3.0 ENVIRONMENT INVENTORY

3.1 Improvement Corridor

In order to determine the magnitude of the future traffic congestion problem, analysis was extended to large areas adjacent to the Improvement Corridor. However, improvements to Tecumseh Road East will be contained within the Improvement Corridor as shown in Figure 3.1. For the remainder of this study, environment inventories and alternative designs were restricted to the Improvement Corridor as shown in Figure 3.1.

3.2 Natural Environment

The only natural area in the Corridor is Little River which extends from the Detroit River to about North Talbot Road and drains about 60.8 sq. km of land in the City of Windsor and Township of Sandwich South. The portion of Little River within the Improvement Corridor and the Open Space designation paralleling it are shown on Figure 3.2. In 1992, a report entitled Little River Comprehensive Stream Study (LRCSS) addressed concerns relative to improvement of environmental quality in the watershed. The areas in that study relevant to the Improvement Corridor are identified as Reaches 2 and 3 which are south and north of the Improvement Corridor respectively. The following is a summary of the environmental evaluation of those reaches from that report (Table 6.1, Section 6.2).

Reach	Environmental Quality	Biological Characteristics	Environmental Problems
2	Impaired	• diverse group of species present • pollution - sensitive species rare • relative abundance of worms high	• lack of riparian vegetation • low flow conditions in summer • sediment accumulation • sccouring related to rain fall events
3	Severely degraded	• low number of species present • lack of snails and clams • pollution-tolerant worms dominate fauna	• metal concentrations in discharge from Windsor Bumper Manufacturing[7]

[7] No longer operating

The Little River Stewardship Study - 1994 (LRSS) recognizes Little River to be "a highly disturbed urban site". However, it underscores the fact that natural areas within Windsor and Essex County are few in number and notes that efforts are underway by the City's Parks and Recreation Department and the Little River Enhancement Group to develop a "naturalized parkland along Little River between Riverside Drive and Tecumseh Road East". The report documents the flora and fauna identified in the Little River Corridor (see Appendix B).

No natural heritage sites are identified within the Improvement Corridor; however, some are in close proximity and are shown on Figure 3.2.

Outside the little River Channel, vegetation consists of grass areas and random trees, mainly on private property. Several commercial and industrial areas have developed landscaped areas.

Because of the extent of urbanization in the Improvement Corridor and the expectation of increased urbanization, a general survey of vegetation was not carried out. However, in compliance with the City's Official Plan, relocation of trees affected by roadway widening will be examined during final design.

3.3 Socio-Economic Environment

3.3.1 Existing Land Use

The pattern of land use in and adjacent to the Tecumseh Road East corridor is shown on Figure 3.3 as defined in the Official Plan. The following describes the main land uses in more detail.

Residential

Five residential neighbourhoods are located in or adjacent to the Improvement Corridor (See Figure 3.3):

1. Ford/Ferndale - bounded by Pillette Road, Tecumseh Road East (on the south), Jefferson Boulevard and the CNR.

2. Fontainbleu - bounded by Norman Road, Tecumseh Road East (on the north), Jefferson Boulevard, and the CNR on the south side.

3. Roseville Gardens - this is a medium density neighbourhood localized along Roseville Garden Drive, east of the CNR and south of Tecumseh Road East.

4. Meadowbrook - bounded by Lauzon Parkway, Forest Glade Avenue on the south, Lauzon Road and the Little River Golf Course on the east and Tecumseh Road East on the north.

5. Forest Glade - bounded by Tecumseh Road East, Robinet Lane, E.C. Row Expressway and Lauzon Road.

Generally, all areas have indirect access to Tecumseh Road East via local intersecting roads. In Forest Glade, houses back onto Tecumseh Road E. In the other neighbourhoods, residential areas are separated from Tecumseh Road East by a commercial strip. Several legal non-conforming residential uses exist along the north side of the Improvement Corridor.

All areas except Meadowbrook have local schools.

Commercial

Between Jefferson Blvd. and Little River, the south side of the Corridor is almost fully developed as are both sides of Jefferson Blvd. between Tecumseh Road East to Rose Avenue and Lauzon Road within the Improvement Corridor. There is a Site Plan Control application for rezoning to commercial uses on the south side between Lauzon Road and Little River.

Between Little River and the City limits on the north side of the Improvement Corridor, there are several commercial operations and the number is expected to increase. Similarly, commercial operations exist in the south east part and more are expected.

Figure 3.6 shows the commercial operations with direct access to the roadways within the Improvement Corridor based on a field survey conducted in November 1995.

Industrial

A substantial portion of the land adjacent to the roadways in the Improvement Corridor is allocated for industrial uses. Figure 3.3 shows the designated industrial land use and the zoning. The existing industrial use in the Improvement Corridor as of November 1995 is shown on Figure 3.6.

3.3.2 Future Development

Considerable vacant land exists within or adjacent to the Improvement Corridor. Information regarding the size, density, and type of development has been provided by the City of Windsor Planning Department. Figure 3.4 shows these areas relative to the Improvement Corridor and Table 3.1 provides a breakdown of the development type and density.

The following are the significant development areas:

East Riverside Planning District

This area consists of over 300 ha. and is bounded by Little River, the CNR, the City of Windsor east boundary and Riverside Drive. As shown in Table 3.1, it is under the control of several development groups (CN Real Estate has recently sold their holdings to 1147077 Ontario Ltd.) and development is proceeding. Development data supplied by the City was consistent with the developer's data for purposes of predicting future traffic.

Tecumseh Road East/Lauzon Parkway Planning Area

The land use breakdown for this area shown in Table 3.1, shows a small area (11 ha± adjacent to Tecumseh Road East for commercial uses. The Official Plan designates the total area, excluding existing commercial uses, for industrial uses. Because commercial uses generate more traffic, it was deemed appropriate to assume that the north frontage would be allowed to develop similar to the south. This provides a worst case for traffic prediction.

TABLE 3.1 (h)

ANTICIPATED FUTURE DEVELOPMENT IN EAST WINDSOR AREA

File: c:\bb\TcmshE\TrafNewDev

Location and Developer	Map Reference	Type of Development		Density Units / Acre	Area Acres	Residential Units by Type	Residential Units Total
A. RESIDENTIAL DEVELOPMENT							
1 . Lauzon Road / Tecumseh Road E. Planning Area							
Residential Components	6						
Residential Sub-area 2		M	(a)	20.0	2.8	55	
Residential Sub-area 3		A		50.0	5.0	250	
Residential Sub-area 4		R/Th		12.0	5.0	60	
Residential Sub-areas 5 and 6		M		30.0	4.5	135	
Over-all Density and Totals				21.4 (b)	17.3	500	500
2 . Sandwich East Planning District							
A) Renaud Property	F	A		50.0	NA	598	600 (c)
B) Simba Lands	D	SFD		5.0	83.5	420	
Eugeni	E	SFD		4.6 (d)	16.5	76	
Robinet Lane	7	SFD		6.1 (d)	4.6	28	
Area Total by Type		SFD		NA	104.6	524	520 (c)
3 . East Riverside Planning District							
A1 CN Realty Holdings	A	SFD	0.62 (e)	5.0	622.0	3114	
		SFS	0.05	6.0	42.0	251	
		R/Th	0.33	10.0	166.0	1657	
Average Density end Totals				6.1 (f)	830.0	5022	5020 (c)
A2 CMHC Lands	A	SFD	0.62	5.0	58.0	289	
		SFS	0.05	6.0	4.0	23	
		R/Th	0.33	10.0	15.0	154	
Average Density and Totals				6.1 (f)	77.0	466	470 (c)
A) Totals for CNR Holdings and CMHC Lands	A	All	NA	6.1	907.0	5488	5490
B) Head Construction	1 & 2	SFD	NA	4.9 (d)	12.0	59	60
C) Lakeview Planning Area	7 to 10	SFD		4.9 (d)	94.0	462	460 (c)
TOTAL for EAST RIVERSIDE AREA by TYPE		SFD	0.62	5.0	786.0	3924	
		SFS	0.05	6.0	46.0	274	
		R/Th	0.33	10.0	181.0	1811	
Over-all Density and Totals: East Riverside Area				5.9 (d)	1013.0	6009	6010 (c)
B. COMMERCIAL AND INDUSTRIAL DEVELOPMENT							
1 . Tecumseh Road E. / Lauzon Parkway Planning Area							
Tecumseh Rd E. North Frontage	None	C		NA	28.0	NA	NA
Remainder of Planning Area	None	Ind		NA	163.0	NA	NA
2 . Tecumseh Mall 550,000 SF GFA	None	C		NA	45.0	NA	NA
3 . Lauzon Road / Tecumseh Road E. Planning Area							
Tecumseh Rd E. South Frontage	6	C		NA	6.0	NA	NA
4 . Sandwich East Planning District					(g)		
Tecumseh Rd E. North Frontage to CNR Tracks	None	Ind		NA	25.5	NA	NA
	None	C		NA	25.5	NA	NA

Notes:

(a) **Type of Residential Development:**
- A = Apartments
- M = Mixed Multiple dwelling units.
- R/Th = Row or Townhouse dwelling units.
- SFD = Single Family Detached dwelling units.
- SFS = Single Family Semi-detached dwelling units.

Type of Other Development:
- C = Commercial
- Ind = Industrial

(b) Over-all density is based on a gross area of:
17.3 acres residential development, 3.8 acres open space, and 2.3 acres for roads = 23.4 acres.

(c) Rounded.

(d) Average density.

(e) Approximate proportions in terms of dwelling units.

(f) Determined from proportions of dwelling unit types:

Number of Units	100
Area	16.53
Average Density	6.05

Type	Prop'n	Number	Density	Area	
SFD	0.62	62	5.0	12.40	Acres
SFSD	0.05	5	6.0	0.83	"
R/Th	0.33	33	10.0	3.30	"
Total	1.00	100	NA	16.53	Acres

(g) Area = sum of open areas deemed able to sustain development assuming proportions will be ⅓ industrial and ⅓ commercial.

(h) extracted from "Traffic Analysis and Planning Report, E. Fearnely Ltd., November 1995

Tecumseh Mall

In 1989, a traffic study was carried out for an expansion of Tecumseh Mall from 254,000 to 550,000 SFGFA[8]. The economic down turn in the early 90's prevented that expansion, however, it is expected to proceed and has been included in the traffic analysis of this study.

Sandwich East Planning District

An area of about 20 ha. lies between Tecumseh Road East and the CNR from just west of Little River to the City limits and is designated for industrial use in the Official Plan. The City's Planning Department has indicated some commercial uses will be permitted in this area. Half of the area was assumed to be commercial for purposes of estimating future traffic.

3.3.3 Access to Adjacent Property - Tecumseh Road East

Figure 3.5 shows driveway accesses as well as existing locations where secondary property (intra-parcel) access is available east of Jefferson Blvd.

From the west study limit to Roseville Gardens Drive, no turning lanes are provided except at the Jefferson Blvd. intersection. Mid-block turns are permitted and left turning vehicles waiting for an appropriate gap block the inside through lane, seriously reducing its capacity. A similar situation exits from Lauzon Road to the east City limits.

From Roseville Gardens Drive to Lauzon Parkway, a centre raised median prevents left turns in and out of adjacent properties except at designated locations. These left turn locations have resulted in the consolidation of access to many commercial operations.

From Lauzon Parkway to Lauzon Road, a painted two-way left-turn lane (TWLTL) allows access to adjacent properties at mid-block locations. At intersections, the TWLTL is used for left turn storage. Unfortunately, because of the high number of entrances and close proximity of left-turn storage lanes, use of the TWLTL, particularly during peak traffic periods,

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[8] Tecumseh Mall Expansion Traffic Impact Study, M. M. Dillon Ltd., April 1989

results in significant congestion and opportunity for driver error. Often the TWLTL is used for over-flow left-turn storage for intersections or the intersection left-turn flow is interrupted by mid-block left turns.

3.3.4 Recreation

No City parks exist within the improvement Corridor, however, several are in the general area and are identified on Figure 3.2. Also shown is a narrow strip of parkland along the east side of Little River.

The Bicycle Use Development Study (December 1990) provided recommendations for implementing the City's 1989 Conceptual Bikeway Plan. Figure 3.2 shows the routes as depicted in the Bicycle Use Development Study which is endorsed by the City's Official Plan.

Of particular note is the parkland located on the east side of Little River between the CNR and Lauzon Road south of Tecumseh Road East. This 6 m easement has been acquired to facilitate a future linkage between the primary recreation way where it crosses the CNR and the greenway paralleling Little River. Currently, the desired extension of the primary recreationway along Little River is prohibited by the CNR and Tecumseh Road East bridges over Little River.

3.3.5 Noise

A simulation of noise levels was prepared for the 5 locations shown on Figure 3.5. The simulations were generated by the MOEE Stamson 5.0 computer simulation program, in accordance with the MTO-MOEE Protocol Agreement for noise evaluations for the following conditions:

1. Existing roadway - existing traffic
2. Existing roadway - 20 year traffic
3. 6 lane divided roadway - 20 year traffic

The Protocol Agreement requires that noise mitigation measures be implemented when noise increases greater than 5 dBA are predicted. As shown in Table 3.2, the estimated increase in noise does not satisfy the warrant for noise mitigation.

TABLE 3.2

NOISE EVALUATION OPPOSITE FOREST GLADE RESIDENTIAL COMMUNITY

RECEPTOR	1996 Leq	20 YEAR TRAFFIC ON 4 LANES		20 YEAR TRAFFIC ON 6 LANES	
		Leq	INCREASE	Leq	INCREASE
R1	61.6	65.2	3.6	65.3	3.7
R2	61.8	65.4	3.6	66.0	4.2
R3	60.6	63.9	3.3	64.3	3.7
R4	60.6	63.9	3.3	63.9	3.3
R5	62.5	65.9	3.4	65.8	3.3

3.3.6 Air Quality

A detailed analysis of the impacts on air quality was not carried out for this study; however, based on past experience on similar roadways, there are some general conclusions which are applicable.

A 1990 evaluation of impacts to air quality was carried out for the environmental assessment for the reconstruction of Huron Church Road. That evaluation considered worst case and normal case situations for concentrations of carbon monoxide, oxides of nitrogen, total hydro carbons, odours and total suspended particulate matter.

The resulting measurements indicated that the background levels of the noted elements are frequently high in the Windsor area. The prediction models also allowed for improvements to vehicle emission systems. It was concluded that there would be no measurable effect on air quality, except for total suspended particulate (dust) for the widening to 6 lanes from 4 lanes. The basic problem with dust is the creation of new clouds by passing vehicles. This effect can be reduced through routine maintenance in the form of pavement sweeping.

On the basis of the foregoing, it is concluded that air quality will not be measurably affected by the widening of Tecumseh Road East and the increase in traffic.

3.4 Soils

An overview of the existing subsurface conditions was carried out by Golder Associates Ltd. For the section from Jefferson Blvd. to Lauzon Road, data was compiled from previous investigative reports. Between Little River and Forest Glade Drive very little data existed and additional shallow boreholes were advanced to determine the pavement structure, subsurface materials and presence of ground water.

The entire improvement Corridor is underlain by an extensive deposit of silty clay fill. The top 0.5-2.0 m is weathered to a mottled brown and grey colour with a stiff to very stiff consistency. Below that the material is a very stiff to hard brown silty clay fill which varies in depth from 1.5 to 2.9 m. The brown silty clay is underlain with very stiff to stiff grey silty clay fill.

The water table was generally located within 2.5 m of the ground surface.

3.5 Stormwater Drainage

3.5.1 Existing Drainage

West of Little River, all stormwater runoff is conveyed to an outlet at Little River by the Casgrain Drain. However, east of Little River, the Improvement Corridor is drained by a much smaller storm sewer and open-ditch municipal drains. Additional examination of the drainage pattern east of Little River was requested to identify any need for a large trunk storm sewer within the right-of-way, similar to the Casgrain Drain west of Little River.

Figure 3.5 shows the general drainage areas east of Little River and south of the CNR which might affect the Improvement Corridor. Area 1 represents the Forest Glade community which is drained to Little River by storm sewers as shown and does not contribute to stormwater runoff from the Tecumseh Rd. E. right-of-way.

Area 2 east of Forest Glade represents a new development area, a portion of which is in the Township of Sandwich South. This area currently drains to the Parent Outlet Drain by

open ditches. Two culverts (both 1.8 m x 2.2 m wide) convey the stormwater under Tecumseh Rd. E. and a 1370 mm (54") pipe carries the flow under the CNR embankment. When developed, this area will include a detention pond to limit peak flows (as per City of Windsor development policy).

Area 3 represents the industrial land designation between Tecumseh Rd. E. and the CNR. As shown, it drains generally northerly to the Parent Relief Drain which begins at the Parent Outlet Drain on the south side of the CNR and flows westerly along the CNR to an outlet at Little River. Runoff from this area is governed by a "zero increase" policy which requires stormwater runoff to not exceed predevelopment flows (as per City of Windsor development policy).

Area 4 represents the storm water runoff within and to the Tecumseh Rd. E. right-of-way, which extends easterly from Little River to about 80 m east of Clover Street. The area is drained by a storm sewer varying in diameter from 900 mm (36") to 1520 mm (60"), which outlets to Little River.

3.5.2 Drainage Capacity

Areas 2 and 3 will include storm detention measures to limit stormwater runoff to the predeveloped levels. Therefore, additional capacity should not be required.

However, a capacity constraint exists at the 1370 mm pipe culvert under the CNR. Earlier studies by M. M. Dillon Ltd. and Hanna, Ghobrial and Spencer Ltd. indicate that a diversion of flow from the Parent Outlet Drain to the Parent Relief Drain is required. The peak flow to the Parent Outlet Drain was estimated at about 2.8 m^3/s (100 cfs) . The recommended flow split was 1.4 m^3/s (50 cfs) to the Parent Relief Drain and 1.4 m^3/s to the Parent Outlet Drain.

There is no additional drainage area for Area 4. Although a widening of the pavement to 6 lanes will increase storm runoff, this can be handled in the existing storm sewer system or relatively small auxiliary storm sewers.

As noted, the capacity constraint for the Parent Outlet Drain at the CNR can be alleviated by diverting flow to the Parent Relief Drain. Detailed survey and analysis will be required to determine what, if any, improvements would be required in the Parent Relief Drain to handle the diversion of flow. Prior to development in Area 3, consideration should be

given to the need to enclose the Parent Relief Drain and allocation of costs. It was concluded that the solution of the capacity problem at the CNR can be most cost effectively handled by the existing system of open municipal drains. If aesthetics become an issue, the existing drains could be enclosed.

3.6 Infrastructure

3.6.1 Roadway Geometry and Operation

Section 2.1.4 identified the classification of roadways in the Improvement Corridor. Figures 3.6A-F shows the existing roadway facility including access to adjacent property.

Tecumseh Road East, except for a short section eastbound between Roseville Garden and Lauzon Parkway is a 4 lane roadway. Most of the roadway under study does not have provision for mid block left turns to adjacent property. Between Roseville Garden and Lauzon Parkway, there are 3 lanes eastbound and two lanes westbound. That section of roadway is separated by a raised median with openings provided at intersecting roads. Between Lauzon Parkway and Lauzon Road, the roadway is 2 lanes in each direction with a TWLTL provided for mid-block left turns to adjacent property. Although there are curves in the existing alignment, from a driver perspective, the road is basically straight.

Jefferson Blvd. in the Improvement Corridor is a basic two lane roadway with a straight alignment.

Roseville Garden Drive is a two lane roadway servicing the residential community south of Tecumseh Road East and east of the CNR spur. It intersects with both Tecumseh Road East and Jefferson Blvd. Future access to the Tecumseh/Lauzon Parkway Planning Area is envisioned in a northerly extension of Roseville Garden Drive as shown on Figure 3.6.

East Park Centre Drive was originally built to provide access for East Park Centre and Parkway Mall. It is a 2 lane divided roadway connecting Tecumseh Road East and Enterprise Way. As shown on Figure 3.6, an extension of East Park Centre Drive to the Tecumseh/Lauzon Parkway Planning Area is consistent with the Secondary Plan for that area.

Lauzon Parkway is a basic 6 lane divided roadway with access to adjacent property provided only through intersecting roads. It currently ends at Tecumseh Road East but a future northerly extension will connect to Lauzon Road at Tranby Avenue.

Annie Street is a two lane roadway which functions similarly to East Park Centre Drive to provide local commercial access. The Annie Street intersection with Tecumseh Road East is aligned with the major south access to the Tecumseh Mall.

Lauzon Road north of Tecumseh Road East is a 4 lane roadway; to the south it is a 2 lane roadway. North of Tecumseh Road East on Lauzon Road, an intersection has been provided for the major east access to Tecumseh Mall and the major west access to Eastown Mall.

Penang Lane is a very narrow public roadway extending north of Tecumseh Road East to the CNR where the roadway continues north but vehicular travel across the CNR is prohibited.

Forest Glade Drive is a 2 lane collector road with sufficient pavement width to permit parking and is the major access to the Forest Glade Community from the north. A 50 ft. (15 m±) easement in favour of the City of Windsor extends northerly from the Forest Glade Drive intersection with Tecumseh Rd. E. to the CNR.

Clover Street is an unassumed road allowance servicing the commercial operations north of Tecumseh Road East. A private level crossing of the CNR exists only for CNR's use. Tecumseh Road East is the southerly limit of Clover Street. The current planning for development of the East Riverside Planning District shows an access to Tecumseh Road East at Clover.

Robinet Lane is a 2 lane roadway which "T" intersects with Tecumseh Road East and serves the existing residences south of Tecumseh Road East.

Banwell Road is a 2 lane roadway extending south from Tecumseh Road East to an intersection with E.C. Row and beyond. It serves the existing development on the east side and will serve the vacant land to the east and west when developed. The planning for the East Riverside Planning District also calls for a northerly extension of Banwell Road across the CNR. (see Figures 3.4 and 3.6)

Several of the intersections are signalized and auxiliary turning lanes have been provided. The intersection configurations are summarized in Table 3.3 and shown on Figure 3.6.

TABLE 3.3

TECUMSEH ROAD EAST CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL ROAD
INTERSECTION CONFIGURATION

		EB		WB		NB		SB		Traffic Signal	Advanced Green
		LT	RT	LT	RT	LT	RT	LT	RT		
Jefferson Blvd.	Rose Avenue/ Roseville Garden Drive	-	-	-	-	-	-	-	-	Yes	No
Tecumseh Road East	Lloyd George Blvd.	X[8]	-	X	-	-	-	-	-	No	-
	Jefferson Blvd.	X	-	X	-	X	-	X	-	Y	Y-ALL
	Roseville Garden	X[1]	-	X	-	X	X[2]	-	-[3]	Y	No
	East Park Centre	X[1]	-	X	-	X	X[2]	-	-[3]	Y	Y-WB
	Lauzon Parkway	X[1]	X[4]	X	-	2X	X	X	-	Y	Y
	Annie Street/Tecumseh Mall	X	-	X	-	X	-	X	X	Y	Y-EB/WB
	Lauzon Road	X	-	X	-	X	-	X	X	Y	Y-ALL
	Forest Glade Drive	-	-	-	-	X	X	X	-	Y	Y[5]
	Robinet Lane	-	-	-	-	X	-[6]	-	-[3]	N	-
	Banwell Road	-	-	-	-	X	-[6]	-	-[3]	N	-
Lauzon Road	Shopping Centre Accesses	X[7]	-	X	-[7]	-	-	-	-	Y	No

Notes: 1) Left turn storage provided for future turns and/or U-turns.
2) 2 lane approach to "T" intersection leaves separate lane for right turn.
3) No existing roadway.
4) Existing 3 lane cross section not continuous. Therefore outside lane used as right turn lane.
5) Signal phasing provides equivalent to advanced green.
6) Single lane approach. If left turn there is no right and vice versa.
7) Not marked but operates as left turn lane.
8) Left turns accommodated from TWLTL.

3.6.2 Existing Pavements

The approximate thickness of the existing pavement components was listed in Golder's Report in Table 1. These pavement structures are shown in the respective locations on Figure 3.6.

3.6.3 Existing Traffic

A comprehensive study of the existing traffic in the area and the predicted future traffic over the next 20 years was carried out by E. Fearnley Ltd. The report is entitled "Traffic Analysis and Planning Report, Tecumseh Road East Reconstruction Project, Jefferson Boulevard to Banwell Road". A copy is included in Appendix B. For detailed information, the reader is referred to that report. The following is a summary of these findings.

Traffic counts were taken at all intersections for the periods 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m. In those counts, vehicles, heavy trucks and pedestrians were counted on all approaches. Figure 3.6 shows the existing traffic volumes and turning movements at the respective intersections. The counts at individual intersections have been balanced and rounded to show consistent traffic flows. Table 3.4 shows an analysis of the existing left turn capacities based on existing traffic volumes relative to the available left turn storage lengths. Where values in the "Hourly Capacity" column are less than the "Traffic" column, the left turn storage length is deficient for the peak hour.

A flow capacity analysis of the existing roadway for the existing traffic was not carried out as substantial traffic growth is anticipated.

3.6.4 Accident Experience

Accident reports were tabulated for the years 1992 and 1993 and categorized as to location.

Absolute accident statistics are of little value unless they are converted to a common denominator for comparison. The accident events were converted to a rate per million vehicle kilometres (MVK). This accounts for variations in traffic volume and length of roadway analyzed.

Accident analysis data was extracted from the Traffic Analysis Planning Report and separated into intersection accidents and mid-block accidents to enable identification of appropriate design elements to address different problems. They are summarized in Tables 3.5 and 3.6. Accidents and rates are shown on Figure 3.6 in the form of a bar graph. There were 434 total accidents in the Improvement Corridor over the two year analysis period. As expected, the 5 highest accident rates occurred at intersections because of the magnitude of turning conflicts. The 5 highest intersection accident rates, expressed per MVK, are as follows:

Lauzon Parkway	25
Forest Glade Drive	19
Annie Street/Tecumseh Mall	19
Jefferson Blvd.	18
Lauzon Road	16

All but the Jefferson Blvd. intersection are associated with the east/west traffic flow on Tecumseh Road East.

Typically, an accident rate of 3 per MVKM (5 per MV Miles) is considered a benchmark for identifying areas where improvements are appropriate. At intersections, 10-12 total accidents signal the need for detailed examination and possible improvement[9].

The most frequent accident type at intersections is rear end collisions (48%). This is contrary to the expectation that most accidents at intersections would involve turning manoeuvres (24% left and 11% right) for the following reasons:

- Intersections with the highest accident rates operate at or near capacity and therefore experience considerable congestion and delay.
- The east bound approach to Lauzon Parkway drops the outside lane forcing motorists to merge quickly, thereby reducing the distance between vehicles leading to chain reaction rear end collisions.
- Vehicles wanting to turn left into adjacent properties present an unexpected traffic backup.

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[9] Traffic Analysis and Planning Report, E. Fearnley Ltd., March 1996

TABLE 3.4 (e)

CURRENT LEFT-TURN CAPACITIES
BASED ON STORAGE CAPABILITIES OF EXISTING LEFT-TURN BAYS AND TRAFFIC SIGNAL CYCLE TIMING (a)

Intersections	Eastbound to Northbound Left Turn					Westbound to Southbound Left Turn				
	Storage Length in Feet	Capacity per Red Signal (Vehicles)	Cycles Each Hour	Hourly Capacity	Traffic vph	Storage Length in Feet	Capacity per Red Signal (Vehicles)	Cycles Each Hour	Hourly Capacity	Traffic vph
Tecumseh Road East at:										
1 . Jefferson Boulevard	85	3	33	112	150 (b)	160	6	33	211	100
2 . Roseville Gardens	NA	NA	46	NA	0	135	5	46	248	70
3 . East Park	110	4	33	145	0	310	12	33	409	130
4 . Lauzon Parkway	350	14	33	462	20	340	14	33	449	305 (c)
5 . Annie Street	155	6	33	205	280 (b)	135	5	33	178	80
6 . Lauzon Road	170	7	33	224	360 (b)	185	7	33	244	90
7 . Forest Glade (d)	NA	NA	33	NA	Nominal	100	NA	33	NA	60
8 . Banwell Road (d)	NA	NA	NA	NA	0	150	NA	NA	NA	50

Notes:

(a) Capacity assumes a vehicle length = 25 ft. Capacity = Left-turn storage length ÷ Assumed storage length.
Current Left-tum storage length scaled from road survey plans.
The term 'Cycle' refers to the time required to complete a cycle of green-to-amber-to-red-to-green. Or, in other words, from the start of one green signal to the start of the next green signal.
Cycles per hour = 3600 seconds in an hour ÷ the cycle time in seconds.

(b) Existing left turning traffic volumes are greater than existing left-turn lane capacity. This causes vehicles to back up (or 'spill over') into through traffic lanes causing conflicts and increasing the potential for accidents to occur.

(c) Existing left-turn traffic volume for the Lauzon Parkway blocks traffic turning into private driveways. The left-turning vehicles, in turn, block the eastbound traffic in the centre lane. This forces lane changes by the through traffic which increases the potential for accidents to occur. At the same time, motorists turning left into private driveways block those wishing to turn left at Lauzon Parkway increasing delay on this movement.

(d) No left-turn lanes at these intersections.

(e) extracted from "Traffic Analysis and Planning Report", E. Fearnley Ltd., November 1995

TECUMSEH ROAD EAST CLASS ENVIROMENTAL ASSESSMENT
JEFFERSON BLVD TO BANWELL RD.

ACCIDENT EXPERIENCE AT MID-BLOCK LOCATIONS (3)

EAST - WEST TRAFFIC FLOW	AADT	SECTION LENGTH	ACCIDENTS	ACCIDENT RATE (PER MVKM)	ACCIDENT TYPE						TOTAL (1) DRIVEWAYS		AVG. DWA SPACING (m)	LT. TUI CONTR
					LT	RT	ACROSS CL	SIDE-SWIPE	REAR-END	OTHER	COMM	RES		
TECUMSEH ROAD EAST														
5850-5930	30600	55	13	11	4	4	0	2	3	0	3		18	TWLT
LLOYD GEORGE BLVD.														
5940-6110	30600	68	8	5	4	2	0	0	2	0	3		23	TWLT
JEFFERSON BLVD.														
6120-6199	31800	89	24	12	8	2	0	1	11	2	4		22	NONE
6200-6300	31900	233	12 (1)	2	2	6	1	1	2	0	5		47	NONE
6400	32000	64	2	1	1	1	0	0	0	0	1	1	64	NONE
6500-6600	32100	169	7	2	3	2	0	0	2	0	3	3	56	NONE
ROSEVILLE GARDEN DR.														
6700-7100	32600	201	4 (2)	1	3	0	0	1	0	0	3		67	RM
EAST PARK CENTRE DR.														
7200	32800	198	3	1	0	2	0	0	1	0	3	2	66	RM
LAUZON PARKWAY														
7300-7750	32900	246	28	5	10	5	0	2	11	0	7		35	TWLT
ANNIE ST. / TECUMSEH MALL														
7750-7890	28700	158	13	4	8	3	0	0	2	0	6		26	TWLT
LAUZON RD.														
7900-8200	24700	198	14	4	8	2	2	0	0	2	2	6	99	NONE
8300-9200	24700	76	3	2	0	1	0	1	1	0	7		11	NONE
9300-9400	24700	381	4	1	3	0	0	0	0	1	6		64	NONE
9500-9800	24700	381	4	1	3	0	0	0	0	1	16		24	NONE
9900-10080	24700	168	22	7	19	1	0	1	0	1	6		28	NONE
FOREST GLADE DR.														
10100-10300	19450	259	9	2	5	0	1	1	1	1	6		43	NONE
10400-10700	19450	427	1	0	0	0	0	0	0	1	6		71	NONE
10800-11000	19450	274		0	0	0	0	0	0	0	2	1	137	NONE
ROBINET LN.														
11100-11400	20850	396	11	2	7	1	0	0	0	3	12	2	33	NONE
BANWELL RD.														
11500-CITY LIMITS	20850	152	1	0	0	0	0	0	0	1	4	4	38	NONE
SUB-TOTALS			183	63	88	32	4	10	36	13				
NORTH - SOUTH TRAFFIC FLOW														
JEFFERSON BOULEVARD														
2200	15500	207	6	3	2	1	1	0	1	1	1	10	207	NONE
TECUMSEH RD. E.														
2450-2600	15800	466	10	2	3	1	0	0	5	1	9		52	NONE
ROSEVILLE GARDEN DR.														
2600	15800	224	5	2	4	0	0	0	1	0	1		224	NONE
LAUZON ROAD														
1800	25000	172	6	2	0	1	0	1	4	0	2		86	NONE
TECUMSEH / EASTOWN MALLS														
2000	25600	117	5	2	0	0	0	0	5	0	0			NONE
TECUMSEH RD. E.														
2500	13100	207	11	6	4	4	0	0	3	0	3	1	69	NONE
2600	13100	229	1	0	1	0	0	0	0	0				
SUB-TOTALS			44		14	7	1	1	19	2				
TOTALS			227		102	39	5	11	55	15				

TOP 5 ACCIDENT LOCATIONS

LOCATIONS WHERE ACCIDENTS ARE RELATIVELY HIGH BUT RATE IS LOW

AADT ANNUAL AVERAGE DAILY TRAFFIC

(1) MAXIMUM NUMBER ONE SIDE

(2) MOST ACCIDENTS OCCUR AT UNSIGNALIZED MEDIAN OPENING

(3) ACCIDENTS FOR PERIOD 1992-1993

MVKM MILLION VEHICLE KILOMETERS

TABLE 3.6

TECUMSEH ROAD EAST CLASS ENVIROMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.

ACCIDENT EXPERIENCE AT INTERSECTIONS (1)

	INTERSECTION WITH:	AADT	SECTION LENGTH	ACCIDENTS	ACCIDENT RATE (PER MVKM)	ACCIDENT TYPE					
						LT	RT	ACROSS CL	SIDE-SWIPE	REAR-END	OTHER
TECUMSEH ROAD EAST	LLOYD GEORGE BLVD	30600	61	9	7	2	0	0	0	7	0
	JEFFERSON BLVD	31200	61	13	9	2	0	0	0	8	3
	ROSEVILLE GARDEN DRIVE	32350	69	11	7	2	2	0	0	7	0
	EAST PARK CENTRE DRIVE	32800	73	10	6	3	0	1	0	5	1
	LAUZON PARKWAY	33300	78	47	25	7	7	1	5	27	0
	ANNIE ST./TECUMSEH MALL	30800	61	26	19	6	1	0	3	10	6
	LAUZON ROAD	28700	67	23	16	9	2	1	0	11	0
	FOREST GLADE DRIVE	22075	61	19	19	3	3	0	1	11	1
	ROBINET LANE	20150	61	2	2	2	0	0	0	0	0
	BANWELL ROAD	20150	152	3	1	3	0	0	0	0	0
JEFFERSON BOULEVARD	TECUMSEH RD. EAST	15700	73	15	18	4	1	0	2	7	1
	ROSEVILLE GARDEN DRIVE	15800	61	4	6	4	0	0	0	0	0
LAUZON ROAD	EASTOWN MALL/TECUMSEH MALL	25300	73	15	11	6	4	0	2	2	1
	TECUMSEH RD. EAST	19400	73	9	9	3	0	0	2	4	0
	SUB-TOTALS			206		56	20	3	15	99	13

TOP 5 INTERSECTION ACCIDENT RATES
AADT ANNUAL AVERAGE DAILY TRAFFIC
LT/RT LEFT TURN / RIGHT TURN
(1) ACCIDENTS FOR PERIOD 1992-1993
MVKM MILLION VEHICLE KILOMETERS

TABLE 3.5

- Insufficient left turn storage areas such that traffic backs up into the through lane.

Examination of Table 3.6 highlights one of the major problems in the Improvement Corridor - **mid-block accidents.** Surprisingly, mid-block accidents represent over 50% of all accidents. The five locations with the highest accident rates are:

	Accident Rate
- between Jefferson Blvd. and the CNR spur	12
- just west of Lloyd George Blvd.	11
- just west of Forest Glade Drive	7
- just east of Lauzon Parkway	5
- just west of Jefferson Blvd.	5

Accidents at these locations represent over 80% of the total mid-block accidents.

Five other locations have high numbers of accidents but low accident rates because either traffic volume is low or the section length is greater:

	Accidents	Accident Rate
- just east of the CNR spur	12	2
- between Annie Street and Lauzon Road	13	4
- just east of Lauzon Road	14	4
- between Robinet Lane and Banwell Road	11	2
- just south of Tecumseh Road East on Lauzon Road	11	6

The majority of the mid-block accidents occur in areas where there are frequent commercial entrances and no control of left turns to and from adjacent properties. In contrast, mid-block locations between Roseville Gardens and Lauzon Road show very low accidents and accident rates because:

1. Access to many commercial operations has been consolidated to only a few entrances and inter-parcel access has been provided, and

2. A raised median prevents random mid-block left turns.

Using the detailed breakdown of accident types from the Traffic Analysis and Planning Report, notes identifying problem accident areas and probable causes have been added to Figure 3.6.

The conclusion to be made from this data is that more traffic capacity (more lanes) is required to relieve congestion and therefore, rear-end accidents; and that a raised median such as exists between Roseville Gardens and Lauzon Parkway will further reduce accidents by reducing left-turning conflicts.

3.6.5 Future Traffic

The Traffic Analysis and Planning Report, which is a companion report to this, has dealt extensively with the prediction of future traffic volumes in the Improvement Corridor.

The City's Planning Department has identified all potential new development areas, as well as specific information regarding the type of development and the density of dwelling units.

Based on a growth factor of 1.5%, the existing traffic was expanded to twenty years hence which is a standard analysis period for transportation studies. To those traffic volumes, the estimated traffic from new development areas, which are considered to be fully built-out over the 20 year study period, was added. Figures 3.7A-G show the future traffic volumes as turning movements at intersections. For a more detailed review, reference can be made to Sections 2.4, 2.5, 2.6, 2.7, and 3.8 of the Traffic Analysis and Planning Report (by E. Fearnley Ltd., March 1996).

3.6.6 Capacity Analysis

Figures 3.7A-G indicate an approximate doubling of traffic in the Improvement Corridor at the end of the study period (20 years). An analysis of the affect of this traffic on the existing roadways was carried out.

In an earlier section, it was noted that the capacity of a single lane passing through a major intersection was 700 vph. This was based on allocating equal amounts of the signal green time to both roadways.

Dividing the future traffic volume per lane by the capacity per lane yields the v/c (volume/capacity) ratio. When this ratio is less than 1.0, the roadway will provide an acceptable level of service. A full system analysis would provide v/c ratios for all lanes. However, for this study a simplified approach was used.

Since cross traffic volumes have a significant effect on signal timing, a combined capacity of crossing lanes was used as an intersection capacity. For major intersections with similar traffic on both roadways, 1,400 vph[10] was used. For minor crossing roadways (where advanced green signal time is not required), a value of 1,300 vph was used and when both roadways are minor, a value of 1,200 vph was used.

The demand traffic flow was averaged on a per lane basis for the existing roadway conditions and the average flow per lane for the peak crossing movement was combined. Dividing that number by the intersection capacity yielded the modified v/c ratios shown on Figure 3.7A-G in the shaded boxes. These values are listed in Table 3.7. Where these values substantially exceed 1.0, severe congestion and delay will be experienced. That condition exists at most intersections on Tecumseh Rd. E. with only 2 approach lanes. By contrast at Roseville Garden Drive and East Park Centre, where 3 lanes already exist for the eastbound direction, v/c's are less than 1.0, representing an acceptable level of service.

TABLE 3.7

V/C RATIOS IN IMPROVEMENT CORRIDOR*

Tecumseh Rd. East Intersections	
Jefferson Boulevard	1.70
Roseville Garden Drive	0.95
East Park Centre Drive	0.93
Lauzon Parkway	1.15
Annie Street/Tecumseh Mall	1.40
Lauzon Road	1.70
Proposed New Road	1.40
Forest Glade Drive	1.30
Robinet Lane	1.10
Banwell Road	1.70
Jefferson Boulevard Intersection	
Roseville Garden Drive/Rose Avenue	1.30
Lauzon Road Intersection	
Eastown Plaza/Tecumseh Mall	0.80

* Future traffic on existing roads

[10] Traffic Analysis and Planning Report, E. Fearnley Ltd., March 1996

The above leads to the general conclusion that **the existing roadway will not be adequate to handle the future traffic volumes.**

3.6.7 Bridges

A concrete rigid frame bridge carries Tecumseh Road East over Little River. About 1950, a steel truss bridge was replaced by a concrete rigid frame bridge providing 10.06 m (33') of pavement between sidewalks. About 1957, that structure was widened to provide the current 17.7 m (58') of pavement which accommodates 2 lanes of traffic eastbound and westbound. The span is 15.24 m (50 ft.) and the deck accommodates a high water level of 177.30 m (582.7 ft.) and has a clearance to stream bed of about 2.7 m (9 ft.). The City's most recent review[11] indicates the structure to be structurally adequate.

3.6.8 Cycling

The City of Windsor, in its Official Plan, has stated objectives regarding the enhancement of cycling opportunities. These objectives follow the recommendations of the 1990 Bicycle Use Development Study.

The policies established to achieve these objectives clearly recognize the need for two types of cycling. One is recreational cycling on a network of off-road trails and paths which may be shared with pedestrians. The important aspect of recreational cycling is the segregation of these **recreationways** from motor vehicles. The second type of cycling is utilitarian cycling using City streets with provision for cyclists in the form of designated **bikeways** or **bikelanes** (see the Bicycle Use Development Study for the City of Windsor for definitions). Figures 3.8A-C illustrate these facilities.

A specific policy in the Official Plan affects this study directly. It is the requirement for arterial widening projects to consider the provision of bikeroutes on a wider pavement shared with vehicles, or separate bike lanes for exclusive use by cyclists.

The existing and planned cycling facilities are shown on Figure 3.2. The existing primary recreationway in the parkland paralleling Little River ends at the Penang Lane crossing of.

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[11] 1993 Structural Appraisal by M. M. Dillon Ltd.

the CNR. From that point, cyclists must use the existing street system. As noted earlier, summer counts indicate that 500-600 cyclists/day use the existing Recreationway (Ganatchio Trail), a significant portion of which are students from the Forest Glade area travelling to Riverside High School. This indicates that recreational facilities also provide important linkages for utilitarian cyclists. It also highlights a safety concern at the intersection of Penang Lane and Tecumseh Road East where cyclists must merge with or cross over the vehicle flow on Tecumseh Road East after enjoying the slower paced, safer, off-road facility.

Also shown on Figure 3.2 are the existing and proposed cycling facilities in the area. A future Primary Recreationway is shown continued from the current termination of the Ganatchio Trail at the CNR, easterly along the south side of the Parent Relief Drain to an easement between Forest Glade Drive and the Drain where the route swings southerly following the easement to the Forest Glade Drive intersection with Tecumseh Road East. From the Forest Glade Drive intersection the route continues along Forest Glade Drive to Lauzon Road as a Secondary Bikeway.

A future Secondary Bikeway is shown along Lauzon Road extending southerly from Clairview, where it intersects a Primary Recreationway (Clairview Bikeway) to Hawthorn Drive where it intersects the Hawthorn Primary Bikeroute.

The 1979 "Little River Corridor Open Space Study" by Johnson, Sustronk, Werstein and Assoc. Ltd. proposed the extension of what is now the Ganatchio Trail southerly from the CNR along Little River and recognized the need for appropriate crossings at the CNR and Tecumseh Road East. A 6 m easement exists along the east side of Little River to accommodate such a route but at this time no connections have been constructed (see Section 3.6.7 and Section 4.3).

3.6.9 Pedestrian Travel

The predominant travel mode in the Improvement Corridor is by automobile. Pedestrian travel is mainly for shopping purposes, to/from school and for recreational purposes. East of Little River, there is a substantial reduction in the number of pedestrians.

Generally, the main pedestrian travel direction is north/south with the largest volume at the Annie Street intersection. Pedestrian crossings are greatest in the first hour of the 3 hour afternoon peak (3:00-4:00 p.m.) influenced substantially by students returning home from school. A considerable number use the paved shoulder on the south side of Tecumseh Rd. E. and cross from Forest Glade to Penang Lane enroute to Riverside High School.

It is not anticipated that pedestrian volumes will grow in the 20 year study period to the extent they would govern future signal timing. However, in examining the capacity of design alternatives, pedestrian crossing time was allowed for a widened Tecumseh Road East (6 through lanes and left turn lanes).

3.6.10 Transit

The existing transit system and service in the City of Windsor was documented in the Traffic Analysis and Planning Report, specifically in Sections 2.1.3 and 3.2.3. They are summarized in Table 3.2 (page 84) and shown on Figure 3.4 (page 85) of that report (Appendix B).

The City's Official Plan supports the enhancement of transit use, and requires that the design of arterials and collector roads accommodates full size busses and provides stop locations, shelter and bus bays in relation to major traffic generators.

Consideration of the following future facilities/routes will be made by Transit Windsor:

- possible east bus terminal at Tecumseh Mall
- possible service to East Riverside Planning District as development proceeds
- possible service to Town of Tecumseh

In the Traffic Analysis and Planning Report, considerable examination of what expansion to the existing transit system would be required to avoid having to widen the roadway (Section 3.8.4, page 146). It indicates that an additional 31 buses would be required to provide the 3 min. headway which theoretically would eliminate the need for an additional lane of pavement. Additional buses on north-south roadways would be required to get passengers to the corridor. The assumptions and analysis used was reviewed with Transit Windsor.

Several factors affect the public's ability or willingness to use public transit:

- nature of work - sales and service employment often requires the use of an automobile.
- locations of transit routes with respect to employment
- amount of shift work in employment within the service area.
- location of residential areas with respect to transit routes
- family income levels and automobile ownership
- transit travel time compared to automobile
- availability of reasonable-cost parking in employment areas
- transit marketing

Based on the City of Windsor's current situation with respect to these transit ridership factors, it was concluded that a significantly large switch to transit to avoid having to widen the roadway to 6 lanes would not occur.

If 770 commuters (700 vehicles per hour)[12] could be attracted out of automobiles and onto a transit system providing a 3 minute interval during the peak period, that number of buses in the traffic stream would dramatically reduce the capacity of the bus lane. Although this matter was not analyzed in detail, an extra lane would probably be required in order to maintain the capacity of the two automobile lanes.

Therefore, expansion of the transit system in the Improvement Corridor to avoid having to widen the roadway to 6 lanes was not considered practical for the following reasons:

- capital cost to expand the transit system is very high
- probability of achieving the necessary switch from automobiles to buses is low
- the number of buses pulling into and out of the traffic stream would cause a substantial reduction in capacity of the curb lane, probably requiring additional lanes

Appropriate location and design of bus bays will be included in the final design.

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[12] Traffic Analysis and Planning Report, E. Fearnley Ltd., March 1996

3.6.11 Rail Traffic

The Canadian National Railway, (two main tracks) parallels the Improvement Corridor from Banwell Road to Lauzon Road. West of Lauzon Road, the Tecumseh Road East alignment deflects to the south resulting in a divergence of alignments. East of Jefferson Blvd. an industrial spur heads south paralleling Jefferson Blvd. and crosses Tecumseh Rd. E. about 110 m to the east (see Figure 3.6A).

The traffic on the main line is almost exclusively passenger service (VIA) with a maximum of 5 trains per day in each direction. The industrial spur accommodates shunting operations and may require 1-2 short closures per day, normally during the evening. The exposure warrant (road traffic x train traffic) would not be sufficient to warrant a grade separation of the industrial spur at Tecumseh Rd. E. Therefore, a level crossing was maintained at the crossing. An agreement between the CNR and the City of Windsor will be required to confirm issues such as cost sharing, use of right-of-way, traffic interruption during construction, and future maintenance.

3.6.12 Utilities

3.6.12.1 Windsor Utilities Commission (WUC) Water

A large diameter trunk watermain varying in diameter from 750 mm to 400 mm parallels the Improvement Corridor on the north side from the area of Green Forest Lumber (6200 Tecumseh Rd. E.) through to the City Limits and beyond into the Town of Tecumseh. These are shown on Figure 3.9. WUC has indicated that no modifications or upgrades to this main are required.

Both a 150 mm and a 300 mm watermain also parallel the Improvement Corridor as shown. These mains allow for the servicing of the adjacent properties. The older 150 mm main which is located under the existing roadway will be considered by W.U.C. for possible abandonment. The services currently connected to it would be transferred to the newer 300 mm main located along the south side of the existing right-of-way.

Hydro

The existing roadway is illuminated for the full extent of the Improvement Corridor on both sides of the roadway. In some areas luminaires are attached to existing hydro service

poles located along the right-of-way. Light standards and hydro poles are shown on Figure 3.9. Because of its normal location, a widening of the pavement from 4 lanes to 6 lanes will require relocation of most of this existing equipment. Following a review with W.U.C. a location for relocated equipment will be established and a decision made to maintain the existing aerial system or put the plant underground. WUC Hydro Division has no plans to upgrade or expand this system.

3.6.12.2 City of Windsor Sewers

Sanitary

The Little River Treatment Plant has capacity to handle all existing and future sanitary flows from the areas adjacent to the Improvement Corridor.

A 1524 mm (60") combined sewer exists on Jefferson Blvd. from Rose Avenue to Tecumseh Rd. E. where it intersects a 1676 x 1524 mm (66" x 60") box culvert combined sewer known as the Casgrain Drain. West of Jefferson, the combined sewer intercepts combined sewers from Balfour Blvd., Lloyd George Blvd., and Empress Ct. A 300 mm (12") sewer on Jefferson Blvd. from Empress Street southerly intersects the combined sewer on Tecumseh Rd. E.

A special manhole in the Tecumseh Rd. E. - Jefferson Blvd. intersection diverts the dry weather flow (sanitary) from the Casgrain Drain to a 600 mm (24") sanitary sewer flowing north on Jefferson Blvd. to Empress Street.

A 250 mm (10") sanitary sewer exists on the north side of Tecumseh Rd. E. from Windsor Honda (7180 Tecumseh Rd. E.) to just east of Lauzon Parkway. When the industrial land north of Tecumseh Rd. E. and west of Lauzon Parkway is developed, it is expected this sanitary sewer will be extended westerly. From east of Lauzon Parkway, it crosses Tecumseh Rd. E. to the south side and outlets to a 400 mm sewer flowing south on Lauzon Road.

A 1200 mm trunk sanitary sewer exists at Forest Glade Drive, heading north to the Little River Sewage Treatment Plant. This trunk accommodates the Forest Glade Area as well as the area between Tecumseh Rd. E. and the CNR. From that trunk, a 380 mm (15") sanitary sewer parallels Tecumseh Rd. E. on a 6 m (20') easement on the north side to just east of Robinet Lane where it moves to the south side. From there it continues to the City Limits on a 6 m easement, south of the right-of-way.

Westerly from the trunk, a 300 mm (12") sanitary sewer exists for a distance of about 150 m on an easement on the north side. This sanitary sewer will be extended westerly to service the area up to Little River.

The sanitary sewers are shown on Figure 3.9.

Storm

Jefferson Blvd. south of Tecumseh Rd. E. is a semi-urban cross section and surface drainage is collected in roadside ditch inlets and conveyed to the 1524 mm combined sewer. North of Tecumseh Rd. E., Jefferson Blvd. is an urban cross section and surface run off is collected at curbs,conveyed to catchbasins and connections to the 300 mm combined sewer.

Tecumseh Rd. E., from Balfour Blvd. to Little River is an urban cross section. Storm runoff is conveyed to the Casgrain Drain by catchbasins and lateral connections. This drain has been sized to accommodate all new development and accordingly, is currently under capacity. Prior to construction of Tecumseh Rd. E. improvements, an inspection will be required to identify any maintenance or cleaning requirements.

Surface runoff on Roseville Garden Drive is conveyed southerly in a 685 mm storm sewer.

Other storm connections to the Casgrain Drain include:

Roadways:

- Lauzon Parkway - 760 mm (30")
  - 450 mm (18")
- Annie Street - 300 mm (12")
- Lauzon Rd. - 685 mm (27")

Commercial Developments:

- Rose City Ford - 380 mm (15")
- Tim Hortons - to be determined during final design
- Swiss Chalet - to be determined during final design
- East Park Centre - to be determined during final design
- Parkway Mall - to be determined during final design

Beginning in the northwest quadrant of the Tecumseh Rd. E. - Lauzon Road intersection, a 914 mm (36") storm sewer crosses Lauzon Rd. and parallels Tecumseh Rd. E. to an outlet at Little River. This sewer services the large parking areas of the two shopping centres on the north side. These storm sewers are shown on Figure 3.9 From Little River to just east of Clover St., a storm sewer ranging in diameter from 900 mm to 1520 mm drain the right-of-way. East of Robinet Lane, the right-of-way drains to the Parent Outlet Drain in roadside ditches.

A widening of Tecumseh Rd. E. will require extensions of lateral connections and or replacement of catch basins. Major reconstruction of the storm trunk sewer system is not anticipated.

3.6.12.3 City of Windsor Traffic Engineering

At each signalized intersection, traffic signal poles are interconnected by a system of underground conduits to the traffic controller. In addition, the signals at Roseville Garden Drive, East Park Centre Drive and Lauzon Parkway are interconnected for synchronizing of the signal timing and therefore better traffic flow. Traffic signal equipment is shown on Figure 3.9.

The improvements required to widen Tecumseh Rd. E. will also require the reconstruction of the traffic signal systems at each intersection. Provision will be made for the interconnection of all new signals so that the operation can be monitored and controlled from a main control centre at the Traffic Engineering Department.

The opticon remote signal control available to Windsor Fire and Police will be modified along with the traffic signal system as required.

3.6.12.4 Union Gas

A system of natural gas distribution and service mains of various diameters exists within the Improvement Corridor as shown on Figure 3.9.

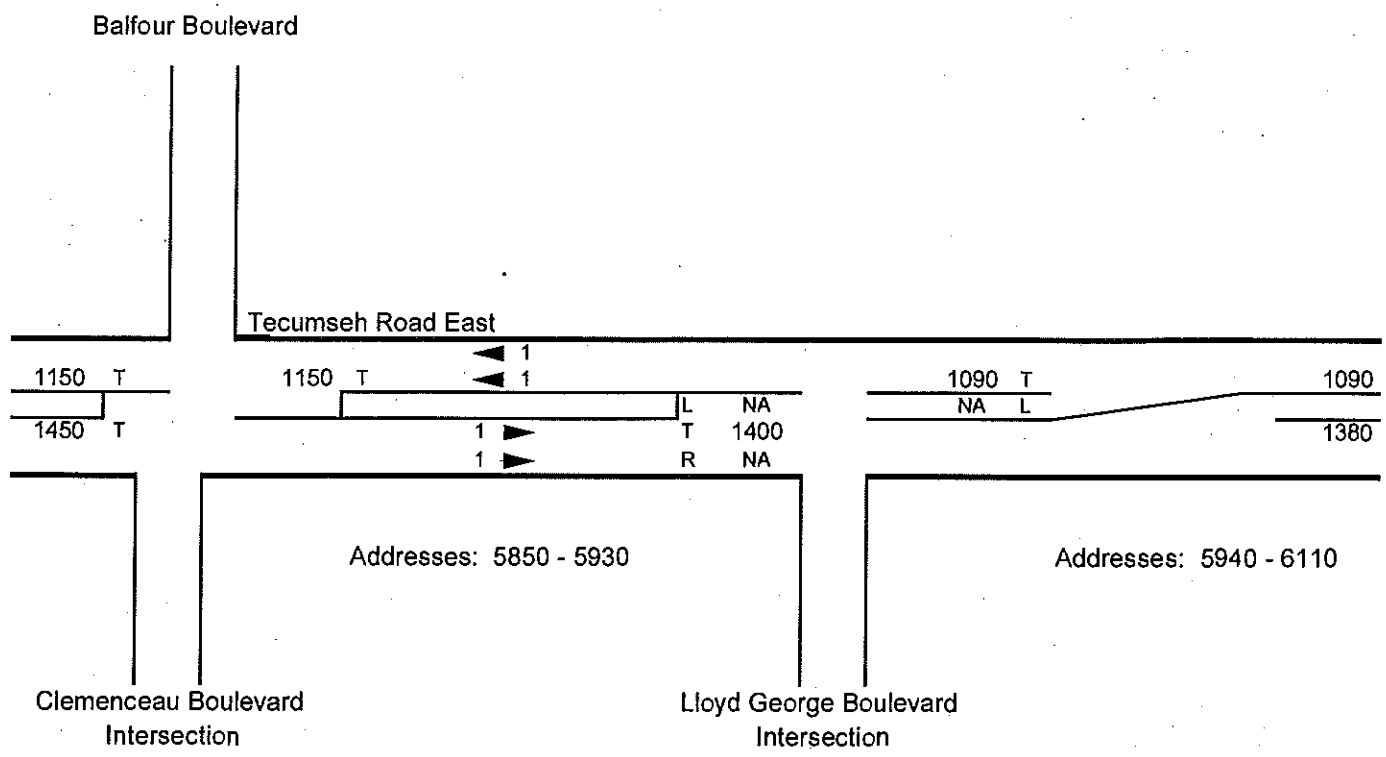
Generally, pavement grades for a widening of Tecumseh Rd. E. will not change substantially. Isolated relocations and or lowering of existing gas mains may be required. No expansion of the existing service is envisioned by Union Gas.

3.6.12.5 Bell Canada

Extensive Bell Canada underground duct systems exist in the Improvement Corridor as shown on Figure 3.9. Bell Canada has no plans for any modifications or expansions to this system. Similar to the gas mains, isolated relocation and lowering of telephone ducts may be required.

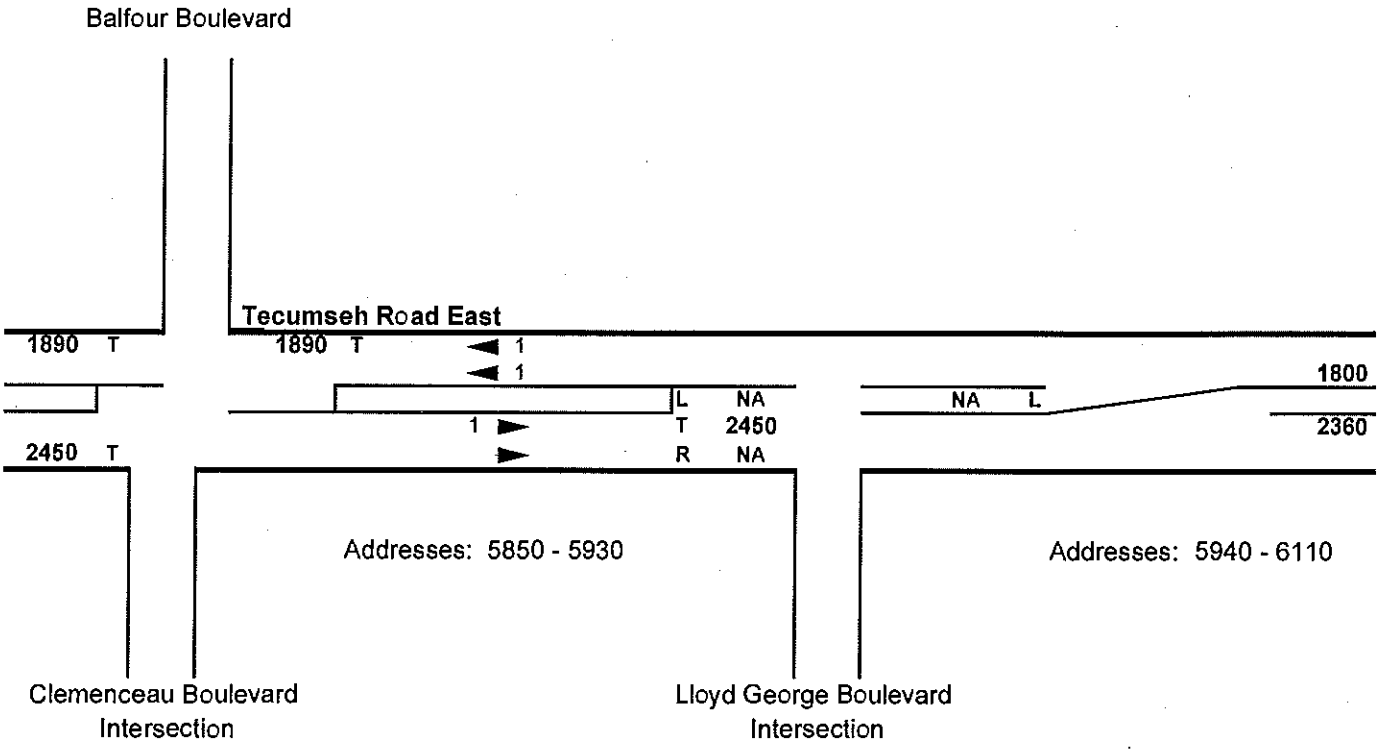
3.6.12.6 Other Utilities

Other utility companies, such as Shaw Cable, frequently use the roadway rights-of-way for the routing of their equipment. Impacts to these systems are relatively minor compared to the overall project.



EXISTING TRAFFIC: TECUMSEH ROAD EAST

FUTURE TRAFFIC: TECUMSEH ROAD EAST

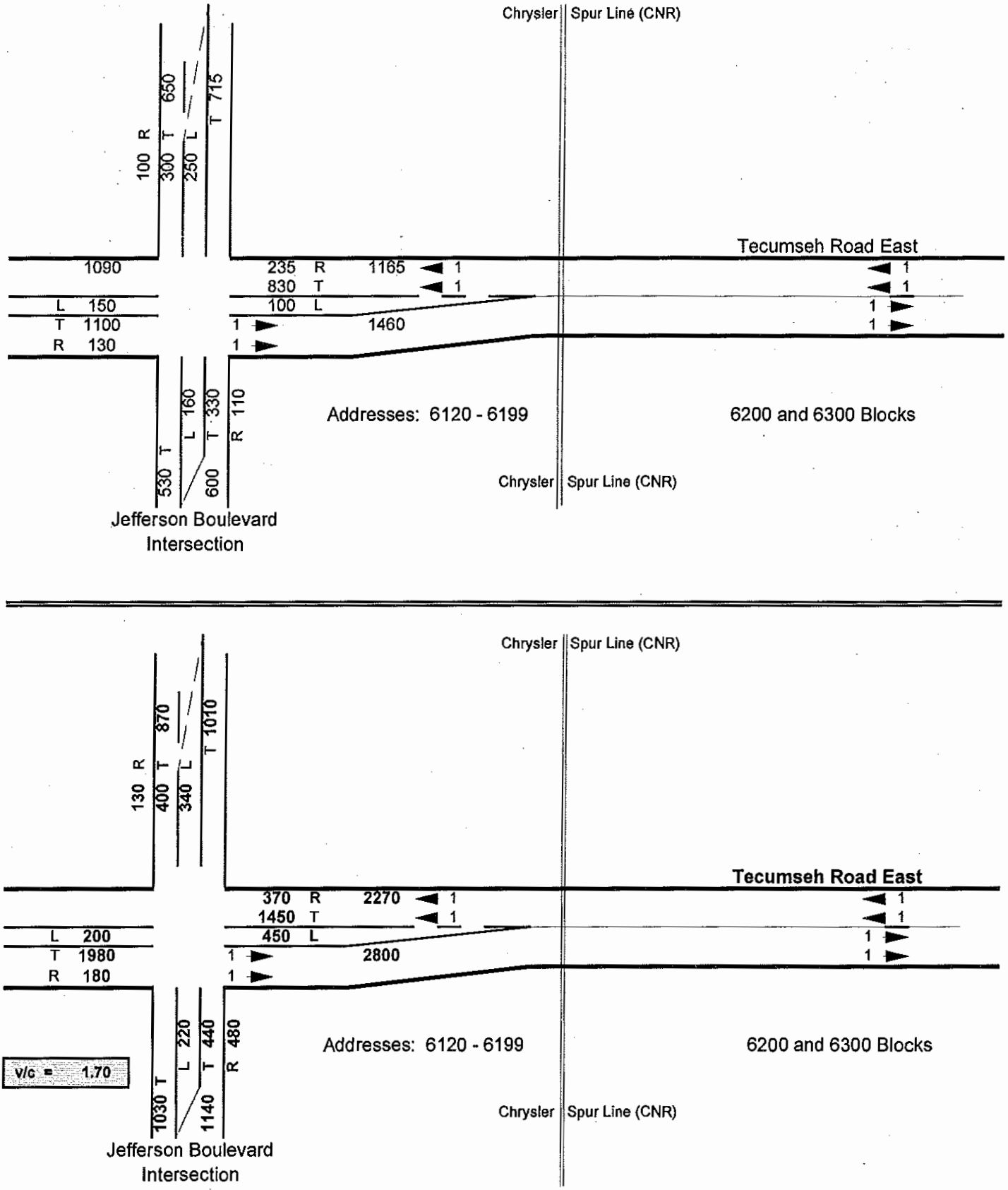


NOTE: L = Left Turns

T = Through Traffic

R = Right Turns

v/c = 0.00 Future traffic volume vs existing capacity

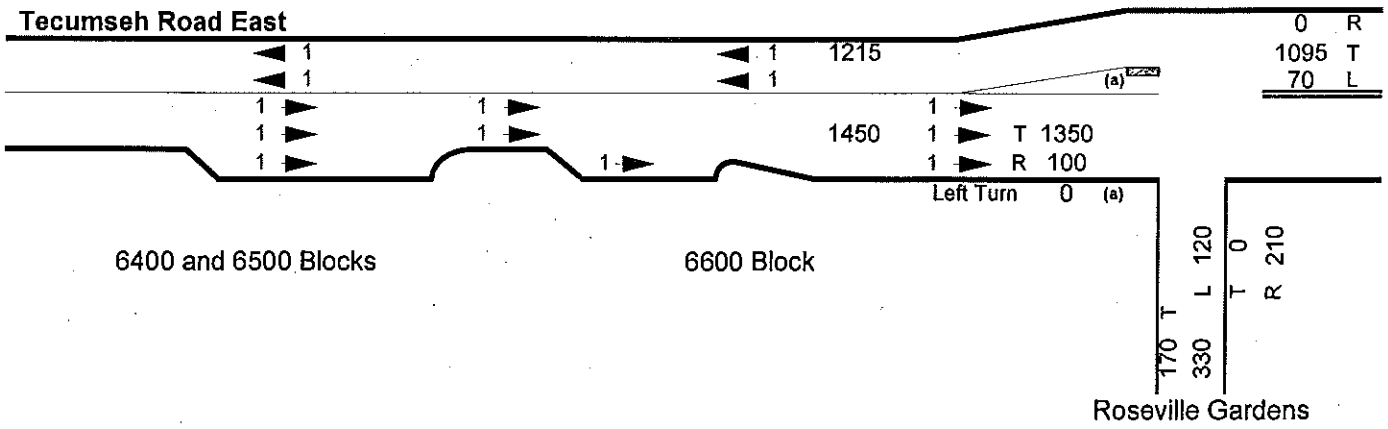


CLEMENCEAU BOULEVARD TO THE 6300 BLOCK

(1)

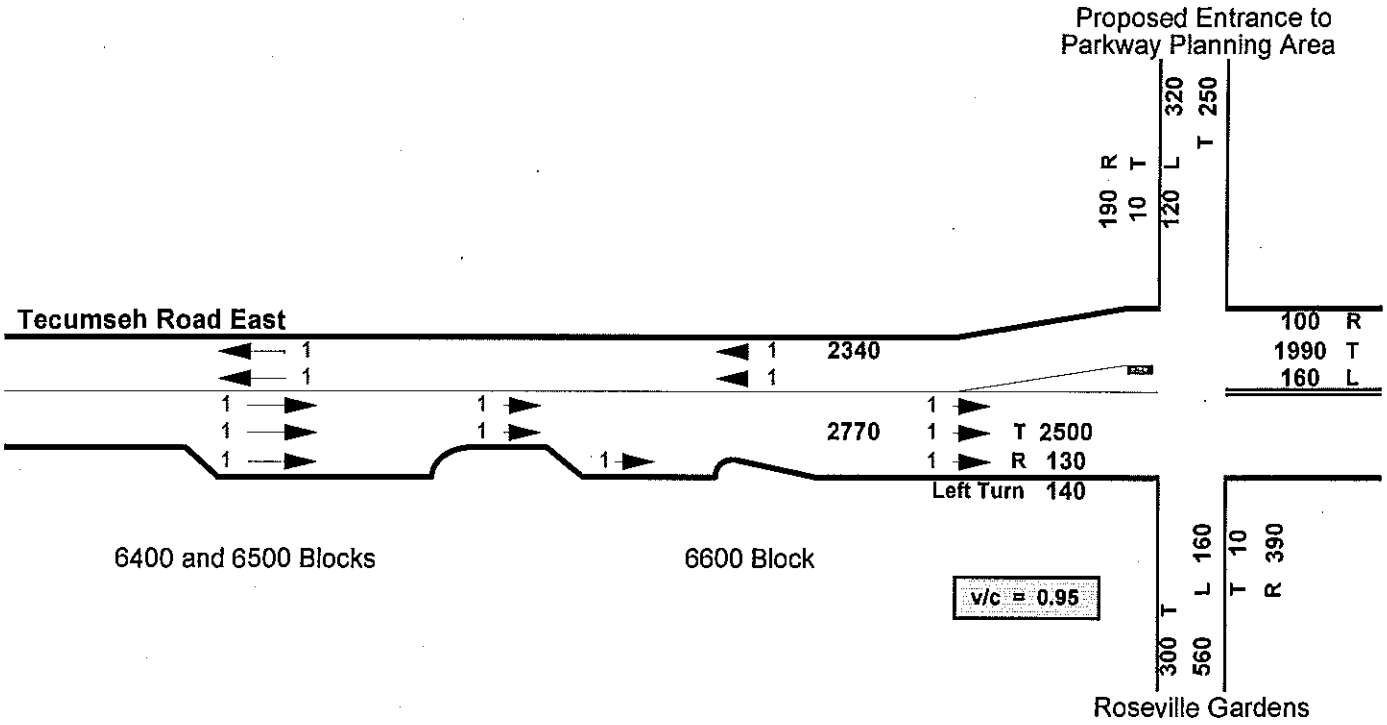
Figure 3.7 A FUTURE TRAFFIC: TECUMSEH ROAD EAST DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG. 3.12 A), E. FEARNLEY LTD., MARCH 1996



EXISTING TRAFFIC: TECUMSEH ROAD EAST

FUTURE TRAFFIC: TECUMSEH ROAD EAST

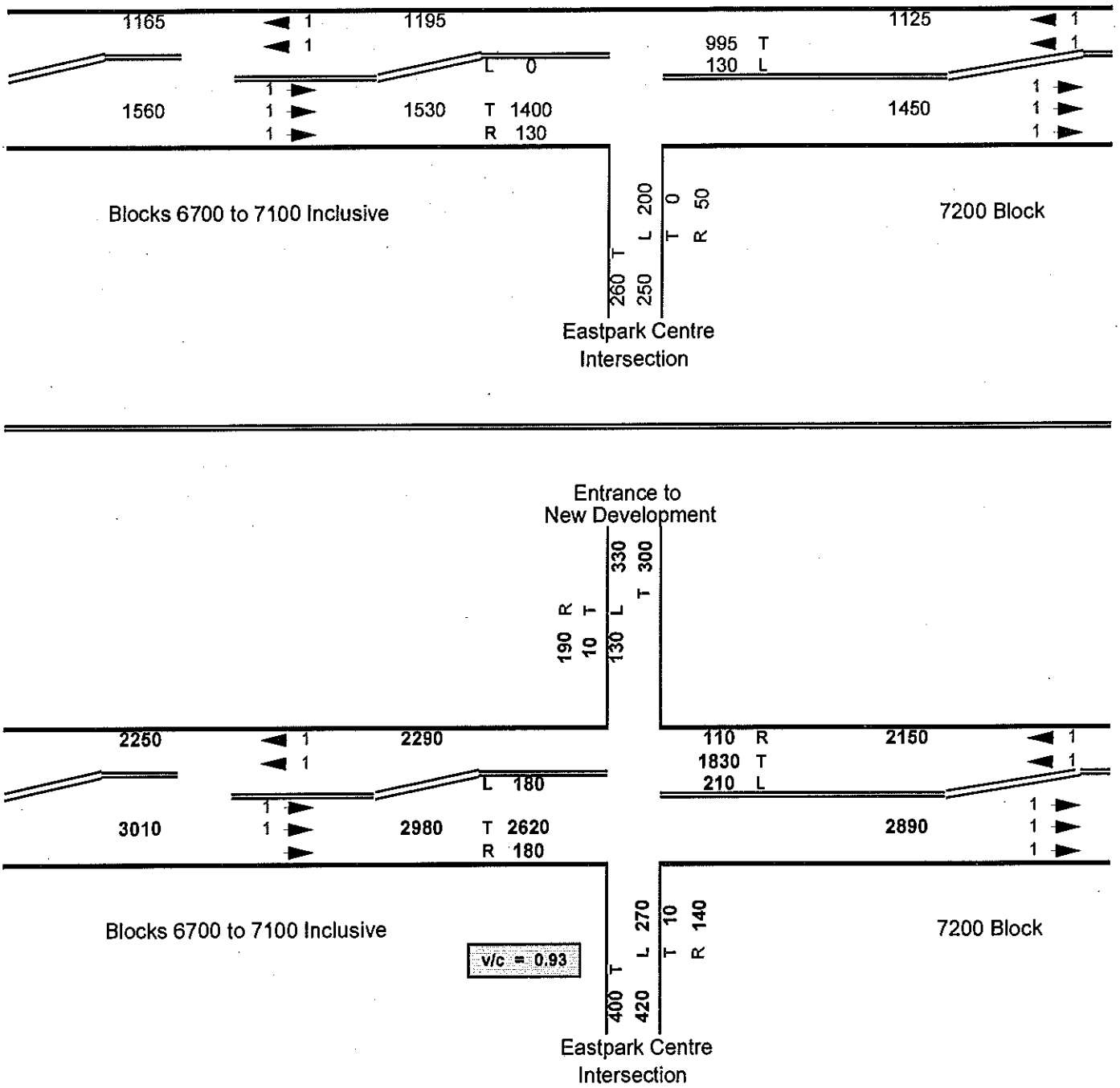


NOTE: L = Left Turns

T = Through Traffic

R = Right Turns

v/c = 0.00 Future traffic volume vs existing capacity



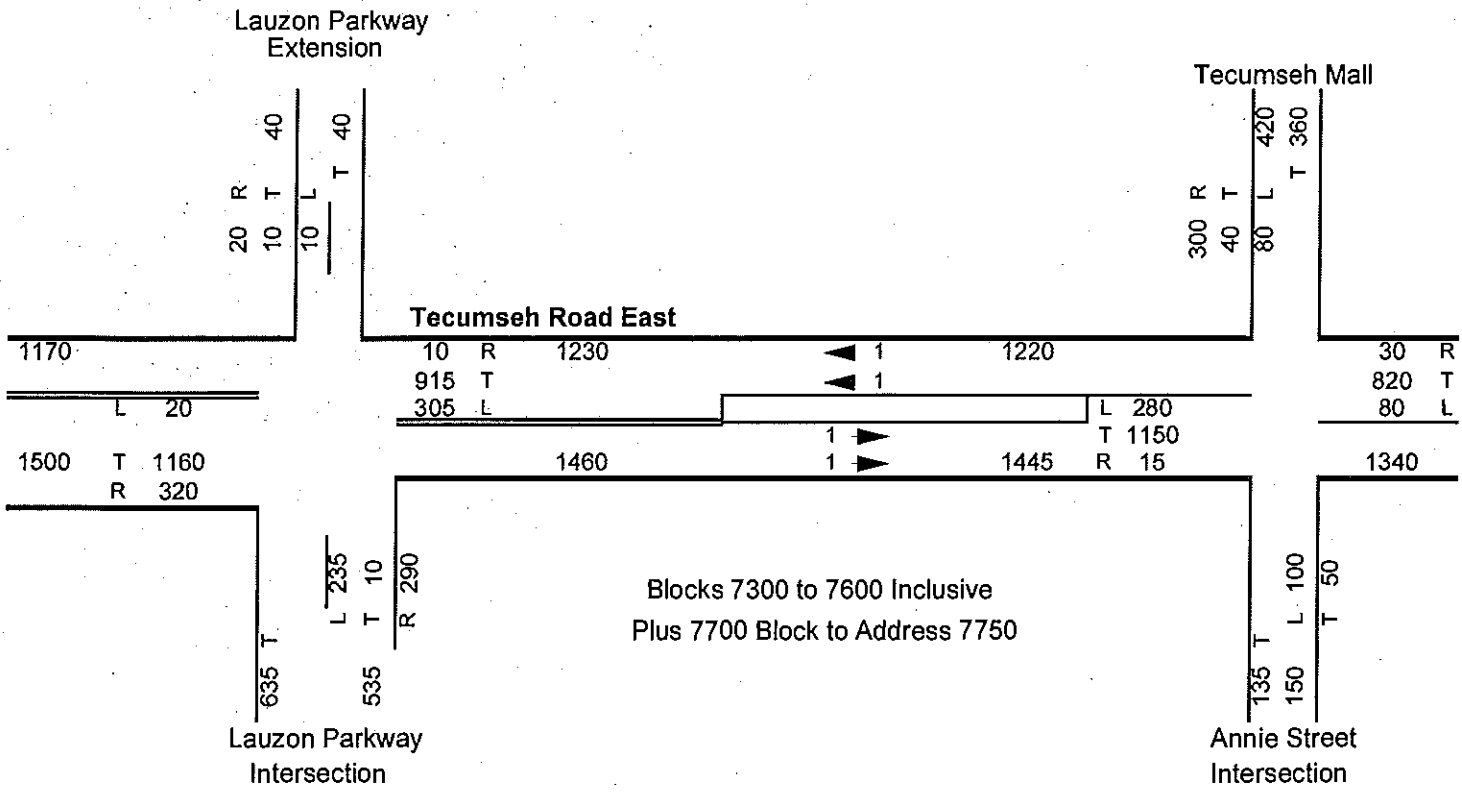
BLOCKS 6400 TO 7200 INCLUSIVE

INCLUDING ROSEVILLE GARDEN DR. AND EAST PARK CENTRE

(1)

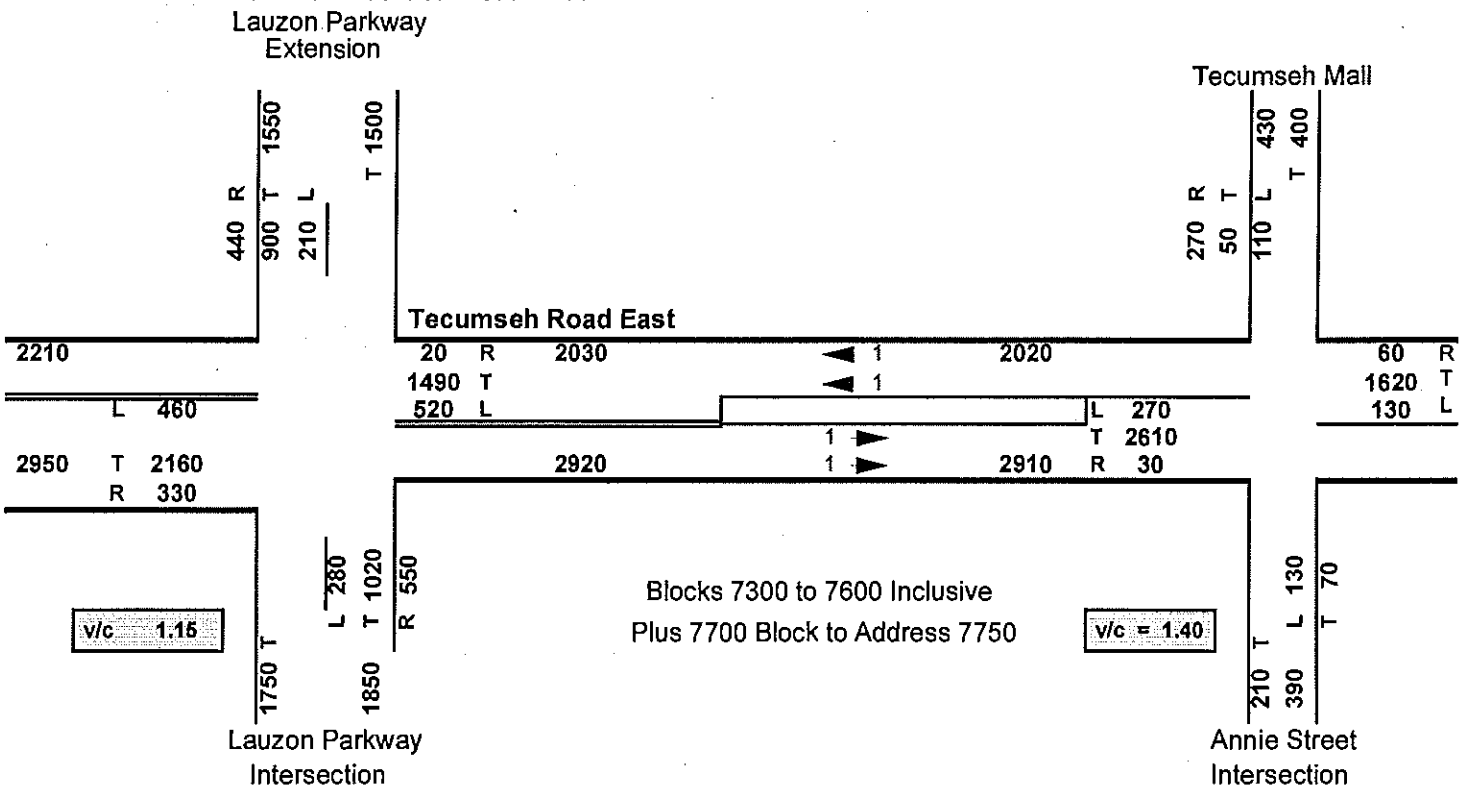
Figure 3.7 B FUTURE TRAFFIC: TECUMSEH ROAD EAST DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG. 3.12 B), E. FEARNLEY LTD., MARCH 1996

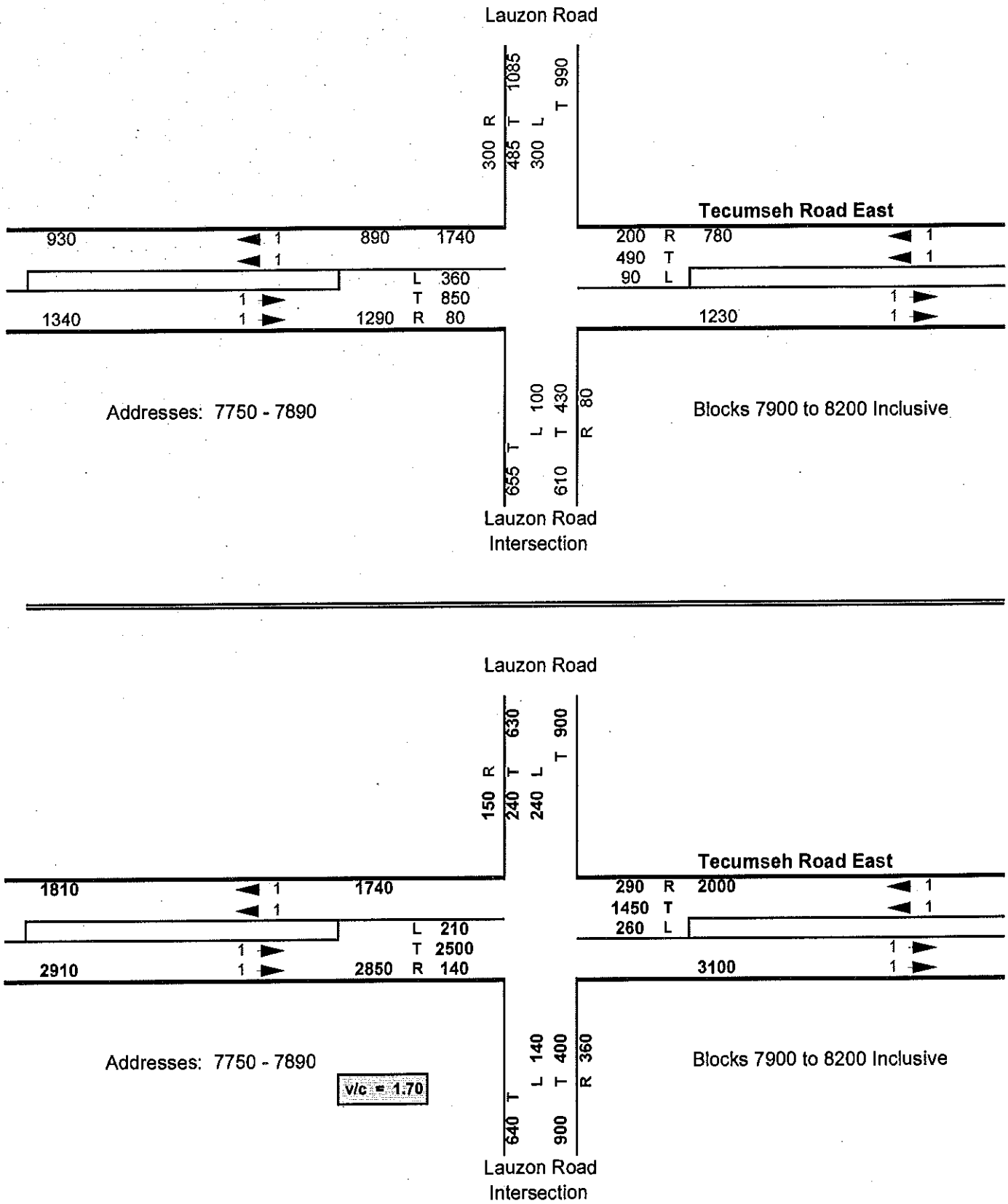


EXISTING TRAFFIC: TECUMSEH ROAD EAST

FUTURE TRAFFIC : TECUMSEH ROAD EAST



NOTE:
- L = Left Turns
- T = Through Traffic
- R = Right Turns
- v/c = 0.00 Future traffic volume vs existing capacity

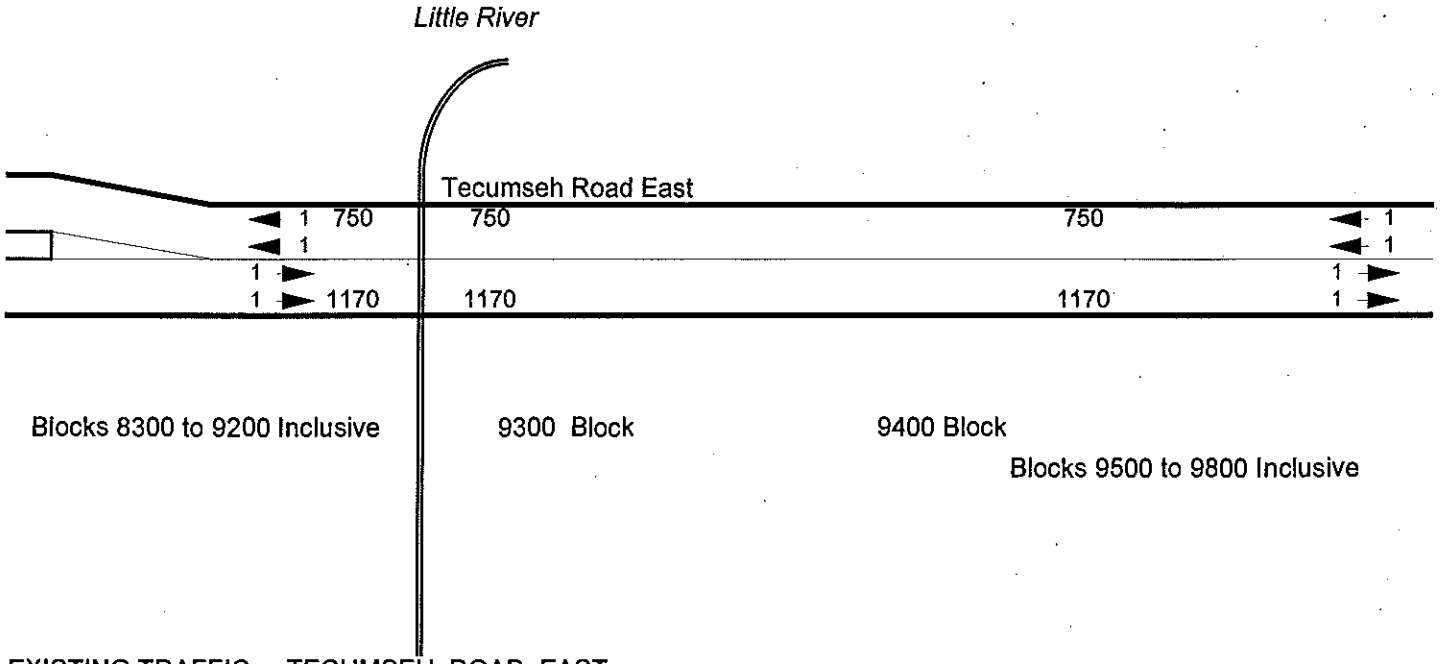


LAUZON PARKWAY TO THE 8200 BLOCK

(1)

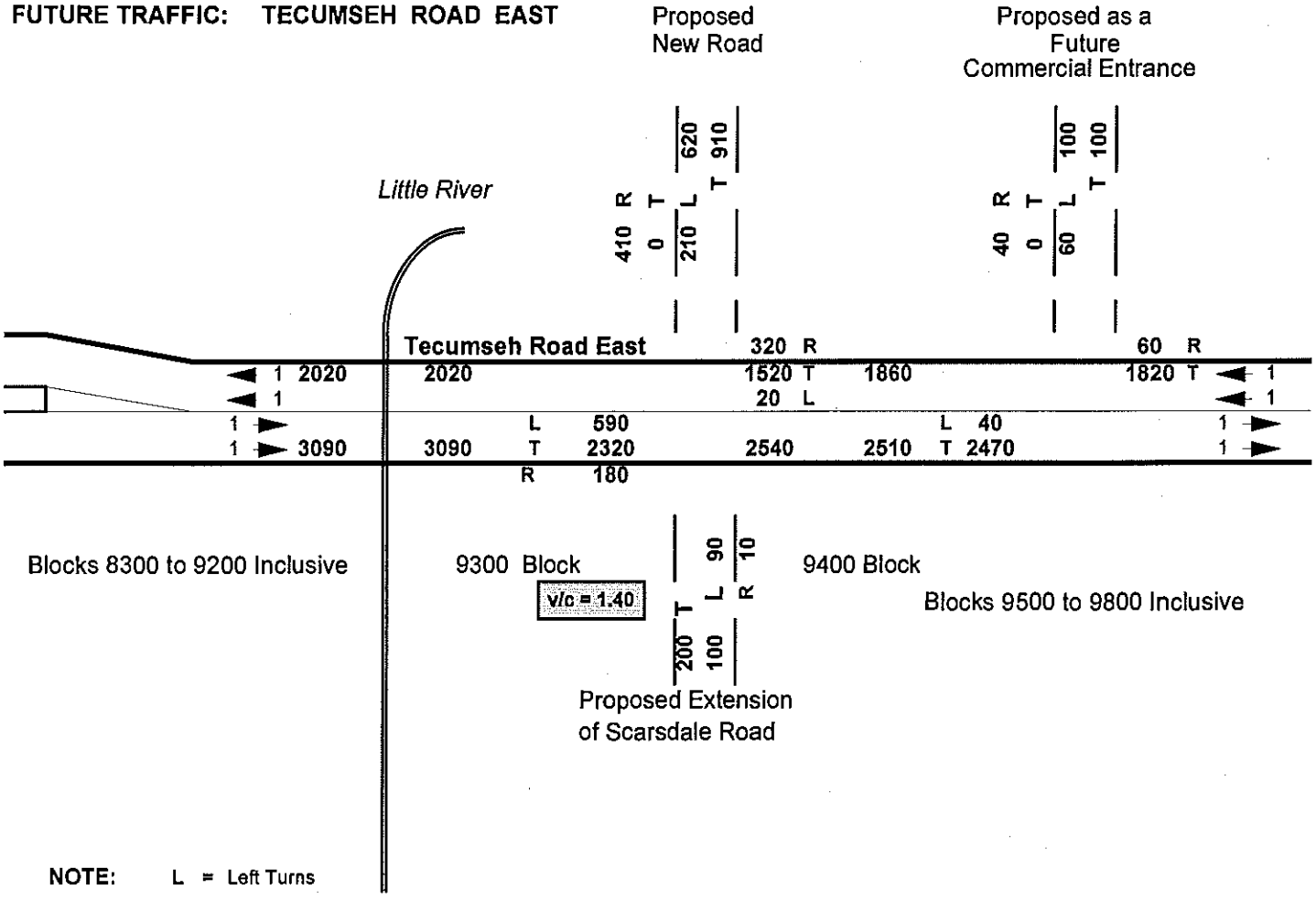
Figure 3.7 C FUTURE TRAFFIC: TECUMSEH ROAD EAST DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG 3.12 C), E. FEARNLEY LTD., MARCH 1996



EXISTING TRAFFIC: TECUMSEH ROAD EAST

FUTURE TRAFFIC: TECUMSEH ROAD EAST

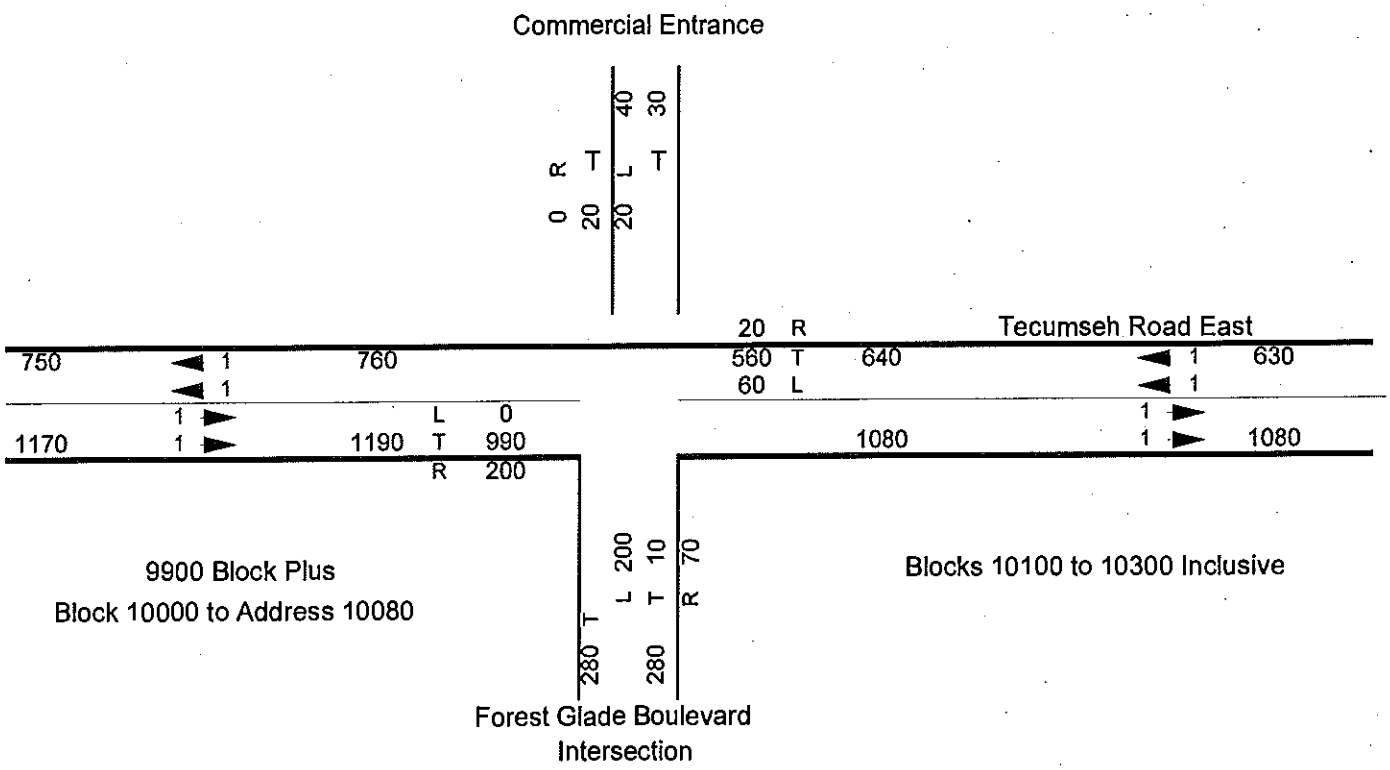


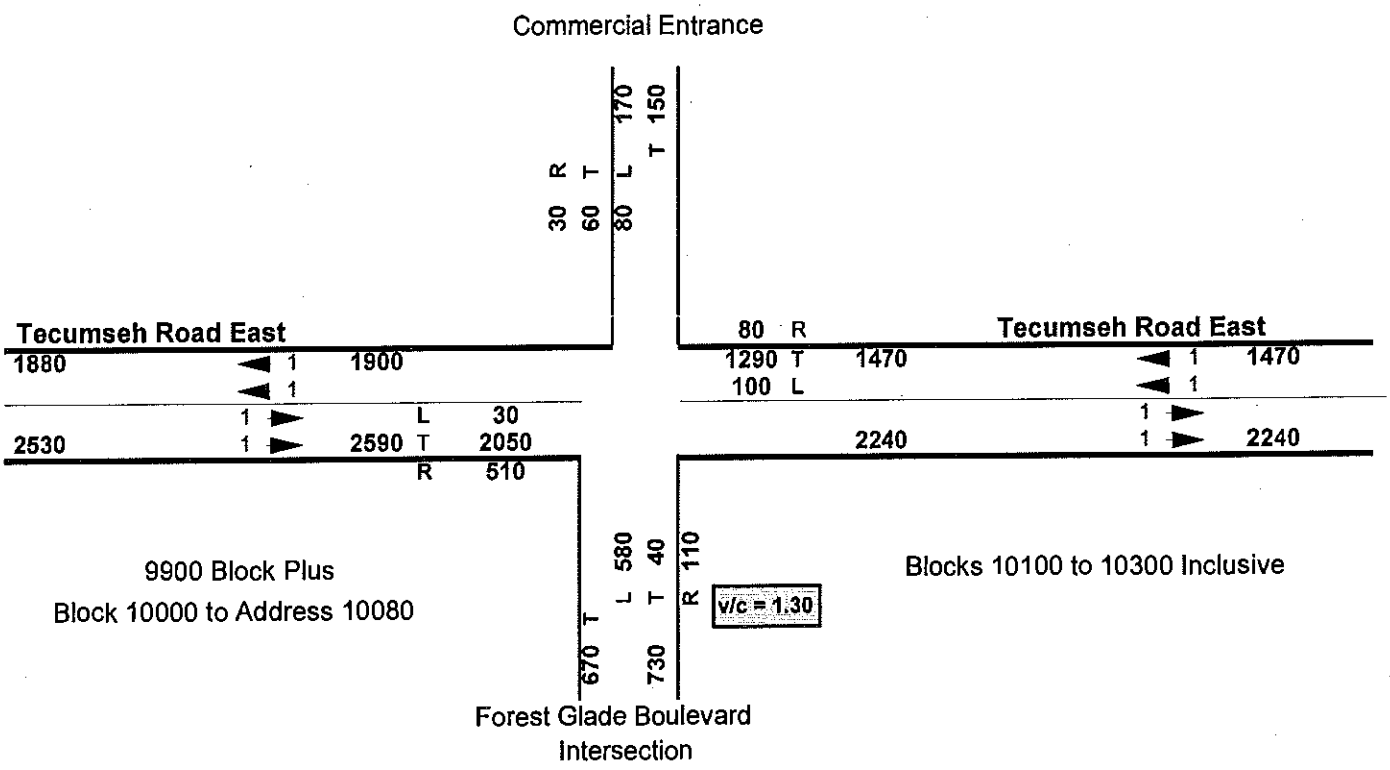
NOTE: L = Left Turns

T = Through Traffic

R = Right Turns

v/c = 0.00 Future traffic volume vs existing capacity



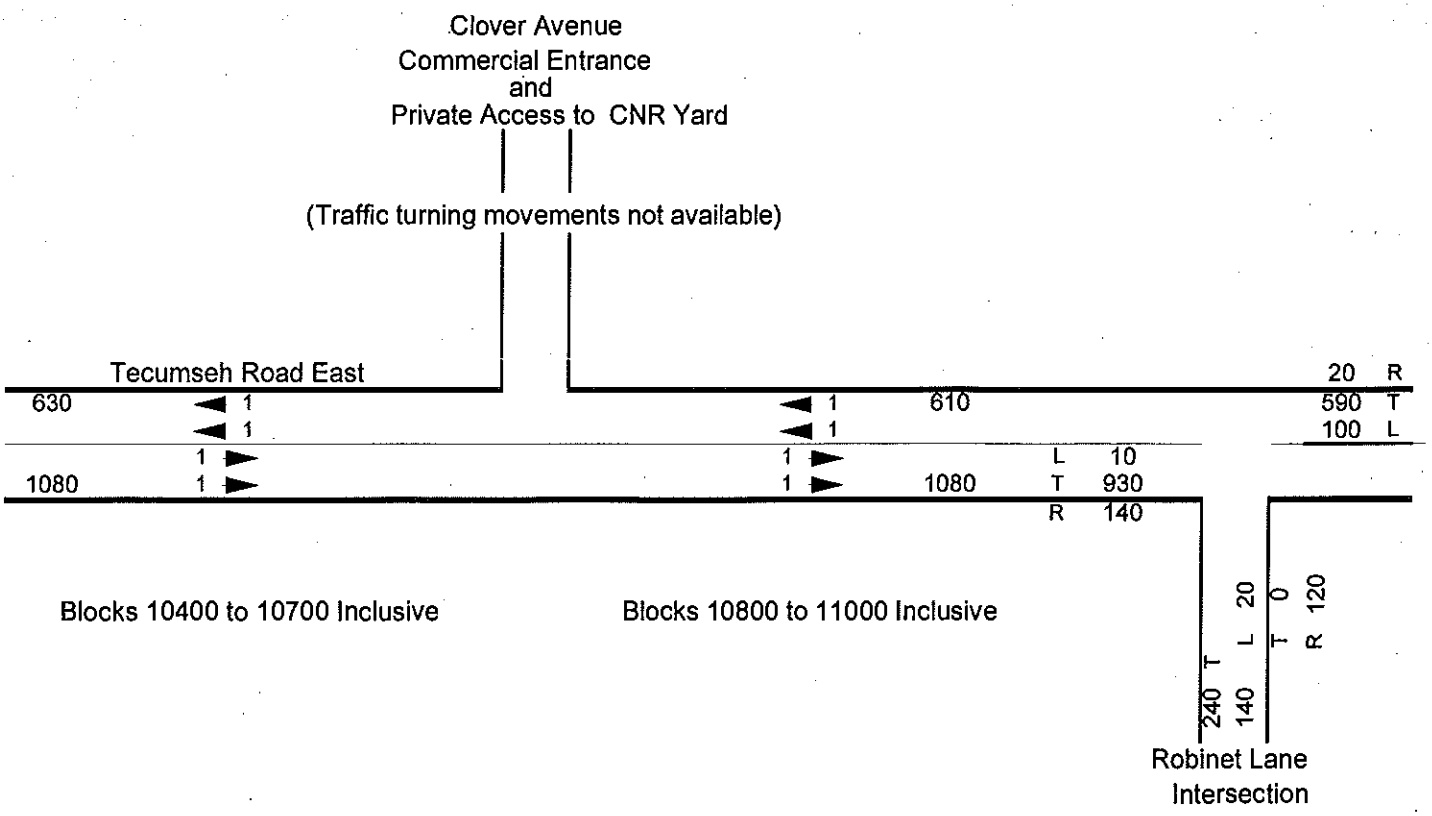


LITTLE RIVER TO FOREST GLADE DRIVE

(1)

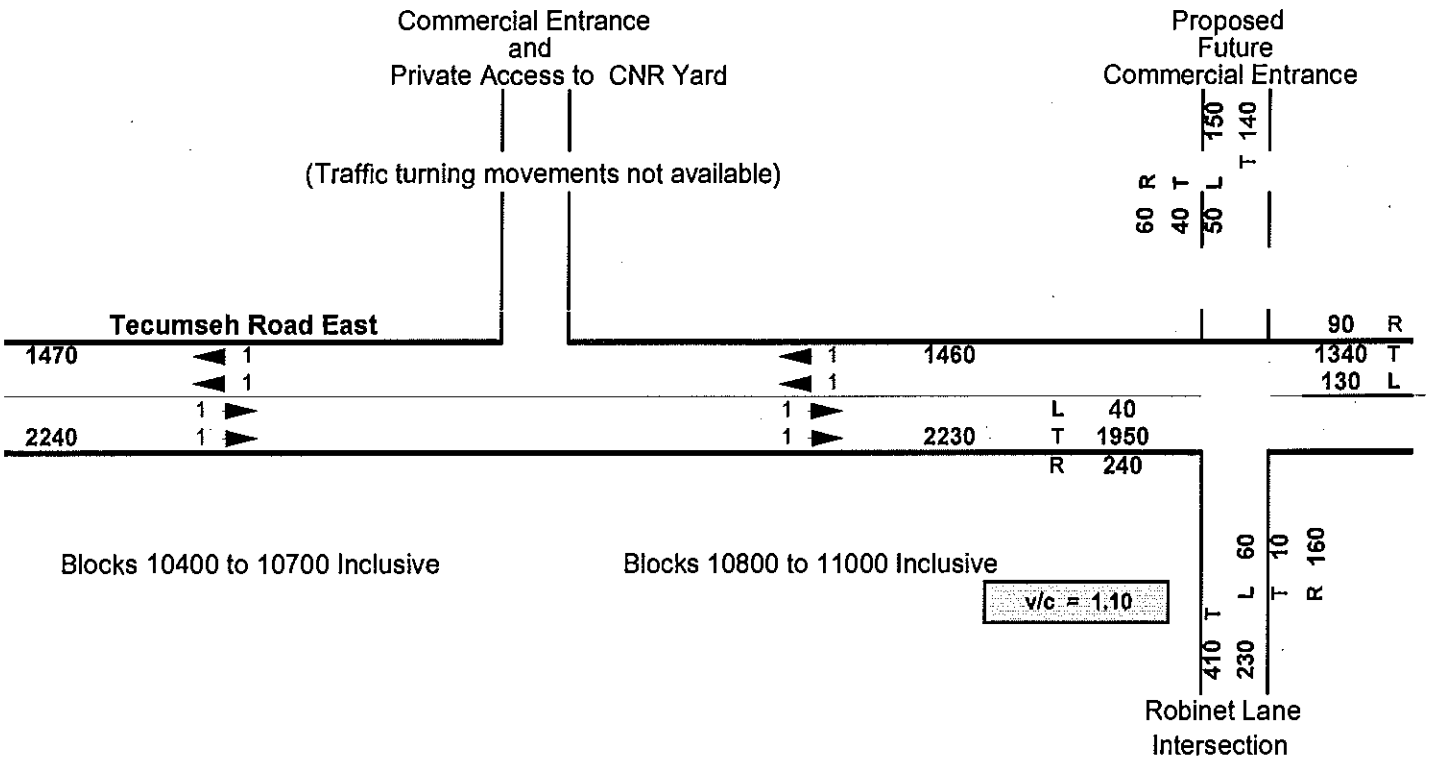
Figure 3.7 D FUTURE TRAFFIC: TECUMSEH ROAD EAST DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG. 3.12 D), E. FEARNLEY LTD., MARCH 1996

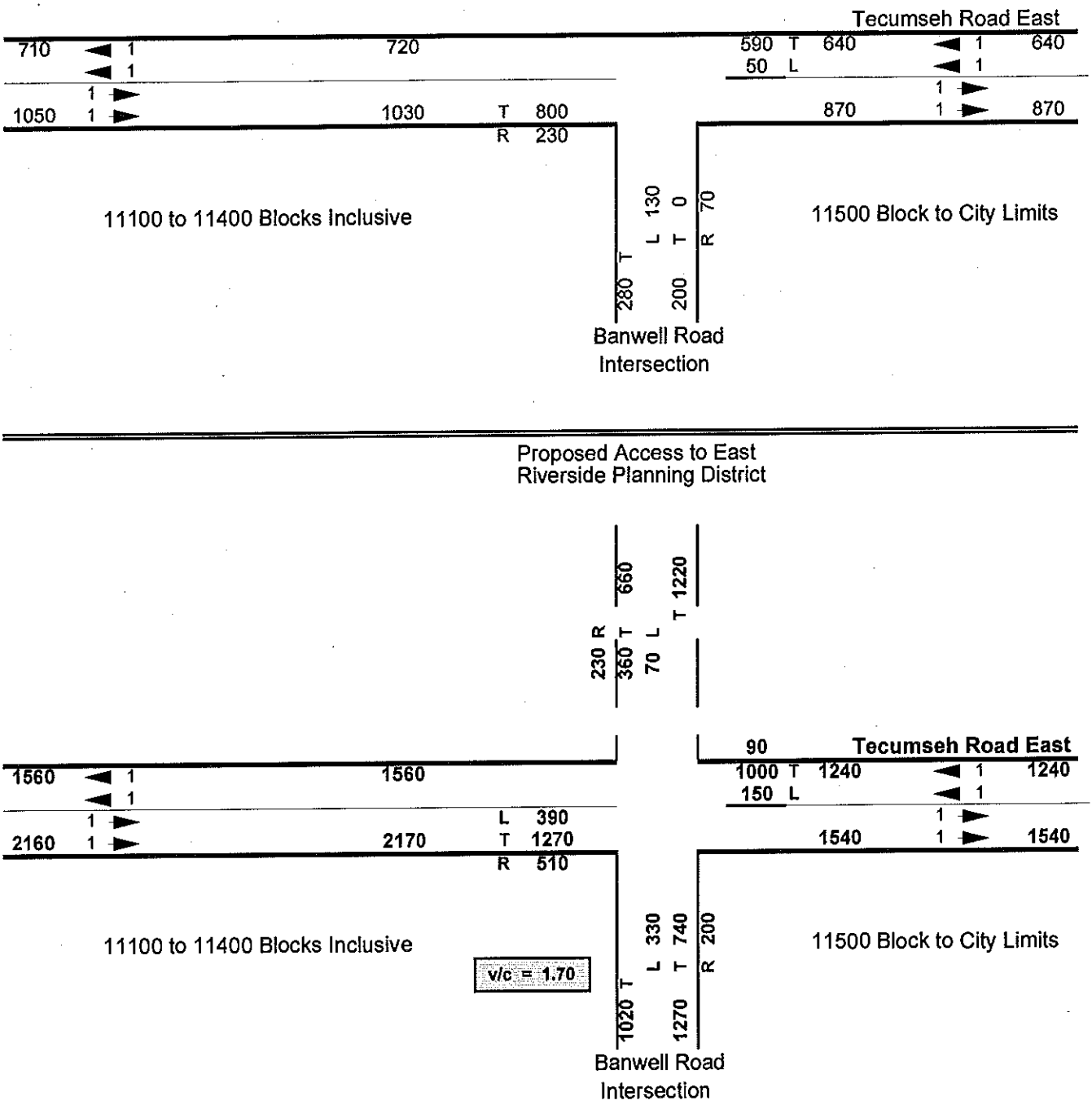


EXISTING TRAFFIC: TECUMSEH ROAD EAST

FUTURE TRAFFIC



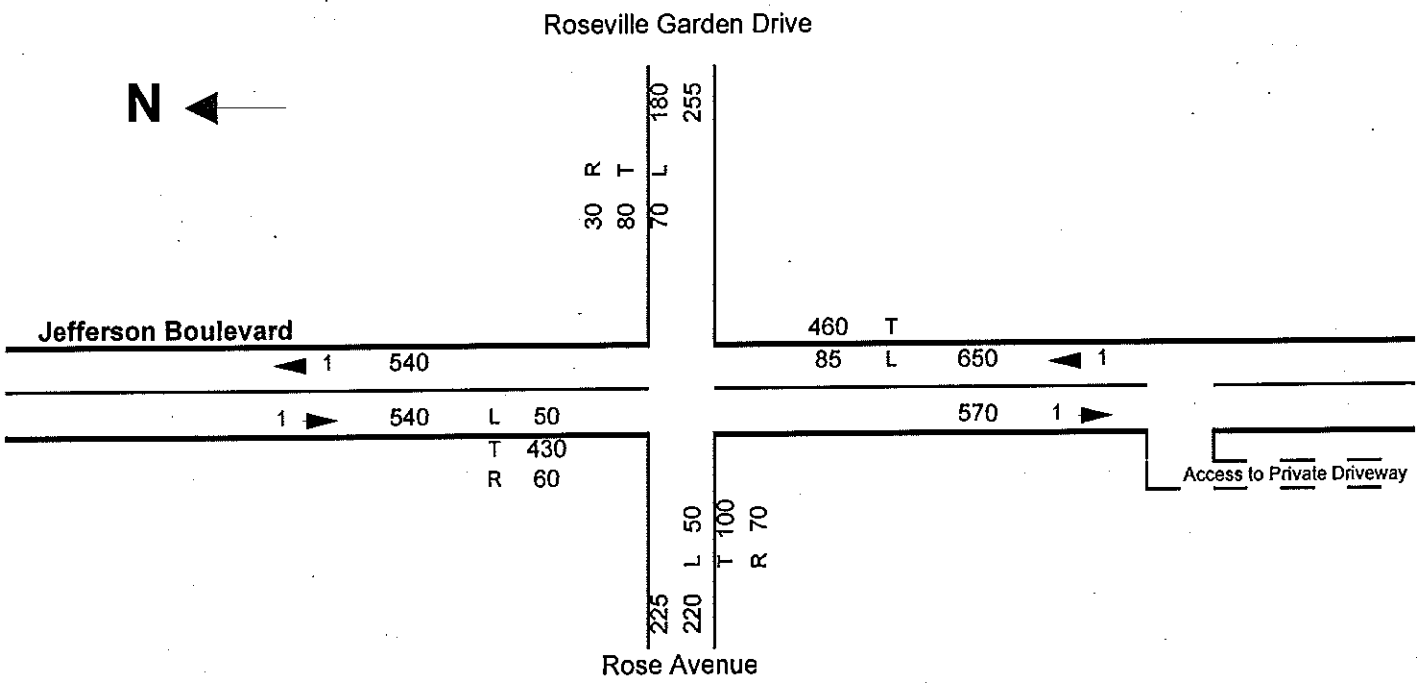
NOTE: **L** = Left Turns
T = Through Traffic
R = Right Turns
v/c = 0.00 Future traffic volume vs existing capacity



(1)

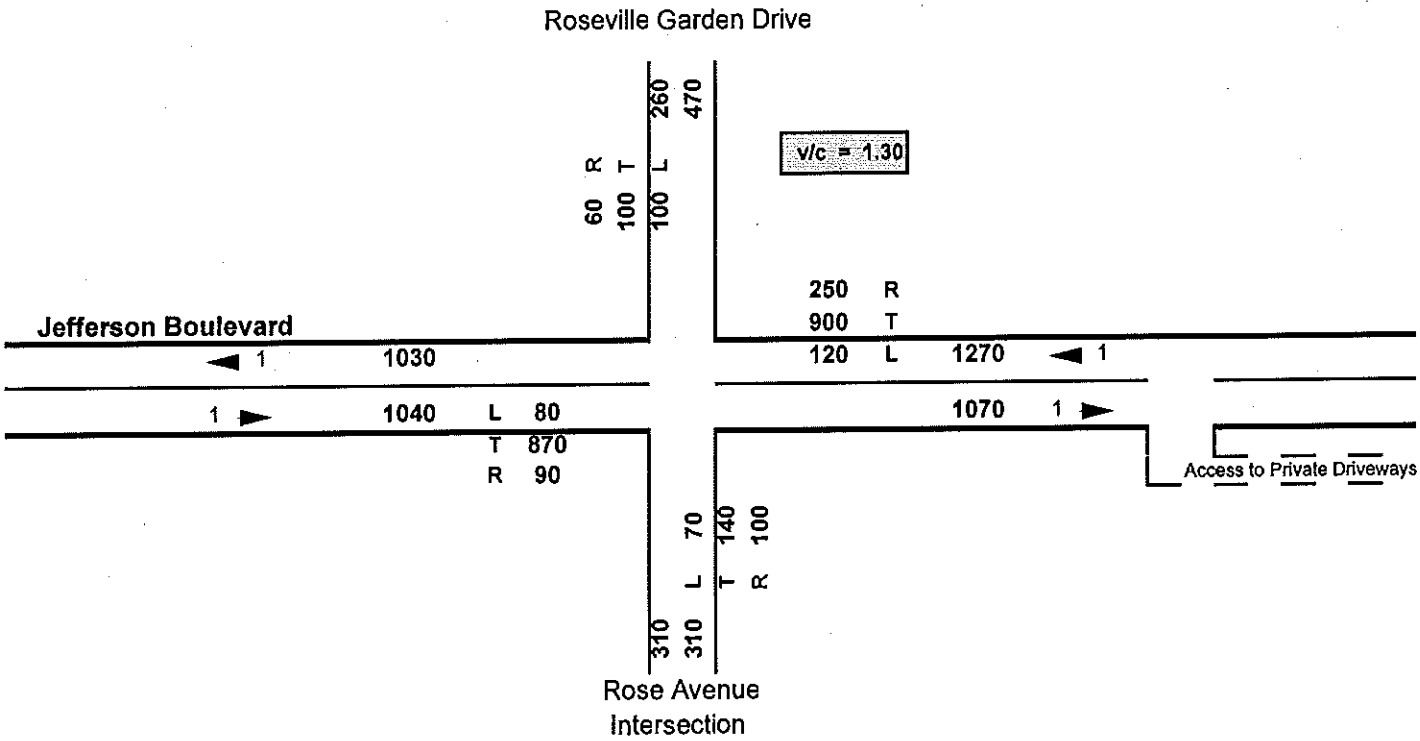
Figure 3.7 E FUTURE TRAFFIC: TECUMSEH ROAD EAST DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG. 3.12 E), E. FEARNLEY LTD., MARCH 1996



EXISTING TRAFFIC

FUTURE TRAFFIC



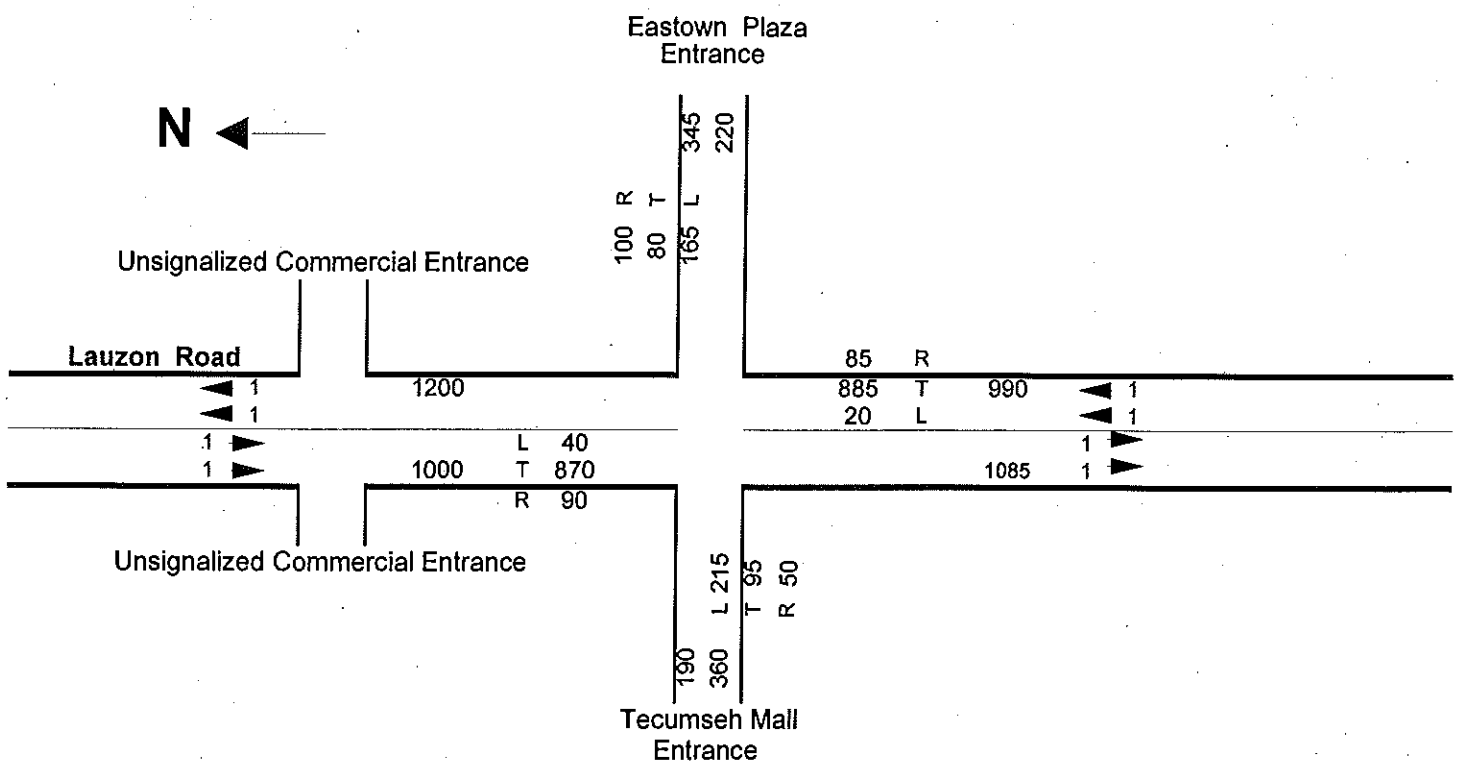
JEFFERSON BOULEVARD: ROSEVILLE GARDEN DRIVE / ROSE AVENUE INTERSECTION

(1)

NOTE L = Left Turns
T = Through Traffic
R = Right Turns
v/c = 0.00 Future traffic volume vs existing capacity

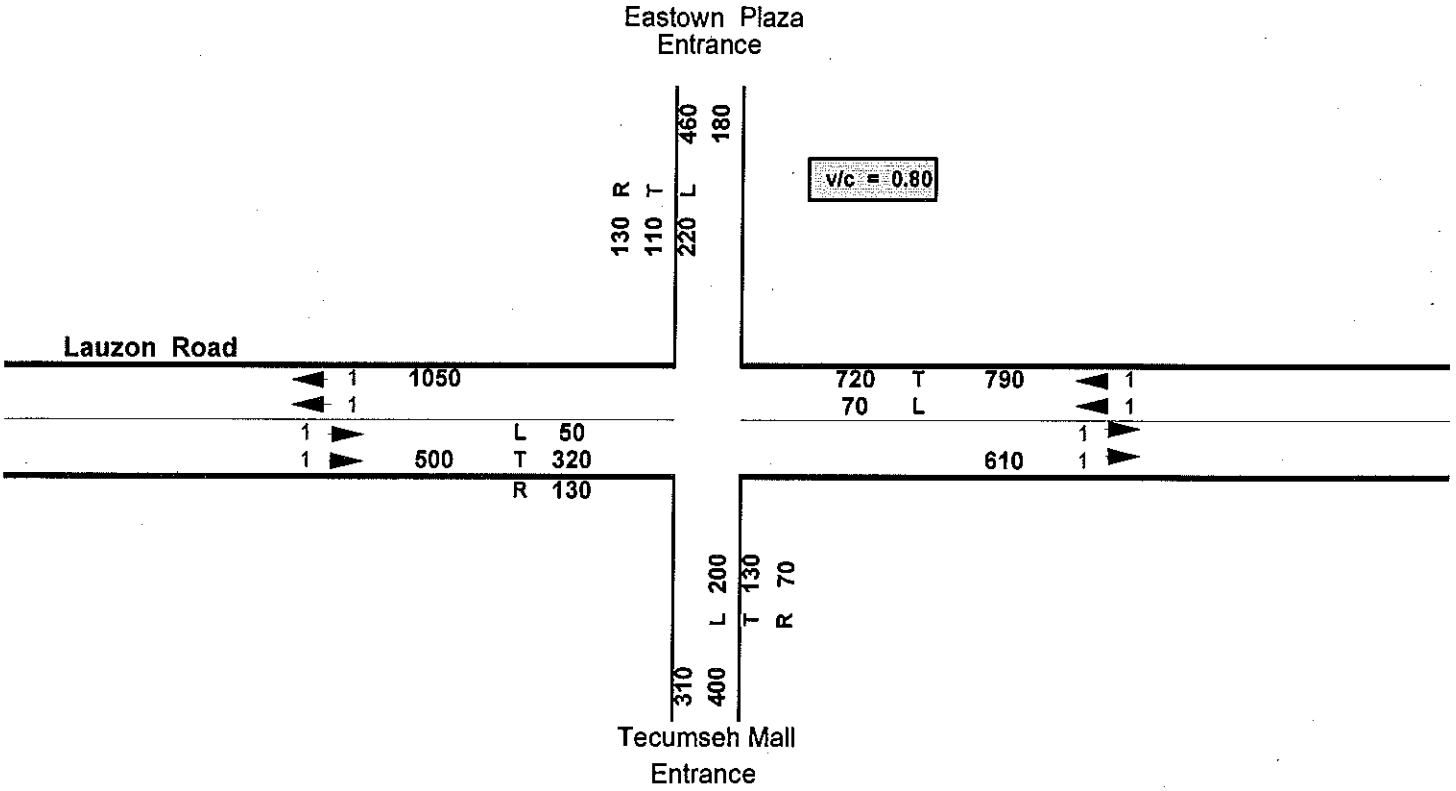
Figure 3.7 F FUTURE TRAFFIC: MAJOR CROSSROADS DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG. 3.13 A), E. FEARNLEY LTD., MARCH 1996



EXISTING TRAFFIC

FUTURE TRAFFIC



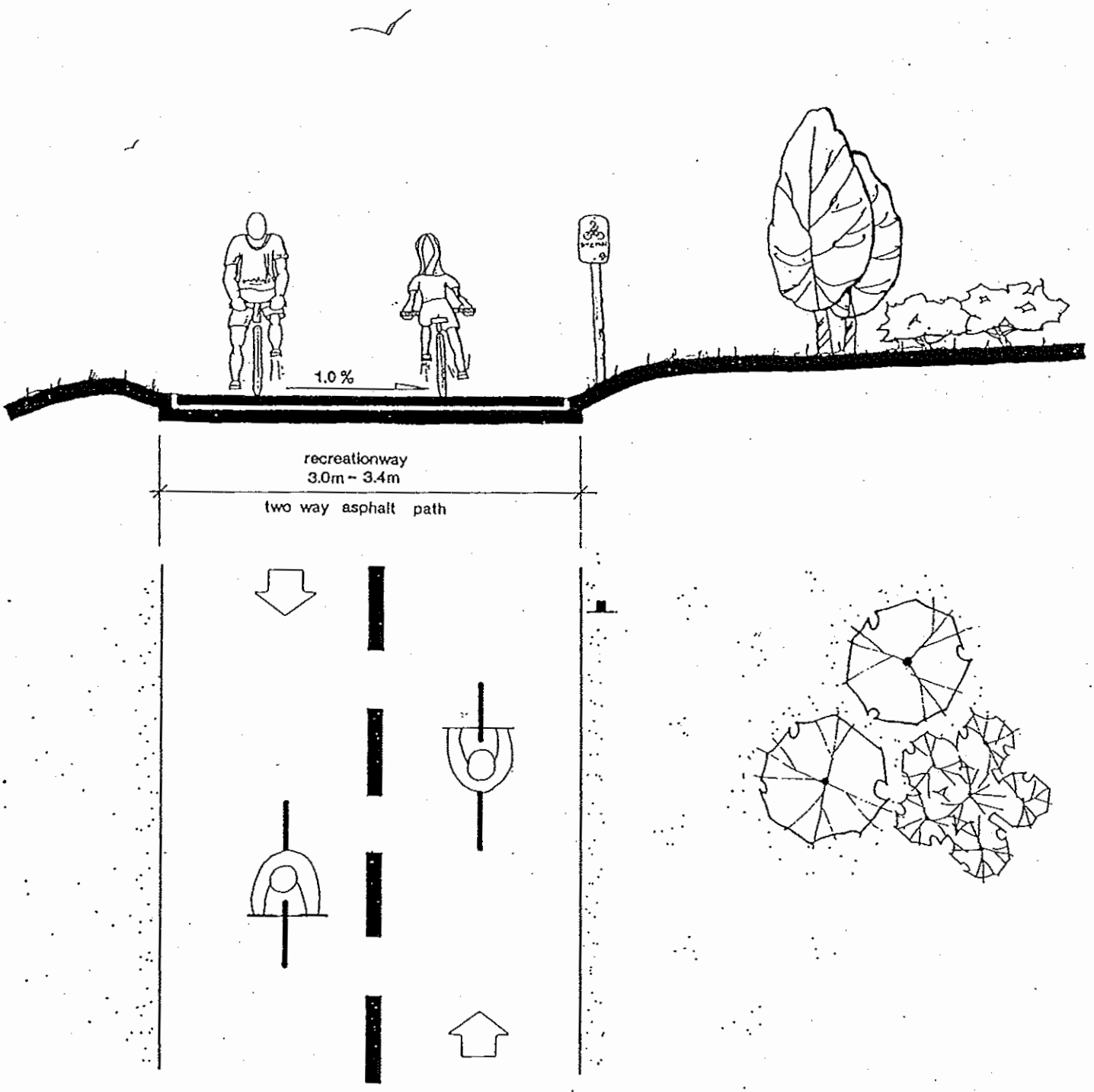
LAUZON ROAD: TECUMSEH MALL / EASTOWN PLAZA ACCESS

(1)

NOTE: L = Left Turns
T = Through Traffic
R = Right Turns
v/c = 0.00 Future traffic volume vs existing capacity

Figure 3.7 G FUTURE TRAFFIC: MAJOR CROSSROADS DESIGN HOUR VOLUMES FOR THE P.M. PEAK

(1) EXTRACTED FROM "TRAFFIC ANALYSIS AND PLANNING REPORT" (FIG. 3.13 B), E. FEARNLEY LTD., MARCH 1996



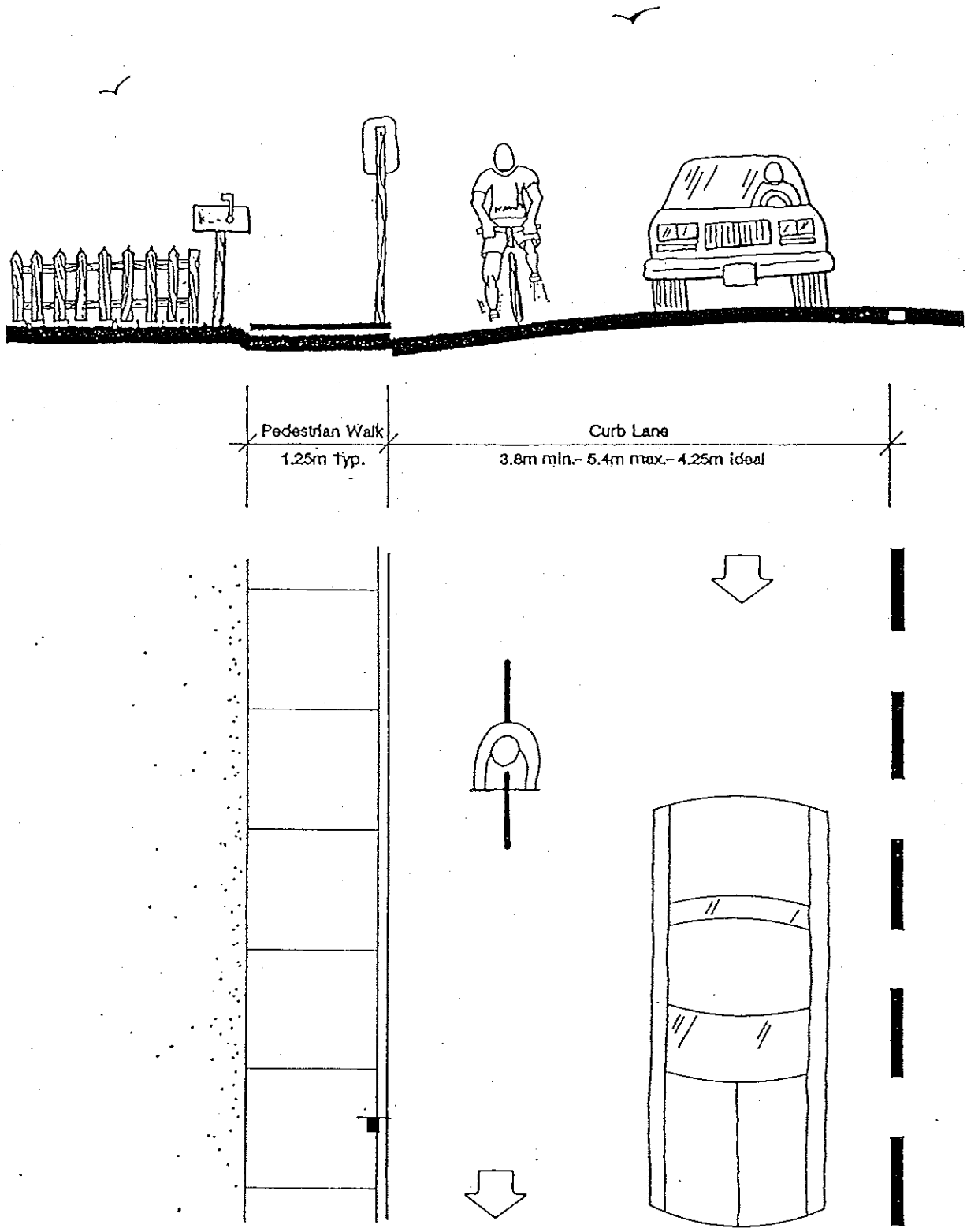
RECREATIONWAY
– ASPHALT

Figure 3.8A

BICYCLE USE STUDY

Victor Ford and Associates inc • Landscape Architects •
191a lakeshore road east oakville ontario l6j 1h5 telephone (416)844 7082

Obtained from Bicycle Use Development Study



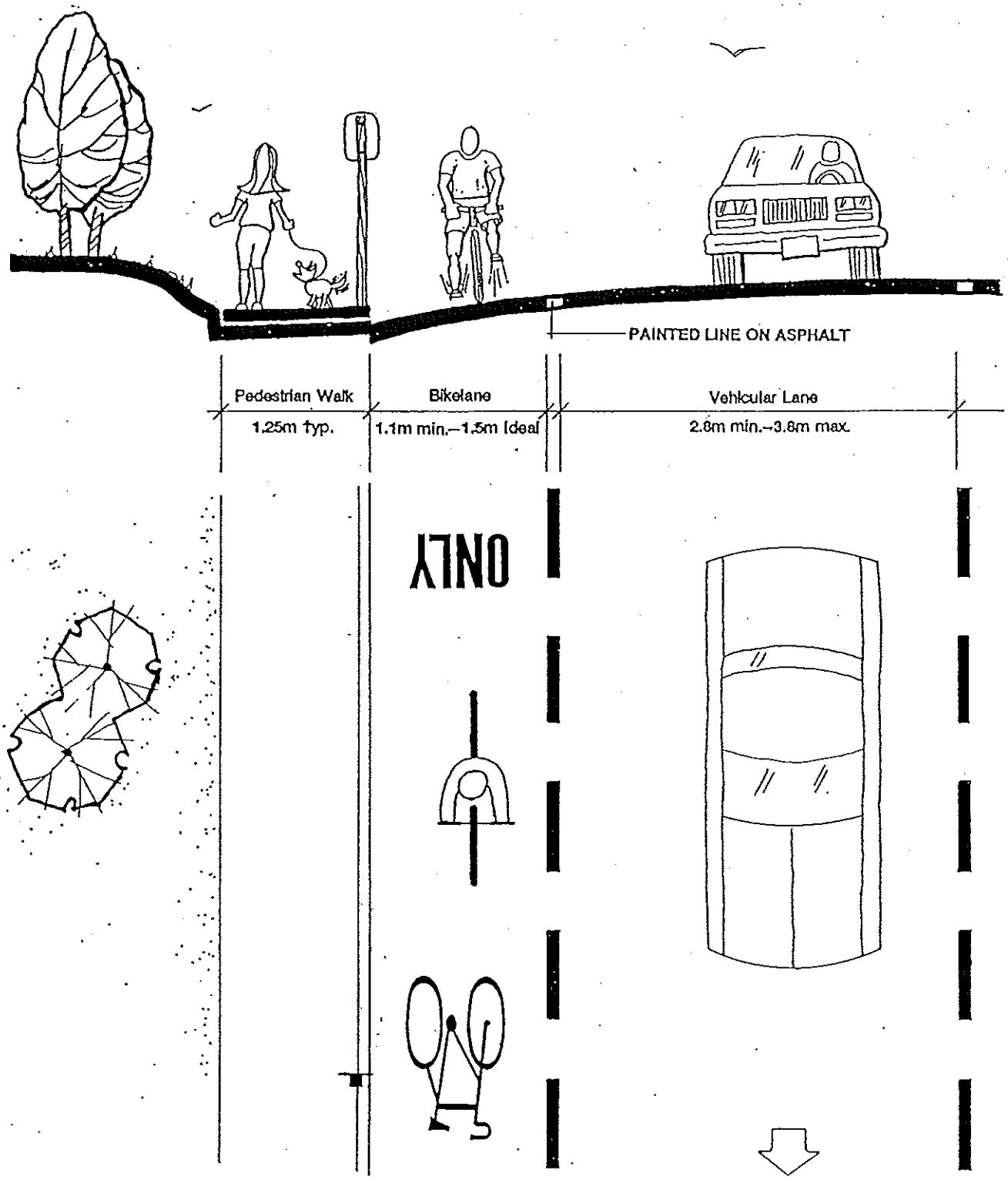
ONE - WAY BIKEROUTE

BICYCLE USE STUDY

Figure 3.8B

Victor Ford and Associates inc • Landscape Architects •
191a lakeshore road east oakville ontario l6j 1h5 telephone (416)844 7082

Obtained from Bicycle Use Development Study



ONE - WAY BIKELANE

BICYCLE USE STUDY

Figure 3.8C

Victor Ford and Associates inc • Landscape Architects •
191a lakeshore road east oakville ontario l6j 1h5 telephone (416)844 7052

Obtained from Bicycle Use Development Study

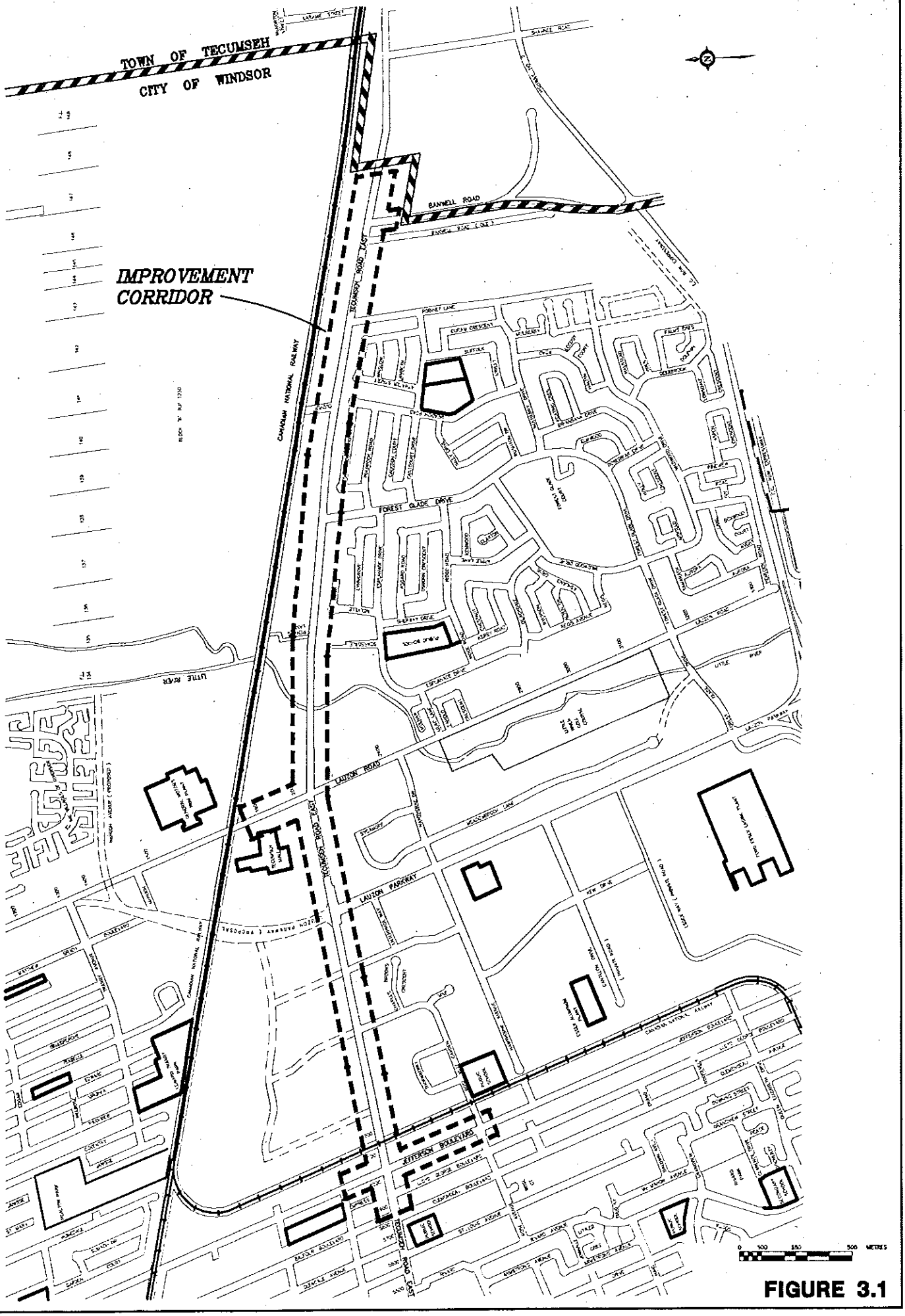
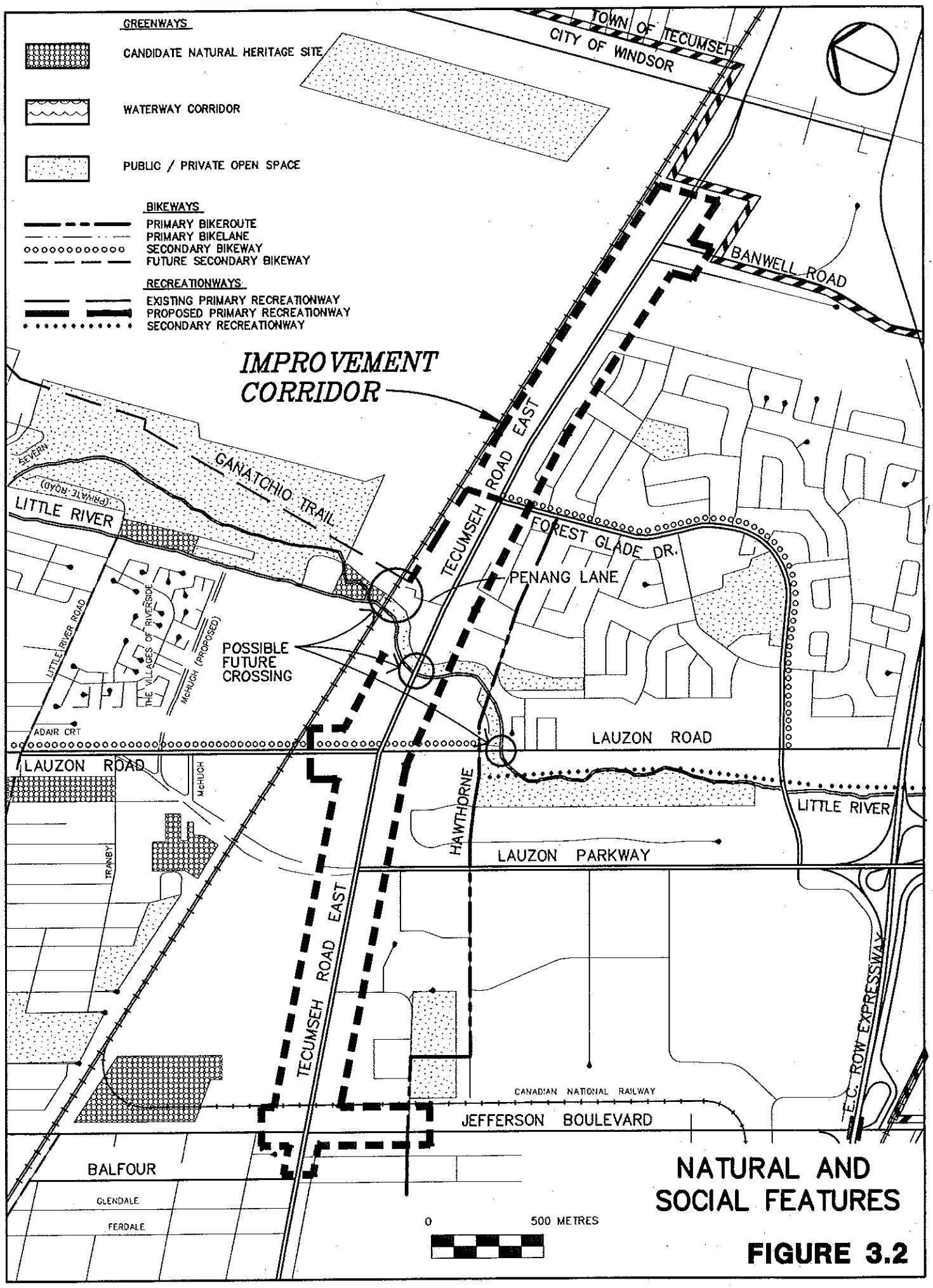

TOWN OF TECUMSEH
CITY OF WINDSOR
IMPROVEMENT CORRIDOR
BANWELL ROAD
TECUMSEH ROAD EAST
CANADIAN NATIONAL RAILWAY
FOREST GLADE DRIVE
LAUZON ROAD
LAUZON PARKWAY
JEFFERSON BOULEVARD
0 100 150 500 METRES

FIGURE 3.1



NATURAL AND SOCIAL FEATURES

FIGURE 3.2

DESIGNATED LAND USE

FIGURE 3.3

EAST RIVERSIDE PLANNING DISTRICT

BLOCK '8' R.P. 1230

IMPROVEMENT CORRIDOR

CITY OF WINDSOR

TOWN OF TECUMSEH

FORD / FERNDALE

ROSEVILLE GARDENS

MEADOWBROOK

FOUNTAINBLEU

FOREST GLADE

THE VILLAGES OF RIVERSIDE

REALTOR PARK

EDWARD TRANBY PARK

GENERAL MOTORS TRIM PLANT

LITTLE RIVER

LITTLE RIVER GOLF COURSE

ESSEX ALUMINUM PLANT

FORD ESSEX ENGINE PLANT

TECUMSEH MALL

PIKES PARK

CANADIAN NATIONAL RAILWAY

NATIONAL STREET

TECUMSEH ROAD EAST

McHUGH AVENUE (PROPOSED)

TRANBY AVENUE

LAUZON PARKWAY

LAUZON ROAD

MEADOWBROOK LANE

HAWTHORNE AVENUE

ESSEX WAY (PRIVATE ROAD)

CANTELON DRIVE (PRIVATE ROAD)

FOREST GLADE DRIVE

HEMLOCK ROAD

E.C. ROW EXPRESSWAY

BANWELL ROAD

HIGHWAY NO. 2

SWINCREST ROAD

McNORTON STREET

LORAINE STREET

LEGEND

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- * POLICY EXCEPTIONS / SPECIAL USE PROVISIONS

0 100 250 500 METRES

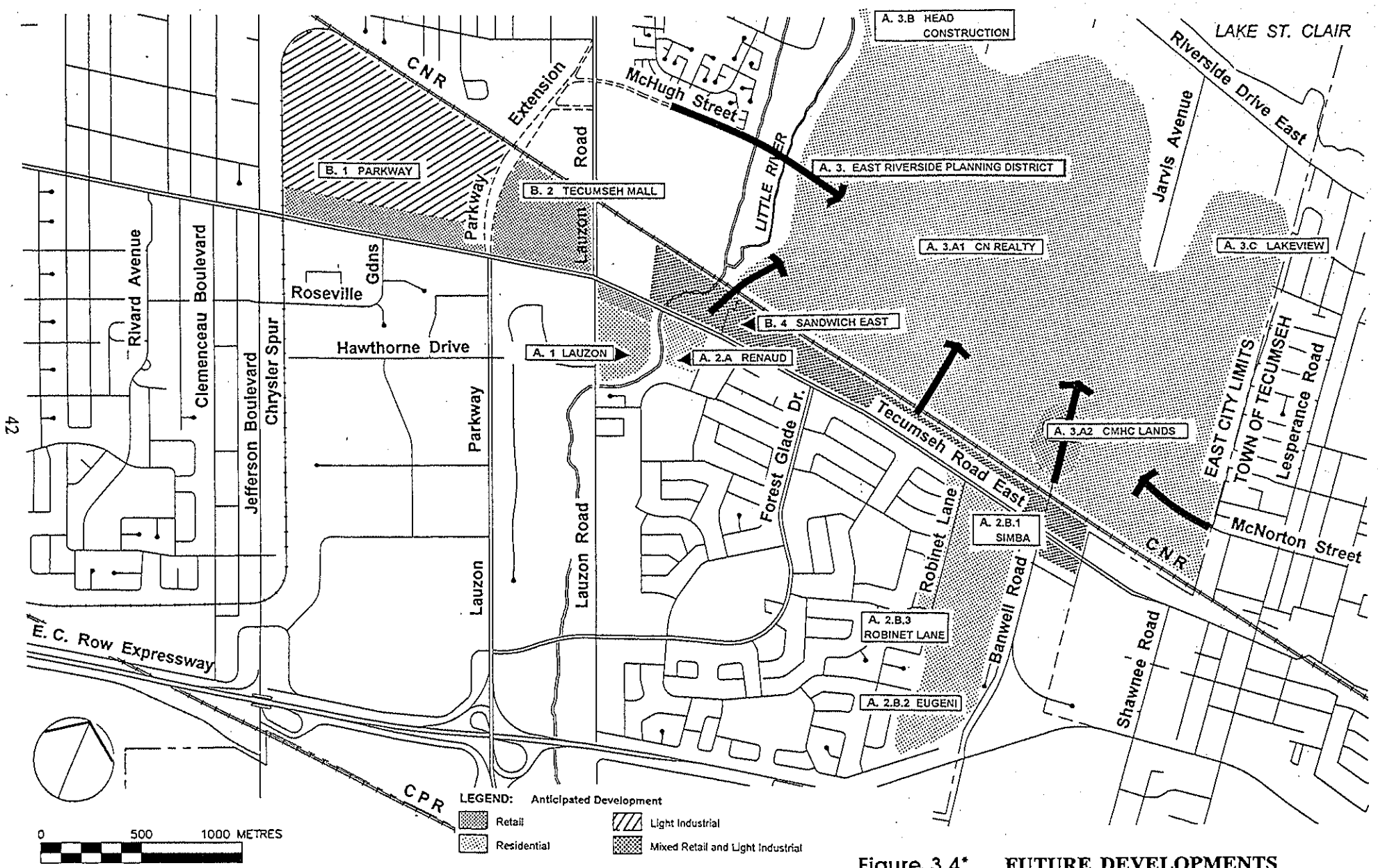
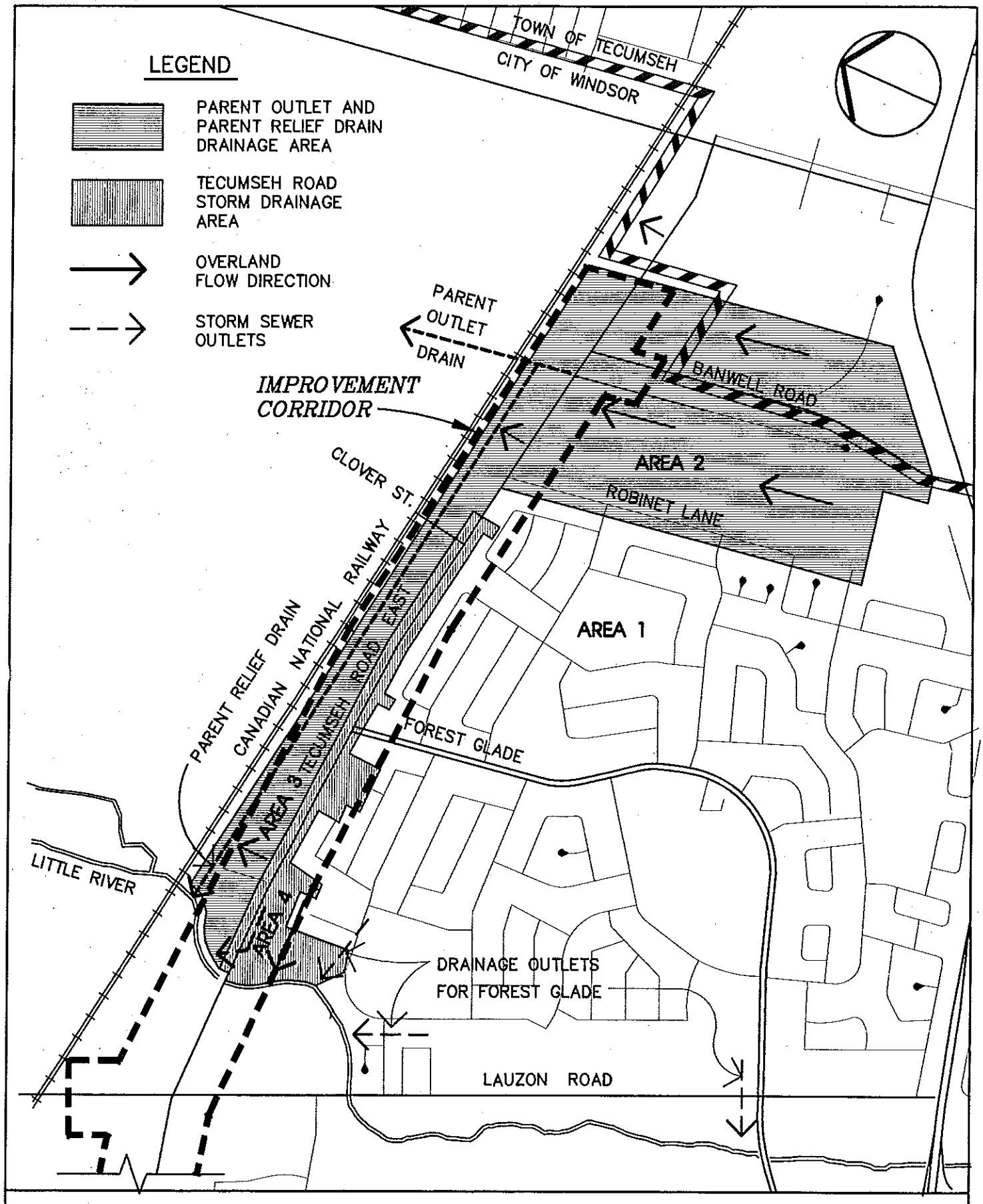


Figure 3.4* **FUTURE DEVELOPMENTS**

*Extracted from Traffic Analysis and Planning Report (Fignre 2.4), E. Fcarnley Ltd. March 1996



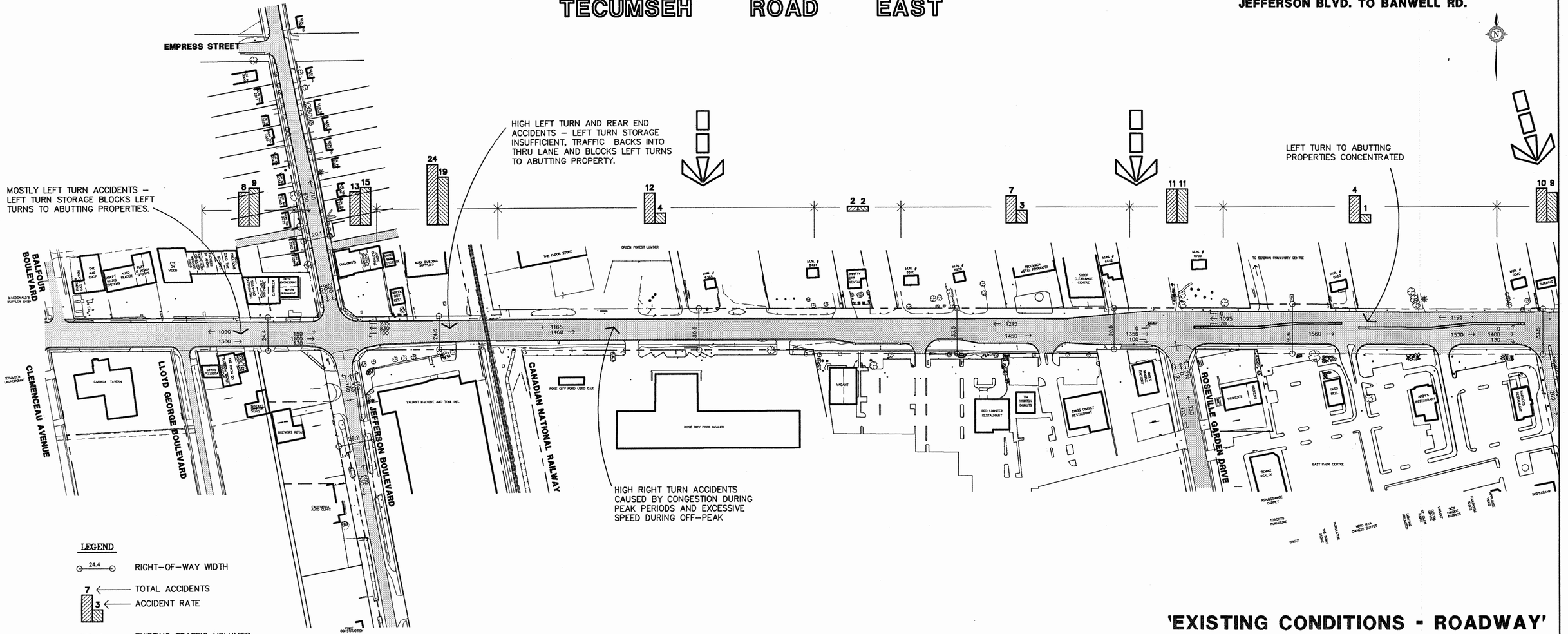
MUNICIPAL DRAINS AND DRAINAGE AREAS

FIGURE 3.5

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.

LOCAL CONSULTING ENGINEERS

TECUMSEH ROAD EAST



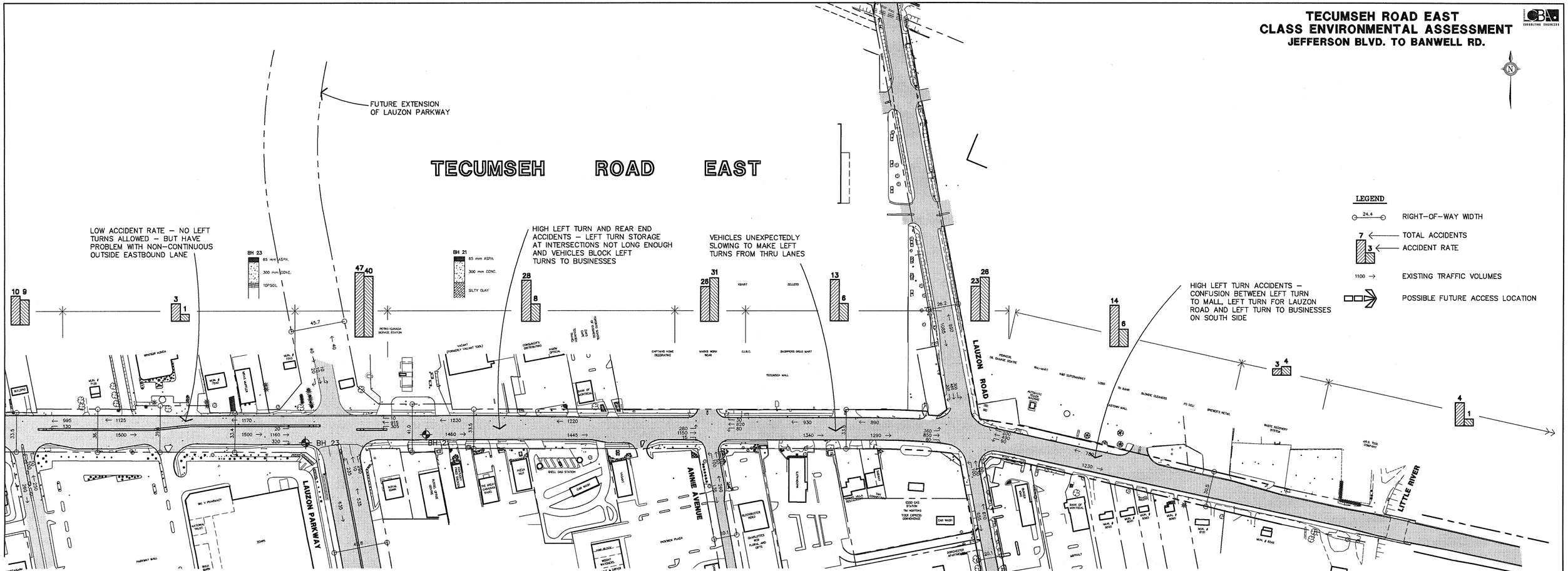
'EXISTING CONDITIONS - ROADWAY'

0 50 METRES

SCALE : 1:2000

FIGURE 3.6(a)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



'EXISTING CONDITIONS - ROADWAY'

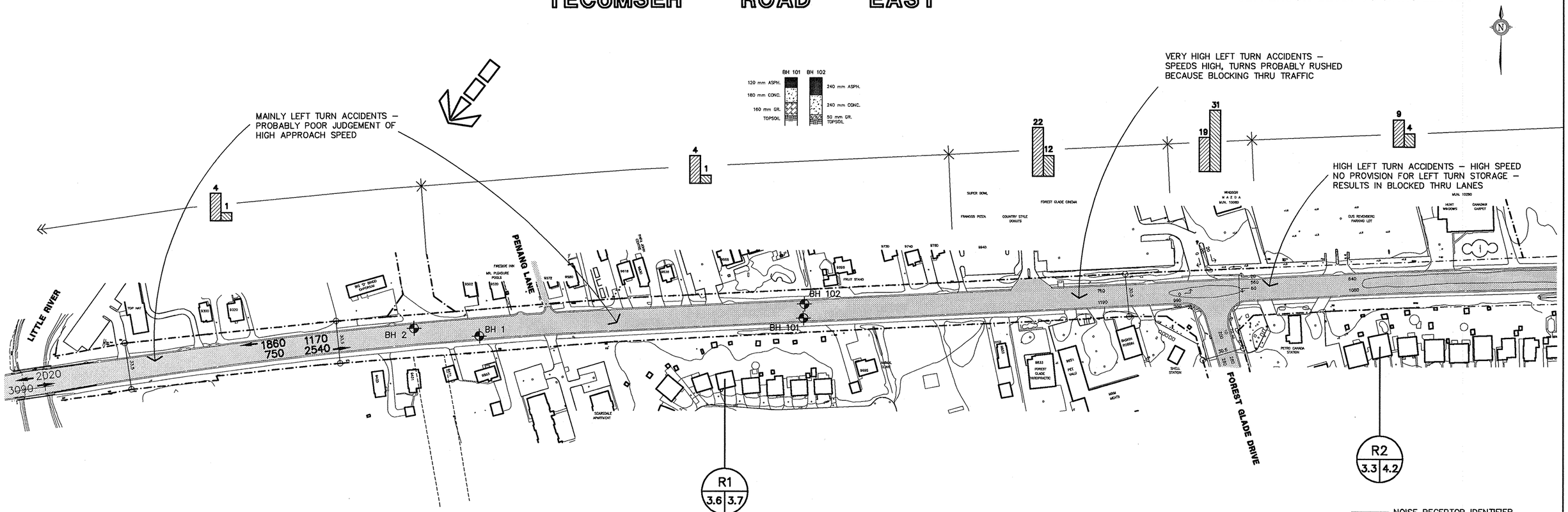
0 50 METRES

SCALE : 1:2000

FIGURE 3.6(b)

TECUMSEH ROAD EAST

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

- 24.4 — RIGHT–OF–WAY WIDTH
- 7 / 3 — TOTAL ACCIDENTS / ACCIDENT RATE
- 1100 → — EXISTING TRAFFIC VOLUMES
- POSSIBLE FUTURE ACCESS LOCATION

NOISE RECEPTOR IDENTIFIER

R1 | 3.6 | 3.7

PREDICTED NOISE LEVEL – EXISTING ROAD WITH 20 YEAR TRAFFIC

PREDICTED NOISE LEVEL – 6 LANE ROAD WITH 20 YEAR TRAFFIC

'EXISTING CONDITIONS - ROADWAY'

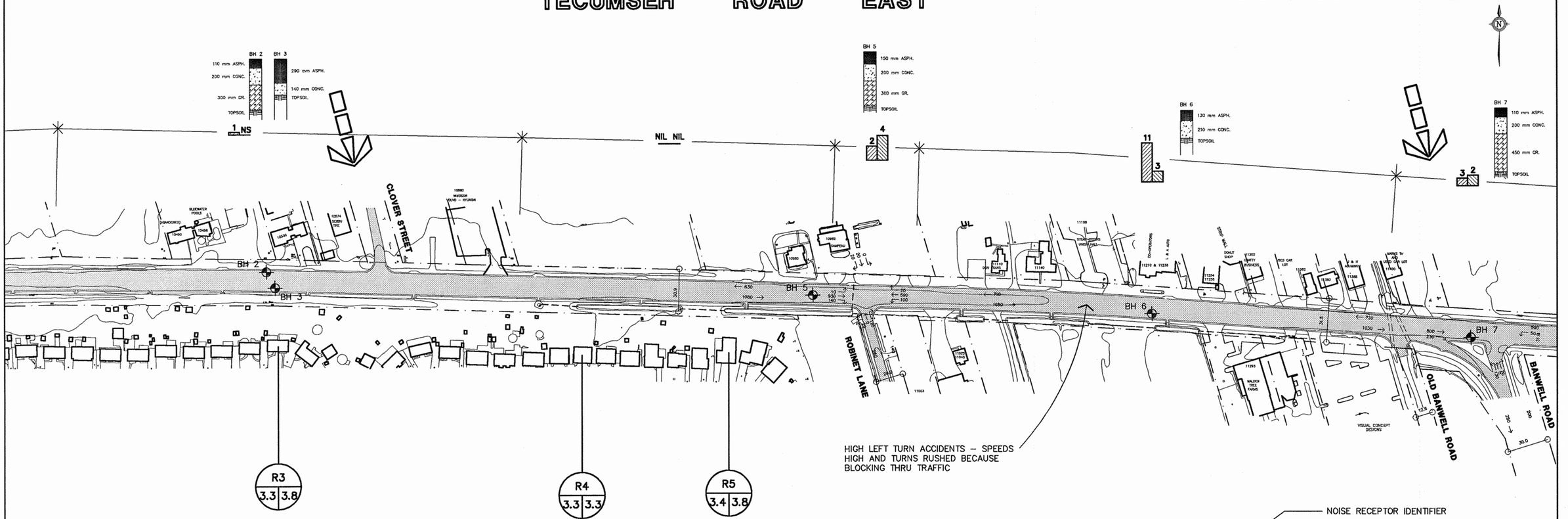
0 50 METRES

SCALE : 1:2000

FIGURE 3.6(c)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.

CBA CONSULTING ENGINEERS



LEGEND

- 24.4 — RIGHT-OF-WAY WIDTH
- 7 / 3 — TOTAL ACCIDENTS / ACCIDENT RATE
- 1100 → — EXISTING TRAFFIC VOLUMES
- POSSIBLE FUTURE ACCESS LOCATION

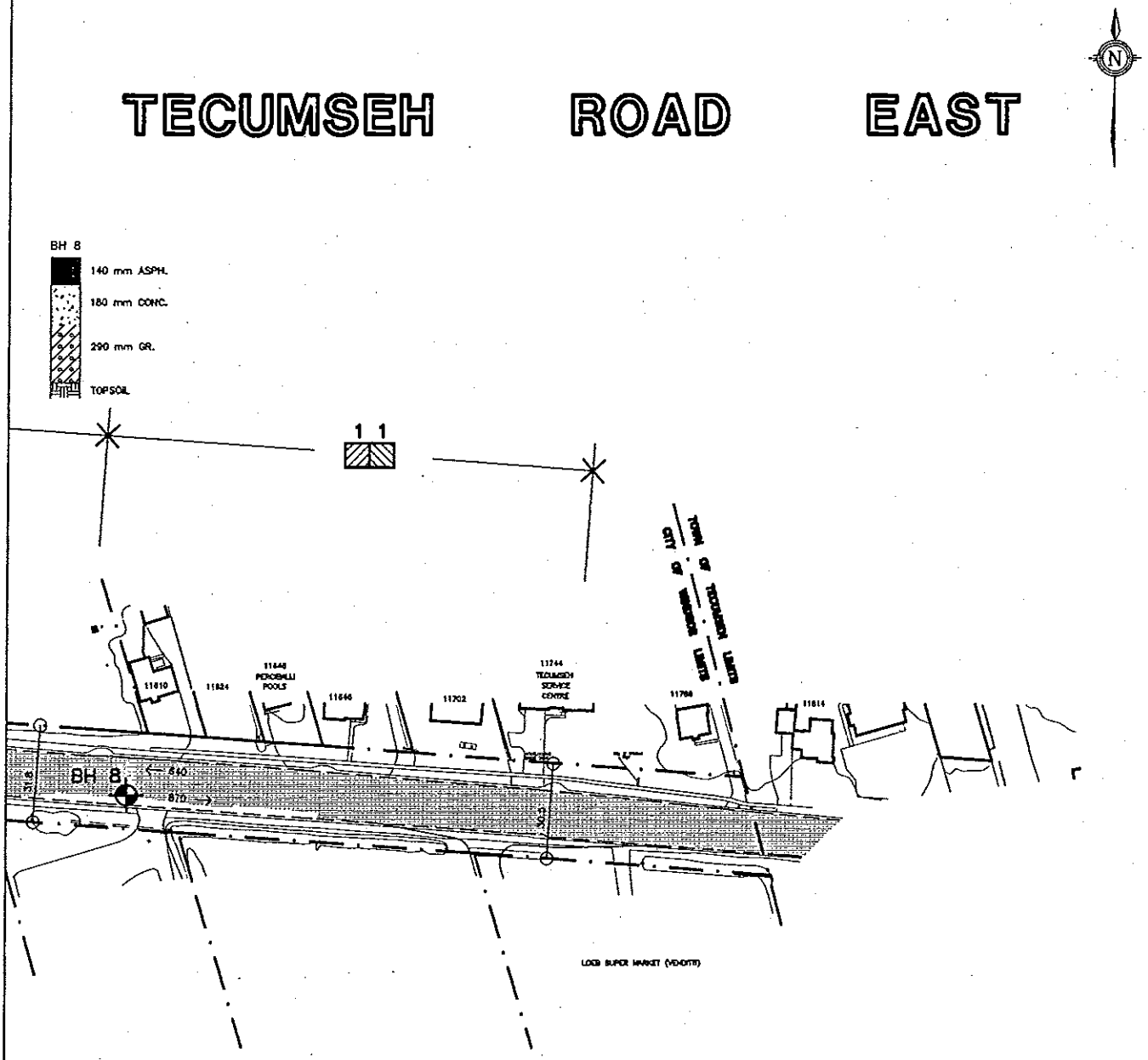
'EXISTING CONDITIONS - ROADWAY'

0 50 METRES

SCALE : 1:2000

FIGURE 3.6(d)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



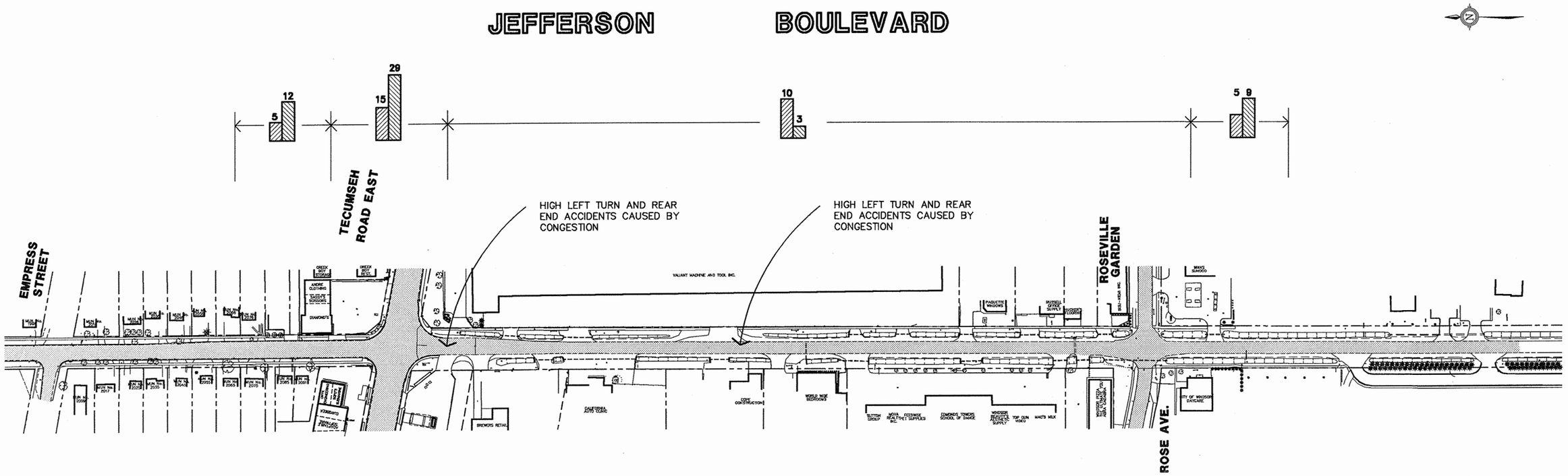
'EXISTING CONDITIONS - ROADWAY'

0 50 METRES

SCALE : 1:2000

FIGURE 3.6(e)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



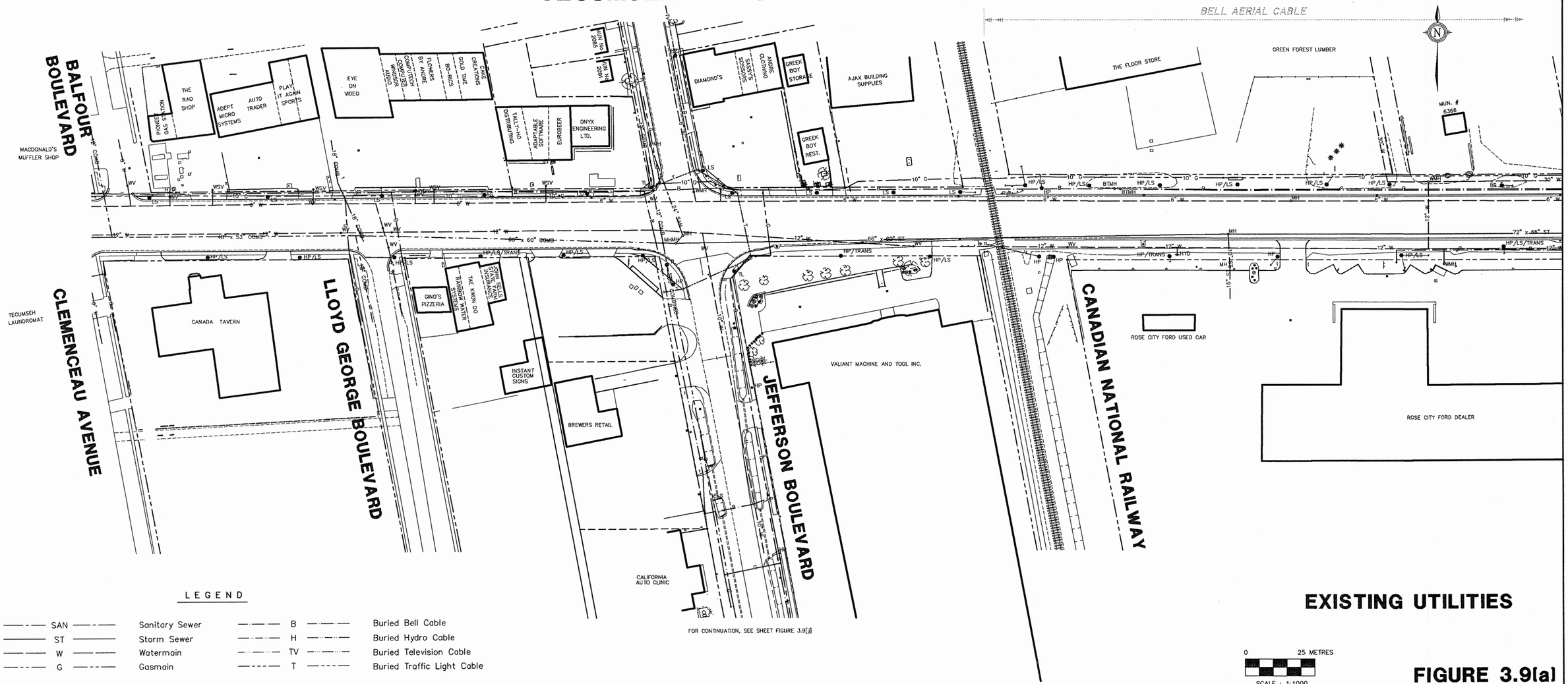
'EXISTING CONDITIONS - ROADWAY'

0 50 METRES

SCALE : 1:2000

FIGURE 3.6(f)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

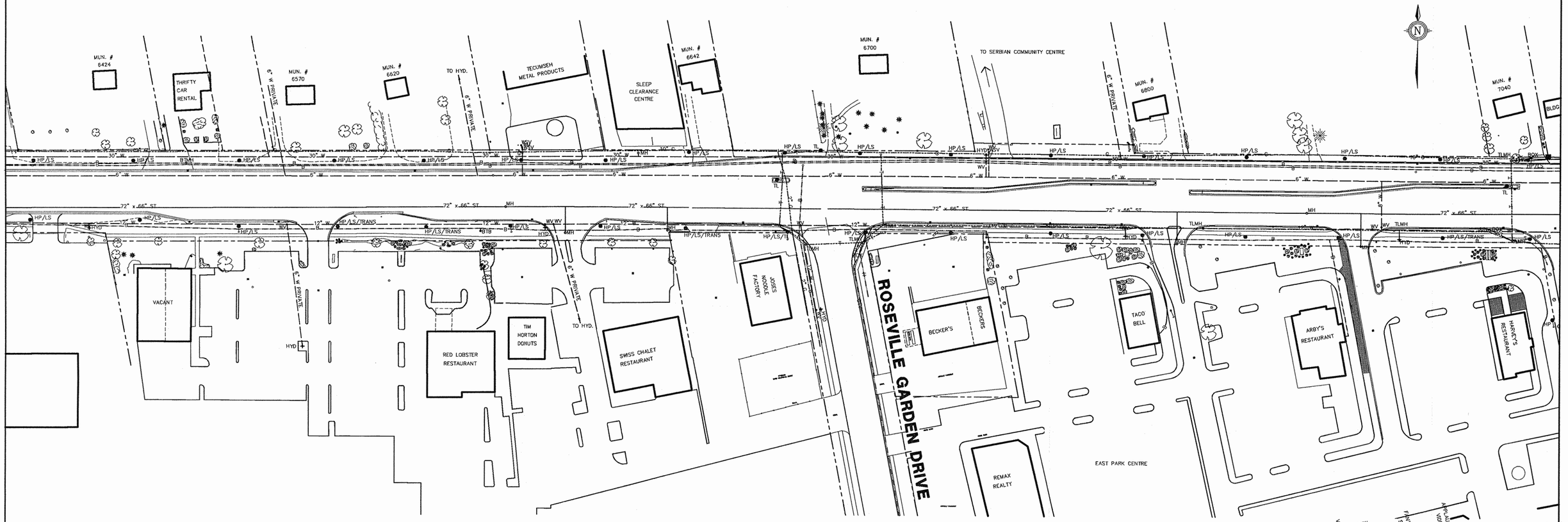
EXISTING UTILITIES

0 25 METRES

SCALE : 1:1000

FIGURE 3.9(a)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

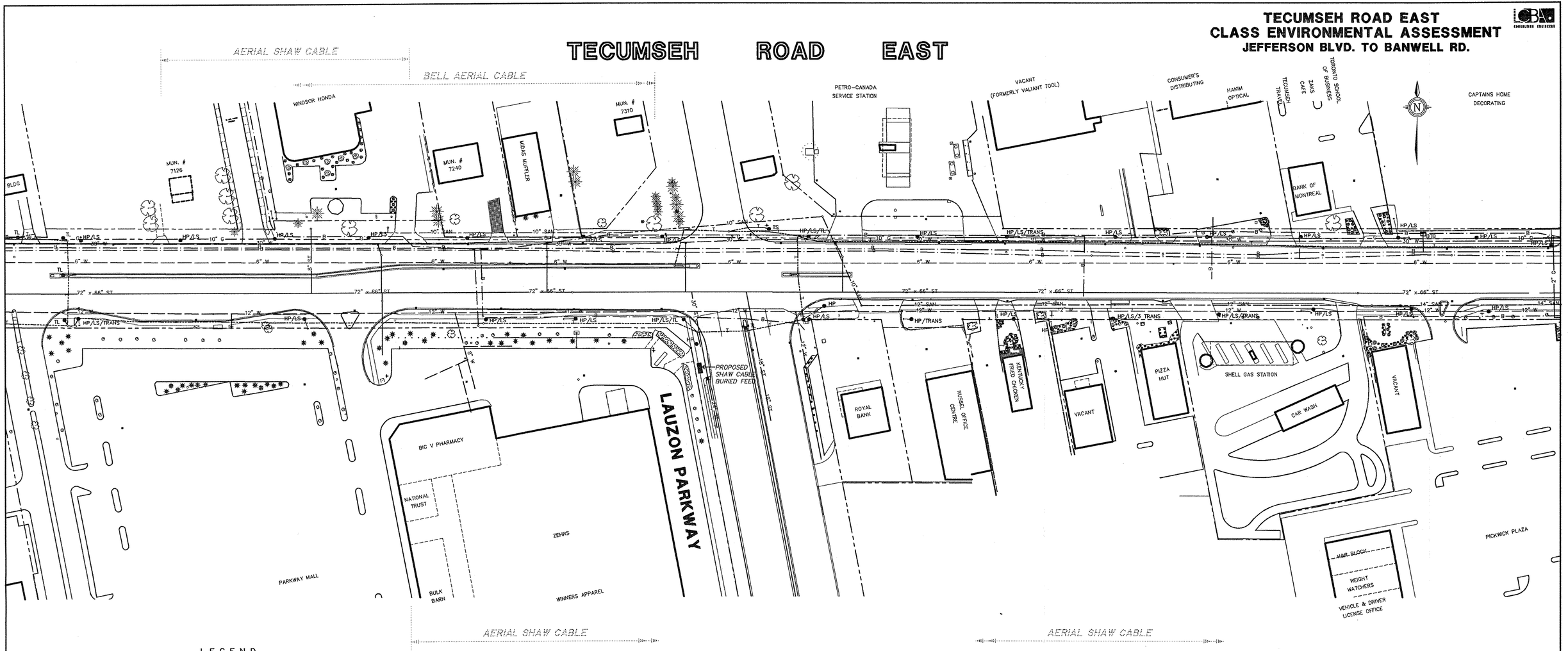
0 25 METRES

SCALE : 1:1000

EXISTING UTILITIES

FIGURE 3.9(b)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

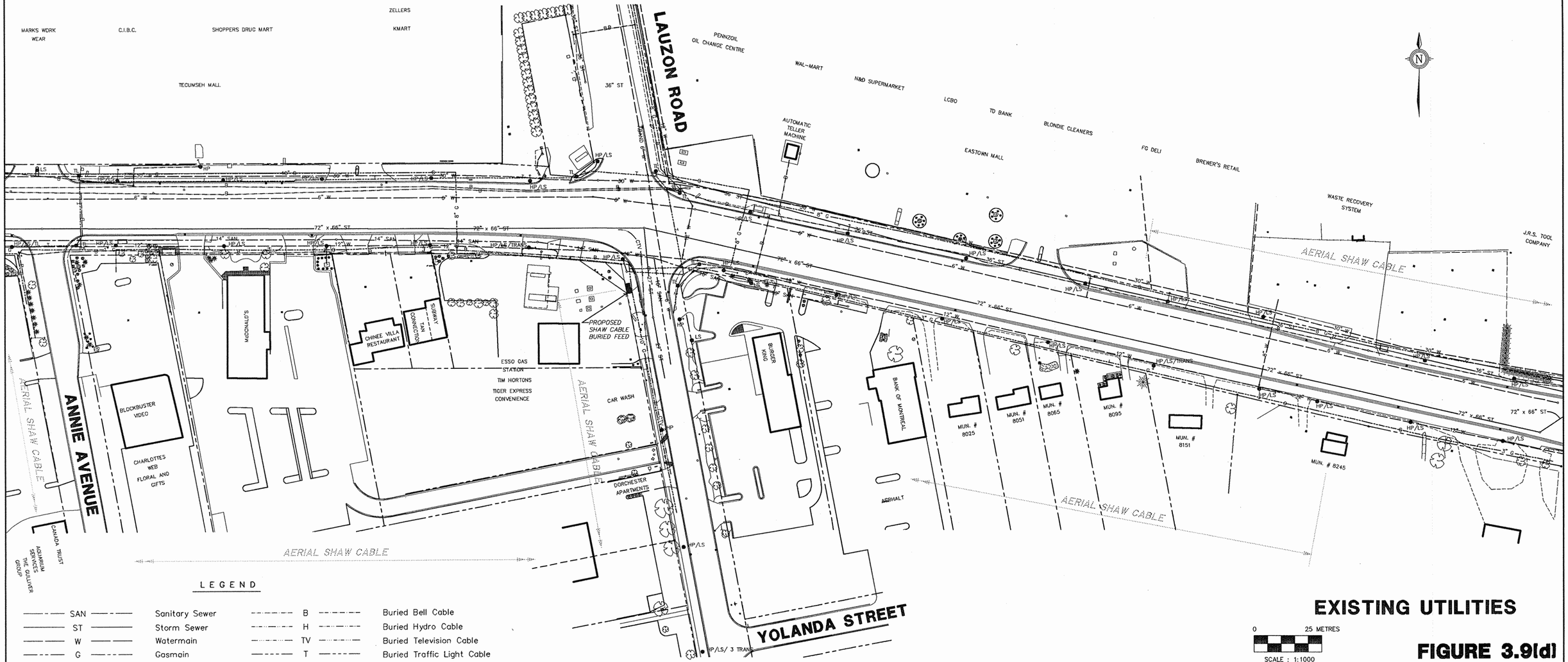
EXISTING UTILITIES

0 25 METRES

SCALE : 1:1000

FIGURE 3.9(c)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

EXISTING UTILITIES

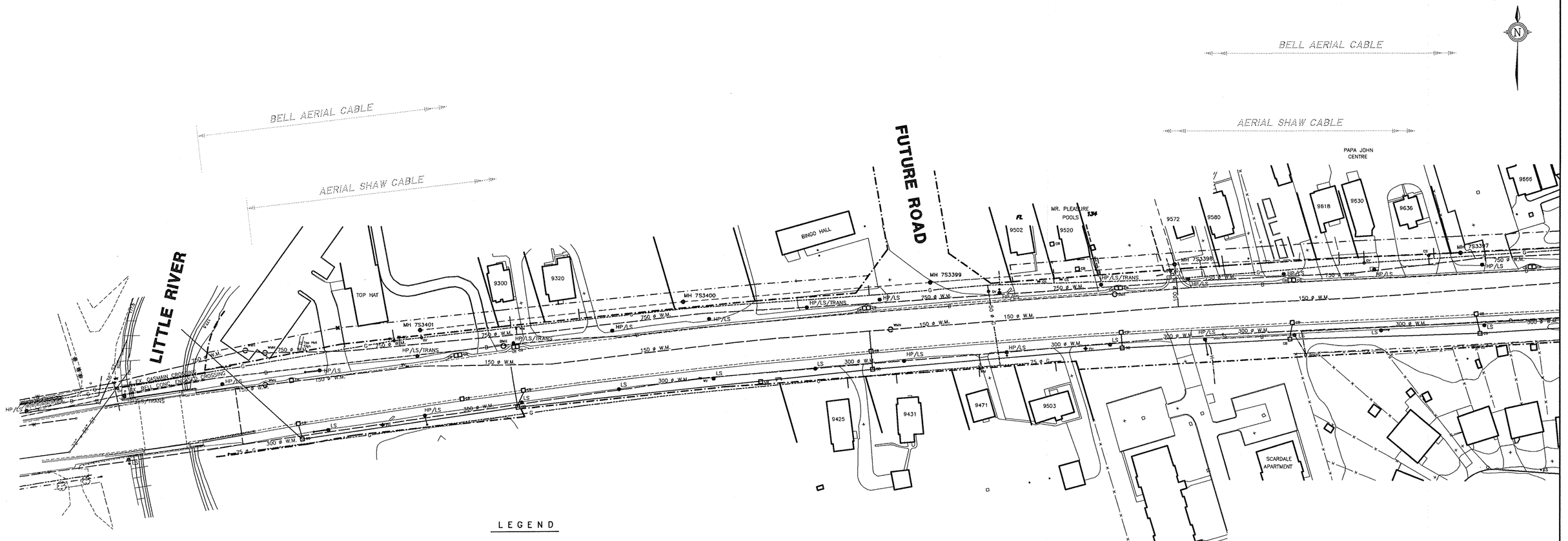
0 25 METRES

SCALE : 1:1000

FIGURE 3.9(d)

TECUMSEH ROAD EAST

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

EXISTING UTILITIES

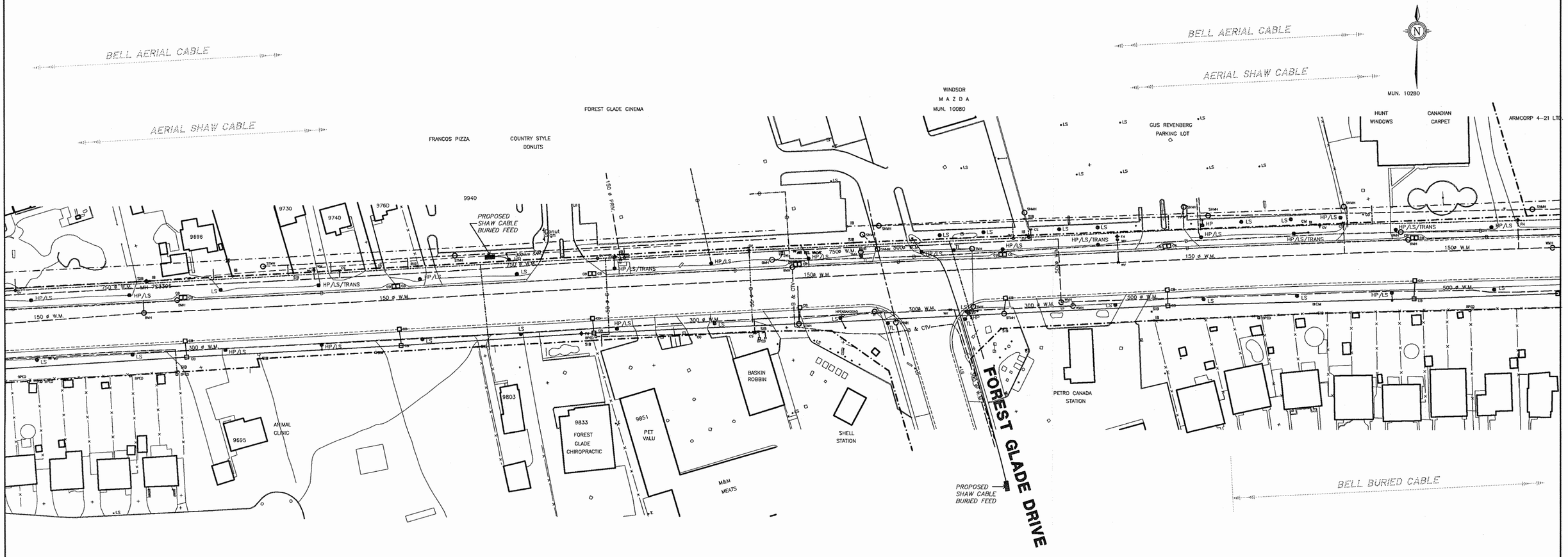
0 25 METRES

SCALE : 1:1000

FIGURE 3.9(e)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.

TECUMSEH ROAD EAST



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

EXISTING UTILITIES

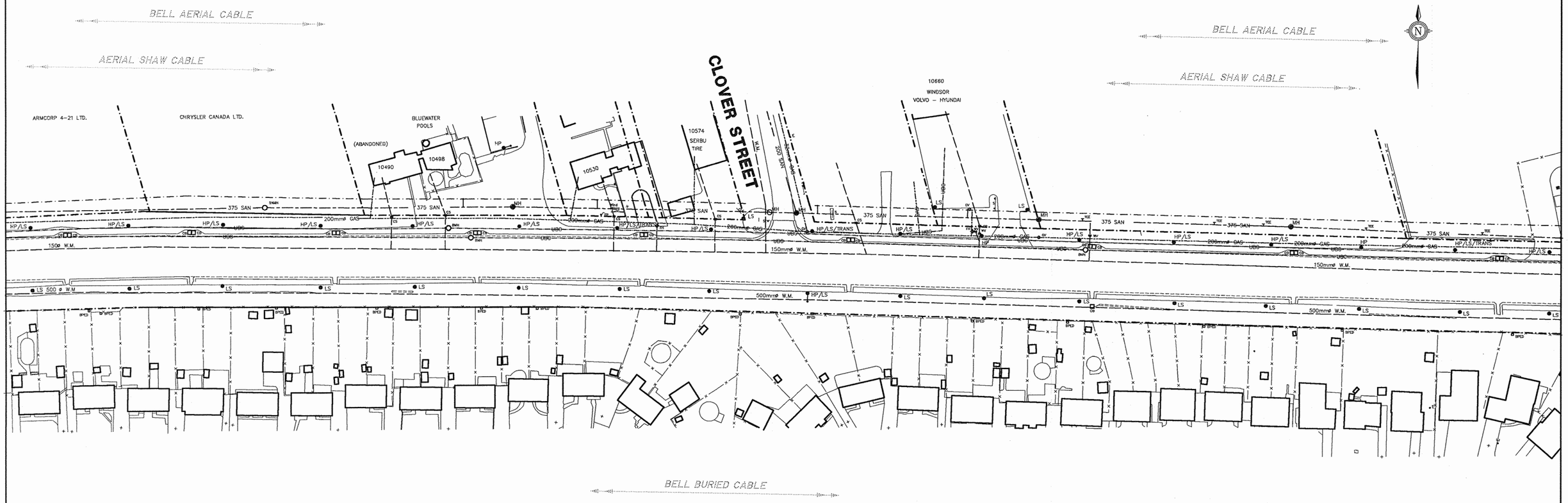
0 25 METRES

SCALE : 1:1000

FIGURE 3-9(1)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.

TECUMSEH ROAD EAST



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

EXISTING UTILITIES

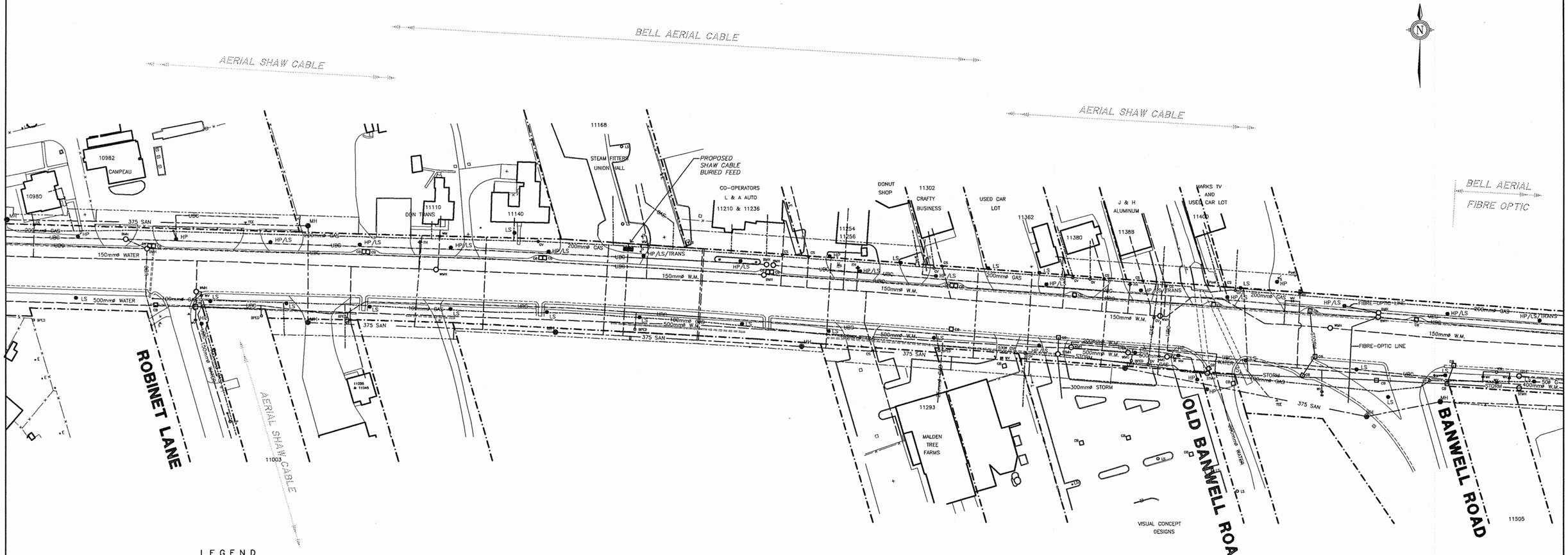
0 25 METRES

SCALE : 1:1000

FIGURE 3.9(g)

TECUMSEH ROAD EAST

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



LEGEND

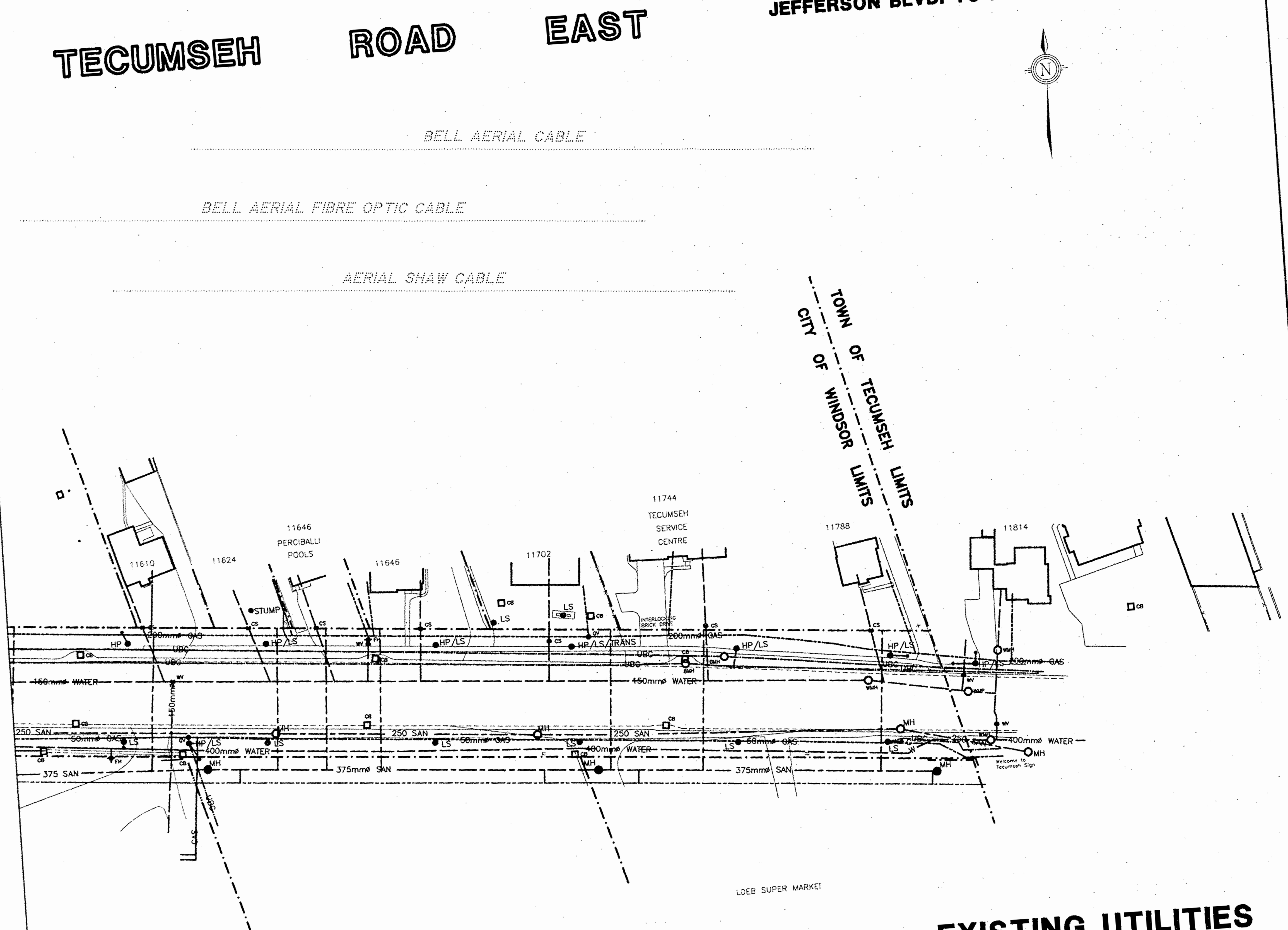
SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

EXISTING UTILITIES

0 25 METRES
SCALE : 1:1000

FIGURE 3.9(h)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.



TECUMSEH ROAD EAST
N
BELL AERIAL CABLE
BELL AERIAL FIBRE OPTIC CABLE
AERIAL SHAW CABLE
TOWN OF TECUMSEH LIMITS
CITY OF WINDSOR LIMITS
11610
11624
11646
PERCIBALLI
POOLS
11646
11702
11744
TECUMSEH
SERVICE
CENTRE
11788
11814
STUMP
200mmø GAS
UBC
150mmø WATER
150mmø
HP/LS
HP/LS/TRANS
INTERLOCKING BRICK DRIVE
250 SAN
50mmø GAS
400mmø WATER
375 SAN
375mmø SAN
250 SAN
MH
LS
CB
GAS
UBC
WATER
400mmø WATER
Welcome to Tecumseh Sign
LOEB SUPER MARKET

EXISTING UTILITIES

LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
ST	Storm Sewer	H	Buried Hydro Cable
W	Watermain	TV	Buried Television Cable
G	Gasmain	T	Buried Traffic Light Cable

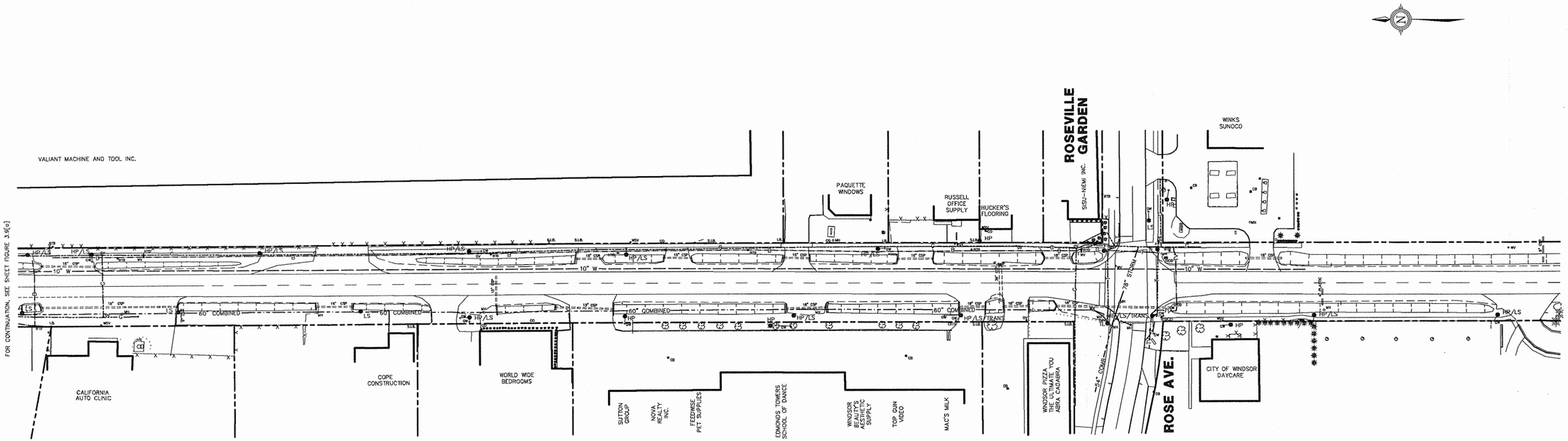
0 25 METRES

SCALE : 1:1000

FIGURE 3.9(I)

TECUMSEH ROAD EAST
CLASS ENVIRONMENTAL ASSESSMENT
JEFFERSON BLVD. TO BANWELL RD.

JEFFERSON BOULEVARD



LEGEND

SAN	Sanitary Sewer	B	Buried Bell Cable
CS	Combined Sewer	H	Buried Hydro Cable
ST	Storm Sewer	TV	Buried Television Cable
W	Watermain	T	Buried Traffic Light Cable
G	Gasmain		

EXISTING UTILITIES

0 25 METRES

SCALE : 1:1000

FIGURE 3.9(j)