TOWN OF OLDS/ MOUNTAIN VIEW COUNTY 2009-2035 TRANSPORTATION & UTILITIES MASTER PLAN DRAFT REPORT

Prepared for: Town of Olds and Mountain View County

Prepared by:	Bunt & Associates Engineering (Alberta) Ltd.
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File No.:	1307-01
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Prepared by:	Bunt & Associates Engineering (Alberta) Ltd.

bunt & associates
TRANSPORTATION PLANNERS AND ENGINEERS

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E.0 EXECUTIVE SUMMARY

E.0.1 Introduction and Project Objectives

The Town of Olds and Mountain View County have experienced considerable residential and employment growth in recent years. This has and will continue to have a significant impact on local and regional infrastructure needs in the areas of transportation and utilities. With this in mind, the Town and County sought to develop a Transportation and Utilities Master Plan to confirm infrastructure planning priorities for the short term and long term horizons.

As outlined in the 2009 Request for Proposals (RFP), the Master Plan will need to be robust to accommodate expected demand while being flexible to allow the Town and County to develop in a pragmatic and logical way (in terms of development areas and corridors). Underlying these requirements is the implicit need for sustainability. It is neither efficient nor economically responsible to accommodate haphazard low density development. A logical, environmentally responsible and fiscally attainable solution must be developed to allow the Town and the County to continue to grow into the future.

The work program for the Master Plan exercise included a number of key components. These were highlighted in the RFP and have been paraphrased here in general terms as follows:

- A review of current and emerging issues in the existing transportation and utilities system based on appropriate analysis methods, and an assessment of short term mitigation measures required through to 2016. This essentially allows the Town and the County to deal with development that has either already been approved or is pending approval.

- Development of appropriate forecast models to establish the necessary transportation and utility infrastructure needs associated with an assumed 30 year (35,000 population) horizon. The models will be developed in a manner that allows for "live" updates in the future as and when required by the Town and County. This will provide the Town and County with the means to establish orderly development and to methodically re-assess changes in the future should development programs change with the passage of time.

- Development of a staging program that identifies development corridors and areas, the order in which those corridors and areas should be developed most efficiently, and the associated incremental infrastructure needs required to accommodate that growth; complete with Level C cost estimates. This will allow the Town and the County to plan their future incrementally, both in terms of assessing directions and intensities of development with an associated infrastructure program to establish fiscal needs and capital project planning.

- Summarize the findings in a comprehensive report and present the findings to Administration and to Council.

In September 2009, the Town and County jointly retained Bunt & Associates, together with BSEI Municipal Consulting Engineers, and Synergy Planning Inc. to undertake the development of a Transportation and Utilities Master Plan. The purpose for this plan is to indentify/confirm the infrastructure and planning needs and priorities for the short term (2016) and long term (35,000 population) horizons.

Currently, the Town's and the County's transportation modeling efforts have been limited to the interpretation of individual past Area Structure Plans, Outline Plans, Functional Planning studies completed for the Province and traffic impact studies undertaken within the Town of Olds and/or Mountain View County. However, the collective impact of these plans and documents had not previously been tied together as part of a single global modeling exercise. An assessment of the future roadway requirements and improvements within Town of Olds and Mountain View County therefore necessitates the development of a Traffic Model. Bunt & Associates used the VISUM traffic modeling software package to accomplish this goal.

To achieve the project goals and objectives, an extensive planning exercise was completed to determine the limits of estimated staging of development based on all three (3) disciplines (transportation, planning, and engineering). This exercise was completed prior to main transportation and utilities elements and sought to layout the estimated directions for development within the study area (in terms of actual directions and quarter sections) and as well, sought to identify appropriate population and employment forecasts by cell for use in developing the forecasting models for the traffic and utility efforts.

E.0.2 Short Term (2016) Improvement Program

Transportation

The overall Short Term improvement program is illustrated in Table 5.7, and illustrated in Exhibit 5.15 for the County and Exhibit 5.16 for the Town. The specific recommended short term improvements include the following:

- Expected signalization of the 57th Avenue/54th Street intersection.
- Monitoring of 57th Avenue/ Shannon Drive, Highway 27/ 48th Avenue, Highway 27/ 49th Avenue and Highway 27/ Range Road 20 (70th Avenue) to assess needs for signalization.
- Extension of concrete median on south leg of 57th Avenue at Highway 27 to prevent short cutting along 50th Street.
- Construct concrete median on north leg of 50th Avenue at Highway 27 to eliminate left turns at the commercial site on the north side.
- Turn restrictions at 57th Avenue and the north service road should be implemented.
- Implement northbound and southbound left turn lanes at Highway 27/ 50th Avenue along with traffic signal optimization.

- Implement northbound and southbound left turn lanes at Highway 27/ 46th Avenue along with traffic signal optimization.

- Commencement of a functional planning and parking study for the 50th Avenue corridor in order to establish the appropriate manner in which to develop the roadway to optimize the utility of the roadway for the downtown core and active modes of transportation, while at the same time optimizing the efficiency of the roadway for the accommodation of traffic volumes.

- Monitor daily traffic volumes along 54th Street to aid in determining the timing for the development of the south arterial. This is not expected to be built at the Short Term horizon, but the volumes should be monitored.

- In the interim, it is recommended that the County implement the necessary dust control measures and/or upgrade to a paved surface are noted below:

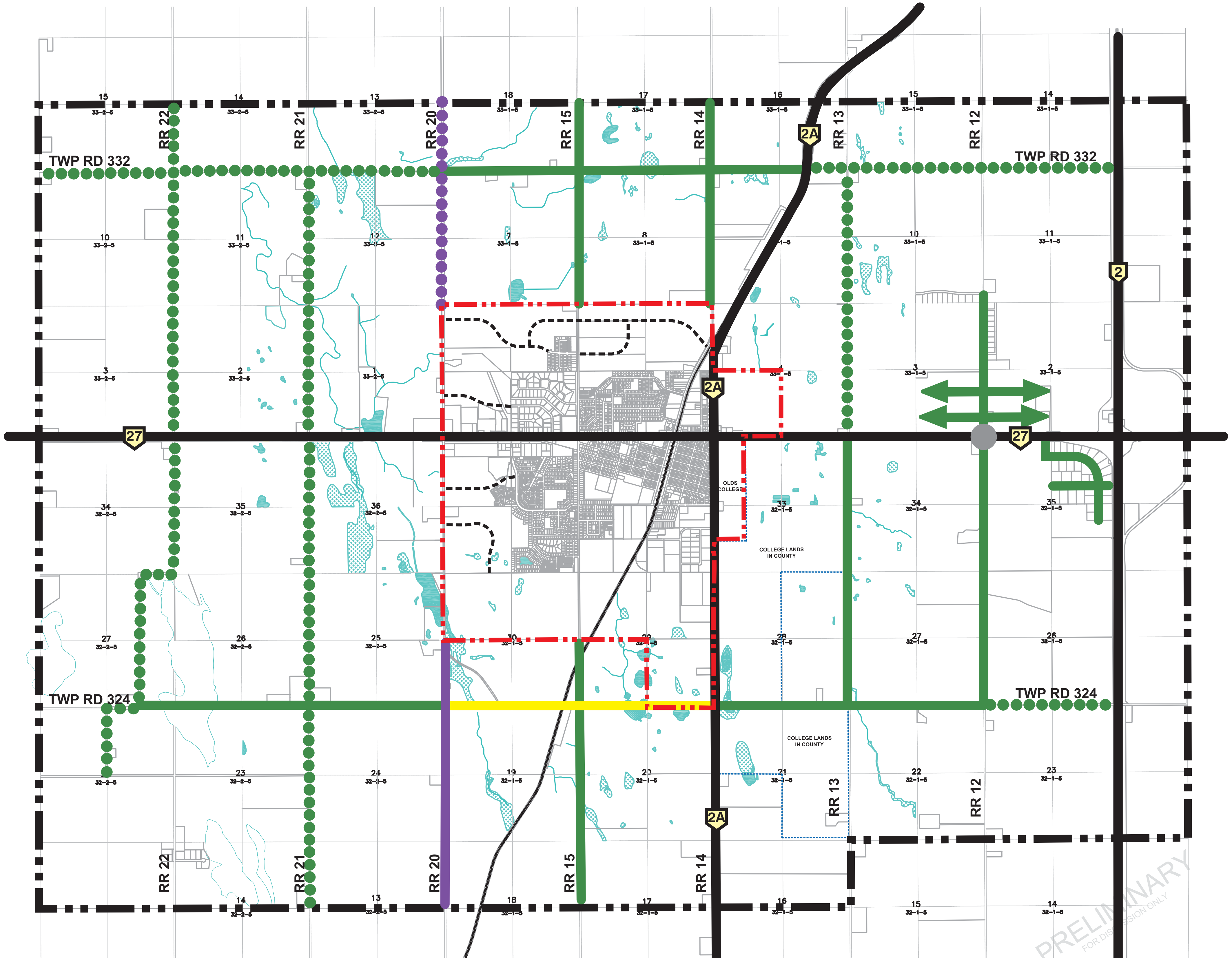
    - Township Road 332 West of RR 14
    - Township Road 324 East of Highway 2A
    - Range Road 20 North of Hwy 27 to Township Road 332
    - Range Road 20 South of Hwy 27 (upgrade chip sealed section south of Highway 27)
    - Range Road 12 South of Highway 27

- Implementation of the previously identified improvements to Highway 27 as outlined in the Highway 27 Planning Study completed by CastleGlenn Consultants in 2009, and as illustrated on Exhibits 5.3 and Exhibit 5.12. These include the following:

    - Closure or restriction to right-in/right-out of the north leg of 61st Avenue at Highway 27.
    - Closure of the south leg of 52nd Avenue at Highway 27 and thus removal of the traffic signal.

Table 5.7: Short Term Improvement Program

Priority	Location	Improvement
Town		
1	Highway 27/ 50th Avenue	* Implement NB & SB left turn lanes * Consider turn restrictions & median on north leg * Traffic signal optimization
2	Highway 27/ 46th Avenue	* Implement NB & SB left turn lanes * Traffic signal optimization
3	Highway 27/ 57th Avenue	* Implement turn restrictions on north leg at service road to only allow right-in/right-out * Extension of concrete median on south leg
4	Highway 27/ 61st Avenue	Closure or restriction to right-in/right-out of the north leg of 61st Avenue
5	Highway 27/ 52nd Avenue	Closure of south leg intersection and removal of traffic signal
On-going	50th Avenue	Undertake functional planning and parking study along the corridor
On-going	54th Street	Monitor daily traffic volumes to aid in determining timing of south arterial
On-going	57th Avenue/ 54th Street	Monitor intersection for signalization
On-going	57th Avenue/ Shannon Drive	Monitor intersection for signalization
On-going	Highway 27/ 49th Avenue	Monitor intersection for signalization
On-going	Highway 27/ 48th Avenue	Monitor intersection for signalization
On-going	Highway 27/ 70th Avenue (RR20)	Monitor intersection for signalization
County		
1	RR 20 North of Hwy 27 to Twp Rd 332	Upgrade gravel to pavement
2	Twp Rd 324 East of Hwy 2A	Upgrade gravel to pavement
3	RR 12 South of Hwy 27	Upgrade gravel to pavement
4	RR 20 South of Hwy 27	Upgrade chip seal to pavement
5	Twp Rd 332 West of RR 14	Apply dust control



LEGEND - BASE MAP

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- FUTURE COLLECTOR ROADWAY as per TOWN MDP LAND USE MAP

LEGEND - SHORT TERM RECOMMENDED NETWORK

- MINOR COLLECTOR (PAVED)
- MINOR COLLECTOR (GRAVEL)
- MAJOR COLLECTOR (PAVED)
- MAJOR COLLECTOR (GRAVEL))
- INDUSTRIAL/COMMERCIAL
- HIGHWAY
- MONITOR INTERSECTION

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Mountain View County Short Term (13,000) Skeletal Recommended Road Network

Exhibit 5.15

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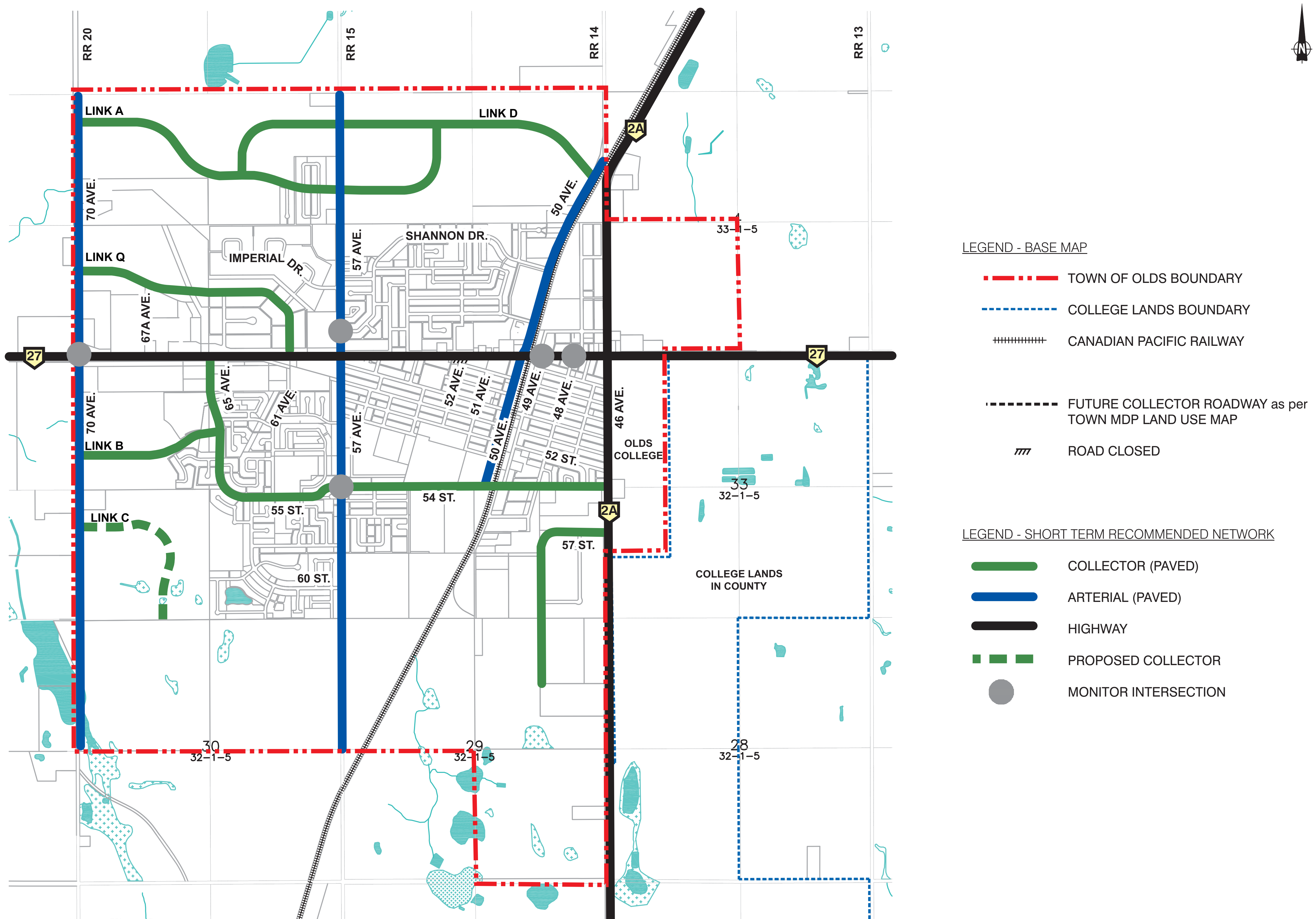

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Short Term (13,000) Skeletal Recommended Road Network

Exhibit
5.16

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Utilities

Potable Water

The recommended improvements for the potable water for short term are shown in Exhibit 14.7. The specific recommended short term improvements include the following:

- The diversion from the Red Deer River by the MVCRWSC in 2006 was approaching 40% while servicing a population of 26,040. The proposed Olds/Mountain View County expansion will increase the residential and work-force population of the Town of Olds by over 5,500 (from the current population) in the short term. Depending on the population growth of the remaining five (5) communities serviced by the MVCRWSC, this increase may exceed the allowable diversion rate from the Red Deer River. If the existing water license is exceeded, an additional water license will be required for the withdrawal of additional raw water from the Red Deer River.

- The Anthony Henday Water Treatment Plant has a current production rate of 20,000m^3/day. Depending on the population growth of the remaining five (5) communities serviced by the MVCRWSC, the existing Water Treatment Plant may require an expansion in order to service the proposed Olds/Mountain View County expansion.

- The proposed 250mm and 300mm distribution piping will be required through the proposed short term growth areas. Also, the installation of the proposed pump station and reservoir (or an upgrade to the existing north pump station and reservoir) will be required in order to service the short term growth areas along the Highway 2/27 corridor. The proposed reservoir should have a minimum a capacity of 4,113m^3 and should provide adequate water consumption and fire flows to the proposed short term (and long term) growth areas.

Wastewater

The recommended improvements for the wastewater short term are shown in Exhibit 14.9. The specific recommended short term improvements include the following:

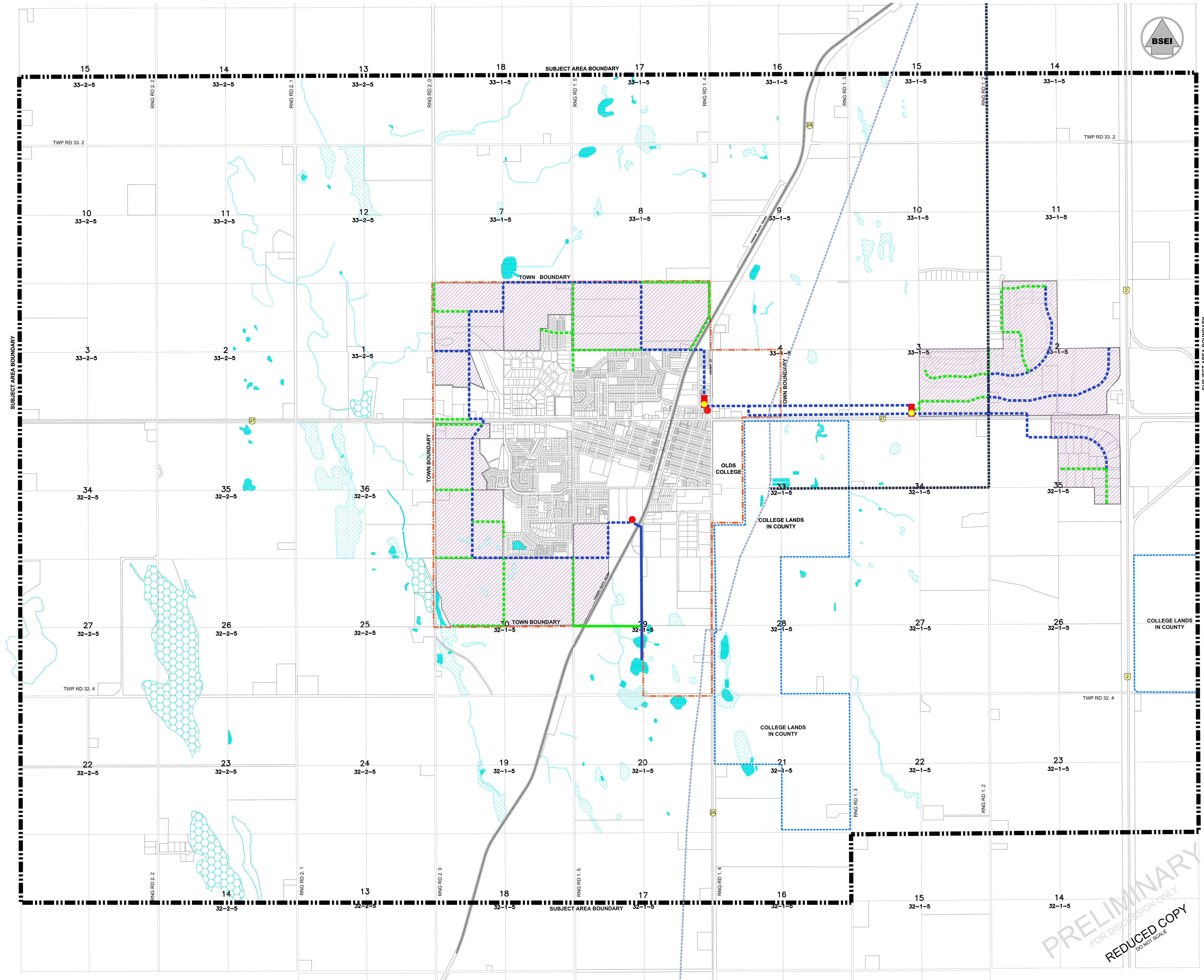
- The proposed wastewater trunkmains, lift stations and forcemains will be required through the proposed short term growth areas. Also, the installation of the proposed east and northeast lift stations and forcemains will be required in order to service the short term growth areas along the Highway 2/27 corridor and north of the existing town. The proposed lift stations will have estimated inflows of 225L/s and 50L/s based on average day flows and an allowance for infiltration. The lift stations would need to accommodate peak hour estimated outflows of 375L/s and 100L/s. The proposed wastewater conveyance system will provide adequate capacity for wastewater flows for the proposed short term (and long term) growth areas.

Stormwater

The recommended improvements for the stormwater short term are shown in **Exhibit 14.11.** The specific recommended short term improvements include the following:

- It is recommended that an overall Master Drainage Plan be prepared by a qualified Stormwater Management Engineer. This type of report will provide the framework for the required stormwater system to accommodate the proposed population growths (short term and long term). The report should propose locations for stormwater facilities, release rates and water quality guidelines.

- It is recommemded that Staged Master Drainage Plans be prepared by a qualified Stormwater Management Engineer with each Outline Plan submittal. These reports should follow the overall recommendations of the Master Drainage Plan (recommended to be prepared prior to the development of short term growth areas).



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
PROPOSED WATER MAIN

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED 250mm POTABLE WATER
- PROPOSED 300mm POTABLE WATER
- PROPOSED 250mm POTABLE WATER(LONG TERM)
- PROPOSED 300mm POTABLE WATER(LONG TERM)
- PROPOSED 400mm POTABLE WATER TRANSMISSION MAIN (CONCEPTUAL)
- EXISTING 400mm POTABLE WATER TRANSMISSION MAIN
- EXISTING RESERVOIR & PUMP STATION
- PROPOSED WATER RESERVOIR & PUMP STATION
- SHORT TERM GROWTH AREA

NOTE

PROPOSED WATER MAINS 200ø AND SMALLER ARE NOT SHOWN.

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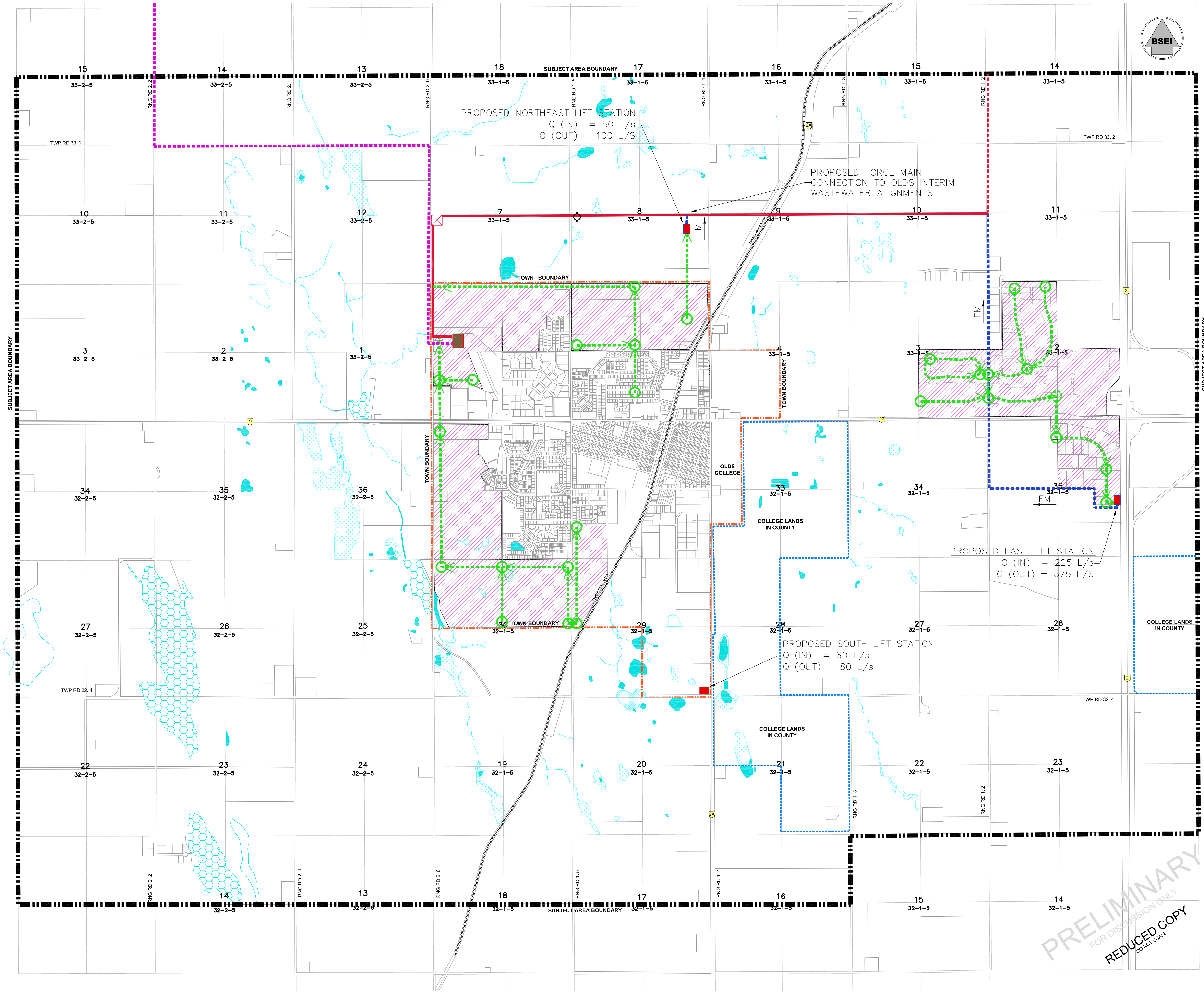
DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
PROPOSED WASTE WATER



LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED WASTE WATER GRAVITY MAIN
- FM PROPOSED WASTE WATER FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED LIFT STATION
- EXISTING WASTE WATER TREATMENT PLANT
- SHORT TERM GROWTH AREA
- PROPOSED OLDS INTERIM WASTE WATER ALIGNMENT
- PROPOSED SOUTH RED DEER REGIONAL WASTE WATER COMMISSION (SRDRWC) SYSTEM
- PROPOSED OLDS LIFT STATION
- PROPOSED TEE (LOCATION TO BE DETERMINED)
- EXISTING WASTEWATER FORCEMAIN (FROM WWTP TO LAGGONS)

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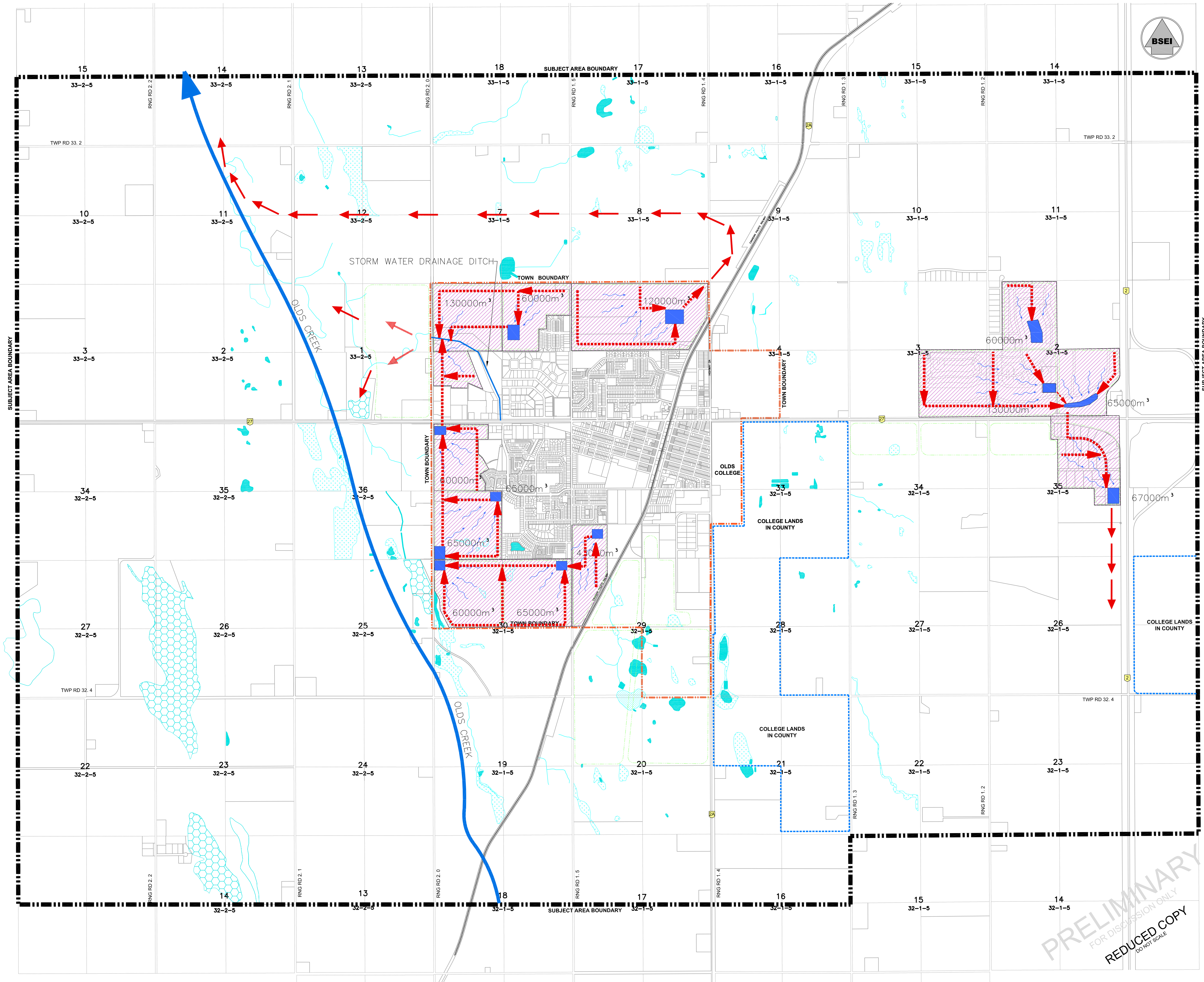

DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
STORM WATER MANAGEMENT

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED STORM WATER (SHORT TERM)
- PROPOSED STORM WATER
- POND / WET LAND
- MARSH OR SLOUGH
- ENVIRONMENTALLY SENSITIVE AREA
- RIVER / CREEK
- 65000m³ ESTIMATED POND VOLUME
- FLOW DIRECTION
- OVERLAND DRAINAGE FLOW
- PROPOSED STORM WATER MANAGEMENT POND
- SHORT TERM GROWTH AREA
- DRAINAGE AREA

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E.0.3 Long Term (35,000 Population Horizon) Improvement Program

Transportation

The recommended long term improvements for the recommended road network incorporating the alternative alignment discussed in Section 7.0 is summarized below in Table 14.3 and Table 14.4 while Exhibit 14.5 and Exhibit 14.6 illustrate the recommendations for the Town and County respectively. The recommended network represented the inclusion of the following new road network links and significant road network element improvements. These improvements represent items that are over and above anything that has previously been identified and approved in requisite Municipal Development Plans, Area Structure Plans or other documents approved by the Town or the County:

- A new major or arterial roadway referred to as the North Connector. This roadway would be aligned along the existing northern Town boundary and would extend from 70th Street in the west through Range Road 12 or 13 in the east. The roadway wpuld provide a very important link for residential development west of Highway 2A (north of Highway 27) to access Highway 2 without being required to utilize 50th or 57th Avenues exclusively to reach Highway 27. This link would be required to cross the CPR corridor and Highway 2A at grade initially. Longer term requirements will eventually require a grade separate structure. It is noted that this roadway alignment, access management plan and function may be affected by the pending outcome of the Alberta Transportation Highway 27 By-pass study that was underway at the time of completion of this Transportation Master Plan exercise.

- A new major or arterial roadway referred to as the South By-pass. This roadway would be aligned south of the existing Lakeside community, offset from the existing residences by a significant distance; and would extend from 70th Street in the west through to Highway 2A in the east. This roadway will serve to provide a southern by-pass for the town for use by through traffic and/or truck traffic. It will also allow traffic generated by residential development in the area to access Highway 2A to Highway 27 without feeding through existing communities and utilizing 50th or 57th Avenues to reach Highway 27.

- Significant upgrade to the proposed status of Range Road 13 (the Netook Connector) as a major or arterial roadway, as an important link to the success of the north connector on the east side of the Town to deter trucks and through traffic from Highway 27.

Table 14.3 Summary of Long Term Recommended Intersection Improvements – Recommended Network

Intersection/Road Link	Recommended Improvements
Highway 27/ 46th Avenue	* Eastbound & westbound left turn lane * Southbound & Northbound right turn lane * Optimize signalization with separate left turn phase
Highway 27/ 50th Avenue	* Eastbound and westbound left turn lanes * Optimize signalization with separate left turn phase
Highway 27/ 51st Avenue	* Westbound right turn lane
Highway 27/ 70th Avenue	* Install traffic signal * Left turn lanes for all legs of intersection * Eastbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Link M	* Monitor for traffic signal * Eastbound left turn lane * Westbound right turn lane

Table 14.3 – Continued

Intersection/Road Link	Recommended Improvements
Highway 27/ Range Road 12	* Install traffic signal * Northbound dual left turn lanes, southbound single left turn lane * Northbound & southbound right turn lanes * Optimize signalization with separate protected left turn phase for the NB/SB
Highway 27/ Range Road 13	* Install traffic signal * Northbound & southbound left turn lanes * Westbound right turn lane * Optimize signalization with separate left turn phases
70th Avenue (RR 20)/ Link P	* Monitor for traffic signal * Eastbound and westbound left turn lanes * Northbound right turn lane
70th Avenue (RR 20)/ Link A	* Install traffic signal * Eastbound single left turn lane and westbound dual left turn lanes * Northbound & southbound right turn lanes * Optimize signalization with protected EB/WB left turns
70th Avenue (RR 20)/ Link B	* Southbound left turn lane
70th Avenue (RR 20)/ Link C	* Southbound left turn lane
70th Avenue/ Link E (Q)	* Monitor for traffic signal * Eastbound right turn lane
70th Avenue (RR 20)/ Link F	* Southbound left turn lane
57th Avenue/ Link F	* Install traffic signal * Left turn lanes for all legs of intersection * Westbound & southbound right turn lane * Optimize signalization with separate left turn phases
57th Avenue/ Link P	* Install traffic signal * Eastbound left turn lane, westbound dual left turn lane * Eastbound and northbound right turn lane * Optimize signalization with protected EB/WB left turns
57th Avenue/ Shannon Drive	* Monitor for traffic signal * Northbound right turn lane
57th Avenue/ 54th Street	* Monitor for traffic signal * Southbound & northbound left turn lanes * Westbound right turn lane
Highway 2A/ 52nd Street	* Monitor for traffic signal
Highway 2A/ 57th Street	* Monitor for traffic signal * Eastbound & westbound left turn lanes
Highway 2A/ Link F	* Monitor for traffic signal * Northbound & eastbound left turn lane * Southbound right turn lane
Highway 2A/ Link J	* Monitor for traffic signal * Southbound & westbound left turn lane * Northbound right turn lane
Highway 2A/ Link O	* Install traffic signal * Left turn lanes on all legs with a westbound dual left turn lane * Eastbound right turn lane * Optimize signalization with protected EB/WB left turns & separate NB/SB left turn lane
50th Avenue/ Link D	* Monitor for traffic signal * Northbound & eastbound left turn lane * Southbound right turn lane
50th Avenue/ Link P	* Install traffic signal * Left turn lanes on all legs with a southbound & westbound dual left turn lane * Northbound and westbound right turn lanes * Optimize signalization with protected left turns
Range Road 13/ Link N	* Monitor for traffic signal * Northbound left turn lane

Table 14.4 Summary of Long Term Recommended Road Link Improvements – Recommended Network

Intersection/Road Link	Recommended Improvements
70th Avenue (Range Road 20)	* Four-lane undivided arterial at Hwy 27
57th Avenue	* Three-lane cross section with a central two-way left turn lane
Link F	* Four-lane undivided arterial
Range Road 15	* Upgrade to a Major Collector from a Minor Collector
Range Road 13	* Upgrade surface treatment to pavement as required once upgraded to arterial road
Range Road 12	* Upgrade to a Major Collector from a Minor Collector
North Bypass Road	* Four-lane divided arterial narrowed to a two-lane undivided arterial at the west end

Utilities

The recommended improvements for the potable water for long term are shown in **Exhibit 14.8.** The specific recommended short term improvements include the following:

- The diversion from the Red Deer River by the MVCRWSC in 2006 was approaching 40% while servicing a population of 26,040. The proposed Olds/Mountain View County expansion will increase the residential and work-force population of the Town of Olds by over 36,600 (from the current population) in the long term, which would exceed the allowable diversion rate from the Red Deer River. This also assumes that there will be zero population growth over the next twenty-five (25) years in the remaining five (5) communities serviced by the MVCRWSC.

- In order for the proposed long term growth to occur within the Town of Olds/Mountain View County, the existing Anthony Henday Water Treatment Plant will require an expansion and an additional water license will be required for the withdrawal of additional raw water from the Red Deer River.

- The additional 250mm and 300mm distribution piping will be required through the proposed long term growth areas.

Wastewater

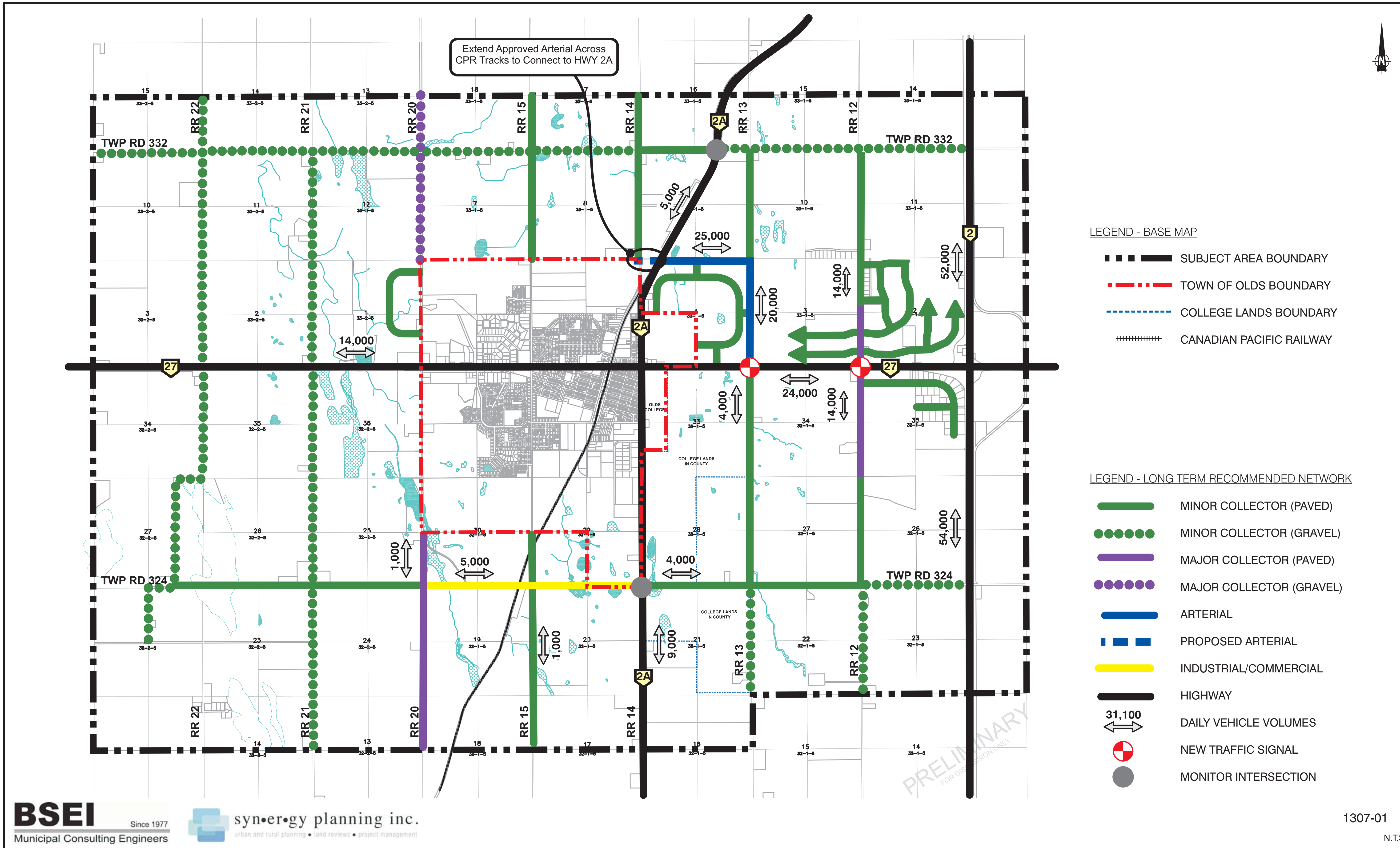
The recommended improvements for the wastewater long term are shown in **Exhibit 14.10.** The specific recommended short term improvements include the following:

- The additional wastewater trunkmains, lift stations and forcemains will be required through the proposed long term growth areas. The proposed south lift station will have an estimated inflow of 60L/s based on an average day flows and an allowance for infiltration. The lift station would need to accommodate a peak hour estimated outflow of 80L/s. The proposed west lift station will have an estimated inflow of 45L/s based on average day flows and an allowance for infiltration. The lift station would need to accommodate a peak hour estimated outflow of 70L/s. The proposed northwest lift station will have an estimated inflow of 40L/s based on average day flows plus an allowance for infiltration and an estimated peak hour outflow requirement of 85L/s.

Stormwater Long Term

The recommended improvements for the stormwater long term are shown in Exhibit 14.12. The specific recommended short term improvements include the following:

- It is recommended that Staged Master Drainage Plans be prepared by a qualified Stormwater Management Engineer with each Outline Plan submittal. These reports should follow the overall recommendations of the Master Drainage Plan (recommended to be prepared prior to the development of short term growth areas).



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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Mountain View County Long Term (35,000) Skeletal Recommended Road Network

Exhibit
14.5

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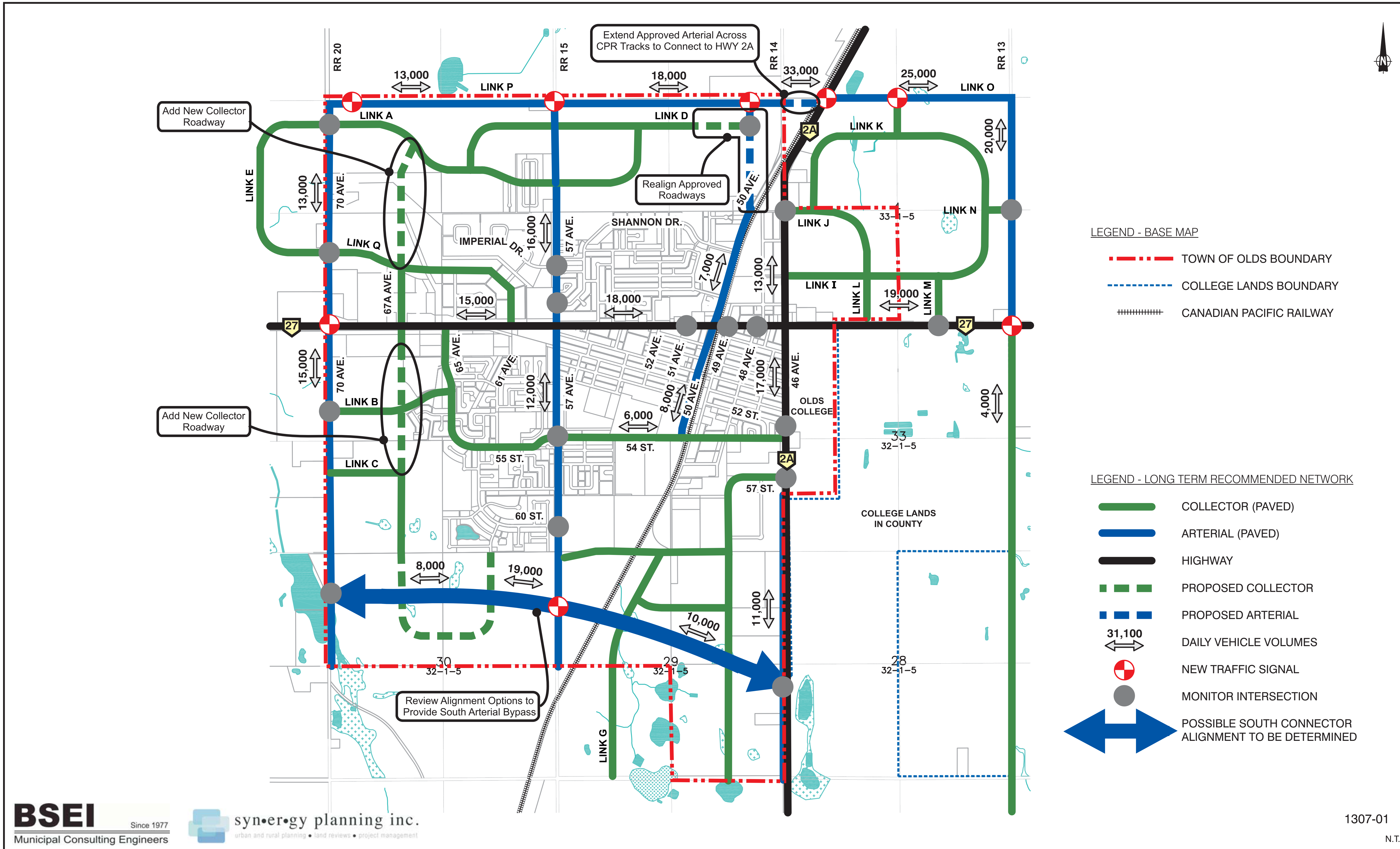

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Long Term (35,000) Skeletal Recommended Road Network

Exhibit 14.6

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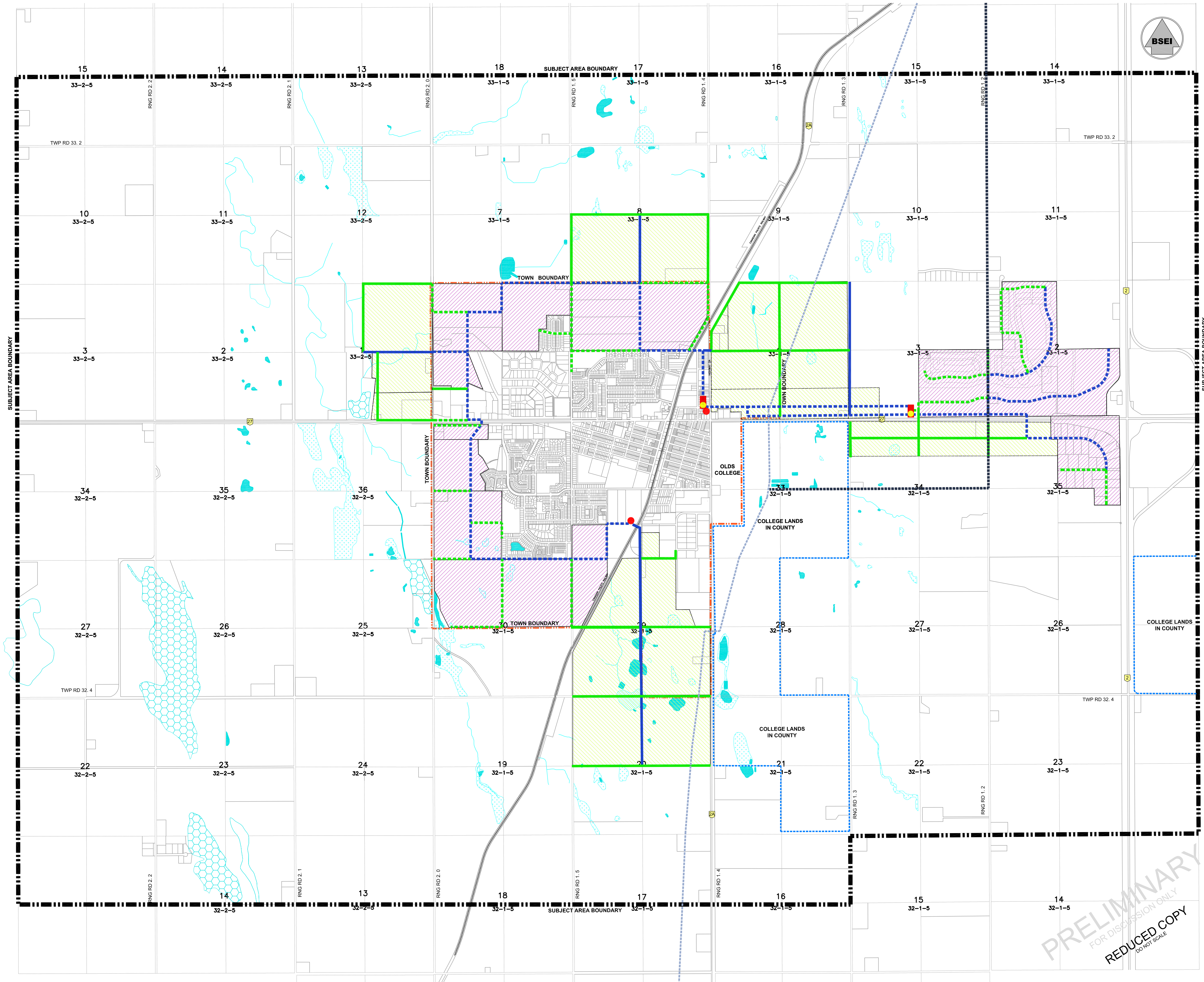

DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
PROPOSED WATER MAIN

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED 250mm POTABLE WATER (SHORT TERM)
- PROPOSED 300mm POTABLE WATER (SHORT TERM)
- PROPOSED 250mm POTABLE WATER
- PROPOSED 300mm POTABLE WATER
- EXISTING 400mm POTABLE WATER TRANSMISSION MAIN
- PROPOSED 400mm POTABLE WATER TRANSMISSION MAIN (CONCEPTUAL)
- EXISTING RESERVOIR & PUMP STATION
- PROPOSED WATER RESERVOIR & PUMP STATION
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA

NOTE

PROPOSED WATER MAINS 200ø AND SMALLER ARE NOT SHOWN.

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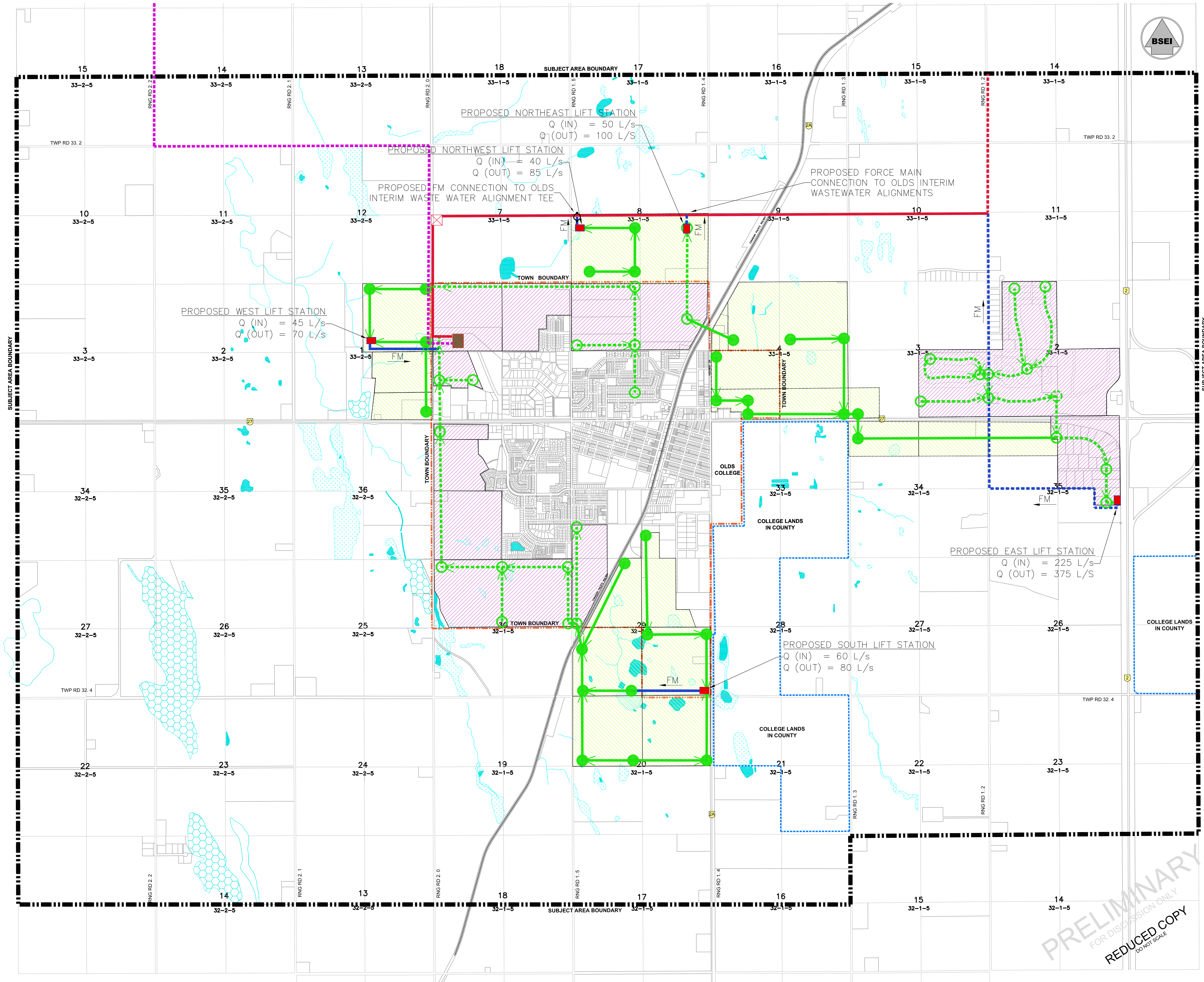
PROJECT No :	W643-014	EXHIBIT 14.8

DEEP UTILITY UPGRADES
MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
PROPOSED WASTE WATER



LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED WASTE WATER GRAVITY MAIN (SHORT TERM)
- PROPOSED WASTE WATER FORCE MAIN (SHORT TERM)
- PROPOSED MANHOLE (SHORT TERM)
- PROPOSED WASTE WATER GRAVITY MAIN
- PROPOSED WASTE WATER FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED LIFT STATION
- EXISTING WASTE WATER TREATMENT PLANT
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA
- PROPOSED OLDS INTERIM WASTE WATER ALIGNMENT
- PROPOSED SOUTH RED DEER REGIONAL WASTE WATER COMMISSION (SRDRWC) SYSTEM
- PROPOSED OLDS LIFT STATION
- PROPOSED TEE (LOCATION TO BE DETERMINED)
- EXISTING WASTEWATER FORCEMAIN (FROM WWTP TO LAGGONS)

Town of Olds

Mountain View COUNTY

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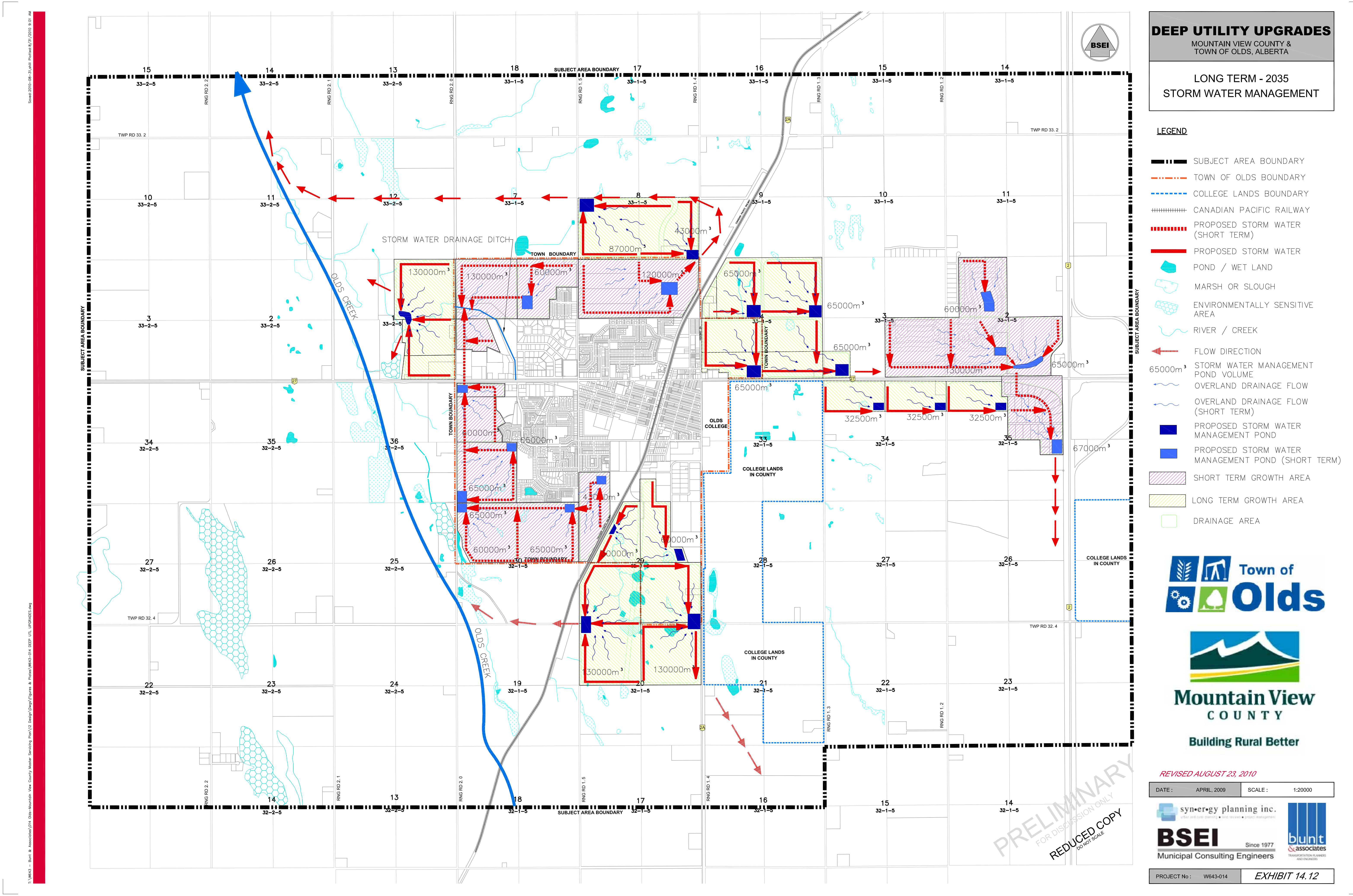
PROJECT No :	W643-014	EXHIBIT 14.10



DEEP UTILITY UPGRADES
MOUNTAIN VIEW COUNTY & TOWN OF OLDS, ALBERTA
LONG TERM - 2035
STORM WATER MANAGEMENT
LEGEND
SUBJECT AREA BOUNDARY
TOWN OF OLDS BOUNDARY
COLLEGE LANDS BOUNDARY
CANADIAN PACIFIC RAILWAY
PROPOSED STORM WATER (SHORT TERM)
PROPOSED STORM WATER
POND / WET LAND
MARSH OR SLOUGH
ENVIRONMENTALLY SENSITIVE AREA
RIVER / CREEK
FLOW DIRECTION
65000m³ STORM WATER MANAGEMENT POND VOLUME
OVERLAND DRAINAGE FLOW
OVERLAND DRAINAGE FLOW (SHORT TERM)
PROPOSED STORM WATER MANAGEMENT POND
PROPOSED STORM WATER MANAGEMENT POND (SHORT TERM)
SHORT TERM GROWTH AREA
LONG TERM GROWTH AREA
DRAINAGE AREA
Town of Olds
Mountain View COUNTY
Building Rural Better
REVISED AUGUST 23, 2010
DATE: APRIL, 2009
SCALE: 1:20000
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PROJECT No: W643-014
EXHIBIT 14.12
STORM WATER DRAINAGE DITCH
OLDS CREEK
OLDS COLLEGE
COLLEGE LANDS IN COUNTY
TOWN BOUNDARY
SUBJECT AREA BOUNDARY
PRELIMINARY FOR DISCUSSION ONLY
REDUCED COPY DO NOT SCALE

E.0.4 Prioritization of Improvements and Cost Estimates

With the analysis complete and recommendations developed for the Short and Long Term horizons, it was possible to prioritize the various items and undertake preliminary high-level cost estimates. This information is intended to be used by the Town and the County for the purpose of aiding in capital planning. While the priority list is estimated based on expected development programming, changes in development occurrence will necessarily result in changes in prioritization. It is therefore recommended that the Town and County review the list on an annual basis to ensure that the list remains as up to date as possible.

The Estimated Costs in 2010 dollars as prepared by BSEI include an estimate for engineering and consulting fees for the various short term and long term transportation and utility improvements. The estimates do not, however, include estimated fees for items such as land acquisition, geotechnical, biophysical, historical, stormwater or environmental components. As outlined in the project scope, the development of the annual cost estimates was outside of the scope of the study. With this in mind, the priorization of improvements and associated order of magnitude cost estimates were developed and limited to the short and long term planning horizons.

Funding for the capital projects can come from a variety of public and private resources. Specifically, the private funding can be sourced through development levies. Whereas the public resources are typically sourced from federal, provincial, and local agencies.

An estimated cost range was determined by BSEI for each item in the recommended transportation and utility program. Priority was established where possible to aid the Town and County in terms of capital planning. The estimated program requirements are outlined here in Tables 15.1 through 15.6.

Table 15.1 Short Term Prioritization List

Priority	Location	Improvement	Estimated Cost in 2010 Dollars
Town of Olds			
1	Highway 27/ 50th Avenue	* Implement NB & SB left turn lanes * Consider turn restrictions & median on north leg * Traffic signal optimization	$100,000 - $200,000
2	Highway 27/ 46th Avenue	* Implement NB & SB left turn lanes * Traffic signal optimization	$100,000 - $200,000
3	Highway 27/ 57th Avenue	* Implement turn restrictions on north leg at service road to only allow right-in/right-out * Extension of concrete median on south leg	< $100,000
4	Highway 27/ 61st Avenue	Closure or restriction to right-in/right-out of the north leg of 61st Avenue	< $100,000
5	Highway 27/ 52nd Avenue	Closure of south leg intersection and removal of traffic signal	$100,000 - $200,000
Mountain View County			
1	RR 20 North of Hwy 27 to Twp Rd 332	Upgrade gravel to pavement	$1,450,000
2	Twp Rd 324 East of Hwy 2A	Upgrade gravel to pavement	$1,450,000
3	RR 12 South of Hwy 27	Upgrade gravel to pavement	$1,450,000
4	RR 20 South of Hwy 27	Upgrade chip seal to pavement	$300,000
5	Twp Rd 332 West of RR 14	Apply dust control	$500,000

Table 15.2 Signalization Prioritization List

Priority	Location (Warrant Points)	Estimated Cost in 2010 Dollars
1	Highway 27/ Range Road 12 (442)	$450,000
2	50th Ave/ Link P (371)	$450,000
3	Highway 2A/ Link O (348)	$450,000
4	Highway 27/ 70th Avenue (275)	$450,000
5	57th Avenue/ Link F (248)	$450,000
6	Highway 27/ Range Road 13 (227)	$450,000
7	57th Avenue/ Link P (207)	$450,000
8	70th Avenue/ Link A (124)	$450,000
9	57th Avenue/ Shannon Drive (77)	$450,000
10	Highway 27/ Link M (75)	$450,000
11	57th Avenue/ 54th Street (73)	$450,000
12	Highway 2A/ Link F (71)	$450,000
13	Highway 2A/ Link J (71)	$450,000
14	Highway 2A/ 57th Street (70)	$450,000
15	Range Road 13/ Link N (61)	$450,000
16	50th Avenue/ Link D (57)	$450,000
17	70th Avenue/ Link E (37)	$450,000
18	Highway 2A/ 52nd Street (21)	$450,000
19	70th Avenue/ Link P (11)	$450,000

Table 15.3 Intersection Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
Existing Intersections		
1	57th Avenue/ Shannon Drive * NB right turn lane (60m bay with a 70m taper)	< $100,000
2	Hwy 27/ 50th Ave * EB & WB left turn lanes (60m bay with a 70m taper)	< $100,000
3	Hwy 2A/ 57th Street * EB & WB left turn lanes (60m bay with a 70m taper)	< $100,000
4	57th Ave/ 54th St * NB & SB left turn lanes (60m bay with a 70m taper) * WB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
5	Hwy 27/ RR 13 * NB & SB left turn lanes (60m bay with a 70m taper) * WB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
6	Hwy 27/ 46th Ave * EB & WB left turn lanes (60m bay with a 70m taper)	$100,000 - $200,000
7	Hwy 27/ 70th Ave * EB, WB, NB, SB left turn lanes (60m bay with a 70m taper) * EB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
8	Hwy 27/ RR 12 * NB dual left turn lanes (60m bay with a 70m taper * 2) * SB left turn lane (60m bay with a 70m taper) * NB & SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000

Table 15.3 Intersection Improvement Prioritization List – Continued

Priority	Improvement	Estimated Cost in 2010 Dollars
Future Intersections		
1	70th Ave/ Link B * SB left turn lane (60m bay with a 70m taper)	< $100,000
2	70th Ave/ Link C * SB left turn lane (60m bay with a 70m taper)	< $100,000
3	70th Ave/ Link E * EB left turn lane (60m bay with a 70m taper)	< $100,000
4	70th Ave/ Link F * SB left turn lane (60m bay with a 70m taper)	< $100,000
5	Range Road 13/ Link N * NB left turn lane (60m bay with a 70m taper)	< $100,000
6	Hwy 27/ 51st Ave * WB right turn lane (60m bay with a 70m taper)	< $100,000
7	Hwy 27/ Link M * EB left turn lane (60m bay with a 70m taper) * WB right turn lane (60m bay with a 70m taper)	< $100,000
8	50th Ave/ Link D * NB & EB left turn lanes (60m bay with a 70m taper) * SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
9	Hwy 2A/ Link J * SB & WB left turn lanes (60m bay with a 70m taper) * NB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
10	Hwy 2A/ Link F * NB & EB left turn lanes (60m bay with a 70m taper) * SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
11	70th Ave/ Link P * EB & WB left turn lanes (60m bay with a 70m taper) * NB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
12	50th Ave/ Link P * NB & EB left turn lanes (60m bay with a 70m taper) * SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
13	70th Ave/ Link A * WB dual left turn lanes (60m bay with a 70m taper * 2) * EB left turn lane (60m bay with a 70m taper) * NB & SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
14	57th Ave/ Link P * WB dual left turn lanes (60m bay with a 70m taper * 2) * EB left turn lane (60m bay with a 70m taper) * NB & EB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
15	Hwy 2A/ Link O * WB dual left turn lanes (60m bay with a 70m taper * 2) * EB, NB & SB left turn lane (60m bay with a 70m taper) * EB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
16	57th Ave/ Link F * EB, WB, NB & SB left turn lanes (60m bay with a 70m taper) * WB & SB right turn lanes (60m bay with a 70m taper)	$100,000 - $200,000

Table 15.4 Road Link Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
1A	70th Avenue (existing roadway – half paved/ half gravel) * 2-lane undivided arterial for 2.5 km	$2,100,000
1B	70th Avenue (existing roadway – half paved/ half gravel) * 2-lane undivided arterial for 500 m	$420,000
1B	70th Avenue (existing roadway – half paved/ half gravel) * 4-lane undivided arterial from Link C to Link P (2 km)	$3,130,000
1C	70th Avenue (existing roadway – half paved/ half gravel) * 4-lane divided arterial from Link C to Link P (2 km)	$3,530,000
2	57th Avenue (existing undivided 2-lane arterial roadway) * 3-lane cross section (2-thru lanes with a central two-way left turn lane) for 800 m	$1,012,000
3A	Range Road 12 (existing 2-lane collector roadway) * 2-lane undivided arterial for 800 m	$504,000
3B	Range Road 12 (existing 2-lane collector roadway) * 4-lane undivided arterial for 800 m	$1,108,000
4A	Range Road 13 (existing gravel road) * 2-lane undivided arterial for 800 m	$672,000
4B	Range Road 13 (existing gravel road) * 4-lane undivided arterial for 800 m	$1,252,000
4C	Range Road 13 (existing gravel road) * 4-lane divided arterial for 800 m	$1,412,000
5A	Link F (new roadway) * 2-lane undivided arterial for 3.2 km	$2,688,000
5B	Link F (new roadway) * 4-lane undivided arterial for 3.2 km	$5,008,000
5C	Link F (new roadway) * 4-lane undivided arterial for 2.2 km	$3,443,000
5C	Link F * 4-lane divided arterial for 1 km	$1,765,000
6A	Link P (O) (new roadway) * 2-lane undivided roadway for 4 km	$3,360,000
6B	Link P (O) (new roadway) * 4-lane undivided roadway for 4 km	$6,260,000
6C	Link P (O) (new roadway) * 4-lane undivided roadway for 3 km	$4,695,000
6C	Link P (O) (new roadway) * 4-lane divided roadway for 1 km	$1,765,000

Table 15.5 Misc. Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
N/A	Link P: 2-lane roadway crossing over CPR tracks & Hwy 2A	> 20 million
N/A	Link P: 4-lane roadway crossing over CPR tracks & Hwy 2A	> 20 million

Table 15.6 Underground Utility Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
WATERMAIN		
Short Term	250mm PVC Watermain (includes valves & hydrants)	$340/lm - $560/lm
Short Term	300mm PVC Watermain (includes valves & hydrants)	$410/lm –$ 620/lm
Short Term	Pump Station & Reservoir	$7,100,000
Short Term	Crossing CP Rail (1 total)	$250,000
Long Term	250mm PVC Watermain (includes valves & hydrants)	$340/lm - $560/lm
Long Term	300mm PVC Watermain (includes valves & hydrants)	$410/lm –$ 620/lm
Long Term	Crossing CP Rail (2 total)	$500,000
WASTEWATER		
Short Term	250mm PVC Gravity Trunk Main (includes manholes)	$270/lm - $500/lm
Short Term	300mm PVC Gravity Trunk Main (includes manholes)	$285/lm - $515/lm
Short Term	375mm PVC Gravity Trunk Main (includes manholes)	$315/lm - $540/lm
Short Term	450mm Concrete Gravity Trunk Main (includes manholes)	$330/lm - $550/lm
Short Term	525mm Concrete Gravity Trunk Main (includes manholes)	$365/lm - $585/lm
Short Term	600mm Concrete Gravity Trunk Main (includes manholes)	$450/lm - $655/lm
Short Term	450mm HDPE Forcemain (includes air-release valves/manholes)	$640/lm
Short Term	East Lift Station	$4,200,000
Short Term	Crossing CP Rail (1 total)	$250,000
Long Term	250mm PVC Gravity Trunk Main (includes manholes)	$270/lm - $500/lm
Long Term	300mm PVC Gravity Trunk Main (includes manholes)	$285/lm - $515/lm
Long Term	450mm Concrete Gravity Trunk Main (includes manholes)	$330/lm - $550/lm
Long Term	250mm HDPE Forcemain (includes air-release valves/manholes)	$580/lm
Long Term	West Lift Station	$2,225,000
Long Term	North Lift Station	$2,225,000
Long Term	South Lift Station	$2,225,000
Long Term	Crossing CP Rail (1 total)	$250,000
STORM WATER		
Short Term	300mm PVC Trunk Main (includes manholes)	$285/lm - $515/lm
Short Term	375mm PVC Trunk Main (includes manholes)	$315/lm - $540/lm
Short Term	450mm Concrete Trunk Main (includes manholes)	$330/lm - $550/lm
Short Term	525mm Concrete Trunk Main (includes manholes)	$365/lm - $585/lm
Short Term	600mm Concrete Trunk Main (includes manholes)	$450/lm - $655/lm
Short Term	750mm Concrete Trunk Main (includes manholes)	$535/lm - $735/lm
Short Term	900mm Concrete Trunk Main (includes manholes)	$655/lm - $835/lm
Short Term	1050mm Concrete Trunk Main (includes manholes)	$785/lm - $950/lm
Short Term	Stormwater Management Ponds (includes earthworks, outfall structure & end sections) - 14 Total	$9,800,000
Long Term	300mm PVC Trunk Main (includes manholes)	$285/lm - $515/lm
Long Term	375mm PVC Trunk Main (includes manholes)	$315/lm - $540/lm
Long Term	450mm Concrete Trunk Main (includes manholes)	$330/lm - $550/lm
Long Term	525mm Concrete Trunk Main (includes manholes)	$365/lm - $585/lm
Long Term	Stormwater Management Ponds (includes earthworks, outfall structure & end sections) – 15 Total	$10,500,000
Long Term	Crossing CP Rail (1 total)	$250,000

1.0 INTRODUCTION

The Town of Olds and Mountain View County have experienced considerable residential and employment growth in recent years. This has and will continue to have a significant impact on local and regional infrastructure needs in the areas of transportation and utilities, which in turn determined the need for a current Transportation and Utilities Master Plan.

The intent of the Transportation and Utilities Master Plan is to accommodate future growth while being flexible to allow the Town and County to expand and develop in a pragmatic and logical manner; both in terms of development areas and corridors. Underlying these requirements is the implicit need for sustainability. It is neither efficient nor economically responsible to accommodate haphazard low-density development. A logical, environmentally responsible and fiscally attainable solution must be developed to allow the Town and County to continue to grow into the future.

In September 2009, the Town and County jointly retained Bunt & Associates, together with BSEI Municipal Consulting Engineers, and Synergy Planning Inc. to undertake the development of a Transportation and Utilities Master Plan. The purpose for this plan is to indentify/confirm the infrastructure and planning needs and priorities for the short term (13,000 population) and long term (35,000 population) horizons. The study area is illustrated on Exhibit 1.1. Specific areas of analysis included the following:

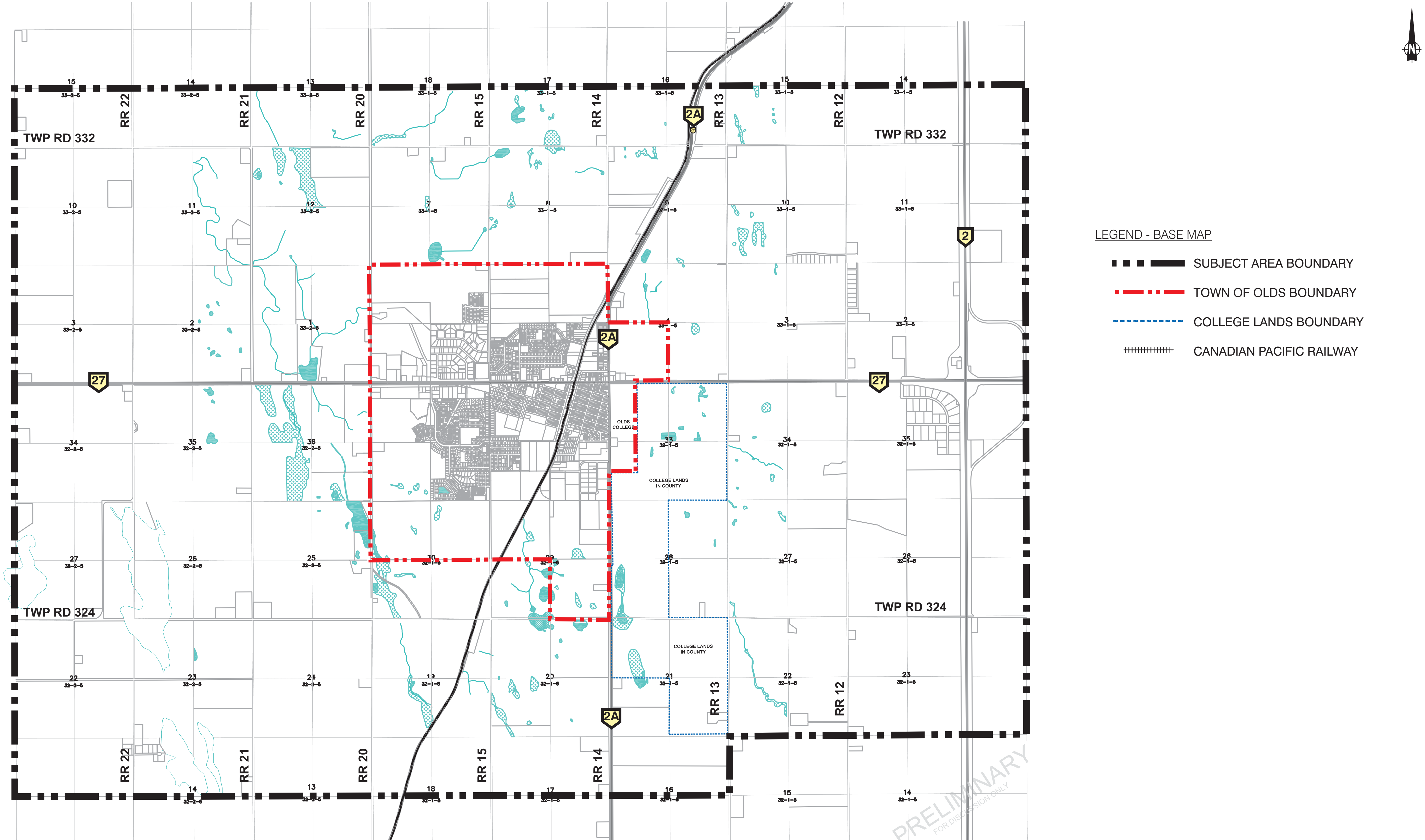
- Assessment of existing conditions and emerging issues. This included traffic conditions as well as planning/policy and utility infrastructure items. It also included the development of comprehensive base mapping.

- Completion of a comprehensive consultation process. This included an on-line resident survey and two public Open Houses, plus five Steering Committee meetings and two half day Design Charrettes with the Steering Committee. The second Charrette was specifically utilized to establish a development matrix, which allowed the Town and County to establish directions for development in terms of the relative difficulty of accommodating development in different physical directions.

- Development and assessment of traffic and utility forecast models for the short term (13,000 population) and long term (35,000 population) horizon. The models were intended to be live models with the ability to be utilized in the future as the needs or desires of the Town and County change.

- Development of recommended road network and utility requirements based on the outcome of the forecasting and consultation processes. As well, development of priorities and high-level cost estimates were included for use by the Town and County in accommodating growth within annual capital budget planning.

The results of the exercise are outlined in the chapters that follow.



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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Study Area

Exhibit 1.1

:\\1307-01_OLDS+MVC_2010-06_JUNE.cdr June 2, 2010 HMF

2.0 EXISTING CONDITIONS AND EMERGING ISSUES

Prior to undertaking any analysis, it was necessary to establish base conditions. This included the collection and amalgamation of available and relevant studies and documentation, plus the assembly of information for creating adequate base mapping for the study area. It also included the collection and analysis of existing traffic volumes. Once this data had been assembled it was possible to develop an understanding of emerging issues from the perspective of transportation, utilities and planning.

The overall process of the review of available documentation/base mapping, and the analysis of existing traffic volumes is outlined in Sections 2.1 and 2.2. The identification of emerging issues is outlined in Section 2.3.

2.1 Review of Available Studies and Base Map Development

2.1.1 Review of Available Documentation

The first task in the identification of emerging issues was a comprehensive review of available documents. As such, one of the tasks undertaken as part of the Transportation and Utilities Master Plan exercise was to obtain and review previous transportation and utility studies undertaken for the Town and the County. The main studies that were reviewed and utilized as background information in this study included the following:

- 2009 Mountain View County Municipal Development Plan Bylaw No.17/07 consolidated on June 3, 2009.
- 2009 Richardson Area Structure Plan prepared by Stantec Consulting Ltd.
- 2009 Highway 27 Planning Study completed by CastleGlenn Consultants Inc.
- 2008 Netook Crossing North Business Park and Residential Community Concept Plan prepared by Brown and Associates.
- 2007 Mountain View Business Park Outline Plan Report prepared by Stantec Consulting Ltd.
- 2007 Town of Olds Municipal Development Plan prepared by Parkland Community Planning Services.
- 2007 Highway 2/27 Area Structure Plan prepared by EBA Engineering Consultants Ltd.
- 2007 Mountain View Business Park Traffic Impact Assessment prepared by Stantec Consulting Ltd.
- 2006 Highway 27:06, Town of Olds Functional Planning Study prepared by UMA Engineering Ltd.

Missing from this list is the *Highway 2/2A Corridor Planning Study* as developed by Alberta Transportation. Information within this study will be vital to the Long Term analysis forthcoming from the forecasting/modeling exercises. To date, AT has not made a copy of this report available to the Town or County.

Much of the Planning information required for the project was covered by the data collection efforts outlined in the Transportation and Utilities/Civil Engineering sections. Information specific to the Planning component included the preliminary review of land use maps, municipal development plans, population projections, and environmental overview maps that provide general direction on existing and proposed developments within Mountain View County and the Town of Olds.

Overall, the policies and intentions of Mountain View County and Town of Olds demonstrated a strong commitment to collaborate and cooperate on planning matters of mutual interest and benefit. This is clearly supported through their respective Municipal Development Plans and the Inter-municipal Development Plan. Notwithstanding, there are areas of emerging issues, which may or not be emerging issues, depending upon the response and clarification provided by the municipality. Furthermore, there are some potential emerging issues also associated with interpretation and implementation of some policies.

Although all of the above studies were reviewed in great detail, the following studies were found to be of the greatest assistance in determining the overall master plan.

- *2007 Town of Olds Municipal Development Plan* prepared by Parkland Community Planning Services.
- *2007 Highway 2/27 Area Structure Plan* completed by EBA Engineering Consulting Ltd.
- *2009 Mountain View County Municipal Development Plan* Bylaw No.17/07 consolidated on June 3, 2009.
- *2009 Highway 27 Planning Study* completed by CastleGlenn Consultants Inc.

2.1.2 Development of Base Mapping

The compilation of existing conditions is essentially a schematic representation of the built and natural environment within the study area. As noted in Exhibit 1.1, the study area included the Town of Olds and the surrounding Mountain View County lands, generally east to Highway 2 and west to Range Road 22. North and south boundaries were identified by just north of Township Road 332 and south of Township Road 324 respectively.

In the case of this master planning study, the development of a summary of existing conditions for analysis of future expectations and opportunities required the collection of a considerable amount of data and information. This included but was not limited to existing roadways, sanitary systems, water systems, storm water systems, pipelines, wells, major utilities, catchment areas, topography and topographic constraints.

This foundation of preliminary information was then amalgamated into a series of base maps for use in identifying suitable areas for development and the analysis of the transportation and utilities components that will be used to identify Sustainable Areas for Development, based on municipal policy and municipal input. It is understood that this foundation remains constant; however the future planning and development that is built on this foundation may change and evolve over time.

The comprehensive information was collected from the Town and County and was compiled into a set of base maps for use in assessing existing conditions and emerging issues. They were also used as a framework for discussion at Design Charrette #1 with the Steering Committee, and the development of the matrix for assessment in determining the direction of development in Design Charrette #2, also held with the Steering Committee.

The full list of base plans are provided in Appendix A. These drawings are not to scale and are included for illustrative purposes only. A full sized set of scaled drawings have been provided as a separate attachment to his report.

2.2 Existing Traffic Conditions

As noted, in addition to the base mapping activity, a considerable amount of traffic and transportation data was collected. Bunt & Associates reviewed this data in order to assess existing conditions. While the Planning and Utility activities associated with data collection were focused on document review and mapping, the Transportation activity included a considerable review of actual occurring conditions. This was necessary to provide the appropriate guidance for developing Short Term traffic recommendations in response to public expectation and the scope outlined in the original proposal; but also to provide a base form which to calibrate the traffic forecasting model that will be developed later in the project.

The comprehensive review of available traffic count data and other transportation information included data sourced from previous counts collected by other consultants for development projects in the area, and data collected for or by Alberta Transportation as part of other transportation infrastructure projects undertaken or being undertaken in the area. Bunt & Associates then augmented this through manual turning movement counts and license plate trace exercises at a number of key study area intersections. Due to budget limitations, a full collection of data from every study area road link and/or intersection was not feasible. However, key locations were identified and data collected accordingly.

2.2.1 Intersection Capacity Analysis

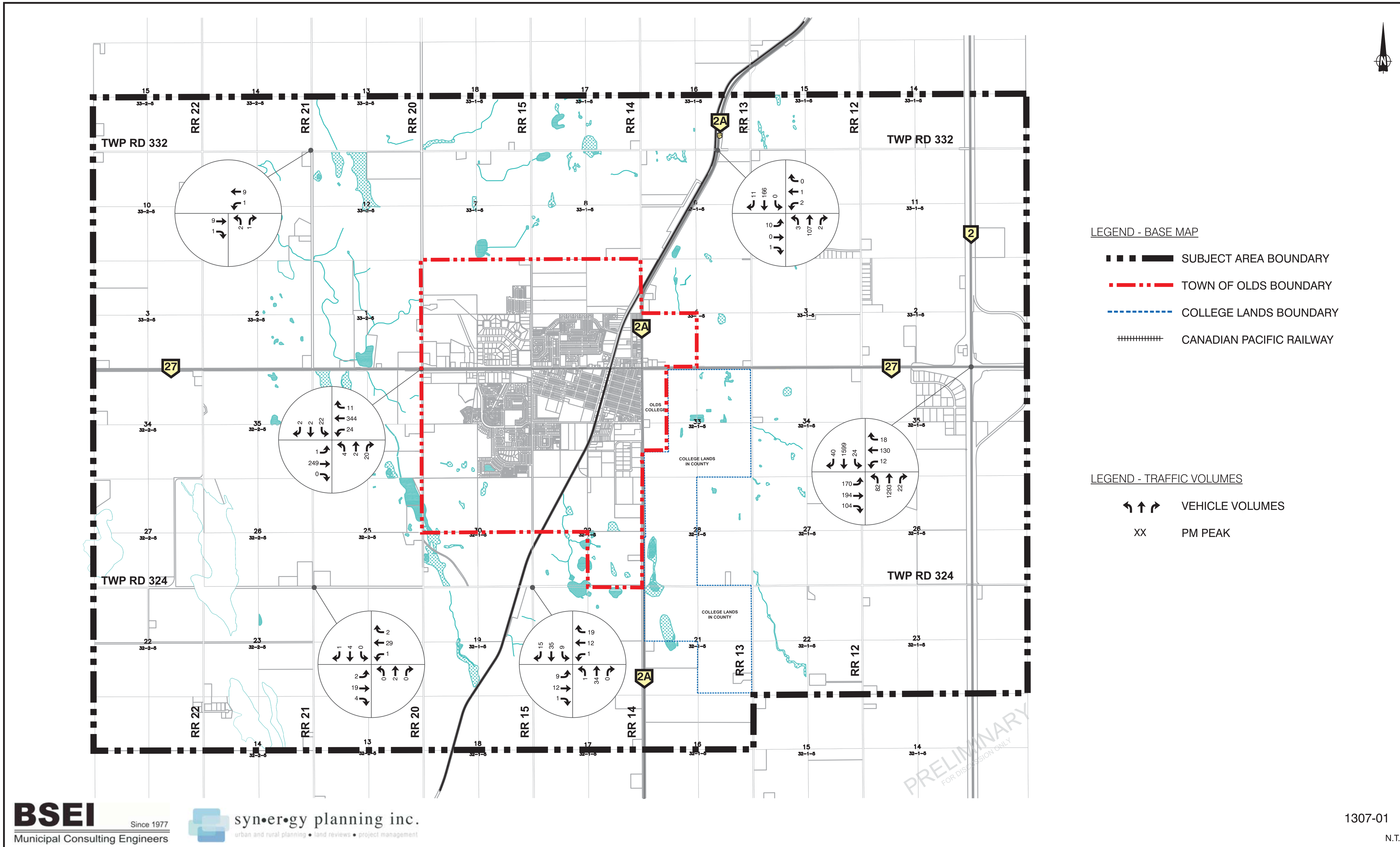
Bunt & Associates collected intersection turning movement data at a total of 30 key intersections throughout the Town and County. This included data collected previously by Alberta Transportation, as well as manual counts undertaken under the direction of Bunt & Associates for the weekday PM peak period during October of 2009. In addition, daily (24-hour) counts in mid-October of 2009 were also carried out to confirm 6-hour to 24-hour conversion factors.

The traffic count data was summarized so as to identify the PM peak hour at the intersections and average daily traffic volumes on roadway links. The daily traffic volumes were taken from the direct counts where available, or estimated from the peak hour counts. The existing peak hour traffic volumes for the County and Town are illustrated on Exhibits 2.1 and 2.2 respectively, while the daily traffic volumes for the County and Town are illustrated on Exhibits 2.3 and 2.4 respectively. A comprehensive capacity analysis was undertaken. This specifically involved an assessment of key signalized and unsignalized intersections using Synchro 7.0, a traffic analysis software package based on the methods outlined in the *Highway Capacity Manual*.

The signalized analysis provided a volume to capacity (v/c) ratio for individual approaches, with a value of 1.0 representing theoretical capacity conditions and a value of 0.90 generally accepted to represent optimized conditions with full utilization of all green time, although a maximum v/c ratio of 0.8 was used for the Town of Olds and Mountain View County to generally reflect the reduced tolerance for congestion that is expected in smaller urban centres.

The unsignalized intersection analysis ranks individual critical movements using a Level of Service (LOS) criteria based on average vehicle delay. Grades of “A” through “F” were assigned based on increasing delay with a LOS of “A” representing ideal, free-flow conditions, and a LOS “F” representing capacity conditions where the average delay per vehicle is greater than 50 seconds. Typically, a LOS of D would represent the point where the traffic conditions would be operating at the limit of the performance criteria for the intersection. Deterioration beyond this point would reflect the need for improvements to the intersection. However, in smaller municipalities such as the Town of Olds and Mountain View County where tolerance for congestion is lower, a LOS of C would be more appropriate as the limit for performance criteria. This revised level of service rating was therefore used as a basis for analysis in this study.

The results of the existing intersection capacity analysis for the study area intersections under existing conditions (i.e., existing lane arrangement, existing signal timing plans, and peak hour traffic volumes) are summarized here in Tables 2.1 through 2.3, and the Synchro outputs are included in Appendix B. It is noted that the values presented in the following tables represent conditions without improvements.



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Mountain View County Existing Peak Hour Traffic Volumes

Exhibit 2.1

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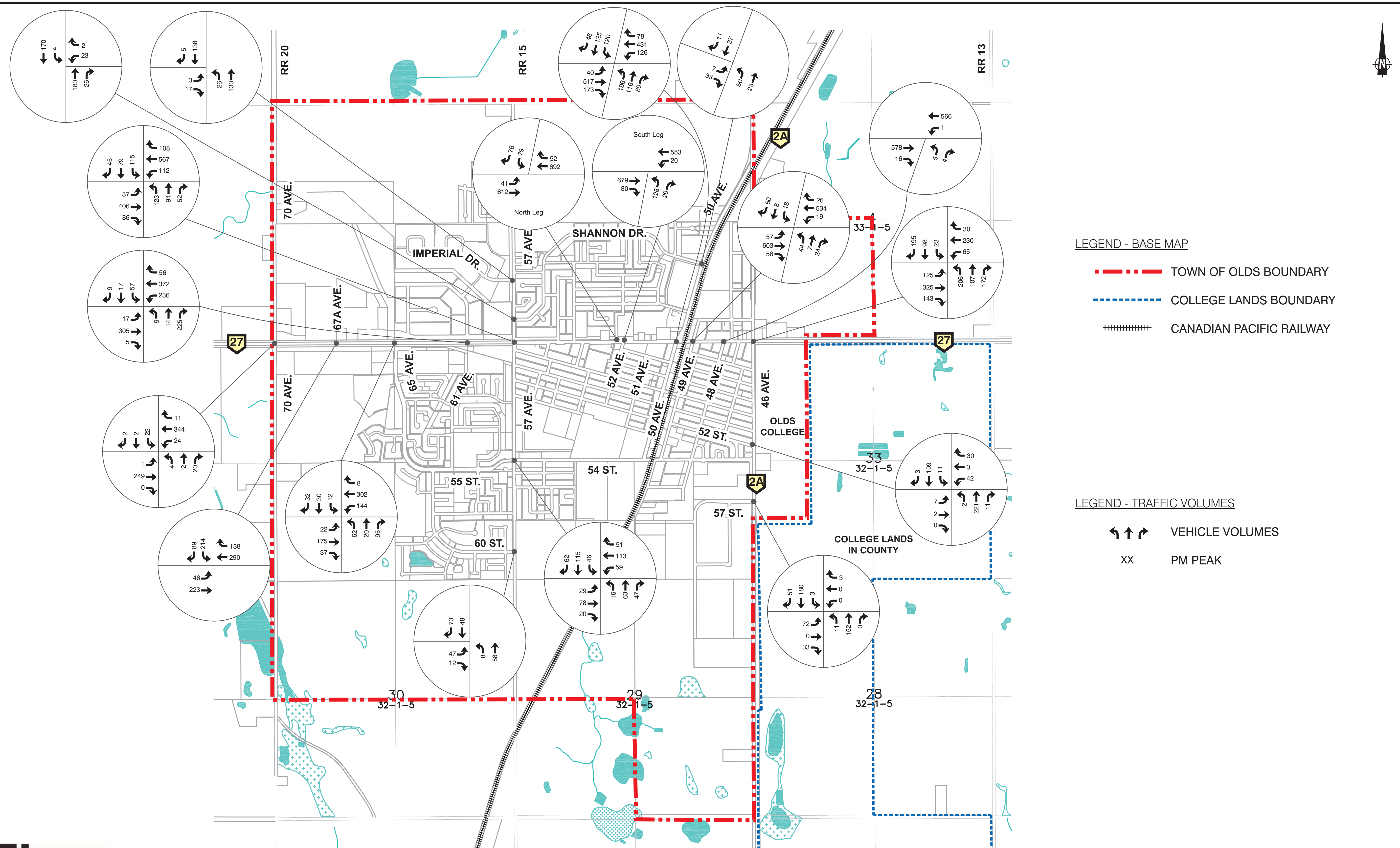

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Existing Peak Hour Traffic Volumes

Exhibit
2.2

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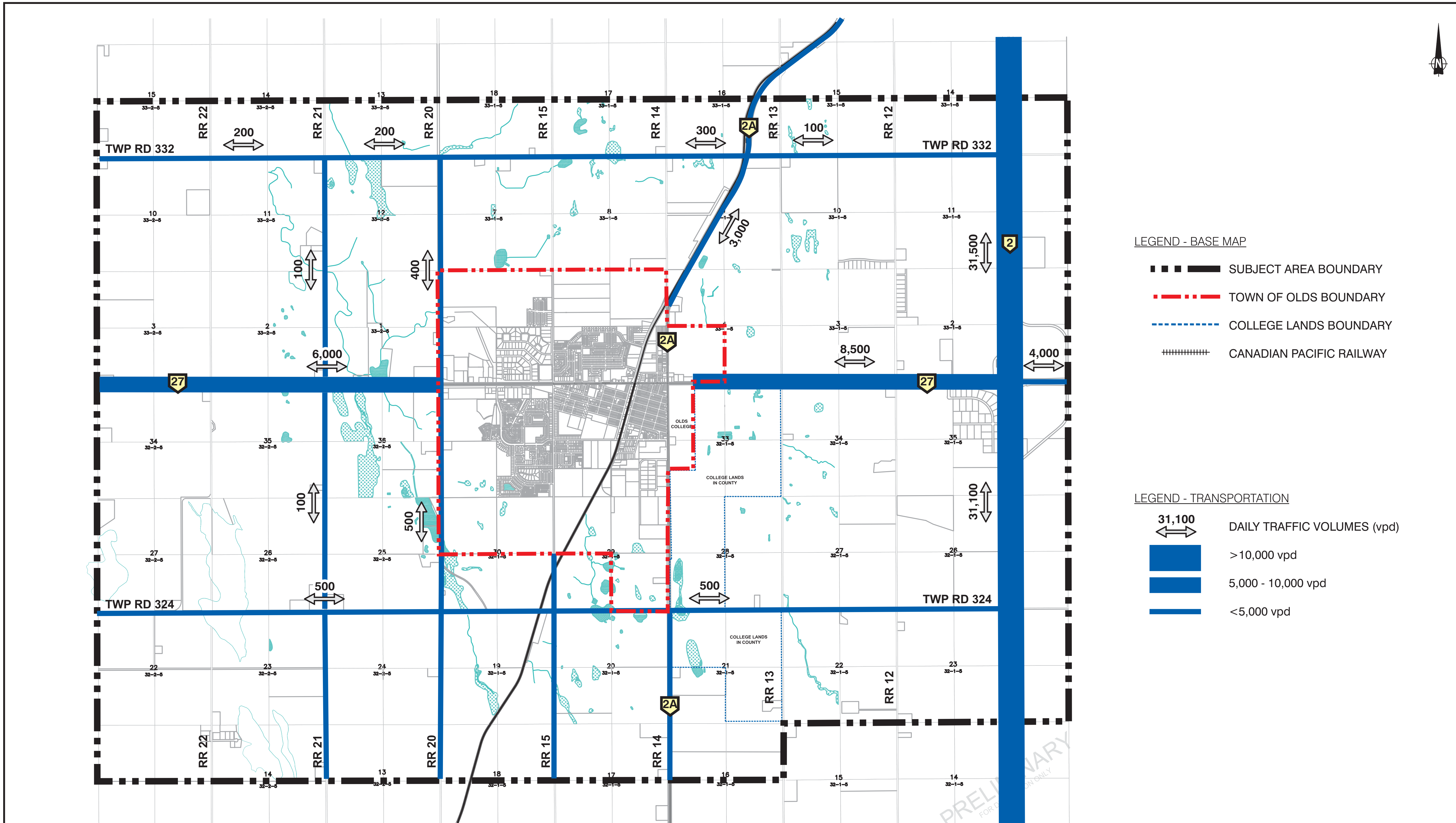

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Mountain View County Existing Daily Traffic Volumes

Exhibit
2.3

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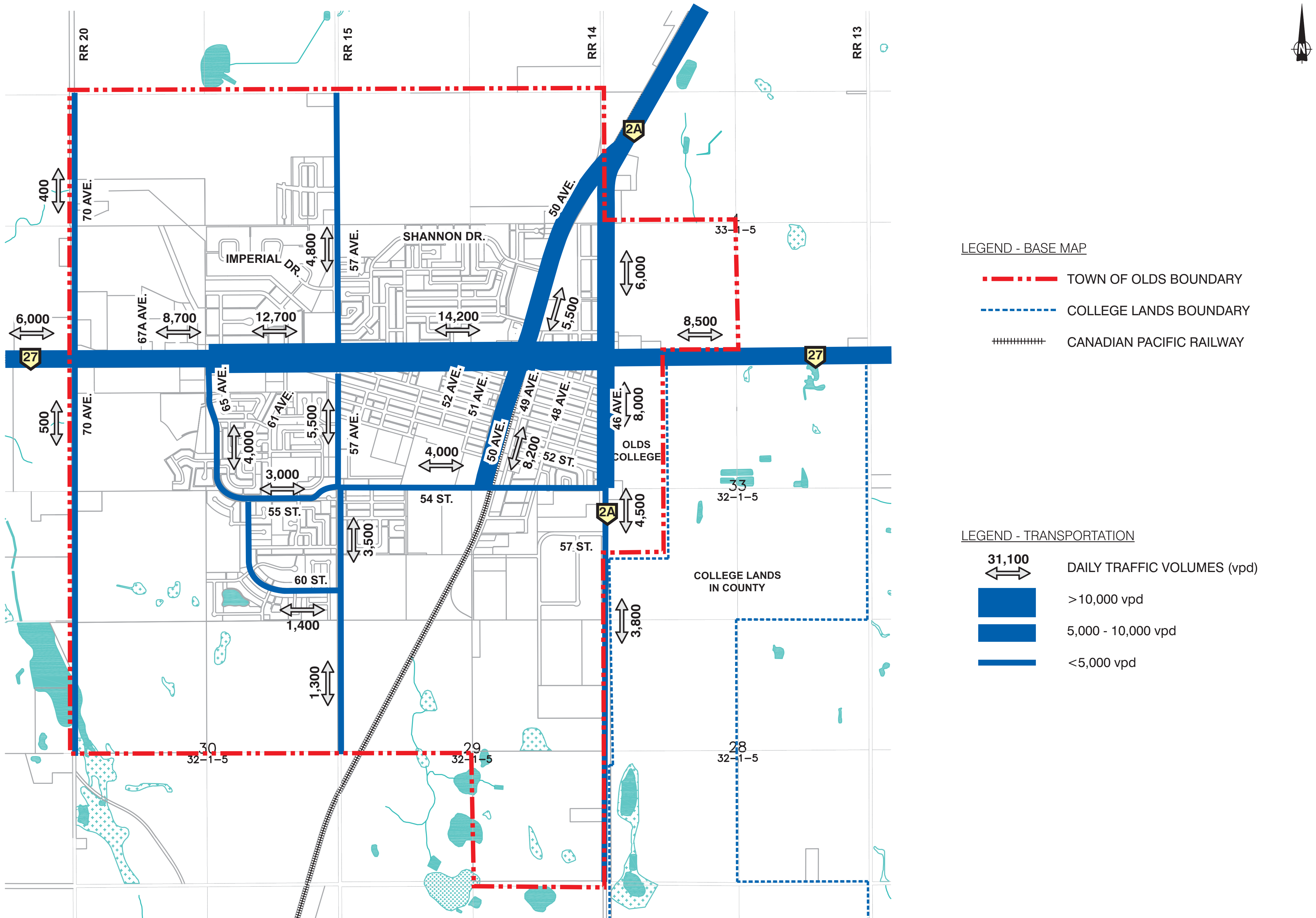

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Existing Daily Traffic Volumes

Exhibit 2.4

:\\1307-01_OLDS-EXHs_2010-06-JUNE.cdr June 2, 2010 HMF

Table 2.1 Intersection Analysis for Highway 27 Corridor– Existing Conditions

Intersection	Movement	PM Peak		
		v/c	LOS	Queue (m)
Highway 27/Highway 2A (signalized)	EB	0.78	C	43
	WB	0.69	C	33
	NB	1.14	F	155
	SB	0.55	B	58
Highway 27/48th Avenue (unsignalized)	EB	0.24	A	0
	WB	0.23	A	0
	NB	0.03	B	1
Highway 27/ 49th Avenue (unsignalized)	EB	0.22	A	2
	WB	0.18	A	1
	NB	0.49	E	18
	SB	0.29	C	9
Highway 27/50th Avenue (signalized)	EB	0.68	B	48
	WB	0.79	C	47
	NB	0.92	D	141
	SB	0.67	C	97
Highway 27/52nd Avenue (east intersection) (signalized)	EB	0.43	A	38
	WB	0.35	A	28
	NB	0.49	C	29
Highway 27/52nd Avenue (west intersection) (signalized)	EB	0.43	A	31
	WB	0.39	A	31
	SB	0.47	B	21
Highway 27/57th Avenue (signalized)	EB	0.52	B	28
	WB	0.69	C	40
	NB	0.37	B	34
	SB	0.35	B	31
Highway 27/61st Avenue (unsignalized)	EB	0.13	A	1
	WB	0.20	A	6
	NB	0.48	C	19
	SB	1.22	F	52
Highway 27/ 65th Avenue (signalized)	EB	0.18	B	9
	WB	0.32	A	9
	NB	0.21	A	9
	SB	0.09	B	9
Highway 27/67A Avenue (signalized)	EB	0.22	B	16
	WB	0.28	B	15
	SB	0.32	B	27
Highway 27/70th Avenue (Range Road 20) (unsignalized)	EB	< 0.01	A	0
	WB	0.11	A	1
	NB	0.04	B	1
	SB	0.09	C	2

Table 2.2 Town of Olds Intersections – Existing Intersection Capacity Analysis

Intersection	Movement	PM Peak		
		v/c	LOS	Queue(m)
57th Avenue/ Imperial Drive (unsignalized)	EB	0.02	A	1
	NB	0.02	A	0
	SB	0.09	A	0
57th Avenue/Shannon Drive (unsignalized)	WB	0.04	B	1
	NB	0.13	A	0
	SB	< 0.01	A	0
57th Avenue/54th Street (unsignalized)	EB	0.19	A	n/a
	WB	0.33	B	n/a
	NB	0.19	A	n/a
	SB	0.32	B	n/a
57th Avenue/60th Street (unsignalized)	EB	0.07	A	2
	NB	0.01	A	0
	SB	0.07	A	0
50th Avenue/Shannon Drive (unsignalized)	EB	0.04	A	1
	NB	0.03	A	1
	SB	0.02	A	0
Highway 2A/52nd Street (unsignalized)	EB	0.02	B	1
	WB	0.15	B	4
	NB	< 0.01	A	0
	SB	0.01	A	0
Highway 2A/ 57th Street (unsignalized)	EB	0.19	B	5
	WB	< 0.01	A	0
	NB	0.01	A	0
	SB	< 0.01	A	0

Table 2.3 County Roads – Existing Intersection Capacity Analysis

Intersection	Movement	PM Peak		
		v/c	LOS	Queue (m)
Highway 2A/Twp Rd 332 (unsignalized)	EB	0.02	B	0
	WB	0.01	B	0
	NB	< 0.01	A	0
	SB	< 0.01	A	0
Range Road 15/Twp Rd 324 (unsignalized)	EB	0.01	A	0
	WB	< 0.01	A	0
	NB	0.05	A	1
	SB	0.07	A	2
Range Road 21/ Twp Rd 332 (unsignalized)	EB	0.01	A	0
	WB	< 0.01	A	0
	NB	< 0.01	A	0
Range Road 21/ Twp Rd 324 (unsignalized)	EB	< 0.01	A	0
	WB	< 0.01	A	0
	NB	< 0.01	A	0
	SB	0.01	A	0
	SB	< 0.01	A	0

The results of the capacity analysis of intersections under existing conditions confirmed there were several intersections along Highway 27 that required improvements based on capacity constraints. These included the following:

- Highway 27 (46th Street)/ Highway 2A (46th Avenue)
- Highway 27 (46th Street)/ 49th Avenue
- Highway 27 (46th Street)/ 50th Avenue
- Highway 27 (46th Street)/ 61st Avenue

All the remaining study area intersections located within the Town of Olds and Mountain View County were found to be operating within acceptable capacity. The assessment of necessary improvements for consideration in the immediate or Short Term period (prior to 2016) is outlined in detail later in this report.

2.2.2 Link Analysis

The existing roadway link volumes illustrated on Exhibit 2.3 and 2.4 were assessed based on existing roadway classifications based on observed number of lanes and existing function of the roadway sections. In general terms, this analysis was intended to identify the classification of the roadway, the existing daily traffic volume and the typical environmental capacity of the roadway. As a practical application, the actual physical capacity of a roadway is considerably higher than the environmental capacities. However, the environmental capacity represents the limit of comfortable operation of the roadway.

The current roadway designation criteria for the Town of Olds and Mountain View County are summarized in Table 2.4 and Table 2.5 respectively with the full table of road standards for each attached in Appendix C. The design standards for the Town of Olds are as per the Geometric Design Standards set out in the Town of Olds Minimum Design Standards[1] for May 2005. It should be noted that this was sourced from the Town of Olds website in which there is a note within the document that states.

" this document is under review and changes are being made; anyone looking for the most up to date details on any particular section should contact the Town of Olds Planning and Development department to double check if that section is likely to change in the near future."

No further information was available at the time of analysis, and so Bunt & Associates utilized this information for this study. It should also be noted that these standards are in accordance with the classification system outlined in the Roads and Transportation Association of Canada (RTAC) Manual – Geometric Design Standards for Canadian Roads and Streets.

The road standards for Mountain View County were based on the Road Template Policy[2], December 13, 2006 provided by Mountain View County.

[1] Town of Olds Minimum Design Standards for Development, Originally Prepared by Infrastructure Systems Ltd., March 1996, Revised by K.K., May 2005.
[2] Road Template Policy, Mountain view County, Approved by County Council, effective December 13, 2006.

Table 2.4 Summary of Town of Olds Road Standards

Classification	Environmental Threshold Traffic Volumes (vpd)	Design Speed (km/h)	Right-of-Way Width (m)	Pavement Width (m)	Travel Lanes[3]
Undivided Arterials	5,000 – 12,000	60 – 70	30.0	14.8	4.0m
Major Residential Collector	< 5,000	60	22.0	12.2	3.7m
Minor Residential Collector	< 5,000	60	20.0	12.0	n/a
Local Residential	< 1,000	60	18.0	11.2	n/a
Commercial & Industrial	n/a	60	18.0	12.2	Optional
Laneways	n/a	n/a	6.1	n/a	n/a

In reviewing the Town of Olds Design Standards, there appeared to be a discrepancy between the pavement width and the travel lanes for the Undivided Arterial and the Major Residential Collector. In the case of the Undivided Arterial, the guidelines called for a pavement width of 14.8 metres with four travel lanes and a specified lane width of 4.0 metres; which is not possible if all lanes are equal in width. The same issue applied to the Major Residential Collector where a four-lane roadway required 14.8 meters of roadway with 3.7 metre lanes, yet the specification provided only 12.2 metres of pavement width. Bunt & Associates therefore sought clarification in terms of the appropriate geometry in order to facilitate the completion of the necessary road sizing exercises within the master planning process. ***Note to Steering Committee: We still require clarification of this item prior to formally issuing the Final Report.***

Table 2.5 Summary of Mountain View County Road Standards

Classification	Traffic Volumes (vpd)[4]	Design Speed (km/h)	Right-of-Way Width (m)	Finished Width (m)
Major Collector Road (paved)	5,000 – 12,000	110	30.48	9.0
Minor Collector Road 'A' (paved)	500 – 5,000	90	30.48	8.6
Minor Collector Road 'B' (gravel)	< 500	90	30.48	8.6
Industrial/Commercial Road (paved)	5,000 – 12,000	110	30.48	9.0
Major Farm Access Road (gravel)	< 500	90	30.48	8.0
Minor Farm Access Road (gravel)	< 500	60	20.12	7.0
Single Lane Access Road (gravel)	< 500	60	20.12	4.0
Residential Subdivision Internal Road (paved)	< 1,000	60	Max. 30.48	7.0

Amec Consulting established the current road standards for Mountain View County as shown above in the Roads Template Procedure No. 4005-01 effective date January 1st, 2006. However, threshold daily traffic volumes for the purpose of establishing environmental capacities were not included at the time those standards were developed. With that said, Bunt & Associates reviewed the road standards from Red Deer County, Rocky View County, City of

[3] Additional travel lane width may be required to accommodate cyclists, e.g. on arterials the outside lanes are 4.2 m wide.
[4] The traffic volumes for the County were determined by Bunt & Associates based on a collaboration of road standards from Red Deer County, Rocky View County, City of Calgary, Alberta Transportation as well as the Town of Olds standards.

Calgary, Alberta Transportation as well as the Town of Olds, as attached in Appendix C, to provide an overview and subsequent recommendation for design level threshold daily traffic volumes (or environmental capacities) for each road classification within the County.

Based on the above noted design standards, and including Bunt & Associates' recommendations regarding daily traffic threshold volumes or environmental capacities for the County roads, the assessment of existing daily traffic conditions is summarized in Table 2.6 and Table 2.7 for the Town of Olds and Mountain View County respectively.

Table 2.6 Summary of Daily Traffic Volumes for Town of Olds

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Existing Traffic Volumes (vpd)
46th Street: East of 46th Ave	Provincial Secondary Highway	< 20,000	8,500
46th Street: Between 46th Ave & 57th Ave	Provincial Secondary Highway	< 20,000	14,200
46th Street: Between 57th Ave & 65th Ave	Provincial Secondary Highway	< 20,000	12,700
46th Street: Between 65th Ave & 67A Ave	Provincial Secondary Highway	< 20,000	8,700
46th Street: West of 67A Ave	Provincial Secondary Highway	< 20,000	6,000
54th Street: Between CPR tracks & 57th Ave	Major Residential Collector	< 5,000	4,000
55th Street: West of 57th Ave	Major Residential Collector	< 5,000	3,000
60th Street: West of 57th Ave	Minor Residential Collector	< 5,000	1,400
65th Avenue: South of 46th Street	Major Residential Collector	< 5,000	4,000
57th Avenue: North of 46th Street	Undivided Arterial	5,000 – 12,000	4,800
57th Avenue: Between 46th St & 54th St	Undivided Arterial	5,000 – 12,000	5,500
57th Avenue: Between 54th St & 60th St	Undivided Arterial	5,000 – 12,000	3,500
50th Avenue: North of 46th Street	Undivided Arterial	5,000 – 12,000	5,500
50th Avenue: South of 46th Street	Major Residential Collector	< 5,000	8,200
46th Avenue: North of 46th Street	Provincial Secondary Highway	< 20,000	6,000
46th Avenue: Between 46th St & 54th St	Provincial Secondary Highway	< 20,000	8,000
46th Avenue: Between 54th St & 57th St	Provincial Secondary Highway	< 20,000	4,500
46th Avenue: South of 57th Street	Provincial Secondary Highway	< 20,000	3,800

Based on the daily link analysis for the Town of Olds roadways, the majority of roadways were found to be operating within acceptable daily traffic volume parameters with the exception of 50th Avenue south of Highway 27. Bunt & Associates assumed the classification as a major residential collector based on the Land Use Map provided in the MDP; though a review of the roadway suggested that it could potentially be re-classified as an Undivided Arterial based on existing volumes without consideration of future growth. In the case that 50th Avenue is classified as a

Major Residential Collector roadway, improvements along this corridor will be required, and although the existing volumes exceed the environmental capacities based on 2009 conditions, it is likely that some time could pass before the need to make any improvements of significance will be required. As such, the improvements here were assumed for the purpose of analysis to be required as part of a longer term improvement program.

Table 2.7 Summary of Daily Traffic Volumes for Mountain View County

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Existing Traffic Volumes (vpd)
Highway 2	Provincial Primary Highway	> 20,000	31,500
Highway 27 (east of Olds)	Provincial Secondary Highway	< 20,000	8,500
Highway 27 (west of Olds)	Provincial Secondary Highway	< 20,000	6,000
Highway 2A (north of Olds)	Provincial Secondary Highway	< 20,000	3,000
Highway 2A (south of Olds)	Provincial Secondary Highway	< 20,000	4,400
Twp Rd 332 West of RR 14	Minor Collector Road 'B' (gravel)	< 500	200
Twp Rd 332 East of RR 14 to Hwy 2A	Minor Collector Road 'A' (paved)	500 – 5,000	300
Twp Rd 332 East of Hwy 2A	Minor Collector Road 'B' (gravel)	< 500	100
Twp Rd 324 West of Hwy 2A to RR 20	Industrial/ Commercial Road (paved)	5,000 – 12,000	500
Twp Rd 324 East of Hwy 2A	Minor Collector Road 'B' (gravel)	< 500	500
Range Road 21	Minor Collector Road 'B' (gravel)	< 500	100
Range Road 20 South of Hwy 27	Major Collector (Paved)[5]	< 5,000	500
Range Road 20 North of Hwy 27	Major Collector (gravel)[6]	< 5,000	400
Range Road 15 south of Town limits	Minor Collector Road 'A' (paved)	500 – 5,000	1,200

Based on the daily link analysis for Mountain View County, all roadways were found to be currently operating within acceptable design capacity and therefore no improvements were recommended for immediate consideration. However it should be noted that the gravel roadways with a daily traffic volume of 200 to 500 vehicles per day should be considered for dust control and as well, an upgrade from gravel to chip seal in the near future.

2.2.3 Highway 2/Highway 27 Interchange Analysis

The Highway 2/ Highway 27 interchange is currently under review by Alberta Transportation. While basic traffic count data was available for the ramps and through lanes, Bunt & Associates did not undertake an analysis of the overall operating conditions of this interchange.

[5] Range Road 20 is classified as a Major Collector Roadway based on the County Collector Road Network. It should be noted that although this roadway is classified as a major collector with a capacity of 5,000 vpd, those sections of this roadway that are currently unpaved are intended to only accommodate 500 vpd prior to pavement being required.

[6] Range Road 20 is classified as a Major Collector Roadway based on the County Collector Road Network. It should be noted that although this roadway is classified as a major collector with a capacity of 5,000 vpd, those sections of this roadway that are currently unpaved are intended to only accommodate 500 vpd prior to pavement being required.

It is known that Alberta Transportation seeks to upgrade this facility in the near future, as well as develop a new interchange to the north on Highway 2. As such, an assessment of conditions at this location was not deemed necessary as part of the analysis.

2.2.4 Through Traffic on Highway 27 and Highway 2A

Bunt & Associates completed a license plate trace on Highway 27 and Highway 2A on a number of days between October 8th, 2009 to October 22nd, 2009 to estimate the amount of through traffic on both highways traveling through the Town of Olds. The results of the license plate trace will be used in aiding the calibration of the pending traffic-forecasting model, and the technical findings are summarized in Table 2.8.

Table 2.8 Summary of Through Traffic Within the Town of Olds

Highway Direction	Percent of Thru Traffic
Westbound on Highway 27	14%
Eastbound on Highway 27	12%
Northbound on Highway 2A	3%
Southbound on Highway 2A	5%

This situation is significant because the Highway 27 corridor is currently congested through the Town, with numerous driveways and intersections. The *Highway 27 Planning Study – Town of Olds* as completed by CastleGlenn Consultants Inc. in 2009 (the CastleGlenn study) identified a number of access management recommendations. The implementation of the internal improvements along Highway 27 will certainly aid in the accommodation of background traffic growth within the corridor, but there may be an eventual need in the future to develop a by-pass around the Town to accommodate future growth in background/through traffic on Highway 27. As noted, Alberta Transportation is pursuing this concept and may seek to develop a corridor that would route Highway 27 around the north side of the Town. Connectivity would be provided between this route and Highway 2, though at this time it is not known whether the connection would be taken through an upgraded Highway 2/27 interchange, or if the by-pass would be directly connected to Highway 2 at a future interchange located several kilometers north of Highway 27 on Highway 2.

For the purpose of this Master Plan, this item is beyond the scope of the exercise. However, it is worthy of note here as it does affect the Short Term conditions for several reasons, as follows:

- The Immediate and Short Term improvements outlined in this report deal with many locations along Highway 27. If the By-pass does occur, then this would affect the timing for the implementation for some of those items.

- The ability for the Town and County to plan capital budgets for improvements will be affected by the plans that Alberta Transportation has for the By-pass, both in terms of time as well as in terms of fiscal responsibility for the improvements identified here for Highway 27.

- Although the Alberta Transportation directive appears to favour a northern by-pass of the Town, there may be merit to reviewing the impacts of improved connectivity on the south side of the Town.

In short, the By-pass will have an effect not only on the long term planning for the Town and County transportation network but also in the planning and implementation of Immediate and Short Term improvements as recommended here.

2.2.5 Railway Crossings

The Red Deer Subdivision Canadian Pacific (CP) Rail line currently runs through the Town of Olds and Mountain View County. The Red Deer Rail Line is part of the CP main freight line and has an estimated train frequency of 15 to 20 freight trains per day. The freight trains run 24 hours a day, seven days a week with no set schedule so trains maybe expected at any time of the day and/or night. The train frequency of 15 to 20 trains per day is an estimate and may fluctuate without notice based on customer requirements and/or changes to the CP business cycle. The maximum train speed that may be reached on the main line through Olds is 45 mph (~70 km/h), which is set in conjunction with Transport Canada and is determined by such factors as track grade, curvature and rail bed conditions.

There are two locations within the Town of Olds where the CP rail line crosses a roadway, which pose a safety concern due to the close proximity of the rail line to the intersections of Highway 27 and 50th Avenue as well as at 54th Street and 49th Avenue. Both rail crossings are located within approximately 50 metres of the intersection and as noted earlier in this report, therefore pose a safety concern if/when long queue lengths occur at the intersections. It should be noted that based on Transport Canada's Road/Railway Grade Crossings Technical Standards[7], an at-grade rail crossing must be at least 30 metres from an intersection when permissible train speeds exceed 15 mph. Based on these standards, the current spacing of approximately 50 metres is sufficient although it is still seen as a safety concern.

Rail/road crossings are classified as either grade-separated or at-grade; and at-grade rail/road crossings can be further classified into two separate categories, passive or active. A review of the existing conditions confirmed that both the Highway 27 and 50th Avenue and the 54th Street and 49th Avenue at-grade rail/road crossings exhibit active control (i.e., warning signal and gate arms). A review of Transport Canada's[8] requirements for rail crossings determines that gates are required at a rail crossing when the forecast cross-product[9] is 50,000 or more. The cross product for the crossing at Highway 27 is 284,000 while the crossing at 54th Street has a cross product of 80,000, thus both intersections currently exhibit the flashers and gates that are required based on this warrant. With that said no further improvements may be made to the crossings as the next upgrade for a rail line is a grade separated crossing.

[7] RTD 10 Road/Railway Grade Crossings Technical Standards and Inspection, Testing and Maintenance Requirements, Transport Canada, March 2002.
[8] ibid
[9] Forecast cross product = number of trains per day * daily traffic volume on the roadway

2.2.6 Travel Survey

In order to assist in determining the existing travel patterns of the residents of the Town of Olds and Mountain View County, a travel survey was advertised to the public on the Town of Olds website as well as Mountain View County's website for input on their PM peak travel habits. In addition, the survey was distributed to the attendees at the first public Open House.

The survey was constructed through an on-line survey service called Survey Monkey and consisted of five questions which were based on a Zone Map of the Town and County that was also provided. The five basic survey questions were as follows with a complete survey attached in Appendix D.

- Question 1: In which zone is your residence located?
- Question 2: Between 3:00pm-6:00pm on a weekday, do you typically make a trip in your vehicle?
- Question 3: What type of trip do you make during this time period?
- Question 4: In which zone did your trip start?
- Question 5: In which zone did your trip end?

A total of 175 survey responses were received. Although all survey responses were not correctly completed, close to 75% of the surveys were useable for the purpose of determining travel patterns and origin/destination (O/D) patterns within the study area. The OD matrix was then used to help establish the future travel patterns as part of the forecast model for the 35,000 population horizon. The raw O/D patterns emerging from the results of the survey are included in Appendix E.

2.3 Identification of Emerging Issues

Once the data had been collected and amalgamated, and once initial analysis of the available information had been completed, it was possible to review the overall program and identify emerging issues. This implicitly included items that were current and therefore worthy of immediate attention, but it also referred to items that may be pending in the Short Term (13,000 population) or in the Long Term (35,000 population).

In terms of Planning, the focus on the activity of establishing emerging issues represented a review of available documentation, and so issues were identified but not addressed. This was due to the fact that changes to Planning documents or directions would require separate studies which were not within the scope of this project where the intent was to identify and direct the process of Planning on the basis of available approved documentation and information.

2.3.1 Transportation

In terms of emerging issues, several areas were determined to be in need of attention, either under existing conditions or into the future. Specific issues included the following:

- Highway 2/ Highway 27 Interchange Improvements (to be undertaken by Alberta Transportation). This was discussed in some detail in the previous section.

- Possible Town Truck By-pass (to be undertaken by Alberta Transportation). This was discussed in some detail in the previous section.

- Highway 27 corridor improvements

  - Access management modifications
  - Intersection improvements
  - Realignment of intersections

- Railway Crossing in Close Proximity to intersection at Highway 27/ 50th Avenue and 54th Street/ 49th Avenue. This was discussed in some detail in the previous section.

- Surface Treatment Upgrades

- Future East-West Connector/Truck Route on south side of Town

- Future North-South Connector/Truck Route on west side of Town

- Trail/Bikeway System

- High Speed Rail Line

As well, the *Highway 27 Planning Study – Town of Olds* completed in 2009 by CastleGlenn Consultants Inc. included a number of recommendations related to access management along the Highway 27 corridor through the Town. Many of these were Longer Term in nature, requiring acquisition of land etc. to facilitate. However, others were related to Short Term improvements that could be considered as part of a more current improvement program. Bunt & Associates reviewed these items individually in the context of the data collected as part of the overall study. The impact of these items and their relative utility as Short Term improvements are outlined later in this report. However, the full list of conclusions and recommendations outlined in the CastleGlenn study are listed here as follows:

- Access management modifications by reducing the number of access points of Highway 27 from 60 to 26.

- Signalization of 54th Avenue (north) and converting 54th Avenue (south) to right-in/right-out only.

- Pedestrian actuated signal at 52nd Avenue (north) and convert 52nd Avenue (north) to right-in/right-out only.

- New signalized intersection of Highway 27/ 51st Avenue approximately 180 metres west of 50th Avenue.

- Highway 27 Intersection Improvements (geometric and lane configurations) at:

  - 65th Avenue

- 57th Avenue
- 55^{th} Avenue
- 54^{th} Avenue (north)
- 52^{nd} Avenue (north)
- 51^{st} Avenue
- 49^{th} Avenue, and
- Highway 2A

- New Service Road (to allow for closure of private access on Hwy 27) and Local Roadway Segments in the following locations:
  - SW corner of Highway 27/ 65^{th} Avenue
  - NW corner of Highway 27/ 57^{th} Avenue
  - Between 55^{th} Avenue and 57^{th} Avenue
  - Proposed Highway 27/ 51^{st} Avenue

A review of the Town of Olds Municipal Development Plan (MDP) identified a number of further items worthy of consideration for the Master Planning exercise. These included the following:

- Item 13.1: (Location of Industrial Land Uses) seeks to direct this land use to the areas conceptually shown on the Land Use Concept Map; predominantly located within the northwest and southeast areas of the Town. Item 13.5 (Truck and Dangerous Goods Routes to Industrial Areas) are planned so as to have direct access to truck routes, highways, and railways to the greatest extent possible. A potential emerging issue is applicable to both 13.1 and 13.5, where a truck route needs to be identified and agreed upon in order to support the current strategic industrial locations for both municipalities. However, the location of industrial development is scattered throughout the study area, which means some industrial areas may have inherent restrictions in order to avoid bringing dangerous goods through residential neighbourhoods.

- Item 16.12: (Highway 27) is the main east/west artery in the MDP area, and is and will continue to be in need of attention of to improve the function and ability of the corridor to service the existing needs of the community. This requires the cooperation of the Province, Mountain View County, Olds College, and landowners. The emerging issue is that there is only so much industrial, commercial, and retail development envisioned for the Study Area by 2035. The challenge of balancing and accommodating this growth within the Town of Olds is further complicated by the opportunities for development within Mountain View County under the Highways 2/27 Area Structure Plan.

- Item 16.13: (Truck/Dangerous Goods Traffic) requires cooperation of the Province and Mountain View County to study the optimum means of accommodating east/west truck and dangerous goods traffic in the Olds area, as well as protecting an appropriate corridor for this activity. Interestingly, Item 16.14 (South Arterial) identifies a future east/west arterial in the southern part of Olds, but it is not currently intended to function as a through truck route. As well, Twp. Rd 324 and 322 (east/west) between Range Road 20 and Highway 2A are identified in the Mountain View County MDP as industrial roads for only this short segment. The next possible significant east/west connection to Highway 2 occurs at Twp. Rd 320. The emerging issue here is related to the need to develop an appropriate corridor for truck and hazardous goods activity that does not compromise the intent of either the Town or County MDP documents.

Items identified in the Inter-municipal Development Plan (IDP) included the following:

- Item 2.2.3: (Provincial Highways) suggests that there will be a new interchange at the intersection of Highways 2 and 27. It is also assumed that Highway 27 will be twinned from this new interchange into the Town of Olds. The implications and/or emerging issues are a need for more land for roads, setbacks 70 metres from centre line and 40 metres from right of way, and limited local road access to Highway 27.

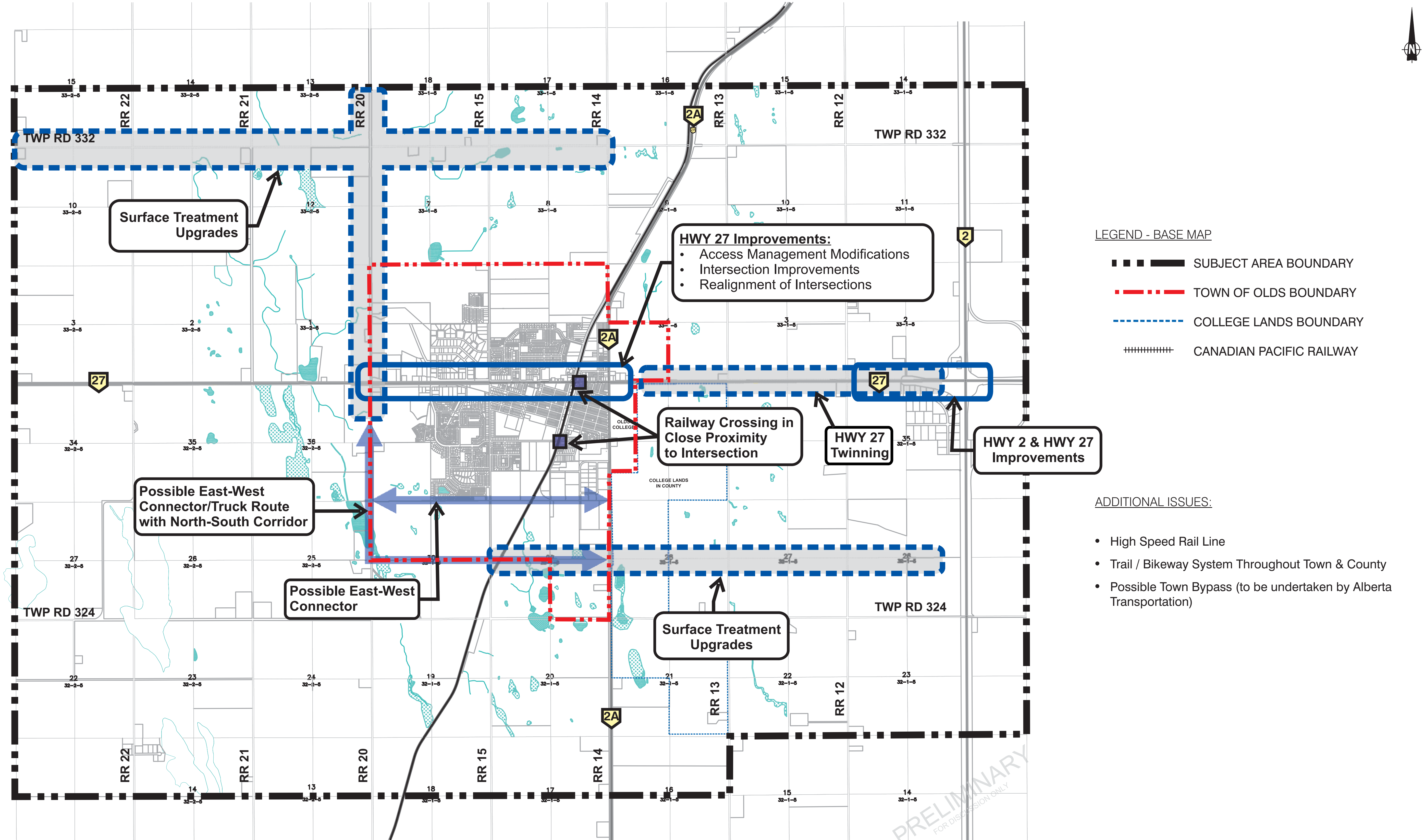
- Item 2.2.4: (Municipal Access Roads) states that when Highway 27 is twinned, access will be limited at RR 12, 13, and 29.1. Service roads are deemed to be necessary to provide access to these intersections. In the interim, existing access points will continue to operate and will need to be modified as needed.

- Item 5.9: (Transportation and Access) is significant in that it notes that the interchange of Highways 2 and 27 is to be upgraded, Highway 27 is to be twinned, and that there will be implications on access roads and service roads. Long-term access will follow the 2006 Alberta Transportation Functional Planning Study. At grade intersections at RR12 and RR13 to provide future north south crossing of Highway 27 need to be reviewed within the surrounding context. RR12 extending into the residential area around the golf course needs to address direct access conflicts. RR13 needs to be evaluated in the context of providing access to the future equestrian centre at Olds College, providing secondary access to Olds College from the east, as well as the industrial area on the south side of the Town of Olds. RR13 also needs to be evaluated in the context of providing access to future development on the north side of the Town of Olds and connection to Highway 2A. These two (2) intersections RR12 and RR13, needs to be protected. The other consideration is whether RR12 and RR13 connect or extend to the major township roads contemplated running east west.

Items identified in the Mountain View County Municipal Development Plan included the following:

- Item 4.3.14: states that all municipal roads accessing highway commercial and/or industrial park developments shall connect to the County Collector Network (CCN) as noted in the Amended Bylaw No. 06/09, June 3, 2009. This required due consideration during the forecasting and modeling exercise, as it was clear that additional CCN roadways will need to be developed in order to provide the necessary connectivity and access. It is noted that the nomenclature of County roadways differs from that of the Town roadays. Bunt & Associates sought to retain this difference throughout the project, and subsequent recommendations for roadway classifications reflect the CCN in all of the Existing, Short Term and Long Term conditions.

The full list of emerging issues assessed as part of the study is illustrated on Exhibit 2.5.



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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Emerging Transportation Issues

Exhibit
2.5

2.3.2 Utilities

Recent annexation discussions between the Town of Olds and Mountain View County resulted in the Town of Olds agreeing to provide connections for potable, waste, and storm water servicing to the County. The study area defines a specific region of the County where this infrastructure sharing will occur. Services will be extended through the Town boundary, to the Mountain View County study area.

In terms of emerging issues, BSEI has identified the following items for consideration.

Water Pressure Zones:

The elevation variance within the Town of Olds boundary ranges from an elevation of +/- 1045 m to +/- 1023 m. The elevation variance within Mountain View County to the extent of the study area ranges from an elevation of +/- 1048 m to +/- 982 m in the south east corner. In general there is a north south ridge mid-point of the study area sloping downward to the east and west. Each water pressure zone range varies (assumption) from a low of 275 kPa (40 psi) to 620 kPa (90 psi). This equates to a 40-metre elevation differential for each pressure zone. Therefore, within the Town of Olds the elevation differential is +/- 22 metres or is within one water pressure zone. Within the study area, the elevation difference is 66 metres or two pressure zones.

If the low end of the pressure zone (275 kPa or 40 psi) is set at the 1048 m elevation (high elevation), a pressure reducing chamber/valve will be required at approximately the 1008 m elevation contour to supply water within the next pressure zone or to the boundary of the study area.

Highway/Railway Crossings:

Within the study area, there are three provincial highways that need to be considered with respect to deep utility infrastructure. These are Highways 2, 2A and 27. Provincial standards do not allow for utilities to be installed within the rights of way. Crossings are allowed only if continuous pipe or a carrier pipe within a steel encasement pipe extending the full distance of the rights of way. Deep utility crossings near intersections should be avoided due to potential future grade separation structures.

Within the study area, there is one Canadian Pacific Railway line in an approximate north south alignment that needs to be considered with respect to deep utility infrastructure. Railway standards do not allow for utilities to be installed within the rights of way. Crossings are allowed only if a carrier pipe within a steel encasement pipe extending the full distance of the rights of way. Deep utility crossings near spur lines or grade-separated structures should be avoided.

Gas and Oil Rights of Way:

There are several oil and gas rights of way within the study area. These have been identified and categorized as to their classification. Any development near the right of way will be required to follow the regulations of the Environmental Utility Board and the owner.

Additional items as identified through the review of planning documents also identified the following:

- *Section 17.0 of the Town MDP:* Item 17.5: (Relocation of Waste Transfer and Wastewater Treatment Facilities) discusses the location of these facilities. They are currently located in the NW 1/4 Sec. 6-33-1-W5M. The potential emerging issue is where should the facilities be relocated and what uses should be proposed around the decommissioned facilities in order to minimize rehabilitation costs to the municipalities.

- Item 2.2.7 in the IDP: (Servicing: Water and Sewage) is significant since it is clear that the ASP hinges on the supply of piped water and sewage with dual lines running east of the Town to the interchange at Highway 2/Highway 27, with connection lines to the residential areas around the Golf Course. The manner in which this is to be facilitated, when it would it be provided, how much will it cost, and who will pay for it have yet to be resolved. Concern and emerging issues around interim solutions are that they have the potential to delay and compromise the ultimate design, even with best of intentions. In order to address these concerns, a servicing feasibility study should be encouraged or confirmed with acreage assessments and special improvement assessments to encourage further intensification. However, increased levies and/or assessments would likely offset the economic and location advantages of this area.

- Item 2.2.8 in the IDP: (Stormwater Management) is also significant. As noted in the ASP, 90% of the Plan area drains to the southeast and rest drains to the northeast. This will need to be considerd when mapping out the modeling exercise for this utility.

- Item 5.10 of the IDP: (Infrastructure) notes that ultimate development is dependent upon the provision of piped and communal servicing. Interim servicing is permitted. Developers will be charged in fees, at time of tie in, to assist in recovering costs for this infrastructure. The emerging issues are how long and how much for the tie in.

2.3.3 Planning

As noted, the focus of the Planning component of the exercise was a review of available documentation by Synergy and the distilling of the various planning documents available for review by the Team. This review highlighted a number of germane points and emerging issues, as outlined in the sections that follow as developed by Synergy.

2007 Town of Olds Municipal Development Plan

The Town's 2006 Population was 7,428 and has grown by an average of 3.4% per year in the past decade. In addition to the permanent resident population, Olds College has full-time student enrollment of approximately 1,000, who live in Olds during the school year. The proposed rates of growth provided for this study from Town of Olds and Mountain View County are 2%, 3.5%, and 5.5% annualized rates of growth for the next 26 years to 2035. The estimated population for the Town of Olds for 2035 at 2% is 12,551 people, at 3.5% is 18,345, and at 5.5% is 30,173. Population Projections generated for Town of Olds and Mountain View County to reflect a 35,000 population in 2035 are shown in Appendix F.

The emerging issue here was related to the assessment of an appropriate growth rate for the purposes of this study. Based on historical rate of growth of 3.4% the probability of this rate to continue is more likely than the 5.5% growth rate, unless there is some economic trigger (significant momentum shift) to distribute more growth to the Town of Olds from within the region. Another major contributing factor for added growth is Olds College, since expansion of this facility would generate additional employment opportunities and increased population to support the facility.

Regional Centres like Red Deer are experiencing double-digit growth rates and will likely continue to do so to attract both employment and people. In order to achieve a rate of 5.5%, then Olds would have to position and market itself to capitalize on potential spillover growth that is not otherwise accommodated or experiencing planning and development approval delays in the City of Red Deer.

Similarly, Crossfield is also planning for industrial and commercial expansion to capture the spillover generated from the City of Airdrie and to a lesser extent from the City of Calgary. One concern with this spillover is to attract stable and independent businesses. For example, the concern with backward linked operations is that these types of operations are governed from a remote location, little or no local control over the operation, and fluctuating demand for employment in both positive and negative directions.

In essence, the assumed and aggressive rate of annualized growth at 5.5% needs to be substantiated by the Town of Olds and Mountain View County in order for it to be meaningful when applied to the current master planning activity. While the eventual population threshold will eventually be met, it will occur later if a rate of 2.75% is used than it will if a rate of 5.5% is used.

It is noted that the MDP assumes a medium growth scenario with 2.75% population growth per year and assuming residential densities of 12 units per hectare (4.9 units per acre). It is anticipated that an additional 316 hectares (5 quarter sections) will be required to accommodate residential growth anticipated between 2006 and 2036. The amount of land required to accommodate the population growth may also decrease with future amendments to the MDP and influences from new provincial legislation, which is suggesting higher residential densities upwards to 25 units per hectare (10 units per acre). A doubling of density would further reduce the amount of land to 152 hectares (2.5-3 quarter sections) to be required to accommodate the estimated growth to 2035.

In an average annual population growth of 2.75% were to be applied, the population of the Town would be expected to move beyond 10,000 around the year 2020. By 2036, the population of the Town would be nearly 16,000 if this rate of population growth were to be realized for the duration of the planning period. This rate may be more appropriate for use in this study, though this requires the input of the Town for ratification.

Future land and dwelling unit requirements as outlined in the Town of Olds MDP to accommodate the Town's needs based on the 2.75% growth rate are shown in Table 2.9. Future demand for commercial and industrial development is expected to grow at a rate 25% faster than the population rate.

Table 2.9 Future Land and Dwelling Unit Requirements

Land Use	Land/Unit Requirement
Residential Land	316.5 hectares
Residential Units	3,909 dwelling units
Commercial	181.3 hectares
Industrial	211.7 hectares

Additional points in the MDP suggest the appropriateness of the 2.75% growth rate. Key concepts shown in the Land Use Concept Map are provided below from the Town of Olds MDP in this regard:

- Sufficient land is assigned for residential use to accommodate long-term growth up to and beyond 2036 with the ability to add 18,500 to 21,000 residents to the current population of approximately 7,000 (based on 2.75% per year growth rate Olds' population is projected to reach 15,800 by 2036).

- Future school sites to meet the needs of the projected 3,700 to 4,200 additional students across all grade levels.

- Major open spaces within new residential areas in combination with school sites, relocation of the livestock components of the Ag Society uses south of 54 Street, and preservation of wetlands and similar natural features.

- Commercial land in locations accessible to future residential areas and visible along the major thoroughfares (Highway 27, Highway 2A) to meet the needs of an expanding population, create employment areas and contribute towards a balanced assessment base.

- Opportunity for the redevelopment of the existing high school site and the associated playing field north of Highway 27/46 Street.

- Balancing of future highway commercial concentrations on the west and east sides of the Highway 27/46 Street corridor with the downtown area as the central hub of the town's main commercial areas.

- Industrial areas for long-term expansion located to avoid or minimize conflict with non-industrial uses, provide choice between two major industrial areas in the southeast and the west, and provide some employment opportunities relatively close to residential areas.

- Recognition that the "more urban" components of Olds College (e.g. main academic buildings) are part of the town while the "more rural" components of Olds College (e.g. crop research fields) will remain part of the County.

- Major road network comprised of highways, arterial roads and collectors roads to manage the future increased volume of vehicle traffic with a focus on establishing a 1 mile grid of highway/arterial roads to move traffic around rather than through major residential areas.

- Identification of the downtown area and the areas generally between the railway and Highway 2A as areas that could benefit from the preparation of an area redevelopment plan to manage development pressures and changes in these areas.

- Creation of a substantial new residential area north of Highway 27/46 Street and north of Olds College to balance the long term residential areas around the Downtown/central core of the town and provide increased residential opportunities close to the college.

Other items of note as contained in the MDP related to emerging issues include the following:

Section 10.0: Housing and Neighbourhood Design

Item 10.2: (Residential Density for New Neighbourhoods) requires that the density shall be at least 12.35 dwelling units per gross developable hectare (5.00 units per acre). This translates into approximately 802 units per quarter section. Item 10.5 (Higher Density Residential Development) states that the MDP may consider the development of higher density residential uses (4 or more units). Clarification is required regarding this point, since the assumption of 16.35 dwelling units per gross developable hectare (6.6 units per acre) translates into approximately 1062 units per quarter section. The emerging issue here, then, is that new Provincial planning legislation may seek to encourage a higher minimum density requirement throughout the municipality. This would impact the form of development as well as the amount of land required to accommodate growth.

Item 10.9: (Inclusion of Non-Residential Land Uses) states that the inclusion of non-residential land uses shall be encouraged in new neighbourhoods, such as local commercial services and public uses that serve the needs of area residents to create identity and bring basic services closer to residents. A potential emerging issue may occur if there is a conflict with moving these basic services from existing established locations and these basic services struggle to survive. In other words, some basic services cannot exist on their own and require the support of other local services to be sustainable.

Item 10.12: (Student Housing) states that issues shall be reviewed as part of any area redevelopment plan prepared by the Town. This suggests that there is an existing issue and further expansion of Olds College would need to address student housing. Student housing requires good transit/transportation access, be affordable and within walking distance of essential services.

Sections 11.0 and 12.0: Commercial Development and the Downtown Core

Item 11.2: (Highway 27/46 Street Commercial Corridor) states that this area shall be the primary highway commercial area within the Town. Emerging issue, is whether or not this commercial corridor becomes the primary commercial area, not just the primary highway commercial area.

This may affect the Downtown Core, and Item 12.1 (Role of Downtown) states that the Downtown is the centre and heart of the Town and as the primary area for the highest level of administrative, retail, office, institutional, and cultural entertainment facilities. A potential emerging issue here could be (for example) that a number of Outlet Stores could locate along Highway 27, drawing retail shopping from the Downtown core and other supporting uses seeking higher visibility and closer to the highway. The real emerging issue would be the potential impact that development and increased automobile oriented development along Highway 27 could have on the Downtown core.

Inter-Municipal Development Plan

The Intermunicipal Development Plan (IDP) establishes the Olds/Mountain View County Intermunicipal Planning Commission, it procedure, conduct, functions, and duties. This document demonstrates collaboration and cooperation between the two municipalities. Given the function of this Commission, at some point in time, this Commission's duties may seek to expand to include major infrastructure such as utilities and transportation initiatives within the Study Area.

There are a number of germane documents affected by the IDP, as follows:

Bylaw No. 01/07 Highway 2/27 ASP: Overall, the Highway 2/27 ASP sets out future development patterns on the east side of the Town of Olds. The intensification of all types of development are dependent upon two (2) critical components that are iterated throughout the document; what is Alberta Transportation ultimately going to do and what will be the ultimate Servicing Strategy. There are several different and possible approaches to address these two (fundamental) questions, which are fundamental to the Transportation and Utility Servicing Strategy. The approach followed in this study incorporated a planned approach based on current available information (preliminary site information, estimated population projections, and current policies for both municipalities).

Items 2.2.5 and 2.26: (Position of Stake Holders: Town of Olds and Olds College). The Town of Olds has expressed concerns over the impact that development along the Highway 2/27 intersection could have on the Town's economic growth, attracting businesses, regional residents and traveling public away from Olds. Olds College is a major landowner in the Plan Area and has plans to develop their area. Notwithstanding the intent to develop, this ASP does not hinder nor facilitate the integration of Olds College into the surrounding context. As a result, there are potential emerging issues pertaining to access and servicing if Olds College is not at the table. Olds College is such a significant piece of the puzzle and their participation and integration is essential.

Item 2.2.9: (Intermunicipal Issues) reflects the IDP which is intended to enhance opportunities for joint planning, referrals and future financial discussions around infrastructure. The Town of Olds MDP is planned to extend 1.5 miles beyond the Town boundaries in all directions. Projections for the land use needs are made for the next 30 years, to approximately 2036. The population is expected to be between 16,000 and 20,000 for the Town of Olds at this horizon. A comment was made in the Highway 2/27 ASP that the Town has not grown to the east, due to restrictions of oil and gas transmission lines and expenses of growth to the east. Based on preliminary findings, the analysis does not support this view. Further analysis in the next part of this Study will begin to address this question on the direction of growth and limits of growth.

Item 4.3: (Principles of Development) deals with the current principles of locating businesses around the Highway 2/27 interchange. Residential development around the golf course, and entranceway development along Highway 27 appear to be supported. Notwithstanding, this should also be caveated with appropriate access to Highway 27; further review may be required to enhance the interface and safety at these strategic intersections. There appears to be too much emphasis within the ASP that servicing will drive a concentration of development to provide guarantees versus a well thought out plan that both the County and Town of Olds can support. Servicing alone will not guarantee anything, except that services will be available. Another principle is that interim development must be supported by overlays, which will show how development will look when services are available. The emerging issue is whether or not the demand will support this type of development and whether or not there is a critical mass to generate or create a destination.

Item 5.2: (Conservation Residential Land Use) suggests that the number of units that are estimated based on the Future Land Use Concept is limited to the following areas:

- Residential - 6.5 quarter sections
- Mixed Use - 1.5 quarter sections
- Future Development (not within the 20 year time horizon) - 5 quarter sections
- Future Urban Development (anticipated to be annexed and developed within the Town of Olds) - 2 quarter sections

At full build-out based on maximum number of units per quarter section (240/quarter section) x 8 quarter sections = 1,920 units within the 20 year time horizon and 3,120 units after the 20 year time horizon. Assuming 3.2 persons per household this would translate into 6,144 people within the 20 year time horizon and 9,840 people after the 20 year time horizon. The recent population projections for the Study Area assumes three (3) annualized growth rates of 2%, 3.5%, and 5.5%. Under the 2% annualized growth rate it appears the population would increase to 12,500 people, at 3.5% annualized growth rate would increase to 18,500 people, and at 5.5% annualized growth rate the population would increase to 35,000.

Estimated population projections for the entire Mountain View County Study Area to 2035 is only estimated to account for only an additional 3,837 people or an additional 1,199 units assuming 3.2 people per unit. If all this growth was accommodated only within this ASP area then it would require 5 quarters sections at a density of 240 units/quarter section. In the event that servicing is not extended to this area in a timely fashion then the density drops to 59 units/quarter section and to accommodate the same amount of development would then require 20 quarter sections.

The emerging issue is that servicing and obtaining 240 units/quarter section is essential to concentrate residential development as envisioned in the ASP. However, further intensification beyond 240 units/quarter section should be considered. One point five (1.5) units per acre would be a maximum in rural area versus 7 units per acre in urban area create and demand entirely different levels of infrastructure.

Item 5.3: (Entranceway) notes that special treatment for future development along Highway is required and that ultimate development is dependent upon the provision of piped and communal servicing. Uses considered appropriate include: institutional uses, business campus, research park, highway commercial and retail, complement agricultural focus, smaller-scale commercial uses, and other uses deemed appropriate by the County.

Item 5.4: (Business Park Development) notes that the intersection/interchange of Highways 2 and 27 is the focus of this ASP for both highway commercial and light industrial. Development of and access to this land shall be coordinated with the Highway 2 Corridor Management Study done by AT in 2006. Again, ultimate development is dependent upon the provision of piped and communal servicing. All access will be predicted on the long-term access management plan prepared by AT, and the first phase is planned to occur on the immediate west side of Highway 2, then the east, and then the rest long term. Access to this parcel has been shown to be limited to a single location. This may need to be re-visited in the long-term transportation forecast exercise.

Item 5.5: (Mixed Use: Residential and/or Business Park) shows this land use to be located south of the Entranceway. It will need to be flexible to respond to the needs of Olds College as it grows. It is noted that a large equestrian centre is proposed for the northeast corner of the College campus and the hope is that area east of the equestrian centre could be mixed use area for manufactured homes and business park. The emerging issue regarding the large equestrian centre proposed is if Minimum Distance Setbacks (MDS) for intensive agricultural operations would be applicable and how that would impact the development potential of adjacent lands.

Item 5.6: (Future Development) identifies two areas that are dependent upon markets and development on this land could go beyond the 20-year time frame generally considered in the ASP.

Item 5.7: (Future Urban Development) suggests that the area along Highway 2A is most likely to be annexed into the Town of Olds for future urban development. This will need to be considered in staging the area.

Item 5.11: (Intermunicipal Cooperation) notes that there is a vested interest for both municipalities to work together to ensure that land use and development do not create conflicts. The IDP is a mechanism that enables these municipalities to work through issues and conflicts in good faith. It is critical that the intermunicipal cooperation is sustained. Although Olds College is not a municipality and likely that neither the Town of Olds nor Mountain View County would want to consider Olds College under this umbrella. It begs the question of how to integrated or work with this third party at a higher level of governance, given their significant land holding area and potential impact on servicing and transportation for both municipalities.

Item 6.0: (Development Phasing) confirms that phasing is dependent upon extending services to this area.

Item 7.0: (Plan Implementation) recognizes that the County MDP is the guiding document for all development within the municipality. As such, the Highway 2/27 ASP may have to be revisited and amended to be in compliance with the newly amended County MDP. This item will require clarification by the Town and County.

2009 Mountain View County Municipal Development Plan

The Mountain View County MDP as does the Town's MDP covers the goals and objectives in terms of growth management, land use development, economic development, environmental management, commercial, residential and industrial development, transportation and utilities amongst additional items. The components of the County's MDP will also significantly assist in the future land use development as well as transportation and utilities that this Master Plan will include:

Section 3.0: Residential Land Use Policies

Item 3.3.4: (Medium Density Rural Residential Development) with a density between six (6) and eighty (80) lots per quarter section shall be considered for land use re-designation and subdivision and may be supported. As well, Item 3.3.5 states that to warrant an increase in density above 80 lots, up to a maximum of 240 lots per quarter section, density bonusing criteria shall be met.

An emerging issue here is that these rural residential densities range from 1.2 units per hectare (0.5 units per acre) to 3.7 units per hectare (1.5 units per acre). New Provincial planning policies are encouraging higher density development. The question remains whether or not the Province will stipulate a minimum density to access the regional water and wastewater services planned to be extended through Mountain View County to the Town of Olds.

Another item in this section (3.3.10) states the following:

"All residential development approved under section 3.3.3, 3.3.4 and 3.3.5 shall be within 800 m of the County Collector Network (CCN); proposed multi-parcel residential development farther than 800 m from the CCN shall not be considered. (Amended Bylaw No. 06/09, June 3, 2009)"

The recently approved Netook Crossing ASP and Mountain View County Business Park ASP include residential areas that are both located farther than 800 metres from the CCN. It is therefore assumed that since these ASP's were approved prior to the above statement which was added to the bylaw in June of 2009 the 800 metre condition does not apply.

This amendment to the original MDP requires further clarification and confirmation from Mountain View County. The term "shall" is a directive term that indicates that the actions outlined are mandatory, therefore must be complied with, without discretion. By contrast, "should" is a directive term that provides direction to strive to achieve the outlined action, but is not mandatory. When the policy is directed to the developer, the onus is on the applicant to justify why the desired action/result is not proposed and/or will not be achieved. As well, the term "may" is a discretionary term, providing notification that the policy in question can be enforced if the County chooses to do so, and is usually dependent on the particular circumstances of the specific site and application.

The County Collector Network (CCN) is referred to throughout the MDP and is stated as being "the official recognized road network for which long term plans for maintenance and/or upgrading exist and may or may not include asphalt paved, chip sealed and gravel roads." When this definition is compared to *Schedules A: Figure 4 County Collector Network and Growth Centre - Olds Appendix B(b) of the MDP*, then it becomes less clear whether or not local roads are also considered as part of the County Collector Network. If local roads are included then it would address some potential emerging issues, such as limiting development along collector standard roads only. Further clarification and confirmation is required, particularly how it applies to the Highways 2/27 Area Structure Plan.

Section 4.0: Economic Development and Land Use Policies

There are a number of policies within this Section of the MDP that provide guidance to general location and access for economic development within the Study Area, as outlined below:

Item 4.3.13: (Municipal Road Access to all Business Parks or Highway commercial/entranceway Commercial Sites Shall be Restricted), but if located on a Provincial highway, Alberta Transportation shall determine the access points and standards for development. If located on a county road the County shall determine the local road access points and the standards for development. (Amended Bylaw No. 06/09, June 3, 2009). The potential emerging issue here is related to a situation where interim access and interim uses are impacted by the restricted access. Further to this point, restricted access requires further planning and collaboration amongst effected landowners in order to ensure ultimate access is protected to the surrounding road network.

Section 8.0: Transportation and Utilities

Item 8.3.6: states that MVC shall continue to negotiate with Regional Servicing Commissions for membership and access to piped treated water. (Amended Bylaw No. 06/09, June 3, 2009). The emerging issue here refer to whether this is confirmed and whether there are any minimum requirements (density) to gain membership and access to piped treated water. This requires clarification.

Item 8.3.7: states that MVC shall apply access management guidelines in the review and evaluation of subdivision applications proposing access from the CCN. (Amended Bylaw No. 06/09, June 3, 2009).

Item 8.3.8: states that MVC shall require that all rural residential development within 800 metres of the CCN be accessed via the planned provision of an internal subdivision road. The County shall require the preparation of a concept plan (small development) in support of all redesignation and subdivision applications within 800 metres of the CCN to address this requirement and where appropriate shall require road dedication as a condition of subdivision approval. (Amended Bylaw No. 06/09, June 3, 2009). As noted earlier, the emerging issue is that this new policy appears to limit all rural residential development to occur within 800 metres of the CCN. The issues that may emerge are situations where development can be supported beyond the 800 metres of the CCN where it is fully serviceable. As also noted earlier, clarification is required in terms of this issue.

Item 8.3.9: states that MVC shall continue to negotiate with urban municipalities for extension of services into the rural area, into the inter-municipal development plan areas and other adjacent rural developments that exist prior to the adoption of this plan. (Amended Bylaw No. 06/09, June 3, 2009). The emerging issue here relates to whether this is confirmed and whether there are there any minimum requirements (density) for extending servicing into the rural area. This is a critical component on the intensification of the Highways 2/27 ASP.

Item 10.3.5: states that subdivision and/or development applications located more than 800 metres (1/2 mile) from the CCN may be considered premature, and not suitable for development. The emerging issue here involves a need for clarification on the definition of the CCN. The above noted policy does not differentiate land use and therefore appears that this policy would apply to all land use districts. The only saving portion of the policy is that is may be considered, should the municipality wish to relax this discretionary policy.

3.0 CONSULTATION PROCESS

The objective of the consultation process was to ensure that the Steering Committee was completely involved and conversant with the process, and that the public had meaningful opportunities to provide input into the development of the transportation and utility study, and to enhance the public's understanding of the need for the recommendations and initiatives outlined in the plan. To this end, several specific measures were undertaken to ensure adequate consultation throughout the study. These included the following:

- A total of five Steering Committee meetings throughout the process. The Steering Committee included representatives from the Study Team (Bunt & Associates, BSEI and Synergy) as well as representatives from the Town and County Engineering and Planning Departments.

- Two half-day design charrettes involving the full Steering Committee.

- Two public Open Houses, on November 12, 2009 and May 11, 2010. Total attendance at these two events was close to 100 people, with the majority attending the second Open House. Advertising was undertaken by the Town and County as per the requirements of the Municipal Government Act with the requisite media releases.

- One on-line interview survey open to all residents of the study area. The survey was completed by a total of 175 people.

A summary of the Open Houses and Design Charrettes is outlined in the following sections.

3.1 Open Houses

3.1.1 Open House #1

The first Open House was intended to introduce the public to the process for the Master Planning exercise, and to provide a means for input to the process. Representatives from Bunt & Associates, BSEI, the Town of Olds and Mountain View County were all present at the Open House to answer questions and to discuss ideas and the study process with the public. People were also invited to fill out comment forms to ensure that their input was recorded and addressed by the project team.

The Open House was held near the beginning of the project on November 12th, 2009 between 4:00 PM to 8:00 PM. A total of approximately 23 people attended the Open House that provided information on the nature of the project and on existing conditions, traffic counts and utility information. Attendees were provided with forms to record their comments on the information presented, and to highlight issues that they wished to see considered as part of the study process. The Open House display panels and a transcription of the comments are included in Appendix G of this report.

In general, the people that commented on the information presented at the Open House confirmed their desire to see a transportation and utility study that dealt with the existing issues and as well, sought to plan the Town and County in a manner that would allow it to maintain a reasonable degree of mobility.

From the comment forms collected, the emerging issues that were raised are summarized below:

- Truck bypass required for Highway 27
- Trucks should be restricted to using right lane on Highway 27 only
- Trail/Bikeway System Required
- Railway crossings in close proximity to intersections, with increased traffic higher safety concern.
- North/south corridor required on the west side of Town
- East/west corridor required on the west side of Town
- Potential airport redevelopment may cause traffic issues
- Traffic volumes on Winter Drive are problematic
- Highway 27/52nd Avenue intersection requires improvements for safety
- Highway 2A/ 55th Street is a bad intersection
- Storm drainage NE 30 – floods 57th Avenue

Additional issues and more detailed description of the comments may be found in Appendix G. These issues that were raised will either be addressed through the short term or long term recommendations in the study. It was noted that there was considerable input provided regarding the need to address immediate or traffic issues.

3.1.2 Open House #2: May 11, 2010

The purpose for this Open House was to provide the public an opportunity to receive and comment on the proposed recommendations that were developed as part of the overall Master Plan, and to provide feedback on those recommendations. Representatives from Bunt & Associates, BSEI, the Town of Olds and Mountain View County were all present at the Open House to answer questions and to discuss the recommendations with the public. People were again invited to fill out comment forms to ensure that their input was recorded and addressed by the project team.

The Open House was held near the end of the project on Tuesday May 11th, 2010 between 4:00 PM to 8:00 PM. A total of approximately 70 people attended the Open House. The Open House display panels and a transcription of the comments are included in Appendix G of this report.

In general, the people that commented on the information presented at the Open House were supportive of the overall direction of the exercise, and supported the majority of the items identified as necessary in the recommended plan. The most contentious item was related to the alignment of the proposed east/west arterial road along the southern edge of the existing Town developed area. Residents in the adjacent community continued to express significant desire to see the roadway shifted further to the south.

3.2 DESIGN Charrettes

3.2.1 Charrette #1

The first charrette focused on the amalgamation of all available information in a single overall plan that was generated with the Steering Committee. The base maps summarized here in Appendix A were used as a basis for the structure of the meeting.

This activity established the basis for all subsequent analysis and will establish such things as planning areas, land use expectations, basic design opportunities and constraints as well as the compilation of existing data and emerging issues from all three disciplines (transportation, planning, and engineering), as Suitable and Sustainable Areas for Development.

The output from Charrette #1 was used as a basis for the go-forward efforts in Design Charette #2 and the subsequent modeling exercises in the Transportation and Infrastructure disciplines.

3.2.2 Charrette #2

Design Charrette #2 and the work that immediately followed laid out the groundwork for the go-forward analysis and modeling effort. This exercise sought to layout the estimated directions for development within the study area (in terms of actual directions and quarter sections) and as well, sought to identify appropriate population and employment forecasts by cell for use in developing the forecasting models for the traffic and utility efforts.

While the Town and County had approved a number of Area Structure Plans (ASP) for certain parts of the study area, much of the study area had not been given significant consideration in terms of land use and infrastructure servicing. Considerable population forecast data was available from the Town for many cells, but employment data was not available, nor was there significant data available from County cells other than those for which ASP document had already been completed.

Preliminary population information was received from the Town and the County for cells of known/approved land use. Including all known areas of approved development, and cells where expectations where clear suggested a total population of approximately 41,000 people for the cells in question. While this was slightly greater than the 35,000 population horizon specified for Long Term analysis in the study, it also did not include consideration of all of the lands contained within the project study area. In essence, it suggested that only part of the overall study area identified for the overall master planning exercise would need to be developed in order to facilitate the accommodation of the desired 35,000 population threshold.

This incongruence was not wholly unexpected, nor was it unreasonable. Long term planning is often difficult when the limitations of the servicing infrastructure are not completely known, or where the incremental effort to expand certain aspects of the infrastructure network have not been assessed. To this end, part of the purpose for undertaking the Master Plan was to seek to develop and assess criteria to enable the Town and County to expand their respective population and employment bases in the most efficient manner possible. This was undertaken by the Bunt/BSEI/Synergy Team through the development of a criteria evaluation matrix.[10] The development of this matrix was commenced at Design Charrette #2 with the Steering Committee.

During the second Design Charrette on January 19th, 2010, the Bunt/BSEI/Synergy Study Team and the Steering Committee participated in developing the criteria for use in developing a comparative matrix. The matrix itself was made up of a series of cells, each representing a section or sections of land within the area up to and including all of the Inter-Municipal Development Plan, and the Highway 2/27 Area Structure Plan areas. The land use expected for each cell was provided by the Steering Committee.

The steps followed in developing the matrix, and the conclusions resulting from its development are outlined below.

Development of Criteria

Prior to examining any individual cell, the Steering Committee and Study Team sought to develop a series of criteria by which each cell would be evaluated, and compared with other cells. A score of zero (0) to two (2) was given for each criteria in each cell. A lowest score of zero (0) reflected optimal opportunity for development, with limited constraints for the individual criteria in question. A highest score of two (2) reflected a constrained condition with little opportunity to accommodate the criteria without incurring significant cost, effort, or other difficulty.

These criteria included the following:

- *Preliminary Planning:* This referred to the presence or absence of existing planning documents such as ASP reports or other items that outlined plans for the development of the area. The presence of existing, approved ASP or other planning documents resulted in a score of zero (0). If some planning effort was evident, then a score of 1 was assigned. If no planning effort had been previously undertaken, then the cell received a score of 2.
- *Environmental Issues:* Issues related to the environment included the topography of the land, location of water courses, sensitive areas (flora, fauna etc.) and other issues related to protection of lands currently not developed. Cells with no issues where development could occur without impacting sensitive environmental issues were given a score of zero (0). Areas with modest issues were assigned a score of one (1). Areas with significant issues or constraints were assigned a score of two (2).
- *Oil and Gas Activity:* The presence of sour or sweet gas wells and oil wellhead facilities was reviewed in considerable detail. Regulated setbacks from gas facilities would result in significant impacts to the developability of certain parcels. Areas with few or no issues were assigned a score of zero (0). Areas with modest but not insurmountable issues were assigned a score of one (1). Areas within setbacks and other areas where constraints were also significant were assigned a score of two (2).

[10] As directed by the Steering Committee and as per the original project scope, the matrix analysis area was expanded to accommodate a projected population of approximately 41,000, which is slightly greater than the 35,000 population horizon specified in the original project scope. As a result, there are additional tracts of land/quarter sections within the Mountain View County MDP growth centre boundary and the study area boundary that are not included in this analysis.

- *Water:* Accessibility to water supplies was a significant item in terms of the developability of a cell. Areas served by regional municipal water supplies were assigned a score of zero (0). Areas with piped communal water were assigned a score of one (1), and areas with only groundwater were assigned a score of two (2).
- *Wastewater:* Accommodation of wastewater was also a significant item in terms of the developability of a cell. Areas served by regional municipal sewer services were assigned a score of zero (0). Areas with communal systems under capacity conditions were assigned a score of one (1), and areas with only private/septic wastewater facilities were assigned a score of two (2).
- *Stormwater:* The accommodation of storm water was considered to be significant, and areas with exiting regional municipal storm water accommodation were assigned a score of zero (0). Areas with some on-site facility accommodation were assigned a score of one (1), and areas with no storm water planning in place, and no facilities available to accommodate storm water were assigned a score of two (2).
- *Agriculture:* Much of the land surrounding the Town and within the County is currently used for agricultural purposes. Conversion of this land to developed land will be affected by the nature of the uses and the extensiveness of use made of the lands today. Lands where there is an approved non-agricultural use within an ASP was assigned a score of zero (0). Areas with an approved agricultural use within an ASP were assigned a score of one (10, and areas without an ASP on which agricultural uses are currently evident were assigned a score of two (2).
- *Subdivision:* The organization of land ownership within a quarter section or section of land will affect the ease with which the development of that land can occur. Lands with multiple or fragmented ownership will be more challenging to develop than lands with single ownership, for example. In this analysis, lands exhibiting single ownership or minor fragmentation of ownership were assigned a score of zero (0). Lands with two to five separate owners and/or lands with good consolidation opportunities were assigned a score of one (1). Lands with greater than five owners and/or with limited or awkward consolidation opportunities were assigned a score of two (2).
- *Road Network Capacity:* Developability of land is affected by the capacity of the road network that serves it. Clearly the size of roadways needs to be tied to the intensity of development, with larger more robust roads designed to accommodate more intense or extensive development areas. The Town and County road network was assessed and values assigned to the criteria based on the nature of the roadways serving or immediately adjacent to the lands in question. Areas serviced by highways or other extremely high-volume accommodating roadways were assigned a score of zero (0). Areas serviced by arterial or collector roadways were assigned a score of one (1) and areas serviced by local roadways were assigned a score of two (2).
- *Accessibility:* While proximity to a large roadway corridor will implicitly provide increased capacity and enhancement of the accommodation of development, it is of little benefit if not accompanied by quality access. Direct access to highways is generally not allowed by Alberta Transportation, but within the limits of the study area it will be possible to accommodate access along Highway 27 and Highway 2A in particular. Specificity of access will need to be reviewed on a case by case basis. However, in general terms lands with direct access to

adjacent roadways of any classification were assigned a score of zero (0). Areas with indirect access to major roadways, but nonetheless feasible, were assigned a score of one (1). Areas where access is both indirect and awkward or infeasible were assigned a score of two (2).

Once the criteria had been identified, reviewed and approved for use by the Steering Committee, each of the cells in the study area were assessed comparatively, using all of the criteria. None of the criteria were weighted for the purpose of this analysis.

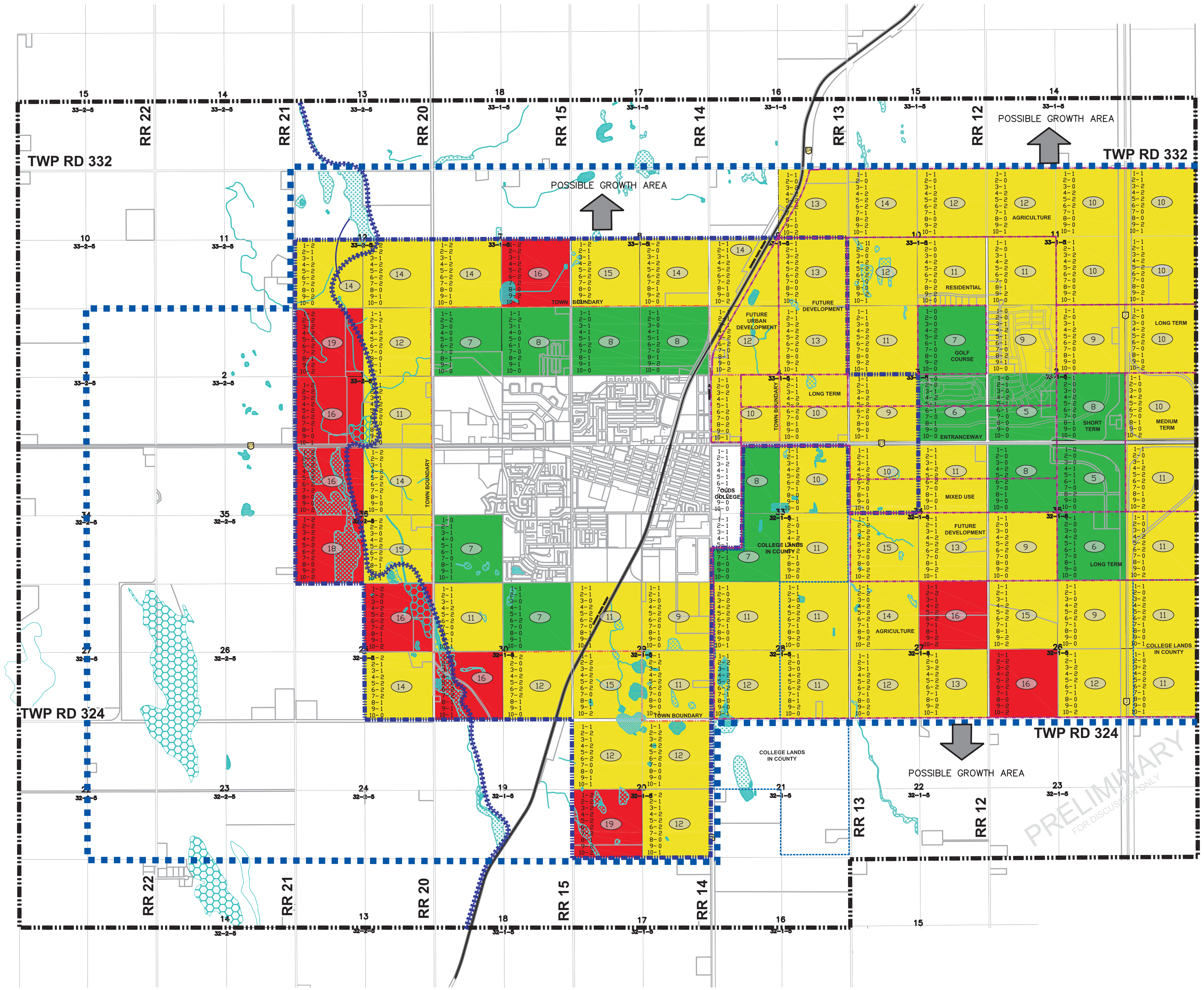
Once the individual cells had been reviewed on the basis of each of the ten criteria, the total score for each cell was calculated by summing the individual criteria scores. The lowest possible score was zero (0), and reflected optimal conditions for unimpeded development. The highest possible score was 20, which reflected extremely constrained conditions and a considerable unlikely nature for development. Scores of eight (8) or less were grouped into a single category for optimal or likely development, and assigned a colour of green. Scores of 16 or more were grouped into a single category for unlikely or difficult development, and assigned a colour of red. Scores of nine (9) to 15 reflected cells that may be developed, but with issues greater than those of the green cells, but not as limiting as those of the red cells.

With the colours assigned, the matrix then provided a 2009/2010 snapshot of possible development patterns for the study area. The matrix analysis results are summarized in **Exhibit 3.1**, which shows the overall scores of each cell for each criteria and shows a resulting colour of green, yellow or red for each cell. In essence, an ideal development pattern for the Town and County would seek to follow the green areas to the extent possible, with forays into yellow areas with scores closer to nine (9) than 15 if possible and efficient.

Review of Matrix Output

A review of the output from the matrix provided some very obvious and at the same time, very subtle information and preliminary conclusions. Main findings included the following:

- The encouragement of urban expansion westward should be considered with caution. Based on the available base mapping, this area appears to be constrained by the topographic relief with an associated wide meandering creek(s), and extensive oil and gas activity. This physical evidence is further supported by the resulting higher scores (overall quarter section) confirming the challenge to move westward. It is important to note that this does not preclude expansion to the west, but it must be recognized that it will be more challenging to expand westward to overcome the inherent features/situation of the lands in this area relative to other surrounding areas. At this preliminary level of review, the westward expansion direction appears not to be supportable.



LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- 2/27 ASP BOUNDARIES
- I.D.P. BOUNDARY
- DEVELOPMENT CONSTRAINT LINE
- POND / WET LAND
- ENVIRONMENTALLY SENSITIVE AREA
- RIVER / CREEK

MATRIX

- (1–8) DEVELOPABLE WITH NO OR MINOR CONSTRAINTS
- (9–15) DEVELOPABLE WITH SOME CONSTRAINTS
- (16–20) DEVELOPABLE WITH CONSTRAINTS
- MOUNTAIN VIEW COUNTY GROWTH CENTER

Criteria

1. **Preliminary Planning**
   - None = 0
   - Some = 1
   - Planned = 0
2. **Environment**
   - None = 0
   - Some = 1
   - Lots = 2
3. **Oil & Gas**
   - None = 0
   - Some = 1
   - Lots = 2
4. **Water**
   - Regional/Municipal = 0
   - Piped Communal = 1
   - Groundwater = 2
5. **Wastewater**
   - Regional/Municipal = 0
   - Communal = 1 at capacity
   - Private/Septic = 2
6. **Stormwater**
   - Integrated Regional/Municipal = 0
   - Some on Site = 1
   - Absence = 2
7. **Agriculture**
   - Approved ASP for different use = 0
   - Approved ASP for ag = 1
   - Not Approved (planned) = 2
8. Subdivision
   - Single Ownership = 0
   - 2-5 owners =1
   - >5 owners = 2
9. **Road Network Capacity**
   - Highway/ Expressway = 0
   - Collector/ Arterial = 1
   - Local 2
10. **Accessibility**
    - Direct0=
    - Indirect by feasible = 1
    - Indirect & awkward = 2

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Matrix Analysis Results

Exhibit 3.1

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- Current development and planning activities appear to promote an eastward bend, and the future growth seems to want to continue to follow this trend. Along with this perspective, there may be seen an opportunity for further north-south development being supported in both rural and urban expansions. This is supported by existing planning policies and evidence of resulting lower scores (overall quarter section) suggesting this area is more suitable to accommodate growth. One of the primary reasons is that this area has fewer development constraints and/or the ability to develop around development constraints to allow for contiguous development. Furthermore, future regional infrastructure and improvements to the area infrastructure will also support further expansion and development activity on the east side of Olds.

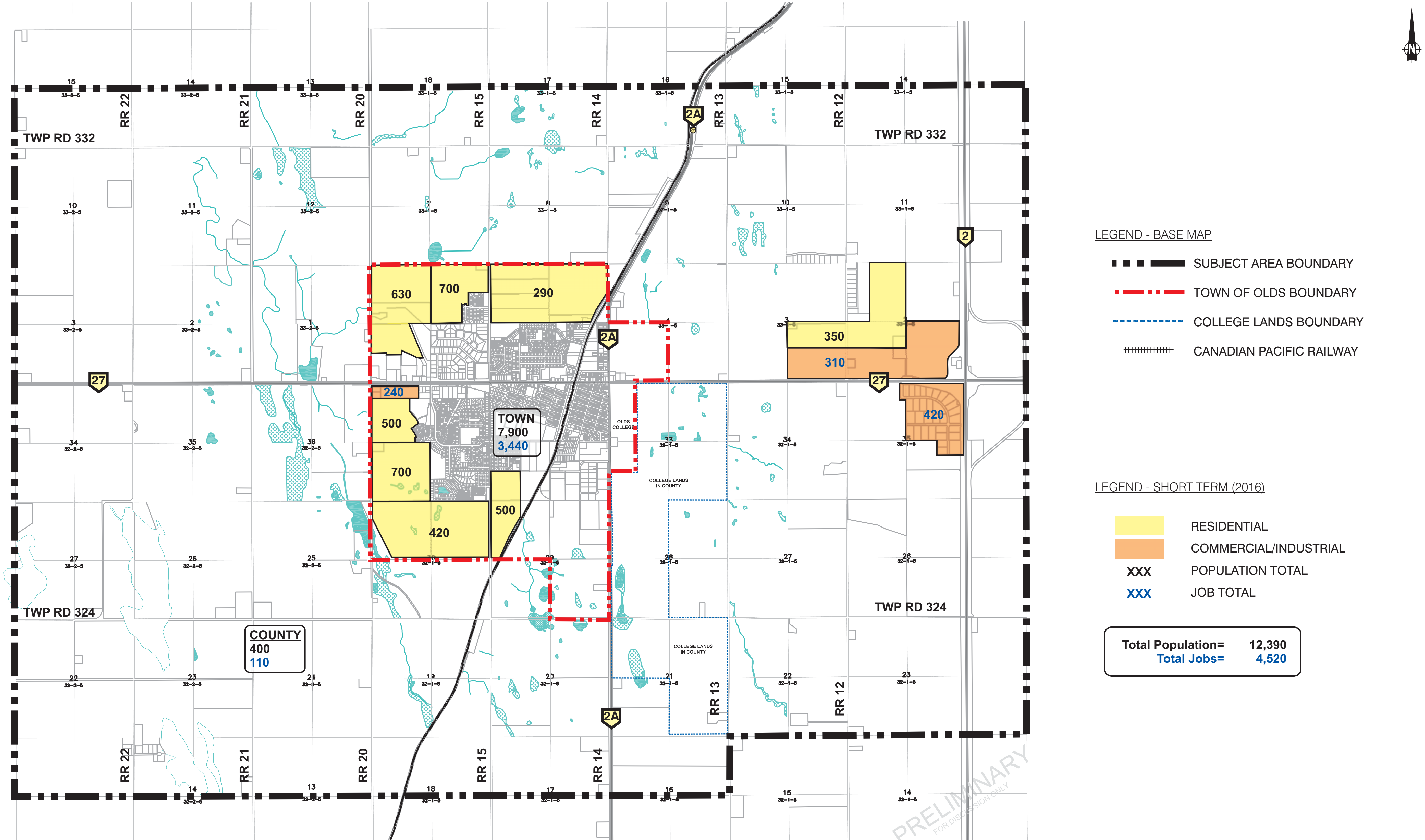
With the matrix completed, the Steering Committee and the Study Team focused the direction of development for the purpose of the completion of the program outlined in the proposal. The output from the matrix was reviewed through a collaborative participation process, and appropriate growth corridors were developed for the purpose of forecasting and analysis. Those corridors were confirmed for the purpose of forecasting and analysis as follows:

- Immediate short-term improvement will occur in the approved ASP areas, totaling 4090 additional people for an overall study area population of 12,390.

- The next stage of development beyond these cells would be most effectively directed to the green and possibly yellow cells, totaling a further 22,210 people for an overall study area population of approximately 34,600. Note that this essentially fills in the remaining green areas at the north edge of the Town.

This brought the horizon to something reasonably close to approximately 35,000 people, which was the horizon sought in the original project scope. However, it did not reflect a large expanse of physical area, and provides limited identification of trend lines for the planning of infrastructure beyond the 35,000 population horizon, since the growth is largely close to the core areas. With that said, the expected population and employment growth for the Short Term (13,000) and the Long-Term (35,000) are illustrated on Exhibit 3.2 and Exhibit 3.3 respectively.

Notwithstanding this, the output from the matrix and associated review and collaboration with the Steering Committee did allow the Study Team to proceed with the forecasting exercises in terms of traffic and utility planning. Bunt & Associates and BSEI then developed models in terms of zones, nodes and links and included all of the areas noted here. As well, all of the remaining cells that were not specifically developed by the 35,000 population horizon were included in the model framework so as to allow the model to be used in the future when these areas do start to develop, without the need to re-tool it. As well, the matrix is a potential “live” document that can and should be reviewed by the Town and County on a regular basis to see if and how the direction of development may alter in the future as the Town and County become more populous.



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Short Term (13,000) Employment & Population

Exhibit 3.2

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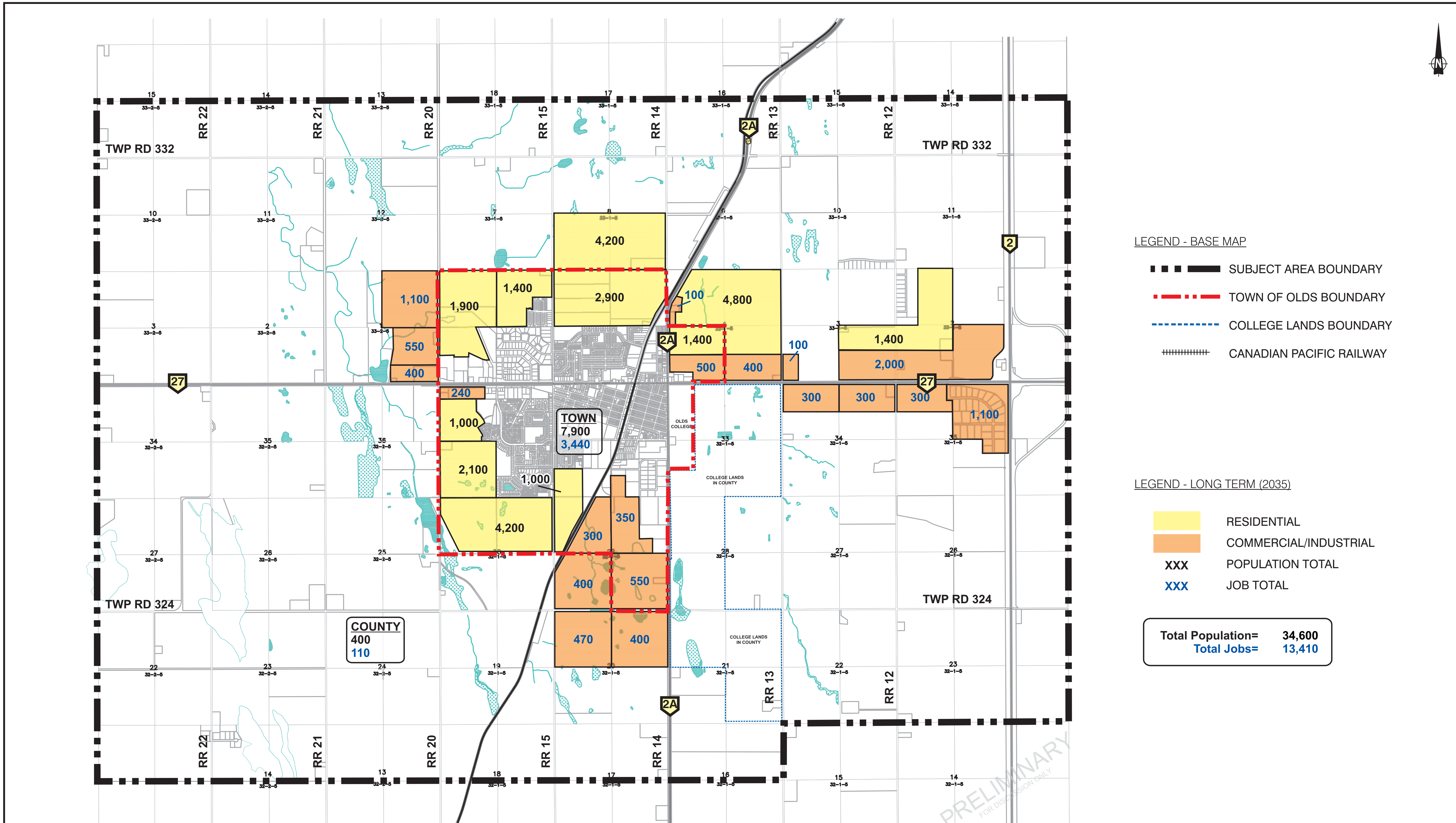

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Long Term (35,000) Employment & Population

Exhibit
3.3

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4.0 TRAFFIC FORECASTING MODEL DEVELOPMENT

4.1 Background

As part of the *2009 TMP* exercise, a transportation model was developed to represent existing traffic volumes and to forecast expected traffic volumes for the short and long term horizons. The model was based on land use, population, and employment information as developed with the Town and County through the matrix exercise as well as the data obtained from the on-line travel survey. This data was than used to calibrate to existing traffic volumes observed on Town and County roadways.

Since the development of a traffic forecasting model represented the largest single item in the project work program, it was determined that a full chapter of discussion was appropriate. This section discuses the manner in which the model was developed and the issues identified as a result of that exercise.

4.2 Development of traffic Forecasting model

4.2.1 Introduction

This section of the report is intended as a guide for those using the Town of Olds and Mountain View County model as developed by Bunt & Associates, and to understand in a general sense how the model was built and implemented. The model contains three steps in the standard four-step planning process: trip generation, trip distribution, and assignment. Mode split, in particular the role of public transit, was not considered in the model's development but could be added as a separate exercise if desired.

4.2.2 Data and Network

Road and Intersection Coding

The VISUM software platform was used, specifically, version 11.03-00. Base network information was imported from NAVTEQ tiles and modified by Bunt & Associates based on field observations of roadway classification, number of lanes, capacity, speed, intersection controls, etc. Table 4.1 summarizes the link coding.

Table 4.1 Assumed Link Volumes and Speeds

Link Type	Per Lane Per Hour Capacity (vehicles)	Free Flow Speed (kph)
Highway	1600 – 1800	110 – 120
Arterials	800 – 1200	60 – 90
Collectors	600	60
Locals	600	35 – 50

Link and node delay are defined in the model stream. Exhibit 4.1 and Exhibit 4.2 demonstrate the link and node delay function used in the Town/County model. Delay functions serve to define how much impedance one experiences by using a specific road or passing through an intersection.

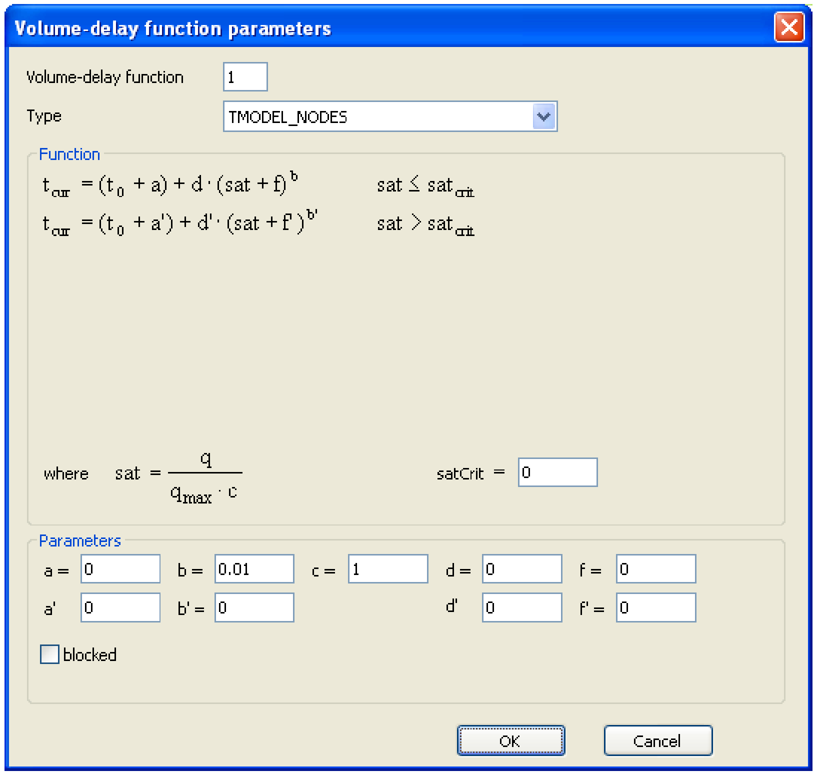


Exhibit 4.1: Node Delay Function

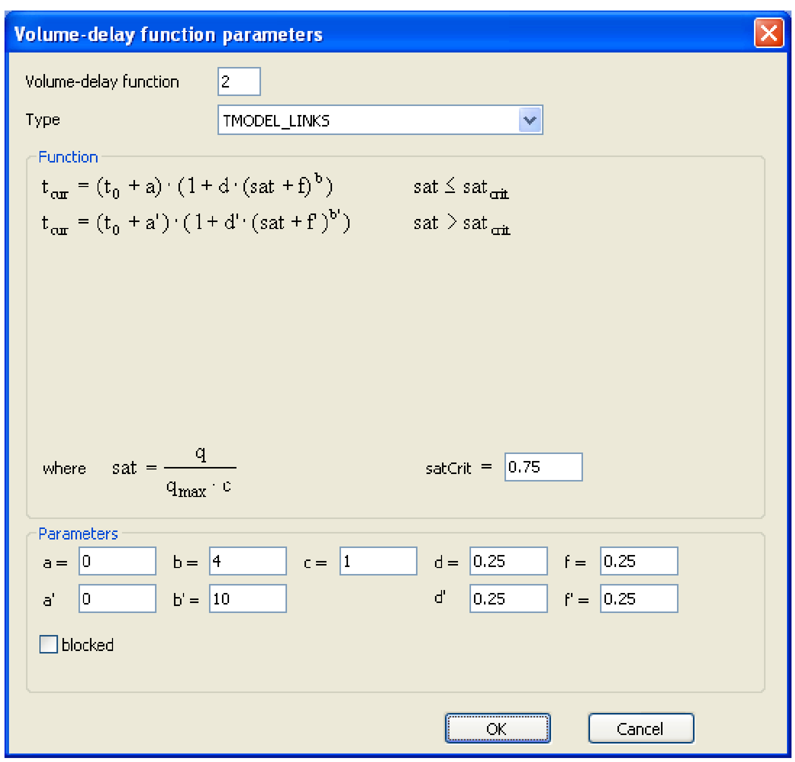


Exhibit 4.2: Link Delay Function

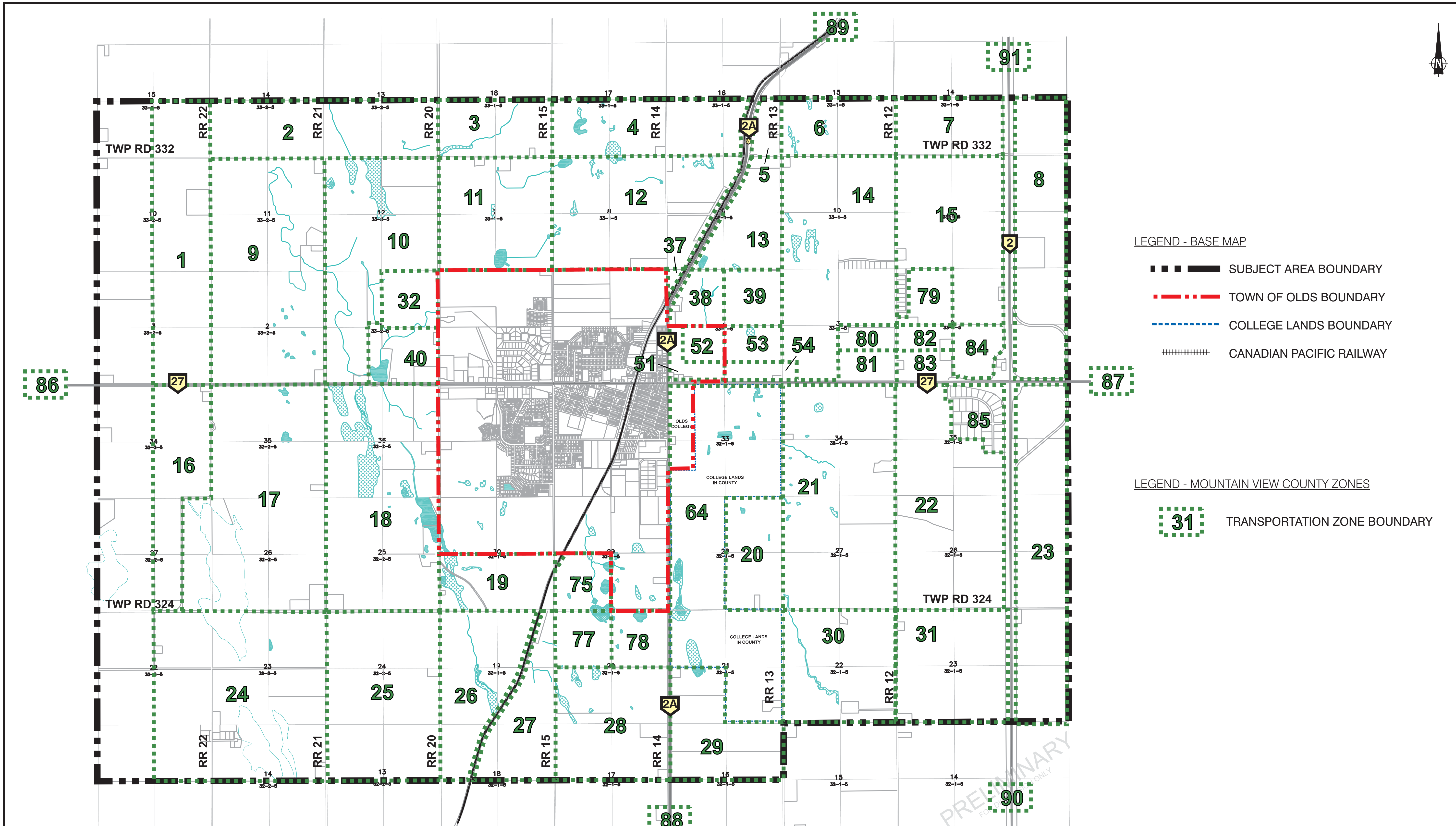
Land Use and Transportation Analysis Zones (TAZ)

The Town of Olds and Mountain View County was broken into 91 Traffic Analysis Zones (TAZs) based on land use recognized in the Municipal Development Plan. The zone system consisted of 85 “internal” zones that represented land uses inside the Town of Olds and Mountain View County and 6 “external” zones that represented highway crossings of the model boundaries. The external zones included the following:

- West: Highway 27 (Zone 86);
- East: Highway 27 (Zone 87);
- South: Highway 2A (Zone 88) and Highway 2 (Zone 90);
- North: Highway 2A (Zone 89) and Highway 2 (Zone 91).

The zone system is illustrated at **Exhibit 4.3** for Mountain View County and **Exhibit 4.4** for the Town of Olds.

Connectors are the network objects in VISUM that are used as links for trips originating and terminating at a zone. VISUM supports multipoint assignment, wherein multiple connectors can be created for one zone with specific weights/percentages so that loading and exit points for trips can be accurately represented.



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Mountain View County Transportation Zone Map

Exhibit
4.3

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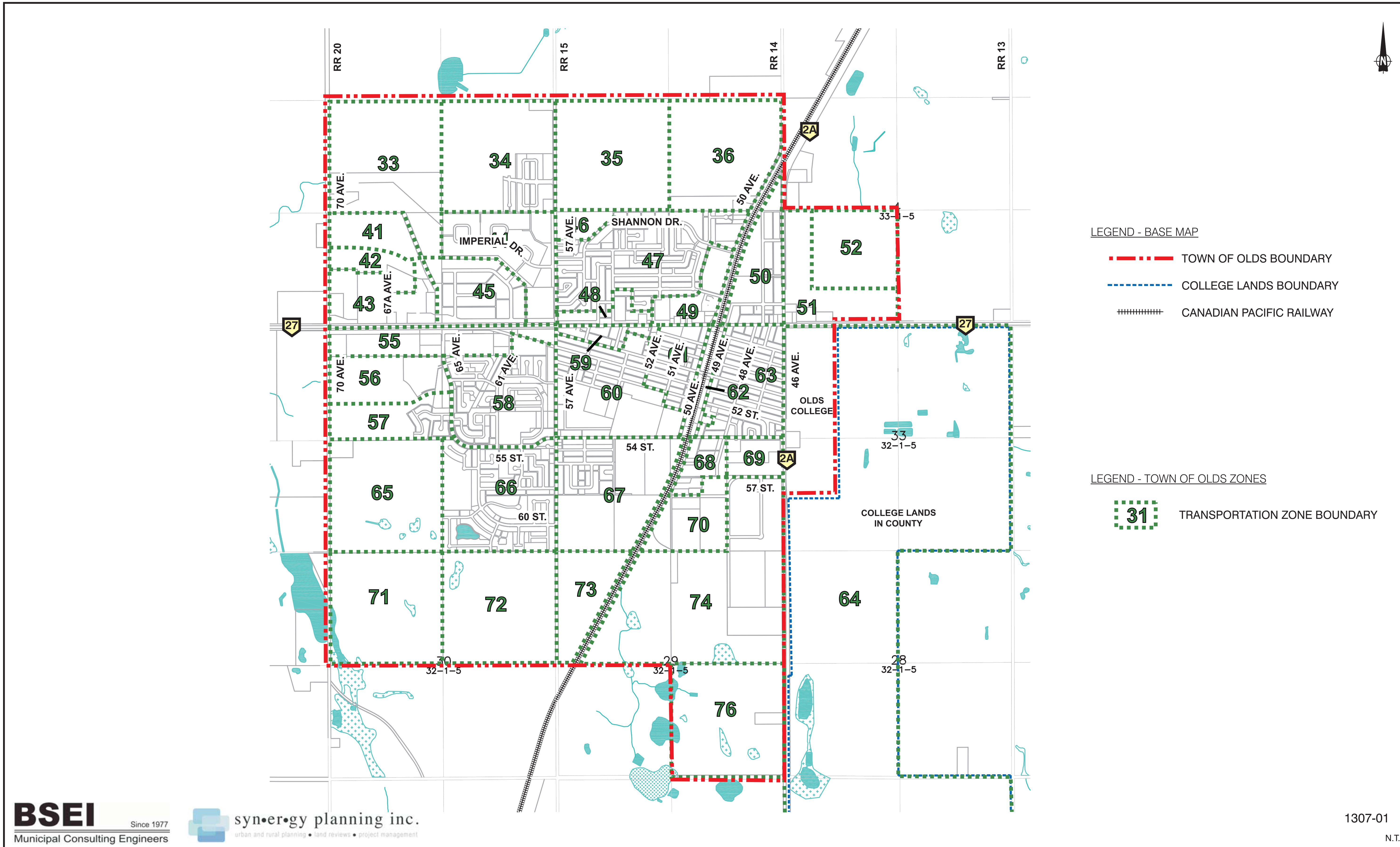

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Transportation Zone Map

Exhibit 4.4

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Trip Generation, Distribution, and Assignment

The Town of Olds and Mountain View County model was developed as a weekday PM peak hour model. Land use data for the base year (2009), including population and employment in each zone, plus the results of the Origin/Destination on-line survey completed as part of the process, formed the basis of trip generation.

Three trip types were considered, as outlined below:

- *Internal to Internal:* trips within the Town of Olds and Mountain View County;
- *Internal to External / External to Internal:* trips with one end (i.e. either origin or destination) outside the Town of Olds and Mountain View County; and
- *External to External*: trips that pass through the Town of Olds and Mountain View County.

These trip types and how they were calculated for the Town of Olds and Mountain View County model are illustrated at **Exhibit 4.5**. A trip account is included in **Table 4.2**.

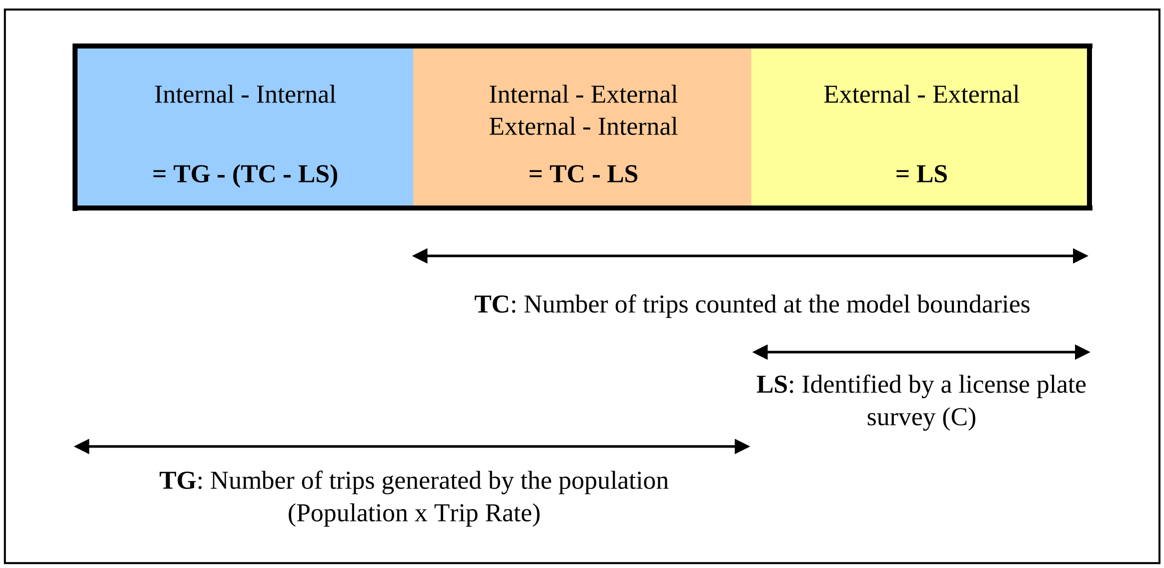


Exhibit 4.5: Trip Types and Calculation Methods

Table 4.2 Trip Account for Town of Olds and Mountain View County Model

	Number of Trips	Notes
Total trips crossing the model boundaries (TC)	4,700 vph	Recorded from a license plate survey conducted on October 2009.
External – External trips identified as travelling through the network (LS)	3,155 vph	License plate survey showed 67% of trips travelled all the way through the network.
Internal – External or External – Internal trips	1,545 vph	TC – LS
Total trips generated by the population & employment (TG)	4,960 vph	Population in model area - 8,190 persons; Employment in the model area - 3,739 persons.
Internal – Internal trips	3,415 vph	TG – (TC – LS)

External to External Trips

External to external trips travel entirely through the network, i.e. they do not have an origin or destination within the Town of Olds or Mountain View County. These trips are coded directly into the model.

To aid in the development of these trips, a license plate trace survey was conducted on October 2009. The crossing point locations are shown on Exhibit 4.6.

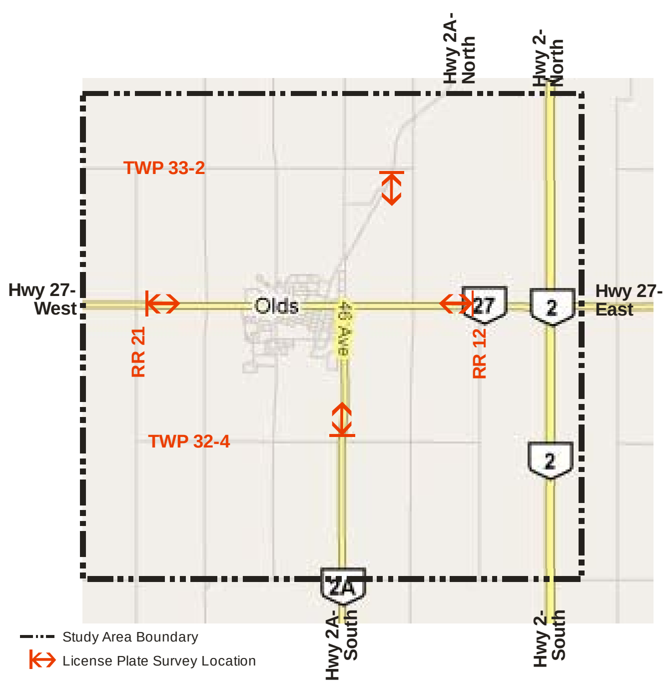


Exhibit 4.6: License Plate Survey Locations

The east location of the survey included through traffic from/to Hwy 27-East, Hwy 2-North and Hwy 2-South. Therefore, traffic passing the east survey point was split proportionally based on the Hwy 2 and Hwy 27 interchange survey volumes.

The survey recorded a total of 4,700 vph crossing the model boundaries; the distribution of which is summarized in Table 4.3.

Table 4.3 License Plate Survey Results
(as a percentage of total traffic crossing the model boundaries)

		DESTINATION							
		Highway 27 West	Highway 27 East	Highway 2A South	Highway 2A North	Highway 2 South	Highway 2 North	Internal	*TOTAL*
ORIGIN	Highway 27 West		0.6%	0.1%	0.3%	0.3%	0.5%	2.9%	4.6%
	Highway 27 East	0.9%		0.0%	0.0%	0.3%	0.4%	2.8%	4.3%
	Highway 2A South	0.3%	0.3%		0.7%	0.0%	0.0%	3.7%	5.0%
	Highway 2A North	0.3%	0.0%	1.1%		0.0%	0.0%	2.9%	4.2%
	Highway 2 South	0.6%	0.5%	0.0%	0.0%		25.7%	3.2%	30.0%
	Highway 2 North	0.3%	0.5%	0.0%	0.0%	33.5%		1.8%	36.1%
	Internal	3.5%	3.4%	3.6%	1.6%	2.6%	1.2%		15.8%
	TOTAL	5.8%	5.2%	4.8%	2.6%	36.6%	27.8%	17.1%	*100%*

Internal Based Trips

Internal based trips are those with at least one end internal to the model area and represent trips made by the population of the Town of Olds and Mountain View County. They include:

- Internal to External: trips with an origin in the Town of Olds or Mountain View County and a destination outside the model boundaries. Table 5.5 showed that 15.8% of trips crossing the model boundaries are internal to external;
- External to Internal: trips with an origin outside the model boundaries and a destination in the Town of Olds or Mountain View County. Table 5.5 showed that 17.1% of trips crossing the model boundaries are external to internal;
- Internal to Internal trips are those with both trip ends in the Town of Olds or Mountain View County.

The employment number provided by the Town of Olds and Mountain View County was divided into 3 different categories based on the 2009 land use data. The trip generation rates for each of the employment categories were derived from the trip diary (origin-destination) questionnaire survey and adjusted based on the ITE (Institute of Transportation Engineers) trip rates. The trip generation rates applied is summarized in Table 4.4 below.

Table 4.4 Trip Generation Assumptions

Land Use	Unit	Inbound	Outbound
Residential	Persons	0.39	0.20
Retail Commercial	Persons	0.64	0.61
Workplace (Industrial, Office, Institutional)	Persons	0.12	0.60
School/Recreational	Persons	0.50	0.50

Trips were created simply by factoring land use activities by a trip generation factor specific for each land use purpose. The subsequent trips needed to then be distributed to develop an origin-destination matrix. A modified gravity type formula was used for each trip purpose which is illustrated in Exhibit 4.7.

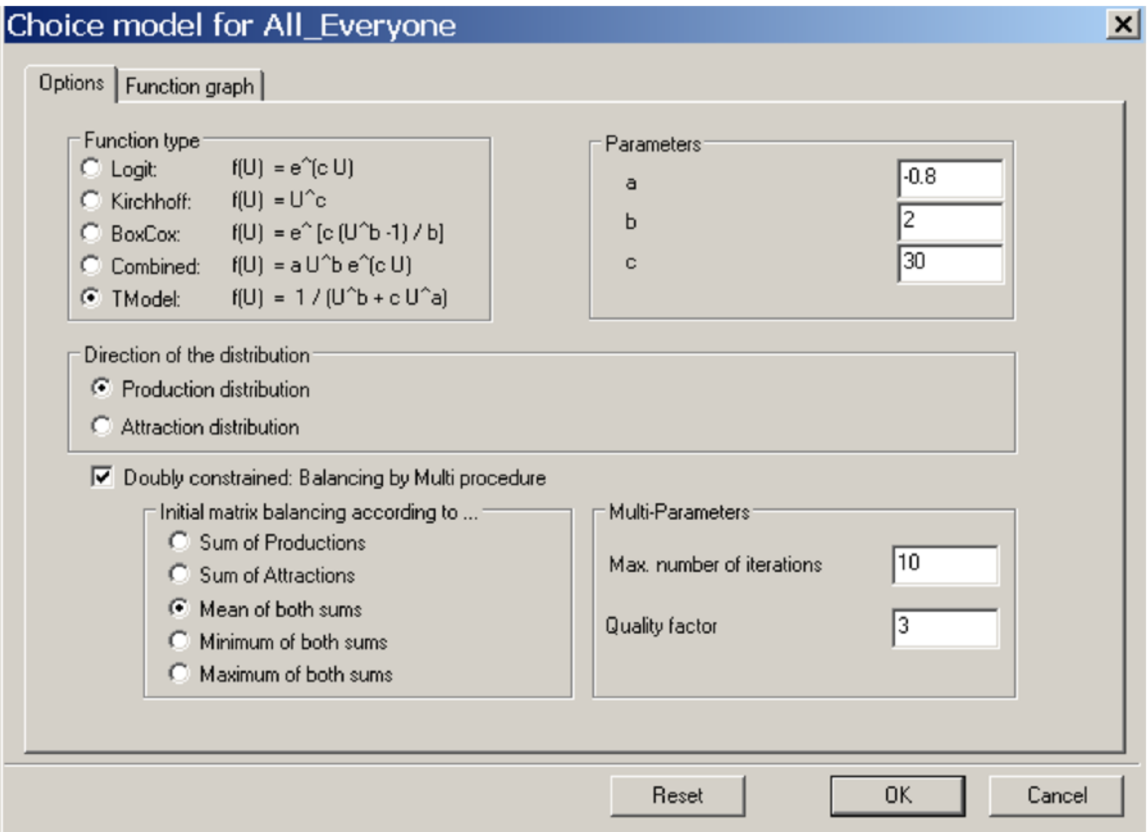


Exhibit 4.7: Trip Distribution Function

Assignment was performed using a multi-equilibrium procedure. Equilibrium assignment is an optimal strategy method where as all paths are assigned in the system aggregate routing reaches a minimum time, distance, or combination of the two. In the Town of Olds and Mountain View County model equilibrium assignment routing was based on optimal time strategies. The initial impedance is defined as the average of the free-flow and constrained routing in the network. The process iterates until the assignment reaches its solution. The assignment process of trips provides roadway volumes and subsequent operational characteristics. The parameters of the assignment are listed in Exhibit 4.8.

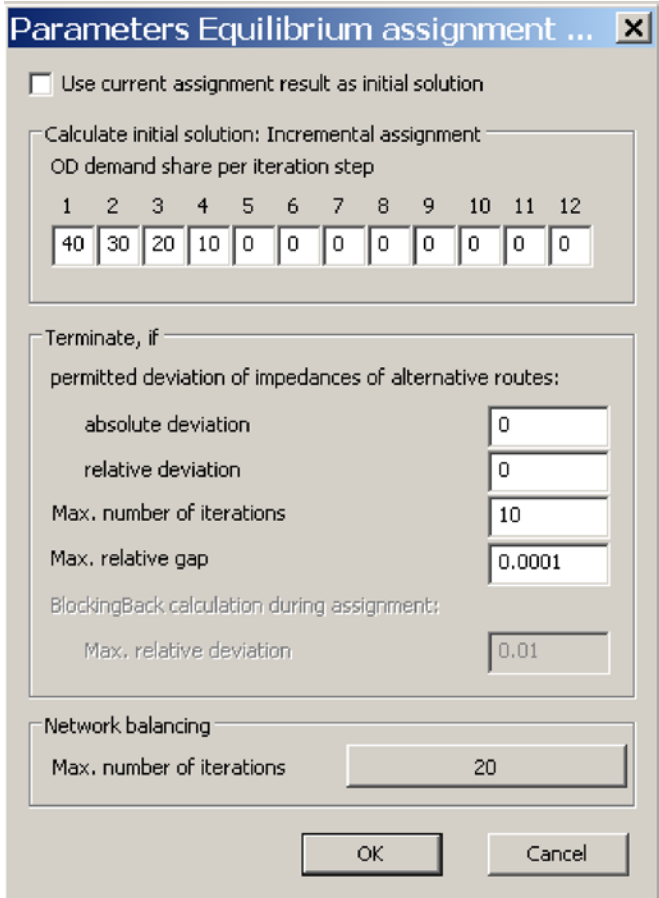


Exhibit 4.8: Equilibrium Assignment Parameters

Model Validation

Model validation was conducted using observed traffic count data for the evening peak hour. Link volumes during the evening peak hour counts were then used to validate the model set for Town of Olds and Mountain View County. To accept a model, an evaluation of model roadway volumes are compared to observed counts. A corresponding plot of this comparison is generated and statistical outcomes are measured. Generally accepted practice is an R-squared value of 0.88 or greater, a slope near 1.0, a percent (In) greater than 75, and an RMSE less than 35 percent. An R-squared value above 0.9 is considered well calibrated. The model assignment analysis is shown below in Exhibit 4.9. The Town of Olds and Mountain View County model was well within the prescribed thresholds for acceptable practice having an R-squared value of 0.96, a percent In of 89, and the RMSE of 24.

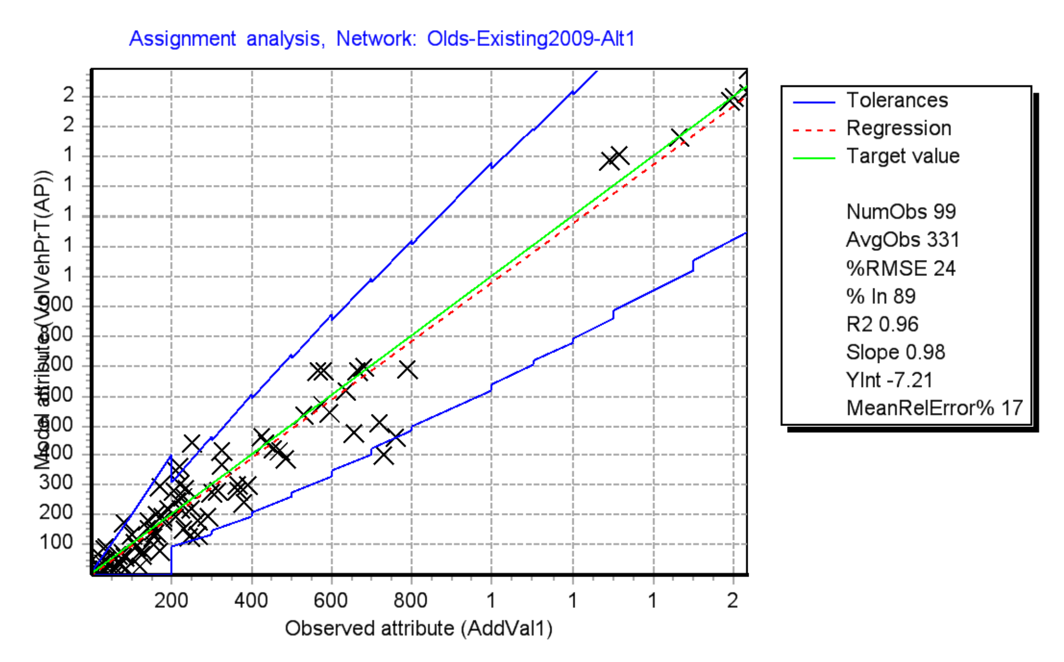


Exhibit 4.9: Comparison of Model Volumes to Observed Volumes

Conclusions

The 2009 Town of Olds and Mountain View County VISUM transportation planning model is well calibrated to match current conditions. It is therefore appropriate for use in developing the forecast traffic volumes at the long term horizon. As with all models, caution should be used with forecasts as different inputs can yield different results.

5.0 DEVELOPMENT AND ASSESSMENT OF SHORT TERM TRAFFIC FORECASTS (BASE NETWORK)

5.1 Introduction

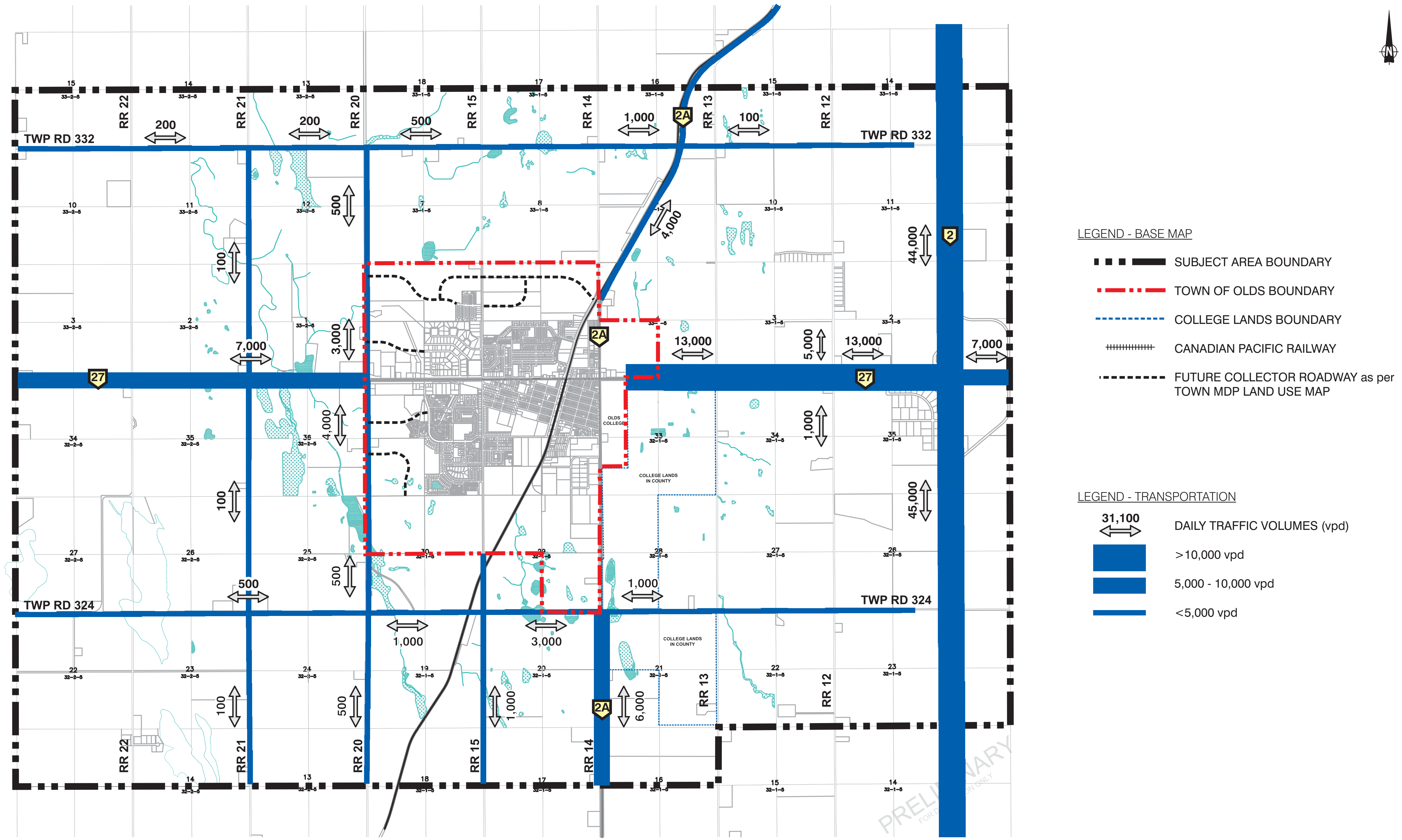
Once the base model had been calibrated as outlined in Section 4.0, it was possible to utilize the land use, population, and employment expectations for the Short Term horizon as provided by the Town and County to develop forecasts for expected traffic volumes associated with that level of development. At this stage, the study area is expected to achieve a population threshold of approximately 13,000 people and include up to approximately 5,000 jobs. The VISUM model was therefore developed for a Short Term horizon for the weekday PM peak hour condition, as prescribed by the Town and County at the outset of the study. Daily traffic volumes were then extrapolated based on the PM peak hour outputs. Once this forecast had been developed, error checked and analyzed, it was possible to ratify the short term road network recommendations outlined in the existing ASP's and from information by the Town and County, and to expand the base recommendations as necessary based on the updated output.

The following section details the findings of the forecasting exercise. It is noted that the roadway classifications for all road links was based on the most recent (2009) road network classification schedule available from the Town and County.

It is also noted that the assessment of the Short Term horizon traffic forecasts identified the need for improvements that will likely be required and/or be beneficial prior to the arrival of the horizons. The development of a thorough time line and schedule for the implementation of all identified improvements on an annual basis was not possible within the scope identified for this project. However, Bunt & associates did review the relative need in general terms and prioritized the improvements as they are expected to be required though it is recommended that their relative need be reassessed by the Town and County annually at the time of developing annual capital budget programs. Since the scope of this study included the development of a computer based traffic forecasting model, it will also be possible for the Town and County to re-assess needs on an as-required basis with relative ease and modest effort.

5.2 Development of Future Short Term Link Volumes

Once the Short Term road network and Town/County-developed land uses were entered into the calibrated base model, it was possible to develop forecasts for the weekday PM peak hour link volumes for the Short Term horizon. These resultant volumes were then reviewed by Bunt & Associates for completeness and general balancing. The peak hour link volumes were then converted to daily link volumes, by applying a factor of 12, which are illustrated in Exhibit 5.1 for Mountain View County and Exhibit 5.2 for the Town of Olds.



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Mountain View County Short Term (13,000) Daily Traffic Volumes

Exhibit 5.1

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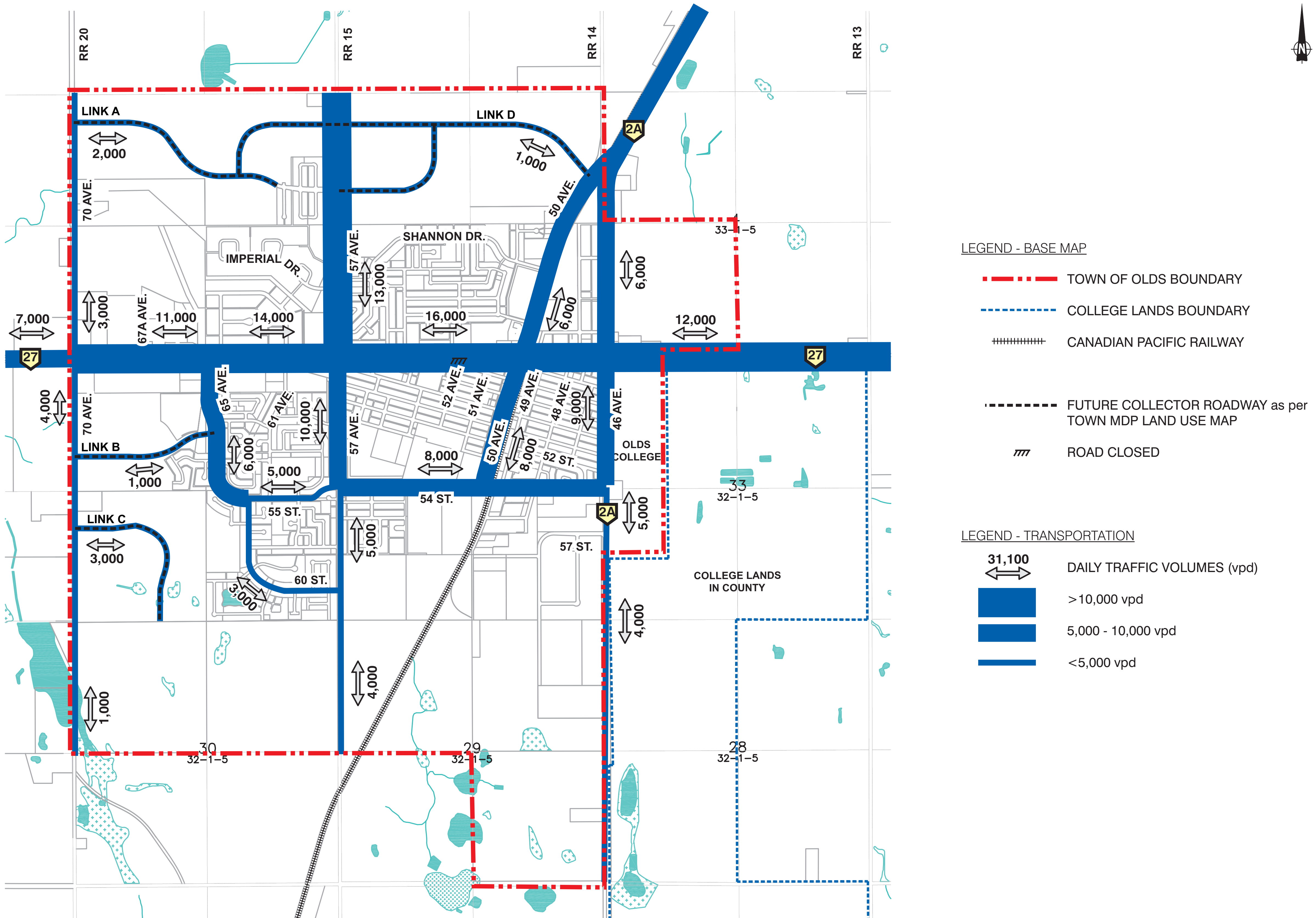

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Town of Olds Short Term (13,000) Daily Traffic Volumes

Exhibit 5.2

:\\1307-01_OLDS-EXHs_2010-06-JUNE.cdr June 2, 2010 HMF

5.3 *Identification of Short Term Network Issues*

Analysis of the road network was completed based on the future Short Term traffic volumes developed by the model and based on the previously described road network.

5.3.1 Intersection Review

The VISUM model is a tool for developing forecasts to show expected traffic volumes. Since volumes are generally developed to a tolerance of approximately +/- 20%, turning movements are often not assessed in detail. Rather, the link volumes are used to determine road sizing (laning, classification etc.) and intersection capacity is assessed by applying a critical volume theory for the peak hour volumes.

The critical volume analysis considers the largest approach volume on both the major and minor roads at an intersection. Each approach volume is divided by the number of core lanes on that respective approach, thus establishing a maximum approach volume per lane for each approach. The maximum individual north/south and maximum individual east/west approach volumes are then added together to obtain the overall critical volume for the intersection. This is represented by the following equation:

$$V_{crit} = \left(\frac{V}{L}\right)_{\max, NorS} + \left(\frac{V}{L}\right)_{\max, EorW}$$

Where: V_{crit} = Critical Volume for the Intersection

$\left(\frac{V}{L}\right)_{\max, NorS}$ = Maximum Approach Volume per lane from the north or south

$\left(\frac{V}{L}\right)_{\max, EorW}$ = Maximum Approach Volume per lane from the east or west

Storage lanes and channelization were not taken into consideration as part of the analysis. Once the critical volume has been determined it is compared to the two following thresholds:

- Unsignalized intersections are considered to operate at an acceptable level when the critical volume is less than 800 vehicles. At the 800 vehicle threshold, signalization is generally found to be necessary in order to manage flows. Certain situations may result in the threshold being met at a lower volume, potentially in the order of 600 vehicles. As such, the 600 to 800 vehicle range was utilized as a means for assessing signalization expectations and priorities.

- Signalized intersections are considered to operate at an acceptable level when the critical volumes are less than 1200 vehicles. This is based on typical conditions, as certain critical movements may experience more delay and be more significant in term of volume than others.

Using this approach, Bunt & Associates then assessed the main intersections within the study area. The results of the intersection review (i.e., critical volume review) are summarized in Table 5.1 through Table 5.4

Table 5.1 Critical Volume Analysis for Highway 27 Corridor– Short Term Conditions

Intersection (existing traffic control)	Critical Volume
Highway 27/Highway 2A (signalized)	750
Highway 27/48th Avenue (unsignalized)	600
Highway 27/ 49th Avenue (unsignalized)	600
Highway 27/50th Avenue (signalized)	750
Highway 27/52nd Avenue (signalized)	600
Highway 27/57th Avenue (signalized)	1050
Highway 27/61st Avenue (unsignalized)	550
Highway 27/ 65th Avenue (signalized)	450
Highway 27/ 67A Avenue (signalized)	550
Highway 27/70th Avenue (Range Road 20) (unsignalized)	600

Table 5.2 Critical Volume Analysis for Town of Olds Intersections – Short Term Conditions

Intersection (existing traffic control)	Critical Volume
57th Avenue/ Imperial Drive (unsignalized)	500
57th Avenue/Shannon Drive (unsignalized)	700
57th Avenue/54th Street (unsignalized)	800
57th Avenue/60th Street (unsignalized)	250
50th Avenue/Shannon Drive (unsignalized)	300
Highway 2A/52nd Street (unsignalized)	350
Highway 2A/ 57th Street (unsignalized)	400

Table 5.3 Critical Volume Analysis for MV County Intersections – Short Term Conditions

Intersection (existing traffic control)	Critical Volume
Highway 2A/Twp Rd 332 (unsignalized)	350
Range Road 15/Twp Rd 324 (unsignalized)	300
Range Road 21/ Twp Rd 332 (unsignalized)	100
Range Road 21/ Twp Rd 324 (unsignalized)	100

Table 5.4 Critical Volume Analysis for Town of Olds Future Intersections – Short Term Conditions

Intersection	Critical Volume
70th Avenue (RR20)/ Link A	300
70th Avenue (RR20)/ Link B	250
70th Avenue (RR20)/ Link C	300
50th Avenue/ Link D	100

In addition to the intersection capacity analysis, Bunt & Associates reviewed observed conditions, feedback from the Steering Committee, information obtained from the public ate the Open House, and the results and analysis outlined in the CastleGlenn study. Based on this, the following intersection improvements were identified for the Short Term horizon:

Intersections Requiring Signalization

Based on the critical volume analysis review, the majority of the study area intersections are expected to continue to operate within acceptable capacity parameters at the Short Term horizon. If the 800 vehicle threshold has been met, then signalization is likely to be necessary and signal warrants were completed. If the 600 vehicle threshold was met then the intersection was identified as being of interest, and in need of monitoring. However, signal warrants were not completed. The summary of expected Short Term requirements is outlined below.

57th Avenue/54th Street: This intersection met the 800 vehicle critical volume threshold at the Short Term horizon, thus suggesting the possible need for signalization at or around this point in time. Bunt & Associates therefore undertook a further analysis to determine if a signal warrant would be met by the estimated forecast volumes. Based on the 2007 TAC Signal Warrant, the intersection scored 67 points out of the typical 80 to 100 points typically identified as the threshold for signalization being warranted based on traffic volumes alone. It is noted that the 100 point threshold is generally used as a guide for larger urban centres where congestion and delay are more expected and tolerated. Smaller urban or semi-rural centres sometimes seek to signalize intersections at a threshold of 80 points. With this in mind, the analysis suggested that the intersection will indeed be nearing a point where signalization may be warranted, assuming an 80 point threshold for the study area. It is therefore recommended that the Town monitor this intersection and that signalization be implemented when warranted, as this intersection represents the most likely candidate for the next new signal location in the study area.

Other Intersections to be Monitored: The following unsignalized intersections were forecast to experience threshold volumes in the order of 600 to 800 vehicles at the Short Term horizon. Although not specifically expected to require signalization, they are certainly representative of locations that should be monitored as they will be candidates for signalization after the Short Term horizon. Specific locations of interest, and their respective scores, include the following:

- 57th Avenue/Shannon Drive (700)
- Highway 27/48th Avenue (600)
- Highway 27/49th Avenue (600)
- Highway 27/70th Avenue (600)

Based on this assessment of additional intersections to be monitored, the intersection of 57th Avenue/Shannon Drive represents the most likely candidate for subsequent signalization immediately beyond the Short Term horizon.

Other Intersection Improvements

There were a number of other locations where intersection improvements were found to be necessary. These are summarized below:

> *50th Street Short Cutting:* In reviewing the Short Term traffic model numbers, Bunt & Associates found that there was a tendency for some traffic to short cut along 50th Street between 50th Avenue and 57th Avenue. Although Bunt & Associates did not find this to be a major problem at the present or in the Short Term, it is recommended that measures be taken to impede short cutting along this roadway. Therefore Bunt & Associates recommends the extension of concrete median on 57th Avenue to restrict 50th Street to right-in/right-out only as illustrated in **Exhibit 5.3**. This would be an adjunct to the original CastleGlenn recommendations that were previously generated for this intersection, and as illustrated on this same exhibit. If found to be a problem by the Town in the future it may be necessary to close 50th Street at 57th Avenue completely as the close intersection spacing is not adequate and therefore unsafe. Although this is not recommended at this time it is an item that the Town should be aware of and that should be monitored in the coming years.

> *Highway 27/ 67A Avenue:* Bunt & Associates completed a capacity analysis of the existing intersection based on the data collected in 2009. The capacity analysis showed that no immediate intersection improvements are required at this location. The CastleGlenn study did not identify any capacity issues at this location, though it did highlight the need to consider the future extension of 67A Avenue south of Highway 27 as shown in **Exhibit 5.4**. The extension of this roadway has been debated in the past given that it would tie Highway 27 and the associated commercial area directly to the residential communities planned to the south of the area. It would also serve to reduce the volume of traffic utilizing the 65th Avenue intersection with Highway 27. Should this occur, resolution of property ownership issues will be required with the stakeholders of the lands to the south. With the upcoming development anticipated in the area, Bunt & Associates concurs that if the alignment has been approved by Council, then this item should be scheduled as a Short Term (5-year) emerging item.

> *Highway 27/ 65th Avenue*: Based on observed traffic volumes, there is no existing constraint in terms of capacity at this intersection or at the adjacent service road intersections to the north and south. Having said this, there are a number of conditions that influence the overall collision risk at this intersection, including the close intersection spacing between the service road and Highway 27 (a separation of only 30 metres between the south edge of Highway 27 and the north edge of the adjacent existing service road is provided), poor visual conspicuity of the pedestrian crossing at the south service road and 65th Avenue, and the lane drop at the service road south of Highway 27. Previous work completed by Bunt & Associates regarding this intersection concluded that while the existing configuration was adequate for current conditions at the time of development of the lands south of Highway 27 (Extra Foods etc.) the current operational safety issues at this intersection and subsequent development of the area would need to include one or both of the development of the 67A Avenue connection to Highway 27 and the elimination of left turns at the service road intersection with 65th Avenue. Bunt & Associates had also previously identified the option to offset the service road

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Hwy 27 (46th Street) / 57th Avenue Recommended Improvements

Exhibit
5.3

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 67A Avenue Recommended Improvements

Exhibit 5.4

further to the south in a manner consistent with the CastleGlenn study as illustrated on Exhibit 5.5. As noted in that study, re-alignment of this service road requires resolution of property concerns in the SW quadrant of the intersection with the involved stakeholders. Bunt & Associates recommends that this be considered as a Short Term issue in need of attention.

Highway 27/ 61st Avenue (Imperial Way): A review of existing operating conditions at this location by Bunt & Associates confirmed that the southbound movement is currently operating at-capacity. The intersection is currently unsignalized and therefore a 2007 Transportation Association of Canada (TAC) traffic signal warrant[11] was completed to determine if a traffic signal is warranted at this location. Based on the warrant, the intersection scored 57 points out of a required 80 to 100-point threshold for the warrant to be met. As such installation is not warranted based on volumes alone. Bunt & Associates also reviewed the collision data at this intersection as provided by Alberta Transportation however there was no significant pattern that caused warrant for a traffic signal.

The issue of southbound capacity suggests a possible hazard in terms of future traffic volumes. However, in Bunt & Associates' opinion, interim signalization may not be worthwhile if alternatives for the accommodation of the southbound movement can be found, in particular improved accessibility via 57th Avenue. A review of the CastleGlenn study confirmed a recommendation and design concept in this regard as illustrated in Exhibit 5.6 and Exhibit 5.7, though the significant property acquisition deems this to be a longer-term solution.

In order to facilitate an improvement at this location, Bunt & Associates recommends that closure of the north side of the intersection be considered as a Short Term improvement ahead of the ultimate design identified in the CastleGlenn study. A review of the traffic volumes suggests that this would not affect a large number of vehicles and it would serve to improve the safety of the intersection and set the stage for future and more invasive improvements in the area. If closed (or even limited to right turns only) then the following measures would be required:

- Construction of an appropriate island (if limited to right turns only) or full closure of the north leg of the intersection.
- Closure and removal of the eastbound left turn lane on Highway 27 through placement of barriers or concrete curb/median.
- Consideration of an island to restrict intersection to right turns only on the north service road west of 57th Avenue concurrent with the changes to 61st Avenue.

Although not identified as an emerging issue by Bunt & Associates, the CastleGlenn study also suggested an improvement to the south side of this intersection. The improvement sought to increase the separation of the service road intersection with Highway 27 and does so within the existing right of way. Bunt & Associates concurs with this improvement and suggests that it be included as an immediate improvement as this will

[11] 2007 Transportation Association of Canada (TAC), Alberta Transportation Traffic Signal Warrant Analysis

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 65th Avenue Recommended Improvements

Exhibit
5.5

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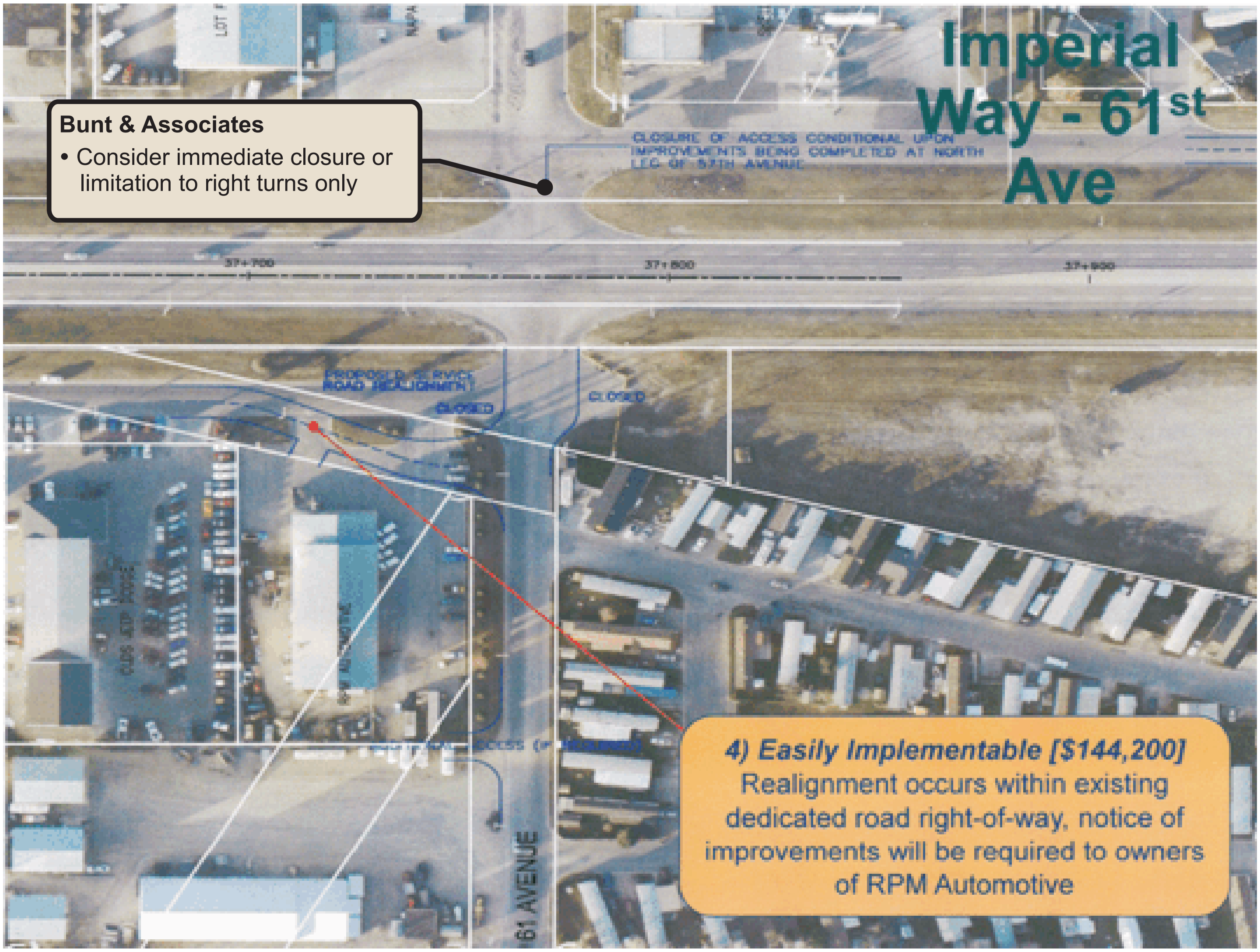

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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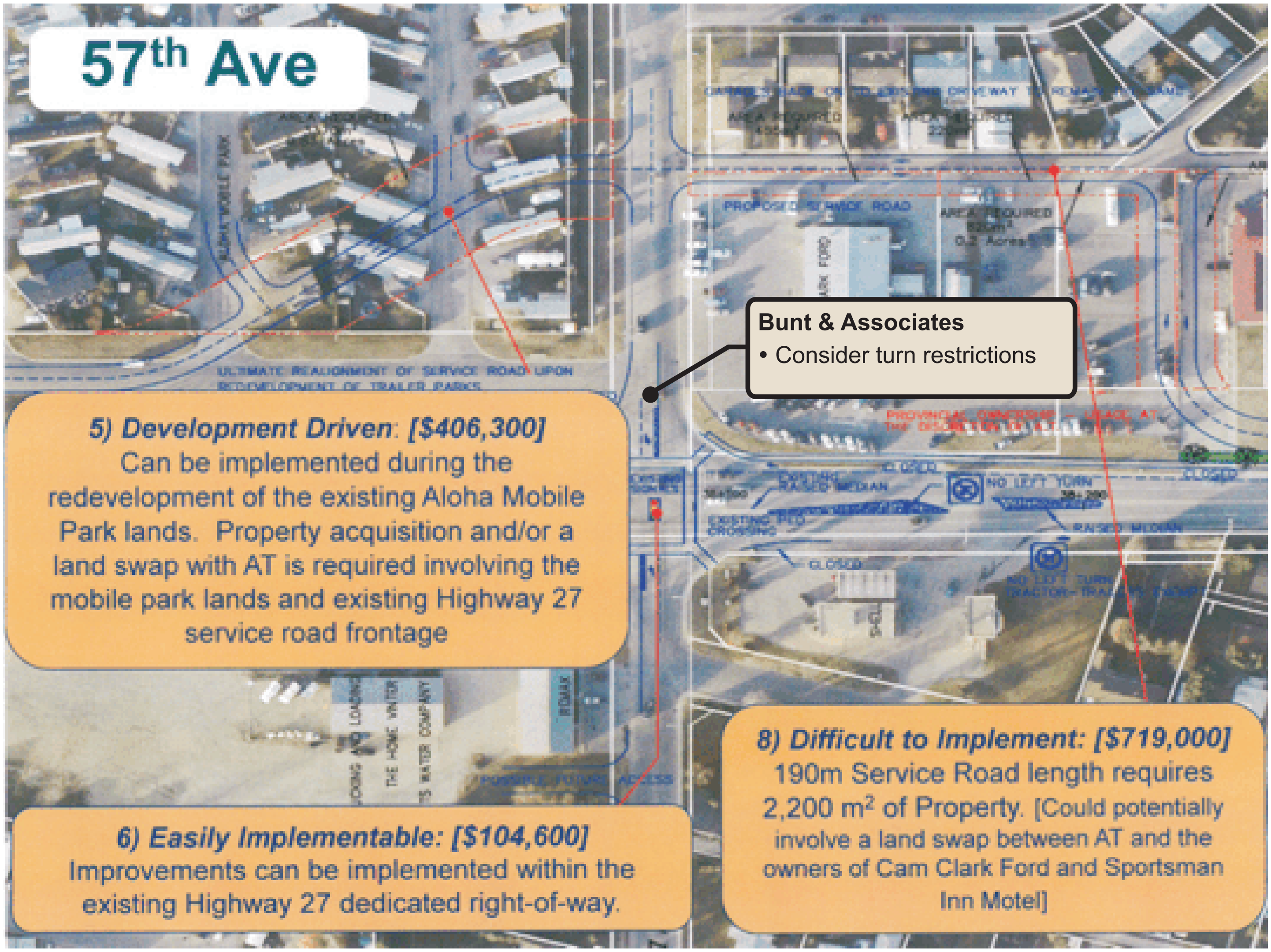
HWY 27 (46th Street) / 61st Avenue (Imperial Way) Recommended Improvements

Exhibit
5.6



BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 57th Avenue Recommended Improvements

Exhibit
5.7

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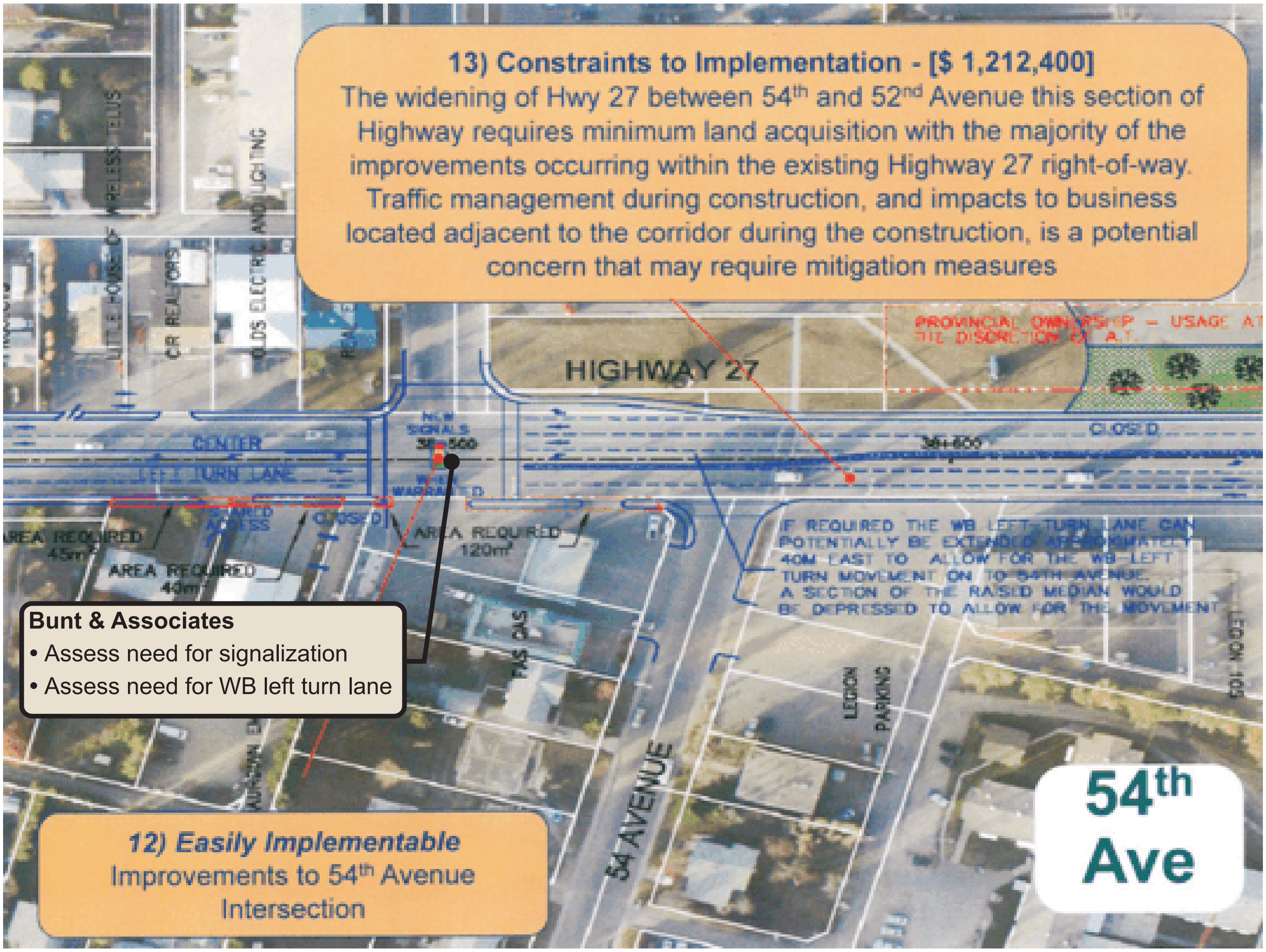
certainly be a significant route in the future. As noted in the CastleGlenn study, this change will require notification of the land owners to the south who are currently utilizing the existing right of way as part of their site. There may be existing agreements in place between the Town and the land owner in this regard. This was not reviewed by Bunt & Associates as part of this exercise.

Highway 27/ 57th Avenue: Although Bunt & Associates' review of existing intersection capacity analysis did not identify any capacity constraints at this location, there were a number of issues noted by Bunt & Associates during the review that suggested a need for improvements. This was echoed by the public at the Open House and further highlighted in the CastleGlenn study as illustrated in Exhibit 5.7. The 57th Avenue corridor is one of very few continuous north/south corridors through the Town and into the County. Discussions at the Open House confirmed the use of this roadway by the public not only as a means of commuting, but also as a recreational corridor for bicycles and walkers/runners. The intersection at Highway 27 is a significant barrier, and the presence of service roads immediately adjacent to the Highway 27 corridor further confines the permeability of the area for non-auto users. As well, although not specifically observed by Bunt & Associates during the data collection process, it is understood that queues on 57th Street do overlap the service road intersections, creating a confusing and potentially unsafe condition for both vehicles as well as non-auto users.

Bunt & Associates nonetheless concurs with the general direction identified in the CastleGlenn study. That study recommends the realignment of the north service road in the NW quadrant as previously mentioned in the 61st Avenue discussion. In addition, a service road in the NE quadrant is recommended as well as a future access off 57th Avenue on the south leg of the intersection. These are considered to be longer term (10-year & beyond) improvements as there is a considerable amount of property that must be acquired by the Town. In terms of Immediate or Short Term improvements, Bunt & Associates recommends consideration of an island to restrict intersection to right turns only at the north service road west of 57th Avenue as referred to in Bunt & Associates' Interim recommendations for 61st Avenue.

Highway 27/ 54th Avenue – Bunt & Associates did not formally analyze the north and south leg of 54th Avenue at 46th Street. As well, no issues were raised at the Open House associated with this intersection. While most of the aspects of the recommendations for this location set out by the CastleGlenn Study illustrated in Exhibit 5.8 are reasonable and logical, Bunt & Associates suggests that further analysis needs to be completed to assess the need for the signalization of the north leg in the Short Term horizon, plus the westbound left turn lane shown on the plan if it is not directly serving 54th Avenue south of Highway 27.

Highway 27/ 52nd Avenue: The intersection capacity analysis completed at this location by Bunt & Associates did not identify a need for any immediate improvements. That said, Bunt & Associates concurs with the CastleGlenn Study recommendations as illustrated in Exhibit 5.9 for Long Term consideration. However Bunt & Associates recommends that in the Short Term timeline, the traffic signal should remain in place and the south leg of 52nd Avenue should be closed. The removal of the traffic signal is not recommended at this time unless the traffic volumes prove that it is no longer warranted.



BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 54th Avenue Recommended Improvements

Exhibit 5.8

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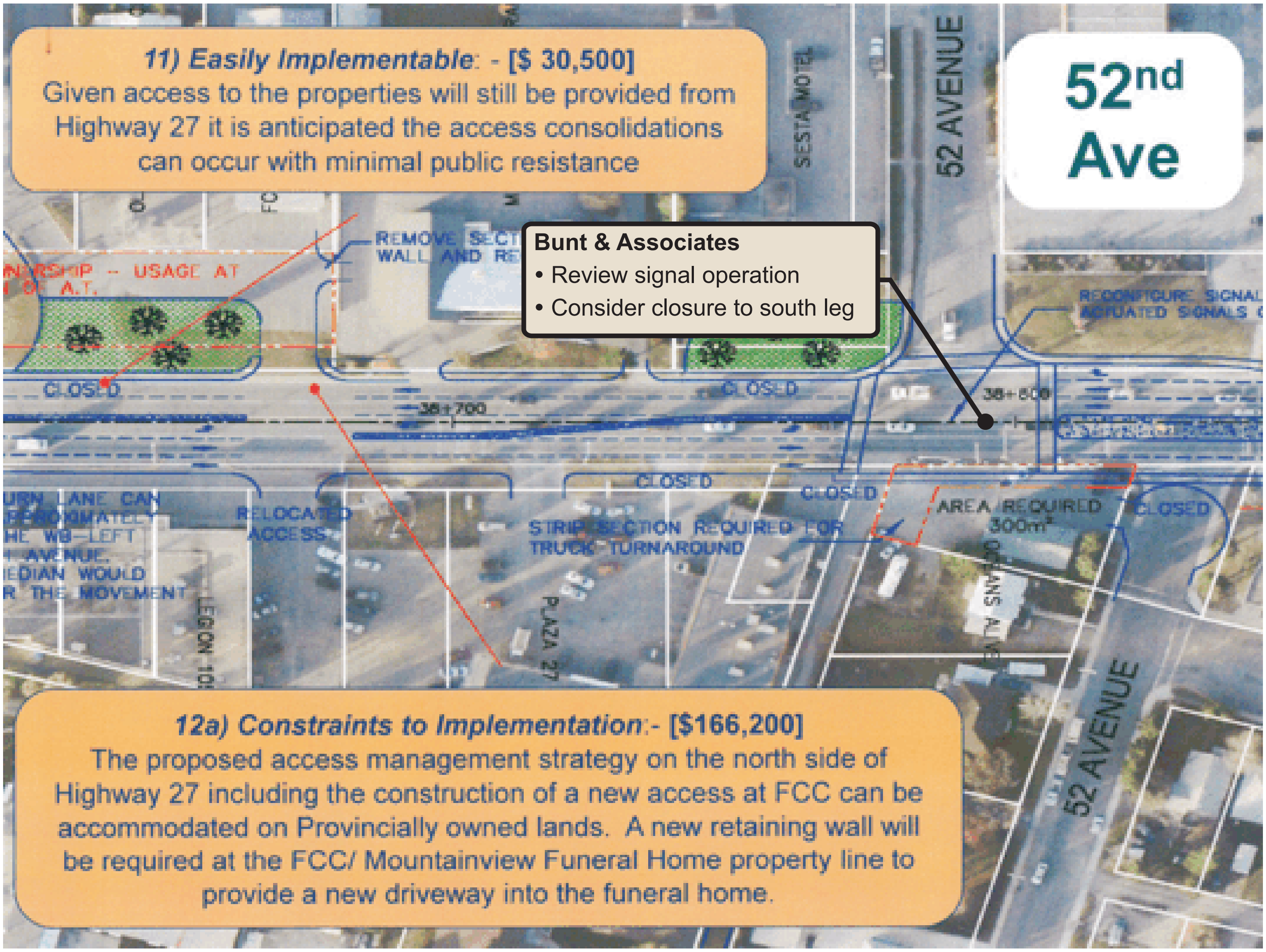

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 52nd Avenue Recommended Improvements

Exhibit
5.9

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The remainder of the improvements are recommended to occur in the Long Term (10-year and beyond) timeline including the conversion of the traffic signal to a pedestrian actuated signal once again only if the warrant is no longer met should the traffic signal be removed.

Highway 27/ 50th Avenue: This intersection was identified at the outset of the study as a key location in need of considerable attention in both the Immediate and Short Term (5 year) horizons. This was echoed by the Steering Committee as well as at the Public Open House. Bunt & Associates' analysis of the capacity issues at the intersection confirmed that the northbound movement currently operates near to capacity with significant queuing. As well, observations at the intersection highlight the significance of the numerous access driveways located on both Highway 27 and the north leg of 50th Avenue in particular. The proximity of the rail crossing to the east of the intersection further adds to the concern related to possible queue overspill, conflicts with rail traffic and general driver confusion in the area. To alleviate the capacity constraints at this intersection Bunt & Associates recommends the immediate implementation of a separate northbound left turn bay and associated mirroring of this lane on the north side of the intersection. Traffic signal optimization is also recommended at this time, as is the provision of a modest raised median along the centre of 50th Avenue north of Highway 27 to limit the first driveway to right turns only. This will require communication with the owner of the parcel on the NW corner of the intersection. This is shown on **Exhibit 5.10**, together with the CastleGlenn recommendations. In reviewing the CastleGlenn Study, no improvements were recommended at this location other than driveway relocation on the north side of Highway 27 west of the intersection; however as previously stated Bunt & Associates recommends the implementation of northbound and southbound left turn lanes as an immediate improvement.

Highway 27/ 49th Avenue: The northbound movement at this location currently operates near to capacity. The intersection is currently unsignalized and therefore a traffic signal warrant[12] was completed for this location. The intersection scored 40 points out of the 80 to 100 points necessary for the warrant to be met and therefore a traffic signal is not technically warranted. Bunt & Associates also reviewed the collision data at this intersection as provided by Alberta Transportation and found no significant crash pattern to suggest a need for signalization. Given the modest traffic volumes associated with the north and southbound movements, and given the proximity of the rail crossing, signalization would not seem to be an appropriate solution for any issues at this intersection in any event. In fact, Bunt & Associates suggests that there may be no need for turn movements at this intersection at all given the low turning volumes being experienced today and the other access options available to the surrounding area. This should be considered as an option by the Town should issues develop at this location. However, no specific improvement was recommended by Bunt & Associates for the Short Term horizon.

[12] 2007 Transportation Association of Canada (TAC), Alberta Transportation Traffic Signal Warrant Analysis

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Town of Olds / Mountain View County Transportation & Utilities Master Plan

Hwy 27 (46th Street) / 50th Avenue Recommended Improvements

Exhibit 5.10

Highway 27/ 48th Avenue and 47th Avenue: The existing intersection capacity analysis completed by Bunt & Associates did not identify capacity constraints at these intersections. This is consistent with the CastleGlenn Study as illustrated in **Exhibit 5.11**. Bunt & Associates concurs with the access consolidation noted by CastleGlenn along this portion of the corridor and it is recommended for consideration in the Short Term timeline.

Highway 27/ Highway 2A Intersection: Review of the data collected at this intersection confirmed that the northbound movement currently operates at-capacity during peak periods. In order to alleviate the capacity constraint at the intersection, Bunt & Associates recommends implementation of a separate northbound left turn bay. With the addition of a northbound left turn lane, for safety reasons, although not warranted, it is recommended that a southbound left turn bay also be implemented. Traffic signal optimization is also recommended at the intersection. As shown in **Exhibit 5.12**, the CastleGlenn Study concurs with Bunt & Associates and recommends northbound and southbound left turn lanes. It is proposed that these improvements occur by the Short Term horizon.

With the inclusion of the signal optimization and recommended intersection improvements noted above, all study area intersections can be expected to operate within acceptable capacity parameters. With that said, Bunt & Associates recommends completion of a Transportation Impact Assessment for future developments throughout the Town and the County that will review intersections within a close proximity of the site so as to determine if and when additional intersection improvements are required.

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 48th Avenue & 47th Avenue Recommended Improvements

Exhibit 5.11

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HWY 27 (46th Street) / HWY 2A (46th Avenue) Recommended Improvements

Exhibit 5.12

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5.3.2 Link Capacity Review

The short term daily link capacities were assessed based on the parameters set out earlier, and are summarized below in **Table 5.5** for the Town of Olds roadways and **Table 5.6** for the Mountain View County roadways. A summary of the network issues are illustrated in **Exhibit 5.13** for Mountain View County and **Exhibit 5.14** for the Town of Olds.

Table 5.5 Summary of Short Term Daily Traffic Volumes for Town of Olds

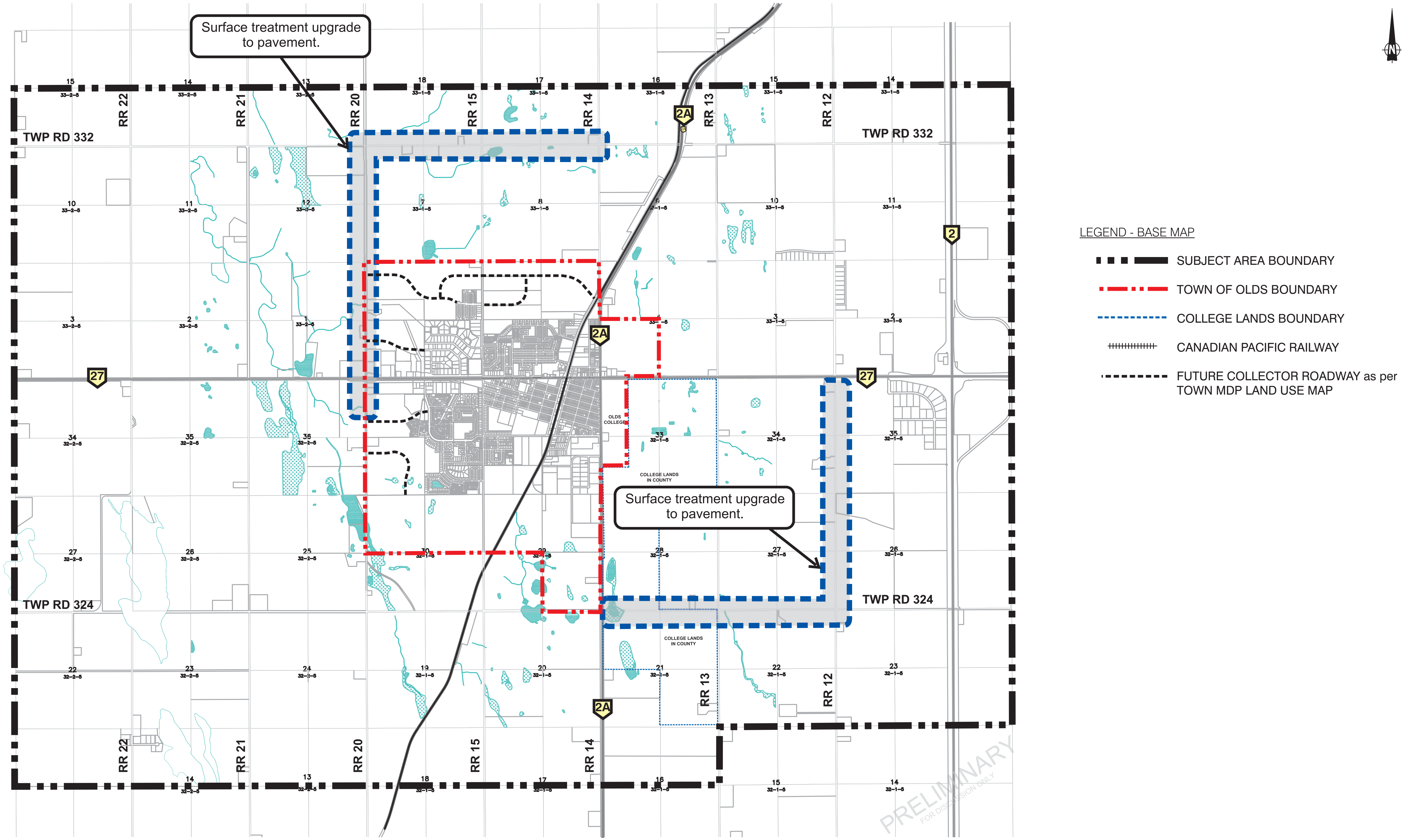
Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Existing Traffic Volumes (vpd)	Short Term Traffic Volumes (vpd)
46th Street: East of 46th Ave	Provincial Secondary Highway	< 20,000	8,500	12,000
46th Street: Between 46th Ave & 57th Ave	Provincial Secondary Highway	< 20,000	14,200	16,000
46th Street: Between 57th Ave & 65th Ave	Provincial Secondary Highway	< 20,000	12,700	14,000
46th Street: Between 65th Ave & 67A Ave	Provincial Secondary Highway	< 20,000	8,700	11,000
46th Street: West of 67A Ave	Provincial Secondary Highway	< 20,000	6,000	7,000
54th Street: Between the railway & 57th Ave	Major Residential Collector	< 5,000	4,000	8,000
55th Street: West of 57th Ave	Major Residential Collector	< 5,000	3,000	5,000
60th Street: West of 57th Ave	Minor Residential Collector	< 5,000	1,400	3,000
65th Avenue: South of 46th Street	Major Residential Collector	< 5,000	4,000	6,000
57th Avenue: North of 46th Street	Undivided Arterial	5,000 – 12,000	4,800	13,000
57th Avenue: Between 46th St & 54th St	Undivided Arterial	5,000 – 12,000	5,500	10,000
57th Avenue: Between 54th St & 60th St	Undivided Arterial	5,000 – 12,000	3,500	5,000
50th Avenue: North of 46th Street	Undivided Arterial	5,000 – 12,000	5,500	6,000
50th Avenue: South of 46th Street	Major Residential Collector	< 5,000	8,200	8,000
46th Avenue: North of 46th Street	Provincial Secondary Highway	< 20,000	6,000	6,000
46th Avenue: Between 46th St & 54th St	Provincial Secondary Highway	< 20,000	8,000	9,000
46th Avenue: Between 54th St & 57th St	Provincial Secondary Highway	< 20,000	4,500	5,000
46th Avenue: South of 57th Street	Provincial Secondary Highway	< 20,000	3,800	4,000

Table 5.6 Summary of Short Term Daily Traffic Volumes for Mountain View County

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Existing Traffic Volumes (vpd)	Short Term Traffic Volumes (vpd)
Highway 2	Provincial Primary Highway	> 20,000	31,500	45,000
Highway 27 (east of Olds)	Provincial Secondary Highway	< 20,000	8,500	13,000
Highway 27 (west of Olds)	Provincial Secondary Highway	< 20,000	6,000	7,000
Highway 2A (north of Olds)	Provincial Secondary Highway	< 20,000	3,000	4,000
Highway 2A (south of Olds)	Provincial Secondary Highway	< 20,000	4,400	6,000
Twp Rd 332 West of RR 14	Minor Collector Road 'B' (gravel)	< 500	200	500
Twp Rd 332 East of RR 14 to Hwy 2A	Minor Collector Road 'A' (paved)	500 – 5000	300	1,000
Twp Rd 332 East of Hwy 2A	Minor Collector Road 'B' (gravel)	< 500	100	100
Twp Rd 324 West of Hwy 2A to RR 20	Industrial/Commercial Road (paved)	5,000 – 12,000	500	500 – 3,000
Twp Rd 324 East of Hwy 2A	Minor Collector Road 'B' (gravel)	500	500	1,000
Range Road 21	Minor Collector Road 'B' (gravel)	< 500	100	100
Range Road 20 South of Hwy 27	Major Collector (Paved)[13]	< 5,000	500	500 – 4,000
Range Road 20 North of Hwy 27	Major Collector (gravel)[14]	< 5,000	400	500 – 3,000
Range Road 15 South of Town limits	Minor Collector Road 'A' (paved)	500 – 5000	1,200	1,000
Range Road 12 North of Hwy 27	Minor Collector Road 'A' (paved)	500 – 5,000	n/a	1,000 - 5,000
Range Road 12 South of Hwy 27	Minor Collector Road 'B' (gravel)	< 500	n/a	1,000

[13] Range Road 20 is classified as a Major Collector Roadway based on the County Collector Road Network. It should be noted that although this roadway is classified as a major collector with a capacity of 5,000 vpd, those sections of this roadway that are currently unpaved can accommodate 500 vpd prior to paving being required.

[14] Range Road 20 is classified as a Major Collector Roadway based on the County Collector Road Network. It should be noted that although this roadway is classified as a major collector with a capacity of 5,000 vpd, those sections of this roadway that are currently unpaved can accommodate 500 vpd prior to paving being required..



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Mountain View County Short Term (13,000) Forecast Network Issues

Exhibit 5.13

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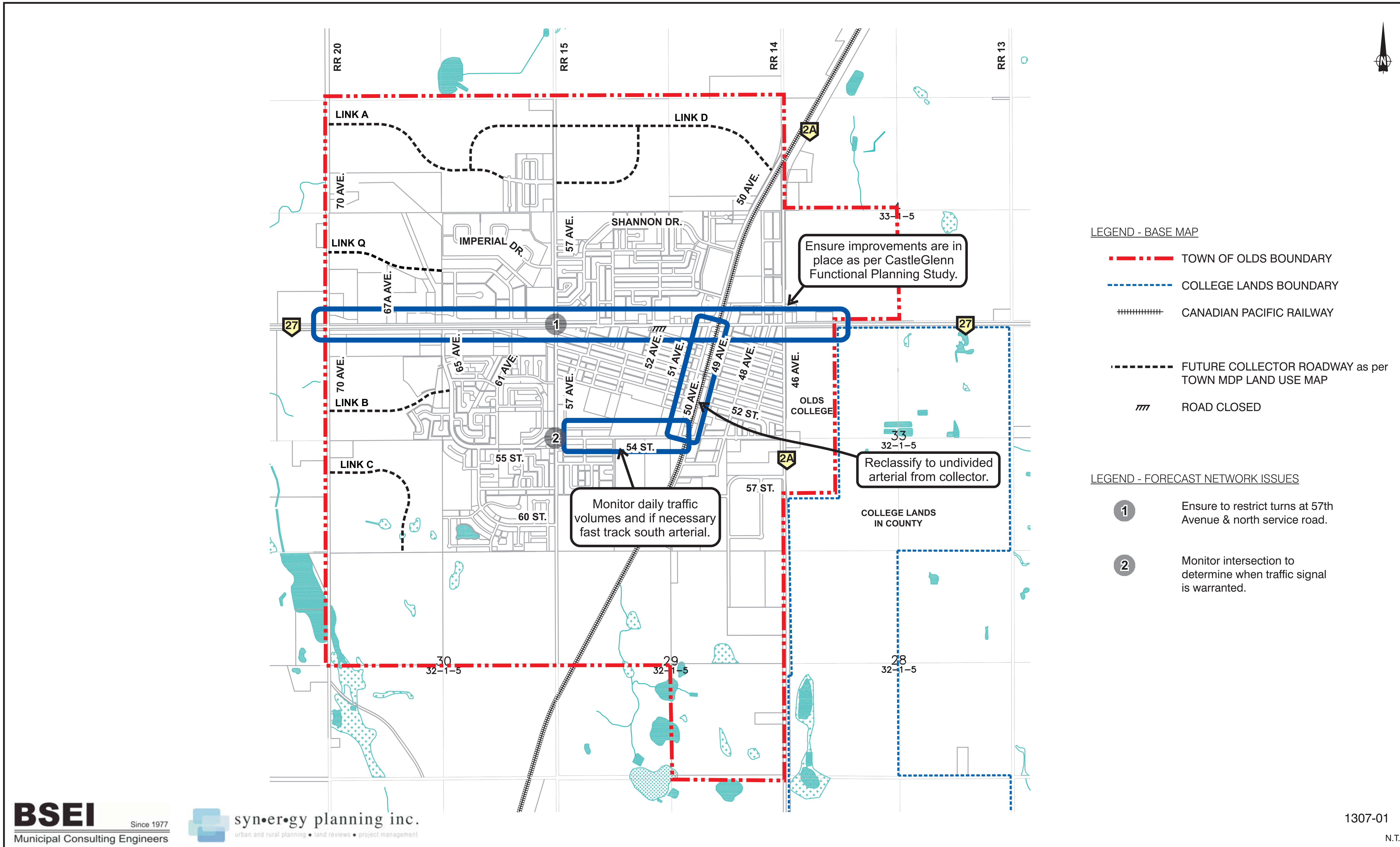

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Town of Olds Short Term (13,000) Forecast Network Issues

Exhibit
5.14

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Town Roadways

The results of this assessment identified a number of roadway links where the typical accepted threshold for maximum daily traffic volumes are expected to be met or exceeded. These are discussed in more detail in the sections that follow.

54 Street: 54th Street between 57th Avenue and the railway line is expected to carry in the order of 8,000 vehicles per day under the Short Term horizon, which is double the amount of traffic that is currently utilizing the roadway. However, with the eventual (Long Term) addition of the proposed south arterial that runs east-west as approved in the Town's Land Use Map, some traffic can be expected to shift from 54th Street to the south arterial and subsequently reduce the overall traffic congestion in the area. Given that the south arterial will not be constructed in the Short Term and is likely to be development driven, it is recommended that the Town monitor the traffic volumes on 54th Street and be aware that the need for the south arterial will be identified primarily by the relative increase of daily traffic volumes on 54th Street.

55 Street and 65 Avenue: Both 55th Street and 65th Avenue are expected to meet or slightly exceed the recommended daily capacity of 5000 vpd for a collector roadway. However, in neither case are the increase traffic levels significant. Improvements are not expected to be necessary.

57 Avenue: The 57th Avenue corridor north of Highway 27 can be expected to experience traffic volumes of 1,000 vpd greater than the recommended daily traffic volume of 12,000 vpd. It should be noted that this occurs just north of the intersection between Highway 27 and the service road and once north of the service road the daily traffic volumes drop to within the acceptable parameters. Bunt & Associates recommends the restriction of turns at the service road to access 57th Avenue to manage queues and to improve the overall operation of the intersection and roadway link. With the restriction of turn movements here, the traffic volume along 57th Avenue would be reduced as alternate routes to access the service road would be established. Therefore, Bunt & Associates recommends the turn restrictions at the service road not only to reduce the daily traffic volume but also to eliminate unsafe left turns at this location.

50 Avenue: 50th Avenue south of Highway 27 exceeds the recommended daily traffic volume, as was the case under existing conditions. 50th Avenue could potentially be re-classified as an undivided arterial as the function of the road is closer to that of an arterial than a collector. A review of the right-of-way confirmed that 50th Avenue has an existing right-of-way of approximately 23.0 metres, which can accommodate an arterial style roadway if the parking restrictions are implemented for the angled parking. With that said, Bunt & Associates suggests that any changes to parking layout and supply be considered in the context of a downtown parking review in order to determine the impacts of reducing the parking along 50th Avenue. With this in mind, Bunt & Associates recommends that 50th Avenue be the subject of a formal functional planning study and downtown parking study to establish opportunities for improvement with full assessment of impact. Clearly the roadway is a vital link for the Town, and should be optimized. However, it is also the corridor to the downtown area and needs to be assessed in the context of form as well as basic traffic function. For this reason, Bunt & Associates contends that the assessment of 50th Avenue and the associated recommendations need to go beyond the scope established for this Transportation Master Plan.

County Roadways

Based on the review of the short term daily link capacities, a number of roadways within the County are expected to exceed their recommended daily traffic volume thresholds. With these anticipated increases in traffic levels, a number of roadways within the County road network may warrant upgrading from a gravel roadway to a paved roadway. Given the significant cost associated with upgrading the gravel road network, it is recommended that the following roadways be monitored and that a detailed review (including comprehensive daily traffic counts and a cost-benefit assessment) be completed prior to a decision to construct. In the interim, it is recommended that the County implement the necessary dust control measures on these critical roadways. The specific roads that require surface management and/or upgrading to a paved surface are noted below:

- Township Road 332 West of RR 14
- Township Road 324 East of Highway 2A
- Range Road 20 North of Hwy 27 to Township Road 332
- Range Road 20 South of Hwy 27 (upgrade chip sealed section south of Highway 27)
- Range Road 12 South of Highway 27

5.4 *recommended short term road network improvements*

Based on the outcome of the VISUM model analysis completed for the Short Term horizon, Bunt & Associates recommends a number of improvements. Specific improvements include the following:

- Expected signalization of the 57th Avenue/54th Street intersection.
- Monitoring of 57th Avenue/ Shannon Drive, Highway 27/ 48th Avenue, Highway 27/ 49th Avenue and Highway 27/ Range Road 20 (70th Avenue) to assess needs for signalization.
- Extension of concrete median on south leg of 57th Avenue at Highway 27 to prevent short cutting along 50th Street.
- Construct concrete median on north leg of 50th Avenue at Highway 27 to eliminate left turns at the commercial site on the north side.
- Turn restrictions at 57th Avenue and the north service road should be implemented.
- Implement northbound and southbound left turn lanes at Highway 27/ 50th Avenue along with traffic signal optimization.
- Implement northbound and southbound left turn lanes at Highway 27/ 46th Avenue along with traffic signal optimization.

- Commencement of a functional planning and parking study for the 50th Avenue corridor in order to establish the appropriate manner in which to develop the roadway to optimize the utility of the roadway for the downtown core and active modes of transportation, while at the same time optimizing the efficiency of the roadway for the accommodation of traffic volumes.

- Monitor daily traffic volumes along 54th Street to aid in determining the timing for the development of the south arterial. This is not expected to be built at the Short Term horizon, but the volumes should be monitored.

- In the interim, it is recommended that the County implement the necessary dust control measures and/or upgrade to a paved surface are noted below:
    - Township Road 332 West of RR 14
    - Township Road 324 East of Highway 2A
    - Range Road 20 North of Hwy 27 to Township Road 332
    - Range Road 20 South of Hwy 27 (upgrade chip sealed section south of Highway 27)
    - Range Road 12 South of Highway 27

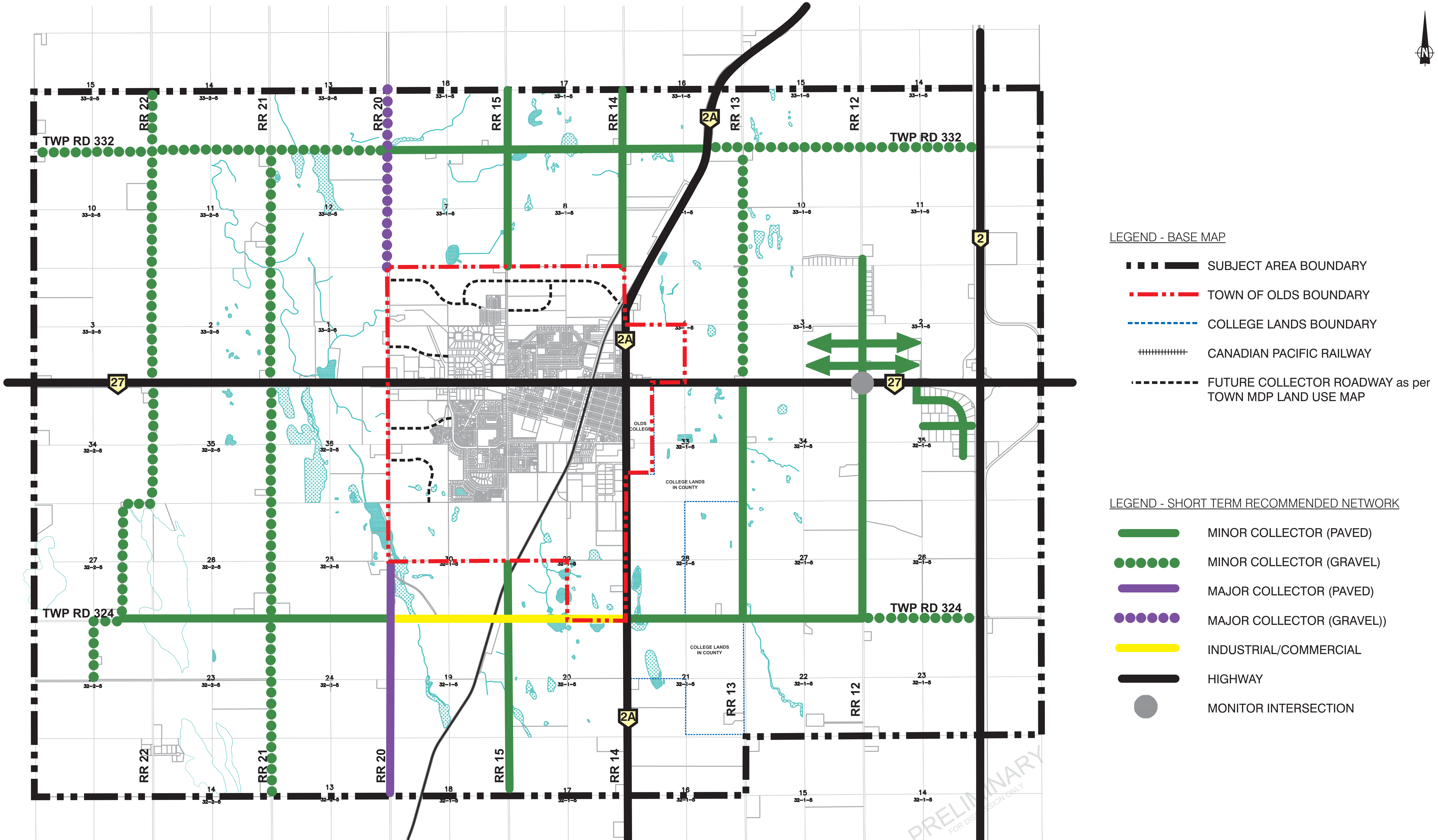
- Implementation of the previously identified improvements to Highway 27 as outlined in the Highway 27 Planning Study completed by CastleGlenn Consultants in 2009, and as illustrated on Exhibits 5.3 and Exhibit 5.12. These include the following:
    - Closure or restriction to right-in/right-out of the north leg of 61st Avenue at Highway 27.
    - Closure of the south leg of 52nd Avenue at Highway 27 and thus removal of the traffic signal.

With these improvements in place, the road network for the Town of Olds and County of Mountain View will be capable of accommodating growth through to the Short Term horizon, assumed to represent approximately 13,000 people.

The overall Short Term improvement program is illustrated in **Table 5.7**, which includes general prioritization of the individual improvements. The short term recommended road network is illustrated in **Exhibit 5.15** for the County and **Exhibit 5.16** for the Town.

Table 5.7: Short Term Improvement Program

Priority	Location	Improvement
Town		
1	Highway 27/ 50th Avenue	* Implement NB & SB left turn lanes * Consider turn restrictions & median on north leg * Traffic signal optimization
2	Highway 27/ 46th Avenue	* Implement NB & SB left turn lanes * Traffic signal optimization
3	Highway 27/ 57th Avenue	* Implement turn restrictions on north leg at service road to only allow right-in/right-out * Extension of concrete median on south leg
4	Highway 27/ 61st Avenue	Closure or restriction to right-in/right-out of the north leg of 61st Avenue
5	Highway 27/ 52nd Avenue	Closure of south leg intersection and removal of traffic signal
On-going	50th Avenue	Undertake functional planning and parking study along the corridor
On-going	54th Street	Monitor daily traffic volumes to aid in determining timing of south arterial
On-going	57th Avenue/ 54th Street	Monitor intersection for signalization
On-going	57th Avenue/ Shannon Drive	Monitor intersection for signalization
On-going	Highway 27/ 49th Avenue	Monitor intersection for signalization
On-going	Highway 27/ 48th Avenue	Monitor intersection for signalization
On-going	Highway 27/ 70th Avenue (RR20)	Monitor intersection for signalization
County		
1	RR 20 North of Hwy 27 to Twp Rd 332	Upgrade gravel to pavement
2	Twp Rd 324 East of Hwy 2A	Upgrade gravel to pavement
3	RR 12 South of Hwy 27	Upgrade gravel to pavement
4	RR 20 South of Hwy 27	Upgrade chip seal to pavement
5	Twp Rd 332 West of RR 14	Apply dust control



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Mountain View County Short Term (13,000) Skeletal Recommended Road Network

Exhibit
5.15

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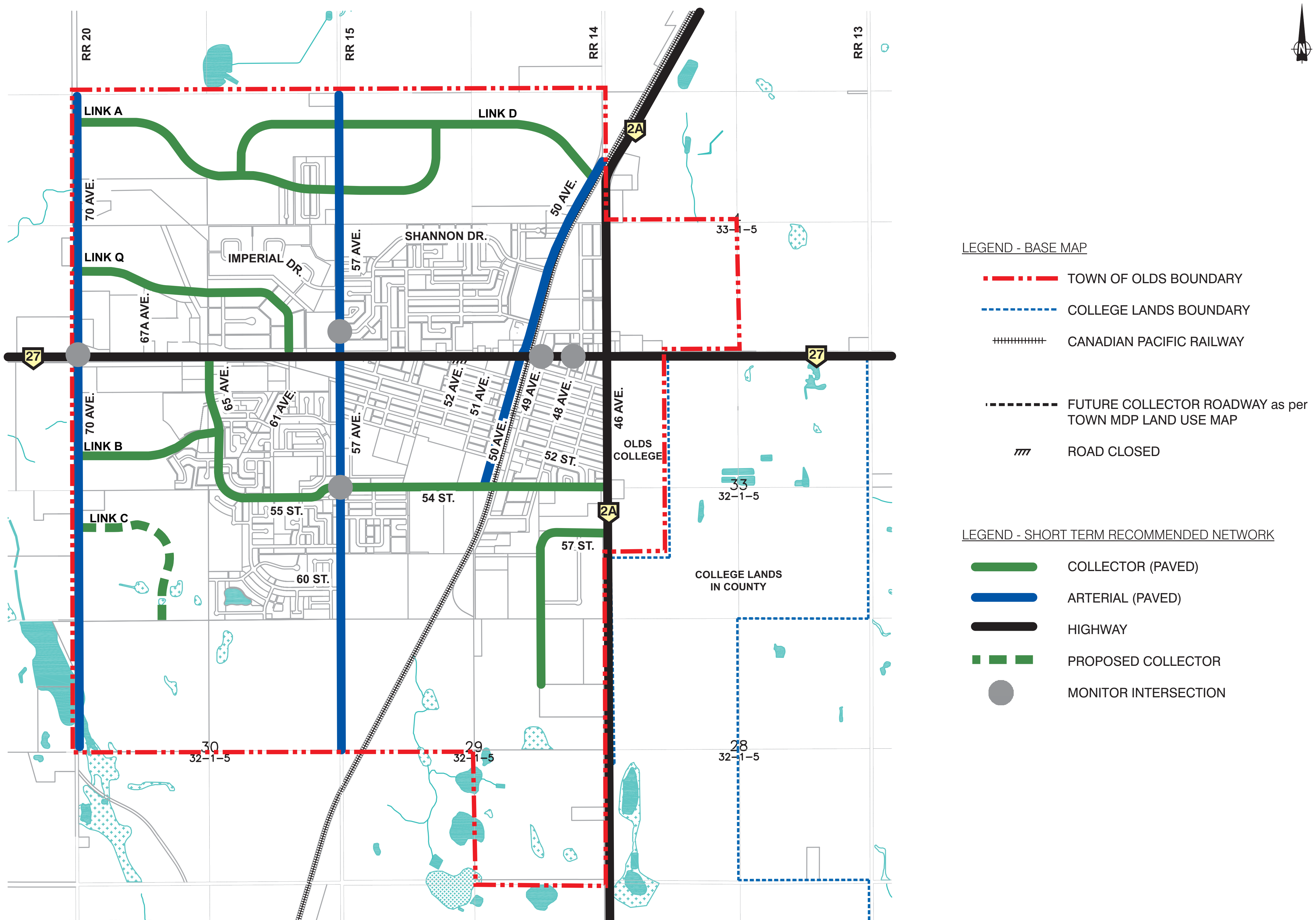

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Town of Olds Short Term (13,000) Skeletal Recommended Road Network

Exhibit
5.16

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6.0 DEVELOPMENT AND ASSESSMENT OF LONG TERM TRAFFIC FORECASTS (BASE NETWORK)

Once the base model had been assessed as outlined previously in Sections 4.0 and 5.0, it was possible to commence the work of examining options to improve the Long Term situation. The first step in this process was to examine the improvements that would be needed in order to maintain the Base Network without substantive change. This essentially represented the "Do Nothing" alternative, which included the addition of roadways and improvements included in the Town and County MDP documents and other related approved documents, but nothing further. Subsequent exercises sought to add new linkages and consider the impact of other improvements.

6.1 Introduction

The Long Term base model was developed based on the projected population and employment numbers developed through the matrix process and in consultation with the Town and County. The Long Term horizon corresponded to a point where the study area has reached a population of approximately 35,000 people and approximately 14,000 jobs. The initial Long Term model was based on the recommended improvements for the Short Term horizon as well as the twinning of Highway 27 (from two to four lanes) from the east edge of the Town to Highway 2, the closure of Range Road 11 at Highway 27 and the extension of Range Road 12 to Township Road 322. It also assumed the inclusion of the following recommendations from the Highway 27 Planning Study[15] completed by CastleGlenn as illustrated previously on Exhibits 5.3 to 5.12, with which Bunt & Associates concurs:

- Closure of 47th Avenue at Highway 27
- Extension of 51st Avenue to Highway 27 to create a new intersection, plus a north leg to the intersection.
- Realignment of north service road (61st Avenue to 57th Avenue) to tie into 57th Avenue at Shannon Drive.

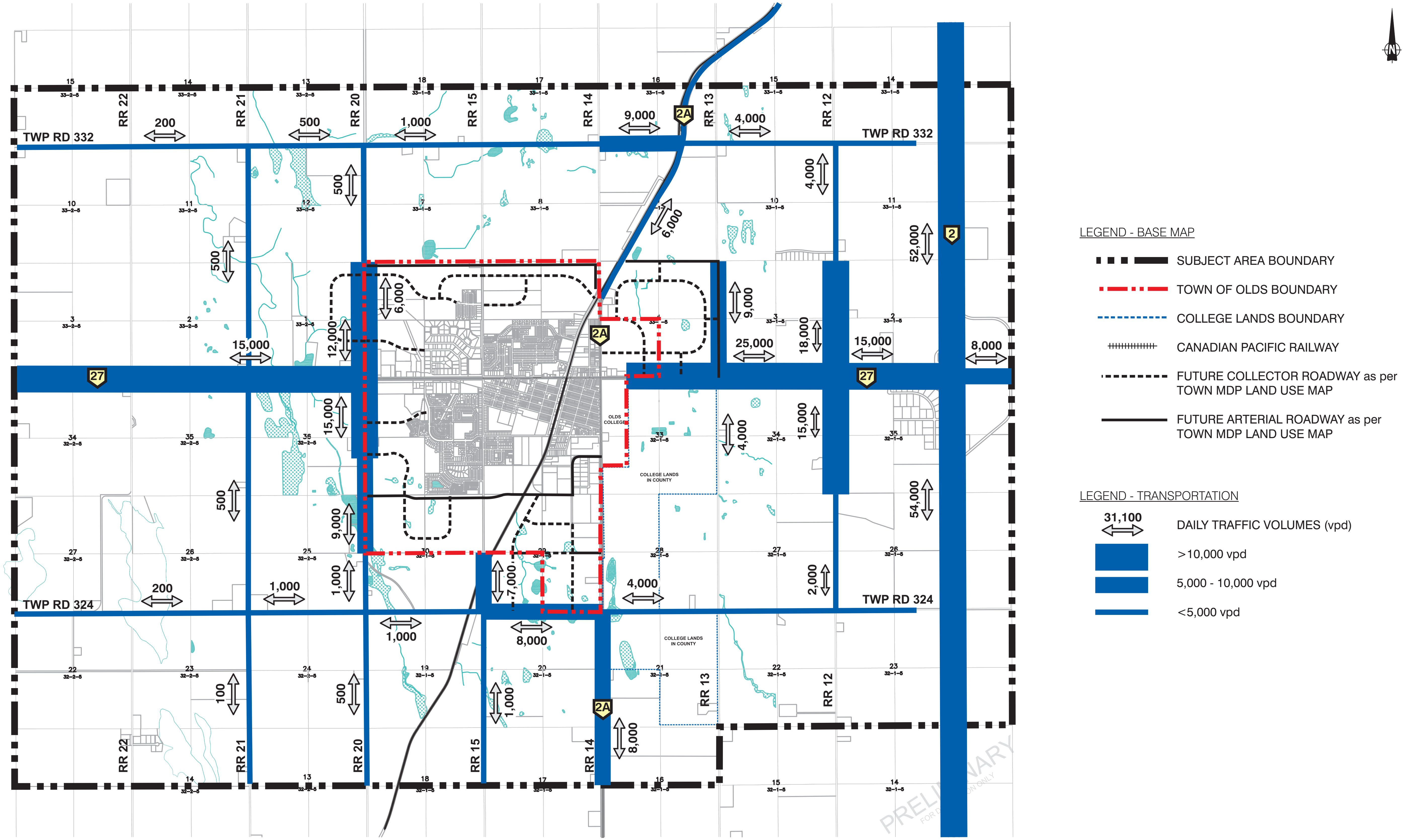
As with the Short Term condition, the VISUM model was developed for the weekday PM peak hour condition, as prescribed by the Town and County at the outset of the study. Daily traffic volumes were again extrapolated based on the PM peak hour outputs. Once this forecast had been developed, error checked and analyzed, it was possible to ratify the Long Term road network recommendations outlined in the existing ASP's and from information by the Town and County, and to expand the base recommendations as necessary based on the updated output.

This section of the process sought to examine the base network assuming no improvements beyond those already contemplated, and to identify key locations or corridors where conditions would warrant modifications to the base network beyond simple traffic signal installation or basic roadway improvements. In essence, this section provided the impetus for the development of a recommended road network in Section 7.7.

[15] Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., April 2009.

6.2 Development of Long Term Link Volumes

The peak hour link volumes were determined for the Long Term horizon and were then converted to daily link volumes as per the same process as the Short Term horizon. The resultant daily link volumes are illustrated on Exhibit 6.1 for the County and Exhibit 6.2 for the Town. Turning movement volumes were also generated for study area intersections for the Long Term horizon. These volumes were necessarily coarse given the limitations of the modelling process and were used for general assessment of intersection improvements on a relative basis, and for prioritizing/comparing one intersection against another. However, they were not shown on the exhibits as they should not be used for design purposes, again, given their relative coarseness.



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Mountain View County Long Term (35,000) Daily Traffic Volumes (as per Approved MDP Road Network)

Exhibit
6.1

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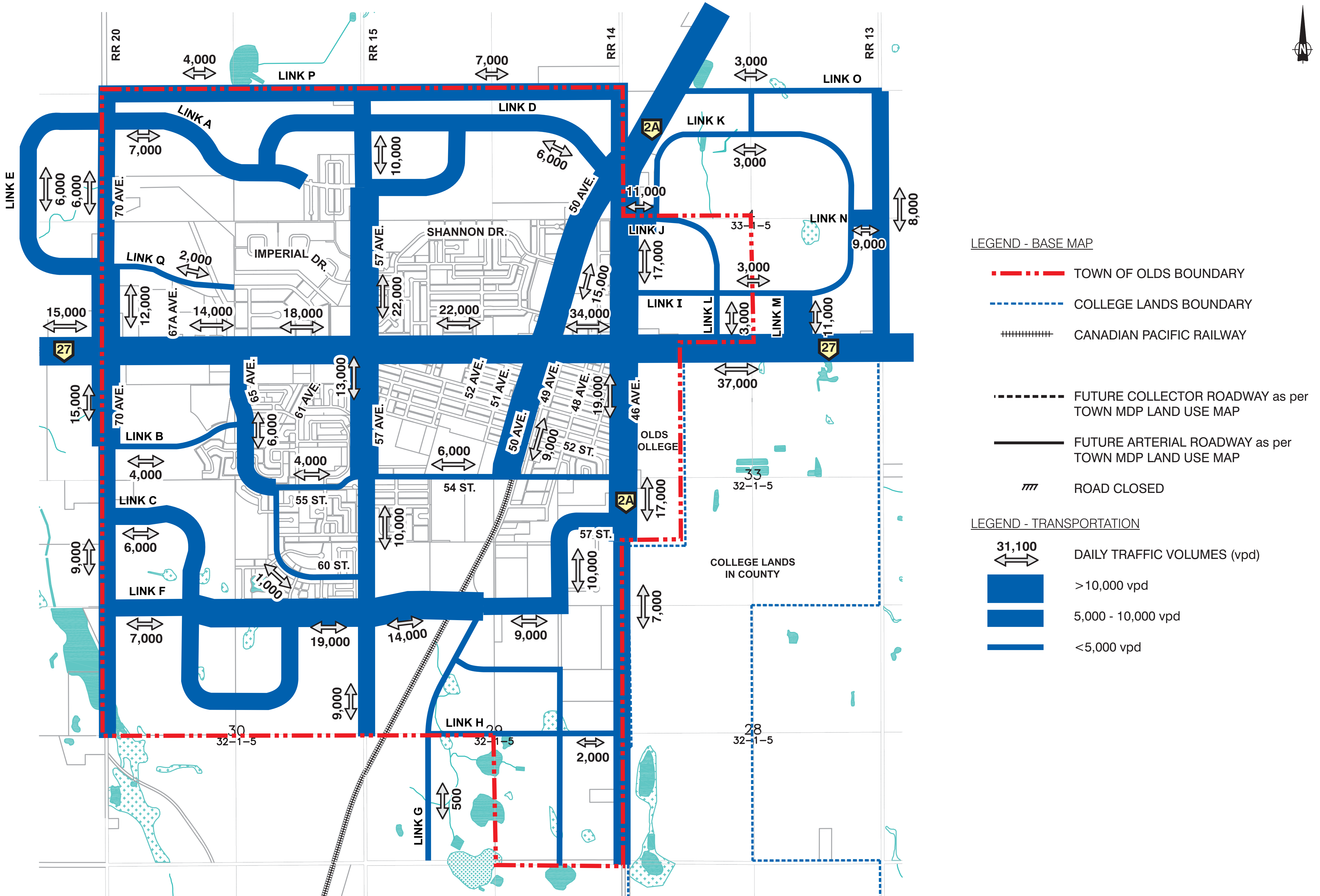

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Town of Olds Long Term (35,000) Daily Traffic Volumes (as per Approved MDP Road Network)

Exhibit 6.2

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6.3 Identification of Long Term Base Network Issues

Once the Long Term link volumes had been established, an analysis of the base network was completed for the Long Term horizon. As noted, this assumed the inclusion of the recommended improvements identified in the Short Term analysis, as well as the inclusion of the confirmed or recommended elements identified in approved ASP and MDP documents and the CastleGlenn Highway 27 Town of Olds Planning Study. However, the base network analysis did not include any further road links beyond those already identified. The purpose for this was to test the Long Term network without the benefit of improvements beyond those that were already known and/or approved. In this manner, it was possible to identify the shortcomings in the network and then develop options for an expanded network.

6.3.1 Intersection Review

As with the Short Term analysis process, the critical volume at each intersection was calculated as previously completed in the Short Term horizon to assess needs for signalization or other congestion mitigation measures. This was again based on a critical volume threshold of 600 for the point at which unsignalized intersections would need to be monitored, 800 for the point at which signalization was likely to be necessary (and accompanied by a warrant review) and 1200 at which point a signalized intersection would be at capacity and in need of further improvements.

Once the intersection analysis was completed, all of the study area intersections were reviewed to determine if physical improvements such as left and/or right turn bays would be required, as well as to determine if particular signal phasing plans were required to accommodate the anticipated traffic levels. For the purpose of this study, the need for improvements (both physical and operational) were based on the methodologies outlined in the Highway Capacity Manual (HCM). Specifically, a separate left turn phase at a traffic signal was assumed to be required when the left turn volume reaches a peak hour volume of 100, which in turn results in the need for a separate left turn bay. A right turn bay was deemed necessary when the right turn volume was in excess of 100 vehicles.

The results of the intersection review are summarized in Table 6.1. Elements such as the sum of the critical volumes, are indicators that improvements are anticipated; and that both the Town and the County should be making provisions for these improvements (as described in the following sections).

6.3.2 Link Capacity

The Long Term daily link capacities were re-assessed based on the inclusion of the recommended upgrades from the Short Term analysis. The results are summarized below in Table 6.2 and Table 6.3 for the Town of Olds roadways and Table 6.4 for the Mountain View County.

Table 6.1 Summary of Intersection Analysis– Long Term Conditions

Intersection	Existing Traffic Control	Critical Volume	TAC Signal Warrant Score	Left Turn Required	Right Turn Required	Signal Optimization Required
Highway 27 Corridor						
Highway 27/Highway 2A	Signalized	1600	n/a	✓	×	✓
Highway 27/48th Avenue	Unsignalized	1000	12	×	×	×
Highway 27/ 49th Avenue	Unsignalized	1000	211	✓	×	✓
Highway 27/50th Avenue	Signalized	1400	n/a	✓	×	✓
Highway 27/ 51st Avenue	Unsignalized	650	n/a	×	×	×
Highway 27/52nd Avenue	Unsignalized	750	n/a	×	×	×
Highway 27/57th Avenue	Signalized	1300	n/a	✓	×	✓
Highway 27/61st Avenue	Unsignalized	600	n/a	×	×	×
Highway 27/ 65th Avenue	Signalized	550	n/a	×	×	✓
Highway 27/ 67A Avenue	Signalized	650	n/a	×	×	✓
Highway 27/70th Avenue	Unsignalized	900	347	✓	✓	✓
Town of Olds Intersections						
57th Avenue/ Imperial Drive	Unsignalized	900	30	×	×	×
57th Avenue/Shannon Drive	Unsignalized	1400	132	✓	×	✓
57th Avenue/54th Street	Unsignalized	700	n/a	×	×	×
57th Avenue/60th Street	Unsignalized	700	n/a	×	×	×
50th Avenue/Shannon Drive	Unsignalized	1000	27	✓	×	×
Highway 2A/52nd Street	Unsignalized	850	26	×	×	×
Highway 2A/ 57th Street	Unsignalized	1100	96	×	×	×
Mountain View County Intersections						
Highway 2A/Twp Rd 332	Unsignalized	600	n/a	×	×	×
Range Road 15/Twp Rd 324	Unsignalized	700	n/a	×	×	×
Range Road 21/ Twp Rd 332	Unsignalized	100	n/a	×	×	×
Range Road 21/ Twp Rd 324	Unsignalized	100	n/a	×	×	×
Highway 27/ Range Road 12	Unsignalized	850	473	✓	✓	✓
Highway 27/ Range Road 13	Unsignalized	1,100	294	✓	✓	✓
Highway 2A/ Twp Rd 324	Unsignalized	800	74	×	×	×
Future Intersections						
70th Avenue/ Link P	n/a	500	n/a	×	×	×
70th Avenue (RR2.0)/ Link A	n/a	800	63	✓	✓	×
70th Avenue (RR2.0)/ Link E	n/a	800	35	×	×	×
70th Avenue (RR2.0)/ Link B	n/a	900	52	✓	×	×
70th Avenue (RR2.0)/ Link C	n/a	1,000	51	✓	×	×
70th Avenue (RR2.0)/ Link F	n/a	700	n/a	✓	×	×
57th Avenue/ Link F	n/a	1,500	334	✓	✓	✓
Highway 2A/ Link H	n/a	500	n/a	×	×	×
Highway 27/ Link M	n/a	1,250	343	✓	×	✓
Link N/ Range Road 13	n/a	800	11	×	×	×
Highway 2A/ Link J	n/a	1,000	47	×	×	×
Highway 2A/ Link P	n/a	400	n/a	×	×	×
50th Avenue/ Link D	n/a	800	35	✓	×	×
Range Road 14/ Link P	n/a	450	n/a	×	×	×
57th Avenue/ Link P	n/a	400	n/a	×	×	×

Table 6.2 Summary of Long Term Daily Traffic Volumes for Town of Olds Future Links

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Long Term Traffic Volumes (vpd)
Link A	Major Residential Collector	< 5,000	7,000
Link B	Minor Residential Collector	< 5,000	4,000
Link C	Major Residential Collector	< 5,000	6,000
Link D	Major Residential Collector	< 5,000	6,000
Link E	Major Residential Collector	< 5,000	6,000
Link F	4 –lane Undivided Arterial	12,000 – 20,000	7,000 – 19,000
Link G	Major Residential Collector	< 5,000	500
Link H	Major Residential Collector	< 5,000	2,000
Link I	Major Residential Collector	< 5,000	3,000
Link J	Undivided Arterial	5,000 – 12,000	11,000
Link K	Minor Residential Collector	< 5,000	3,000
Link L	Minor Residential Collector	< 5,000	3,000
Link M	Undivided Arterial	5,000 – 12,000	11,000
Link N	Undivided Arterial	5,000 – 12,000	9,000
Link O	Undivided Arterial	5,000 – 12,000	3,000
Link P	Undivided Arterial	5,000 – 12,000	7,000
Link Q	Major Residential Collector	< 5,000	2,000

Table 6.3 Summary of Long Term Daily Traffic Volumes for Town of Olds

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Long Term Traffic Volumes (vpd)
Highway 27: East of 46th Ave	Provincial Secondary Highway	< 20,000	37,000
Highway 27: Between 46th Ave & 50th Ave	Provincial Secondary Highway	< 20,000	34,000
Highway 27: Between 50th Ave & 57th Ave	Provincial Secondary Highway	< 20,000	22,000
Highway 27: Between 57th Ave & 65th Ave	Provincial Secondary Highway	< 20,000	18,000
Highway 27: Between 65th Ave & 67A Ave	Provincial Secondary Highway	< 20,000	14,000
Highway 27: West of 67A Ave	Provincial Secondary Highway	< 20,000	15,000
54th Street: Between Railway & 57th Ave	Major Residential Collector	< 5,000	6,000
55th Street: West of 57th Ave	Major Residential Collector	< 5,000	4,000
60th Street: West of 57th Ave	Minor Residential Collector	< 5,000	1,000
65th Avenue: South of Highway 27	Major Residential Collector	< 5,000	6,000
57th Avenue: Between Hwy 27 & Link A	Undivided Arterial	5,000 – 12,000	15,000 – 22,000
57th Avenue: Between Link A & Link P	Undivided Arterial	5,000 – 12,000	10,000
57th Avenue: Between Hwy 27 & 54th St	Undivided Arterial	5,000 – 12,000	13,000
57th Avenue: Between 54th St & 60th St	Undivided Arterial	5,000 – 12,000	10,000
50th Avenue: North of Highway 27	Undivided Arterial	5,000 – 12,000	15,000
50th Avenue: South of Highway 27	Undivided Arterial	5,000 – 12,000	9,000
46th Avenue (HWY 2A): North of Highway 27	Provincial Secondary Highway	< 20,000	17,000
46th Avenue: Between HWY 27 & 54th St	Provincial Secondary Highway	< 20,000	19,000
46th Avenue: Between 54th St & 57th St	Provincial Secondary Highway	< 20,000	17,000
46th Avenue: South of 57th Street	Provincial Secondary Highway	< 20,000	7,000
70th Avenue (RR 20) North of Hwy 27 to Link E	Undivided Arterial	5,000 – 12,000	12,000
70th Avenue (RR 20) Link E to Link P	Undivided Arterial	5,000 – 12,000	6,000
70th Avenue (RR 20) South of Hwy 27 to Link C	Undivided Arterial	5,000 – 12,000	15,000
70th Avenue (RR 20) Link C to Link F	Undivided Arterial	5,000 – 12,000	9,000

Table 6.4 Summary of Long Term Daily Traffic Volumes for Mountain View County

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Long Term Traffic Volumes (vpd)
Highway 2	Provincial Primary Highway	> 20,000	54,000
Highway 27 (east of Olds)	Provincial Secondary Highway	< 20,000	15,000 – 25,000
Highway 27 (west of Olds)	Provincial Secondary Highway	< 20,000	15,000
Highway 2A (north of Olds)	Provincial Secondary Highway	< 20,000	6,000
Highway 2A (south of Olds)	Provincial Secondary Highway	< 20,000	8,000
Twp Rd 332 West of RR 14	Minor Collector Road ‘A’ (paved)	500 – 5000	1,000
Twp Rd 332 East of RR 14 to Hwy 2A	Minor Collector Road ‘A’ (paved)	500 – 5000	9,000
Twp Rd 332 East of Hwy 2A	Minor Collector Road ‘B’ (gravel)	< 500	4,000
Twp Rd 324 West of Hwy 2A to RR 20	Industrial/Commercial Road (paved)	5,000 – 12,000	8,000
Twp Rd 324 East of Hwy 2A	Minor Collector Road ‘A’ (paved)	500 – 5000	4,000
Range Road 21	Minor Collector Road ‘B’ (gravel)	< 500	500
Range Road 20 South of Link F	Major Collector	5,000 – 12,000	1,000
Range Road 20North of Link P	Major Collector	5,000 – 12,000	500
Range Road 15 North of Twp Rd 324	Minor Collector Road ‘A’ (paved)	500 – 5000	7,000
Range Road 15 South of Twp Rd 324	Minor Collector Road ‘A’ (paved)	500 – 5000	1,000
Range Road 12 South of Twp Rd 332	Minor Collector Road ‘A’ (paved)	500 – 5,000	4,000
Range Road 12 North of Hwy 27	Minor Collector Road ‘A’ (paved)	500 – 5,000	18,000
Range Road 12 South of Hwy 27	Minor Collector Road ‘A’ (paved)	500 – 5,000	15,000
Range Road 12 North of Twp Rd 324	Minor Collector Road ‘A’ (paved)	500 – 5,000	2,000
Range Road 13 North of Hwy 27	Minor Collector Road ‘B’ (gravel)	< 500	9,000
Range Road 13 South of Hwy 27	Minor Collector Road ‘A’ (paved)	500 – 5,000	4,000

6.4 Required Long Term Base Network Improvements

The analysis of the Long Term base network under the condition of “Do Nothing” identified significant issues with the study area roadways and intersections. If no other roadway links or improvements are added other than those already identified in approved policy documents, then there would be a need for a significant improvement program. This is outlined in the following sections, and it is noted that even with these improvements in place, conditions on the study area road network would not be acceptable. Additional road links and improvements are required beyond those already contemplated in the MDP and other policy documents. This is discussed in more detail in Section 7.0.

6.4.1 Intersection Improvements

The Long Term intersection improvements under the “Do Nothing” alternative mainly consist of installing traffic signals with optimization as well as the introduction/provision of left and right turn bays at specific locations as summarized in Table 6.5. It is noted that even with these improvements in place, key locations will continue to experience considerable congestion and delay. Of particular note are the intersections along Highway 27, and on 57th Avenue.

Table 6.5: Summary of Long Term Intersection Improvements – Base/Do-nothing Alternative

Intersection/Road Link	Recommended Improvements
Highway 27/ 46th Avenue	* Eastbound and westbound dual left turn lanes * Optimize signalization with dual protected left turns
Highway 27/ 49th Avenue	* Install traffic signal * Eastbound and westbound left turn lanes * Optimize signalization with EB/WB separate left turn phases
Highway 27/ 50th Avenue	* Eastbound and westbound left turn lanes * Optimize signalization with WB separate left turn phase
Highway 27/ 51st Avenue	* Install traffic signal * Eastbound and westbound left turn lanes * Optimize signalization with EB/WB separate left turn phases
Highway 27/ 57th Avenue	* Northbound and southbound left turn lanes * Optimize signalization with separate left turn phases
Highway 27/ 70th Avenue	* Install traffic signal * Left turn lanes for all legs of intersection * Northbound and eastbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Link M	* Install traffic signal * Eastbound left turn lane * Optimize signalization with EB separate left turn phase
Highway 27/ Range Road 13	* Install traffic signal * Left turn lanes for all legs of intersection * Southbound and westbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Range Road 12	* Install traffic signal * Left turn lanes for all legs of intersection with a dual northbound left turn * Right turn lanes for all legs of intersection * Optimize signalization with separate protected left turn phase for the NB/SB left turns and a separate left turn phase for the EB/WB left turns
57th Avenue/ Shannon Drive	* Install traffic signal
Highway 2A/ 57th Street	* Monitor intersection to determine when traffic signal is warranted
70th Avenue (RR 20)/ Link A	* Eastbound and westbound left turn lanes * Northbound right turn lane
70th Avenue (RR 20)/ Link B	* Southbound left turn lane
70th Avenue (RR 20)/ Link C	* Southbound left turn lane
70th Avenue (RR 20)/ Link F	* Southbound left turn lane
57th Avenue/ Link F	* Install traffic signal * Left turn lanes for all legs of intersection * Westbound right turn lane * Optimize signalization with separate left turn phases
50th Avenue/ Link D	* Northbound left turn lane

6.4.2 Link Improvements

The recommendations for the road link improvements for the "Do Nothing" alternative include classification upgrades, surface treatment upgrades and/or road widening as discussed below. It should be noted that although some of the collector roadways are carrying in excess of the recommended traffic volume, the slight increase is not expected to impact the roadway overall. If the traffic volumes become an issue traffic calming measures may be placed to deter the traffic elsewhere.

A summary of the required Long Term road link improvements for the "Do Nothing" alternative are described in Table 6.6. Again, these improvements serve to optimize the network to the extent possible, but they are insufficient to provide the study area with an overall acceptable level of mobility. As well, some of these required improvements may be undesirable for the Town or County. Further improvements will be required through fundamental changes to the skeletal road network. This is discussed in detail in Section 7.0.

Table 6.6: Summary of Long Term Recommended Road Link Improvements – Base/Do-nothing Alternative

Intersection/Road Link	Recommended Improvements
70th Avenue (Range Road 20)	* Four-lane undivided arterial
57th Avenue	* Three-lane cross section with a central two-way left turn lane
50th Avenue	* Upgrade to a four-lane undivided arterial
Highway 27	* Four-lane divided arterial with separate left & right turns at key intersections
Link F	* Four-lane undivided arterial
Range Road 15	* Upgrade to a Major Collector from a Minor Collector
Range Road 13	* Upgrade surface treatment to pavement
Range Road 12	* Upgrade to a Major Collector from a Minor Collector
Township Road 324	* Upgrade to a Major Collector from a Minor Collector

As shown in the Table 6.6, a number of key improvements will be required to the approved road network, as follows:

- *70th Avenue (Range Road 20):* It is anticipated that 70th Avenue between Link E and Link C will carry approximately 15,000 vpd. This would require a four-lane undivided arterial standard roadway, which can be accommodated within the available right of way.

- *57th Avenue:* 57th Avenue between 54th Street and Link A can be expected to carry between 15,000 and 22,000 vpd in the Long Term and is considered to be primary north-south route throughout the study area, including the heart of the downtown core area. As such, 57th Avenue will be a critical link for all road users. Considering the anticipated traffic levels and the regional importance of this road, provisions for a substantial four-lane arterial facility would typically be required. However, due to the limited existing right-of-way of approximately 20.0 metres, upgrading the roadway to a four-lane facility may not be achievable. This will result in substantial congestion, even if alternative methods such as a three lane section with two-way left turn lanes were to be implemented as a means to accommodate growth to approximately 18,000 vehicles per day.

- *50th Avenue:* 50th Avenue just north of Highway 27 can be expected to carry approximately 15,000 vpd in the Long Term and 9,000 vpd on the south leg of 50th Avenue. This would necessitate the possible need to re-classify the south leg of 50th Avenue as an undivided arterial given the expected function of the roadway. A review of the right-of-way confirmed that 50th Avenue has an existing right-of-way of approximately 23.0 metres, which could technically accommodate an arterial style roadway if parking restrictions were to be implemented. That said, the accommodation of such high volumes on 50th Avenue in the vicinity of Highway 27 would result in congestion as well as issues related to access.

- *Highway 27:* Highway 27 between 50th Avenue and Range Road 13 can be expected to experience volumes greater than 30,000 vehicles per day in the long term. In addition to the base four-lane section, this level of traffic would require separate left and right turn lanes at critical intersections. This would also limit all other accesses to right-in/right-out only along this corridor. It is also noted that the growth in development along the north edge of the Town west of the CPR corridor in particular will result in the need for all eastbound traffic generated by those areas to pass through the intersection of Highway 27 / 50th Avenue. This will result in considerable congestion and delay at this location, even with additional turn lanes in place. Notwithstanding the volume and capacity issues generated by this situation, this also presents the Town and County with difficulty related to access and accommodation of emergency vehicles. In Bunt & Associates' opinion, this location is the single greatest constraint to the adequacy of the overall study area road network. An additional east/west linkage across the Town (and the CPR corridor) is required in order to provide an adequate level of service for day-to-day traffic activity, and a redundancy for emergency response vehicles.

- *Link F:* Link F is an approved roadway under the current MDP and is currently assumed to be located along the south edge of the community of Lake Ridge offset from the homes by a berm and associated landscaped buffers. Based on the projected traffic volumes, this roadway is expected to carry between 7,000 and 19,000 vpd in the Long Term; thus resulting in the need for a classification as a four-lane undivided arterial roadway with access at key intersections only. It may be possible to reduce the cross section to two lanes at the east and west end sections of this roadway, though adequate rights of way should be protected to accommodate a four lane section if found to be necessary. It is noted that there is some question as to the actual alignment for this roadway. The Town has indicated that residents of the Lake Ridge community are seeking to see the roadway shifted south so as to increase the separation between their community and what will certainly be a substantial roadway carrying significant volumes of traffic, including trucks. This position was echoed by the residents at the Open Houses held for this project, and so alignments other than the current approved option needed to be considered. This is discussed in more detail later in Section 7.0.

- *Range Road 15:* Range Road 15 south of the Town limits to Township Road 324 is currently classified as a minor collector roadway; however due to the projected traffic volumes of approximately 9,000 vpd on this segment, this roadway would need to be upgraded to a major collector. Based on the County design requirements, the accommodation of a major collector is feasible within the existing right-of-way of 30.48 metres.

- *Range Road 13:* Range Road 13 is currently classified as a minor collector with a gravel surface north of Highway 27 and a paved surface south of Highway 27. The projected traffic volumes on the roadway are approximately

8,000 vpd. With these anticipated traffic volumes, Range Road 13 will require upgrading to a paved surface and should be upgraded to major collector under the County road classifications. However, as time progresses Range Road 13 will become a part of the Town of Olds skeletal road network and as such, it is recommended that this particular road be reclassified to an arterial classification, as per the Town of Olds road classifications.

- *Range Road 12:* Range Road 12 just north of the Netook Crossing development to south of the Opus lands also requires an upgrade from a minor collector to a major collector as the roadway is expected to carry in excess of 18,000 vpd. Based on the County's current design requirements, the accommodation of a major collector is feasible with the existing right-of-way of 30.48 metres. The intersection of RR 12 and Highway 27 is expected to be extremely congested as the 18,000 vpd is located at the intersection. Based on the forecast traffic volumes the northbound left turn and southbound right turn are expected to be in the order of 500 vehicles during the PM peak hour.

- *Township Road 324:* Township Road 324 from Highway 2A to Range Road 12 would also require an upgrade from a minor collector to a major collector as the roadway is expected to carry in excess of 9,000 vpd.

6.5 Summary of Long Term Base Network Shortcomings

Based on the results of the intersection and link capacity analyses noted above, a number of shortcomings and pinch points were identified in the base network. For example, approximately half of the study area intersections would be expected to require some form of improvement by the Long Term horizon with no fewer than seven intersections requiring signalization, and numerous left and right turn bays would need to be implemented to reduce the impedance on the through traffic. Signal optimization and possible corridor progression may also be required. The daily link capacity analysis showed that there will be a considerable number of roadways that will either require an upgrade in road classification or an alteration in the functionality of the road, and in some case surface treatment upgrades.

Once all aspects of the intersection and link analysis had been assessed, it was clear that the base network as per the approved MDP and associated ASP documents would not function at an acceptable level of service for the Town or County without changes and additions. A number of key pinch points were found to exist in the network. Main items of note for consideration in the assessment of an expanded or otherwise modified network included the following:

- The Highway 27 corridor is expected to be very congested, with intersection capacity being met or exceeded at a number of locations. This would necessarily result in a need to widen Highway 27 to accommodate separate left and right turn lanes between Highway 2 and Range Road 20 (70th Avenue) as necessary to accommodate intersection turning movements at numerous locations. Access management may need to be considered, which would result in possible amalgamation of access driveways, closures etc. Growth on the cells along the north edge of the Town area in particular suggest a need to provide a strong and continuous east/west connection across the north edge of the Town.

- Twp Rd 332 will be heavily utilized in the vicinity of Highway 2A. Volumes will be far in excess of what the corridor is intended to carry. This is due to significant growth in the area and the absence of a strong east/west connection further to the south along the northern edge of the Town.

- The 57th Avenue corridor will be heavily overloaded in certain sections due to the absence of adequate alternative north/south corridors. This extends north of the Town into the County (as Range Road 15). To a lesser degree, the same is true for 50th Avenue. Both of these roadways and 57th Avenue in particular, are vital to the function of the Town, both in terms of traffic capacity as well as pedestrian/bicycle active modes use. The 57th Avenue corridor may arguably be the most significant corridor in the study area after Highway 27. Part of the issue is related to the inability to reach areas east of the CP railway corridor without utilizing Highway 27. A crossing of that rail corridor north of Highway 27 is therefore vital to the long term health of the network, and for these two roadways in particular.

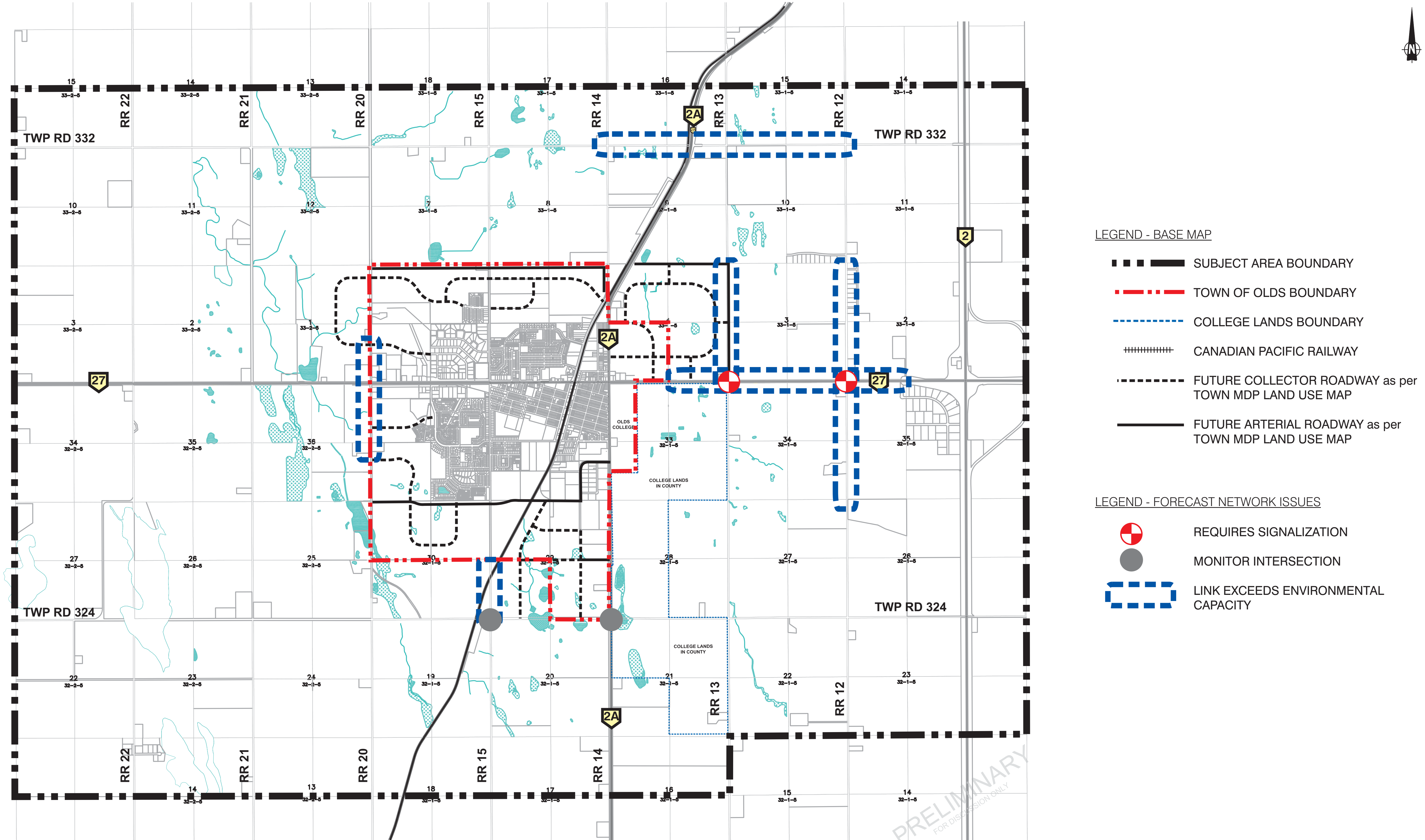
- The development of lands in the County between the Town and Highway 2 show a strong need for multiplicity of access to Highway 27 that may be challenging under current road network plans. The congestion expected to be evident at connections between these areas and Highway 27 suggest a need to provide a viable alternative access to and from the areas north and south of Highway 27 in this area suggest a need for a strong north/south connection between the Town and Highway 2, preferably along Range Road 12 or 13. This is further supported by the expected congestion on 57th Avenue throughout the Town in terms of desire lines for north/south connectivity. Akin to a ring road, this would provide a means for traffic to travel between the southwest residential nodes in the Town and the industrial/commercial node on the east side without the need to necessarily utilize Highway 27 for access.

- A considerable amount of development traffic pressure will result in a need for 70th Avenue (Range Road 20) to be a substantial roadway. The forecast volumes along this corridor are significant, and the excessive congestion forecast for the 57th Avenue corridor highlights the need to ensure adequate connectivity to and from 70th Avenue for areas developed along that corridor. Utilization of this roadway to a level greater than anticipated in the MDP may be necessary in order to alleviate congestion in other corridors.

A summary of the overall network issues for both the intersection review and the link capacity review is illustrated in **Exhibit 6.3** for Mountain View County and **Exhibit 6.4** for the Town of Olds.

The next step in the process was to specifically assess the opportunities to improve the base network through the inclusion of upgraded intersections and road links, and new road links. Cursory consideration was also given to the potential for a northern by-pass of the Town area as currently being reviewed by Alberta Transportation. The cursory nature of the analysis was necessary given that Alberta Transportation had not commenced with that study at the time of development of forecasts for use in this Transportation Master Plan.

The examination of expanded Long Term road network options is discussed in Section 7.0.



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Mountain View County Long Term (35,000) Forecast Network Issues (as per Approved MDP Road Network)

Exhibit
6.3

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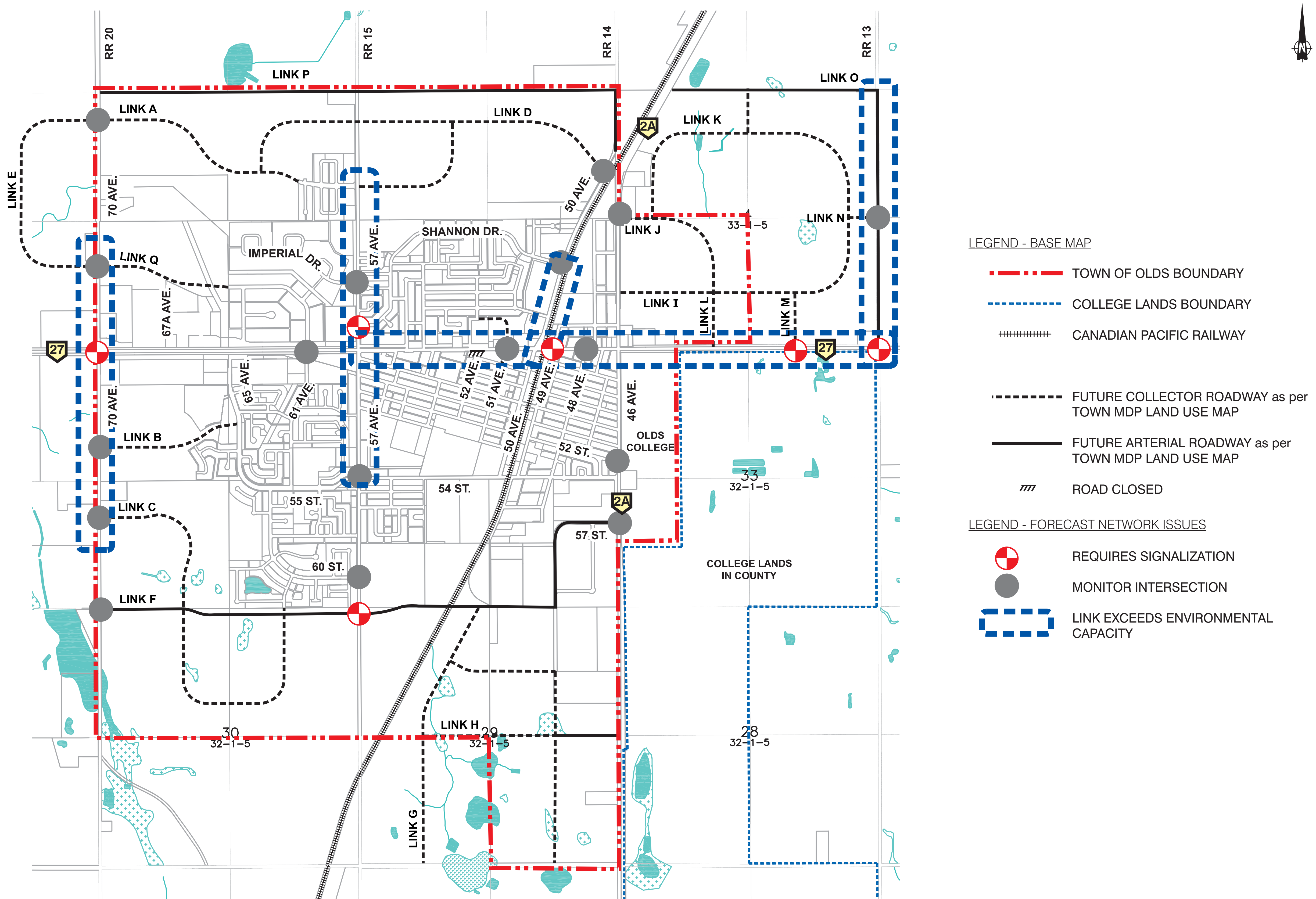

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Town of Olds Long Term (35,000) Forecast Network Issues (as per Approved MDP Road Network)

Exhibit
6.4

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7.0 ASSESSMENT OF LONG TERM ROAD NETWORK ALTERNATIVES

7.1 Introduction

With the anticipated growth within the Town of Olds and Mountain View County, traffic volumes within the area will continue to increase. The Highway 27 corridor is expected to experience a significant amount of congestion within the Town limits and east to Highway 2. The assessment of the Do Nothing scenario outlined in the previous section highlighted the need for additional road links to accommodate growth. These links would be over and above those already planned for within approved ASP and MDP documents.

Bunt & Associates, together with the Steering Committee, reviewed options worthy of consideration in terms of additional road links and improvements for the area. Major items of note included the following:

- *Item 1:* A need to provide an east/west corridor along the northern edge of the Town that might or might not also function as part of the possible by-pass being contemplated by Alberta Transportation. Impacted by this is the consideration of the needs of both 50th and 57th Avenue corridors as major vehicular routes, but with due consideration of Active or Non-motorized transportation modes.

- *Item 2:* Confirmation of capacity for north/south linkages in the Netook area south to Twp Rd. 324.

- *Item 3:* Review of alternatives to Link F, or the South Connector, with options to connect it through to Highway 2A.

- *Item 4:* Management of the Highway 27 corridor.

- *Item 5:* Consideration of an internal ring road route to enhance opportunities for the provision of transit.

Implicitly included within this was the need to consider a possible by-pass around the Town as part of a future Alberta Transportation initiative. This initiative would see the existing Highway 2/Highway 27 interchange upgraded; or augmented with a new interchange likely located several kilometers north of the Town on Highway 2. While the Alberta Transportation study was not yet underway at the time of the completion of this Master Plan exercise, the notion was given due consideration to the extent possible within this study.

The development of these alternative road network connections occurred through the various Steering Committee meetings, Design Charrettes and VISUM modeling efforts. Bunt & Associates reviewed all of the identified alignment options to determine which alignments would benefit both the Town and the County in the future based on the amount of traffic it would alleviate from the congested road network.

A review of the additional links proposed by Bunt & Associates, their respective impacts, with respect to a proposed long term road network are outlined in the sections that follow.

7.2 Item 1: North Connector

As noted in Section 6.0, the assessment of the Base Network under the Do Nothing alternative showed the potential for 57th Avenue between 54th Street and Link A to carry between 15,000 and 22,000 vpd in the Long Term. Considering the anticipated traffic levels and the regional importance of this road as a vital internal north/south connector, provisions for a substantial four-lane arterial facility would typically be required. However, due to the limited existing right-of-way of approximately 20.0 metres, and given the use and potential for expanded use of this corridor as an Active Modes (non-motorized) corridor, upgrading the roadway to a four-lane facility may not be achievable.

The resulting need for all eastbound traffic generated by areas north of Highway 27 and west of the CP railway corridor those areas to utilize the intersection of Highway 27 / 50th Avenue will result in considerable congestion and delay at this location, even with additional turn lanes in place. As noted earlier, this location is the single greatest constraint to the adequacy of the overall study area road network. An additional east/west linkage across the Town (and the CPR corridor) is required in order to provide an adequate level of service for day to day traffic activity, and a redundancy for emergency response vehicles. Bunt & Associates recommends that this be provided along the north edge of the Town, on or in the vicinity of Twp Rd. 332, and that it extend as a continuous link between RR 12 or RR 13 in the east through to RR 20 (70th Avenue) in the west. This roadway will need to be an arterial in terms of classification, with four lanes protected, and it will be necessary to accommodate closely spaced intersections and a railway crossing toward the east end of the section. This may carry with it the eventual need for a grade separation over the CP railway corridor and potentially Highway 2A. A separate functional planning study would be required in order to assess alignment options for this crossing, and it is recommended that the Town and County seek to undertake that study prior to the need for the link occurring.

Since Alberta Transportation is undertaking a review of possible by-pass options for the Town, and since the main focus of this exercise is understood to involve a by-pass around the northern edge of the Town, it is respectfully submitted that the need for this North Connector could dovetail with the Provincial need for a by-pass route. Any opportunities to work with Alberta Transportation to secure the opportunity for this roadway, with requisite intersections to/from development cells north and south of the corridor, should be pursued.

In addition to identifying the need for the North Connector, Bunt & Associates sought to establish the relative impact to the Highway 27 corridor if different alignments further to the north were considered for this roadway. Intuitively, the further north the roadway is placed, the less utility it provides to the Town and County in terms of resolving the issues related to the Highway 27/50th Avenue intersection. Bunt & Associates therefore undertook a cursory assessment of forecast outputs for three separate alignments to review and determine which would best meet the Town and County needs. It should be noted that the north bypass will also be utilized as a truck route in order to keep the trucks out of the Town and off Highway 27. It should also be noted that this assessment was very cursory and by no means complete. It is intended only for discussion purposes and to provide input information for the Town and County in terms of beginning a review of the Alberta Transportation by-pass review.

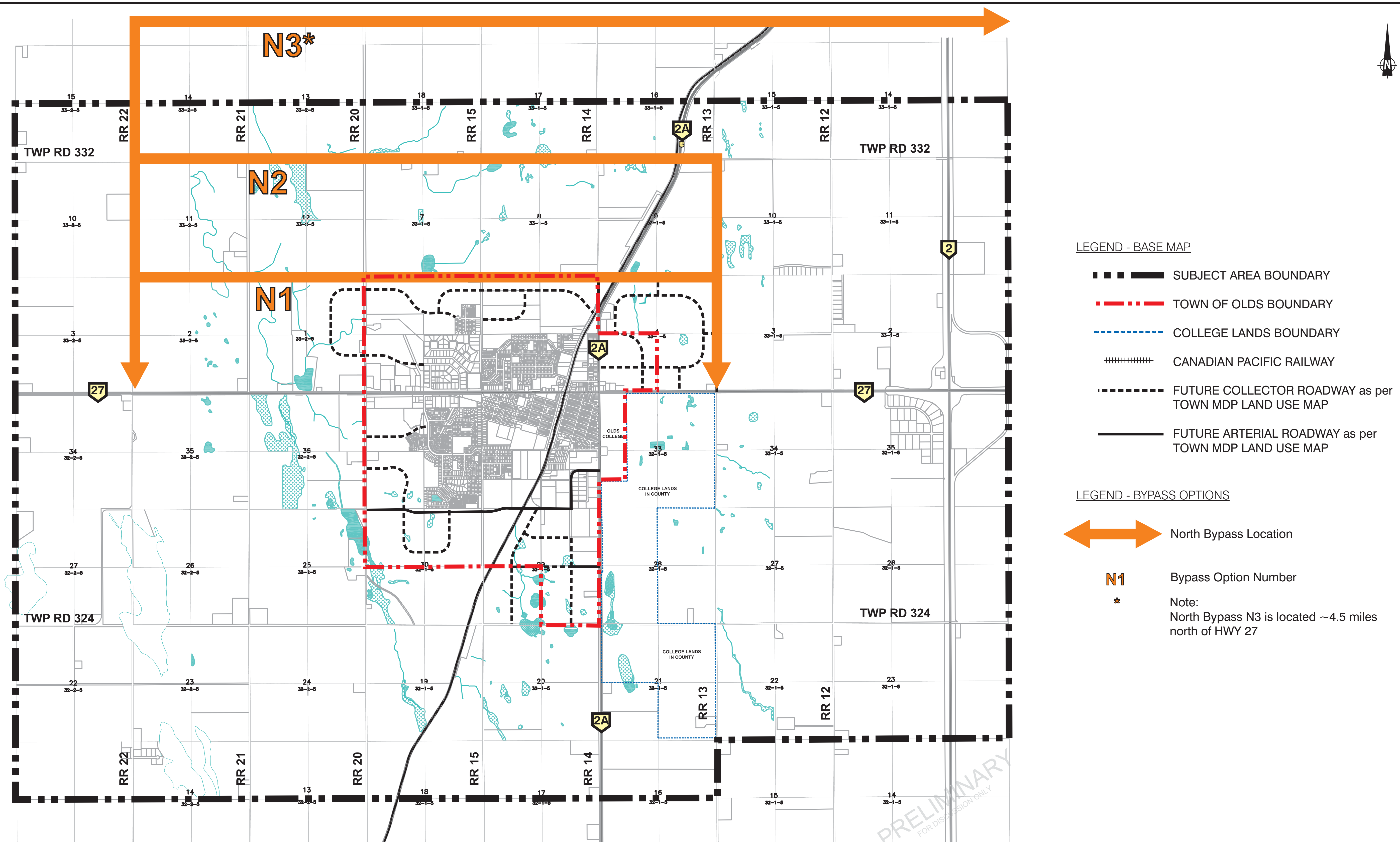
The first alignment alternative was located at the north end of the existing Town boundary, the second alignment ran along Township Road 332, while the third alignment was placed approximately 4.5 miles north of Highway 27 as it is expected that a future interchange at Highway 2 may occur at this location. The relative alignment locations are illustrated notionally on Exhibit 7.1. A preliminary list of pros and cons for each alignment is summarized in Table 7.1. This list is not exhaustive and as noted, is intended primarily for discussion purposes only and as input information for use by the Town and County in reviewing the Alberta Transportation by-pass alignment review.

Table 7.1 Pros versus Cons of North Bypass

Option	Pros	Cons
N1	* Residents will profit as close to Town * No oil & gas concerns * Sections of the roadway will be built as part of the Town's future road network * Significant shift in traffic from Highway 27	* No direct connection to Hwy 2 * Small water bodies to cross * Truck traffic close to Town * Apply for rail crossing * Adjacent to north side of existing golf course * Adjacent to small existing residential community & farms * Upgrade to Hwy 2A where roadway intersects
N2	* Existing roadway * Existing rail crossing * Existing intersection at Hwy 2A * Existing intersection at Hwy 2A * No oil & gas concerns * Trucks moved out of Town area	* No direct connection to Hwy 2 * Not a significant shift in traffic from Highway 27 * Small water bodies to cross * Hwy 2A intersection may require upgrades * Adjacent to existing farms
N3	* Connection to Hwy 2 via future interchange * Trucks moved out of Town area	* Entire roadway must be built * Negligible shift in traffic * Will not be used by residents of the Town * Apply for rail crossing * Unknown oil & gas concerns * Intersection at Hwy 2A required * Adjacent to existing farms

Based on the review of the three alignments, Bunt & Associates concluded, as expected, that the first alignment (N1) along the Town boundary would exhibit the most noticeable shift in traffic away from Highway 27. This shift in traffic would alleviate some of the congestion that is expected to be experienced along the Highway 27 corridor in the Long Term, and may serve to allow the Town to downgrade Highway 27 to a possible three lane roadway with wider pedestrian and bicycle areas through a Road Diet approach to road planning. In addition, it also removes the trucks from the centroid of the Town and creates a northern vehicular and truck bypass.

Although the provision of the proposed north connector across the northern edge of the Town appears to be the most logical option for the by-pass currently being considered by Alberta Transportation in terms of relieving traffic volumes along Highway 27 within the study area. Should a by-pass route further to the north be considered, this would not eliminate the need for the north connector. It is therefore recommended that the Town and County work with Alberta Transportation is establishing how and if the by-pass should overlap with the north connector or if the two routes should be separate in terms of location and function.



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Potential North Bypass Options

Exhibit
7.1

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7.3 Item 2: Netook Connector

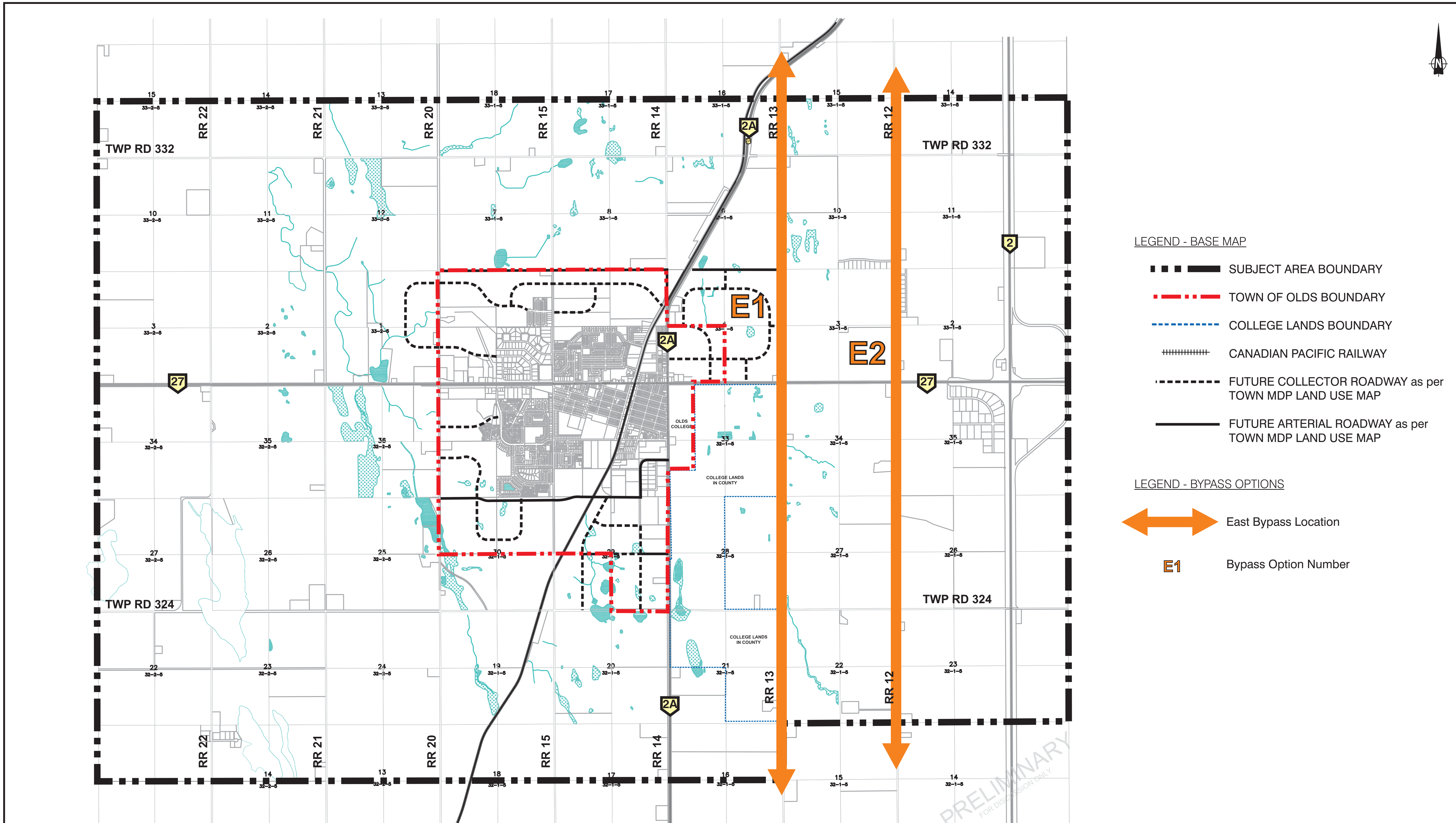
Range Road 15 south of the Town limits to Township Road 324 is currently classified as a minor collector roadway; however due to the projected traffic volumes of approximately 7,000 vpd on this segment, this roadway would need to be upgraded to a major collector. By comparison, Range Road 13 is currently classified as a minor collector with a gravel surface north of Highway 27 and a paved surface south of Highway 27. The roadway is currently within the County of Mountain View; however as time progresses Range Road 13 will function as an arterial roadway in the future road network as it will be a part of the Town's skeletal road network. Range Road 12 just north of the Netook Crossing development to south of the Opus lands also requires an upgrade from a minor collector to a major collector as the roadway is expected to carry in excess of 18,000 vpd. Based on the County's current design requirements, the accommodation of a major collector is feasible with the existing right-of-way of 30.48 metres.

The intersection of RR 12 and Highway 27 is expected to be extremely congested. However, good connectivity to the south to access additional routes such as Highway 2A would serve to alleviate this congestion to a certain degree. To this end, Bunt & Associates reviewed the impacts of providing a significant arterial roadway through this area, primarily on RR 12 or RR 13. Several factors will influence the decision in determining where the alignment will be placed, such as environmental, utility, and traffic conditions. With this in mind, a cursory review of the existing environmental and utility data along with an assessment of the potential future traffic volumes was conducted for the separate alignment options. The influences of the various factors were also sourced from the matrix output from Design Charrette #2.

As part of this exercise, separate model runs were undertaken to establish the variances between the two separate alignments, shown on Exhibit 7.2 as alignments E1 and E2. As a result of the modeling exercise, it was determined that the two alignments are placed so close together and are not significantly different from a traffic volume perspective. In essence, either alignment would adequately serve the transportation network needs of the Town and County. The choice of alignment would therefore be based on other criteria, as outlined as a complete list of pros and cons for each alignment is summarized in Table 7.2

Table 7.2 Pros versus Cons of Netook Connector

Option	Pros	Cons
E1 (Range Road 13)	*Existing Roadway *Existing four-legged intersection at Hwy 2A	*Runs along east side of College lands *Adjacent to existing farms *Adjacent to future residential units
E2 (Range Road 12)	* Existing Roadway * Existing T-intersection at Hwy 2A * 4-legged intersection to be constructed at Highway 27 with addition of Netook and Opus lands (this may not occur until RR 11 is closed) * Closet to Highway 2 and easy access for trucks	* Adjacent to small existing residential * Adjacent to approved future residential units * Adjacent to east side of existing golf course * Sweet gas well located on alignment at south end



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Potential Netook Connector (East Bypass)

Exhibit 7.2

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Although there were no significant benefits from a traffic management perspective (i.e., one option clearly influenced route choice), alignment E1 or Range Road 13 was considered to be more desirable route for several reasons as follows:

- It is the central area for the development occurring within the County.
- Close proximity to Hwy 2 for truck access.
- It is already designated as an arterial roadway based on the Town of Olds Land Use Map.
- Will not inhibit existing golf course or residential dwellings.

It is noted that the provision of this link will not alleviate concern related to congestion at the intersections with Highway 27. However, the provision of access to the south will result in more manageable conditions at these intersections.

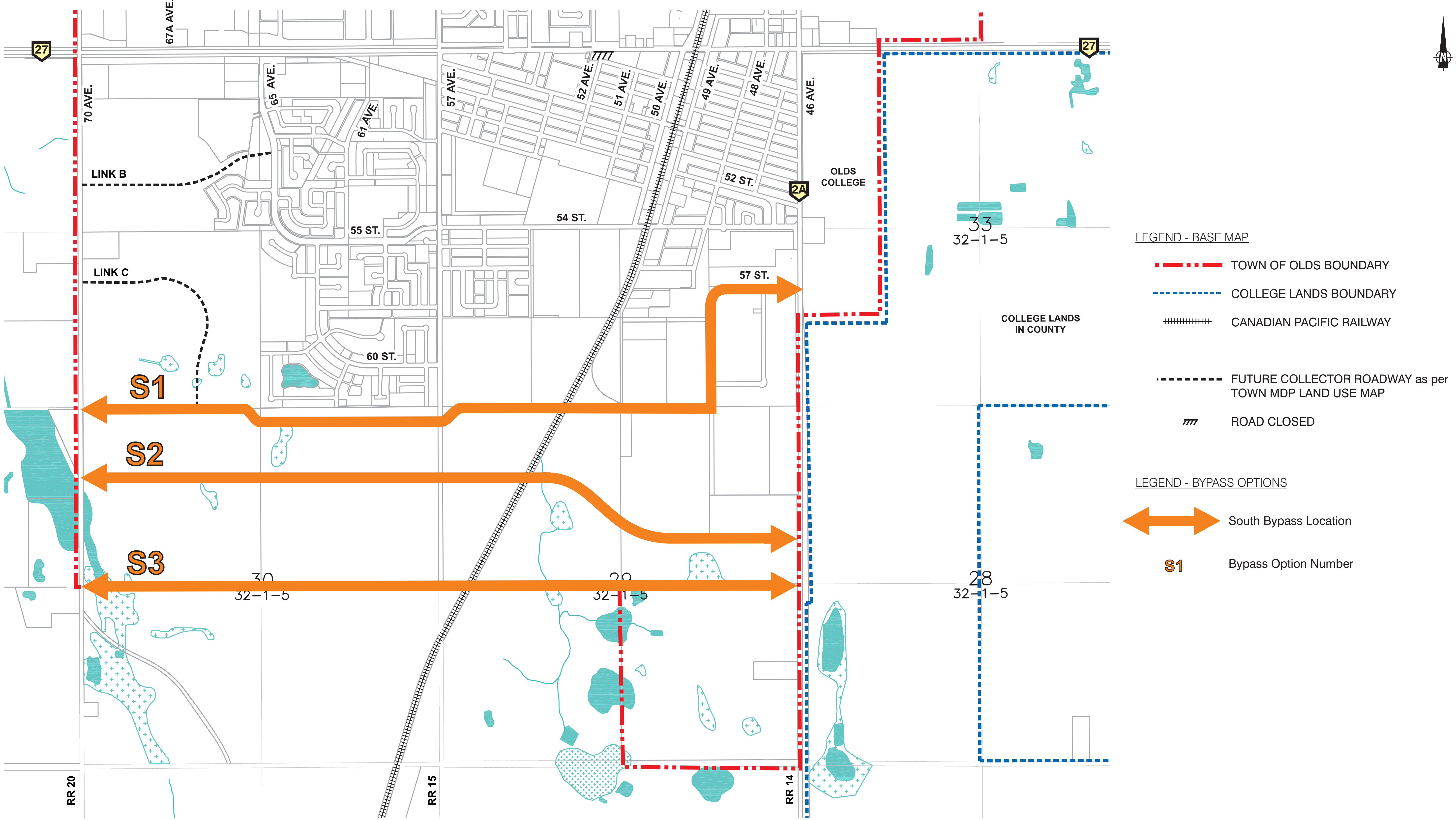
7.4 Item 3: South Connector

Link F is an approved arterial roadway under the current MDP that is currently assumed to be located adjacent to the existing Lake Ridge community in the southwest area of the Town. The current plans would see this roadway extend as a continuous link between 70th Avenue in the west and 57th Street in the east, at which point traffic would have to continue either north or south on 57th Street to access Highway 2A. The roadway would be offset from the homes by a berm and associated landscaped buffers. Based on the projected traffic volumes, this roadway is expected to carry between 7,000 and 19,000 vpd in the Long Term; thus resulting in the need for a classification as a four-lane undivided arterial roadway with access at key intersections only. It may be possible to reduce the cross section to two lanes at the east and west end sections of this roadway, though adequate rights of way should be protected to accommodate a four lane section if found to be necessary.

It was noted in the Emerging Issues that there is considerable public opposition to the current alignment of this roadway. The Town therefore required that Bunt & Associates complete a cursory assessment of options to shift this alignment south, and to connect it directly to Highway 2A.

The South Connector could potentially follow one of three separate alignments as illustrated notionally in Exhibit 7.3. The first alignment is shown along Link F which is already a proposed future arterial roadway, the second alignment is located just south of this alignment in response to public input received at Open House #1, while the third alignment is located on the next quarter section line to the south. Once again several factors apply to the decision in determining where the alignment will be placed such as environmental, utility and traffic conditions. Therefore, the existing environmental and utility data were reviewed, together with the matrix output from Design Charrette #2, and the future traffic volumes were determined.

The analysis confirmed that the proximity of the three alignments would not result in appreciably different traffic forecasts for the longer term horizon. As such, a single model run was completed and the decision of which alignment best suits the needs of the Town and County needed to be assessed based on other criteria not associated with pure traffic volumes.



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Potential South Bypass Options

Exhibit
7.3

:\\1307-01_EXH7.3_2010-06-JUNE.cdr June 2, 2010 HMF

A preliminary list of pros and cons for each alignment is summarized in Table 7.3. Note that this list is by no means exhaustive, and it is recommended that the Town undertake a formal functional planning study to determine the actual alignment to be utilized for this roadway.

Table 7.3 Pros versus Cons of South Bypass

Option	Pros	Cons
S1	* Aligns with quarter section * No water bodies to cross * Alignment already approved as future arterial roadway * Closest to Town, highest opportunity for local utilization	* Adjacent to existing residential * Noise attenuation required *Not recommended for a truck by-pass * Connection to Highway 2A is indirect and awkward, and passes through developed areas
S2	* No water bodies to cross * No existing adjacent residential development * Provides opportunity for direct connection to Highway 2A *Good opportunity for utilization as a truck by-pass * Good opportunity for utilization by through traffic	* Divides quarter section * Limits development of the quarter section *Access through to Highway 2A to be acquired and designed
S3	* Aligns with quarter section * No existing adjacent residential adjacent * Provides opportunity for direct connection to Highway 2A *Best option for accommodation of a truck by-pass *Best opportunity for utilization by through traffic.	* Extensive water bodies to cross * Environmental sensitive area *Access through to Highway 2A to be acquired and designed

From a traffic management perspective, the differences between the three alignments are minimal (i.e., the anticipated utilization is expected to be the same for all three alignments). However, the non-traffic related impacts (from both a positive and negative perspective) are very different for each alignment. For example, alignment S3 has a number of challenges associated with the environment, alignment S2 may induce some areas to be undevelopable, and alignment S1 may reduce the overall quality of life for the nearby residents. Considering the impacts associated with the environment and potential development, any of the alignments has potential merit, but option S2 appears to offer the best balance of accommodating the desire of the adjacent residents as well as avoiding the environmentally sensitive areas to the south.

To this end, Bunt & Associates recommends that the Town review opportunities to develop an alignment for this roadway that shifts the roadway south from the currently approved alignment, and that it be developed so as to extend directly to Highway 2A, and potentially beyond to the east. It is also recommended that the Town undertake a detailed corridor assessment and functional design exercise to establish the design details and precise placement of this alignment, complete with requisite public consultation and design efforts.

7.5 Item 4: Management of Highway 27

The Base or Do Nothing analysis of the Long Term forecast volumes showed considerable traffic volumes and congestion along the Highway 27 corridor. This included intersections throughout the Town as well as sections of roadway east between the Town and Highway 2. As noted earlier, this highlighted the need for a strong east/west connection along the north edge of the Town (the North Connector). This was necessary in order to allow traffic generated by future residential growth north of Highway 27 to reach areas east of the CPR corridor without being required to use the Highway 27 corridor. Key to that strategy was the crossing of the CPR corridor at grade initially, and then on a possible grade separated structure in the future. The Alberta Transportation By-pass study that commenced during the completion of this Master Plan may provide opportunities to study this item further.

With the inclusion of the Northern Connector, Long Term traffic volumes on Highway 27 can be expected to drop from the Do Nothing Forecast of 37,000 vehicles per day to a more readily managed 19,000 vehicles per day. The volume will vary depending upon the location along the link, but the impact of the North Connector is clear, with or without consideration of a formal highway by-pass of the Town.

There are several issues that will still need to be addressed at the future horizon, even with the reduction in through volumes due to the North Connector and/or by-pass. These include the need to manage the intersections of RR 12 and 13 at Highway 27 due to the high expected turn volumes, and the need to modify sections of Highway 27 through the Town that were not addressed at the Short Term horizon. Note that this latter discussion also includes a potential for a modification to the original CastleGlenn plans based on a Complete Streets or Road Diet program. These two items are discussed in more detail in the following sections, together with a discussion regarding possible options for altering the character of Highway 27 if a by-pass is developed by Alberta Transportation that serves to further reduce traffic flows on this roadway.

7.5.1 RR 12 and 13 Intersections

These two intersections will be expected to serve the dual purpose of providing access to the developed areas along their alignments north and south of Highway 27; plus a requirement to accommodate traffic destined for the north connector that is proposed and recommended in this study. The actual means by which traffic traverses from Highway 27 to the proposed North Connector will depend largely upon the manner of development in the area and the nature of the roadways. As noted earlier, Bunt & Associates recommended that RR 13 be selected and planned for use as the primary route for this purpose.

It is also noted that the Highway 27 By-pass study that is currently underway by Alberta Transportation may result in a change to this traverse activity. Alignments for this by-pass and the means by which it does or does not connect directly or indirectly to Highway 27 will have a significant impact on the way that the North Connector functions and will therefore affect the expected function and traffic volumes on both of RR 12 and RR 13.

The presence of these unknown factors and their possible impact on the future of RR 12 and RR 13 makes it very difficult for the Town and County to make provision for adequate rights of way. In the absence of any further information regarding the by-pass study, it is recommended that these two roads both be designated as major collectors (RR12) and/or as an arterial (RR13) classification with right of way of 30.48 metres for a major collector as per County standards and 30.00 metres for an arterial as per Town standards.

7.5.2 Highway 27 Upgrades

The development of an adequate North Connector, with or without consideration of an Alberta Transportation by-pass, will continue to require that improvements be made to Highway 27. In the absence of changing the overall function of the roadway, a number of improvements would be worthy of consideration. These were generally covered in the CastleGlenn study for Highway 27, and include the following highlights:

70th Avenue: It is anticipated that the intersection at 70th Avenue will require improvements with the development. It is expected these improvements will be resolved through Area Structure plans, as illustrated in the CastleGlenn analysis and shown here in Exhibit 7.4.

57th Avenue: The 57th Avenue corridor is one of very few continuous north/south corridors through the Town and into the County. Discussions at the Open House confirmed the use of this roadway by the public not only as a means of commuting, but also as a recreational corridor for bicycles and walkers/runners. The intersection at Highway 27 is and will continue to be a significant barrier, and the presence of service roads immediately adjacent to the Highway 27 corridor further confines the permeability of the area for non-auto users. Bunt & Associates nonetheless concurs with the general direction identified in the CastleGlenn study. That study recommended the realignment of the north service road in the NW. In addition, a service road in the NE quadrant is recommended as well as a future access off 57th Avenue on the south leg of the intersection. These are considered to be longer term (10-year & beyond) improvements as there is a considerable amount of property that must be acquired by the Town. The plan is illustrated on Exhibit 5.3 and Exhibit 5.7.

55th Avenue: No traffic count data or observations of activity were collected by Bunt & Associates at this location as part of the overall study. As well, no issues were raised at the Open House associated with this intersection. However, the recommended improvements set out by the CastleGlenn Study illustrated in Exhibit 7.5 seem reasonable and logical for the intended purpose.

52nd Avenue: Bunt & Associates concurs with the CastleGlenn Study recommendations as illustrated in Exhibit 5.9 for Long Term consideration.

51st Avenue: Fifty First Avenue does not currently intersect Highway 27 (46th Street); however the CastleGlenn Study recommends that with the closure of the south leg of 52nd Avenue that 51st Avenue should now be extended to 46th Street as illustrated in Exhibit 7.6. The extension would run through the old high school site (the high school was recently relocated) and head north through the school grounds located on the north side of Highway 27. Bunt & Associates concurs with this recommendation.

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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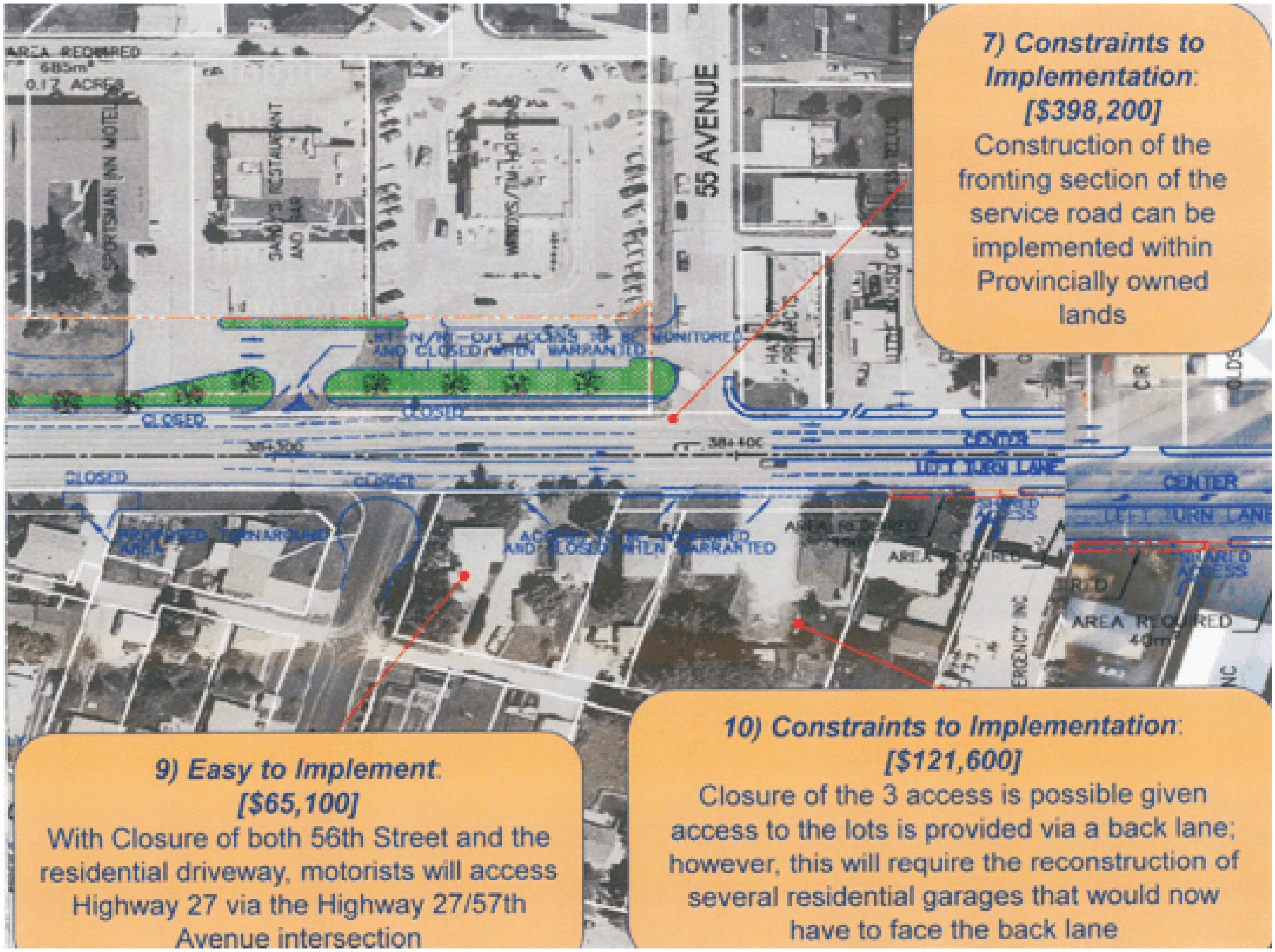
HWY 27 (46th Street) / 70th Avenue (RR 20) Recommended Improvements

Exhibit
7.4



BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 55th Avenue Recommended Improvements

Exhibit 7.5

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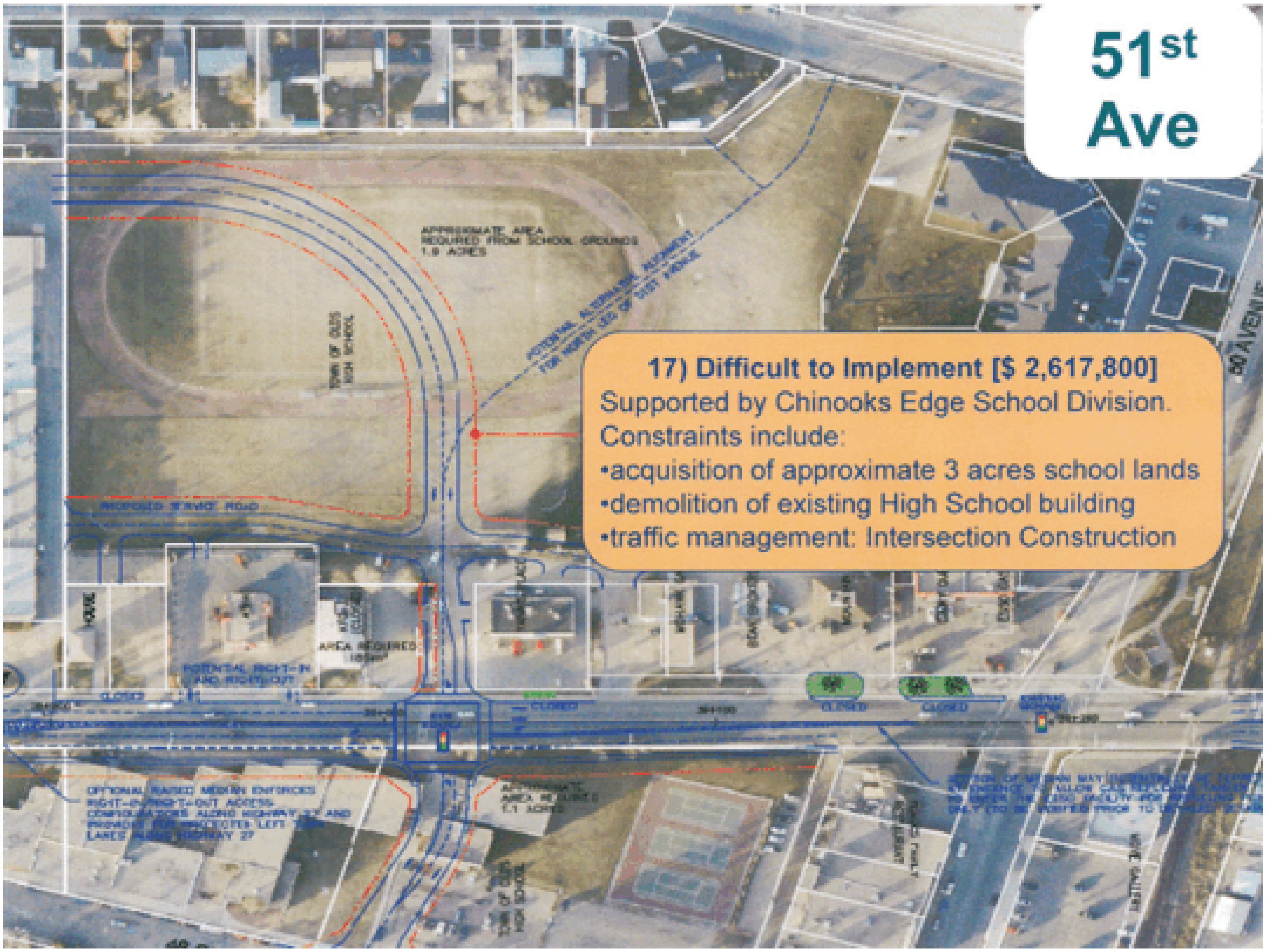

BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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HWY 27 (46th Street) / 51st Avenue Recommended Improvements

Exhibit 7.6

Highway 2A: Bunt & Associates recommends northbound and southbound right turn bays as well as a westbound right turn lane. In addition, CastleGlenn is recommending a service road in the NE quadrant north of the Town Administration building as shown in Exhibit 7.7.

7.5.3 Road Diet or Complete Street Alternative

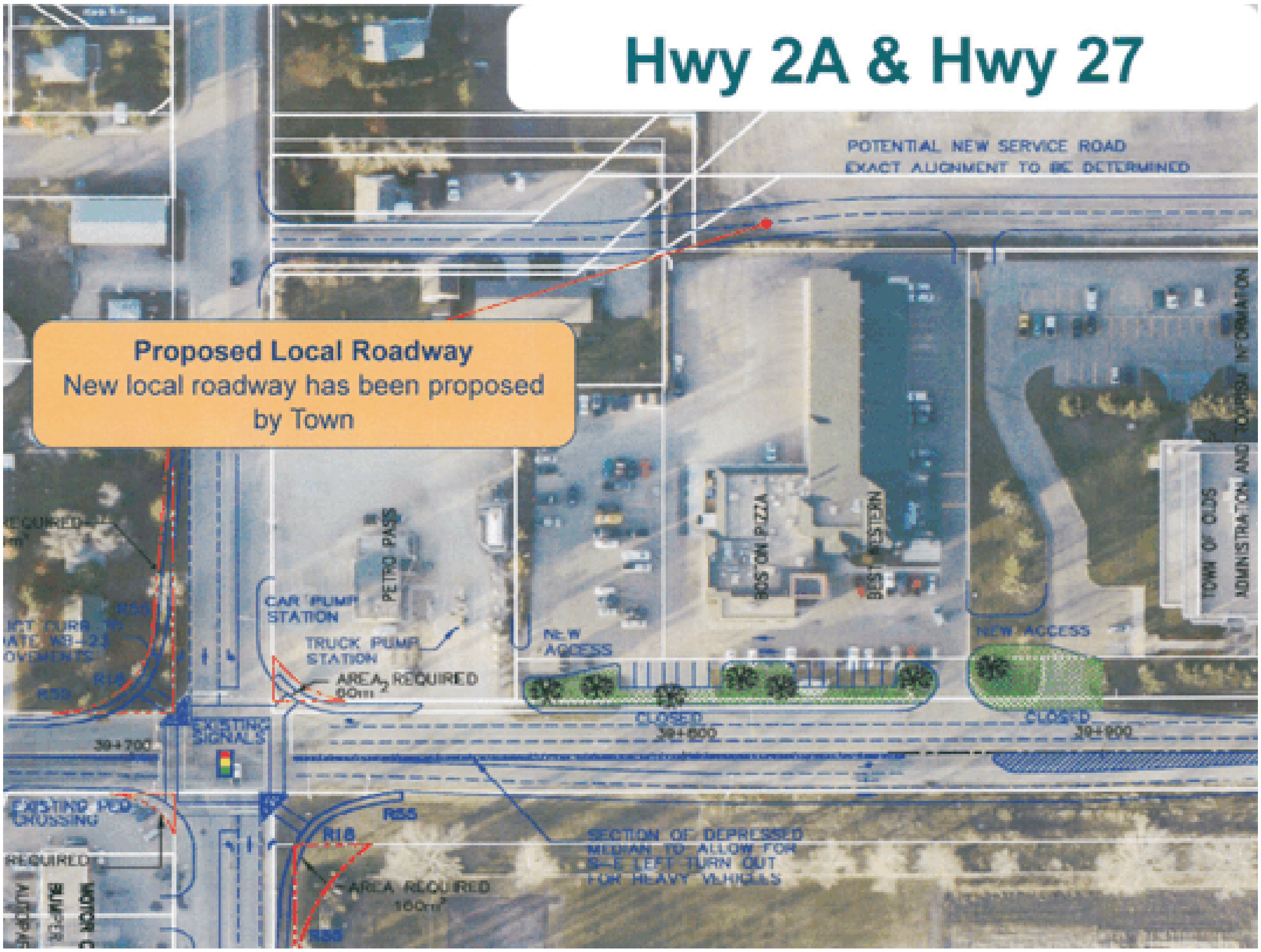
The term "Road Diet" has been coined to refer to measures taken by a municipality to accommodate a greater number of vehicles on a narrower roadway. This type of treatment is also referred to as a Complete Street. Based on literature by Dan Burden and Peter Lagerwey (*Road Diets: Fixing the Big Roads*), a traffic volume that would often typically necessitate a widening from two to four lanes has been shown to be workable and safe on a two lane roadway with enhancements regarding turning opportunities and intersection/bicycle treatments. The typical threshold for conversion of a two lane arterial roadway to four lanes is often considered to be 10,000 to 15,000 vehicles per day. The Complete Street approach seeks to accommodate 15,000 to 20,000 vehicles per day on a two lane cross-section with enhanced turning opportunities etc. While every roadway represents a unique situation, which may or may not be appropriate for a Road Diet application, Bunt & Associates suggests that if Alberta Transportation does indeed develop a by-pass for Highway 27 around the perimeter of the Town, that it may be possible to alter the character of Highway 27 through a Complete Street approach. Critical in this assumption would be the elimination of substantive volumes of trucks on the roadway, which would certainly be accommodated through the development of a by-pass.

The Highway 27 corridor has been assessed at a cursory level so as to confirm the workability of possible application of Road Diet or Complete Street initiatives. This preliminary assessment confirmed that if the by-pass were to be developed, and if that by-pass were to result in the essential elimination of truck traffic on Highway 27 between RR 13 and 70th Street, and if the resultant traffic volumes on Highway 27 were less than 15,000 to 20,000 vehicles per day, then there would be merit in reviewing opportunities to reduce Highway 27 to a three lane cross section between at least Highway 2 and 65th Avenue, perhaps further. This three lane section would include one wide travel lane in each direction, and a raised central median to accommodate left turn lanes as and when required. Wide curb areas could then be accommodated with increased vegetation, regional pathway/bikeways, sidewalks and other features. This would serve to maintain a reasonable level of vehicular mobility along Highway 27 while at the same time promoting Active Modes of transportation. It is recommended that the Town and County give this notion due consideration if/when a by-pass route is provided.

The same road diet approach may be applied to 57th Avenue north of Highway 27 as was recommended due to the limited right-of-way and high traffic volumes.

7.6 Item 5: Internal Ring Road for Transit

Transit planning is based on the premise of optimizing ridership through an efficient network of routes that utilize roadway infrastructure to maximize coverage and minimize walking distances. While this is not easily accommodated within the County areas, it is prudent for the Town and County to ensure that their respective road networks are organized with future transit routing in mind. In the case of the County this is well covered through a grid network of roadways. In the case of the Town, the provision of the North Connector, South Connector, Netook Connector, Highway 2A, Highway 27, 50th Avenue, 57th Avenue and 70th Avenue provide an adequate skeletal roadway system for this purpose.



BASE MAP SOURCE: Highway 27 Planning Study Town of Olds, CastleGlenn Consultants Inc., January 2009

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Proposed Local Roadway North of HWY 27 Connecting to HWY 2A

Exhibit 7.7

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Having said this, it was noted during the planning process that the significant residential density on the western side of the Town could be far better served by future transit if a routing along 70th Avenue were to be replaced with a new link to the east. The road network was therefore adjusted to include such a link which extends 67A Avenue north to Link A and south to Link C. This provides the opportunity to better connect residential density with transit coverage as well as commercial uses are as prevalent in the vicinity of Highway 27 where this link would meet that roadway.

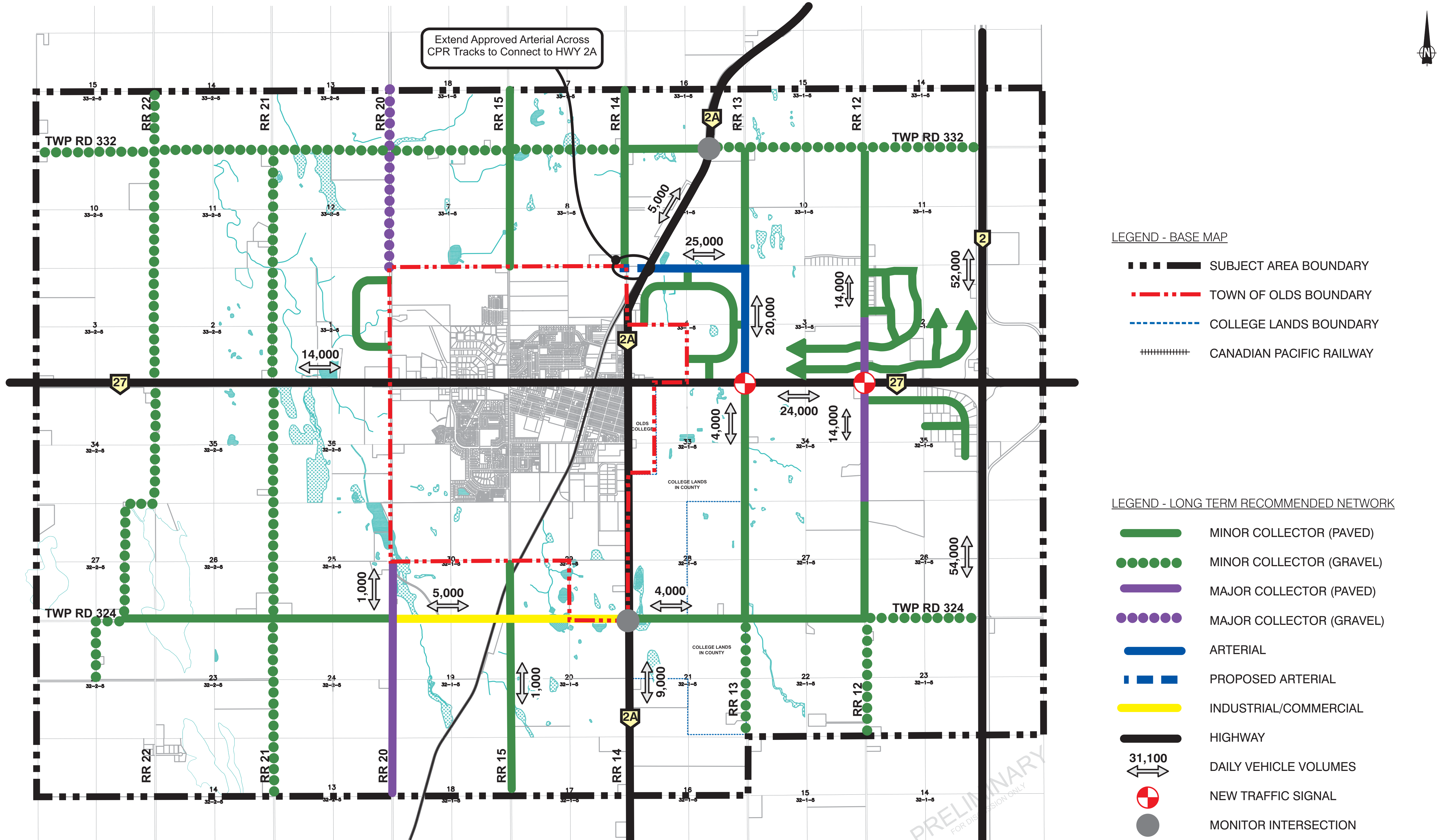
Similar logic was applied to the North Connector corridor in the sense that a parallel roadway inboard from the Town limits would provide a higher level of service. To this end, the links of A and D would be best suited to serve the routing needs. However, the crossing point of Highway 2A and the CPR corridor would need to occur on the North Connector alignment.

7.7 Assessment of Recommended Future Road Network

Based on Bunt & Associates' review of the issues identified in the forecast results, and the assessments outlined in Sections 7.2 through 7.6, a recommended skeletal road network program along with the associated daily traffic forecasts were developed for the County and Town. This is illustrated in **Exhibit** 7.8 for the County and **Exhibit** 7.9 for the Town. Once the network had been confirmed as appropriate at a high level, it was possible and necessary to undertake a detailed assessment at the micro level to establish the various internal improvements that would be necessary within the framework of the overall program. These micro level improvements based on the recommended network are outlined in the sections that follow.

7.7.1 Intersection Review

Similar to the assessment completed for "base" or Do Nothing road network, the intersection review for the recommended option was completed using the same parameters and guidelines for improvements. **Table** 7.4 summarizes the outcome of the study area intersections.



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Mountain View County Long Term (35,000) Skeletal Recommended Road Network

Exhibit 7.8

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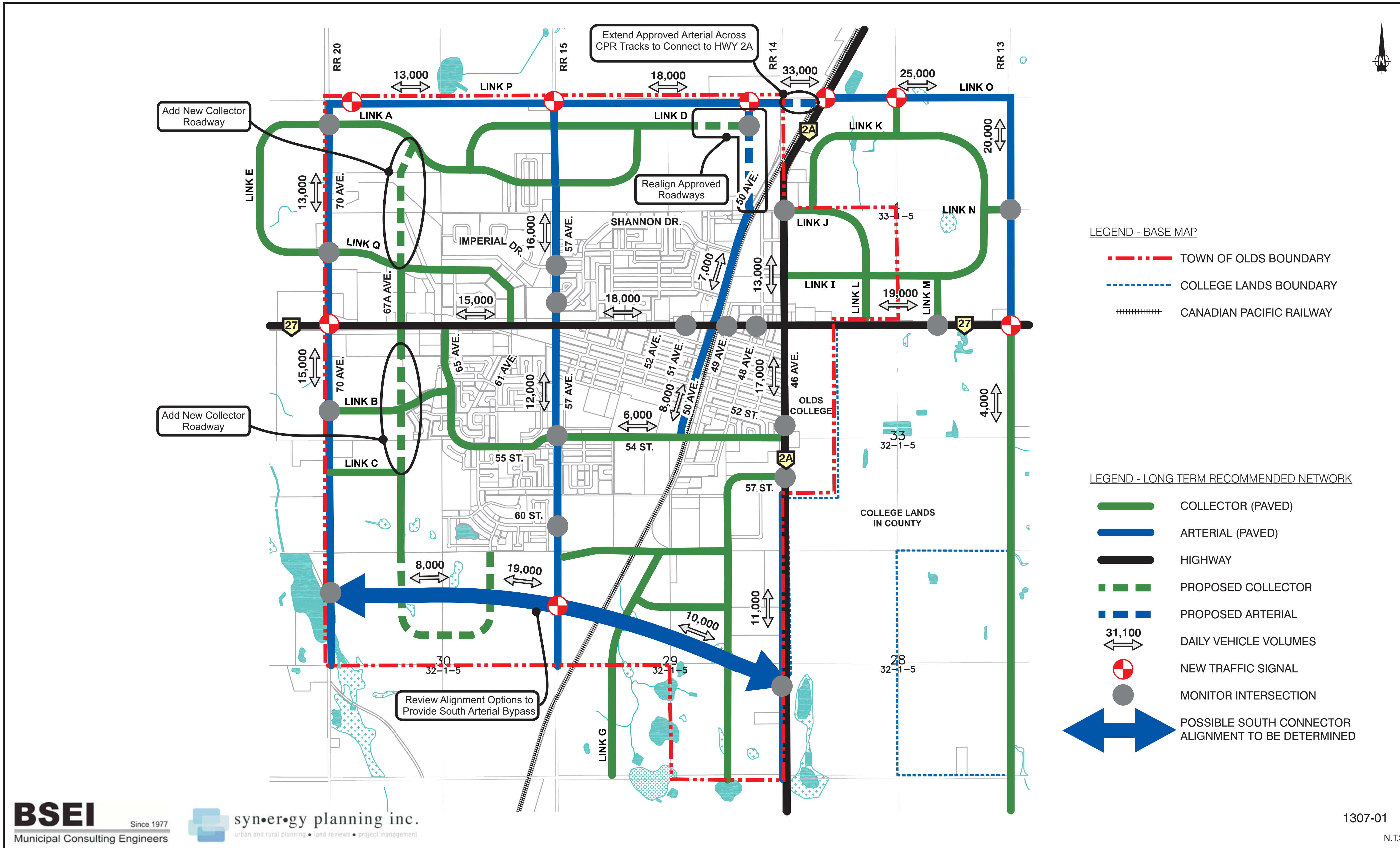

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Long Term (35,000) Skeletal Recommended Road Network

Exhibit 7.9

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Table 7.4 Summary of Intersection Analysis– Recommended Long Term Conditions

Intersection	Traffic Control	Critical Volume	TAC Signal Warrant Score	Left Turn Required	Right Turn Required	Signal Optimization Required
Highway 27 Corridor						
Highway 27/Highway 2A	Signalized	1350	n/a	✓	×	✓
Highway 27/48th Avenue	Unsignalized	600	n/a	×	×	×
Highway 27/ 49th Avenue	Unsignalized	600	n/a	✓	×	×
Highway 27/50th Avenue	Signalized	950	n/a	✓	×	✓
Highway 27/ 51st Avenue	Unsignalized	600	n/a	×	×	×
Highway 27/52nd Avenue	Unsignalized	400	n/a	×	×	×
Highway 27/57th Avenue	Signalized	1050	n/a	×	×	✓
Highway 27/61st Avenue	Unsignalized	550	n/a	×	×	×
Highway 27/ 65th Avenue	Signalized	450	n/a	×	×	✓
Highway 27/ 67A Avenue	Signalized	600	n/a	×	×	✓
Highway 27/70th Avenue	Unsignalized	700	275	✓	✓	✓
Town of Olds Intersections						
57th Avenue/ Imperial Drive	Unsignalized	600	n/a	×	×	×
57th Avenue/Shannon Drive	Unsignalized	900	77	×	×	×
57th Avenue/54th Street	Unsignalized	800	73	✓	×	×
57th Avenue/60th Street	Unsignalized	600	n/a	×	×	×
50th Avenue/Shannon Drive	Unsignalized	500	n/a	×	×	×
Highway 2A/52nd Street	Unsignalized	900	21	×	×	×
Highway 2A/ 57th Street	Unsignalized	800	70	×	×	×
Mountain View County Intersections						
Highway 2A/Twp Rd 332	Unsignalized	400	n/a	×	×	×
Range Road 15/Twp Rd 324	Unsignalized	500	n/a	×	×	×
Range Road 21/ Twp Rd 332	Unsignalized	100	n/a	×	×	×
Range Road 21/ Twp Rd 324	Unsignalized	100	n/a	×	×	×
Highway 27/ Range Road 12	Unsignalized	800	442	✓	✓	✓
Highway 27/ Range Road 13	Unsignalized	1050	227	✓	✓	✓
Highway 2A/ Twp Rd 324	Unsignalized	600	n/a	×	×	×
Future Intersections						
70th Avenue/ Link P	n/a	1200	11	✓	×	×
70th Avenue (RR2.0)/ Link A	n/a	1000	124	✓	✓	✓
70th Avenue (RR2.0)/ Link E	n/a	900	37	×	✓	×
70th Avenue (RR2.0)/ Link B	n/a	600	n/a	✓	×	×
70th Avenue (RR2.0)/ Link C	n/a	550	n/a	✓	×	×
70th Avenue (RR2.0)/ Link F	n/a	650	n/a	✓	×	×
57th Avenue/ Link F	n/a	1200	248	✓	✓	✓
Highway 27/ Link M	n/a	800	75	✓	✓	×
Link N/ Range Road 13	n/a	900	61	✓	×	×
Highway 2A/ Link J	n/a	1000	71	✓	✓	×
Highway 2A/ Link P	n/a	1050	348	✓	✓	✓
50th Avenue/ Link D	n/a	900	57	✓	✓	×
Range Road 1.4/ Link P	n/a	1350	371	✓	✓	✓
57th Avenue/ Link P	n/a	1000	207	✓	✓	✓

Based on the results of the intersection analysis, approximately half of the study area intersections that were previously identified as problematic in the Base/Do-Nothing analysis will no longer be required to be improved, or can be improved with less effort. The remaining intersections will continue to require some form of improvement; however different intersections now require improvements than those required in the base condition. Eight intersections require signalization, along with several intersections which require monitoring . If a traffic signal was not warranted, the intersection should be developed as stop-control. In addition, several left and right turn bays should be implemented to reduce the impedance on the through traffic and it is recommended that all traffic signals are optimized and that those traffic signals that run along the Highway 27 corridor are optimized and coordinated to achieve better flow along the corridor.

It is clear that with the inclusion of the northern connector, traffic levels along Highway 27 will reduce and significantly reduce the degree congestion that is expected in the Long Term (when compared to the base or Do Nothing case). At this stage, and as noted earlier, there may be opportunities to the redesign the Highway 27 corridor to exhibit elements of a more Complete Street, such as to accommodate separate bike lanes.

7.7.2 Environmental Link Capacity

The long term daily link capacities were assessed based on the parameters set out earlier in this report and include the recommended upgrades from the short term analysis. The results are summarized below in Table 7.5 and Table 7.6 for the Town of Olds roadways and Table 7.7 for the Mountain View County roadways.

Table 7.5 Summary of Long Term Daily Traffic Volumes for Town of Olds Future Links

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Long Term Traffic Volumes (vpd)
Link A	Major Residential Collector	< 5,000	6,000
Link B	Minor Residential Collector	< 5,000	4,000
Link C	Major Residential Collector	< 5,000	5,000
Link D	Major Residential Collector	< 5,000	9,000
Link E	Major Residential Collector	< 5,000	9,000
Link F	4 –lane Undivided Arterial	12,000 – 20,000	8,000 – 19,000
Link G[16]	Major Residential Collector	< 5,000	1,000
Link I	Major Residential Collector	< 5,000	7,000
Link J	Undivided Arterial	5,000 – 12,000	9,000
Link K	Minor Residential Collector	< 5,000	8,000
Link L	Minor Residential Collector	< 5,000	1,000
Link M	Undivided Arterial	5,000 – 12,000	6,000
Link N	Undivided Arterial	5,000 – 12,000	8,000
Link O	Divided Arterial	12,000 – 20,000	13,000 – 25,000
Link P (50th Avenue to Hwy 2A)	Divided Arterial	12,000 – 20,000	33,000
Link P (50th Avenue to RR 20)	Divided Arterial	12,000 – 20,000	13,000 – 18,000

16 Please note there is no Link H in this analysis as it was replaced with the south connector arterial roadway.

Table 7.6 Summary of Long Term Daily Traffic Volumes for Town of Olds

Road Link	Classification	Environmental Capacity/ Threshold Traffic Volumes (vpd)	Long Term Traffic Volumes (vpd)
46th Street: East of 46th Ave	Provincial Secondary Highway	< 20,000	19,000
46th Street: Between 46th Ave & 50th Ave	Provincial Secondary Highway	< 20,000	19,000
46th Street: Between 50th Ave & 57th Ave	Provincial Secondary Highway	< 20,000	14,000
46th Street: Between 57th Ave & 65th Ave	Provincial Secondary Highway	< 20,000	15,000
46th Street: Between 65th Ave & 67A Ave	Provincial Secondary Highway	< 20,000	10,000
46th Street: West of 67A Ave	Provincial Secondary Highway	< 20,000	14,000
54th Street: Between 46th Ave & 57th Ave	Major Residential Collector	< 5,000	6,000
55th Street: West of 57th Ave	Major Residential Collector	< 5,000	3,000
60th Street: West of 57th Ave	Minor Residential Collector	< 5,000	1,000
65th Avenue: South of 46th Street	Major Residential Collector	< 5,000	6,000
57th Avenue: Between 46th Street & Link A	Undivided Arterial	5,000 – 12,000	17,000
57th Avenue: Between Link A & Link P	Undivided Arterial	5,000 – 12,000	15,000
57th Avenue: Between 46th St & 54th St	Undivided Arterial	5,000 – 12,000	12,000
57th Avenue: Between 54th St & 60th St	Undivided Arterial	5,000 – 12,000	9,000
50th Avenue: North of 46th Street	Undivided Arterial	5,000 – 12,000	7,000
50th Avenue: South of 46th Street	Undivided Arterial	5,000 – 12,000	8,000
46th Avenue: North of 46th Street	Provincial Secondary Highway	< 20,000	13,000
46th Avenue: Between 46th St & 54th St	Provincial Secondary Highway	< 20,000	17,000
46th Avenue: Between 54th St & Link F	Provincial Secondary Highway	< 20,000	14,000
46th Avenue: South of Link F	Provincial Secondary Highway	< 20,000	9,000
70th Avenue (RR 20) Hwy 27 to Link P	Undivided Arterial	5,000 – 12,000	13,000
70th Avenue (RR 20) South of Hwy 27 to Link C	Undivided Arterial	5,000 – 12,000	15,000
70th Avenue (RR 20) Link C to Link F	Undivided Arterial	5,000 – 12,000	9,000

Table 7.7 Summary of Long Term Daily Traffic Volumes for Mountain View County

Road Link	Classification	Environmental Capacity/Threshold Traffic Volumes (vpd)	Long Term Traffic Volumes (vpd)
Highway 2	Provincial Primary Highway	> 20,000	54,000
Highway 27 (Hwy 2 to RR 12)	Provincial Secondary Highway	< 20,000	15,000
Highway 27 (RR 12 to RR 13)	Provincial Secondary Highway	< 20,000	24,000
Highway 27 (west of Olds)	Provincial Secondary Highway	< 20,000	14,000
Highway 2A (north of Olds)	Provincial Secondary Highway	< 20,000	4,000
Highway 2A (south of Olds)	Provincial Secondary Highway	< 20,000	8,000
Twp Rd 332 West of RR 14 to Range Road 20	Minor Collector Road 'A' (paved)	500 – 5000	100
Twp Rd 332 East of RR 14 to Hwy 2A	Minor Collector Road 'A' (paved)	500 – 5000	500
Twp Rd 332 East of Hwy 2A	Minor Collector Road 'B' (gravel)	< 500	500
Twp Rd 324 West of Hwy 2A to RR 20	Industrial/Commercial Road (paved)	5,000 – 12,000	5,000
Twp Rd 324 East of Hwy 2A	Minor Collector Road 'A' (paved)	500 – 5000	4,000
Range Road 21	Minor Collector Road 'B' (gravel)	< 500	100
Range Road 20 South of Link F	Major Collector	5,000 – 12,000	100
Range Road 20 North of Link P	Major Collector	5,000 – 12,000	100
Range Road 15 North of Twp Rd 324	Minor Collector Road 'A' (paved)	500 – 5000	7,000
Range Road 15 South of Twp Rd 324	Minor Collector Road 'A' (paved)	500 – 5000	1,000
Range Road 12 South of Twp Rd 332	Minor Collector Road 'A' (paved)	500 – 5,000	1,000
Range Road 12 North of Hwy 27	Minor Collector Road 'A' (paved)	500 – 5,000	14,000
Range Road 12 South of Hwy 27	Minor Collector Road 'A' (paved)	500 – 5,000	14,000
Range Road 12 North of Twp Rd 324	Minor Collector Road 'A' (paved)	500 – 5,000	3,000
Range Road 13 North of Hwy 27 to Link O	Minor Collector Road 'B' (gravel)	< 500	20,000
Range Road 13 South of Hwy 27	Minor Collector Road 'A' (paved)	500 – 5,000	4,000

Based on the review of the long term daily link capacity analysis several roadways will either require an upgrade in road classification, an alteration in the functionality of the road as well as surface treatment upgrades. The specific changes are summarized here:

- The traffic levels on 57th Avenue north of the Highway 27 and on Range Road 20 south of Highway 27 are expected to increase and exceed the environmental capacity limits. Although this increase would suggest there is a need to the modified classification, the modest increase in traffic is not substantial enough to warrant a reclassification and/or widening.

- The traffic levels on Range Road 12 north and south of the Highway 27 are expected to increase and exceed the environmental capacity limits. This increase is considered to be significant and warrants the need to upgrade this road to a Major Collector.

7.7.3 Recommended Improvement Program for the Long Term Horizon

Based on the outcome of the VISUM model analysis completed for the Long Term horizon (35,000-population) and the previously described network issues that were found, Bunt & Associates recommends the following improvements to the road network for based on the critical intersections and road links.

7.7.3.1 Intersections

The intersection improvements mainly consist of installing traffic signals with optimization as well as the introduction of left and right turn bays at specific locations as summarized in Table 7.8.

Table 7.8 Summary of Long Term Recommended Intersection Improvements

Intersection/Road Link	Recommended Improvements
Highway 27/ 46th Avenue	* Eastbound & westbound left turn lane * Southbound & Northbound right turn lane * Optimize signalization with separate left turn phase
Highway 27/ 50th Avenue	* Eastbound and westbound left turn lanes * Optimize signalization with separate left turn phase
Highway 27/ 51st Avenue	* Westbound right turn lane
Highway 27/ 70th Avenue	* Install traffic signal * Left turn lanes for all legs of intersection * Eastbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Link M	* Monitor for traffic signal * Eastbound left turn lane * Westbound right turn lane
Highway 27/ Range Road 12	* Install traffic signal * Northbound dual left turn lanes, southbound single left turn lane * Northbound & southbound right turn lanes * Optimize signalization with separate protected left turn phase for the NB/SB
Highway 27/ Range Road 13	* Install traffic signal * Northbound & southbound left turn lanes * Westbound right turn lane * Optimize signalization with separate left turn phases
70th Avenue (RR 20)/ Link P	* Monitor for traffic signal * Eastbound and westbound left turn lanes * Northbound right turn lane
70th Avenue (RR 20)/ Link A	* Install traffic signal * Eastbound single left turn lane and westbound dual left turn lanes * Northbound & southbound right turn lanes * Optimize signalization with protected EB/WB left turns
70th Avenue (RR 20)/ Link B	* Southbound left turn lane
70th Avenue (RR 20)/ Link C	* Southbound left turn lane
70th Avenue/ Link E (Q)	* Monitor for traffic signal * Eastbound right turn lane
70th Avenue (RR 20)/ Link F	* Southbound left turn lane
57th Avenue/ Link F	* Install traffic signal * Left turn lanes for all legs of intersection * Westbound & southbound right turn lane * Optimize signalization with separate left turn phases
57th Avenue/ Link P	* Install traffic signal * Eastbound left turn lane, westbound dual left turn lane * Eastbound and northbound right turn lane * Optimize signalization with protected EB/WB left turns

Table 7.8 Summary of Long Term Recommended Intersection Improvements – Continued

Intersection/Road Link	Recommended Improvements
57th Avenue/ Shannon Drive	* Monitor for traffic signal * Northbound right turn lane
57th Avenue/ 54th Street	* Monitor for traffic signal * Southbound & northbound left turn lanes * Westbound right turn lane
Highway 2A/ 52nd Street	* Monitor for traffic signal
Highway 2A/ 57th Street	* Monitor for traffic signal * Eastbound & westbound left turn lanes
Highway 2A/ Link F	* Monitor for traffic signal * Northbound & eastbound left turn lane * Southbound right turn lane
Highway 2A/ Link J	* Monitor for traffic signal * Southbound & westbound left turn lane * Northbound right turn lane
Highway 2A/ Link O	* Install traffic signal * Left turn lanes on all legs with a westbound dual left turn lane * Eastbound right turn lane * Optimize signalization with protected EB/WB left turns & separate NB/SB left turn lane
50th Avenue/ Link D	* Monitor for traffic signal * Northbound & eastbound left turn lane * Southbound right turn lane
50th Avenue/ Link P	* Install traffic signal * Left turn lanes on all legs with a southbound & westbound dual left turn lane * Northbound and westbound right turn lanes * Optimize signalization with protected left turns
Range Road 13/ Link N	* Monitor for traffic signal * Northbound left turn lane

7.7.3.2 Road Links

The recommendations for the road link improvements include classification upgrades, surface treatment upgrades and/or road widening as discussed below. It should be noted that although some of the collector roadways are carrying in excess of the recommended traffic volume, the slight increase is not expected to impact the roadway overall. If the traffic volumes become an issue traffic, calming measures may be placed to deter the traffic elsewhere.

A summary of these recommendations is shown in Table 7.9.

Table 7.9 Summary of Long Term Recommended Road Link Improvements

Intersection/Road Link	Recommended Improvements
70th Avenue (Range Road 20)	* Four-lane undivided arterial at Hwy 27
57th Avenue	* Three-lane cross section with a central two-way left turn lane
Link F	* Four-lane undivided arterial
Range Road 15	* Upgrade to a Major Collector from a Minor Collector
Range Road 13	* Upgrade surface treatment to pavement as required once upgraded to arterial road
Range Road 12	* Upgrade to a Major Collector from a Minor Collector
North Bypass Road	* Four-lane divided arterial narrowed to a two-lane undivided arterial at the west end

Details of the various items are highlighted below:

- *70th Avenue (Range Road 20):* 70th Avenue between Highway 27 and Link C carries 15,000 vpd and 13,000 vpd between Highway 27 and Link P; as such, Bunt & Associates recommends that this section of roadway exhibit a four-lane undivided arterial standard in order to accommodate the high traffic volumes.

- *57th Avenue:* 57th Avenue between 54th Street and Link P carries 16,000 vpd in the long term recommended road network. As stated in the base case, right-of-way is limited to 20.0 metres and upgrading the roadway to a four-lane facility may be not be achievable. As such, an alternative three lane cross-section could be implemented to manage access requirements.

- *Link F:* Link F is a proposed roadway that runs along the south side of the Town from east to west and is proposed to be an arterial roadway. Based on the projected traffic volumes, the roadway is expected to carry between 7,000 and 17,000 vpd; therefore Bunt & Associates is recommending that this intersection is classified as a four-lane undivided arterial roadway with access at key intersections only.

- *Range Road 15:* Range Road 15 south of the Town limits to Township Road 324 is currently classified as a Minor Collector roadway; however due to the projected traffic volumes of approximately 10,000 vpd on this segment, Bunt & Associates recommends that the road classification is upgraded to a Major Collector. The right-of-way for each road classification is equal at 30.48 metres and therefore implementable

- *Range Road 13:* Range Road 13 is currently classified as a Minor Collector with a gravel surface north of Highway 27 and a paved surface south of Highway 27. The projected traffic volumes on the roadway are approximately 10,000 vpd, therefore the roadway will require upgrading to a paved surface as will be the case when the arterial classification of the roadway is built.

- *Range Road 12:* Range Road 12 just north of the Netook Crossing development to south of the Opus lands also requires an upgrade from a Minor Collector to a Major Collector as the roadway carries 20,000 vpd. As stated in the base case, the roadway should have adequate right-of-way and therefore implementable.

- North Bypass Road (Link P/Link O): The north bypass road is expected to carry a significant amount of traffic. As such, it is recommended that this potential alignment exhibit a four-lane divided arterial standard from Range Road 12 to Range Road 20.

8.0 FUTURE TRUCK ROUTING

Input received from key Town and County staff and the public indicated that there were a number of concerns associated with the current trucking activity within the Town limits. As such, consideration was given to the potential benefits associated with reviewing future truck routes. Other than reviewing the current truck data, no analysis or fieldwork was undertaken as part of this high level review.

8.1 Existing Truck and Issues

The existing truck route map for the Town is shown in **Exhibit 8.1**. As shown, the primary routes are focused to the Highway 27 and 2A corridors, and along the 70th Avenue north of Highway 27. Additional roadways have been identified as designated truck routes and are primary focused to the supporting road network to/from the commercial and industrial area. It is clear that the current truck routes through the Town were developed to keep truck movements out the residential areas.

Although the current truck routes are restricted to major roadways and do not infiltrate the residential communities, the tone of the comments through the public consultation process at Open House #1 were generally negative. A summary of the feedback from the general public are summarized here:

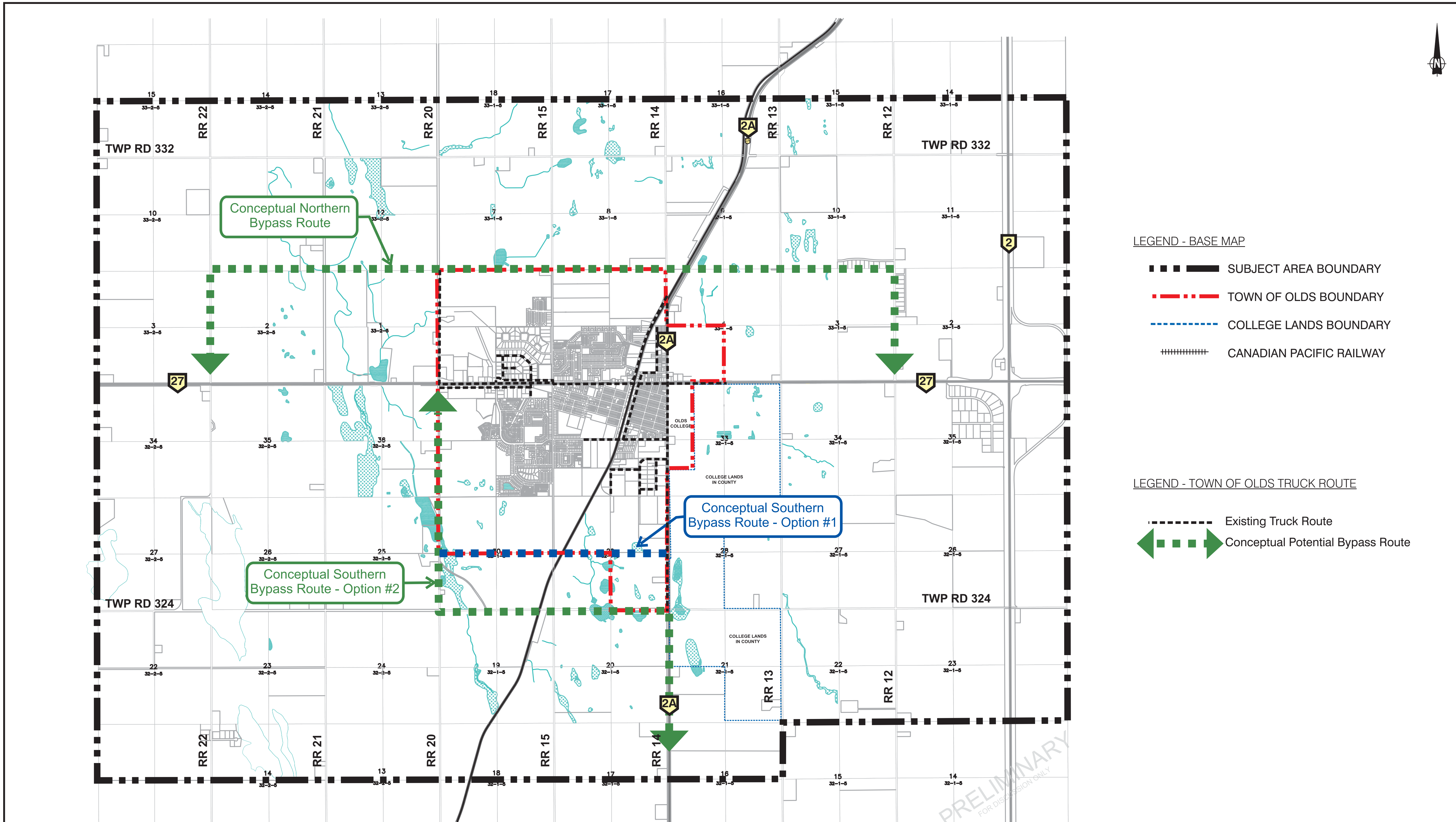
- Truck bypass needed for Town.
- Trucks should be restricted to using the right lane on Highway 27 to simplify operations and to avoid having them make lane changes to get around other cars stopped to make left turns.
- Parking of large trucks at motels is a problem. They are on the street behind sites along the north side of Highway 27.

At present, the Town of Olds' truck routes are highly constrained, impacts the overall traffic operations along the Highway 27 and Highway 2A corridors, and promote trucks movements through the Town.

8.2 Future Truck Routes

As part of this review, two scenarios were reviewed, specifically a northern by-pass and southern by-pass. This high level review included a cursory assessment the potential traffic benefits and general environmental impacts.

- *A South Truck By-pass:* At present, trucks traveling north along Highway 2A and are required to access Highway 27 to travel west. Based on the future Long Term road network, there are three possible routes on the south side that could be used as a designate truck route. For the purpose of this review, alignments S1 and S2 were considered to be an undesirable route for accommodated designate truck traffic.



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Truck Routes - Existing and Proposed

Exhibit
8.1

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- Although not technically required to manage traffic volumes at the 2035 horizon, a southern by-pass represents a possible means of reducing truck traffic on internal Town roadways. Given that alignment S1 and S2 were considered to the undesirable, the following route could be considered as feasible routes for accommodating a southern truck by-pass:

Alignment S3 (see Exhibit 7.3) is considered to be a possible alignment; however, there are some environmental challenges with this particular alignment and if the Town chooses to purse this route, a more detailed review will be required so as to ensure that the environmentally sensitive areas are protected.

- A southern truck by-pass that allows trucks to travel north/south on 70th Avenue and travel east/west on Township 324, which connects Highway 2A, would reduce the truck traffic on Highway 27. Given the low environmental impact, this is the preferred route as directing by-pass truck traffic to the new southern east-west connector (Link F) is likely to negatively impact a number of residential communities.

- A North Truck By-pass: Depending the location of the alignment (i.e., its proximity to the Town of Olds), the northern truck by-pass routes could serve as a means to reduce the overall traffic congestion along Highway 27 as well as a designate truck by-pass route. With this in mind, a northern truck by-pass situated north of the Town limits and follows the Town boundary (i.e., Link P) would allow through truck traffic by-pass Highway 27 and avoid the traffic congestion along this corridor. The implementation of the northern truck route by-pass would reduce the delays and environmental impacts with the community. Although either route north of the Town would significantly reduce the impacts of through truck traffic along Highway 27, an alignment close to the Town limits is the preferred route, as it would also benefit the Town from a traffic management perspective.

While not conclusive, the analysis of the alternatives does suggest clearly that options will exist to reduce or remove the impact of truck traffic through the core of the Town through the development of a north and/or south by-pass. As noted, use of the south by-pass may be more restrictive for trucks if the alignment closest to the existing residential area is selected, as the noise from truck traffic would be difficult to attenuate.

To this end, it is recommended that the Town promote the development of a truck route that avoids Highway 27 once options become available to do so. The most desirable routes would be the north or south by-passes, provided that the route is sufficiently removed from existing residential development.

9.0 ALTERNATIVE TRANSPORTATION MODES OVERVIEW

9.1 INTRODUCTION

The scope of the 2009 Master Plan included a preliminary high level or overview assessment of alternative transportation modes. These included transit, pedestrian/bicycle network planning and high speed rail. While not exhaustive and while not intended to represent formal transit or active modes studies given the limited scope of the Master Plan project for 2009, they do nonetheless identify basic elements of the existing and future network. More extensive and detailed study would be required to develop full transit plans and comprehensive active modes networks. As such, the information contained in this report is intended to provide an introduction to the issues, and a preliminary assessment of options on terms of a go-forward strategy for the Town and County.

9.2 Transit System Concept

As part of the Transportation Master Plan, a high level review of preliminary transit planning was completed based on literature review of transit implementation studies as well as a review of similar sized municipalities where transit studies have been completed.

Based on the review there are several factors that must be considered when deciding if implementing a transit system is feasible. There is no specific threshold in terms of population as to when to implement a transit system; as any population level may require a transit system based on the financial resources of the community, the desire to implement as well as the flexibility in applying a solution.

A study completed by Masterton Planning group in association with D.A. Watt Consulting called *Transit Implementation Guidelines for Small Canadian Municipalities*[17] states that the simplest method to determine both the transit feasibility and implementation is to answer the following questions:

1. What is the community wishing to accomplish with the implementation of public transit? What are the social, economic and environmental benefits of public transit?

2. Who will use public transit? What is the potential market for public transit?

3. What are the urban form, size, economic structure and demographics of the community? Is your community organized to support a transit system?

4. Do you have public/ political support?

5. What type of public transit service is required?

6. Where should the public transit service operate? What are the most common areas and facilities that citizens wish to travel to/from?

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[17] Transit Implementation Guidelines for Small Canadian Municipalities, Masterton Planning Group in Association with D.A. Watt Consulting, Transportation Division, March 29, 2006.

7. When should the transit service operate? What days of the week and hours of the day should the service be available?

8. How much service will be provided, how much will the service cost and how will the operating costs be funded?

9. Who will plan, promote, operate and maintain the transit system? What components of the system will be operated by the municipality or contracted?

10. How much revenue is the system expected to generate? What are the types and amounts of passenger fares? How is revenue collected, managed and accounted for?

11. What type of vehicle and physical infrastructure is required? How will the vehicles and capital infrastructure be funded, operated and maintained?

12. What is the level of community financial support for public transit?

Based on these guidelines, once the community has answered "Yes" to all of the feasibility questions, the next step is to design a system and create an Implementation Plan that takes into consideration the above questions as well as a detailed costing of the system based on known features.

The Transit Implementation Guidelines for Small Canadian Municipalities summarizes some examples of costing for small urban centres within Canada as shown in Appendix H. Bunt & Associates also completed the Town of Canmore Master Transportation Study in which a review of the transit feasibility study that was completed in 2006 was reviewed. Based on the results, a 'starter' transit system for the Town of Canmore was recommended in 2006 or at a population of 18,000 people; however the implementation is likely dependent upon the emergence of a sponsoring group or committee who will assist with the process.

Overall a future public transit system is dependent upon several factors and cannot be precisely established based on a future population number. Therefore, Bunt & Associates recommends that the Town/County review the above listed questions set out by the Transit Implementation Guidelines for Small Canadian Municipalities and once all of the feasibility questions can be answered positively than a Transit Feasibility Study is recommended to be undertaken.

9.3 Future Trail/Bikeway Corridor Concepts

For transportation systems to be considered sustainable, more mobility choices should be provided to all users of the transportation network. Non-motorized modes including walking and cycling and are highly influenced by the land use/development patterns and available transportation systems. Both the Town of Olds and Mountain View County recognize there is a need to seriously consider the benefits associated with non-motorized modes. With this in mind, the following focuses on a cursory review of pedestrian and bicycle (vulnerable road user) issues.

The objectives of the non-motorized mode review are based on the movement of people and goods, encourage mode choice, promote liveability and sustainability, and minimize environmental impact. The specific objectives are to:

- Provide safe routes that link major destinations throughout the Town and County. This would include a review of the overall topographical plans in the context of community connectivity for bicycles and pedestrians.

- Identify main corridors where bicycle lanes and/or regional pathways should be located. Also identify any other logical links for future study as part of subsequent area structure plans. The intent of this review would be to identify a network of routes that provide direct, comfortable, and safe connection for all cyclists.

- Provide a summary of bicycle lane design details and accommodation strategies for consideration by the Town and County.

- Provide the basic format and overview for a more formal pathway network planning study if found to be necessary.

9.3.1 Existing and Proposed Trail System

The review of the existing trail system was based on a review of the current documentation available on the Town of Olds' website and currently approved area structure plans, specifically:

- Town of Olds - 2006 Hay City Trails

- Parks and Trails System – Richardson ASP: May 2009

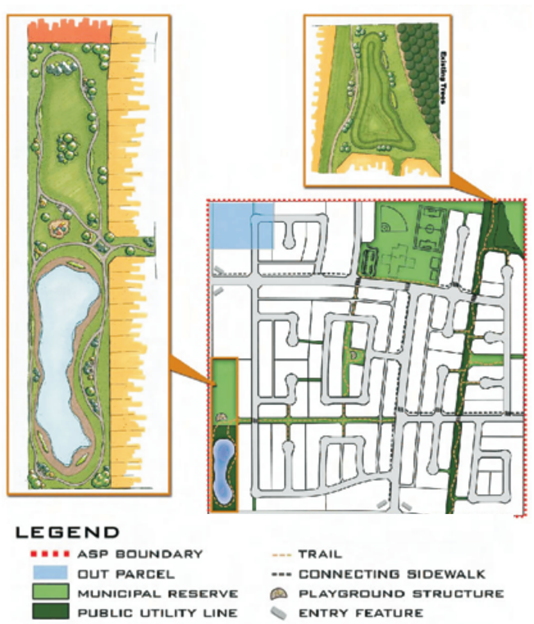
- Netook Crossing North Business Park & Residential Community: September 2008

- Deer Ridge Environmental Reserve Trail Plan: January 2008

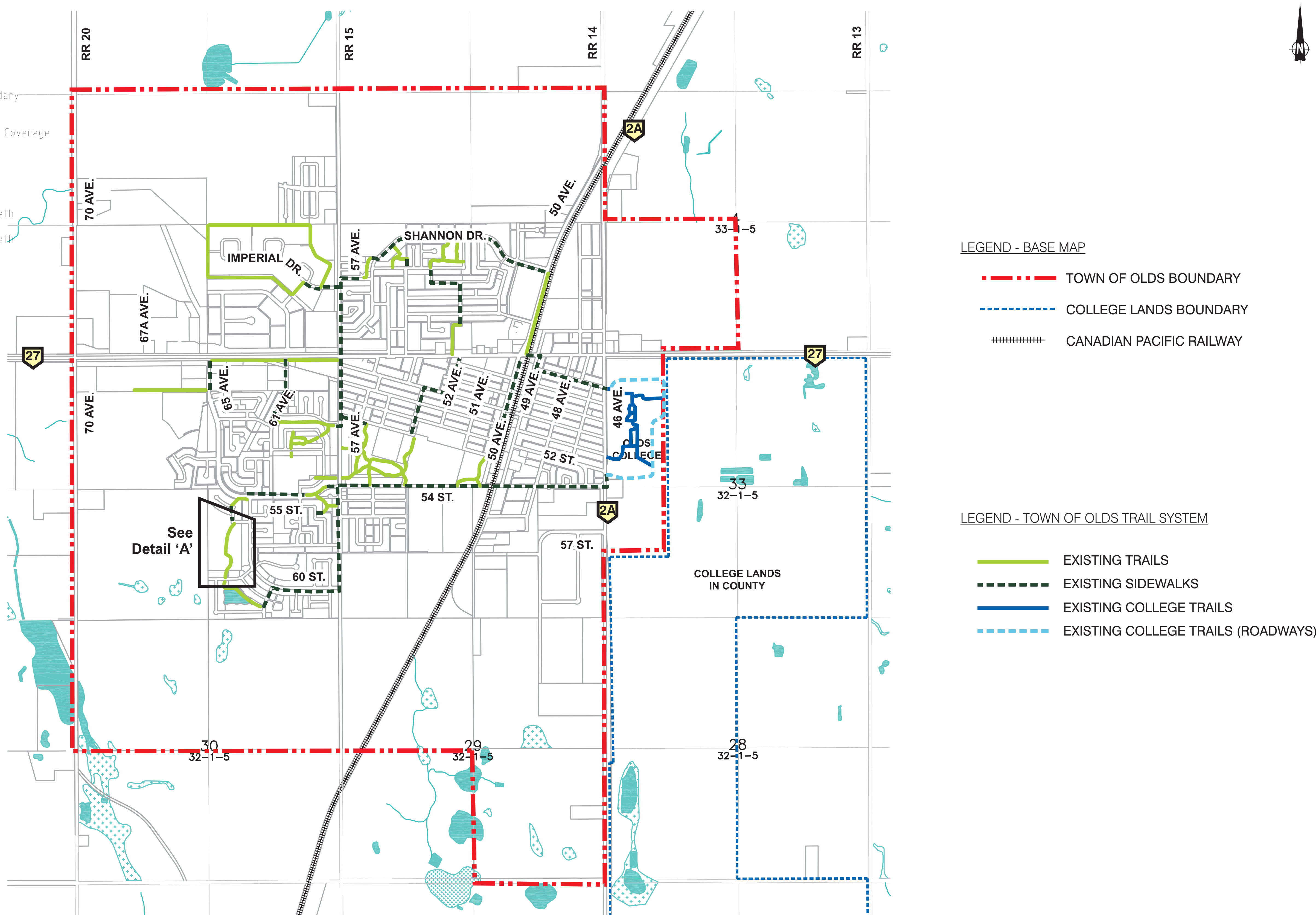
The current and recommended conceptual trail alignments within the Town of Olds and Mountain View County are illustrated in Exhibit 9.1 and Exhibit 9.2 respectively.

Detail 'A'

Base Map Source: Deer Ridge Environmental



Base Map Source: Stantec



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Town of Olds - Existing and Proposed Trail System

Exhibit
9.1

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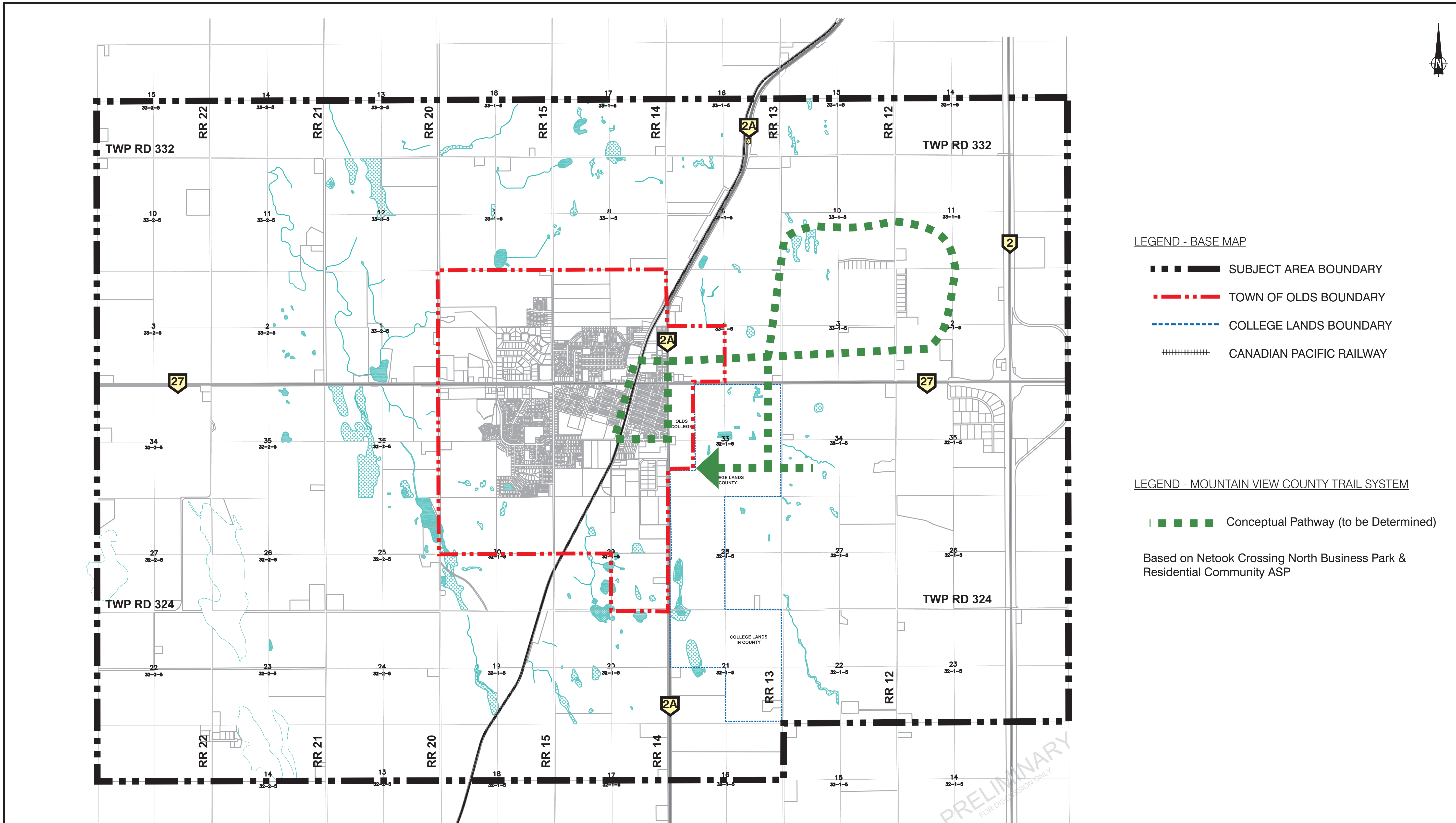

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Mountain View County - Existing and Proposed Trail System

Exhibit 9.2

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Within the Town of Olds there are number of the existing trails that exhibit a multi-purpose function. As present, the current system comprises of formal trails and sidewalks. There are three north-south routes that connect the north and south side of the Town, linking a number of key residential and commercial nodes. At this stage, these north-south routes are limited to 57 Avenue, 52nd Avenue, and 50th Avenue. The primary east-west connections follow the Shannon Drive (on the north side) and 54th Street (on the south side) alignments. Connectivity between the College and the Town is via the 47th Street and 54th Street alignments. Generally, the current multi-purpose trail system provides pedestrians with safe routes to a wide variety of destinations throughout the Town of Olds. That said, connectivity to the major commercial nodes on the west side of Town and along the Highway 27 and Highway 2A corridors are limited.

As for Mountain View County, other than the proposed trail system through the Netook ASP, a formal trail system has not been established for the County. With this in mind, the non-motorized (pedestrians and cyclists) patrons are forced to utilize the sides of the road. Under this condition, both the vulnerable road user and the driver are required to take action to avoid potential conflicts and/or crashes, which is considered to be a less than desirable condition for non-motorized road users. Having said that, with the inclusion of the future conceptual trail system between the Netook ASP and the eastern limits of the Town, non-motorized users will have a choice and a safe route between key population and commercial nodes within the County.

Based on the feedback through the public consultation process, there were a number of concerns with current trail system. These concerns are summarized here:

- Trail systems need to be supported and adequately profiled and marked for multi-use.
- There is a need for a multi-use Trail Management Plan – monitoring, funding, maintenance
- Bike paths for commuter use and not just recreational use. That is, bikeways and bike lanes in addition to bike paths and trails.
- 57th Avenue South – busy with walkers/runners, especially south beyond Town past the tracks to bird watching area on 32-1-5 east/west
- 57th Ave north of Hwy 27 – recreation corridor
- No sidewalk on 65th Avenue around the bend at the SW part of town. Safety issue, temp warning or maybe barriers to set aside a separate lane.
- Pedestrian crossing dangerous at Hwy 27/52nd Avenue.
- Significant volume of pedestrian traffic walking to Olds College along 50th and 57th

9.3.2 Possible Conceptual Alignments

The most effective non-motorized networks provide efficient and safe connections between population centres and local attractions (e.g. employment nodes, commercial districts, schools, recreational activities, etc.). Generally, the multi-purpose trail systems should consider the following principles:

- Connectivity: specifically between population centres and major attractors
- Safety: off-street routes or low-traffic volume streets are considered safer, particularly by less frequent users
- Constraints: physical constraints such as restricted rights-of-way, difficult terrain, etc. were avoided where possible;
- Comfort: busy intersections, narrow roadways, etc. can impact the desirability to cycle.

With the above in mind, a review of the future land use patterns, future road network, and general input from the public consultation process was conducted to ascertain the deficiencies within the existing and proposed trail system. A summary of the current/proposed trail system and its relationship between the future land use patterns, specifically the associated deficiencies and/or issues, are illustrated in Exhibit 9.3.

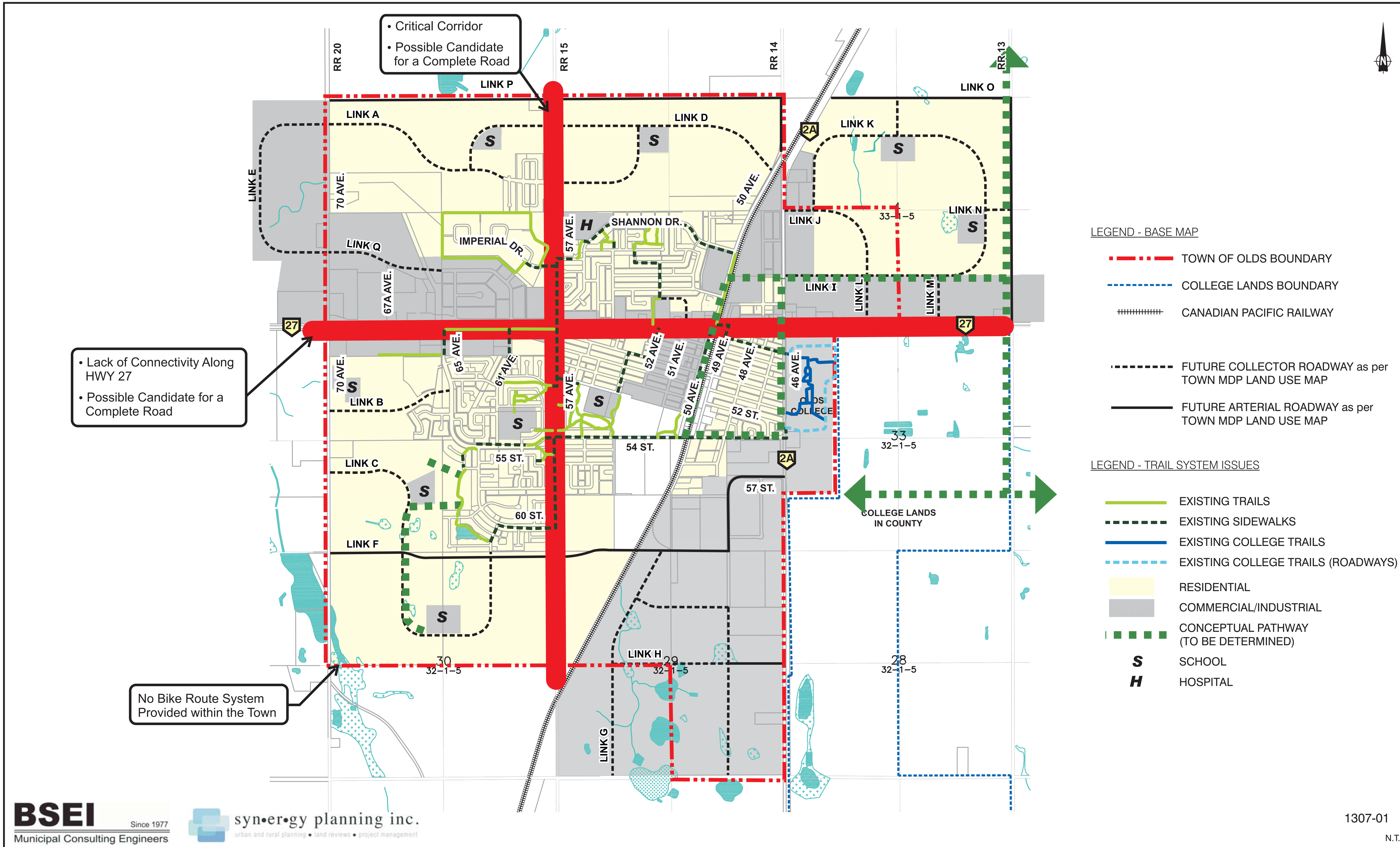
As shown in Exhibit 9.3, there are a number of deficiencies/issues with the current/proposed trail system network, specifically:

- Although a multi-purpose trail system has been developed, the Town of Olds does not have a formal bicycle trail system in place. At present, cyclists are required to travel on the existing roadway and interact with the motorized vehicles. Considering this, it is important that safe and convenient bike routes are well established between key population and commercial nodes.
- Based on the current and future land use patterns, 57th Avenue is considered to be a critical link for both motorized and non-motorized road users. From vehicular perspective, 57th Avenue is considered to be primary north-south route within the heart of the Town. As for the non-motorized road users, this roadway links to a number of key trails that are considered to be safe and convenient for all types of the road users. At this stage, the trail system along the 57th Avenue corridor is disjointed and/or is not continuous in a number places. Given the anticipated importance both from a regional road network and non-motorized road user perspective, improvements to the trail system and roadway should be seriously considered. In essence, 57th Avenue should exhibit the typical characteristics of a complete roadway. Specifically, this roadway should include not only the typical transportation and utility elements, but also other elements such as bicycle/pedestrian facilities.
- Connectivity in the east-west directions of travel is limited to a couple of the routes on the north and south sides of Town. At this stage, east-west connectivity within the heart of the community is limited to a couple connections on the west side, specifically on the south side of Highway 27 between 57th Avenue and 65th Avenue. Highway 27 is the primary east-west corridor for the Town of Olds and Mountain View County. Currently, the roadway is defined as a primary highway and is under the jurisdiction of Alberta Transportation. Given the character of the road and the anticipated traffic levels/composition in the long-term, opportunities to develop a safe/convenient trail system

along this corridor will be a challenge. With the inclusion of the northern pass-by, the traffic levels are expected to reduce to such a level whereby elements related to a “road diet” could be implemented, which includes provisions for separate bike lanes in both directions of the travel.

- Generally, the current/proposed trail system does provide adequate connectivity for pedestrians and it is assumed that with the development of future roadways, pedestrian facilities will be constructed as development proceeds, which further strengthens the current system.

Considering the potential opportunities and challenges with the current/proposed trail system in relation with the future land use patterns, possible alignments for safe and convenient bicycle routes were developed. As well, locations for completed streets were identified as key corridors for a sustainable transportation system. The proposed conceptual alignments for the bike route and the complete streets are illustrated on Exhibit 9.4. It is recommended that consideration should be given to implementing or upgrading the current trail system and that the Town and County undertake a formal Active Modes or Non-Motorized Master Plan review to verify the need and location of the key routes within the system and to expand the recommendations into a more formal and comprehensive document with appropriate implementation strategies.



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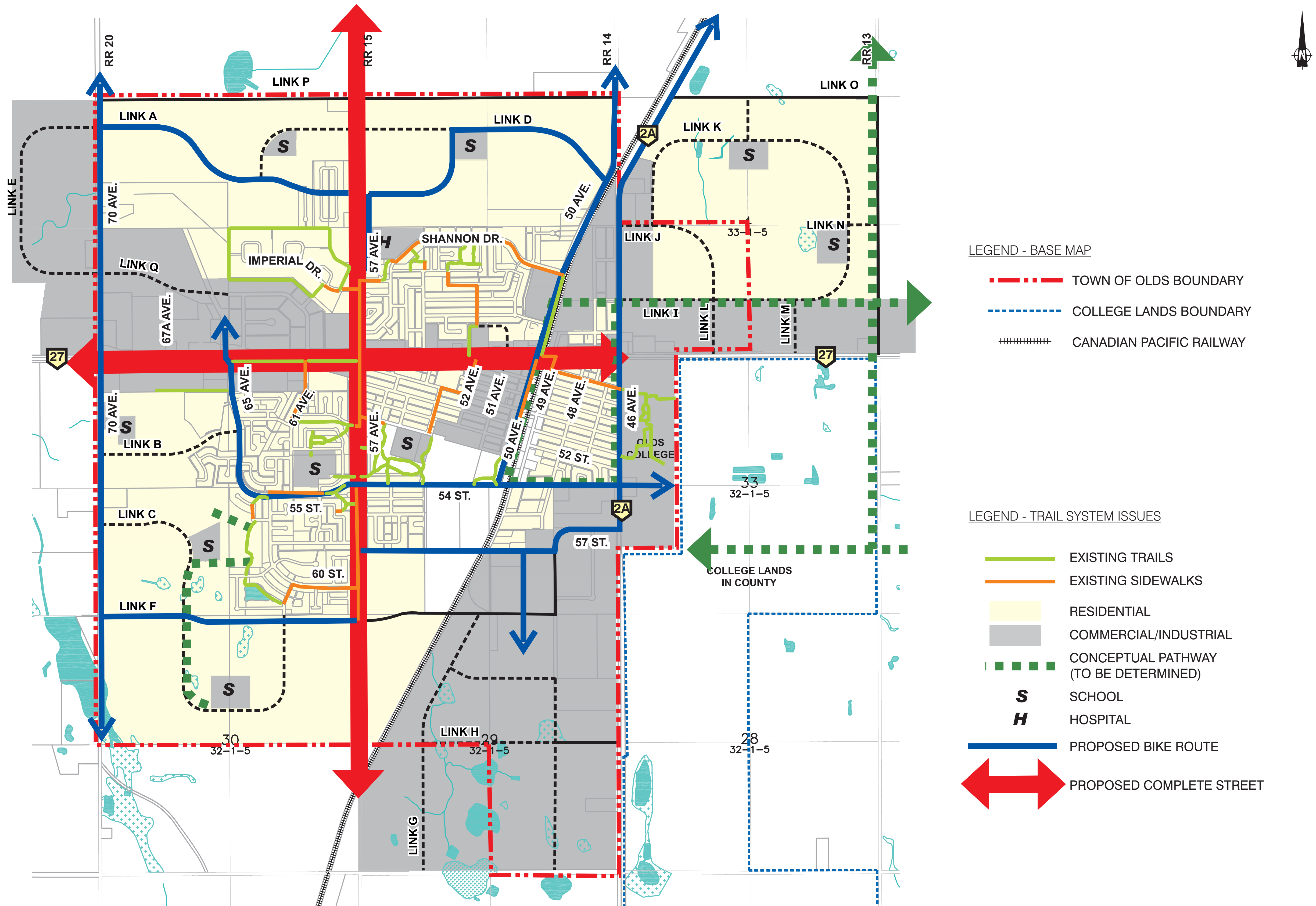
Current/Proposed Trail System Issues

Exhibit 9.3



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Conceptual Non-Motorized Alignments

Exhibit
9.4

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9.3.3 Typical Design Considerations

Cross-section and Signage needs were developed based on a review of typical sidewalk and cycle route requirements. It is recommended that the Town and the County adhere to the design requirements outlined in TAC's Geometric Design Guide[18] and Town of Olds Minimum Design Standards for Development[19]. Examples of the typical cross-sections and signage requirements are illustrated in Exhibit 9.5 and Exhibit 9.6 respectively.

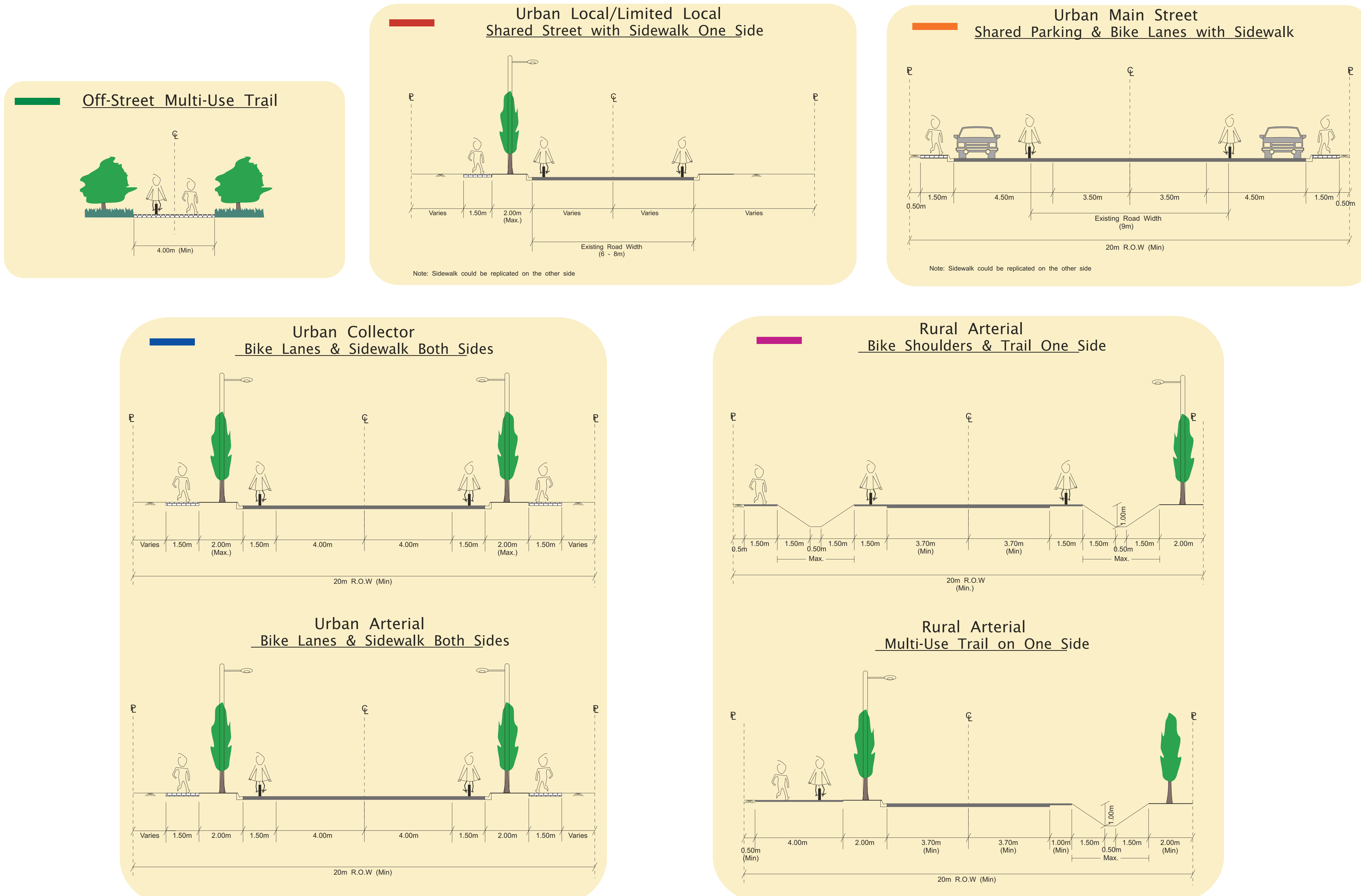
9.3.4 Accommodation Strategies

It's noted that the proposed conceptual alignments are subject to a more detailed review and would require conformation through a formal Non-Motorized Master Plan Review. It is recommended that the future Master Plan study provide the framework and/or series of recommendation that would support and encourage the use of non-motorized vehicles. Specifically, the future Master Plan could the include:

- Town and County Trail Maps
- Education Programs
- Bicycle Parking Provisions
- Bicycle-Friendly Signs
- Detailed Feasibility Assessment for both recreation and commuter based routes
- Bicycle Sharing Programs
- A review of overall connectivity and convenience
- Elements associated with space requirements

There are number of technical documents and guidelines that could assist the Town and the County with future non-motorized planning studies. It is recommended that the Town and County incorporate the practices outlined in those references.

[18] Geometric Design Guide for Canadian Roads, Transportation Association of Canada (TAC), 1999
[19] Town of Olds Minimum Design Standards for Development, May 2005



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Cross Section Requirements - Minimum Standards

Exhibit
9.5

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Based on TAC Sign Pattern Manual 2001

LEFT SIDE PEDESTRIAN CROSSWALK SIGN / PASSAGE POUR PIÉTONS — RA-4L

DIMENSIONS (mm)	600 x 75	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	MUTCDC A6.4.1	BACKGROUND / FOND	WHITE / BLANC
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	5	MESSAGE	BLACK / NOIR

RIGHT SIDE PEDESTRIAN CROSSWALK SIGN / PASSAGE POUR PIÉTONS — RA-4R

DIMENSIONS (mm)	600 x 75	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	MUTCDC A6.4.1	BACKGROUND / FOND	WHITE / BLANC
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	5	MESSAGE	BLACK / NOIR

SHARED PATHWAY SIGN / PISTE CYCLO-PÉDESTRE — RB-93

DIMENSIONS (mm)	300 x 45	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	BTCGC / GSVC 3.7.10	BACKGROUND / FOND	WHITE / BLANC
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	3	MESSAGE	GREEN / VERT BLACK / NOIR

LEFT PUSHBUTTON SIGN / PANNEAU DU BOUTON POUSSOIR — ID-20L

DIMENSIONS (mm)	130 x 20	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	BTCGC / GSVC 5.2.3	BACKGROUND / FOND	WHITE / BLANC
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	2	MESSAGE	BLACK / NOIR

RIGHT PUSHBUTTON SIGN / PANNEAU DU BOUTON POUSSOIR — ID-20R

DIMENSIONS (mm)	130 x 20	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	BTCGC / GSVC 5.2.3	BACKGROUND / FOND	WHITE / BLANC
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	2	MESSAGE	BLACK / NOIR

PEDESTRIAN AND BICYCLE CROSSING AHEAD SIGN / SIGNAL AVANCÉ DE PASSAGE POUR PIÉTONS ET BICYCLETTES — WC-46

DIMENSIONS (mm)	600 x 60	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	BTCGC / GSVC 4.6.3	BACKGROUND / FOND	YELLOW / JAUNE
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	6	MESSAGE	BLACK / NOIR

CROSSING TAB SIGN / PANONCEAUX COMPLÉMENTAIRE — WC-7S

DIMENSIONS (mm)	600 x 30	COLOUR / COULEUR	
REFERENCE / RÉFÉRENCE	BTCGC / GSVC 4.6.3	BACKGROUND / FOND	YELLOW / JAUNE
		BORDER / BORDURE	BLACK / NOIR
ENLARGEMENT / AGRANDISSEMENT	4	MESSAGE	BLACK / NOIR

Based on Manual of Uniform Traffic Control Devices 2003

R3-17
750mm x 600mm

R3-17b
750mm x 300mm

1307-01

N.T.S.

bunt & associates

Town of Olds & Mountain View County Transportation & Utilities Master Plan

Standard Traffic Signs

Exhibit 9.6

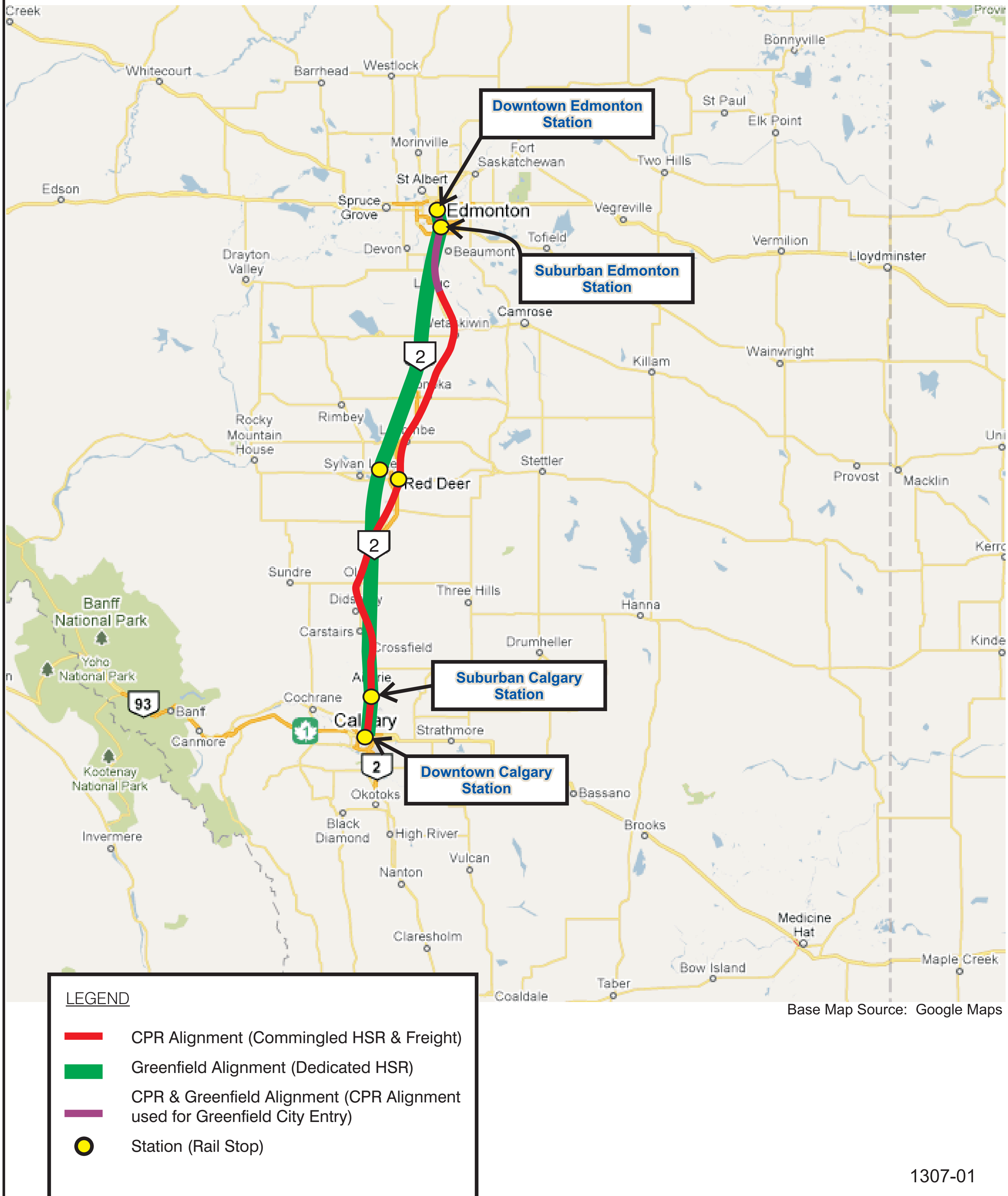
:\\1307-01_TRAFFIC-SIGNS_2010-06-JUNE.cdr June 2, 2010 HMF

9.4 High-Speed Rail

Due to the strong economic growth that the province of Alberta has experienced over the last several years, discussions regarding the high-speed rail system have resurfaced. With the rapid growth of travel between the Calgary-Edmonton corridor, a high-speed rail system has been proposed to reduce the heavy traffic volumes travelling on this corridor either via air or roadway. Although the system has yet to be approved, Bunt & Associates felt it was prudent to review the proposed rail lines as either line is expected to pass through the study area.

There are currently two proposed alignments for the proposed high-speed rail line, the Canadian Pacific Railway (CPR) Alignment and the Greenfield Alignment as illustrated in Exhibit 9.7. Both alignments will have rail service between downtown Calgary and downtown Edmonton with intermediate stops in north suburban Calgary, Red Deer and south suburban Edmonton (north of the Ring Road). The CPR alignment will utilize the existing CPR railroad right-of-way and would combine freight and passenger trains, while the Greenfield alignment would require new right-of-way that would be developed as a dedicated High Speed Rail corridor and thus only serve passenger trains.

Although the specifics of the alignment are yet to be determined, the CPR alignment will run through the Town of Olds within the CPR right-of-way and will thus increase the number of trains that travel through the Town each day. This alignment may pose additional safety concerns at the rail crossings within the Town and therefore it is recommended that the Town pursue further input and involvement with the development of the rail line. The Greenfield alignment is not expected to travel through the Town of Olds however is expected to run closer to Highway 2, which may affect the residents of Mountain View County.



Base Map Source: Google Maps

1307-01

N.T.S.

bunt & associates

Town of Olds & Mountain View County Transportation & Utilities Master Plan

Calgary - Edmonton High Speed Rail Alignment Alternatives

Exhibit 9.7

:\\1307-01_EXH9.7_2010-06-JUNE.cdr June 1, 2010 HMF

10.0 UTILITY MODEL DEVELOPMENT

10.1 Introduction

Recent annexation discussions between the Town of Olds and Mountain View County resulted in the Town of Olds agreeing to provide connections for potable water, wastewater and stormwater servicing to the County. The study area defines a specific region of the County where this infrastructure sharing will occur. Services will be extended through the Town boundary, to the Mountain View County study area.

The Town of Olds and Mountain View County have authorized the Bunt & Associates project team to undertake a Transportation & Utilities Master Plan to confirm infrastructure planning priorities for the short term (2016) and long term (2035) horizons.

10.2 Review of Existing Information

BSEI reviewed the following information (provided by the Town of Olds) with respect to underground utility services within the Town of Olds:

- February 2010 – Town of Olds Interim Plan for Wastewater Treatment (Stage 1 – 2012), prepared by Stantec Consulting Ltd.;
- June 2009 – Town of Olds Record Drawings, prepared by Stantec Consulting Ltd.;
- May 2009 – Richardson Area Structure Plan, prepared by Stantec Consulting Ltd.;
- October 2008 – Town of Olds Geographical Information System (GIS) data, prepared by Stantec Consulting Ltd.;
- March 2007 – Environmental Protection and Enhancement Act R.S.A. 2000, c.E-12, as amended (Approval No. 1037-02-00, expiry date March 1, 2017);
- June 2002 – Town of Olds Infrastructure Review, prepare by Tagish Engineering Ltd.

BSEI also reviewed the following information with respect to underground utility services within Mountain View County:

- September 2008 – Netook Crossing North Business Park and Residential Community Concept Plan, prepared by Brown & Associates Planning Group;
- November 2007 – Mountain View Business Park Outline Plan Report, prepared by Stantec Consulting Ltd.;
- October 2007 – Mountain View Regional Water Service Commission – Application for Renewal of Municipal Waterworks System;
- May 2007 – Central Alberta Regional Wastewater – Concept Refinement Report, prepared by Stantec Consulting Ltd.;

- January 2007 – Highway 2/27 Area Structure Plan, prepared by EBA Engineering Consultants Ltd.

The Town of Olds and Bunt & Associates provided population projections for the short term (2016) and long term (2035) horizons to BSEI along with anticipated areas for this proposed growth. Based on information provided by the Town of Olds and Bunt & Associates, the existing Town of Olds has a population of 7,900 with an additional 3,440 work-force population.

The proposed population projections are as follows:

- Short term (2016): 12,390 residents with an additional 4,520 work-force population;
- Long Term (2035): 34,600 residents with an additional 13,410 work-force population.

These population projections and existing information were used to determine possible upgrades to the existing infrastructure and/or new infrastructure required to accommodate these population projections.

11.0 POTABLE WATER

11.1 Background Information

The Town of Olds receives treated water from the Mountain View Regional Water Service Commission (MVCRWSC), which owns and operates the Anthony Henday Water Treatment Plant. It is situated on the banks of the Red Deer River northwest of Innisfail, Alberta and has a current production rate of 20,000m^3/day. Based on the Mountain View Regional Water Service Commission – Application for Renewal of Municipal Waterworks System, the regional water treatment plant serviced a total population of 26,040 in 2006 (2006 Census) in six communities, including Innisfail, Bowden, Olds, Didsbury, Carstairs and Crossfield.

In 2006, the diversion from the Red Deer River by the MVCRWSC was 10,549m^3/day (average day flow), which is approaching 40% of the total allowable diversion of 27,272m^3/day from the Red Deer River per License to Divert No.08441 (with a gross diversion of 9,954,200m^3/year). The current license from the MVCRWSC does not limit the quantity of water provided specifically for the Town of Olds.

The Towns of Bowden, Olds, Didsbury, Carstairs and Crossfield currently receive treated water from the Anthony Henday Water Treatment Plant, via a 400mm diameter supply main. The supply main extends from the Water Treatment Plant to a 6,800m^3 MVCRWSC Treated Water Storage Reservoir and Pump Station, located just west of the Town of Olds. Treated water is then pumped through a supply main to the five (5) communities. Currently the limiting factor for the system is the actual flow through the 400mm supply main. However, an additional supply main is planned for the future; with the exact size and location unknown at the present time.

Per capita potable water usage (excluding Olds College) was estimated at 0.454 m^3/day (average consumption) and 1.135m^3/day (2.5 times for maximum day consumption), based on the Mountain View Regional Water Service Commission – Application for Renewal of Municipal Waterworks System.

11.2 Existing System

The existing potable water system in the Town of Olds consists of two (2) treated water storage reservoirs and pump stations as well as distribution piping throughout the Town. The MVCRWSC reservoir is connected to the Town's south reservoir via a 400mm feedermain. The south reservoir is located on the north side of 57th Street (extended), just south of O.R. Hedges Park and has a capacity of 9,092m^3. The south reservoir feeds the north reservoir through the existing distribution piping system. The north reservoir has a capacity of 2,272m^3 and is located at the northeast corner of 46th Avenue and 45th Street. The current potable water system (including distribution piping, pumps and storage reservoirs) adequately services the existing Town for water consumption and fire flows. Based on the Town of Olds Infrastructure Review (prepared by Tagish Engineering Ltd. and dated June 2002) and the known hydrant flows, the existing fire flow capacities are lower than recommended for industrial developments.

11.3 Analysis

Water modeling was performed using MikeNET software. Existing distribution piping and reservoir capacities were utilized in the proposed network. Proposed distribution piping (250mm & 300mm feedermains) was added to future growth areas based on City of Calgary water distribution grid standards.

In order to accommodate the proposed population growths (short term and long term), the existing distribution system will require one upgrade in addition to the proposed new infrastructure. Based on the modeling, it is recommended that the existing water pipe located in the lane between 46th and 47th Avenues be upgraded from 42nd Street to 45th Street to a 300mm feedermain. This upgrade is required to strengthen the existing connection between north reservoir and pump station and the proposed short term distribution grid. As an alternative, a second connection could be made between the existing pump station and the short term distribution grid.

It should be noted that an in-depth analysis of the existing water system was not performed at this time. The above mentioned upgrade is required in conjunction with the proposed infrastructure.

Existing pump data for the north and south pump stations was not available and therefore the water modeling assumed unlimited pumping capacity to analyze the distribution system network. This assumption allowed for the ultimate design of the distribution system. The water modeling demonstrated that the distribution system (short term and long term as proposed) is adequate to support the proposed population growths provided adequate pumping is available. If the existing pump data becomes available and it is determined that the existing pumps are not able to produce the required flows, the pumps would need to be upgraded with no additional upgrades to the proposed distribution system network.

The proposed population growth areas along the Highway 2/27 corridor will require a separate distribution system due to the elevation difference between these areas and the existing north and south reservoirs in the Town. A new reservoir and pump station will also be required to provide adequate water supply and fire protection which requires a separate pressure zone compared to the existing Town system.

It is recommended that the proposed pump station and reservoir have a minimum capacity of 4,113m^3 and be fed directly from a supply main (existing or proposed) from the Anthony Henday Water Treatment Plant. The proposed pump station and reservoir should ultimately be connected directly to the existing north reservoir in order to further strengthen the proposed potable water system.

The proposed pump station and reservoir was sized for fire flows within the expected industrial developments along the Highway 2/27 corridor. The proposed pump station and reservoir should be capable of supplying water consumption and fire flows to the industrial areas separate from the Town of Olds. Due to the elevation differential between the Town and the proposed east areas, the location and capacity of the existing reservoirs and the distance to the proposed east areas, upgrading the existing reservoirs and distribution system within the Town is not recommended.

11.4 Conclusions

11.4.1 Short Term

The proposed short term population projections include 12,390 residents with an additional 4,520 work-force population (an additional 5,570 combined population). This population increase will result in the following required upgrades and/or new infrastructure in the short term, i.e. to 2016.

- The diversion from the Red Deer River by the MVCRWSC in 2006 was approaching 40% while servicing a population of 26,040. The proposed Olds/Mountain View County expansion will increase the residential and work-force population of the Town of Olds by over 5,500 (from the current population) in the short term. Depending on the population growth of the remaining five (5) communities serviced by the MVCRWSC, this increase may exceed the allowable diversion rate from the Red Deer River. If the existing water license is exceeded, an additional water license will be required for the withdrawal of additional raw water from the Red Deer River.

- The Anthony Henday Water Treatment Plant has a current production rate of 20,000m^3/day. Depending on the population growth of the remaining five (5) communities serviced by the MVCRWSC, the existing Water Treatment Plant may require an expansion in order to service the proposed Olds/Mountain View County expansion.

- The proposed 250mm and 300mm distribution piping (as shown on Exhibit 11.1) will be required through the proposed short term growth areas. Also, the installation of the proposed pump station and reservoir (or an upgrade to the existing north pump station and reservoir) will be required in order to service the short term growth areas along the Highway 2/27 corridor. The proposed reservoir should have a minimum a capacity of 4,113m^3 and should provide adequate water consumption and fire flows to the proposed short term (and long term) growth areas.

11.4.2 Long Term

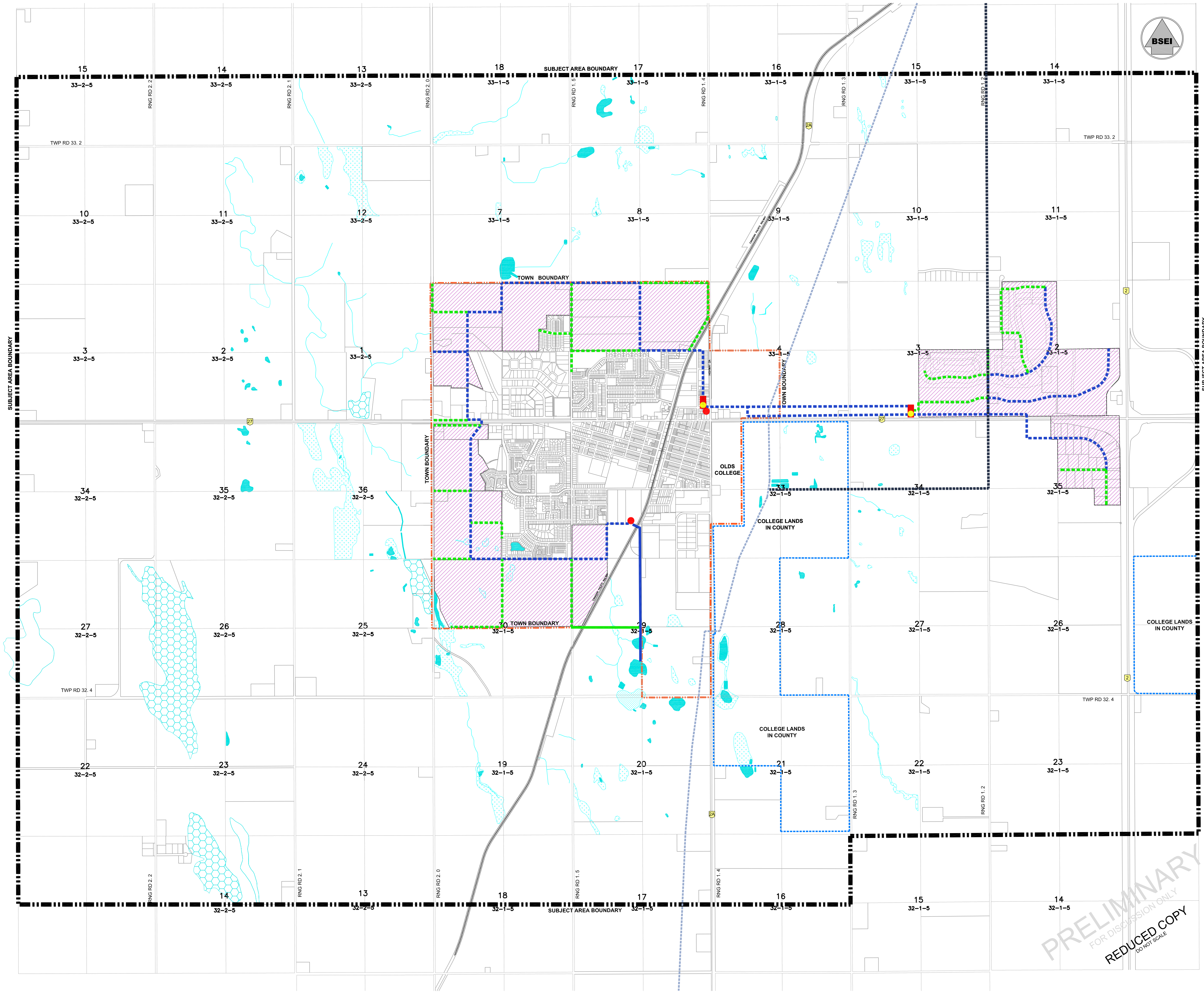
The proposed long term population projections include 34,600 residents with an additional 13,410 work-force population (an additional 36,670 combined population from the current population). This population increase will result in the following required upgrades and/or new infrastructure in the long term, i.e. to 2035.

- The diversion from the Red Deer River by the MVCRWSC in 2006 was approaching 40% while servicing a population of 26,040. The proposed Olds/Mountain View County expansion will increase the residential and work-force population of the Town of Olds by over 36,600 (from the current population) in the long term, which would exceed the allowable diversion rate from the Red Deer River. This also assumes that there will be zero population growth over the next twenty-five (25) years in the remaining five (5) communities serviced by the MVCRWSC.

- In order for the proposed long term growth to occur within the Town of Olds/Mountain View County, the existing Anthony Henday Water Treatment Plant will require an expansion and an additional water license will be required for the withdrawal of additional raw water from the Red Deer River.

- The additional 250mm and 300mm distribution piping (as shown on Exhibit 11.2) will be required through the proposed long term growth areas.

It should be noted that this Utilities Master Plan did not analyze upgrades required within the existing Town. The one (1) upgrade recommended is required in conjunction with the proposed infrastructure. It should also be noted that the alignments of the proposed water feedermains (as shown) are conceptual and should be finalized in accordance with detailed design.



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
PROPOSED WATER MAIN

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED 250mm POTABLE WATER
- PROPOSED 300mm POTABLE WATER
- PROPOSED 250mm POTABLE WATER(LONG TERM)
- PROPOSED 300mm POTABLE WATER(LONG TERM)
- PROPOSED 400mm POTABLE WATER TRANSMISSION MAIN (CONCEPTUAL)
- EXISTING 400mm POTABLE WATER TRANSMISSION MAIN
- EXISTING RESERVOIR & PUMP STATION
- PROPOSED WATER RESERVOIR & PUMP STATION
- SHORT TERM GROWTH AREA

NOTE

PROPOSED WATER MAINS 200ø AND SMALLER ARE NOT SHOWN.

Town of Olds

Mountain View COUNTY

Building Rural Better

REVISED AUGUST 23, 2010

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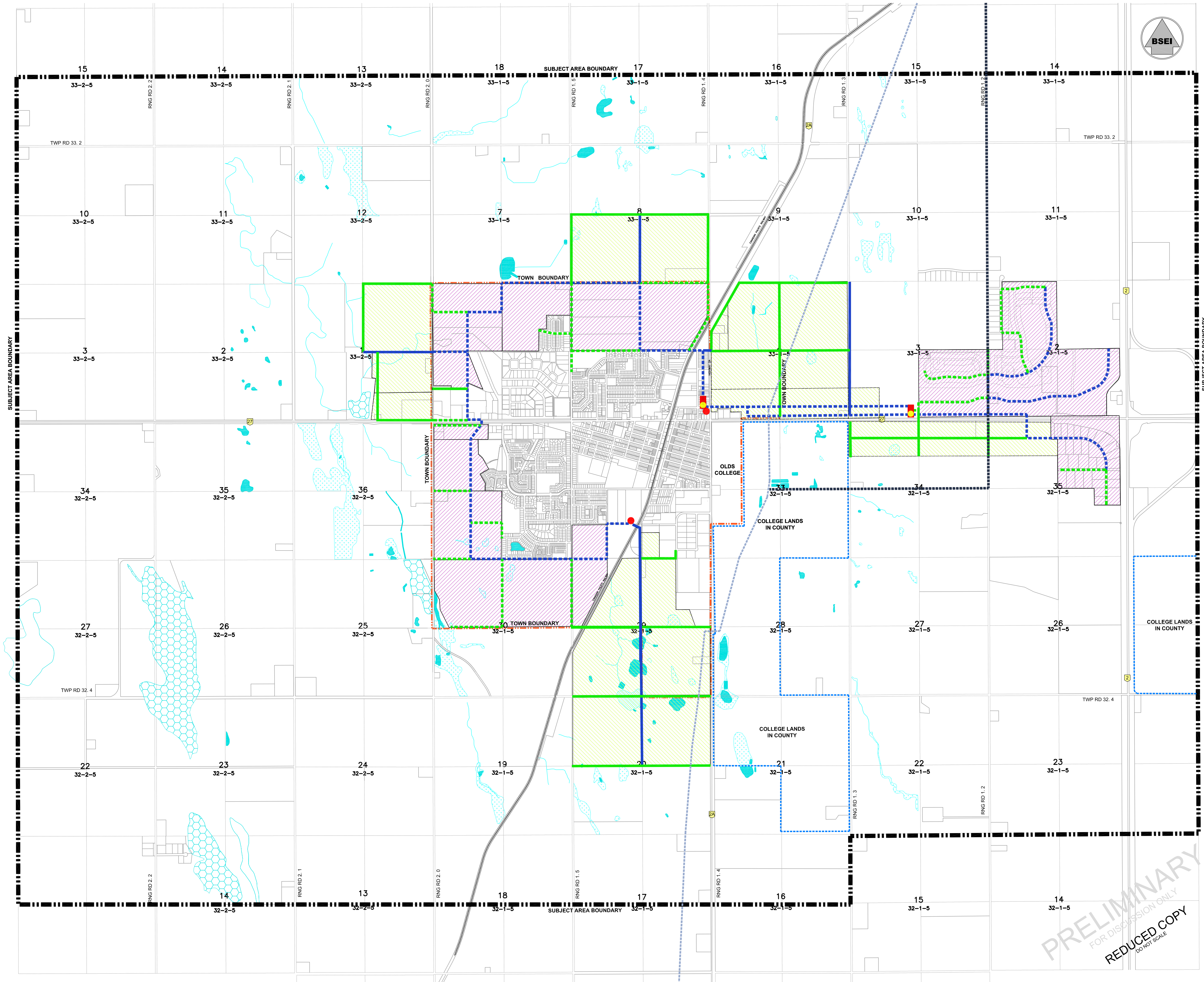
PROJECT No :	W643-014	*EXHIBIT 11.1*



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
PROPOSED WATER MAIN

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED 250mm POTABLE WATER (SHORT TERM)
- PROPOSED 300mm POTABLE WATER (SHORT TERM)
- PROPOSED 250mm POTABLE WATER
- PROPOSED 300mm POTABLE WATER
- EXISTING 400mm POTABLE WATER TRANSMISSION MAIN
- PROPOSED 400mm POTABLE WATER TRANSMISSION MAIN (CONCEPTUAL)
- EXISTING RESERVOIR & PUMP STATION
- PROPOSED WATER RESERVOIR & PUMP STATION
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA

NOTE

PROPOSED WATER MAINS 200ø AND SMALLER ARE NOT SHOWN.

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PROJECT No :	W643-014	*EXHIBIT 11.2*

12.0 WASTEWATER

12.1 Background Information

The Town of Olds currently uses a piped collection and conveyance system which discharges into a Wastewater Treatment Plant in the northwest quadrant of the Town. The treatment facility consists of bar screens, primary clarification, rotating biological contactor (RBC) units, secondary clarification, treated effluent storage and a treated wastewater outfall to Olds Creek, located in the NW23-33-2-5. The effluent from the lagoon is discharged to Olds Creek twice annually.

Mountain View County currently uses septic fields (which discharge the effluent directly into the ground) or septic tanks (which require pumping and hauling to the Town's wastewater system). Due to the concerns of possible contamination of water wells near existing septic fields (especially shallow wells considered under the direct influence of surface waters), Alberta Environment (AENV) strongly encourages regional wastewater servicing be provided. This also ensures that the wastewater quality is strictly monitored to meet AENV regulations prior to discharge.

Future plans call for the construction of the South Red Deer Regional Wastewater Commission (SRDRWC) pipeline, which would convey wastewater from the communities of Olds, Bowden, the Bowden Institution, Innisfail Penhold, Springbrook and the South Hills Region to the City of Red Deer Wastewater Treatment Plant. The connection of the SRDRWC to the Town of Olds is outlined in the Town of Olds Interim Plan for Wastewater Treatment (Stage 1 – 2012), prepared by Stantec Consulting Ltd. and dated February 2010.

The Environmental Protection and Enhancement Act R.S.A. 2000, c.E-12, as amended (Approval No. 1037-02-00, expiry date March 1, 2017), also states that "the approval holder shall upgrade the Olds wastewater system to:

- construct a wastewater treatment plant that meets Alberta Environment's present wastewater standards on or before January 1, 2010; or
- shall connect to a regional wastewater collection system on or before January 1, 2010.

As neither of these upgrades have been completed to date, it is recommended the Town immediately contact Alberta Environment to request an extension to the required upgrade schedule.

12.2 Existing System

The existing wastewater system in the Town of Olds consists of wastewater trunkmains which convey the wastewater to the Wastewater Treatment Plant, located in the NW6-33-1-5. The Wastewater Treatment Plant has a capacity of 4,213m^3/day (based on the Central Alberta Regional Wastewater – Concept Refinement Report, prepare by Stantec Consulting Ltd. and dated June 18, 2007).

12.3 Analysis

Average day per capita wastewater flow was estimated at 0.400m³/day (approximately 90% of average day water usage) and the per capita peak hour flow was estimated at 1.600m³/day (4 times the average usage).

The Town of Olds has a current population of 11,340 (combined residents and work-force population). Therefore the flow of wastewater from the entire Town is estimated at 52.5L/s. Based on the Town of Olds Infrastructure Review (prepared by Tagish Engineering Ltd. and dated June 2002), the major rainstorms of July 1999 produced massive infiltration that increased sewer flows to 176% of expected flows. Since more recent information was not available, the existing infiltration within the Town of Olds was estimated at 40L/s (76% of total wastewater flow). Infiltration within the proposed growth areas (short term and long term) was estimated at 0.28L/s/ha based on AENV standards (Standards and Guidelines for Municipal Waterworks, Wastewater & Storm Drainage Systems, January 2006).

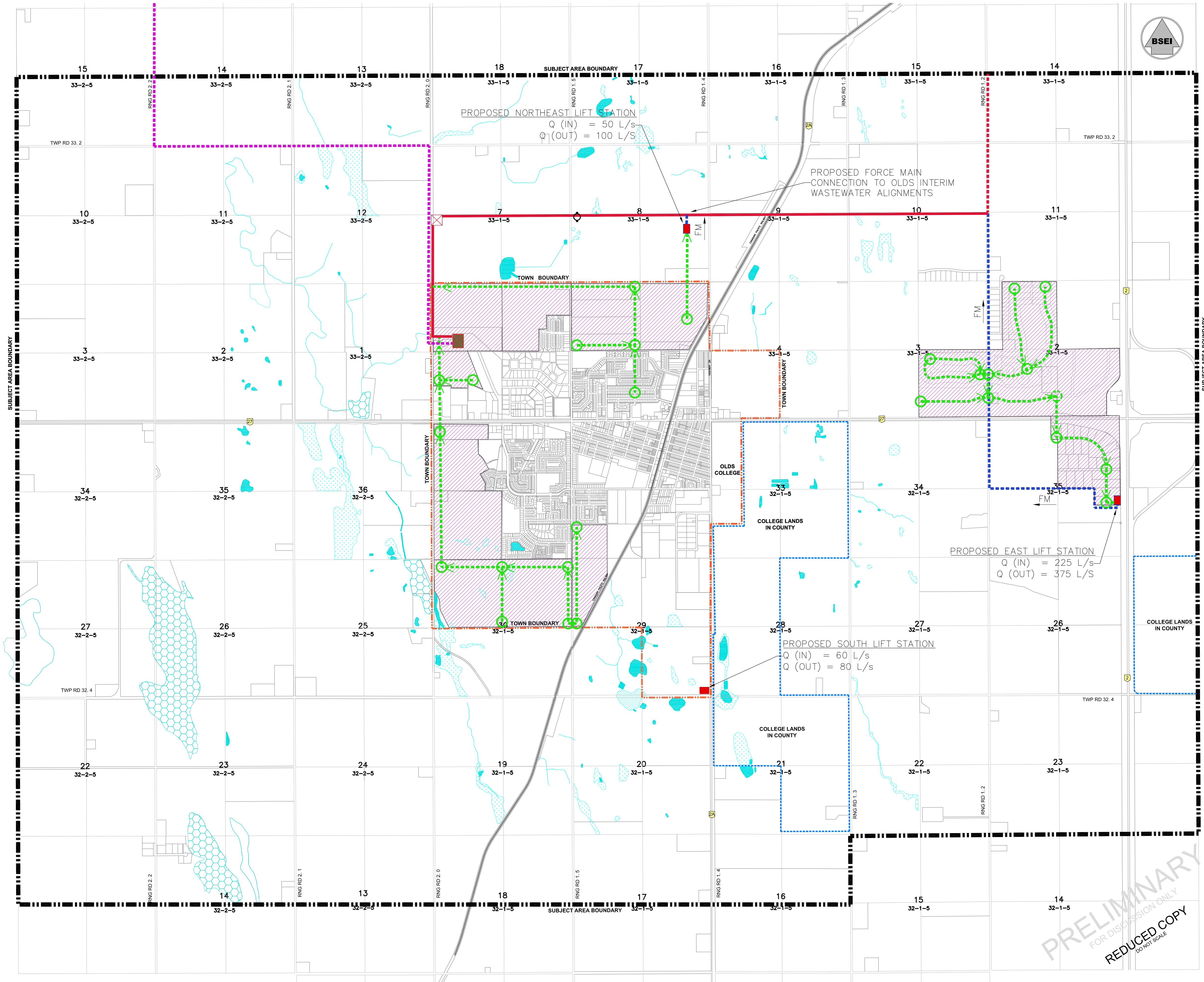
Also, a review of the Town of Olds Geographical Information System (GIS) data and Record Drawing information revealed that the majority of the existing wastewater information (inverts, slopes and pipe material) was not available or was contradictory. Therefore in order to estimate the existing pipe capacities, it was assumed that the existing wastewater pipes were constructed at minimum slopes per AENV guidelines with a Manning's n-value of 0.013.

In order to accommodate the proposed population growths (short term and long term), additional wastewater trunkmains (gravity) will be required throughout the future growth areas. Due to the topography of the existing Town and future growth areas, several lift stations will also be required to pump the wastewater from low-lying collection points through proposed forcemains to discharge into the proposed gravity trunkmains. Wastewater flow within the proposed forcemains was estimated at the peak hourly flow (4 times average wastewater usage) plus infiltration (estimated at 0.28L/s/ha) for each of the proposed growth areas. Refer to Exhibit 12.1 and Exhibit 12.2 for conceptual wastewater system layouts.

Stantec Consulting Ltd. prepared an Interim Plan for Wastewater Treatment (dated February 2010) for the Town of Olds, which outlines the proposed upgrades required to utilize the proposed South Red Deer Regional Wastewater Commission System (SRDRWC). The interim plan includes the construction of the following:

- 900mm diameter gravity pipe, to convey wastewater from the existing Wastewater Treatment Plant to the proposed lift station;
- Proposed lift station, located approximately 1.6km north of the existing Wastewater Treatment Plant;
- 400mm diameter forcemain, to convey wastewater from the proposed lift station to the proposed SRDRWC pipeline (located adjacent to Range Road 12). The proposed 400mm forcemain will include the installation of two (2) tees on the east side of the CP Rail for future tie-ins from the Town of Olds and Mountain View County as well as one (1) tee on the west side of the CP Rail for a future tie-in from Mountain View County.

The estimated wastewater flows for the majority of the proposed growth areas exceed the estimated capacities of the existing trunkmains. Therefore it is recommended that all wastewater from the proposed growth areas be conveyed to the existing Wastewater Treatment Plant via new trunkmains, adequately sized for the anticipated flows.



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
PROPOSED WASTE WATER

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED WASTE WATER GRAVITY MAIN
- FM PROPOSED WASTE WATER FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED LIFT STATION
- EXISTING WASTE WATER TREATMENT PLANT
- SHORT TERM GROWTH AREA
- PROPOSED OLDS INTERIM WASTE WATER ALIGNMENT
- PROPOSED SOUTH RED DEER REGIONAL WASTE WATER COMMISSION (SRDRWC) SYSTEM
- PROPOSED OLDS LIFT STATION
- PROPOSED TEE (LOCATION TO BE DETERMINED)
- EXISTING WASTEWATER FORCEMAIN (FROM WWTP TO LAGGONS)

Town of Olds

Mountain View COUNTY

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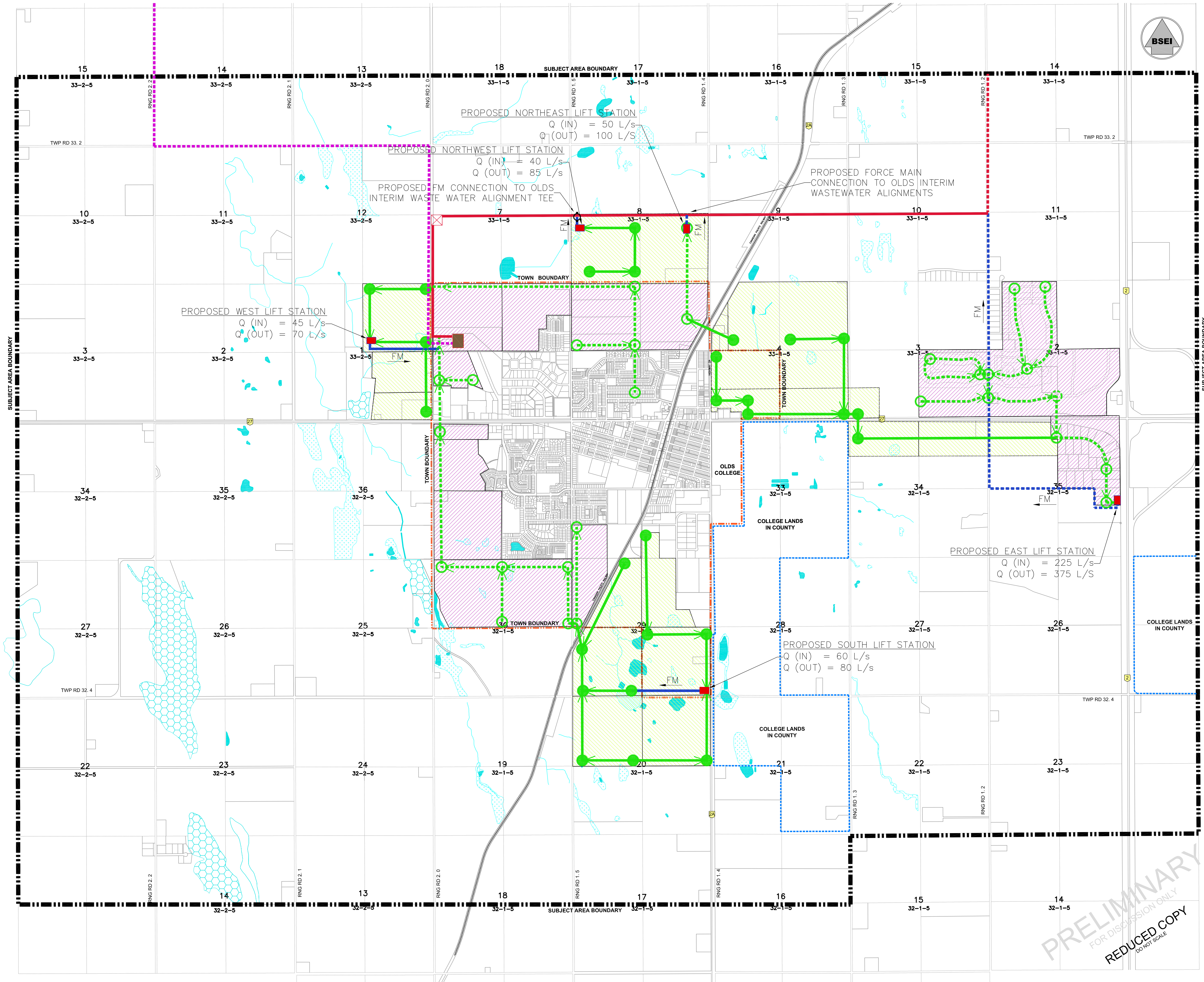
PROJECT No :	W643-014	*EXHIBIT 12.1*



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
PROPOSED WASTE WATER

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED WASTE WATER GRAVITY MAIN (SHORT TERM)
- PROPOSED WASTE WATER FORCE MAIN (SHORT TERM)
- PROPOSED MANHOLE (SHORT TERM)
- PROPOSED WASTE WATER GRAVITY MAIN
- PROPOSED WASTE WATER FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED LIFT STATION
- EXISTING WASTE WATER TREATMENT PLANT
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA
- PROPOSED OLDS INTERIM WASTE WATER ALIGNMENT
- PROPOSED SOUTH RED DEER REGIONAL WASTE WATER COMMISSION (SRDRWC) SYSTEM
- PROPOSED OLDS LIFT STATION
- PROPOSED TEE (LOCATION TO BE DETERMINED)
- EXISTING WASTEWATER FORCEMAIN (FROM WWTP TO LAGOONS)

Town of Olds

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PROJECT No :	W643-014	EXHIBIT 12.2

12.4 Conclusions

12.4.1 Short Term

The proposed short term population projections include 12,390 residents (7,900 existing and 4,490 new) with an additional 4,520 work-force population (3,440 existing and 1,080 new). This represents an increase in population to be serviced of 5,570 or a total population of 16,910.This population increase will result in the following new infrastructure required in the short term, i.e. to 2016.

- The proposed wastewater trunkmains, lift stations and forcemains (as shown on Exhibit 12.1) will be required through the proposed short term growth areas. Also, the installation of the proposed east and northeast lift stations and forcemains will be required in order to service the short term growth areas along the Highway 2/27 corridor and north of the existing town. The proposed lift stations will have estimated inflows of 225L/s and 50L/s based on average day flows and an allowance for infiltration. The lift stations would need to accommodate peak hour estimated outflows of 375L/s and 100L/s. The proposed wastewater conveyance system will provide adequate capacity for wastewater flows for the proposed short term (and long term) growth areas.

12.4.2 Long Term

The proposed long term population projections include 34,600 residents (7,900 existing and 26,700 new) with an additional 13,410 work-force population (3,440 existing and 9,970 new). This represents an increase in population of 36,670 or a total population of 48,010. This population increase will result in the following new infrastructure required in the long term, i.e. to 2035.

- The additional wastewater trunkmains, lift stations and forcemains (as shown on Exhibit 12.2) will be required through the proposed long term growth areas. The proposed south lift station will have an estimated inflow of 60L/s based on an average day flows and an allowance for infiltration. The lift station would need to accommodate a peak hour estimated outflow of 80L/s. The proposed west lift station will have an estimated inflow of 45L/s based on average day flows and an allowance for infiltration. The lift station would need to accommodate a peak hour estimated outflow of 70L/s. The proposed northwest lift station will have an estimated inflow of 40L/s based on average day flows plus an allowance for infiltration and an estimated peak hour outflow requirement of 85L/s.

It should be noted that this Utilities Master Plan did not analyze upgrades required within the existing Town. It should also be noted that the alignments of the proposed wastewater trunkmains and lift stations (as shown) are conceptual and should be finalized in accordance with detailed design.

13.0 STORMWATER

13.1 Background Information

Urban development causes an increase in storm runoff, which can have a significant environmental impact. The increased volume runoff can cause erosion in conveyance streams and the pollutants carried in the urban runoff can cause water quality changes in receiving water bodies. To mitigate the effects of urban development in the environment, site specific Stormwater Management Plans must be put in place. Stormwater management involves careful application of site design principles, construction techniques, source controls to prevent sediment and other pollutants from entering surface waters or groundwater, treatment of runoff to reduce pollutants and flow controls to reduce the impact of altered hydrology. Stormwater techniques and management are a continuous evolving science. New technology is being developed and should be considered for current and future developments.

13.2 Existing System

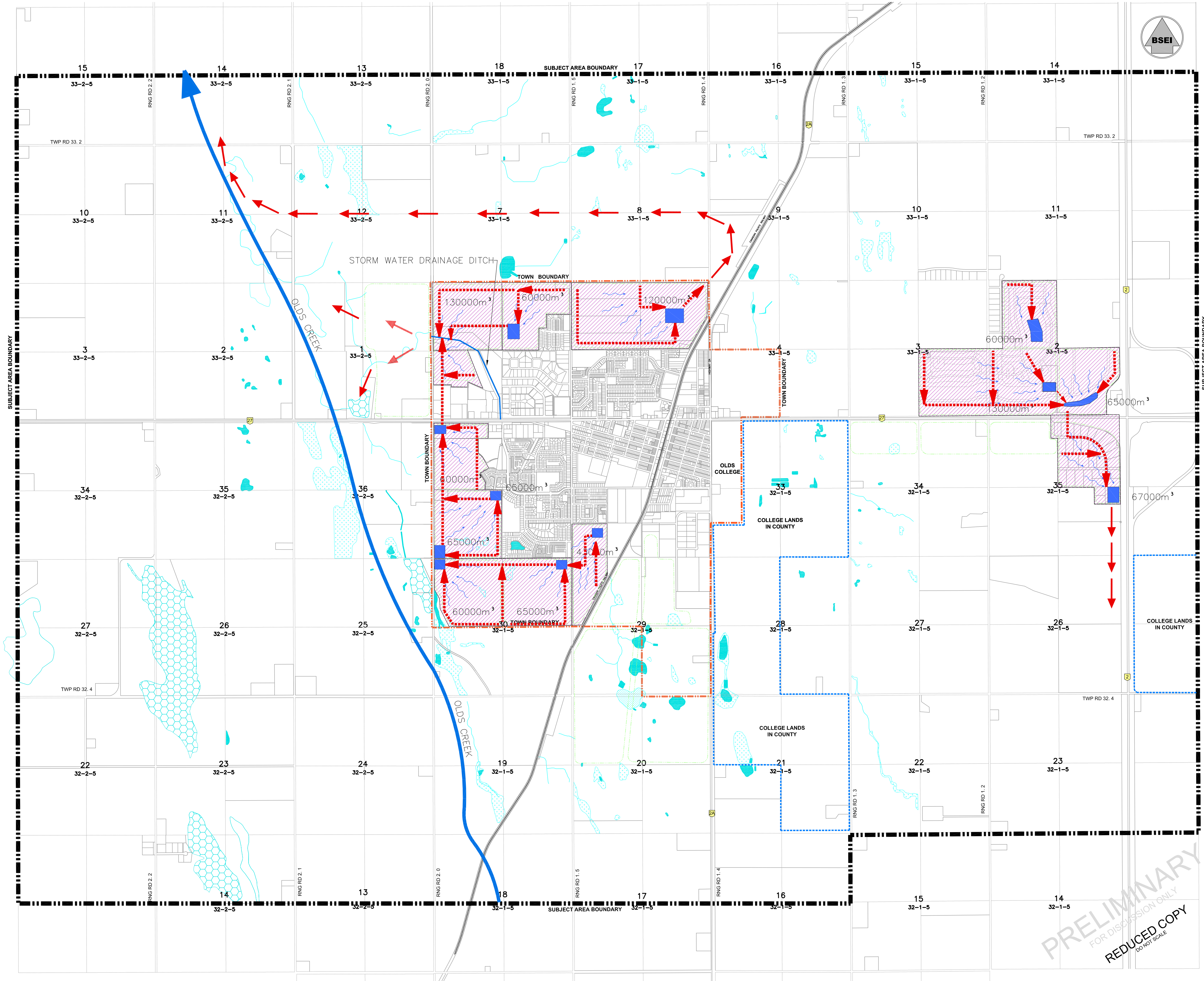
The existing stormwater flow is managed through a combination of overland and piped conveyance with direct discharge and stormwater facilities with controlled discharge into receiving areas. The Town has two (2) existing receiving areas, a stormwater drainage ditch located in the northwest corner of Town and an existing channel located in the northeast corner of the Town.

The majority of the Town's stormwater discharges to the stormwater drainage ditch, which discharges to an existing channel on the west side of 70th Avenue (Town Boundary). The channel conveys the stormwater to an existing detention pond (owned by the Town of Olds) located on the north side of Highway 27, approximately 800m west of 70th Avenue, ultimately discharging to Olds Creek.

A portion of the Town's stormwater is conveyed to the northeast, to two (2) detention ponds located on the north and south sides of Shannon Drive, west of 50th Avenue. The detention ponds discharge into a series of channels which run north along Highway 2A and west along the north side of Town and ultimately discharge to Olds Creek.

13.3 Analysis

A review of the existing topography within the Town of Olds and the proposed growth areas reveals a north-south ridge though the center of Town, sloping towards the east (Highway 2) and west (Olds Creek). Catchment areas (short term and long term) were estimated based on the proposed growth areas and existing topography. Proposed detention ponds were located in low-lying areas and volumes were estimated based of four (4) inches of stormwater over the proposed catchment area. A schematic of the proposed stormwater management system is shown in **Exhibit** 13.1 and **Exhibit** 13.2.



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
STORM WATER MANAGEMENT

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED STORM WATER (SHORT TERM)
- PROPOSED STORM WATER
- POND / WET LAND
- MARSH OR SLOUGH
- ENVIRONMENTALLY SENSITIVE AREA
- RIVER / CREEK
- 65000m³ ESTIMATED POND VOLUME
- FLOW DIRECTION
- OVERLAND DRAINAGE FLOW
- PROPOSED STORM WATER MANAGEMENT POND
- SHORT TERM GROWTH AREA
- DRAINAGE AREA

Town of Olds

Mountain View COUNTY

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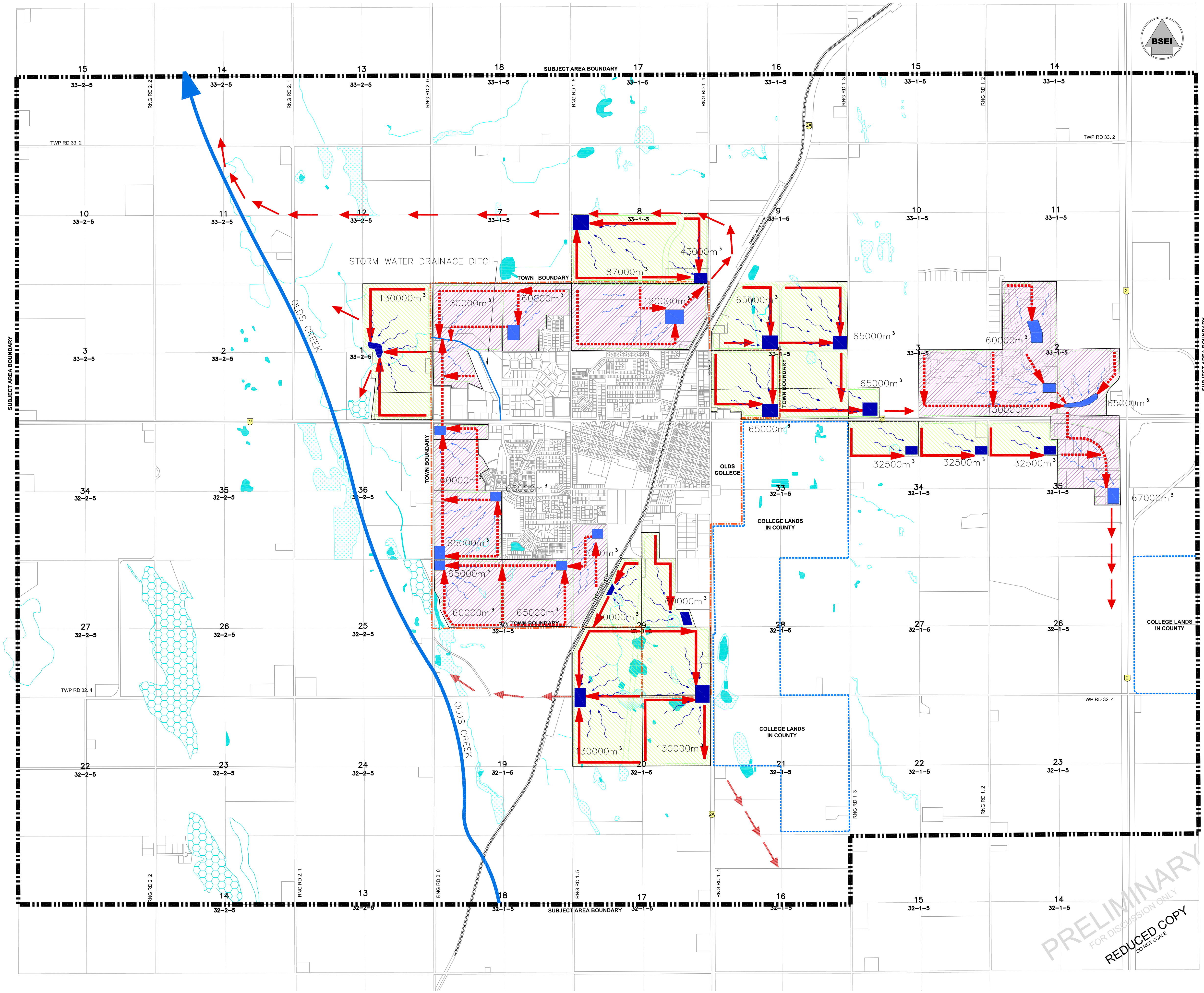
DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
STORM WATER MANAGEMENT



LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED STORM WATER (SHORT TERM)
- PROPOSED STORM WATER
- POND / WET LAND
- MARSH OR SLOUGH
- ENVIRONMENTALLY SENSITIVE AREA
- RIVER / CREEK
- FLOW DIRECTION
- 65000m³ STORM WATER MANAGEMENT POND VOLUME
- OVERLAND DRAINAGE FLOW
- OVERLAND DRAINAGE FLOW (SHORT TERM)
- PROPOSED STORM WATER MANAGEMENT POND
- PROPOSED STORM WATER MANAGEMENT POND (SHORT TERM)
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA
- DRAINAGE AREA

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13.4 Conclusions

13.4.1 Short Term

The proposed short term population projections include 12,390 residents with an additional 4,520 work-force population (an additional 5,570 combined population). An increase in population growth means new developments, which leads to larger volumes of stormwater runoff that need to be controlled (quantity and quality). Therefore it is recommended that:

- An overall Master Drainage Plan be prepared by a qualified Stormwater Management Engineer. This type of report will provide the framework for the required stormwater system to accommodate the proposed population growths (short term and long term). The report should propose locations for stormwater facilities, release rates and water quality guidelines.

- Staged Master Drainage Plans be prepared by a qualified Stormwater Management Engineer with each Outline Plan submittal. These reports should follow the overall recommendations of the Master Drainage Plan (recommended to be prepared prior to the development of short term growth areas).

13.4.2 Long Term

The proposed long term population projections include 34,600 residents with an additional 13,410 work-force population (an additional 36,670 combined population from the current population). An increase in population growth means new developments, which leads to larger volumes of stormwater runoff that need to be controlled (quantity and quality). Therefore it is recommended that:

- Staged Master Drainage Plans be prepared by a qualified Stormwater Management Engineer with each Outline Plan submittal. These reports should follow the overall recommendations of the Master Drainage Plan (recommended to be prepared prior to the development of short term growth areas).

It should be noted that this Utilities Master Plan did not analyze upgrades required within the existing Town. It should also be noted that the alignments of the proposed stormwater trunkmains and stormwater management facilities (as shown) are conceptual and should be finalized in accordance with detailed design.

14.0 SUMMARY OF SHORT AND LONG TERM TRANSPORTATION AND UTILITY RECOMMENDATIONS

14.1 INTRODUCTION

The analysis undertaken by Bunt & Associates and BSEI identified a number of necessary and recommended upgrades to the existing road network and utility infrastructure based on the Short and Long Term traffic volumes.

14.2 Transportation Road Network Improvements

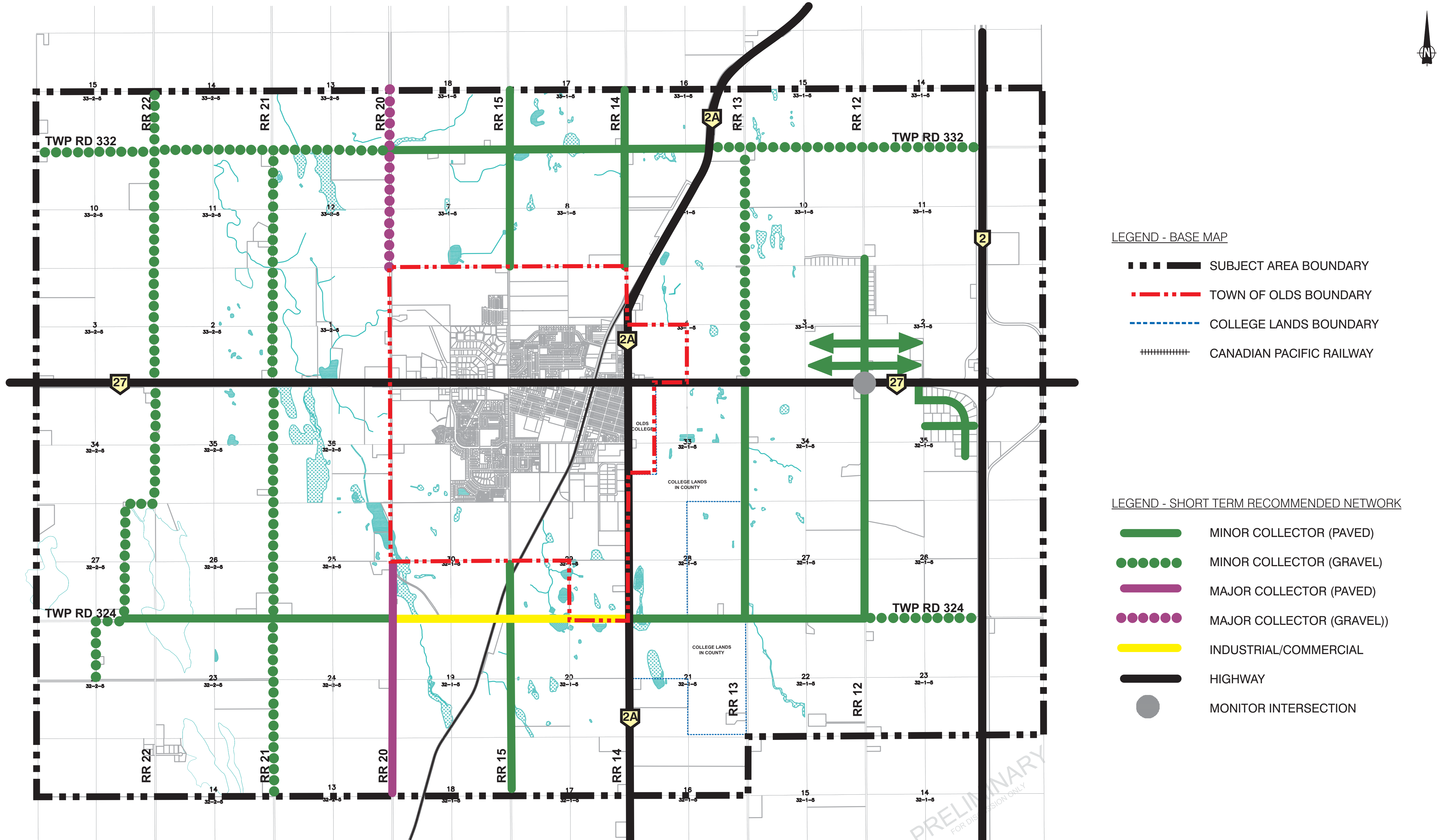
14.2.1 Short Term Improvements

The recommended short term improvements specifically include the following:

- Expected signalization of the 57th Avenue/54th Street intersection.
- Monitoring of 57th Avenue/ Shannon Drive, Highway 27/ 48th Avenue, Highway 27/ 49th Avenue and Highway 27/ Range Road 20 (70th Avenue) to assess needs for signalization.
- Extension of concrete median on south leg of 57th Avenue at Highway 27 to prevent short cutting along 50th Street.
- Construct concrete median on north leg of 50th Avenue at Highway 27 to eliminate left turns at the commercial site on the north side.
- Turn restrictions at 57th Avenue and the north service road should be implemented.
- Implement northbound and southbound left turn lanes at Highway 27/ 50th Avenue along with traffic signal optimization.
- Implement northbound and southbound left turn lanes at Highway 27/ 46th Avenue along with traffic signal optimization.
- Commencement of a functional planning and parking study for the 50th Avenue corridor in order to establish the appropriate manner in which to develop the roadway to optimize the utility of the roadway for the downtown core and active modes of transportation, while at the same time optimizing the efficiency of the roadway for the accommodation of traffic volumes.
- Monitor daily traffic volumes along 54th Street to aid in determining the timing for the development of the south arterial. This is not expected to be built at the Short Term horizon, but the volumes should be monitored.

- In the interim, it is recommended that the County implement the necessary dust control measures and/or upgrade to a paved surface are noted below:
    - Township Road 332 West of RR 14
    - Township Road 324 East of Highway 2A
    - Range Road 20 North of Hwy 27 to Township Road 332
    - Range Road 20 South of Hwy 27 (upgrade chip sealed section south of Highway 27)
    - Range Road 12 South of Highway 27
- Implementation of the previously identified improvements to Highway 27 as outlined in the Highway 27 Planning Study completed by CastleGlenn Consultants in 2009, and as illustrated on Exhibits 5.3 and Exhibit 5.12. These include the following:
    - Closure or restriction to right-in/right-out of the north leg of 61st Avenue at Highway 27.
    - Closure of the south leg of 52nd Avenue at Highway 27 and thus removal of the traffic signal.

The recommended short term road network is illustrated on Exhibit 14.1 for the County and Exhibit 14.2 for the Town.



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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Mountain View County Short Term (13,000) Skeletal Recommended Road Network

Exhibit
14.1

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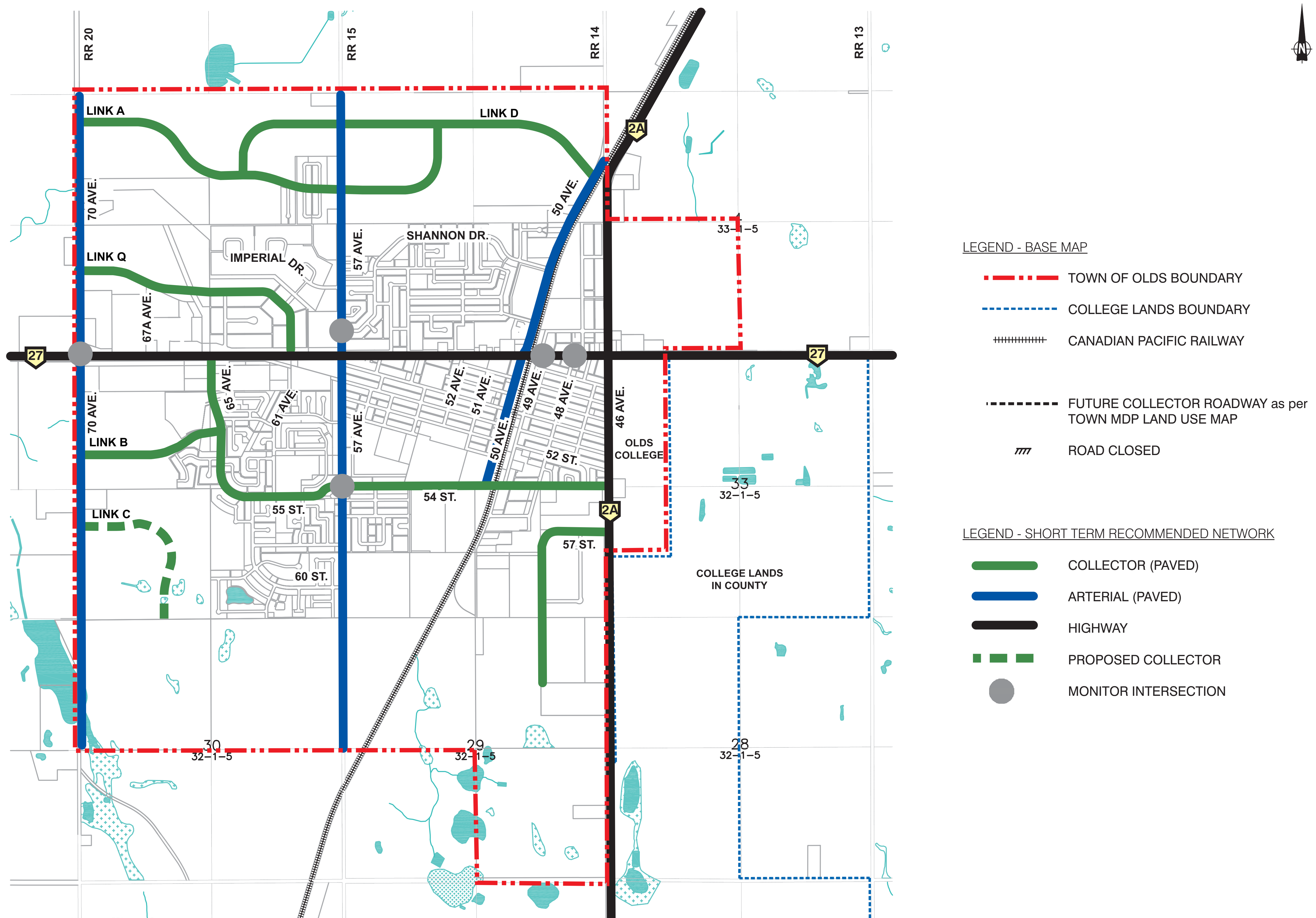

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Short Term (13,000) Skeletal Recommended Road Network

Exhibit
14.2

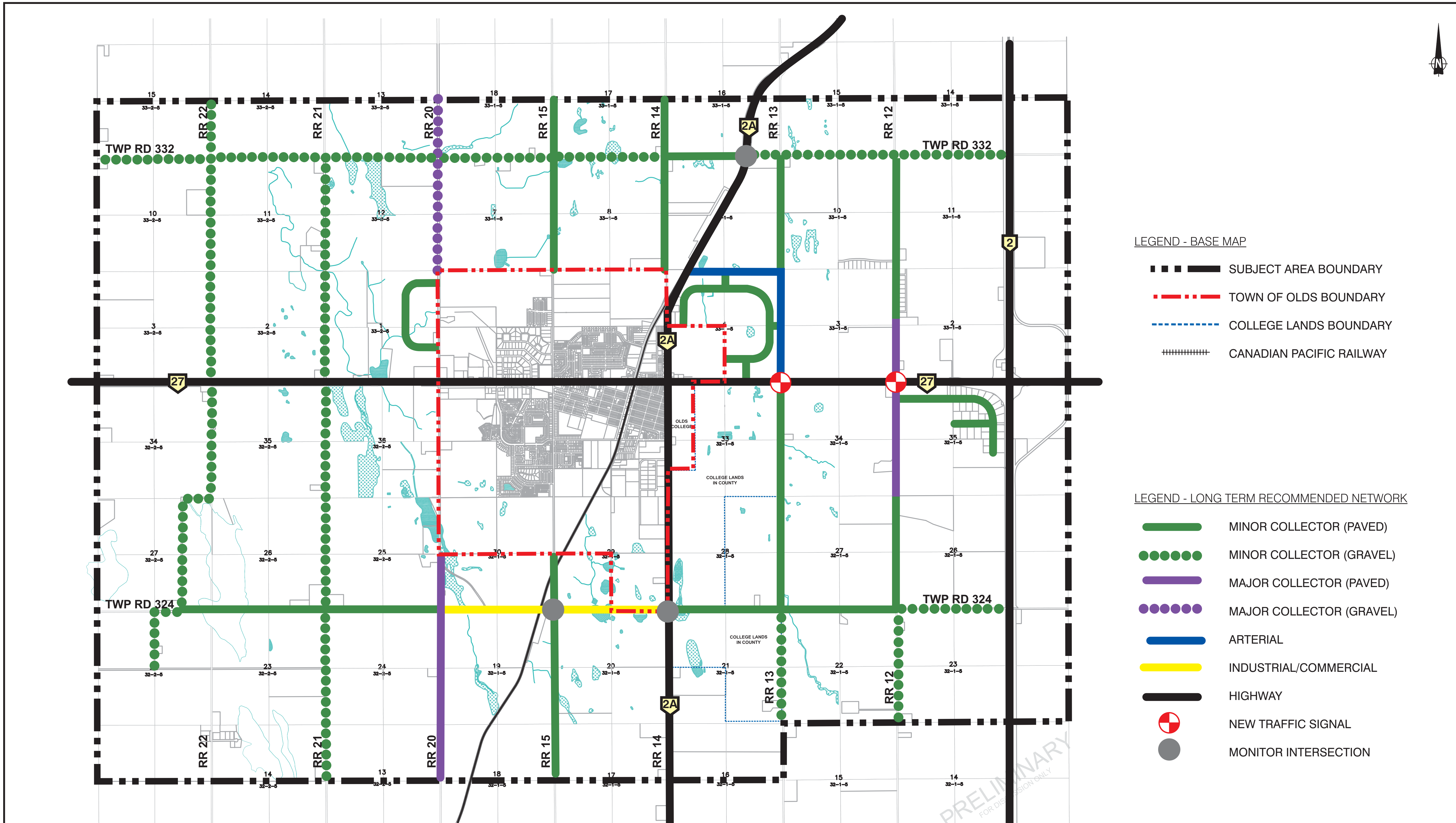
:\\1307-01_OLDS-EXHs_2010-06-JUNE.cdr June 2, 2010 HMF

14.2.2 Long Term Improvements – Base or "Do Nothing" Network

The recommended long term improvements for the base or "do nothing" network analysis are summarized below in **Table 14.1** and **Table 14.2** while **Exhibit 14.3** and **Exhibit 14.4** illustrate the recommendations for the Town and County respectively.

Table 14.1 Summary of Long Term Recommended Intersection Improvements – Base Network

Intersection/Road Link	Recommended Improvements
Highway 27/ 46th Avenue	* Eastbound and westbound dual left turn lanes * Optimize signalization with dual protected left turns
Highway 27/ 49th Avenue	* Install traffic signal * Eastbound and westbound left turn lanes * Optimize signalization with EB/WB separate left turn phases
Highway 27/ 50th Avenue	* Eastbound and westbound left turn lanes * Optimize signalization with WB separate left turn phase
Highway 27/ 51st Avenue	* Install traffic signal * Eastbound and westbound left turn lanes * Optimize signalization with EB/WB separate left turn phases
Highway 27/ 57th Avenue	* Northbound and southbound left turn lanes * Optimize signalization with separate left turn phases
Highway 27/ 70th Avenue	* Install traffic signal * Left turn lanes for all legs of intersection * Northbound and eastbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Link M	* Install traffic signal * Eastbound left turn lane * Optimize signalization with EB separate left turn phase
Highway 27/ Range Road 13	* Install traffic signal * Left turn lanes for all legs of intersection * Southbound and westbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Range Road 12	* Install traffic signal * Left turn lanes for all legs of intersection with a dual northbound left turn * Right turn lanes for all legs of intersection * Optimize signalization with separate protected left turn phase for the NB/SB left turns and a separate left turn phase for the EB/WB left turns
57th Avenue/ Shannon Drive	* Install traffic signal
Highway 2A/ 57th Street	* Monitor intersection to determine when traffic signal is warranted
70th Avenue (RR 20)/ Link A	* Eastbound and westbound left turn lanes * Northbound right turn lane
70th Avenue (RR 20)/ Link B	* Southbound left turn lane
70th Avenue (RR 20)/ Link C	* Southbound left turn lane
70th Avenue (RR 20)/ Link F	* Southbound left turn lane
57th Avenue/ Link F	* Install traffic signal * Left turn lanes for all legs of intersection * Westbound right turn lane * Optimize signalization with separate left turn phases
50th Avenue/ Link D	* Northbound left turn lane



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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Mountain View County Long Term (35,000) Skeletal Recommended Road Network (as per Approved MDP Road Network)

Exhibit
14.3

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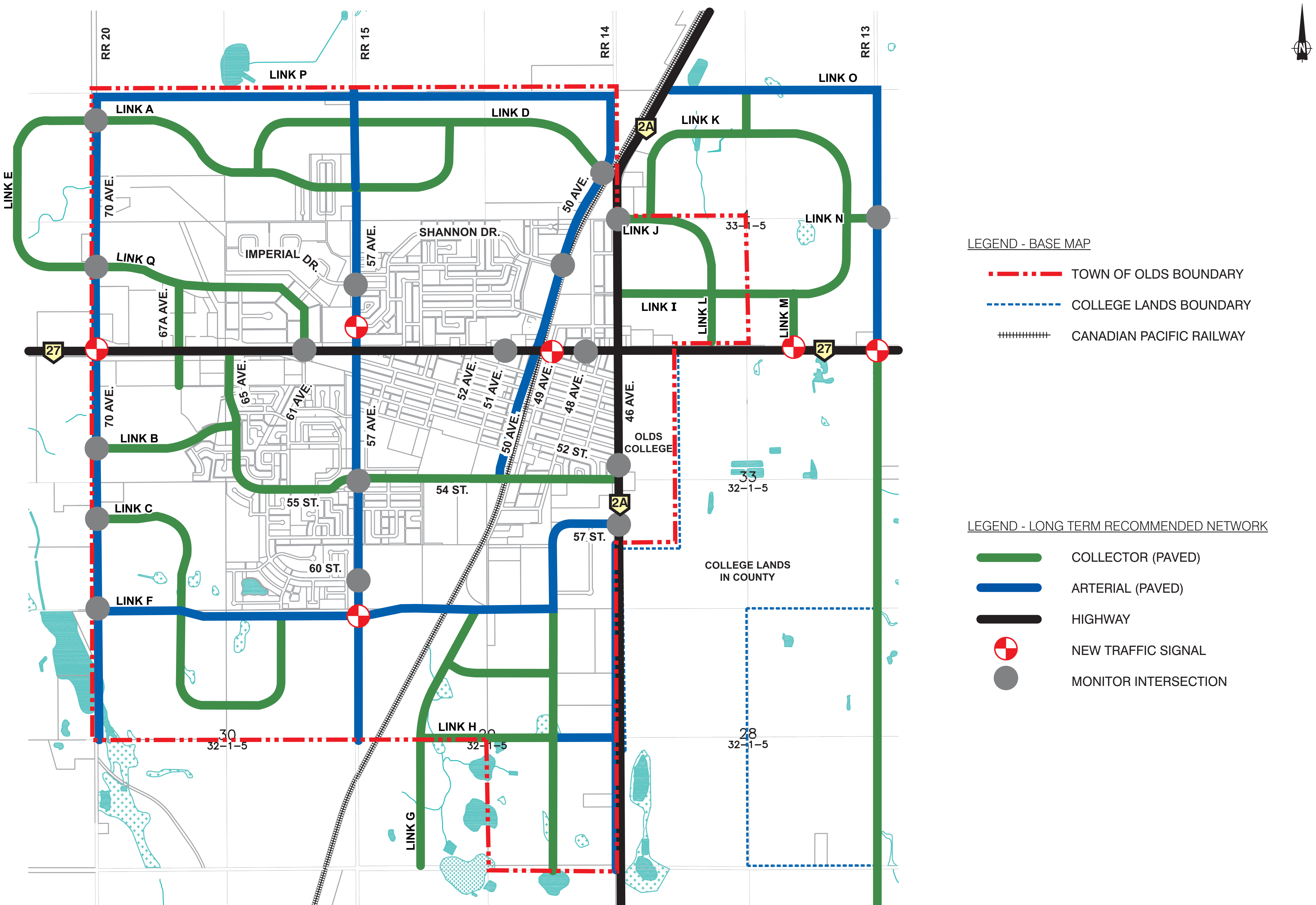

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Long Term (35,000) Skeletal Recommended Road Network (as per Approved MDP Road Network)

Exhibit
14.4

:\\1307-01_OLDS-EXHs_2010-06-JUNE.cdr June 2, 2010 HMF

Table 14.2 Summary of Long Term Recommended Road Link Improvements – Base Network

Intersection/Road Link	Recommended Improvements
70th Avenue (Range Road 20)	* Four-lane undivided arterial
57th Avenue	* Three-lane cross section with a central two-way left turn lane
50th Avenue	* Upgrade to 4-lane undivided arterial
Highway 27	* Four-lane divided arterial with separate left & right turns at key intersections
Link F	* Four-lane undivided arterial
Range Road 15	* Upgrade to a Major Collector from a Minor Collector
Range Road 13	* Upgrade surface treatment to pavement
Range Road 12	* Upgrade to a Major Collector from a Minor Collector
Township Road 324	* Upgrade to a Major Collector from a Minor Collector

14.2.3 Long Term Improvements – Recommended Network

The recommended long term improvements for the recommended road network incorporating the alternative alignment discussed in Section 7.0 is summarized below in Table 14.3 and Table 14.4 while Exhibit 14.5 and Exhibit 14.6 illustrate the recommendations for the Town and County respectively. The recommended network represented the inclusion of the following new and significant road network elements over and above the base or "do nothing" condition:

- North Connector aligned along the northern Town boundary and crossing the CPR corridor and Highway 2A at grade initially, but on a grade separate structure in the Long Term .It is noted that this roadway alignment, access management plan and function may be affected by the pending outcome of the Alberta Transportation Highway 27 By-pass study that was underway at the time of completion of this Transportation Master Plan exercise.

- South By-pass aligned so as to be located away from the existing residents of the Lakeside community. This will generally follow an alignment midway between the approved alignment for this roadway as per the current MDP, and the next quarter section line. The roadway will need to be continuous between 70th Avenue in the west and Highway 2A in the east.

- Range Road 13 (Netook Connector) is an important link to the success of the north connector on the east side of the Town to deter trucks and through traffic from Highway 27.

All other recommended improvements involved upgrades of existing intersections and road links. The above noted list identifies the only "new" items other than roadways that will be constructed as already approved in the various ASP documents.

Table 14.3 Summary of Long Term Recommended Intersection Improvements – Recommended Network

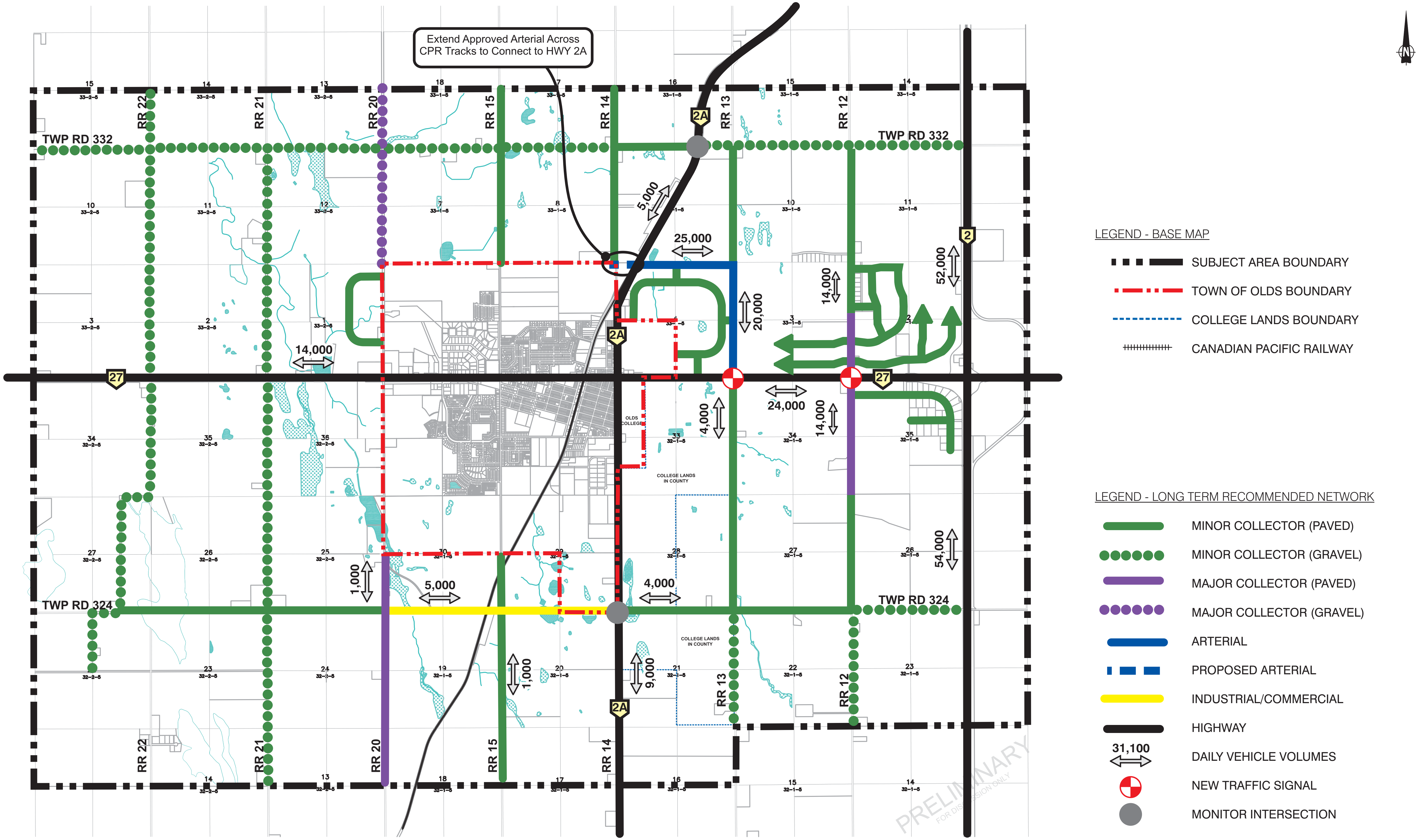
Intersection/Road Link	Recommended Improvements
Highway 27/ 46th Avenue	* Eastbound & westbound left turn lane * Southbound & Northbound right turn lane * Optimize signalization with separate left turn phase
Highway 27/ 50th Avenue	* Eastbound and westbound left turn lanes * Optimize signalization with separate left turn phase
Highway 27/ 51st Avenue	* Westbound right turn lane
Highway 27/ 70th Avenue	* Install traffic signal * Left turn lanes for all legs of intersection * Eastbound right turn lane * Optimize signalization with separate left turn phases
Highway 27/ Link M	* Monitor for traffic signal * Eastbound left turn lane * Westbound right turn lane
Highway 27/ Range Road 12	* Install traffic signal * Northbound dual left turn lanes, southbound single left turn lane * Northbound & southbound right turn lanes * Optimize signalization with separate protected left turn phase for the NB/SB
Highway 27/ Range Road 13	* Install traffic signal * Northbound & southbound left turn lanes * Westbound right turn lane * Optimize signalization with separate left turn phases
70th Avenue (RR 20)/ Link P	* Monitor for traffic signal * Eastbound and westbound left turn lanes * Northbound right turn lane
70th Avenue (RR 20)/ Link A	* Install traffic signal * Eastbound single left turn lane and westbound dual left turn lanes * Northbound & southbound right turn lanes * Optimize signalization with protected EB/WB left turns
70th Avenue (RR 20)/ Link B	* Southbound left turn lane
70th Avenue (RR 20)/ Link C	* Southbound left turn lane
70th Avenue/ Link E (Q)	* Monitor for traffic signal * Eastbound right turn lane
70th Avenue (RR 20)/ Link F	* Southbound left turn lane
57th Avenue/ Link F	* Install traffic signal * Left turn lanes for all legs of intersection * Westbound & southbound right turn lane * Optimize signalization with separate left turn phases
57th Avenue/ Link P	* Install traffic signal * Eastbound left turn lane, westbound dual left turn lane * Eastbound and northbound right turn lane * Optimize signalization with protected EB/WB left turns
57th Avenue/ Shannon Drive	* Monitor for traffic signal * Northbound right turn lane
57th Avenue/ 54th Street	* Monitor for traffic signal * Southbound & northbound left turn lanes * Westbound right turn lane

Table 14.3 - Continued

Intersection/Road Link	Recommended Improvements
Highway 2A/ 52nd Street	* Monitor for traffic signal
Highway 2A/ 57th Street	* Monitor for traffic signal * Eastbound & westbound left turn lanes
Highway 2A/ Link F	* Monitor for traffic signal * Northbound & eastbound left turn lane * Southbound right turn lane
Highway 2A/ Link J	* Monitor for traffic signal * Southbound & westbound left turn lane * Northbound right turn lane
Highway 2A/ Link O	* Install traffic signal * Left turn lanes on all legs with a westbound dual left turn lane * Eastbound right turn lane * Optimize signalization with protected EB/WB left turns & separate NB/SB left turn lane
50th Avenue/ Link D	* Monitor for traffic signal * Northbound & eastbound left turn lane * Southbound right turn lane
50th Avenue/ Link P	* Install traffic signal * Left turn lanes on all legs with a southbound & westbound dual left turn lane * Northbound and westbound right turn lanes * Optimize signalization with protected left turns
Range Road 13/ Link N	* Monitor for traffic signal * Northbound left turn lane

Table 14.4 Summary of Long Term Recommended Road Link Improvements – Recommended Network

Intersection/Road Link	Recommended Improvements
70th Avenue (Range Road 20)	* Four-lane undivided arterial at Hwy 27
57th Avenue	* Three-lane cross section with a central two-way left turn lane
Link F	* Four-lane undivided arterial
Range Road 15	* Upgrade to a Major Collector from a Minor Collector
Range Road 13	* Upgrade surface treatment to pavement as required once upgraded to arterial road
Range Road 12	* Upgrade to a Major Collector from a Minor Collector
North Bypass Road	* Four-lane divided arterial narrowed to a two-lane undivided arterial at the west end



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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Mountain View County Long Term (35,000) Skeletal Recommended Road Network

Exhibit
14.5

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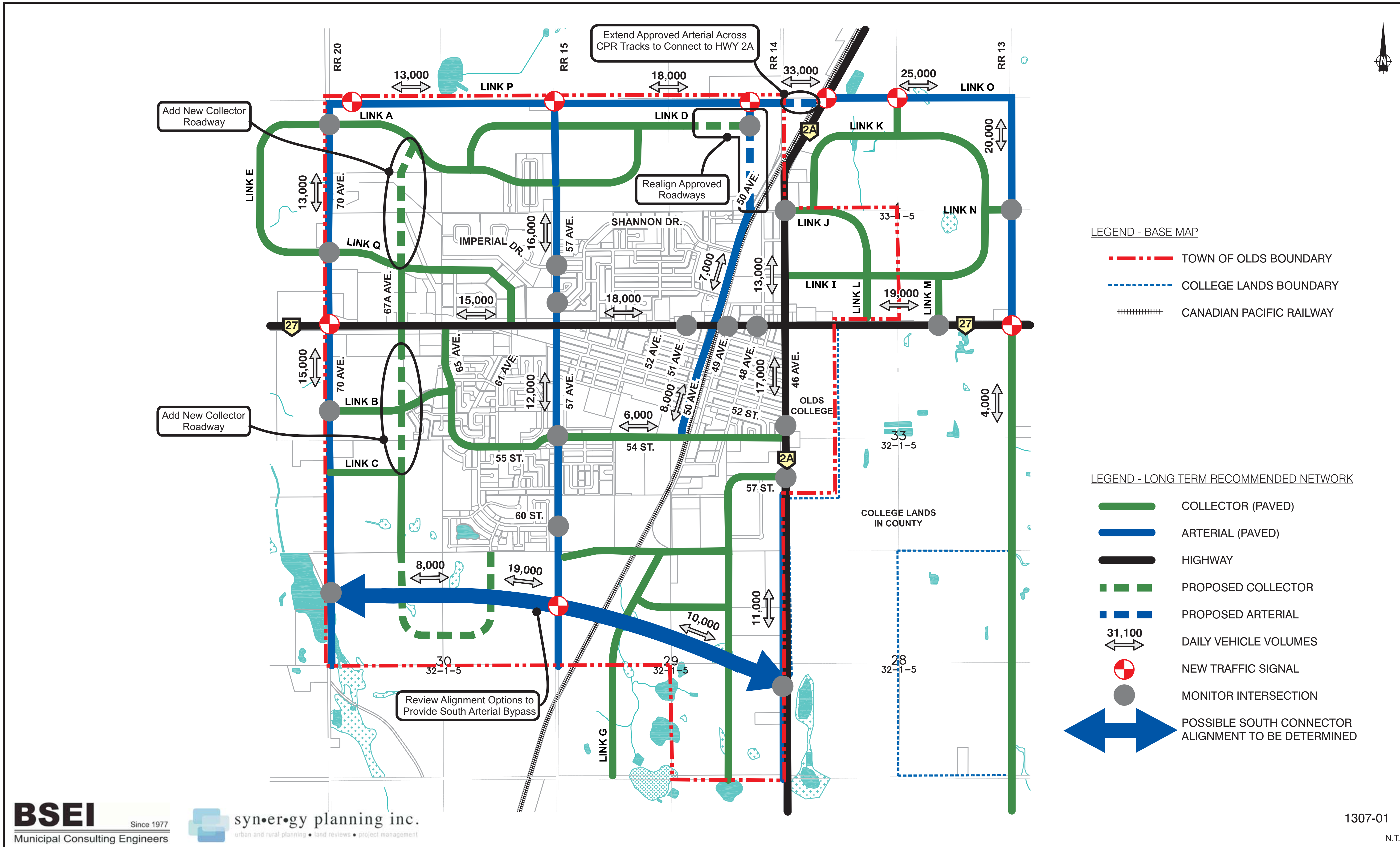

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Town of Olds & Mountain View County Transportation & Utilities Master Plan

Town of Olds Long Term (35,000) Skeletal Recommended Road Network

Exhibit 14.6

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14.3 Utility Improvements

14.3.1 Potable Water

Short Term

- The diversion from the Red Deer River by the MVCRWSC in 2006 was approaching 40% while servicing a population of 26,040. The proposed Olds/Mountain View County expansion will increase the residential and work-force population of the Town of Olds by over 5,500 (from the current population) in the short term. Depending on the population growth of the remaining five (5) communities serviced by the MVCRWSC, this increase may exceed the allowable diversion rate from the Red Deer River. If the existing water license is exceeded, an additional water license will be required for the withdrawal of additional raw water from the Red Deer River.

- The Anthony Henday Water Treatment Plant has a current production rate of 20,000m^3/day. Depending on the population growth of the remaining five (5) communities serviced by the MVCRWSC, the existing Water Treatment Plant may require an expansion in order to service the proposed Olds/Mountain View County expansion.

- The proposed 250mm and 300mm distribution piping will be required through the proposed short term growth areas. Also, the installation of the proposed pump station and reservoir (or an upgrade to the existing north pump station and reservoir) will be required in order to service the short term growth areas along the Highway 2/27 corridor. The proposed reservoir should have a minimum a capacity of 4,113m^3 and should provide adequate water consumption and fire flows to the proposed short term (and long term) growth areas.

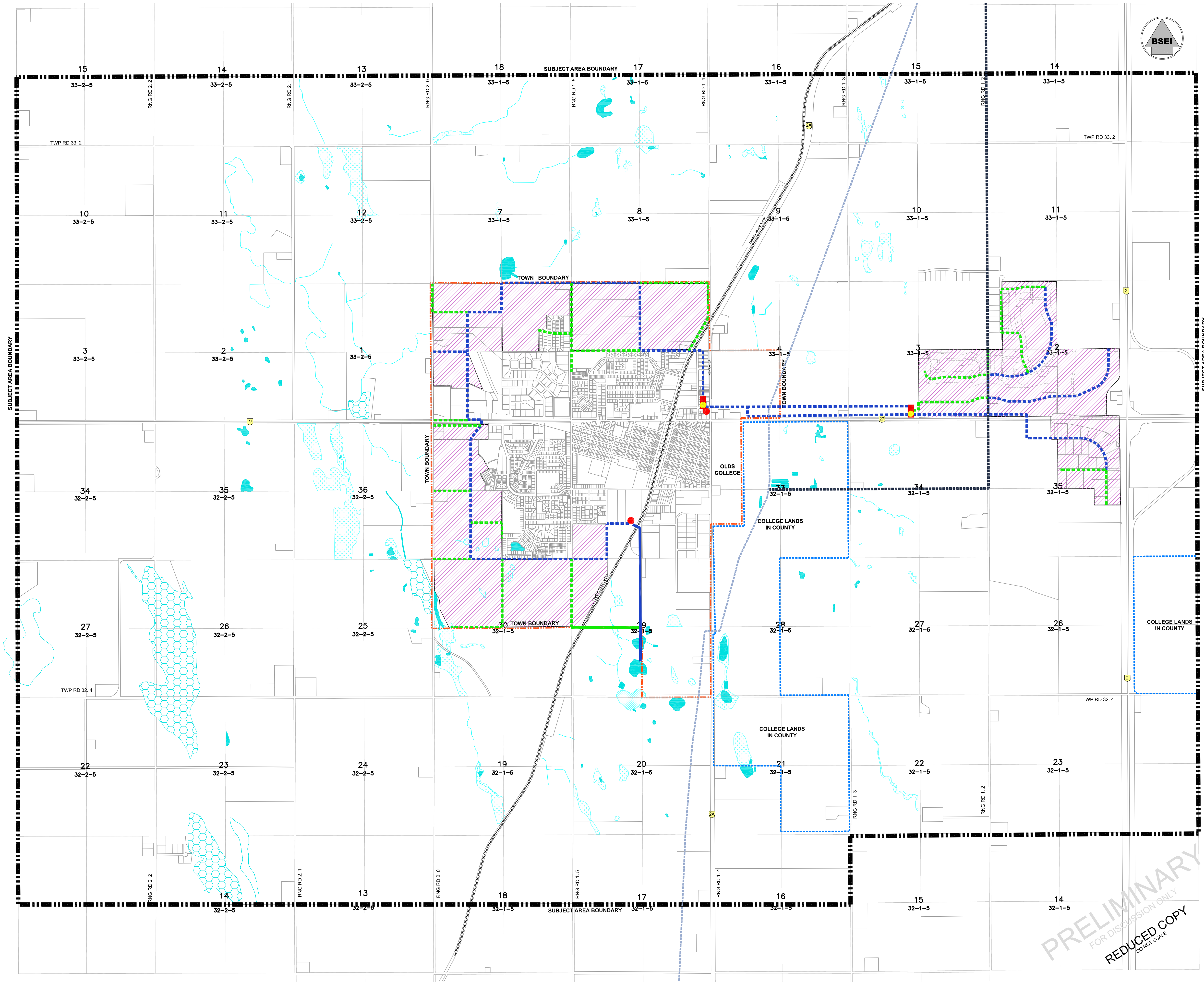
Long Term

- The diversion from the Red Deer River by the MVCRWSC in 2006 was approaching 40% while servicing a population of 26,040. The proposed Olds/Mountain View County expansion will increase the residential and work-force population of the Town of Olds by over 36,600 (from the current population) in the long term, which would exceed the allowable diversion rate from the Red Deer River. This also assumes that there will be zero population growth over the next twenty-five (25) years in the remaining five (5) communities serviced by the MVCRWSC.

- In order for the proposed long term growth to occur within the Town of Olds/Mountain View County, the existing Anthony Henday Water Treatment Plant will require an expansion and an additional water license will be required for the withdrawal of additional raw water from the Red Deer River.

- The additional 250mm and 300mm distribution piping will be required through the proposed long term growth areas.

The recommended improvements for the potable water for short term and long term are shown in Exhibit 14.7 and Exhibit 14.8 respectively.



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
PROPOSED WATER MAIN

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED 250mm POTABLE WATER
- PROPOSED 300mm POTABLE WATER
- PROPOSED 250mm POTABLE WATER(LONG TERM)
- PROPOSED 300mm POTABLE WATER(LONG TERM)
- PROPOSED 400mm POTABLE WATER TRANSMISSION MAIN (CONCEPTUAL)
- EXISTING 400mm POTABLE WATER TRANSMISSION MAIN
- EXISTING RESERVOIR & PUMP STATION
- PROPOSED WATER RESERVOIR & PUMP STATION
- SHORT TERM GROWTH AREA

NOTE

PROPOSED WATER MAINS 200⌀ AND SMALLER ARE NOT SHOWN.

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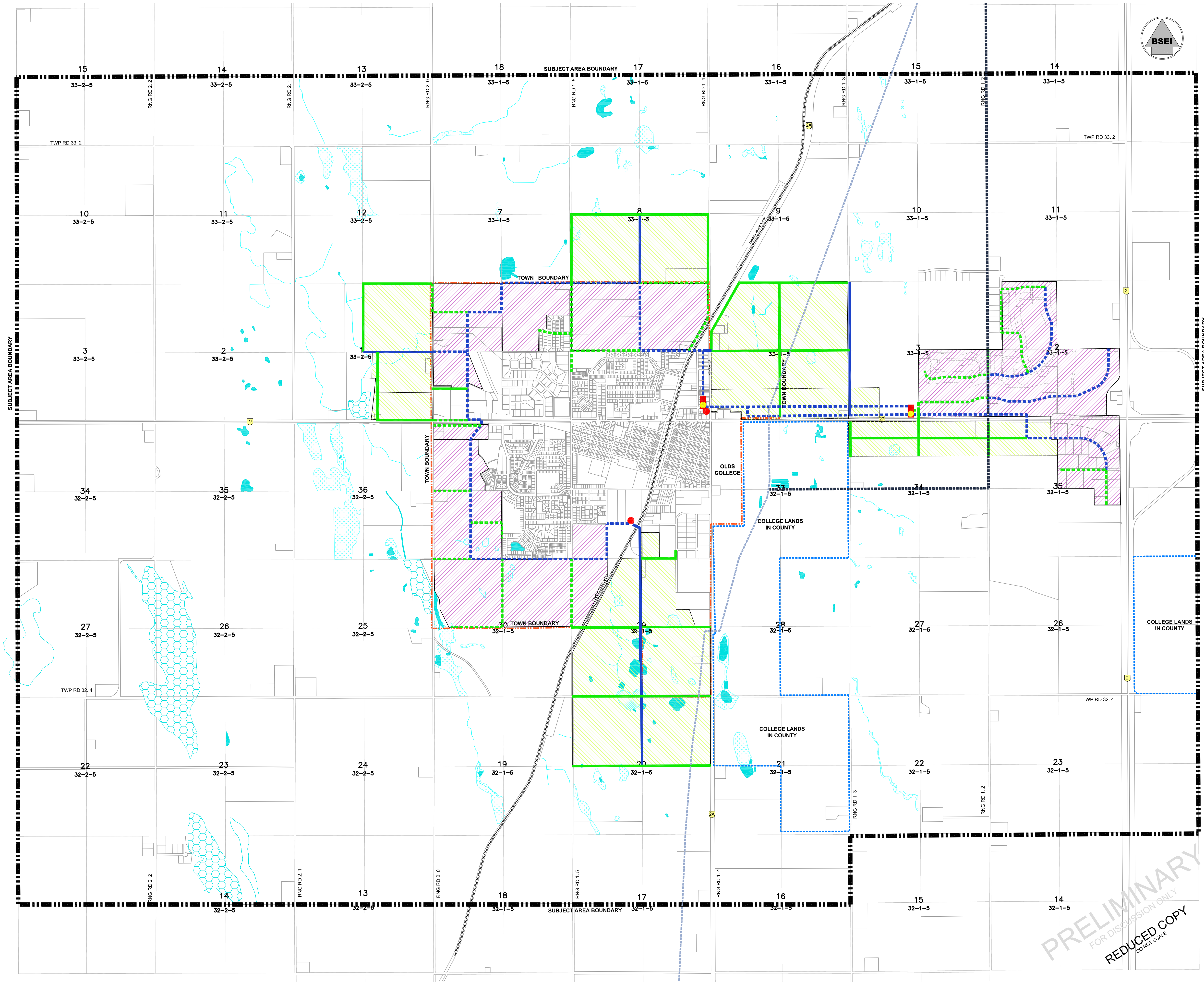
PROJECT No :	W643-014	EXHIBIT 14.7



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
PROPOSED WATER MAIN

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED 250mm POTABLE WATER (SHORT TERM)
- PROPOSED 300mm POTABLE WATER (SHORT TERM)
- PROPOSED 250mm POTABLE WATER
- PROPOSED 300mm POTABLE WATER
- EXISTING 400mm POTABLE WATER TRANSMISSION MAIN
- PROPOSED 400mm POTABLE WATER TRANSMISSION MAIN (CONCEPTUAL)
- EXISTING RESERVOIR & PUMP STATION
- PROPOSED WATER RESERVOIR & PUMP STATION
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA

NOTE

PROPOSED WATER MAINS 200ø AND SMALLER ARE NOT SHOWN.

Town of Olds

Mountain View COUNTY

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PROJECT No :	W643-014	*EXHIBIT 14.8*

14.3.2 Wastewater

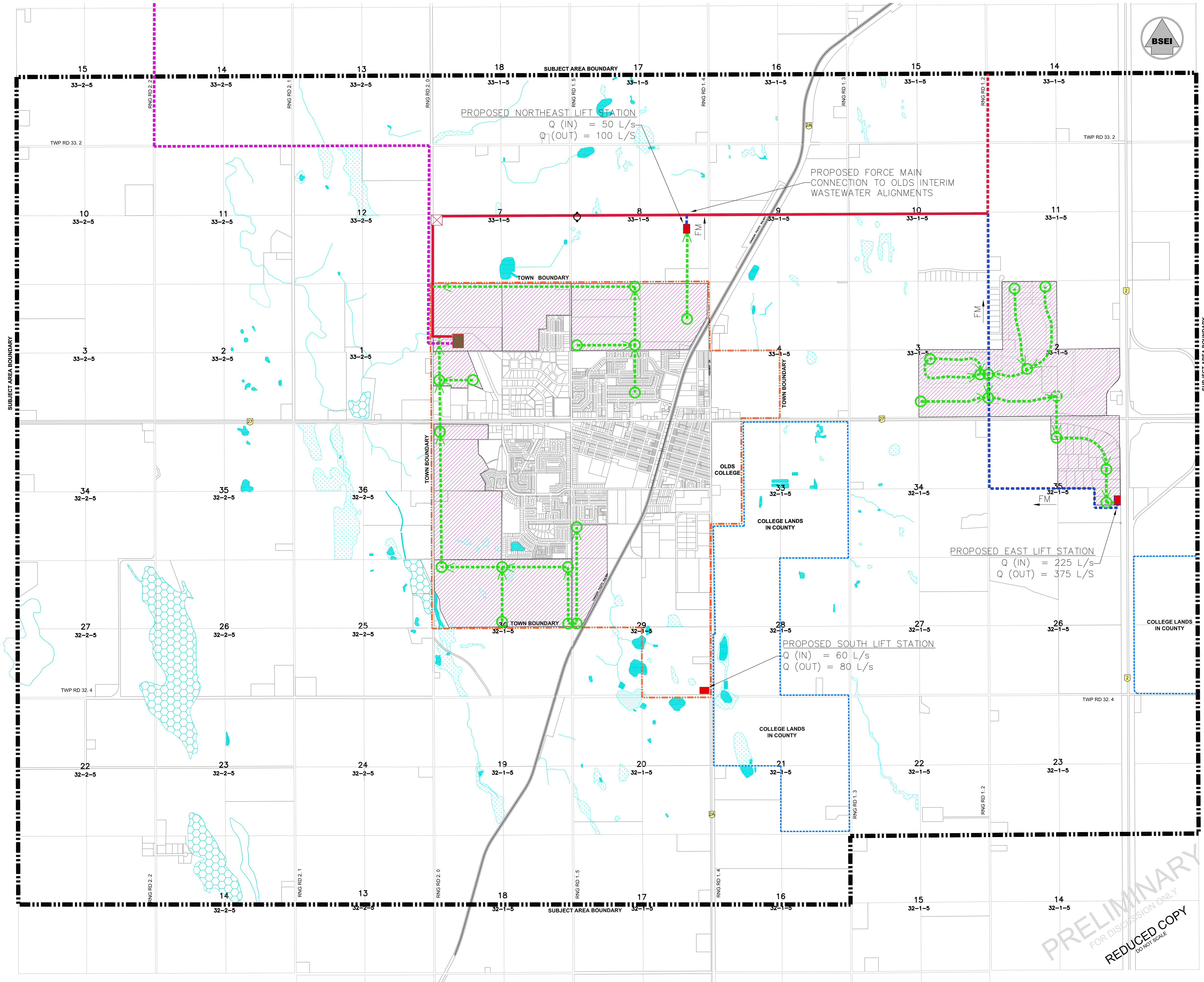
Short Term

- The proposed wastewater trunkmains, lift stations and forcemains will be required through the proposed short term growth areas. Also, the installation of the proposed east and northeast lift stations and forcemains will be required in order to service the short term growth areas along the Highway 2/27 corridor and north of the existing town. The proposed lift stations will have estimated inflows of 225L/s and 50L/s based on average day flows and an allowance for infiltration. The lift stations would need to accommodate peak hour estimated outflows of 375L/s and 100L/s. The proposed wastewater conveyance system will provide adequate capacity for wastewater flows for the proposed short term (and long term) growth areas.

Long Term

- The additional wastewater trunkmains, lift stations and forcemains will be required through the proposed long term growth areas. The proposed south lift station will have an estimated inflow of 60L/s based on an average day flows and an allowance for infiltration. The lift station would need to accommodate a peak hour estimated outflow of 80L/s. The proposed west lift station will have an estimated inflow of 45L/s based on average day flows and an allowance for infiltration. The lift station would need to accommodate a peak hour estimated outflow of 70L/s. The proposed northwest lift station will have an estimated inflow of 40L/s based on average day flows plus an allowance for infiltration and an estimated peak hour outflow requirement of 85L/s.

The recommended improvements for the wastewater short term and long term are shown in Exhibit 14.9 and Exhibit 14.10 respectively.



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
PROPOSED WASTE WATER

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED WASTE WATER GRAVITY MAIN
- PROPOSED WASTE WATER FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED LIFT STATION
- EXISTING WASTE WATER TREATMENT PLANT
- SHORT TERM GROWTH AREA
- PROPOSED OLDS INTERIM WASTE WATER ALIGNMENT
- PROPOSED SOUTH RED DEER REGIONAL WASTE WATER COMMISSION (SRDRWC) SYSTEM
- PROPOSED OLDS LIFT STATION
- PROPOSED TEE (LOCATION TO BE DETERMINED)
- EXISTING WASTEWATER FORCEMAIN (FROM WWTP TO LAGOONS)

Town of Olds

Mountain View COUNTY

Building Rural Better

REVISED AUGUST 23, 2010

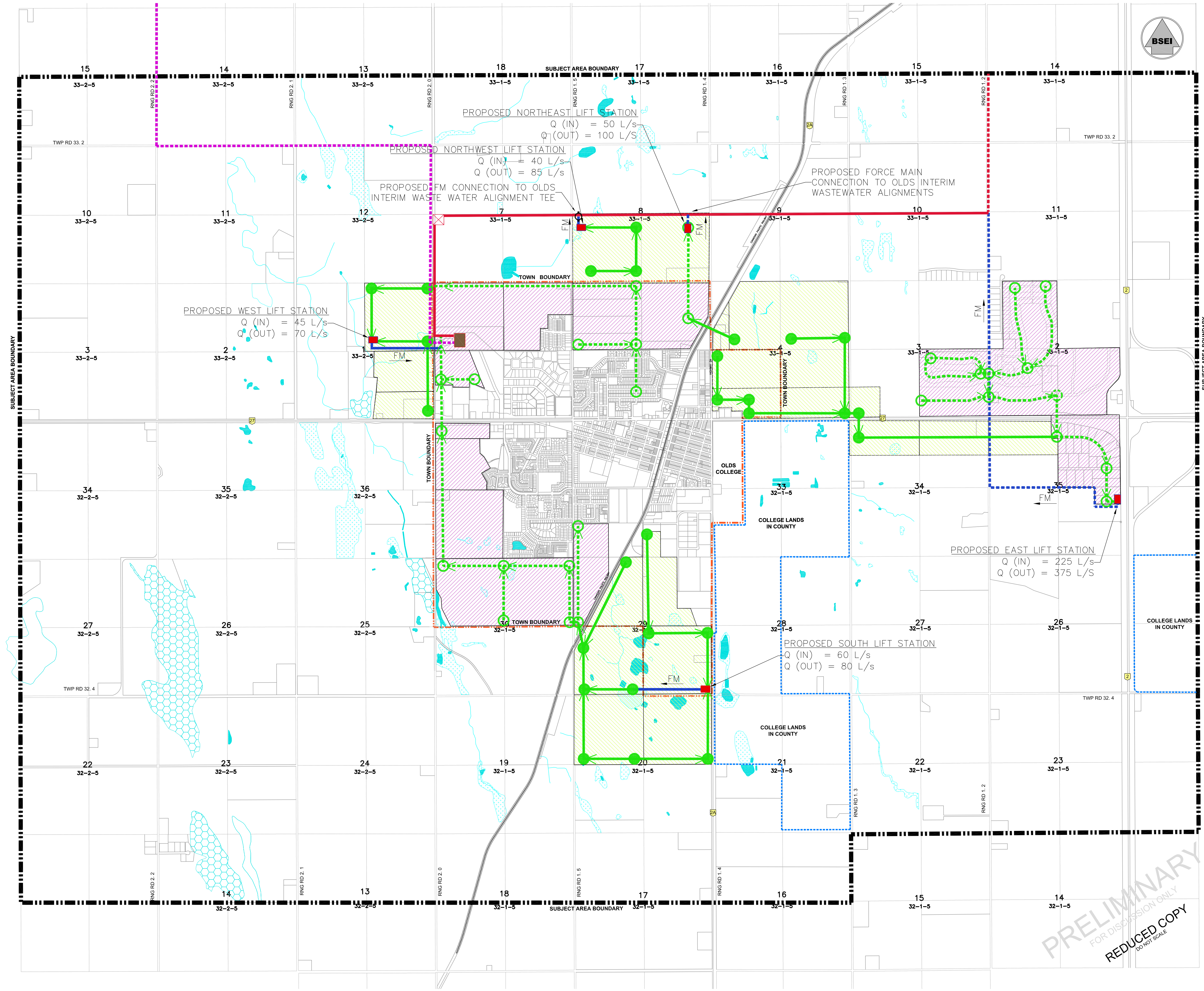
DATE:	APRIL, 2010	SCALE:	1:20000

syn•er•gy planning inc.

BSEI Since 1977
Municipal Consulting Engineers

bunt & associates

PROJECT No:	W643-014	*EXHIBIT 14.9*



DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
PROPOSED WASTE WATER

LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED WASTE WATER GRAVITY MAIN (SHORT TERM)
- PROPOSED WASTE WATER FORCE MAIN (SHORT TERM)
- PROPOSED MANHOLE (SHORT TERM)
- PROPOSED WASTE WATER GRAVITY MAIN
- PROPOSED WASTE WATER FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED LIFT STATION
- EXISTING WASTE WATER TREATMENT PLANT
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA
- PROPOSED OLDS INTERIM WASTE WATER ALIGNMENT
- PROPOSED SOUTH RED DEER REGIONAL WASTE WATER COMMISSION (SRDRWC) SYSTEM
- PROPOSED OLDS LIFT STATION
- PROPOSED TEE (LOCATION TO BE DETERMINED)
- EXISTING WASTEWATER FORCEMAIN (FROM WWTP TO LAGOONS)

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14.3.3 Stormwater

Short Term

- It is recommended that an overall Master Drainage Plan be prepared by a qualified Stormwater Management Engineer. This type of report will provide the framework for the required stormwater system to accommodate the proposed population growths (short term and long term). The report should propose locations for stormwater facilities, release rates and water quality guidelines.

- It is recommemded that Staged Master Drainage Plans be prepared by a qualified Stormwater Management Engineer with each Outline Plan submittal. These reports should follow the overall recommendations of the Master Drainage Plan (recommended to be prepared prior to the development of short term growth areas).

Long Term

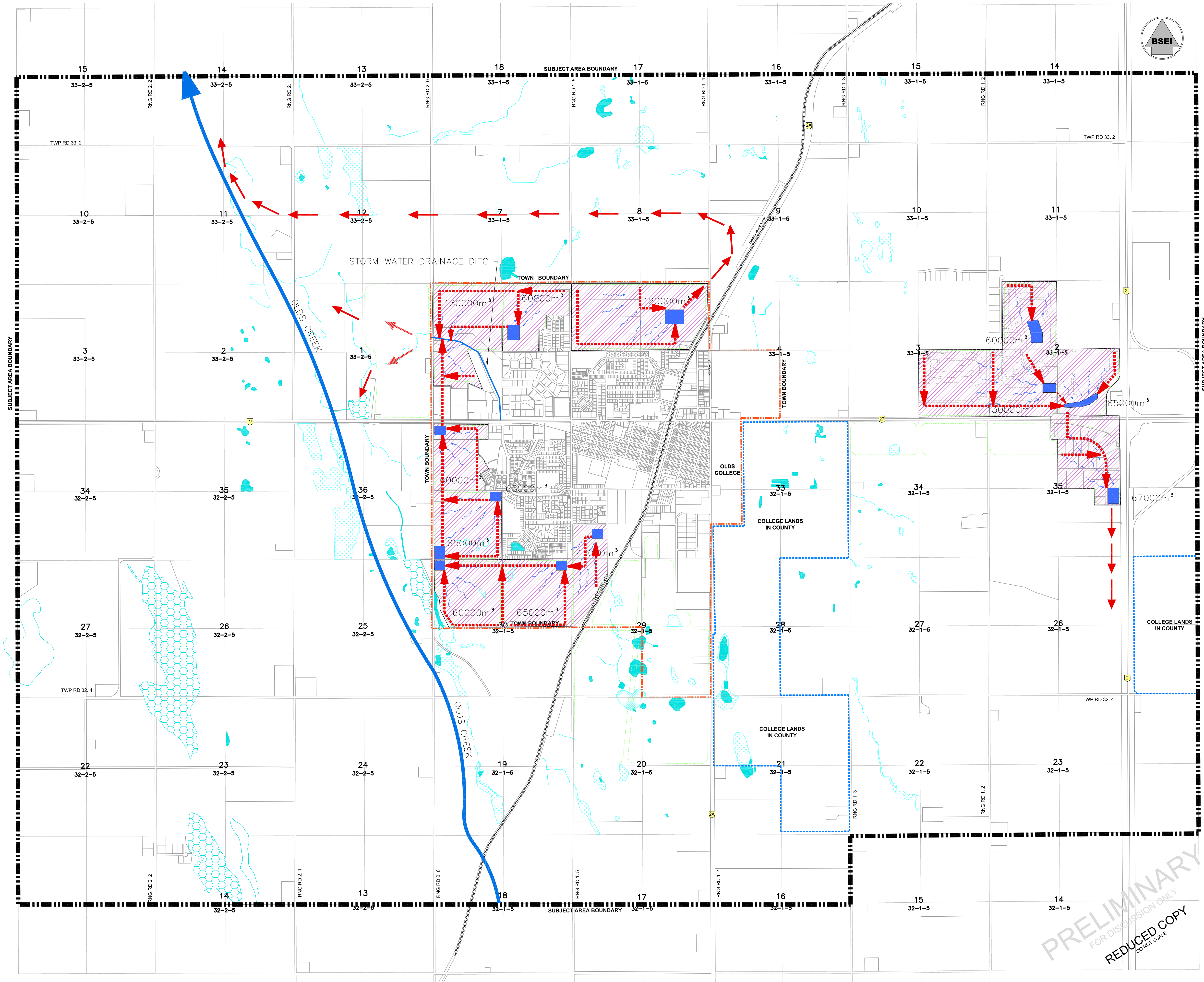
- It is recommended that Staged Master Drainage Plans be prepared by a qualified Stormwater Management Engineer with each Outline Plan submittal. These reports should follow the overall recommendations of the Master Drainage Plan (recommended to be prepared prior to the development of short term growth areas).

The recommended improvements for the stormwater short term and long term are shown in Exhibit 14.11 and Exhibit 14.12 respectively.

DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

SHORT TERM - 2016
STORM WATER MANAGEMENT



LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED STORM WATER (SHORT TERM)
- PROPOSED STORM WATER
- POND / WET LAND
- MARSH OR SLOUGH
- ENVIRONMENTALLY SENSITIVE AREA
- RIVER / CREEK
- 65000m³ ESTIMATED POND VOLUME
- FLOW DIRECTION
- OVERLAND DRAINAGE FLOW
- PROPOSED STORM WATER MANAGEMENT POND
- SHORT TERM GROWTH AREA
- DRAINAGE AREA

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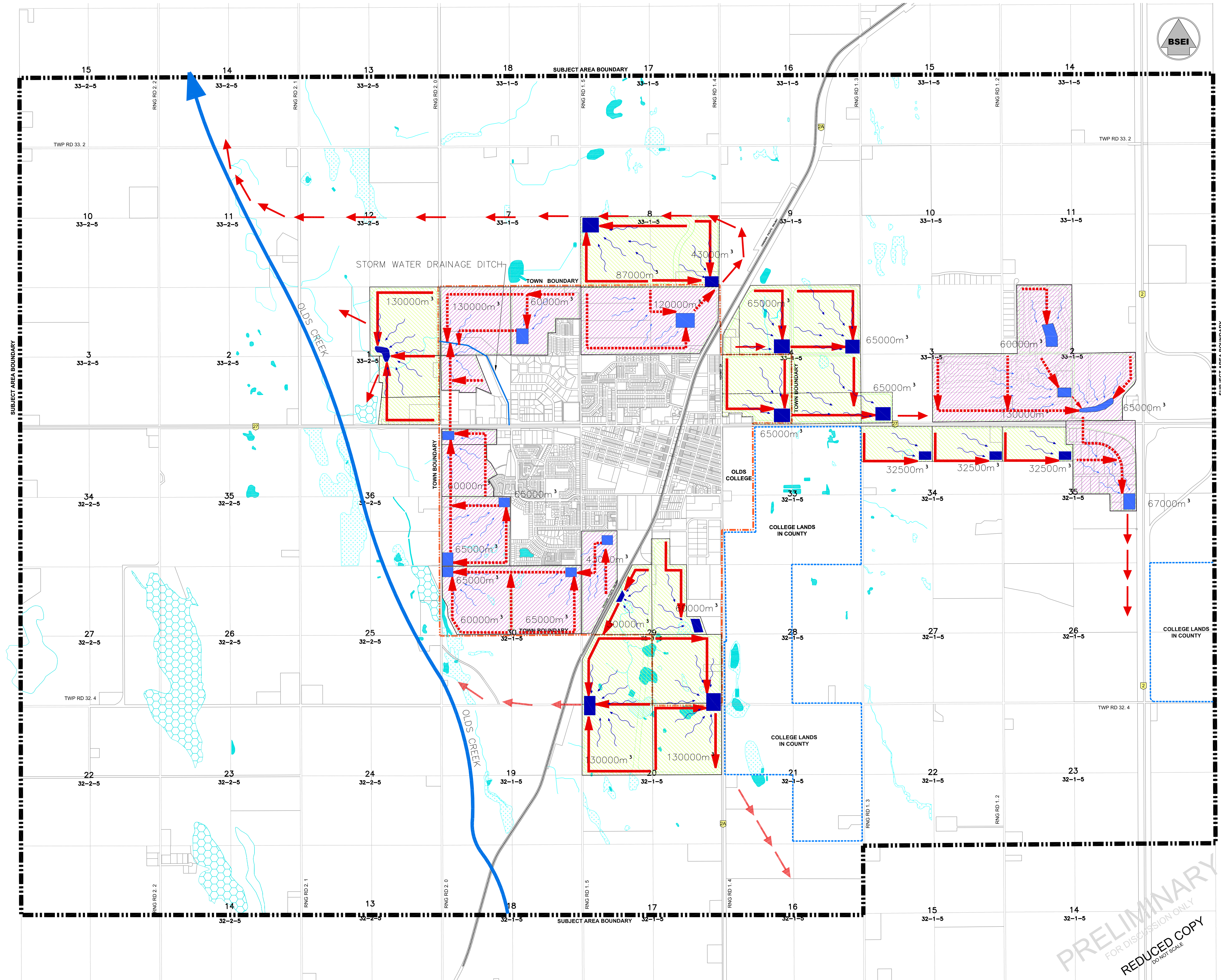
PROJECT No :	W643-014	EXHIBIT 14.11

DEEP UTILITY UPGRADES

MOUNTAIN VIEW COUNTY &
TOWN OF OLDS, ALBERTA

LONG TERM - 2035
STORM WATER MANAGEMENT



LEGEND

- SUBJECT AREA BOUNDARY
- TOWN OF OLDS BOUNDARY
- COLLEGE LANDS BOUNDARY
- CANADIAN PACIFIC RAILWAY
- PROPOSED STORM WATER (SHORT TERM)
- PROPOSED STORM WATER
- POND / WET LAND
- MARSH OR SLOUGH
- ENVIRONMENTALLY SENSITIVE AREA
- RIVER / CREEK
- FLOW DIRECTION
- 65000m³ STORM WATER MANAGEMENT POND VOLUME
- OVERLAND DRAINAGE FLOW
- OVERLAND DRAINAGE FLOW (SHORT TERM)
- PROPOSED STORM WATER MANAGEMENT POND
- PROPOSED STORM WATER MANAGEMENT POND (SHORT TERM)
- SHORT TERM GROWTH AREA
- LONG TERM GROWTH AREA
- DRAINAGE AREA

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PROJECT No : W643-014	*EXHIBIT 14.12*

15.0 PRIORITIZATION AND PRELIMINARY COST ESTIMATES

15.1 Overview

With the analysis complete and recommendations developed for the Short and Long Term horizons, it was possible to prioritize the various items and undertake preliminary high-level cost estimates. This information is intended to be used by the Town and the County for the purpose of aiding in capital planning. While the priority list is estimated based on expected development programming, changes in development occurrence will necessarily result in changes in prioritization. It is therefore recommended that the Town and County review the list on an annual basis to ensure that the list remains as up to date as possible.

15.2 Transportation Prioritization & Preliminary Cost Estimates

The Estimated Costs in 2010 dollars as prepared by BSEI include an estimate for engineering and consulting fees for the various short term and long term transportation improvements. The estimates do not, however, include estimated fees for items such as land acquisition, geotechnical, biophysical, historical, stormwater or environmental components. It os recommended that functional and detailed designs be undertaken prior to finalization of costing.

An estimated cost range was determined for each item. An economy of scale can be applied to larger scale products, in which case the engineering fees become a percentage of the construction costs. The estimated program requirements are outlined here in Tables 15.1 through 15.5.

Table 15.1 Short Term Prioritization List

Priority	Location	Improvement	Estimated Cost in 2010 Dollars
Town of Olds			
1	Highway 27/ 50th Avenue	* Implement NB & SB left turn lanes * Consider turn restrictions & median on north leg * Traffic signal optimization	$100,000 - $200,000
2	Highway 27/ 46th Avenue	* Implement NB & SB left turn lanes * Traffic signal optimization	$100,000 - $200,000
3	Highway 27/ 57th Avenue	* Implement turn restrictions on north leg at service road to only allow right-in/right-out * Extension of concrete median on south leg	< $100,000
4	Highway 27/ 61st Avenue	Closure or restriction to right-in/right-out of the north leg of 61st Avenue	< $100,000
5	Highway 27/ 52nd Avenue	Closure of south leg intersection and removal of traffic signal	$100,000 - $200,000
Mountain View County			
1	RR 20 North of Hwy 27 to Twp Rd 332	Upgrade gravel to pavement	$1,450,000
2	Twp Rd 324 East of Hwy 2A	Upgrade gravel to pavement	$1,450,000
3	RR 12 South of Hwy 27	Upgrade gravel to pavement	$1,450,000
4	RR 20 South of Hwy 27	Upgrade chip seal to pavement	$300,000
5	Twp Rd 332 West of RR 14	Apply dust control	$500,000

Table 15.2 Signalization Prioritization List

Priority	Location (Warrant Points)	Estimated Cost in 2010 Dollars
1	Highway 27/ Range Road 12 (442)	$450,000
2	50th Ave/ Link P (371)	$450,000
3	Highway 2A/ Link O (348)	$450,000
4	Highway 27/ 70th Avenue (275)	$450,000
5	57th Avenue/ Link F (248)	$450,000
6	Highway 27/ Range Road 13 (227)	$450,000
7	57th Avenue/ Link P (207)	$450,000
8	70th Avenue/ Link A (124)	$450,000
9	57th Avenue/ Shannon Drive (77)	$450,000
10	Highway 27/ Link M (75)	$450,000
11	57th Avenue/ 54th Street (73)	$450,000
12	Highway 2A/ Link F (71)	$450,000
13	Highway 2A/ Link J (71)	$450,000
14	Highway 2A/ 57th Street (70)	$450,000
15	Range Road 13/ Link N (61)	$450,000
16	50th Avenue/ Link D (57)	$450,000
17	70th Avenue/ Link E (37)	$450,000
18	Highway 2A/ 52nd Street (21)	$450,000
19	70th Avenue/ Link P (11)	$450,000

Table 15.3 Intersection Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
Existing Intersections		
1	57th Avenue/ Shannon Drive * NB right turn lane (60m bay with a 70m taper)	< $100,000
2	Hwy 27/ 50th Ave * EB & WB left turn lanes (60m bay with a 70m taper)	< $100,000
3	Hwy 2A/ 57th Street * EB & WB left turn lanes (60m bay with a 70m taper)	< $100,000
4	57th Ave/ 54th St * NB & SB left turn lanes (60m bay with a 70m taper) * WB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
5	Hwy 27/ RR 13 * NB & SB left turn lanes (60m bay with a 70m taper) * WB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
6	Hwy 27/ 46th Ave * EB & WB left turn lanes (60m bay with a 70m taper)	$100,000 - $200,000
7	Hwy 27/ 70th Ave * EB, WB, NB, SB left turn lanes (60m bay with a 70m taper) * EB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
8	Hwy 27/ RR 12 * NB dual left turn lanes (60m bay with a 70m taper * 2) * SB left turn lane (60m bay with a 70m taper) * NB & SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
Future Intersections		
1	70th Ave/ Link B * SB left turn lane (60m bay with a 70m taper)	< $100,000
2	70th Ave/ Link C * SB left turn lane (60m bay with a 70m taper)	< $100,000
3	70th Ave/ Link E * EB left turn lane (60m bay with a 70m taper)	< $100,000
4	70th Ave/ Link F * SB left turn lane (60m bay with a 70m taper)	< $100,000
5	Range Road 13/ Link N * NB left turn lane (60m bay with a 70m taper)	< $100,000
6	Hwy 27/ 51st Ave * WB right turn lane (60m bay with a 70m taper)	< $100,000
7	Hwy 27/ Link M * EB left turn lane (60m bay with a 70m taper) * WB right turn lane (60m bay with a 70m taper)	< $100,000
8	50th Ave/ Link D * NB & EB left turn lanes (60m bay with a 70m taper) * SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000

Table 15.3 Intersection Improvement Prioritization List - Continued

Priority	Improvement	Estimated Cost in 2010 Dollars
Future Intersections		
9	Hwy 2A/ Link J * SB & WB left turn lanes (60m bay with a 70m taper) * NB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
10	Hwy 2A/ Link F * NB & EB left turn lanes (60m bay with a 70m taper) * SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
11	70th Ave/ Link P * EB & WB left turn lanes (60m bay with a 70m taper) * NB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
12	50th Ave/ Link P * NB & EB left turn lanes (60m bay with a 70m taper) * SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
13	70th Ave/ Link A * WB dual left turn lanes (60m bay with a 70m taper * 2) * EB left turn lane (60m bay with a 70m taper) * NB & SB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
14	57th Ave/ Link P * WB dual left turn lanes (60m bay with a 70m taper * 2) * EB left turn lane (60m bay with a 70m taper) * NB & EB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
15	Hwy 2A/ Link O * WB dual left turn lanes (60m bay with a 70m taper * 2) * EB, NB & SB left turn lane (60m bay with a 70m taper) * EB right turn lane (60m bay with a 70m taper)	$100,000 - $200,000
16	57th Ave/ Link F * EB, WB, NB & SB left turn lanes (60m bay with a 70m taper) * WB & SB right turn lanes (60m bay with a 70m taper)	$100,000 - $200,000

Table 15.4 Road Link Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
1A	70th Avenue (existing roadway – half paved/ half gravel) * 2-lane undivided arterial for 2.5 km	$2,100,000
1B	70th Avenue (existing roadway – half paved/ half gravel) * 2-lane undivided arterial for 500 m	$420,000
1B	70th Avenue (existing roadway – half paved/ half gravel) * 4-lane undivided arterial from Link C to Link P (2 km)	$3,130,000
1C	70th Avenue (existing roadway – half paved/ half gravel) * 4-lane divided arterial from Link C to Link P (2 km)	$3,530,000
2	57th Avenue (existing undivided 2-lane arterial roadway) * 3-lane cross section (2-thru lanes with a central two-way left turn lane) for 800 m	$1,012,000
3A	Range Road 12 (existing 2-lane collector roadway) * 2-lane undivided arterial for 800 m	$504,000
3B	Range Road 12 (existing 2-lane collector roadway) * 4-lane undivided arterial for 800 m	$1,108,000
4A	Range Road 13 (existing gravel road) * 2-lane undivided arterial for 800 m	$672,000
4B	Range Road 13 (existing gravel road) * 4-lane undivided arterial for 800 m	$1,252,000
4C	Range Road 13 (existing gravel road) * 4-lane divided arterial for 800 m	$1,412,000
5A	Link F (new roadway) * 2-lane undivided arterial for 3.2 km	$2,688,000
5B	Link F (new roadway) * 4-lane undivided arterial for 3.2 km	$5,008,000
5C	Link F (new roadway) * 4-lane undivided arterial for 2.2 km	$3,443,000
5C	Link F * 4-lane divided arterial for 1 km	$1,765,000
6A	Link P (O) (new roadway) * 2-lane undivided roadway for 4 km	$3,360,000
6B	Link P (O) (new roadway) * 4-lane undivided roadway for 4 km	$6,260,000
6C	Link P (O) (new roadway) * 4-lane undivided roadway for 3 km	$4,695,000
6C	Link P (O) (new roadway) * 4-lane divided roadway for 1 km	$1,765,000

Table 15.5 Misc Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
N/A	Link P: 2-lane roadway crossing over CPR tracks & Hwy 2A	> 20 million
N/A	Link P: 4-lane roadway crossing over CPR tracks & Hwy 2A	> 20 million

15.3 Utility Prioritization & Preliminary Cost Estimates

As with the Transportation items, the Estimated Costs in 2010 dollars as prepared by BSEI for the utility items include an estimate for engineering and consulting fees for the various short term and long term underground utility improvements. The municipal works (pipelines and appurtenances) include engineering and consulting fees for the planning, legal, geotechnical, biophysical, historical, stormwater and environmental components. These fees also include facilitating all applications and approvals as well as detailed design to Construction Completion Certification (CCC). The mechanical works (pump station, reservoir and lift stations) include engineering and consulting fees for the mechanical, structural, electrical, HVAC and controls/SCADA components. These fees also include any planning, additional consulting, applications and/or approvals required as well as detailed design to commissioning.

An estimated cost range was determined for each pipe size based on both small scale and large scale projects. The price per lineal meter of pipe for a small scale project will be closer to the high end of the cost range due to the base engineering fees required to design any project. An economy of scale can be applied to larger scale products, in which case the engineering fees become a percentage of the construction costs. Therefore the price per lineal meter of pipe for a larger scale project will be closer to the low end of the cost range. The actual costs for pipelines (including all appurtenances) will be based on the size and scope of the individual developments throughout the short and long term growth areas.

The underground utility improvement prioritization list is summarized in Table 15.6.

Table 15.6 Underground Utility Improvement Prioritization List

Priority	Improvement	Estimated Cost in 2010 Dollars
WATERMAIN		
Short Term	250mm PVC Watermain (includes valves & hydrants)	$340/lm - $560/lm
Short Term	300mm PVC Watermain (includes valves & hydrants)	$410/lm –$ 620/lm
Short Term	Pump Station & Reservoir	$7,100,000
Short Term	Crossing CP Rail (1 total)	$250,000
Long Term	250mm PVC Watermain (includes valves & hydrants)	$340/lm - $560/lm
Long Term	300mm PVC Watermain (includes valves & hydrants)	$410/lm –$ 620/lm
Long Term	Crossing CP Rail (2 total)	$500,000
WASTEWATER		
Short Term	250mm PVC Gravity Trunk Main (includes manholes)	$270/lm - $500/lm
Short Term	300mm PVC Gravity Trunk Main (includes manholes)	$285/lm - $515/lm
Short Term	375mm PVC Gravity Trunk Main (includes manholes)	$315/lm - $540/lm
Short Term	450mm Concrete Gravity Trunk Main (includes manholes)	$330/lm - $550/lm
Short Term	525mm Concrete Gravity Trunk Main (includes manholes)	$365/lm - $585/lm
Short Term	600mm Concrete Gravity Trunk Main (includes manholes)	$450/lm - $655/lm
Short Term	450mm HDPE Forcemain (includes air-release valves/manholes)	$640/lm
Short Term	East Lift Station	$4,200,000
Short Term	Crossing CP Rail (1 total)	$250,000
Long Term	250mm PVC Gravity Trunk Main (includes manholes)	$270/lm - $500/lm
Long Term	300mm PVC Gravity Trunk Main (includes manholes)	$285/lm - $515/lm
Long Term	450mm Concrete Gravity Trunk Main (includes manholes)	$330/lm - $550/lm
Long Term	250mm HDPE Forcemain (includes air-release valves/manholes)	$580/lm
Long Term	West Lift Station	$2,225,000
Long Term	North Lift Station	$2,225,000
Long Term	South Lift Station	$2,225,000
Long Term	Crossing CP Rail (1 total)	$250,000
STORM WATER		
Short Term	300mm PVC Trunk Main (includes manholes)	$285/lm - $515/lm
Short Term	375mm PVC Trunk Main (includes manholes)	$315/lm - $540/lm
Short Term	450mm Concrete Trunk Main (includes manholes)	$330/lm - $550/lm
Short Term	525mm Concrete Trunk Main (includes manholes)	$365/lm - $585/lm
Short Term	600mm Concrete Trunk Main (includes manholes)	$450/lm - $655/lm
Short Term	750mm Concrete Trunk Main (includes manholes)	$535/lm - $735/lm
Short Term	900mm Concrete Trunk Main (includes manholes)	$655/lm - $835/lm
Short Term	1050mm Concrete Trunk Main (includes manholes)	$785/lm - $950/lm
Short Term	Stormwater Management Ponds (includes earthworks, outfall structure & end sections) - 14 Total	$9,800,000
Long Term	300mm PVC Trunk Main (includes manholes)	$285/lm - $515/lm
Long Term	375mm PVC Trunk Main (includes manholes)	$315/lm - $540/lm
Long Term	450mm Concrete Trunk Main (includes manholes)	$330/lm - $550/lm
Long Term	525mm Concrete Trunk Main (includes manholes)	$365/lm - $585/lm
Long Term	Stormwater Management Ponds (includes earthworks, outfall structure & end sections) – 15 Total	$10,500,000
Long Term	Crossing CP Rail (1 total)	$250,000