THE COUNTY OF VERMILION RIVER IN THE PROVINCE OF ALBERTA

BYLAW 12-06

A BYLAW FOR THE ADOPTION OF THE COUNTY OF VERMILION RIVER 'MASTER TRANSPORTATION PLAN – 20 APRIL 2012'

The County of Vermilion River ("The County") in the Province of Alberta, wishes to adopt a plan for a specific area of the County for future road improvements in accordance with Section 7 of the Municipal Government Act, Chapter M-26, as amended.

WHEREAS, the Council of the County of Vermilion River has done public consultation on May 31, 2012 for the plan attached as 'Schedule A' and wishes to use it as the foundation for any offsite levy bylaw that may be introduced

WHEREAS, the implementation of this Bylaw (12-06) does hereby rescind Bylaw 09-18 in the County of Vermilion River,

THEREFORE, the Council of the County of Vermilion River, in the Province of Alberta, duly assembled, hereby approve the Master Transportation Plan 20 April 2012 as attached as 'Schedule A'.

First Reading Date: May 22, 2012

Second Reading Date: June 12, 2012

Third Reading Date: June 12, 2012

Date Signed: June 12, 2012

SEVERED

County Reeve

SEVERED

County Chief Administrative Officer

Submitted To:

County of VERMILION River

Transportation Master Plan Report

Submitted By: AMEC Environment & Infrastructure

20 April 2012

ACKNOWLEDGEMENT

AMEC Environment and Infrastructure was fortunate to have worked with a highly qualified and dedicated project team to complete the County of Vermilion River's Transportation Master Plan study.

We would like to acknowledge their support in completing this study:

County of Vermilion River (Client):

Project Sponsor:
Rhonda King – Chief Administrative Officer

AMEC Environment & Infrastructure (Consultant):

In addition, we would like to acknowledge the assistance and cooperation of the Technical Steering Committee (TSC) members:

County of Vermilion River:	Richard Van Ee	Reeve
	David Gamracy	Deputy Reeve
	Murray King	Councilor Division 1
	Daryl Watt	Councilor Division 2
	Glenda Elkow	Councilor Division 5
	Ed Parke	Councilor Division 6
	Brent Romanchuk	Councilor Division 7
	Rhonda King	Chief Administrative Officer
	Keegan Rutherford	Manager/Planning Officer
	Randy Belliveau	Public Works Superintendent
AMEC Environment & Infrastructure	Gabe Rohr	North Alberta Roads Manager

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1.0 INTRODUCTION

1.1 Background

The City of Lloydminster is one of the fastest growing communities in Canada. The City has a unique geographical location where it straddles the provincial border of both Alberta and Saskatchewan. Meridian Avenue (50 Avenue) delineates the provincial boundary through the City. East of Meridian Avenue is considered to be part of Saskatchewan, west of Meridian Avenue is considered to be part of Alberta. A map of the City of Lloydminster is shown in Figure 1.1.

The City of Lloydminster is faced with significant transportation challenges. As development increases in the City, traffic congestion continues to increase. Traffic congestion on arterial roads extend travel times, thus affecting the quality and level of service.

The County of Vermilion River retained the services of AMEC Environment & Infrastructure to create a Transportation Master Plan (TMP) for their roadway network.

The scope of the Transportation Master Plan as outlined by the Technical Steering Committee includes the following rural roadways:

- Township Road 494: between Range Road 12 and HWY 897 (identified in red and the letter 'A' on Figure 1.2 – key Plan).
- Township Road 502: between Range Road 12 and Range Road 20 (identified in red and the letter 'B' on Figure 1.2 – key Plan).
- Township Road 504: between HWY 17 and Range Road 20 (identified in red and the letter 'C' on Figure 1.2 – key Plan).
- Township Road 510: between HWY 17 and HWY 897 (identified in red and the letter 'D' on Figure 1.2 – key Plan).
- Range Road 12: between Township Road 502 and Township Road 504 (identified in blue and the letter 'E' on Figure 1.2 – key Plan).
- Range Road 14: between Township Road 494 and Township Road 504 (identified in blue and the letter 'F' on Figure 1.2 – key Plan).
- Range Road 20: between HWY 619 and Township Road 514 (identified in blue and the letter 'G' on Figure 1.2 – key Plan).
- Township Road 501: between Range Road 12 and Range Road 20 (identified in red and the letter 'H' on Figure 1.2 – key Plan).
- Township Road 495: between Range Road 12 and HWY 16 (identified in red and the letter 'I' on Figure 1.2 – key Plan).

Figure 1.2 highlights the study area.

This transportation master plan includes the following elements:

- An assessment and evaluation of the County's roadway system and classification standards.
- An evaluation of the typical roadway cross sections in accordance with roadway classifications.
- Identify future Right of Way (ROW) requirements to provide a framework for future roadway improvements.
- An assessment of construction cost estimates.

The Transportation Master Plan, presented in this report, has been preceded by:

- **Matrix Planning and G.T. Hoffmann & Associates**, County of Vermilion River and City of Lloydminster Intermunicipal Development Plan, June 2006.
- **Stantec Consulting Ltd.**, Highway 16 – Functional Planning Study – Future Realignment Around Lloydminster, 2002.

The intent of the Intermunicipal Development Plan (IDP) is to establish a regional framework for attracting economic opportunities and managing land use, subdivions and development within the IDP area.

Alberta Transportation and Saskatchewan Department of Highways recently completed a route location study that recommended Highway 16 bypass routes south of the City of Lloydminster. The route location study identified future interchange locations and roadway cross sections.

1.2 Description of Roadway System

The County of Vermilion River's roadway network contains roads built and maintained to both urban and rural standards in accordance with Alberta Provincial Standards. Most municipalities classify roadways based on the Ministry of Transportation's hierarchy of roadway function[1], or the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[2], with variations as necessary to reflect historical practices. Some municipalities also designate sub-classes in their roadway hierarchy (i.e. Major/Minor, Class I/Class II) as required to meet their local needs.

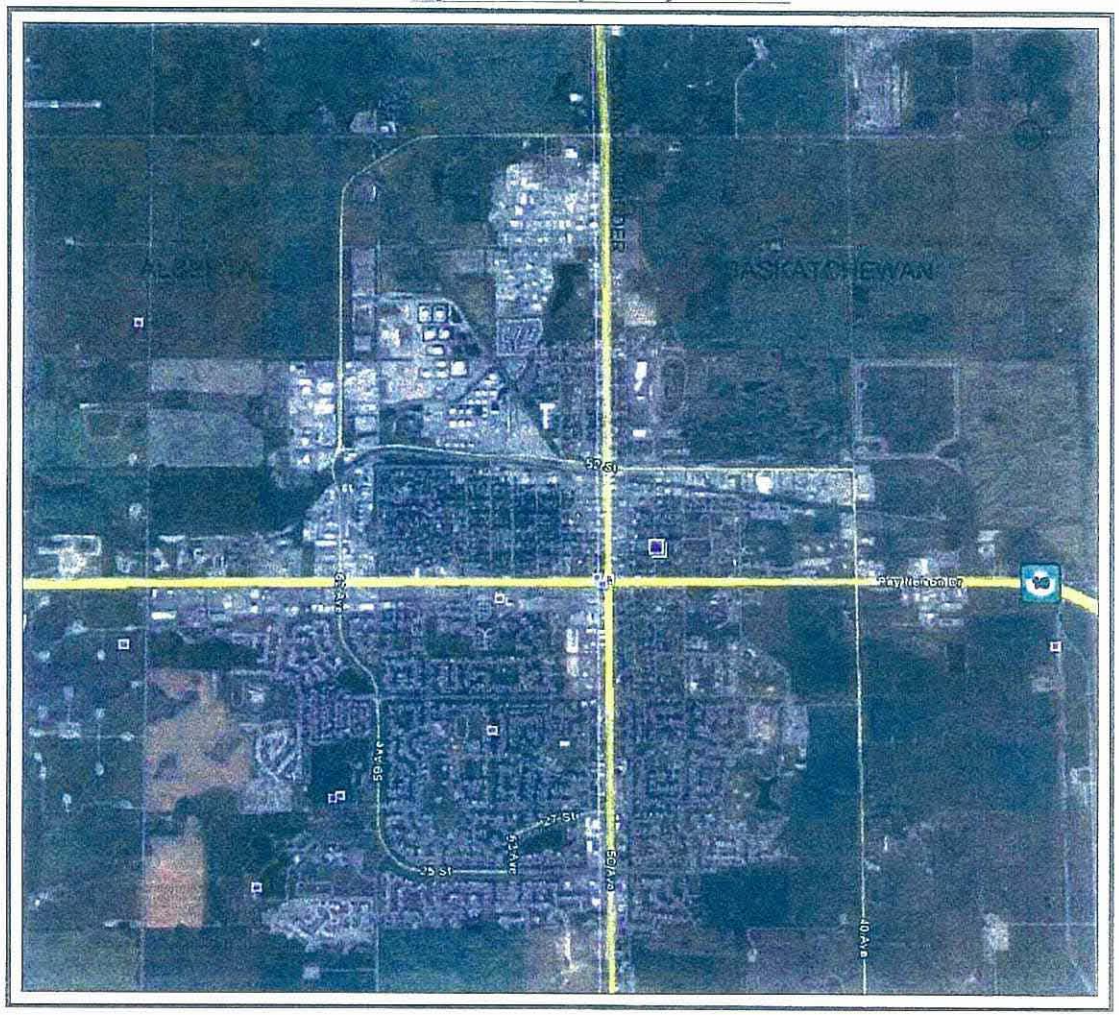
[1] Ministry of Transportation Geometric Design Standards Manual
[2] Transportation Association of Canada (TAC) Geometric Design Guidelines for Canadian Roads

Table 1.1 summarizes the rural and urban roadway characteristics.

Table 1.1: Rural and Urban Roadway Characteristics

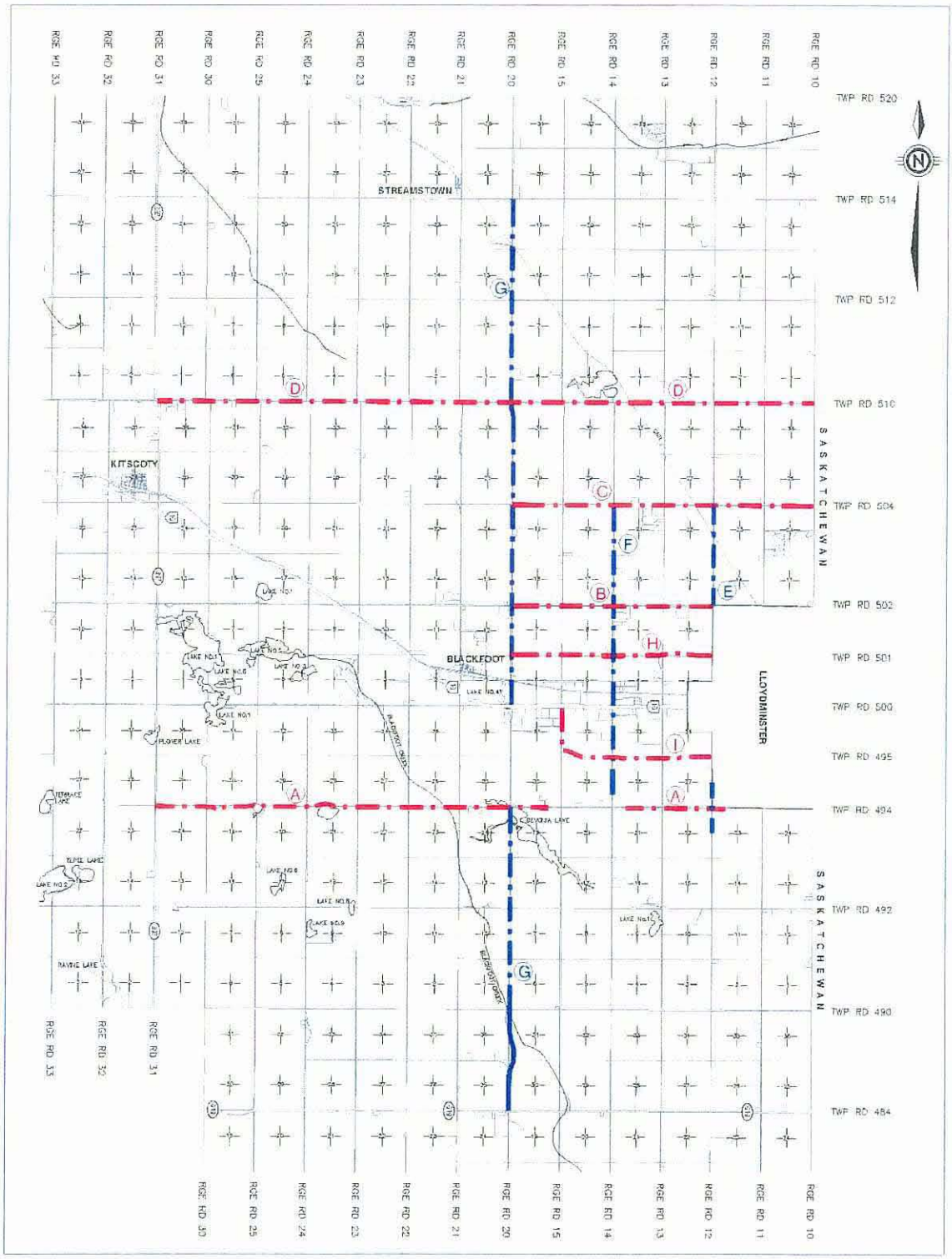
Roadway Characteristic	Rural	Urban
Service Function, such as degree of mobility and land access	Unlimited land access and maximum mobility	Controlled land access with associated mobility limitations (i.e. one way streets)
Traffic Volumes & Level of Service (LOS)	Low traffic volumes and high LOS (LOS A to C)	High traffic volumes (depending on type of road) with reduced LOS during peak periods (LOS D to F)
Traffic Flow/Composition of Traffic	Free Flow / Mixed	Interrupted Flows / Mixed
Running Speed of traffic during off peak conditions	Medium to High (50-90km/h)	Low to Medium (40-80km/h)
Vehicle Types (proportion of cars, trucks, buses)	High percentage of heavy vehicles Slow moving vehicles including farm vehicles	High degree of heavy vehicles on designated major routes

Figure 1.1: City of Lloydminster



REFERENCE: IMAGE OBTAINED FROM GOOGLE EARTH

Figure 1.2: Key Plan



2.0 EXISTING AND FUTURE CONDITIONS

2.1 Existing Transportation System

There is an extensive existing transportation networks in the County of Vermilion River serving commuter and recreational demands for passenger and service movement. The inner city network within the City of Lloydminster consists of dense networks in the downtown, radiating out to less dense networks in the suburban and rural areas. The inner city network is a well developed and diverse network of roadway, railway and air links.

The County of Vermilion River has the following Standard Roadway Classifications, which are characterized by operational and design characteristics.

- Class A: Collector Road (Class A1, A2 and A3)
- Class B: Local Upgraded + Developer 3
- Class C: Local Upgraded + Developer 2
- Class D: Local Upgraded + Developer 1
- Class E: Local
- Class F: Undeveloped Road
- Class G: Special Projects
- Class H: Not Open
- Class I: Internal Hamlet and Multi-lot Roads
- Class J: Hamlet Roads
- Class K: Oil Field Traffic only

The characteristics of these types of roadways may vary depending on its location relative to the County or local municipality. For example, a local road may serve to provide access to farm land, country residence or local businesses. A Class A2 or A3 road serves to gather traffic from the local roads to the Class A1 collector roads. Class A1 collector roads serve to carry large volumes of traffic between areas in urban centres and tends to link to expressways and freeways. Table 2.1 summarizes the County of Vermilion River's existing transportation system.

The main function of the County of Vermilion River's rural roadway network is to provide a high degree of connectivity within the rural area. The local, A1, A2 and A3 collector rural roads enhance the rural connectivity, which reduces average delay per vehicle and trip lengths

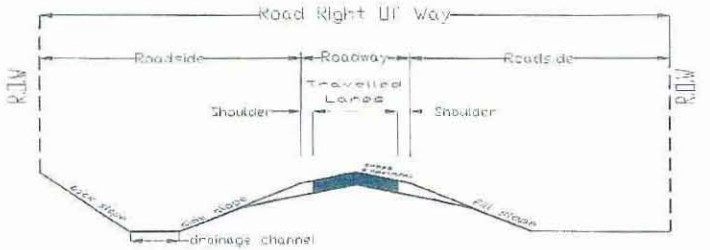
The level of service in terms of average delay for a signalized and un-signalized intersection is summarized in Appendix A.

Table 2.1: County of Vermilion River's Existing Transportation System

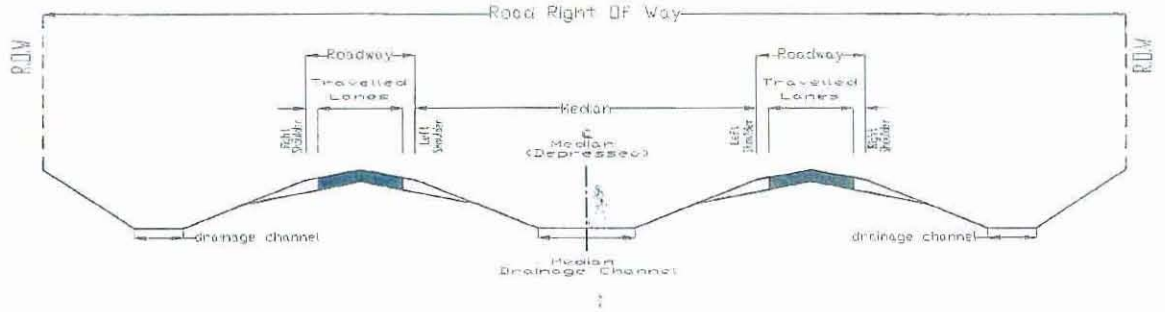
	Rural		
	Local	**Class A2 or A3 Collector**	**Class A1 Collector**
Traffic Service Function	Secondary movement	Primary and secondary movement	Primary traffic movement
Land Service Access	Primary land access	Primary & secondary movement with land access	Secondary land access
Typical Traffic volumes (veh/day)	< 500	500 < Collector < 2500	> 2500
Flow Characteristics	Interrupted flow	Interrupted flow	Free flow except at signals
Design Speed (km/h)	70-90	80-100	80-100
Posted Speed	70-80	80	80
Vehicle Type	Passenger & service	Passenger & service	All types
Desirable Connections	Local & collector	Local & Class A2 or A3 Collector	Class A1 collector, freeways, & highways
Cyclists Accommodation	Permitted, with no special accommodation	Permitted with no special accommodation	Wider lanes where required
Pedestrian Accommodation	Permitted with no special accommodation	Permitted with no special accommodation	Permitted with no special accommodation
Typical Parking	Not permitted	Not permitted	Not permitted
Minimum Intersection Spacing	N/A	N/A	N/A
Typical Right of Way (ROW) m	20-30	20-30	20-30
Traffic Calming	N/A	N/A	N/A
Rumble Strips	N/A	N/A	N/A

In general, rural roads in the County of Vermilion River are constructed with paved shoulders and ditches leading to natural drainage channels.

Figure 2.1: Typical Rural Roadway Key Plan



A. Rural Undivided Highway Cross Section



B. Rural Divided Highway Cross Section

There are some key sections of County Roads in the vicinity of the City of Lloydminster currently operating at an acceptable LOS A to E that will require capacity enhancement and operational improvement measures as growth occurs. Table 2.2 provides a summary of the identified rural roadway structure, roadway width, and existing right of way.

Table 2.2: Identified Rural Roadway Characteristics

	Between	Roadway Structure and Roadway Width (m)	Existing Right of Way (m)
Range Road (RR) 12	TWP 502 & TWP 504	Gravel, 8.0	±20
Range Road (RR) 14	HWY 16 & TWP 502	Paved, 8.5	±30
	TWP 494 & HWY 16	Gravel, 8.0	±30
	TWP 502 & TWP 504	Gravel, 8.0	±30
Range Road(RR) 20	HWY 619 & TWP 494	Paved, 8.5	±30
	HWY 16 & TWP 510	Paved, 8.5	±30
	TWP 510 & TWP 514	Gravel, 8.0	±30
Township Road (TWP) 494	RR 12 & RR 20	Paved, 8.5	±30
	RR 20 & HWY 897	Gravel, 8.0	±30
Township Road (TWP) 502	RR 12 & RR 20	Paved, 8.5	±30
Township Road (TWP) 504	HWY 17 & RR 20	Gravel, 8.0	±30
Township Road (TWP) 510	HWY 17 & HWY 897	Gravel, 8.0	±30

2.2 Future Conditions

Most of the transportation system needs in the County of Vermilion River region will evolve over the next 20 years in direct response to the amount, location and form of population and employment growth during this period. The growth forecasts in Table 2.3 were developed and provided by the County of Vermilion River and City of Lloydminster for this Transportation Master Plan Study. As a result, a 20 year forecast of these growth patterns was developed and shown in Table 2.4.

Table 2.3: Population Forecast

REGION	POPULATION YEAR					
	1971 Population	2003 Population	2005 Population	2006 Population	2021 Population	2034 Population
City of Lloydminster	9,000	22,500	23,643	24,350	37,000	56,250
	1986 Population	2006 Population	2008 Population	2016 Population	2021 Population	2034 Population
County of Vermilion River	8,112	7,467	7,900	8,532	8959	10213

Source: City Data provided by City of Lloydminster
County Data provided by County of Vermilion River

Table 2.4: 20 Year Population Forecast

REGION	POPULATION YEAR	
	2008	2028
City of Lloydminster	25750*	46500*
County of Vermilion river	7900	9640*

* Represents interpolated data from the provided City of Lloydminster and County of Vermilion River data

This 20 year City/County population forecast for 2028 was used for this study.

3.0 RECOMMENDED LONG TERM TRANSPORTATION STRATEGY

The components of the recommended transportation strategy are listed and described below:

- Roadway
- Right of Way

3.1 Roadway and Right of Way Strategy

The recommended 2028 roadway network is presented in Appendix B – Roadway Functional Plans and includes improvements to rural local, Class A1, A2 or A3 collector roads.

Range Road 12 (between Township Road 502 & Township Road 504)

- Range Road (RR) 12 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Range Road 14 (between Township Road 502 and Township Road 504)

- Range Road (RR) 14 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Range Road 14 (between Township Road 494 to Township Road 502)

- Range Road (RR) 14 classified as Class A1divided roadway
- 10.4 meter top roadway width (four 3.7 meter paved travel lanes with 1 meter inside and 2 meter outside paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 60 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.
-

Range Road 20 (between Township Road 510 and Township Road 514)

- Range Road (RR) 20 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.
- Realign "dog leg" T intersections at RR 20 & TWP 510 into a single intersection. Alignments should incorporate traffic calming measures.

Range Road 20 (between Highway 16 and Township Road 510 & Highway 619 and Township Road 494)

- Range Road (RR) 20 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 494 (between West of Range Road 15 to Highway 897)

- Township Road (TWP) 494 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 494 (between East of Range Road 14 to West of Range Road 15)

Roadway Right of Way To Be Confirmed Upon Approval of the Proposed Highway 16 Bypass Interchange Plan.

- Township Road (TWP) 494 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 494 (between Range Road 12 to East of Range Road 14)

- Township Road (TWP) 494 classified as Class A1 divided roadway
- 10.4 meter top roadway width (four 3.7 meter paved travel lanes with 1 meter inside and 2 meter outside paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 60 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.
-

Township Road 502 (between Range Road 12 to Range Road 14)

- Township Road (TWP) 502 classified as Class A1 divided roadway
- 10.4 meter top roadway width (four 3.7 meter paved travel lanes with 1 meter inside and 2 meter outside paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 60 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 502 (between Range Road 14 to Range Road 20)

- Township Road (TWP) 502 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 504 (between Highway 17 and Range Road 20)

- Township Road (TWP) 504 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 510 (between Highway 17 and Highway 897)

- Township Road (TWP) 510 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr

- Increase Right of Way to 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 495 (between Range Road 12 and Highway 16)

- Township Road (TWP) 495 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Proposed Right of Way is 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

Township Road 501 (between Range Road 12 and Range Road 20)

- Township Road (TWP) 501 classified as Class A2 undivided roadway
- 9 meter top roadway width (two 3.5 meter paved travel lanes with two 1 meter paved shoulders)
- Proposed roadway design speed is 100km/hr
- Proposed Right of Way is 40 meters
- Natural open ditch drainage
- Intersections require 30 by 30 corner cuts for intersection treatments.

4.0 CONSTRUCTION COST ESTIMATES

4.1 Unit Costs for Construction

Construction costs were developed to assist in the budget and programming process. Costs were developed using the average 2012 unit price averages published by Alberta Transportation and do not include inflation. Unit costs were developed for key components such as grade widening, base and paving, utility relocation, right of way and drainage. Table 4.1 summarizes the unit cost based on roadway characteristics.

Table 4.1: Construction Unit Prices based on Roadway Characteristics

Roadway Characteristics	Unit Cost ($/km)
Class A1: Collector Road – 10.4m top width	1,400,000
Class A2: Collector Road – 9.0m top width	800,000
Road Widening & Overlay	400,000

4.2 Total Cost Estimate for Construction

Table 4.2 summarizes the cost estimate for the roadways outlined in the Transportation Master Plan.

Table 4.2: Construction Cost Estimates – Class A1: Collector Roads (Divided)

Roadway	Section		Classification	Length (km)	Costs ($)
	From	To			
RR 14	TWP 494	TWP 502	Class A1	6.4	8,960,000
TWP 494	RR 12	RR 14		3.3	4,620,000
TWP 502	RR 13	RR 14		0.8	1,120,000
				SUBTOTAL	**14,700,000**

Table 4.3: Construction Cost Estimates – Class A2: Collector Roads (Undivided)

Roadway	Section		Classification	Length (km)	Costs ($)
	From	To			
RR 12	TWP 502	TWP 504	Class A2	2.4	1,920,000
RR 14	TWP 502	TWP 504		3.2	1,280,000
RR 20	TWP 510	TWP 514		6.5	5,200,000
RR 20	HWY 619	TWP 494		9.8	3,920,000
RR 20	HWY 16	TWP 510		9.8	3,920,000
TWP 494	RR 15	HWY 897		12.8	10,240,000
TWP 502	RR 14	RR 20		3.2	1,280,000
TWP 504	HWY 17	RR 20		9.6	7,680,000
TWP 510	HWY 17	HWY 897		21.2	16,960,000
TWP 495	RR 12	HWY 16		6.4	5,120,000
TWP 501	RR 12	RR 20		6.4	5,120,000
SUBTOTAL					**62,640,000**

The cost estimates include the cost of pavement widening and overlay of paved roads for a 20-year life cycle.

The recommended long term (2028) transportation strategy will require an estimated **$77.34 million**.

5.0 PUBLIC CONSULTATION

During the course of this study, the project team received feedback and comments from key stakeholders and the general public. Two sets of public open houses were held on; March 2009 and June 2009 respectively.

The first phase of the consultation process (March 2009), was intended to inform the public, receive input and provide all parties with balanced and objective information to assist them in understanding:

- the overall conceptual plans and locations of the County's roadways system and classification standards,
- the transportation master plans' study process, typical roadway cross sections, right of way requirements and framework for future roadway improvements.

The second phase of the process (June 2009), was intended to keep stakeholders and the public informed of the progress and communicate new developments. The focus was:

- on providing stakeholders and the general public with balanced and objective information as the study continued and concluded , and
- to ensure the stakeholders and general public heard and responded to key issues, concerns and ideas.

Table 5-1 summarizes the consultation activities.

Table 5.1: Public Consultation

Date	Function
March 2009	Open House 1
June 2009	Open House 2

6.0 CONCLUSION AND RECOMMENDATION

The outcome of this study is a rural roadway classification system. The primary methodology used in this study is to identify the functional purpose of the rural roadways in the County of Vermilion River. Two main categories are recommended for the transportation network in the County of Vermilion River consisting of:

- Class A1 – Collector (divided)
- Class A2 – Collector (undivided)

A 20-year (2028) population forecast for the City of Lloydminster and County of Vermilion River was used for this study. A roadway network is a dynamic entity that must change and react to changing traffic volumes and demands. Therefore, it is recommended that another review be conducted in five years to see if the recommended classification system is based on reasonable growth projection and has met the desired outcomes.

The recommended long term (2028) transportation strategy as outlined in this report will require an estimated $77.34 million.

APPENDIX A

LEVEL OF SERVICE

Table A.1: Level of Service in Terms of Average Delay per Vehicle for Signalized Intersections

LEVEL OF SERVICE (LOS)	AVERAGE DELAY PER VEHICLE (SEC/VEH)	COMMENTS
A	Less than 10	Very Good Operation
B	10.1 to 20.0	Good Operation
C	20.1 to 35.0	Acceptable Operation
D	35.1 to 55.0	Some Congestion
E	55.1 to 80	Significant Congestion
F	Greater than 80.0	Unacceptable Operation

Source: Trafficware Synchro 7.0 (2003)

Table A.2: Level of Service in Terms of Average Delay per Vehicle for Unsignalized Intersections

LEVEL OF SERVICE (LOS)	AVERAGE DELAY PER VEHICLE (SEC/VEH)	COMMENTS
A	Less than 10	Very Good Operation
B	10.1 to 15.0	Good Operation
C	15.1 to 25.0	Acceptable Operation
D	25.1 to 35.0	Some Congestion
E	35.1 to 50	Significant Congestion
F	Greater than 50.0	Unacceptable Operation

Source: Trafficware Synchro 7.0 (2003)

APPENDIX B

ROADWAY FUNCTIONAL PLANS