DISTRICT
OF LAKE
COUNTRY

Traffic Study

DRAFT

Winfield Town Centre

URBAN SYSTEMS

December
1998

URBAN SYSTEMS.

ENGINEERS
PLANNERS
LANDSCAPE ARCHITECTS

January 7, 1999 File No.: 6157708.1

Ministry of Transportation and Highways
South Okanagan Highways District
254 Haynes Street
Penticton, BC V2A 5R9

Attention: Ms. Joey Bryant
Senior District Development Technician

Dear Ms. Bryant:

Reference: Winfield Town Centre Traffic Study

Enclosed is a copy of our draft Traffic Study for the proposed Winfield Town Centre, as well as a diskette containing output from our traffic analysis in electronic format.

Would you please review the report and indicate whether the Ministry of Transportation and Highways is in agreement with the study conclusions. At the outset of our work, you had indicated that you would be able to review material within two weeks, and consequently we would ask that if possible, your comments be provided by January 22. As you are aware, the District of Lake Country wishes to proceed with re-zoning as soon as possible, and the Ministry's feedback regarding the conclusions of the Traffic Study is an essential step in that process.

If you have any questions regarding the Traffic Study, please call me at 604-273-8700.

Sincerely,

URBAN SYSTEMS LTD.

Richard Drdul, P.Eng.
Community Transportation Planner

cc: Randall Rose, District of Lake Country
Ed Grifone, Urban Systems, Kelowna

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DISTRICT OF LAKE COUNTRY

Traffic Study

Winfield Town Centre

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SUMMARY

This report provides a description of the traffic analysis for the proposed Winfield Town Centre. The purpose of this study is to estimate the amount of traffic which would be generated by proposed development in the Winfield Town Centre, and identify off-site highway improvements and on-site transportation facilities required to accommodate this traffic.

The proposed Winfield Town Centre is located east of and adjacent to Highway 97, between Beaver Lake Road and Berry Road. Planned and proposed future development in the Town Centre includes 28,000 m^2 of commercial uses, 12,000 m^2 of office and institutional uses, and 30 multi-family dwelling units. It is anticipated that development of the Town Centre would be completed by 2007.

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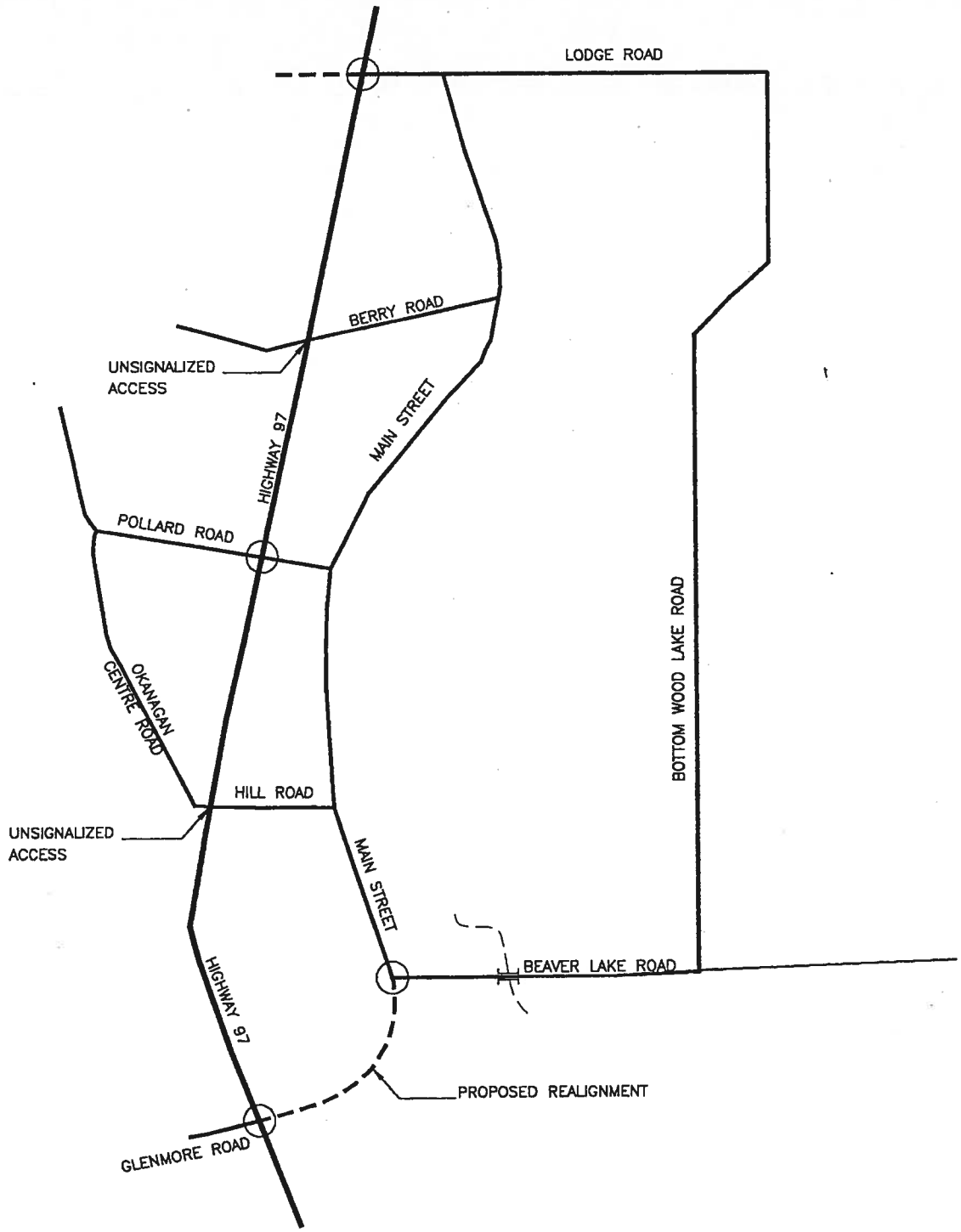
The traffic analysis was based on forecasts of future traffic volumes, which were prepared using traffic data provided by the Ministry of Transportation and Highways (MoTH) and trip generation rates contained in MoTH's *Trip Generation and Parking* manual. In accordance with MoTH requirements, the traffic analysis was undertaken for four horizon years — 2003, 2007, 2012 and 2017. The key findings of the traffic analysis are:

Road Network

- The proposed Town Centre road network — illustrated in Figure A — will accommodate Town Centre traffic at acceptable levels of service through to 2017.

- Efficient traffic operations on the Town Centre road network will require several additions and changes to the road network elsewhere in Lake Country, including:

  - A connection from Bottom Woods Lake Road (east of Vernon Creek) to Lodge Road.
  - A direct connection between Pollard Road and Okanagan Centre Road.



TRAFFIC SIGNAL

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DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

FUTURE ROAD NETWORK

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FIGURE A DEC 1998

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- There is no need to realign Beaver Lake Road as proposed by MoTH in order to accommodate traffic generated by Town Centre development. However, realignment of Beaver Lake Road to a new intersection south of the existing intersection would be desirable to improve grades on Beaver Lake Road.

- New traffic signals will be required at the Pollard/Highway 97 intersection. The existing traffic signals at the Berry/Highway 97 intersection should be relocated to the Lodge/Highway 97 intersection.

- Traffic signals will be required at the Beaver Lake/Main intersection by 2007 as a result of Town Centre development. Traffic signals are required regardless of whether or not Beaver Lake Road is realigned as proposed by MoTH.

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Berry Road

- The traffic signals at the Berry/Highway 97 intersection should remain until the following improvements are implemented, at which time the signals should be relocated to the Lodge/Highway 97 intersection.

  - Bottom Woods Lake Road (east of Vernon Creek) is connected to Lodge Road.
  - The Pollard/Highway 97 intersection is signalized.
  - Main Street is completed between Pollard Road and Berry Road.

- The crossing of Vernon Creek at Bottom Woods Lake Road should not be closed until Bottom Woods Lake Road (east of Vernon Creek) is connected to Lodge Road, and the Lodge/Highway 97 intersection is signalized.

- Access to Grant Road immediately east of Highway 97 on Berry Road should be restricted to right-in/right-out only (no left turns) when Main Street is completed between Berry Road and Pollard Road, or when additional development occurs in the area south of Berry Road (whichever occurs first).

- When the Pollard/Highway 97 intersection has been signalized and Main Street completed between Pollard and Berry Roads, the existing commercial driveway on the east side of Highway 97 south of Berry Road should be restricted to right turns in and right turns out only. Left turns into or out of the driveway would be prohibited.

Pollard Road

- Pollard Road should be connected directly to Okanagan Centre Road prior to removal of the signal at Berry Road. The section of Okanagan Centre Road south of Pollard Road would become a local street providing access to adjacent residences.

- When developments proceed which require access via Pollard, one of two things must occur:
  - Signalization of Pollard/Highway 97.
  - Or, completion of Main Street from Pollard to Berry Road or to Beaver Lake Road (where there are traffic signals).

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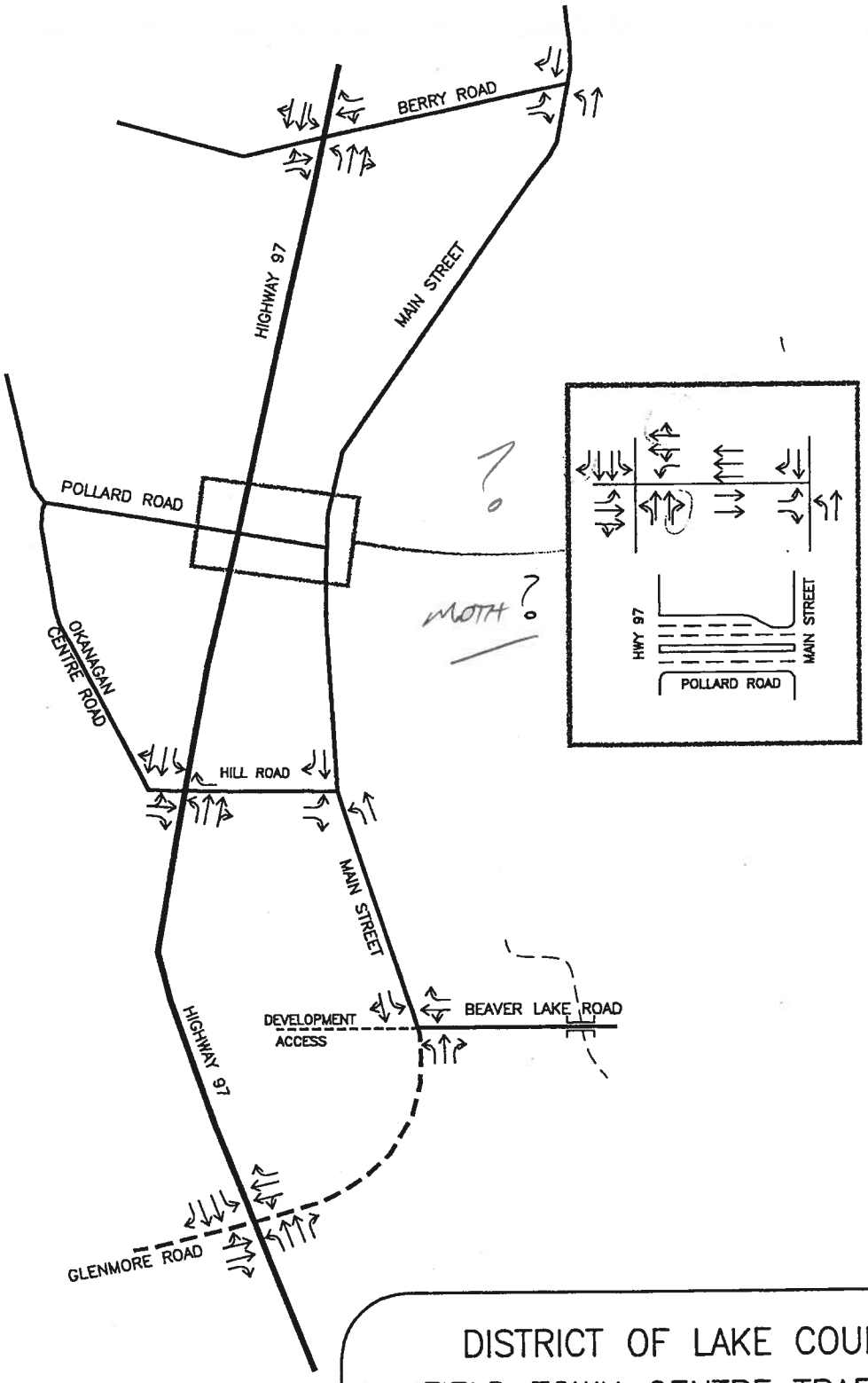
- A minimum distance of 50m is required between crosswalks on Pollard Road between Highway 97 and Main Street. Westbound, there would be three lanes on this section of Pollard Road, with a curb extension at Main Street to narrow the westbound part of the roadway to two lanes at this point (thereby minimizing weaving movements on Pollard). Eastbound there would be two lanes throughout, as illustrated in Figure B.

- No access should be permitted on Pollard Road between Highway 97 and Main Street. All access to adjacent properties should be via Main Street.

- Right turn lanes will be required northbound and southbound at the Pollard/Highway 97 intersection by 2012.

Hill Road

- The existing westbound left turn prohibition at the Hill/Highway 97 intersection should remain.



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DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

INTERSECTION LANING

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FIGURE B DEC 1998

6157708.1 NOT TO SCALE

- In order to accommodate traffic generated by additional development in the vicinity of Hill Road, Main Street must be completed between Hill Road and Pollard Road (if signalized), Berry Road or Beaver Lake Road.

- When Main Street is connected to both Beaver Lake Road *and* Pollard Road, the existing commercial driveway on the east side of Highway 97 north of Hill Road should be restricted to right turns in and right turns out only. Left turns into or out of the driveway would be prohibited.

Beaver Lake Road

- Beaver Lake Road can remain a two-lane road across Vernon Creek. The proposed alignment of Main Street locates the Main/Beaver Lake intersection further west than proposed by MoTH. This is preferred as it would provide sufficient distance between the intersection and the creek crossing to widen westbound Beaver Lake Road to two lanes in this section, providing one left/through lane and one right turn lane at the Main Street intersection, as illustrated in Figure B.

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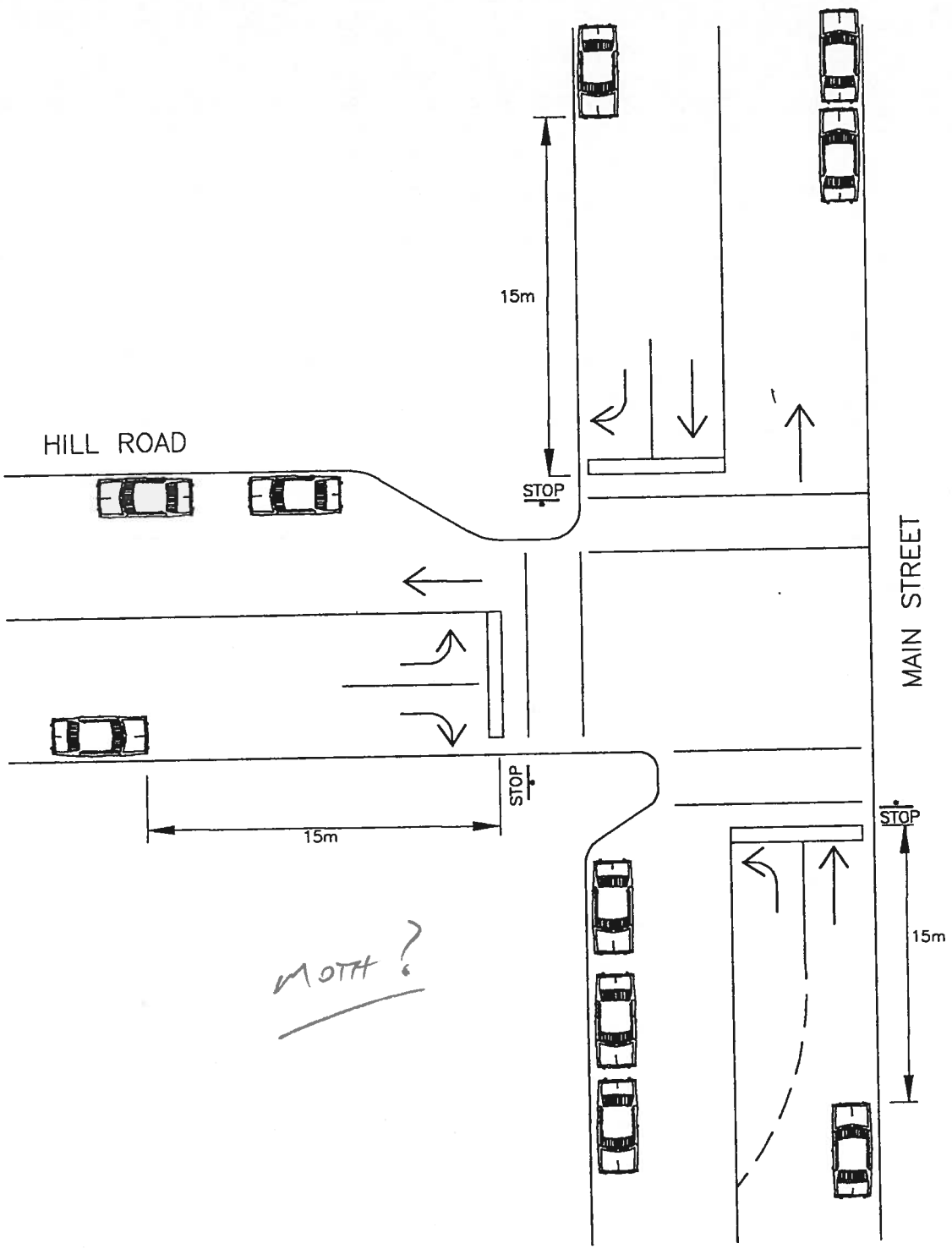
- By 2007 when Town Centre development is complete, a separate westbound right turn lane will be required at the Beaver Lake/Highway 97 intersection, if this intersection has not been relocated to the south as proposed by MoTH.

- In order to accommodate increased traffic in 2017, an additional left turn lane will be required at the Beaver Lake/Highway 97 intersection, as compared with the intersection design proposed by MoTH. This additional turn lane is required because of additional traffic generated by the Town Centre.

Main Street

- Two travel lanes (one in each direction) are sufficient on Main Street. Additional turning lanes (left turn and right turn lanes) should be provided at all intersections, as illustrated in Figure C. Turn lanes are not likely to be necessary at driveways unless turning volumes are expected to be high — this would be determined at the development approval stage.



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

TYPICAL INTERSECTION DESIGN

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FIGURE C DEC 1998

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- On-street parking can be provided on both sides of Main Street. Parking should be restricted within 15m of the approach to an intersection, so that turning lanes can be provided, as illustrated in Figure C.

- Driveways can be located anywhere along Main Street, except with 15m to 25m of intersections as illustrated in Figure D. Developers should be encouraged to avoid locating driveways close to other driveways — in this case, it would be preferable to consolidate access into a single driveway rather than have two driveways located side-by-side.

- The only traffic signals required on Main Street are at the Beaver Lake Road intersection. This signal is required regardless of whether or not Beaver Lake Road is realigned as proposed by MoTH.

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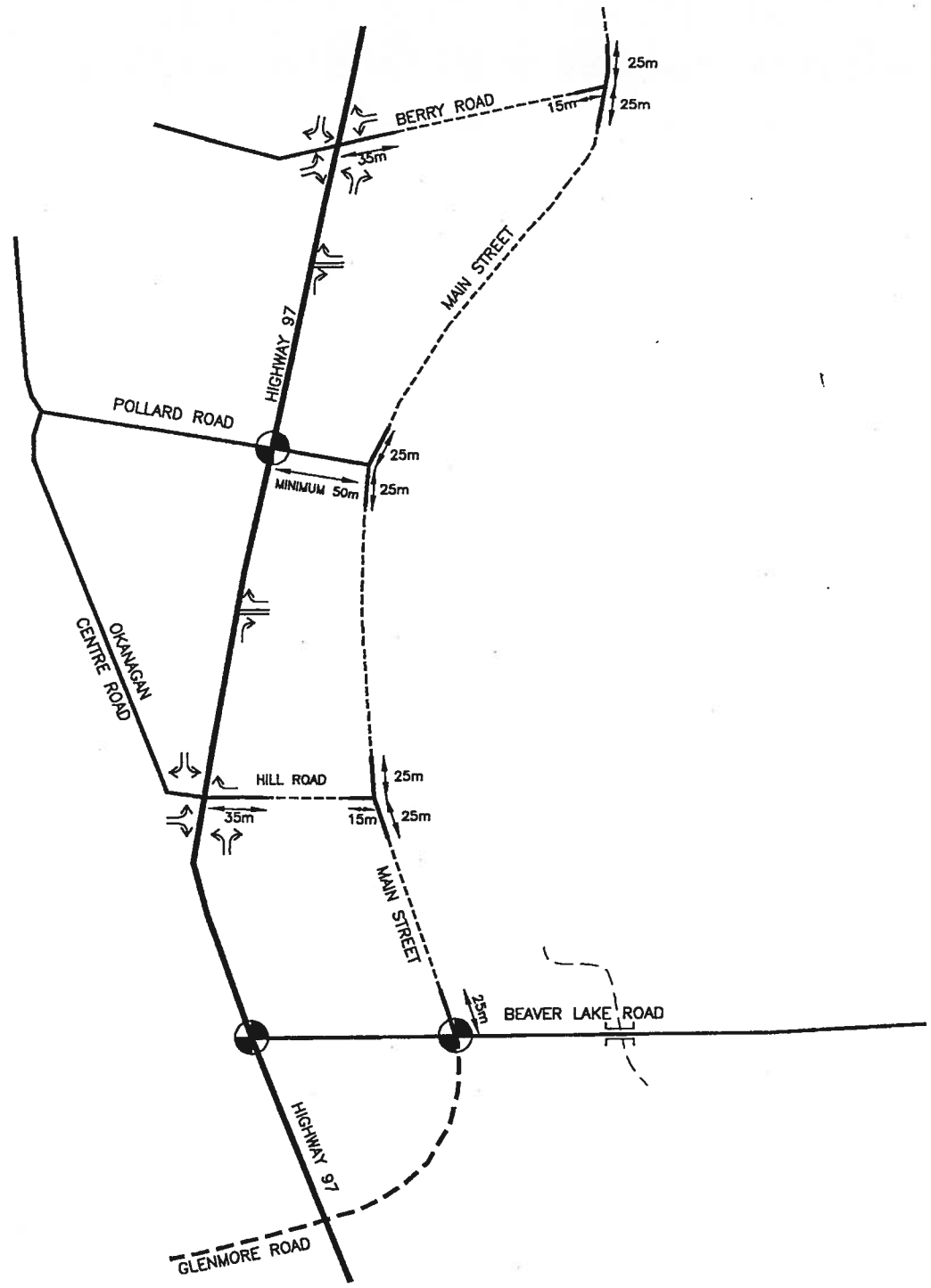
- Three-way stop control is desirable at the Main/Pollard intersection, so as to ensure efficient traffic movement and minimum queue lengths on Pollard Road between Highway 97 and Main Street.

- Although the preferred orientation of stop signs at the Hill Road and Berry Road intersections on Main Street is east-west (with priority to Main Street), three-way stop control could be considered at these intersections to minimize the potential for vehicle-vehicle and vehicle-pedestrian conflicts.

- When Beaver Lake Road is realigned as proposed by MoTH, the existing west leg of the intersection should be retained to provide access to development west of Main Street.

- The most costly section of Main Street to construct will be the section between Hill Road and Beaver Lake Road, as significant earthworks and a retaining wall will be required to cross the small ravine. For this reason, this section of Main Street is identified in the implementation phasing as the last section to be constructed.



NOTE:
DIMENSIONS ARE TO CROSSWALKS AT INTERSECTIONS, NOT TO CENTRE LINES OF INTERSECTIONS.

- NO ACCESS
- ACCESS PERMITTED
- FUTURE ALIGNMENT (NO ACCESS)
- DRIVEWAY
- PERMITTED MOVEMENT
- TRAFFIC SIGNAL

DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

ACCESS MANAGEMENT

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FIGURE D DEC 1998

6157708.1 NOT TO SCALE

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Parking

- Up to 1,564 additional parking stalls will be required in the Town Centre (parking requirements are calculated based on MoTH parking rates).

- Up to 300 parking stalls can be provided on Main Street, Hill Road and Berry Road. This estimate assumes a length of 6.6m per parking stall (with a width of 2.4m).

- For on-site parking lots, stall dimensions should be 2.7m by 5.3m. Ninety-degree parking with two-way circulation is preferred, which requires a module width of 17.6m. Reduced-dimension "small car" parking stalls are not recommended in view of the increasing proportion of larger automobiles (minivans, sport-utility vehicles and pickup trucks).

- Where possible, commercial loading bays should be provided on-site. This will likely not be possible for development on the east side of Main Street, however, due to constrained lot dimensions. For commercial uses in this area, an option would be to provide designated commercial loading bays on the east side of Main Street, at intervals of approximately 100m.

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Highway Improvements Required Due To Town Centre Development

The following improvements on Highway 97 would be required as a result of additional traffic generated by Town Centre development:

- Traffic signals at the Pollard/Highway 97 intersection.

- Right turn lanes northbound/southbound on Highway 97 at the Pollard/Highway 97 intersection.

- A separate westbound right turn lane at the existing Beaver Lake/Highway 97 intersection, *or* an additional westbound left turn lane at the new Beaver Lake/Highway 97 intersection.

- Raised medians at the two driveway accesses on the east side of Highway 97, to prevent left turns.

It is estimated that the costs of these improvements would total $350,000. Other improvements on Highway 97 — particularly the relocation of the Beaver Lake/Highway 97 intersection to the south — are not required as a result of additional Town Centre traffic.

Implementation

Although it anticipated that Town Centre development would be completed by 2007, the timing of development of specific properties within the Town Centre area is uncertain. Despite this uncertainty, it is possible to identify specific phasing requirements relating to development. The following summary is intended to provide guidance as to how the Town Centre road network would be implemented as development proceeds.

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1. Immediate (1999/2000)

- The proposed development on the north side of Beaver Lake Road proceeds. All development access is via Beaver Lake Road.
- The proposed development at Pollard Road proceeds. The Pollard/Highway 97 intersection is signalized (the signals at Berry/Highway 97 remain). Northbound and southbound right turn lanes are constructed at the intersection.
- The proposed expansion of the development on the northeast corner of the Hill/Highway 97 intersection proceeds. Main Street is completed between Pollard Road and Hill Road.

2. Short-Term (2001-2003)

- Pollard Road is connected directly to Okanagan Centre Road.
- The following four improvements should occur at the same time:
  - Bottom Woods Lake Road (east of Vernon Creek) is extended to Lodge Road.
  - Berry/Highway 97 signals relocated to Lodge/Highway 97.
  - Main Street is completed between Berry and Pollard Roads.
  - Bottom Woods Lake Road across Vernon Creek is closed.

- Remaining additional development(s) in the area between Berry Road and Pollard Road proceed.
- Remaining additional development(s) in the area between Pollard Road and Hill Road proceed.

3. Medium-Term (2004-2007, full build-out)

- Main Street is completed between Beaver Lake Road and Hill Road. The Main/Beaver Lake intersection is signalized.
- Remaining additional development(s) in the area between Hill Road and Beaver Lake Road proceed.
- Development of the area south of Beaver Lake Road proceeds, consistent with MoTH plans to realign Beaver Lake Road in future. All development access is via Beaver Lake Road (when Beaver Lake Road is realigned, access would be via a fourth leg of the Main/Beaver Lake intersection).
- A separate westbound right turn lane is constructed at the existing Beaver Lake/Highway 97 intersection (if the intersection has not been relocated as proposed by MoTH).

4. Long-Term (2008-2017)

- MoTH relocates Beaver Lake/Highway 97 intersection to the south of the existing intersection.
- An additional westbound left turn lane is constructed at the Beaver Lake/Highway 97 intersection, creating dual left turn lanes.

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1. INTRODUCTION

This report provides a description of the traffic analysis for the proposed Winfield Town Centre. The purpose of this study is to estimate the amount of traffic which would be generated by proposed development in the Winfield Town Centre, and identify off-site highway improvements and on-site transportation facilities required to accommodate this traffic.

This Traffic Study was undertaken in accordance with the requirements contained in the Ministry of Transportation and Highways' (MoTH's) *Site Impact Analysis* manual. There were also discussions and correspondence with MoTH District staff regarding assumptions used in developing traffic forecasts and analyzing traffic conditions. These assumptions are documented in Section 3.

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1.1 Town Centre Location and Study Area

The proposed Winfield Town Centre is located on the east side of Highway 97, between Beaver Lake Road and Berry Road, as illustrated in **Figure 1**. Vernon Creek forms the eastern boundary of the Town Centre. Within the Town Centre, approximately 16 acres of land is available for development, in addition to existing development.

NO GOES ACROSS !

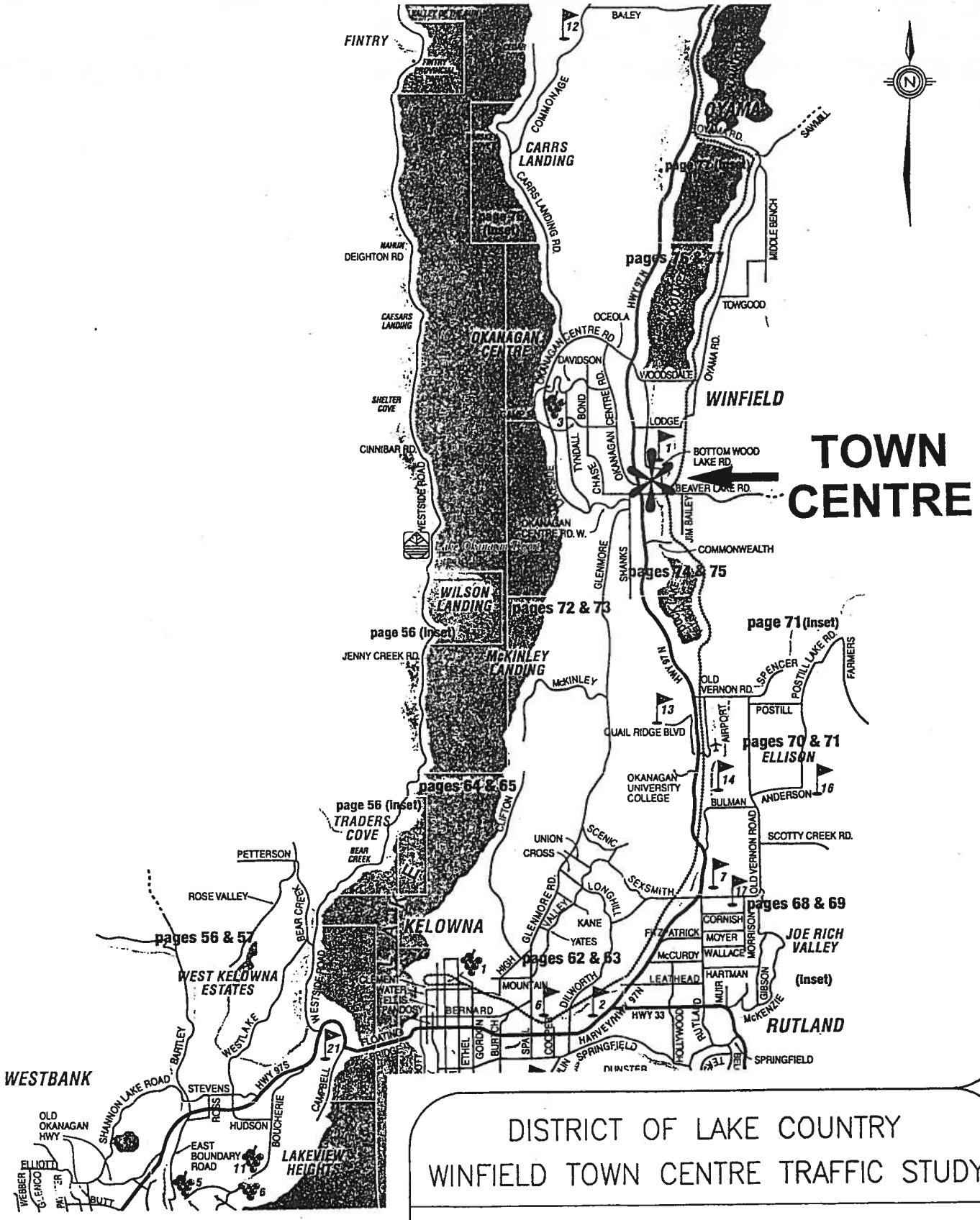
The study area for the Traffic Study includes the site of the proposed Town Centre. Development plans for the areas east of vernon Creek and north of Berry Road were also considered for the purposes of forecasting background traffic, although these areas are not within the Town Centre site.

SOME IS IN SOCIETY OF HOPE

Traffic operations were analyzed for the following intersections within and on the boundary of the Town Centre:

- Berry Road/Highway 97
- Pollard Road/Highway 97

LODGE ROAD/HWY 97



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

TOWN CENTRE LOCATION

URBAN SYSTEMS

FIGURE 1

DEC 1998

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- Hill Road/Okanagan Centre Road/Highway 97
- Beaver Lake Road/Glenmore Road/Highway 97
- Berry Road/Main Street
- Pollard Road/Main Street
- Hill Road/Main Street
- Beaver Lake Road/Main Street

Traffic operations at other intersections were not analyzed. At intersections such as Lodge Road/Highway 97 and Bottom Wood Lake Road/Beaver Lake Road, improvements have been identified in previous plans or would be required in order to accommodate background traffic and/or traffic generated by new development other than the Town Centre. Consequently, Town Centre traffic would not be a significant factor in determining the scope of improvements. For this reason, traffic operations at these intersections were not analyzed.

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1.2 Road Network

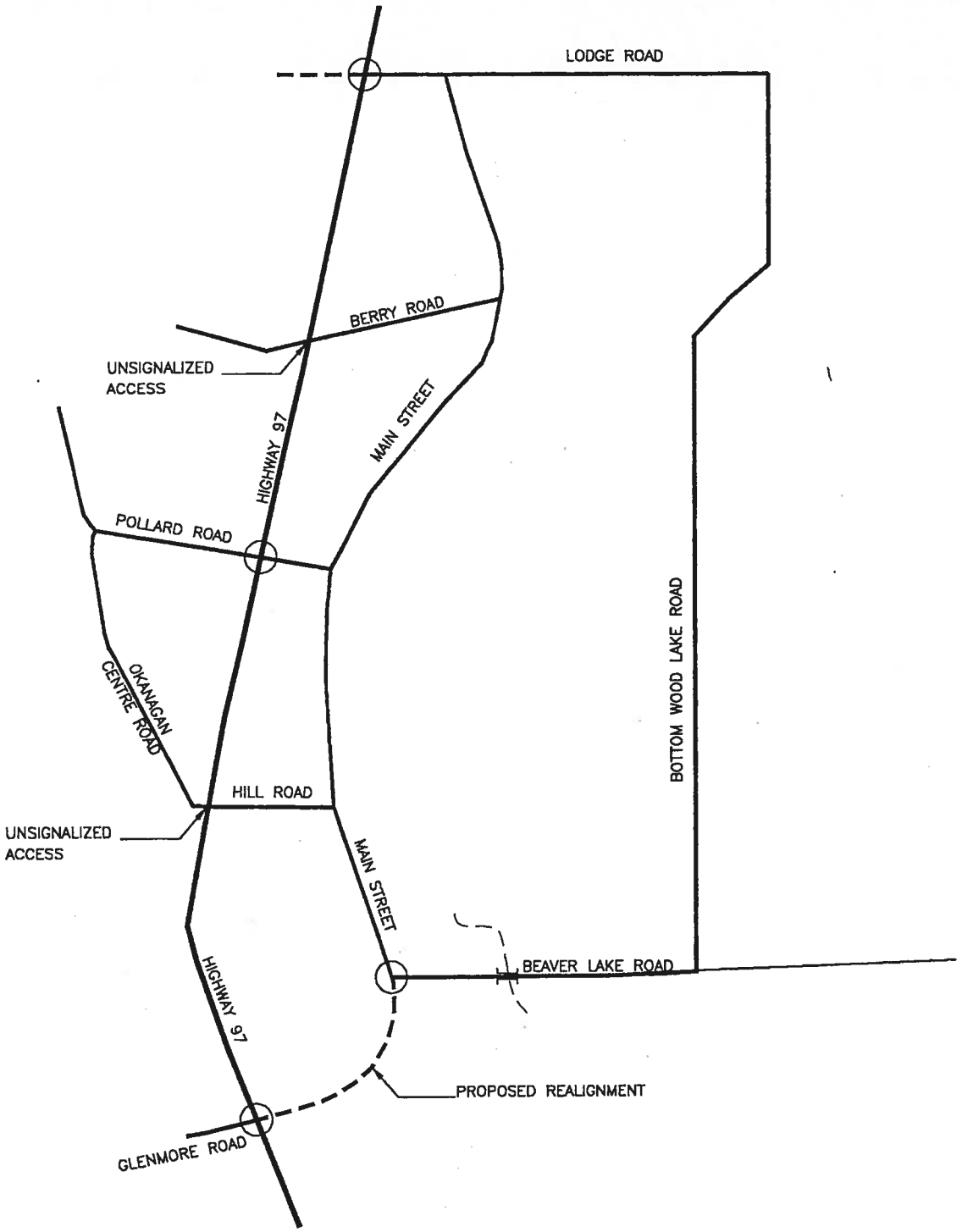
Figure 2 illustrates the planned future road network in the vicinity of the Town Centre. This road network is based on the District's Official Community Plan, plus other road improvement plans, as described below. The key features of the future road network include:

- **Main Street.** In order to provide for efficient access and circulation to, from and within the Town Centre, Main Street is planned as a new roadway paralleling Highway 97 between Beaver Lake Road and Berry Road. Main Street will connect directly with existing Bottom Woods Lake Road north of Berry Road. Main street will be a two-lane roadway plus left turn lanes at intersections, with wide travel lanes to accommodate cyclists and on-street parking.

NOT A Good Plan!

- **Pollard Road** will connect directly with Okanagan Centre Road north of Pollard Road. This will divert almost all traffic away from the existing Okanagan Centre Road/Highway 97, where there are sight distance limitations and other geometric deficiencies. The existing section of Okanagan Centre Road south of Pollard Road will become a local street for access to adjacent properties only.

No!!



TRAFFIC SIGNAL

DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

FUTURE ROAD NETWORK

URBAN SYSTEMS.

FIGURE 2 DEC 1998

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- **Beaver Lake Road.** Consistent with the Ministry of Transportation and Highways' December 1995 *Beaver Lake Road and Highway 97 Intersection* study, it was assumed that Beaver Lake Road would be realigned to intersect Highway 97 south of the existing Beaver Lake Road intersection. On the west side of the highway, Glenmore Road would be realigned as well.

- **Bottom Woods Lake Road.** The existing crossing of Vernon Creek will be eliminated, and Bottom Woods Lake Road east of the creek will be extended north to connect with Lodge Road.

- **Lodge Road** is proposed to be extended to the west of Highway 97. No plans for this extension have been developed at this time.

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2. PROPOSED DEVELOPMENT

This section provides a detailed description of development plans for the Town Centre, as well as development in the vicinity of the Town Centre.

2.1 Land Uses

For the purposes of the traffic study, the Town Centre was divided into eight zones, as illustrated in Figure 3. Existing, proposed and anticipated Town Centre development in each of these eight zones are summarized in Table 1. Existing developments which would be redeveloped (such as existing residential dwellings) are not included in Table 1.

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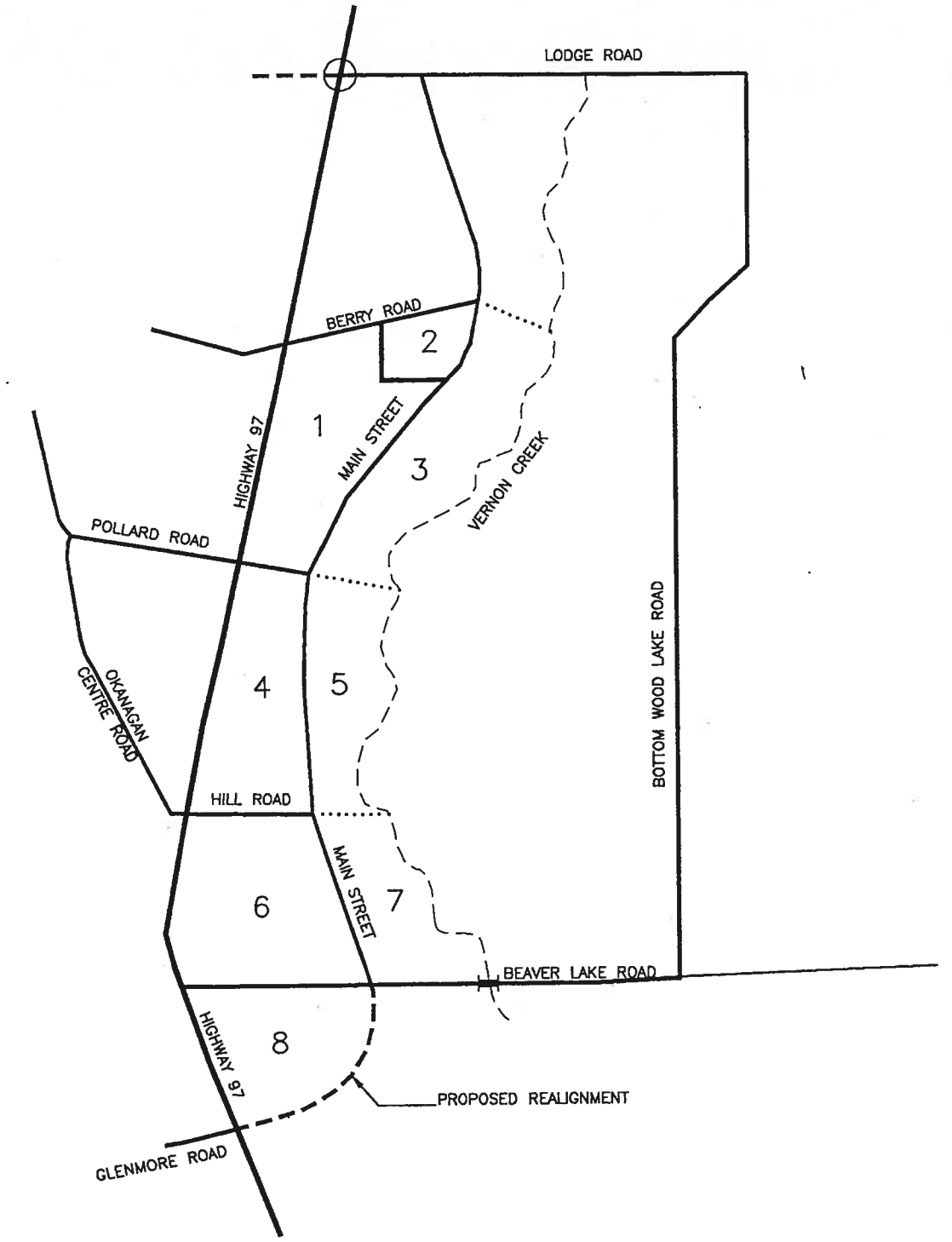
It is anticipated that approximately 28,000 m^2 of additional commercial uses will be developed in the Town Centre, as well as approximately 12,000 m^2 of office and institutional uses. Multi-family residential development within the Town Centre will be minimal — only 30 units. Rather, significant multi-family development will occur east of Vernon Creek, with direct pedestrian connections to the Town Centre.

It is important to note that much of the "future" development indicated in Table 2 reflects assumptions based on land uses indicated in the Town Centre Plan and Official Community Plan. The types and amounts of actual development might vary from those shown in Table 1, particularly in zone 5 where a civic centre has been assumed, and in zone 8, where highway commercial has been assumed.

2.2 Transportation Facilities

The key transportation facilities proposed to be provided on-site are described below. Detailed descriptions of intersection configurations and access management requirements are included in Section 5.



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

TRAFFIC ZONES

URBAN SYSTEMS.

FIGURE 3 DEC 1998

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Table 1
Winfield Town Centre Development

Zone	Existing*		Future	
	Land Use	Quantity	Land Use	Quantity
1	General retail Supermarket	2,188 m^2 1,178 m^2	General retail Supermarket Liquor store Quality res't	1,502 m^2 1,486 m^2 427 m^2 139 m^2
2	Post office Police station	400 m^2 600 m^2	General retail	545 m^2
3	none		General retail Drugstore	650 m^2 633 m^2
4	General retail Fast food res't Gas station	700 m^2 156 m^2 4 veh	General retail	8,706 m^2
5	none		Civic centre Office	5,306 m^2 5,432 m^2
6	General retail Office Gas station	475 m^2 3,716 m^2 4 veh	General retail Supermarket Drugstore Department store Office Multi-family res'l	1,262 m^2 1,505 m^2 334 m^2 930 m^2 886 m^2 12 du
7	none		General retail Office Multi-family res'l	625 m^2 625 m^2 18 du
8	none		Hwy commercial	8,911 m^2

* Excludes existing residential and other uses to be redeveloped

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- **Main Street** will be a two-lane roadway paralleling Highway 97 between Beaver Lake Road and Berry Road. North of Berry Road, Main Street will connect directly with the existing Bottom Woods Lake Road.

Main Street will incorporate two 4.3m wide travel lanes, plus on-street parking. At intersections, parking will be restricted so that left turn lanes can be provided.

- **Pollard Road** will be extended east of Highway 97 to intersect Main Street. As described in Section 5, this section of Pollard Road will incorporate five lanes — three westbound and two eastbound. Traffic signals will be installed at the Pollard Road/Highway 97 intersection.

- Bicycles will be accommodated with wide travel lanes. The curb lanes on all roads will be 4.3m wide, which is sufficiently wide for a cyclist and motor vehicle to safely share the lane.

- Sidewalks will be provided on both sides of all roadways within the Town Centre. Sidewalks will be a minimum of 2.5m wide.

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2.3 Development Phasing

It is anticipated that development of the Town Centre would occur over a period of seven to ten years. For the purposes of the traffic analysis, it was assumed that development would begin in 1999 and be completed by 2007. One "interim" development phase was assumed at the mid-way point of development, in 2003.

The specific land uses included in the interim phase are summarized in Table 2. The development indicated for 2003 includes all current development proposals, plus development in areas considered likely to proceed sooner than other areas.

Table 2
Interim 2003 Development Phase

Zone	Percentage of Full Build-Out	Future Land Uses	Quantity
1	100%	General retail Supermarket Liquor store Quality restaurant	1,502 m^2 1,486 m^2 427 m^2 139 m^2
2	100%	General retail	545 m^2
3	100%	General retail Drugstore	650 m^2 633 m^2
4	25%	General retail	2,177 m^2
5	25%	Office	2,716 m^2
6	100%	General retail Supermarket Drugstore Department store Office	1,262 m^2 1,505 m^2 334 m^2 930 m^2 886 m^2
7	100%	General retail Office	625 m^2 625 m^2
8	0%	none	

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3. TRAFFIC FORECASTS

This section presents forecasts of background and site-generated traffic, based on assumed trip generation rates. These forecasts are presented for four time horizons — full development, full development plus five years, full development plus ten years, and an interim development phase. The proposed land uses included in both the full and interim development phases are described in Section 2.

3.1 Town Centre Traffic

It is estimated that at full development, additional development in the Town Centre would generate a total of 1,581 additional off-site vehicle trips during the PM peak hour — 737 vehicle trips into the Town Centre, and 844 trips out of the Town Centre. Forecasts of site-generated traffic for full build-out (2007) and for the interim development phase (2003) are illustrated in Figures 4 and 5.

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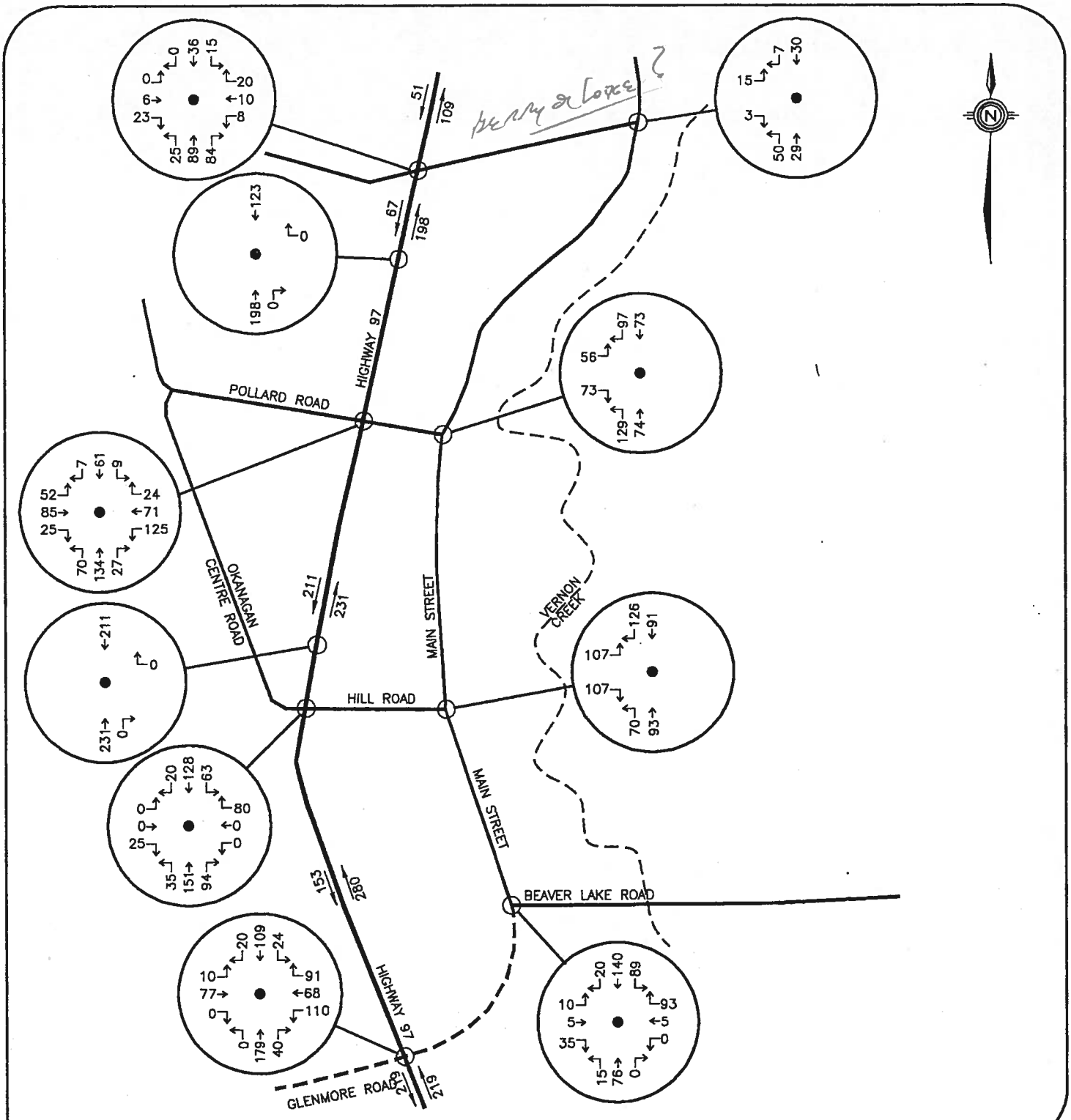
This section describes the methodology and assumptions used in estimating site-generated Town Centre traffic.

3.1.1 Horizon Years

Horizon years for the analysis include:

- 2007 — full development. For the purposes of this Traffic Study, development is assumed to begin in 1999 and be completed in 2007.
- 2012 — full development plus five years.
- 2017 — full development plus ten years.
- 2003 — interim development. For the purposes of this Traffic Study, the interim development phase is defined as the development which would occur during the first half of the development period.



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

SITE GENERATED TRAFFIC (2007+)
(INCLUDING PASS-BY TRIPS)

URBAN SYSTEMS.

FIGURE 4 DEC 1998

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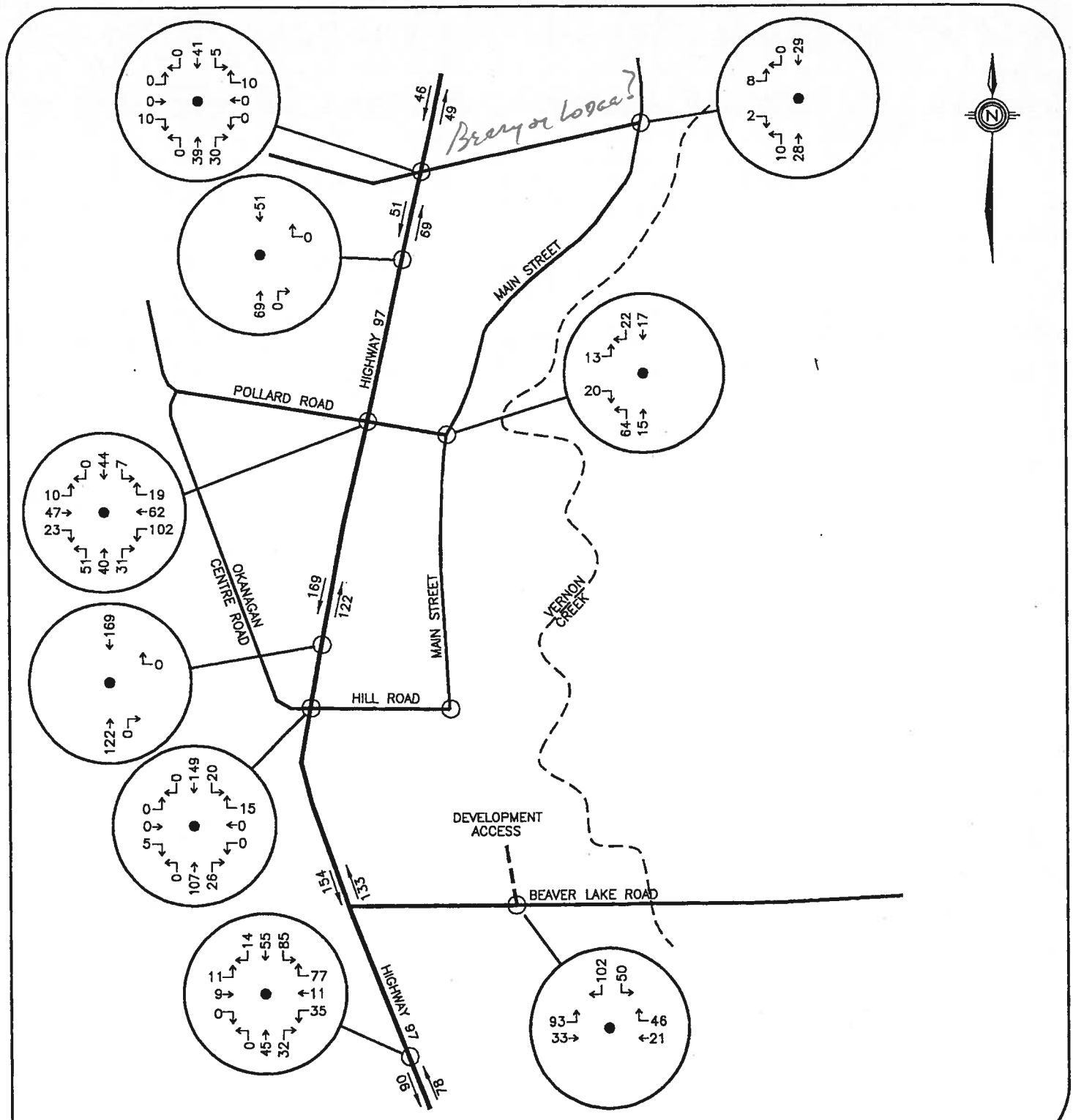

DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

SITE-GENERATED TRAFFIC(2003+)
(INCLUDING PASS-BY TRIPS)

URBAN SYSTEMS.

FIGURE 5 DEC 1998

6157708.1 NOT TO SCALE

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3.1.2 Analysis Period

The traffic analysis was undertaken for the summertime weekday PM peak hour. Traffic counts provided by the Ministry of Transportation and Highways indicate that peak traffic volumes occur from June through September. To avoid extreme peak weekend conditions, a "typical" weekday in July/September was selected for the analysis.

Traffic count data provided by the Ministry of Transportation and Highways indicates that the highest traffic volumes on Highway 97 occur during the afternoon. Consequently, the analysis was undertaken for the weekday PM peak hour, which occurs at approximately 3:30 to 4:30 PM.

3.1.3 Trip Generation

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Trip generation rates used in the Traffic Study are based on MoTH rates, as documented in MoTH's *Trip Generation and Parking* manual. MoTH rates were used except where ITE rates (as documented in *Trip Generation, 6th Edition)* were more specific to a particular land use, such as for supermarkets and drugstores. It should be noted that 50th percentile rates were used, consistent with information and guidelines in the current version of MoTH's *Trip Generation and Parking* manual. Trip generation rates for the "PM peak hour of adjacent street" are used rather than for the peak hour of the generator.

Weekday PM peak hour trip generation rates for new development within the Town Centre are summarized in Table 3. These trip generation rates were then adjusted to reflect multi-purpose, pass-by, internal and non-automobile trips, as described below.

- **Multi-purpose trips.** MoTH and ITE trip generation rates reflect "driveway counts," or in other words, counts of trips to and from an isolated land use (such as a single-family dwelling). The rates do not account for multiple purposes in a single vehicle trip. For example, someone might drive to the Town Centre to pick up groceries, mail a parcel at the post office, and fill the tank of their car with gas. If trip generation rates for each of these land uses are used without adjustment, the number of estimated vehicle trips would be triple the actual number — three round trips rather than a single round trip as actually occurred.

Table 3
Trip Generation Rates

Land Use	MoTH Rate		ITE Rate	
	Category	Rate	Category	Rate
General retail	B-15	0.0630		
Supermarket			850	0.1238
Department store	B-15	0.0630		
Drugstore			880	0.0344
Liquor store	B-15	0.0630		
Highway commercial	B-15	0.0630		
Quality restaurant	B-33	0.0930		
Office	B-25	0.0180		
Multi-family	B-4	0.6800		
Civic centre			733	0.0308

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Most trips to the Town Centre will be single-purpose trips. However, some will be multiple-purpose trips, and consequently assumed trip generation rates must be reduced to account for multiple-purpose trips. Assumed adjustment factors are summarized in Table 4. Generally, the greatest reductions are for retail uses.

- **Pass-by trips.** Not all vehicle trips generated by new development in the Town Centre will be new trips. Some vehicle trips will be existing trips which already "pass by" the Town Centre. For example, someone who commutes between Vernon and Kelowna every weekday via Highway 97 might stop at a coffee shop in the Town Centre to buy a coffee each morning. This trip generated by the coffee shop is not a new trip, but rather is termed a "pass-by" trip.

  MoTH and ITE trip generation rates represent "driveway counts," and consequently do not distinguish between new trips and pass-by trips. To avoid over-estimating the number of new trips, the trip generation rates were reduced by varying adjustment factors, as summarized in Table 4. These reductions are based on pass-by

MoTH ?

Table 4
Trip Generation Rate Adjustment Factors

Land Use	Adjustment Factors			Net Trip Generation Rate
	Multiple-Purpose	Pass-By	Non-Auto	
General retail	0.75	0.90	0.98	0.0417
Supermarket	0.85	0.80	0.98	0.0825
Department store	0.75	0.90	0.98	0.0417
Drugstore	0.85	0.90	0.98	0.0258
Liquor store	0.90	0.90	0.98	0.0500
Hwy commercial	0.90	0.80	0.98	0.0444
Quality restaurant	0.95	1.00	0.98	0.0866
Office	1.00	1.00	0.98	0.0176
Multi-family	1.00	1.00	0.98	0.6664
Civic centre	0.95	1.00	0.98	0.0287

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rates of up to 50% and greater, documented in the ITE *Trip Generation Manual*.

It should be noted that the site-generated traffic volumes illustrated in Figures 4 and 5 include pass-by trips, and consequently reflect driveway volumes — the number of vehicles turning into and out of proposed development. When combined with background traffic volumes, as described in Section 3.3, it is necessary to reduce site-generated traffic volumes by the number of pass-by trips, to avoid double-counting pass-by trips.

- **Non-automobile trips.** Some of the trips generated by Town Centre development will be made by persons who walk, cycle or take the bus. MoTH and ITE trip generation rates generally reflect a low non-automobile trip proportion (in the range of 2%). With significant residential development on the east side of vernon Creek in close proximity to the Town Centre, it is anticipated that non-automobile mode splits will be higher than 2% for many land uses. As summarized in Table 4, an additional 2% non-automobile mode split was assumed for these uses.

3.1.4 Trip Distribution

In assigning generated vehicle trips to the road network, it was assumed that traffic would be distributed as follows:

- 67% of traffic generated by development in the proposed Town Centre will originate or be destined to the locations with Lake Country.
- 23% will be destined to or originate from locations to the south (Kelowna and the South Okanagan, for example).
- 10% will be destined to or originate from locations to the north (Vernon, Salmon Arm and Kamloops, for example).

3.2 Background Traffic

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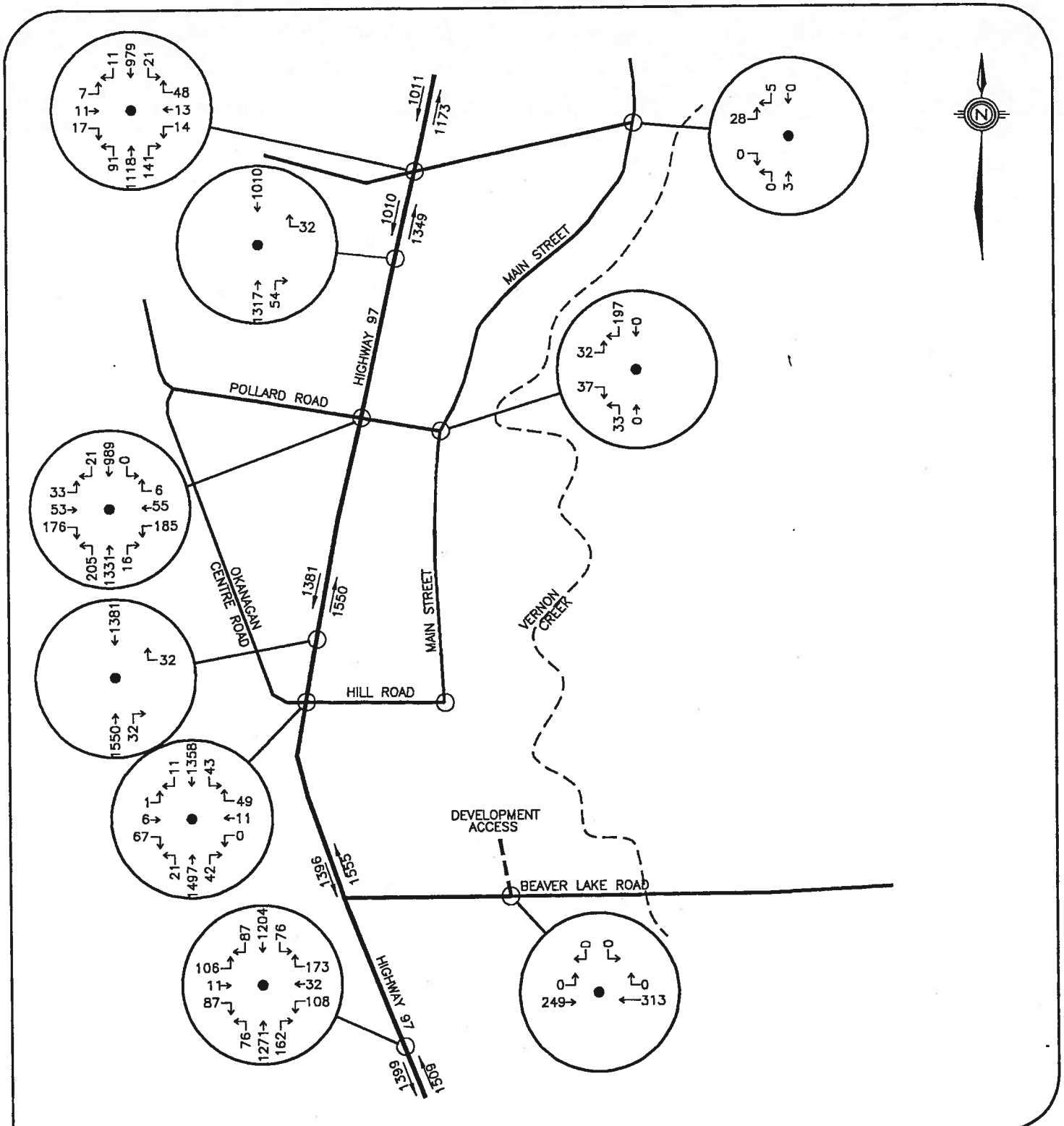
Forecast background traffic volumes for 2003, 2007, 2012 and 2017 are illustrated in Figures 6 through 9. Background (existing) traffic volumes were calculated based on existing traffic volumes, which were estimated using traffic counts provided by MoTH for the Beaver Lake and Berry Road intersections on Highway 97, as well as estimates of existing development-generated traffic.

Existing 1998 traffic volumes were increased to reflect future traffic volumes for 2003, 2007, 2012 and 2017. Because of a lack of sufficient historical traffic data, it was not possible to calculate the historical annual growth rate for highway traffic. Consequently, the following growth rates were assumed in estimating future traffic volumes:

- An annual growth rate of 3% (compounded annually) was assumed for through traffic on Highway 97, consistent with the findings of Phase A of the Okanagan Valley Transportation Plan.
- An average annual growth rate of 2% was assumed for other traffic movements on Highway 97 and other roads in the study area, to account for additional residential, commercial, institutional and industrial development in Lake Country and in the north end of the City of Kelowna.



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2003 BACKGROUND TRAFFIC

URBAN SYSTEMS.

FIGURE 6 DEC 1998

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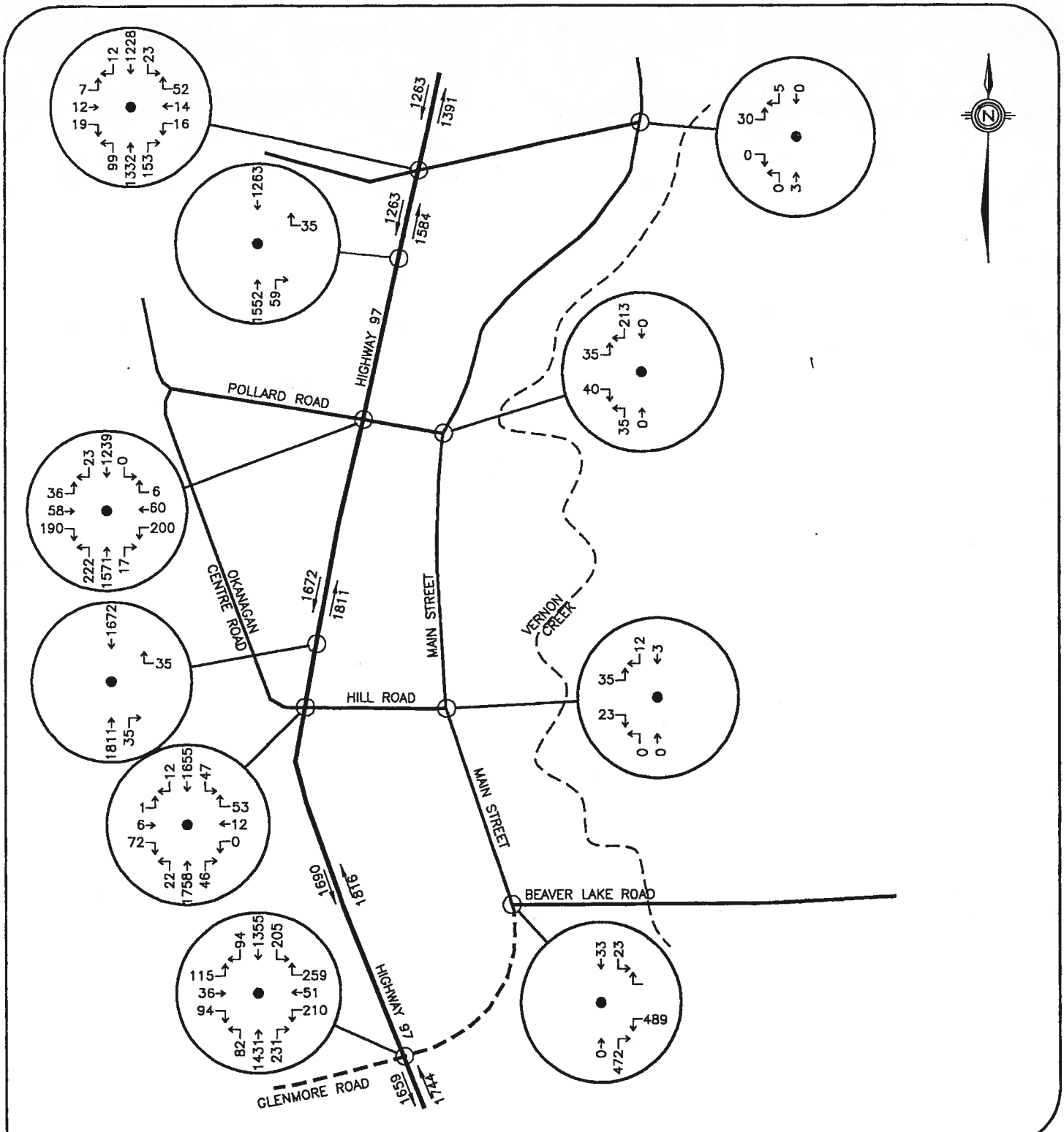

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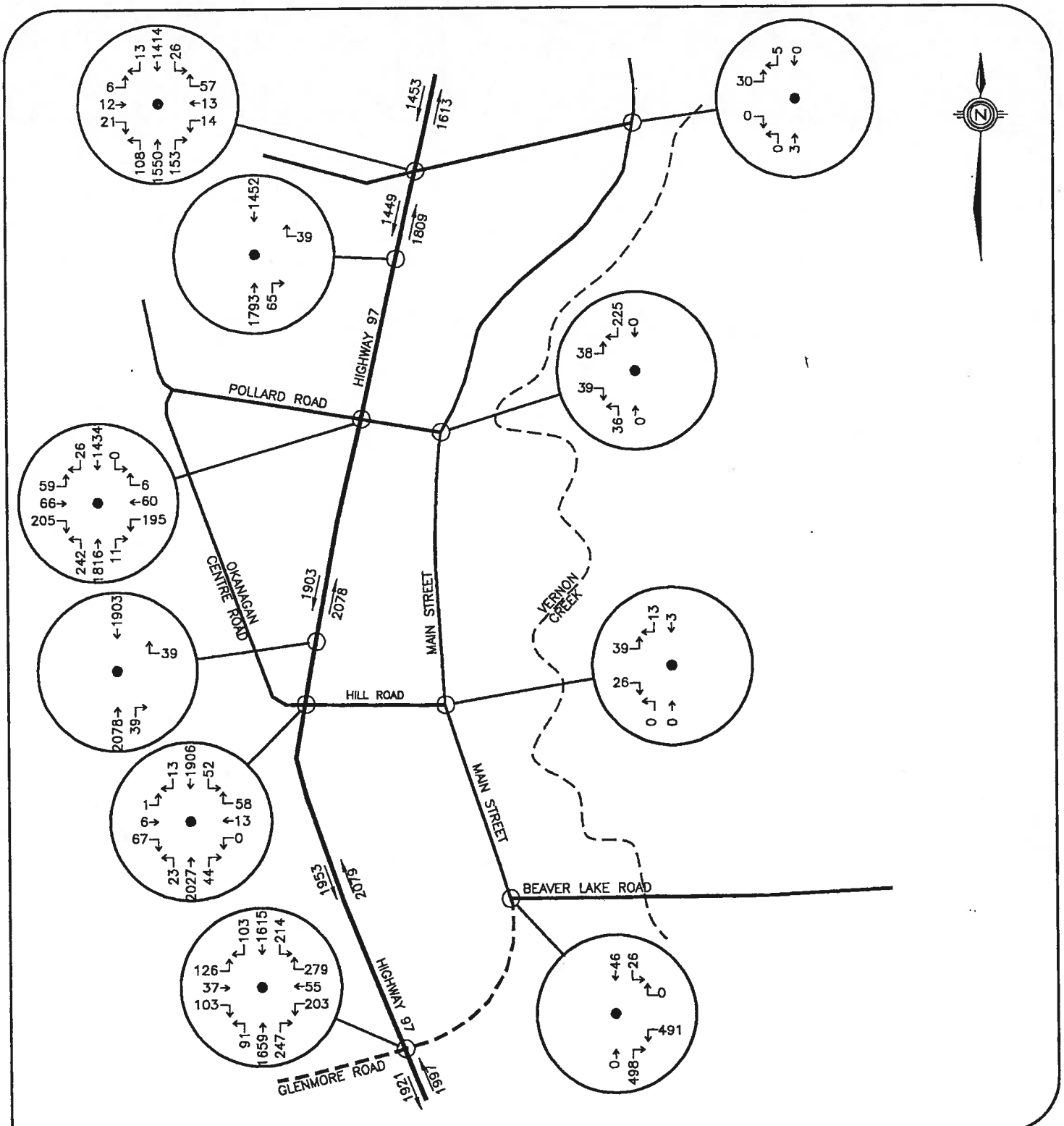
DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2007 BACKGROUND TRAFFIC

URBAN SYSTEMS.

FIGURE 7 DEC 1998

6157708.1 NOT TO SCALE



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DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2012 BACKGROUND TRAFFIC

URBAN SYSTEMS.

FIGURE 8 DEC 1998

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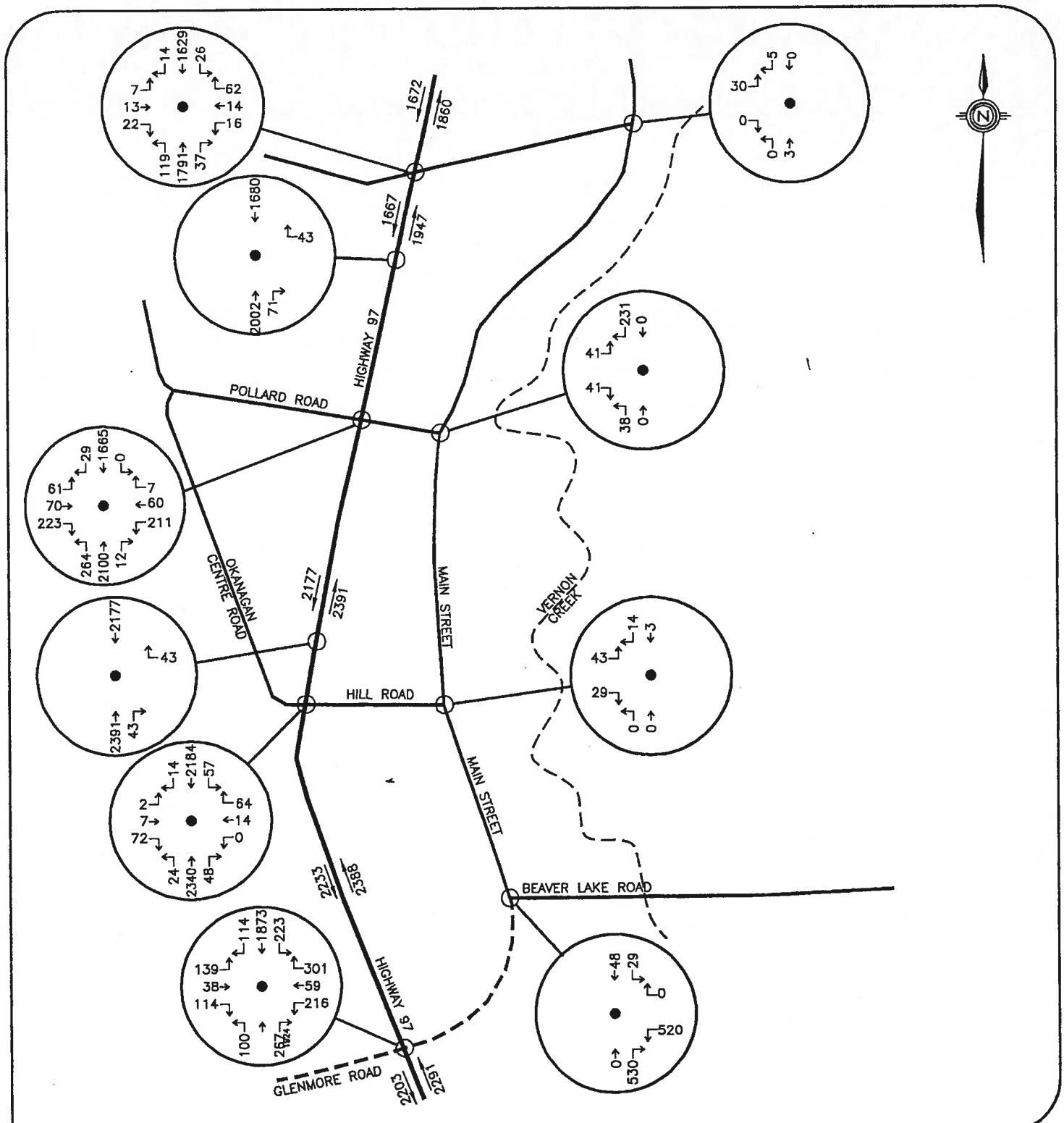

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DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2017 BACKGROUND TRAFFIC

URBAN SYSTEMS.

FIGURE 9 DEC 1998

6157708.1 NOT TO SCALE

Estimates of traffic generated by planned development in the areas east of Vernon Creek and north of Berry Road were added to background traffic volumes estimated using annual growth rates. The net effect of adding this traffic is that the average annual growth rate for traffic in the vicinity of the Town Centre is higher than 2%.

3.3 Combined Traffic

Combined traffic volumes for the four horizon years are illustrated in Figures 10 through 13. These traffic volumes incorporate the estimated site-generated Town Centre traffic volumes presented in Section 3.1, and the forecast background traffic volumes presented in Section 3.2.

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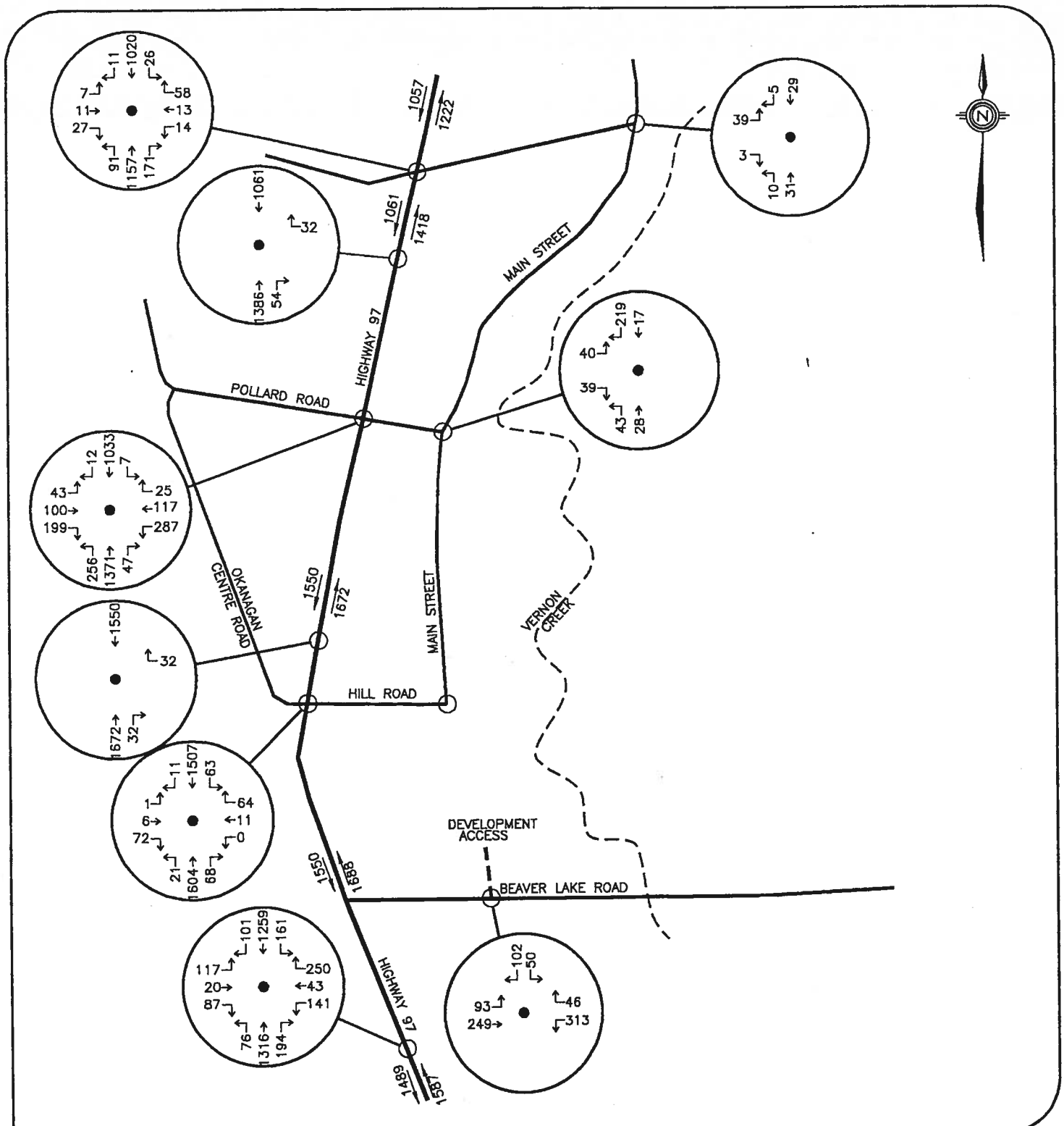
It is important to note that in most cases, combined traffic volumes are slightly less than the sum of the site-generated traffic volumes and background traffic volumes. This is because the site-generated traffic volumes illustrated in Figures 4 and 5 represent total site-generated vehicle trips, including pass-by trips (described in Section 3.1.3). In other words, the site-generated volumes represent driveway volumes. In combining site-generated and background traffic volumes, it is necessary to reduce the traffic volumes by the number of estimated pass-by trips, to avoid double-counting traffic volumes.



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2003 COMBINED TRAFFIC

URBAN SYSTEMS.

FIGURE 10 DEC 1998

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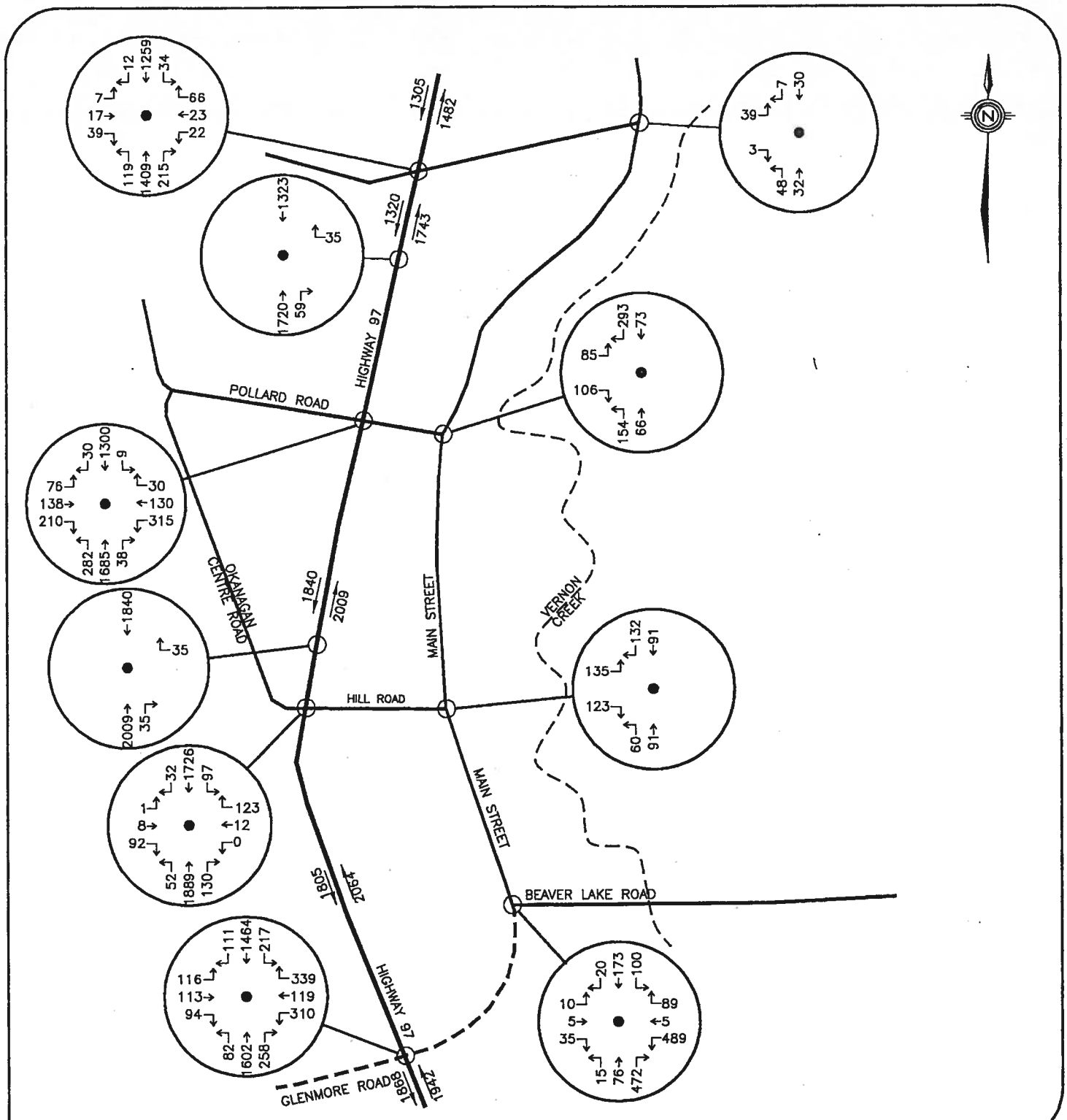

DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2007 COMBINED TRAFFIC

URBAN SYSTEMS.

FIGURE 11 DEC 1998

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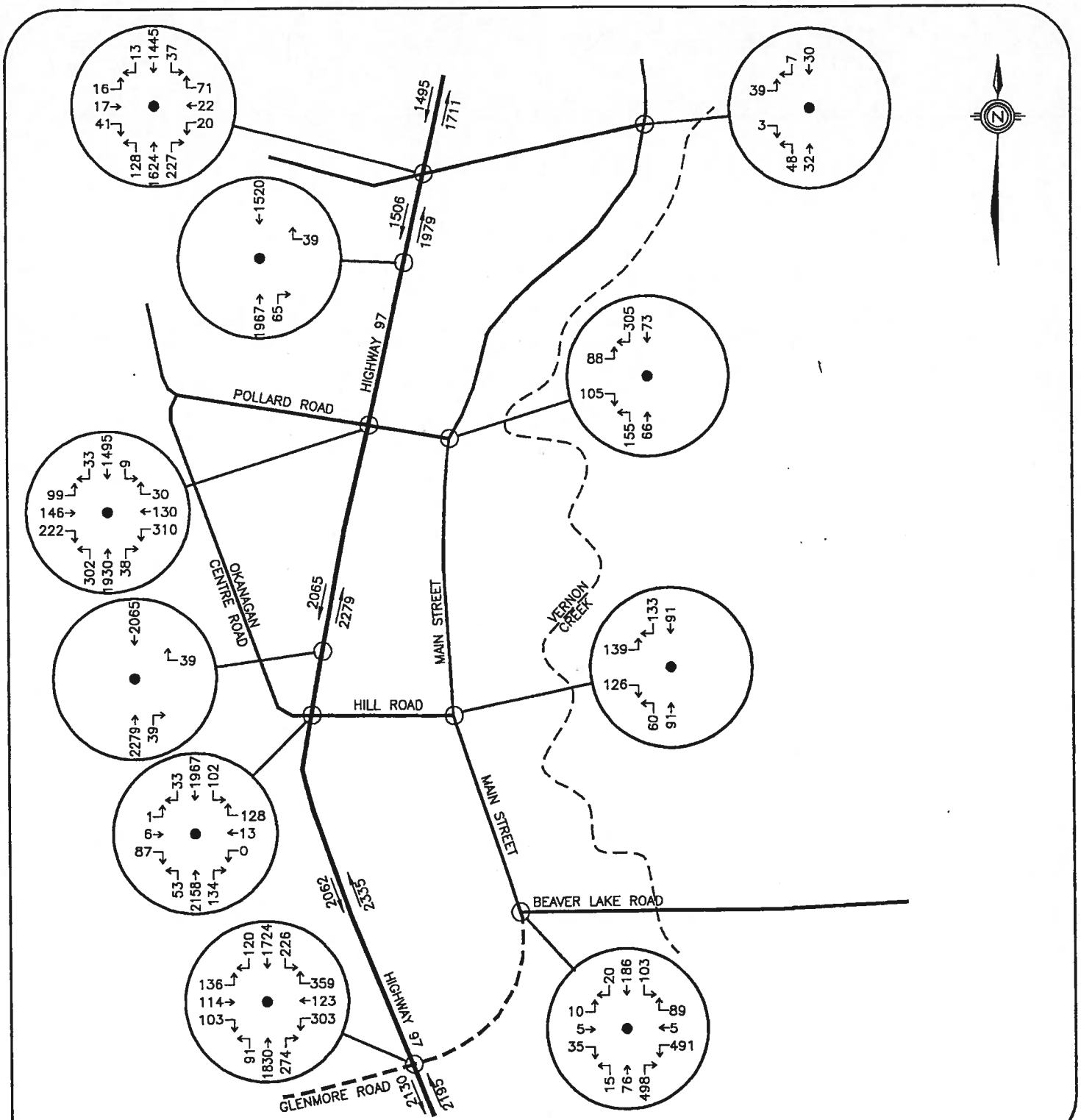

DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2012 COMBINED TRAFFIC

URBAN SYSTEMS.

FIGURE 12 DEC 1998

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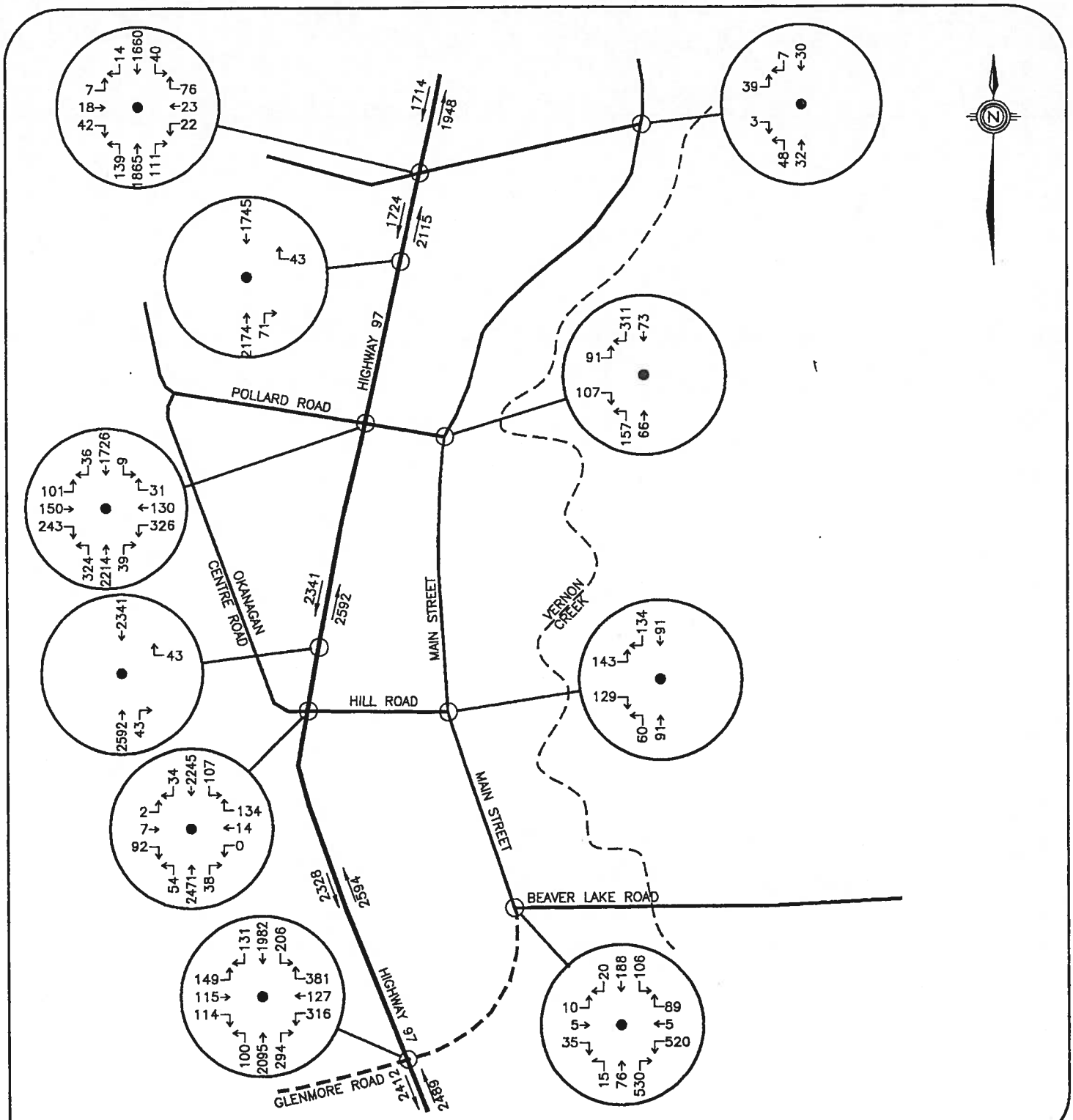

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DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

2017 COMBINED TRAFFIC

URBAN SYSTEMS.

FIGURE 13 DEC 1998

6157708.1 NOT TO SCALE

4. TRAFFIC ANALYSIS

This section presents the results of the analysis of traffic conditions, based on the estimated traffic volumes presented in **Section 3,** as well as specific site characteristics.

Analysis of intersection traffic operations was based on the techniques contained in the 1994 *Highway Capacity Manual* for signalized and unsignalized intersections. No site-specific data regarding gap acceptance, arrival patterns and saturation flows were available, and consequently default values were used for these factors.

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4.1 Full Development Phases

As described in Section 3.1.1, it is assumed that full development of the Town Centre will occur by 2007. The results of the intersection operations analyses for full development in 2007, as well as the subsequent horizon years of 2012 and 2017, are summarized in Tables 5 through 10. Detailed output from the *Highway Capacity Manual* software is available in electronic format upon request.

Critical movements indicated in the analysis of unsignalized intersection operations reflect left turns from side streets. Not all left turn and through movements from side streets are indicated — only those movements with the highest levels of delay are included, and identified as critical movements.

Table 5
Unsignalized Intersection Analysis
(2007 PM Peak Hour Conditions)

Intersection	Background Traffic		Combined Traffic	
	Delay	**LOS**	**Delay**	**LOS**
Berry/Hwy. 97				
• W/B left/thru	> 60 s	F	> 60 s	F
• E/B left/thru	> 60 s	F	> 60 s	F
Hill/Hwy. 97				
• W/B left/thru	> 60 s	F	> 60 s	F
• E/B left/thru	> 60 s	F	> 60 s	F
Berry/Main				
• E/B left	3.6 s	A	4.4 s	A
Pollard/Main				
• E/B left	4.5 s	A	9.6 s	B
• N/B left*	5.5 s	B	12.4 s	C
Hill/Main				
• E/B left	3.6 s	A	7.4 s	B
Beaver Lake/Main, existing alignment				
• S/B left*	12.6 s	C	52 s	F
Beaver Lake/Main, proposed realignment				
• W/B left*	37.5 s	E	> 60 s	F

* indicates critical movements

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Table 6
Signalized Intersection Analysis
(2007 PM Peak Hour Conditions)

Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Pollard/Hwy. 97	10.9 s	B	13.4 s	B
Beaver Lake/Hwy. 97	10.7 s	B	16.8 s	C
Beaver Lake/Main				
• existing alignment	n/a	n/a	7.1 s	B
• proposed alignment	n/a	n/a	4.2 s	A

Table 7
Unsignalized Intersection Analysis
(2012 PM Peak Hour Conditions)

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Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Berry/Main				
• E/B left	3.6 s	A	4.3 s	A
Pollard/Main				
• E/B left	4.6 s	A	9.9 s	B
• N/B left*	5.7 s	B	13.1 s	C
Hill/Main				
• E/B left	3.7 s	A	7.8 s	B

* indicates critical movement

Table 8
Signalized Intersection Analysis
(2012 PM Peak Hour Conditions)

Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Pollard/Hwy. 97	12.0 s	B	14.8 s	B
Beaver Lake/Hwy. 97	11.4 s	B	17.9 s	C
Beaver Lake/Main • proposed alignment	3.3 s	A	4.1 s	A

Table 9
Unsignalized Intersection Analysis
(2017 PM Peak Hour Conditions)

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Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Berry/Main • E/B left	3.6 s	A	4.4 s	A
Pollard/Main • E/B left • N/B left*	4.7 s 5.9 s	A B	12.2 s 19.0 s	C C
Hill/Main • E/B left	3.7 s	A	7.9 s	B

* indicates critical movement

Table 10
Signalized Intersection Analysis
(2017 PM Peak Hour Conditions)

Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Pollard/Hwy. 97	16.4 s	C	18.8 s	C
Beaver Lake/Hwy. 97	14.3 s	B	21.1 s*	C*
Beaver Lake/Main • proposed alignment	3.4 s	A	4.1 s	A

* dual westbound left turn lanes

The results of the intersection operations analysis indicate that with specific improvements, forecast background traffic and additional site-generated traffic can be accommodated on the road network in the vicinity of the Town Centre at acceptable levels of service. Specific improvements required are described below. The phasing of these improvements is described in Section 6.1.

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- New traffic signals will be required at the Pollard/Highway 97 intersection prior to 2007. Right turn lanes will be required northbound and southbound at the Pollard/Highway 97 intersection by 2012.

- The existing traffic signals at the Berry/Highway 97 intersection should be relocated to the Lodge/Highway 97 intersection.

- There is no need to realign Beaver Lake Road as proposed by MoTH in order to accommodate traffic generated by Town Centre development. A separate westbound right turn lane will be required at the Beaver Lake/Highway 97 intersection by 2007, if this intersection has not been relocated to the south as proposed by MoTH.

- In order to accommodate increased traffic in 2017, an additional left turn lane will be required at the Beaver Lake/Highway 97 intersection, as compared with the intersection design proposed by

MoTH. This additional turn lane is required because of additional traffic generated by the Town Centre.

- The Hill/Okanagan Centre Road/Highway 97 intersection should remain unsignalized. The existing westbound left turn prohibition should remain, due to sight distance limitations.

- By 2007, when Main Street has been completed, driveway accesses on Highway 97 north of Hill Road and south of Berry Road should be restricted to right turns in and right turns out only. Left turns into or out of these driveways would be prohibited.

- Traffic signals will be required at the Beaver Lake/Main intersection by 2007 as a result of Town Centre development. Traffic signals are required regardless of whether or not Beaver Lake Road is realigned as proposed by MoTH.

- Three-way stop control is desirable at the Main/Pollard intersection, so as to ensure efficient traffic movement and minimum queue lengths on Pollard Road between Highway 97 and Main Street. One-way stop control is sufficient at the Berry/Main and Hill/Main intersections.

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4.2 Interim Development Phase

The results of the analysis of traffic conditions for the interim development phase are summarized in Tables 11 and 12. For the purposes of this analysis, it was assumed that Main Street would be completed between Berry Road and Hill Road. At this stage, new development in zones 6 and 7 immediately north of Beaver lake Road would be accessed via Beaver Lake Road only.

Table 11
Unsignalized Intersection Analysis
(2003 PM Peak Hour Conditions)

Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Berry/Hwy. 97				
• W/B left/thru	> 60 s	F	> 60 s	F
• E/B left/thru	> 60 s	F	> 60 s	F
Hill/Hwy. 97				
• W/B left/thru	> 60 s	F	> 60 s	F
• E/B left/thru	> 60 s	F	> 60 s	F
Berry/Main				
• E/B left	3.6 s	A	4.0 s	A
Pollard/Main				
• E/B left	4.4 s	A	5.0 s	A
• N/B left*	5.3 s	B	5.9 s	B
Beaver Lake/Main				
• S/B left	-	-	12.0 s	C

* indicates critical movement

DRAFT

Table 12
Signalized Intersection Analysis
(2003 PM Peak Hour Conditions)

Intersection	Background Traffic		Combined Traffic	
	Delay	LOS	Delay	LOS
Pollard/Hwy. 97	8.7 s	B	9.6 s	B
Beaver Lake/Hwy. 97	12.4 s	B	15.6 s	C

The results of the analysis indicate that at the interim development phase, background traffic and additional Town Centre traffic could be accommodated at acceptable levels of service, provided the following improvements are implemented:

- Traffic signals are installed at the Pollard/Highway 97 intersection.
- Traffic signals are removed from the Berry/Highway 97 intersection and relocated to the Lodge/Highway 97 intersection.
- The following planned road network improvements are completed:
  - Pollard Road is connected directly to Okanagan Centre Road.
  - Bottom Woods Lake Road (east of Vernon Creek) is extended to Lodge Road.
  - Bottom Woods Lake Road across Vernon Creek is closed.

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restricted to right turns in and right turns out only. This would likely require construction of a raised median to ensure that motorists obey traffic regulations.

- **Relocation of the Beaver Lake Road intersection** as proposed by MoTH is not required to accommodate traffic generated by Town Centre development. However, realignment of Beaver Lake Road to a new intersection south of the existing intersection would be desirable to improve grades on Beaver Lake Road.

- **Berry Road intersection.** A separate westbound right turn lane would be required at the existing Beaver Lake/Highway 97 intersection to accommodate Town Centre traffic. Alternatively, an additional westbound left turn lane would be required at the new Beaver Lake/Highway 97 intersection, as compared with MoTH's proposed design for this new intersection.

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5.2 Town Centre Road Network

The on-site road network would provide sufficient capacity to accommodate all forecast traffic. Specific observations regarding the Town Centre Road network include:

- Two travel lanes (one in each direction) are sufficient on Main Street. Additional turning lanes (left turn and right turn lanes) should be provided at all intersections, as illustrated in Figure 14. Turn lanes are not likely to be necessary at driveways unless turning volumes are expected to be high — this would be determined at the development approval stage.

- On-street parking can be provided on both sides of Main Street. Parking should be restricted within 15m of the approach to an intersection, so that turning lanes can be provided, as illustrated in Figure 15.

- Three-way stop control is desirable at the Main/Pollard intersection, so as to ensure efficient traffic movement and minimum queue lengths on Pollard Road between Highway 97 and Main Street.

restricted to right turns in and right turns out only. This would likely require construction of a raised median to ensure that motorists obey traffic regulations.

- **Relocation of the Beaver Lake Road intersection** as proposed by MoTH is not required to accommodate traffic generated by Town Centre development. However, realignment of Beaver Lake Road to a new intersection south of the existing intersection would be desirable to improve grades on Beaver Lake Road.

- **Berry Road intersection.** A separate westbound right turn lane would be required at the existing Beaver Lake/Highway 97 intersection to accommodate Town Centre traffic. Alternatively, an additional westbound left turn lane would be required at the new Beaver Lake/Highway 97 intersection, as compared with MoTH's proposed design for this new intersection.

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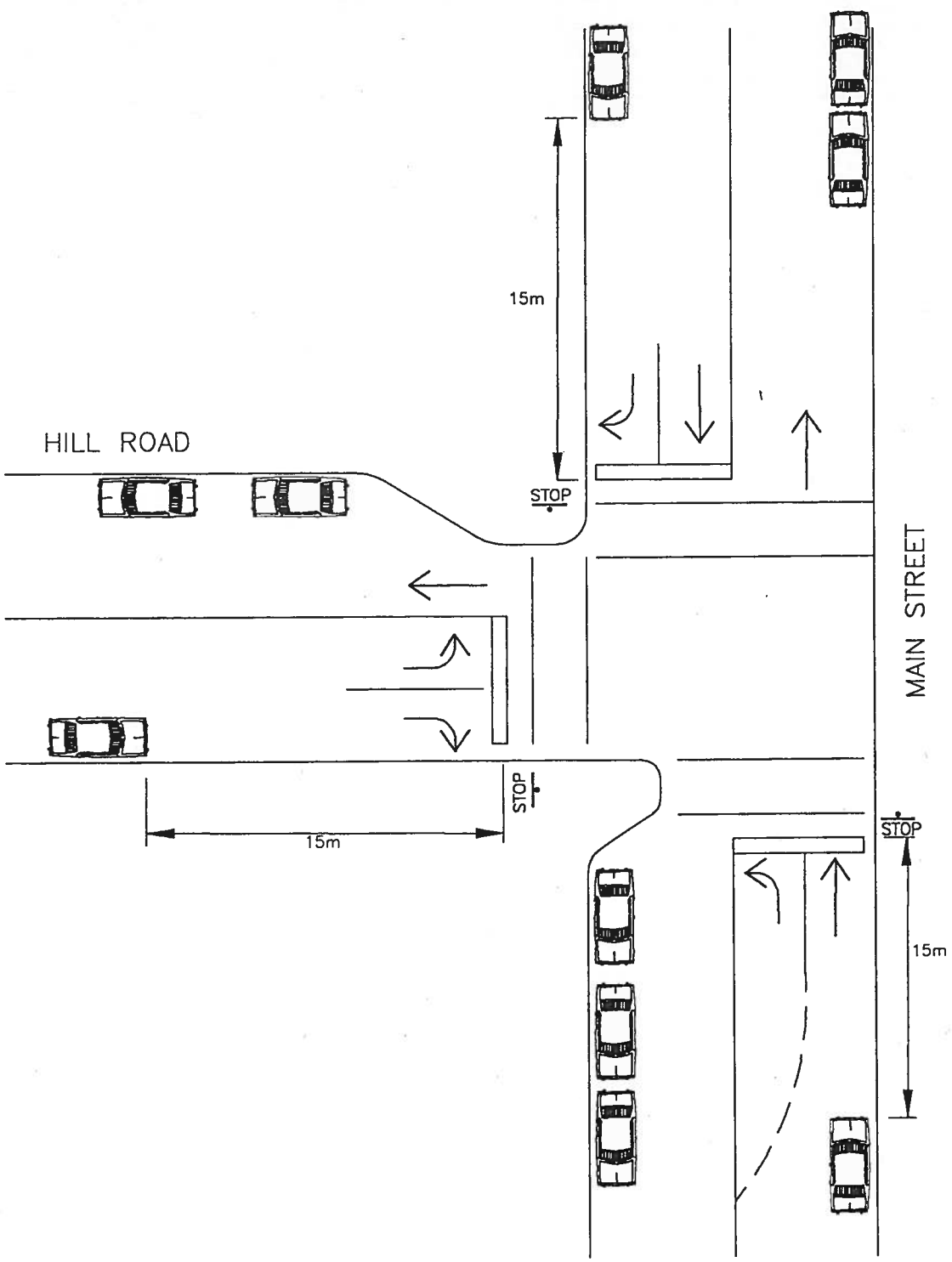
5.2 Town Centre Road Network

The on-site road network would provide sufficient capacity to accommodate all forecast traffic. Specific observations regarding the Town Centre Road network include:

- Two travel lanes (one in each direction) are sufficient on Main Street. Additional turning lanes (left turn and right turn lanes) should be provided at all intersections, as illustrated in Figure 14. Turn lanes are not likely to be necessary at driveways unless turning volumes are expected to be high — this would be determined at the development approval stage.

- On-street parking can be provided on both sides of Main Street. Parking should be restricted within 15m of the approach to an intersection, so that turning lanes can be provided, as illustrated in Figure 15.

- Three-way stop control is desirable at the Main/Pollard intersection, so as to ensure efficient traffic movement and minimum queue lengths on Pollard Road between Highway 97 and Main Street.



DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

TYPICAL INTERSECTION DESIGN

URBAN SYSTEMS.

FIGURE 15 DEC 1998

6157708.1 NOT TO SCALE

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- A minimum distance of 50m is required between crosswalks on Pollard Road between Highway 97 and Main Street. Westbound, there would be three lanes on this section of Pollard Road, with a curb extension at Main Street to narrow the westbound part of the roadway to two lanes at this point (thereby minimizing weaving movements on Pollard). Eastbound there would be two lanes throughout, as illustrated in Figure 14.

- Although the preferred orientation of stop signs at the Hill Road and Berry Road intersections on Main Street is east-west (with priority to Main Street), three-way stop control could be considered at these intersections to minimize the potential for vehicle-vehicle and vehicle-pedestrian conflicts.

- The only traffic signals required on Main Street are at the Beaver Lake Road intersection. This signal is required regardless of whether or not Beaver Lake Road is realigned as proposed by MoTH.

- When Beaver Lake Road is realigned as proposed by MoTH, the existing west leg of the intersection should be retained to provide access to development west of Main Street.

- Beaver Lake Road can remain a two-lane road across Vernon Creek. The proposed alignment of Main Street locates the Main/Beaver Lake intersection further west than proposed by MoTH. This is preferred as it would provide sufficient distance between the intersection and the creek crossing to widen westbound Beaver Lake Road to two lanes in this section, providing one left/through lane and one right turn lane at the Main Street intersection, as illustrated in Figure B.

- The most costly section of Main Street to construct will be the section between Hill Road and Beaver Lake Road, as significant earthworks and a retaining wall will be required to cross the small ravine. For this reason, this section of Main Street is identified in the discussion of phasing in Section 6.1 as the last section to be constructed.

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5.3 Access Management

Along Highway 97, access management will be desirable to minimize effects of Town Centre traffic on through highway traffic. Access management measures recommended for Highway 97 include:

- Re-spacing of traffic signals to the Beaver Lake, Pollard and Lodge intersections, to so as to provide maximum opportunity for two-way signal coordination, thereby minimizing delays to through traffic. It should be noted that in the traffic analysis presented in Section 4, improved signal coordination was not assumed. Consequently, it can be expected that with improved signal coordination, average stopped delays for Highway 97 traffic would be less and levels of service better than indicated in Section 4.

- Restriction of driveway access to right turns in and out only. left turns would be prohibited.

- Restriction of driveways on streets intersecting Highway 97 within a minimum of 35m of the highway, so as to ensure that vehicles turning to and from intersecting streets are not obstructed, which might in turn effect highway traffic.

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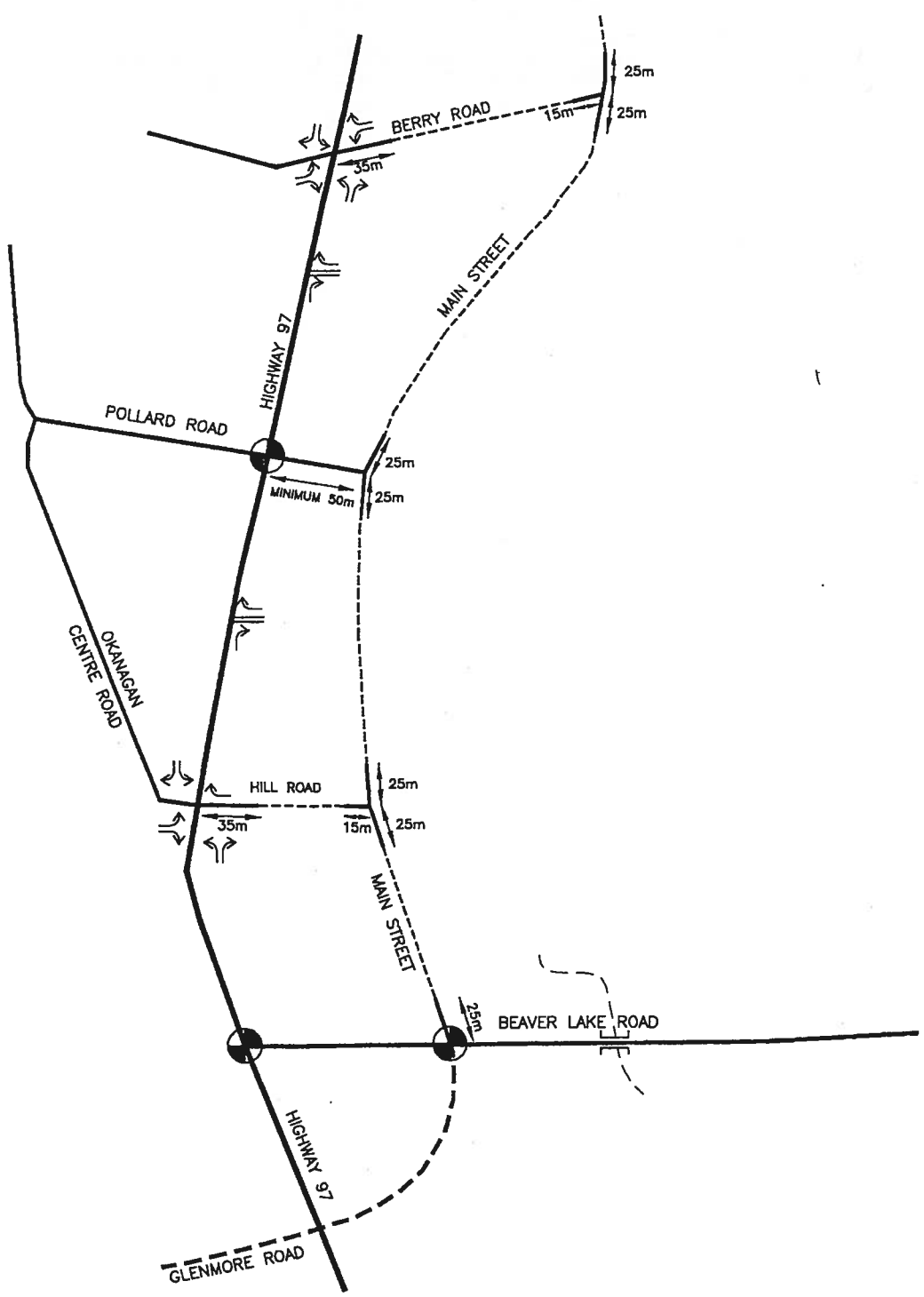
Within the Town Centre, driveways can be located anywhere along Main Street, except with 15m to 25m of intersections as illustrated in Figure 16. Developers should be encouraged to avoid locating driveways close to other driveways — in this case, it would be preferable to consolidate access into a single driveway rather than have two driveways located side-by-side.

As illustrated in Figure 16, no access should be permitted on Pollard Road between Highway 97 and Main Street. All access to adjacent properties should be via Main Street.

5.4 Parking

Parking requirements for new Town Centre Development are summarized in **Table 13.** These were calculated based on 50th percentile MoTH parking generation rates, as documented in MoTH's



NOTE:
DIMENSIONS ARE TO CROSSWALKS AT INTERSECTIONS, NOT TO CENTRE LINES OF INTERSECTIONS.

- NO ACCESS
- ACCESS PERMITTED
- FUTURE ALIGNMENT (NO ACCESS)
- DRIVEWAY
- PERMITTED MOVEMENT
- TRAFFIC SIGNAL

DISTRICT OF LAKE COUNTRY
WINFIELD TOWN CENTRE TRAFFIC STUDY

ACCESS MANAGEMENT

URBAN SYSTEMS.

FIGURE 16 DEC 1998

6157708.1 NOT TO SCALE

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Trip Generation and Parking Manual. Where there were no applicable MoTH rates for specific land uses, parking rates from ITE's *Parking Generation, 2nd Edition* were used if available.

Table 13
Parking Requirements for New Town Centre Development

Land Use	MoTH (ITE) Category	Adjustment Factors		Net Parking Rate
		Shared Parking	Non-Auto Trips	
General retail	A-4	1.00	0.98	0.0431
Supermarket	A-4	1.00	0.98	0.0431
Department store	A-4	1.00	0.98	0.0431
Drugstore	A-4	1.00	0.98	0.0431
Liquor store	A-4	1.00	0.98	0.0431
Hwy commercial	A-4	1.00	0.98	0.0431
Quality restaurant	A-9	0.60	0.98	0.0747
Office	A-5	0.85	0.98	0.0233
Multi-family	A-1	0.75	0.98	0.8820
Civic centre	(730)	0.85	0.98	0.0344

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For some land uses, parking generation rates were reduced to reflect shared parking opportunities between different, adjacent land uses. Data presented in the Urban Land Institute's *Shared Parking* indicates that for some land uses, the weekday daytime parking demand is as low as 75% of the peak parking demand. For example, during the daytime, when the parking demand for commercial uses is at its peak, the parking demand for residential uses is less than 75% of the peak parking demand, which for residential uses occurs at night. Consequently, it is not necessary to provide more than 75% of the number of parking stalls required for residential uses, as the remaining 25% of the parking demand can be accommodated in commercial parking stalls during evenings.

Assumed shared parking adjustment factors are summarized in Table 13. To provide a consistent basis for calculations, no adjustment was made for commercial uses. Shared parking adjustment factors for

other uses reflect the net shared parking opportunities between these uses and commercial uses.

As with trip generation rates, parking rates were reduced by an additional 2% to account for anticipated non-automobile trips to the Town Centre.

As indicated in Table 14, up to 1,564 additional parking stalls will be required in the Town Centre. Up to 300 of these new parking stalls can be provided on Main Street, Hill Road and Berry Road. This estimate assumes a length of 6.6m per on-street parking stall (with a width of 2.4m), as indicated in Table 15.

Table 14
Additional Parking Required for Town Centre Development

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Zone	Additional Parking Stalls Required		
	Total	On-Street	Off-Street
1	157	up to 45	112
2	24	up to 5	19
3	55	up to 45	10
4	375	up to 65	310
5	310	up to 55	255
6	205	up to 45	160
7	54	up to 40	14
8	384	0	384
Totals	**1,564**	**up to 300**	**1,264**

Table 15
Parking Stall Dimensions

Location	Length	Width
On-Street	6.6m	2.4m
Off-Street	5.3m	2.7m

6.2 Costs

Table 16 provides estimated order-of-magnitude costs for road network improvements required on Highway 97 to accommodate additional Town Centre traffic. It should be noted that these costs exclude property acquisition.

Table 16
Estimated Costs of Highway 97 Improvements

Location	Improvement	Estimated Cost
Pollard Road	• Traffic signals • N/S right turn lanes	$120,000 $140,000
Berry Road	• Remove signals	$10,000
Beaver Lake Road	• Westbound right turn lane	$50,000
Driveways (2)	• Raised median	$30,000
Total		**$350,000**

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