

Executive Summary – Hwy 27: Olds Functional Planning Study

A) Background

CastleGlenn Consultants Inc. was retained in September 2007 to undertake a functional planning study that would address operational and safety concerns along the Highway 27 corridor through the Town of Olds. Olds has a population of approximately 7500 persons and is considered a major service center and regional market for over 40,000 people. With the advent of increased development initiatives within the town traffic volumes are increasing along Highway 27. The increased traffic volume in combination with poor access management, offset intersections and the mixture of local and through traffic is perceived to have resulted in increased operational and safety concerns along the corridor.

The recommendations presented in this study build upon the information outlined in a 2006 functional planning study (*“Highway 27:06, Town of Olds – Functional Planning Study”*, UMA Engineering, 2006); however, the proposed improvements and Highway 27 access management strategy contained within this document focuses on minimizing adverse impacts to properties/businesses in addition to achieving a major reduction in infrastructure costs.

B) Existing Conditions

The study area includes the limits of Highway 27 that run directly through the Town of Olds, between 70th Avenue and approximately 250m east of Highway 2A. The Highway 27 corridor can be classified as a “Multi-Lane” highway with a cross-section that transitions from a 4-lane urban divided cross-section (from east of 70th Avenue) to a four lane urban undivided cross-section beginning east of 57th Avenue (through to Highway 2A). East of Highway 2A the cross-section transitions to a 2-lane undivided rural configuration. The posted speed along the Highway 27 corridor transitions from 100km both east and west of the Town of Olds to as low as 30kph in the vicinity of the Olds Junior/Senior High School for specific times during the day.

The Highway corridor through Olds is characterized by 13 intersections (with intersection spacing varying from 50m to 410m). Six of the intersections are controlled by traffic signals. Four of the intersections can be described as offset (or Split “T”) intersections. The corridor through the urban area provides for over 60 accesses/driveways (on the 1.7 km segment of Highway 27 between 57th Avenue and just east of Highway 2A). Each of the accesses currently provide all-directional access to/from Highway 27 with access spacing ranging from as little as 8m to 200m. The cumulative effect of these direct accesses inhibits the flow of highway-through traffic. As highway traffic volumes continue to increase, operating speeds along the corridor are anticipated to decline and vehicle congestion increase.

C) Forecast Traffic Conditions

Traffic forecasts were prepared that accounted for an average annual growth rate of 3.0% in traffic volumes over a 10 year time horizon. The forecast traffic was then applied to the intersection and access modifications recommended within this study. The findings indicated that the proposed roadway modifications are anticipated to provide satisfactory levels of service (LOS “D” or better) during both morning and afternoon peak hours of travel demand even past the 10-year horizon period. Beyond this time frame, however, traffic characteristics become highly dependent on future development initiatives and the continued growth patterns associated with highway through traffic from nearby communities accessing the community of Olds. It was anticipated that more significant solutions would be required within the 15 year time frame.

D) The Recommended Access Management Strategy

The recommended access management strategy and proposed Highway 27 improvements through the Town of Olds took into account:

- current design standards;
- traffic volumes and operational characteristics at intersections;
- number and spacing of accesses;
- impacts to business as a result of access closures/consolidations;
- proximity of buildings and parking areas to the existing highway corridor;
- heavy vehicle turning movements specifically at fuel stations; and
- waste removal (garbage-collection).

In general, the proposed road works can be characterized as follows:

- *Realignment / Relocation of Intersections;*
- *Highway 27 Intersection Modifications;*
- *Access Modifications;*
- *New Service Road/ Local Roadway Segments;* and
- *Pedestrian Accommodations.*

The access management strategy provides for:

- a reduction in the number of accesses from 60 to 26 achieved largely through consolidation;
- the closure of the following 3 intersections;
 - closure of north leg of the 61st Avenue (Imperial Way) intersection;
 - closure of the south leg of the 56th Avenue intersection; and
 - closure of south leg of the 47th Avenue intersection.
- a reduction in the number of rear lane connections from 7 to 3;

- closure of laneway located at rear of Plaza 27 opposite north leg of 52nd Avenue; [This laneway could also be realigned in front of Oceans Alive to connect to the cul-de-sac opposite the south leg of 52nd Avenue.]
- closure of the two laneway on the north and the south sides of Hwy 27 located 40 and 60 meters respectively east of 49th Avenue; and
- closure of the laneway on the south side of Hwy 27 located 55 meters west of 56th Avenue;

[As regards the remaining 3 laneway connection all situated between 48th Avenue and Hwy 2A, discussions between Mountain View Regional Waste Management Commission (MVRWMC) and the Town of Olds have taken place regarding new waste removal vehicles which may be too large to operate on the narrow back lanes; as such waste pickup would occur in the front of residential lots. AT in concert with the Town of Olds is encouraged to review the need and justification for these remaining rear-lane connections which no longer would be used for any other purpose as alternative access exists.]

E) The Proposed Highway 27 Improvements

The proposed Highway 27 improvements and access management strategy focuses on improving the operations and safety along the corridor by implementing the following:

- *Realignment/Relocation of Intersections:* The following improvements are proposed to improve intersection spacing and reduce the number of vehicle turning conflicts at intersections:
 - converting 54th Avenue (south) to right-in/right-out only and signalization of 54th Avenue (north)
 - reverting 52nd Avenue (south) to right-in/right-out only and converting 52nd Avenue (north) to pedestrian actuated signals only
 - construction of a new Highway 27/51st Avenue intersection located approximately 180m west of 50th Avenue
- *Highway 27 Intersection Improvements:* Geometrical and lane configuration improvements are proposed at the following Highway 27 intersections:
 - 65th Avenue: Improved curb radii on the north leg of 65th Avenue and construction of a protected northbound left-turn lane on the south leg of 65th Avenue;
 - 57th Avenue: Dedicated left-turn lanes with short medians on both sides of 57th Avenue. Addition of a dedicated Highway 27 westbound right-turn lane;
 - 55th Avenue: New Highway 27 eastbound left-turn lane;
 - 54th Avenue (north): Dedicated eastbound and westbound left-turn lanes along Highway 27 providing for access into the Fas Gas facility and the north leg of 54th Avenue;
 - 52nd Avenue (north): Dedicated Highway 27 eastbound left-turn lane with a raised median;
 - 51st Avenue: The new intersections includes dedicated left-turn lanes in all four quadrants of the intersection;
 - 49th Avenue: Dedicated Highway 27 eastbound and westbound left-turn lanes; and

- Highway 2A: Curb radii improvements in the SE and NW quadrants of the intersection including channelization. Addition of Highway 27 eastbound and westbound right-turn lanes at the intersection.
- *New Service Road and Local Roadway Segments:* Service roads are proposed in the following locations to allow for the closure/consolidation of private access along Highway 27 and to improve operation at intersections:
 - *SW quadrant of the Highway 27/65th Avenue intersection:* A new service road is proposed extending west from 65th Avenue. The road would provide for improved left-turn storage along 65th Avenue and allows for a direct connection between 65th Avenue and the retail developments (No Frills/Canadian Liquor) located on the south side of Highway 27 between 70th Avenue and 65th Avenue;
 - *NW quadrant of the Highway 27/57th Avenue intersection:* Realignment of the existing service road (fronting Highway 27) is proposed. The new alignment would allow for improved left-turn lane storage along 57th Avenue and a new 57th Avenue 4-way intersection located approximately 100 north of Highway 27.
 - *Between 57th Avenue and 55th Avenue:* A 340m long service road is proposed to allow for the consolidation of several accesses located on the north side of Highway 27.
 - *The new Highway 27/51st Avenue intersection:* A new north and south extension of 51st Avenue is proposed. In addition an east-west service road is proposed on the north side of Highway 27 on the Olds High School property that would allow for the consolidation of several Highway 27 accesses in the vicinity of the new intersection.

F) The Public Involvement Process

Two sets of focus group meetings were arranged on the following dates with the objective of discussing and refining the design concept by obtaining public feedback:

- Focus Group Meetings No. 1 (4 Sessions) October 27th and 28th, 2008; 42 attendees
- Focus Group Meetings No. 2 (2 Sessions) November 18th, 2008; 34 attendees

G) Staging the Preferred Access Management Strategy

A staging strategy was developed that identified twenty separate improvement packages that could be implemented along the Highway 27 corridor as either separate, sequential or potentially simultaneous projects. The strategy provides AT with the flexibility to respond to specific Highway 27 operational constraints by implementing relatively low cost improvements and staging construction costs over time. The proposed improvements have been classified into following four categories.

- Easily Implementable or “Spot” improvements; (8 projects)
- Constraints to Implementation; (7 projects)
- Difficult to Implement; (2 projects)
- Development Driven; (2 projects)

H) The Estimated Construction Cost

The total construction cost for the Highway 27 improvements is estimated at \$8.7 million including all highway, service road and access modifications. This construction cost estimate was broken down as follows:

- Easily Implementable or “Spot” improvements; (\$836K)
- Constraints to Implementation; (\$3.7M)
- Difficult to Implement: (\$3.3M)
- Development Driven: (\$930K)

I) Recommendations

It is recommended that.....

1. The infrastructure improvements consistent with the *Highway 27- Town of Olds Functional Planning Study* be received by Alberta Transportation;
2. The Town of Olds be informed that the *Highway 27 Functional Planning Study* represents a planning document and as such highway intersection / widening construction are currently not scheduled.
3. The Town of Olds Council be requested to incorporate the *Highway 27- Town of Olds Functional Planning Study* within the town’s municipal development plans;
4. Subsequent to Alberta Transportations endorsement of the *Highway 27- Town of Olds Functional Planning Study*, the Province be encouraged to pursue those initiatives necessary to undertake detailed engineering of the proposed improvements. These activities would likely include, but are not limited to:
 - a) Monitoring vehicular traffic at critical intersections along the Highway 27 corridor to enable AT to assess warrants for signalization and/or infrastructure improvements;
 - b) Determine the timing and sequence of the proposed improvements projects; (identified as 20 improvement projects in section 5.0 of this study)
 - c) A presentation to the Town of Olds Council with the goal of seeking endorsement of those components of functional plan that would proceed to detailed design;
 - d) Meetings with owners of properties that require land acquisition for road right-of-way purposes including Chinook’s Edge School Division; and
 - e) Coordinating lane closures along the Highway 27 corridor with the Town of Olds and the Mountain View Regional Waste Management Commission (MVRWMC).

70 AVENUE

FUNCTIONAL PLAN ONLY

CONSULTANT

PROJECT NO. 1031

FUNCTIONAL PLAN
SUBJECT TO REVISION
DATE: DECEMBER 2008

CastleGlenn Consultants Inc.
Engineers, Project Managers & Planners

ES - 1
HIGHWAY 27
FUNCTIONAL PLANNING STUDY
TOWN OF OLDS
PROPOSED HIGHWAY 27 IMPROVEMENTS
70TH AVENUE TO 65TH AVENUE

REGION	PLAN No.	PROJECT	CONTRACT No.	SHEET
CENTRAL		HWY 27:06		1 OF 4

10m
HORIZONTAL

Alberta
TRANSPORTATION

EXISTING PLAZA DEVELOPMENT

EXISTING
67 AVENUE

IMPERAL ROAD

UFA CARDUCCI BULK FUELS

MOUNTAIN VIEW TANNERY

TRACKSIDE SALES

SKIDOO' BOMBARDIER RECREATIONAL PRODUCTS

TIMELINE SOURCE FOR SPORTS

R40
R10
NEW CURB RADI ALLOW. FOR IMPROVED
WB-23 RIGHT TURN MOVEMENT

36+500 36+600 36+700 36+800 36+900 37+000 37+100 37+200 37+300 37+400

HIGHWAY 27

EXISTING
SIGNALS

EXISTING
SIGNALS

EXISTING HIGHWAY 27 CONFIGURATION

FUTURE CONFIGURATION OF 70TH AVENUE INTERSECTION
TO BE DETERMINED UPON FURTHER DEVELOPMENT IN
THE VICINITY OF 70TH AVENUE

70 AVENUE

FUTURE
67 AVENUE

CLOSED

RIGHT-IN/RIGHT-OUT

LOT 1
AREA REQUIRED
1706m²
0.42 Acres

LOT 2
AREA REQUIRED
1080m²
0.27 Acres

LOT 4
AREA REQUIRED
975m² 0.24 Acres

DESIRED CONNECTING LINK
BETWEEN 67TH AVE AND 65TH AVE

PROPOSED NEW SERVICE
ROAD ALIGNMENT

NEW FUTURE FIRE HALL

65 AVENUE

BEECH CREEK

FUNCTIONAL PLAN ONLY

ES - 2

HIGHWAY 27
FUNCTIONAL PLANNING STUDY
TOWN OF OLDS
PROPOSED HIGHWAY 27 IMPROVEMENTS
61ST AVENUE TO 55TH AVENUE

CONSULTANT
PROJECT NO. 1031

FUNCTIONAL PLAN
SUBJECT TO REVISION
DATE: DECEMBER 2008

CastleGlenn Consultants Inc.
Engineers, Project Managers & Planners

REGION	PLAN No.	PROJECT	CONTRACT No.	SHEET
CENTRAL		HWY 27:06		2 OF 4

100m
0 20m
HORIZONTAL

IMPERIAL CLOSE

SKIDOO BOMBARDIER RECREATIONAL PRODUCTS

TIMELINE SOURCE FOR SPORTS

TELUS

ADVANCED TELECOM

IMPERIAL EQUIPMENT RENTALS

HERBAL WARE

THRECRIFT

VACANT LOT

LOT FOR SALE

NAPA AUTO PARTS

IMPERIAL WAY

STEEL COMMERCIAL ACCESS

ALPHA MOBILE PARK

AREA REQUIRED
5770m²
0.83 Acres

CLOSURE OF ACCESS CONDITIONAL UPON IMPROVEMENTS BEING COMPLETED AT NORTH LEG OF 57TH AVENUE

ULTIMATE REALIGNMENT OF SERVICE ROAD UPON REDEVELOPMENT OF TRAILER PARKS

PLACE SIGN ON 57TH AVENUE. HEAVY VEHICLE ACCESS ON TO 57TH ST PERMITTED FOR AUTO DELIVERY PURPOSES ONLY

57 AVENUE

SHANNON DRIVE

GARAGES BACK ON TO EXISTING DRIVEWAY TO REMAIN THE SAME

AREA REQUIRED
485m²

AREA REQUIRED
220m²

PROPOSED SERVICE ROAD

AREA REQUIRED
520m²
0.2 Acres

CAM CLARK FORD

AREA REQUIRED
685m²
0.17 ACRES

SPORTSMAN INN MOTEL

SANIK'S RESTAURANT AND BAR

MENUS/TIN TUBES

55 AVENUE

PROVINCIAL OWNERSHIP - USAGE AT THE DISCRETION OF THE PROVINCIAL GOVERNMENT

STREET CLOSURE ACCESS TO BE MONITORED AND CLOSED WHEN WARRANTED

LEFT TURN LANE

EXISTING SIGNALS

EXISTING RAISED MEDIAN

NO LEFT TURN

EXISTING PED CROSSING

RAISED MEDIAN

NO LEFT TURN TRACTOR - TRAILERS EXEMPT

PROPOSED TURNAROUND AREA

ACCESS TO BE MONITORED AND CLOSED WHEN WARRANTED

AREA REQUIRED
450m²

AREA REQUIRED
400m²

SHARED ACCESS

GAURDIAN EMERGENCY INC

50 STREET

56 AVENUE

51 STREET

52 STREET

55 AVENUE

61 AVENUE

SERVICE ROAD

PROPOSED SERVICE ROAD REALIGNMENT

CLOSED

ADDITIONAL ACCESS (IF REQUIRED)

REX AUTOMOTIVE

OLD'S LIP DOODIE

OLD'S LIQUOR AND BEER

HOME HARDWARE

HILDEBRAND DEALER

57 AVENUE

ASPEN CLOSE

ALDER CLOSE

ECH CRESCENT



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1.0 INTRODUCTION

CastleGlenn Consultants Inc. was retained in September 2007 to undertake a functional planning study that would address operational and safety concerns along the Highway 27 corridor through the Town of Olds. A previous planning study was completed in 2006 (Highway 27:06, Town of Olds – Functional Planning Study, UMA Engineering) that recommended significant improvements to the Highway 27 corridor. However, the recommended option resulted in:

- substantial access impacts to business and residents located adjacent to the highway;
- high construction and property costs (construction estimated at \$20M and property at \$34M);
- significant property and building acquisition including residential houses, retail and commercial developments.

The recommendations presented in this study builds on the information outlined in the 2006 functional planning study; however, the proposed improvements and Highway 27 access management focus on minimizing adverse impacts to properties/businesses and reducing construction costs.

1.1 Study Area

The study area (See Exhibit 1-1) encompasses the area of influence within the vicinity of the Highway 27 extending 3.5km from 70th Avenue (west project limit) to approximately 250m east of Highway 2A (east study limits). The general characteristics of the Highway 27 corridor can be characterized as follows (a detailed existing conditions assessment is provided in the Highway 27:06, Town of Olds – Functional Planning Study, UMA, 2006)

- *Classification:* According to *AT Geometric Design Guide Figure I-1.2i* within the study area Highway 27 is classified as a “*Multi-Lane*” highway
- *Cross-Section:* The Highway 27 cross-section transitions from a four lane urban divided cross-section (beginning east of 70th Avenue) to a four lane urban undivided cross-section beginning east of 57th Avenue and continues to Highway 2A. East of Highway 2A the cross-section transitions to a 2 lane undivided rural configuration
- *Posted Speed Limits:* West of 70th Avenue the Highway 27 posted speed limit is 100km/hr. East of 70th Avenue the speed limit transitions from 70km/hr to 50km/hr just west of 65th Avenue. Through the Town of Olds the speed limit remains at 50km/hr except in the vicinity of the Olds Junior/Senior High School where it is reduced to 30km/hr for specific times during the day. East of Highway 2A the speed limit transitions from 70km/hr to 100km/hr for the rural Highway 27 segment.

- *Highway 27 Intersections:* 13 intersections are located along the highway corridor with an intersection spacing that varies from 50m to 410m (see Exhibit 1-1). Six intersections are signalized and four are offset (Split T) intersections.
- *Highway 27 Accesses/Driveways:* Approximately 60 accesses/driveways (including north and south side of Highway 27) are located between 57th Avenue and 250m east of Hwy 2A. The driveways provide all directional access from Highway 27 to retail and commercial developments located adjacent to the highway. Between 49th Avenue and Highway 2A approximately 17 driveways provide access to residential properties located on the north and south side of Highway 27. Generally the access spacing along the Highway 27 corridor varies from 8m (in the vicinity of the Siesta Motel) to 200m (south side of Highway 27 at the Olds High School Property); and
- *Utilities:* Utilities located adjacent to the Highway 27 corridor include Telus, Atco, TCPL, Fortis, Bell, Street Lights and municipal wet utilities (storm, sanitary and water). For cost analysis purposes it was assumed the cost of relocating Telus and Bell cable located within the Highway 27 right-of-way would be at no cost to AT (this assumption was based on information provided in the Highway 27:06, Town of Olds – Functional Planning Study, UMA, 2006)

1.2 Background

Highway 27 (also referred to as 46th Street in the Town of Olds) serves as an east-west corridor that provides access to the Town of Sundre and Town of Olds and provides a direct link to Highway 2 and 2A. The study area addressed within this functional planning study includes the limits of Highway 27 that run directly through the Town of Olds, between 70th Avenue and approximately 250m east of Highway 2A.

The Town of Olds is located just north of the midpoint between the City of Calgary and Red Deer in the north central region of Mountain View County. Olds has a population of approximately 7500 persons and is considered a major service center and regional market for over 40,000 people within the county. The town's desirable location and access to Highway 27, Highway 2A and Highway 2 allows for favorable development conditions including residential and industrial sites. With the advent of development within the town (including the recent Cornerstone Mall Development located on the west side of Olds) traffic volumes are increasing along Highway 27. The increased traffic volume in combination with poor access management, offset intersection configurations and mixture of local and through traffic is creating operational and safety concerns along the corridor.

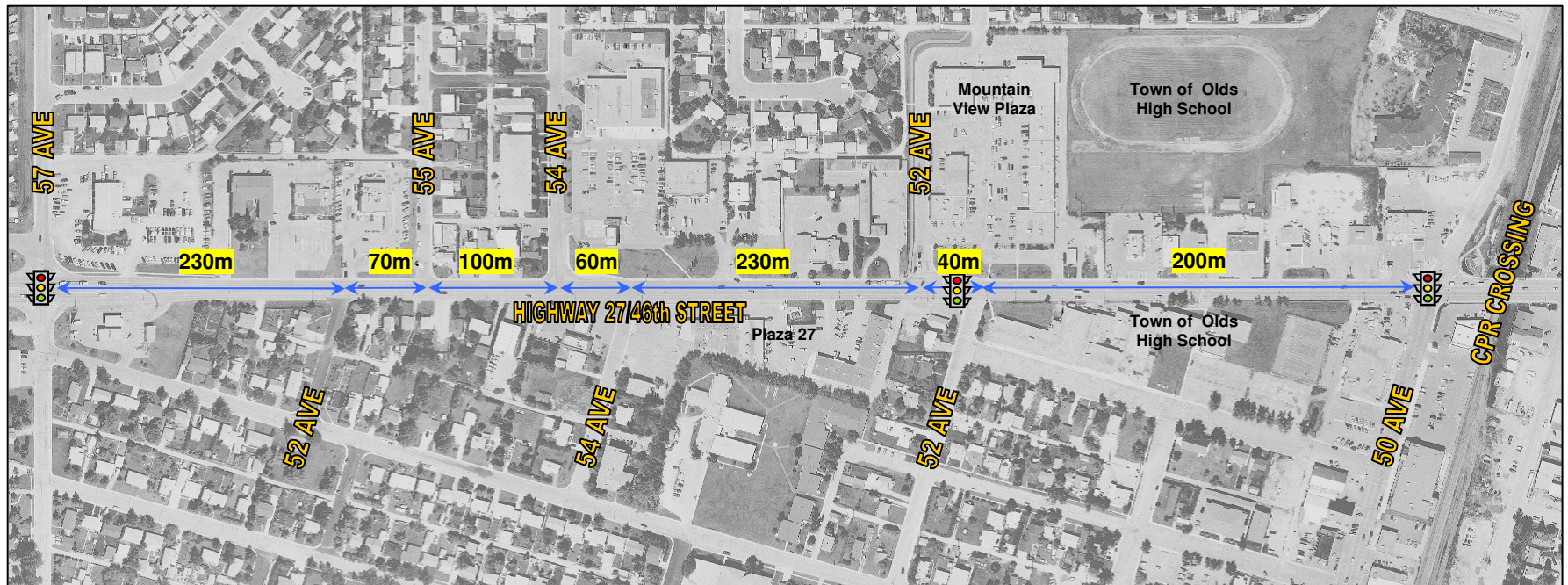
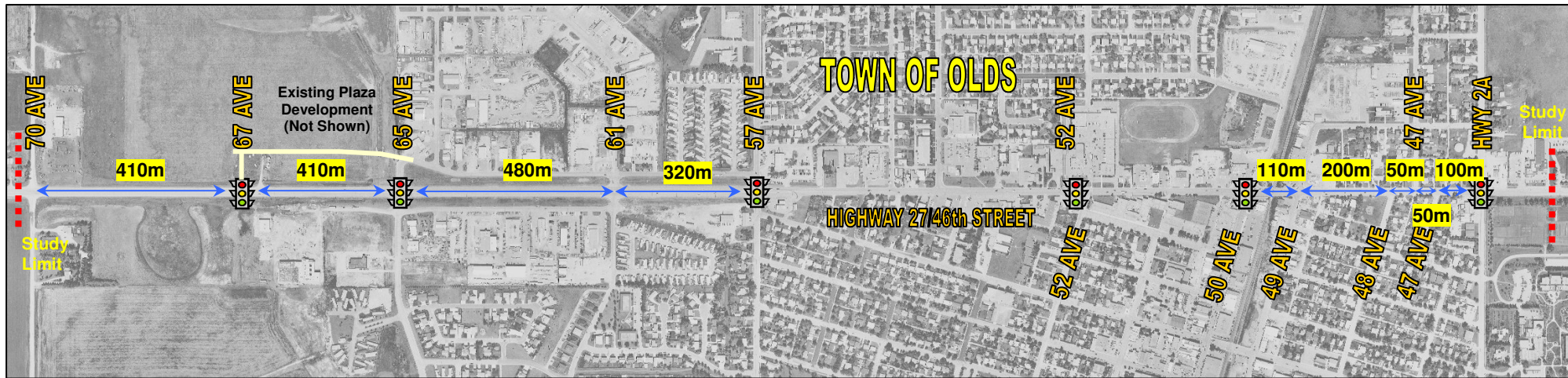


Exhibit 1-1 Highway 27 – Town of Olds Study Area

Approximately 60 access/driveways (includes north and south side of Highway 27) are located along the 1.7 km segment of Highway 27 between 57th Avenue and just east of Highway 2A. The relatively high number (60) of accesses along the corridor has developed over time as a function of individual development initiatives. The cumulative effect of these direct accesses inhibits the flow of highway-through traffic. As highway traffic volumes continue to increase, operating speeds along the corridor are anticipated to decline and vehicle congestion increase.

A functional planning study was completed in 2006 (Highway 27:06, Town of Olds – Functional Planning Study, UMA Engineering) that outlined the improvements required to address the Highway 27 operational deficiencies and develop a staging strategy to accommodate 40-year forecast traffic volumes; however, the recommended improvements require significant property/building acquisition and are considered cost prohibitive by AT. As such, this functional planning study is intended to address the major Highway 27 traffic operational/access issues with emphasis given to minimizing property impacts and construction costs. In addition the recent proposed closure/relocation of the Olds Junior/Senior High Schools presents an opportunity to develop an alternative roadway network that will improve intersection configuration between 54th Avenue and 50th Avenue.

1.3 Past Planning Initiatives

As part of the study process a comprehensive review was conducted of previous planning initiatives including the 2006 Highway 27, Town of Olds Functional Planning Study (UMA Engineering). The objectives of the 2006 study were to develop a plan that would accommodate the future transportation requirements of the highway corridor including:

- addressing access management requirements along the highway consistent with the function and classification of the corridor [this included reviewing the recommended phased improvement outline in a 2001 study (Highway 27 Operational Review, Infrastructure Systems Ltd)]
- addressing existing and future safety/operational constraints along the corridor; and
- developing functional plans and identifying the right-of-way requirements for the recommended improvements

The major conclusions of the study were as follows:

- The Town of Olds should consider developing alternative east-west traffic routes to remove the dependence on Highway 27 for east-west connectivity for local traffic;
- The recommended plan (referred to as Alternative 5 in the UMA Study) accommodates 40 year forecast traffic volumes and includes the following general improvements:

- a raised center median varying in width from 9.7m to 2.5m along Highway 27 that restricts access/egress to adjacent properties;
- front service road from 70th Avenue to 57th Avenue with back service roads (where possible) to provide alternate access;
- a four-lane Highway 27 cross-section except from 61st Avenue to 57th Avenue where six lanes are provided;
- widening of Highway 27 on both the north and south side of the existing lanes;
- left-turn and right-turn storage lanes at all intersections are provided to meet anticipated 40 year capacity requirements; and
- a 9.1m boulevard is proposed on both sides of Highway 27 to provide space for future extra lane or auxiliary lanes

A construction phasing plan consisting of the following three stages was proposed in the study (it should be noted that the implantation of the plan is depended on the pace of development in the Town of Olds):

- Stage 1: Year 2005-2014 (short term)
 - An intersection located between 70th Avenue and 65th Avenue will be required as development proceeds. [It should be noted that this intersection has been constructed and is referred to as 67th Avenue]
 - 70th Avenue, 65th Avenue, 54th Avenue (west), and 49th Avenue: upgraded to signalized intersections. A signalized intersection at 70th Avenue will be dependant on future development and the intersection should be monitored to confirm when signals are required;
 - 56th Avenue, 55th Avenue, and 54th Avenue (east): The geometry of the existing intersections should be modified from the existing three leg intersections to right-in/right-out intersections
 - 52nd Avenue: Realign the east and west legs of 52nd Avenue to obtain a four leg signalized intersection and construct turning lanes with the storage length required for the 40 year configuration by the year 2015
- Stage 2: Year 2015-2025 (mid-term)
 - 67th Avenue: upgrade to a signalized intersections and introduce the turning bay storage lengths required for 40-year configuration by year 2025
 - 70th Avenue and 65th Avenue: construct turning bays with the storage lengths required for 40-year configuration
 - 50th Avenue and 49th Avenue: introduce three through lanes at the intersection and the storage lengths required for the 40-year configuration

- Stage 3: Year 2025-2045 (long-term)
 - *61st Avenue*: First upgrade the eastbound lanes to three through lanes and introduce turning bays on the south leg with the storage lengths required for the 40 year configuration. Second upgrade the westbound lanes to three through lanes and construct turning bays on the north leg with the storage lengths required for the 40 year configuration.
 - *57th Avenue*: First upgrade the eastbound lanes to three through lanes and introduce turning bays on the south leg with the storage lengths required for the 40 year configuration. Second upgrade the westbound lanes to three through lanes and construct turning bays on the north leg with the storage lengths required for the 40-year configuration.
 - *46th Avenue*: construct turning bays with the storage lengths required for the 40 year configuration. At 50th Avenue and 49th Avenue: introduce three through lanes.

1.4 Objectives

The primary objectives of the Highway 27, Olds Functional Planning Study are to:

- identify improvements and upgrading requirements for Highway 27 that will address safety and operational issues along the study corridor while remaining sensitive to property impacts and construction costs;
- develop an access management strategy that will consolidate and remove redundant access/driveways, thereby reducing the number of entrance and exit volumes that interrupt through traffic along Highway 27;
- provide cost estimates for all identified improvements;
- define basic right-of-way requirements for the recommended improvements;
- obtain public, municipal and county feedback on the proposed highway improvements through a thorough public consultation process consisting of focus group and TRC meetings; and
- document the study findings/recommendations and develop functional plans for the recommended improvements

1.5 Methodology

The following activities were undertaken as part of the “tailor-made” methodology to address the planning requirements for this study:

- information outlined 2006 Highway 27, Town of Olds Functional Planning Study (UMA Engineering) was reviewed including existing collisions, geometric deficiencies, utility locations, recommended improvements and the proposed staging strategy;
- traffic exhibits illustrating existing and future traffic volumes (20 year projections) were prepared using historical traffic count information from Alberta Infrastructure and traffic counts contained in the Highway 27, Town of Olds Functional Planning Study (UMA Engineering, 2006);
- a site survey was undertaken to record the addresses of all institutions, businesses and residences along the study corridor;
- possible options, alternatives and various access management strategies were prepared. Advanced recommendations with supporting rationale were evaluated taking into consideration such factors as costs, impacts to properties, advantages, and disadvantages;
- a staging strategy was developed that identified twenty separate improvement packages that can be implemented along the Highway 27 corridor as either separate, sequential or potential simultaneous projects. The improvement projects were classified into four categories (easy to implement, constraints to implementation, difficult to implement and development driven)
- cost estimates were prepared for all identified improvement projects
- right-of-way requirements were determined for the recommended solutions
- functional plans on digital mosaic/profile base sheets (using 3°TM NAD 83 standards) were prepared depicting the proposed improvements and the required right-of-way to accommodate the improvements
- presentations to the Town of Olds and Mountain View County were organized to present the study findings; and
- a public involvement program was initiated that included two focus group meetings with a total of six individual sessions held with property/business owners impacted by the proposed improvements

2.0 TRAFFIC OPERATIONS AND ANALYSIS

Historical traffic information concerning the Highway 27 corridor within the vicinity of the Town of Olds was obtained from Alberta Transportation (AT) web site as well as relevant traffic counts conducted as part of previous studies along the corridor. [Please refer to Appendix G for a copy of the most recent traffic count information.]

Current morning and afternoon peak hour traffic volumes representing the following intersections along the Highway 27 corridor were collected:

- 65th Avenue / Highway 27;
- 61st Avenue / Highway 27;
- 57th Avenue / Highway 27;
- 52nd Avenue [Western Junction] / Highway 27;
- 52nd Avenue [Eastern Junction] / Highway 27;
- 50th Avenue / Highway 27;
- 49th Avenue / Highway 27;
- 48th Avenue / Highway 27; and
- Highway 2A / Highway 27.

A review of historical traffic information indicated an average annual growth rate of approximately 3.0 percent along the entire study corridor. This growth rate was derived subsequent to a review of 5-year average historical growth information along various points of the Highway 27 alignment [See Appendix G-1]. This growth rate was applied to the most recent traffic counts (2007) to update them to current (2008) traffic volumes. Traffic volumes at intersections located immediately adjacent to one another were balanced to reflect the ‘worst-case’ scenario of peak hour traffic volumes.

2.1 Current Traffic Operations

Intersection capacity analysis using Synchro 6TM traffic analysis software was conducted at intersections along the Highway 27 corridor assuming current (2008) traffic volumes [See Appendix G-2]. The analysis was undertaken to provide an assessment of current traffic operations along the corridor that can be used as a basis for comparison with the improvements as proposed by the CastleGlenn designs. The existing roadway and intersection configurations were assumed and optimized signal timing was developed for each of the signalized intersections along the study corridor. For the purposes of this analysis a level-of-service (LOS) of “E” was considered to be unsatisfactory.

Table 2-1 contains a summary of the intersection capacity analysis results for the existing (2008) horizon year assuming the current roadway configuration.

Table 2-1: Summary of Intersection Capacity Results for 2008 Horizon Year
(Assuming the Existing Intersection Configuration)

Intersection (North-South / East-West)	Analysis Characteristics for Worst Case Approach							
	AM Peak Hour				PM Peak Hour			
	Approach	LOS	Delay (sec.)	V/C Ratio	Approach	LOS	Delay (sec.)	V/C Ratio
65 th Avenue / Highway 27	NB	B	12.6	0.13	NB	B	12.3	0.11
61 st Avenue / Highway 27	SB	F	520.4	1.69	SB	F	482.5	1.66
57 th Avenue / Highway 27	WB – R	C	29.8	0.06	WB - R	D	40.1	0.08
52 nd Avenue WJ / Highway 27	EB	B	12.4	0.69	WB	B	11.4	0.52
52 nd Avenue EJ / Highway 27	NB	F	62.2	0.77	NB	F	58.1	0.76
50 th Avenue / Highway 27	WB	C	23.9	0.81	WB	C	22.7	0.77
49 th Avenue / Highway 27	NB	F	80.3	0.67	NB	F	55.7	0.55
48 th Avenue / Highway 27	NB	C	17.8	0.05	NB	B	13.8	0.05
Highway 2A / Highway 27	WB	B	17.2	0.51	NB	C	28.4	0.86

Table 2-1 indicates that the current intersection configuration and operations along the Highway 27 corridor through Olds presents operational challenges. Three of the ten intersections [See shaded areas in Table 2-1] were found to be characterized by unsatisfactory levels-of-service during the morning and/or afternoon peak hours of travel demand for several approaches. All of these three intersections are currently two-way STOP-controlled with the ‘worst-case’ delays occurring on the minor-leg approaches to the intersection. It should be understood that the low performance levels of the ‘worst-case’ approaches are not necessarily indicative of the performance of the entire or overall intersection performance as Highway 27 through traffic proceeds through these STOP-controlled intersections relatively unimpeded.

The remaining 7 of the 10 study area intersections analysed were observed to operate at satisfactory levels-of-service (LOS “D” or better) during both the morning and afternoon peak hours of travel demand.

This analysis was then compared to the effect of the improvements outlined in Section 4.0 of this document.

2.2 Corridor Improvements: 2008 Traffic Conditions

The proposed roadway modifications associated with the “preferred” (See Section 4.0 for a description of the preferred option) improvements to the Highway 27 corridor through the community of Olds were reviewed in terms of the potential diversion of traffic that would be anticipated to occur. Existing (2008) traffic volumes were then diverted assuming all of the proposed improvements to be in place.

This analysis was undertaken to provide an appreciation of the traffic operational benefits associated with the proposed improvements. [See Appendix G-3]

[In particular, the extension of 51st Avenue north of Highway 27 was assumed to be in place and diversion assumption developed to provide an estimate of the morning and afternoon peak hour volumes at this new intersection.]

In addition, the diversion assumptions also incorporated information referenced from the “*Highway 27:06, Town of Olds – Functional Planning Study*” (UMA, 2006) depicting the traffic volumes at several of the commercial developments along the corridor. This information was also incorporated into the simulation of traffic which could be added to/diverted from the intersections of study as a result of the access management strategy suggested in Section 4.0 of this document.

Table 2-2 contains a summary of the intersection capacity analysis results for the existing (2008) horizon year assuming the “preferred” improvements to the Highway 27 corridor to be in place.

Table 2-2: Summary of Intersection Capacity Results for 2008 Horizon Year
(Assuming Proposed Modifications Consistent with Preferred Design)

Intersection (North-South / East-West)	Analysis Characteristics for Worst Case Approach							
	AM Peak Hour				PM Peak Hour			
	Approach	LOS	Delay (sec.)	V/C Ratio	Approach	LOS	Delay (sec.)	V/C Ratio
65 th Avenue / Highway 27	SB	B	13.4	0.23	SB	B	12.7	0.15
61 st Avenue / Highway 27	NB	B	13.5	0.38	NB	B	14.1	0.39
57 th Avenue / Highway 27	WB – R	D	41.8	0.10	WB - R	D	44.3	0.10
52 nd Avenue WJ / Highway 27	WB	B	18.2	0.63	WB	B	15.3	0.57
51 st Avenue / Highway 27	NB	B	11.4	0.46	NB	B	11.8	0.48
50 th Avenue / Highway 27	NB	C	26.3	0.83	NB	C	23.9	0.79
49 th Avenue / Highway 27	SB	B	14.7	0.19	SB	C	16.0	0.21
48 th Avenue / Highway 27	NB	C	18.2	0.12	NB	C	15.6	0.15
Highway 2A / Highway 27	EB	C	20.4	0.69	EB	C	20.2	0.68

The table indicates a significant operational improvement to the corridor in that all of the 10 intersections along the Highway 27 study corridor are provided with satisfactory levels of service (LOS “D” or better) during the morning and afternoon peak hours of travel demand.

2.3 Corridor Improvements: 2018 Traffic Conditions

Traffic forecasts for the 10-year horizon period (2018) were produced at each of the intersections along the Highway 27 study corridor. The forecast volumes were obtained

by applying the average annual growth rate of 3.0% over 10 years to the morning and afternoon peak hour ‘diverted’ traffic volumes described in Section 2.2.

Table 2-3 contains a summary of the intersection capacity analysis results assuming the 10-year forecast (2018) traffic volumes and the proposed roadway modifications consistent with the preferred design to be in place. Intersection capacity analysis using Synchro 6™ traffic analysis software assuming optimized signal timing at signalized intersections along the study corridor [See Appendix G-4] to determine the performance and residual capacity provided by the improvements.

Table 2-3 indicates that the proposed roadway modifications are anticipated to continue to provide all of the 10 intersections along the Highway 27 study corridor with satisfactory levels of service (LOS “D” or better) during the morning and afternoon peak hours of travel demand.

Table 2-3: Summary of Intersection Capacity Results for 2018 Horizon Year
(Assuming Proposed Modifications Consistent with Preferred Design)

Intersection (North-South / East-West)	Analysis Characteristics for Worst Case Approach							
	AM Peak Hour				PM Peak Hour			
	Approach	LOS	Delay (sec.)	V/C Ratio	Approach	LOS	Delay (sec.)	V/C Ratio
65 th Avenue / Highway 27	SB	B	14.3	0.30	NB – L	B	13.5	0.21
61 st Avenue / Highway 27	NB	C	19.0	0.57	NB	D	26.2	0.67
57 th Avenue / Highway 27	WB – L	B	18.4	0.53	WB – L	C	27.6	0.70
52 nd Avenue WJ / Highway 27	SB	C	31.6	0.51	SB	C	28.4	0.35
51 st Avenue / Highway 27	SB	C	28.7	0.56	SB	C	25.8	0.38
50 th Avenue / Highway 27	WB	D	35.1	0.85	WB	D	41.1	0.91
49 th Avenue / Highway 27	SB	C	22.1	0.35	SB	D	25.2	0.39
48 th Avenue / Highway 27	NB	D	26.8	0.23	NB	C	22.7	0.29
Highway 2A / Highway 27	EB	C	16.5	0.73	NB – L	C	21.0	0.63

Given the levels-of-service exhibited during the 10-year horizon period and the remaining capacity at each of the study area intersections (assuming the proposed improvements have been implemented) it is anticipated that the proposed roadway configuration will continue to provide satisfactory levels-of-service past the 10-year horizon period. Beyond this time frame, however, traffic characteristics become highly dependent on future development initiatives and the continued growth patterns associated with highway through traffic from nearby communities accessing the community of Olds. It was anticipated that more significant solutions would be required within the 15 year time frame.

3.0 ACCESS MANAGEMENT & FUNCTIONAL DESIGN CRITERIA

The recommended access management strategy and proposed Highway 27 improvements through the Town of Olds required a “tailor-made” solution that took into account the varying characteristics of the corridor within the study area. These characteristics included:

- traffic volumes and operational characteristics at intersections;
- number and spacing of accesses;
- impacts to business as a result of access closures/consolidations;
- proximity of buildings and parking areas to the existing highway corridor; and
- heavy vehicle turning movements specifically at gas stations.

Section 4.0 of this report outlines the specific improvements proposed along the Highway 27 corridor; however, generally the road works can be characterized as follows:

- *Realignment/relocation of intersections* – relocation of intersections is proposed, where possible, to improve intersection spacing along the highway corridor and eliminate offset (“Split T”) intersection configurations.
- *Highway 27 Intersection modifications* – in areas where intersection modifications can be accommodated, the improvements include the addition/reconfiguration of traffic signals, widening for auxiliary lanes, improved curb radii and addition of raised medians;
- *Access Modifications* – the access management strategy focuses on improving operations along Highway 27 by consolidating all possible accesses, while minimizing property and business impacts. Alberta Transportation *Access Management Guidelines* (see AT Highway Geometric Design Guide Chapter I) indicate: “*proper access management maintains or enhances safety of the through traffic*” on a roadway. *Random entrance and exit volumes interrupt the through traffic which, for highways with high traffic volumes, can result in “unstable traffic flow” and deteriorating operating speeds.* In addition to relocation and/or closure the access modifications include: improving access geometry (curb return radii and access width), increasing spacing between accesses and limiting movements to right-in/right-out;
- *New service road segments* – to allow for the closure and consolidation of private access along Highway 27, service roads are proposed in several locations that provide for a connection between properties and existing public roads that connect to Highway 27; and
- *Pedestrian Accommodation* – improvements to pedestrian facilities including construction of sidewalks, boulevards, landscaping to encourage walking and pedestrian actuated signals

3.1 Design Criteria

Given Highway 27 can be characterised as an urban corridor through the Town of Olds, the access management and geometrical design criteria applied to the Highway 27 improvements were referenced from urban design standards including:

- “*Alberta Transportation Highway Geometric Design Guide Urban Supplement*” (Draft-Nov.2003); and
- “*Geometric Design Guide for Canadian Roads*” Transportation Association of Canada (September 1999)

Table 3-1 summarizes the access management and highway design criteria established for the proposed Highway 27 improvements.

Table 3-1: Highway 27 and Service Road Design Criteria

CRITERIA		HIGHWAY 27	SERVICE ROAD
DESIGN	<i>Design Classification</i>		
	<i>Design Speed</i>	60 km/hr	40 km/hr to 50km/hr
	<i>Design Vehicle</i>	WB-23	WB-23 and/or Single Unit Truck
INTERSECTION CONFIGURATION	<i>Intersection Spacing</i>	400m	N/A
	<i>Auxiliary Lane Length (not including storage)</i>	80m	50m
	<i>Curb Radius at Intersections</i>	8m to 25m	8m to 12m
URBAN CROSS SECTION	<i>No. of Lanes</i>	4	2
	<i>Through Lane Width</i>	3.7m	4.0m to 6.5m
	<i>Auxiliary Lane width</i>	3.5m	3.5m
	<i>Median Width</i>	1.0m to 5.0m	N/A
	<i>Basic ROW Width</i>	Varies	20m to 30m
Access Configuration	<i>Minimum Spacing Between Driveways</i>	25m	N/A
	<i>Driveway Width</i>	4m to 9m	4m to 9m
	<i>Driveway Curb Radius</i>	0m (depressed curb) to 8m	0m (depressed curb) to 5m
	<i>Corner Clearance to Access at Signalized Intersections</i>	70m	55m
	<i>Corner Clearance to Access at Stop Controlled Intersections</i>	35m	20m

It should be noted that due to existing property constraints and the number of accesses along the Highway 27 corridor, portions of the improvements do vary from the design standards (predominately access management criteria). These variances were required to minimize land acquisition, provide for feasible improvements while still maintaining accesses to existing properties/businesses where no other desirable alternative could be found. As such the design criteria depicted in Table 3-1 represented a desirable standard that served as a benchmark for the proposed improvements and was used where possible.

In addition to the design criteria depicted in Table 3-1 the proposed Highway 27 improvements took into consideration the appropriate design vehicle requiring access and the need for municipal access in terms of waste removal (garbage pick-up).

3.2 Design Vehicle

The design vehicles used to simulate vehicle turning movements within the study area included passenger cars, single unit trucks and heavy vehicles (WB-23). Turning movement diagrams were produced at the following locations to ensure that the proposed roadway improvements could indeed accommodate the design vehicles:

- *Fuel Stations:* The five existing fuel stations (Shell Gas - at Hwy 27/57th Ave intersection, Fas Gas – at Hwy 27/54th Ave intersection, Mohawk Gas located 100m west of 50th Ave, Esso Station – at Hwy 27/50th Ave and Petro Pass – at Hwy 27/Hwy 2A) that are located adjacent to Highway 27 currently enjoy unrestricted access/egress to the Highway 27 corridor. The proposed Highway 27 improvements, specifically the addition of a center raised median and intersections/access closures, would restrict the number of turning movements permitted at the gas stations; however, access/egress to the facilities would still be provided via adjacent Highway 27 intersections, proposed service roads or existing public roads. Turning movement diagrams were completed at all five fuel stations located adjacent to the Highway 27 corridor assuming a 25m long WB-23 design vehicle. [The WB-23 (Super-B train) vehicle represents the largest turning envelope when compared to “Tri-Tri” heavy vehicles also used to delivery fuel to gas stations]. The turning movement diagrams were produced to ensure that the proposed design could accommodate large tanker refuelling trucks.
- *Parking Facilities:* Passenger car and single unit truck turning simulations were completed for the parking area facing the developments (Hay City Projects, Little House of Wireless, CIR Realtors and Olds Electric) located on the north side of Highway 27 between 55th Avenue and 54th Avenue. The turning simulations indicate that, despite the proposed widening of Highway 27, motorists would be able to manoeuvre and park within the shared parking lots as envisioned within this functional plan.
- *Lanes, Service Roads and intersections:* Heavy vehicle (WB-23) and waste pick-up truck turning simulations were completed at the following locations where the proposed improvements included closures/realignment of roads and intersection modifications:
 - Highway 27/65th Avenue intersection (north leg)

- Highway 27/61st Avenue intersection (south leg service road bulbing)
- residential lane/access located west of 56th Avenue
- side lane located just east of the Plaza 27 building
- Highway 27/Highway 2A intersection

3.3 Waste Removal

During the course of the study CastleGlenn Consultants contacted staff from the Mountain View Regional Waste Management Commission (MVRWMC). This agency is responsible for waste disposal within the Town of Olds. Exhibits depicting the proposed lane and road closures (See Appendix “H”) were forwarded to the MVRWMC. The agency confirmed that:

- the proposed lane and road closures (as depicted on the functional plans) are anticipated to have minimal impact on waste pick-up routes and waste removal vehicles would continue to have access to all residential and commercial lots.
- discussions between the MVRWMC and the Town of Olds have taken place regarding the potential closure of numerous back lanes with direct access to Highway 27. The MVRWMC indicated that waste removal vehicles will be replaced in the near future and the new vehicle configuration may be too large to operate on the narrow back lanes; as such waste pickup would occur in the front of residential lots.

It is recommended that AT in concert with the Town of Olds review the need and justification for all rear-lane connections to the Highway 27 corridor subsequent to resolution of the use of the laneways by the MVRWMC for garbage collection purposes with a view to effecting closures where the laneways would no longer be used for any other purpose.

4.0 HIGHWAY 27 PROPOSED IMPROVEMENTS AND ACCESS MANAGEMENT

The following section of the report identifies the access management strategy and roadway improvements proposed for the Highway 27 corridor. The Highway 27 corridor is divided into the following four segments proceeding from west to east (Sections 4.1 to 4.4) to more easily describe and reference the proposed improvements:

- Section 1: 70th Avenue to 65th Avenue;
- Section 2: 61th Avenue to 55th Avenue;
- Section 3: 54th Avenue to 49th Avenue;
- Section 4: 49th Avenue to East of Highway 2A;

The technical characteristics of the proposed Highway 27 improvement, including intersection modifications, widening and access management, are presented in Annex “C” in the form of 11”x17” functional plans. The plans represent an approximate 3.5 km section of the study corridor and generally depict the following:

- a plan view of the existing and proposed Highway 27 lanes;
- intersection modifications;
- access closures/consolidation;
- proposed service road configurations;
- existing lot lines with proposed highway and service road right-of-way boundaries;
- required right-of-way area; and
- business name information for lots adjacent to Highway 27.

In addition to the functional plans (presented in Annex “C”), Appendix “I” contains exhibits with brief descriptions of the “alternative” Highway 27 improvements that were examined during the study process.

The following sections of the report are intended to compliment the functional plans and as such the the reader is encouraged to reference Annex “C” which depicts the “preferred” Highway 27 access management strategy and highway improvements corresponding to the various segments of the Highway 27 corridor.

4.1 Section 1: 70th Avenue to 65th Avenue (Annex “C”: Functional Plan Sheet 1)

The existing 830m long section of Highway 27 between 70th Avenue and 65th Avenue is a four lane urban divided cross-section (beginning east of 70th Avenue) that can be generally characterized as follows:

- the posted speed for westbound Highway 27 lanes is 50km/hr that transitions to 100km/hr west of 70th Avenue. For the eastbound Highway 27 lanes the posted speed limit is 70km/hr that transitions to 50 km/hr just west of 65th Avenue;
- three major intersections (70th Avenue, 67th Avenue, and 65th Avenue) are located along the corridor with an intersection spacing of approximately 415m. 70th Avenue is STOP controlled on the minor legs while 67th Avenue (“T” intersection configuration) and 65th Avenue are both signalized.
- major retail developments are located on both the north and south side of Highway 27 with access to Highway 27 provided via 67th Avenue and 65th Avenue only.
(The aerial photography in the functional plans does not depict the retail plazas; however, where available, line work has been superimposed over the photo-mosaic depicting the existing plaza and Highway 27 cross-section configuration)

Given this existing section of Highway 27 has been constructed to meet desirable design criteria no improvements along Highway 27 are required and the improvement strategy focuses primarily on the following service road configurations:

- *New service road extending west from 65th Avenue* will allow the closure of the existing west leg of the Highway 27 fronting service road (located at the Highway 27 /65th Avenue intersection). The new service road is offset 110m south of Highway 27 providing for:
 - approximately 85m of storage for the northbound left turn movement at the Highway 27/65th Avenue intersection; and
 - a direct connection from 65th Avenue to the existing retail shopping developments (No Frills), Real Canadian Liquor, Extra Foods) located on the south side of Highway 27 will improve circulation and traffic operations within the area.
- *Modified curb radii* in the northeast quadrant of the of the 65th Avenue /North Service road intersection will provide for improved WB-23 heavy vehicle turning movements. (During the course of the study CastleGlenn was informed that heavy vehicle drivers were experiencing difficulty navigating the service road)
- *East leg of the 65th Avenue/Highway 27 fronting service road* is limited to a right-in/right-out configuration that is enforced with a center raised median located at the south leg of the Highway 27/65th Avenue intersection. The 1.0m median improves traffic separation at the intersection and allows for a protected northbound 85m long dedicated left turn lane.

- A southerly extension of 67th Avenue (See Exhibit 4-1) will provide an additional access to the retail developments located on the south side of Highway 27, allowing motorists to access the shopping plaza using either 67th Avenue and/or 65th Avenue. [The configuration of the 67th Avenue extension and the proposed 65th Avenue service road connection was developed with input from stakeholders and landowners. Appendix “H” contains the exhibit depicting the service road configuration representing the consensus reached between AT and the affected property owners.]



Exhibit 4-1: Southerly Extension of 67th Avenue

It should be noted that for the purpose of this study no improvements are proposed at the Highway 27/70th Avenue intersection given that the future requirements at the intersection are considered to be development driven and will be determined when warranted.

4.2 Section 2: 61st Avenue to 55th Avenue (Annex “C”: Functional Plan Sheet 2)

From a point just east of the Highway 27/61st Avenue intersection, the Highway 27 corridor transitions from a four-lane *rural undivided* cross-section to a four-lane *urban divided* cross-section over a distance of approximately 630m (between the 61st Avenue and 55th Avenue).

The existing segment of the Highway 27 corridor can be characterized as follows:

- the posted speed in both the Highway 27 eastbound and westbound directions is 50 km/hr;
- a total of four intersections are located along the corridor including 3 un-signalized intersections (61st Avenue, 56th Avenue, and 55th Avenue) and one signalized intersection (57th Avenue);
- on the north side of Highway 27 between 57th Avenue and 55th Avenue (approximate 300m separation) four driveways provide direct access/egress from Highway 27 to developments fronting Highway 27 (including: Cam Clark Ford, Sportsman Inn Motel, Sandy’s Restaurant and Bar , and Wendy’s/Tim Horton’s);
- on the south side of Highway 27 between 57th Avenue and 55th Avenue six driveways provide direct access/egress from Highway 27 to residential properties and one gas station (Fas Gas)
- the average Highway 27 intersection spacing is approximately 275m including:
 - 485m between 65th Avenue and 61st Avenue

- 320m between 61st Avenue and 57th Avenue
- 230m between 57th Avenue and 56th Avenue
- 70m between 56th Avenue and 55th Avenue

During the study process five “alternative” design concepts were evaluated and vetted during focus group meetings (See the Public Consultation Report for a detailed description of correspondence with landowners/business representatives.), where stakeholders provided input on various sections of the Highway 27 corridor. (See Appendix “I” for exhibits and descriptions of the alternative designs). Subsequent to the focus group meetings, a “preferred” Highway 27 access management strategy was developed through refinement of the alternative designs.

The “preferred” Highway 27 access management strategy includes the following proposed improvements:

Intersection Improvements

- *Highway 27/61st Avenue Intersection* would remain un-signalized with the addition of intersection bulbing in the south-east quadrant of the intersection. Realigning the service road approximately 20m south of the existing location was found to improve:
 - traffic operations at the intersections by increasing the northbound left-turn storage from 20m to 40m at the intersection; and
 - turning movements for the design vehicle (WB-23).

The proposed realignment (bulbing) of the service road as designed is within a dedicated road right-of-way and no land acquisition is required, however, these lands are currently being encroached upon by RPM Automotive for parking and traffic circulation purposes. A formalized access to the RPM Automotive lot is proposed at the back of the lot that would allow for improved traffic and heavy vehicle circulation within the RPM Automotive site.

Additional improvements proposed at the Highway 27/61st Avenue intersection include:

- closure of the access located in the southeast quadrant of the intersections with a new alternative access provided to the triangular lot (located east of 61st avenue) from 57th avenue; and
- Conversion of the Highway 27/61st Avenue intersection to a “T” configuration by closing Imperial Way. This would be dependant upon the realignment of the service road located east of the Highway 27/57th Avenue intersection. This closure reduces the number of crossing conflicts at the intersection, increases SB-left turn storage (provided at the Highway 27/57th Avenue intersection); and improves turning radii for heavy vehicles using the north service road.
- *Highway 27/57th Avenue Intersection* would remain signalized with the addition of dedicated NB and SB left-turn lanes along 57th Avenue. A new alignment for the west

leg of the Highway 27 fronting service road is proposed in the north-west quadrant of the intersection. The service road (which is conditional upon the redevelopment of the Aloha Mobile Park) will form a new four way intersection with 57th Avenue located approximately 100m north of Highway 27 providing for:

- improved traffic operations at the intersections including 80m of SB left-turn lane storage along 57th Avenue;
- a continuous east-west connection with a new service road proposed east of 57th Avenue;

Signage in conjunction with a designated temporary unloading area is proposed directly adjacent to the Cam Clark Ford lot (located in the northeast quadrant of the Highway 27/57th Avenue intersection). The area is intended to permits heavy vehicles to unload the new passenger vehicles/van/cars/trucks designated for the Ford lot. These vehicles would then re-enter the Highway 27 traffic stream by using the service road west of 57th Avenue. (Annex B presents an alternative access arrangement.)

- *Highway 27/55th Avenue Intersection* would remain un-signalized with the addition of a Highway 27 eastbound left turn lane and a two center left-turn lane beginning east of the intersection. Improvements to the intersections also include a westbound right-turn lane beginning west of the intersection and new sidewalks located on the north side of Highway 27

Access Improvements: South Side of Corridor

The “preferred” Highway 27 access management strategy addresses the accesses along the south side of Highway 27 corridor between 57th Avenue and 55th Avenue as follows:

- *Restricted Movements to Shell Gas Station* – A continuation of a raised center median is proposed along Highway 27 fronting the Shell Gas Station facility. The median will restrict left-turn movements into the gas station from Highway 27 while permitting a NB left-turn from the facility for tanker refueling trucks only. Highway 27 westbound motorists will use the Highway 27/57th Avenue intersection to access the gas station from 50th Street. To improve corner clearance criteria, the closure of the first access to the gas station located 18m east of 57th Ave is proposed (see Exhibit 4-2)



Exhibit 4-2: Shell Gas located at Hwy 27/57th Ave

- Closure of the residential driveway located approximately 60m west of 56th Avenue; [Access to the lot is provided via a laneway connected to 56th Avenue.]
- Closure of the Highway 27/56th Avenue intersection; [Motorists using 56th Avenue to access Highway 27 will divert to the Highway 27/57th Avenue intersection.]
- Monitoring and, when warranted, closure of residential driveways located along Highway 27 between 56th Avenue and 55th Avenue. [Closure of these access is possible given access to the lots is provided via a back lane; however, this will require the reconstruction of the residential garages that currently front Highway 27 that are difficult to access from the back lane.]

Access Improvements: North Side of Corridor

The “preferred” Highway 27 access management strategy addresses the accesses along the *north side of Highway 27 corridor* between 57th Avenue and 55th Avenue as follows:

- a new right-in/right-out only access (located approximately 90m west of 56th Avenue) and closure of all remaining existing access along Highway 27. It is recommended that the access be monitored and closed when warranted. [During the public consultation process (see Highway 27 Public Consultation Report – separate document) representatives from the Tim Horton’s establishment strongly opposed the closure of the existing direct Highway 27 access to Tim Horton’s/Wendy’s as such the RT-in/RT-out access was permitted on a temporary basis];
- a continuous right turn lane extending from 55th Avenue to 57th Avenue. The right turn lane reduces conflicts between Highway 27 eastbound motorists and motorists turning into the developments located on the north side of Highway 27 (includes Wendy’s Tim Horton’s, Sandy’s Restaurant and Bar and Sportsman Inn Motel).
- a new service road extending west from 55th Avenue to 57th Avenue that includes widening of a 125m segment of the existing back lane located south of Shannon drive. The east end of the service road ties into a new 57th Avenue intersection located approximately 100 north of Highway 27. The primary purpose for the service road is to allow the closure of several Highway 27 driveways while providing access to the services located on the north side of Highway 27 (See Exhibit 4-3).



The 150m section of service road directly fronting Highway 27 is located on Provincial lands, as such no property acquisition is required; however, to accommodate the remaining 190m service road length approximately 2200m² of roadway right-of-way is required.

4.3 Section 3: 54th Avenue to 49th Avenue (Annex “C”: Functional Plan Sheet 3)

The existing 800m long section of Highway 27 between the 54th Avenue and 49th Avenue is a four lane undivided cross-section that can be generally characterized as follows:

- the posted speed along the Highway 27 corridor is 50km/hr that transitions to 30km/hr (at specified times during the day) in the vicinity of Olds High School.
- four major intersections (54th Avenue, 52nd Avenue, 50th Avenue, and 49th Avenue) are located along the corridor of which two (54th and 52nd Avenue) are offset or split “T” intersections. Only two (52nd Avenue and 50th Avenue) of the four intersections are signalized with no dedicated left-turn lanes
- approximately 25 driveways (includes both the north and south side of Highway 27) provide direct access to commercial developments. The separation between accesses varies from 8m (in the vicinity of Siesta Motel) to 200m (south side of Highway 27 at the Olds High School property)
- the average Highway 27 intersection spacing is approximately 260m (not including offset intersection configurations of 54th and 52nd Avenue intersections) including:
 - 280m between 54th Avenue and 52nd Avenue
 - 385m between 52nd Avenue and 50th Avenue
 - 115m between 50th Avenue and 49th Avenue

The improvement strategy for this section of Highway 27 focused on reducing the number of access along the Highway 27 corridor and eliminating the offset (split “T”) intersection configurations at 54th and 52nd Avenue. During the study process three alternative design concepts (See Appendix C) were evaluated for this section of Highway 27.

[Generally offset intersections are considered undesirable given the 32 potential turning conflicts that can occur at these intersection where paths of vehicles diverge, merge or cross. As traffic volumes increase the number of turning conflicts have the potential of increasing collision frequency.]

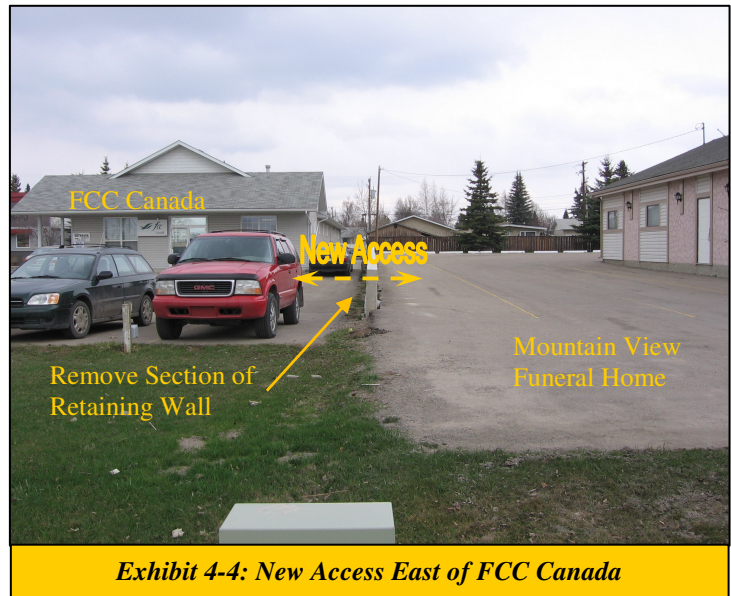
Subsequent to the focus group meetings, a “preferred” Highway 27 access management strategy was developed through refinement of the alternative designs. The “preferred” Highway 27 access management strategy includes the following proposed improvements:

Intersection Improvements

- *Highway 27/54th Avenue Intersection* - The existing un-signalized offset (split “T”) intersection is redesigned to include:
 - a signalized “T” intersection configuration with the north leg of 54th Avenue
 - a right-in/right-out only configuration on the south leg of 54th Avenue.
 - an “in” only access (enforced with signage) to the Fas Gas fuel station located on the south side of Highway 27 that is aligned with the north leg of 54th Avenue. This configuration would allow the Highway 27/54th Avenue intersection to

operate as a signalized “T” configuration. [Under the signalized “T” intersection configuration motorists exiting the Fas Gas facility have the option of proceeding eastbound along Highway 27 using either the right-out access from the gas station or 54th Avenue. Motorists that wish to proceed westbound along Highway 27 can access the Highway via 50th Avenue which connects to the Highway 27/57th Avenue intersection] It may be prudent to accommodate a potential 4-way intersection with the Fas Gas entrance due to future re-development of the site. (This flexibility in operation could be preserved by assuring that the underground conduit is capable of accommodating 4-way signalized traffic operation and implementing the additional Fas Gas traffic signal heads that could support northbound egress traffic, at a time the operation become warranted.)

- *A new intersection located 100m east of 54th Avenue intersection.* This new intersection would be used to consolidate all of the accesses fronting Highway 27 between 54th Avenue and 52nd Avenue (which includes Olds Legion, Plaza 27, FCC Canada, Mountain View Funeral Home, Olds Dental Clinic, Shoppers Drug Mart and Wild Rose Medical Center). The intersection would be two-way STOP controlled and be located adjacent to the Olds Legion. A center median located along Highway 27 would allow for the advent of protected eastbound and westbound left-turn lanes at the intersection and would serve to enforce right-in/right-out access to/from the remaining Plaza 27 and Mountain View Funeral Home accesses. A new east-west access is proposed linking FCC Canada to the Mountain View Funeral Home. The access would require removal of a section of existing retaining wall as depicted. (See Exhibit 4-4.)



- *Highway 27/52th Avenue Intersection-* The existing signalized offset (split “T”) intersection would be reconfigured to:
 - a “T” intersection configuration; (by closing the south leg of 52nd Avenue).
 - provide pedestrian only actuated traffic signals at the north leg of 52nd Avenue (Removal of the existing traffic signals allows for a desirable 520m separation between the signalized Highway 27/54th Avenue intersection and the new signalized Highway 27/51st Avenue Intersection)
 - include closure of the laneway located on the south side of the intersection just east of the Plaza 27 building (See Exhibit 4-5). Closure of the lane will be required on the south side of Highway 27 and east of Plaza 27. If required an alternate access could be provided by extending the lane south to 49th Street. The extension of the lane south to 49th Street, in conjunction with a dedicated

truck turn around area in the vicinity of Ocean's Alive, would accommodate the requirements of Plaza 27 delivery and waste pick up trucks.

- *A new Hwy 27/51st Avenue intersection is proposed.* The intersection would be located approximately 180m west of 50th Avenue to incorporate the northerly extension of 51st Avenue. The intersection

would provide for all directional movements and be controlled by traffic signals. Construction of the intersection along with the 51st Avenue extension would require demolition of the Town of Olds High School buildings and acquisition of approximately 1.9 acres of school property on the north side of Highway 27. During the study process staff from the Chinook's Edge School Division provided comments (See Public Consultation Report) on the proposed 51st Avenue alignment and stated: "We would support the plan that you have outlined, it would create a needed improvement to the road system in that area."

- *Highway 27/49th Avenue Intersection* improvements include widening of Highway 27 in the vicinity of the intersection to accommodate Highway 27 eastbound and westbound left-turn lanes. The proposed Highway 27 eastbound left-turn lane is limited to 25m in length (due to the 60m separation between the intersection and CP rail corridor.) and would accommodate sufficient storage length for 2 to 3 vehicles. The Highway 27 westbound left turn lane is approximately 35m in length and would provide storage for 3 to 4 vehicles. (Extending the lane further east was thought to be undesirable given the adverse impact on residential properties fronting Highway 27.) It is proposed that the 49th Avenue intersection remain STOP controlled; however, subsequent to implementation of the new traffic signals at 51st Avenue it remains prudent to examine the relocation of the existing 50th Avenue traffic signals to 49th Avenue. Relocating the signals would increase the traffic signal separation from 180m (51st Avenue to 50th Avenue) to 300m (51st Avenue to 49th Avenue) allowing for improved traffic signal progression along the Highway 27 corridor.

Improvements to the Highway 27 Corridor

- *A Two way left-turn lane between 55th Avenue and 54th Avenue* has been incorporated into the design to permit motorists to turn left into the following driveways without impeding through traffic on the Highway 27 corridor:
 - a consolidated driveway located on the north side of Highway 27 providing access to Hay City projects, Little House of Wireless Telus, Olds Electric and Two Real Estate companies



Exhibit 4-5: Highway 27/52nd Ave Intersection

- a new shared driveway on the south side of Highway 27 providing access to Guardian Emergency Inc and a residential property located immediately to the west
- *A raised center median along the Highway 27 corridor* is proposed between 52nd Avenue to 40m west of 50th Avenue. The raised median allows for protected left-turn lanes in each direction at the Highway 27/51st Avenue intersection and enforces restricted accesses at the following locations:
 - The east-most accesses from/to the Mountainview Plaza building would be reconfigured to operate as a one way right-out only egress onto Highway 27 westbound (with appropriate signage) allowing heavy vehicles to exit the plaza loading dock area;
 - The two accesses serving the A&W Restaurant would be converted to right-in (east access) and right-out (west access) which would still permit motorists to circulate around the drive-through facility. With the advent of the new east-west roadway at the rear of the A&W westbound Hwy 27 traffic can still access the A&W site from the rear. [The location of the new east-west roadway should remain sensitive to assure that the operation of the A&W drive-through is not impeded];
 - A shared access linking the Dairy Queen-Esso Gas Station facility and Mountain Air Computer located in the vicinity of the property line of would provide for a new right-in/right-out driveway (located approximately 40m west of 50th Avenue) that would consolidate the existing all-movement accesses. The new driveway would allow for the closure of the existing access to the Dairy Queen and Esso Gas Station located approximately 20m west of 50th Avenue and the Mountain Air Computer access located 60m west of 50th Avenue. Relocating the existing access improves the corner clearance at the signalized Highway 27/50th Avenue intersection by 20 meters. [According to the “*Geometric Design Guide for Canadian Roads*” (TAC Figure 3.2.8.2) the minimum separation (corner clearance) between a signalized intersection and a driveway/public lane is 70m; however due to strong opposition from the owner of the Esso Gas station regarding the relocation of his access, the driveway is positioned only 40m from Highway 27/50th Avenue intersection. To date, this compromise solution has still not received the owner’s concurrence. (See Highway 27 Public Consultation Report)]

4.4 Section 4: 49th Avenue to 250m East of Highway 2A (Annex “C”: Functional Plan Sheet 4)

The existing 650m long section of Highway 27 between 49th Avenue and 250m east of Highway 2A can be generally characterized as follows:

- a four lane undivided cross-section that transitions to two lanes approximately 220m east of Highway 2A;
- the posted speed along the Highway 27 corridor is 50km/hr that transitions to 70km/hr approximately 250m east of Highway 2A.
- three major intersections including 48th Avenue (“T” intersection), 47th Avenue (offset “split T” intersection) and Highway 2A (4-way signalized intersection)

- approximately 18 driveways (includes both the north and south side of Highway 27) providing direct access to primarily residential developments.

The “preferred” Highway 27 access management strategy proposes implementing the following closures:

- closure of the lane located on the north side of Highway 27 approximately 75m east of 49th Avenue;
- closure of the lane located on the south side of Highway 27 approximately 55m east of 49th Avenue;
- closure of the two residential driveways located 100m and 170m east of 49th Avenue on the north side of the Highway 27 corridor. [Access to the lots is provided from a back or side lane. The driveways are to be monitored and closed when warranted.];
- closure of the residential driveway located on the south side of Highway 27, located approximately 30m east of 48th Avenue. [Access to the lot is provided from a side lane.]
- closure of the south leg of 47th Avenue. [The design proposes that the northern terminus of the south leg of the intersection be bulbed to eliminate the offset (“split T”) configuration of 47th Avenue.];

In addition to the above closures, the following modifications are proposed at the Hwy 27/Hwy 2A intersection which are intended to improve traffic operations:

- larger (25m) curve radii with channelization in the northwest and southeast quadrants of the intersections will improve turning movements of heavy vehicles (WB-23) while accommodating pedestrians at the traffic islands.
- a southbound Highway 2A right-turn lane that will allow vehicle deceleration and storage in the northwest quadrant of the intersection
- an westbound Highway 27 acceleration lane that will improve free flow of traffic in the southeast quadrant of the intersection



Exhibit 4-6: Access Management in Vicinity of Best Western

- an extension of the existing Highway 27 westbound right-turn to the Highway 2A intersection

- a new driveway connecting the Boston Pizza parking lot with the Petro Pass Highway 27 Access. The new connection would allow for the closure of the existing Boston Pizza driveway located on Highway 27 approximately 100m east of Highway 2A
- a new access connecting the Best Western lot with the Town of Olds Municipal building (see Exhibit 4-6). The new access would allow the closure of the existing Highway 27 driveway that provides access to the Olds Municipal building directly from the highway:
- a continuous Highway center median between Highway 2A and the intersection to the Best Western Lot. The median provides for a protected left-turn lane that would accommodate vehicles turning left into the Best Western, Boston Pizza and Olds Municipal building. A section of the median directly fronting the access to Petro Pass should be depressed to accommodate the heavy vehicles turning left out of the fuel station facility.

5.0 PROJECT STAGING AND COST ESTIMATES

A staging strategy was developed that identified twenty separate improvement packages that can be implemented along the Highway 27 corridor as either separate, sequential or potentially simultaneous projects. This strategy provides AT with the flexibility to respond to specific Highway 27 operational constraints, implement initial low cost improvements and stage construction costs over time.

Table 5-2 to 5-5: Highway 27 Project Staging and Cost Estimate list the proposed improvements for four specific sections of the Highway 27 corridor and classifies each improvement into following four categories:

- *Easily Implementable or “Spot” improvements* generally include access closures and roadway modifications that can be completed at cost ranging from \$20k to \$360k with minimal to no constraints.
- *Constraints to Implementation* represent improvements that can be completed at a cost ranging from \$50K to \$1.3M; however the projects may be subject to the following:
 - opposition from land/business owners that may require resolution prior to construction;
 - potential traffic management issues and traffic delays during construction; and
 - moderate impacts to private property with land acquisition required for road right-of-way purposes.
- *Difficult to Implement* improvements may require a significant amount of private or institutional property and represent the higher end of the construction cost spectrum for this study ranging \$700K to \$2.6M.
- *Development Driven* improvements for Highway 27, service roads and access configurations are estimated at approximately \$500K and can be implemented subsequent to the:
 - redevelopment of an existing commercial or commercial lot such as the Aloha Mobile Park;
 - development of an Area Structure Plan and completion of a Traffic Impact assessment to determine the required improvements

The total construction cost for the Highway 27 improvements is estimated at \$8.7 million including all highway, service road and access modifications. Table 5-1 summarizes the cost estimates provided in Appendix “J”.

Table 5-1: Summary of Costs Classified by Improvement Type

Section of Highway 27	Easily Implementable	Constraints to Implementation	Difficult to Implement	Development Driven
70 th Ave to 65 th Ave (Project 1 to 3)	-	\$346K	-	\$524K
61 st Ave to 52 nd Ave (Project 4 to 13)	\$344K	\$1.89M	\$719K	\$406K
52 nd Ave to 49 th Ave (Project 14 to 17)	\$386K	\$53K	\$2.62M	-
49th Ave to 250m east of Hwy 2A (Project 18 to 20)	\$106K	\$1.35M	-	-
Total	\$836K	\$3.64M	\$3.33M	\$930K

* All Costs includes 30% contingency and 15% for engineering services.

The following items should be taken into consideration when reviewing the cost estimates contained in Appendix “J”:

- The cost estimates provide a 30 percent contingency and an estimate of 15 percent for required engineering services that include planning, design, construction administration and project management.
- The cost of protecting and/or relocating existing utilities is based on a preliminary field investigation and on information provided in the Highway 27:06, Town of Olds – Functional Planning Study (completed by UMA Engineering, October 27, 2006). The utility estimate should be refined at the time of a more detailed utility assessment that will identify the exact location and burial depth of utilities.
- Unit prices used to determine the project cost estimate were referenced from the “Alberta Infrastructure and Transportation Central Region and Provincial Weighted Unit Price Averages Report” based on 2008/2009 Construction prices; however cost of items not listed in the AIT unit price report were assumed.
- The cost of land acquisition for road right-of-way purposes was determined as follows:
 - where a land swap between AT and private landowners is possible/applicable the net cost of land acquisition to AT was assumed to be zero;
 - where a purchase of land is required a unit cost was assumed based on 2008 real estate prices in the Town of Olds (estimated at \$700k/acre for highway commercial); and
 - lands required from the Olds High School property (Chinook’s Edge School Division) where assumed to be transferable to AT at no cost (including the demolition of the school building located on the south side of Highway 27)

Table 5-2: Highway 27 Project Staging and Cost Estimate - 70th Avenue to 65th Avenue

<i>Project Description</i>	<i>Easily Implementable</i>	<i>Constraints to Implementation</i>	<i>Difficult to Implement</i>	<i>Development Driven</i>
Project 1) Highway 27/70 th Ave Intersection– Project definition to be determined at time of completion of Area Structure Plan and Traffic Impact Assessments				Requires resolution of Area Structure Plan in vicinity of intersection.
Project 2) 67 th Ave south leg extension – Includes southerly 160m extension of 67 th Avenue to a preliminary 2 lane local road [Exact configuration of local roadway and intersection to be determined by Town of Olds and land use configuration at completion of Traffic Impact Assessment.]				[\$ 524,300] Requires property resolution involving retail stores (No-Frills/Canadian Liquor) and stakeholders of lands south of Hwy 27
Project 3) 65 th Ave Intersection/Service Road Modifications – Includes new service road extension west of 65 th Ave and improvements to the Highway 27/65 th Avenue intersection		[\$ 346,500] Requires resolution of property concerns involving stakeholders of lands in SW quadrant of intersection		

Table 5-3: Highway 27 Project Staging and Cost Estimate – 61st Avenue to 52nd Avenue

<i>Project Description</i>	<i>Easily Implementable</i>	<i>Constraints to Implementation</i>	<i>Difficult to Implement</i>	<i>Development Driven</i>
Project 4) Highway 27/61 st Ave –Realignment of service road located in the SW quadrant of the intersection and closure of existing access in SE quadrant.	[\$ 144,200] Realignment occurs within existing dedicated road right-of-way, notice of improvements will be required to owners of RPM Automotive			
Project 5) Highway 27/Imperial Way intersection closure & realignment of service road located in NW quadrant of Highway 27/57 th Ave intersection				[\$ 406,300] Can be implemented during the redevelopment of the existing Aloha Mobile Park lands. Property acquisition and/or a land swap with AT is required involving the mobile park lands and existing Highway 27 service road frontage
Project 6) Highway 27/57 th Ave intersection improvements & extension of Highway 27 center median fronting the Shell Gas station facility. Intersection improvements are limited to addition of dedicated left-turn lanes along 57 th Avenue.	[\$ 104,600] Improvements can be implemented within the existing Highway 27 dedicated right-of-way. Notice of the median improvements must be communicated to the Shell Gas Station representatives			
Project 7) Construction of a 150m section of service road, fronting the north side of Highway 27 between 55 th Ave and 57 th Ave including: a proposed right-in/right-out access, closure of all existing Highway 27 accesses, a right-turn lane between 55 th Avenue and the right-in/right-out access. A 10m radius cul-de-sac can be constructed on the west end of the service road to allow vehicles to turn around at the end of the service road		[\$ 398,200] Construction of the fronting section of the service road can be implemented within Provincially owned lands; however, notice of the improvements must be given to the stakeholders located on the north side of Highway 27.		

Table 5-3 Continued: Highway 27 Project Staging and Cost Estimate – 61st Avenue to 52nd Avenue

<i>Project Description</i>	<i>Easily Implementable</i>	<i>Constraints to Implementation</i>	<i>Difficult to Implement</i>	<i>Development Driven</i>
Project 8) A continuation of Project 7, this project includes the northerly and westerly extension of the proposed service road between 55 th Avenue and 57 th Avenue. The 190m service road segment ties into proposed on 57th Avenue located approximately 100m north of Highway 27. In addition the project includes the extension of the Highway 27 westbound right-turn lane from the right-in/right-out access (constructed as part of Project 7) to the Highway 27/57 th Avenue intersection			[\$ 719,000] Construction of this service road requires acquisition of approximately 2200m ² of property for roadway right-of-way that can potentially involve a land swap between AT and the owners of Cam Clark Ford and Sportsman Inn Motel	
Project 9) Closure of 56 th Avenue and one residential driveway with access onto Highway 27 located 60m west of 56 th Avenue.	[\$ 65,100] With Closure of both 56 th Street and the residential driveway, motorists will still be able to access Highway 27 via the Highway 27/57 th Avenue intersection			
Project 10) Closure of Three residential access on the south side of Highway 27 with direct access onto the Highway. (Station 38+3580 to 38+410)		[\$ 121,600] Closure of these access is possible given access to the lots is provided via a back lane; however, this will require the reconstruction of several residential garages that cannot be accessed from the back		
Project 11) Consolidation of accesses to the commercial properties located on the north side of Highway 27 (includes Hay City Projects, Little House of Telus, CIR Realtors, Olds Electric and Lighting). Consolidation of the Guardian Emergency Inc access with the residential property located west of the Guardian Emergency Inc Lot.	[\$ 30,500] Given access to the properties will still be provided from Highway 27 it is anticipated the access consolidations can occur with minimal public resistance			
Project 12) Highway 27 access management between 54 th Avenue and 52 nd Avenue including: <ul style="list-style-type: none"> • construction of a new access located opposite FCC Canada and just east of the Town of Olds Legion building; • closure of the existing Highway 27 access to the Legion and the north driveway providing access to FCC Canada, Olds Family Dental Clinic, Shoppers Drugmart and Wild Rose Medical Center; • closure of the two driveways providing direct access to the Siesta Motel located just west of 52nd Avenue • closure of the most easterly Plaza 27 driveway and the lane located immediately east of Plaza 27. Closure of the side lane will require property acquisition from the Oceans Alive property to allow for turnaround of waste removal trucks at the northern terminus of the lane. • conversion of the Mountainview Funeral Home driveways and the driveway located in the middle of Plaza 27 (directly opposite Mountainview Funeral Home) to a right-in/right-out only configuration enforced by signage 		[\$ 166,200] The proposed access management strategy on the north side of Highway 27 including the construction of a new access at FCC can be accommodated on Provincially owned lands. A new retaining wall will be required at the FCC/ Mountainview Funeral Home property line to provide a new driveway into the funeral home. On the south side of Highway 27 private property/paved area is required from Oceans Alive property to allow for the closure of the lane located east of Plaza 27. Generally some constraints including opposition from affected property owners.		
Project 13) Widening of Highway 27 between 55 th Avenue and 52 nd Avenue to accommodate: <ul style="list-style-type: none"> • a Highway 27 eastbound left-turn lane at the Highway 27/55th Avenue intersection • a two way left-turn lane between 55th Avenue and 54th Avenue 		[\$ 1,212,400] The widening of this section of Highway requires minimum land acquisition with the majority of the		

Table 5-3 Continued: Highway 27 Project Staging and Cost Estimate – 61st Avenue to 52nd Avenue

<i>Project Description</i>	<i>Easily Implementable</i>	<i>Constraints to Implementation</i>	<i>Difficult to Implement</i>	<i>Development Driven</i>
<ul style="list-style-type: none"> dedicated left-turn lanes with a center raised median along Highway 27 at 54th Avenue intersection, new FCC Canada/Legion intersection and the 52nd Avenue north leg intersection <p>East of the 52nd Avenue the Highway 27 widening can transition back to the existing four lane undivided cross-section</p>		improvements occurring within the existing Highway 27 right-of-way. Traffic management during construction, and impacts to business located adjacent to the corridor during the construction, is a potential concern that may require mitigation measures		

Table 5-4: Highway 27 Project Staging and Cost Estimate – 52nd Avenue to 49th Avenue

<i>Project Description</i>	<i>Easily Implementable</i>	<i>Constraints to Implementation</i>	<i>Difficult to Implement</i>	<i>Development Driven</i>
Project 14) Construction of a new access located along the north leg alignment of the future Highway 27/51 st Avenue intersection. The new access will allow for the closure/consolidation of the existing KFC and Yannis Place driveways into one central access located between the two lots.	<p>[\$ 22,000]</p> <p>The proposed shared access is located on the Olds High School property; therefore, an agreement is required with the Chinook's Edge School division. Given the school supports the proposed improvements, no major opposition for the construction of the access is anticipated</p>			
Project 15) Consolidation of the existing Highway 27 driveway at the Dairy Queen/Eso Station with the adjacent access located opposite Mountain Air Computer (approximately 42m west of 50 th Avenue)		<p>[\$ 53,000]</p> <p>The primary issue associated with the construction of the Dairy Queen/Eso station may be the strong opposition by the owner of the facility to relocate the access</p>		
Project 16) Improvements to the Highway 27/49 th Avenue intersection specifically widening to accommodate the proposed Highway 27 left-turn lanes	<p>[\$ 364,100]</p> <p>Only minor land acquisition (approximately 160m²) is required to accommodate the proposed Highway 27 widening therefore no major opposition to the project are anticipated</p>			
<p>Project 17) Construction of a new Highway 27/51st Avenue intersection including:</p> <ul style="list-style-type: none"> a north and south 51st Avenue extension requiring the demolition of the Olds High School building; 180m long east-west service road located 100m north of the Highway 27/51st Avenue intersection; 350m long Highway 27 raised center median beginning at 52nd avenue and ending approximately 40m west of 50th Avenue; closure of the south leg of 52nd Avenue; signalization of 51st Avenue and 54th Avenue; and modification of 52nd Avenue traffic lights to pedestrian actuated lights only 			<p>[\$ 2,617,800]</p> <p>Project 17 represents the most costly improvements proposed along the Highway 27 corridor. The Chinooks Edge School Division supports the construction of the Highway 27/51st Avenue intersection (See Highway 27 Public Consultation Report – Separate document); however, several constraints will have to be addressed including:</p> <ul style="list-style-type: none"> acquisition of approximate 3 acres of school property demolition of existing High School building potential traffic constraints during Highway 27 construction 	

Table 5-5: Highway 27 Project Staging and Cost Estimate – 49th Avenue to 250m East of Highway 2A

<i>Project Description</i>	<i>Easily Implementable</i>	<i>Constraints to Implementation</i>	<i>Difficult to Implement</i>	<i>Development Driven</i>
<p>Project 18) Highway 27 access management between 49th Street and 250m east of Highway 2A including:</p> <ul style="list-style-type: none"> • on the north side of Highway 27 closure of a lane located approximately 75m east 49th Avenue (Station 39+390) • on the south side of Highway 27 closure of the lane located approximately 50m east of 49th Avenue (Station 39+361) • closure of the south 47th Avenue leg and a residential access located 30m east of 48th Avenue (Station 39+550) • potential closure of two residential access (See Annex “C” Functional Plans Sheet 3 and Sheet 4) (Station 39+400 to 39+500) 	<p>[\$ 69,500]</p> <p>Opposition to the access closures from some residents is expected; however, generally the proposed improvements should be implemented with minimal constraints.</p>			
<p>Project 19) Consolidation of Highway 27 accesses in the vicinity of Best Western located on the north side of Highway 27 including:</p> <ul style="list-style-type: none"> • closure of the access to the Boston Pizza parking lot • closure of the access to the Town of Municipal building • construction of a new access east of the Best Western front parking lot to the Town of Olds Municipal building 	<p>[\$ 36,300]</p> <p>No major constraints are anticipated with the proposed access consolidation. The Town of Olds, Best Western and Boston Pizza will have to be notified prior to construction</p>			
<p>Project 20) Improvements to the Highway 27/Highway 2A intersection including:</p> <ul style="list-style-type: none"> • widening of Highway 27 to accommodate the raised center median east of Highway 2A with a new left turn lane proposed to the Best Pizza/ Best Western access • improvements to the curb radii specifically in the NW and SE quadrant of the Highway 27/Highway 2A intersection • Widening of Highway 27 to accommodate the proposed eastbound merge lane located on the south side of Highway 27 		<p>[\$ 1,348,500]</p> <p>To accommodate the curb radii improvements proposed in the four quadrants of the Highway 27/Highway 2A intersection approximately 400m² of right-of-way is required from private lands; however, the majority of the improvements are proposed within the existing Highway 27 right-of-way. A potential constraint may be traffic management during the construction of the Highway 27 widening.</p>		

6.0 PUBLIC CONSULTATION SUMMARY

The public involvement strategy for the Highway 27 Functional Planning Study in the Town of Olds involved inviting business owners, property owners, Town Councilors and residents that could potentially be impacted by the proposed Highway 27 improvements and access management strategy to several focus group meetings. Two sets of focus group meetings were arranged on the following dates with the objective of discussing and obtaining public feedback on the proposed concepts:

- Focus Group Meetings No. 1 - October 27th and 28th, 2008;
- Focus Group Meetings No. 2 - November 18th, 2008.

Focus Group Meeting No. 1

Focus Group Meeting No. 1 consisted of four sessions held at the Town of Olds Royal Canadian Legion #105. Each session was held at various times to assure that invitees could find it convenient to attend. As well, the sessions were structured geographically so as to permit attendees to emphasize the various segments along the Highway 27 corridor that would be of most interest to them:

- 1) 70th Avenue to 57th Avenue - Monday October 27th, 2008 at 2:00 pm
- 2) 57th Avenue to 54th Avenue - Monday October 27th, 2008 at 6:00 pm
- 3) 54th Avenue to 49th Avenue - Tuesday October 28th, 2008 at 9:00 am and
- 4) 49th Avenue to east of Hwy 2A - Tuesday October 28th, 2008 at 2:00 pm.

The purpose of these sessions was to present the consultant's preliminary access management strategy to land/business owners and residents who would be directly affected by the proposed improvements, and consequently, obtain feedback on the concepts presented. Several alternative improvement scenarios were presented and discussed during the sessions. The ratio of public attendance at the meetings to the number of invitation letters sent out for each meeting was determined to be as follows:

- Session 1 (70th Avenue to 57th Avenue) - 25 letters of invitation, 11 landowners in attendance,
- Session 2 (57th Avenue to 54th Avenue) - 46 letters of invitation, 13 landowners in attendance
- Session 3 (54th Avenue to 49th Avenue) - 27 letters of invitation, 9 landowners in attendance
- Session 4 (49th Avenue to east of Hwy 2A) - 22 letters of invitation, 9 landowners in attendance

The general issues and concerns expressed by the public in the first set of focus group meetings focused on the effects of the proposed Highway 27 improvements and access modifications on:

- *turning movements of emergency and heavy vehicles* (tanker refueling trucks & WB-23 vehicles). CastleGlenn addressed these concerns by presenting vehicle turning diagrams (WB-23, passenger car & single unit trucks) at locations where turning movements could be an issue;
- *accessibility to business and residential properties* fronting Highway 27. Every effort was undertaken during the focus group sessions to develop compromise solutions that would address the operational issues along Highway 27 while still providing access to businesses/residences. This was generally achieved by consolidating adjacent Highway 27 driveways and/or constructing service road segments to provide access to all properties located adjacent to the Highway 27 corridor; and
- *removal of Parking stalls* along lots fronting Highway 27. CastleGlenn addressed these concerns by indicating that in several areas along Highway 27 (specifically on the north side of Highway 27 from 57th Avenue to 55th Avenue and 54th Avenue to 52nd Avenue) existing parking stalls are located on lands owned by the Province of Alberta; as such, the use of these lands for parking is at the discretion of Alberta Transportation who may remove the parking to accommodate the proposed Highway 27 improvements.

Focus Group Meeting No. 2

Focus Group Meeting No. 2 (held at the Town of Olds Royal Canadian Legion #105) consisted of two sessions that occurred 3 weeks after the first set of focus group meetings. The first session occurred on November 18th, 2008 at 10:00 am with an attendance of 17 property owners (from an invited 49) located adjacent to Highway 27 between 70th Avenue and 54th Avenue. The second session occurred on November 18th, 2008 at 2:00 pm with an attendance of 17 property owners (from an invited 71) located between 54th Avenue and east of Highway 2A.

The primary objective of the second set of focus group meetings was to present the consultant's "preferred" Highway 27 improvements. Generally the feedback obtained from the public was positive and the majority of concerns expressed by individual land/property owners in the previous sessions were addressed; In general, opposition to the preferred design was voiced by only a few attendees.

A summary of issues raised during the focus groups and CastleGlenn's response to each specific issue has been documented in the public consultation report. (Separate document: See Table 3.0.)

7.0 FINDINGS AND RECOMMENDATIONS

7.1 Findings

The following sections summarize the findings of this functional planning study.

7.1.1 The General Study Area

The study area focuses on a 3.5km segment of Highway 27 (from 70th Avenue to East of Highway 2A) through the Town of Olds that can generally be characterized as follows:

- *Classification:* According to *AT Geometric Design Guide Figure I-1.2i* within Highway 27 is classified as a “Multi Lane” highway
- *Cross-Section:* Highway 27 is a four-lane urban divided roadway between 70th Avenue and 57th Avenue. East of 57th Avenue to Highway 2A the cross-section is four lanes undivided that transitions to two lanes undivided east of Highway 2A
- *Posted Speed Limits:* Through the urban core the Highway 27 posted speed limit is 50km/hr except in the vicinity of the Olds High School where the limit is reduced to 30km/hr for specific hours. In the vicinity of the town boundaries the posted speed limit transitions from 70km/hr to 100 km/hr outside the town limits.
- *Highway 27 Intersections:* 13 intersections are located along the highway corridor with an intersection spacing that varies from 50m to 410m (see Exhibit 1-1). Six intersections are signalized (67th Ave, 65th Ave, 57th Ave, 52nd Ave, 50th Ave, and Highway 2A) and three are offset (Split “T”) intersections (54th Ave, 52nd Ave and 47th Ave).
- *Highway 27 Accesses/Driveways:* Approximately 60 accesses/driveways are located along the Highway corridor (primarily through the urban core). The driveway’s are separated by a spacing that varies from 8m to 200m and provide for all directional access from Highway 27 to retail and commercial developments located adjacent to highway.
- *Utilities:* Utilities located adjacent to the Highway 27 corridor include Telus, Atco, TCPL, Fortis Bell, Street Lights and municipal wet utilities (storm, sanitary and water).

7.1.2 Traffic Volumes

Traffic forecasts were prepared that accounted for an average annual growth rate of 3.0% in traffic volumes over a 10 year time horizon. The forecast traffic was then applied to the intersection and access modifications recommended within this study. The findings indicated that the proposed roadway modifications are anticipated to provide satisfactory levels of service (LOS “D” or better) during both morning and afternoon peak hours of travel demand even past the 10-year horizon period. Beyond this time frame, however, traffic

characteristics become highly dependent on future development initiatives and the continued growth patterns associated with highway through traffic from nearby communities accessing the community of Olds. It was anticipated that more significant solutions would be required within the 15 year time frame.

7.1.3 Proposed Highway 27 Improvements

The proposed Highway 27 improvements and access management strategy focuses on improving the operations and safety along the corridor by implementing the following:

- *Realignment/relocation of intersections* –To improve intersection spacing and reduce the number of vehicle turning conflicts at intersections the following improvements are proposed:
 - closure of north leg of 61st Avenue (Imperial Way)
 - closure of 56th Avenue
 - converting 54th Avenue (south) to right-in/right-out only and signalization of 54th Avenue (north)
 - reverting 52nd Avenue (south) to right-in/right-out only and converting 52nd Avenue (north) to pedestrian actuated signals only
 - construction of a new Highway 27/51st Avenue intersection located approximately 180m west of 50th Avenue
 - closure of 47th Avenue (south)
- *Highway 27 Intersection geometrical improvements*- Geometrical and lane configuration improvements are proposed at the following Highway 27 intersections:
 - 65th Avenue - improved curb radii on the north leg of 65th Avenue and construction of a protected northbound left-turn lane on the south leg of 65th Avenue;
 - 57th Avenue – dedicated left-turn lanes with short medians on both sides of 57th Avenue. Addition of a dedicated Highway 27 westbound right-turn lane;
 - 55th Avenue – new Highway 27 eastbound left-turn lane;
 - 54th Avenue (north) – dedicated eastbound and westbound left-turn lanes along Highway 27 providing for access into the Fas Gas facility and the north leg of 54th Avenue;
 - 52nd Avenue (north) – dedicated Highway 27 eastbound left-turn lane with a raised median;
 - 51st Avenue – the new intersections includes dedicated left-turn lanes in all four quadrants of the intersection;
 - 49th Avenue - dedicated Highway 27 eastbound and westbound left-turn lanes; and

- o Highway 2A – curb radii improvements in the SE and NW quadrants of the intersection including channelization. Addition of Highway 27 eastbound and westbound right-turn lanes at the intersection.
- *Access Modifications* – The access management strategy included reducing the number of driveways and lanes with direct access onto Highway 27 from the approximate 60 existing accesses to the proposed 26 accesses
- *New Service Road and Local Roadway Segments* – To allow for the closure/consolidation of private access along Highway 27 and to improve operation at intersections, service roads are proposed in the following locations:
 - o in the SW quadrant of the Highway 27/65th Avenue intersection a new service road is proposed extending west from 65th Avenue. The road provides for improved left-turn storage along 65th avenue and allows for a direct connection between 65th avenue and the retail developments (No Frills/Canadian Liquor) located on the south side of Highway 27 between 70th Avenue and 65th Avenue;
 - o in the NW quadrant of the Highway 27/57th Avenue intersection realignment of the existing service road (fronting Highway 27) is proposed. The new alignment allows for improved left-turn lane storage along 57th Avenue and a new 57th Avenue 4-way intersection located approximately 100 north of Highway 27.
 - o between 57th Avenue and 55th Avenue an approximately 340m long service road is proposed that will allow for the consolidation of several accesses located on the north side of Highway 27
 - o as part of the new Highway 27/51st Avenue intersection a new north and south extension of 51st Avenue is proposed. In addition an east-west service road is proposed on the north side of Highway 27 on the Olds High School property that will allow for the consolidation of several Highway 27 accesses in the vicinity of the new intersection

7.1.4 Proposed Staging Strategies

The following staging strategy identifies twenty separate improvement projects that can be implemented along the Highway 27 corridor: (The projects are classified into four categories including Easily Implementable, Constraints to Implementation, Difficult to Implement and Development Driven projects)

- **Easily Implementable** improvement projects (**Total Cost \$838K**) generally include access closures and roadway modifications that can be completed with minimal to no constraints:
 - o *Highway 27/61st Ave Intersection (Project Cost \$144K)*: Realignment of service road located in the SW quadrant of the intersection and closure of existing access in SE quadrant

- *Highway 27/57th Ave Intersection* (Project Cost \$104K): Addition of NB and SB dedicated left-turn lanes on 57th Avenues and extension of Highway 27 raised center median fronting the Shell Gas station facility.
- *56th Avenue* (Project Cost \$65K): Closure of 56th Avenue and one residential driveway with access onto Highway 27 located 60m west of 56th Avenue
- *Consolidation of Accesses between 55th Avenue & 54th Avenue* (Project Cost \$30K): Consolidation of access to the commercial properties located on the north side of Highway 27 (includes Hay City Projects, Little House of Telus, CIR Realtors , Olds Electric and Lighting). Consolidation of the Guardian Emergency Inc access with the residential property located west of the Guardian Lot
- *Construction of a New Access* (Project Cost \$22K): The access is proposed on the north side of Highway 27 opposite the Olds High School (Hwy 27 Sta 39+017). The new access will allow for the closure/consolidation of the existing KFC and Yannis Place driveways into one central access located between the two lots.
- *Highway 27/49th Avenue Intersection* (Project Cost \$365K): Widening of Highway 27 to accommodate proposed eastbound and westbound Highway 27 left-turn lanes
- *Access Management Between 49th Street and East of Highway 2A* (Project Cost \$70K): on the north side of Highway 27 closure of a lane located at Hwy 27 Sta 39+390; on the south side of Highway 27 closure of the lane located at Hwy 27 Sta 39+361, closure of the south leg of 47th Avenue, on the south side of Highway 27 closure of a residential drive located at Hwy 27 Sta 39+550, potential closure of two driveways located between Hwy 27 Sta 39+400 to 39+500
- *Consolidation of Highway 27 Accesses in the Vicinity of Best Western* (Project Cost \$36K) includes closure of the access to the Boston Pizza parking lot, closure of the access to the Town of Olds Municipal building, construction of a new access east of the Best Western front parking lot to the Town of Olds Municipal building
- **Constraints to Implementation** represent improvement projects (Total Cost \$3.64M) that may be subject to constraints including: opposition from land/business owners, potential traffic management issues/delays during construction and moderate impacts to private property:
 - *Highway 27/65th Avenue Intersection* (Project Cost \$346K): includes construction of a new 160m long service road extending west of 65th Ave and improvements to the Highway 27/65th Avenue intersection
 - *New 150m section of Service Road* (Project Cost \$398K) fronting the north side of Highway 27 between 55th Ave and 57th Ave including: a proposed right-in/right-out access, closure of all existing Highway 27 accesses, a right-turn lane between 55th Avenue and the right-in/right-out access.
 - *Closure of Three Residential Access* (Project Cost \$121K) located on the south side of Highway 27 between 56th Avenue and 54th Avenue (Hwy 27 Sta 38+350 to 38+410).

- *Access Management Between 54th Avenue and 52nd Avenue* (Project Cost \$166K): includes closures of exiting driveways and construction of alternative access to FCC Canada, Siesta Motel, Mountain View Funeral Home and Plaza 27
- *Widening of Highway 27 Between 55th Avenue and 55th Avenue* (Project Cost \$1.2M): to accommodate intersection auxiliary lanes, raised Highway 27 center median and a Highway 27 two way left-turn lane between 55th Avenue and 54th Avenue.
- *Closure of the Dairy Queen/Esso Station Access* (Project Cost \$53K) and construction of a new access located at the property line between Dairy Queen/Esso Station and Mountain Air Computer (approximately 42m west of 50th Avenue, Hwy 27 Sta 39+150)
- *Highway 27/Highway 2A Intersection* (Project Cost \$1.35M): includes widening of Highway 27 to accommodate a Highway 27 raised center median located on the east side of the intersection and an EB merge lane. Additional modifications include curb radii improvements in the NW and SE quadrants of the intersections and a Highway 2A SB right-turn lane.
- **Difficult to Implement** improvement projects (**Total Cost \$3.33M**) constitute projects that require significant land acquisition and represent the higher end of the construction cost spectrum for this study:
 - *Continuation of Proposed Service Road between 55th Avenue and 57th Avenue* (Project Cost \$720K) includes the 190m extension of the fronting service road that ties into the proposed intersection on 57th Avenue located approximately 100m north of Highway 27. In addition this project includes the extension of the Highway 27 westbound right-turn lane from the right-in/right-out access (constructed as “Constraints to Implementation Project”) to the Highway 27/57th Avenue intersection.
 - *Highway 27/51st Ave Intersection* (Project Cost \$2.67M): Construction of a new Highway 27 intersection that includes: a north and south extension of 51st Avenue (through the Town of Olds School Property), a Highway 27 center median between 52nd Avenue and 50th Avenue, and signalization of 51st Avenue and 54th Avenue
- **Development Driven** improvement projects (**Total Cost \$930K**) can be implemented subsequent to redevelopment of an existing parcel of land and/or development of an Area Structure Plan to determine the required roadway improvements
 - *Highway 27/70th Ave Intersection* (Project Cost to be determined): Required improvements at the intersection will be determined subsequent to the development of an Area Structure Plan and completion of Traffic Impact Assessment
 - *Highway 27/Imperial Way Intersection* (Project Cost \$400K): Includes closure of the intersection and realignment of the fronting service road located in the NW quadrant of the Highway 27/57th Avenue intersection. The improvements can be implanted subsequent to the redevelopment of the Aloha Mobile Park lands.

7.2 Recommendations

It is recommended that.....

1. The infrastructure improvements consistent with the *Highway 27- Town of Olds Functional Planning Study* be received by Alberta Transportation;
2. The Town of Olds be informed that the *Highway 27 Functional Planning Study* represents a planning document and as such highway intersection / widening construction are currently not scheduled.
3. The Town of Olds Council be requested to incorporate the *Highway 27- Town of Olds Functional Planning Study* within the town's municipal development plans;
4. Subsequent to Alberta Transportations endorsement of the *Highway 27- Town of Olds Functional Planning Study*, the Province be encouraged to pursue those initiatives necessary to undertake detailed engineering of the proposed improvements. These activities would likely include, but are not limited to:
 - a) Monitoring vehicular traffic at critical intersections along the Highway 27 corridor to enable AT to assess warrants for signalization and/or infrastructure improvements;
 - b) Determine the timing and sequence of the proposed improvements projects; (identified as 20 improvement projects in section 5.0 of this study)
 - c) A presentation to the Town of Olds Council with the goal of seeking endorsement of those components of functional plan that would proceed to detailed design;
 - d) Meetings with owners of properties that require land acquisition for road right-of-way purposes including Chinook's Edge School Division; and
 - e) Coordinating lane closures along the Highway 27 corridor with the Town of Olds and the Mountain View Regional Waste Management Commission (MVRWMC).