

3. IMPLEMENTATION PROGRAM

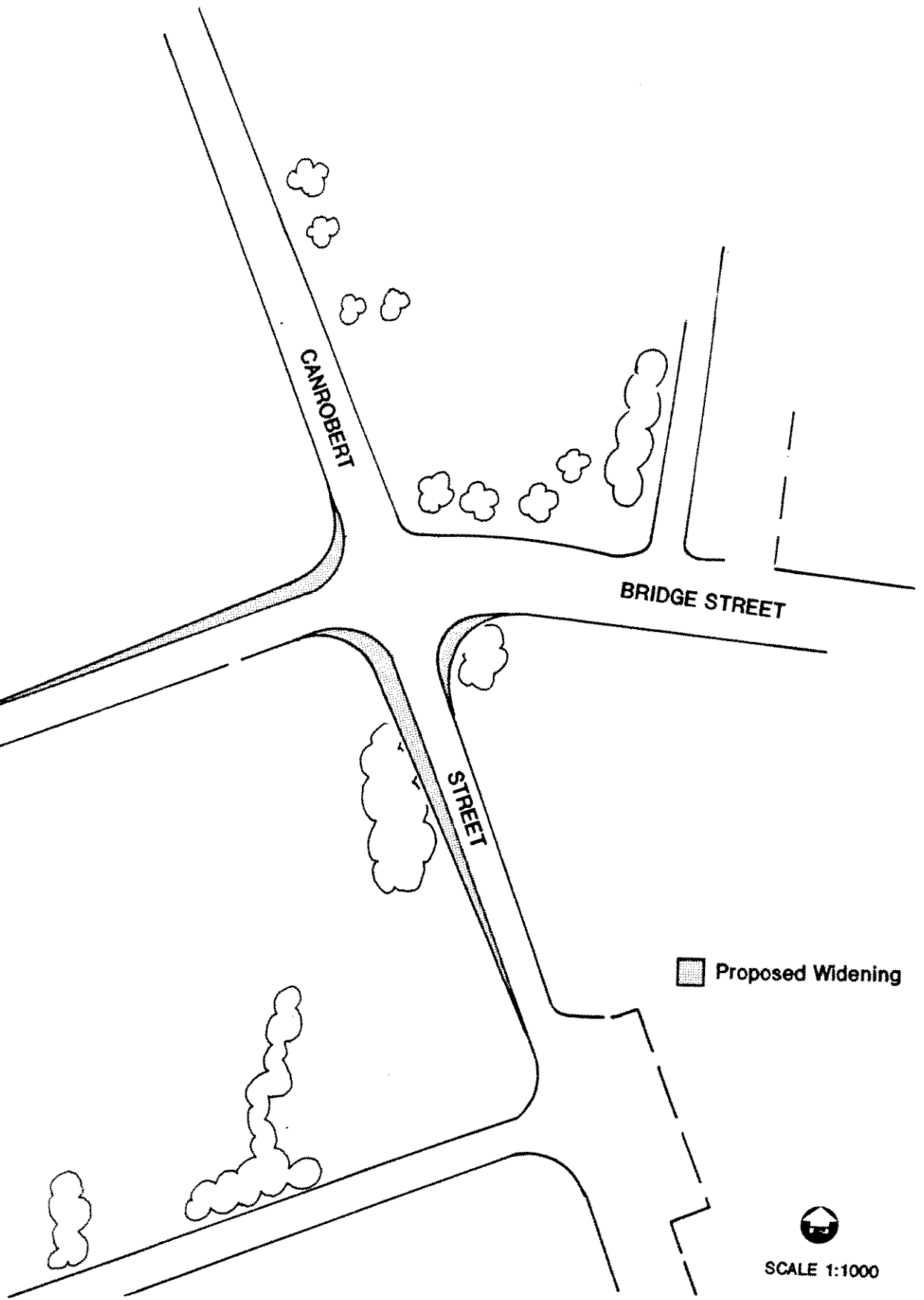
3.1 Intersection Modifications

This study examined possible modifications at the following intersections to improve operations:

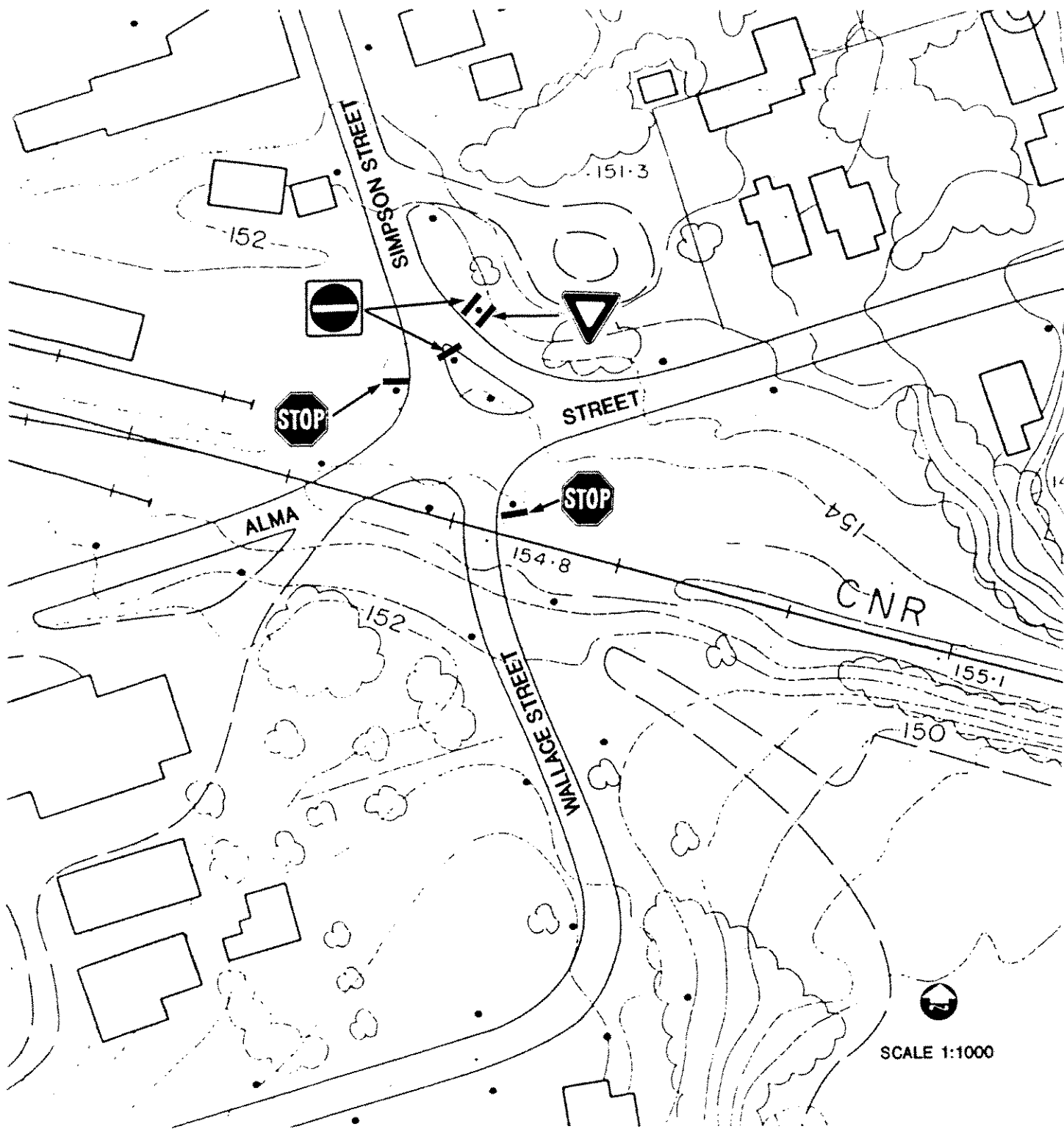
- Canrobert Street/Bridge Street
- Alma Street/Simpson Street
- Centre Street/Bridge Street

The recommended modification at Canrobert Street and Bridge Street are shown in Figure 3.1. These modifications are part of an overall scheme to improve traffic operation on Bridge Street. The objective is to shift westbound left turns now being made at Queen Street and Bridge Street to Canrobert and Bridge Street during the Monday to Saturday peak periods on Bridge Street from noon to 6 p.m. To accommodate these left turns it will be necessary to widen Bridge Street to add a westbound left turn lane, and accommodate a through by-pass lane. In addition, Canrobert Street would be modified to implement an improved northbound right turn radius and encourage trucks to use this route for access to downtown. These modifications would be put in place with a provision for future signalization when this is warranted by traffic volumes (i.e. add signal duct work with improvements). Due to the visibility problem for northbound lefts at this location and the increased volume of westbound left turns it is recommended that northbound left turns be banned at this location until signals are installed.

The improvements to Alma/Simpson Streets are shown in Figure 3.2. The westbound channelized right turn lane at this location is not warranted based on the volume of traffic



<p>Town of Campbellford Traffic Operations Study</p>	<p>RECOMMENDED IMPROVEMENTS AT CANROBERT STREET/ BRIDGE STREET</p>	<p>FIGURE 3.1 DILLON</p>
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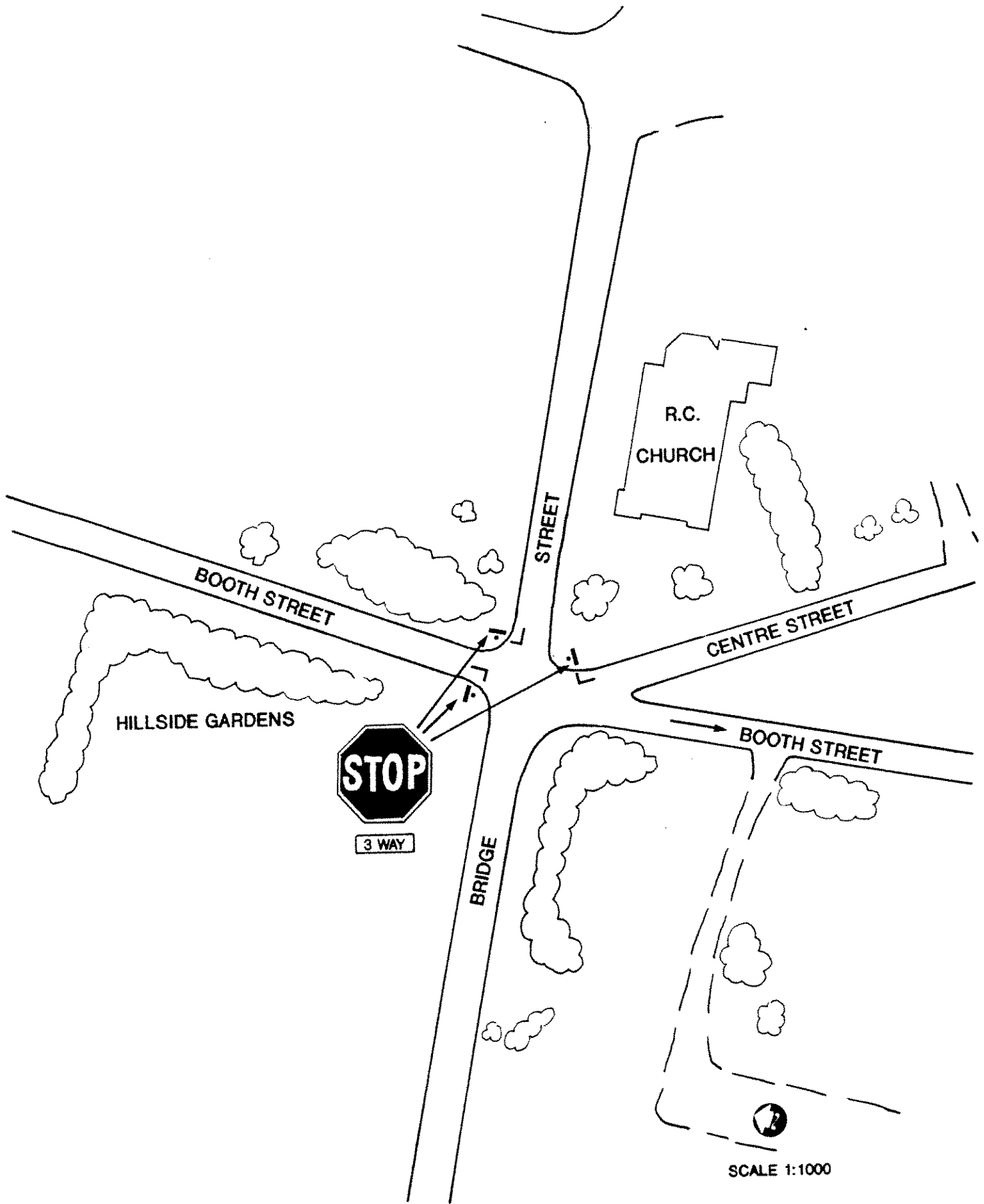
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<p>Town of Campbellford Traffic Operations Study</p>	<p>RECOMMENDED IMPROVEMENTS AT ALMA STREET/ SIMPSON STREET</p>	<p>FIGURE 3.2 DILLON</p>
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at this location; however the alignment permits truck movements to turn north and not interfere with southbound vehicles. In addition, visibility is slightly restricted for southbound vehicles and the alignment provides a degree of separation for these movements. Therefore it is recommended to maintain existing alignment with the additional signage, with the ultimate goal of improving the visibility at the intersection so that the channelization may be removed.

The existing alignment of Centre Street at Bridge Street is shown in Figure 3.3. No improvements are warranted for this location based on the available information; however, the ultimate alignment for this location should include provision for traffic signal when the warrants are met. The traffic volumes to/from Centre Street and Bridge are the critical volumes at this location and the accident analysis indicates one accident per year involves some conflicts between northbound and eastbound vehicles. The delineation of the eastbound right turns by the use of an exclusive right turn lane would provide a physical barrier between these two movements and improve safety. This will become more critical as the development of Ferris Provincial Park takes place over the next few years.

The ultimate alignment of this intersection will depend on the future traffic growth in the area, and will likely involve the closure of Booth Street South and re-alignment of Centre Street. This possibility should be examined on the basis of land availability and traffic safety. As an interim measure, the tab "3 way" should be added under the existing stop signs.



3.2 Traffic Signal Control Improvements

A number of traffic signal control improvements have been identified as a result of this study. These include improvements to the existing Bridge Street signal system, and possible implementation of future traffic signal control equipment when vehicle warrants are met.

Bridge Street Signals

The operation of Bridge Street between Queen Street and Doxsee Street is governed by the operation of the three signalized intersections. It has previously been demonstrated that the intersections operate at a tolerable level-of-service at the present time; however, due to the short distance between the intersections a progressive signal system would improve the operation and reduce delays to road users (i.e. an interconnection of the signal controllers to minimize the number of vehicle stops required). Under the existing geometrics and signal phasing, a coordinated system would not be effective since the left turning vehicles at either end of the bridge obstruct the through flow of traffic.

There are three means of removing this impedance to the traffic flow

- provide left turn lanes on the bridge;
- ban left turns from the bridge; or
- provide exclusive phasing for traffic exiting the bridge.

The first method has been deemed inappropriate at this time for the following reason: there is insufficient width on the existing bridge structure to accommodate a left turn lane; and a left turn lane on the bridge would create problems for emergency vehicles since the centre area may be clogged with left turning vehicles.

The second method was found to be appropriate for the westbound traffic and the intersection modification to the Canrobert/Bridge Street intersection which would accommodate these additional left turns have been identified earlier; however, this was not seen to be appropriate for the eastbound traffic due to lack of capacity at Doxsee and the potential impacts to merchants on Front Street North.

The third method was suggested by Central Region of MTO as an inexpensive measure which could be implemented and tested in the near future, and can remain in operation during peak periods in conjunction with the Canrobert Street improvements.

With the implementation of exclusive phasing for traffic exiting from the bridge it is possible to provide a co-ordination for eastbound and westbound traffic on Bridge Street through the Town. Under this system there will be a separate eastbound and westbound green phase at Front Street, and at Queen Street, the north-south movements would remain on one phase. The disadvantage of this system is that the north and south approaches may experience slightly longer delays than at present, and in order to maintain a short cycle length (to minimize queuing) the northbound left turn advance green would be eliminated at Front Street North.

To partially compensate for the impact on the side street, traffic northbound and southbound right turn green arrow could be implemented at Queen Street and Front Street respectively to operate during the appropriate eastbound and westbound phases, and a northbound advance green could be added at Doxsee if found to be necessary. Figure 3.4 illustrates the phasing, signal timings and Table 3.1 shows the expected level-of-service at the intersection during the noon and p.m. peak periods when the phasing would be implemented.

Traffic Control Equipment

To implement this signal timing scheme it will be necessary to co-ordinate the traffic controllers at each location. The existing control equipment can be co-ordinated with a master time clock and hardwire interconnection. However, the existing electro-mechanical controller equipment has been identified by the Town maintenance contractor as worn and soon in need of replacement. This type of control equipment is now in limited production and replacement parts are difficult to obtain. It is recommended that the existing equipment be replaced with solid state control equipment with either time base co-ordination, or hardwire connection using existing duct work in the bridge and overhead connection along Bridge Street. This will provide the Town with state-of-the-art equipment and can implement signal co-ordination. The manufacturers of the equipment will provide training for Town staff and support for equipment operation and maintenance.

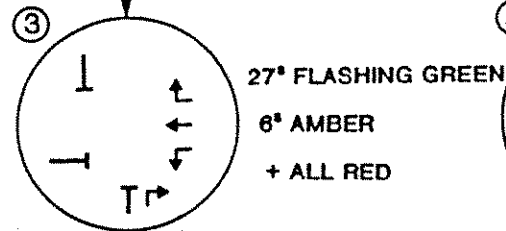
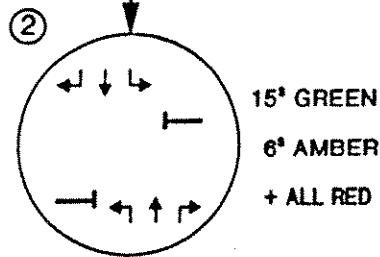
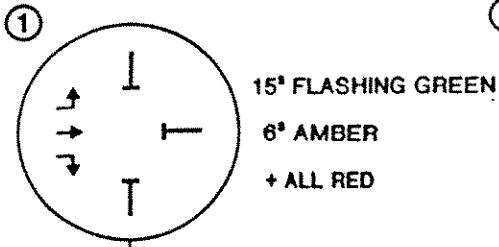
There are two routes for the Town to go in terms of new equipment to facilitate this operation: NEMA standard, or manufacturer specification. With NEMA standard controllers the Town would not be tied to one manufacturer for replacement and service as all components are interchangeable;

TABLE 3.1
LEVEL-OF-SERVICE (LOS) AT SIGNALIZED INTERSECTIONS
ON BRIDGE STREET WITH PROPOSED OPERATION (JULY CONDITIONS)

<u>INTERSECTION</u>	<u>LOS ON APPROACH</u>			
	<u>N/B</u>	<u>S/B</u>	<u>E/B</u>	<u>W/B</u>
Bridge/Queen				
a.m.	B	A/B	A	B
noon	B	A/C*	C	C
p.m.	B	A/C*	B	C
Bridge/Front				
a.m.	A	B	B	A
noon	B/C*	B	C	C
p.m.	A/C*	B	C	C
Bridge/Doxsee				
a.m.	A	A	A	A
noon	A	A	A	A
p.m.	A	A	A	A

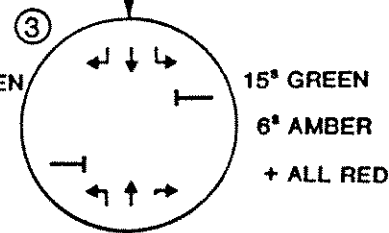
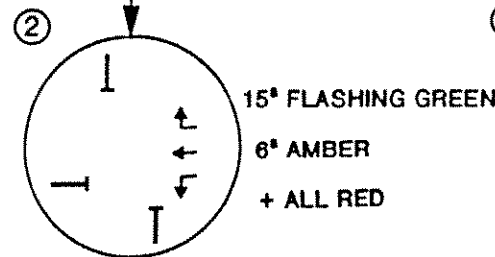
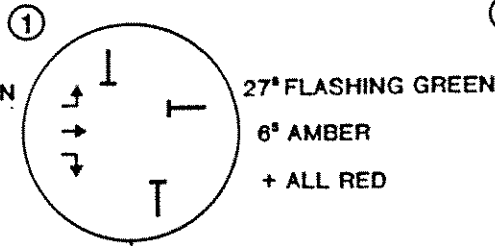
* through and rights/left turn lane

QUEEN/BRIDGE



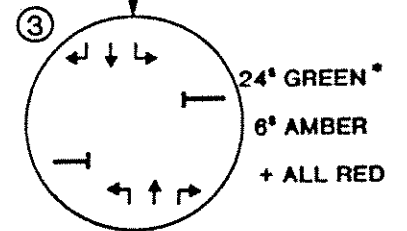
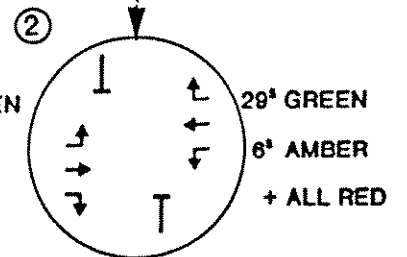
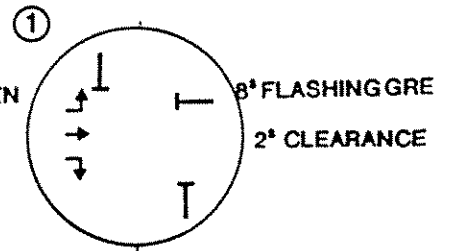
TOTAL CYCLE = 75^s
OFF-SET = 0^s

FRONT/BRIDGE



TOTAL CYCLE = 75^s
OFF-SET = 12^s

DOXSEE/BRIDGE



* NORTHBOUND FLASHING ADVANCING GREEN MAY BE ADDED IF NECESSARY

TOTAL CYCLE = 75^s
OFF-SET = 14^s

Town of Campbellford Traffic Operations Study	PROPOSED INTERIM SIGNAL PHASING ON BRIDGE STREET	FIGURE 3.4 DILLON
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however, this equipment tends to be more sophisticated, more expensive, and contains a lot of additional function which are not likely to be used by the Town. A number of Ontario communities have opted to go for the less expensive manufacturer specified equipment due to the easier operation and low cost. Two examples of the type of controllers which would suit the Town's needs are as follows:

- Econolite: KFT 1800
- Fortran: LS-180

The cost of the manufacturer specific equipment (without installation) is about \$6,000.00, while NEMA equipment will be \$8,000.00 to \$9,000.00 per unit.

Progression Test

It has been suggested by MTO that the proposed signal timing and co-ordination system be implemented for a trial period using existing equipment and adjusting the off-set manually to test the effectiveness of the system. There is a certain amount of risk in such a test procedure. A manual co-ordination will not last much longer than a day, and since the benefits of the proposed operation are derived through the progressive nature of the system, the test period would be very short and not necessarily conclusive. Secondly, the new operation will introduce new phasing arrangements which are radically different from the existing situation and it may take some time for local drivers to become familiar with the operation. Since it will be necessary to implement improved traffic control equipment in any event, it is recommended that the implementation of the new signal phasing and co-ordination be conducted at the same time that the new equipment is installed to avoid confusion to drivers, and provide a longer test period for more conclusive results.

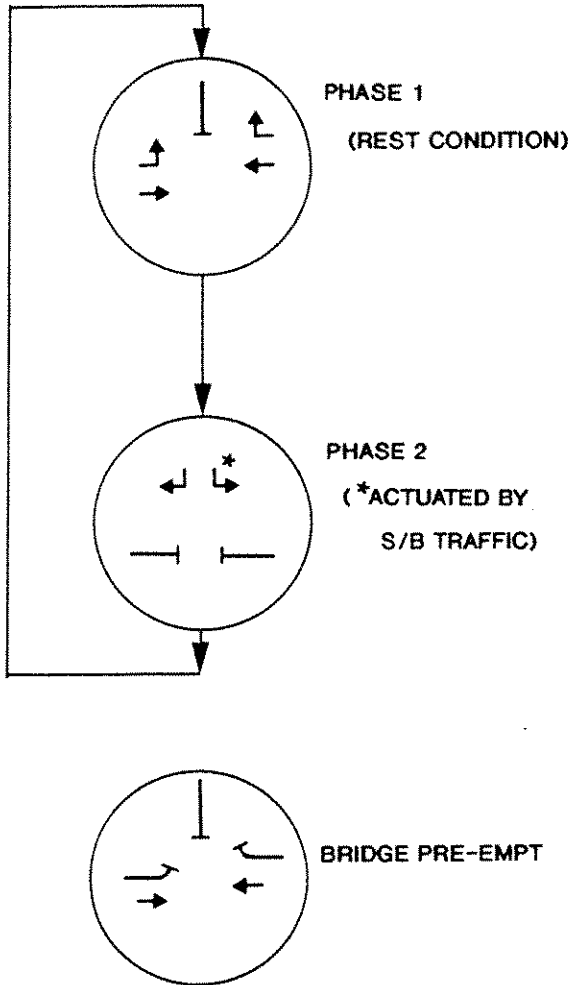
Trent Drive/Industrial Road

The operation of this intersection is closely tied to the operation of the swing bridge on Trent Drive. The swing bridge is a one lane roadway with a 5 ton load restriction. Under the existing operation safe access across the bridge is dependent on drivers from one direction giving right-of-way to the driver approaching from the other direction which works effectively due to local knowledge and co-operation.

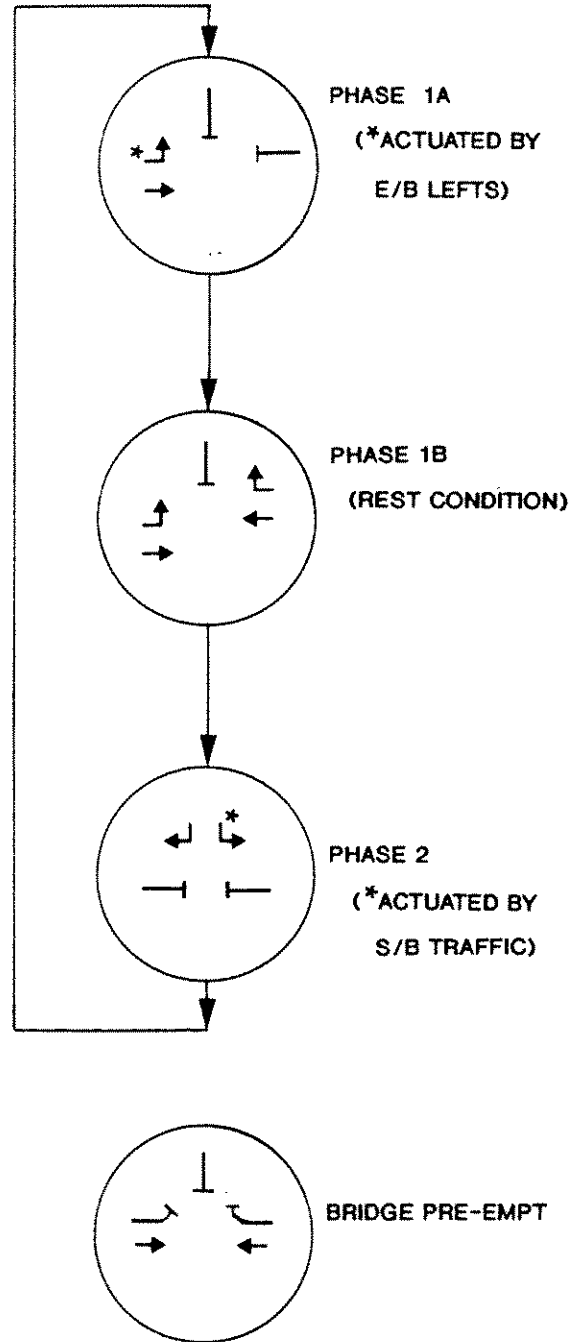
With the increasing congestion experienced on Bridge Street across the Trent River the use of the swing bridge as an alternative route to the Town Centre is a possibility. The 1988 licence plate trace survey indicated that the majority of the vehicles crossing the river on Bridge Street and originating south of Trent Drive were destined to the east side of town or Centre Street South (see Table 2.3 and 2.5). With a more effective operation of the swing bridge crossing as an alternate route this may reduce volumes on the Bridge Street crossing by 30 to 50 vehicles in the peak hour.

The proposed operation would include the adoption of the existing signals at the bridge and additional signals on Industrial Drive to identify rights-of-way to approaching vehicles. Initially, a two phase signal plan would be used, as shown in Figure 3.5, with provision for three plans in the future should there be additional traffic demands on Industrial Drive. The intersection would rest in phase 1 providing right-of-way for the vehicles approaching from Industrial Drive until vehicle demands on Trent Drive activate the southbound phase. When the swing bridge is open the bridge pre-emption phase would be in effect. It may also be prudent

INITIAL PHASING



POSSIBLE EXPANSION



<p>Town of Campbellford Traffic Operations Study</p>	<p>PROPOSED SIGNAL PHASING AT TRENT DRIVE/INDUSTRIAL DRIVE</p>	<p>FIGURE 3.5 DILLON</p>
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to install opticom to activate the southbound phase in the event that an emergency vehicle is approaching the bridge in the southbound direction.

The implementation of this system may require discussion with the Federal authorities responsible for the bridge operation.

3.3 Second Trent River Crossing

One of the objectives of the study was to determine the potential need for a second crossing of the Trent River. The analysis of the existing operation of Bridge Street has shown that the bridge operates at or near capacity during the afternoon peak periods in both the winter and summer conditions. Strategies to improve its operation will have an impact on other intersection and will reduce the level-of-service of the connecting roadways. The licence plate matching survey showed that the majority of the traffic on the bridge is internal Town traffic travel between the two sides of Town, while through traffic only accounts for less than 10% of the peak hour flows.

Preliminary findings of the Town's future growth indicates that there will be increased residential developments on both sides of the river which will add to the already congested river crossing. In addition, improvements to Ferris Provincial Park will increase the influx of through traffic during the summer months. These factors in addition to the existing condition on the bridge indicate an increasing demand for access across the Trent River to/from the Highway 30 which connects to Highway 401 south of the Town. A new river crossing would provide the Town the opportunity

to expand the residential and commercial areas on the east side of the river and provide adequate transportation service to Highway 30.

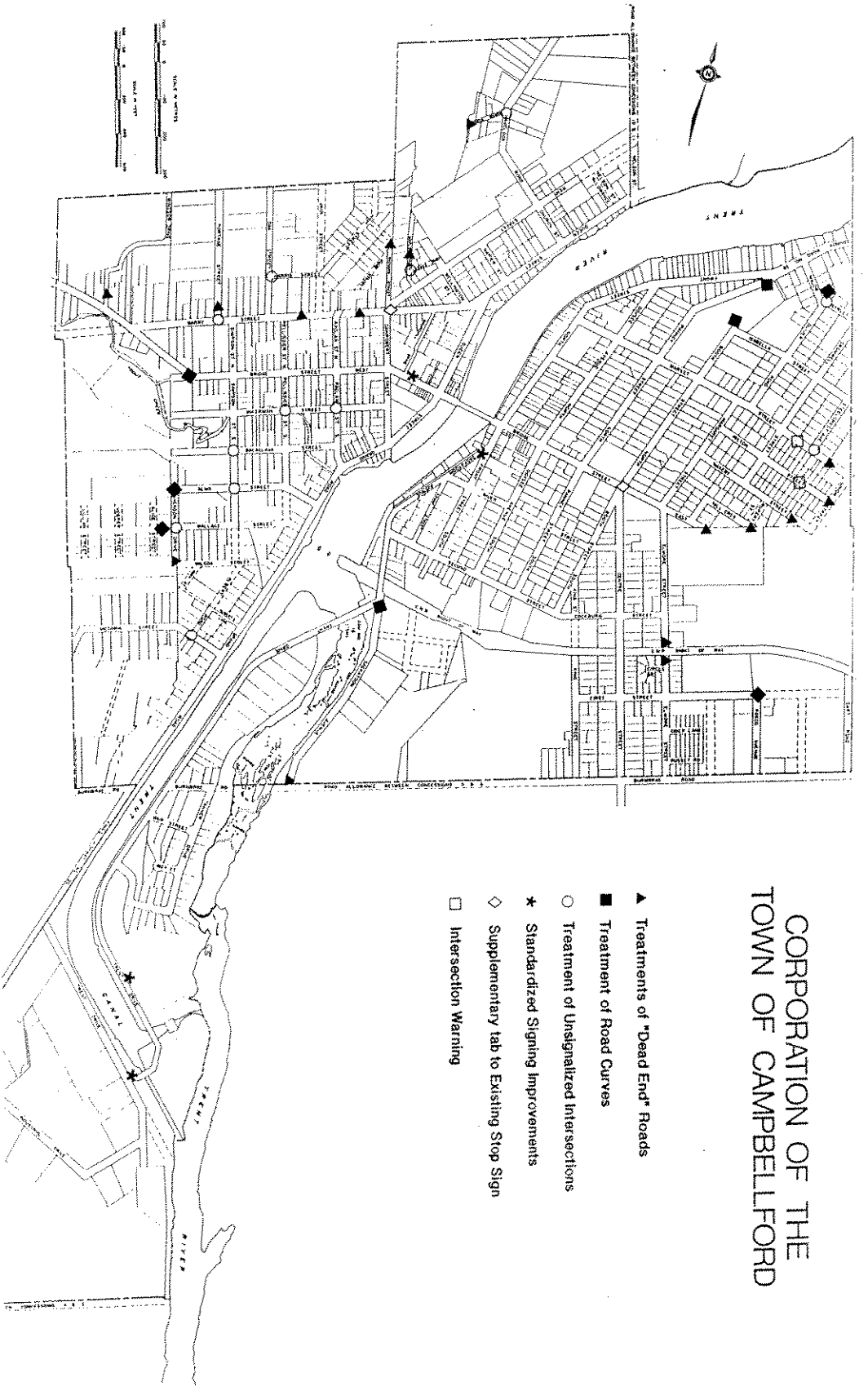
The location of the potential crossing requires further investigation. This study indicates that the highest users of the bridge is the traffic to and from Bridge Street West. However, the next highest users arrive via Grand Road (Highway 30). With the proposed expansion to the Ferris Provincial Park it is anticipated that there will be increased flow of traffic from the south to access the Park area. Therefore, a crossing located south of the present bridge locate would likely provide the best service to outside users. However, the physical constraints at other locations would also need to be considered.

In order to fully assess the impacts and feasibility of a second bridge crossing, it will be necessary to carry out a origin-destination study of the internal traffic patterns of the Town. This will provide information on the areas of the Town which places the greatest impact on the bridge crossing. Such a study should take into account the future residential and industrial land uses in the Town.

3.4 Traffic Signing and Markings

A number of deficiencies were noted during the review of the existing traffic signing in the Town and therefore recommendations have been made to improve the operations. The improvements have been divided into the following categories and are shown on the enclosed map #1:

CORPORATION OF THE
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Town of Campbellford
Traffic Operations Study

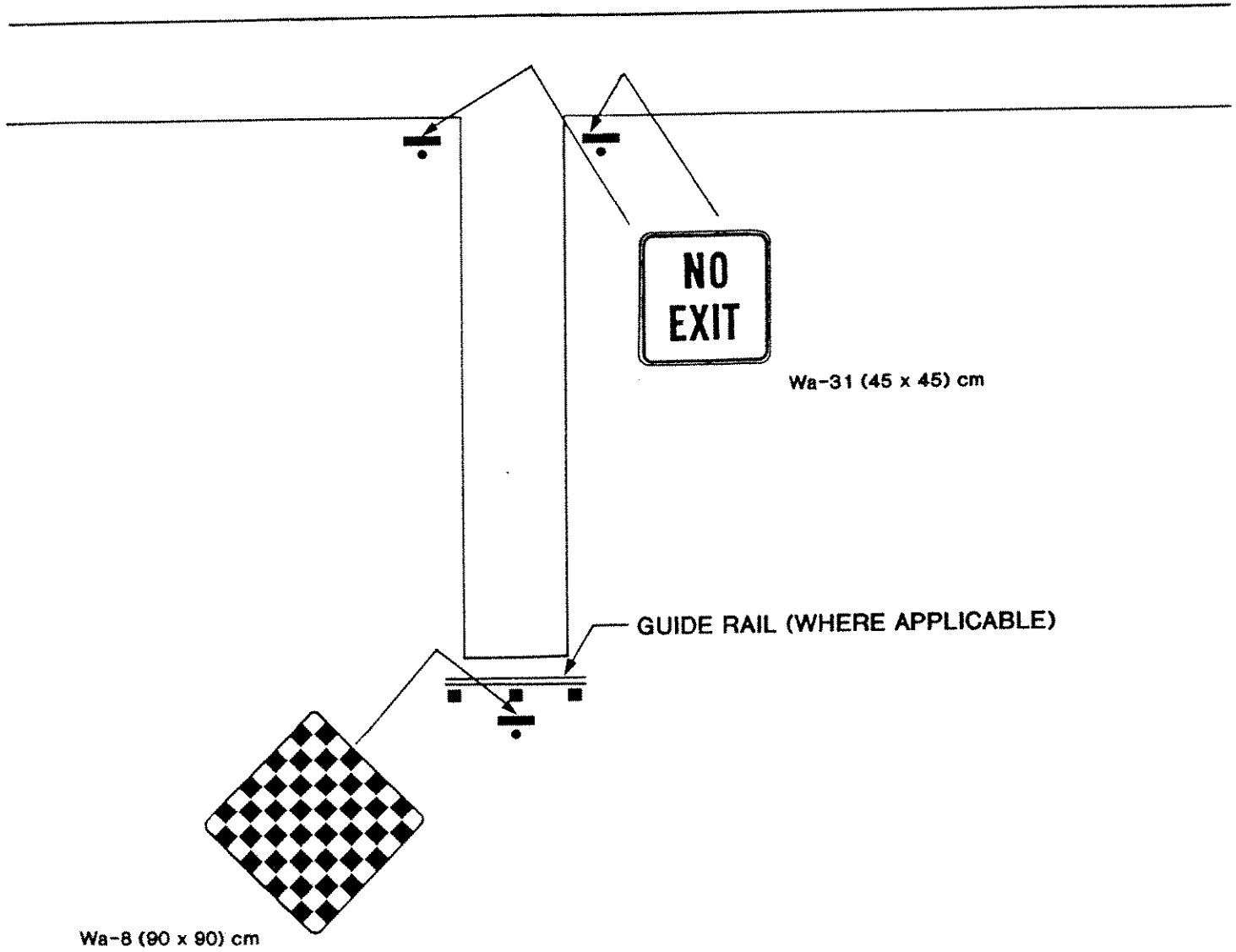
TRAFFIC SIGNAGE DEFICIENCIES

MAP 1
DILLON

- treatment of "dead end" roadways
- treatment of road curves
- treatment of unsignalized intersection
- standardized signing improvements

At the present time there are a number of dead end roadways in the Town which do not provide the adequate signing to warn motorists. In some instances residents have installed their own sign to discourage traffic from entering the residential areas. It is recommended that these locations be treated in a standardized manner using a "NO EXIT" sign where the dead end road intersects another roadway, a checkerboard sign at the end of the roadway, and a guide rail at the road's termination where safety is a concern (see Figure 3.6). The following "dead end" roads will require this treatment:

- Market Street east of Steelcase Road
- Ireton Street east of Cromwell Street
- Noseby Street east of Cromwell Street
- Hillcrest Street north of Bridge Street
- Elmore Street south of Cockburn Street
- Elmore Street north of First Street
- Saskatoon Street south of Trent Drive (checkerboard on fence; no guide rail)
- Henson Road south of Wallace Road
- Windsor Road north of Bridge Street (no checkerboard or guide rail)
- Portage Street north of Garry Street (no checkerboard or guide rail)
- Oak Street north of Garry Street (no checkerboard or guide rail)
- Garry Street east of Pelliser (no checkerboard or guide rail)



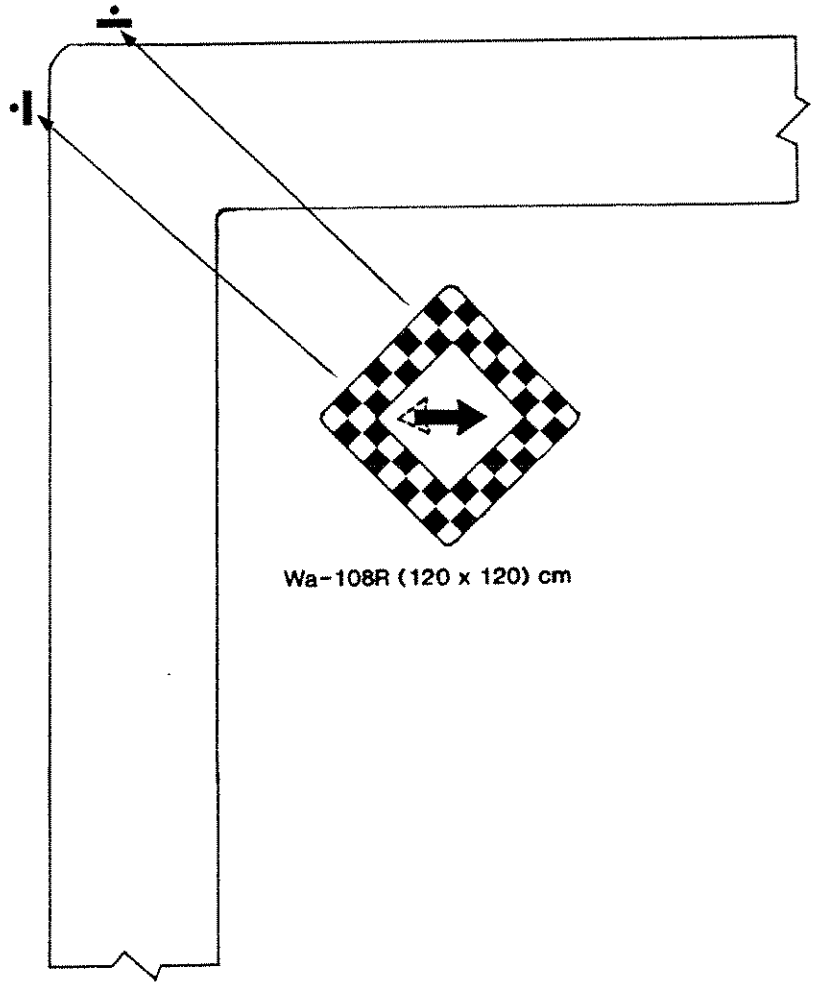
<p>Town of Campbellford Traffic Operations Study</p>	<p>TYPICAL DEAD END TREATMENT</p>	<p>FIGURE 3.6 DILLON</p>
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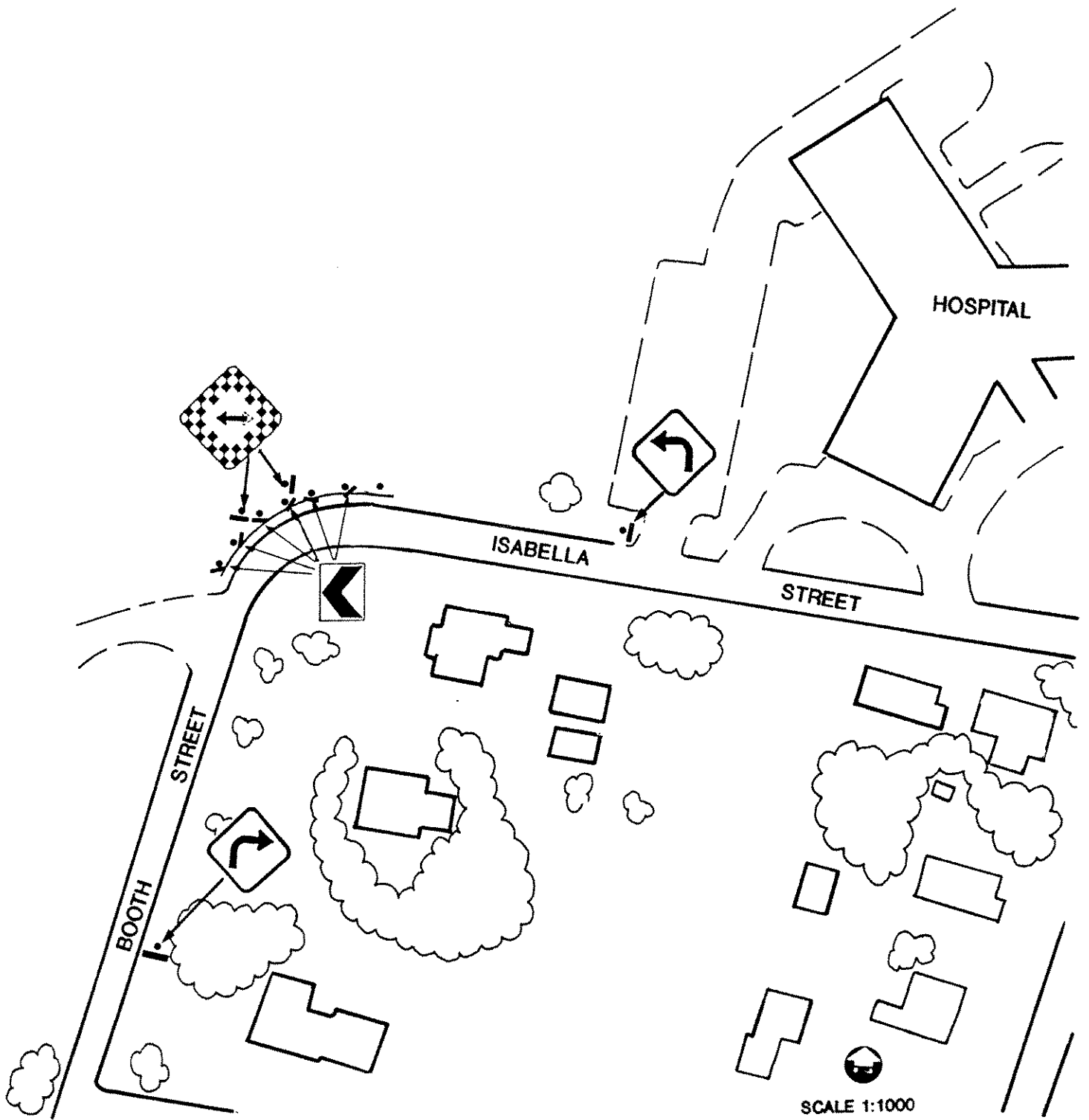
- Maple Street north of Jane Street (no checkerboard or guide rail)
- Richard Street north of Garry Street (no checkerboard or guide rail)
- North Street south of Havelock (no checkerboard or guide rail)
- Garry Street west of Canrobert
- Bridge Street north of Margaret

Curves on some roadways in the Town require signage to warn motorists of a sharp turn which is otherwise not apparent. This can be accommodated in most cases with two checkerboards with one way directional arrows facing each approach to the curve (see Figure 3.7). The following locations would require this treatment:

- Ranney Street at Front Street
- Major Street at Oliver (two arrowheads; facing east)
- Rosco Avenue at First Street (remove existing sign)
- Alma Street at Henson Road (place east facing sign on fence)
- Wallace Road south of Alma Street
- Wallace Road at Henson (two arrowheads; face east)
- Trent Drive at Saskatoon Street (two arrowheads; facing west)

There are two locations in Town which require special treatment for the curves in order to provide adequate safety. It is recommended that the curve on Isabella Street at Booth Street be upgraded to provide a curve warning sign with advisory speed of 40 kph and chevrons mounted on the guide rail posts to guide drivers from either direction (see Figure 3.8). At the curve on Bridge Street near Highway 30 it is recommended that two checkerboards be installed to face either approach; an oversized curve warning sign with 40 km/h





<p>Town of Campbellford Traffic Operations Study</p>	<p>RECOMMENDED TREATMENT AT ISABELLA/BOOTH</p>	<p>FIGURE 3.8 DILLON</p>
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advisory speed; delineation on guiderail posts; upgrade centreline strip and add edge of pavement striping through the corner; and provide correct end treatments for guiderail (see Figure 3.9).

The appropriate traffic control is necessary at all unsignalized intersection locations. The following location should be improved from no control to "Yield" control:

- Steelcrest Road approaching Market Street
- First Street approaching King Street
- Wallace Street approaching Henson Road
- Portage Street approaching Garry Street
- Jane Street approaching Maple Street
- North Street approaching Havelock Road
- King Street approaching Burnbrae Road
- Balaclava Street approaching Simpson Street
- High Street approaching Oak Street

The following locations should be upgraded from no control to "stop" control:

- Inkerman Street approaching Raglan Street
- Inkerman Street approaching Pelliser Street
- Wallace Street approaching Alma Street
- Albert Street approaching Victoria Street

The following locations should be upgraded from yield control to stop control:

- Simpson Street approaching Alma Street

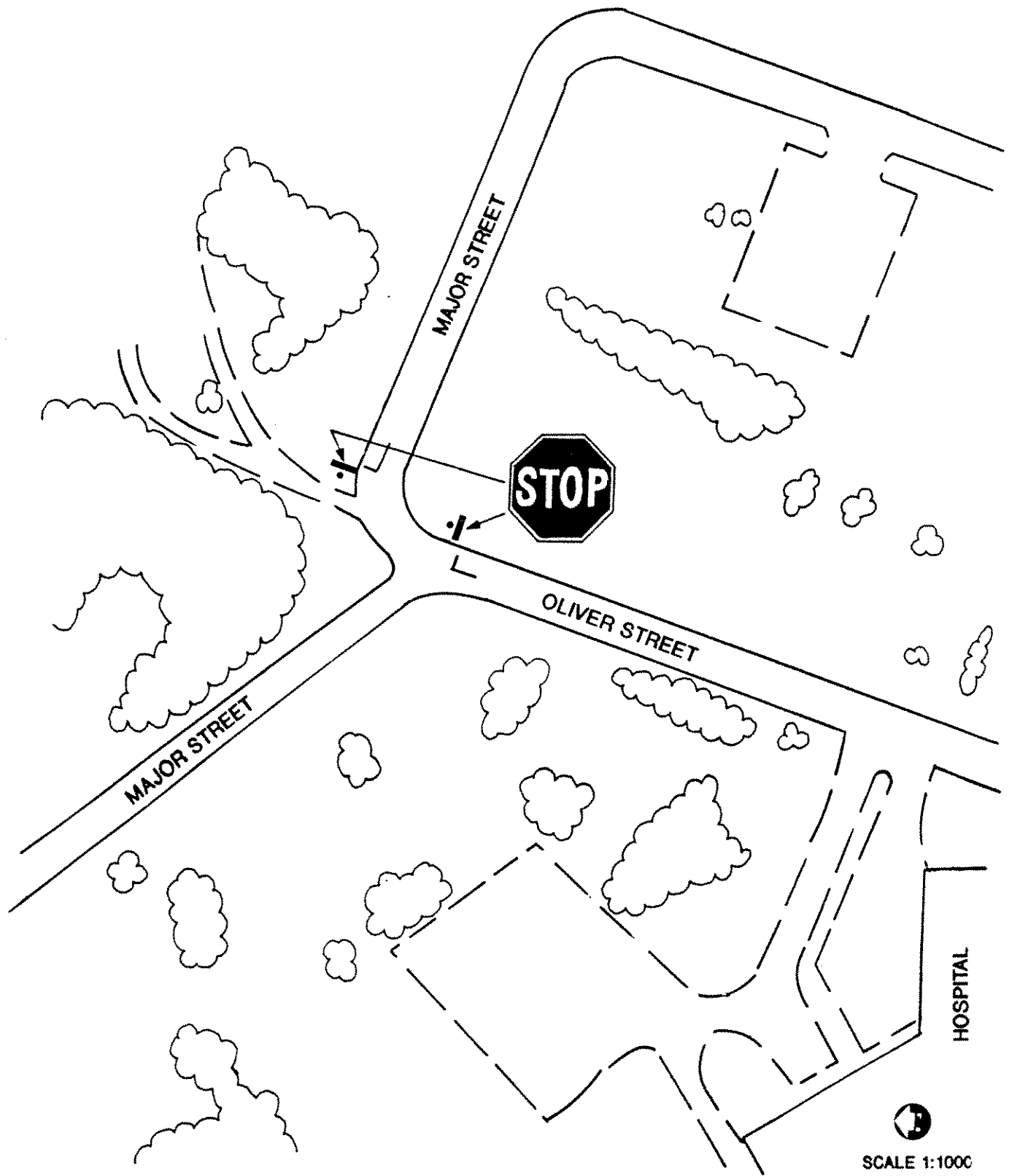
The existing traffic control at some locations can be enhanced to provide a safe environment to road users. The

intersection of Canrobert/Garry/Richard/Kent is a five legged intersection all under stop control and it is recommended that the tab "ALL WAY" be added under each sign on the approaches. The intersection of Centre Street and Bridge Street is four legged intersection; however, there is stop control on three approaches, therefore it is recommended that the tab " 3 way" be added below each sign, and stop bars be maintained.

The intersection of Major Street and Oliver Street requires upgrading in terms of traffic control. With the odd arrangement of the approaches and visibility constraints, it is recommended that a "STOP" sign be erected on the northbound approach of Oliver, the other existing control on Major Street will remain. These improvements are shown in Figure 3.10.

Visibility in the vicinity of some unsignalized intersection is less than desirable and therefore requires special attention. The crest of the hill on Market and on Ireton creates difficulties for turns from Cromwell onto Ireton, from Market onto Margaret, and Oliver at Market. It is recommended that "hidden intersection" signs be installed facing north on Ireton north of Cromwell, and at Market north of Oliver to provide warning to motorists. There is also poor visibility at the intersection of King and Booth Streets. It is recommended that a "hidden intersection" sign be installed on Booth Street south of River Street to provide warning regarding the King Street intersection.

A number of signs in the Town were noted to be non-standard with respect to the Manual of Uniform Traffic Control Devices of Ontario. It is recommended that the following signs be replaced with the standard signs:



<p>Town of Campbellford Traffic Operations Study</p>	<p>RECOMMENDED IMPROVEMENTS AT MAJOR STREET/ OLIVER STREET</p>	<p>FIGURE 3.10 DILLON</p>
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- Fort Street south at Saskatoon : No U Turn
- Bridge Street west of Canroberts: No U Turn
- Industrial Drive approaching Trent Drive: Opening Bridge
- Trent Drive approaching Industrial Drive: Opening Bridge

See Appendix C for illustration of standard signs to be used.

3.5 On-Street Parking

Parking on Bridge Street between Front and Doxsee has presented some problems to traffic flow in this area, it has also resulted in a number of accidents over the past years. The survey of these parking spots revealed that there is constant demand for parking at these locations and illegal parking throughout the day. The merchants on this street have no other parking facilities available for customers in close proximity.

In order to improve the congestion it is recommended that the no parking areas have to be delineated with yellow curb paint, and close monitoring and enforcement of no parking is advised. Strategies to provide accessible off-street parking in this area will need to be examined before eliminating parking in peak periods.

3.6 Traffic Monitoring Program

This study has brought the Town up to date with respect to traffic conditions and estimated future works. In order to assess the effectiveness of the implementation program presented here, it will be necessary to continue monitoring

the traffic conditions on the roadway and maintain an inventory of the traffic control equipment and traffic related information.

It is recommended that the Town continue to monitor the intersections on Bridge Street to determine changes in traffic flow. Records of accidents on Town roadways should be maintained and plotted on an accident location map, and details of incidents recorded on collision diagrams (see Appendix B) at intersection in order to determine trends in accident events to support future improvements. An inventory of all existing traffic control signage should be implemented to record when sign was installed, replaced or repaired.

The evaluation of the traffic operations of the Town should continue on an on-going basis to include such items as level-of-service at signalized intersections and parking duration/turnover. Future developments should be evaluated to determine the impacts they may have on the operation of the major roads in Town and the crossings of the Trent River.

To implement this program may require intensive work initially, then the monitoring and updating can continue at a reduced level of effort. Co-ordination of field staff to conduct and summarize traffic surveys would also be required. Such activities would likely require one half person per year with the most intensive work during the traffic survey.

Should the Town wish to pursue the option of maintaining their own traffic signal equipment, it would be necessary to hire technicians with training in the operation of solid state equipment. Alternatively the Town can continue using an outside maintenance controller to operate the system.

4. SCHEDULE FOR IMPLEMENTATION AND COST ESTIMATE

The recommended improvements have been grouped into four categories for implementation: immediate, 1 to 2 years, 3 to 5 years and 6 to 10 years time frames. The priority levels were developed based on the importance of the improvements to the safety of the road users, the available information on traffic demands, and the estimated cost of the improvements.

4.1 Immediate Program

The immediate implementation program includes items which affect the safety of the roadways in the Town and can be done by Town forces. The following items have been identified for this priority level:

1. Installation of "YIELD" control at 9 locations	\$450
2. Installation of "STOP" control at 4 locations	\$275
3. Add "ALL WAY" tabs to stop sign at Kent/Canrobert; and	\$275
4. Add "3 WAY" to sign at Centre/Bridge and upgrade paint strips	\$400
5. Signing improvements at Alma/Simpson	\$275
6. Install "Hidden Intersection" signs at three locations	\$175
7. Curve improvements at Isabella/Booth Street	\$1,100
8. Implement standard sign replacements	\$275
9. Design work for Canrobert/Bridge Street improvements	\$10,000
10. Installation of two checkerboard curve warning signs at 4 locations	\$1,350
11. Installation of one checkerboard warning sign with two arrow heads at 3 locations	\$500
12. Install "NO EXIT" signs at 7 locations	\$800
13. Install "NO EXIT" signs and checkerboard only at 1 location	\$200

The total estimated cost for these improvements is in the \$16,125.

4.2 One to Two Year Program

This program includes safety items that have a higher cost or a lesser importance than the immediate measures and could be combined with proposed improvements by others. Included in this program would be the following items:

- | | | |
|----|---|----------|
| 1. | Improvements to Bridge Street traffic control including the new traffic controllers, right turn green arrows (includes 90% subsidy for Grand/Bridge intersection) | \$25,000 |
| 2. | Install "NO EXIT" signs, checkerboard, and guiderail at 9 locations (contractor for guiderail) | \$6,250 |
| 3. | Implement a traffic monitoring and inventory program (by Town) | - |
| 4. | Initiate a strategic planning study for future development in the Town and impact on traffic patterns including Bridge location study | \$15,000 |
| 5. | Reconstruction of Canrobert/Bridge Street intersection with signal duct work | \$75,000 |
| 6. | Curve improvements on Bridge Street near Highway 30 | \$3,000 |

The estimated cost for these activities totals \$124,250 spread over a 2 year period. Items 5 and 6 could be carried out at the same time as the proposed reconstruction of the Bridge Street connecting link west of Grand Road. This two-year period of traffic monitoring will provide information to facilitate further improvement needs.

4.3 Three to Five Year Program

The improvements carried out in the first two years will provide benefits to traffic in the Town and also help to identify the development of any new problem areas. The

following items are identified for the four to five year time period but may vary based on the traffic trends experienced over the earlier time period:

1. Installation of traffic signals at Canrobert and Bridge Street \$75,000
2. Undertake study of Bridge Street and Centre Street to establish improvements necessary (by County)

The estimated cost to the Town for these items is \$75,000.

4.4 Six to Ten Year Program

This is the longer term program and it will depend on the trends established in the traffic monitoring program, and plans for development in the Town. The following items are identified as possible improvements:

1. Centre Street and Bridge Street realignment
2. Swing Bridge Signal System implementation
3. Preliminary Design and Construction of Second Bridge Crossing

No costs have been assigned to these items as they are variable.

APPENDIX A

TURNING MOVEMENTS FOR A.M., NOON, AND P.M. PEAK HOURS

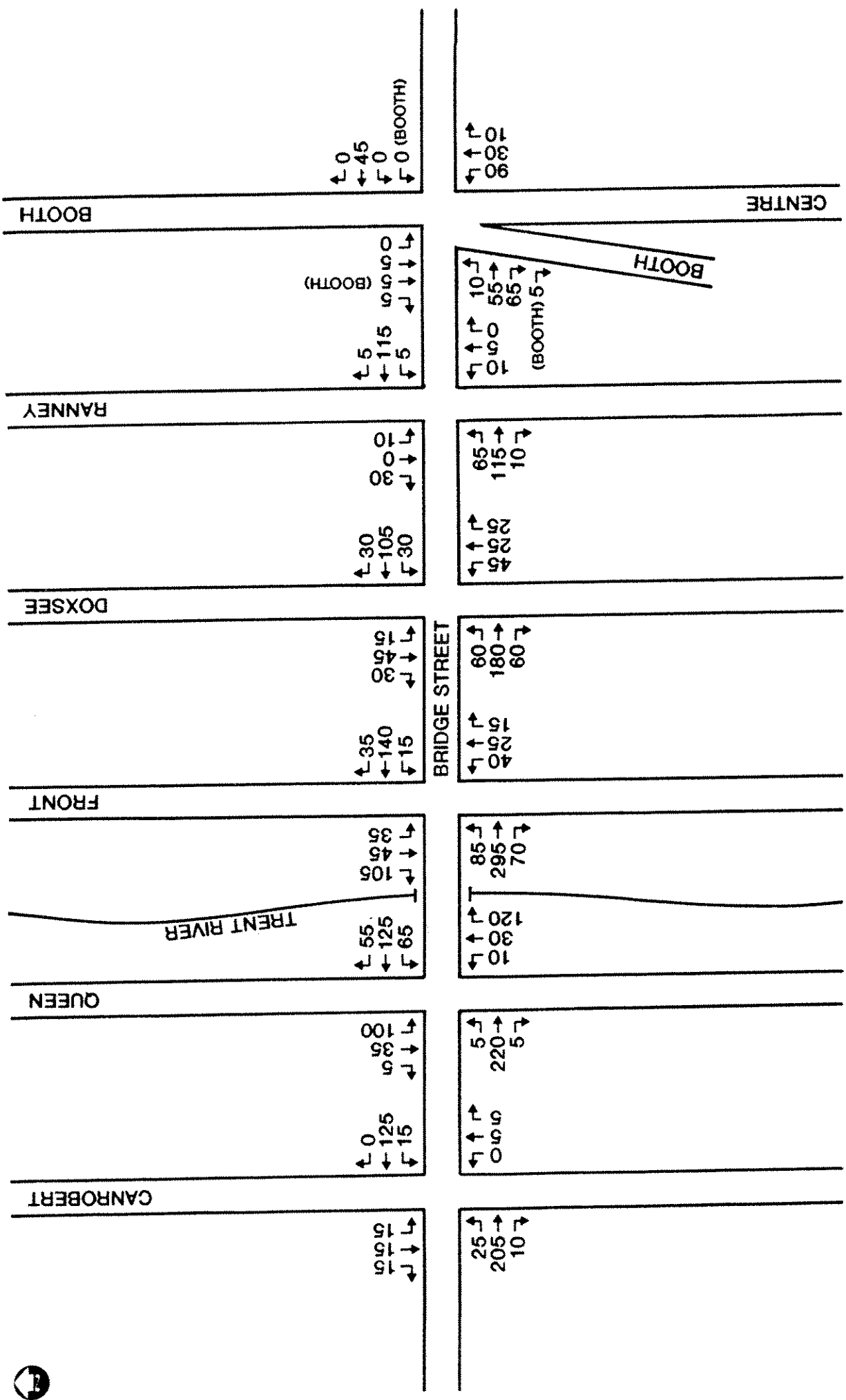
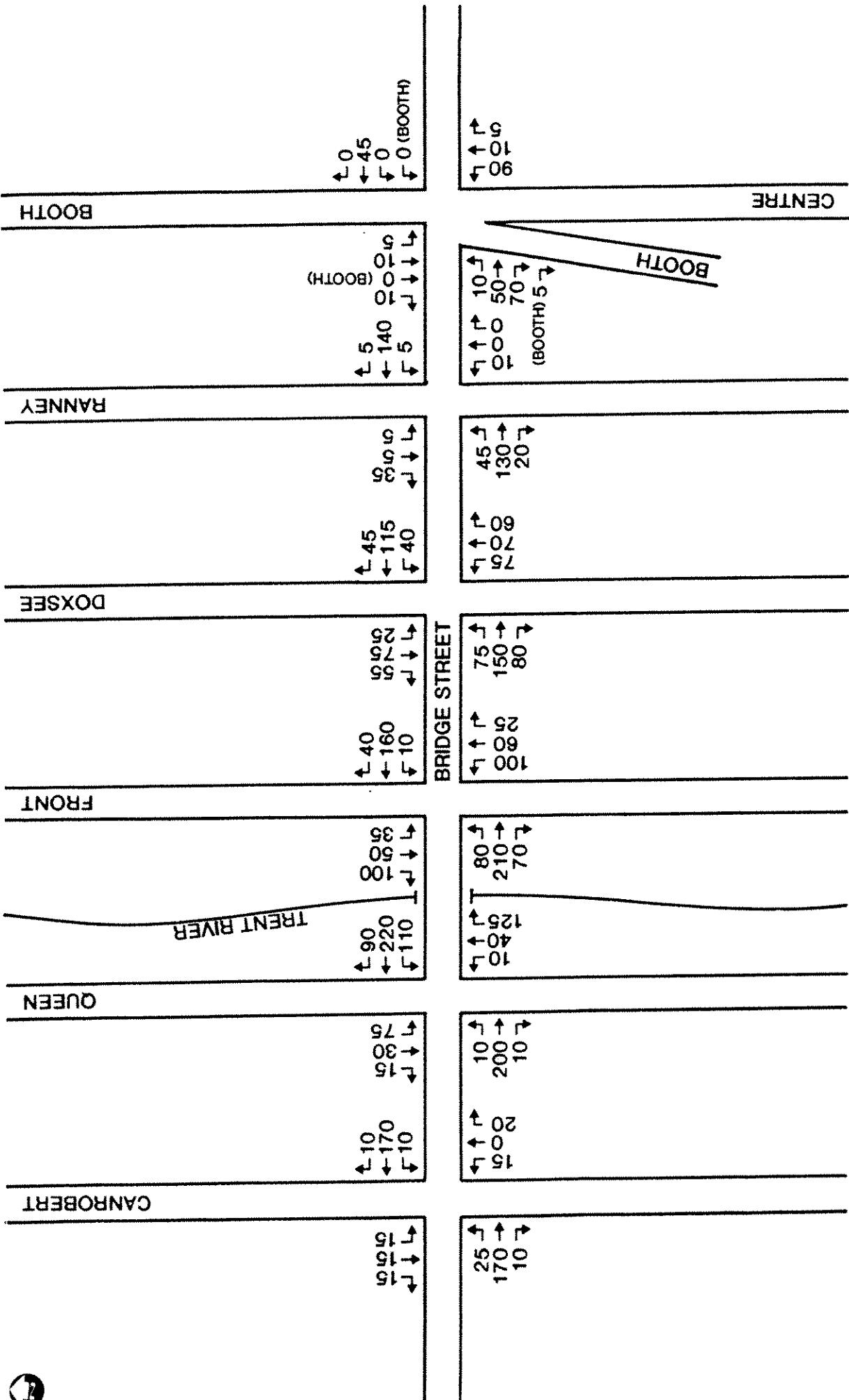
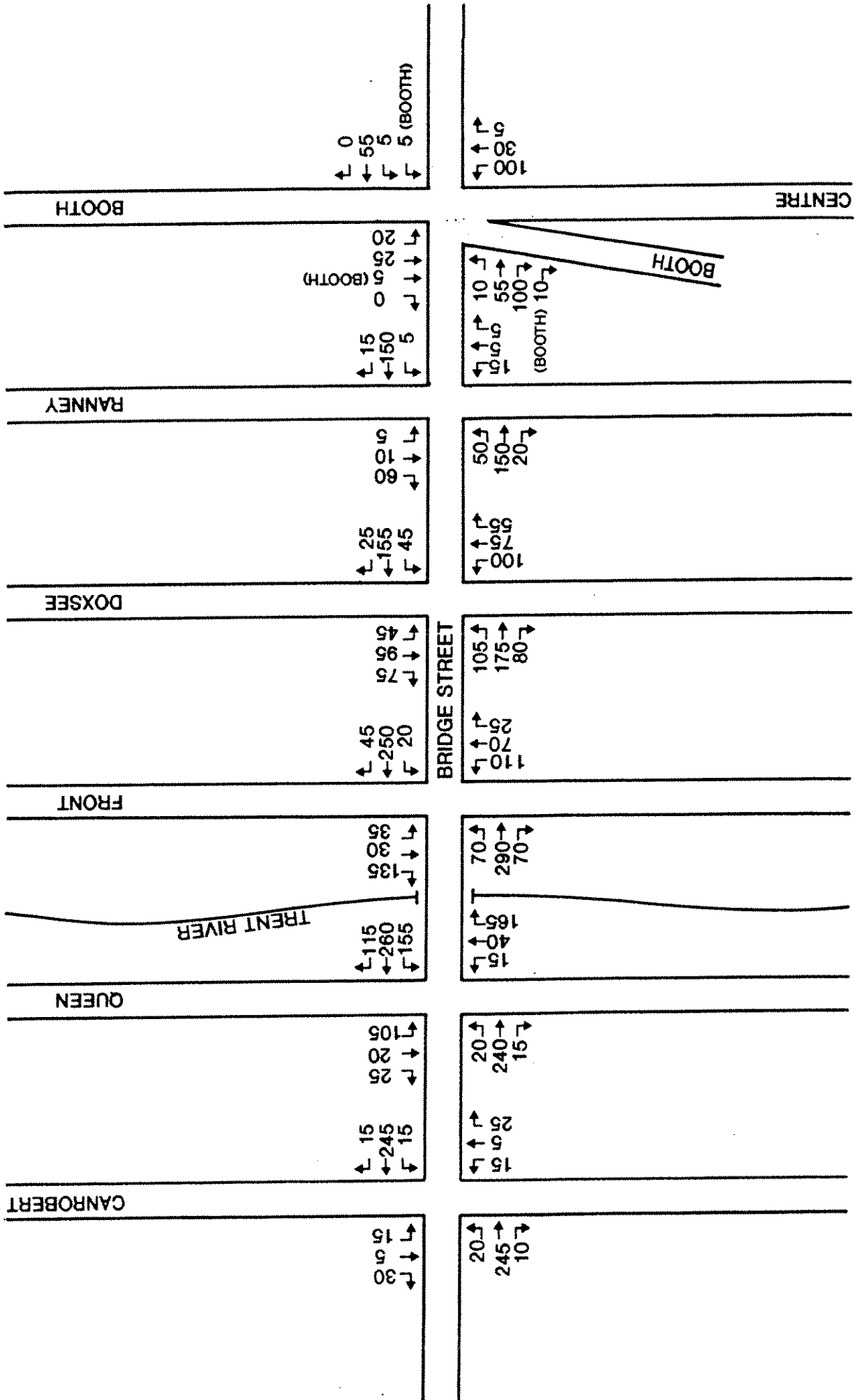


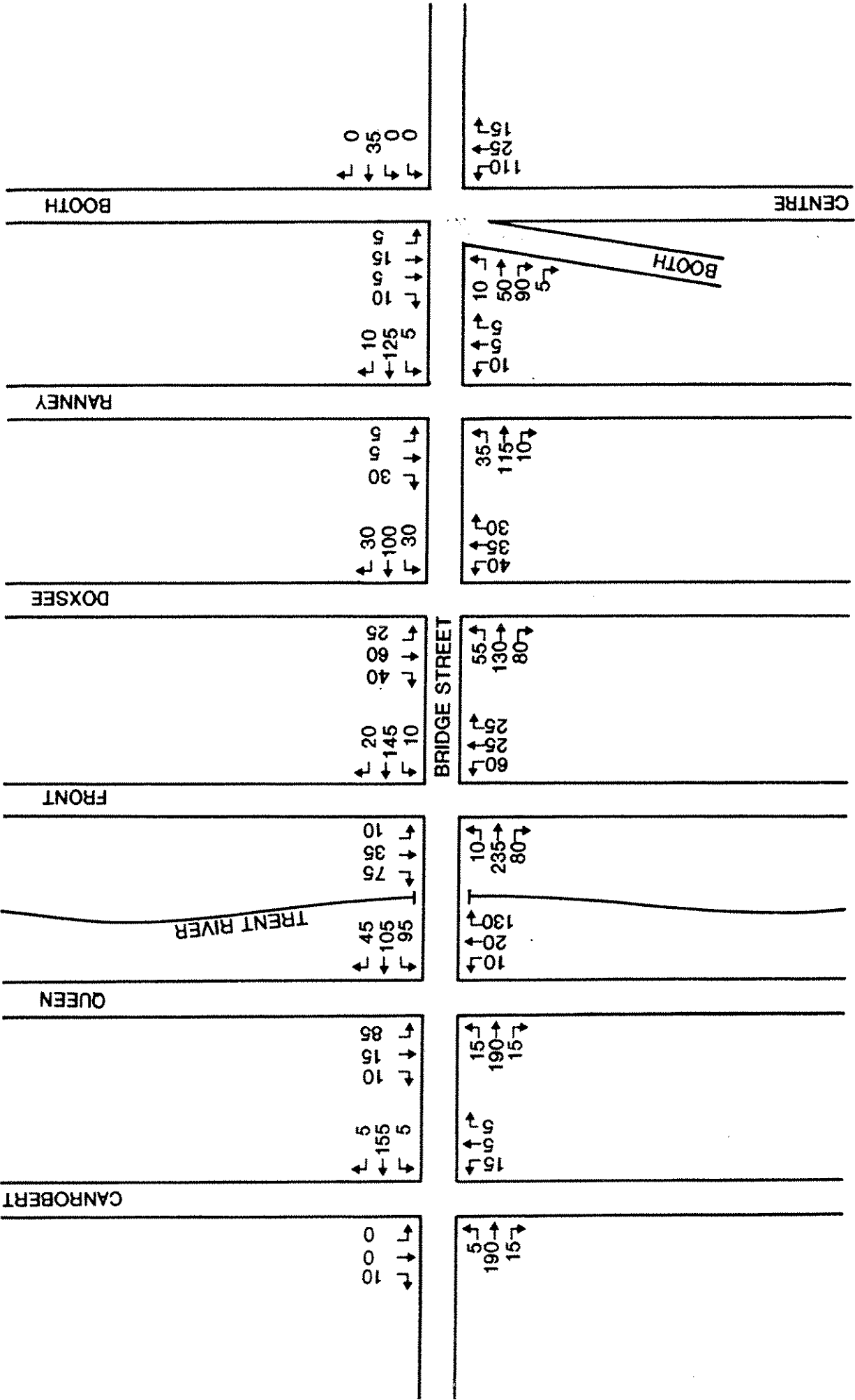
FIGURE A-1
DILLON

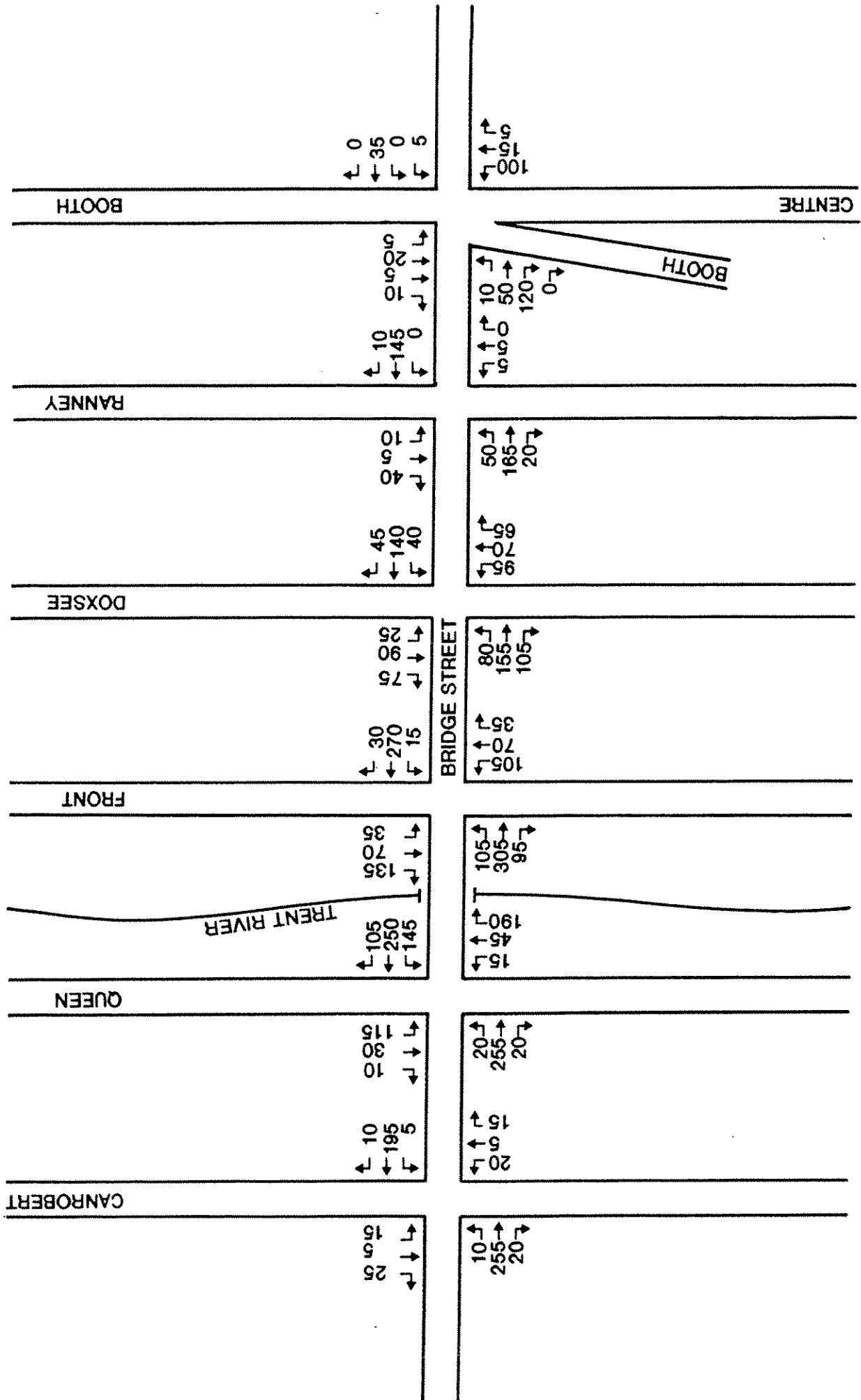
A.M. PEAK HOUR ON BRIDGE STREET
MARCH 1988

Town of Campbellford
Traffic Operations Study









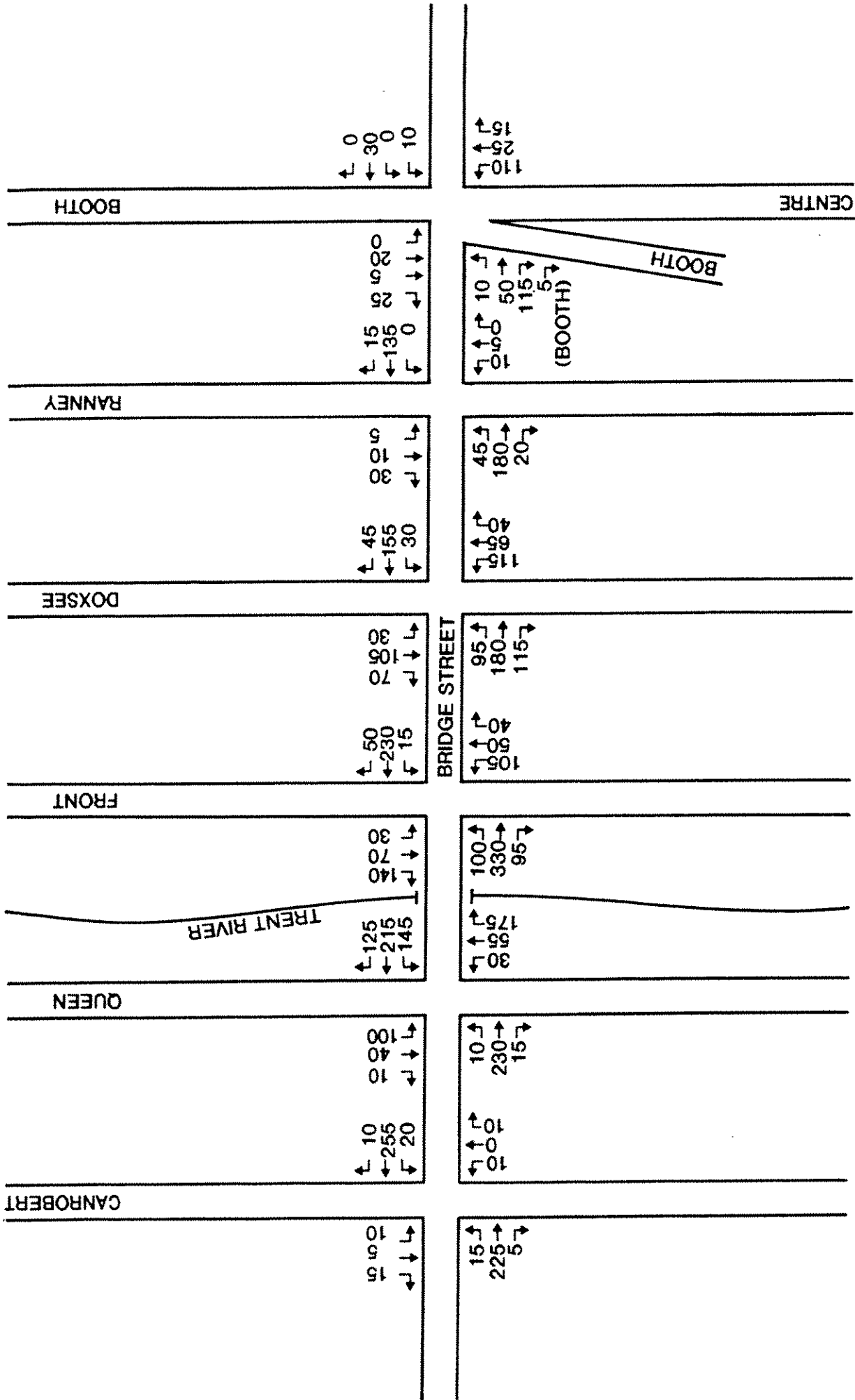


FIGURE A-6
DILLON

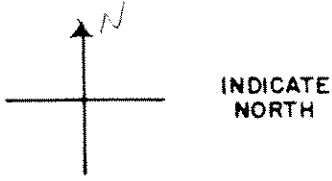
P.M. PEAK HOUR ON BRIDGE STREET
JULY 1988

APPENDIX B

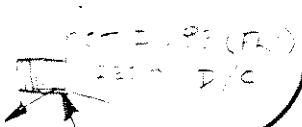
1983 TO 1987 COLLISION DIAGRAMS AT INTERSECTION ON
BRIDGE STREET

CAMPBELLFORD SURVEY
 LOCATION Bridge St. at Campbell St

COUNT No. _____
 FILE No. _____
 ANALYSIS BY _____
 DATE FROM 12- _____
 TO 1967 _____
 PERIOD _____



Year	Daylight	Darkness	Total
53	—	—	—
22	1	—	—
21-22	—	—	—



Handwritten notes:
 Mar 19, 66 (FRID)
 10:44 P.M.
 (4th St. - 1st St.)
 (at - 1st St. - 1st St.)
 (at - 1st St. - 1st St.)

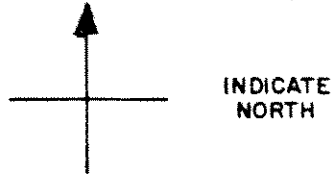
Handwritten note:
 Mar 15, 66 (FRID)
 10:35 I/Snow

LEGEND

- FATALITY
- PERSONAL INJURY
- ← VEHICLE PATH
- ←- - PEDESTRIAN PATH
- ←+ REAR END COLLISION
- ←/ SIDESWIPE
- ←+ HEAD ON COLLISION
- ☒ PARKED CAR
- ▨ FIXED OBJECT

- TIME:**
 A - a.m.
 P - p.m.
- ROAD CONDITION:**
 D - DRY
 W - WET
 S - SNOW
 I - ICE
- WEATHER:**
 C - CLEAR
 R - RAIN
 F - FOG

CAMPBELLFORD SURVEY
 LOCATION Bridge st AT Grand Rd



COUNT No. _____
 FILE No. _____
 ANALYSIS BY JWC
 DATE FROM 1983
 TO 1987
 PERIOD _____

Year	Daylight	Darkness	Total
83	3	-	3
84	-	1	1
87	2	-	2

Queen St

Oct 30, 83 (SUN)
 1400 D/C

Sept 7, 87 (Mon)
 1545 D/C

July 21, 83 (Tues)
 1345 W/R

Jan 1, 84 (SUN)
 1919 D/C

Jan 25 87 (SUN)
 0950 S/C

Sept 16, 83 (FRI)
 1655 W/R

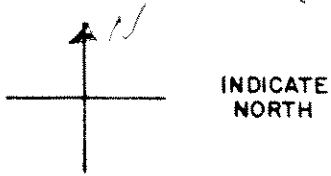
LEGEND

- FATALITY
- PERSONAL INJURY
- ← VEHICLE PATH
- ←- PEDESTRIAN PATH
- ←+ REAR END COLLISION
- ←/ SIDESWIPE
- ←X HEAD ON COLLISION
- ☒ PARKED CAR
- ▨ FIXED OBJECT

- TIME:**
 A - a.m.
 P - p.m.
- ROAD CONDITION:**
 D - DRY
 W - WET
 S - SNOW
 I - ICE
- WEATHER:**
 C - CLEAR
 R - RAIN
 F - FOG

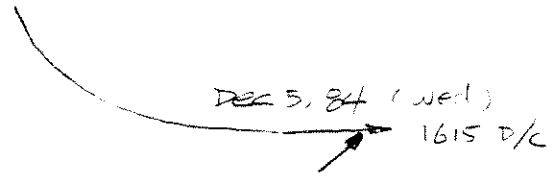
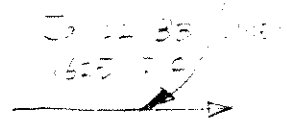
Grand Rd

CAMBERFORD SURVEY
 LOCATION BIDGE ST AT FRONT ST



COUNT No. _____
 FILE No. _____
 ANALYSIS BY JW
 DATE FROM 1985
 TO 85
 PERIOD _____

Year	Daylight	Darkness	Total
83	1	-	1
84	1	-	1
85	1	-	1
86-87	-	-	-



LEGEND

- FATALITY
- PERSONAL INJURY
- ← VEHICLE PATH
- ←- - - PEDESTRIAN PATH
- ←+ REAR END COLLISION
- ←/ SIDESWIPE
- ←X HEAD ON COLLISION
- ☒ PARKED CAR
- ▨ FIXED OBJECT

- TIME:
 A - a.m.
 P - p.m.
- ROAD CONDITION:
 D - DRY
 W - WET
 S - SNOW
 I - ICE
- WEATHER:
 C - CLEAR
 R - RAIN
 F - FOG

CAMPBELLFORD SURVEY
 LOCATION Bridge ST AT DOXSEE ST

COUNT No. _____
 FILE No. _____
 ANALYSIS BY JWL
 DATE FROM 1983
 TO 1987
 PERIOD _____



DOXSEE ST

Year	Daylight	Darkness	Total
83	1	-	1
84	-	2	2
85	1	-	1
87	-	2	2

^A
 Nov 10, 84 (SAT)
 1820 W/C

Bridge St
 Dec 26, 84 (Wed)
 2330 D/C

Apr 17, 87 (FRI)
 1205 D/C

LEGEND

- FATALITY
- PERSONAL INJURY
- ← VEHICLE PATH
- ←- - - PEDESTRIAN PATH
- ←* REAR END COLLISION
- ←/ SIDESWIPE
- ←* HEAD ON COLLISION
- ☒ PARKED CAR
- ▨ FIXED OBJECT

Mar 05, 87 (Thu)
 1154 D/C

Jan 6, 83 (Thu)
 0855 W/C

Oct 05, 85 (SAT)
 1030 D/C

TIME

- A - a.m.
- P - p.m.

ROAD CONDITION:

- D - DRY
- W - WET
- S - SNOW
- I - ICE

WEATHER:

- C - CLEAR
- R - RAIN
- F - FOG



M. M. DILLON LIMITED
 CONSULTING ENGINEERS

INTERSECTION ANALYSIS

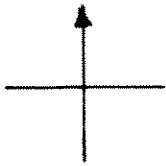
FORM: 6037

TRANSPORTATION PLANNING DEPT.

COLLISION DIAGRAM

MAR. 1966

CAMPBELL-FORD SURVEY
 LOCATION Bridge St. E AT Ranney St.



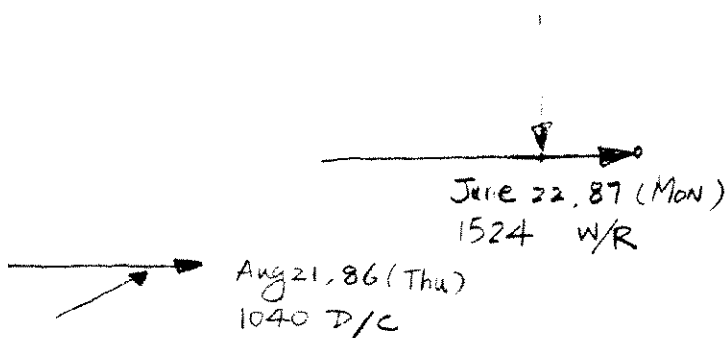
INDICATE NORTH

Ranney St

COUNT No. _____
 FILE No. _____
 ANALYSIS BY JWL
 DATE FROM 1986
 TO 1987
 PERIOD _____

Year	Daylight	Darkness	Total
86	1	-	1
87	1	-	1

Bridge St.



LEGEND

- FATALITY
- PERSONAL INJURY
- ← VEHICLE PATH
- ←- - PEDESTRIAN PATH
- ←+ REAR END COLLISION
- ←/ SIDESWIPE
- ←X HEAD ON COLLISION
- ☒ PARKED CAR
- ▨ FIXED OBJECT

TIME

- A - a.m.
- P - p.m.

ROAD CONDITION:

- D - DRY
- W - WET
- S - SNOW
- I - ICE

WEATHER:

- C - CLEAR
- R - RAIN
- F - FOG

M. M. DILLON LIMITED
 CONSULTING ENGINEERS

INTERSECTION ANALYSIS

FORM: 6037

TRANSPORTATION PLANNING DEPT.

COLLISION DIAGRAM

MAR. 1966

CAMPBELL FORD SURVEY
 LOCATION Bridge of E AT Centre St.

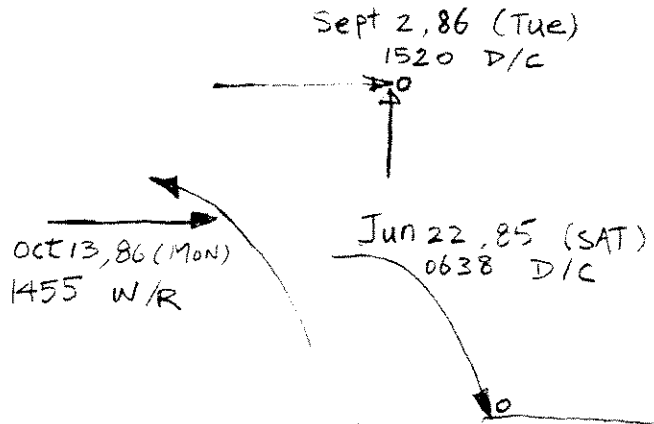
COUNT No. _____
 FILE No. _____
 ANALYSIS BY Jaw
 DATE FROM 1933
 TO 1977
 PERIOD _____



Booth St. W

Year	Daylight	Darkness	Total
85	1	-	1
86	2	-	2

Bridge



LEGEND

- FATALITY
- PERSONAL INJURY
- ← VEHICLE PATH
- ← PEDESTRIAN PATH
- ←* REAR END COLLISION
- ←↔ SIDESWIPE
- ←→ HEAD ON COLLISION
- ☒ PARKED CAR
- ▨ FIXED OBJECT

- TIME:**
 A - a.m.
 P - p.m.
- ROAD CONDITION:**
 D - DRY
 W - WET
 S - SNOW
 I - ICE
- WEATHER:**
 C - CLEAR
 R - RAIN
 F - FOG

 **M. M. DILLON LIMITED**
 CONSULTING ENGINEERS
 TRANSPORTATION PLANNING DEPT.

INTERSECTION ANALYSIS
COLLISION DIAGRAM

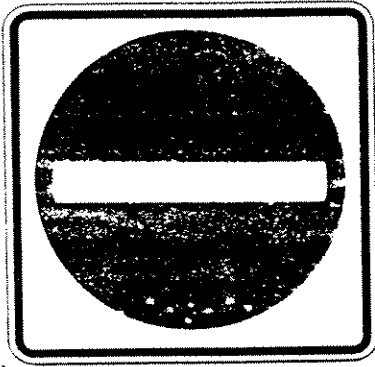
FORM: 6037
 MAR. 1966

APPENDIX C

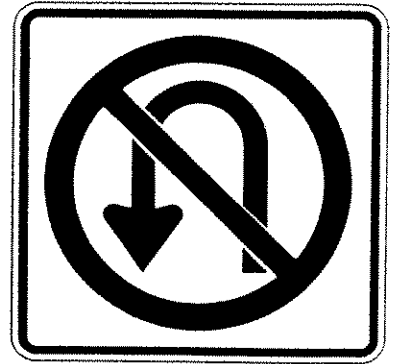
STANDARD SIGN DESCRIPTION

APPENDIX C

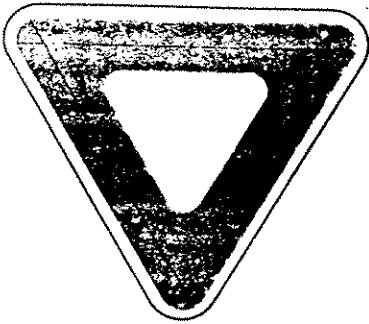
STANDARD SIGN DESCRIPTION



DO NOT ENTER



NO U TURN



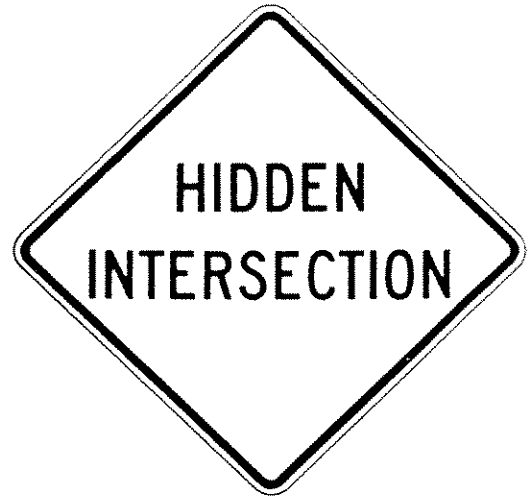
YIELD



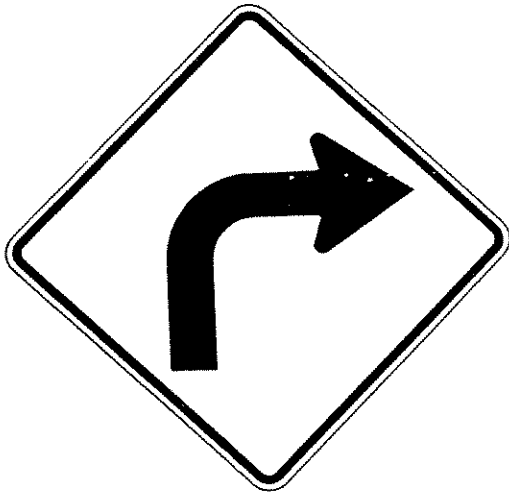
STOP



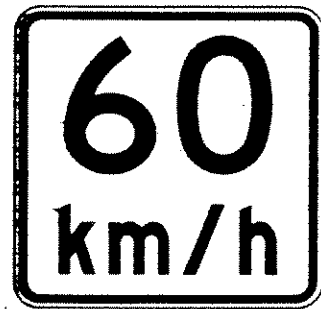
NO EXIT



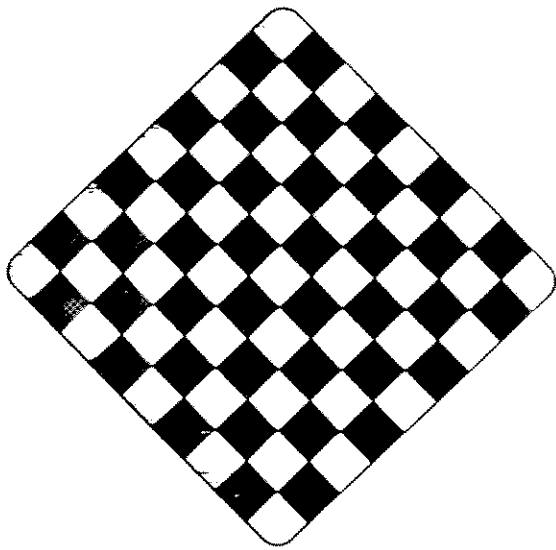
HIDDEN INTERSECTION



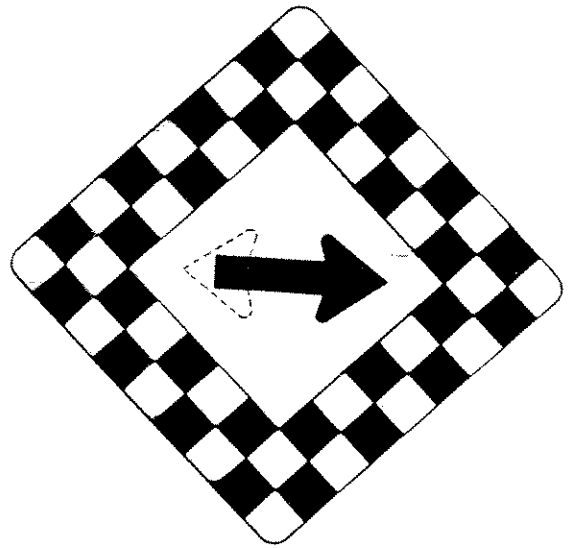
CURVE WARNING



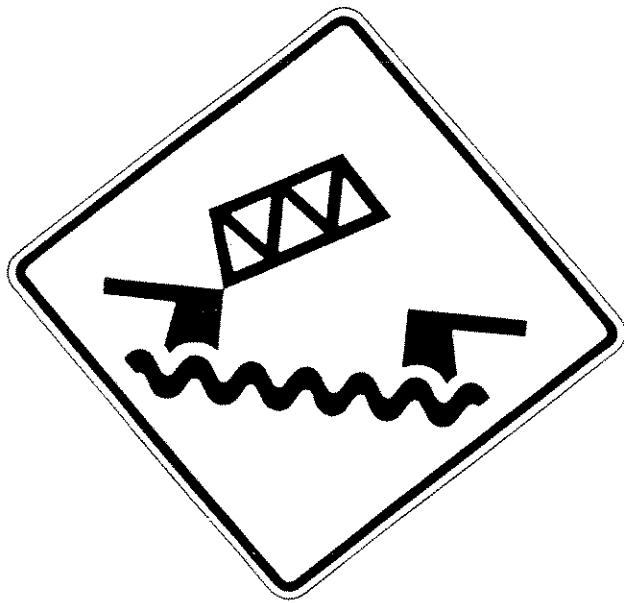
SPEED ADVISORY



CHECKER BOARD



CHECKER BOARD
WITH ARROWS



OPENING BRIDGE