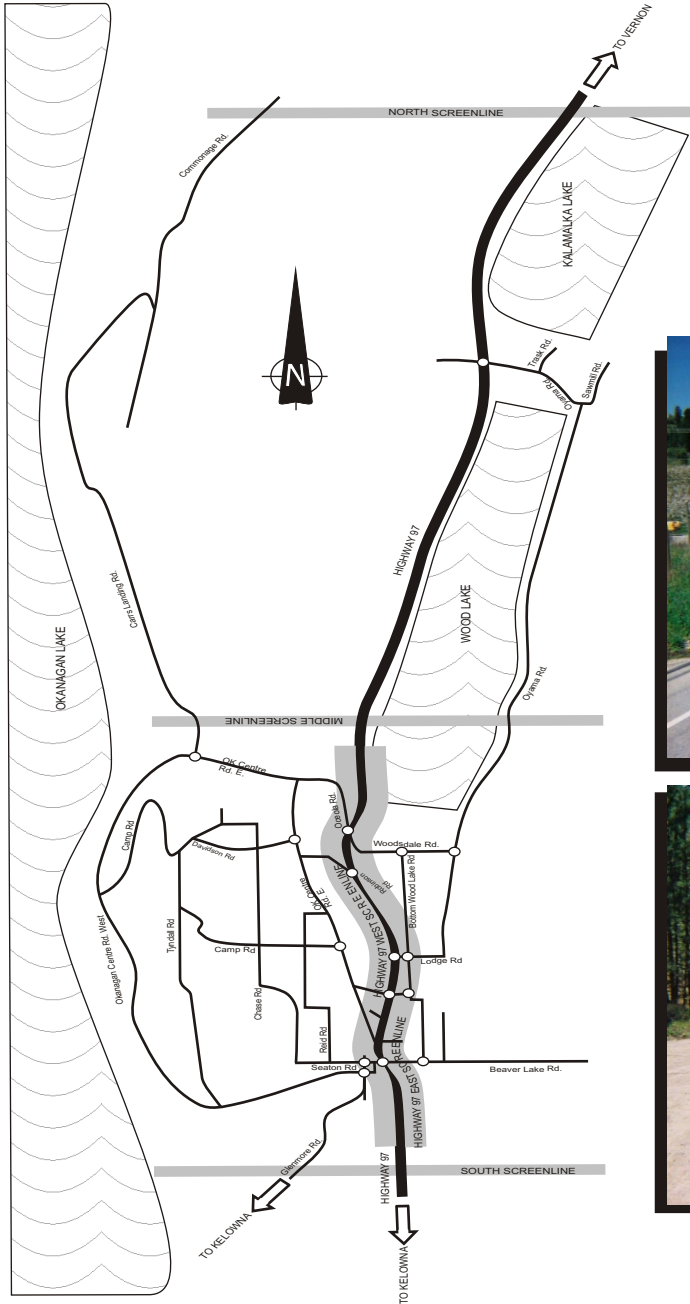
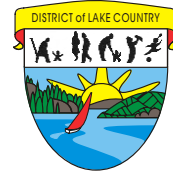


# DISTRICT OF LAKE COUNTRY TRANSPORTATION PLAN

## Phase 2 - Final Report



Prepared for



District of Lake Country



Prepared by



In association with



ward  
consulting  
group

March 2007

# DISTRICT OF LAKE COUNTRY TRANSPORTATION PLAN

## Phase 2 – Develop Updated Transportation Plan



*Prepared for:*

### **DISTRICT OF LAKE COUNTRY**

10150 Bottom Wood Lake Road  
Lake Country, B.C. V4V 2M1  
(250)

*Prepared by:*

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**31 March 2007**

*File no: 3247-201*





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## EXECUTIVE SUMMARY

---

*Creative Transportation Solutions Ltd. (CTS), in association with Associated Engineering (B.C.) Ltd. (AE) and Ward Consulting Group were retained by the District of Lake Country on 15 April 2003 to undertake Phase 2 - Develop Updated Transportation Plan. The study was initiated by the District of Lake Country to develop a future transportation plan that will accommodate the future development as outlined in the District Official Community Plan (OCP). Development pressures in the District have advanced the need for an updated comprehensive District transportation plan.*

*The primary objectives are as follows:*

- 1) Seek public input on existing and future planned transportation facilities;*
- 2) Determine what future road links are necessary to support the development needs of the OCP;*
- 3) Develop options to provide those future road links;*
- 4) Develop a draft 20 year Transportation Plan;*
- 5) Present the draft plan to both the District and the public for comments;*
- 6) Finalize the 20 year Transportation Plan;*
- 7) Prepare a 10 year Transportation Plan;*
- 8) Prepare a 10 and 20 year capital works program; and*
- 9) Document the study process in a final report.*

*The work program by CTS, AE and Ward consisted of 2 distinct phases and the work undertaken in each phase is summarized below:*

### **PHASE 1 – Review Existing Conditions**

*A large-scale data collection program was undertaken in September 2002 in order to provide valuable transportation information on both the existing conditions in Lake Country, as well as to provide data for calibrating the transportation model in Phase 2. Following are the findings from the traffic manual count and subsequent analysis of the data:*

- 1) During the weekday afternoon peak hour, the majority of municipal roads surveyed carry volumes of less than 200 vehicles per direction;*
- 2) Highway 97 carries the majority of traffic within municipal borders;*
- 3) Highway 97 carried the highest volume of traffic within the municipality during the afternoon peak hour;*
- 4) Glenmore Road is used significantly as an alternative to Highway 97 to and from Kelowna;*
- 5) None of the unsignalized intersections surveyed which are under the jurisdiction of Lake Country require any operational and/or geometrical improvements;*
- 6) Surveyed pedestrian and bicycle volumes in Lake Country were quite low in comparison to similar intersections and locales elsewhere in B.C.*

*A comprehensive license plate survey conducted for the District of Lake Country has determined the following key travel patterns:*

- 1) 67% of the traffic entering Lake Country from the north via Highway 97 has a destination within the municipality. Only 33% of the observed southbound traffic on Highway 97 was traveling through Lake Country without stopping;*



- 2) 70% of the traffic entering Lake Country from the south via Highway 97 has a destination within the municipality. Only 30% of the observed northbound traffic on Highway 97 was traveling through Lake Country without stopping;
- 3) 82% of the traffic entering Lake Country from the south via Glenmore Road has a destination within the municipality. Only 18% of the observed northbound traffic on Glenmore Road was traveling through Lake Country without stopping.

Therefore, the majority of traffic on both Highway 97 and Glenmore Road is not “through traffic” as the motorists have an origin or destination within Lake Country.

The following short-term recommendations were made to the District of Lake Country as a result of the work completed in Phase 1:

- 1) That the Ministry of Transportation undertake a full seven hour intersection count at the intersection of Highway 97 & Beaver Lake Road to update the 1993 historical count;
- 2) That the Ministry of Transportation undertake an intersection improvement study of the intersection of Highway 97 & Beaver Lake Road to determine if any short term improvements (e.g. optimizing the traffic signal timing plan, adding left turn phases, etc.) are warranted; and
- 3) That the District of Lake Country use the findings from Phase 1 to assist in the updating of the Lake Country Transportation Plan. The transportation plan update should include strategies to improve the use of alternative modes of transportation to the private automobile as the current level of use is minimal.

## **PHASE 2 – Develop Updated Transportation Plan**

Planning for a future street network in order to accommodate projected population and employment levels is a vital task of any municipal organization. The planning must be done in a controlled and staged manner in order to ensure that future traffic volumes do not destroy the livability of the community that the roads are attempting to serve. In addition, the staging of new facilities must be undertaken in a cost-effective manner during these times of fiscal constraint. Of utmost importance is public awareness and support for future municipal transportation facilities, as the public are the primary beneficiary. Therefore, local public support is often the most critical component for any proposed municipal transportation plan.

The District of Lake Country is projecting the following increases in population and employment based on the Official Community Plan and known development applications:

- Population to increase from 9,551 in the year 2003 to 19,126 by the year 2020. This represents a doubling of population and is the equivalent of an annual population increase of 4.2% per year (compounded).
- Employment to increase from 2,044 in the year 2003 to 3,976 by the year 2020. This is the equivalent of an annual employment increase of 4.0% per year (compounded).

The first public meeting of the Transportation Plan Update was held on Thursday, 12 June 2003 at the Municipal Hall in Lake Country. District, CTS and AE staff were in attendance to host an Open House and solicit public input. A total of 30 members of the public attended the meeting of which many provided valuable comments.



A transportation model was developed for Lake Country using the TMODEL2 software to assist the project team in evaluating various future road network scenarios. The following horizon years were used in this study to coincide with the planning horizon years in the Central Okanagan Transportation Model:

20-Year Horizon	Year 2020
10-Year Horizon	Year 2010

A total of three initial 20-year road network options were initially tested with the forecast traffic volumes as described below:

- Option 1 - Do Nothing (i.e. Existing Major Road Network)
- Option 2 - Official Community Plan
- Option 3 - Official Community Plan + Highway 97 Access Management Plan

An evaluation of the results from the three options led to the development of a first draft of the updated transportation plan for the year 2020. The first draft of the updated transportation plan was developed based on feedback from the public at the first public meeting and the findings of the technical work (i.e. transportation planning, traffic engineering and road design) completed to date. The key elements of this first draft plan were as follows:

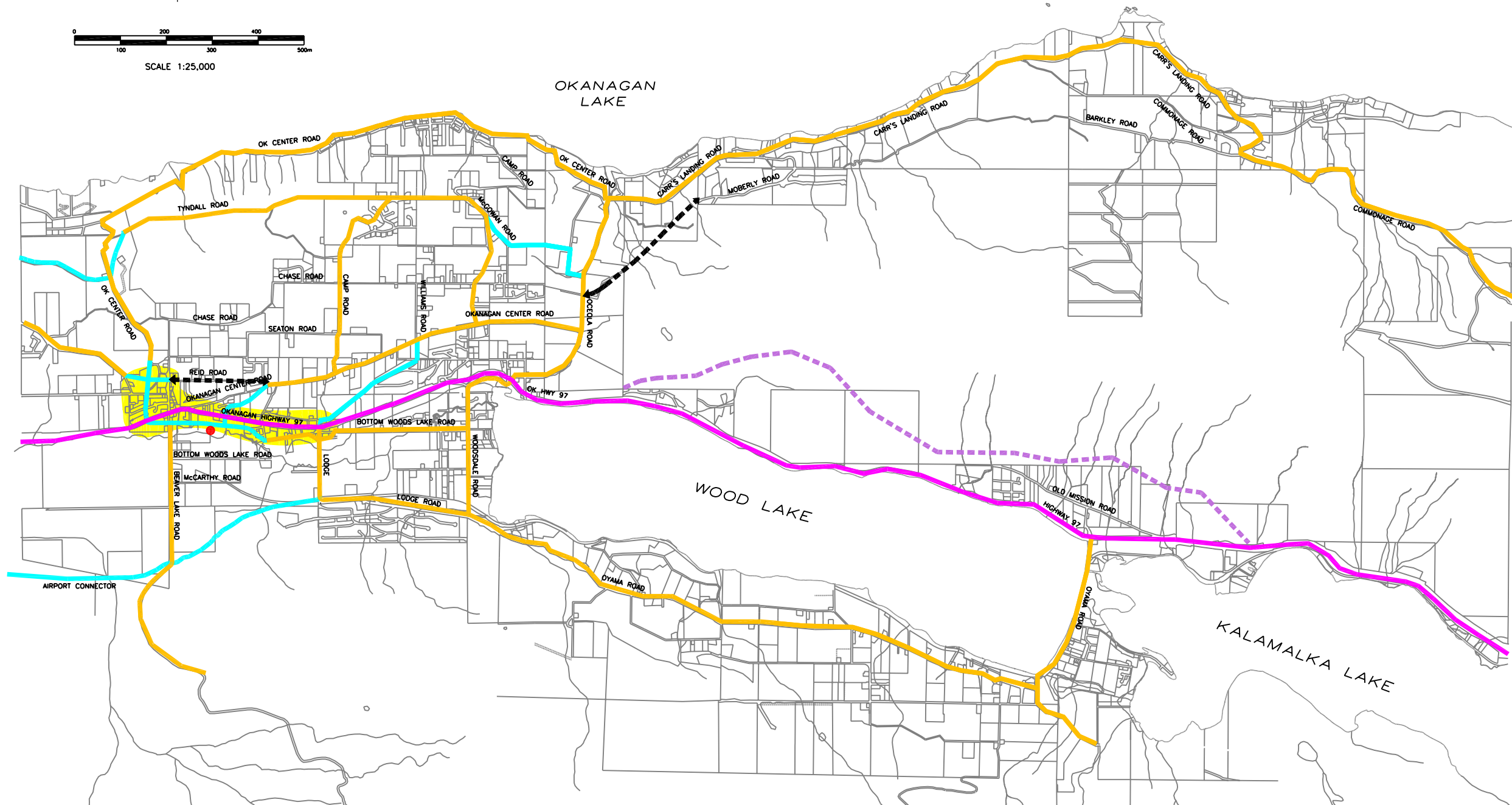
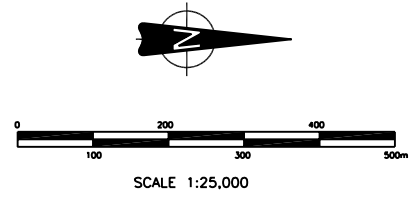
1. Realignment of Beaver Lake Road to Highway 97;
2. Realignment of Glenmore Road to Highway 97;
3. Completion of Main Street through the commercial area of Winfield;
4. Construction of the Airport Connector / Lodge / Williams Road link;
5. Construction of Tyndall Road to Glenmore Road;
6. Construction of McGowan Road connection to OK Centre Road East;
7. Construction of the Highway 97 Access Management Plan; and
8. Construction of a new transportation centre on Main Street between Beaver Lake Road and Pollard Road where Kelowna transit, taxi and Greyhound transfers can be made.

Of note, the Wood Lake Bypass of Highway 97 is shown on the plan as a future link with the timeline undefined as there is still further work required by the Ministry of Transportation on the potential alignment. Both the preliminary updated transportation plan, as well as the assessment of the above options, were presented to the public and stakeholders at the second public meeting on Monday, 27 September 2004 at the Municipal Hall in Lake Country. It is estimated that at least 50 members of the public attended the meeting (of which 41 signed in) and provided comments on the various options. As well, there was a followup 30 day comment period where the public could submit comments after the 2<sup>nd</sup> public meeting directly to Municipal Hall.

Based on the feedback from both the public and municipal staff, CTS and AE staff prepared a revised draft transportation plan and this illustrated in **FIGURE E1**. The key changes from the first draft include the following:

1. Removal of Williams Road from the Transportation Plan (from Bond Road to OK Centre Road East);
2. Addition of Davidson Road to the Transportation Plan (from Camp Road to OK Centre Road East); and
3. Addition of the Reid Road Connector to the Transportation Plan (from Glenmore Road to OK Centre Road East) as a future link required beyond 20 years.

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**LEGEND**

- EXISTING CONNECTOR ROADS
- PROPOSED CONNECTOR ROADS
- HIGHWAY 97 EXISTING
- - - FUTURE ROAD LINKS REQUIRED BEYOND 20 YEARS
- HIGHWAY 97 ACCESS MANAGEMENT PLAN
- NEW TRANSPORTATION CENTRE
- - - FUTURE HIGHWAY 97 ALIGNMENT

# 20 YEAR REVISED DRAFT TRANSPORTATION PLAN

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	3247
SCALE	AS SHOWN
DRAWN	C.L.
DESIGNED	JV
CHECKED	EB
APPROVED	JV
DATE	OCT. 2005
	INITIAL

CLIENT	DISTRICT OF LAKE COUNTRY
LAKE COUNTRY TRANSPORTATION PLAN UPDATE – PHASE 2	

FIGURE E1		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		





### **PHASE 3 – Develop 10 and 20 Year Capital Works Program**

*The recommended Capital Works Program identifies the scope of road construction works that are required to achieve the recommended 20-year transportation plan developed in Phase 2. Generally, the works involve construction of new roads or sections of roads, or in many cases, construction to improve existing roads to the current collector and arterial standards. The capital works program recognizes that some areas of the District of Lake Country are expected to maintain their rural character, while others will continue, or be developed, towards an urban character. Thus, the capital works program projects a combination of rural and urban standards of road construction works.*

*Road standards that have been developed for the capital works program for both future neighbourhood connector and rural community connector roads. Two standard cross sections are proposed: urban and rural. The primary differences are that an urban connector will have 10.0 metres of pavement, 2 bike lanes, curbs, gutters and underground utility services while the rural road cross section will consist of 9.6 metres of pavement, gravel shoulders, some overhead utilities and drainage by ditch and culvert systems. In general, the proposed urban connector road cross section cost at \$1,693 per metre is approximately double that for a rural cross section at \$889 per metre.*

*Generally, the application of the two standards has been determined based on the long term land use of the area traversed by each proposed road. The total cost estimate for the recommended transportation plan is \$76,000,000 (in 2006 dollars) of which the District's portion is \$46,100,000 broken down as follows:*

- Years 1 to 10 = \$7,800,000
- Years 11 to 20 = \$38,300,000

*The balance of the plan costs (i.e. \$29,900,000) is to be paid by the Province of B.C. and development cost charges.*

*The timing of the implementation of the 10 and 20 year Transportation Plans will be affected by the actual growth rate and timing of development applications.*

### **PHASE 4 – Final Report**

*Phase 4 consisted of preparing the written documentation of the overall study process. The first draft report was issued on 18 October 2005. This revised draft report was prepared to include updated construction costs estimates based on year 2006 dollars.*

**STUDY RECOMMENDATIONS**

- 1) *That the District of Lake Country adopt the recommended cross sections for both the Rural Community Connector and the Neighbourhood Connector roadways, both of which incorporate bike facilities to varying degrees;*
- 2) *That the District of Lake Country develop a bicycle network for the community in order to further support this mode of transportation;*
- 3) *That the District of Lake Country work with Kelowna Transit and BC Transit on developing community bus routes that would provide improved and more cost effective bus service to residents in order to increase transit usage within Lake Country, as well as connecting to existing regional transit services to Kelowna and possibly future service to Vernon; and*
- 4) *That the District of Lake Country identify a preferred location along the Main Street corridor for a future multi-modal transportation centre where Kelowna Transit, taxi companies, Greyhound Bus and other transportation services can provide transfer activities at one location resulting in improved customer service.*
- 5) *That the District of Lake Country encourage the Ministry of Transportation to begin detailed planning and design of the proposed Wood Lake Bypass so that the right-of-way can be finalized.*
- 6) *That the District of Lake Country develop a transportation monitoring program in order to monitor future traffic volumes.*



SECTION

1

## INTRODUCTION

Creative Transportation Solutions Ltd. (CTS) in association with Associated Engineering (B.C.) Ltd. (AE) and Ward Consulting Group were retained by the District of Lake Country on 15 April 2002 to develop the updated transportation plan. The study was initiated by District of Lake Country primarily to develop an updated future transportation plan that will accommodate the development as outlined in the Official Community Plan (OCP). Development pressures in the District have advanced the need for an updated comprehensive District transportation plan as the population is expected for double by the year 2020.

The primary objectives are as follows:

- 1) Seek public input on existing and future planned transportation facilities;
- 2) Determine what future road links are necessary to support the development needs of the OCP;
- 3) Develop options to provide those future road links;
- 4) Develop a draft 20 year Transportation Plan;
- 5) Present the draft plan to both the District and the public for comments;
- 6) Finalize the 20 year Transportation Plan;
- 7) Prepare a 10 year Transportation Plan;
- 8) Prepare a 10 and 20 year capital works program; and
- 9) Document the study process in a final report.

The District of Lake Country encompasses the community of Winfield, Oyama, Carr's Landing and Okanagan Centre, and is located between Kelowna and Vernon. The work program consisted of two distinct phases and they were:

- |         |  |
|---------|--|
| PHASE 1 | Review Existing Conditions (by CTS)                          |
| PHASE 2 | Develop Transportation Plan (by CTS, AE and Ward)            |
| PHASE 3 | Develop 10 and 20 Year Capital Works Program (by CTS and AE) |
| PHASE 4 | Final Report (by CTS and AE)                                 |

Phase 1 was completed in January 2003 and the Interim Report for Phase 2 and 3 was issued in May 2004. This **REPORT** summarizes the work completed to date on all phases of this project.

**SECTION**  
**2****EXISTING CONDITIONS****2.1 Study Area**

The study area is bounded by Okanagan Lake to the west, the municipal boundary to the north and south, and Oyama Road to the east. The following twelve (12) unsignalized intersections were analyzed within the study area:

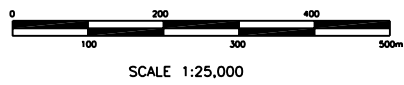
- Okanagan Centre Road West & Glenmore Road;
- Seaton Road & Glenmore Road;
- Bottom Wood Lake Road & Beaver Lake Road;
- Okanagan Centre Road East & Robinson Road;
- Bottom Wood Lake Road & Lodge Road;
- Bottom Wood Lake Road & Woodsdale Road;
- Okanagan Centre Road East & Camp Road;
- Okanagan Centre Road East & Carrs Landing Access Road;
- Bottom Wood Lake Road & Berry Road;
- Oyama Road & Woodsdale Road;
- Oyama Road & Sawmill Road; and
- Oyama Road & Traks Road.

In Phase 2, the following four (4) additional signalized intersections on Highway 97 were included in the road network assessment:

- Highway 97 & Beaver Lake Road;
- Highway 97 & Berry Road;
- Highway 97 & Oceola Road; and
- Highway 97 & Oyama Road.

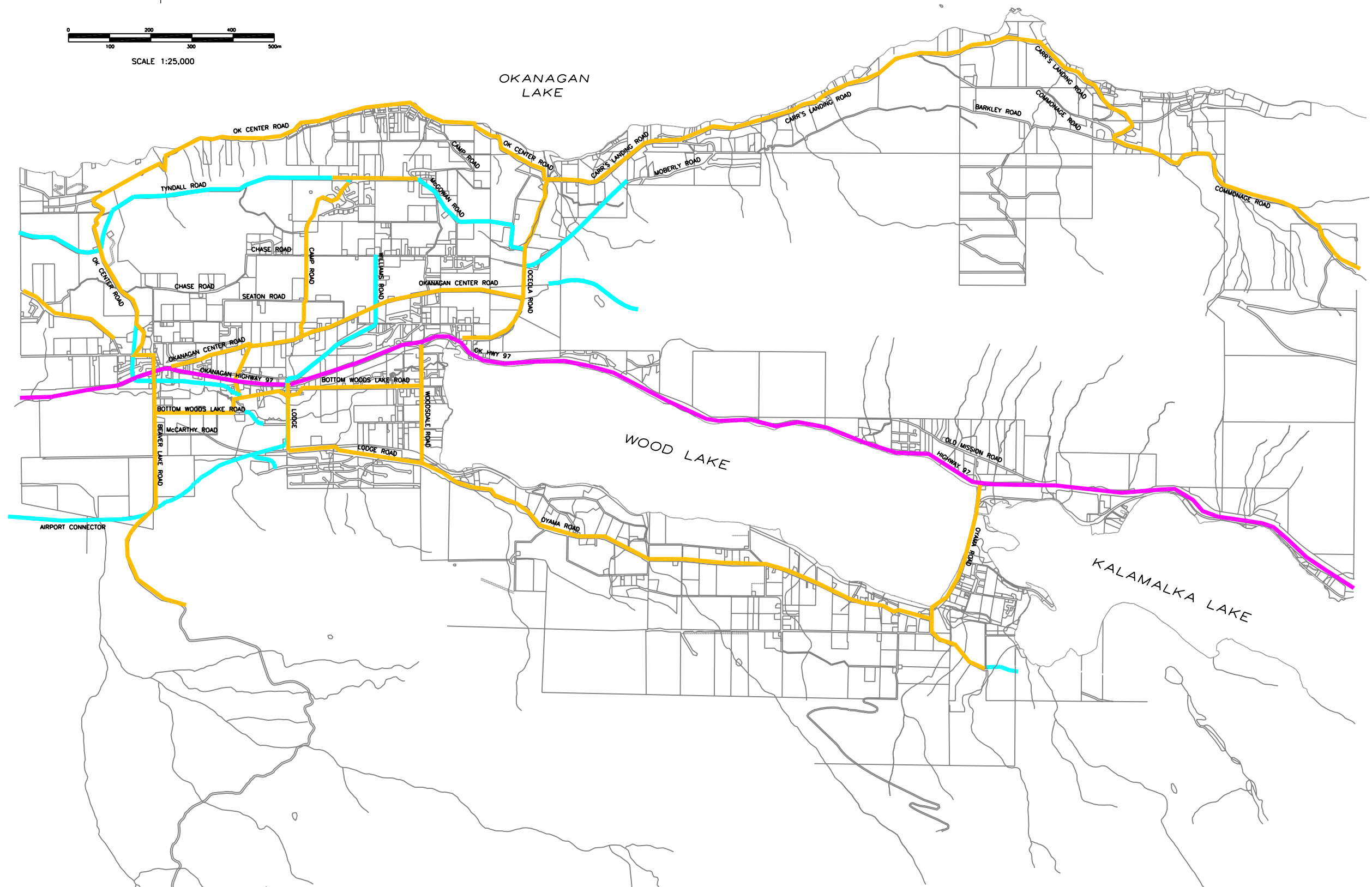
**FIGURE 2.1** illustrates the study area and road network for Lake Country, including proposed roads from the Official Community Plan.

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**LEGEND**

- EXISTING CONNECTOR ROADS
- HIGHWAY 97 EXISTING



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	032418		
SCALE	AS SHOWN		
DRAWN	C.L.		03/11/06
DESIGNED	E.A.L.		03/11/06
CHECKED	E.A.L.		03/11/06
APPROVED			03/11/06
DATE	NOV. 2003	INITIAL	

**CLIENT**  
 DISTRICT OF LAKE COUNTRY  
 LAKE COUNTRY TRANSPORTATION  
 PLAN UPDATE – PHASE 2

<b>FIGURE 2.1</b> STUDY AREA AND EXISTING ROAD NETWORK		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		



## 2.2 Traffic Zones

A traffic zone network was developed in consultation with the District of Lake Country staff which took into account land use zoning, geographical and topographical features and jurisdictional borders. A total of 51 traffic zones were developed as illustrated on **FIGURE 2.2**. 46 traffic zones are located in Lake Country while the remaining 5 are located outside the District (i.e. 418, 419, 420, 421 and 422).

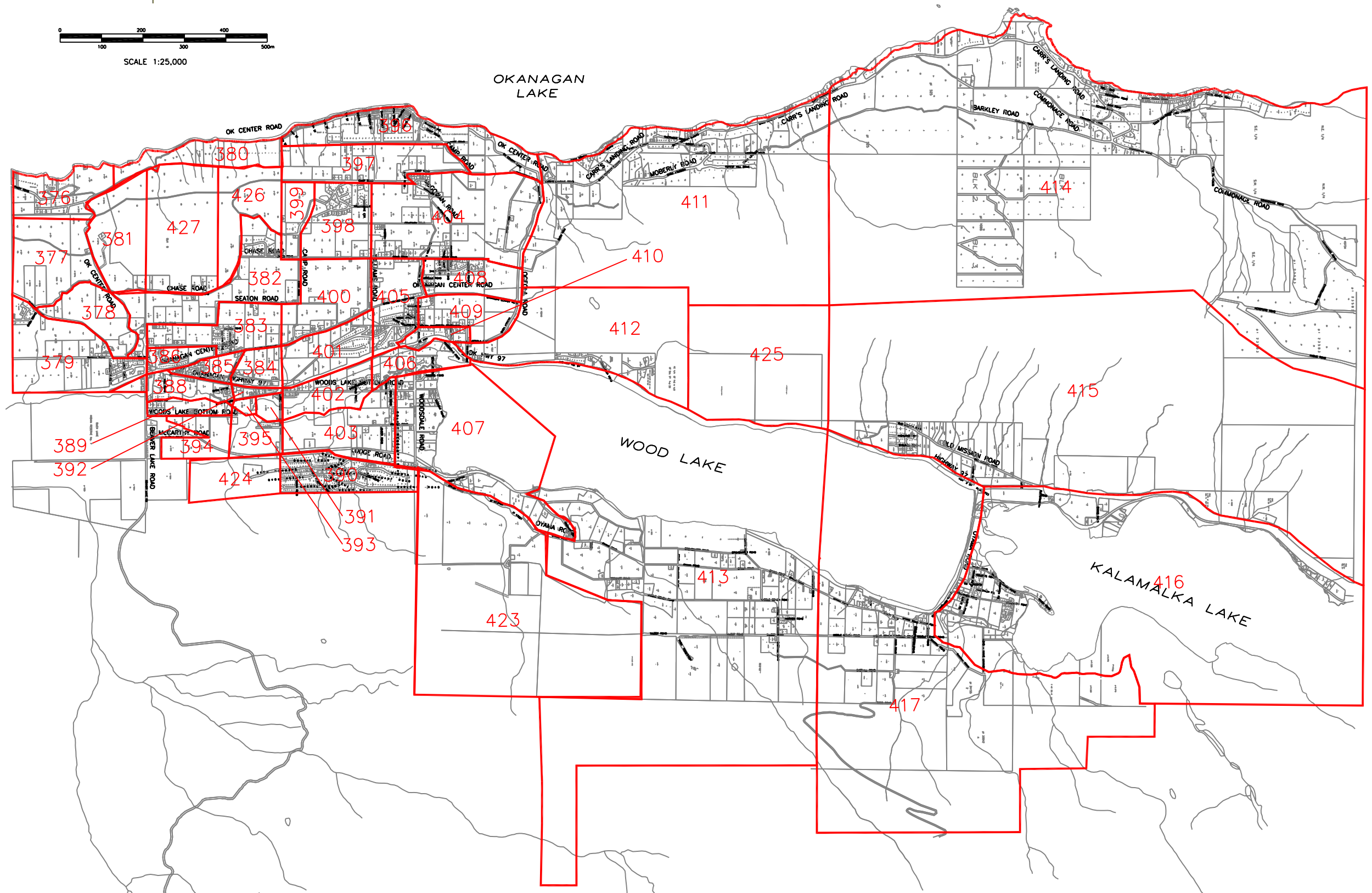
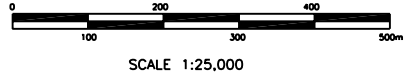
## 2.3 Data Collection Program

A traffic count program of the four traffic signals on Highway 97 in Lake Country was organized and undertaken in order to augment the traffic data previously collected in Phase 1 of this project. This additional data provided valuable transportation information for both the existing conditions as well as for calibrating the transportation model. The data collection program was undertaken on Wednesday, 28 May 2003 from 07:00 to 09:00, from 11:00 to 13:00, and from 15:00 to 18:00. No unusual circumstances (eg. motor vehicle accident, etc.) were noted that might have skewed the results.

**FIGURE 2.3** illustrates the 2003 Weekday afternoon peak hour traffic volumes for the study area. Intersection capacity analysis for the existing volumes are documented in Section 5.4.

Regarding existing pedestrian and bicycle volumes, these are illustrated on **FIGURE 2.4** and **FIGURE 2.5** respectively.

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NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	032418		
SCALE	AS SHOWN		
DRAWN	C.L.		03/11/06
DESIGNED	E.A.L.		03/11/06
CHECKED	E.A.L.		03/11/06
APPROVED			03/11/06
DATE	NOV. 2003	INITIAL	

CLIENT	DISTRICT OF LAKE COUNTRY
LAKE COUNTRY TRANSPORTATION PLAN UPDATE – PHASE 2	

FIGURE 2.2 TRAFFIC ZONES		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		



FIGURE 2.3: 2003 WEEKDAY AFTERNOON PEAK HOUR TRAFFIC VOLUMES

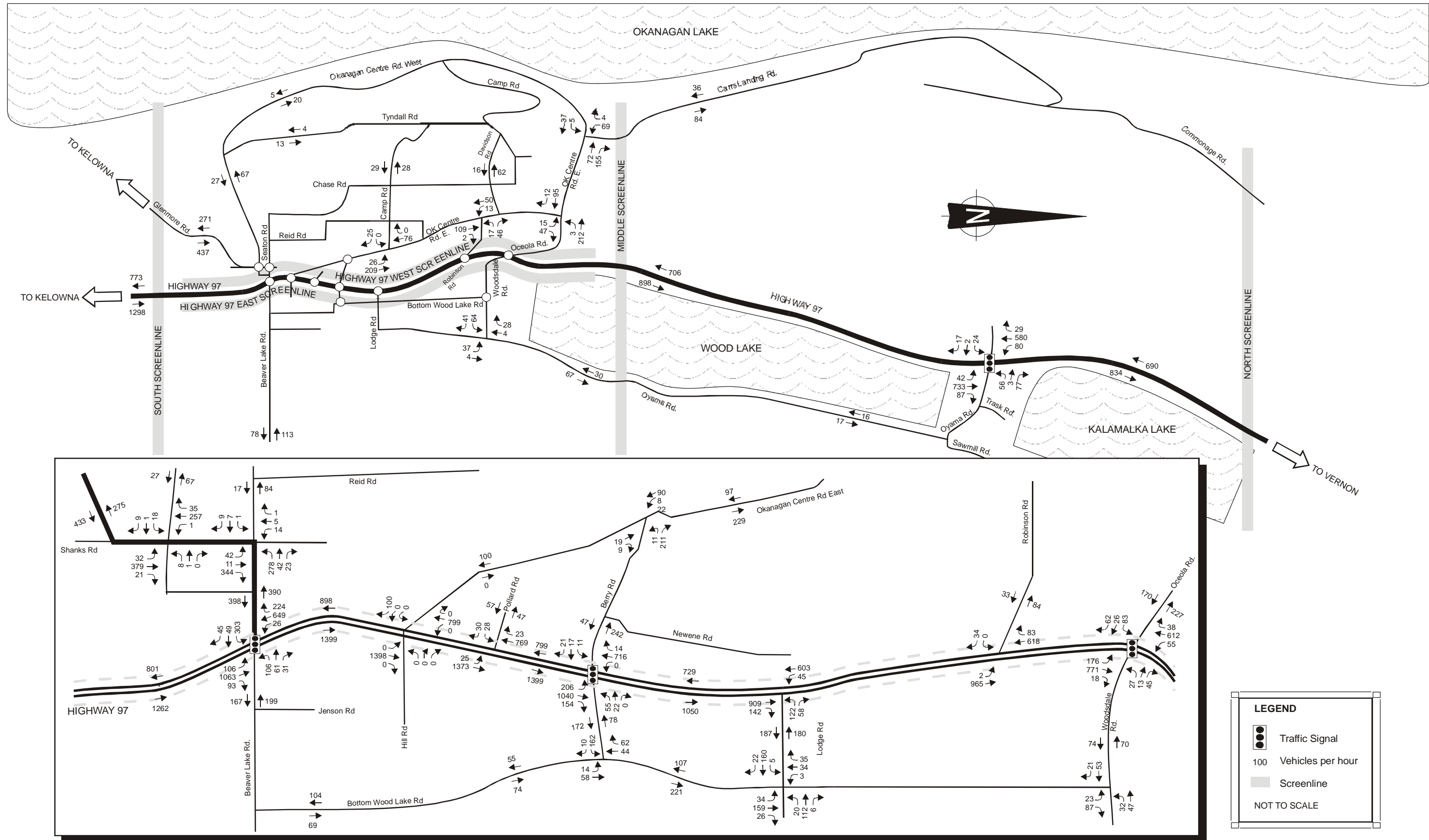
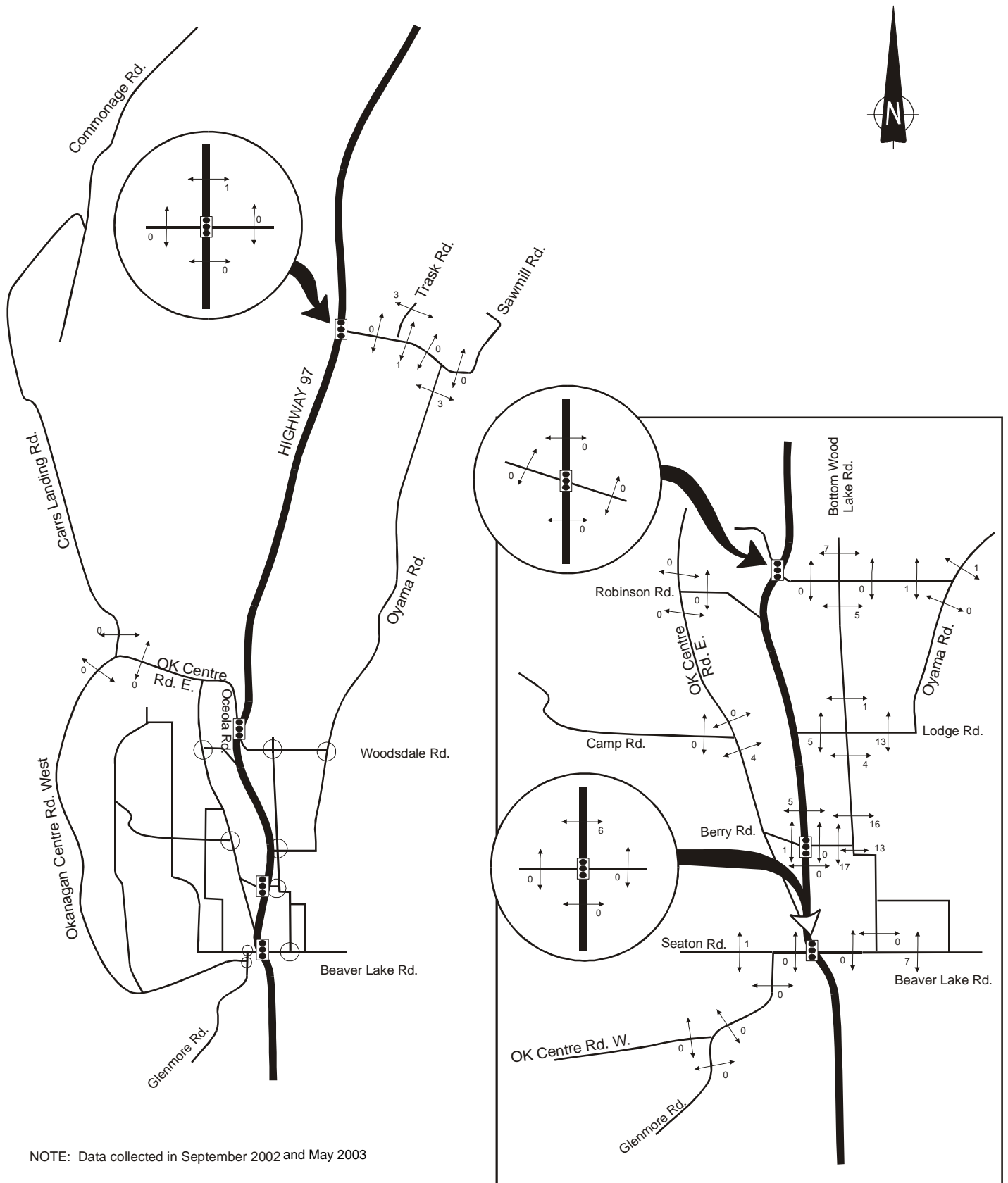




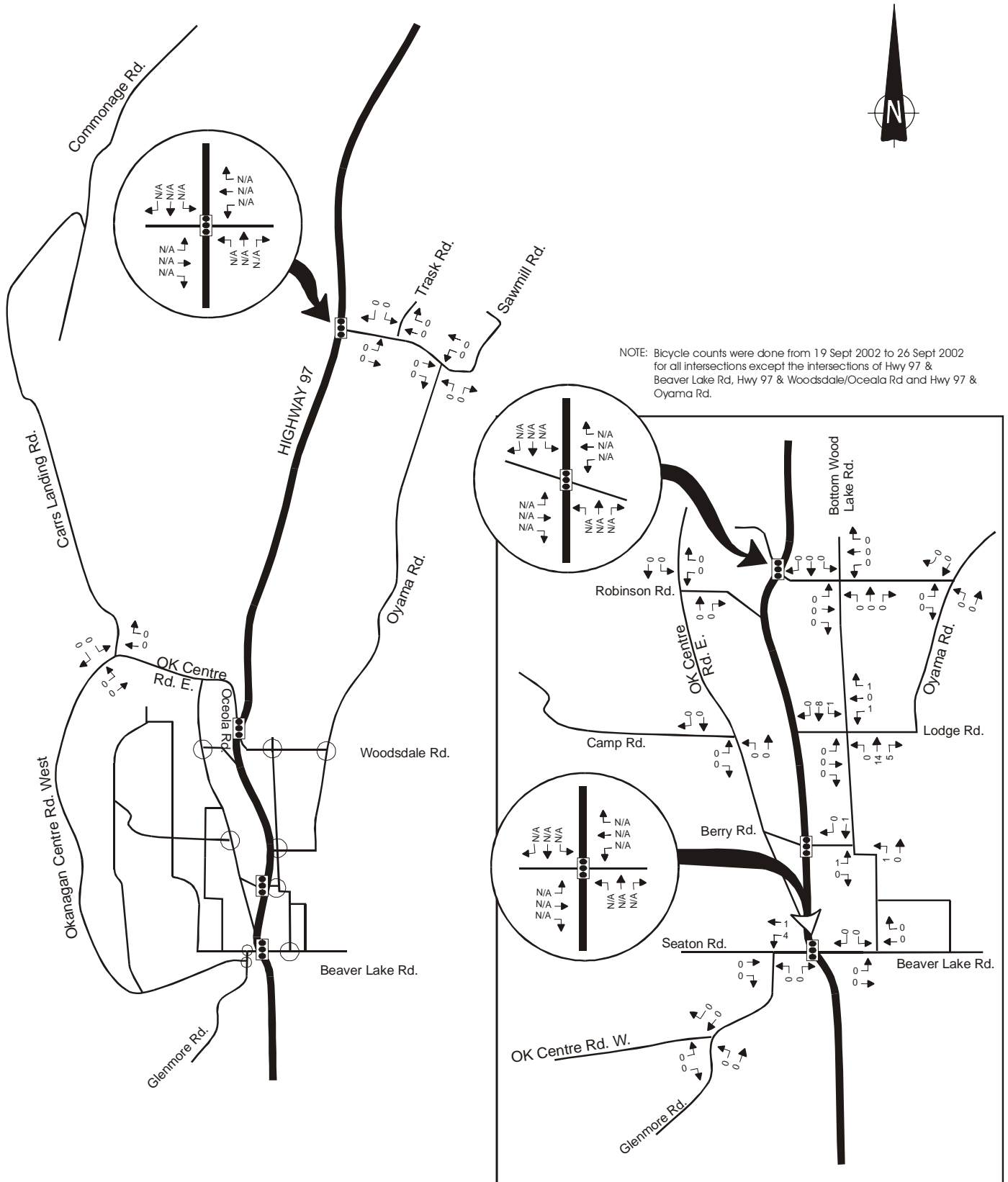


FIGURE 2.4: EXISTING PEDESTRIAN VOLUMES - WEEKDAY AFTERNOON PEAK HOUR



NOTE: Data collected in September 2002 and May 2003

**FIGURE 2.5: EXISTING BICYCLE VOLUMES - WEEKDAY AFTERNOON PEAK PERIOD (15:00 – 18:00)**





SECTION  
3

## LAND USE

### 3.1 Land Use

The District of Lake Country is projecting the following increases in population and employment based on the Official Community Plan and known development applications:

- Population to increase from 9,551 in the year 2003 to 19,126 by the year 2020. This represents a doubling of population and is the equivalent of an annual population increase of 4.2% per year (compounded).
- Employment to increase from 2,044 in the year 2003 to 3,976 by the year 2020. This is the equivalent of an annual employment increase of 4.0% per year (compounded).

In general, the above growth rates are considered to be quite aggressive and may not be sustainable over a period of 17 years to the year 2020. **TABLE 3.1** provides a detailed summary of the proposed changes in population and employment by traffic zone.



**TABLE 3.1 - SUMMARY OF POPULATION AND EMPLOYMENT BY TRAFFIC ZONE**

TRAFFIC ZONE	2003 DATA		2020 DATA		NET CHANGES		COMMENTS
	POP	EMP	POP	EMP	POP	EMP	
376	115	13	144	15	30	2	
377	53	7	100	13	47	6	
378	27	3	85	38	58	35	
379	388	53	418	53	31	0	
380	97	11	100	12	3	1	
381	40	4	750	86	710	82	Large development (see zone 426 and 427)
382	233	27	250	29	17	2	
383	348	40	349	37	1	-3	
384	61	61	200	200	139	139	
385	120	97	120	97	0	-1	
386	180	23	195	23	15	0	
387	25	3	25	3	0	0	
388	84	223	170	466	87	242	
389	66	65	499	125	433	59	
390	1237	143	950	109	-287	-34	
391	4	31	4	34	0	3	
392	64	16	209	126	145	110	
393	0	78	0	105	0	27	
394	27	3	56	26	29	22	
395	43	80	115	133	72	53	
396	491	59	508	56	16	-3	
397	132	51	191	56	59	6	
398	234	27	293	31	59	4	
399	48	5	91	10	44	5	
400	91	10	91	10	0	-1	
401	204	35	400	57	196	22	
402	125	18	169	21	44	4	
403	419	58	450	58	31	0	
404	344	81	450	115	106	34	
405	457	73	488	73	31	-1	
406	161	31	248	61	87	30	
407	265	30	699	89	434	59	
408	324	37	325	35	1	-3	
409	207	24	237	25	30	1	
410	89	34	118	38	29	3	
411	434	50	494	53	60	3	
412	122	96	1053	169	931	73	Pollards Pond development
413	492	57	523	56	31	-1	
414	582	67	758	83	176	16	
415	386	56	473	75	88	19	
416	720	157	809	311	89	154	
417	12	7	12	8	0	0	
423	0	0	1750	276	1750	276	Proposed golf course development
424	0	0	950	109	950	109	
425	0	0	1053	169	1053	169	
426	0	0	875	101	875	101	Large development (see zone 381 and 427)
427	0	0	875	101	875	101	
<b>Total</b>	<b>9551</b>	<b>2045</b>	<b>19126</b>	<b>3976</b>	<b>9575</b>	<b>1931</b>	
<b>GROWTH RATE (compounded)</b>			<b>4.2%</b>	<b>4.0%</b>			



SECTION  
4

## TRAVEL DEMAND FORECASTING

### 4.1 Model Development

The model used for the study was the Central Okanagan Transportation Model based on the T-MODEL2 software. This covers the entire Central Okanagan Regional District, i.e., includes Lake Country, City of Kelowna, Westbank, and Peachland and was calibrated to the year 1997. The only land use data established for this model was the base year of 1997 and the anticipated growth to 2020. For all other interim year projections (e.g. for 2010), the land use data was simply interpolated between these two years. This meant that the model assumed that growth was uniform throughout the city.

The 1997 road network was also updated to existing conditions to ensure that it included recent network changes in Lake Country and the Greater Kelowna area.

Screenlines were established to calibrate the model with existing conditions. The model's projections were then compared with field counts obtained from a variety of sources. The model's projected volumes on each of the links across the screenlines were then compared against the available traffic counts from **FIGURE 2.3** and any discrepancies noted. Any significant discrepancies were investigated and the model further refined until the discrepancies were found to be within the allowable deviation percentage as recommended in the NCHRP Report 255.

**SECTION**  
**5****DEVELOPMENT OF 20-YEAR TRANSPORTATION PLAN**

Planning for a future street network in order to accommodate projected population and employment level is a vital task of any municipal organization. It must be done in a controlled and staged manner in order to ensure that future traffic volumes do not destroy the livability of the community that the roads are attempting to serve. In addition, the staging for new facilities must be undertaken in a cost-effective manner during these times of fiscal constraint. Of utmost importance is public awareness and support for future municipal transportation facilities, as the public is the primary beneficiary. Therefore, local public support is often the most critical component for any proposed municipal transportation facility.

**5.1 Public Meeting #1**

The first public meeting on the District of Lake Country Master Transportation Plan was held on Thursday, 12 June 2003 from 19:00 to 22:00 at the Carr's Landing Room at the Municipal Hall in Lake Country. District, CTS and AE staff were in attendance to host an Open House and solicit public input. A total of 30 members of the public attended the meeting and the main comments were as follows:

1. Concerned about the traffic impacts on Woodsdale Road from future development activity. Also concerned about the lack of sidewalks on Woodsdale Road.
2. Concerned about the existing 2-way stop controlled operation at the intersection of Bottom Wood Lake Road & Lodge Road. Sight lines are not good too.
3. At the intersection of Reiswig & Woodsdale Road, the hedge in the corner has sight line problems.
4. At the intersection of Highway 97 & Beaver Lake Road, there is the need to install a number of left turn arrows to address high left turn traffic volumes at certain times of the day.
5. It is difficult to make the left turn from Hill Road onto Highway 97 southbound.
6. The new median on Highway 97 adjacent to the 7-11 is very dangerous as the gap permits northbound left turn movements into 7-11. However, these vehicles can impede the inside northbound through lane on Highway 97 as there is no vehicle storage for the northbound left turn movements.
7. It is difficult to enter Highway 97 (both northbound and southbound) from the A&W driveway.



8. Concerned about the intersection operation and vehicle delays at the intersection of Bottom Wood Lake Road & Berry Road.
9. Will Bottom Wood Lake Road be renamed to Main Street once all of Main Street is constructed?
10. Concerned about the traffic impacts on Oyama Road, Woodsdale Road and Talbot Road from the proposed golf resort development on the east side of Wood Lake. This development will be equivalent to another Oyama sized community.
11. Would like to see the addition of a community transit bus to service the local communities with a transfer location on Main Street / Bottom Wood Lake Road with the regional transit service from Kelowna. This way, local residents will have an alternative to driving to do their local shopping.
12. Make sure that any future improvements to Highway 97 through Lake Country can accommodate bikes in the design, either with designated bike lanes or widened curb lanes.
13. Concerned about the stretch of Highway 97 along Wood Lake. Considers this segment to be very dangerous to drive. Would like this highway section to be widened to 4 lanes along a new alignment to the west as currently proposed.
14. Concerned about the impact of Kelowna based traffic (from the industrial area) on Beaver Lake Road.
15. Concerned about the impact of the proposed European spa resort near Predator Ridge on Commonage Road and Carr's Landing Road.
16. Concerned about emergency vehicle access to Carr's Landing if Carr's Landing Road is blocked due to an incident. Alternative routes are desirable.
17. Carr's Landing residents in attendance prefer the use of Barkley Road to Commonage Road as the future "bypass" to the area.

## 5.2 Project Website

A project website has been setup to facilitate communication with the public ([www.lakecountryplan.com](http://www.lakecountryplan.com)). To date, traffic has been much lighter than expected.

## 5.3 Road Network Scenarios Tested

A total of three (3) road network scenarios were initially tested as described below:



### 5.3.1 Option 1 – Do Nothing

Option 1 – Do Nothing was setup to create a benchmark with which to gauge the effectiveness of the other two options, both of which involve various capital improvements. The projected weekday afternoon peak hour volumes from the model for Option 1 are illustrated in **FIGURE 5.1**. The total construction cost for Option 1 is estimated to be \$0 (in 2004 dollars).

### 5.3.2 Option 2 – Official Community Plan

The Official Community Plan contains the current transportation plan for Lake Country and this is illustrated in **FIGURE 5.2**. Option 2 tests the effectiveness of the current transportation plan which includes the following key features:

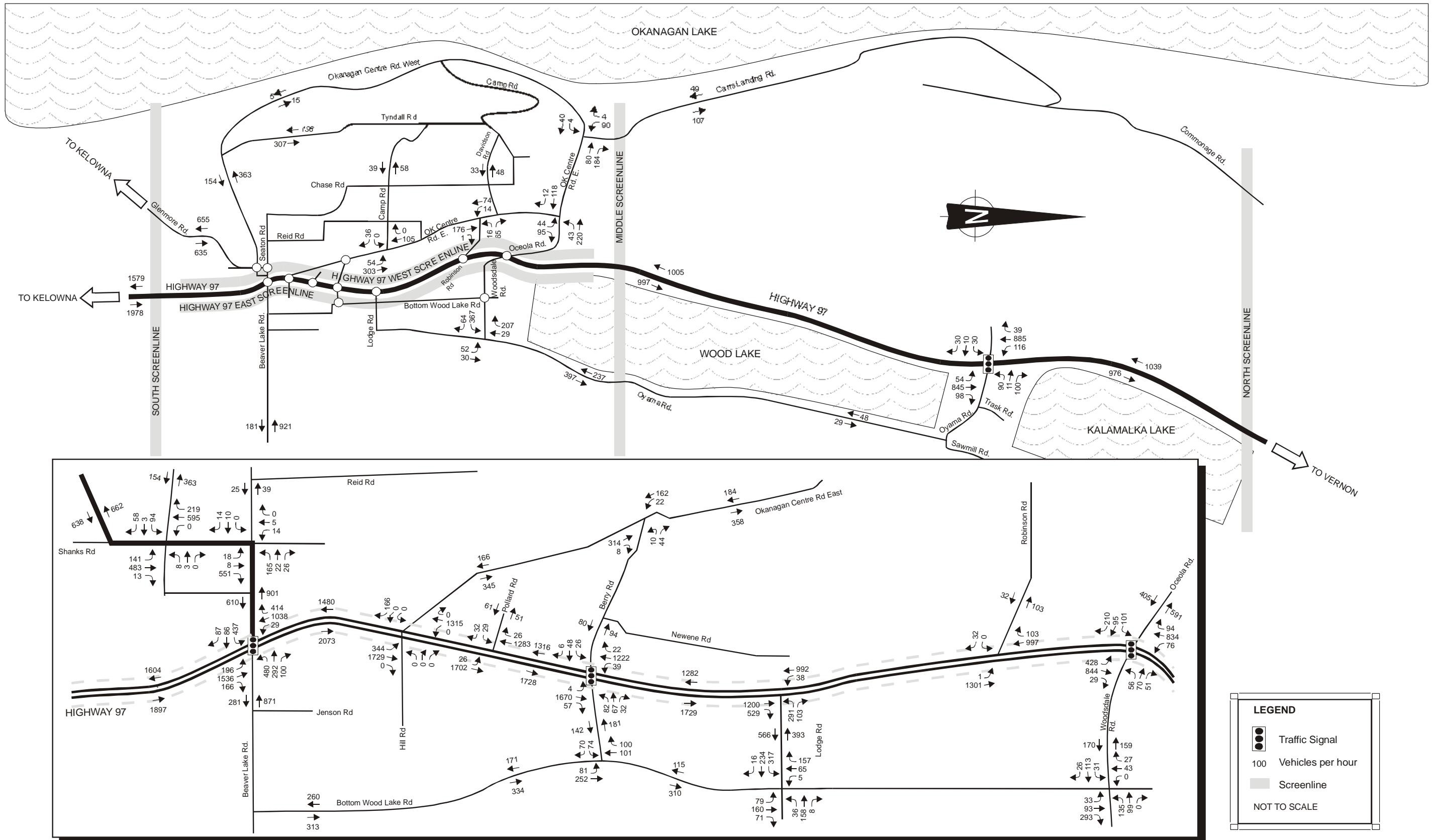
1. Realignment of Beaver Lake Road to Highway 97;
2. Realignment of Glenmore Road to Highway 97;
3. Completion of Main Street through the commercial area of Winfield;
4. Construction of the Airport Connector / Lodge / Williams Road link;
5. Construction of Tyndall Road to Glenmore Road;
6. Construction of McGowan Road connection to OK Centre Road East;
7. Construction of Moberly Road connection to OK Centre Road East; and
8. Construction of the Highway 97 Wood Lake bypass.

The projected weekday afternoon peak hour volumes from the model for Option 2 are illustrated in **FIGURE 5.3**. The total construction cost for Option 2 is estimated to be \$51,900,000 (in 2004 dollars) excluding the Highway 97 Wood Lake Bypass. Of this, the District's share is estimated to be \$33,700,000 with the balance to be paid by the Province of B.C. and development cost charges.





FIGURE 5.1: 2020 WEEKDAY AFTERNOON PEAK HOUR TRAFFIC VOLUMES  
PROJECTED TRAFFIC VOLUMES (OPTION 1 – DO NOTHING)

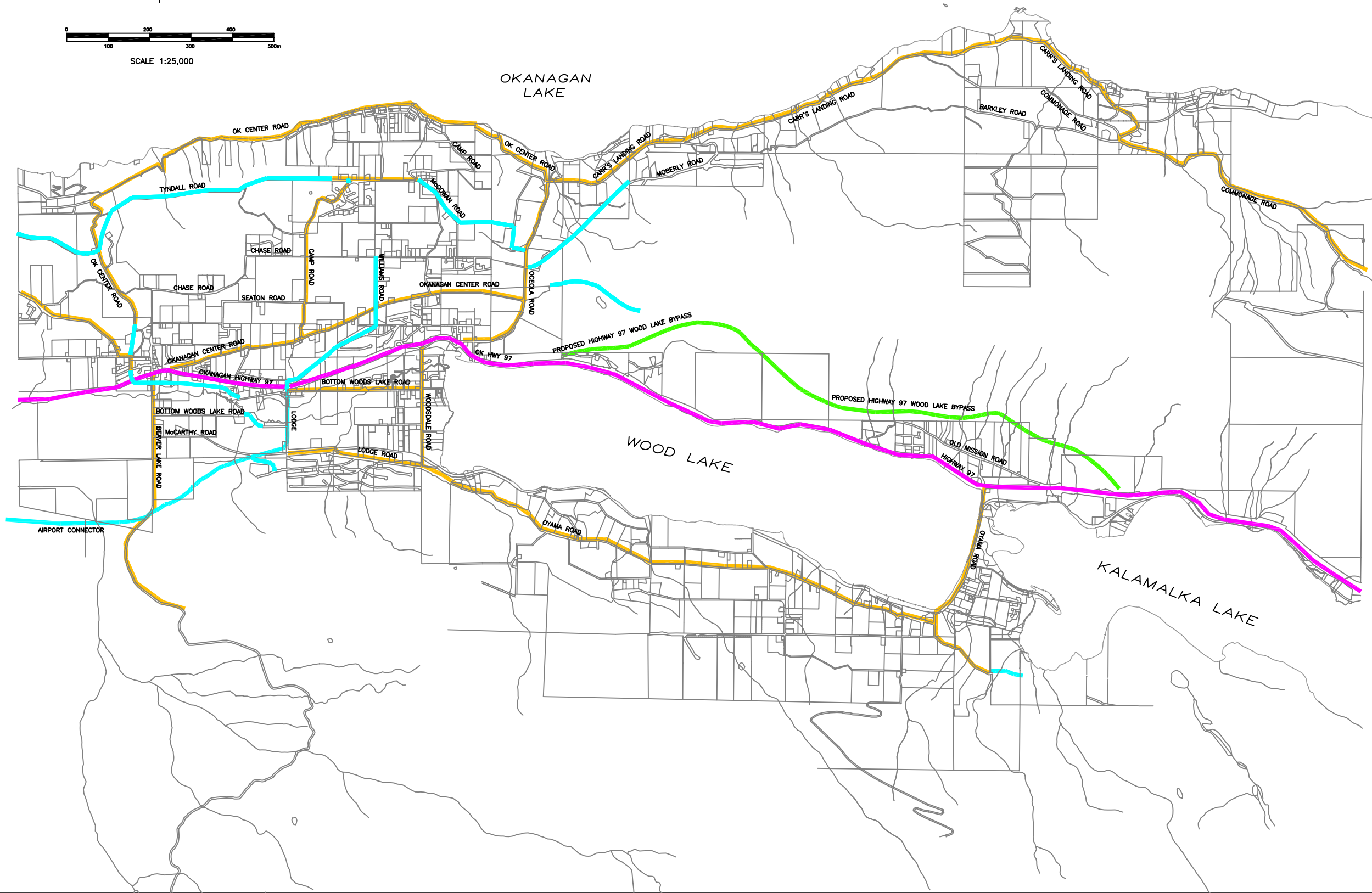




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LEGEND

- EXISTING MAJOR ROADS
- PROPOSED MAJOR ROADS
- HIGHWAY 97 EXISTING
- HIGHWAY 97 PROPOSED



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



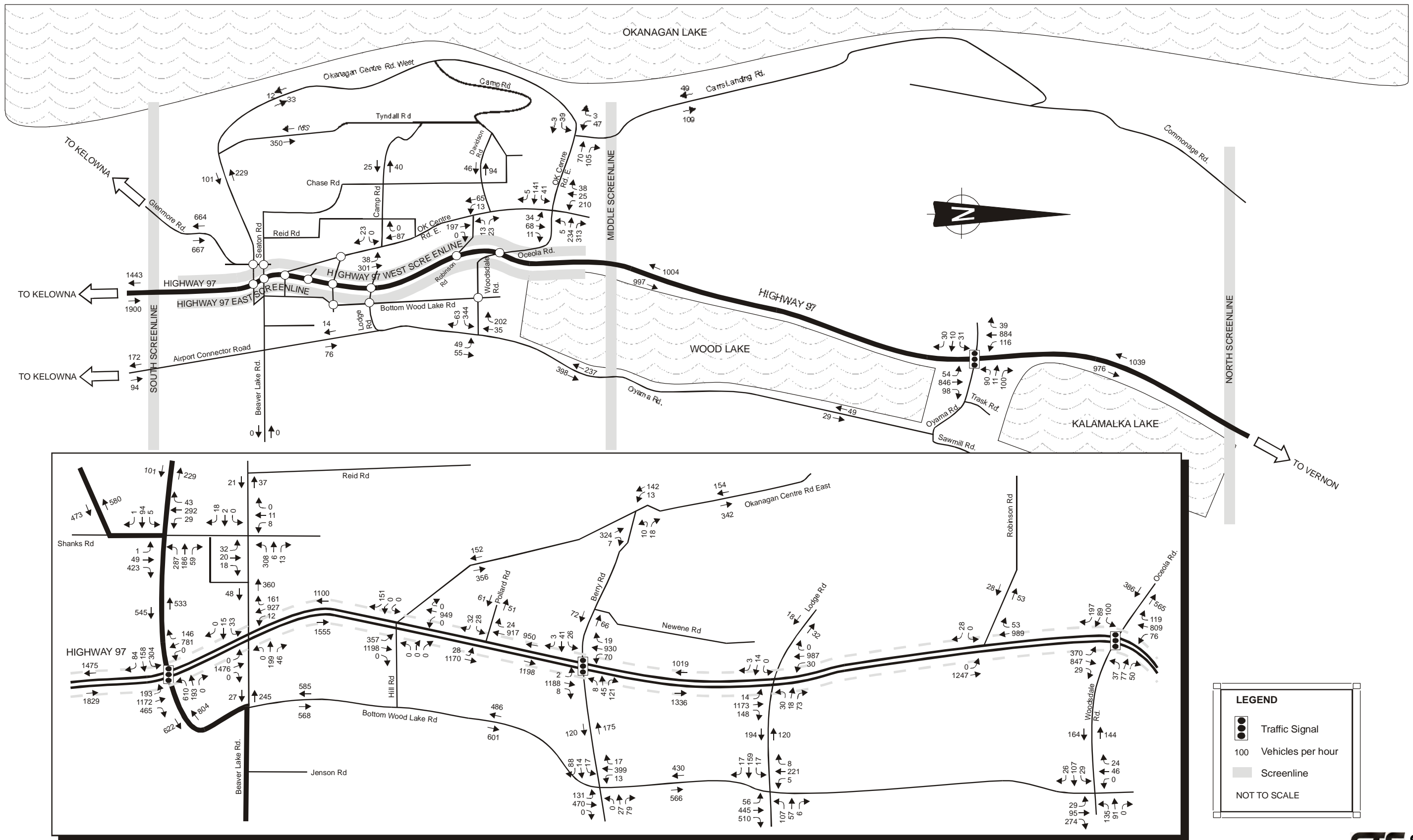
PROJECT No.	032418	
SCALE	AS SHOWN	
DRAWN	C.L.	03/11/06
DESIGNED	E.A.L.	03/11/06
CHECKED	E.A.L.	03/11/06
APPROVED		03/11/06
DATE	NOV. 2003	INITIAL

CLIENT	DISTRICT OF LAKE COUNTRY
--------	--------------------------

FIGURE 5.2 OPTION 2 – OCP NETWORK		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		



FIGURE 5.3: 2020 WEEKDAY AFTERNOON PEAK HOUR TRAFFIC VOLUMES  
PROJECTED TRAFFIC VOLUMES (OPTION 2 – OFFICIAL COMMUNITY PLAN)





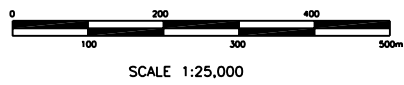
### 5.3.3 Option 3 – Official Community Plan + Highway 97 Access Management Plan

The District of Lake Country and the Ministry of Transportation have been negotiating a Highway 97 Access Management Plan through Winfield. The purpose of the Access Management Plan is to improve mobility on Highway 97 by consolidating accesses and consolidating side street movements at key locations. If approved, it will allow Highway 97 to remain as a four lane highway through Winfield. Otherwise, Highway 97 will likely require widening to 6 lanes through Winfield with significant negative implications on the adjacent properties. Option 3 is a combination of the OCP Road Network Plan from Option 2 plus the following key features from the Highway 97 Access Management Plan:

1. Signalization of Highway 97 & Lodge intersection;
2. Removal of traffic signal at Highway 97 & Berry intersection;
3. Signalization of Highway 97 & Pollard intersection;
4. Convert Highway 97 & OK Centre Road East intersection to a right-in, right-out;
5. Convert Highway 97 & Beaver Lake Road / Seaton intersection to a right-in, right-out;
6. Signalization of Glenmore Road & OK Centre West; and
7. Signalization of Glenmore Road extension / Beaver Lake Road & Main Street.

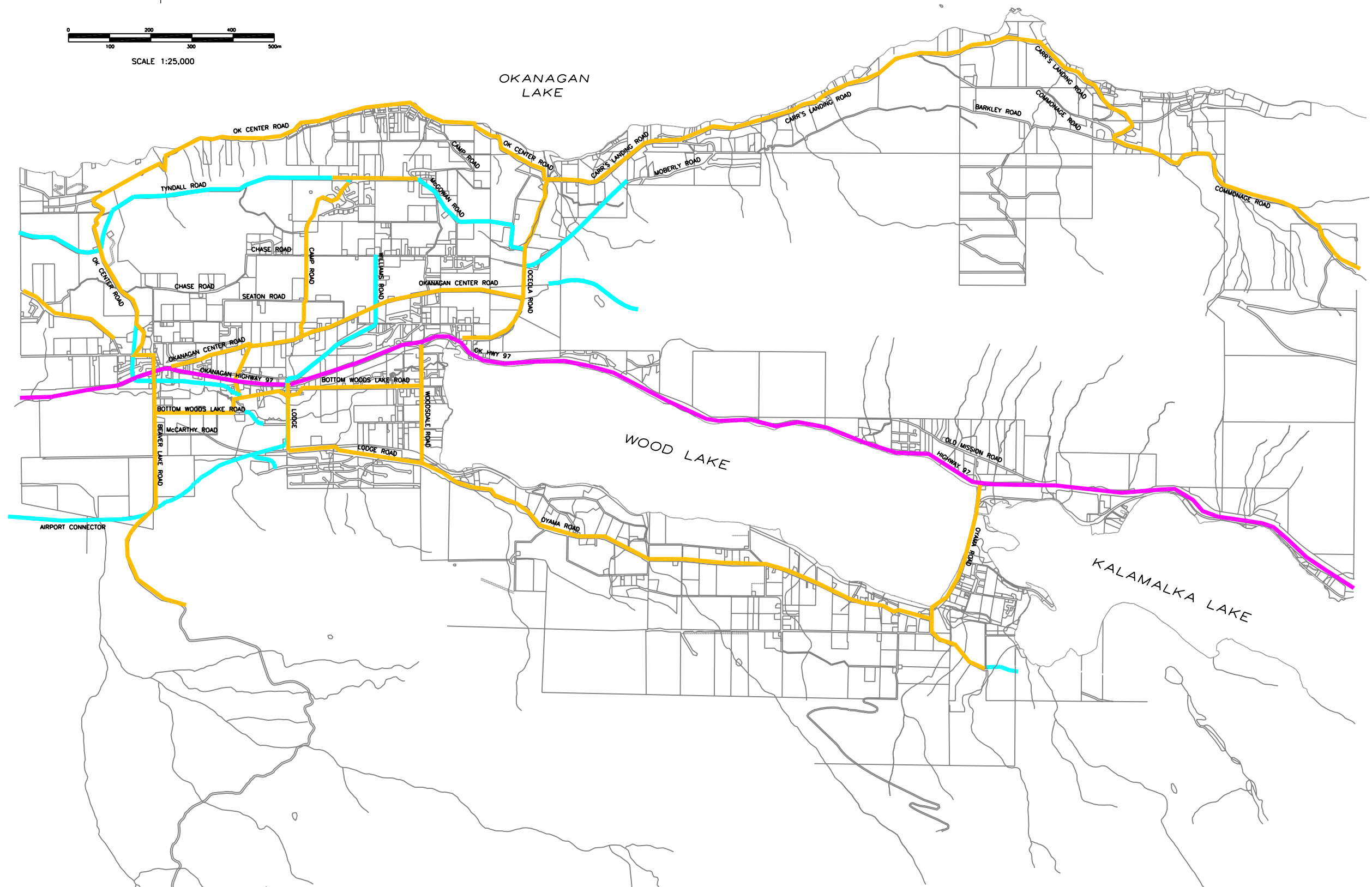
The proposed network for Option 3 is illustrated on **FIGURE 5.4**. The projected weekday afternoon peak hour volumes from the model for Option 3 are illustrated in **FIGURE 5.5**. The total construction cost for Option 3 was estimated to be \$51,900,000 (in 2004 dollars) excluding the Highway 97 Wood Lake Bypass of which the District's share remains at \$33,700,000. This figure is identical to that for Option 2 as it was assumed that all capital works on Highway 97 associated with the Highway 97 Access Management Plan would be funded by the Provincial Government.

This Drawing is For The Use Of The Client And Project Indicates No Representations Of Any Kind Are Made To Other Parties



**LEGEND**

- EXISTING CONNECTOR ROADS
- PROPOSED CONNECTOR ROADS
- HIGHWAY 97 EXISTING
- HIGHWAY 97 PROPOSED



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				

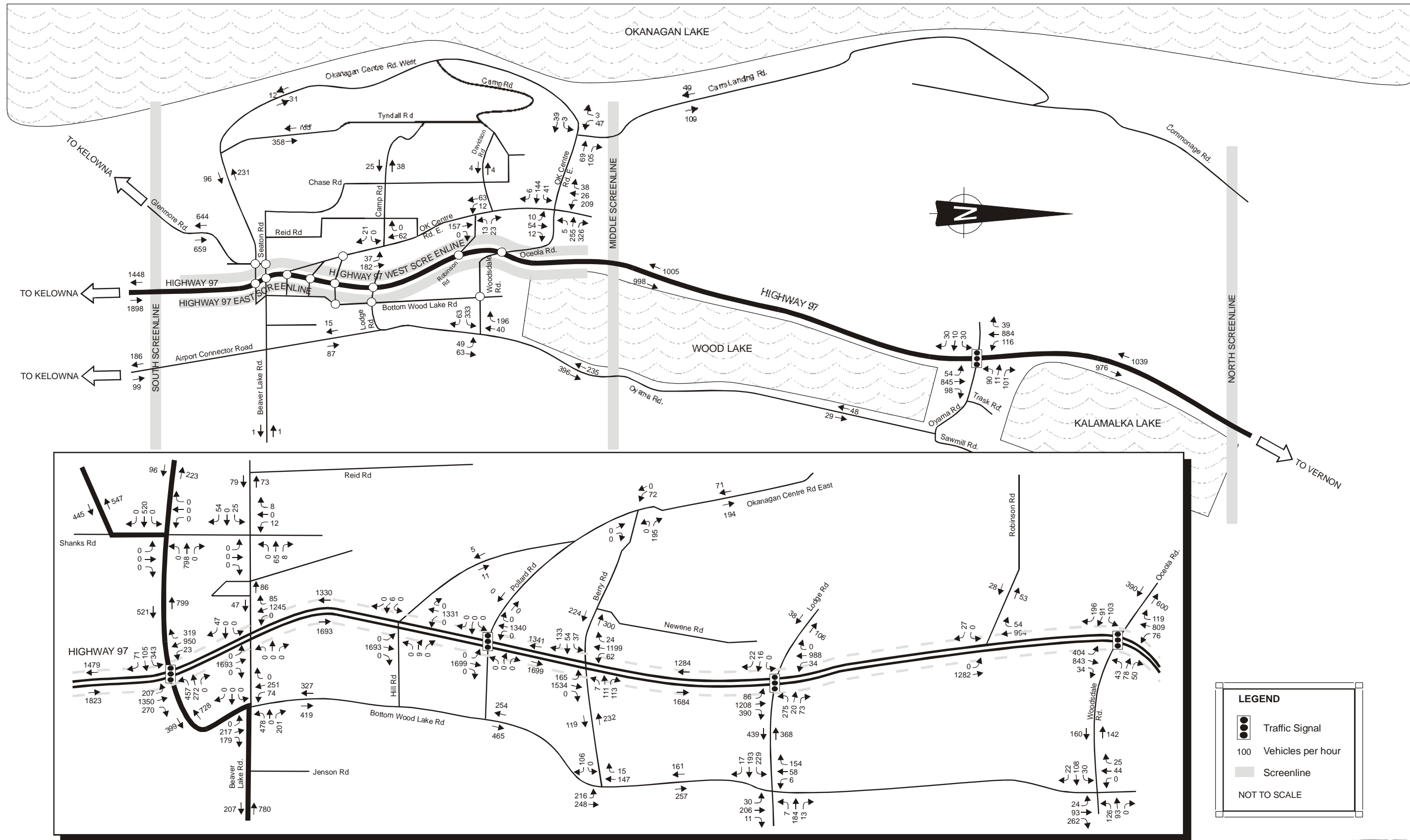


PROJECT No.	032418		
SCALE	AS SHOWN		
DRAWN	C.L.		03/11/06
DESIGNED	E.A.L.		03/11/06
CHECKED	E.A.L.		03/11/06
APPROVED			03/11/06
DATE	NOV. 2003	INITIAL	

**CLIENT**  
 DISTRICT OF LAKE COUNTRY  
 LAKE COUNTRY TRANSPORTATION  
 PLAN UPDATE – PHASE 2

FIGURE 5.4 OPTION 3 – OCP NETWORK + HIGHWAY 97 ACCESS MANAGEMENT PLAN		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		

**FIGURE 5.5: 2020 WEEKDAY AFTERNOON PEAK HOUR TRAFFIC VOLUMES  
PROJECTED TRAFFIC VOLUMES (OPTION 3 – OCP + ACCESS MANAGEMENT PLAN)**





### 5.4 Intersection Capacity Analysis

Capacity analysis was performed at each of the intersections in order to determine the intersection levels of service (LOS) that is provided to motorists. The Level of Service (LOS) for intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption and travel time. LOS range from “A” (excellent) to “F” (failing). For unsignalized intersections, LOS criteria are stated in terms of total delay, where total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required to travel from the last-in-queue position to the first-in-queue position. The criteria for unsignalized intersections are given in **TABLE 5.1**.

For a rural community like the District of Lake Country where motorists typically have a lower level of tolerance to traffic congestion, a LOS of “C” or better during the critical peak hours is considered acceptable for overall intersection operation.

**TABLE 5.1: LEVEL OF SERVICE AND DELAY CRITERIA FOR UNSIGNALIZED INTERSECTIONS**

LEVEL OF SERVICE	CONTROL DELAY* (seconds per vehicle)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

\* Highway Capacity Manual 2000 (HCM)



For signalized intersections, LOS criteria are stated in terms of the control delay per vehicle for a 15-minute analysis period. The criteria for signalized intersections are given in **TABLE 2.2**. The LOS thresholds for signalized intersections are somewhat different from the criteria used in **TABLE 5.2** because drivers generally tolerate less delay at an unsignalized intersection than at one that is signalized. A LOS of “D” or better is considered acceptable for left turn movements at signalized intersections.

Intersection capacity analysis was performed at each of the intersections using the methods and procedures outlined in the Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209, Millennium Edition). The Highway Capacity Software (HCS2000, Version 4.1d), which incorporates the HCM methodologies, was used for the unsignalized analysis. Synchro was used for the signalized analysis. Synchro also evaluates the intersection based on actuated green times as opposed to maximum green time, yielding a more accurate result.

The following assumptions were made with respect to the intersection capacity analysis of the weekday afternoon peak hour volumes:

- Saturation flow rate = 1,800 passenger cars per hour
- Heavy vehicle percentage = 3%
- Peak Hour Factor = 0.90 (average of municipal intersections surveyed excluding that of Bottom Wood Lake Road & Woodsdale Road due to road construction)
- Existing signal timing plans at signalized intersections were used for all scenarios.

Intersection capacity analysis was undertaken with the projected turning movements for Options 1, 2 and 3 using the assumptions outlined in Section 2.4 and the results are presented in **TABLE 5.3**. From **TABLE 5.3**, the following intersections requires improvements) operational and/or geometrical) in order to maintain a level of service C or better:

- 1) Glenmore Road & OK Centre West Road;
- 2) Bottom Wood Lake Road & Lodge Road; and
- 3) Highway 97 & Realigned Beaver Lake Road.



**TABLE 5.2: LEVEL OF SERVICE AND DELAY CRITERIA FOR SIGNALIZED INTERSECTIONS**

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE* (seconds/veh)	DESCRIPTION
<b>A</b>	$\leq 10.0$	This LOS occurs when traffic progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all.
<b>B</b>	$> 10.0$ and $\leq 20.0$	This LOS generally occurs with good traffic progression, short cycle lengths or both. More vehicles stop than LOS A, causing higher level of average delay.
<b>C</b>	$> 20.0$ and $\leq 35.0$	This LOS generally occurs with fair traffic progression, longer cycle lengths or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
<b>D</b>	$> 35.0$ and $\leq 55.0$	At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable traffic progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
<b>E</b>	$> 55.0$ and $\leq 80.0$	LOS E is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor traffic progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences.
<b>F</b>	$> 80.0$	LOS F is considered to be unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.0 with many individual cycle failures. Poor traffic progression and long cycle lengths may also be major contributing causes to such delay levels.

\* Highway Capacity Manual 2000 (HCM)



**TABLE 5.3: INTERSECTION CAPACITY ANALYSIS OF YEAR 2020 NETWORK OPTIONS**

Jurisdiction	Intersection	ANALYSIS YEAR					Comments
		2003	2020 Option 1 Do Nothing	2020 Option 2 OCP* Network	2020 Option 3 OCP*+AMP**	Initial Recommended Transportation Plan	
District of Lake Country	OK Ctr Rd & Carrs Landing	A	A	A	A	A	No operational problems
	OK Ctr Rd E & Oceola		B	B	B	B	No operational problems
	OK Ctr Rd E & Robinson	A	A	A	A	A	No operational problems
	Ok Ctr Rd E & Camp	A	A	A	A	A	No operational problems
	OK Ctr Rd E & Berry		A	A	A	A	No operational problems
	OK Ctr Rd W & Glenmore	A	F	F	No data available	No data available	Signalized for recommended plan. Current design requires further review.
	Glenmore & Seaton	B	A	B	No data available	No data available	No operational problems
	Woodsdale & Bottom Wood Lake	A	B	B	B	B	No operational problems
	Woodsdale & Oyama	A	B	B	B	B	No operational problems
	Main Street & Glenmore / Beaver			F	F	B	Signalized for recommended plan
	Bottom Wood Lake & Berry	A	A	A	No data available	No data available	No operational problems projected
	Bottom Wood Lake & Lodge	B	F	F	F	A	Signalized for recommended plan
Ministry of Transportation	Hwy 97 & Oyama	A	A	A	A	A	No operational problems
	Hwy 97 & Oceola	A	D	B	B	B	Added Nb left turn phase for Options 2, 3 and recommended plan, Nb LT lane requires lengthening
	Hwy 97 & Lodge				A	A	Signalized in Option 3
	Hwy 97 & Berry	A	A	A	A	A	Signal removed in Option 3
	Hwy 97 & Pollard				A	A	Signalized in Option 3
	Hwy 97 & Beaver Lake	B	E				Intersection at capacity by 2020 for Option 1 Do Nothing.
	Hwy 97 & Realigned Beaver Lake			D	D	D	Current design may be inadequate and requires further review

LOS = Level of Service

\* OCP = Official Community Plan

\*\* AMP = Highway 97 Access Management Plan

Below Capacity

Approaching Capacity

Above Capacity



## 5.5 Screenline and Link Volume Analysis

The following screenlines were selected to analyze the impact on regional traffic volumes with the changes to the road network in the future:

1. South Screenline
2. Middle Screenline
3. North Screenline
4. West Screenline
5. East Screenline

The screenlines used in the link volume analysis are illustrated with grey wide lines in **FIGURE 5.1**, **FIGURE 5.3** and **FIGURE 5.5**. **TABLE 5.4** summarizes the key changes in link volumes for the three model runs.



**TABLE 5.4: SUMMARY OF SCREENLINE VOLUMES**

**SOUTH SCREENLINE**

Cross Street	Direction	2003	2020		
			Option 1	Option 2	Option 3
Tyndall Road	NB			200	211
	SB			95	98
Glenmore Rd	NB	294	635	465	445
	SB	272	655	571	547
Highway 97	NB	877	1978	1900	1898
	SB	745	1579	1443	1448
Airport Connector Rd	NB			94	99
	SB			172	186
TOTAL	NB	1171	2613	2659	2653
	SB	1017	2234	2186	2181
	2-Way	2188	4847	4845	4834
	Gross %		122%		
	Annual %		7%		

**MIDDLE SCREENLINE**

Cross Street	Direction	2003	2020		
			Option 1	Option 2	Option 3
Carrs Landing Rd	NB	152	188	144	108
	SB	84	94	50	50
Moberly Extension	NB			80	80
	SB			45	45
Highway 97	NB	934	997	997	998
	SB	641	1005	1004	1005
Oyama Rd	NB	124	397	398	396
	SB	83	237	237	235
TOTAL	NB	1210	1582	1539	1502
	SB	808	1336	1291	1290
	2-Way	2018	2918	2830	2792
	Gross %		45%		
	Annual %		3%		

**NORTH SCREENLINE**

Cross Street	Direction	2003	2020		
			Option 1	Option 2	Option 3
Commonage Rd	NB	0	0	0	0
	SB	0	0	0	0
Highway 97	NB	863	976	976	976
	SB	681	1039	1039	1039
TOTAL	NB	863	976	976	976
	SB	681	1039	1039	1039
	2-Way	1544	2015	2015	2015
	Gross %		31%		
	Annual %		2%		



**WEST SCREENLINE**

Cross Street	Direction	2003	2020		
			Option 1	Option 2	Option 3
New Link Just South of Beaver lake Rd	EB			545	521
	WB			533	799
Seaton Rd / Beaver Lake Rd	EB	282	610	48	47
	WB	274	901	360	86
Hill Rd	EB	50	166	152	5
	WB	150	345	356	11
Pollard Rd	EB	50	61	61	224
	WB	50	51	51	300
Berry Rd	EB	152	80	72	
	WB	174	94	66	
Lodge Rd	EB			18	38
	WB			32	106
Robinson Rd	EB	50	32	28	28
	WB	100	103	53	53
Oceola Rd / Woodsdale Rd	EB	108	405	386	390
	WB	155	591	565	600
TOTAL	EB	692	1354	1310	1253
	WB	903	2085	2016	1955
	2-Way	1595	3439	3326	3208
	Gross %		116%		
	Annual %		7%		

Note : italicized volumes are estimated

**EAST SCREENLINE**

Cross Street	Direction	2003	2020		
			Option 1	Option 2	Option 3
New Link Just South of Beaver lake Rd	EB			622	399
	WB			804	728
Seaton Rd / Beaver Lake Rd	EB	266	281	27	1
	WB	299	871	245	0
Hill Rd	EB	0	0	0	0
	WB	0	0	0	0
Pollard Rd	EB				0
	WB				0
Berry Rd	EB	271	142	120	119
	WB	286	181	175	232
Lodge Rd	EB	112	566	192	439
	WB	125	393	121	368
Oceola Rd / Woodsdale Rd	EB	118	200	194	201
	WB	97	177	164	171
TOTAL	EB	767	1189	1155	1159
	WB	807	1622	1509	1499
	2-Way	1574	2811	2664	2658
	Gross %		79%		
	Annual %		5%		



From **TABLE 5.4**, the following observations can be made:

1. SOUTH SCREENLINE

- TMODEL2 is projecting traffic volumes to grow by 7% per year across this screenline between 2003 and 2020.
- The proposed Tyndall Road extension will reduce demand on Glenmore Road entering Lake Country.
- The proposed Airport Connector road will reduce demand on Highway 97 by approximately 6%.

2. MIDDLE SCREENLINE

- TMODEL2 is projecting traffic volumes to grow by 3% per year across this screenline between 2003 and 2020.
- No major shifts in traffic patterns observed except on the Moberly extension.

3. NORTH SCREENLINE

- TMODEL2 is projecting traffic volumes to grow by 2% per year across this screenline between 2003 and 2020.
- No major shifts in traffic patterns are forecast.

4. WEST SCREENLINE

- TMODEL2 is projecting traffic volumes to grow by 7% per year across this screenline between 2003 and 2020.
- Major shift in traffic patterns forecast for Pollard with the Highway 97 Access Management Plan in place.

5. EAST SCREENLINE

- TMODEL2 is projecting traffic volumes to grow by 5% per year across this screenline between 2003 and 2020.
- Major shift in traffic patterns only occurs on the proposed Glenmore / Beaver & Main link.



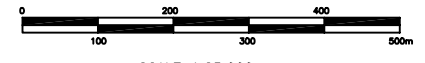
General comments on the model outputs are as follows:

1. The construction of the Airport Connector link is projected to reduce traffic volumes on Highway 97 by approximately 6%.
2. Traffic volumes on Seaton Road/Beaver Lake Road between Shanks Road and Bottom Wood Lake Road are projected to decrease significantly with the introduction of the new link just south of Highway 97 & Beaver Lake Road and the relocation of the traffic signal.
3. Traffic volumes on Hill Road are projected to decrease significantly with the introduction of a traffic signal at Highway 97 & Pollard Road and connecting Pollard Road to Okanagan Centre Road East.
4. Traffic volumes on Lodge Road are projected to increase significantly when the intersection of Highway 97 & Lodge Road is signalized.
5. The 2020 volume projections for Highway 97 adjacent to Wood Lake indicate that the construction of a new alignment is not warranted until after 2020.

## 5.6 Initial Recommended Updated Transportation Plan

The initial recommended updated transportation plan was developed based on the transportation planning, traffic engineering and road design work to date, as well as comments received from the public at the first public meeting and this is illustrated in **FIGURE 5.6**. Please note that only Provincial and District connector roads are illustrated on this drawing. All others are classified as local roads. The key elements of this plan are as follows:

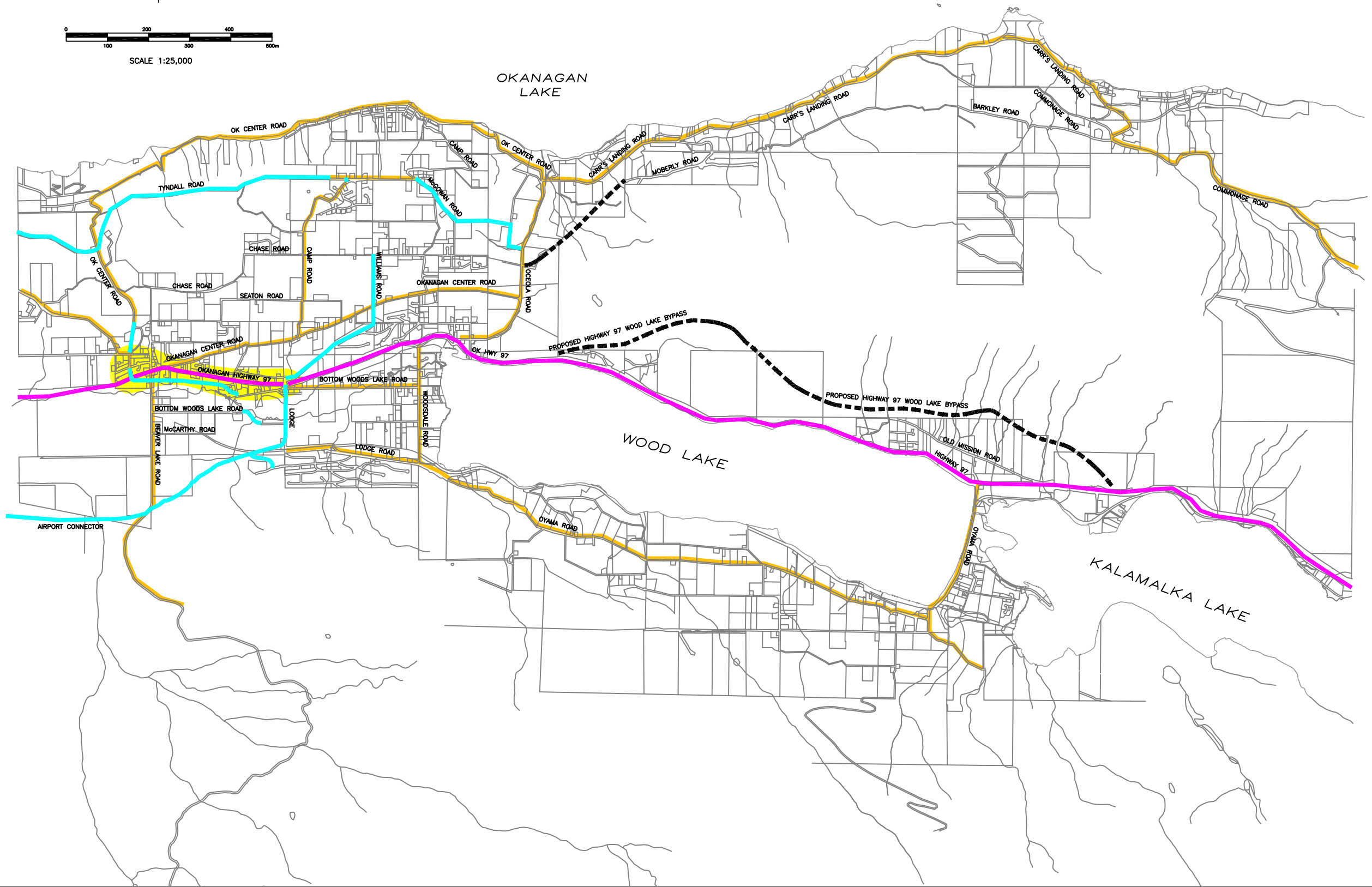
1. Realignment of Beaver Lake Road to Highway 97;
2. Realignment of Glenmore Road to Highway 97;
3. Completion of Main Street through the commercial area of Winfield;
4. Construction of the Airport Connector / Lodge / Williams Road link;
5. Construction of Tyndall Road to Glenmore Road;
6. Construction of McGowan Road connection to OK Centre Road East;
7. Construction of the Highway 97 Access Management Plan; and
8. Construction of a new transportation centre on Main Street between Beaver Lake Road and Pollard Road where Kelowna transit, taxi and Greyhound transfers can be made.



SCALE 1:25,000

**LEGEND**

- EXISTING MAJOR ROADS
- PROPOSED MAJOR ROADS
- HIGHWAY 97 EXISTING
- HIGHWAY 97 PROPOSED
- HIGHWAY 97 ACCESS MANAGEMENT PLAN
- - - REQUIRED BEYOND 20 YEARS



NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	032418	
SCALE	AS SHOWN	
DRAWN	C.L.	03/11/06
DESIGNED	E.A.L.	03/11/06
CHECKED	E.A.L.	03/11/06
APPROVED		03/11/06
DATE	NOV. 2003	INITIAL

CLIENT  
DISTRICT OF LAKE COUNTRY

FIGURE 5.6 INITIAL RECOMMENDED 20 YEAR TRANSPORTATION PLAN		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		





Of note, the construction of Moberly Road connection to OK Centre Road East is still on the transportation plan but because of insufficient traffic demand, is not expected to be warranted until sometime after the year 2020.

As well, the proposed Highway 97 Wood Lake Bypass is shown on the transportation plan but as further work is required on the alignment by the Ministry of Transportation, no timeline is recommended at this time.

The total construction costs for the initial recommended Updated Transportation Plan is \$50,800,000 of which the District's share is \$32,700,000.

## 5.7 Public Meeting #2

Both the preliminary updated transportation plan, as well as the assessment of the above options, were presented to the public and stakeholders at the second public meeting on Monday, 27 September 2004 at the Municipal Hall in Lake Country. It is estimate that at least 50 members of the public attended the meeting (of which 41 signed in) and provided comments on the various options. As well, there was a followup 30 day comment period where the public could submit comments after the 2<sup>nd</sup> public meeting directly to Municipal Hall.

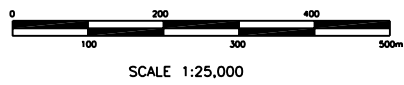
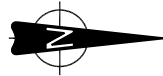
## 5.8 Revised Draft Transportation Plan

Based on the feedback from both the public and municipal staff, CTS and AE staff prepared a revised draft transportation plan and this illustrated in **FIGURE 5.7**. The key changes from the first draft include the following:

1. Removal of Williams Road from the Transportation Plan (from Bond Road to OK Centre Road East);
2. Addition of Davidson Road to the Transportation Plan (from Camp Road to OK Centre Road East); and
3. Addition of the Reid Road Connector to the Transportation Plan (from Glenmore Road to OK Centre Road East) as a future link required beyond 20 years.

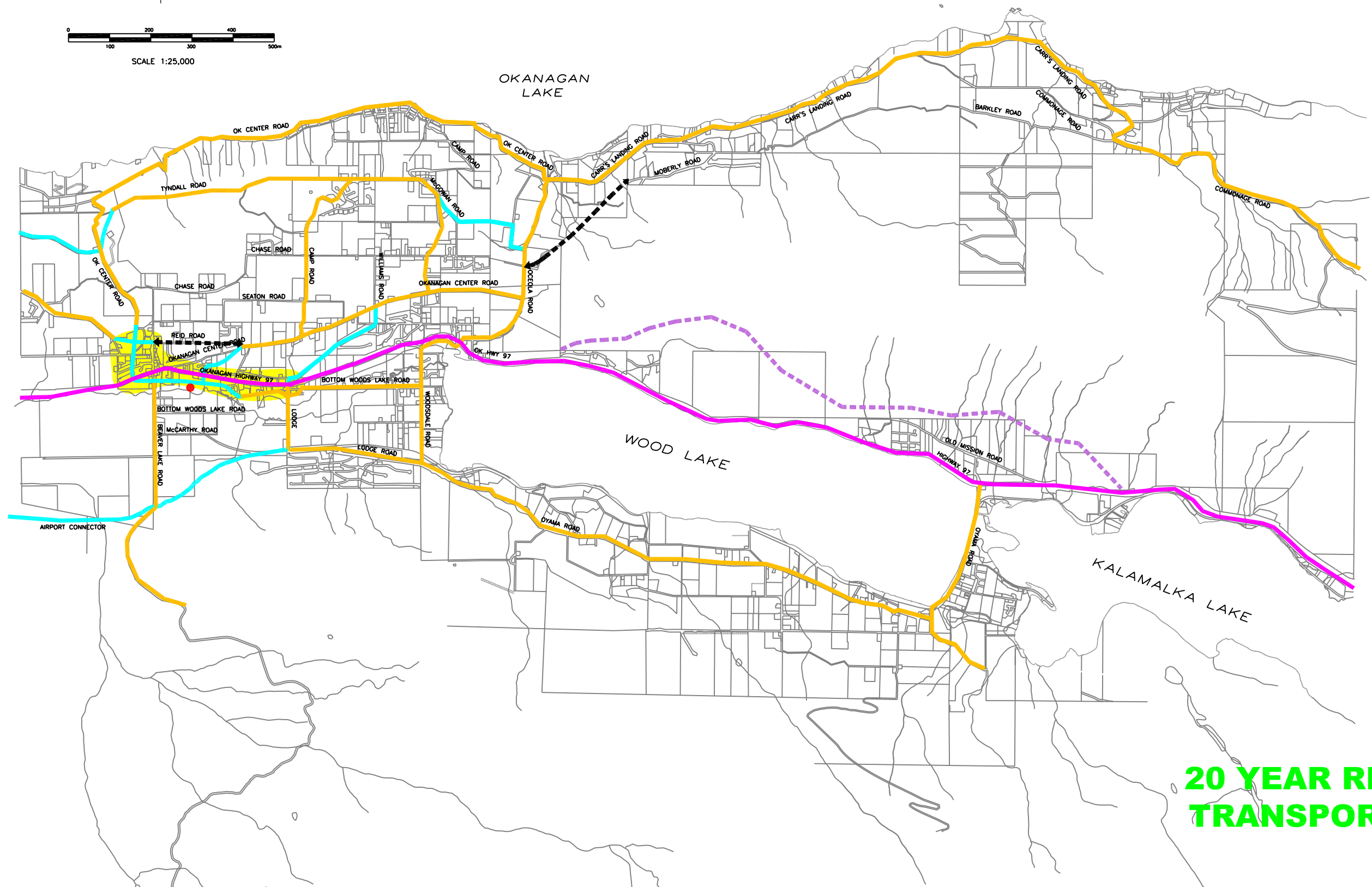
The total construction costs for the revised draft Transportation Plan is \$61,000,000 of which the District's share is \$35,500,000.

This Drawing is For The Use Of The Client And Project Indicates No Representations Of Any Kind Are Made To Other Parties



**LEGEND**

- EXISTING CONNECTOR ROADS
- PROPOSED CONNECTOR ROADS
- HIGHWAY 97 EXISTING
- - - FUTURE ROAD LINKS REQUIRED BEYOND 20 YEARS
- HIGHWAY 97 ACCESS MANAGEMENT PLAN
- NEW TRANSPORTATION CENTRE
- - - FUTURE HIGHWAY 97 ALIGNMENT



20 YEAR REVISED DRAFT  
TRANSPORTATION PLAN

NO.	DATE	ENG.	BY	SUBJECT
REVISIONS				



PROJECT No.	3247
SCALE	AS SHOWN
DRAWN	C.L.
DESIGNED	JV
CHECKED	EB
APPROVED	JV
DATE	OCT. 2005

CLIENT	DISTRICT OF LAKE COUNTRY
LAKE COUNTRY TRANSPORTATION PLAN UPDATE – PHASE 2	

FIGURE 5.7		
DRAWING NUMBER	REV. NO.	SHEET
032418-FIG. 1		



SECTION  
**6**

## DEVELOP 10-YEAR TRANSPORTATION PLAN

---

The intermediate transportation plan between existing and the ultimate adopted plan should follow a logical sequence culminating in the 20-year transportation plan. As well, they should be designed to address projected road network capacity deficiencies in a proactive and cost-effective approach.

The major elements of the proposed 10-Year Transportation Plan are as follows:

1. Realignment of Beaver Lake Road to Highway 97;
2. Realignment of Glenmore Road to Highway 97;
3. Completion of Main Street through the commercial area of Winfield;
4. Construction of the Ellison Connector between Beaver Lake Road and Lodge;
5. Construction of Tyndall Road to Glenmore Road;
6. Construction of the Highway 97 Access Management Plan; and
7. Construction of a new transportation centre on Main Street between Beaver Lake Road and Pollard Road where Kelowna transit, taxi and Greyhound transfers can be made.

**SECTION**  
**7****10- AND 20- YEAR CAPITAL WORKS PROGRAM****7.1 Background**

The Capital Works Program identifies the scope of road construction works that are required to achieve the recommended 20-year transportation plan. Generally, the works involve construction of new roads or sections of roads, or in many cases, construction to improve existing roads to the proposed connector standards. The capital works program recognizes that some areas of the District of Lake Country are expected to maintain their rural character, while others will continue, or be developed, towards an urban character. Thus, the capital works program projects a combination of rural and urban standards of road construction works.

The future construction of roads is further categorized depending on the function of the road. The Official Community Plan envisages that these will be local areas of significant development within the District. These areas are identified in the Official Community Plan as CDAs – Comprehensive Development Areas. The CDAs are so significant that their future residents require roads constructed for their sole benefit. Such roads are designated in the plan as CDA roads, with the expectation that they will be funded, or constructed, by the private sector developers. Other planned roads will have wider general benefits for the citizens of Lake Country, and the District would fund these through the normal funding mechanisms. A third category of road improvements also appears in the plan, the provincial roads. Senior levels of government will fund the provincial roads and their cost does not appear under the capital works program.

To assist the District in planning their capital works expenditures, two horizon years are identified for the capital works program. A separate works program has been developed for each horizon year, and the intent is that the works of each program would be fully implemented by the end of the horizon year. However, the required rate of implementation of the recommended transportation plan is based on the assumed growth rate, and projections of where and when developments will proceed during the life of the plan. Variations in actual growth rate and development locations will impact the capital works plan and therefore it must be used for guidance, subject to periodic review and modification to suit the actual growth demands of Lake Country.



## 7.2 Roadway Cross Section

Road standards have been developed for the capital works program for neighbourhood and rural community connectors. Standards do vary according to the local character and zoning, in different parts of the District. Two standard cross sections are proposed: urban and rural.

Generally, the application of the two standards had been determined based on the long term land use of the area traversed by each proposed road. In some circumstances the urban section has been maintained in a case where a proposed road will pass through a rural area between two urban areas, for the sake of continuity. The proposed 2020 road network comprises a combination of new roads and upgrades of existing roads to one of the two standards described below.

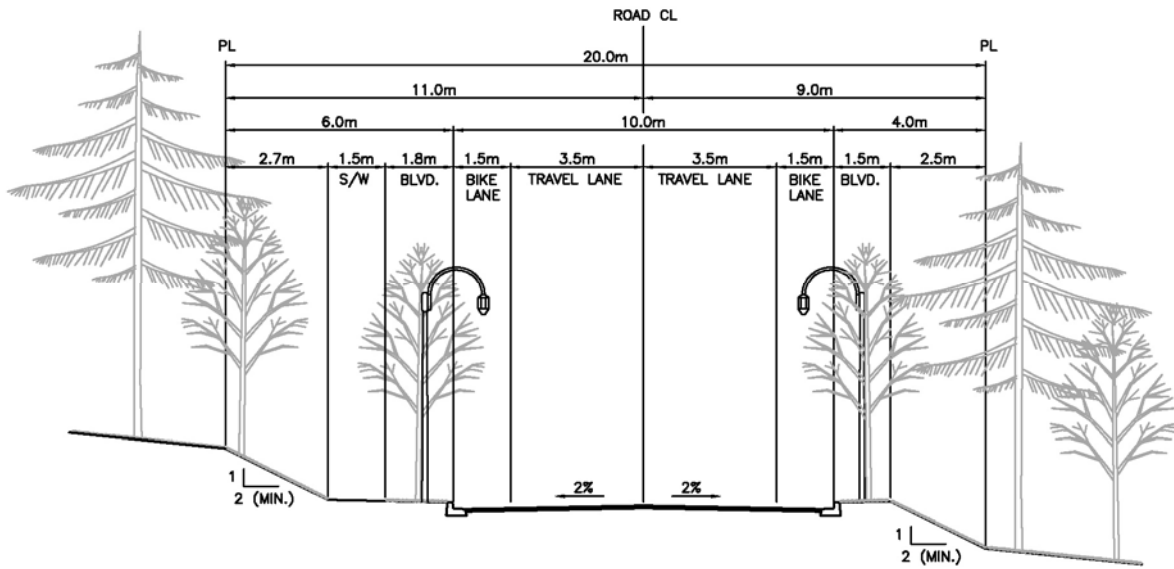
### 7.2.1 Neighbourhood Connector

The urban cross section features a ten metre wide pavement, curb and gutter, concrete sidewalks, underground power, telephone and communication wiring and piped storm sewer system as illustrated in **FIGURE 7.1**. The 10.0 metre wide pavement typically is intended for two 3.5 metre wide vehicle lanes and two 1.5 metre wide bicycle lanes. At intersections, where a left turn lane is required, there is sufficient pavement width for two 3.5 metre wide vehicle lanes and a 3.0 metre left turn lane, without bicycle lanes.

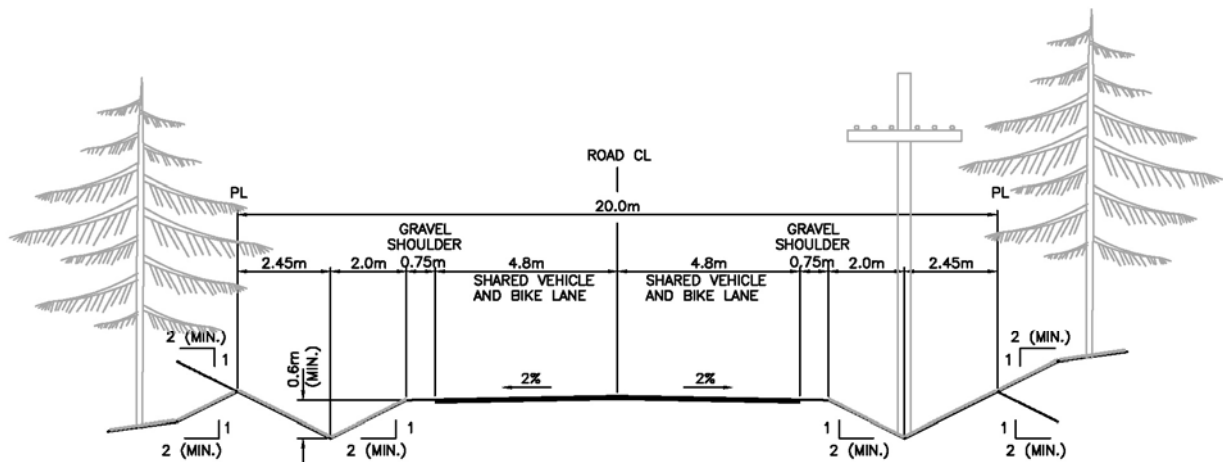
### 7.2.2 Rural Community Connector

The rural cross section features a 9.6 metre wide pavement with 0.75 metre wide gravel shoulders, Power, telephone and communications are overhead, attached to poles. Drainage of the rural cross section is by roadside ditch and culvert systems as illustrated in **FIGURE 7.1**. The 9.6 metre wide pavement width typically is intended for two 4.8 metre wide shared vehicle / bike lanes. Where used as an interim standard, the rural standard can be upgraded to the urban standard by elimination of the ditches and gravel shoulders and addition of curb and gutter, and sidewalks. Where future upgrading to urban standard is planned, construction of the storm sewer with the initial construction to rural standard will avoid the need to remove existing pavement structure when the upgrade proceeds.

FIGURE 7.1: CONNECTOR ROAD CROSS SECTIONS



**NEIGHBOURHOOD CONNECTOR**



**RURAL COMMUNITY CONNECTOR**



### 7.3 Unit Prices

Unit price estimates are based on process extracted from recently tendered projects. Road construction costs are estimated by identifying the items of construction involved in building each metre of road to either the rural or urban standards, and then applying the typical unit price to each of those items and totaling the unit prices to provide an estimate of the unit cost of a linear metre of constructed road. The prices documented in this report for the recommended 10 year and 20 year plans are in present day dollars (i.e.2006) and the details on the cost estimates are contained in **APPENDIX A**.

Additional construction costs are incurred for the storm sewer that is required to be constructed with the urban road standard. Also, costs are added for realigning existing driveways to match the generally wide roads, in an upgrade situation, and for relocating existing utilities.

In locations where adverse construction conditions exist, such as surface rock and/or steep natural grades, allowances have been made for additional road construction costs. For example, construction items such as rock blasting, retaining walls, increased excavation and embankment construction are incorporated in these additional costs.

### 7.4 Cost Estimate

Using the unit prices and allowances outlines above, the road construction cost estimates for the updated transportation plan were calculated and are tabulated in **APPENDIX A**. In summary:

- 1) The total cost for the recommended 20 year transportation plan is \$76,000,000 (in 2006 \$) of which the District's share is estimated at \$46,100,000. Of note, the cost for implementation of the Highway 97 Access Management Plan and any municipal roadways required to service a new development are excluded from these costs.
- 2) The total cost for the 10 year transportation plan is \$27,000,000 (in 2006 \$) of which the District's share is estimated at \$8,000,000. Of note, the cost for implementation of the Highway 97 Access Management Plan and any municipal roadways required to service a new development are excluded from these costs.



## 7.5 Capital Works Program

**APPENDIX A** contains the recommended overall Capital Works Program for the District of Lake Country. The program includes both road upgrades and new roadway construction where required to accommodate forecast travel demand.



**SECTION**  
**8****CONCLUSION AND RECOMMENDATIONS**

This study examined existing traffic conditions in the District of Lake Country and future growth patterns as documented in the District's Official Community Plan in order to develop an updated Transportation Plan.

**8.1 Conclusions**

- 3) The District of Lake Country is projecting the following increases in population and employment based on the Official Community Plan and known development applications:
  - Population to increase from 9,551 in the year 2003 to 19,126 by the year 2020. This represents a doubling of population and is the equivalent of an annual population increase of 4.2% per year (compounded).
  - Employment to increase from 2,044 in the year 2003 to 3,976 by the year 2020. This is the equivalent of an annual employment increase of 4.0% per year (compounded).
- 4) During the Friday afternoon peak hour, all the major intersections included in the review were performing well and no major operational issues were noted. However, at the intersection of Highway 97 & Beaver Lake Road, left turn movements are occasionally experiencing significant delays for short periods of time when there are platoons of arriving vehicles (e.g. shift changes at nearby plants).
- 5) From a comprehensive one day license plate survey, it was noted that the majority of traffic on both Highway 97 and Glenmore Road is locally based. That is the motorists have either an origin or destination within the District of Lake Country, including those traveling on Highway 97 that are stopping in Lake Country for gas, a meal or a rest stop.
- 6) Actual demand for alternative modes of transportation in Lake Country (i.e. pedestrians, bicycles and transit) was observed to be very low during the transportation surveys. Therefore, increased use of these transportation modes



- should be encouraged more through design and policies in order to reduce the reliance on the private automobile as the primary mode of transportation in the District.
- 7) A review of three future transportation plans has determined that the proposed Highway 97 Access Management Plan will have a positive impact on the future mobility of motorists in Lake Country and therefore is included in the recommended plan.
  - 8) The revised draft transportation plan has been developed to serve the District's projected transportation requirements by the year 2020 or later if actual population growth rates are less than 4.2% per year (compounded).
  - 9) The total cost for the recommended 20 year transportation plan is \$76,000,000 (in 2006 \$) of which the District's share is estimated at \$46,100,000. Of note, the cost for implementation of the Highway 97 Access Management Plan and any municipal roadways required to service a new development are excluded from these costs.
  - 10) The total cost for the 10 year transportation plan is \$27,000,000 (in 2006 \$) of which the District's share is estimated at \$8,000,000. Of note, the cost for implementation of the Highway 97 Access Management Plan and any municipal roadways required to service a new development are excluded from these costs.

## 8.2 Recommendations

- 1) That the District of Lake Country adopt the recommended cross sections for both the Rural Community Connector and the Neighbourhood Connector roadways, both of which incorporate bike facilities to varying degrees;
- 2) That the District of Lake Country develop a bicycle network for the community in order to further support this mode of transportation;
- 3) That the District of Lake Country work with Kelowna Transit and BC Transit on developing community bus routes that would provide improved and more cost effective bus service to residents in order to increase transit usage within Lake Country, as well as connecting to existing regional transit services to Kelowna and possibly future service to Vernon;



- 4) That the District of Lake Country identify a preferred location along the Main Street corridor for a future multi-modal transportation centre where Kelowna Transit, taxi companies, Greyhound Bus and other transportation services can provide transfer activities at one location resulting in improved customer service;
- 5) That the District of Lake Country encourage the Ministry of Transportation to begin detailed planning and design of the proposed Wood Lake Bypass so that the right-of-way can be finalized; and
- 6) That the District of Lake Country develop a transportation monitoring program in order to monitor future traffic volumes.



**APPENDIX A**  
**CAPITAL WORKS PROGRAM**

Table E.1



**COST ESTIMATE**

CLIENT: DISTRICT OF LAKE COUNTRY  
 DATE: 6-Jun-06  
 PROJECT: ROAD NETWORK STUDY  
 JOB NO. : 032418

MAIN STREET - PRICE PER LINEAR METRE					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENSION
1.0	ROADWORKS				
	Clear and Grub	20	m <sup>2</sup>	\$3.00	\$60.00
	Earthworks	20	m <sup>3</sup>	\$12.00	\$240.00
	Subbase (200mm thickness)	13.4	m <sup>2</sup>	\$7.00	\$93.80
	Basecourse (100mm thickness)	18	m <sup>2</sup>	\$5.50	\$99.00
	Asphaltic Pavement				
	Surface Course (75mm thickness)	12	m <sup>2</sup>	\$15.50	\$186.00
	Curb and Gutter	2	m	\$62.00	\$124.00
	Sidewalk	4	m <sup>2</sup>	\$56.00	\$224.00
	Stamped Concrete Feature	1.2	m <sup>2</sup>	\$96.00	\$115.20
	Storm Sewer	1	m	\$168.00	\$168.00
	Catch Basins	0.05	ea.	\$1,456.00	\$72.80
	Catch Basin Leads	0.5	m	\$90.00	\$45.00
	Topsoil and Hydroseed	2.1	m <sup>2</sup>	\$7.00	\$14.70
	Street Trees	0.18	ea.	\$500.00	\$90.00
2.0	POWER, TELEPHONE, STREET LIGHTING				
	Underground Power	1	m	\$75.00	\$75.00
	Communications Ducts	1	m	\$30.00	\$30.00
	Underground Telephone, CATV	1	m	\$115.00	\$115.00
	Street Lighting	1	m	\$110.00	\$110.00
			<b>TOTAL</b>		<b>\$1,862.50</b>



Table E.3



**Associated  
Engineering**

## COST ESTIMATE

CLIENT: DISTRICT OF LAKE COUNTRY
DATE: 6-Jun-06
PROJECT: ROAD NETWORK STUDY
JOB NO. : 032418

UPGRADE TO NEIGHBOURHOOD CONNECTOR - PRICE PER LINEAR METRE					
ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENSION
1.0	<b>ROADWORKS</b>				
	Clear and Grub	10	m <sup>2</sup>	\$3.00	\$30.00
	Earthworks	10	m <sup>3</sup>	\$12.00	\$120.00
	Subbase (200mm thickness)	4	m <sup>2</sup>	\$7.00	\$28.00
	Basecourse (100mm thickness)	5.8	m <sup>2</sup>	\$5.50	\$31.90
	<b>Asphaltic Pavement</b>				
	Surface Course (40mm overlay)	9.6	m <sup>2</sup>	\$9.00	\$86.40
	Lower Course (50mm thickness)	5	m <sup>2</sup>	\$10.50	\$52.50
	Tack Coat	9.6	m <sup>2</sup>	\$0.50	\$4.80
	<b>Curb and Gutter</b>	2	m	\$62.00	\$124.00
	<b>Sidewalk</b>	1.5	m <sup>2</sup>	\$56.00	\$84.00
	<b>Storm Sewer</b>	1	m	\$168.00	\$168.00
	<b>Catch Basins</b>	0.05	ea.	\$1,456.00	\$72.80
	<b>Catch Basin Leads</b>	0.5	m	\$90.00	\$45.00
	<b>Topsoil and Hydroseed</b>	9	m <sup>2</sup>	\$7.00	\$63.00
	<b>Street Trees</b>	0.18	ea.	\$500.00	\$90.00
2.0	<b>POWER, TELEPHONE, STREET LIGHTING</b>				
	Underground Power	1	m	\$75.00	\$75.00
	Communications Ducts	1	m	\$30.00	\$30.00
	Underground Telephone, CATV	1	m	\$115.00	\$115.00
	Street Lighting	1	m	\$110.00	\$110.00
			<b>TOTAL</b>		<b>\$1,330.40</b>









**DISTRICT OF LAKE COUNTRY  
ROAD NETWORK STUDY  
CONSTRUCTION BUDGET ESTIMATES**

**ESTIMATED UNIT ROAD CONSTRUCTION COSTS**

MAIN STREET - PRICE PER LINEAR METRE	MS	\$1,863 per metre
NEW NEIGHBOURHOOD CONNECTOR	NNC	\$1,693 per metre
UPGRADE TO NEIGHBOURHOOD CONNECTOR	UNC	\$1,330 per metre
NEW RURAL COMMUNITY CONNECTOR	NRCC	\$889 per metre
UPGRADE TO RURAL COMMUNITY CONNECTOR	URCC	\$509 per metre
Driveways		\$1,200 each

**ALLOWANCES**

Contingencies	15%
Engineering	20%

DESCRIPTION REFER TO FIGURE 1 FOR ROAD NAMES	SURFACE WORKS		DRIVEWAYS		CREEK CROSSINGS	RAILWAY CROSSINGS	SUB-TOTAL	ENG. & CONT.	TOTAL	FUNDING MECHANISM		DISTRICT ALLOCATION	
	LENGTH (m)	CONSTRUCTION TYPE	NUMBER							DEVELOPMENT COST CHARGE			PROV. COST SHARE
										FULL	PART		
McCoubrey Road - District limit to Okanagan Centre Road.	1050	NRCC	\$ 933,713				\$933,713	\$326,800	\$1,260,513	100%		\$12,605	
Tyndall Road - Okanagan Centre Road to Camp Road	3550	NNC					CONSTRUCTION BY DEVELOPER						
Camp Road													
Okanagan Centre Road to Tyndall Road	2350	UNC	\$ 3,126,440	18	\$21,600		\$3,148,040	\$1,101,900	\$4,249,940			\$4,249,940	
Tyndall Road to McGowan Road	800	UNC	\$ 1,064,320	8	\$9,600		\$1,073,920	\$375,900	\$1,449,820	0%		\$1,449,820	
Davidson Road												\$283,080	
Camp Road to McGowan Road	400	URCC	\$ 203,680	5	\$6,000		\$209,680	\$73,400	\$283,080			\$283,080	
McGowan Road to Okanagan Centre Road	1250	URCC	\$ 636,500	16	\$19,200		\$655,700	\$229,500	\$885,200			\$885,200	
McGowan Road - Davidson Road to Ocoela Road	1500	NRCC	\$ 1,333,875				\$1,333,875	\$466,900	\$1,800,775	100%		\$18,008	
Okanagan Centre Road (West)													
Glenmore Road to Highway 97	820	MoT	\$ 1,991,700		incl.		\$1,991,700	\$697,100	\$2,688,800		50%	50%	\$13,444
Glenmore Road to Gravel Pits	350	NNC	\$ 592,550				\$592,550	\$207,400	\$799,950	100%		\$8,000	
Gravel Pits to Tyndall Road	1050	UNC	\$ 1,398,920	6	\$7,200		\$1,406,120	\$491,500	\$1,897,620	100%		\$18,956	
Tyndall Road to Carrs Landing Road	7200	URCC	\$ 3,666,240	50	\$60,000		\$3,726,240	\$1,304,200	\$5,030,440			\$5,030,440	
Okanagan Centre Road (East)													
Highway 97 to Camp Road	1650	URCC	\$ 840,180	20	\$24,000		\$864,180	\$302,500	\$1,166,680			\$1,166,680	
Camp Road to Williams Road	950	URCC	\$ 483,740	26	\$31,200		\$514,940	\$180,300	\$695,240			\$695,240	
Williams Road to Ocoela Road	1850	URCC	\$ 942,020	36	\$43,200		\$985,220	\$344,900	\$1,330,120			\$1,330,120	
North of Ocoela Road	1950	NNC											
Moberly Road	1650	NRCC	\$ 1,467,263				\$1,467,263	\$513,600	\$1,980,863			\$1,980,863	
Ocoela Road													
Carrs Landing Road to McGowan Road	900	URCC	\$ 458,280	5	\$6,000		\$464,280	\$162,500	\$626,780			\$626,780	
McGowan Road to Okanagan Centre Road	800	UNC	\$ 798,240	6	\$7,200		\$805,440	\$282,000	\$1,087,440			\$1,087,440	
Okanagan Centre Road to Highway 97	1100	UNC	\$ 1,463,440	7	\$8,400		\$1,471,840	\$515,200	\$1,987,040	100%		\$19,870	
Carrs Landing Road - Ocoela Road to Barkley Road	8400	URCC	\$ 4,277,280	145	\$174,000		\$4,451,280	\$1,558,000	\$6,009,280			\$6,009,280	
Commonage Road - Barkley Road to District limit	3700	URCC	\$ 1,884,040	16	\$19,200		\$1,903,240	\$666,200	\$2,569,440			\$2,569,440	
Glenmore Road - District limit to Okanagan Centre Road	1650	URCC	\$ 840,180	16	\$19,200		\$859,380	\$300,800	\$1,160,180			\$1,160,180	
Main Street													
Main Street extension Beaver Lk. Road. to Highway 97	220	MoT	\$ 872,200		incl.		\$872,200	\$305,300	\$1,177,500		50%	50%	\$5,888
Coopers to IGA	680	MoT	\$ 1,244,500		incl.		\$1,244,500	\$435,800	\$1,680,300		50%	50%	\$8,401
Hill Road	100	MoT	\$ 184,000		incl.		\$184,000	\$64,400	\$248,400		50%	50%	\$1,242
Berry Road Intersection	300	MoT	\$ 458,100		incl.		\$458,100	\$160,400	\$618,500		50%	50%	\$3,093
Bottom Wood Lake Road													
Lodge Road to Woodsdale Road	1650	UNC	\$ 2,195,160	45	\$54,000	\$145,000	\$2,394,160	\$838,000	\$3,232,160			\$3,232,160	
Lodge Road													
Lodge Road to Woodsdale Road	1700	UNC	\$ 2,261,680	30	\$36,000	\$100,000	\$2,397,680	\$839,200	\$3,236,880			\$3,236,880	
Lodge Road to Bottom Wood Lake Road	750	UNC	\$ 997,800				\$997,800	\$349,300	\$1,347,100	100%		\$13,471	
Bottom Wood Lake Road to Highway 97	90	MoT	\$ 350,750		incl.	\$145,000	\$495,750	\$173,600	\$669,350		50%	50%	\$3,347
Highway 97 to Pretty Road	1350	NNC	\$ 2,285,550				\$2,285,550	\$800,000	\$3,085,550	100%		\$30,856	
Woodsdale Road - Highway 97 to Lodge Road	1500	UNC	\$ 1,995,600	32	\$38,400	\$145,000	\$2,279,000	\$797,700	\$3,076,700	100%		\$30,767	
Ellison Connector													
Beaver Lake Road to Lodge Road	1800	NNC	\$ 3,047,400			\$145,000	\$3,292,400	\$1,152,400	\$4,444,800		20%		\$3,564,730
Sherman Road Connection	700	NNC											
Oyama Road													
Woodsdale Road to Sawmill Road	6700	URCC	\$ 3,411,640	50	\$60,000	\$145,000	\$3,471,640	\$1,215,100	\$4,686,740			\$4,686,740	
Sawmill Road to Highway 97	1850	UNC	\$ 2,461,240	17	\$20,400	\$100,000	\$2,726,640	\$954,400	\$3,681,040		50%		\$1,858,925
Sawmill Road													
Oyama Road to unnamed road	1050	URCC	\$ 534,660	7	\$8,400		\$543,060	\$190,100	\$733,160			\$733,160	
Pollard Road													
Highway 97 to Main Street	70	MoT	\$ 422,352		incl.		\$422,352	\$147,900	\$570,252		50%	50%	\$2,851
Highway 97 to Okanagan Centre Road East	600	MoT	\$ 1,009,120		incl.		\$1,009,120	\$353,200	\$1,362,320		50%	50%	\$6,812
Pollard Court access	80	MoT	\$ 137,424		incl.		\$137,424	\$48,100	\$185,524		50%	50%	\$928
Highway 97 Upgrade													
Main Street extension to Okanagan Centre Road East	540	MoT	\$ 943,236		incl.		\$943,236	\$330,200	\$1,273,436		50%	50%	\$6,367
Okanagan Centre Road East to Pollard Road	540	MoT	\$ 486,892		incl.		\$486,892	\$170,500	\$657,392		50%	50%	\$3,287
Pollard Road to Berry Road	400	MoT	\$ 534,100		incl.		\$534,100	\$187,000	\$721,100		50%	50%	\$3,606
Berry Road to Lodge Road	740	MoT	\$ 740,040		incl.		\$740,040	\$259,100	\$999,140		50%	50%	\$4,996
Berry Road Access	220	MoT	\$ 188,608		incl.		\$188,608	\$66,100	\$254,708		50%	50%	\$1,274
<b>Totals</b>	<b>63750</b>		<b>\$54,228,940</b>	<b>561</b>	<b>\$673,200</b>	<b>\$725,000</b>	<b>\$400,000</b>	<b>\$56,027,140</b>	<b>\$19,611,400</b>	<b>\$75,638,540</b>			<b>\$46,042,557</b>

Notes: 1. In the "Construction Type" column, "New" denotes that the road does not currently exist. "Upgrade" denotes that an existing 2-lane road will be upgraded to the applicable proposed standard road section. MoT denotes that construction standards and costs are defined in the Highway 97 Access Management Plan.  
2. The construction budget estimates do not include land acquisition costs.  
3. The Development Cost Charge (DCC) assist factor is 1%.



Table E.7

**DISTRICT OF LAKE COUNTRY  
ROAD NETWORK STUDY  
CONSTRUCTION BUDGET ESTIMATES  
YEARS 1 THROUGH 10**

**ESTIMATED UNIT ROAD CONSTRUCTION COSTS**

MAIN STREET - PRICE PER LINEAR METRE	MS	\$1,863 per metre
NEW NEIGHBOURHOOD CONNECTOR	NNC	\$1,693 per metre
UPGRADE TO NEIGHBOURHOOD CONNECTOR	UNC	\$1,330 per metre
NEW RURAL COMMUNITY CONNECTOR	NRCC	\$889 per metre
UPGRADE TO RURAL COMMUNITY CONNECTOR	URCC	\$509 per metre
Driveways		\$1,200 each

**ALLOWANCES**

Contingencies	15%
Engineering	20%

DESCRIPTION <small>REFER TO FIGURE 1 FOR ROAD NAMES</small>	SURFACE WORKS		DRIVEWAYS		CREEK CROSSINGS	RAILWAY CROSSINGS	SUB-TOTAL	ENG. & CONT.	TOTAL	FUNDING MECHANISM		DISTRICT ALLOCATION (1% DCC ASSIST FACTOR)	
	LENGTH (m)	CONSTRUCTION TYPE	NUMBER							DEVELOPMENT COST CHARGE			PROV. COST SHARE
										FULL	PART		
<b>ROADS</b>								35%					
<b>Tyndall Road - Okanagan Centre Road to Camp Road</b>	3550	NNC											
<b>McGowan Road - Davidson Road to Oceola Road</b>	1500	NRCC	\$ 1,333,875				\$1,333,875	\$466,900	\$1,800,775	100%		\$18,008	
<b>Okanagan Centre Road (West)</b>													
Glenmore Road to Highway 97	820	MoT	\$ 1,991,700		incl.		\$1,991,700	\$697,100	\$2,688,800		50%	50%	\$13,444
Glenmore Road to Gravel Pits	350	NNC	\$ 592,550				\$592,550	\$207,400	\$799,950	100%			\$8,000
Gravel Pits to Tyndall Road	1050	UNC	\$ 1,396,920	6	\$7,200		\$1,404,120	\$491,500	\$1,895,620	100%			\$18,956
<b>Okanagan Centre Road (East)</b>													
North of Oceola Road	1950	NNC											
<b>Oceola Road</b>													
McGowan Road to Okanagan Centre Road	600	UNC	\$ 798,240	6	\$7,200		\$805,440	\$282,000	\$1,087,440				\$1,087,440
Okanagan Centre Road to Highway 97	1100	UNC	\$ 1,463,440	7	\$8,400		\$1,471,840	\$515,200	\$1,987,040	100%			\$19,870
Glenmore Road - District limit to Okanagan Centre Road	1650	URCC	\$ 840,180	16	\$19,200		\$859,380	\$300,800	\$1,160,180				\$1,160,180
<b>Main Street</b>													
Main Street extension Beaver Lk. Road. to Highway 97	220	MoT	\$ 872,200		incl.		\$872,200	\$305,300	\$1,177,500		50%	50%	\$5,888
Coopers to IGA	680	MoT	\$ 1,244,500		incl.		\$1,244,500	\$435,600	\$1,680,100		50%	50%	\$8,401
Hill Road	100	MoT	\$ 184,000		incl.		\$184,000	\$64,400	\$248,400		50%	50%	\$1,242
Berry Road intersection	300	MoT	\$ 458,100		incl.		\$458,100	\$160,400	\$618,500		50%	50%	\$3,093
<b>Ellison Connector</b>													
Beaver Lake Road to Lodge Road	1800	NNC	\$ 3,047,400			\$145,000	\$3,292,400	\$1,152,400	\$4,444,800		20%		\$3,564,730
Shermon Road Connection	700	NNC											
<b>Oyama Road</b>													
Sawmill Road to Highway 97	1850	UNC	\$ 2,461,240	17	\$20,400	\$145,000	\$2,726,640	\$954,400	\$3,681,040		50%		\$1,858,925
<b>Pollard Road</b>													
Highway 97 to Main Street	70	MoT	\$ 422,352		incl.		\$422,352	\$147,900	\$570,252		50%	50%	\$2,851
<b>Highway 97 Upgrade</b>													
Main Street extension to Okanagan Centre Road East	540	MoT	\$ 943,236		incl.		\$943,236	\$330,200	\$1,273,436		50%	50%	\$6,367
Okanagan Centre Road East to Pollard Road	540	MoT	\$ 486,892		incl.		\$486,892	\$170,500	\$657,392		50%	50%	\$3,287
Pollard Road to Berry Road	400	MoT	\$ 534,100		incl.		\$534,100	\$187,000	\$721,100		50%	50%	\$3,606
<b>Totals</b>	<b>16220</b>		<b>\$19,070,925</b>	<b>52</b>	<b>\$62,400</b>	<b>\$290,000</b>	<b>\$200,000</b>	<b>\$19,623,325</b>	<b>\$6,869,000</b>	<b>\$26,492,325</b>			<b>\$7,784,286</b>

- Notes:** 1. In the "Construction Type" column, "New" denotes that the road does not currently exist. "Upgrade" denotes that an existing 2-lane road will be upgraded to the applicable proposed standard road section. MoT denotes that construction standards and costs are defined in the Highway 97 Access Management Plan.  
2. The construction budget estimates do not include land acquisition costs  
3. The Development Cost Charge (DCC) assist factor is 1%.



Table E.8

**DISTRICT OF LAKE COUNTRY  
ROAD NETWORK STUDY  
CONSTRUCTION BUDGET ESTIMATES  
YEARS 11 THROUGH 20**

**ESTIMATED UNIT ROAD CONSTRUCTION COSTS**

MAIN STREET - PRICE PER LINEAR METRE	MS	\$1,863 per metre
NEW NEIGHBOURHOOD CONNECTOR	NNC	\$1,693 per metre
UPGRADE TO NEIGHBOURHOOD CONNECTOR	UNC	\$1,330 per metre
NEW RURAL COMMUNITY CONNECTOR	NRCC	\$889 per metre
UPGRADE TO RURAL COMMUNITY CONNECTOR	URCC	\$509 per metre
Driveways		\$1,200 each

**ALLOWANCES**

Contingencies	15%
Engineering	20%

DESCRIPTION <small>REFER TO FIGURE 1 FOR ROAD NAMES</small>	SURFACE WORKS		DRIVEWAYS		CREEK CROSSINGS	RAILWAY CROSSINGS	SUB-TOTAL	ENG. & CONT.	TOTAL	FUNDING MECHANISM		DISTRICT ALLOCATION (1% DCC ASSIST FACTOR)	
	LENGTH (m)	CONSTRUCTION TYPE	NUMBER							DEVELOPMENT COST CHARGE			PROV. COST SHARE
										FULL	PART		
<b>ROADS</b>								35%					
<b>McCoubrey Road - District limit to Okanagan Centre Road.</b>	1050	NRCC	\$ 933,713				\$933,713	\$326,800	\$1,260,513	100%		\$12,605	
<b>Camp Road</b>												\$4,249,940	
Okanagan Centre Road to Tyndall Road	2350	UNC	\$ 3,126,440	18			\$3,148,040	\$1,101,900	\$4,249,940			\$4,249,940	
Tyndall Road to McGowan Road	800	UNC	\$ 1,064,320	8			\$1,073,920	\$375,900	\$1,449,820	0%		\$1,449,820	
<b>Davidson Road</b>												\$283,080	
Camp Road to McGowan Road	400	URCC	\$ 203,680	5			\$209,680	\$73,400	\$283,080			\$283,080	
McGowan Road to Okanagan Centre Road	1250	URCC	\$ 636,500	16			\$655,700	\$229,500	\$885,200			\$885,200	
<b>Okanagan Centre Road (West)</b>												\$5,030,440	
Tyndall Road to Carrs Landing Road	7200	URCC	\$ 3,666,240	50			\$3,726,240	\$1,304,200	\$5,030,440			\$5,030,440	
<b>Okanagan Centre Road (East)</b>												\$1,166,680	
Highway 97 to Camp Road	1650	URCC	\$ 840,180	20			\$864,180	\$302,500	\$1,166,680			\$1,166,680	
Camp Road to Williams Road	950	URCC	\$ 483,740	26			\$514,940	\$180,300	\$695,240			\$695,240	
Williams Road to Oceola Road	1850	URCC	\$ 942,020	36			\$985,220	\$344,900	\$1,330,120			\$1,330,120	
<b>Moberly Road</b>	1650	NRCC	\$ 1,467,263				\$1,467,263	\$513,600	\$1,980,863			\$1,980,863	
<b>Oceola Road</b>												\$626,780	
Carrs Landing Road to McGowan Road	900	URCC	\$ 458,280	5			\$464,280	\$162,500	\$626,780			\$626,780	
<b>Carrs Landing Road - Oceola Road to Barkley Road</b>	8400	URCC	\$ 4,277,280	145			\$4,451,280	\$1,558,000	\$6,009,280			\$6,009,280	
<b>Commonage Road - Barkley Road to District limit</b>	3700	URCC	\$ 1,884,040	16			\$1,903,240	\$666,200	\$2,569,440			\$2,569,440	
<b>Bottom Wood Lake Road</b>												\$3,232,160	
Lodge Road to Woodsdale Road	1650	UNC	\$ 2,195,160	45	\$145,000		\$2,394,160	\$838,000	\$3,232,160			\$3,232,160	
<b>Lodge Road</b>												\$3,236,880	
Lodge Road to Woodsdale Road	1700	UNC	\$ 2,261,680	30		\$100,000	\$2,397,680	\$839,200	\$3,236,880			\$3,236,880	
Lodge Road to Bottom Wood Lake Road	750	UNC	\$ 997,800				\$997,800	\$349,300	\$1,347,100	100%		\$13,471	
Bottom Wood Lake Road to Highway 97	90	MoT	\$ 350,750		incl.	\$145,000	\$495,750	\$173,600	\$669,350		50%	50%	\$3,347
Highway 97 to Pretty Road	1350	NNC	\$ 2,285,550				\$2,285,550	\$800,000	\$3,085,550	100%			\$30,856
<b>Woodsdale Road - Highway 97 to Lodge Road</b>	1500	UNC	\$ 1,995,600	32	\$145,000	\$100,000	\$2,279,000	\$797,700	\$3,076,700	100%			\$30,767
<b>Oyama Road</b>												\$4,686,740	
Woodsdale Road to Sawmill Road	6700	URCC	\$ 3,411,640	50			\$3,471,640	\$1,215,100	\$4,686,740			\$4,686,740	
<b>Sawmill Road</b>												\$733,160	
Oyama Road to unnamed road	1050	URCC	\$ 534,660	17			\$543,060	\$190,100	\$733,160			\$733,160	
<b>Pollard Road</b>												\$6,812	
Highway 97 to Okanagan Centre Road East	600	MoT	\$ 1,009,120		incl.		\$1,009,120	\$353,200	\$1,362,320		50%	50%	\$6,812
Pollard Court access	80	MoT	\$ 137,424		incl.		\$137,424	\$48,100	\$185,524		50%	50%	\$928
<b>Highway 97 Upgrade</b>												\$4,460	
Berry Road to Lodge Road	740	MoT	\$ 660,750		incl.		\$660,750	\$231,300	\$892,050		50%	50%	\$4,460
Berry Road Access	220	MoT	\$ 168,400		incl.		\$168,400	\$59,000	\$227,400		50%	50%	\$1,137
<b>Totals</b>	<b>47530</b>		<b>\$35,058,517</b>	<b>509</b>	<b>\$610,800</b>	<b>\$435,000</b>	<b>\$36,304,317</b>	<b>\$12,707,500</b>	<b>\$49,011,817</b>			<b>\$38,257,599</b>	

**PRELIMINARY  
S.D. DRAFT**

- Notes:**
- In the "Construction Type" column, "New" denotes that the road does not currently exist. "Upgrade" denotes that an existing 2-lane road will be upgraded to the applicable proposed standard road section. MoT denotes that construction standards and costs are defined in the Highway 97 Access Management Plan.
  - The construction budget estimates do not include land acquisition costs.
  - The Development Cost Charge (DCC) assist factor is 1%.



Table E.9