Scientific Name	Common Name	UNIT	SECTION
	Urtica dioica gracilis	American Stinging Nettle	M,TS,S	W,C,E
	Utricularia vulgaris	Common Bladderwort	M	W,C
I	Verbascum thapsus	Common Mullein	OF	W,C,E
	Verbena hastata	Blue Vervain	M,TS,OF	W,C,E
	Verbena urticifolia	White Vervain	OF	W,C,E
	Veronica americana	American Brooklime	M	W
I	Veronica anagallis-aquatica	Water Speedwell	M	W
I	Veronica officinalis	Common Speedwell	F	W,C,E
	Veronica scutellata	Marsh Speedwell	M,TS	W,C
	Viburnum acerifolium	Maple-leaved Viburnum	F	C,E
	Viburnum lentago	Nannyberry	S,F	W,C,E
	Viburnum trilobum	Highbush-cranberry	S,F	W,C,E
I	Vicia cracca	Bird Vetch	OF	W,C,E
I	Vicia sativa nigra	Common Vetch	OF	W,C,E
	Viola canadensis	Canada Violet	S,F	W,C,E
	Viola conspersa	Dog Violet	F	W,C,E
	Viola pubescens	Downy Yellow Violet	F	W,C,E
	Viola rostrata	Long-spurred Violet	F	C,E
	Viola sororia	Common Blue Violet	F	W,C,E
	Vitis riparia	Riverbank Grape	S,F	W,C,E
	Waldsteinia fragarioides	Barren Strawberry	S,F	W,C,E
	Zanthoxylum americanum	Prickly-ash	F	E

APPENDIX 6

CLI CLASSIFICATION SYSTEM

Canadian Land Inventory (CLI) Classification System
Potential Capability of Soils - Classes and Subclasses

The Soil Capability Classification for Agriculture system was developed as part of the Canada Land Inventory (CLI) classification system as a means of rating the mineral soils of Canada for the production of common field crops (grain corn, fodder corn, cereal grains and hay). The system utilizes a seven class discrimination method to designate the potential productive capability wherein, Class 1 denotes soils which have a high productivity potential and Class 7 denotes soils which have no agricultural productivity potential. The *Canada Land Inventory Soil Capability Classification for Agriculture* system is described in CLI Report No 2. (1965). Subclasses are used to indicate limiting factors affecting productivity. Organic deposits are not rated for agricultural capability under this system.

It is important to note that the system:

- refers to productivity potential;
- applies only to common field crops such as forage crops, small grains and corn;
- assigns classes on the degree of limitation, while the subclass defines the type of limitation;
- assigns classes to the continuing limitation affecting production after reclamation has taken place, and assumes that the best management practices (e.g. drainage, irrigation, stone removal) are implemented; and
- does not consider: distances to market, kind of roads, location or size of farms, type of ownership, cultural patterns, skills or resources of individual operators, and hazard of crop damage by storm.

Soil Capability Classes

Class 1	No significant limitation for use or range of crops.
Class 2	Moderate limitations that restrict the range of crops, or require moderate conservation practices.
Class 3	Moderately severe limitations that restrict the range of crops, or require special conservation practices.
Class 4	Severe limitations that restrict the range of crops or require special conservation practices, or both.

Class 5	Very severe limitations that restrict their capability to produce perennial forage crops, and improvement practices are feasible.
Class 6	Only capable of producing perennial forage crops, and improvement practices are not feasible.
Class 7	No capability for arable culture or permanent pasture.
Class 0	Organic - not placed in agricultural capability classification.

Soil Capability Subclasses

Subclass D	Undesirable soil structure and/or permeability.
Subclass E	Erosion damage, or potential damage from erosion, limits agricultural use of the land.
Subclass F	Low natural fertility, which may or may not be possible to correct by additions of fertilizers or manure.
Subclass I	Inundation of flooding of streams or lakes limits agricultural use.
Subclass M	Moisture limitations due to low moisture-holding capacities, cause droughtiness that limits agricultural use.
Subclass P	Stoniness. Stones interfere with tillage, planting and harvesting.
Subclass R	Shallowness to bedrock, which is less than one metre from the soil surface.
Subclass S	Adverse soil characteristics. Two or more of the limitations represented by subclasses.
Subclass T	Adverse topography due to steepness, or complexity of slopes, limits agricultural use.
Subclass W	Excess water, other than from flooding, limits use for agriculture. The excess water may be due to poor drainage, a high water table, seepage, or runoff from surrounding areas.

APPENDIX H

Noise Analysis

HIGHWAY 400 - 404 EXTENSION LINK
ROUTE LOCATION AND
ENVIRONMENTAL ASSESSMENT
STUDY

NOISE ANALYSIS

McCormick Rankin Corporation
August, 1997

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1. INTRODUCTION

Noise impact analysis was done at two stages in the Highway 400 - 400 Extension link study:

- as part of the analysis of alternative routes, at an overview level of detail; and
- as part of the impact analysis and development of mitigation measures for the recommended route.

Noise impact is a concern with the project because, although the Recommended Plan extends through mostly agricultural lands, there are many residential properties scattered along 10 Sideroad (Middletown Road), County Road 4 (Highway 11), Bathurst Street, Yonge Street, 2nd Concession Road and Leslie Street. The proposed alignment will also be adjacent to the River Drive Park community north of Queensville Sideroad and west of the Holland River (East Branch).

The analysis covers Noise Sensitive Areas[1] (NSAs) adjacent to the proposed four lane freeway and compares future noise levels at these sites without the proposed facility against noise levels with the proposed facility. There is no scheduled year of construction for the Link; for analysis purposes the traffic levels projected for the year 2021 were taken to adequately represent a mature land use/travel demand situation.

2. TRAFFIC AND HIGHWAY NOISE

Highway noise has four basic noise source variables, namely:

- the inherent noise-producing ability of a travelling vehicle, including the engine, exhaust system and wind noise
- the operation of that vehicle on the roadway
- the design of the road and its facilities including alignment, grade and pavement type
- the maintenance of the roadway, e.g. bumps, potholes, expansion joints, etc.

The sensitivities of noise related to traffic and the above-noted variables influence how much noise is generated. Some of the major sensitivities influencing noise from road sources include:

1 NSAs must have an Outdoor Living Area (OLA) associated with the residential unit. The following land uses with OLAs, would qualify as NSAs: private homes, townhouses, apartment building, hospitals/nursing homes. Source: MTO Noise Manual.

- volume of traffic - a doubling of traffic volumes results in a 3 dBA[2] increase in noise levels
- operating speed - a change of 15 km/h in operating speed results in a 2 dBA change in noise levels
- pavement type - special pavements can lower noise levels up to 2 dBA while some concrete surfaces can increase levels up to 6 dBA
- rows of buildings - an attenuation of 3 to 5 dBA is provided by the first row of buildings located between the source and receiver, depending on the density of the first row
- wood lots - an attenuation of 5 dBA is provided by each 30 m depth of trees up to 10 dBA maximum attenuation
- ground cover - where the ground between the road and the receiver is hard (e.g. pavement, water), an attenuation rate of 3 dBA per distance doubling occurs. When the ground is soft (e.g. grass, crops), 5 dBA attenuation per doubling distance occurs.

3. NOISE MODEL

3.1 Model Predictions

The noise analysis at the analysis of route alternatives stage did not directly involve use of a computer prediction model (see Section 4.2).

Noise level predictions for the Recommended Plan were generated using the Ministry of Environment and Energy's (MOEE)/MTO approved STAMINA 2.0 computer modelling program. The program, which analyses the study area as a three dimensional image, predicts noise levels from road sources as heard from the outdoor living areas (OLAs) of NSAs adjacent to the alignment. It considers numerous variables including traffic volumes, percentage of trucks, distance from roadway, grade of road, posted speed, topography, pavement type, barriers and vegetation.

3.2 Sound Level Objectives

The MOEE has established the desirable upper noise limit for all OLAs as 55 dBA. The MTO policy for new highway construction projects is based on the "MOEE/MTO Protocol for Dealing with Noise Concerns During the Preparation, Review, and Evaluation of Provincial Highway Environmental Assessments":

Where a highway construction project is proposed through or adjacent to an existing or draft approved residential area, the Ministry shall investigate the feasibility of attenuating

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2 dBA - Noise levels are predicted in decibels in the A-weighted dBA scale which best approximates the human perception of sound over a specified time period. An increase in noise levels of 2 to 3 decibels is considered to be just perceivable to the average person.

noise where impacts are significant (>5 dBA). The objective shall be to reduce noise levels, where warranted, to as close to 55 dBA or pre-construction ambient[3] as is technically or econmically feasible.

Typical mitigation measures include walls and earth berms or a combination of both.

3.3 Traffic

Future Annual Average Daily Traffic (AADT) volumes were used to predict noise levels for the MTO required 24 hour time period (Leq(24hr)). Future traffic volumes (year 2021) were derived from an analysis of existing travel patterns, use of the Region of York Travel Demand Model, and investigation of land use changes and growth expectations in Simcoe County and York Region. Traffic volumes used for the analysis are referenced from the Travel Demand Forecasts Report (Appendix A of the Highway 400-Highway 404 Extension Link Environmental Assessment Report) and are included in Appendix 1 of this report. Normally, Summer Average Daily Traffic (SADT) volumes are used for such assessments, however as part of the travel demand analysis it was concluded that future AADT and SADT volumes would not be significantly different through the corridor.

4. NOISE ANALYSIS

4.1 Noise Receiver Locations

Noise levels are predicted for NSAs at what is referred to as a receiver location. The receiver location is normally located in what is considered to be the Outdoor Living Area (OLA) of the NSA (e.g. patio deck in a back yard) and within 600 m of the proposed alignment. In areas where there is more than one house such as in subdivisions, receiver locations are selected to be representative of the houses in the area. The receiver locations identified typically represented at least one NSA in each location. Approximately 214 NSAs were identified within 600m of either side of the ROW for the Recommended Plan. Receiver locations are shown on 1:5,000 scale plans at the back of this report.

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3 Ambient sound is the all encompassing sound as heard in a given area. Ambient sound levels for areas where there is no dominant noise source is assumed as follows: rural, 45 dBA; suburban, 50 dBA; and urban, 55 dBA. Source: MTO Noise Manual.

4.2 Analysis Results

Predictions

a) Comparative Analysis for Route Segment Alternatives (used as part of the analysis and evaluation of Route Alternatives - refer to Section 4.2.3 of the main report)

This analysis was carried out to determine the relative impacts of each route segment alternative considered and was part of a comprehensive analysis examining all impacts to the environment. Noise impact was one of approximatey 130 measures used to compare route alternatives.

The change in future noise levels (i.e. future with the facility compared to future without) was predicted on the basis of the relationship between AADT volumes and distance from a roadway. Noise level curves in 5 dBA increments (from 50-70 dBA) were plotted on a traffic vs. distance graph using the STAMSON 4.1 modelling program. With these curves it was possible to predict future noise levels for comparison purposes, with a reasonable degree of accuracy for each route segment alternative considered. The noise level curves graph is included in Appendix 2 of this report.

Assuming a forecast AADT volume of 32,000 vehicles for the Link, Leq (24 hr) noise level contours (for 50, 55, 60, 65 and 70 dBA) were plotted on topographic plans for each alternative using the graph. The contours showed the number of houses which would fall within each of the 5 dBA contour ranges (i.e. between the 50 dBA and 55 dBA contour lines, 55 dBA and 60 dBA, etc.).

The analysis was carried out such that the following could be identified:

- NSAs predicted to experience noise level increases greater than 5 dBA above existing ambient conditions, 10 years after project completion;
- NSAs predicted to experience increases in noise levels which result in an absolute noise level greater than 55 dBA, 10 years after project completion; and
- NSAs predicted to experience significant construction noise problems.

Results of the noise analysis for route segment alternatives is included in Appendix 2 of this report. That is, the part of the comprehensive analysis which identified the preferred west segment alternative (CFJ) and preferred east segment alternative (JSYB), both of which ultimately formed the Recommended Plan.

b) Analysis for the Recommended Plan

Noise levels were predicted for the following scenarios:

- future noise levels without the Recommended Plan (Year 2021)
- future noise levels with the Recommended Plan (Year 2021)

For both scenarios, the future noise level predictions include noise generated from traffic forecast on adjacent crossing roads. Exhibit 1 provides a summary of predicted noise level ranges for the 24 hour period, with and without the freeway, in specific areas adjacent to the right-of-way. It also includes the number of NSAs subject to increases in noise levels for the following ranges:

- 0 - 5 dBA increase;
- 5 - 10 dBA increase; and
- >10 dBA increase

Based on the above-noted increase range, Exhibit 1 also identifies 49 NSAs where noise control measures should be investigated (i.e. area where increases exceed 5 dBA or where future noise levels exceed 55 dBA in places that would be less than 55 dBA if the facility was not in place). A summary of noise levels predicted at each receiver location is included in Appendix 3 of this report.

It should be noted that future noise level increases in the study area may be overstated. In areas where there is heavily vegetated woodlots between the Link and affected NSAs (such as River Drive Park and the residential settlement along Yonge Street north of Queensville Sideroad) a shielding factor of 3 dBA noise attenuation was assumed for NSAs. However, given the density and height of trees in the woodlots, up to 10 dBA attenuation could be provided.

This overstatement of noise levels may also be true in Bradford. As it becomes more urbanized the ambient sound level which is currently in the 45± dBA range beyond the influence of the major roads could increase as activity in newly developed areas contributes to, and begins to dominate, the ambient noise level thus narrowing the gap between future noise levels with and without the Link. That is, if future noise levels without the Link were predicted to be 45± dBA, but will more realistically be in the 50± dBA range with a more urban Bradford, and future noise levels with the Link are predicted to be 55 dBA then the real increase will be closer to 5 dBA and not 10 dBA. In addition, the infilling of undeveloped areas between the Link and existing houses will also provide a shielding of noise as a benefit to the latter thereby lowering the overall future noise level increase. This is noted in the following section discussion of mitigation.

Exhibit 1 - Summary of Predicted Noise Levels

NSA LOCALE	NUMBER OF NSAs WITHIN 600m OF PROPOSED ALIGNMENT				
Leq24hr	WITHOUT LINK	INCREASE WITH LINK IN PLACE			WITH LINK
		0-5dBA	5-10dBA	>10dBA	
HIGHWAY 400					
<45 dBA	6	5	1	0	0
45-50 dBA	2	2	0	0	1
50-55 dBA	0	0	0	0	7
55-60 dBA	2	2	0	0	0
>60 dBA	0	0	0	0	2
Subtotal by Locale	10	9	1	0	10
10 SIDEROAD					
<45 dBA	27	17	8	2	0
45-50 dBA	5	5	0	0	17
50-55 dBA	4	4	0	0	17
55-60 dBA	3	3	0	0	4
>60 dBA	8	8	0	0	9
Subtotal by Locale	47	37	8	2	47
COUNTY ROAD 4 (HWY.11)					
<45 dBA	26	11	15	0	1
45-50 dBA	9	9	0	0	10
50-55 dBA	0	0	0	0	24
55-60 dBA	8	8	0	0	8
>60 dBA	5	5	0	0	5
Subtotal by Locale	48	33	15	0	48
HOLLAND RIVER (west branch)					
<45 dBA	42	39	0	3	0
45-50 dBA	0	0	0	0	39
50-55 dBA	0	0	0	0	0
55-60 dBA	0	0	0	0	3
>60 dBA	0	0	0	0	0
Subtotal by Locale	42	39	0	3	42
HOLLAND RIVER (east branch)					
<45 dBA	33	24	4	5	5
45-50 dBA	0	0	0	0	19
50-55 dBA	0	0	0	0	4
55-60 dBA	0	0	0	0	4
>60 dBA	0	0	0	0	1
Subtotal by Locale	33	24	4	5	33
EAST of YONGE STREET					
<45 dBA	12	4	3	5	0
45-50 dBA	0	0	0	0	4
50-55 dBA	0	0	0	0	3
55-60 dBA	0	0	0	0	5
>60 dBA	0	0	0	0	0
Subtotal by Locale	12	4	3	5	12
EAST of 2nd CONCESSION ROAD					
<45 dBA	0	0	0	0	0
45-50 dBA	2	0	2	0	0
50-55 dBA	5	5	0	1	4
55-60 dBA	4	4	0	0	7
>60 dBA	11	10	0	0	11
Subtotal by Locale	22	19	2	1	22
TOTAL NUMBER OF NSAs	214	165	33	16	214

Field Tests

Although the MOEE prefers only noise level predictions using accepted modelling techniques because of its overall consistency, noise levels were measured at several locations using a sound level meter (SLM) to get an understanding of actual existing conditions in the study area. Field measurements were useful in assessing the effects of varying ground cover and identifying ambient noise levels in the study area where there is no dominant noise from road sources.

Noise levels were measured over a two day period starting on Thursday, May 22, 1997 at several locations throughout the study area. Temperatures on both days were in the 13° - 16°C range and it was sunny. However, a strong breeze on Thursday limited the use of the SLM because of the effects of wind noise.

Results of the field measurements are shown below:

Location	Measurement Period	Noise Level Range (dBA)	Comments
9th Line - 400 m west of Hwy 400	20 minutes	46	Traffic from Hwy 400 dominant noise source; comparable to levels in River Drive Park with Bypass
Vacant Lot on Arthur Evans Ct. - north of proposed alignment east of 18th Sideroad	21 minutes	43	
8th Line - 320 m west of Barrie St. (Hwy 11) in vacant lot	20 minutes	47	Majority of traffic on 8th Line destined to new subdivision; tractor operating down the road (typical of area since development began)
8th Line at Barrie St. (Hwy 11) - 21 m from centreline of 8th Line; 50 m from centreline of Hwy 11	45 minutes	59	Traffic from Hwy 11 dominant noise source.
North End of River Drive Park - north side of Queensville Sideroad	20 minutes	42	
Holborn Road - 500 m west of 2nd Concession	25 minutes	48	Agricultural activity and many birds in the area.
2nd Concession Road - 200 m north of Queensville Sideroad	20 minutes	47	Traffic from Queensville Sideroad is the dominant noise source.
Leslie Street at Holborn - 55 m from centreline of Leslie St.	30 minutes	60	Very busy throughout the day; significant truck traffic.

The above noise level measurements are only "snap shots", that is, they are representative of only a short period in time and not the required 24 hour time period that modelling provides, therefore, the levels are only indicators of the magnitude of ambient noise in the study area. The measured noise levels are, however, generally consistent with the modelled assumptions of a 45 dBA ambient noise level in rural parts of the study area.

4.3 Noise Mitigation for the Recommended Plan

Exhibit 1 indicated that approximately 49 of the 214 homes currently within 600 m of the proposed alignment will experience noise level increases greater than 5 dBA. An increase in noise levels greater than 5 dBA generally requires that noise mitigation be considered. The following summarizes MTO policy (MTO Noise Protocol) where increases exceed 5 dBA:

- investigate noise control measures within the right-of-way
- if project cost is not significantly affected, introduce noise control measures within the right-of-way
- noise control measures where introduced, should achieve a minimum of 5 dBA attenuation averaged over the first row of receivers (NSAs)

Given that the Recommended Plan has been developed only to a conceptual design level of detail the recommended noise mitigation strategy will be determined in subsequent phases of the project after the approval of this EA. However, as part of this study, where there are opportunities for implementing noise control measures, including the type of control, they have been identified (see Exhibit 2). Types of noise control measures could include: noise walls; earth berms; and low noise pavement (open friction course).

MTO Noise Protocol requires that only on right-of-way mitigation be investigated, and only where technically and economically feasible, thus in several noise sensitive areas it was considered not practical to effectively implement noise control measures. These areas typically include houses which are isolated in nature or are too far from the right-of-way for measures such as walls or berm to be cost-effective. In addition many of the affected houses are so far from the right-of-way that a barrier within the right-of-way would have negligible effect in lowering noise levels. A barrier will provide the greatest benefit if it significantly breaks the line of sight between the freeway and the receiver.

It should be noted that once this EA is approved and the corridor designated by the MTO, noise mitigation for any subsequent development of an NSA (homes, hospitals, etc.) impacted by the freeway becomes the responsibility of the developer. The developer would have to adhere to current Provincial and applicable municipal noise guidelines.

4.4 Construction Noise

Future construction activities will have the potential to result in temporary noise level increases (particularly in areas previously described as noise sensitive). At the detail design stage, the Ministry of Transportation (MTO) will carry out the following commitments:

- Noise sensitive areas will be identified.

Exhibit 2 Noise Mitigation - Recommended Plan

Area	Number of NSAs (existing houses) experiencing noise level increase of >5 dBA due to Link in 2021	Location	Opportunity for Noise Control Measures	Type of Mitigation	Rationale/ Comments
Highway 400 to 10th Sideroad	1 (Rec #4)	Midblock between alignment and 9th Line	No	--	Houses are isolated and too far away for mitigation to be effective.
10th Sideroad to Highway 11	8 (Rec #'s 7,8,8A,9,10)	Between Arthur Evans Ct. and the alignment	Yes	Berm/wall or combination	May not be economically feasible to achieve 5 dBA attenuation.
	2 (Rec #'s 13,15)	Midblock between alignment and 8th Line	No	--	Houses are isolated and too far away for mitigation to be effective.
Highway 11 to Holland River (West)	15 (Rec #'s 26,27,35)	Adjacent to 8th Line near Artesian Industrial Parkway	No	--	Development is too far away for mitigation to be effective. Future development will provide shielding of noise.
Bathurst Street to Holland River (East)	1 (Rec #42)	Adjacent to marina	No	--	House is isolated; mitigation would not be cost effective.
	2 (Rec #41)	On Bathurst Street ~600 m south of alignment	No	--	Houses front on to Bathurst which is main noise source.
Holland River (East) to East of Yonge Street	6 (Rec #'s 52-56)	On Yonge Street south of the alignment	Yes	Walls at edge of shoulder	Other measures such as berm would not be effective because alignment is on fill.
	3 (Rec #'s 57-59)	On Yonge Street north of the alignment	Yes	Walls at edge of shoulder	Other measures such as berm would not be effective because alignment is on fill.
East of Yonge Street to East of 2nd Concession	1 (Rec #45)	Midblock between Yonge and 2nd Concession south side	No		House is isolated and too far away for mitigation to be effective.
	3 (Rec #'s 63-65)	On 2nd Concession south of alignment	Yes	Berm/wall or combination	
	4 (Rec #'s 66-68)	On 2nd Concession north of alignment	Yes	Berm/wall or combination	
West of Leslie Street to Highway 404	1 (Rec #75)	Adjacent to W-N/S ramp	No	--	Alignment is on fill and house is isolated; mitigation would not be cost effective.
	2 (Rec #83)	On Holborn Road west of Leslie Street	No	--	Houses are isolated and too far away for mitigation to be effective.

- Applicable municipal noise control by-laws will be identified. Where timing constraints, or any other municipal by-law may cause hardship to MTO, an exemption will be sought.

- An initial complaint from the public will require verification by MTO that the general noise control measures agreed to are in effect; MTO will investigate all noise concerns, warn the contractor of any problems, and enforce its contract.

- Notwithstanding compliance with the "general noise control measures", a persistent complaint will require a contractor to comply with MOEE sound level criteria for construction equipment contained in the MOEE Model Municipal Noise Control By-Law. Subject to the results of field investigation, alternative noise control measures will be required, where these are reasonably available.

- In selecting the appropriate construction noise control and mitigation measures, MTO will give consideration to the technical, administrative, and economic feasibility of the various alternatives.

- Where pile driving or blasting may be necessary in noise sensitive areas monitoring will be determined an adopted by Ministry of Transportation policy pursuant to prevailing provincial legislation at the time of construction.

APPENDIX 1

TRAFFIC VOLUMES USED FOR ANALYSIS OF RECOMMENDED PLAN

Bradford Bypass
Traffic Volumes used for Noise Analysis

		AADT			2011 Hourly Volumes			2021 Hourly Volumes		
		2011	2021	configuration	Cars	MT	HT	Cars	MT	HT
Hwy400		74,000	81,000	1-way	1388	39	116	1519	42	127
Bypass	*west of Bathurst*	27,000	32,000	1-way	506	14	42	600	17	50
	east of Bathurst	31,000	43,000	1-way	581	16	48	806	22	67
Hwy11		35,000	42,000	2-way	1313	36	109	1575	44	131
Bathurst Street		10,500	13,000	2-way	394	22	22	488	27	27
Leslie Street		14,000	17,000	2-way	525	29	29	638	35	35
Hwy404	*south of Bypass*	50,000	65,000	1-way	938	26	78	1219	34	102
	north of Bypass	61,000	85,000	1-way	1144	32	95	1594	44	133

assumes: 10% trucks
25MT/75HT split on freeways
50MT/50HT split on arterials

APPENDIX 2

COMPARATIVE ANALYSIS RESULTS FOR ROUTE SEGMENT ALTERNATIVES

Comparative Analysis Results (extracted from study's analysis charts - refer to Appendix D of main report)

- West Segment (West of the Holland River) - CFJ ULTIMATELY PREFERRED BASED ON EVALUATION OF OVERALL EFFECTS
- East Segment (East of the Holland River) - JSYB ULTIMATELY PREFERRED BASED ON EVALUATION OF OVERALL EFFECTS

Completed in January 1995 (Set 13 Completed in February 1996)

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 1						ALTERNATIVE SET 2						ALTERNATIVE SET 3			ALTERNATIVE SET 4					
			AEJ	BEJ	AFJ	BFJ	CFJ	DFJ	AEK	BEK	AFK	BFK	CFK	DFK	EGL	EHL	EIL	AEL	BEL	AFL	BFL	CFL	DFL
3.3 NOISE	a) noise sensitive receivers which are predicted to experience increases in sound levels 5dBA above existing ambient conditions, 10 years after project completion	#: 6-10 dBA	13	15	34	30	25	27	15	17	36	32	27	29	23	24	31	34	36	60	56	51	53
		#: 11-15 dBA	12	5	11	7	6	14	12	5	11	7	6	14	20	18	20	27	20	29	24	24	32
		#: >15 dBA	4	3	6	5	4	4	2	1	4	3	2	2	6	5	5	7	6	7	6	5	5
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55dBA, 10 years after project completion	#	16	8	17	12	10	18	14	6	15	10	8	16	26	23	25	34	26	36	30	29	37
	c) noise sensitive receivers which are predicted to experience significant noise problems	residence-season	22	33	14	25	21	31	20	31	12	23	19	29	37	33	40	47	39	65	57	53	63

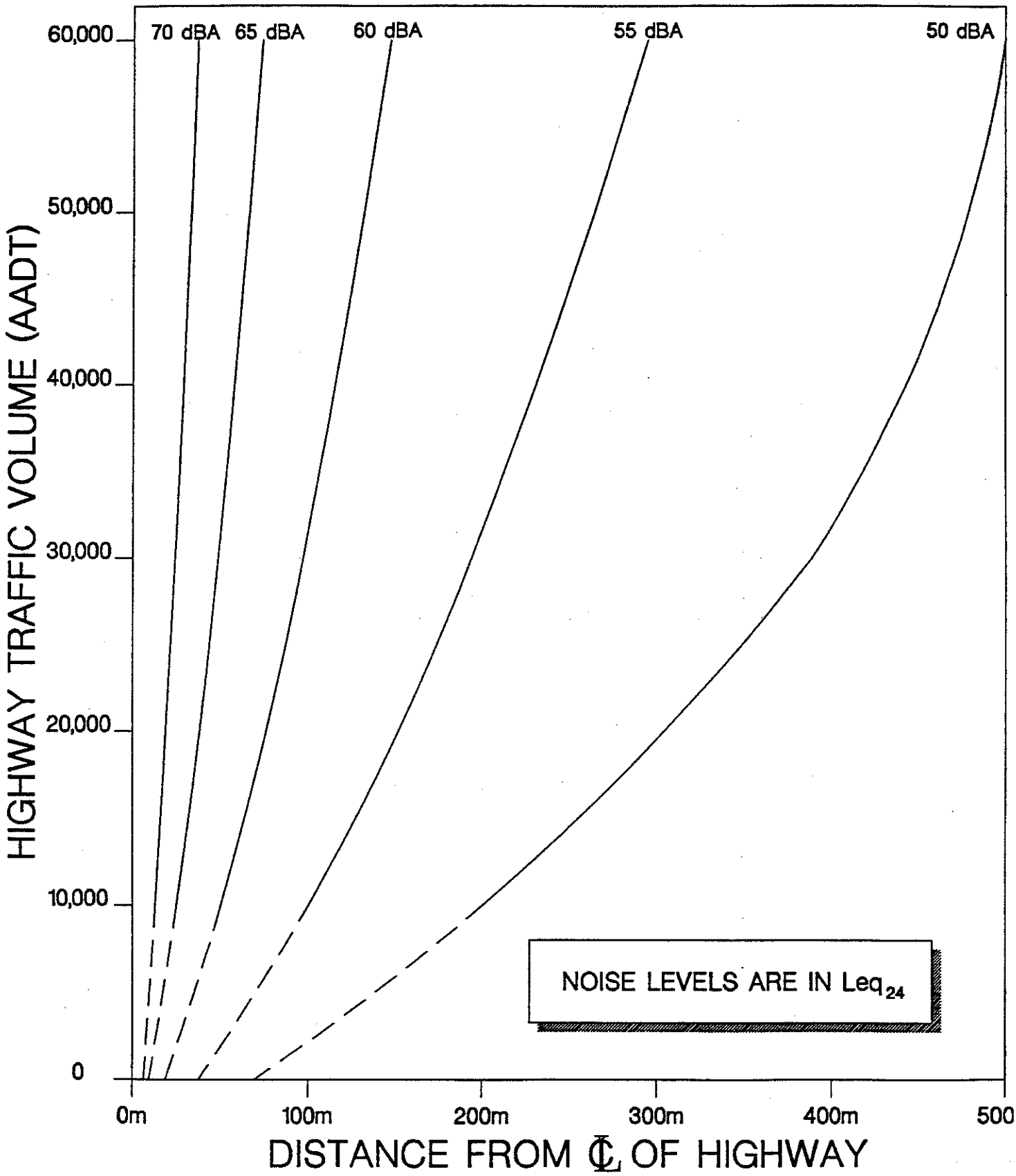
FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 5				ALTERNATIVE SET 6				ALTERNATIVE SET 7			ALTERNATIVE SET 8				ALTERNATIVE SET 9			
			JQX	JRX	JSX	JTX	KQX	KRX	KSX	KTX	LRX	LSX	LTX	JQY	JRY	JSY	JTY	KQY	KRY	KSY	KTY
3.3 NOISE	a) noise sensitive receivers which are predicted to experience increases in sound levels 5dBA above existing ambient conditions, 10 years after project completion	#: 6-10 dBA	9	13	31	67	11	15	33	68	24	37	70	11	13	31	65	13	15	33	66
		#: 11-15 dBA	8	10	13	18	8	9	12	19	16	18	24	3	8	9	14	3	7	8	15
		#: >15 dBA	3	4	3	6	4	5	5	4	4	5	5	3	3	2	5	4	4	4	3
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55dBA, 10 years after project completion	#	11	14	16	24	12	14	17	23	20	23	29	6	11	11	19	7	11	12	18
	c) noise sensitive receivers which are predicted to experience significant noise problems	residence-season	28	36	38	58	32	36	38	57	60	62	78	11	19	20	39	15	19	20	35

FACTOR / CRITERION	INDICATOR	UNIT	ALTERNATIVE SET 10			ALTERNATIVE SET 11					ALTERNATIVE SET 12					ALTERNATIVE SET 13						
			LRY	LSY	LTY	CFJQX	CFJRX	CFKQX	CFKRX	CFLRX	CFJQY	CFJRY	CFKQY	CFKRY	CFLRY	JQXC	JQYC	JRXB	JRYB	JSXB	JSYB	JUYB
3.3 NOISE	a) noise sensitive receivers which are predicted to experience increases in sound levels 5dBA above existing ambient conditions, 10 years after project completion	#: 6-10 dBA	23	37	71	31	36	34	39	78	33	36	36	39	77							
		#: 11-15 dBA	13	14	21	12	14	12	13	44	7	12	7	11	41	27*	54*	61*	95*	64*	88*	42*
		#: >15 dBA	4	4	4	4	6	5	7	9	4	5	5	6	9							
	b) noise sensitive receivers which are predicted to experience increases in sound levels which result in an absolute noise level over 55dBA, 10 years after project completion	#	17	18	25	16	20	17	20	53	11	17	12	17	50	19	7	13	11	18	13	4
	c) noise sensitive receivers which are predicted to experience significant noise problems	residence-season	43	44	60	43	51	47	51	113	26	34	30	34	96	49	42	51	43	59	56	27

* Total number of receivers with >5dBA increase

Note: CFJ combined with JSYB was identified as the Technically Preferred Route when considering all effects to the environment. Ultimately the preferred route was refined and identified as the Recommended Plan.

NOISE VERSUS DISTANCE



* IDEAL HIGHWAY: NO GRADE DIFFERENCE, 5% TRUCKS, RURAL AREA, NO INTERVENING TREES OR STRUCTURES, PEAK HOUR = 10% OF AADT

APPENDIX 3

SUMMARY OF PREDICTED NOISE LEVELS AT INDIVIDUAL RECEIVER LOCATIONS FOR THE RECOMMENDED PLAN

(Use in conjunction with 1:5,000 plans at the back of this report)

WEST SECTION

RECEIVER NUMBER		FUTURE NOISE LEVELS Leq_{24} - dBA			
		WITHOUT BYPASS	WITH BYPASS	INCREASE	INVESTIGATE NOISE CONTROL
HIGHWAY 400					
1	SOUTH	59.4	60.9	1.5	NO
2	NORTH	49.0	51.2	2.2	NO
3	SOUTH	47.0	51.8	4.8	NO
4	NORTH	45	50.1	5.1	YES
5	SOUTH	45	47.2	2.2	NO
10 SIDEROAD					
6	NORTH	45	48.1	3.1	NO
7	NORTH	45	50.4	5.4	YES
8	NORTH	45	51.1	6.1	YES
8A	NORTH	45	51.0	6.0	YES
9	NORTH	45	55.4	10.4	YES
10	NORTH	45	62.4	17.4	YES
11	NORTH	45	49.2	4.2	NO
12	NORTH	45	47.6	2.6	NO
13	SOUTH	45	50.1	5.1	YES
14	SOUTH	45	47.0	2.0	NO
15	SOUTH	45	51.1	6 1	YES
16	SOUTH	45	47.6	2 6	NO
17	SOUTH	45	49.2	4.2	NO
18	SOUTH	46.9	50.4	3.5	NO
19	SOUTH	50.4	52.5	2.1	NO
20	SOUTH	60.8	61.1	0.3	NO
23	NORTH	61.4	62.0	0.6	NO
24	NORTH	58.5	58.7	0.2	NO
29	NORTH	56.9	58.2	1.3	NO
33	NORTH	64.0	64.5	0.5	NO
HWY.11					
21	NORTH	64.5	64.6	0.1	NO
22	SOUTH	57.1	57.7	0.6	NO
25	NORTH	deleted from analysis - not required			
26	SOUTH	45	52.2	7.2	YES
27	SOUTH	45	50.4	5.4	YES
28	SOUTH	45	48.3	3.3	NO
30	SOUTH	58.3	58.9	0.6	NO
31	SOUTH	48.2	51.9	3.7	NO
32	NORTH	65.5	65.8	0.3	NO
34	NORTH	deleted from analysis - not required			
35	SOUTH	45	50.1	5.1	YES
36	SOUTH	45	45	0	NO
HOLLAND RIVER (west branch)					

EAST SECTION

RECEIVER NUMBER		FUTURE NOISE LEVELS Leq_{24} - dBA			
		WITHOUT BYPASS	WITH BYPASS	INCREASE	INVESTIGATE NOISE CONTROL
BATHURST STREET					
37	SOUTH	deleted from analysis - not required			
41	SOUTH	45	59.9	14.9	YES
42	NORTH	45	58.9	13.9	YES
43	SOUTH	45	47.2	2.2	NO
44	SOUTH	45	47.9	2.9	NO
45	SOUTH	45	45.6	0.6	NO
HOLLAND RIVER (east branch)					
46	SOUTH	45	45.0	0.0	NO
47	SOUTH	45	45.0	0.0	NO
48	SOUTH	45	45.5	0.5	NO
49	SOUTH	45	46.2	1.2	NO
50	SOUTH	45	49.1	4.1	NO
51	SOUTH	45	49.8	4.8	NO
52	SOUTH	45	51.3	6.3	YES
53	SOUTH	45	53.4	8.4	YES
54	SOUTH	45	55.1	10.1	YES
55	SOUTH	45	56.0	11.0	YES
56	SOUTH	45	60.2	15.2	YES
57	NORTH	45	59.7	14.7	YES
58	NORTH	45	54.9	9.9	YES
59	NORTH	45	59.7	14.7	YES
60	NORTH	45	48.2	3.2	NO
EAST of YONGE STREET					
38	SOUTH	deleted from analysis - not required			
39	SOUTH	deleted from analysis - not required			
61	SOUTH	45	51.2	6.2	YES
62	SOUTH	45	48.7	3.7	NO
63	SOUTH	45	54.1	9.1	YES
64	SOUTH	45	55.1	10.1	YES
65	SOUTH	45	56.8	11.8	YES
66	NORTH	45	58.0	13.0	YES
67	NORTH	45	56.0	11.0	YES
68	NORTH	45	54.5	9.5	YES
69	NORTH	45	47.5	2.5	NO
EAST of 2nd CONCESSION					
40	SOUTH	deleted from analysis - not required			
70	SOUTH	56.3	57.1	0.8	NO
71	SOUTH	57.7	58.4	0.7	NO
72	SOUTH	53.6	55.8	2.2	NO
73	SOUTH	61.5	62.6	1.1	NO
74	SOUTH	62.7	64.0	1.3	NO
75	SOUTH	52.4	62.8	10.4	YES
76	SOUTH	61.5	63.9	2.4	NO
77	SOUTH	60.1	64.7	4.6	NO
78	NORTH	60.4	62.1	1.7	NO
79	NORTH	53.1	55.8	2.7	NO
80	NORTH	57.1	58.3	1.2	NO
81	NORTH	53.5	54.7	1.2	NO
82	NORTH	61.5	62.0	0.5	NO
83	NORTH	46.5	52.4	5.9	YES
HIGHWAY 404					

BRADFORD BYPASS - NOISE PLAN

TECHNICALLY PREFERRED ALIGNMENT

THIS PLAN IS SUBJECT TO PUBLIC REVIEWS. THE ALIGNMENT MAY UNDERGO MODIFICATIONS AS A RESULT. ALL INFORMATION SHOWN ON THE PLAN SHOULD BE TREATED ACCORDINGLY.

HIGHWAY 400

9 th LINE

8 th LINE

SIDEROAD (TOWN ROAD)

NOTTAWASAGA LAKE SIMCOE CONSERVATION REGION CONSERVATIO

600m

11+500

12+000

12+500

13+000

13+500

14 LOCS

R=420

R=100

B=5000

9 th LINE

8 th LINE

HIGHWAY 11

600m

600m

13+500

14+000

14+500

5+000

15+500

16+000

16+500

R=6000

R=76

R=250

R=1000

N-E

N-W

S-W

S-E

NORTH

TECHNICALLY PREFERRED ALIGNMENT

THIS PLAN IS SUBJECT TO PUBLIC REVIEWS. THE ALIGNMENT MAY UNDERGO MODIFICATIONS AS A RESULT. ALL INFORMATION SHOWN ON THE PLAN SHOULD BE TREATED ACCORDINGLY.

REET

SCALE: 1:5,000

TECHNICALLY PREFERRED ALIGNMENT

THIS PLAN IS SUBJECT TO PUBLIC REVIEWS. THE ALIGNMENT MAY UNDERGO MODIFICATIONS AS A RESULT. ALL INFORMATION SHOWN ON THE PLAN SHOULD BE TREATED ACCORDINGLY.

HIGHWAY 11

ARTESIAN INDUSTRIAL PARKWAY

C.N. RAIL

WEST BRANCH

HOLLAND RIVER

8th LINE

REALIGNED HOCHREITER ROAD

JUNICIPAL WELL

5+000

15+500

16+000

16+500

17+000

18+000

18+500

600m

R=70

R=250

R=1000

R=1600

McCORMICK RANKIN

Project : Proposed Bypass W.O. : 2341-21

Description : Key Plan - West Leg

Scale : 1:5,000 Date : JAN 1997

WEST LEG



BRADFORD BYPASS - NOISE PLAN

HOLBORN ROAD

2nd CONCESSION ROAD

YONGE STREET

MORGAN'S ROAD

SILVERLAKES GOLF COURSE

NORTH

600m

R=2200

R=2000

22+000

22+500

23+500

24+500

25+000

TECHNICALLY

THIS PLAN IS SI
THE ALIGNMENT
AS A RESULT
THE PLAN SHOU

38 (DELETED)

39 (DELETED)

SCALE: 1:5,000

HOLBORN ROAD

DISLE STREET

WOODBIN

600m

600m

24+500

25+000

25+500

25+800

26+500

N/S-W

S-W

N-W

W-N

R=200

R=200

R=400

R=420

R=1600

R=100

TECHNICALLY PREFERRED ALIGNMENT

THIS PLAN IS SUBJECT TO PUBLIC REVIEWS. THE ALIGNMENT MAY UNDERGO MODIFICATIONS AS A RESULT. ALL INFORMATION SHOWN ON THE PLAN SHOULD BE TREATED ACCORDINGLY.

THE ALIGNMENT FOR PROPOSED HIGHWAY 404 EXTENSION IS UNDER A SEPARATE STUDY. THE ALIGNMENT SHOWN HERE MAY BE REVISED IN THE COURSE OF THAT WORK.

HIGHWAY 404 EXTENSION (PROPOSED)

40 (DELETED)

McCORMICK RANKIN
Project : Bridges & Grks, W.O. : 22431
Description : Wide Plan - East Leg
Scale : 1:5000 Date : Jan 97

EAST LEG

APPENDIX I

Economic Impact Analysis

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK

ECONOMIC IMPACT STUDY

Part A: Existing Conditions & Survey Results

December, 1996

HEMSON

INTRODUCTION

An Environmental Assessment is currently being prepared for a proposed new highway link between Highways 400 and 404 near the Town of Bradford West Gwillimbury (referred to as the Highway 400-404 Link). Alternative routes under consideration all pass to the north of Bradford (Map 1).

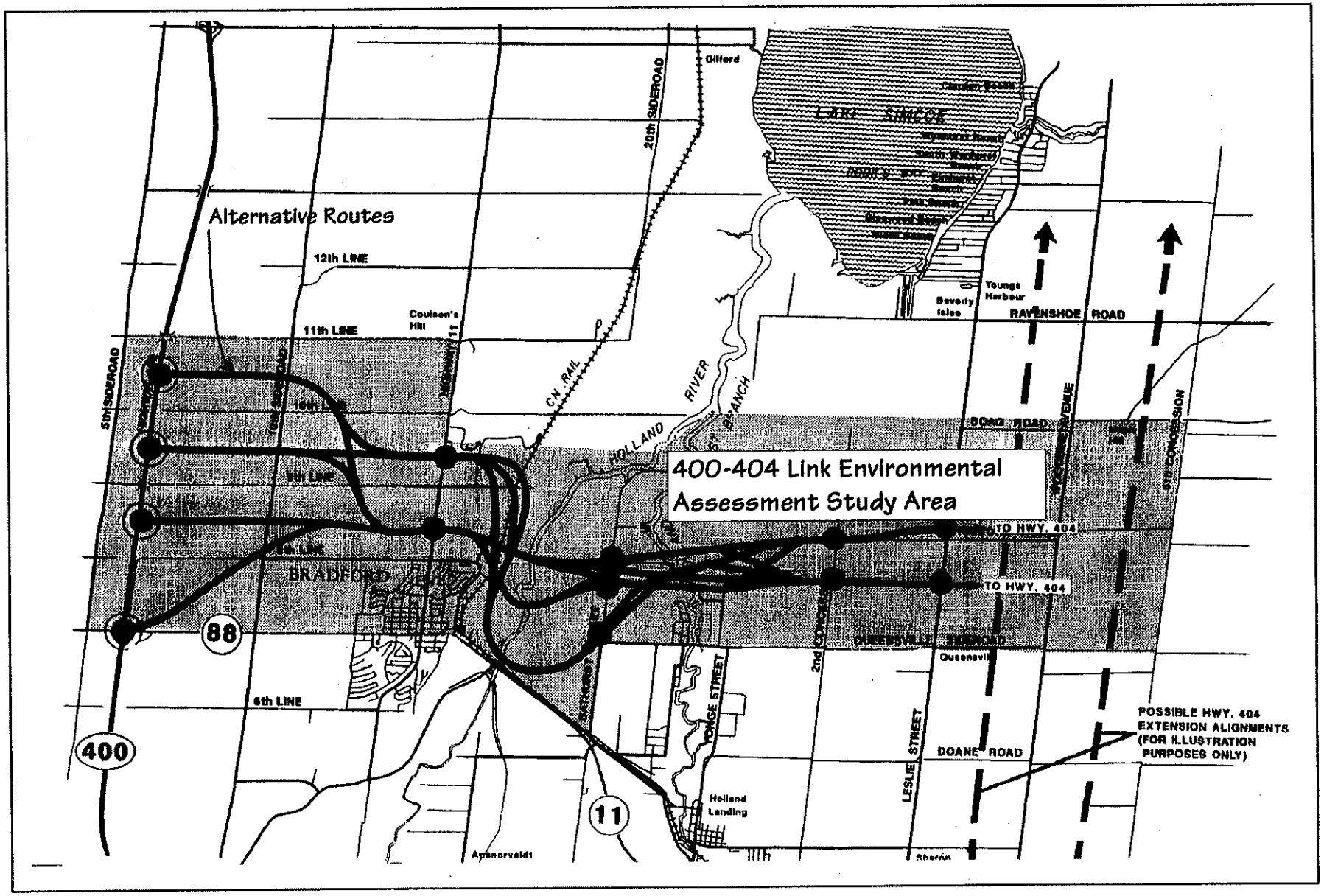
McCormick Rankin has been retained by the Ministry of Transportation to undertake this Environmental Assessment. The process by which it is undertaken involves many tasks that include a broad range of engineering, environmental, social, and economic issues. Hemson Consulting Ltd. is working with McCormick Rankin to address the latter aspect.

This interim report (Part A) provides background economic information as input to the route evaluation process and to contribute to the understanding of the potential impact of the proposed 400-404 Link within Bradford West Gwillimbury. Specifically this report:

- Provides an overview of past, current, and future economic and demographic conditions in the Town of Bradford West Gwillimbury; and
- Summarizes the results of a survey that was undertaken of the study area business community. The results of this survey were presented to Town Council, the Chamber of Commerce and the HEART (Heritage, Environment, Agriculture, Recreation and Tourism)committee, a local citizens group. A second report (Part B) addresses the economic analysis component of the study.

When finalized, this report will be included in the overall Environmental Assessment Report for the road proposal. For further information regarding the overall study, contact Mr. Steve Jacobs of the Ministry of Transportation of Ontario, phone (416)235-5522, fax (416) 235-4940, or email jacobss@gov.on.ca.

MAP 1


Alternative Routes
400-404 Link Environmental Assessment Study Area
LAKE SIMCOE
Gilford
20th SIDEROAD
12th LINE
11th LINE
Coulson's Hill
5th SIDEROAD
C.N. RAIL
HOLLAND RIVER
EAST BRANCH
Young's Harbour
Beverly Isles
RAVENSHOE ROAD
BRADFORD
88
400
6th LINE
TO HWY. 404
TO HWY. 404
2nd CONCESSION
5th CONCESSION
YONGE STREET
LESLIE STREET
DOANE ROAD
Holland Landing
11
POSSIBLE HWY. 404 EXTENSION ALIGNMENTS (FOR ILLUSTRATION PURPOSES ONLY)

ECONOMIC TRENDS & CONDITIONS

The overall study area for the Environmental Assessment covers a large part of the Town of Bradford West Gwillimbury (Map 1). The Town of Bradford is the focus of the overall economic and demographic trends for the study area. A more detailed analysis of business activity within the study area focuses on the commercial corridor located directly on Holland Street/Bridge Street through the town..

A. BRADFORD WEST GWILLIMBURY IS A RAPIDLY GROWING TOWN AT THE EDGE OF THE GTA

In the 20 years up to 1991 Bradford West Gwillimbury experienced an increase in population from 6,700 to 17,700 with an average annual growth rate of 5 per cent. In the past few years, however, the town has experienced more rapid growth (6 per cent annually from 1986 to 1991) and has recently been projected to be one of the fastest growing municipalities within Simcoe County.

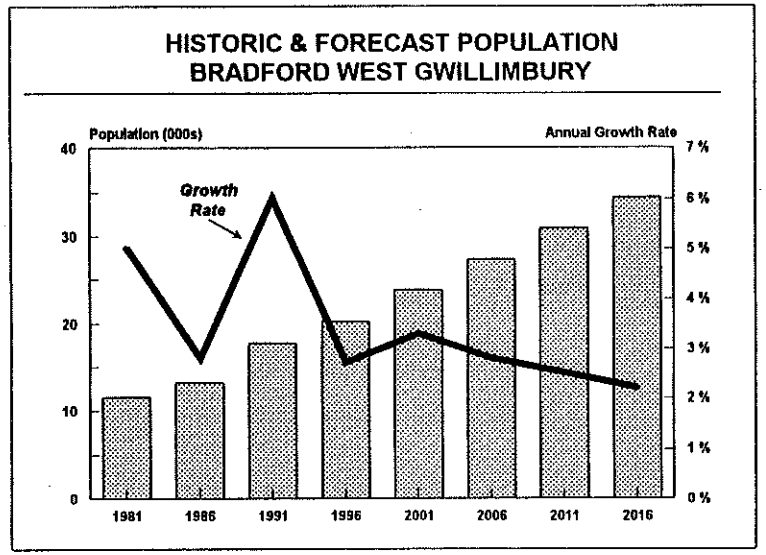
HISTORIC POPULATION GROWTH

	Bradford West Gwil.	Avg. Annual Growth Rate	Simcoe County	Avg. Annual Growth Rate
1971	6,700		171,400	
1976	9,000	6.1%	210,700	4.8%
1981	11,500	5.0%	225,100	1.3%
1986	13,200	2.8%	238,400	1.2%
1991	17,700	6.0%	288,700	3.9%

Source: Statistics Canada, 1971 to 1991 Census

As noted in a recent report entitled *Growth Outlook for Simcoe County*[1] Bradford West Gwillimbury and the City of Barrie are anticipated to be the two fastest growing municipalities in Simcoe. The greatest influence on the long term outlook for the town will be the movement into Simcoe of people from the Greater Toronto Area (GTA), primarily York Region, who are attracted by the value of new homes in the community. As illustrated in the following chart the Town's population is expected to more than double over the next 20 years to 36,400.

[1] *Growth Outlook for Simcoe County*, Hemson Consulting Ltd., December 1995, updated May 1997

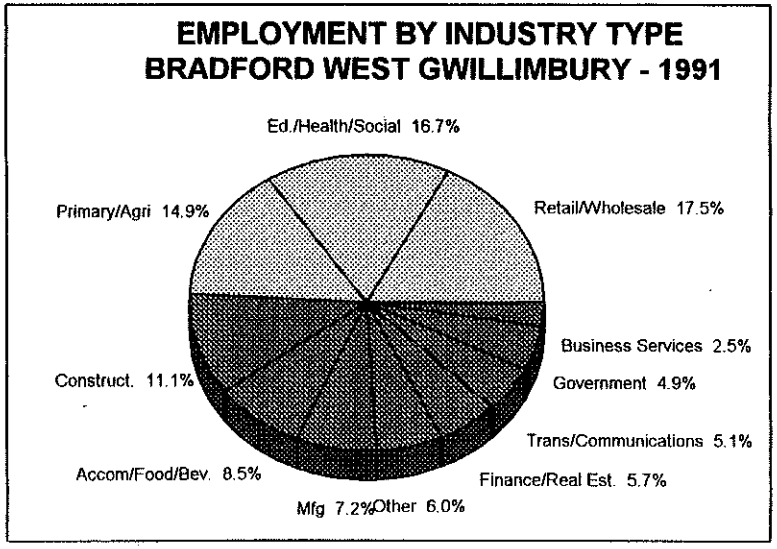


Source: Growth Outlook for Simcoe County, Hemson Consulting Ltd., Dec. 1995, updated May 1997

Bradford West Gwillimbury's future growth is strongly influenced by future growth in the Greater Toronto Area due to the town's location on the northern edge of this large economic area containing over 4.6 million people. Population growth in the GTA continues to be very strong. Over the next 20 years forecasts indicate the GTA's population will rise to over 6.3 million people[2]. As the GTA's population grows so to will its geographical area of influence. Municipalities currently at the edge of the GTA, such as Bradford West Gwillimbury, will therefore increasingly become a part of the GTA economy.

B. BRADFORD HAS A SIGNIFICANT SHARE OF EMPLOYMENT IN PRIMARY INDUSTRIES

Historically, Bradford West Gwillimbury has primarily been a rural and residential community. This characteristic is evidenced by the fact that 15 per cent of the town's employment is in primary industries, most notably agriculture, due to the town's proximity to



Source: Statistics Canada, 1991 Census

[2] *Source: The Outlook for Population & Employment in the GTA, Hemson Consulting Ltd. & Coopers & Lybrand, August 1993*

the Holland Marsh. Many communities with populations of about 20,000 in southern Ontario typically have less than 5 per cent of their employment based in primary industries.

The approximately 4,200 people who worked in Bradford West Gwillimbury in 1991 generate an activity rate (employment to population ratio) of approximately 24 per cent. In contrast Barrie has an activity rate of 60 percent while other towns such as Midland and Orillia have rates of 65 per cent. A low activity rate is an indication that the town's resident labour force is commuting to other municipalities for employment. Midland and Orillia are more isolated from the GTA and are able to provide significantly more employment opportunities.

C. TOTAL EMPLOYMENT WILL DOUBLE IN BRADFORD WEST GWILLIMBURY

Although the rate of employment growth is anticipated to remain high in the future, the dominant pattern of residents commuting to work elsewhere is expected to continue. Within Simcoe County the City of Barrie is expected to become a dominant economic centre for much of north central Ontario. Immediately to the south of Bradford West Gwillimbury, the GTA, especially York Region, will continue to provide numerous employment opportunities to local residents. Therefore, because of the close proximity of these two economic centres a high proportion of Bradford's residents will continue to commute to other municipalities for employment.

FORECAST EMPLOYMENT & POPULATION GROWTH
Bradford West Gwillimbury

	Employment	Avg. Annual Growth Rate	Activity Rate	Population	Avg. Annual Growth Rate
1991	4,500		25%	17,700	
1996	5,200	2.9%	24%	21,600	4.1%
2001	6,230	3.6%	25%	25,300	3.2%
2006	7,300	3.2%	25%	29,000	2.8%
2011	8,400	2.8%	26%	32,700	2.4%
2016	9,400	2.3%	26%	36,400	2.2%

Source: Growth Outlook for Simcoe County, Hemson Consulting Ltd., Dec. 1995, updated May 1997.

BRADFORD'S COMMERCIAL ACTIVITY IS FOCUSSED ALONG HOLLAND ST./BRIDGE ST.

As noted in the previous section the more detailed analysis of business activity within the Environmental Assessment study area focuses on the commercial corridor along Holland Street/Bridge Street. This commercial corridor extends east of Highway 400 along Highway 88 for 9 kilometres to Bathurst St. (Map 2) and includes the Bradford business community.

A survey of businesses in this commercial corridor was undertaken to assist in evaluating the economic impact of the proposed bypass. The commercial corridor is comprised of three general areas:

- Downtown: generally bounded by Church St. to the west and Bingham St. to the east.
- West: Area west of Church to Highway 400
- East: Area east of Bingham St. to Bathurst St.

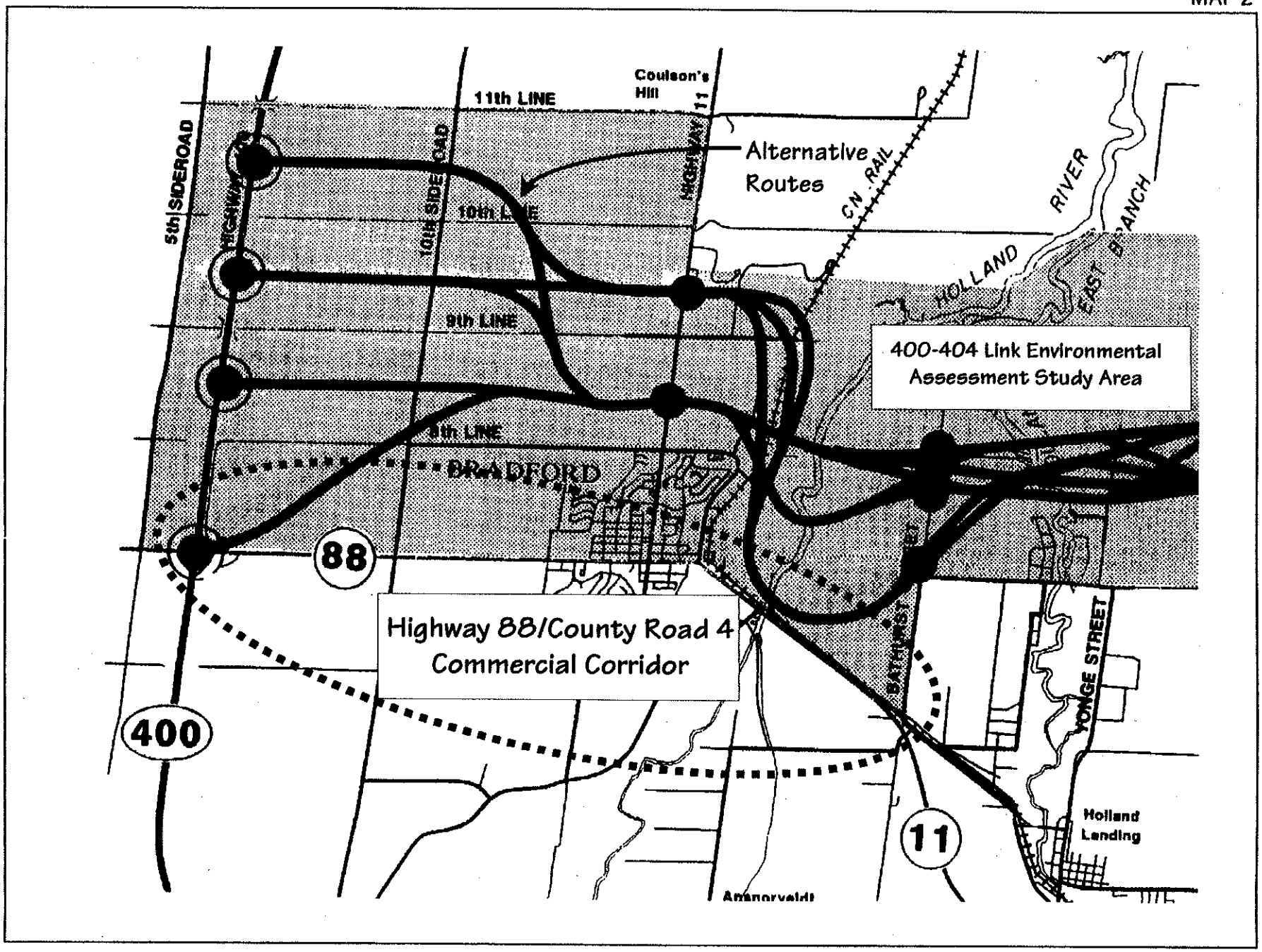
In August 1996 surveys were distributed in person to all of the nearly 140 businesses in the study area. A copy of this survey is provided in Appendix A. While the businesses were given the opportunity to respond to the survey by FAX, or with a postage paid envelope, initially only 27 surveys were completed. In order to increase the response rate a return visit was made to the town in September 1996. In addition many businesses were contacted by telephone throughout the month of September. A final visit was made in October. As indicated in the following table 119 surveys were completed of the 139 that were distributed.

SURVEY RESPONSE RATE

	Number of Businesses	
Completed Surveys	119	86%
Refused to Respond	5	3%
Did Not Complete Survey	15	11%
Total Businesses	139	100%

Note: An 86% response rate is a very good rate for a survey of this type, and provides a sound basis for subsequent analysis.

MAP 2


Coulson's Hill
11th LINE
Alternative Routes
5th SIDEROAD
10th SIDEROAD
10th LINE
9th LINE
8th LINE
C.N. RAIL
RIVER
HOLLAND
EAST BRANCH
400-404 Link Environmental Assessment Study Area
BRADFORD
88
Highway 88/County Road 4 Commercial Corridor
400
BATHURST
YONGE STREET
11
Holland Landing

This section summarizes results of the surveys and illustrates the make-up of business activity in the corridor. Individual results of the survey will not be provided publicly due to the confidentiality of information provided by the businesses. However, an aggregated summary of results by business type is provided in Appendix B. No further attempt will be made to obtain completed surveys from those businesses who have yet to respond. Conclusions, as well as estimates of revenues and employment for businesses that did not complete the survey, will be based upon 86 per cent of businesses which did complete the survey.

A. THE HOLLAND STREET/BRIDGE STREET CORRIDOR SERVES PRIMARILY AS A LOCAL SERVICE CENTRE

In terms of business activity and employment the Holland Street/Bridge Street commercial corridor primarily serves the local area residents. As illustrated in the table below retail stores, personal services establishments and restaurants account for over 65 per cent of the establishments surveyed.

BUSINESSES BY TYPE IN STUDY AREA

Business Activity	Number of Businesses	% of Total
Retail	44	32%
Restaurants/Bars	26	18%
Personal Services (banks, dentists etc.)	25	18%
Grocery and Convenience Stores	14	10%
Automotive Related	14	10%
Business Services	7	5%
Other Transportation	5	4%
Motels	3	2%
Manufacturing	1	1%
Total	139	100%

Some businesses do provide goods and services both to local customers and to those from outside the community. These include businesses which are furthest from the town's core especially the automotive/gas stations, motels, fruit & vegetable markets including those associated with the Holland Marsh, and a large plastics manufacturer located north of Highway 88 on 10th Side road. With these exceptions, the corridor, and the entire town, does not have any significant attraction (shopping mall, tourist sites) for people from beyond the Bradford West Gwillimbury area.

Each business, in the survey, was asked to estimate the proportion of annual revenues derived from local customers as opposed to customers from beyond the Bradford area. The results of this question confirmed that the economy in Bradford West Gwillimbury is very localized with, on average, 70 per cent revenues estimated by respondents as being generated from local customers.

B. STUDY AREA PROVIDES MANY EMPLOYMENT OPPORTUNITIES

Based upon the businesses who completed the survey it is estimated that there are 1,265 people working in the study area (based upon an average of 9 employees per business of those businesses who reported). The number of employees increases in the summer months when businesses hire approximately 150 additional people. The table below provides a breakdown of estimated employment by business type from the 119 completed surveys.

ESTIMATED BY BUSINESS TYPE IN STUDY AREA

Business Activity	Employment	Avg. Per Business
Retail	260	6
Personal Services (banks, dentists etc.)	125	5
Restaurants/Bars	335	13
Grocery and Convenience Stores	220	16
Automotive Related	125	9
Business Services	35	5
Other Transportation	55	11
Motels	40	13
Manufacturing	70	70
Total	1265	9

C. COMMERCIAL CORRIDOR CONTRIBUTES SIGNIFICANTLY TO LOCAL ECONOMY

Question 18 of the survey addressed annual gross revenues of the surveyed businesses. This question was sought in order to obtain an indication of how significant from a financial standpoint the study area is to the local economy. Due to the sensitivity of this financial information only 53 businesses responded to this question.[3] However, it has been estimated that the business community along the Holland

[2] *Based on the data provided estimates of gross revenues were made for those businessess who chose not to respond. The reader should be cautioned that this is only a 'best guess" estimate.*

Street/Bridge corridor generates over $96 million in annual gross revenues. This would suggest that the Holland Street/Bridge Street corridor injects a significant amount of money in the local economy.

ESTIMATED GROSS ANNUAL REVENUES OF BUSINESSES BY TYPE IN STUDY AREA

Business Activity	Gross Annual Revenues (millions $)
Retail	$ 22.4
Personal Services (banks, dentists etc.)	12.2
Restaurants/Bars	9.4
Grocery and Convenience Stores	18.8
Automotive Related	22.0
Business Services	3.5
All Other Businesses	7.8
Total	$ 96.1

C. VISUAL EXPOSURE TO TRAFFIC AN IMPORTANT FACTOR FOR STUDY AREA BUSINESSES

While study area businesses stated that approximately 70 per cent of customers and revenues are derived from the local area Holland Street/Bridge Street is also considered by them to play a significant role in the local economy. The average share of annual gross revenues that was considered by respondents to be the result of visual exposure to drive-by traffic was just over 50 per cent. As well 75 per cent of businesses also rated visual exposure to drive-by traffic as "very important". These factors will be considered by respondents in more detail in determining the impact of future changes to traffic levels along Holland Street/Bridge Street in Part B of the study.

INTERIM CONCLUSIONS & NEXT STEPS

As a rapidly growing town that is situated on the edge of Canada's largest economic centre, and which lies within the fastest growing county in southern Ontario, Bradford West Gwillimbury will change substantially over the next 20 years. By 2016 forecasts suggest that the town will have doubled in size to over 35,000 people. A 20 year time frame also reflects the fact that the timing of construction of the link has not been determined, and may be many years in the future. This report provides a foundation for determining the effects of the proposed link. Key conclusions to this point include:

- Bradford West Gwillimbury has been and will continue to be a rapidly growing town. The town's future growth will be highly influenced by strong growth in Simcoe County and in the GTA.

- The economy in Bradford West Gwillimbury is highly localized. Primary industries, in particular agriculture, continue to provide significant employment opportunities while other sectors such as retail trade, education, health and social services serve the local community. Employment will double into the future[4] but will not alter the current pattern of people commuting to larger urban areas such as Barrie and York Region to work.

- Holland Street/Bridge Street corridor businesses are major contributors to the local economy providing over 1,250 jobs and generating over $96 million in gross annual revenues. Based upon a survey of businesses the corridor primarily serves the local community.

In Part B of the economic impact study an analysis of potential economic effects of the proposed link on the local business community is documented. Since the link will provide an alternative route to Holland Street/Bridge Street when it is built the effect on employment and business revenues along the Holland Street/Bridge Street corridor is a key issue. More importantly the issue of future growth levels will play a key role in determining the economic impacts of the bypass since the town is forecast to grow rapidly with or without its construction.

[4] *Source: The Growth Outlook for Simcoe County, Hemson Consulting Ltd., December 1995, updated May 1997*

APPENDIX A:

BUSINESS SURVEY

HEMSON

BRADFORD BY-PASS
ENVIRONMENTAL ASSESSMENT STUDY

Planning and Preliminary Design Study

SURVEY OF LOCAL BUSINESS COMMUNITY

PART A: IDENTIFICATION

Company Name: _____

Address: _____

Phone #: _____ Fax # _____

Contact Person: _____

PART B: NATURE OF YOUR BUSINESS

1. First, would you briefly describe the nature of your business. Specifically, what types of goods and services do you provide?

   _____

   _____

   _____

   _____

   _____

2. How long has the business been operating?

   Under present owner _____ years.
   Under previous owner _____ years.

3. Do you operate year-round? Yes: _____ No: _____

   If **NO**, during which months are you open for business?
   From _____ to _____

4. Does the ***volume*** of your business change from season to season?

   Yes: _____ No: _____

If **YES**, estimate the percentage of total gross revenues collected in each of the four seasons:

Spring: _____ %
Summer: _____ %
Fall: _____ %
Winter: _____ %

Total 100 **%**

5. Including yourself, how many people do you employ? Total: _____

a. Year-round:

Full-time: _____
Part-time: _____

b. Summer Season:

Full-time: _____
Part-time: _____

6. What trends or changes have you noticed in your business over the last 5 to 10 years? (in terms of: type of customers, volume of business, seasonality of business, etc.)

_____

_____

_____

7. What share of your business revenues are from local customers (as opposed to tourists and people passing through Bradford)? _____ %

8. Does the **LOCAL** share of your ***revenues*** change with the seasons, if so, please indicate below:

During the summer _____ % of revenues are local
During the winter _____ % of revenues are local
In an average year _____ % of revenues are local

9. Have you made physical improvements or expanded your business in the past five or so years? If **YES**, please describe.

_____

_____

_____

_____

10. What, if any, plans do you have for changing or expanding your business over the next five years or so?

_____

_____

_____

_____

_____

PART C: PROFILE OF YOUR CUSTOMERS

11. Please describe the main character of your customers (e.g. local residents, commuters on the way to work, local trades people/renovators, etc.).

_____

_____

_____

12. How do your customers travel to your business?

Automobile _____ %
Other (bus, walking, etc.) _____ %

13. What percentage of your customers are local (i.e. live in the Bradford area)? _____ %

14. Do you advertise beyond Bradford (e.g. Southern Ontario newspaper, in provincial, federal publications, trade journals, etc.)? If so, please describe:

_____

_____

_____

_____

PART D: ROLE OF HIGHWAY 88/11

15. Of your customers that drive to your business, what share make a left or right turn to get into your site?

    Right turn into your site _____ %
    Left turn into your site _____ %

16. How important is it to have visual exposure to drive-by traffic on Highway 88/11?

    Very _____
    Somewhat important _____
    Not important _____

17. What share of your total annual gross revenue depends on visual exposure to drive-by traffic on Highway 88/11 _____ %

18. What were the approximate total gross revenues of your business last year? _____. ***Please remember that the results of this survey are kept in the strictest of confidence.***

19. A Bradford By-Pass has been publicly discussed for many years. Have you participated in any of these previous discussions?

    Yes: _____ No: _____

20. What changes to your business, if any, would you make, assuming a Bradford By-Pass is to be built?

    _____

    _____

    _____

    _____

    _____

Thank you for taking the time to complete this questionnaire. It is greatly appreciated.

If you have any questions or concerns regarding this survey please call David MacLeod, collect, at Hemson Consulting Ltd. (416)593-5090.

APPENDIX B:

SUMMARY OF RESULTS

HEMSON

SUMMARY ANALYSIS OF BUSINESS SURVEY

Business Type	Average Years Open	Employees					Avg. Share of Revenues From Locals	Importance of Visual Exposure			Estimated share of Revenue from Visual Exposure on 11/88
		Year-Round			Additional Summer			Very	Some	Not	
		Full Time	Part Time	Total	Full Time	Part Time					
Auto Related	15	77	27	104	0	0	63%	83%	17%	0%	61%
Business Services	9	25	10	35	2	0	72%	29%	43%	29%	22%
Grocery/Convenience	16	57	133	190	1	44	73%	58%	25%	17%	55%
Manufacturing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Motel	21	13	25	38	0	76	32%	100%	0%	0%	65%
Other Transportation	20	23	22	45	0	6	57%	75%	25%	0%	57%
Personal Services	9	45	64	109	0	0	81%	76%	14%	10%	60%
Restaurants	7	85	179	264	3	9	72%	75%	20%	50%	50%
Retail	9	110	99	209	0	11	67%	82%	13%	50%	52%

Note: ***These results area based upon 119 businesses who completed the survey (86% of 139 businesses in the study area).***
The above analysis is only based on firms who responded to each questions. Some businesses chose not to respond to some of the questions asked.
Summary responses have been aggregated by business type. Disaggregated results could not be published due to the confidentiality of some answers.

HIGHWAY 400 TO HIGHWAY 404 EXTENSION LINK

ECONOMIC IMPACT STUDY

Part B: Economic Effects of Future 400-404 Link

July 1997

HEMSON

INTRODUCTION

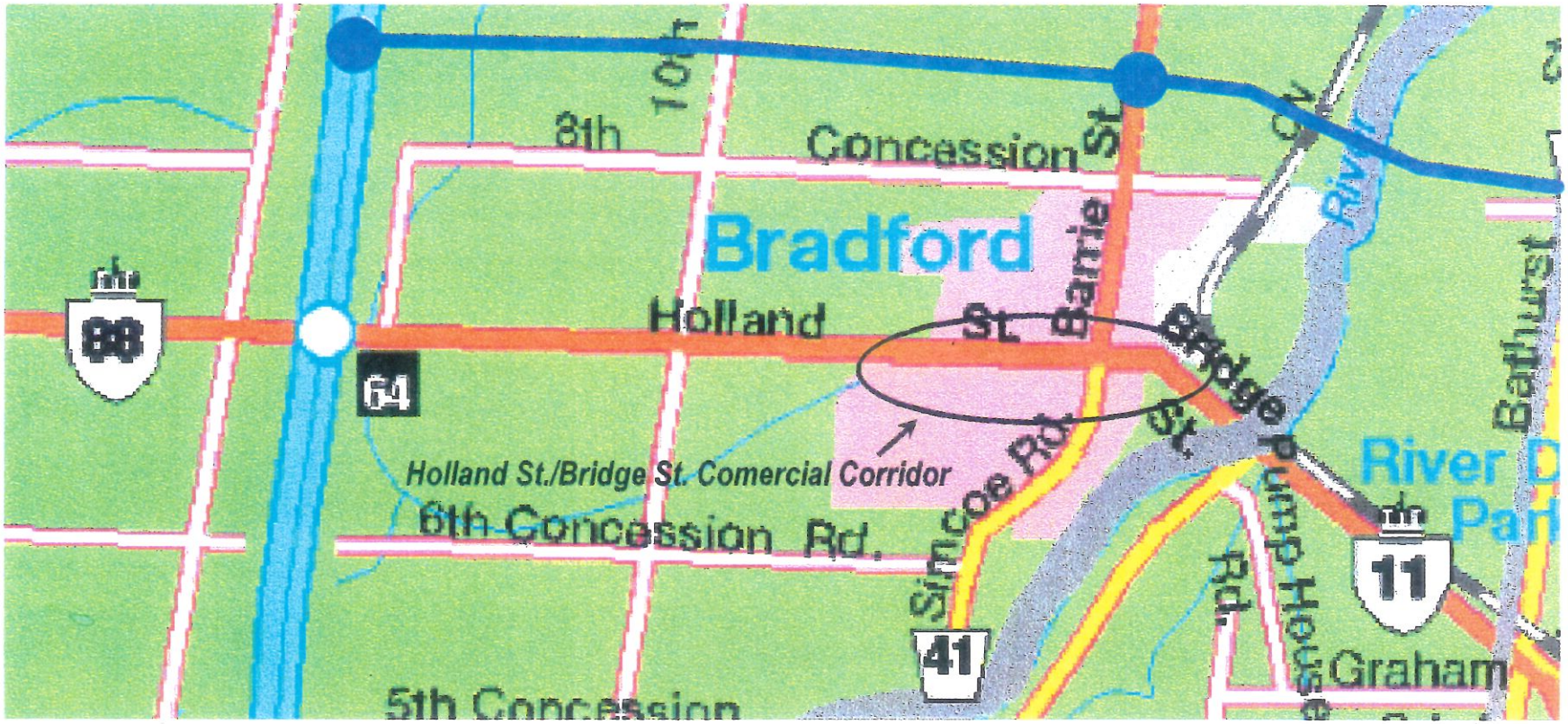
An Environmental Assessment is currently being prepared for a proposed new highway link between Highways 400 and 404 near the Town of Bradford West Gwillimbury (referred to as the Highway 400-404 link). A technically preferred route has been chosen and is illustrated in Map 1.McCormick Rankin has been retained by the Ministry of Transportation to undertake this Environmental Assessment. The process by which it is undertaken involves many tasks that include a broad range of engineering, environmental, social, and economic issues. Hemson Consulting Ltd. is working with McCormick Rankin to address the latter aspect.

This report (Part B) is the second of two reports being prepared for the economic component of the Environmental Assessment. It will assess the economic effects of the technically preferred alignment of the proposed 400-404 link. The first report, *Part A: Existing Conditions & Survey Results*, was prepared in June 1996. The following are some of the key conclusions from that report:

- Bradford West Gwillimbury has been and will continue to be a rapidly growing Town. The Town's population will rise from a current level of 20,200 to over 34, 000 in the next 20 years.
- The economy in Bradford West Gwillimbury is highly localized. Employment levels will rise but the pattern of local residents commuting to other larger urban areas or employment will continue.
- Businesses in the Holland Street/Bridge Street (formerly Highway 11/Highway 88) corridor currently provide over 1,250 jobs and contribute over $96 million dollars per year to the local economy.

This report, *Part B: The Economic Effects of the Future 400-404 Link*, examines in more detail the possible effects of the future bypass on the the local economy and more specifically the Holland Street/Bridge Street corridor businesses. When finalized, the Part A and Part B reports will be included in the overall Environmental Assessment Report for the road proposal. The findings of this report will also be presented to Town Council, the Chamber of Commerce and the HEART (Heritage, Environment, Agriculture, Recreation and Tourism) Committee, a local citizens group in the Town of Bradford West Gwillimbury. For further information regarding the overall study, contact Mr. Steve Jacobs of the Ministry of Transportation of Ontario, phone (416)235-5522, fax (416) 235-4940, or email jacobss@gov.on.ca.

LOCATION OF THE TECHNICALLY PREFERRED ROUTE



Recommended Route for Proposed 400-404 Link

Full Interchange

ASSESSING THE OVERALL EFFECTS OF THE BRADFORD BYPASS

The 400-404 link study is to protect an appropriate right of way for the future roadway. There has been no decision or commitment to a construction schedule, but it is unlikely to be built for several years. For the purposes of assessing economic issues it may be assumed that a twenty year time frame (ie. 2016) provides an adequate reference framework to consider the impact of the new route on the Town. Assessing the exact effects the link will have on the local economy today for 2016 is difficult since twenty years is an extremely long period in the lifetime of a business. It is likely that many of the businesses that are operating today will not be in existence in 2016, while many others will have been established. Furthermore, the high growth environment in which Bradford West Gwillimbury is situated makes a proper assessment of the bypass' potential effects even more difficult. As noted in the following sections, the growth outlook for Bradford West Gwillimbury, especially in the intervening period until the bypass is constructed, will have as much effect on the local economy as will the link when it is built in 2016. The possible effects that the link will have on the local economy must be assessed in light of the future growth the Town will experience over the next 20 years

A. BRADFORD WILL GROW WITH OR WITHOUT 400-404 LINK

- ***Census Confirms Bradford West Gwillimbury Fast Growing Community***

The 1996 Census results were released in April of this year. As anticipated Bradford West Gwillimbury continues to experience high rates of population growth. In the period between 1991 and 1996 the Town's population grew at a rate of 2.7 per cent, from 17,700 to 20,200. The Town's annual rate of growth was equal to the county-wide rate of 2.7 per cent. This is significantly higher than the provincial rate of 1.3 per cent.

- ***Updated Forecasts Suggest Town Will Double in Size***

Forecasts which were prepared by Hemson Consulting for Simcoe County in December 1995 have been updated to incorporate the results of the 1996 Census. As indicated in the following table it is predicted that the Town will increase from its present size of 20,200 to 34,400 by 2016. Employment levels will continue a similar growth pattern to population, more than doubling current levels over the next 20 years. Much of this employment will been concentrated in sectors which service the local population. This is typical for committees of this size next to the GTA which provides more of the office and employment lands employment.

UPDATED EMPLOYMENT & POPULATION FORECASTS
Bradford West Gwillimbury

	Population	Avg. Annual Growth Rate	Employment	Activity Rate	Avg. Annual Growth rate
1991	17,700				
1996	20,200	2.7%	4,900	24.1%	
2001	23,800	3.3%	5,900	24.6%	3.8%
2006	27,300	2.8%	6,900	25.3%	3.3%
2011	30,900	2.5%	7,900	25.7%	2.8%
2016	34,400	2.2%	8,900	25.8%	2.2%

Source: Reference Forecast, Growth Outlook for Simcoe County, Hemson Consulting Ltd., Dec. 95, updated May 1997.

- ***Bradford West Gwillimbury will be Part of a Major Economic Region***

Bradford West Gwillimbury is one of many municipalities which are part of the fastest growing county in Ontario*. Simcoe County has, and continues to, experience tremendous population growth. Forecasts suggest that over the next 20 years Simcoe may grow from its 1996 population of 329,000 to between 475,000 and 587,000. This amount of growth will have major implications for the economy of Simcoe as well as its local municipalities.

* *Note: The only two upper tiers which grew at a faster rate between 1991 and 1996 were the Regions of Peel and York.*

- ***Future Traffic Levels on Holland Street/Bridge Street will Rise***

In conjunction with high levels of population growth traffic levels on Holland Street/Bridge Street will undoubtedly rise. Traffic volumes on Holland Street/Bridge Street have, over the past 30 years, grown at a rate similar to the rate of Bradford's population growth. As growth continues pressures will be placed upon Holland Street/Bridge Street to accommodate increased local traffic and to maintain its role as a provincial highway facilitating traffic passing through the Town.

B. HOLLAND STREET/BRIDGE STREET CORRIDOR WILL STRENGTHEN AS A LOCAL SERVICE CENTRE

- ***As Suggested by Survey Results Holland Street/Bridge Street serves as a Local Service Centre***

As indicated in *Part A: Existing Conditions & Survey Results* businesses in the Holland Street/Bridge Street corridor reported, on average, that two-thirds of their revenues came from local area customers. This confirms that the Holland Street/Bridge Street business corridor primarily serves the local economy. In fact all sectors, with the exception of the accommodation sector reported that between 57 and 81 per cent of their revenues were generated locally.

- ***Continued Strong Population Growth will Solidify this Position***

Over the next 20 years high levels of population will continue to provide a larger local customer base for all Holland Street/Bridge Street corridor businesses. Strong population growth will provide a number of opportunities for existing commercial establishments to enhance their business. As the local community is the primary market for the Holland Street/Bridge Street corridor, continued local growth should result in increased volumes for most businesses.

- ***Strong Growth will Likely Result in Increased Competition***

Increased growth of the local population may suggest continued growth for all businesses in the Holland Street/Bridge Street corridor since it is primarily a local service provider. However, as Bradford West Gwillimbury's population grows the Town will become more attractive to new commercial/retail ventures. Increased growth on its own is positive to existing businesses, but it will also bring with it increased competition. This competition may come in many forms:

- ***Retail Mall*** - Unlike other Town's with a population of 20,000 (e.g. Orangeville, Lindsay) Bradford West Gwillimbury does not have an indoor retail mall. Continued population growth may fuel demand for such a facility.

- ***New Format Retailing*** - 'Big-box', warehouse retailing is a major growth format in today's retail sector. Other Towns in close proximity to major provincial highways (Cookstown factory outlet stores) have experienced pressure from these stores to locate in their community.

- ***Large Chains & Franchise Stores*** - As municipalities increase in size they develop trade areas large enough to attract regional and national chains.

C. HOW WILL THE LINK ALTER THIS OUTLOOK

- ***Potential for Even Stronger Population Growth***

As suggested earlier in this section Bradford West-Gwillimbury is forecasted to grow substantially over the time during which the proposed 400-404 link would be built. While it is difficult if not impossible to predict exactly how the link will affect the Town's outlook in or after 2016 the following points provide the range of scenarios that could unfold:

- ***Potential for Increased Exposure*** - As a major link in the east west traffic flow through Central Ontario, between Highways 400 and 404, the Town will experience increased exposure to greater volumes of traffic. The 400-404 link will carry between 30,000 and 40,000 vehicles daily providing local businesses with the potential for increased exposure. Increased exposure may result in a greater awareness of the Town to potential new residents.

- ***Improved Access*** - Over the next twenty years, as the GTA grows in population and the built up/urban area expands Bradford West Gwillimbury will increasingly become more closely tied to the largest economic centre in Canada. With the construction of the 400-404 link the urban area Town will be located on the provincial system of 400 series highways. This will facilitate more efficient links between the built up parts of Town and all other major economic centres located with the 400 series system of highways.

- ***Key County Centre*** - Due to its proximity to the GTA and its location at the southern edge of the fastest growing county in Ontario, the link will provide the Town with a distinct locational advantage for attracting new economic investment to the area. Improved access will solidify Bradford West Gwillimbury's position within Simcoe, the fastest growing county in Ontario.

THE TRANSPORTATION EFFECTS OF THE TECHNICALLY PREFERRED ROUTE

A. CURRENTLY HOLLAND STREET/BRIDGE STREET FACILITATES EAST-WEST TRAFFIC WITH A GOOD LEVEL OF SERVICE

In Bradford West Gwillimbury the Holland Street Bridge Corridor is a 4-lane urban roadway with numerous entrances and intersections as well as parking in the curb lane (Map 2). West of the Corridor, Holland Street becomes Highway 88, a two land rural arterial County Road 4 (called Barrie Street within Bradford) also goes north of Holland Street as a 2-lane arterial road. With its connection to CR4, Holland Street/Bridge Street is a major route facilitating east-west traffic through southeastern Simcoe County and northern York Region.

- ***Current Traffic and Service Levels Along Holland Street/Bridge Street Vary***

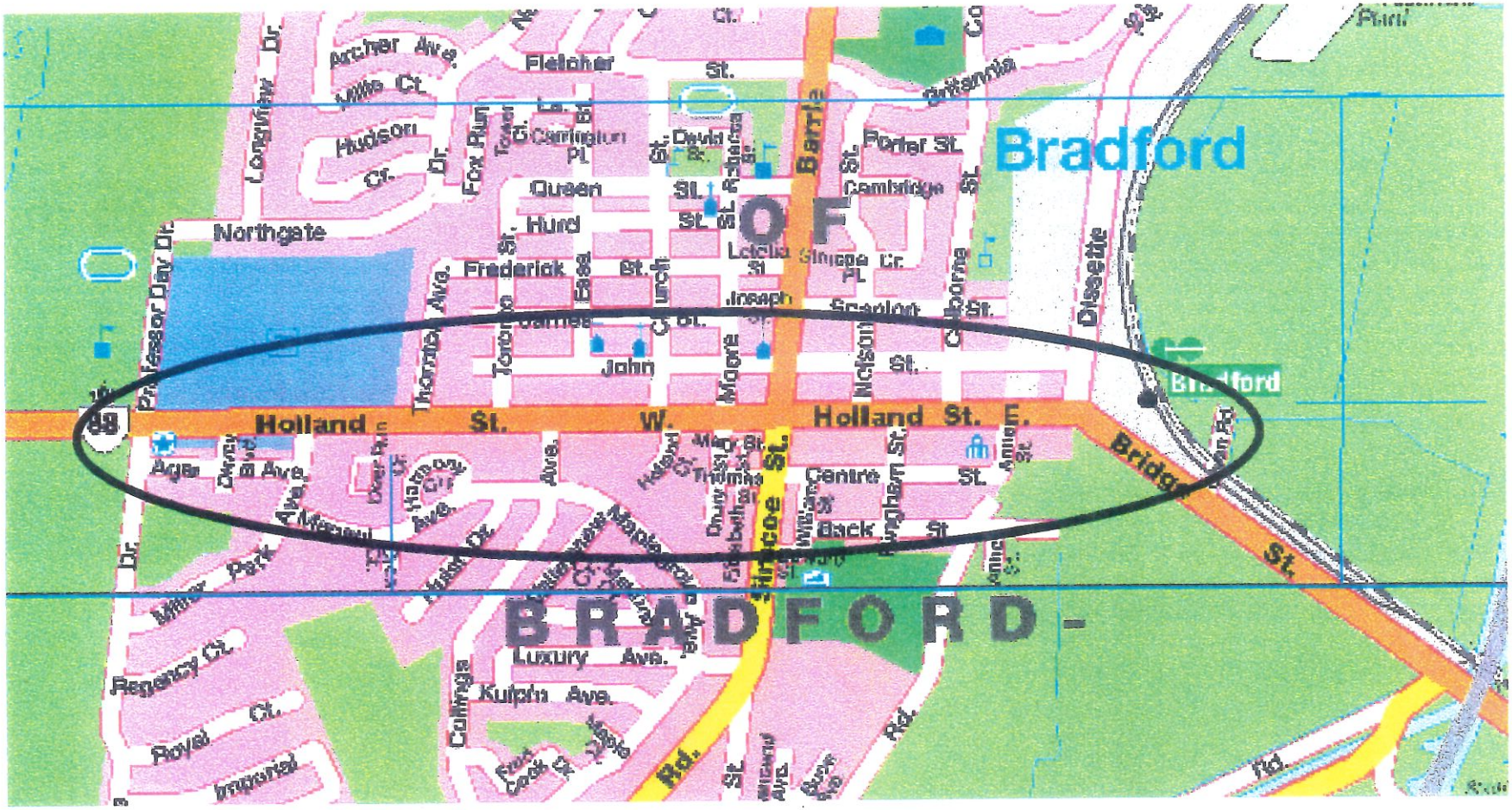
  The following outline variations in levels of traffic and service levels along sections of Holland Street/Bridge Street through the study area:

  - ***Highway 88 West*** - Average annual daily traffic (AADT) on Highway 88 west of Bradford is 9,000 vehicles (1992 counts), with summer volumes averaging 10,800 vehicles per day. Vehicle capacity for the 2-lane section of Highway 88 is in the range of 20,000 to 24,000 AADT. Therefore service levels on this section are good and there is sufficient capacity to handle forecast 2011 volumes based on historic growth patterns.

  Highway 88 Within Urban Bradford - Within urban Bradford Highway 88 absorbs local traffic as it forms the "main street" for the Town. Downtown Bradford presently experiences significant traffic delays during peak periods resulting in long queues and congestion because provincial, regional, and local traffic use the route. This is a problem during both commuter and recreational peak periods.

  Highway 88's operations are affected not only by demand but also several physical constraints to its capacity within Bradford, such as on-street parking, driveways, traffic signals, and pedestrian crossings. These constraints all reduce the ability of the route to facilitate through demand, and there are no reasonable alternative routes available. This is particularly true for the Highway 88 intersection with Barrie Street which experiences long delays during peak periods.

HOLLAND STREET/BRIDGE COMMERCIAL CORRIDOR



Barrie Street East of 88 - Traffic volumes along this section are 23,900 AADT, and are 9,000 AADT to the north. While service levels are currently satisfactory on Barrie Street, it is somewhat constrained at the intersection with Highway 88. Future (2011) forecast demands indicate that east of Highway 88 the practical capacity of Barrie Street will be reached before the 2011 time frame. The intersection at Highway 88 will be congested at most times of the day. The level of service on the rural section of Barrie Street north of Highway 88 will be good, similar to that on Highway 88 west of Bradford.

B. FUTURE TRAFFIC SERVICE LEVELS WILL BE CONSTRAINED

As indicated earlier in this report Bradford West Gwillimbury is forecast to nearly double its population over the next 20 years. This level of growth will undoubtedly have an effect on future traffic and levels of service on the current highway network.

- ***Identified Deficiencies will Continue***

  The identified traffic deficiencies along Highway 88 in the core area of Bradford are expected to continue as growth occurs in Simcoe County and York Region to the point that traffic will increasingly infiltrate local streets and, because there is no alternate route for through traffic, local traffic may begin to avoid the downtown area.

C. 400-404 LINK WOULD ALLEVIATE CONSTRAINTS ON HOLLAND STREET/BRIDGE STREET

The implementation of the 400-404 Link will provide the needed capacity to relieve Highway 88 of a number of burdens it currently and is forecast to experience.

- ***East-West Commuter Traffic Relief***

  The burden of accommodating long distance commuter east-west trips (both weekday and weekend) will be shifted from Highway Holland Street/Bridge Street to the 400-404 link. Future forecast volumes with the link in place indicate that traffic volumes on Highway 88 will stabilize as it changes to a roadway primarily serving regional and local travel demand.

- ***Core Area will Remain Constrained***

  Growth on Holland Street/Bridge Street will be limited by the constraints through the core area, but since such traffic will primarily be locally generated there exists several options for managing demand. This is an issue which is often best addressed through the municipal planning process.

- ***Holland Street/Bridge Street will Serve Local & Regional Function When Link Opens***

  When the 400-404 link opens there will be only marginal changes to current traffic levels. However, it is likely that in the intervening years traffic volumes will rise although they will be limited by capacity constraints through Bradford. Once in operation the 400-404 link will allow Holland Street/Bridge Street to serve a more local and regional function as long distance commuters will rely on the provincial freeway system which the new link will be part of.

EVALUATING THE ECONOMIC EFFECTS OF THE TECHNICALLY PREFERRED ROUTE

As noted earlier in this report assessing the economic effects of a highway link that will not be open for at least 20 years is very difficult. Attempting to predict the direct economic effects on key economic variables such as revenues and employment is an even more complicated task. While recognizing these difficulties, this chapter presents a range of scenarios and discusses the possible direct effects that the future link will have on the Holland Street/Bridge Street business corridor.

A. BUSINESSES WITH DEPENDENCE ON TRAFFIC MORE SUSCEPTIBLE TO TRAFFIC VOLUME CHANGES

- A major change to traffic activity such as the proposed 400-404 link can have significant implications for businesses with a heavy reliance on traffic. A key factor which could result in the Holland Street/Bridge Street business community experiencing negative effects as a result of the construction of the 400-404 link is a high dependency on drive-by long distance traffic. In conjunction with large decreases in AADT a business with high dependency on drive-by traffic will experience significant negative effects. In the case of Holland Street/Bridge Street this is not anticipated to happen for the following reasons:

1. ***Few Businesses have Major Dependence on Traffic*** - As revealed by the business corridor survey few businesses rely heavily on drive-by traffic. However, as shown in the table below, sectors such as accommodation and other transportation which have the highest dependency on drive by traffic, could potentially lose 40 to 70% of their business. While other sectors will be less affected it is still possible that some individual businesses within these sectors could be adversely affected.

ESTIMATED GROSS REVENUES DEPENDENT ON DRIVE- BY TRAFFIC - HOLLAND STREET/BRIDGE STREET BUSINESSES

Sector	Total Revenues	% Revenues From Traffic	Estimated Revenues From Traffic
Accommodation	$0.2	68%	$0.1
Other Transportation	$7.6	43%	$3.2
Auto-related	$22.0	38%	$8.4
Retail	$22.4	31%	$6.9
Business Services	$3.5	28 %	$1.0
Restaurant	$9.4	28%	$2.6
Grocery/Convenience	$18.8	27%	$5.1
Personal Services	$12.2	19%	$2.3
Manufacturing	n/a	n/a	n/a
Total	***$96.1***		***$29.6***

Source: Highway Holland Street/Bridge Street Business Survey, December 1996, updated July 1997

2. ***Current Traffic Levels will be the Same in 2016*** - Even if a Holland Street/Bridge Street business has a high dependency on drive-by traffic, forecasts for Holland Street/Bridge Street in twenty years, the earliest possible date the 400-404 link will open, show that there will be only marginal changes to current traffic levels. This is because the new link will more efficiently accommodate east-west travel through the Bradford area thus allowing Holland Street/Bridge Street to return to a more local serving traffic route.

3. *Revenues in Intervening Years May Rise* - While traffic forecasts suggest that traffic volumes will return to current levels on Holland Street/Bridge Street once the 400-404 link opens, in the intervening years traffic volumes will likely rise in conjunction with the high levels of population growth which are anticipated for Bradford West Gwillimbury and Simcoe County. However, the rise in traffic will be marginal as at current volumes the road is already almost at capacity. Until the 400-404 link is built the Holland Street/Bridge Street corridor will continue to provide service to local, regional, and provincial traffic through this area. As a result while businesses are likely to experience an increase in revenues most of it will be attributable to the growth in the local community.

4. ***Sufficient Preparation Time to Mitigate Effects*** - There will be a long lead time during which the plans for the new road will be known. Therefore there will be adequate opportunity for the municipality and individual businesses to prepare development plans to reflect the link's ultimate presence. Some of the possible mitigation actions could include:

- ***Signing:*** Through the use of roadside signs travellers on the new 400-404 Link can be informed of nearby destinations in Bradford such as the downtown, hotels, gas stations etc.

- ***Restriction of Uses Along New Link:*** The new link will be a controlled access divided highway with access only possible at major interchanges. As such no new businesses will be able to locate along the highway.

- ***Interchange Control:*** The Ministry of Transportation maintains land use control within 1 km of any major interchange on the 400 series highways. Proper land use controls can minimize the potential effects on the existing Bradford business area.

CONCLUSION

The proposed 400-404 link to the north of Bradford will be a significant addition to the provincial 400 series highway. When it opens it will facilitate the east west movement of traffic between the two major highways leading north south from the Greater Toronto Area. This new link will undoubtedly have a significant effect on southern Simcoe County, and especially on the Town of Bradford West Gwillimbury.

This report has assessed the economic effects of the new link that are likely to occur when it is constructed. As discussed, evaluating the precise effect a highway that will not be built until after 2016 is a difficult task. However this report has highlighted a number of potential scenarios which may result when the link opens. The most important factor which has been taken into consideration throughout this evaluation is the fact that Bradford West Gwillimbury will undergo significant change in the intervening years leading up to 2016. The Town will grow from a current population of 20,200 to over 34,000 before the link is built.

In summary, the key conclusions of this report are:

- When the 400-404 link opens there will be only marginal changes to current traffic levels. However, it is likely that in the intervening years traffic volumes will rise although they will be limited by capacity constraints through Bradford. Therefore, ultimate volumes on Highway 88 are unlikely to be higher than current levels. As a result local businesses will experience increased activity more as a consequence of population growth than from the marginal changes in traffic volumes. Increased traffic in the intervening years in conjunction with continued population growth will, however, provide local businesses significant opportunity for attracting new clientele.

- The 400-404 link may present a significant opportunity for businesses to take advantage of the increased level of exposure as a resulting from the large volumes of traffic that will pass by the Bradford area. When built the link will carry between 30,000 and 40,000 vehicles (AADT) as compared to the 10,000 AADT on Highway 88 today.

- According to a survey of local businesses, on average 70 per cent of revenues are generated locally while 30 per cent of revenues are directly dependent upon Highway 88 traffic passing through Town. While little change will occur in Highway 88 traffic, even after the link is built, the significant increase in the local population will result in related revenues.

The economic effects on the local business corridor in Bradford West Gwillimbury from the proposed 400-404 link are likely to be quite modest. This is primarily because in the interim growth in the local population and traffic volumes in general are likely to generate sufficient additional business revenues to make up for and probably exceed any potential declines attributable to the diversion of traffic onto the new link. However, it has been recognized that some individual businesses could be adversely affected by the new link. However, potential mitigation measures such as signing and land use restrictions along the new link and at major interchanges could minimize these effects.

The 400-404 link will have an effect on the overall economy of Bradford West Gwillimbury. The link will improve access for those coming to the Town and for those travelling from Bradford to other nearby destinations. As a result the link may accelerate growth in a community which is already growing at a fast pace. Increased growth will result in increased demand locally for goods and services.

APPENDIX J

Historical and Archaeological Assessment

SUMMARY of FINAL TECHNICAL REPORT
CULTURAL ENVIRONMENT

EXISTING CONDITIONS,
DATA COLLECTED,
and
PRELIMINARY ASSESSMENT

ROUTE SELECTION PHASE

BRADFORD BY-PASS

ROUTE PLANNING AND ENVIRONMENTAL STUDY

W.P. 377-90-00

The Landplan Collaborative Ltd.
Guelph, Ontario

and

Ruth Zaryski Jackson
Environmental Planner - Archaeology and Heritage Unit, MTO

June 17, 1997
(final report date - August 23, 1996)

SUMMARY of FINAL TECHNICAL REPORT - CULTURAL ENVIRONMENT

Following is a concise summary of the Final Technical Report prepared and submitted, August 23, 1996. The topics covered by that report included:
Historical Resources - a general description and findings, built environment features, an assessment and discussion of significance and sensitivities, an impact analysis of route alternatives, the preferred route impact analysis and appropriate mitigation and options;
Cultural Landscapes - covering the same topics as above;
Summary - Preferred Route Impact Analysis and Mitigation; and
Future Work (Preliminary Design Phase of the Assessment).

Appendices attached included:
A Selected Bibliography, a Built Environment Classification System, Interpreting Built Heritage Record Forms, Built Heritage Record Forms, Cultural Landscape Impact Significance Definitions, Cultural Landscape Record Forms, Impacts of Route Alternatives on Built Heritage Features and on Cultural Landscapes, and Acknowledgements.

Figures and tables are also incorporated including historic maps, and summaries of the built heritage features and cultural landscapes, impacts on same, and mitigating measures.

The study of heritage resources was carried out as part of the route planning investigations associated with the Environmental Assessment for the Bradford Bypass/Transportation Corridor. This investigation of heritage resources incorporated the intent of the *Guidelines on the Man-Made Heritage Component of Environmental Assessments*, *The Environmental Reference Book: Historical Resources*, and the *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments*.

Information sources included results of an associated route planning study Highway 404 Extension, W.P. 299-89-00; windshield surveys and detailed survey of all sites in the study area by the Historical Planner in 1990 and 1991; archival and library research on the historical background of the study area by the Historical Planner in 1990 and 1991; verbal and written communication with a variety of federal and provincial agencies and interested historical organizations.

Numerous groups were contacted including: Tecumseth & West Gwillimbury Historical Society, East Gwillimbury Historical Society, Heritage East Gwillimbury (LACAC), Sharon Temple Museum, York Pioneer & Historical Society, Heritage Georgina (LACAC), Georgina Historical Society & Museum, West Gwillimbury Township, Environmental Assessment Co-ordinator, MCTR, Heritage Branch, Canadian Inventory of Historic Building Section, Environment Canada.

Parts of the study area were settled as early as 1798, and Yonge Street was opened from York to Pine Fort (Upper Landing) near Lake Simcoe in 1795.

One hundred and fifteen (115) built environment features of varying heritage significance were

identified in the study; 17 exceptionally significant, 16 moderately significant, and 82 of ordinary significance. No historical sites in the study area had been designated under the *Ontario Heritage Act*.

Type of Feature	Level of Significance			Total
	Exceptional	Moderate	Ordinary	
Residence and/or Farmstead	11	16	70	97
Church and/or Cemetery	6	0	0	6
Barn/Shed	0	0	12	12
Total	17	16	82	115

In the assessment of the preferred route, it scored approximately at the midpoint of impacts to built heritage features ("4" on a scale from "1" to "7") and relatively high for impacts to cultural landscapes ("31" on a scale from "18" to "39").

No built heritage features received a direct impact as none was located within the proposed right-of-way. Two "exceptional" built heritage features received impacts of a contextual nature due to their proximity to the proposed right-of-way and an interchange. The impacts appear to be ones that could be partially mitigated with sensitive landscape treatments.

Cultural landscapes received relatively high impacts, with three cultural landscape units of relatively high sensitivity being affected. Partial mitigation of these impacts, however, appears to be feasible. The preferred route generates a moderate impact on the cultural environment and one that can be partially mitigated through design of the highway and through improvements to the landscape context.

An Archaeological Assessment of the Proposed Bradford Bypass Yonge Street to East Holland River Town of East Gwillimbury Regional Municipality of York

Submitted to

Ecoplans Limited
Kitchener, Ontario

Prepared by

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(File #:96EP-01)

July 1997

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AN ARCHAEOLOGICAL ASSESSMENT OF THE PROPOSED BRADFORD BYPASS, YONGE STREET TO EAST HOLLAND RIVER TOWN OF EAST GWILLIMBURY, REGIONAL MUNICIPALITY OF YORK

1.0 INTRODUCTION

Archaeological Services Inc. was retained by Ecoplans Limited of Kitchener, Ontario to conduct a Stage 2 archaeological assessment of the proposed Bradford Bypass from Yonge Street to the East Holland River (Figure 1). The assessed right-of-way is 600 metres long and 100 metres wide (Figure 2).

The assessment was conducted under the project direction of Mr. Martin Cooper and the field direction of Dr. Shaun Austin in May, 1997. The weather was variable, windy and mild all three days. Fieldwork was conducted in accordance with the *Ontario Heritage Act* (1990) under an archaeological consulting licence (97-017) issued to Archaeological Services Inc.

2.0 PREVIOUS RESEARCH IN THE VICINITY OF THE STUDY AREA

The site information data base of the Canadian Heritage Information Network and the files of Archaeological Services Inc. were consulted in order to identify any sites that have been previously registered on or within two kilometres of the study area. While no sites have been registered within the bypass area, 14 sites have been registered within a two-kilometre radius (Table 1). Having noted the presence of these sites, their historical context may be understood by reviewing the major chronological and cultural designations of Native occupation of southern Ontario in Appendix A.

TABLE 1: SITES WITHIN A TWO-KILOMETRE RADIUS

BORDEN NUMBER	SITE NAME	CULTURAL AFFILIATION
BaGu-1	Harvey Graham Cemetery	Mid-19th Century Ojibwa. Also a Middle Woodland Component
BaGu-3	Orpel	Middle to Late Archaic
BaGu-4	Swezie	Historic Native
BaGu-5	Thompson	Historic Euro-Canadian. Late 19th Century
BaGu-6	Drive-In	Early Archaic
BaGu-12	Upper Landing	Unknown
BaGu-14	James	Woodland
BaGu-44	Swasey	Historic Euro-Canadian. 1820-1874
BaGu-45	Blue Heron	Unknown Prehistoric
BaGu-47	Gleason	Historic Euro-Canadian. Early to Mid 19th Century
BaGu-51	Oriole	Unknown Prehistoric

TABLE 1: SITES WITHIN A TWO-KILOMETRE RADIUS		
BORDEN NUMBER	SITE NAME	CULTURAL AFFILIATION
BaGu-52	Toucan	Unknown Native
BaGv-18	Scanlon Creek	Paleoindian?
BaGv-26	Romanelli	Late Woodland

The Lower Landing of the east branch of the Holland River also has numerous historical associations (Hunter 1979:21). Following a trading pattern that pre-dated the contact period, aboriginal people such as the Iroquois, Mississauga, and Ojibwa, used the Holland to gain access to the Toronto Carrying Place, an important portage route that linked Lake Ontario to Lake Simcoe. In particular, the Lower Landing was a favourite camping place where the French and English traders met the aboriginal people to barter for furs (Hunter 1979:23). Later, after treaties had been conducted to purchase land from the Mississauga and Ojibwa in advance of European settlement, the government distributed their annual payments to the aboriginal people at the Lower Landing, eventually moving this ceremony to Penetanguishene (Rolling 1967:22; Hunter 1979:23).

After the province of Upper Canada was established in 1793, goods in transit between Lake Ontario and Lake Huron were transferred at the Lower Landing to large bateaux for transportation across Lake Simcoe, as the river was wide enough at that point to accommodate steamers and other large vessels (Hunter 1979:23). To house naval and military stores unloaded during the transfer, the government of Upper Canada constructed Fort Gwillimbury, a cluster of pine log buildings described as long and low, with strong shutters on the windows (Hunter 1979:23). The importance of the Lower Landing to navigation was superseded by the advent of the railway in the 19th-century, and by 1893, when Andrew F. Hunter (1979:23) wrote his guide to Lake Simcoe and its environs, the Lower Landing was deserted.

The known historic use of the study area, the proximity of numerous previously registered prehistoric and historic archaeological sites, and the overall physiography of the subject lands, together provided an excellent rationale for the completion of the archaeological assessment of the proposed right-of-way.

3.0 FIELD RESEARCH

Archaeological fieldwork was undertaken to inventory, identify and describe any archaeological resources extant within the study area prior to development.

The proposed right-of-way extends over level terrain immediately adjacent to the East Holland River. The area is located within the Lake Simcoe basin of the Simcoe Lowlands physiographic region (Chapman & Putnam 1973: 304-307). These moist level plains contain deep deposits of sand and silt.

FIGURE 1: LOCATION OF SUBJECT PROPERTY

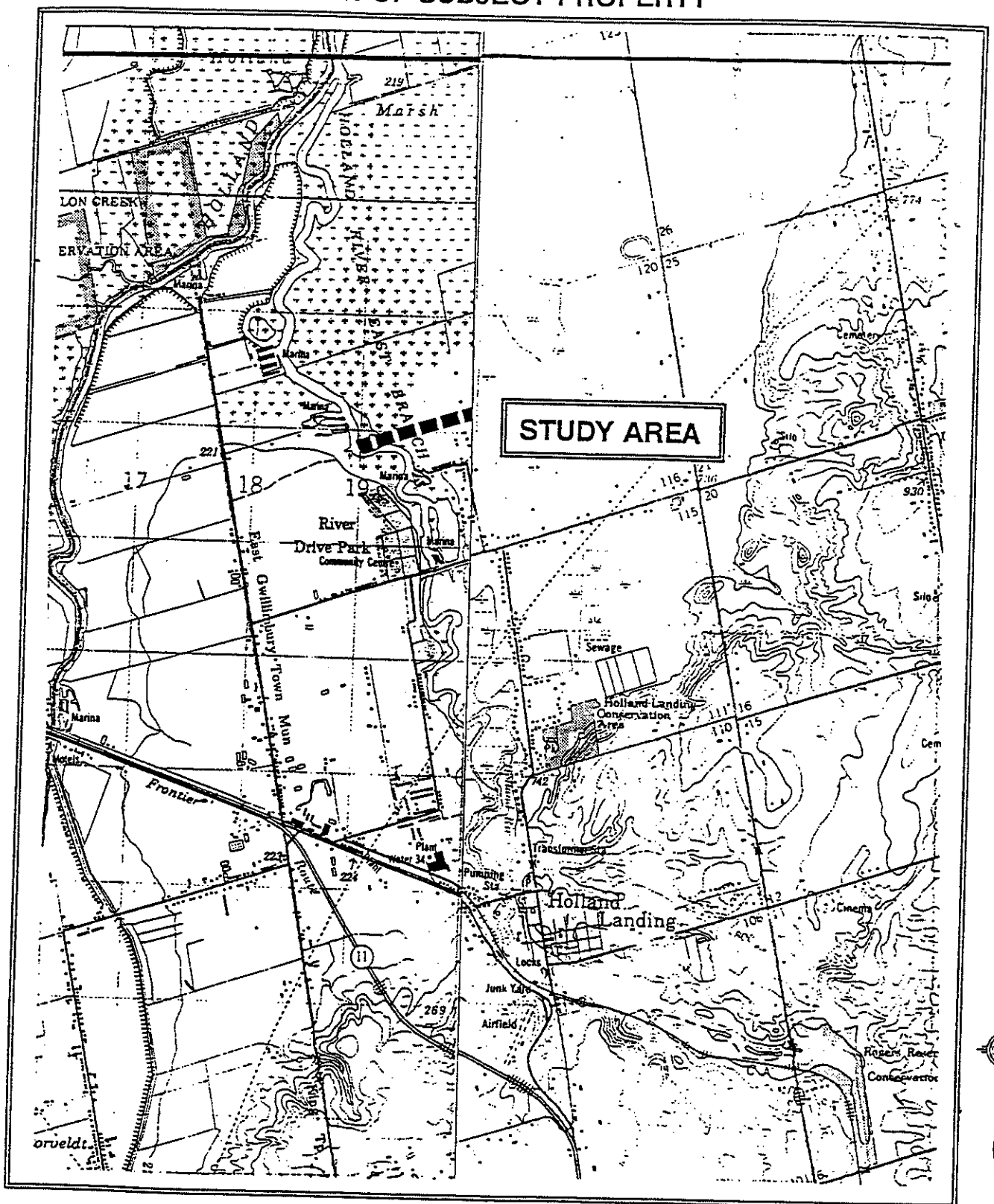
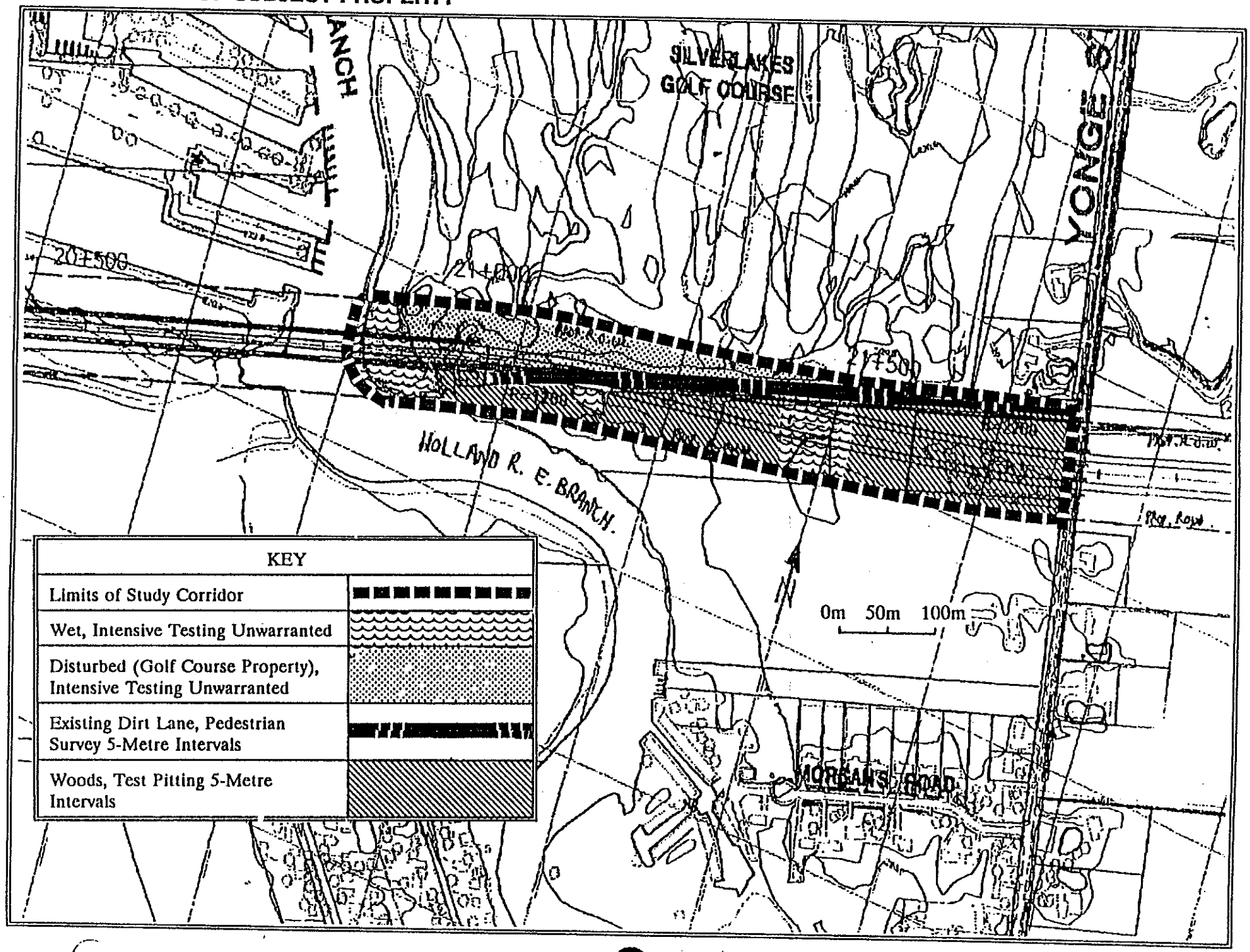


FIGURE 2: MAP OF SUBJECT PROPERTY



Four sections of the study area were not systematically investigated. The first of these, comprising about one-quarter of the right-of-way, consists of the southern edge of the Silverlakes Golf Course. As the golf course lands had been heavily disturbed by filling, grading and ditching activities, systematic investigation was unwarranted (Plates 1, 2, Figure 2). The remaining sections where intensive testing was not required consist of three separate wetlands totalling approximately two hectares (Plate 3, Figure 2).

With the exception of a dirt lane running the length of the right-of-way, the remainder of the study corridor consisted of woodlot with a small residential dwelling at both the eastern and western ends. As the surface visibility along the lane was excellent, this area was subjected to pedestrian survey at five-metre intervals. Both the woodlot and the residential lawns at either end of the study corridor were surveyed by means of testpitting at five-metre intervals. Test units were excavated to subsoil and the contents were screened through six-millimetre mesh to facilitate the recovery of small artifacts. Topsoil depths ranged from 25 to 40 centimetres. Approximately 2,000 test units were excavated along the proposed right-of-way.

During the course of the survey, the East Holland River site was identified (Figure 3).

3.1 East Holland River Site (BaGv-42)

The East Holland River site is an extensive multi-component site that appears to have been established sometime before A.D. 800 and continued to witness use through to the nineteenth century. The site extends from the western end of the study route at the East Branch of the Holland River, approximately 200 metres to the east, encompassing an area of almost one hectare (Figures 3, 4).

The recovered artifact assemblage includes 65 prehistoric ceramic sherds, five prehistoric lithic artifacts, four historic period artifacts, 12 bone fragments and 46 amorphous lumps of fired clay daub (Appendix B).

The analyzable prehistoric ceramic vessel assemblage exhibits decorative techniques and motifs, most notably interior punctates (Plate 4), that are occur in greatest frequency during the latter portion of the Middle Woodland period (400 B.C.-A.D. 800).

The lithic items recovered include a small end scraper (Plate 4), a bipolar core, two secondary retouch flakes (one of which has been retouched, and a piece of shatter. All specimens are Onondaga chert.

The analyzable historic material includes two sherds of a thermally altered ware of unidentified type that is decorated with a blue transfer print and a highly vitreous bluish glaze. A highly corroded, probably hand-wrought spike with a squarish flat head, and a small unanalyzable bowl fragment from a white ball clay smoking pipe were also recovered.

Two test pits yielded amorphously-shaped fragments of fired, untempered, clay that are likely derived from a wattle and daub structure. The use of wattle and daub chimneys was a comparatively common

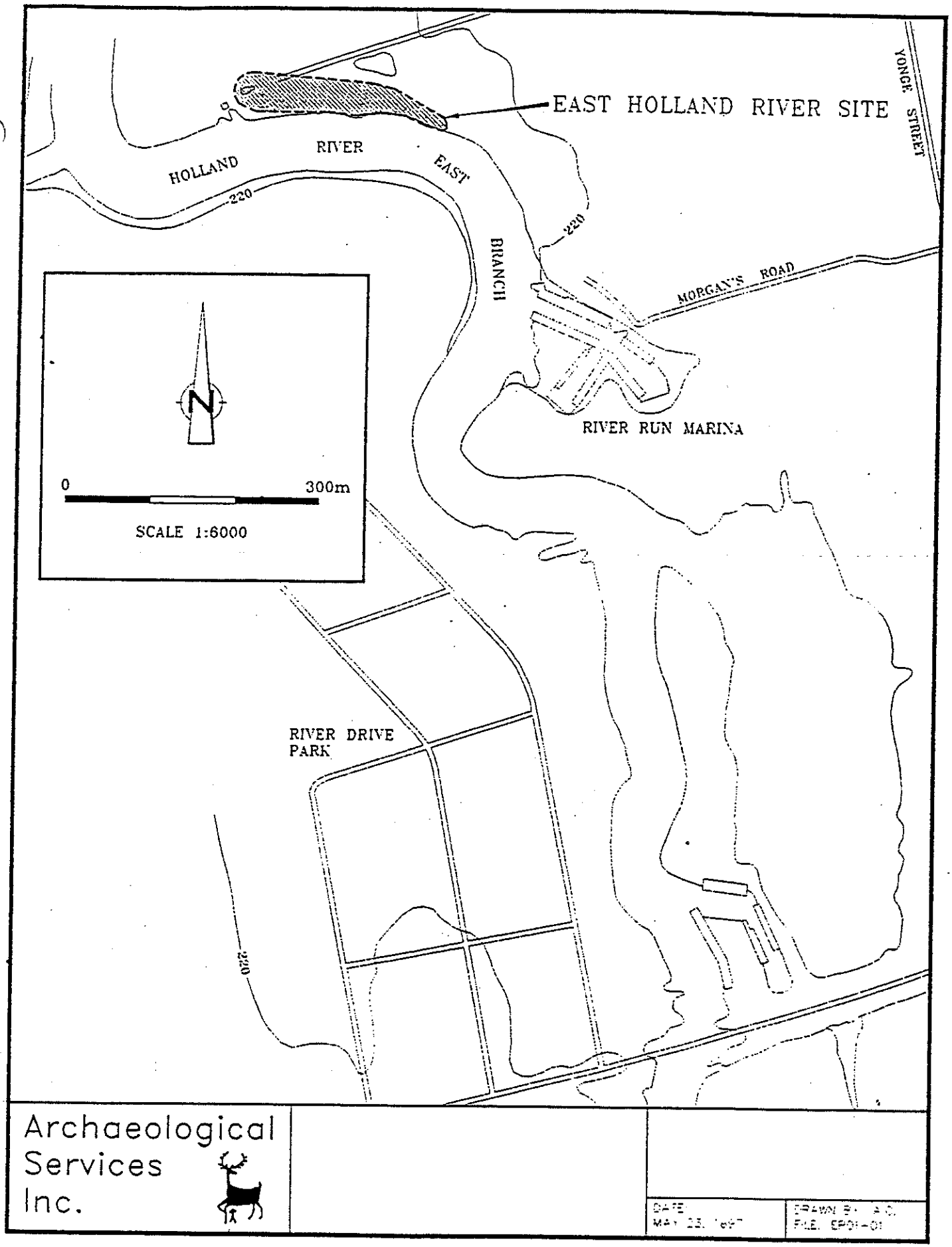


Figure 3: Location of East Holland River Site (BaGv-42)

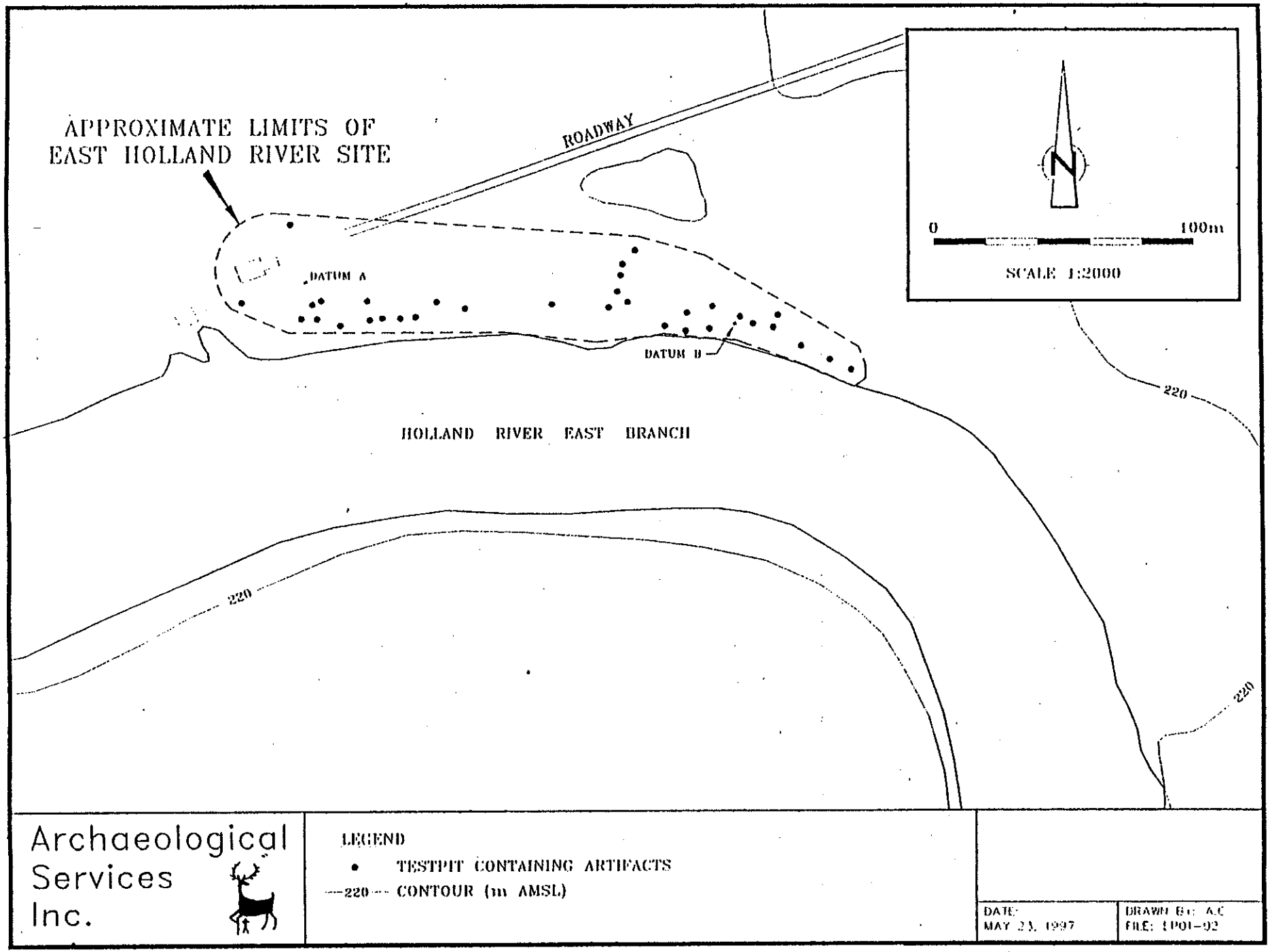


Figure 4: Location of Numbered Test Pits Throughout East Holland River Site (BaGv-42)

practice in the early nineteenth century, both on farmstead sites (Rempel 1967:59-60; Kenyon n.d.:1, 3), and on fur trade sites (Karklins 1983:41, Figure 25; Oerichbauer 1982:174, 180; Archaeological Services Inc. 1996:136). In general, these were not intended as permanent features, but they had the advantage of being erected quickly with materials that were readily available.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The archaeological assessment of the proposed Bradford Bypass, Yonge Street to the East Holland River, resulted in the discovery of the East Holland River site (BaGv-42). It is therefore recommended that:

1. If the East Holland River site (BaGv-42) cannot be protected within the proposed by-pass development plan, the site should be subject to comprehensive salvage excavation. Such mitigation activities should commence with a detailed Stage 3 archaeological assessment in order to precisely determine the locations, character and extent of archaeological deposits within the proposed right-of-way.

   These investigations should entail the hand excavation of a series of test units within the site area. The test units should be excavated to sterile subsoil and soil fills screened through six millimetre wire mesh to facilitate artifact recovery. The subsoil should be trowelled and all profiles should be examined for evidence of cultural deposits.

2. The remainder of the proposed right-of-way may be considered clear of any further archaeological concern.

3. In the event that deeply buried archaeological deposits are encountered along the study route during construction activities, the office of the Regional Archaeologist, Cultural Programs Branch, *Ministry of Citizenship, Culture and Recreation* should be notified immediately.

4. In the event that human remains are encountered during construction activities, the proponent should contact both *MCzCR* and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit, *Ministry of Consumer and Commercial Relations*, (416) 326-8392.

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Appendix B: Artifact Catalogue, East Holland River Site (BaGv-42)	
Test Pit No.	**Description of Items**
1	1 unanalyzable body sherd.
2	45 fragments of fire-hardened daub.
3	1 body sherd. Exterior plain, interior combed. 2 fragments of thermally altered blue glazed, blue transferprint ceramic (unidentified ware).
4	1 unanalyzable bone fragment, calcined.
5	1 body sherd. Exterior dentate stamp, interior exfoliated.
6	1 body sherd. Exterior and interior plain.
7	1 plain body sherd.
8	3 unanalyzable body sherds. 1 antler fragment.
9	1 body sherd. Exterior dentate stamp, interior exfoliated.
10	2 body sherds. Specimen 1: Exterior dentate stamp, interior combed. Specimen 2: Exterior decorated, interior exfoliated.
11	1 unanalyzable body sherd.
12	4 body sherds. Two with plain exteriors and exfoliated interiors, two with rocker dentate exteriors and exfoliated interiors.
13	1 unanalyzable body sherd.
14	1 juvenile rim. Exfoliated exterior, plain lip and interior.
15	1 unanalyzable body sherd.
16	1 fragment of fire-hardened daub. 7 unanalyzable bone fragments.
17	1 retouched secondary knapping flake of Onondaga chert.
18	2 unanalyzable bone fragments. Burnt.
19	1 white ball clay pipe bowl fragment. 1 secondary knapping flake of Onondaga chert.
20	1 unanalyzable body sherd. 1 metal spike (probable hand-wrought).
21	1 rocker stamped neck sherd.
22	9 unanalyzable body sherd fragments. 1 fish vertebra.

Appendix B: Artifact Catalogue, East Holland River Site (BaGv-42)	
Test Pit No.	**Description of Items**
23	1 unanalyzable body sherd. 1 thumbnail end scraper of Onondaga chert. Sides trimmed. Length=24mm, Width=18mm, Thickness=4mm.
24	1 Onondaga chert shatter fragment. Thermally altered.
25	1 body sherd. Plain exterior and interior. 1 unanalyzable bone.
26	6 body sherds with one side plain, one side exfoliated. 1 rocker stamped body sherd with combed interior. 1 rocker stamped neck sherd with partial punctate. Interior unanalyzable. 1 juvenile rim sherd. Exterior fingernail impressed, interior and lip plain. 2 rim sherds. Specimen 1: Rocker stamped exterior, interior and lip, interior punctates, exterior bosses. Specimen 2: Rocker stamped exterior, combed interior and lip.
27	2 unanalyzable body sherds. 1 bipolar core of Onondaga chert.
28	3 body sherds. One with decorated exterior, interior exfoliated. Two unanalyzable.
29	1 plain coil fragment.
30	2 body sherds. One combed interior, exterior exfoliated. One unanalyzable.
31	1 body sherd. Plain exterior and interior.
32	1 body sherd. Exterior decorated, interior combed.
33	1 unanalyzable body sherd.
34	11 body sherds. Three dentate stamp exterior, combed interior. Eight dentate stamp exterior, exfoliated interior.



Plate 1: Looking Westward Along Study Corridor. Golf Course is to the Right of Lane



Plate 2: Looking Southeast Across Golf Course, Western End of Study Corridor



Plate 3: Looking South at Wetland Near Centre of Study Corridor

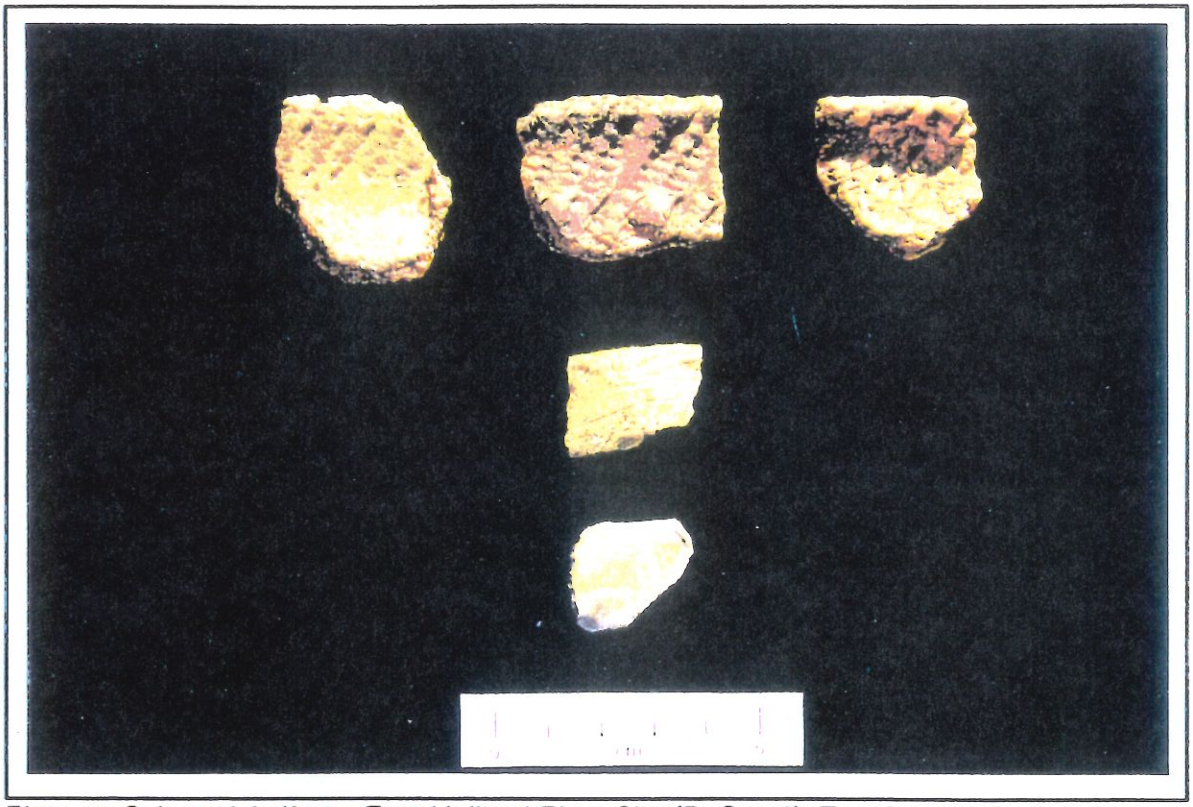


Plate 4: Selected Artifacts, East Holland River Site (BaGv-42). Top: Vessel Neck Fragment (TP21) and Vessel Rims (TP26). Middle: Juvenile Vessel Rim (TP14). Bottom: End Scraper (TP23)

APPENDIX A

A SYNOPSIS OF SOUTHERN ONTARIO PREHISTORY

A SYNOPSIS OF SOUTHERN ONTARIO PREHISTORY

Introduction

Southern Ontario has a cultural history which begins approximately 11,000 years ago and continues to the present. Due to the diversity and richness of its natural environment, the region in which the study area lies has attracted human habitation from the time of man's first entrance into Ontario. The chronological ordering of the periods in Ontario's past has been made with respect to the following three temporal referents: B.C. - before Christ; A.D. - Anno Domini (in the year of our Lord); and B.P. - before present (1950).

Palaeo-Indian Period (9,000 B.C.-7,000 B.C.)

While the arrival of Palaeo-Indian hunting bands in Ontario has not been accurately dated, it is thought that they arrived sometime after the draining of several large meltwater lakes which isolated southern Ontario until approximately 12,500 years before present. Radiocarbon dates from other North American Palaeo-Indian sites suggest that the earliest sites found in Ontario date between approximately 11,000 and 10,500 years B.P.

Evidence concerning these people is very limited since populations were not large and since little of the sparse material culture of these nomadic hunters has survived the millenia. Virtually all that remains are the tools and by-products of their chipped stone industry, the hallmark being large, fluted projectile points. Given the tundra-like or taiga-like environment which prevailed during this period and the location of their hunting camps, we postulate that their economy focussed on the hunting of large Pleistocene mammals such as mastodon, moose, elk and especially caribou. Of particular interest in this regard is the frequent location of Palaeo-Indian sites adjacent to the strandlines of large post-glacial lakes. This settlement pattern has been attributed to the strategic placement of camps in order to intercept migrating caribou herds.

Archaic Period (7,000 B.C.-1,000 B.C.)

The Archaic period is commonly divided into three sub-periods: Early Archaic (c. 7,000-6,000 B.C.), Middle Archaic (c. 6,000-3,000 B.C.), and Late Archaic (c. 3,000-1,000 B.C.). Few Early or Middle Archaic period sites have been investigated and they, like Palaeo-Indian sites, are often identified on the basis of the recovery of isolated projectile points. Recent environmental data suggest that a deciduous forest cover had been established in southernmost Ontario by circa 7,500 B.C. and that the nomadic hunter-gatherers of this period exploited deer, moose and other animals, as well as fish and some plant resources. Archaeological data, however, suggest a broader more adaptable subsistence base for Late Archaic foragers. Their annual subsistence cycle involved interior fall and winter microband hunting camps, which were situated to exploit

nuts and animals attracted to mast-producing forest, and larger spring and summer macroband settlements, which were located near river mouths and lakeshores in order to exploit rich aquatic resources.

Woodland Period (1,000 B.C.-A.D. 1650)

The Woodland period is divided into three subperiods: Early (1,000 B.C.-400 B.C.), Middle (400 B.C.-A.D. 800) and Late Woodland (A.D. 800-A.D. 1650). Moreover, the latter subperiod, which witnessed the florescence of Iroquoian society in the Northeast, is divided in Ontario into the Early, Middle and Late Iroquoian stages.

The Early Woodland period differed little from the previous Late Archaic period with respect to settlement-subsistence pursuits. On the other hand, this period is marked by the introduction of ceramics into Ontario and may be characterised as a time of increasing social or community identity. This latter attribute is especially evident in changes to and elaboration of mortuary ceremonialism.

The analyses of Early Woodland cemeteries have provided evidence of ritual burial behaviour such as the application of large quantities of symbolically important red ochre to human remains. In addition, these cemeteries often contain grave offerings of art indicative of prevailing social and spiritual perspectives. Much of this art is often fabricated from exotic raw materials such as native copper from the western end of Lake Superior and, as in the case of certain ground slate figurines, it often displays a considerable investment of time and artistic skill. Moreover, the nature and variety of these exotic grave goods suggest that members of the community outside of the immediate family of the deceased were contributing mortuary offerings. Thus, social integration during the Early Woodland period appears to have increased and expanded relative to earlier times.

The Middle Woodland period similarly represents a continuation of earlier settlement-subsistence activities, the exploitation of spring-spawning fish being especially well-documented. In some areas the influences of complex societies focussed in the Ohio Valley are exhibited, especially in the realm of mortuary ceremonialism. Most notable are the burial mounds constructed in the vicinity of Rice Lake. Toward the end of the period, corn is introduced into the province initiating significant changes in Native culture.

The Late Woodland period witnessed a revolution in the settlement-subsistence regime of southern Ontario's Native peoples unparalleled in the prehistory of the province. As the most populous group and the most involved in the development of this new life-style, Ontario Iroquoian society often forms a distinct focus of Late Woodland archaeology. The Late Woodland period is often subdivided into an Early (A.D. 800-A.D. 1300), Middle (A.D. 1300-A.D. 1400) and Late Iroquoian Period (A.D. 1400-A.D. 1650).

Early Iroquoian society represents a continuation of Middle Woodland subsistence and settlement patterns with the aforementioned addition of corn horticulture to the subsistence programme. Villages tended to be small, palisaded compounds with longhouses occupied by either nuclear or, with increasing frequency, extended families. These extended families formed the basis of community socio-politics and, to a lesser extent, the basis of intercommunity integration. Around the villages, camps and hamlets were strategically placed in order to facilitate the traditional exploitation of naturally-occurring food resources by the community. While some corn appears to have been an important dietary component at this time, its role was more of a supplementary nature than that of a staple. Early Iroquoian society is best viewed as an important transitional stage between Middle Woodland hunting and gathering society and later, fully agricultural Iroquoian society.

The Middle Iroquoian period marks a stage in Iroquoian cultural evolution characterised by fully developed corn-bean-squash agriculture, a more fully integrated village political system based on extended kinship, and a further development of intervillage alliances. Widespread similarities in pottery and smoking pipe styles also point to increasing levels of intercommunity communication and integration.

In most cases, it appears that Early Iroquoian communities may have actually coalesced during the beginning of the fourteenth century precipitating these dramatic changes in the economic, social and political spheres of Iroquoian life. While the data are still difficult to interpret, it is also clear at this time that villages and village confederacies were in conflict, with each other, and/or together against Algonkian-speaking peoples to the southwest. Whatever the cause/effect relationship, some villages become more heavily palisaded and some household groups (and longhouses) become larger at this time. In part, this may be due to a general increase in population over Middle Woodland levels.

Settlement and subsistence patterns appear to remain relatively stable during the Late Iroquoian period. The most noticeable changes appear in the socio-political system. Through the fifteenth century, certain village households appear to have been consistently larger and more variable in membership than others within the same community. This trend peaks around the turn of the sixteenth century with some longhouses reaching lengths of over 120 metres with three or more extensions evident. Some villages attain a size of over 4 hectares. This trend may reflect changes in the fortunes and solidarity of dominant lineages within villages and/or the movement of families between allied communities. During the sixteenth century, longhouses become more regular in size. This modification of residential patterning suggests that changes had occurred in the kin-based political system. It has been suggested that this change reflects increased importance of clans over lineages. Since clan membership cut across related communities, this aspect of kinship was an important source of tribal integration. When European explorers and missionaries arrived in Ontario at the beginning of the seventeenth century, Iroquoian villages were under the direction of various chiefs elected from the principal clans. In turn, these villages were allied within powerful tribal confederacies. Unfortunately, intertribal warfare with the Five Nations Iroquois of New York State during the seventeenth century, exacerbated by the intrusion of

Europeans, resulted in the dispersal of the three Ontario Iroquoian confederacies – the Huron, the Petun and the Neutral.

The following chart illustrates, for quick reference, some of the salient features of the major cultural and temporal periods of Southern Ontario Prehistory.

TABLE 1: Southern Ontario Prehistory

DATE	PERIOD	DESCRIPTION
A.D. 1650 - A.D. 1400	Late Iroquoian (Late Woodland)	- complex agricultural society - villages, hamlets, camps - politically allied regional populations
A.D. 1400 - A.D. 1300	Middle Iroquoian (Late Woodland)	- major shift to agricultural dependency - villages, hamlets, camps - development of socio-political complexity
A.D. 1300 - A.D. 800	Early Iroquoian (Late Woodland)	- foraging with limited agriculture - villages, hamlets, camps - socio-political system strongly kinship based
A.D. 800 - 400 B.C.	Middle Woodland	- hunter-gatherers, spring/summer congregation and fall/winter dispersal - large and small camps - band level society with kin-based political system - some elaborate mortuary ceremonialism
400 B.C. - 1000 B.C.	Early Woodland	- hunter-gatherers, spring/ summer congregation and fall/winter dispersal - large and small camps - band level society with first evidence of community identity - mortuary ceremonialism - extensive trade networks for exotic raw materials
1,000 B.C. - 7,000 B.C.	Archaic	- hunter-gatherers - small camps - band level society - mortuary ceremonialism - extensive trade networks for exotic raw materials
7,000 B.C. - 9,000 B.C.	Palaeo-Indian	- first human occupation of Ontario - hunters of caribou and now-extinct Pleistocene mammals - small camps - band level society