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The Regional Municipality of Niagara

Town of Grimsby
Transportation Planning Study

Final Report
Preferred Transportation Plan

July 1995

01-3167A

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1 INTRODUCTION

The overall purpose of this study is to develop a Transportation Plan for the Town of Grimsby. The product of this study will be a detailed Transportation Plan for the horizon year of 2011, and the development of a short term plan to address existing and foreseeable deficiencies in the near future (next 5 years). Improvement priorities will be recommended with associated costs and an implementation strategy. This study consists of 3 technical papers and a final report summarizing the results and recommendations of the study.

This first technical paper documented all findings and analysis from the review of existing conditions. The second technical paper documented the assessment of future traffic conditions and the third technical paper documents the evaluation of the alternatives and the selection of recommended transportation improvements.

1.1 BACKGROUND

The last comprehensive transportation study undertaken for the Town of Grimsby was completed in 1971. Since that time there have been several smaller studies addressing specific operational problems, but there has not been a system-wide review undertaken to provide a comprehensive short and long term transportation strategy.

Grimsby has experienced considerable growth in recent years and has a current (1992) population of approximately 18,700. This growth can be attributed to the Town's proximity to the Region of Hamilton-Wentworth, which has also been experiencing growth. Although an increasing number of families are relocating their place of residence from the Hamilton Wentworth and the Greater Toronto Area (GTA), many continue to work in those major employment centres. Therefore, broader transportation needs throughout the western part of the Region of Niagara and commuting patterns to the Hamilton Wentworth and the GTA

business sheds must be addressed. In light of land use and demographic changes since the previous study in 1971, the Town, the Region, and the Province have initiated this Transportation Planning Study for the Town of Grimsby. Part of the goal of the study is to assess the impact of the land use and demographic changes, and to develop a future program to address the transportation requirements of this area.

While transportation analyses traditionally focus upon road and highway improvements, this study must also consider other passenger modes -- including transit and bicycling -- and future inter-municipal bus and rail services. Downtown parking utilization and requirements must be addressed in addition to reviewing the requirements for accommodating truck travel patterns.

The geographical boundaries of the study area are identified on **Exhibit 1.1**. The primary boundary includes the lands from Lake Ontario to the brow of the Niagara Escarpment. This area represents the urbanized area of the Town and the general location of future development. There is limited growth potential for lands south of the Escarpment.

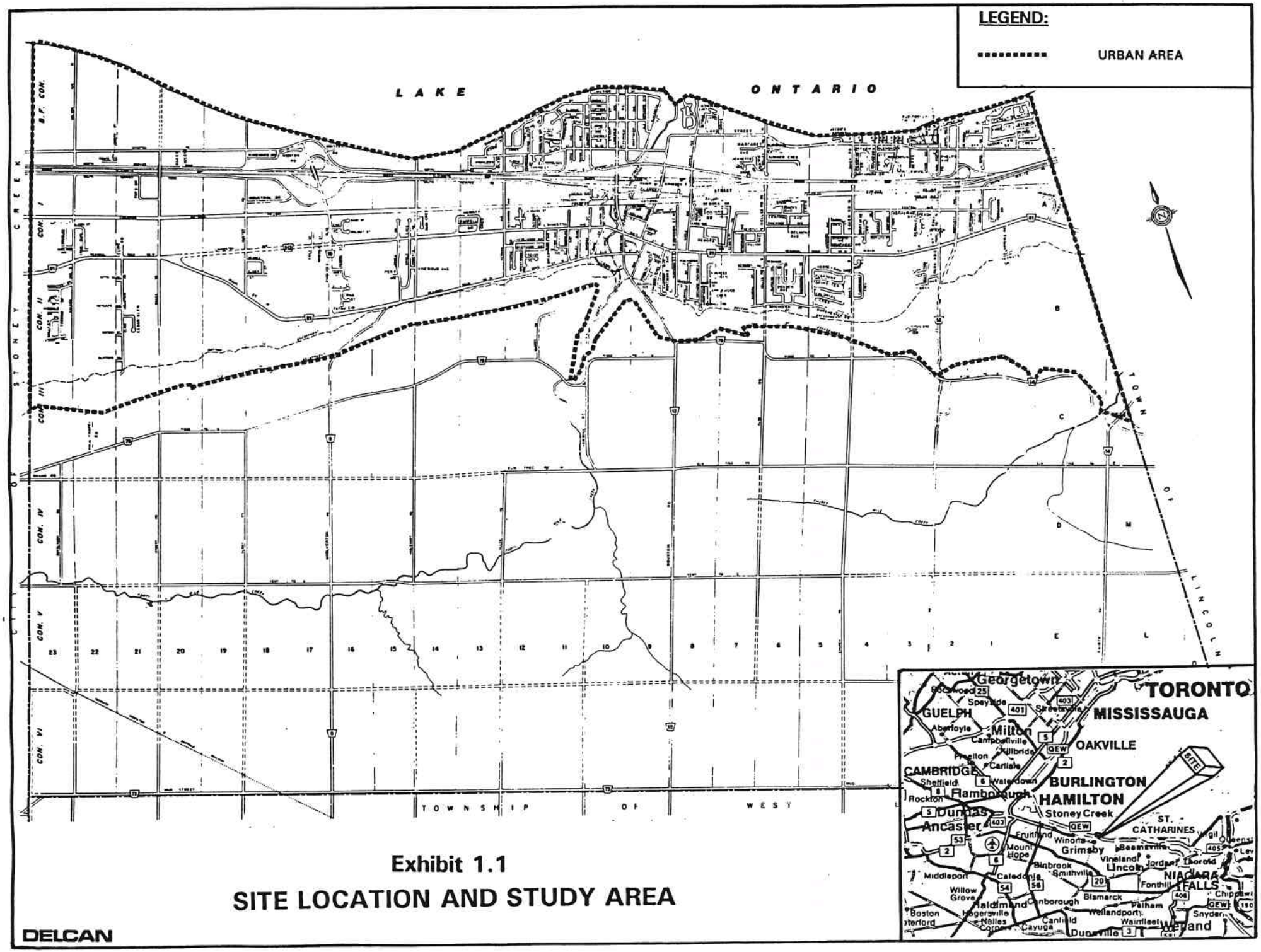

Exhibit 1.1

SITE LOCATION AND STUDY AREA

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2 EXISTING CONDITIONS

The base data for this study also includes road jurisdiction and road classification information for the Town of Grimsby. This information is based on data obtained from the Town of Grimsby Official Plan, BRIMMS database, the Regional Municipality of Niagara Consolidating By-Law and Ministry of Transportation Planning Department.

2.1 POPULATION \ EMPLOYMENT AND LAND USE

The development of the Town of Grimsby is influenced by a number of physical barriers. These barriers include Lake Ontario to the north, the Niagara Escarpment and good agricultural land to the south and unique agricultural lands to the east and west. The QEW and CN rail lines are two other factors which have an influence on development.

As a result of these constraints the existing Town of Grimsby consists of two major portions; the area above the escarpment (mainly rural) and the area below the escarpment (mainly urban). The majority of the Town's population is located north of the escarpment with industrial development concentrated between the QEW and the CN rail line, commercial development concentrated along Main Street and Livingston Avenue between Grimsby Square and Robinson Street. Residential development is located both north and south of the QEW and consists mainly of low density neighbourhoods. Residential development south of the escarpment will be difficult and costly due to the physical constraints imposed by the escarpment (ie. servicing).

Regional demographic trends and projections indicate a declining growth rate in population. The annual population growth rate is expected to decline from 1.7% in the 1980's to 0.5% by year 2011. This translates to a population of 16,596 in 1986 to 21,600 in 2011.

Based on the Town of Grimsby Urban Land Needs Study the employment in Grimsby is primarily in the service and trade sectors although the resident labour force is mainly employed in the manufacturing, services and trade sectors. Thirty two percent of Grimsby's employed labour force works in manufacturing, mainly outside of Grimsby. Employment in Grimsby can only accommodate 59% of the Town's labour force, however, only 38% of the Town's labour force is employed in Grimsby, the remaining 62% is employed outside of the Town, with Hamilton accounting for 51% of these jobs.

Of the jobs available in Grimsby, 62% are taken by Grimsby residents and the remaining 38% are filled by persons from adjacent communities, with Lincoln accounting for the greatest amount (24.51%).

A review of the mode of travel within the Town shows that 86.4% of all the daily trips are made by auto (either as a driver or passenger).

The data presented above shows a high level of commuter related traffic both into and out of the Town of Grimsby. If this current trend remains unchanged, it will prove to be a major consideration in any proposed transportation improvements.

2.2 ROAD CLASSIFICATION

Within the Town of Grimsby the various roadways can be categorized into the four basic road classifications listed below:

- Expressways;
- Arterial;
- Collectors, and
- Local

A description of each of these road classifications is included in the Glossary. The following sections will review which roads fall into each category within Grimsby.

Expressways

The Queen Elizabeth Way (QEW) is a four lane divided expressway oriented in an east-west direction. There are currently three QEW interchanges within the Town of Grimsby. These interchanges provide access to the following streets:

- Casablanca Boulevard;
- Bartlett Avenue;
- Maple Avenue;
- Ontario Street, and
- Christie Street.

The QEW is currently being widened to a six lane cross-section which will be in place by the year 2000.

Arterial

The arterial roads below the escarpment form an irregular network in direct contrast to the more common grid system found above the escarpment. This is partly due to the physical constraints posed by the Lake Ontario shoreline and the Niagara Escarpment.

Collectors

The key point worth noting with regard to the collectors is that although Elm Street is designated as a collector it is operating as an arterial extension of Main Street. This section of road provides a by-pass around the congested downtown area for traffic travelling through the central core area. The remaining collector roads provide a link between the various residential, commercial and industrial centres to the arterial street system. The exception to this is Dorchester Drive, however, future plans are to eventually extend the roadway to Main Street. The existing road classification for the Town of Grimsby is presented in **Exhibit 2.1.**

2.3 ROAD JURISDICTION

The Town of Grimsby road network consists of Provincial, Regional and Town owned roads. The Province has jurisdiction over the QEW and certain sections of the north and south service roads. The Regional Municipality of Niagara roads consist of 9 arterial roads both above and below the escarpment. These existing road jurisdictions within the Town of Grimsby are presented in **Exhibit 2.2.**

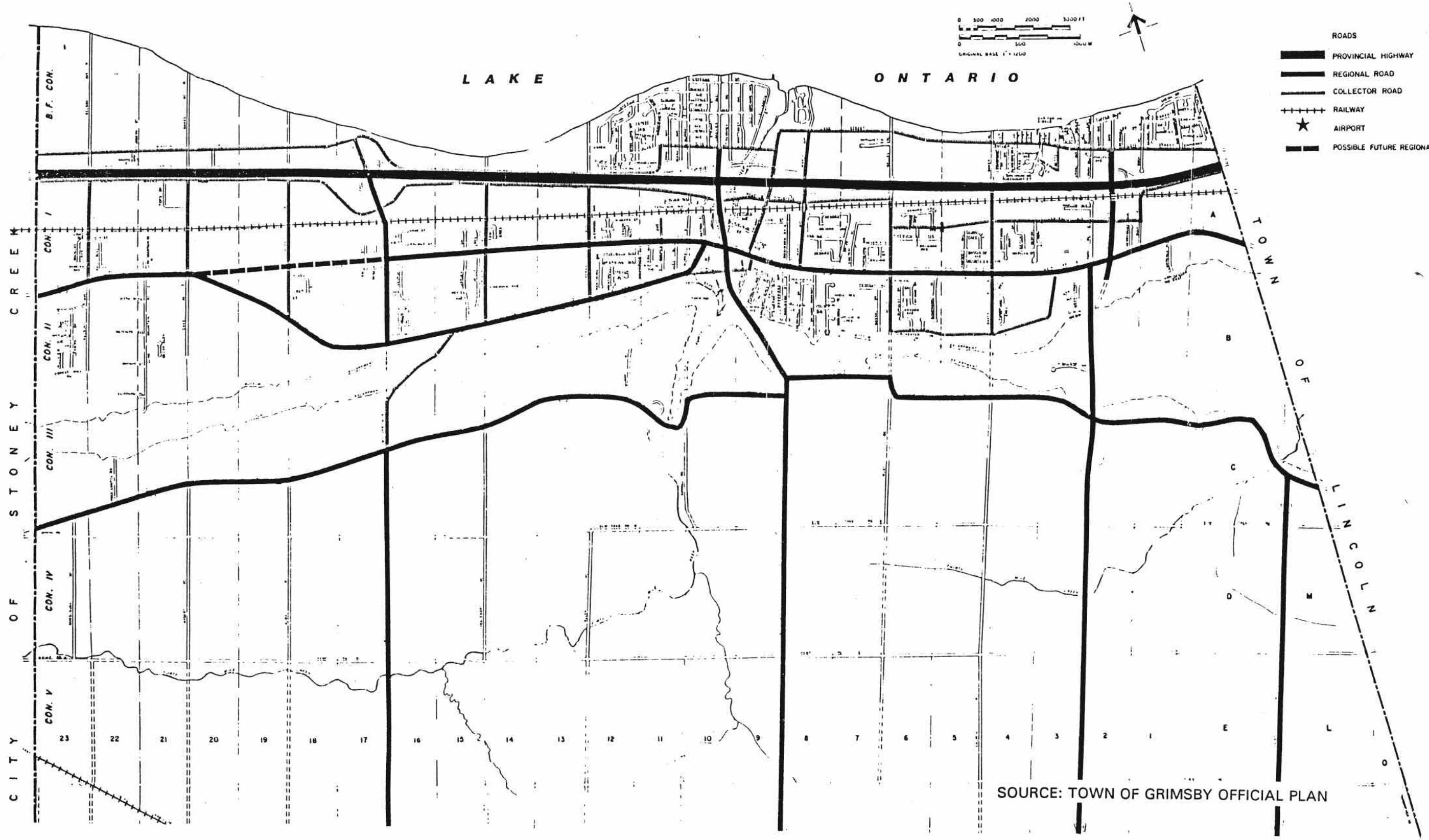
2.4 TRAFFIC

Existing Traffic

For the purposes of this study, a traffic flow diagram showing the AM and PM peak hour volumes during the weekday was created. In this particular case the volumes which represent the **weekday** conditions are based primarily on counts recorded in the month of May (generally on a Thursday or Friday). Overall historical trends indicate that May counts tend to closely represent average conditions over the year, and as a result have been used as a basis for this study. It is recognized that the Saturday peak in the downtown is more severe than the average weekday. The traffic data used in the study were collected by the Town of Grimsby, the Region of Niagara, the MTO, and Delcan.

Traffic Growth Rate

A review of the historical traffic volumes (last eight years) indicated an annual compounded growth rate of approximately 2% for Town roads and approximately 4% for Regional roads. These growth rates, in conjunction with the most recent volumes recorded in 1992, were used to create the AM and PM peak hour traffic flow diagram for the Town. This flow diagram represents the 1992 base traffic volumes used for this study. In addition to the peak hour flow diagram, a summary of existing AADT's was also prepared and these are shown on **Exhibit 2.3**



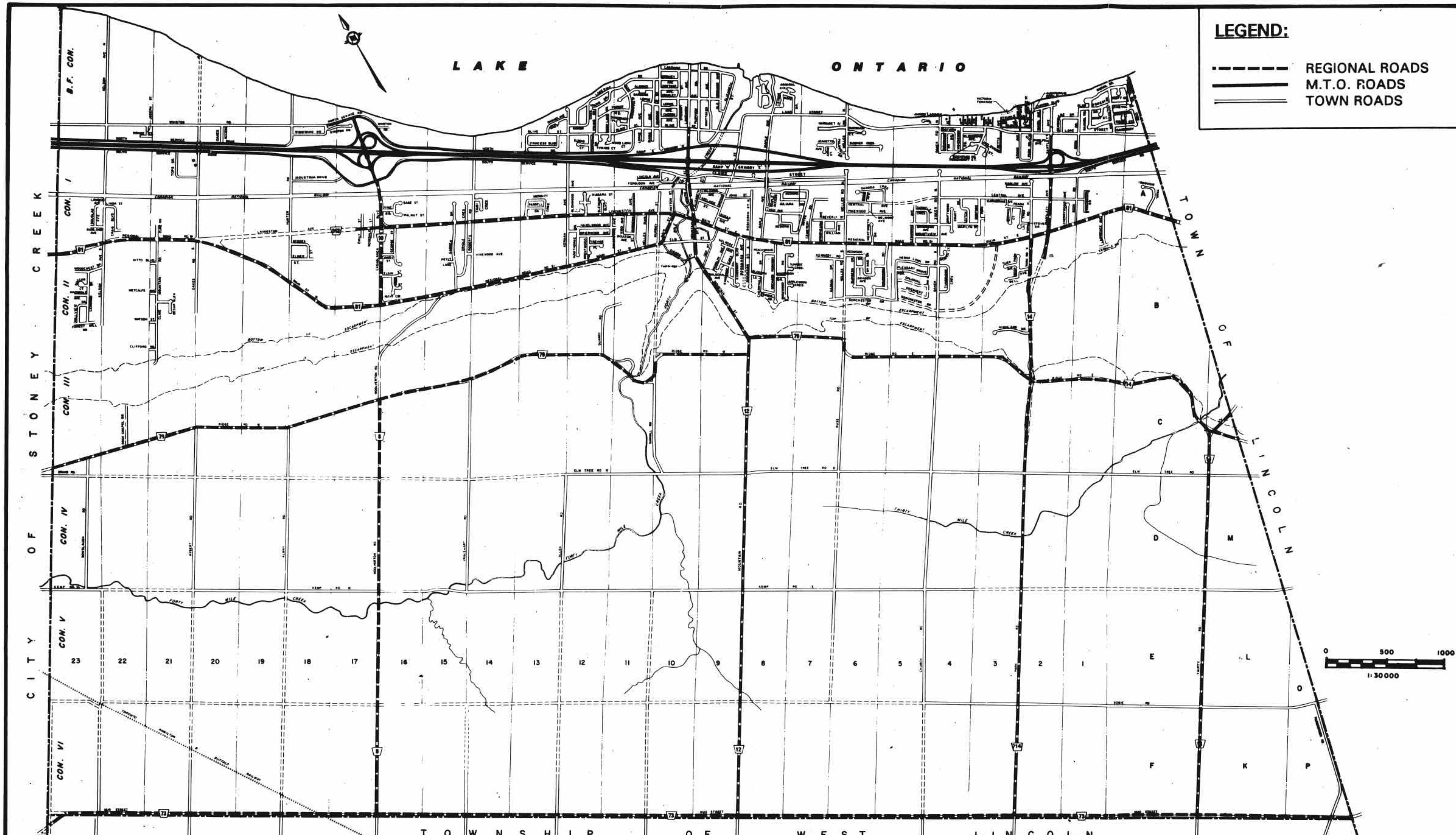
SOURCE: TOWN OF GRIMSBY OFFICIAL PLAN

TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

EXISTING ROADWAY CLASSIFICATION

Exhibit
2.1

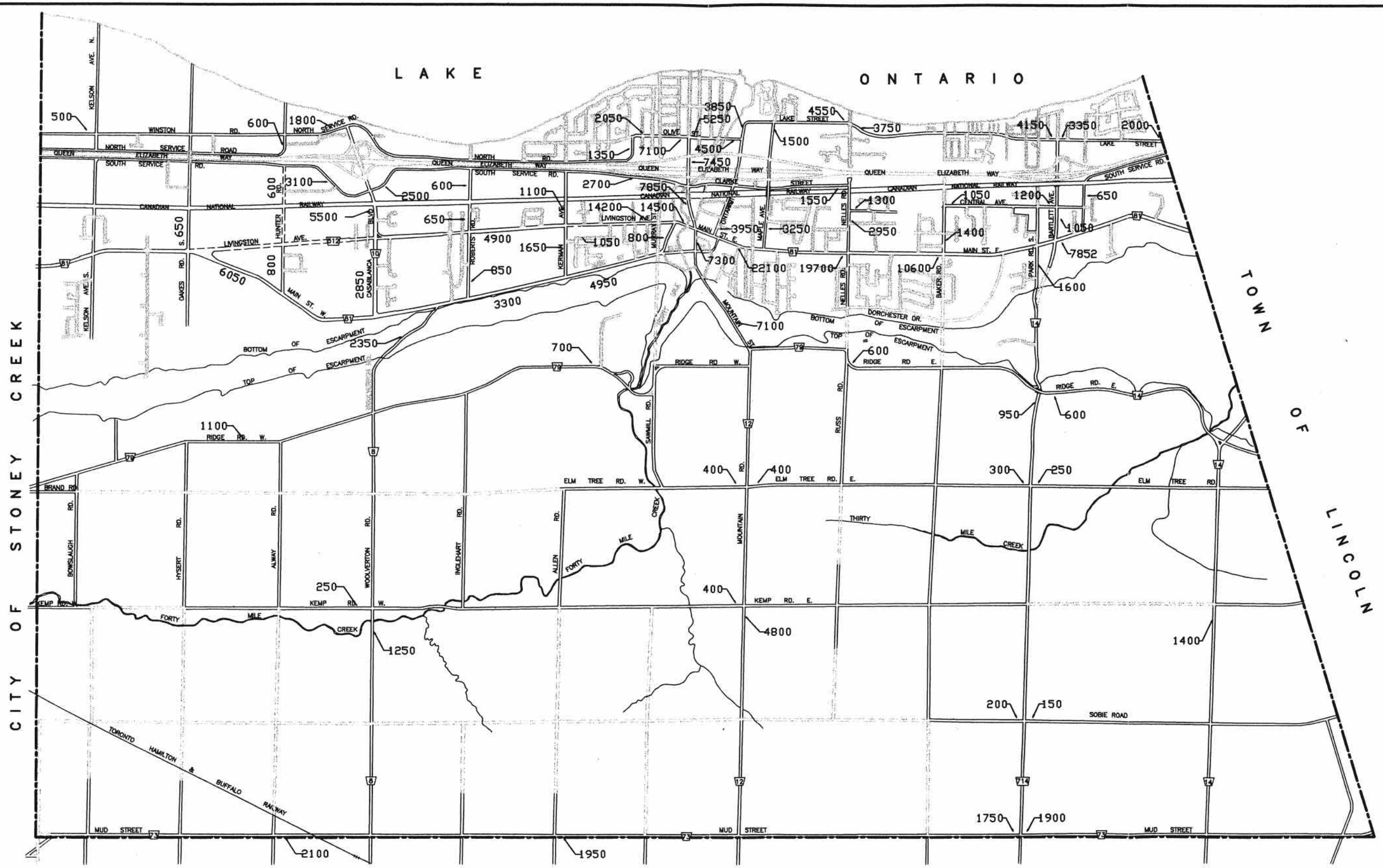


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

ROAD JURISDICTION

Exhibit 2.2



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS

24-HOUR TRAFFIC VOLUMES FOR BASE YEAR - 1992

Exhibit 2.3

Signalized Intersection Operations

There are five signalized intersections in the Town of Grimsby, four of which are fully actuated and the other is semi-actuated. The AM and PM peak hour traffic volumes for existing conditions at the 5 signalized intersections are shown on **Exhibits 2.4 and 2.5.**

The 1985 Highway Capacity Manual (HCM, computerized CINEMA20 version) was used to analyze traffic operations at the five intersections and this analysis was supplemented by field observations at the key locations. A summary of the results is presented in **Table 2.1.**

Although the results in **Table 2.1** indicate that the overall level of service is satisfactory (A or B) at each intersection, there are certain specific problems, or potential problems. The specific problems include:

- The eastbound approach at Main Street @ Mountain Street backs up past the Village Inn driveway in the PM peak period. However, vehicles are "let in and out" by waiting drivers on Main Street. The Village Inn has 3 accesses which help minimize delays. The maximum eastbound queue on Main Street reaches approximately 12 vehicles, but, drivers rarely have to wait more than one cycle to clear the intersection.

- The westbound approach at Main/Mountain backs up to the Ontario Street intersection, however, the left-turn prohibition for westbound vehicles to Mountain Road allows the queue to clear rapidly. Westbound drivers rarely have to wait for more than one cycle.

- Traffic on the eastbound approach at Main/Elm is restricted by a combination of left-turning vehicles from Main Street to Ontario Street and by curbside parking on Main Street (Ontario Street operations will be discussed in greater detail in the next section). Left-turning vehicles often stop beside parked vehicles thus blocking the eastbound flow of traffic approaching Elm Street. The result is increased delays for eastbound

vehicles which is not accounted for in the HCM analysis of the Main/Elm intersection (the HCM analysis addresses each intersection on an individual basis therefore it is important to supplement the analysis with field observations).

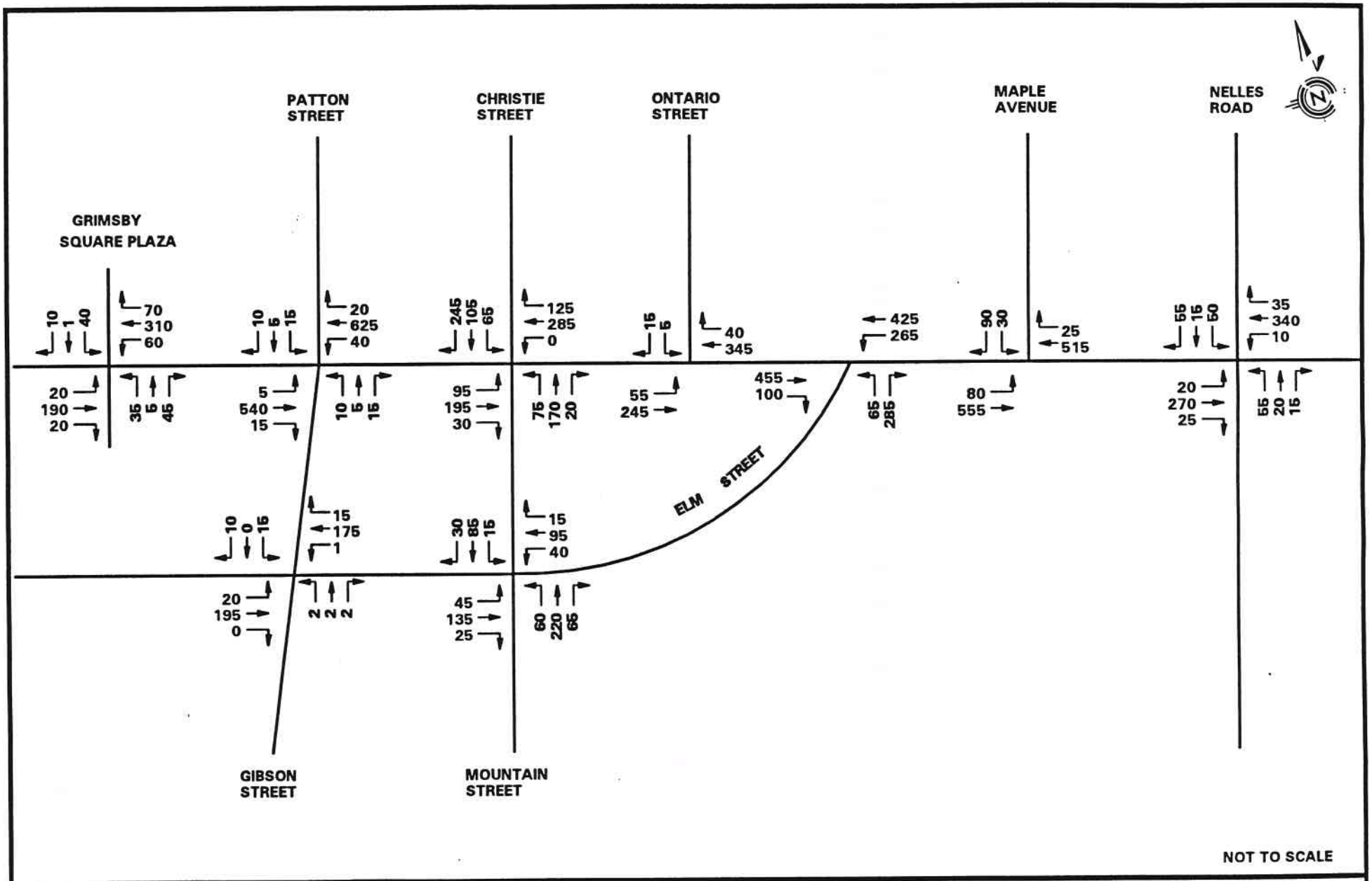
- The function of Elm Street as a by-pass route for traffic avoiding Main Street is reflected in the fact that the key movements at Main/Elm are the northbound right-turn and the westbound left-turn. In the PM peak hour the volume/capacity ratio for these movements are 0.74 and 0.82 respectively, however, the actual delay experienced by drivers performing these manoeuvres is relatively minor. In the westbound direction, however, the left-turning vehicles occasionally extend beyond the available storage, and combined with the vehicles parked on Main Street, they effectively block the vehicles travelling through the intersection. This is similar to the problem caused by eastbound left-turns from Main Street to Ontario Street.

The remaining signalized intersections accommodate less traffic, are more isolated in terms of proximity to each other, and as a result the delays at these intersections are significantly less.

Unsignalized Intersection Operations

The Highway Capacity Manual was also used to analyze traffic operations at the unsignalized intersections. The results of the analysis are summarized in **Tables 2.2 and 2.3** for the AM and PM peak hours respectively. The level of service criteria for unsignalized intersections is defined in **Table 2.4**.

These levels of service criteria are based on approximate delays and should be regarded in general terms. Since they are not associated with the level of service for signalized intersections, comparisons between the two should not be made.

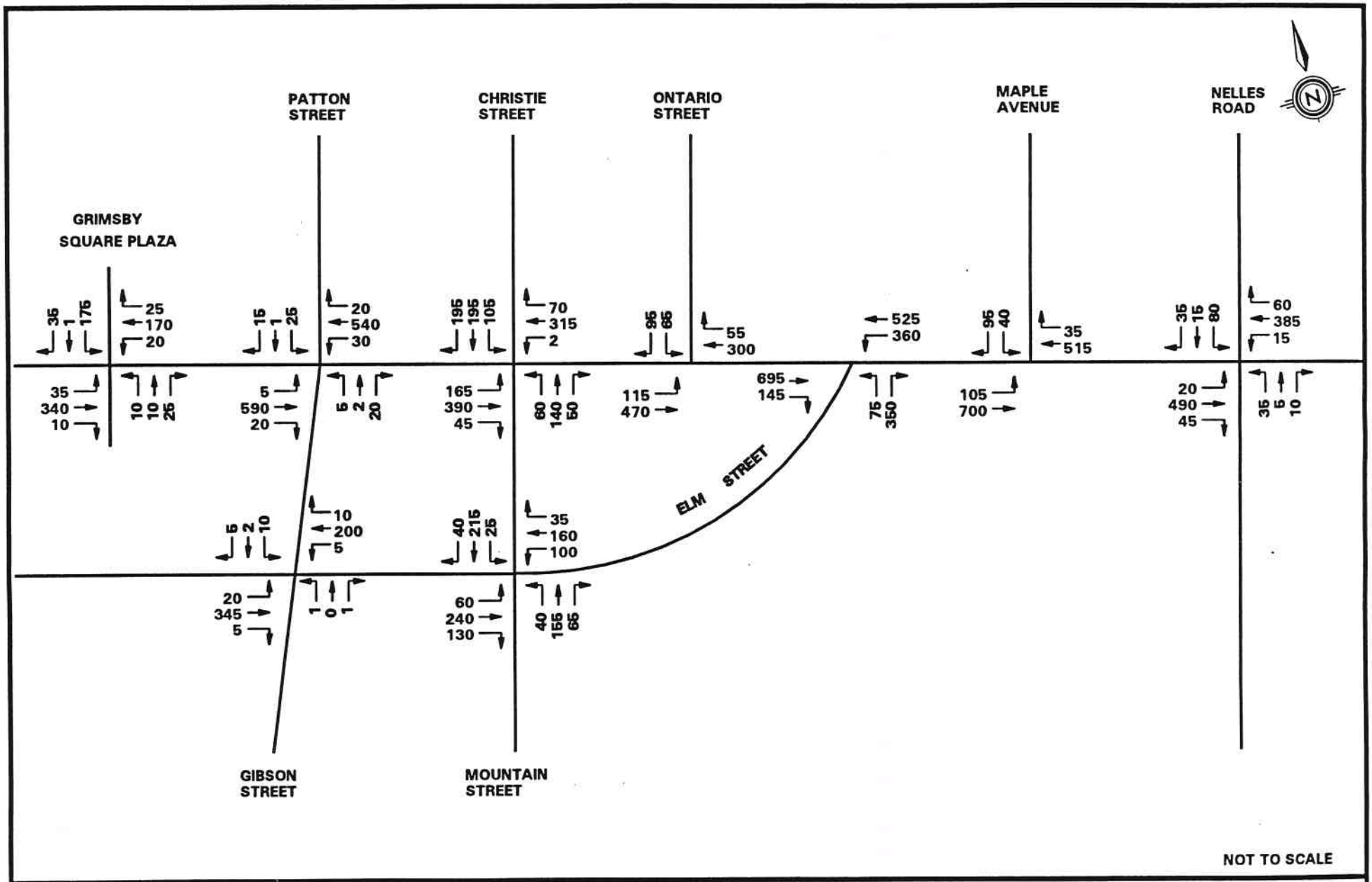


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

1992 AM PEAK HOUR TRAFFIC VOLUMES
DOWNTOWN AREA AND VICINITY

Exhibit 2.4



TOWN OF GRIMSBY
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DELCAN ENGINEERS PLANNERS ARCHITECTS

1992 PM PEAK HOUR TRAFFIC VOLUMES
DOWNTOWN AREA AND VICINITY

Exhibit 2.5

Table 2.1

SIGNALIZED INTERSECTION ANALYSIS SUMMARY

	AM			PM		
INTERSECTION	VOLUME/ CAPACITY	DELAY (SEC/VEH)	LEVEL OF SERVICE	VOLUME/ CAPACITY	DELAY (SEC/VEH)	LEVEL OF SERVICE
Livingston-Kidd	0.38	4.2	A	0.41	7.7	B
Elm-Mountain	0.44	7.2	B	0.53	8.1	B
Main-Mountain	0.47	12.4	B	0.58	14.5	B
Main-Elm	0.72	11.2	B	0.80	9.2	B
Main-Nelles	0.32	8.0	B	0.44	6.7	B

Level of service for signalized intersections is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Specifically, level of service criteria are stated in terms of the average stopped delay per vehicle for 15-minute analysis period.

LEVEL OF SERVICE DESCRIPTION

A It describes operations with very low delay, i.e., less than 5.0 seconds per vehicle. This occurs when progression is extremely favourable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

B It describes operations with delay in the range of 5 to 15 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

C It describes operations with delay in the range of 15 to 25 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

D It describes operations with delay in the range of 25 to 40 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, higher v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failure are noticeable.

E It describes operations with delay in the range of 40 to 60 seconds per vehicle. This is considered to be in the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

F It describes operations with delay in excess of 60 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Table 2.2

UNSIGNALIZED INTERSECTION ANALYSIS SUMMARY FOR THE AM PEAK HOUR

INTERSECTION	CRITICAL MOVEMENT	FLOW RATE (PCPH)	CAPACITY (PCPH)	RESERVE CAPACITY	VOLUME/ CAPACITY	LEVEL OF SERVICE
Main/Maple	SB L	34	135	101	0.25	D
Christie/QEW North Ramp	WB L	120	244	124	0.49	D
Livingston/Main/Patton	SB LTR	34	163	129	0.21	D
Livingston/Murray	SB LTR	24	216	192	0.11	D
Main/Baker	NB LTR	12	244	232	0.05	C
Main/Park	NB LTR	75	324	249	0.23	C
Christie/Clarke	WB L	14	282	268	0.05	C
Christie/QEW South Ramp	EB LT	41	317	276	0.13	C
Main/Ontario	EB L	6	328	322	0.02	B
Bartlett/Lake	NB LT	152	488	336	0.31	B
Main/Bartlett	SB L	86	444	358	0.19	B
Christie/Olive	SB LTR	52	458	406	0.11	A
Main/Elm/Gibson	SB L	16	461	445	0.03	A
Casablanca/South Service	EB LTR	92	540	448	0.17	A
Bartlett/QEW South Ramp	EB LT	24	476	452	0.05	A
Livingston/Kerman	SB LTR	29	484	455	0.06	A
Bartlett/Central	EB LTR	73	562	489	0.13	A
Bartlett/QEW North Ramp	WB L	86	601	515	0.14	A
Ontario/QEW South Ramp	EB LT	78	598	520	0.13	A
Casablanca/QEW South Ramp	EB L	29	563	534	0.05	A
Casablanca/Livingston	EB LTR	9	561	552	0.02	A
Main/Woolverton	NB LR	118	707	589	0.17	A
Casablanca/North Service	NB L	11	600	589	0.02	A
Main/Kerman	SB LR	34	635	601	0.05	A
Maple/QEW South Ramp	EB LT	82	687	605	0.12	A
Ontario/QEW North Ramp	WB LT	69	695	626	0.10	A
Casablanca/QEW North Ramp	WB L	92	722	630	0.13	A
Maple/QEW North Ramp	WB LT	83	737	654	0.11	A
Casablanca/Main	SB LR	97	767	670	0.13	A
Ontario/Olive	EB LR	160	845	685	0.19	A
Maple/Lake	NB LTR	29	904	875	0.03	A

WB LTR (for example) = One lane for westbound vehicles turning left, through and right.
PCPH = Passenger Cars Per Hour

Table 2.3

UNSIGNALIZED INTERSECTION ANALYSIS SUMMARY FOR THE PM PEAK HOUR

INTERSECTION	CRITICAL MOVEMENT	FLOW RATE (PCPH)	CAPACITY (PCPH)	RESERVE CAPACITY	VOLUME/ CAPACITY	LEVEL OF SERVICE
Christie/Clarke	EB LTR	223	258	35	0.86	E
Main/Maple	SB L	45	97	52	0.46	E
Christie/QEW North Ramp	WB L	114	196	82	0.58	E
Christie/QEW South Ramp	EB LT	146	256	110	0.57	D
Main/Ontario	SB L	73	201	128	0.36	D
Livingston/Main/Patton	SB LTR	47	177	130	0.27	D
Livingston/Murray	SB LTR	45	180	135	0.25	D
Livingston/Kerman	SB LTR	74	241	167	0.31	D
Main/Park	NB LTR	115	311	196	0.37	D
Casablanca/South Service	EB LTR	281	493	212	0.57	C
Main/Plaza Driveway	NB LR	129	342	213	0.38	C
Main/Baker	NB LTR	8	256	248	0.03	C
Main/Bartlett	SB L	103	357	254	0.29	C
Casablanca/Livingston	WB LT	92	377	285	0.24	C
Bartlett/QEW South Ramp	EB LT	143	440	297	0.33	C
Main/Elm/Gibson	SB LT	13	347	334	0.04	B
Christie/Olive	NB L	149	489	340	0.30	B
Main/Woolverton	NB LR	167	536	369	0.31	B
Bartlett/Central	EB LTR	62	433	371	0.14	B
Ontario/QEW South Ramp	EB LT	142	515	373	0.28	B
Bartlett/QEW North Ramp	WB L	69	451	382	0.15	B
Bartlett/Lake	NB LT	168	554	386	0.30	B
Ontario/QEW North Ramp	WB LT	138	593	455	0.23	A
Casablanca/QEW South Ramp	EB L	126	585	459	0.22	A
Casablanca/Main	SB LR	177	648	471	0.27	A
Maple/QEW South Ramp	EB LT	153	626	473	0.24	A
Ontario/Olive	EB LR	195	698	503	0.28	A
Mountain/Plaza Driveway	EB LR	95	643	548	0.15	A
Maple/QEW North Ramp	WB LT	89	661	572	0.13	A
Main/Kerman	SB LR	41	618	577	0.07	A
Casablanca/QEW North Ramp	WB L	52	645	593	0.08	A
Casablanca/North Service	NB L	29	682	653	0.04	A
Maple/Lake	NB LTR	75	854	779	0.09	A

TABLE 2.4
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

RESERVE CAPACITY (PCPH)	LEVEL OF SERVICE	EXPECTED DELAY TO MINOR STREET TRAFFIC
≥ 400	A	Little or no delay
300 - 399	B	Short traffic delays
200 - 299	C	Average traffic delays
100 -199	D	Long traffic delays
0 - 99	E	Very long traffic delays
*	F	*

* When demand volume exceeds the capacity of the lane, extreme delays will be encountered with queuing which may cause congestion affecting other traffic movements in the intersection. This condition usually warrants improvement to the intersection.

Source: Highway Capacity Manual - Special Report 209, Transportation Research Board, Washington, D.C., 1985.

The unsignalized intersections listed in Tables 2.2 and 2.3 are arranged in order from least reserve capacity (for the key movement) to the most available. As with the signalized intersections the busiest conditions occur during the PM peak hour. During this time period the critical intersection is Christie Street and Clarke Street. The eastbound approach at this location provides inadequate sight distance, and the problem is compounded by a high flow rate of 223 vph sharing a single lane. The poor sight distance is a result of the railway overpass to the south and the proximity to the QEW South Ramp to the north. The problem at this location is also reflected in the high number of accidents recorded over the last five years. In addition, the situation may actually be worse than the results indicate, since

some drivers may choose to avoid the intersection because of the safety risks.

The southbound left-turn at Main/Maple appears second on the list, although in reality the southbound left-turn at Main/Ontario (fifth on the list) warrants more attention. The volumes on Main Street at Maple are heavier than they are at Ontario, however, congestion is greater at Ontario Street because of the traffic queues stemming from the Mountain Road and Elm Street traffic signals. Traffic delays are also experienced by eastbound motorists at Main Street and Maple Avenue as a result of queued vehicles attempting to turn left onto Maple Street. Main Street has recently been reconstructed from just west of Nelles Road to just east of Baker Road. The roadway was reconstructed to a 3-lane cross section (left-turn lane at all intersections). This should improve the overall Main Street traffic operations, including minor street delays.

During the PM peak hour the reserve capacity for minor street left-turns from the QEW eastbound and westbound ramps onto Christie Street is low. This is primarily due to the high volume of opposing traffic on Christie Street, however, westbound drivers wishing to make this manoeuvre have the alternative of using either the Ontario Street or Maple Avenue intersections.

At the request of the Town the intersection of Christie Street and Olive Street was reviewed. Specifically the concern was whether or not a four way stop was warranted. From Table 2.2 and 2.3 it can be seen that this intersection is operating at a LOS of A and B during the AM and PM peak hours, respectively. Also, the Region of Niagara Traffic Department completed a four way stop warrant analysis based on existing volumes and it was determined that the four way stop was not warranted.

2.5 PARKING

In 1988 the Town of Grimsby completed a parking study for the downtown area. The study concluded that the overall parking supply satisfies the peak weekday and weekend demand. This is somewhat deceiving since the spaces which are visible, convenient, and accessible are either close to, or at capacity. The least utilized spaces are generally north of Main Street, where the lots are not directly visible nor easily accessible to the main shopping areas. Consequently, one of the main recommendations of the 1988 parking study was that measures be taken to improve the visibility, appearance, and accessibility (vehicular and pedestrian links) of the least utilized parking areas.

Another key point worth noting from the study is that the accessible and convenient parking spaces are approaching capacity due to a high demand by short-term parkers, and not as a result of long-term parkers occupying the spaces.

Based on discussions with Town of Grimsby staff, we have assumed that there have been no new major developments in the area, or significant change in the parking supply since the 1988 parking study. Consequently, the data and results of that study are considered to be applicable to current conditions.

The following is a list of additional comments provided by the Town, regarding current parking conditions and issues:

- The Town is currently in the process of revising their zoning by-law which regulates parking and loading provisions. One of the recommendations of the 1988 study suggested that the Town ensure that all new developments adhere to the parking provisions of the by-law, and that cash-in-lieu of parking only be accepted if there is an abundance of parking nearby, or if there is an accepted plan in place that will increase the supply.

- The Town is also pursuing options for improving the accessibility to the parking areas on the north side of Main Street. Negotiations are being

held with land owners in the area in order to provide a public vehicle laneway leading from Christie Street to Ontario Street.

- The Town had an agreement with Zellers to lease their 73 space parking lot which is north of Main Street. The lease expired in June 1992 and it has not been renewed.

- The question of public versus private parking raises an even broader issue. That question is should the entire downtown parking supply be treated as a collective group? Thereby disregarding public and private boundaries, recognizing the fact that many businesses share the same patrons (multi-purpose trips), and accepting that the downtown parking supply should be shared. The Official Plan for the Town of Grimsby (Office Consolidation - December 1991) also recognizes the idea of common parking facilities in the downtown area as a key issue. Although the Official Plan does not go so far as to refer to the downtown parking supply as a whole, it does state under special policies for the Commercial Core Area that:

  > "The Town supports the development of common parking areas as a solution to the parking problems in the Commercial Core Area and will actively seek to provide such facilities."

- In 1991 the Town staff measured the parking demand in the Zellers parking lot and also in the Town owned public parking lot north of Main Street and east of Christie Street. The Zellers lot was not fully utilized, which reflects its poor visibility and accessibility (and confirms previous findings). The Town's public lot (30 spaces) was full the majority of the time, and 80-90% of the vehicles were parked all-day (this was not identified in the 1988 study). We can speculate that these long-term parkers are either employees who work in the area, or possibly commuters who park in the lot and then share rides (the on and off-ramps for the QEW are immediately north of the Christie Street public lot). If these parkers are employees who work in the area then this is a regulation problem. If the

parkers are ridesharing commuters, this raises the issue of providing facilities for this third group of parkers (short-term and long-term parkers being the other two).

Finally, it should be noted that any parking plan for the downtown area should be considered in the context of the Town's objective for the Central Core Area (as outlined in the Official Plan). That objective is identified as:

> "To maintain and strengthen the Central Core Area as the focal point of the community and the area with the major concentration of retail, office and service commercial uses."

2.6 SAFETY

The purpose of this section is to identify high accident frequency locations in terms of absolute numbers and accident rates. At the moment the Town reviews the accident data on a yearly basis, and in terms of absolute numbers. The Region is in the process of setting up a review system for accident data.

A review was conducted of all recorded traffic accidents which occurred in the Town of Grimsby since January 1, 1988 (4.5 years for Regional data) and since January 1, 1987 (5.5 years for the Town data). Accidents were categorized according to intersection (directly or indirectly associated with a specific intersection) or midblock (non-intersection) related. Review was based on accident data reports provided by the Town and Region.

Intersections

The collision rate for intersections is expressed as the **number of collisions per million vehicle entries (vehicles entering the intersection in a 24 hour period) per year.** In general terms a collision rate in excess of approximately 1.5 collisions per

million vehicle entries indicates that a review of the details of the collisions may be appropriate. For the purposes of this review we have identified those intersections with a **collision rate** greater than 1.0. These collision rates have been summarized in **Table 2.5**.

TABLE 2.5
SUMMARY OF HIGH ACCIDENT RATE INTERSECTIONS

INTERSECTION	24 HR VOLUME	TOT ACC'NTS (4.5 YRS)	AVG ACC'NTS/ YEAR	COLL'N RATE
Woolverton/Kemp	1,512	5	1.1	2.0
Mountain/Mud	3,300	10	2.2	1.8
Christie/Clarke	11,712	34	7.6	1.8
Thirty/Elm Tree	1,188	3	0.7	1.5
Park/Elm Tree	1,188	3	0.7	1.5
Woolverton/Ridge	2,318	5	1.1	1.3

The collision rate was calculated for all the intersections in the Town which had a total of 2 or more accidents recorded since 1987. Intersections with only one accident were not considered to be significant.

Four of the six intersections experienced an average of approximately 1 accident or less per year. The collision rate for these intersections, however, is still high because of the relatively low 24 hour traffic volume at these locations.

Midblocks

The collision rate for midblock sections is expressed as the **number of collisions per million vehicle-kilometres (24-hour volume x the length of the midblock section) per year.** In general terms a collision rate in excess of 7 collisions per million vehicle-kilometres per year indicates that a review of the collision details may be warranted. For the purposes of this study we have identified those midblock sections with a collision rate greater than 6.0. The collision rates are summarized in Table 2.6.

The most critical locations (in terms of the actual number of accidents) are North Service Road from Casablanca to Olive, and Lake Street from Olive to Maple. On the Lake Street section the Town installed warning signs, speed reduction signs, and better lighting at the curve. These improvements were all implemented in 1991 and since then the accident rate has dropped to 3 accidents in two years (1.5 accidents/year).

2.7 ESCARPMENT CROSSINGS

There are currently three escarpment crossing routes in the Town of Grimsby. They are: Woolverton Road; Mountain Road; and Park Road. All three routes are 2-lane roadways, and have severe grades. Mountain Road and Park Road are both under the jurisdiction of the Region of Niagara, while Woolverton Road is under the jurisdiction of the Town of Grimsby. The Grimsby escarpment crossings are a key link between Mud Street (and beyond), the Grimsby business area, and the QEW. Mountain Road provides a direct link to the QEW. Traffic travelling along Park Road towards the QEW must make a right at Main Street and then a left at Bartlett Street to gain access to the QEW. Similarly, traffic travelling along Woolverton Road must make a left at Main Street and then a right at Casablanca Road in order to access the QEW.

Based on historical evidence, the Mountain Road and Woolverton Road crossings have been the key focus of attention. Property owners have voiced their concerns regarding general safety along the road, especially in those locations where sidewalks are not available. The number of trucks and the speed of vehicles travelling on the road are also concerns.

The traffic accident review has found that of the three escarpment crossings, the greatest number of collisions have occurred along Mountain Road, the most heavily travelled of the escarpment crossings. A summary of the accident data for the escarpment crossings over a 4.5 year period shows there have been:

- Fourteen reported accidents along Mountain Road; and
- Five reported accidents along Park Road

On Woolverton Road, the only escarpment crossing under the responsibility of the Town, there have been eight reported accidents since January 1, 1987. A comparison of the collision rates for the three escarpment crossings revealed that the rate is highest along the Woolverton Road crossing.

2.8 TRANSIT

At present the Town of Grimsby does not have a conventional intra-municipal, parallel or inter-regional transit system. There are two intercity coachlines that service the Town of Grimsby and they are Gray Coach Lines (with seven trips a day) and Trentway Wagar (with six trips a day). Trentway Wagar does offer fully accessible intercity coaches on all its regularly scheduled trips in the Hamilton/Niagara corridor. There have been some discussions between GO Transit and the Regional Municipality of Niagara as to the possibility of extending the existing GO Transit service from Hamilton to the Niagara Region, however, this will be dealt with in the Transfocus 2021 study.

Table 2.6

ACCIDENT SUMMARY FOR THE KEY MIDBLOCK SECTIONS

MIDBLOCK SECTION	LENGTH (KM)	24 HR VOLUME	TOTAL ACC'TS (4.5 OR 5.5 YRS)	ACC'TS/ YEAR	COLL'N RATE
Town Roads (5.5 years)					
Gibson (Main-Mountain)	0.37	160	2	0.4	16.8
Kidd & Bolton (Livingston-St. Andrews)	0.26	320	2	0.4	12.0
N. Service (Casablanca-Olive)	1.65	555	23	4.2	12.5
StoneGate (Maple-Lake)	0.39	293	2	0.4	8.7
S. Service (Central-E. Boundary)	0.87	635	8	1.5	7.2
Lake Street (Olive-Maple)	0.38	3,830	19	3.5	6.5
Regional Roads (4.5 years)					
Ridge (Mountain-Russ)	0.85	500	7	1.6	10.0
Mud (Bowslaugh-Boundary)	0.42	2,100	10	2.2	6.9

3 FUTURE CONDITIONS

3.1 LAND USE

This section presents an assessment of existing landuse patterns and policies and also suggests possible changes.

3.1.1 PROJECTIONS

The principal factor which determines the traffic volumes at any location is the land use of the surrounding area.The automobile will continue to be the principal mode of transportation in the study area in the foreseeable future. The specific daily travel characteristics of the Town's labour force (i.e. out commuting) and the lack of any attractive transit alternatives makes this a reality. For this reason the Region of Niagara's Computerized Transportation Model was used to obtain traffic volume projections for the planning horizon years 2001 (short-term) and 2011 (long-term). These projections are based upon the land development which is anticipated for the area and the trip making characteristics of the area's population. These projections within the Town of Grimsby were based on the traffic zone system presented in Exhibit 3.1.

The short-term and long-term growth in residential development is expected to occur primarily below the escarpment, between Bartlett Avenue and the downtown area. This area (represented by traffic zones #15, #16 and #18) is expected to have increases in residential development of between 65% and 220%. The projected growth for these three areas totals 76% of the total projected growth for the Town of Grimsby.

The following items were noted from the employment projections for the Town of Grimsby.

- The Town of Grimsby is projected to increase their employment base by 96% by the year 2011.

- 63% of this projected employment growth will occur in traffic zones #1, #2 and #3.

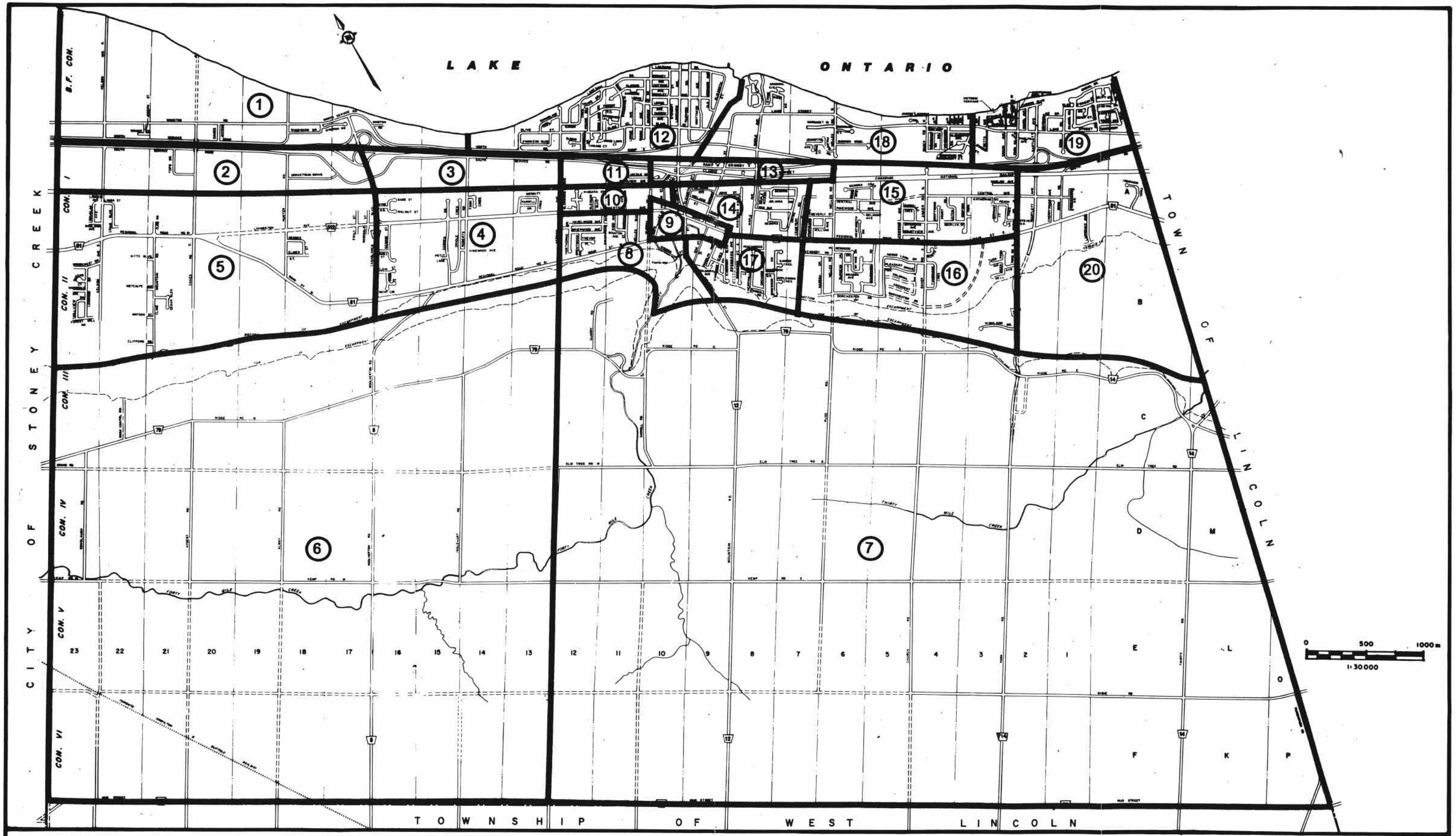
A review of the existing travel patterns within Grimsby revealed the following trends/facts:

- Over 35% of all trips by Grimsby residents are destined to or from Hamilton and the Greater Toronto Area (GTA);

- Jobs not taken by Grimsby residents are most frequently filled by residents of Lincoln and St. Catharines.

From a transportation perspective, the general development pattern, which provides residential development to the east and employment growth to the west, will not only increase the travel demand through the "core" of Grimsby, but it will intensify traffic demand which already exists in the peak direction of travel.

The form of anticipated land use development adjacent to the QEW has been a topic of debate for a number of years. Proposals for commercial development along the QEW have, in the past, been turned down partly in an effort to preserve Grimsby's downtown core. The QEW provides neighbouring municipalities with a high degree of access. Our experience tells us that, from a transportation perspective, restrictions which have been placed upon development adjacent to the QEW have contributed to the large volume of traffic moving to and from the neighbouring municipalities each day.



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

TRAFFIC ZONES

Exhibit
3.1

3.1.2 Possible Changes in Land Use

Traffic volume forecasts have a direct relationship with future land use. Changes to future land use development scenarios will also result in changed future traffic volumes. This would potentially affect both the priority and the extent of any required improvements to the road network depending upon the significance of these differences.

Three changes to existing land use policies which are currently being considered and have been discussed with the Planning Administrator for the Town are:

- Urban Area Boundary Expansions
  - North of Regional Road #81, East of Casablanca Boulevard.
  - South of Regional Road #81, East of Bartlett Avenue.
- Rezoning
  - Adjacent to the Casablanca interchange to permit a mix of Light Industrial and Highway Commercial on both sides of the QEW.

3.2 COMMITTED ROAD PROGRAMS

To assess the impact of future travel demands upon the transportation system within Grimsby, consideration must be given to the facilities and/or services which have already received approval and will be in place prior to the identified horizon years. Plans are currently in place for the following two improvements to the Road Network:

- Widening the QEW from 6 lanes to 8 lanes from Hamilton to St. Catharines; and
- Extend Central Avenue from Nelles Road to Baker Road.

Although no specific commitment has been made for their construction, other improvements to the road network for which some support has previously been demonstrated includes :

The Extension of Bartlett Avenue

- To connect with Park Road. The designation for this connection exists within the Official Plan and the required property for the right-of-way has already been purchased.

The Extension of Livingston Avenue

- Westward from Casablanca Boulevard to Main Street would utilize an existing right-of-way.

4 ASSESSMENT OF FUTURE CONDITIONS

4.1 TRAVEL DEMAND

The Region of Niagara used this existing Regional Transportation Model to supply PM peak hour forecasts for both the short-term (2001) and long-term (2011) travel demands within the Town of Grimsby. The model is calibrated to forecast average conditions. At certain times during the year, therefore, the traffic volumes will be higher due to seasonal variations. To assist in identifying any deficiencies within the road network the travel demands for these two forecast periods were assigned to an existing road network, updated to reflect the addition of the committed roadway construction projects.

The travel demands which were projected by the model were examined on a screenline basis to identify deficiencies in the road network. The locations of the screenlines used in this Study are presented in Exhibit 4.1.

Screenlines to identify the north-south movement of traffic were developed along:

- The CN Railway Tracks, and
- The Niagara Escarpment.

Screenlines to identify the flow of east-west traffic were identified as:

- East of Bartlett Avenue
- West of Baker Road
- West of Christie Street, and
- West of Casablanca Boulevard.

4.1.1 Traffic Volumes

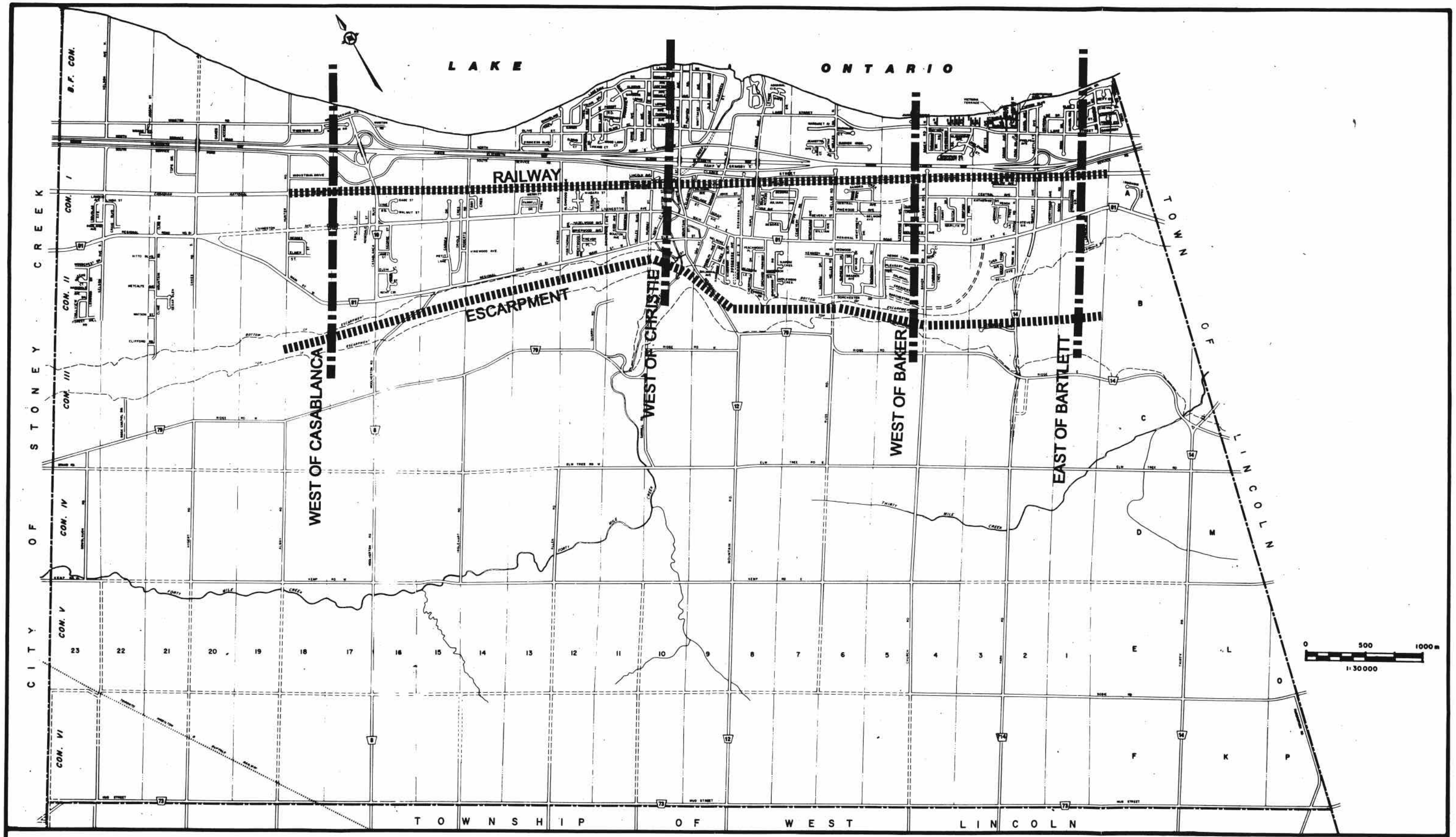
Projections of PM peak hour traffic volumes are presented on a screenline basis in Exhibit 4.2. The exhibit provides both short-term (2001) and long-term (2011) forecasts of the travel demands within the Town of Grimsby. During the PM peak hour the dominant flow of traffic will continue to be in the eastbound direction, as commuters from the Hamilton and Greater Toronto areas return home. Similarly, due to traffic exiting the QEW, the southbound direction is the dominant traffic flow in the PM Peak Hour.

From an initial examination of these traffic projections, it is quickly apparent that a tremendous growth in traffic volume is anticipated in the years ahead. It is also apparent that a large proportion of the traffic in Grimsby is external traffic which travels through Grimsby principally along the QEW and to a much lesser extent along Regional Road #81. Regional Road #81 is the continuation of Highway #8 which is designated as "The Wine Route". It has been promoted as a route for tourists who are seeking a more relaxing or scenic alternative to the freeway.

The QEW as the primary facility for east-west traffic typically supplies between 70% and 80% of the available roadway capacity north of the escarpment and accommodates from 75% to 85% of the total traffic demand. With such a complete reliance on one facility, as is the case with the QEW, significant delays and some diversion of traffic through the Town can be anticipated during those occasions when traffic incidents occur on the freeway which either slow or block the movement of freeway traffic. As traffic congestion along the QEW continues to increase, so will the frequency of these incidents.

4.1.2 Levels of Service

Traffic levels of service can be defined as a qualitative measure to describe the operational traffic conditions of the road network. Six levels of service (A through F), with level of service A representing the best operating conditions and level of service F representing the worst.

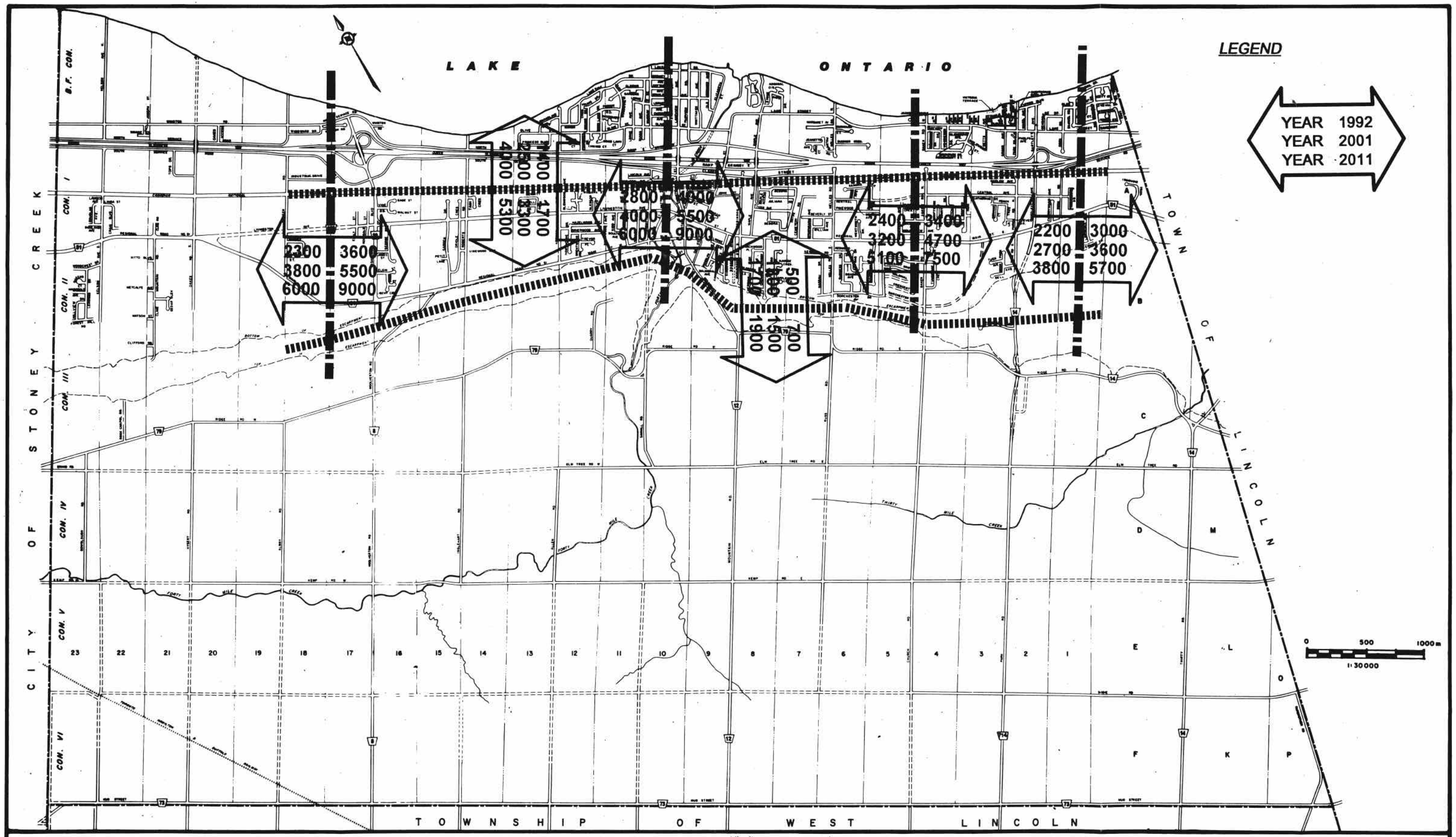


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

LOCATION OF SCREENLINES

Exhibit
4.1



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

P.M. PEAK HOUR TRAVEL DEMANDS

Exhibit
4.2

Without the provision of new or improved facilities to accommodate the demand, the resulting level of service will deteriorate as traffic volumes increase. Exhibit 4.3 presents the levels of service that would be observed for the peak direction at the various screenlines if only the committed roadway construction projects were completed. These levels of service therefore represent average values across the length of the screenline. The level of service at the intersections may be lower depending on the turning movements and the type of traffic control at the intersection.

Individual sections of a screenline may receive higher travel demands due to the proximity of major traffic generators or a discontinuity elsewhere in the road network. Traffic generated by the downtown area, for instance, will continue to travel principally along Main Street regardless if additional roadway capacity is available along the QEW.

4.1.3 Identification of Specific Problem Areas

North-South Corridors

The Niagara Escarpment, because of the limited number of crossings (3) and the geometric standards of these crossings, will continue to be the most serious restraint upon the flow of north-south traffic. Safety on the existing escarpment crossings is also one of the major concerns for both the general public and the area municipalities. As the traffic volume using these crossings continues to increase, so will the potential for a serious traffic accident, unless improvements are made to the existing roadways. In the long-term (2011) if no new capacity is provided, the capacity across the escarpment would be deficient by the equivalent of approximately one lane of traffic (400 - 700 vph) at Level of Service E.

Below the escarpment, sufficient north-south capacity appears to be available on a screenline basis to handle motorists exiting the QEW and distributing themselves

onto various north-south routes. Depending upon the configuration of the ultimate road network, Casablanca Boulevard, Christie Street, Ontario Street and Nelles Road each represent corridors in which the traffic demands could meet or exceed the future capacity.

East-West Corridors

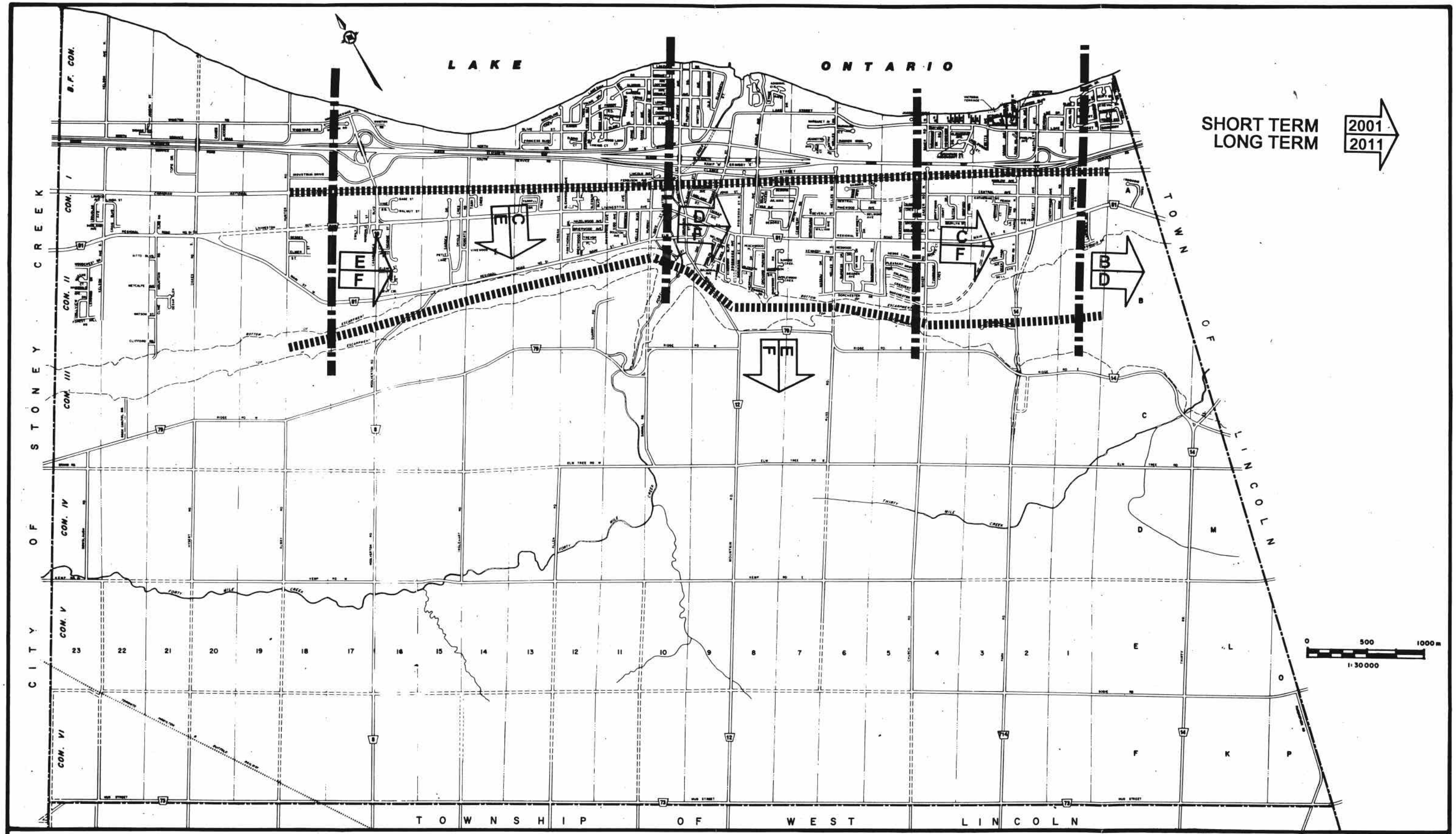
By the year 2011, even with the construction of two additional lanes along the QEW, the travel demands of east-west traffic will meet or exceed the available capacity throughout most of the Town.

The urban area of the Town is effectively divided in half by the QEW. To the north, the existing road system will be capable of accommodating the projected increases in traffic volumes that will result from the additional development. To the south, the projected increases in traffic volumes will be much more significant and some improvements will be required to address existing deficiencies in the road network and to accommodate the growth in traffic demand.

West of Casablanca

The area, as shown in Exhibit 4.4, is serviced by only two corridors: the QEW corridor including the Service Roads and the Main Street corridor. In the short term, the widening of the QEW will supply excess roadway capacity across the screenline. Main Street, however, will operate at or near its capacity due to motorists who either choose not to travel along the freeway or, because of the origin or destination of their trip feel that the freeway is not convenient.

In the longer term, the traffic demand in the east-west direction is expected to exceed the available roadway capacity by 2000 vph which is the equivalent of two lanes of arterial traffic. This capacity deficiency is distributed between the QEW (1600 vph) and Main Street\South Service Road (400 vph). The increased

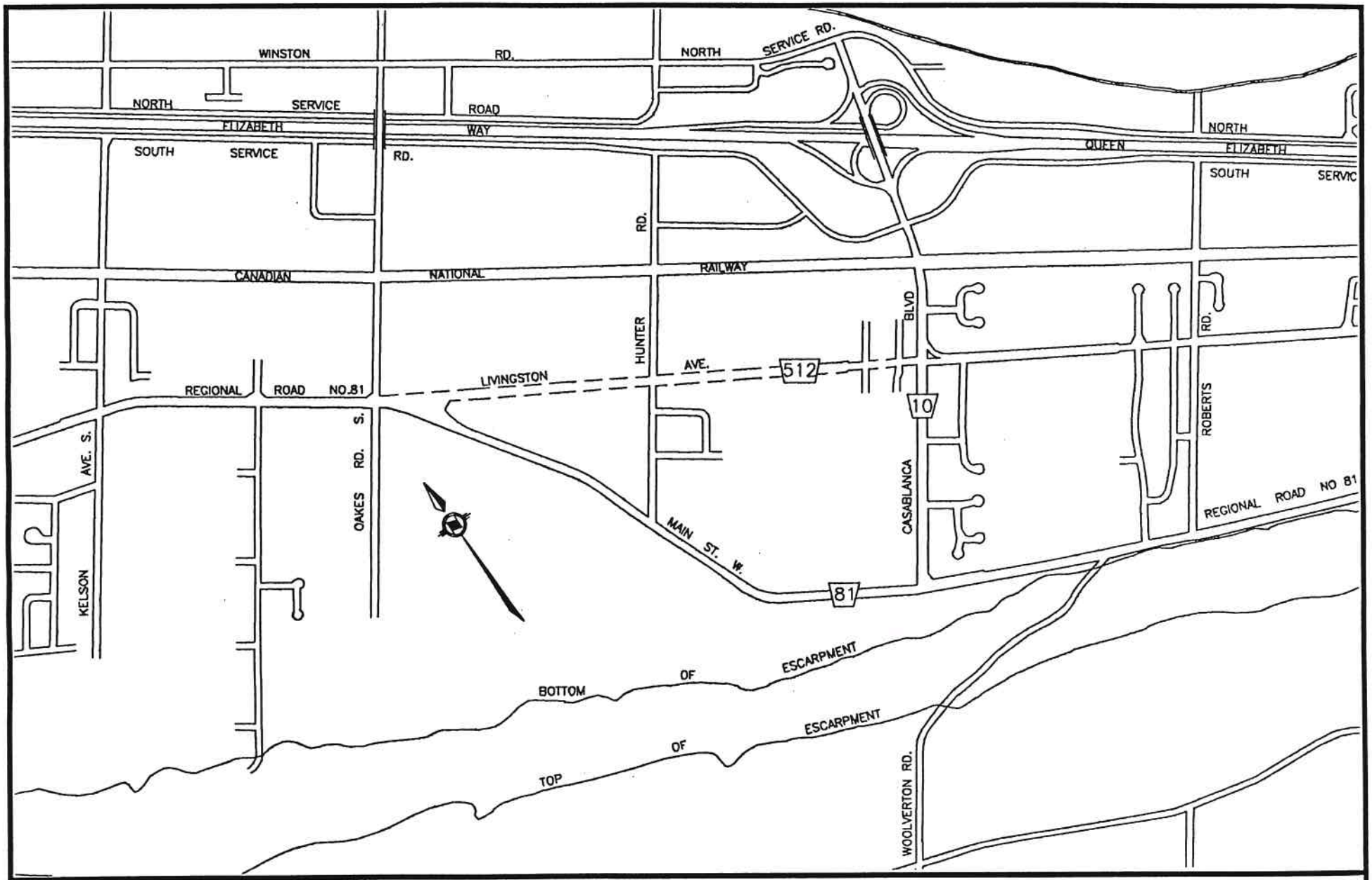


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

PROJECTED P.M. PEAK HOUR LEVELS OF SERVICE

Exhibit
4.3



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN

EXISTING ROAD NETWORK WEST OF CASABLANCA

Exhibit
4.4

congestion may have an additional impact, since Main Street West, which is currently designated as "the Wine Route", would no longer be perceived as a leisurely scenic drive. This could deter tourism traffic.

Downtown Core

At one time the development of the downtown area, Exhibit 4.5, with Main Street as the only through route was envisaged as a method of promoting the downtown area. By forcing consumers to drive past the store fronts, it increased the exposure for those businesses. Today, this strategy operates to the detriment of the downtown area by limiting the accessibility of the area to local traffic. Without the option of parallel routes, the road network is less able to respond to small peaks in the traffic demand resulting in some delays. As delays become more frequent, more people will try to avoid the area. Consumers are also confronted with the decision each day, "Do I drive downtown? or Do I hop on the QEW and drive a few minutes to nearby Stoney Creek?".

By the year 2001, although excess capacity will be available on the QEW through this section, Main Street will be forced to operate at or near its capacity. This would result in an increase in the traffic delays which are currently being experienced.

In the long term (2011) the situation would continue to deteriorate as the travel demands are expected to exceed the capacity by at least the equivalent of two full arterial traffic lanes (1600 vph). This capacity deficiency is distributed between the QEW (1500 vph) and Main Street\South Service Road (100 vph).

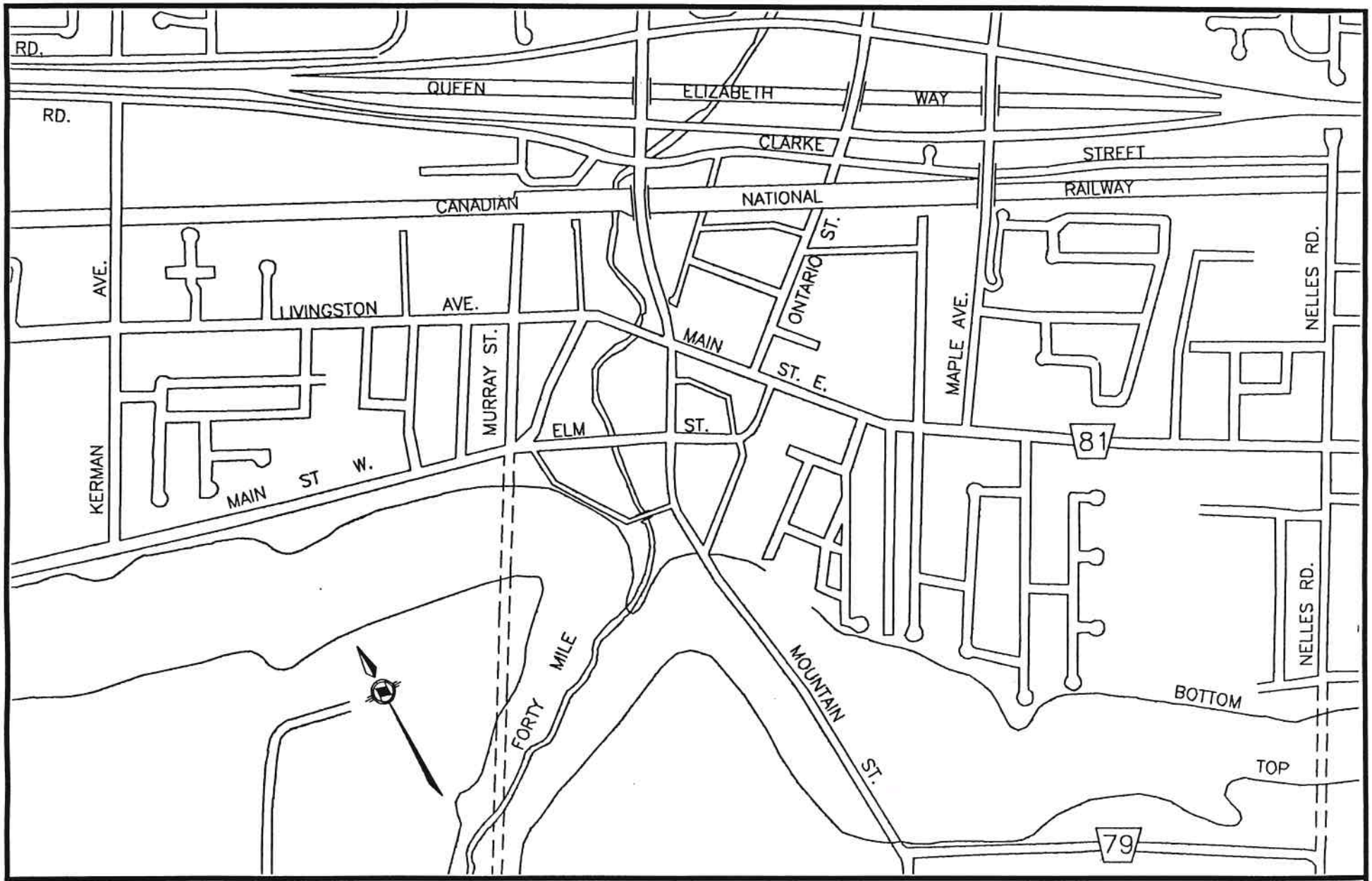
East of Downtown

The area, as shown in Exhibit 4.6, will in the short term provide a high level of service on average across the screenline. The combined effects of a wider QEW and the connection of Central Avenue to better distribute locally generated traffic

will result in a high level of service being provided. However, the Main Street corridor will operate at a poor level of service, with traffic demands exceeding the available capacity by approximately 250 vph. The left turn lanes which have recently been added along this section of the corridor significantly improve traffic operations and slightly increase the roadway capacity.

In the longer term, the traffic demand across this screenline would exceed the available capacity by approximately 700 vph or one arterial lane. The QEW demand would exceed its capacity and Main Street would reach levels beyond the available capacity by 200 vph. Also, Central Avenue would be operating at capacity. Without any improvements to either Main Street or the provision of an alternative corridor to accommodate this growth in traffic, motorists would likely continue to use Central Avenue as a through route.

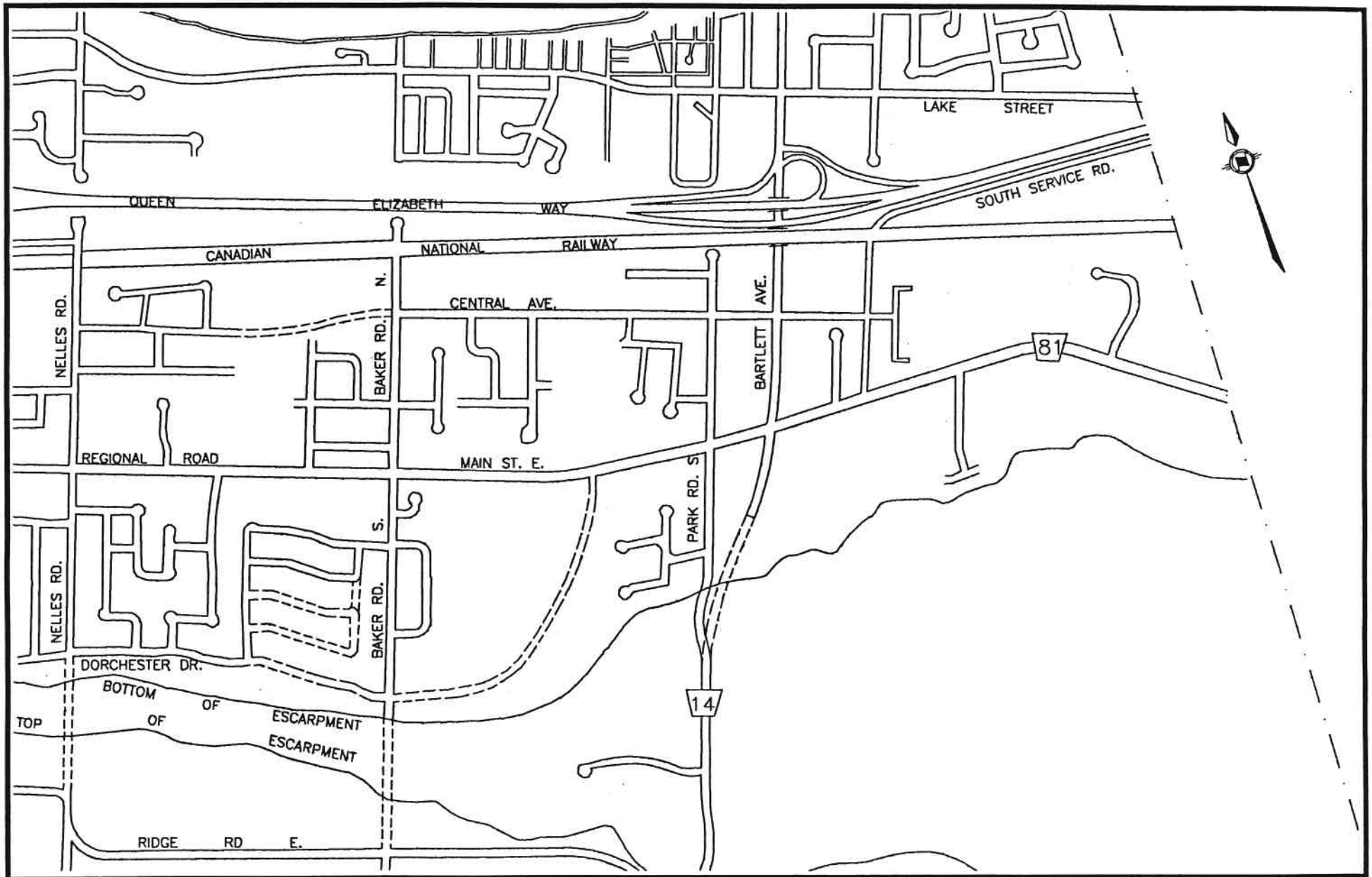
This area is the most critical area in the Town of Grimsby. Excluding the QEW traffic, the major traffic movement is in the east-west direction between the Highway and the escarpment. Currently the only continuous east-west roadway is Main Street East and it currently has two lanes. At some point in the future Central Avenue will be completed between Nelles Road and Bartlett Avenue, but it is a residential roadway designated as local collector. This lack of alternative east-west roadways focuses all the traffic demand on Main Street and places more pressure on Grimsby's downtown. This will result in peak hour congestion and inefficient traffic operations. The bottleneck caused by the lack of alternative roadways will also force some residents and emergency vehicles to utilize the QEW when travelling from one end of the Town to the other. This is undesirable from both the MTO and Town's perspective in that this type of use of the QEW adversely affects the mainline operation and it is inconvenient to the Town's residents.



TOWN OF GRIMSBY
Transportation Planning Study
DELCAN

EXISTING ROAD NETWORK
DOWNTOWN CORE

Exhibit
4.5



TOWN OF GRIMSBY
Transportation Planning Study

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EXISTING ROAD NETWORK EAST OF DOWNTOWN

Exhibit
4.6

4.2 PARKING

A suitable supply of well located and accessible parking is one of the key factors in the Town's plan to maintain a vibrant downtown area. Grimsby's downtown area, like many municipalities, is facing strong competition from large shopping centres located in neighbouring municipalities.

Parking Requirements

The 1988 Parking Study observed a peak parking demand of approximately 720 vehicles. Using the projected forecast in employment for the downtown area as a basis, the demand for parking would increase as follows:

- **observed demand 1988 - 720 spaces**
- **projected demand 2001 - 760 spaces**
- **projected demand 2011 - 810 spaces**

The employment projections that were supplied by the Region of Niagara indicate that moderate employment growth in the retail sector is expected in Grimsby's downtown area. The resulting increase in parking demand should therefore be in the form of long-term or all day parking. The growth in long-term parking demand could be further affected by the continued growth of Grimsby as a "bedroom" community to Hamilton-Wentworth and the Greater Toronto Area. The resulting increased volume of commuter traffic brings with it a greater potential for car pooling and other ride-sharing programs. These often require a central location for commuters to meet and congregate into carpools. Such a park-and-ride lot should not be located in this downtown area. It would be more appropriate to locate the facilities in an area which would intercept a greater number of commuters and not take up valuable downtown space.

Parking Supply and Utilization

The conclusion of the 1988 Parking Study was that although specific high demand areas exist within the downtown area, sufficient parking spaces are available to accommodate the peak demand. This finding may be deceiving. A parking problem does in fact exist in the downtown area. This is confirmed by the fact that 90% of the downtown businessmen surveyed by the parking study felt there was a parking problem in the downtown core. From a marketing standpoint, if consumers have the same opinion as the merchants, it does not matter if a shortage of parking spaces is real or merely perceived; they may elect to go elsewhere to shop.

Observations made by Delcan on two separate occasions in June 1993 further confirm that parking problems do exist in the downtown area. These might be isolated instances. However, they are indicative of a potential problem:

- On-street parking, which is intended to provide shoppers with the greatest convenience, was largely occupied before the stores even opened in the morning. This suggests that short-term spaces intended for shoppers were being utilized by workers for long-term parking.

- The public lot located north of Main Street, off Christie, had been reported by Town staff in 1991 to be 80-90% filled by vehicles left all day. This lot, due to its high visibility, is an ideal location for shoppers and was observed in the morning to be used by employees of local businesses as well as the adjacent taxi stand.

- Some confusion also seems to exist regarding the existing parking restrictions for the public lot off Christie Street. Although reference has previously been made to a two-hour parking limit, no signs posting this restriction were observed. The adjacent Zellers parking lot, however, was clearly identified as having a two-hour limit.

A review of the 1988 study indicates that the parking supply identified in the report might more accurately be described as the total potential parking supply rather than actual available supply of parking. The study indicated that 87% of the parking demand was for four hours or less. The majority of this demand would be created by shoppers. Between 15% and 20% of the parking spaces included in the inventory however, cannot be considered suitable for this parking use due to problems with either the accessibility, visibility or the condition of the lots. The 28 parking spaces located beside St. George's Church at the corner of Ontario and Adelaide Streets, for instance, were included; although at the time the area was posted as a tow-away zone and since then gates have been installed across the entrance.

Improvements to the supply of parking would appear to be warranted. The solution is not to simply increase the number of time restrictions that exist since the longer term parking demand must also be accommodated. The development of larger, more efficient and integrated parking layouts instead of smaller lots with limited access may assist in reducing congestion on the road system. For instance, motorists who circle the block in search of a parking space contribute to traffic volumes and congestion, but are not reflected in any traffic forecast.

4.3 TRANSIT

Grimsby's population of 18,700 is predominantly concentrated between the escarpment and Lake Ontario. It is projected to grow to 21,600 by the year 2011. There is a large seniors population now as well as a growing number of households with children. Canadian demographic trends indicate that the population is aging and with this trend will come a greater number of people with disabilities. At the same time, Canadians are concerned about the environment and the quality of urban life. The automobile, as a major contributor to air pollution, also has a negative impact on the quality of urban life, even in smaller cities and towns as can be seen through traffic congestion and the inefficient use of land for parking and roads. For these reasons, Canadians are generally in

favour of the improvement and expansion of public transit services. Our investigation of Grimsby's transportation planning needs has revealed similar concerns with residents.

Other towns, even smaller than Grimsby, now have some form of public transit system. These include:

TOWN	SERVICE AREA POPULATION	No. OF BUSES IN SERVICE
Cobourg	14,600	2
Fort Erie	26,000	1
Fort Lindsay	15,500	4
Orangeville	17,000	2
Port Hope	10,500	1

Although many factors such as geography, population density, road network and urban design can affect the feasibility of a public transit service, it would appear that Grimsby is now at the point, in terms of socio-economic characteristics, where consideration of some form of public transit service would be reasonable.

Due to the absence of any form of public transit, Maplecrest Village (a retirement home located in Grimsby) offers a shuttle service for its residents. This service can only be offered one afternoon each week. A transit service operating all week would be much more convenient since scheduling for medical appointments and other arrangements are difficult to organize around that single day service.

There are many forms that transit can take, both in the vehicle selection and in method of operation. Although the provision of transit services may be feasible, an intra-municipal transit service would have a limited impact upon the actual traffic volumes on the roads. This impact would not be significant enough to affect the requirement for any road network improvements considered in this study. Transit service even in larger centres is frequently viewed as an alternative for

those who have no car or who are unable to drive. The added convenience provided by private automobiles is difficult to compete with. This would be particularly true in Grimsby where the majority of households have two or more vehicles and a relatively low proportion (50%) of trips made by Grimsby residents remain within the Town.

Specialized Transit Service

The 1989 Household Travel Survey revealed that over 6% of Grimsby respondents indicated that they have some form of special transportation need. This included services ranging from handicapped parking to bicycle services. Service provided by Moore's Taxi does not include access to wheelchair accessible vehicles. Maplecrest Village have, on occasion, rented such a vehicle from Babcock Coach in Beamsville, but unfortunately the costs involved prohibit doing so with any frequency. Due to the lack of any existing alternative, the greatest potential for intra-municipal transit services lies in the area of specialized needs for persons with transportation disabilities.

Inter-Municipal Services

Services are currently provided by both Trentway Wagar and Greyhound. During the course of this study, two factors inhibiting the use of these services have become evident:

- The prevention of Trentway Wagar from providing service to the Toronto area; and

- The lack of public awareness that, with the absence of formal bus stops, buses can be boarded anywhere along the route.

The recent sale of Canada Coach Lines to Trentway Wagar has resulted in an application by Trentway Wagar for provincial approval to expand the previous services. The issue of inter-municipal transit service is being examined as part of

the Transfocus 2021 Study which is currently underway. The anticipated growth of Grimsby as a bedroom community to Hamilton and the Greater Toronto Area, in addition to the ever increasing traffic congestion confronting these communities, should result in a greater potential demand for these services.

4.4 OTHER MODES

Though the automobile will remain the dominant mode of transportation in Grimsby, other modes (walking, cycling, etc.) do account for an important part of the Town's travel demands. The 1989 Household Travel Survey identified 8.5% of all trips generated in Grimsby to be by other modes.

The Region of Niagara has recently announced that a Regional Bicycle Study is now being conducted to develop a Regional Master Plan and is expected to be completed by February, 1994. It is essential that any local or Regional initiatives to promote cycling be fully integrated to ensure that the maximum benefit can be obtained.

Bicycling can provide numerous benefits to a community, both as a means of transportation (i.e. utilitarian cycling, whereby the trip has a specific destination and purpose such as work, school, shopping, etc.,) and as a recreational activity. The benefits of cycling are not limited by the size of the community, and they may include any of the following:

- accessibility and affordability;
- can make the existing transportation system more efficient;
- provides an alternative to the automobile for short trips (i.e. within approximately 7km);
- noiseless, pollution-free and does not contribute to the drain on existing forms of non-renewable forms of energy;
- promotes a healthy lifestyle; and
- requires a minimum area for parking - relative to the automobile.

As environmental, health, affordability, and other related concerns keep growing in the 1990s and beyond, the bicycle will play an ever increasing role in providing solutions to transportation and other related problems. The Town, including politicians, staff, community groups, local health organizations and others, can all adopt a positive role in promoting the bicycle as an alternative mode of transportation.

In most communities the bicycle is already used as a means of transportation and recreation. However, many people do not use the bicycle (or use it less) because they perceive the bicycle to be unsafe[1]. Consequently, our efforts have been concentrated on suggestions aimed at making bicycling safer for those who already cycle, and at the same time encouraging those who might like to start, or would like to use their bicycle more.

In many cases upgrading existing facilities to make bicycling safer can be done in conjunction with scheduled work programs, thus minimizing the overall costs. One of the first steps that should be taken if the promotion of cycling is to be pursued would be to assign one staff member the responsibility of "Bicycle Program Manager". Initially, this title may accomplish little beyond serving as a reminder of the cycling concerns during the existing roadway design review process.

The role of "Bicycle Program Manager" should be to ensure that bicycling is considered and incorporated in all transportation projects where appropriate; provide assistance on technical matters; and develop policies/guidelines that define the goals and objectives of the Municipality and ensure that these are consistent with the overall Regional Plan being developed. Ultimately the responsibilities may include the promotion of bicycling through liaison with community groups or public education programmes. Selecting the "Bicycle Program Manager" from the Engineering or Planning Departments will ensure the best access to information and other resources necessary to carry out the tasks involved.

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[1] A. Clarke. Bicycle Friendly Cities: Key Ingredients For Success. Transportation Research Record 1372. Washington, D.C. 1993. pg. 71.

Recreational or tourist bicycling has the potential to provide a different set of benefits for Grimsby. Bicycle touring is becoming more popular, especially in the Niagara Region where a number of attractions already exist. For example, the Wine Regions of Ontario, which span the area from Stoney Creek to Niagara Falls, already has major tourist promotions in the summer. Along with a number of other events, their Calendar of Events includes one-day bicycle tours featuring 3 or 4 different wineries. These bicycle tours create a number of economic spin-off benefits, including a demand for accommodation, restaurants, and support services such as bicycle shops, gift shops, etc.

Coincidentally, the Wine Regions Welcome Centre is located just off the QEW at Casablanca Boulevard, and the following three wineries are also located nearby:

- Andrés Wines at Kelson Avenue & South Service Road in Winona;
- Stoney Ridge Cellars at 1468 Highway 8 in Winona; and
- Montravin Cellars at 4701 Ontario Street in Beamsville.

The Town should consider the potential for encouraging tourism and cycling, and wherever possible, the routes should be linked with those geared towards utilitarian cyclist. This will help minimize costs of upgrading existing facilities.

5 IDENTIFICATION OF ALTERNATIVES

This section presents the options which are available to improve the transportation system within the Town of Grimsby.

5.1 ROADWAY & TRAFFIC OPERATION IMPROVEMENTS

The roadway and traffic operation improvement options presented represent three levels of priority, namely:

- An immediate action plan
- Longer term options, which upon evaluation will be prioritized into:
  - a short-term plan, and
  - a long-term plan

These plans will combine to form the overall Transportation Strategy which will shape the transportation future of the Town of Grimsby.

5.1.1 Immediate Action Plan

The following options to be considered for an immediate action plan were developed in response to existing traffic operations and safety concerns that were identified during the study.

Christie Street at Clarke Street/South Service Road

The traffic accident experience at the intersection indicates that the installation of traffic signals would be warranted (under MTO accident warrant). The intersection was found to be the most frequent accident location with a total of 34 accidents over 4.5 years. This translates into a collision rate of 1.8 accidents per million vehicle entries. The accident record could be much worse, as many motorists currently avoid Clarke Street due to the safety concerns of this location. This diversion of traffic contributes to the traffic congestion along Main Street.

The main factor which contributes to the high number of accidents is the restricted sight distance at this location. The obstruction of the sight distance is caused by the profile of Christie Street over the CNR tracks to the south and the parapet wall of the structure spanning the QEW to the north. The close proximity to the intersection of Christie Street and the eastbound QEW off ramp is also a factor.

Christie Street and the QEW South Ramp

If the adjacent intersection of Christie Street and Clarke Street were to be signalized, the operation of the eastbound QEW off ramp would be affected. As a result signalization of the two intersections might be considered. As an alternative to signalization, the following lane designation adjustments could be considered:

- redesignate the 2 eastbound lanes currently on the ramp as an exclusive right turn lane and a shared left turn and through lane;

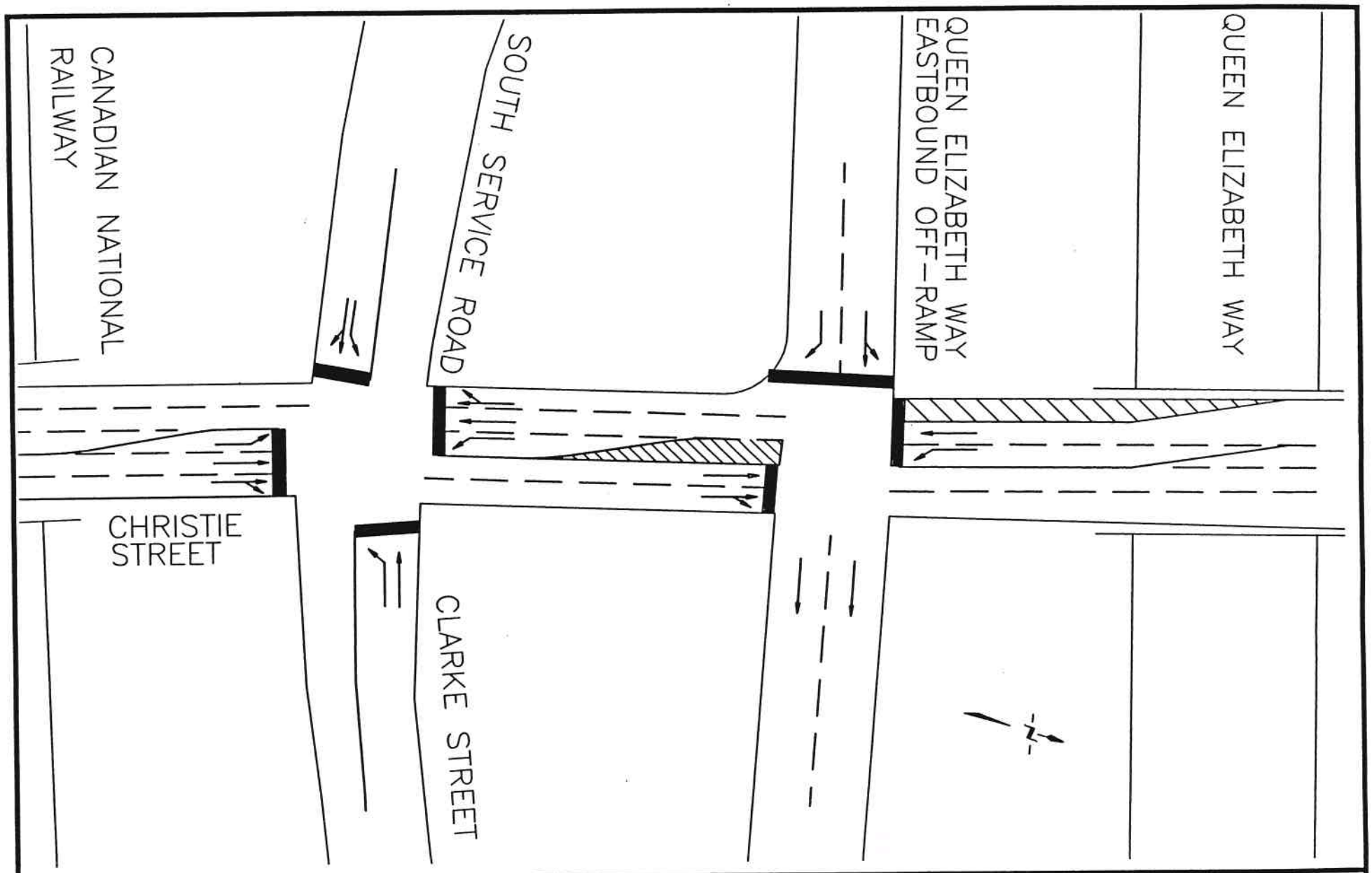
- restrict southbound Christie Street, over the QEW, to a single through lane to allow for a discharge lane to be provided for the right turning vehicles coming off the ramp.

A schematic of this potential lane configuration is provided in Exhibit 5.1.

An alternative to revising the lane designations would be to signalize both intersections and coordinate the signal timing designs.

Mountain Road and Mud Street

A review of the historical traffic accident rates indicated a higher than average accident record at this location. The Region of Niagara has already responded through the provision of a four-way stop with oversized signs and the addition of "stop ahead" signs on the approach. As a result, no further action is required at



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS

CHRISTIE/QEW SOUTH RAMP POTENTIAL LANE CONFIGURATION

Exhibit 5.1

this time.

North Service Road (East of Casablanca)

A review of the limited information available from traffic accident records failed to reveal any single consistent pattern of traffic accidents in this area. While some of the accidents have been related to slower moving truck traffic, others appear to be the result of impatient drivers and roadway alignment. It is also noted that traffic in the area is currently undergoing a period of transition. The traffic demands have changed as a result of removing the "Hunt Club" hotel (May 1989), which previously was located just east of "The Fifth Wheel". The travel patterns are now changing further due to the recent opening of the new commercial development west of Casablanca Boulevard. As a result, it is suggested that the MTO, who control the roadway, continue to monitor the accident experience along this section prior to any action being taken.

Central Avenue

It is the desire of both the Town and area residents that Central Avenue continue to function as a local collector roadway. In response to concerns expressed by some of the residents and to help ensure potential problems do not develop in the area in future, it is suggested that the use of Central Avenue by trucks be prohibited. This could be initiated as an initial traffic demand management measure to discourage through truck traffic from using the roadway connection. The bylaw restricting truck traffic would have to include an exception for trucks on delivery to businesses and residences located on or accessed by Central Avenue. If measures to further discourage traffic infiltration become necessary, a variety of traffic calming techniques can be considered. These range from passive controls such as stop signs, speed limits and turn prohibitions to physical controls. The decision to implement these measures should be made by the Town's Staff dependent on the traffic conditions at the time.

Main Street at Ontario Street

Traffic delays are currently being experienced by eastbound motorists as the result of queued vehicles attempting to turn left onto Ontario Street. In response, it is recommended that the no parking designation which currently exists on the south side of Main Street be extended an additional 15 m west of the intersection. This would require the removal of two parking spaces.

Main Street at Maple Street

The provision of an eastbound left turn lane on Main Street at Maple Avenue and a run out area east of the intersection would improve the traffic operations but would require some minor road widening and utility pole relocations. This will allow eastbound through vehicles to bypass left turning vehicles and will provide a refuge for southbound left turning vehicles exiting Maple Avenue. This three lane cross-section can ultimately be connected to the existing three lane cross-section which currently exists between Baker Road and Nelles Road. This extension will reduce the delays to the side street traffic wishing to enter or exit Main Street by providing them with a centre lane refuge. Also, Main Street traffic flow will be improved by the removal of the turning vehicles from the traffic stream. In the longer term with the completion of the Dorchester and the Sherwood subdivisions, Dorchester Drive will be connected to Main Street West between Baker Road and Bartlett Avenue. Based on the site impact traffic study which was prepared for these developments a traffic signal will be warranted at Main Street and Baker Road. This point along with the increase in turning activity to\from Main Street West may require the extension of the 3 lane Main Street section from Baker Road to the four lane Main Street section just west of Bartlett Avenue.

Main Street and Christie Street/Mountain Road

The collision rate at this location was found to be relatively low. A closer examination of the accident record was conducted since the total number of reported accidents at this intersection was second only to the intersection of Christie Street and Clarke Street.

The accident record indicated that approximately one-third of the accidents were right-angled collisions, types that are normally preventable by traffic control signals. An examination of the intersection revealed that for the northbound approach, visibility of the secondary signal head is partially obscured by utility poles and a tree planted in the boulevard west of Mountain Street. Having the tree trimmed would result in some improvement. Signal visibility does not appear to have been a major factor in the collisions. The absence of available sight distance on certain approaches due to the proximity of the existing buildings to the intersection does compound these problems. After review of the traffic signal timings, it is suggested that, consistent with the guideline for Signal Timings produced by the Ministry of Transportation[2], the signal timings be adjusted by increasing the length of the clearance intervals to provide approximately a 4 second amber and 2 second all-red phase. This would give motorists additional time to clear the intersection.

5.1.2 Longer Term Options

The road network that will be developed to service Grimsby's transportation requirements will influence the shape and the character of the Town in the years ahead. It is important, therefore, to ensure that all options are given consideration. These options may then be tested and evaluated to determine their relative advantages, disadvantages and possible trade-offs in order to determine the preferred solution.

[2] W.G. Hutton, T. Radvanyi, and B.Y. Quan, "Traffic Control Signal Timing and Capacity Analysis at Signalized Intersections", Ontario Ministry of Transportation, Traffic Management and Engineering Office, Dec. 1989.

NORTH-SOUTH CORRIDORS

Escarpment Crossings

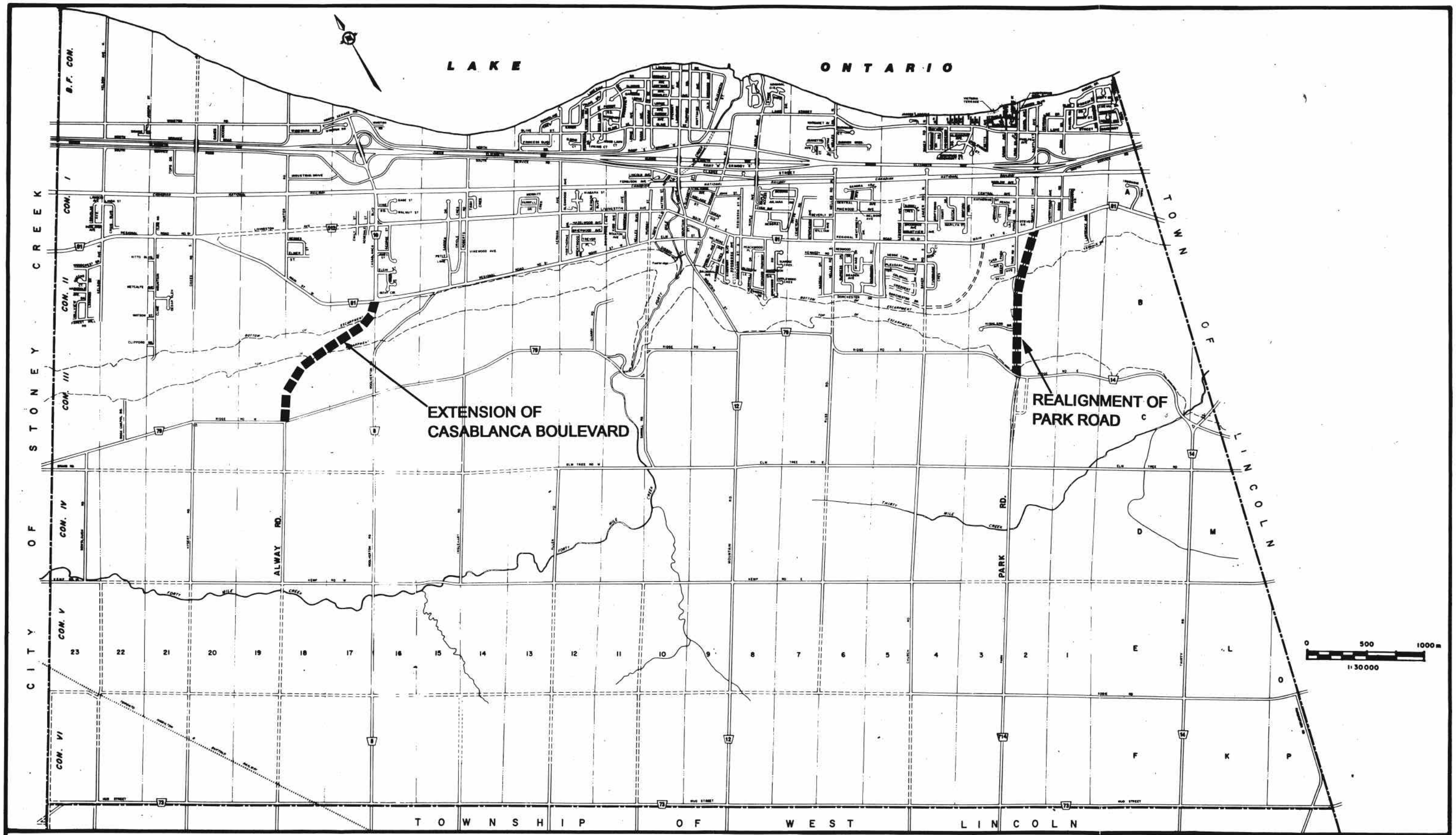
To respond to residents' concerns regarding the safety of the existing escarpment crossing while also satisfying the future traffic demands up and down the escarpment, a crossing constructed to higher geometric standards is essential. A sidewalk may also be included in the design to minimize the opportunity for pedestrian-vehicular conflicts. To maximize the efficiency of the road system, any new or upgraded crossing should provide a direct connection with the QEW. Maximizing the efficiency of the escarpment crossings would also be consistent with the objective of the Niagara Escarpment Commission which is to protect the escarpment from future disturbance. It also allows the potential impact upon the surrounding neighbourhood to be kept to a minimum.

Discussions with Regional Staff confirmed that upgrading existing Mountain Street is not feasible due to the limited width that is available and the Environmental impact on the escarpment. The two options described below that have been identified are shown in Exhibit 5.2.

1. Realignment of Park Road as a 4-lane cross-section connecting with Bartlett Avenue;

2. Extension of Casablanca Boulevard connecting Casablanca Boulevard with Alway Road as a two lane arterial but with the potential to widen ultimately to four lanes.

These alternatives were developed by examining Grimsby in isolation. However, the planning of truly efficient escarpment crossings should be studied on an Inter-Regional level similar to that of the ongoing Transfocus 2021 Study. In discussions with the study Project Coordinator it has been determined that the escarpment crossing issue has yet to be resolved.



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

ALTERNATIVE ESCARPMENT CROSSING IMPROVEMENTS

Exhibit
5.2

Below the Escarpment

On a screenline basis the projected north-south travel demands indicate that limited additional roadway capacity is required. A large proportion of the north-south traffic is destined to/from the QEW corridor. Therefore, in order to provide the required level of access to the QEW interchanges a limited number of options are available. These specific requirements are:

- The widening of Casablanca Boulevard to four lanes between the QEW and Livingston. This is essential under all network alternatives.

- In the downtown area, where right-of-way constraints make any road widening difficult, efforts should focus upon methods of encouraging motorists to distribute themselves more evenly among the available corridors.

EAST-WEST CORRIDORS

West of Casablanca

A limited number of options are available. Further widening within the QEW corridor would not be economically feasible and it also would be unable to provide required access to new development in the area. The options which are available are (refer to Exhibit 5.3):

1. Widen Main Street West to provide a 4-lane cross-section between Casablanca Boulevard and Oakes Road.
2. Extend Livingston Avenue from Casablanca Boulevard to Main Street West:
   - as a 2-lane facility,
   - as a 4-lane facility.

If the extension of Livingston Avenue is constructed, two basic alternatives would

exist for the configuration of the resulting intersection with Main Street West (Regional Road #81) as shown in Exhibit 5.4. This intersection configuration should be consistent with the ultimate plan that is selected through the downtown core.

Downtown Core

Satisfying the future traffic demands through the downtown core of Grimsby is paramount to both this study and the vitality of the area. To accomplish this, options which have been proposed include:

1. **4-Lane Main Street Option** as shown in Exhibit 5.5.

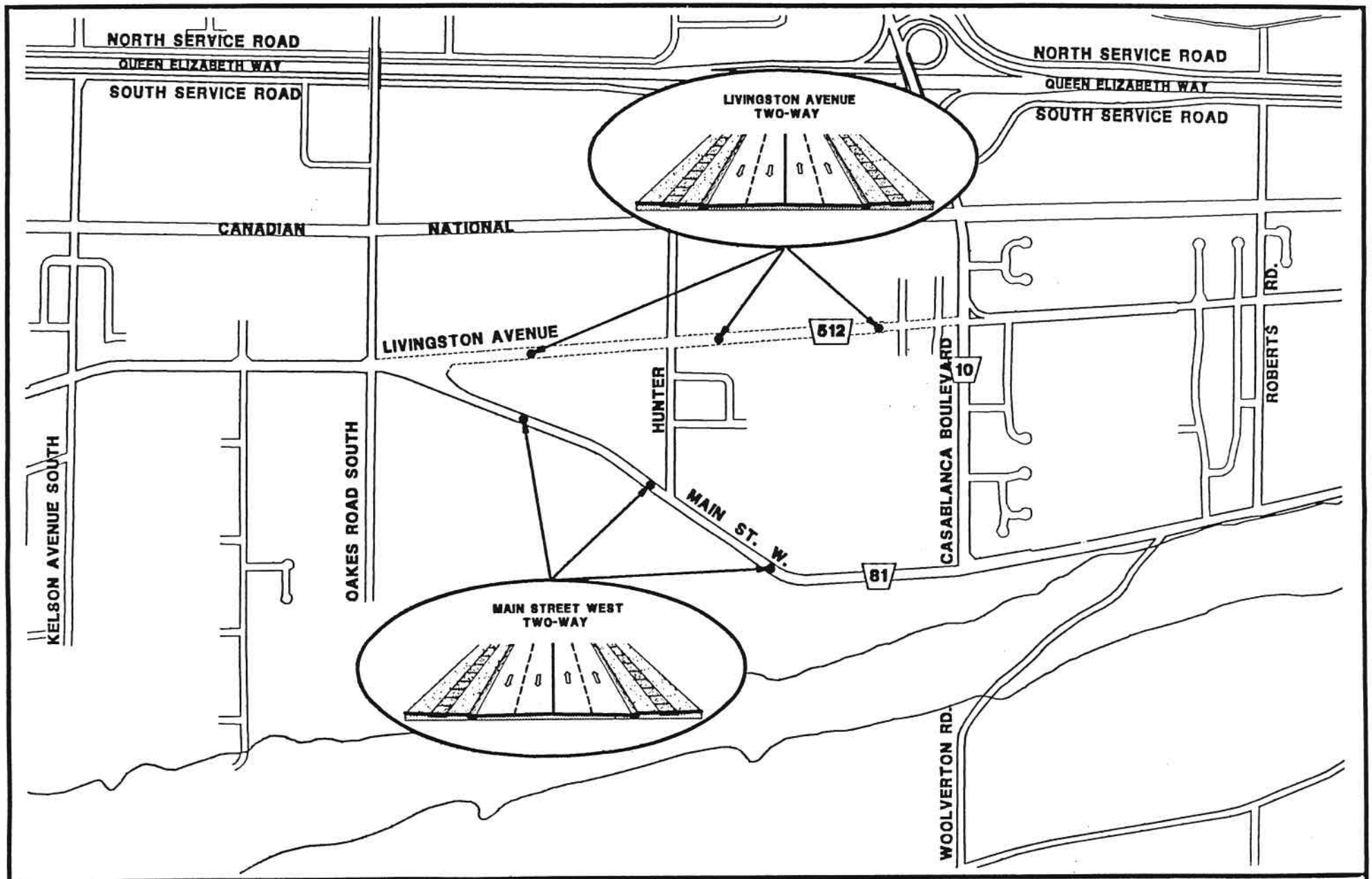
This would require the removal of on-street parking during the peak periods from Main Street between Maple Avenue and Livingston Avenue. Immediately west of the downtown area, Livingston Avenue would also be designated as a 4-lanes through the revision of the existing pavement markings.

2. **One-Way Street System** as shown in Exhibit 5.6.

Main Street East would be designated as one-way westbound providing three lanes from Elm Street to Livingston Avenue. This would require the restriction of on-street parking from the south side of Main Street during the peak periods. Elm Street would then be designated as one-way eastbound, providing two lanes of traffic. Finally, on Main Street between Maple Avenue and Elm Street a four lane roadway is required.

3. **South Service Road**

The extension of Clarke Street to complete the South Service Road through Grimsby is an option that has been promoted by various groups in recent years. One of the complaints from area residents is that when lengthy delays are experienced along the QEW, eastbound motorists who use the service road are stopped at Nelles Road. Reports of conflicts have been received as motorists who



TOWN OF GRIMSBY
Transportation Planning Study

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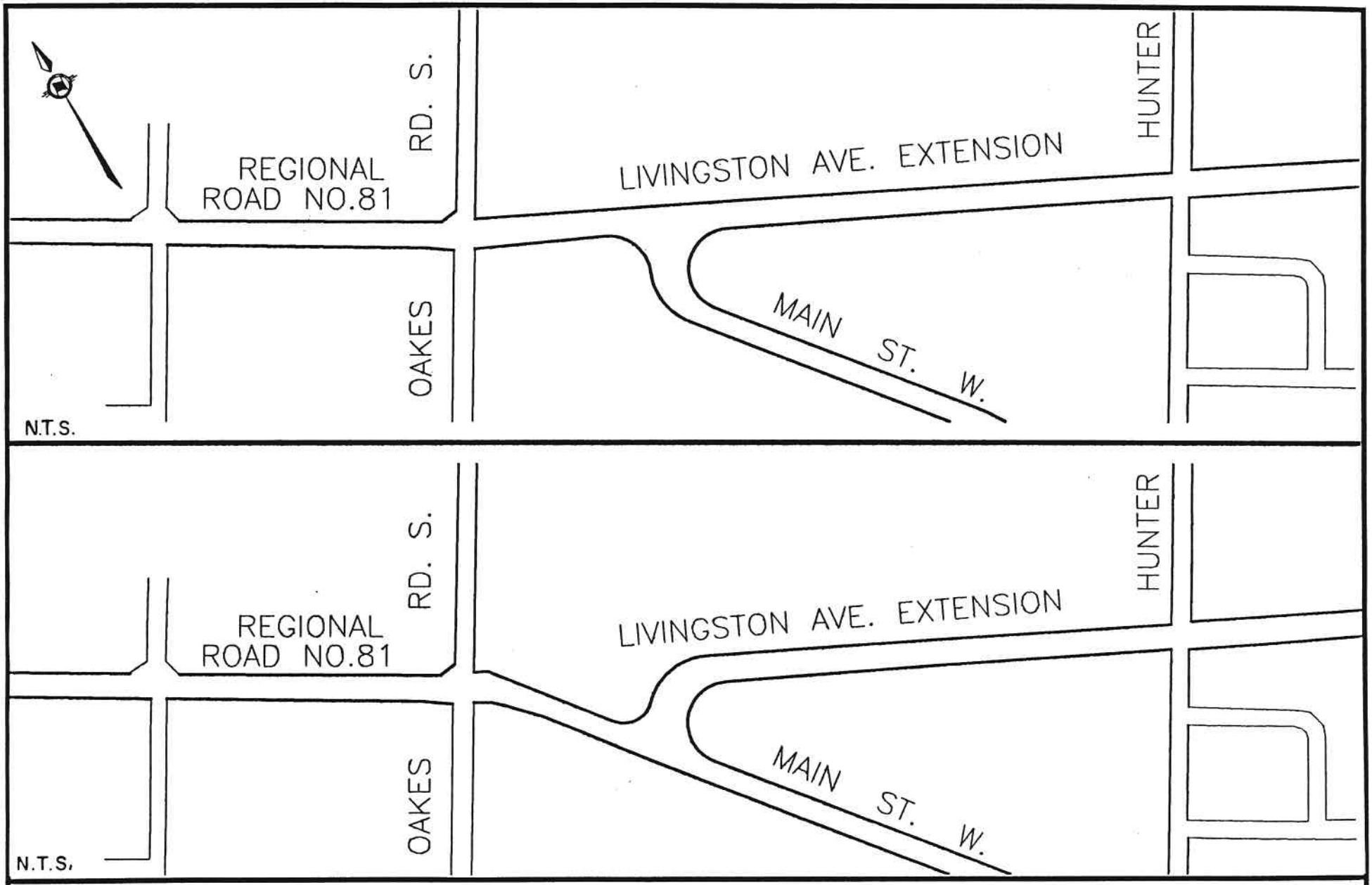
WEST OF DOWNTOWN

ALTERNATIVE ROAD IMPROVEMENTS

Exhibit

5.3



TOWN OF GRIMSBY
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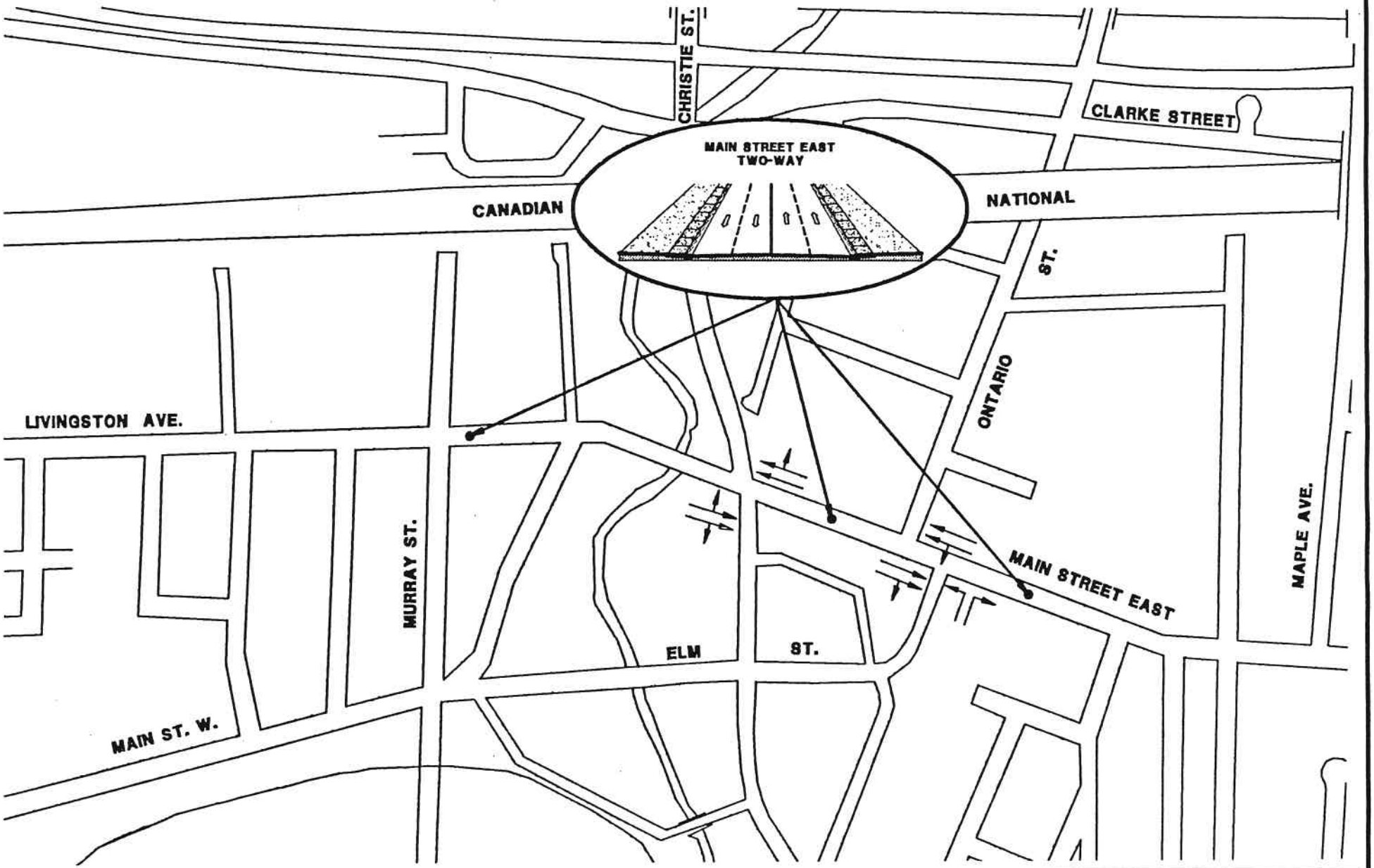
LIVINGSTON AVE. EXTENSION AT MAIN ST. WEST
ALTERNATIVE INTERSECTION CONFIGURATIONS

Exhibit
5.4



TOWN OF GRIMSBY
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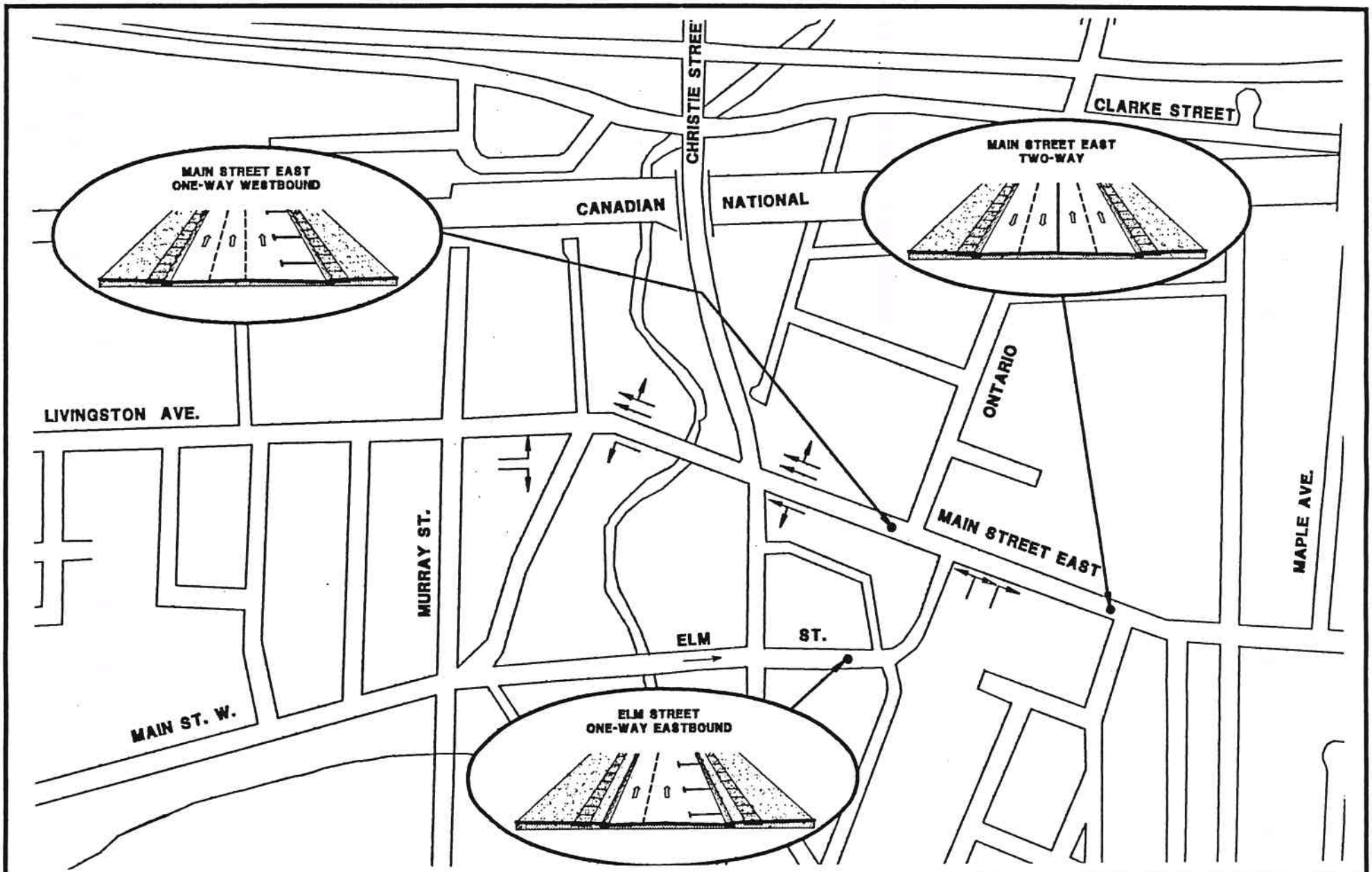
DOWNTOWN

FOUR-LANE MAIN STREET ALTERNATIVE

Exhibit

5.5



TOWN OF GRIMSBY
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DELCAN

DOWNTOWN

ONE-WAY STREET SYSTEM ALTERNATIVE

Exhibit

5.6

may be unfamiliar with the area have then tried to use local area streets to cut through the surrounding residential neighbourhood. It is difficult to justify the construction of a roadway unless a significant benefit to the overall road network can be demonstrated beyond it simply being available if there is an incident on the QEW.

The area east of the Downtown is the most critical area in the Town of Grimsby as it is serviced solely by Main Street. Excluding the QEW traffic, the major traffic movement within Grimsby is in the east-west direction and occurs between the Highway and the escarpment. Currently the only continuous east-west roadway is Main Street East and it is only two lanes. At some point in the future Central Avenue will be completed between Nelles Road and Bartlett Avenue, but it is a residential roadway designated as local collector. The lack of an alternative east-west roadway focuses all the traffic demand on Main Street and places more pressure on Grimsby's downtown. This results in peak hour congestion and inefficient traffic operations. To address this problem, capacity improvements through the Downtown are required. Options such as removing on street parking and creating a four lane roadway through the downtown as well as widening Main Street East to either 4 or 5 lanes will have to be investigated. These options will have high social and environmental impacts.

The bottleneck caused by the lack of alternative east-west roadways also forces some residents and emergency vehicles to utilize the QEW when travelling from one end of the Town to the other. This is undesirable from both the MTO and Town's perspective in that this type of use of the QEW adversely affects the QEW mainline operation and it is inconvenient to the Town's residents. Also, the location of the new Fire Station at the intersection of the South Service Road and Ontario Street further emphasizes the need for this direct link into one of the largest residential areas in the Town of Grimsby.

A number of alternative configurations for this possible extension were previously prepared by the MTO as part of the Queen Elizabeth Way - Hamilton to St. Catharines Preliminary Design Study. These options were reviewed. When the future travel demands were considered, it was determined that a basic requirement

of any alternative should be to attempt to maintain all movements at the Bartlett Avenue Interchange. To enable the roadway to serve as a viable alternative to Main Street for local area traffic, connections to the area collector roads are essential. The three concepts that have been considered are presented in Exhibit 5.7. They are:

- **Option "A"** - Allows the extension to operate as a two-way facility. This requires a grade separation with no connection to Bartlett Avenue. Connections with Baker Road and Book Road are options.

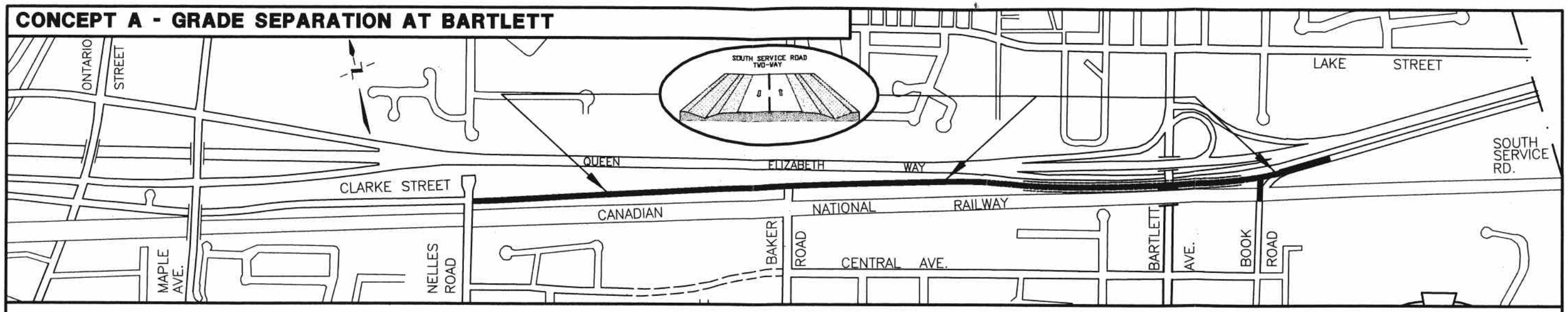
- **Option "B"** - Allows an at-grade connection to Bartlett Avenue to be provided. The extension would operate as a two-way facility from Nelles Road to Baker Road and as a one-way facility eastbound from Baker Road to Book Road. Prior to the Bartlett Avenue intersection this one-way link would merge with a reconstructed QEW eastbound off-ramp. Connections with Baker Road, Book Road and an extension of Lawrence Avenue are options.

- **Option "C"** - Allows an at-grade connection to Bartlett Avenue to be provided. The extension would operate as a two-way facility from Nelles Road until it reconnects with the east section of the South Service Road. The roadway would utilize the existing QEW eastbound on and off ramps at Bartlett Avenue to provide the at-grade intersections with Bartlett Avenue. The QEW eastbound off-ramp would be relocated west of the existing location connecting with the existing service road at that point. The QEW eastbound on-ramp would be relocated east of Bartlett Avenue along the service road. A connection with Baker Road is an option.

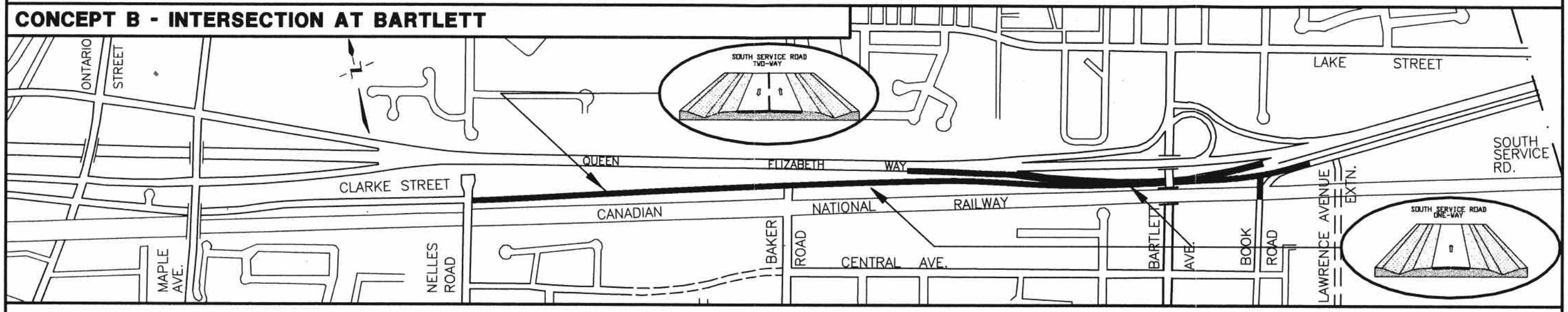
East of Downtown

Improvements to the arterial road network will ultimately be required if traffic infiltration into the Central Avenue neighbourhood is to be avoided. The options

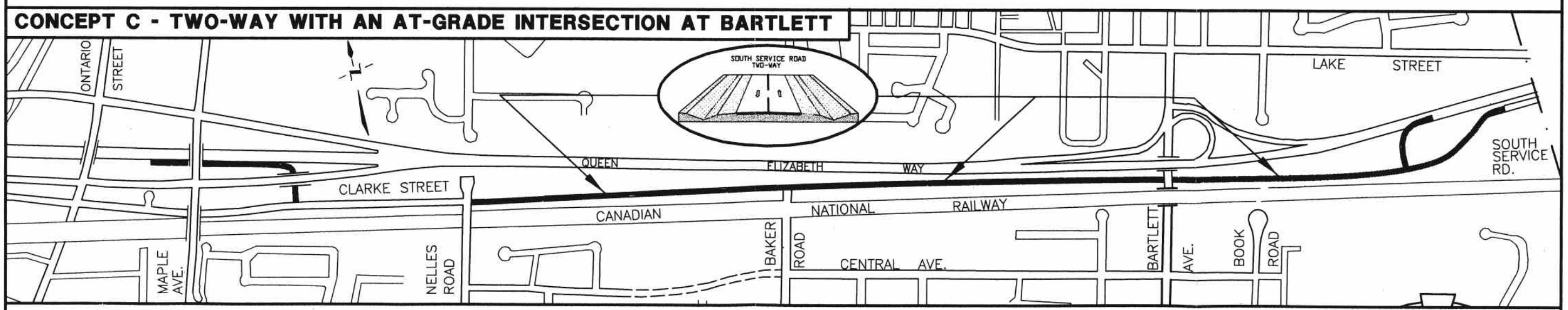
CONCEPT A - GRADE SEPARATION AT BARTLETT



CONCEPT B - INTERSECTION AT BARTLETT



CONCEPT C - TWO-WAY WITH AN AT-GRADE INTERSECTION AT BARTLETT



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS

SOUTH SERVICE ROAD CONFIGURATION CONCEPTS

Exhibit
5.7

which are available to achieve this are:

1. **Widening Main Street East** to four or possibly five lanes. This would include the conversion to an urban cross-section and the provision of sidewalks to reduce pedestrian-vehicular conflicts; (See Exhibit 5.8) or

2. **Extend Clark Street** to complete the South Service Road.

It is essential with either of these options that the system of collector roads be expanded to allow for a better distribution of local traffic and improved emergency vehicle access. The practice of ensuring that collector roads are provided in all new subdivisions is essential if efficient traffic operation along the arterial roadways is to be achieved. The continuation of Dorchester Drive between Baker Road and Main Street plus Central Avenue between Nelles Road and Baker Road would be prime examples.

5.2 PARKING

The supply of parking is essential if Grimsby's downtown businesses are to successfully compete with the lure of shopping malls located in neighbouring municipalities. To accomplish this, a co-ordinated plan is required which, in addition to merely supplying a suitable number of parking spaces, must tackle the stigma of insufficient downtown parking and traffic congestion. The latter is perhaps the most difficult task.

Consideration must be given to the differing needs associated with short-term and long-term parking. To be customer oriented, short-term parking should be located in the most visible areas and must be close to the retail establishments they serve. As safety is becoming an increasing concern, the illumination and appearance of parking areas must receive more consideration.

On-street parking provides the most convenience for short-term parking and it is therefore desirable to maximize the number of on-street spaces available, consistent with the requirements of the roadway to move traffic. Development is now reaching the point, however, where consideration must be given to restricting the on-street parking during peak hours to meet the growing traffic demands. This increases the urgency to provide suitable off-street facilities.

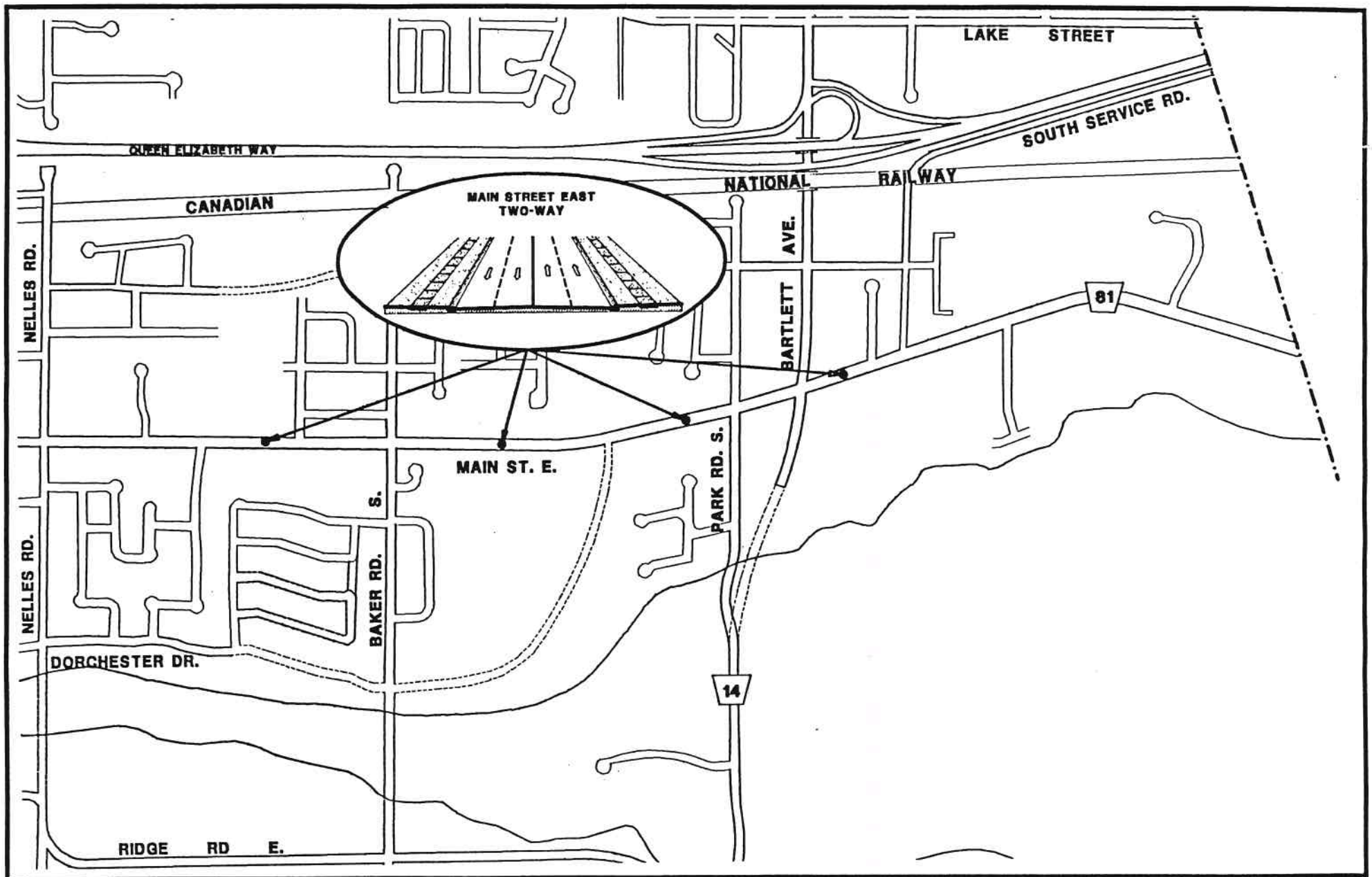
The provision of parking signs on Main Street and Christie Street/Mountain Road can assist in directing tourists who are not familiar with the Town to the off-street lots. The signs can also increase the awareness of area residents to some of the existing under-utilized parking areas, such as those off Ontario Street. The standard sign consists of a green background with a white capital 'P' and arrow to indicate the direction. These standard signs help improve visibility and are easily recognized.

To increase the supply of parking, an area was identified which has the most suitable location and greatest potential. It is the area north of Main Street between Christie Street and Ontario Street. The area currently consists of several disjointed parking lots which are under-utilized because of limited access and their state of disrepair. Improvements that would be required include:

- **Improved Traffic Circulation:** Interconnecting the areas would allow traffic to circulate through the parking area, while also providing access from both Christie Street and Ontario Street. This would also improve traffic operations on Main Street by reducing the number of vehicles which currently circle the block in search of a parking space.

- **Pedestrian Access:** The creation of pedestrian walkways from the parking areas out to Main Street.

- **Construction:** Paving and illumination of the parking areas is essential. This would improve their appearance, enable more efficient use of the available area by allowing a defined parking layout to be established and



TOWN OF GRIMSBY
Transportation Planning Study

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EAST OF DOWNTOWN

FOUR-LANE MAIN STREET ALTERNATIVE

Exhibit

5.8

increase the security for the patrons.

To assist in ensuring that the most accessible parking spaces would be reserved for retail customers, the north end of the resulting lot could be designated for longer term parking.

5.3 TRANSIT

The potential provision of intra-municipal public transit service does not necessarily mean "big buses" would be required. Public transit services can be provided in many different ways, such as:

Community Bus small buses operating on fixed routes linking important destination points and residential areas. Buses should feature low floors to accommodate people with disabilities.

Dial-a-Bus small buses which provide door-to-door service.

Jitneys taxi-vans which serve more than one customer at a time.

Paratransit special transit services which meet the needs of those with disabilities.

The most suitable service for the Town should be determined through an in-depth study which would analyze the needs of residents and the community. It should also consider opportunities for interfacing with the existing inter-city services. Utilizing and sharing existing school transportation related resources and special services now provided by seniors homes would be another consideration. The need for some form of transit terminal and services to the main business district would also be considered. The study would identify the costs involved, alternative methods of delivering and operating the service, as well as how it would be

A variety of possibilities also exist for inter-municipal services. These include:

- Expansion of existing services based in other communities;
- Extension of the Go-Bus system services, and
- Car\van pooling.

The potential for extending the Go-Bus system to suit the needs of a growing number of commuters will be addressed in the Transfocus 2021 study. If a more proactive role in encouraging individuals to leave their cars at home is desired, it should be considered now as the construction delays along the QEW present an excellent opportunity to introduce and market those services. Delays can be expected during the construction and, although each vehicle that is taken off the road will assist in reducing congestion, there is no benefit to using a car pool or the bus if you are going to sit in traffic anyway. The designation of High Occupancy Vehicle Lanes prior to the construction period would assist in encouraging people to consider these other modes.

To support a car pool network, a parking area with quick access on and off the QEW (that is signed appropriately) would be essential. The area should be illuminated at night and a pay phone should also be available. It may be possible to locate this park and ride lot in a portion of the parking area at the existing fruit stand adjacent to the Casablanca Interchange for relatively little expense.

5.4 OTHER MODES

Pedestrians

As the Town continues to grow, a continued expansion of the existing sidewalk system, particularly along collector and arterial roadways, will help reduce pedestrian/vehicle conflicts, thereby improving pedestrian safety. As area development changes, monitoring of pedestrian volumes, particularly in the vicinity of schools, is required to ensure that appropriate cross-walk facilities are provided.

The provision of pedestrian walkways could complement the existing sidewalk system. In some areas where discontinuities exist in the road network, the addition of pedestrian walkways could greatly improve the accessibility of the downtown area for pedestrians. This could ultimately increase the attractiveness and convenience of the downtown.

Bicycles

Promoting the use of bicycles involves increasing their safety through the provision of bikeways and education of both the motoring and cycling publics plus the availability of appropriate parking facilities. There are three different types of bikeways: bicycle routes, bicycle lanes and bicycle paths. The differences between the three are illustrated in Exhibit 5.9. Bicycle routes are effective as a cost efficient means of providing a reliable facility for cyclist. Bicycle routes require a 4.3 meter wide curb lane and appropriate signing. This permits cars to safely overtake bicycles without crossing into the next lane, thus increasing the level of comfort between cyclist and overtaking motorist.

Some of the key advantages of bicycle routes are:

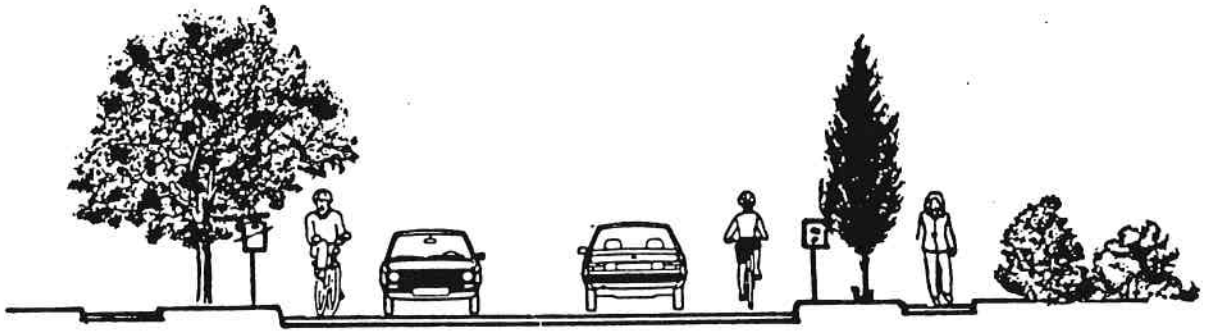
- They make use of the existing road network with minimum redesign,
- They can be implemented in conjunction with other planned road improvements (where the Right of Way permits),
- They encourage cyclists to obey the rules of the road and function as a vehicle, and
- Improve cycling skill and increase safety.

The major east-west route (excluding the QEW) in Grimsby is the Livingston-Main Street combination. Although the traffic volumes on these roads are relatively high they provide the following advantages as a utilitarian bicycle route: high degree of accessibility; directness; continuous; flat; and provides a good connection between residential areas and the downtown core. In conjunction with other road improvements, a link between the Livingston-Main route and the residential areas

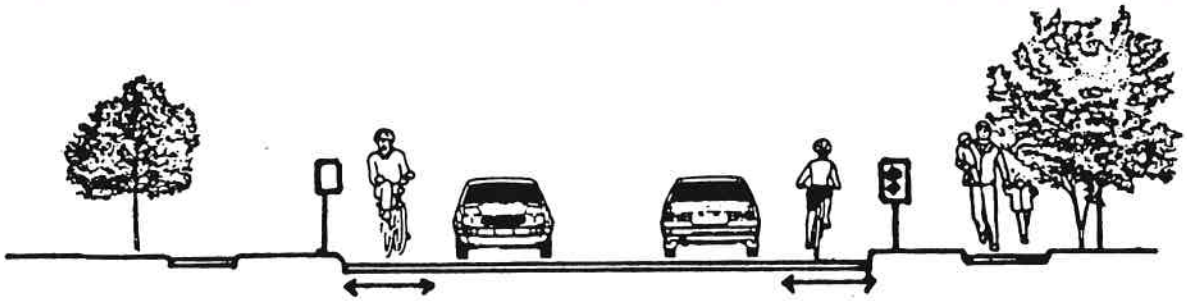
to the north of the QEW may also be considered. To minimize the potential conflict between bicycle traffic and the higher volumes of truck traffic on both Christie Street and Bartlett Avenue, the utilization of either Maple Avenue or Ontario Street might be more desirable. These alternatives would be subject to the recommendations of the Regional Bicycle Study which is currently underway.

Bicycle parking facilities that are secure, available in sufficient quantity, and located in convenient places, can quickly improve the attractiveness of the bicycle as a fast means of transport with few parking problems. It is perhaps the most important link in a comprehensive bicycle facilities design. If secure parking is not available, the incentive to use bicycles as a means of transportation can be seriously undermined.

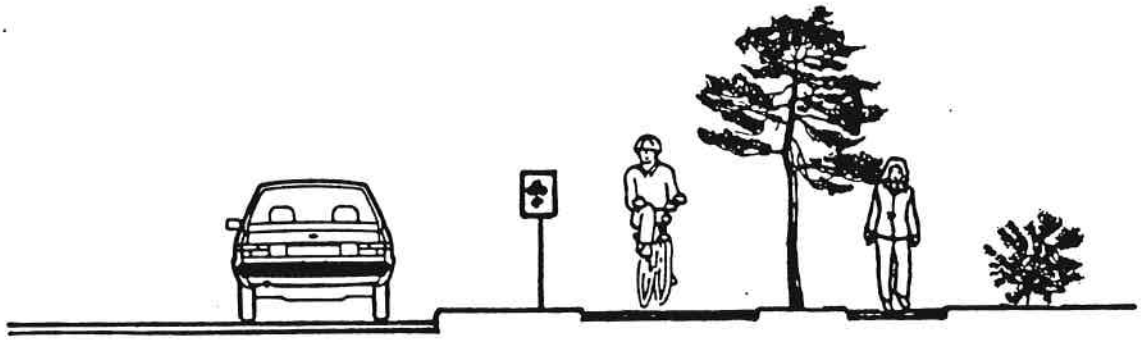
The decision as to where parking should be located, what type of bicycle rack should be provided, and how many will be needed, will all require an assessment of existing conditions, and some data collection. In general, however, bicycle parking should be highly visible, avoid conflicts with pedestrians, and provide safety against both bicycle theft and damage. Many examples exist in other municipalities, both in Canada and in foreign cities and much information can be secured. Excellent cooperative efforts to identify and implement improvements can be expected from the local bicycling community.



BICYCLE ROUTE INTEGRATED WITH TRAFFIC



BICYCLE LANE DISTINCT BIKE LANE bike only lane designated by painted line



BICYCLE PATH SEPARATED BIKE PATH

SOURCE: Canadian Institute of Planners
Community Planning Manual

TOWN OF GRIMSBY
Transportation Planning Study
DELCAN

TYPES OF BIKEWAYS

Exhibit
5.9

6 EVALUATION CRITERIA

Based upon our experience with similar projects and the concerns that have been expressed to members of the Study Team, Delcan has identified a preliminary list of criteria to be considered in the evaluation of the alternatives. These criteria and some of the factors which would influence them are as follows:

Transportation Service

- Level of Service (ability to accommodate traffic demand)
- Network Continuity and Geometrics
- Vehicular and Pedestrian Safety

Community Effects

- Compatibility with Adjacent Development
- Consistency with Area Plan and Policies
- Aesthetics/Visual Impacts
- Impact of Through Traffic on Neighbourhood

Property Impacts

- Right-of-Way Requirements

Environmental Impacts

- The Escarpment
- Removal of Trees, Orchards, Vineyards

Impact on Heritage Resources

- Historical
- Architectural

Cost

- Capital Construction and Property Requirements

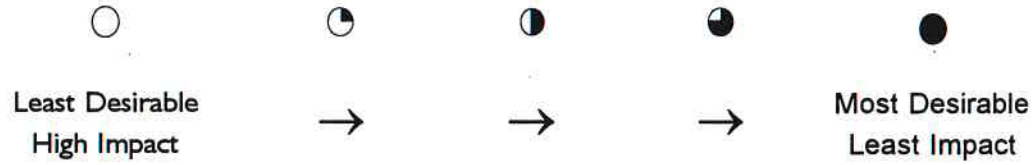
Staging Options

- Compatibility with Long-Range Plans
- Social and Traffic Disruption During Construction
- Ease of Implementation.

At the Public Open House held on September 22, 1993 a questionnaire was distributed asking the attendees to rank the seven evaluation criteria in order of importance. The result of the ranking is as follows:

- Community effects were the residents' primary concern.
- Property impacts, environmental impacts and transportation service were concerns identified to follow in close succession.
- Impact on Heritage Resources and staging options were criteria identified as being of least importance.

Each of the options presented in section two were ranked with respect to the evaluation criteria. The options were rated as to how well they would meet the future needs of the community. The rating was summarized graphically using the following circular symbols. These symbols reflect how well each option might fulfil the objectives of the Transportation Plan. The symbol definitions are as follows:



Summaries of the assessment tables are provided to allow easy comparison of the alternatives. After the assessment of the alternatives, a weighted and an unweighted comparison of each was conducted before the selection of the preferred alternatives.

In the unweighted comparison, all seven of the evaluation criteria were considered to be of equal importance. The weighted comparison reduced the influence of Staging Options and Impact on Heritage Resources to half that of the other criteria to reflect the attitudes of Grimsby residents as reported at the September 22, 1993 Public Meeting.

6.1 LONG TERM OPTIONS

6.1.1 Escarpment Crossings

EVALUATION OF ESCARPMENT CROSSING ALTERNATIVES

Criteria	Casablanca Extension	Bartlett Ave. Park Road
Transportation Service	◑	◑
Community Effects	◑	◕
Property Impacts	○	●
Environmental Impacts	○	◑
Impact on Heritage Resources	N/A	N/A
Cost	◔	◕
Staging Options	◑	◑

6.1.2 West of Downtown

The redistributed traffic demands that would result from the extension of Livingston Avenue alternative and the widening of Main Street West alternative are presented in Exhibits 6.1 and 6.2, respectively. The volumes represent PM peak-hour traffic demands for the year 2011, obtained from the Niagara Regional Transportation Model.

The volume projections confirm that a widening of Casablanca Boulevard north of Livingston Avenue will ultimately be required and that a two-lane extension of Livingston Avenue between Casablanca Boulevard and Oakes Road would be capable of accommodating the 2011 projected travel demands.

EVALUATION OF ALTERNATIVES WEST OF THE DOWNTOWN

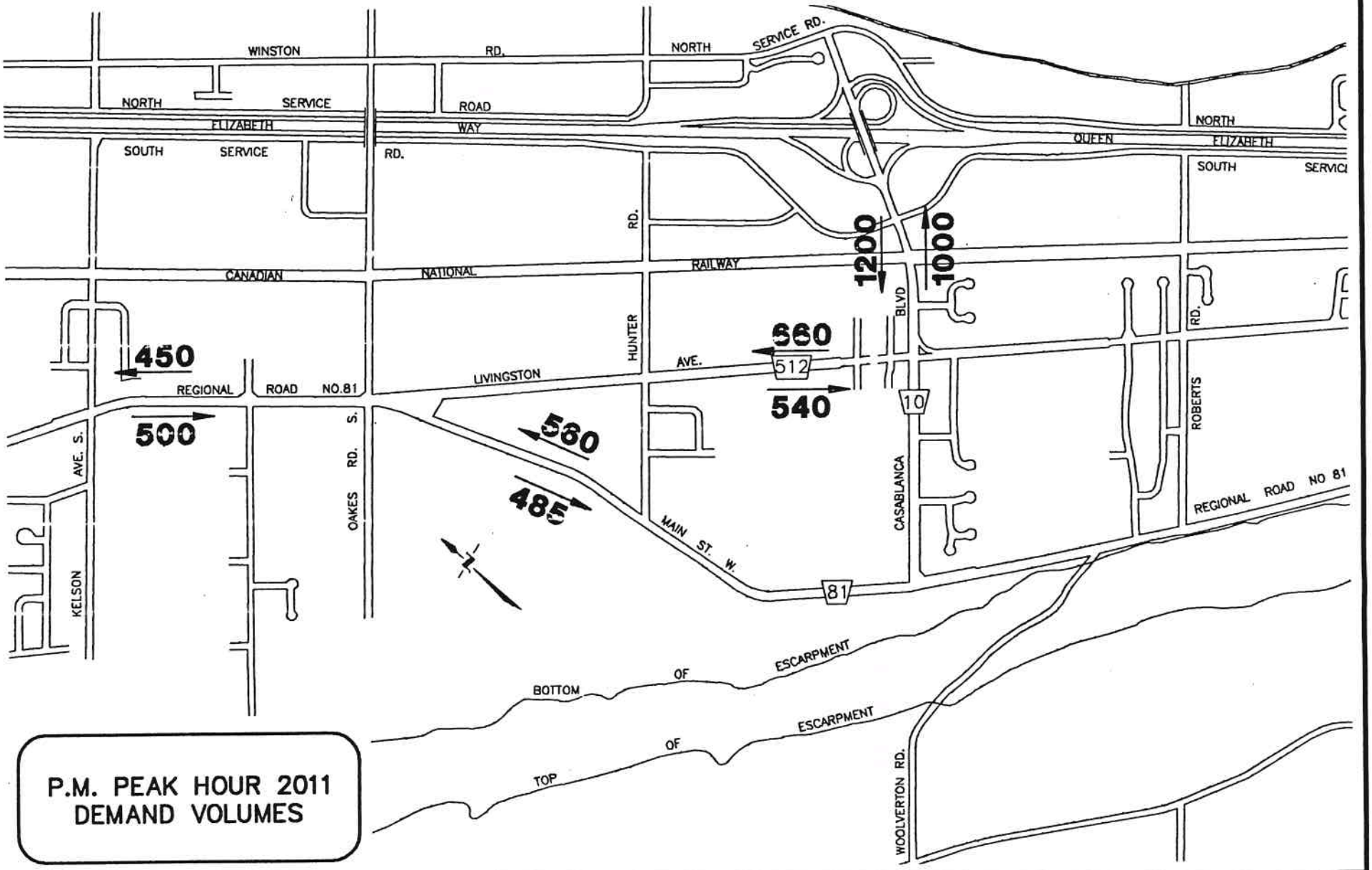
Criteria	Livingston Extension Two-Lane	Livingston Extension Four-Lane	Widen Main Street
Transportation Service	●	●	◑
Community Effects	◕	◑	○
Property Impacts	◕	◕	◔
Environmental Impacts	◕	◕	◑
Impact on Heritage Resources	●	●	◔
Cost	◕	◑	○
Staging Options	◕	●	◔

6.1.3 Downtown Core

There are two alternatives for the downtown core. One is to convert Main Street to four lanes and eliminate on street parking and the second is to introduce a one-way street system. The 2011 pm peak-hour traffic demands for the two downtown core alternatives are provided in Exhibits 6.3 and 6.4, respectively.

- The four-lane Main Street, and
- The one-way street system

In commercial areas such as Grimsby's downtown core, pass-by traffic is a source of a significant portion of the business's revenue. The effect of a one-way street system upon this traffic is therefore a major concern. The transportation model has projected an increase of 10% in the total volume of traffic on Main Street between Christie Street and Ontario Avenue under the one-way street system.

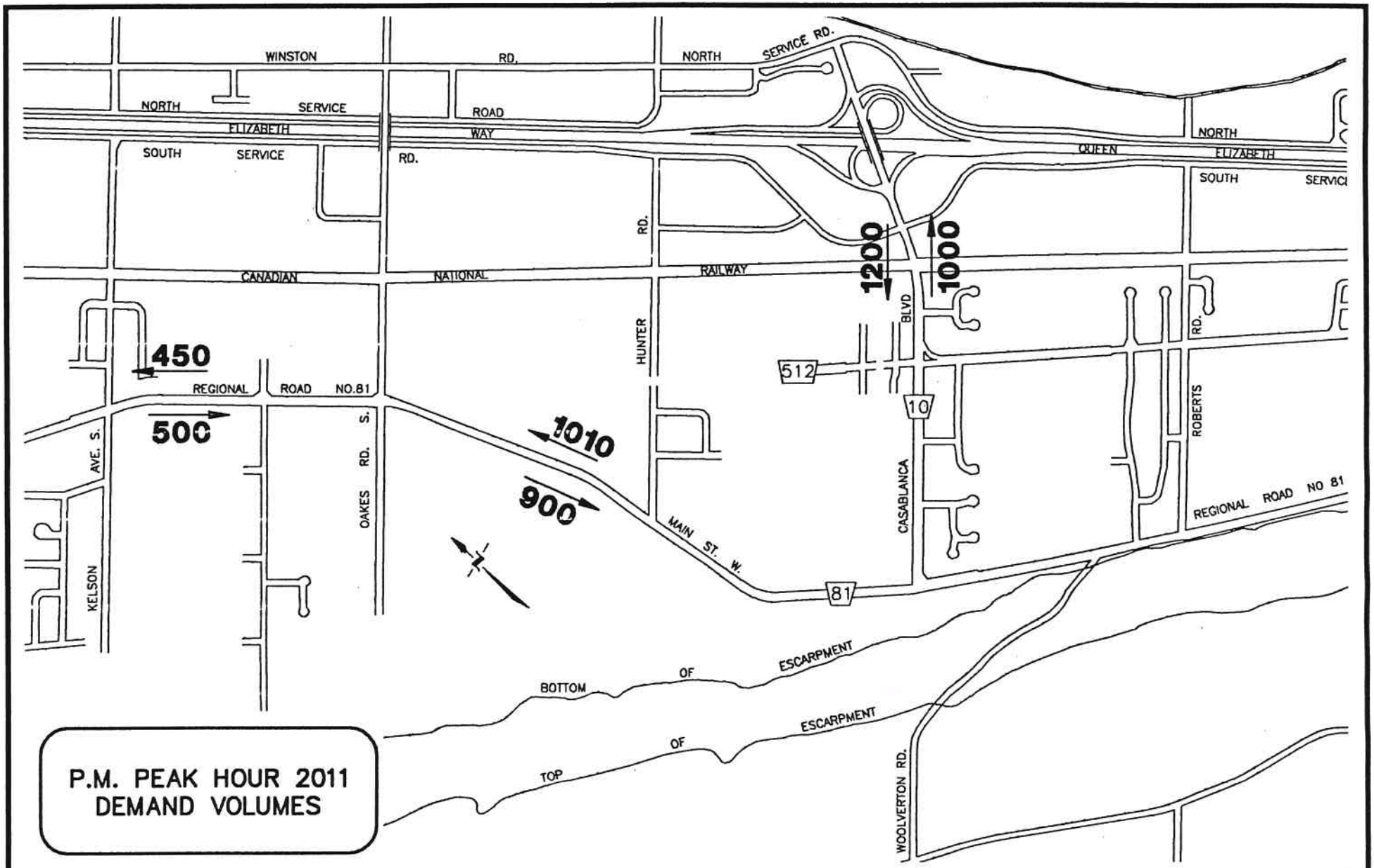


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN

WEST OF DOWNTOWN - TRAFFIC VOLUME PROJECTIONS
LIVINGSTON AVENUE EXTENSION

Exhibit
6.1



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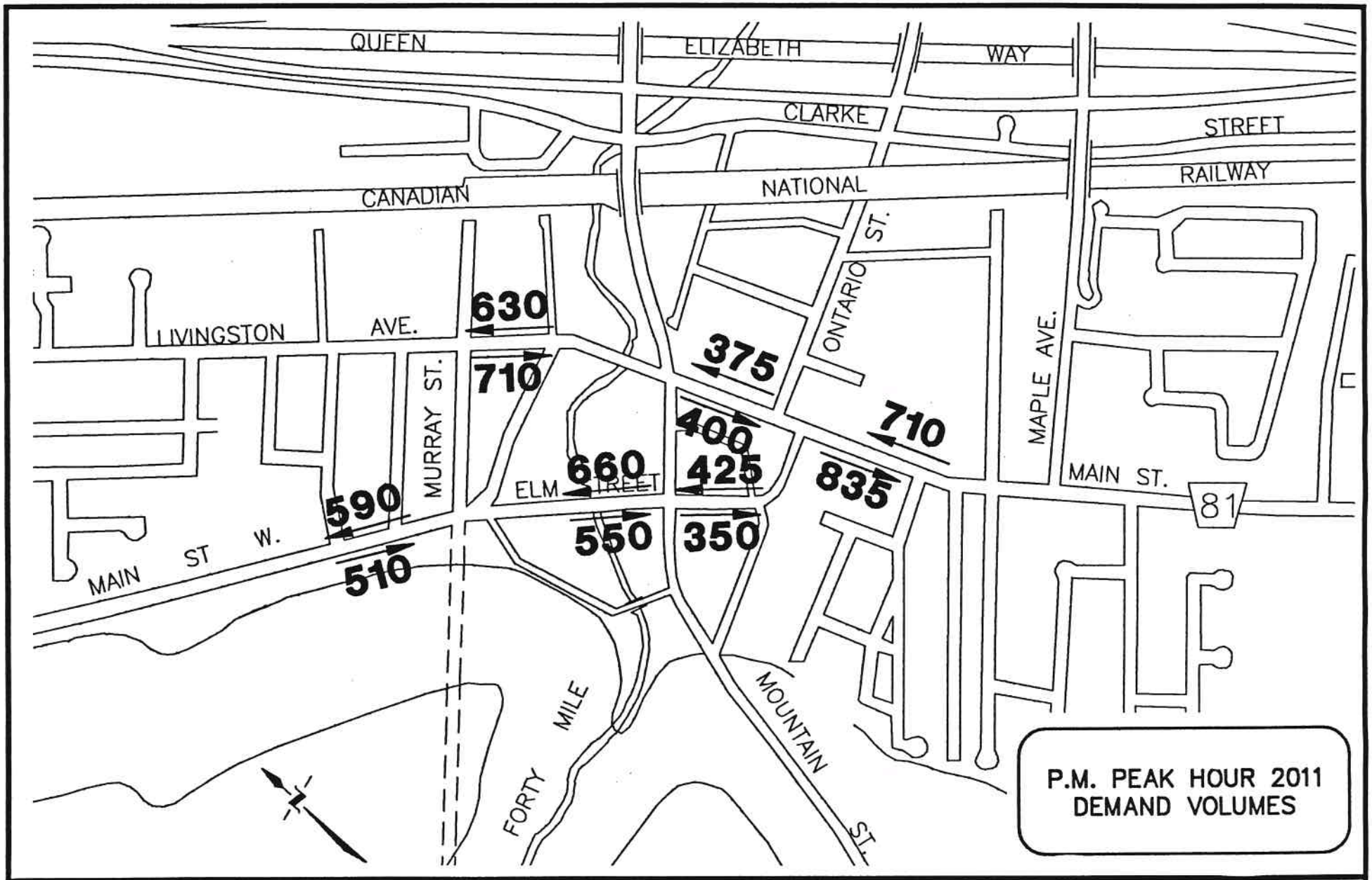
WEST OF DOWNTOWN - TRAFFIC VOLUME PROJECTIONS
WIDEN MAIN STREET

Exhibit
6.2

DELCAN

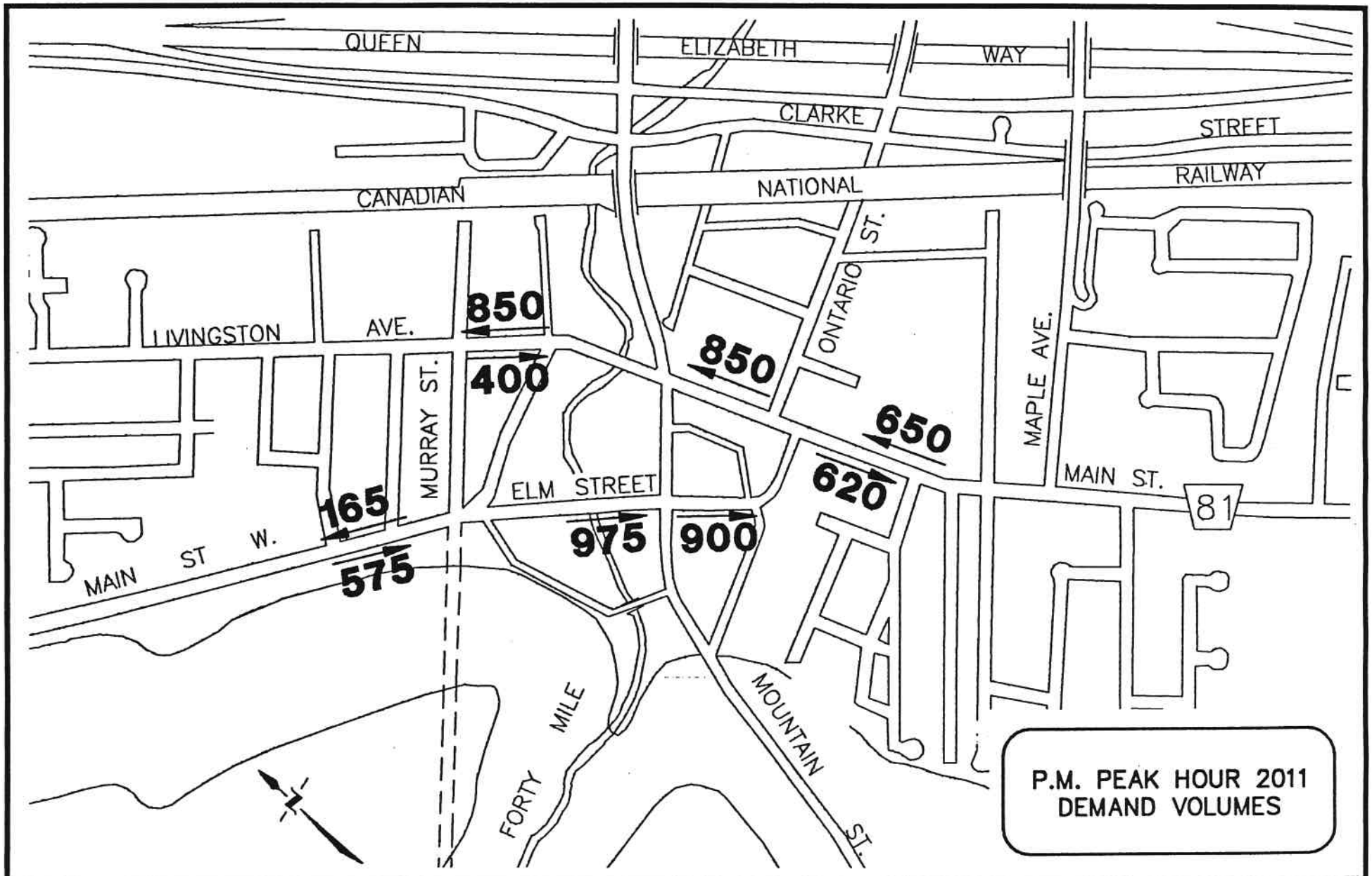


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN

DOWNTOWN CORE - TRAFFIC VOLUME PROJECTIONS
FOUR-LANE MAIN STREET

Exhibit
6.3



TOWN OF GRIMSBY
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DOWNTOWN CORE - TRAFFIC VOLUME PROJECTIONS
ONE-WAY MAIN STREET

Exhibit
6.4

DELCAN

EVALUATION OF DOWNTOWN CORE ALTERNATIVES

Criteria	Four-Lane Main Street	One-Way Street System
Transportation Service	◑	◕
Community Effects	◕	◑
Property Impacts	◕	◕
Environmental Impacts	◕	◕
Impact on Heritage Resources	●	●
Cost	◕	◕
Staging Options	◕	◑

6.1.4 East of Downtown

To allow a comparison to be made of the effectiveness of the various alternatives east of the downtown, 2011 pm peak-hour traffic demands were developed for the following alternatives:

- South Service Road - Concept "A" - Exhibit 6.5
- South Service Road - Concept "B" - Exhibit 6.6
- South Service Road - Concept "C" - Exhibit 6.7
- Widen Main Street Option - Exhibit 6.8

EVALUATION OF ALTERNATIVES EAST OF DOWNTOWN

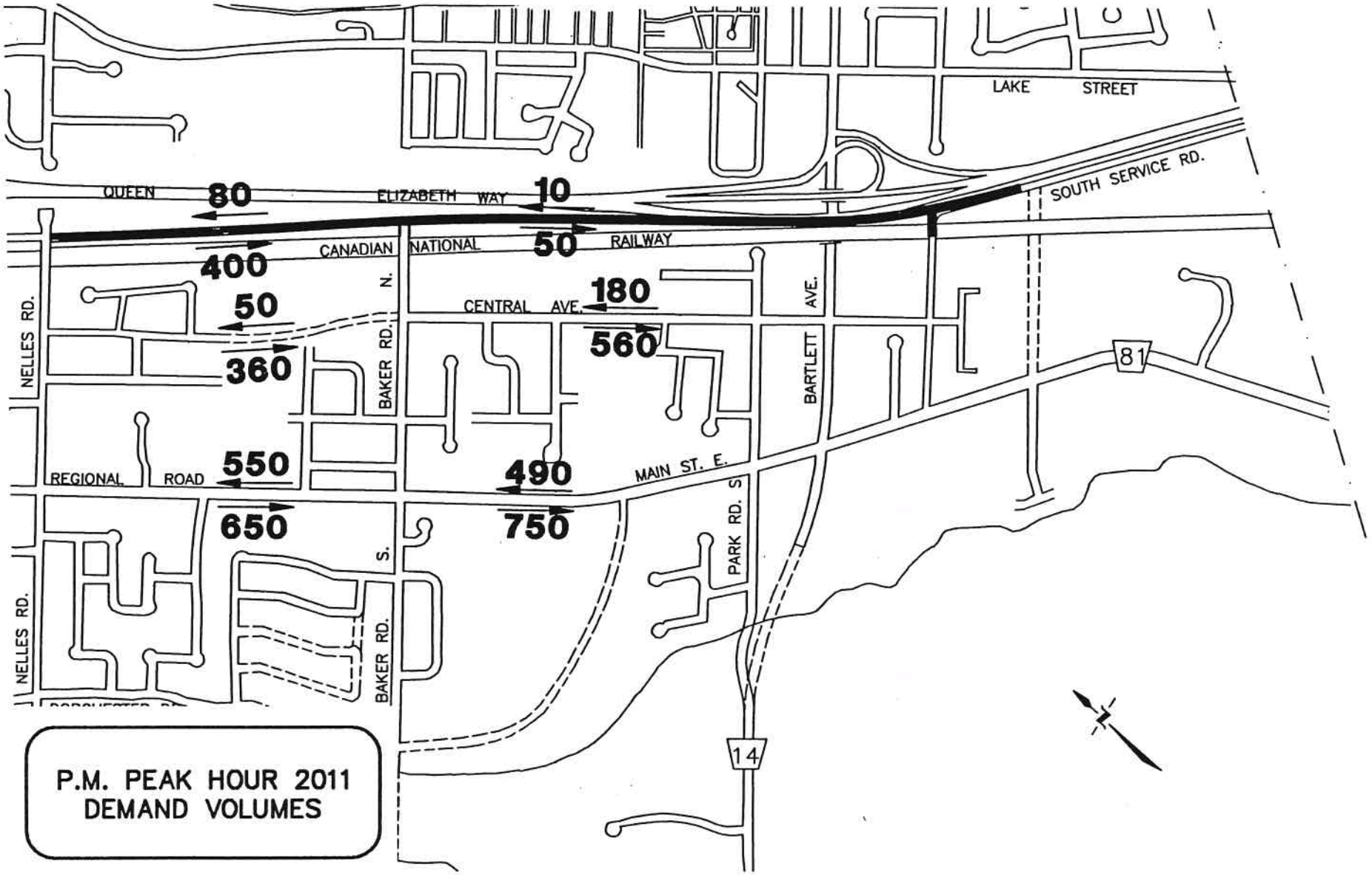
Criteria	Service Road Option A	Service Road Option B	Service Road Option C	Widen Main Street
Transportation Service	◔	◕	●	◑
Community Effects	◑	◕	●	◑
Property Impacts	◔	◔	◔	◕
Environmental Impacts	◕	◕	◕	◑
Impact on Heritage Resources	●	●	●	●
Cost	○	◕	◑	◕
Staging Options	◑	◑	◕	◕

6.2 IMMEDIATE ACTION ALTERNATIVE

These items are mainly traffic operation improvements. Typically, they are lower cost items, and rather than being true alternatives, each is intended to address specific deficiencies in the operation of the existing road network.

An evaluation of these alternatives was essentially a component of identifying the need for these improvements. As a result, few require additional evaluation, however, each alternative must be examined to ensure its consistency with the long range plan.

For the treatment of Christie Street at the South Service Road/Clarke Street and



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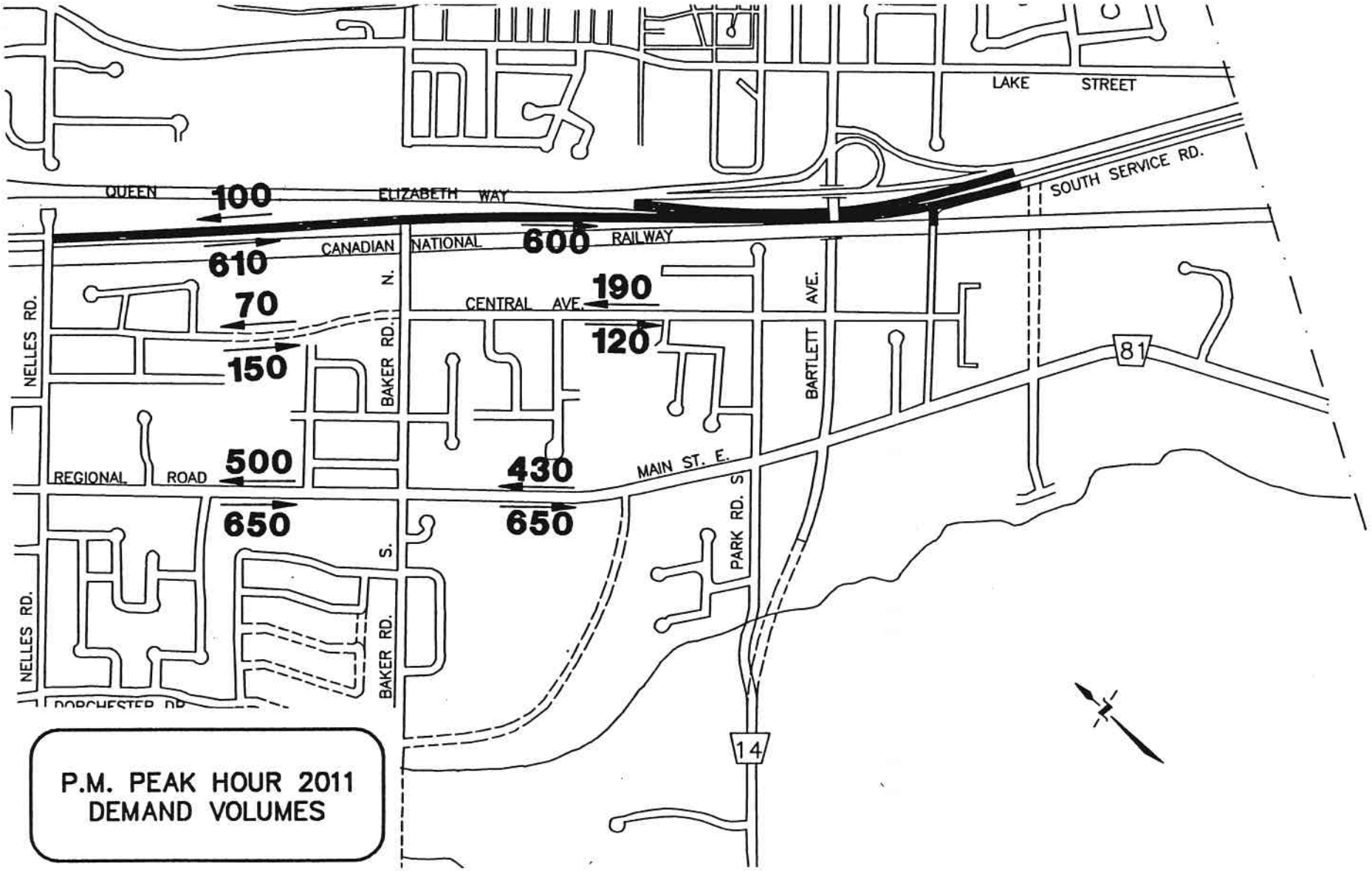
DELCAN ENGINEERS PLANNERS

EAST OF DOWNTOWN - TRAFFIC VOLUME PROJECTIONS
SOUTH SERVICE ROAD - CONCEPT "A"
(GRADE SEPARATION AT BARTLETT AVENUE)

Exhibit
6.5



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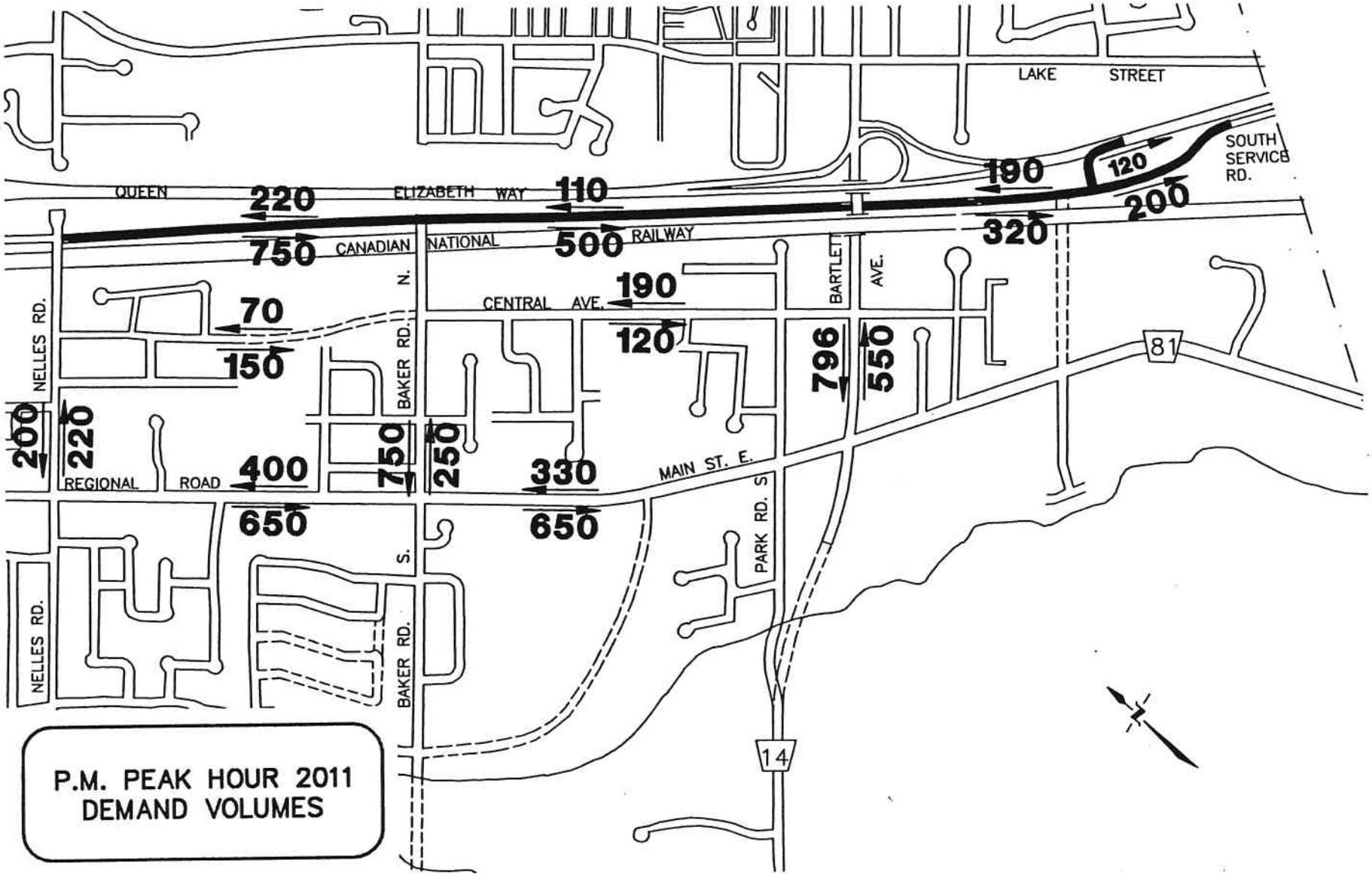
EAST OF DOWNTOWN - TRAFFIC VOLUME PROJECTIONS
SOUTH SERVICE ROAD - CONCEPT "B"
(INTERSECTION AT BARTLETT AVENUE)

Exhibit
6.6



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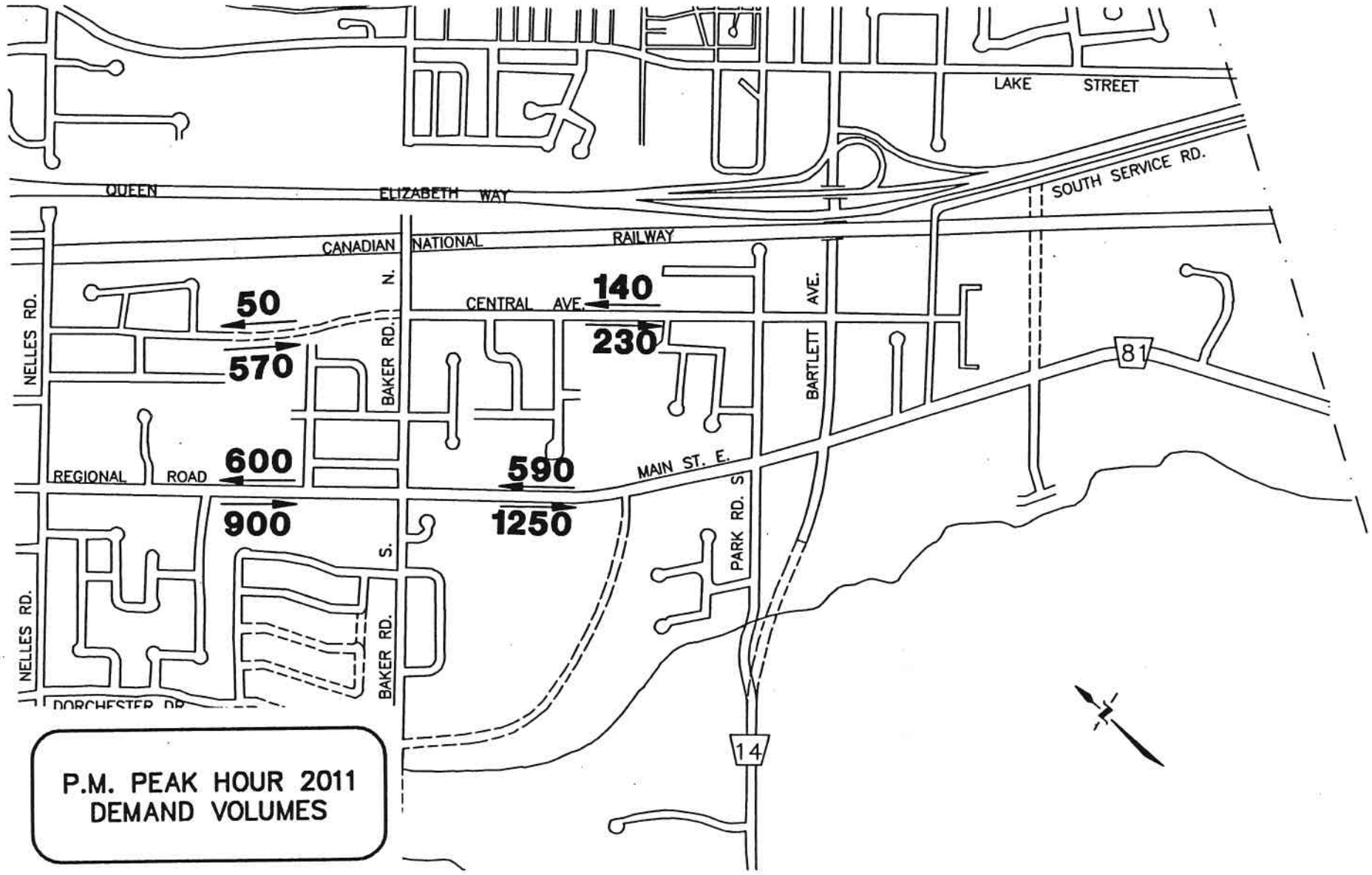
EAST OF DOWNTOWN - TRAFFIC VOLUME PROJECTIONS
SOUTH SERVICE ROAD - CONCEPT "C"
(TWO-WAY WITH AN AT-GRADE INTERSECTION AT BARTLETT AVENUE)

Exhibit
6.7



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS

EAST OF DOWNTOWN - TRAFFIC VOLUME PROJECTIONS
WIDEN MAIN STREET

Exhibit
6.8

Christie Street at the QEW Eastbound off-ramp, two alternatives were developed. An evaluation of these alternatives based upon factors such as:

- Impact on Heritage Resources,
- Property impacts,
- Environmental impacts,
- Community effects.

is not appropriate for improvements of this nature. The selection of a preferred option was based on a careful examination of various traffic operations and traffic safety considerations summarized as follows:

1) **Signalization of the Christie Street and South Service Road/Clarke Street intersection.**

   - Current sight distances are restricted by the profile of the road and the location of the parapet on the adjacent structure.

   - Installation of traffic signals is warranted based on the traffic accident experience.

   - Ensuring the safety of this intersection is paramount if Clarke Street is to be promoted as an alternative corridor to Main Street (bypass for through traffic).

   - Signals would restrict the capacity of the east-bound right-turn movement from the adjacent QEW exit ramp.

   - The effect on the operation of the QEW ramp could be mitigated by revising the lane designation at the intersection of the QEW ramp with Christie Avenue.

   - Would not preclude a future expansion of the traffic signal plant to include the adjacent intersection at the QEW south ramp.

2) Signalization of both intersections

- Eastbound traffic volumes exiting the QEW at Christie Street are much greater than the volumes on the South Service Road/Clarke Street.

- The queuing of south-bound traffic due to the installation of signals at Clarke Street may restrict the visibility and movement of motorists coming off the ramp.

- Longer sight distances are currently available for motorists at the intersection of the QEW ramp.

- There is no evidence from the traffic accident records of any traffic safety problems at the existing Christie Street and QEW south ramp intersection.

- Standard practice is to normally avoid the installation of traffic signals in such close proximity.

- The potential to create "grid-lock" is inherent.

- The placement of signals at the QEW ramp would assist in encouraging motorists exiting the QEW to use Ontario and Maple Streets.

7 PREFERRED ROADWAY IMPROVEMENT PLAN

The preferred roadway improvement plan identified through the evaluation of the various alternatives is detailed in Exhibit 7.1. The longer term components of this plan were selected following a comparison of the weighted versus un-weighted evaluations.

It was observed that the weighted evaluation had no impact upon the selection of the preferred roadway improvement alternatives.

7.1 SHORT TERM PLAN

The proposed roadway improvements were prioritized to identify a short term (2001) and a long term (2011) implementation plan. The priorities were established based on:

- the projected growth in travel demands,
- the long term policies of the Town and the Region,
- a rationalization of the scope of the proposed improvements,
- the recognition that financial resource limitations would make it necessary to complete the construction in stages, and
- engineering judgement.

The elements of the short term plan, in order of priority are:

1) South Service Road (Nelles Road - Book Road)

This involves :

- Provides a continuous two-way service road from the west Town boundary to the east Town Boundary.
- the extension of Clarke Street (2 lanes, two-way) from Nelles Road to the east section of the South Service Road.
- the QEW eastbound on and off ramp at Bartlett Avenue are removed and utilized by the Service Road to create an at-grade intersection with Bartlett Avenue
- Book Road may be cul-de-sac south of the rail line and reclassified as a local town road.
- relocating the QEW eastbound off-ramp west of the existing location connecting with the existing service road at that point.
- relocating the QEW eastbound on-ramp east of Bartlett Avenue along the service road.
- a connections with Baker Road is an option.

This is the technically preferred concept, which represents one of the alternatives which will be investigated during the subsequent Environmental Assessment process. Construction of this roadway should be encouraged to take place in unison with the QEW widening project which is underway. Any adjustments required to the Bartlett Avenue eastbound on and off ramps to accommodate this connection would be made at the same time.

2) Livingston Avenue Extension (Casablanca Boulevard - Oakes Road)

The growth in commuter traffic will have the greatest impact upon the town's west end and therefore any long term initiatives must first address that area. The extension has been proposed as a 2 lane roadway recognizing that it would be located beyond the existing Urban Area Boundary. Traffic volumes will also be limited somewhat by the roadway

LAKE ONTARIO

LEGEND:

- IMMEDIATE ACTION PLAN
- SHORT TERM ACTION PLAN
- LONG TERM ACTION PLAN

4-LANES

2-LANES (4-LANES ULTIMATE)

2-LANES

3-LANES

3-LANES

4-LANES

INSTALLATION OF TRAFFIC SIGNALS

SIGNAL TIMING ADJUSTMENTS

RESTRICT PARKING

EAST BOUND LEFT-TURN LANE

CITY OF STONEY CREEK

TOWN OF LINCOLN

TOWNSHIP OF WEST LINCOLN

TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

RECOMMENDED ROADWAY IMPROVEMENT PLAN

Exhibit 7.1

capacity west of Oakes Road which includes sections of Highway # 8 in Stoney Creek. As an extension of Livingston Avenue it is anticipated that 4 lanes will ultimately be required. This requirement is expected to be beyond the current 20 year planning period, however, this should be considered as part of the roadway design. Two alternative configurations were previously developed for the new intersection created at Livingston Avenue and Regional Road 81. These alternatives as seen in Exhibit 7.2 were developed to compliment the needs of the two downtown schemes (one-way or 4-lane). Since the four lane option was selected for the downtown it is recommended that Livingston Avenue be the main east\west Regional Road and that intersection Option A be adopted. The intersection configuration encourages the use of Livingston Avenue and discourages the use of Old Highway #8.

3) **Widening of Casablanca Boulevard (Livingston Avenue to QEW)**

- provision of four-lanes is necessary to meet the future travel demands to and from the Livingston Avenue corridor.

4) **Parking Supply**

Increasing the supply and improving the condition of the off-street parking areas, particularly north of Main Street, will remain an integral part of the Town's efforts to attract people downtown. Since the implementation of the four lane Main Street Option in the downtown will require the removal of on-street parking at least during the peak periods, it would be beneficial for the Town to start upgrading the supply of off-street parking in the near future. Also, the implementation of the four lane option will increase the need for improved access to the existing off-street parking areas north of Main Street. This can be accomplished by inter-connecting the existing parking areas, thereby allowing traffic to circulate between Christie and Ontario Street. This would greatly improve the accessibility of the area, which would benefit the businesses located there, as well as increasing security in the area.

Phase 2 of the study also identified an opportunity to improve the utilization of existing parking areas by placing special municipal parking lot signs along the arterial to inform motorists of the location of the lots. Improved lighting and pedestrian access to/from Main Street were also identified as requirements. Therefore, consideration should be given to the implementation of the improved signing, security and access measures.

5) **Extension of 3-Lane Main Street from Nelles Road to Maple Avenue**
The three lane cross-section implemented in the immediate action plan at Maple Avenue and Main Street can ultimately be connected to the existing three lane cross-section which currently exists between Baker Road and Nelles Road. This extension will reduce the delays to the side street traffic wishing to enter or exit Main Street by providing them with a centre lane refuge. Also, Main Street traffic flow will be improved by the removal of the turing vehicles from the traffic stream.

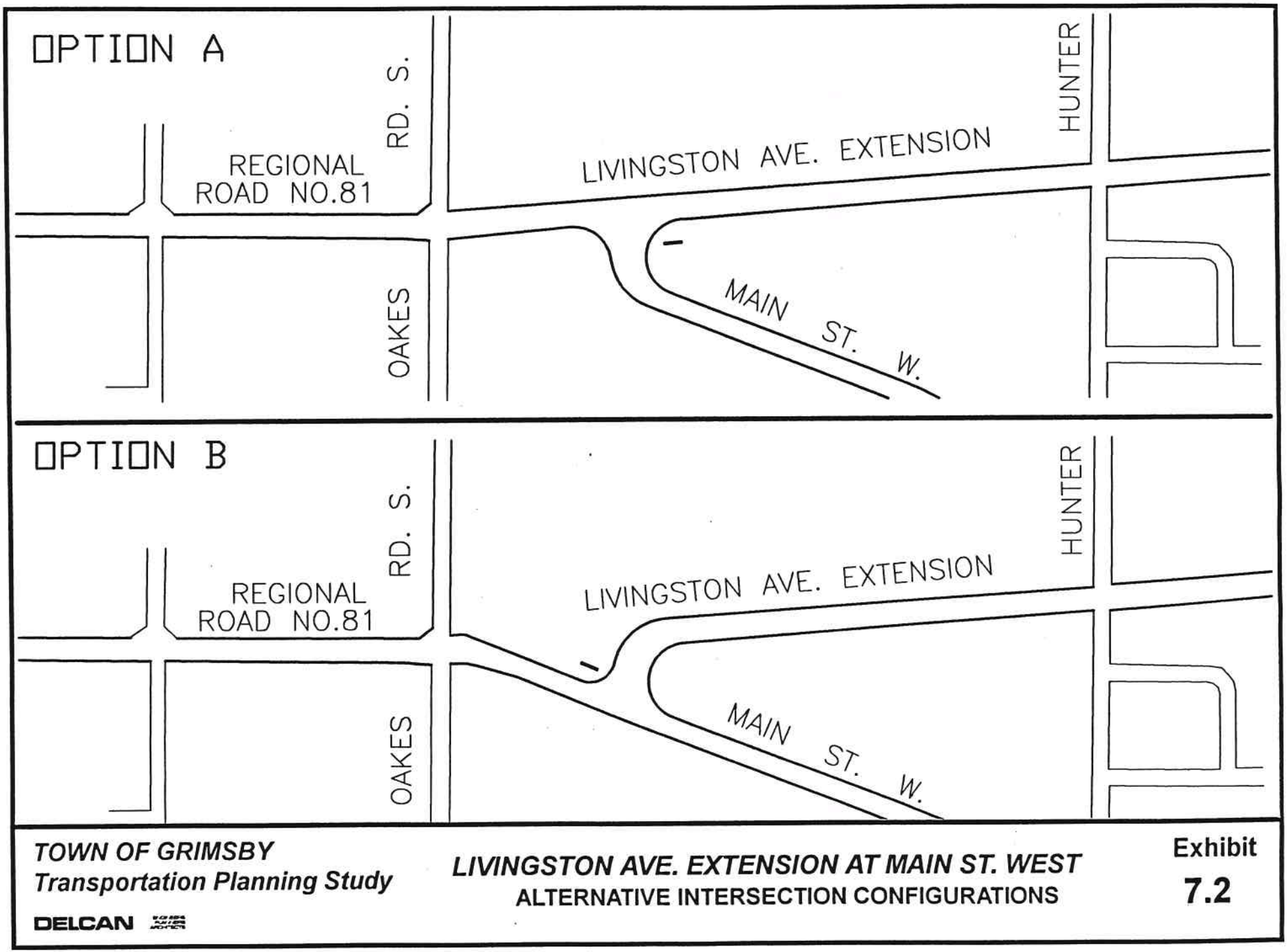
7.2 LONG TERM PLAN

Using the same method for establishing the suggested order of construction as outlined for the short term plan, the elements of the long term plan in order of priority are:

1) Four-Lane Main Street through the Downtown Core
2) Park Road Re-alignment
3) Centre Turn Lane on Main Street, East of Baker Road

The following sections will describe each of these elements in more detail.

1) **Implementing the Four-Lane Main Street through the Downtown Core**
This improvement focuses on the complaints regarding existing traffic congestion which were received throughout the Study. This project would require the removal of on-street parking during the peak periods from Main Street between Maple Avenue and Livingston Avenue. Immediately west



TOWN OF GRIMSBY
Transportation Planning Study

DELCAN

LIVINGSTON AVE. EXTENSION AT MAIN ST. WEST
ALTERNATIVE INTERSECTION CONFIGURATIONS

Exhibit
7.2

of the downtown area, Livingston Avenue would also be designated as a 4-lane road through the revision of the existing pavement markings.

2) Park Road Re-alignment

This involves the following:

- the provision of an improved escarpment crossing facility
- construction of a 4 lane arterial connection to more stringent geometric standards
- the connection of Bartlett Avenue with the existing Park Road at a point midway up the escarpment.

The absence of a high grade escarpment crossing is a major constraint on the road network within Grimsby and its surrounding area. This affects both the movement of traffic as well as the safety of motorists and pedestrians. The identified priority does not accurately reflect the public's need for this facility but is more a recognition of reality that any project impacting upon the Niagara Escarpment can only be considered as a long term goal. Due to the limited number of escarpment crossings, this is truly an inter-regional issue and the effects it would have upon traffic would extend well beyond Grimsby's borders. While an improved escarpment crossing at this location has been identified as desirable for Grimsby, it must now be examined from an inter-regional context. Since the Transfocus 2021 Study currently being conducted by the Ministry of Transportation is studying the issue of escarpment crossings, it is recommended that this issue be evaluated by them in order to ensure that the solution identified will suit the needs of the entire area.

3) Centre Turn Lane on Main Street, East of Baker Road

With the completion of the Dorchester and the Sherwood subdivisions, Dorchester Drive will be connected to Main Street West between Baker Road and Bartlett Avenue. Based on the site impact traffic study which was prepared for these developments a traffic signal will be warranted at Main Street and Baker Road. This will point, along with the increase in

turning activity to\from Main Street West will require the extension of the 3 lane Main Street section from Baker Road to the four lane Main Street section just west of Bartlett Avenue.

7.3 IMMEDIATE ACTION PLAN

As noted previously, the immediate action plan was formulated to address specific traffic operations problems which presently exist. It is essential that these improvements are not contrary to the long term objectives of the Transportation Plan. The elements of this plan in order of importance are as follows :

1) **Addition of an Eastbound Left Turn Lane at Main Street and Maple Avenue**
This will include the addition of an eastbound left turn lane on Main Street at Maple Avenue and a run out area east of the intersection. This will allow eastbound through vehicles to bypass left turning vehicles and will provide a refuge for southbound left turning vehicles exiting Maple Avenue.

2) **Signalization of Christie Street and Clarke Street/South Service Road Intersection**
Due to the restricted sight distances which exist at the present intersection, signalization is essential to improve safety and allow Clarke Street to be promoted as an alternative corridor to Main Street. The location of the new Fire Station on Clarke Street further magnifies this existing need. This intersection currently meets the MTO accident signal warrant criteria. Since a signal at this location would impact the operation of the QEW eastbound off-ramp\Christie Street intersection it is further recommended that a signal be installed at this location as well. These two signals would be inter-connected and phased to encourage the use of Clarke Street as a downtown bypass for through traffic.

3) **Main Street at Ontario Street - Parking Restrictions**
In the interim, until the four lane Main Street is implemented, extending the

existing no parking designation on the south side of Main Street an additional 15 metres west of the intersection (removal of two parking spaces) will assist in reducing delays caused by queued left turning motorists.

4) **Main Street and Christie Street/Mountain Road - Revision to Signal Timings**
Increasing the length of the clearance intervals in the existing signal timings can be accomplished at little to no expense and should reduce the potential for serious traffic accidents.

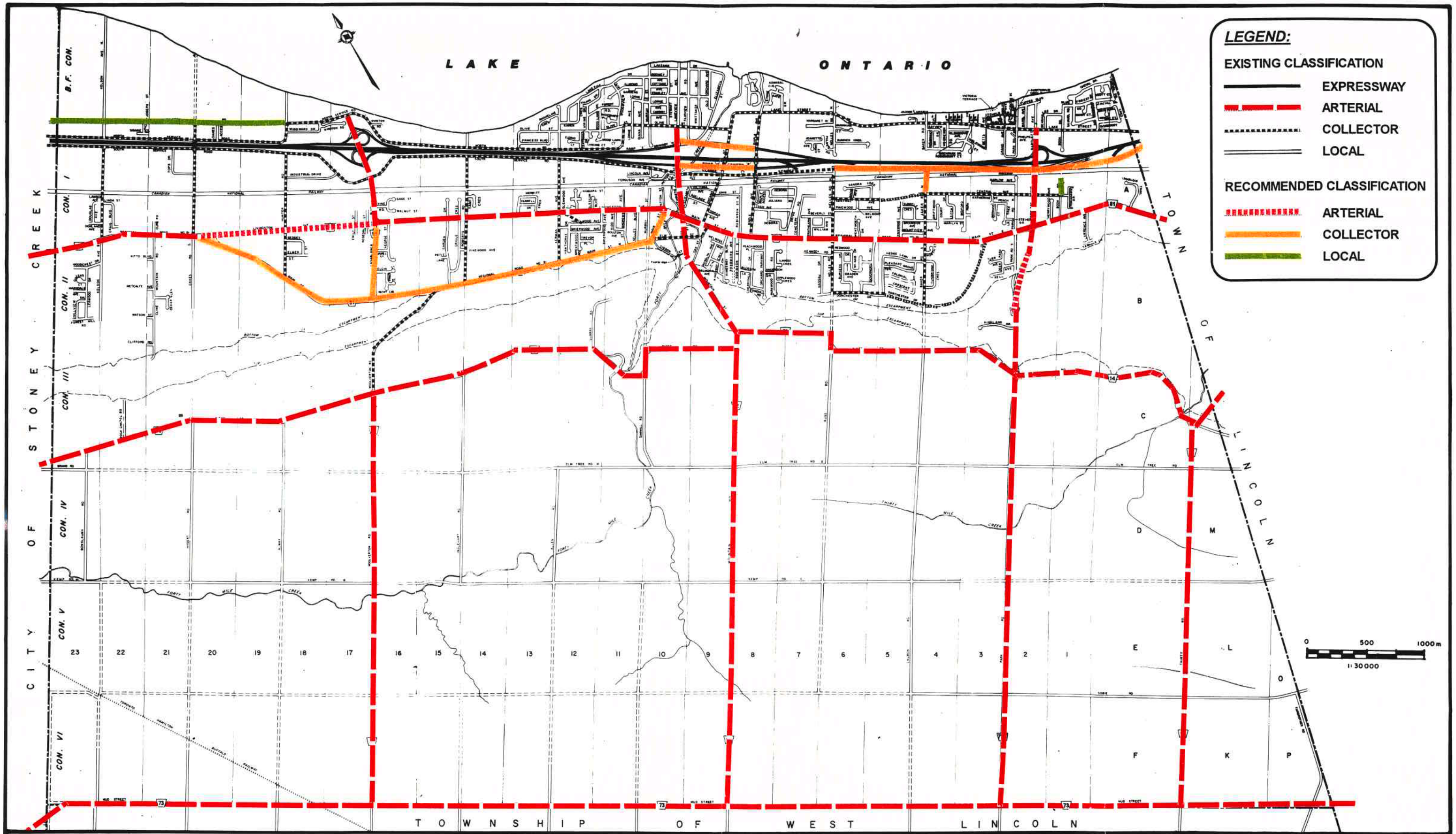
5) **Central Avenue (Baker Road - Nelles Road) - Prohibition of Trucks**
This can be initiated when the proposed connection is constructed as an initial traffic demand management measure to discourage through truck traffic from using the roadway connection. The bylaw restricting truck traffic would have to include an exception for trucks on delivery to businesses and residences located on or accessed by Central Avenue.

7.4 PROPOSED ROADWAY JURISDICTION AND CLASSIFICATION

The proposed roadway classifications and jurisdictions for the Town of Grimsby that would result from the implementation of the preferred Roadway Improvement Plan are presented in Exhibit 7.3 and Exhibit 7.4, respectively. This revised classification and jurisdiction reflect the provision of additional links in the roadway network and the resulting changes in the function of the existing roadways. The changes have also been summarized in Tables 7.1 and 7.2.

Table 7.1
Proposed Changes in Roadway Jurisdiction

Roadway	Current Jurisdiction	Proposed Jurisdiction
Main Street West - from Oakes Road to Livingston Avenue	Region of Niagara	Town of Grimsby
Livingston Avenue- from Casablanca Boulevard to dead end	Town of Grimsby	Region of Niagara
Extension of Livingston Avenue- from dead end to Oakes Road	N/A	Region of Niagara
Casablanca Boulevard-from Livingston Avenue to Main Street West	Region of Niagara	Town of Grimsby
New South Service Road Extension	N/A	Town of Grimsby or Region
Park Road-from Main Street East south to proposed Cul-de-sac	Region of Niagara	Town of Grimsby
Bartlett Avenue from the north QEW off-ramp to Lake Street	MTO	Region
New Bartlett Avenue extension- from Main Street East to Park Road South of Cul-de-sac	N/A	Region of Niagara

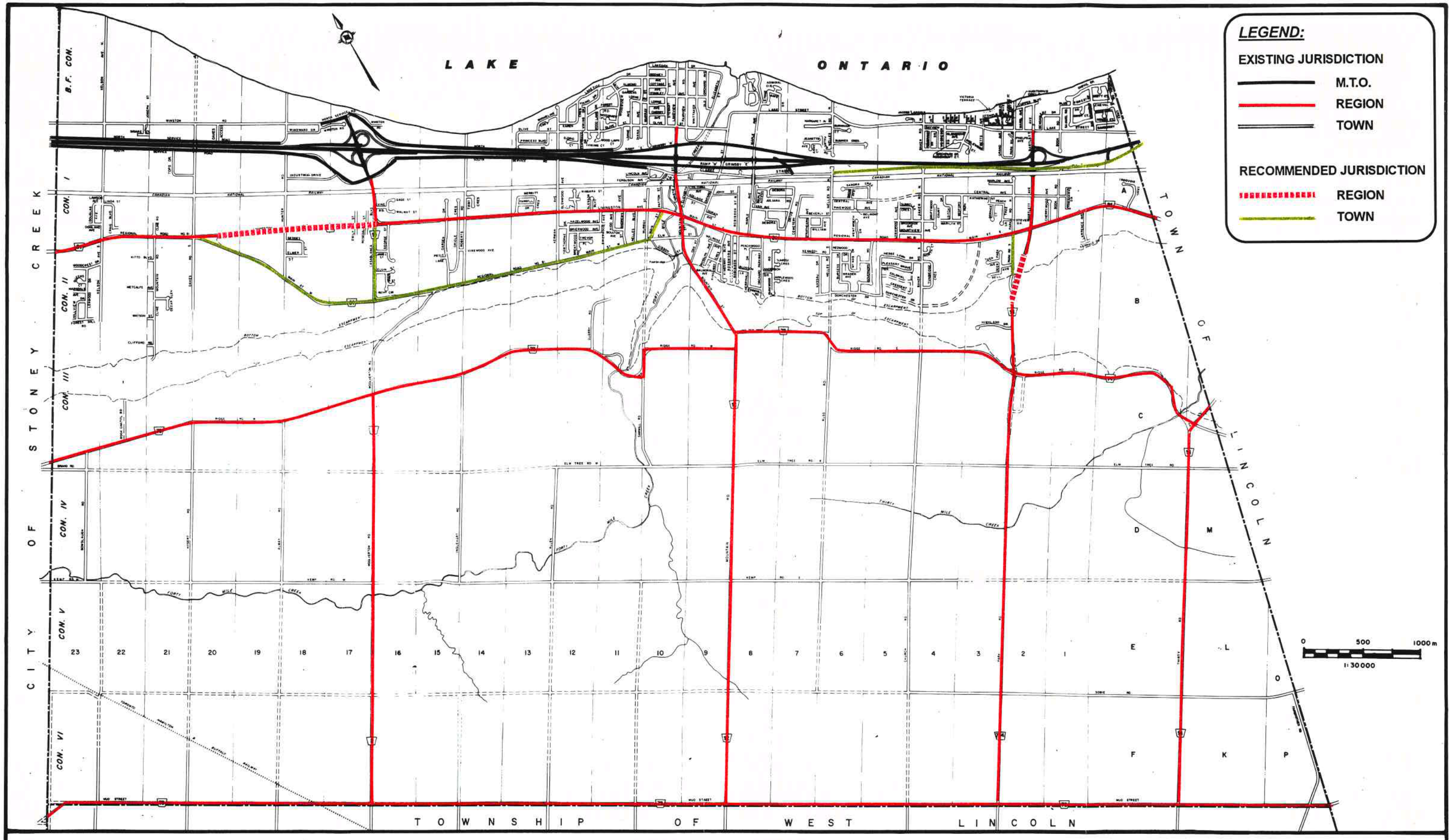


TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

RECOMMENDED ROAD CLASSIFICATION

Exhibit
7.3



LEGEND:

EXISTING JURISDICTION

- M.T.O.
- REGION
- TOWN

RECOMMENDED JURISDICTION

- REGION
- TOWN

TOWN OF GRIMSBY
Transportation Planning Study

DELCAN ENGINEERS PLANNERS ARCHITECTS

RECOMMENDED ROAD JURISDICTION

Exhibit
7.4

Table 7.2
Proposed Changes in Roadway Classification

Roadway	Current Classification	Proposed Classification
Main Street West - from Oakes Road to Livingston Avenue	Arterial	Collector
Livingston Avenue- from Casablanca Boulevard to dead end	Local	Arterial
Livingston Avenue- from dead end to Oakes Road	N/A	Arterial
Casablanca Boulevard-from Livingston Avenue to Main Street West	Arterial	Collector
New South Service Road Extension	N/A	Collector
Park Road-from Main Street East south to proposed Cul-de-sac	Arterial	Local
New Bartlett Avenue extension-from Main Street East to Park Road South of Cul-de-sac	N/A	Arterial
Book Road- from Central Avenue to Cul-de-sac	Collector	Local
Winston Road-from west Town boundary to North Service Road	Collector	Local

7.5 COST ESTIMATES

The preliminary cost estimates for the short term and long term plans are provided in Table 7.3.

Table 7.3
Preliminary Cost Estimate

Item Description	Total Cost * (1993 $ MILLIONS)
Short Term Plan	
South Service Road	$2.1 to $5
Livingston Avenue Extension	$1.2
Widen Casablanca	$1.0
Sub Total	$4.3
Long Term Plan	
Four Lane Downtown Main Street	$0.5
Park Road Re-alignment	$1.8
Sub Total	$2.3
Total	**$6.6**

* Does not include property acquisition or environmental assessment study

8 PUBLIC CONSULTATION PROCESS

A major component of this Transportation Planning Study has been the Public Consultation Process. By conducting a thorough public consultation process during the various phases of this study, the study team has ensured the general public's concerns have been heard and addressed within the context of the study. This public involvement means that the public has been a participant in the process and has assisted the study team by noting their concerns at various public meetings and through their correspondence with the study team.

This process has been completed so that the resulting Transportation Plan for the Town of Grimsby is in keeping with the desires of the residents of Grimsby and will help to fulfil the requirements of any future Environmental Assessment process required to implement the various alternatives outlined in the plan.

The following is a chronological listing of the main events completed during the Public Consultation Process :

ITEM / EVENT	PURPOSE	DATE
Project Initiation Advertisement	Announce the project and inform residents that a public consultation process will be undertaken.	September 1992
Public Meeting #1	Advertisement	November 1992
Public Meeting #1	This meeting was held to provide residents an opportunity to view and comment on work to date.	Dec. 3, 1992
Mailing	To inform affected agencies and solicit comments regarding issues.	Dec. 7,1992
Newsletter #1	Newsletter produced and distributed to interested residents and agencies.	March 1993

Public Meeting #2	Advertisement	September 1993
Public Meeting #2	The purpose of this meeting was to solicit feedback pertaining to the various proposed transportation alternatives for the Town of Grimsby.	Sept. 22, 1993
Newsletter #2	Newsletter produced and distributed to interested residents and agencies.	November 1993
Public Meeting #3	Advertisement	April 1994
Public Meeting #3	This meeting was held at the completion of the study and allowed residents the opportunity to view the results and recommendations of the completed study prior to its presentation to the Grimsby Public Works Committee.	April 27, 1994
Presentation #1	Study results presented to Town of Grimsby Public Works Committee	April 27, 1994
Presentation #2	Study results presented to The Region of Niagara Public Works Committee	May 10, 1994

Questionnaires were circulated at both Public Meeting #1 and #2 in an effort to retrieve feedback from the local residents and other concerned citizens with the community. A copy of both these questionnaires is included in Appendix A along with copies of the various responses which were returned to the study team.

The Steering Committee for the project was comprised of the following persons, representing the interests of their respective agencies.

Bob LeRoux	Director of Public Works, Town of Grimsby
Keith Vogl	Planning Administrator, Town of Grimsby

George Gouett	Manager, Transportation Systems, Region of Niagara
Bob Johnson	Supervisor, Transportation Systems, Region of Niagara
Peter Kinnear	Ministry of Transportation, Burlington
Joesph Ivanski	Citizen's Representative, Town of Grimsby
Tony Joosse	Chairman of Public Works, Town of Grimsby
N. Andreychuk	Mayor, Town of Grimsby
Dave Winkworth	Ministry of Transportation, Downsview
B. Timms	Public Works Representative, Region of Niagara
A. Veal	Planner, Region of Niagara
Nick Palomba	Delcan Corporation

Appendix A contains all the public consultation documentation.

GLOSSARY

Road Classifications :

Expressway

Expressways accommodate high volumes of traffic moving at high speeds under free-flow conditions. Expressways do not have direct access to adjacent lands and serve to provide connections between cities and form the highway routes through intensely developed areas.

Arterial Road

Arterial primary function is to carry large volumes of all types of traffic at medium to high speeds. These roads serve the major traffic flows between principle areas of traffic generation and provide access to abutting properties as a secondary function.

Collector Road

Collectors streets provide both land access and traffic circulation service within residential, commercial and industrial areas. Their access function is more important than that of arterial.

Local Road

The function of local roads is to provide land access, and direct access is allowed to all abutting properties. These roads are not intended to carry large volumes of traffic and usually carry traffic which has an origin or destination some where along the road's length.

Traffic Analysis Terminology

AADT - Average Annual Daily Traffic. This volume represents average conditions for a one year period including weekdays and weekends.

Actuated Traffic Signals - Traffic signals can be fully- or semi-actuated. Fully-actuated signals employ detectors on all approaches of an intersection; the detectors indicate the presence of a waiting vehicle. This information is relayed to a controller which determines the length of green time for each approach. Semi-actuated signals are at intersections where the detectors are only present on the minor street.

Delay - Average time that a vehicle has to wait in order to clear an intersection. The delay is used to determine the operating level at signalized intersections.

PCPH - Passenger Cars Per Hour. In order to conduct certain traffic analyses, trucks and buses are converted to an equivalent number of passenger cars. For example, 1 bus may be equivalent to 1.2 passenger cars in terms of impact and operations.

Reserve Capacity - Generally used to assess the level of operation at unsignalized intersections. Each movement at an intersection (e.g. left-turn, right-turn, etc.) has a practical limit of traffic that it can accommodate. The Reserve capacity is the spare or additional traffic, above and beyond the existing or forecast volumes, which an unsignalized intersection can accommodate.

Sight Distance - In this particular case it refers to the field of view for a driver waiting to turn at an intersection or cross the intersection. The field of view available to a driver is one of the key determining factors of the safety of an intersection.

Traffic Growth Rate - Measurement of the growth in traffic from one year to the next, or over a number of years, summarized as a percentage increase per year.

Volume/Capacity Ratio - Whereas the reserve capacity is the key factor at unsignalized intersections, the volume/capacity ratio is the key factor at signalized intersections. The principle is the same as the reserve capacity, although, in this case the available capacity which is used is expressed as a ratio of the total available capacity. For example, a volume/capacity ratio shown as 0.50 indicates that 50% of the available capacity is used.

Screenlines - A set of control points which are established throughout a planning area as a means of monitoring traffic volumes and other traffic / planning data. Any changes to the road network will usually be reflected in changes to the traffic volumes flowing across the various screenlines. The volumes produced at a screenline level usually represent trends in travel patterns such as an increase in volume travelling east to west.