

EXECUTIVE SUMMARY

This functional planning study represents a component of a series of planning assignments mandated under the Northeast Alberta Transportation Corridor (NATC) initiative. The NATC initiative is intended to facilitate inter-municipal travel demand to/from Alberta's northern communities.

NATC
Component

Existing Conditions

The section of Hwy 28A:03/28:04 addressed within this functional planning study has a total length of approximately 21 km and is classified as a Level 1 (Freeway/Expressway Standard) facility. Within the study area, the highway:

Length &
Classification

- has, over the majority of its length, a posted speed limit of 100 kph. Within the vicinity of the Hwy 28A:03/Hwy 37 at-grade intersection (along a 600m segment) a posted speed limit of 70kph is evident. A posted speed of 80kph exists along a 950m segment of Hwy 28A:03 within the vicinity of the Town of Gibbons;
- connects with Highway 37, Highway 643 and Highway 28:02 all of which are provincially-significant highway corridors;
- connects with 9 at-grade intersections. All of the existing at-grade intersections within the study area are STOP-controlled with the exception of the traffic-signal controlled Hwy 28A/Hwy 37 intersection.
- There are approximately 58 driveways/accesses that currently connect directly to the Highway 28A:03/28:04 corridors. Some of these driveway accesses are redundant and/or are located a short distance from adjacent public roadways and do not conform to the minimum spacing standards
- The land use within close proximity to the study area include:
 - residential and commercial properties within the vicinity of the Town of Gibbons;
 - country residential and agricultural acreages along and adjacent to the corridor;
 - industrial parks serving both Gibbons and Sturgeon County;
 - provisions for the planned Heartland Industrial Area (which is a major industrial area located east of Gibbons and west of the North Saskatchewan River); and
 - recreational uses such as the Goose Hummock Golf Resort.
- The Highway 28A:03 corridor runs immediately to the east of the Town of Gibbons (2007: 2,900 population, 1,000 dwellings) located approximately 37 km north of the Edmonton's downtown. The Town of Gibbons has expressed the desire to limit to the greatest extent possible, any negative impacts associated with the ultimate alignment and interchange requirements.
- Sturgeon County maintains an extensive network of Township and Range Roads within the study area serving clusters of existing and planned country residential and industrial developments.

Highway
Connections

Accesses

Land Uses

Town of
Gibbons

Sturgeon
County

- Current traffic volumes along Highway 28A:03;
 - between Highway 37 and the Town of Gibbons/50th Avenue, are approximately 7,600 vehicles per day (vpd) and are growing at an annual rate of approximately 2.1 percent.
 - Traffic generated by the Town of Gibbons community (on 50th Avenue and 53rd Avenue) is 5,700 AADT with 65% originating from, and destined to the south.
 - Traffic generated by Highway 643 is 2,050 AADT with 70% originating from, and destined to the south.
 - Eastbound between Hwy 643 and the Hwy 28A/28 interchange traffic volumes (2009) decreased to 4,100 vpd; and
 - between the Hwy 28A/28 interchange and north of Twp Rd 570, traffic volumes (2009) along the Hwy 28:04 corridor range from 6,000-to-7,100 vpd and characterized by an annual growth rate of 2.0 percent.
 - Traffic generated by the Hwy 28:02 corridor is 3,600AADT with 85% originating from, and destined to the north.

Traffic Volumes

The reason or the drop in traffic between Hwy 643 and the Hwy 28A/28 interchange is the effect of Gibbons, Highway 643 and the Hwy 28:02 corridors

Forecast Growth

- The population of the overall study area was estimated to rise to 21,200 persons by 2041 and 56,650 persons by 2112 with the urban centres of Gibbons, Redwater and Bon Accord accounting for 68% of the population forecast by 2041.
- The employment of the overall study area was forecast to rise to 15,250 jobs by 2041 and 32,640 jobs by 2112. By 2041, the majority (75%) of employment within the study area can be attributed to the Heartland Industrial Area with 18% attributed to the three urban centres: [Town of Gibbons, Redwater and Bon Accord]. By 2112, the Heartland Industrial Area was forecast to account for 47% of the total employment in the study area with the three major areas accounting for 17%. The remainder of the employment was forecast to occur within the adjacent rural areas.
- Peak hour two-way traffic volumes on ...
 - *Highway 28:04* north of the proposed Twp Rd 564 interchange are forecast to increase to 5,500 vph by 2112.
 - *Hwy 28A:03* in the vicinity of the Town of Gibbons are forecast to reach 8,200 vph by 2112. [However, 5,800 vph are travelling in the dominant direction of travel.]
 - *Hwy 28A:03* in the vicinity of the Twp Rd 554 corridor are forecast to reach 10,150 vph south of the Twp Rd 554 interchange.

Population Growth

Employment Growth

Traffic Growth

The Preferred Design [See Exhibit ES-1 and ES-2]

- The Hwy 28A:03/28:04 corridor would be widened to provide a 39m centreline and spaced as follows:
 - 4 lanes from Hwy 37 (South Study limit) through to the Town of Gibbons
 - 4 lanes from Town of Gibbons to North Study Limit (N of Twp Rd 570)

Additional Lanes

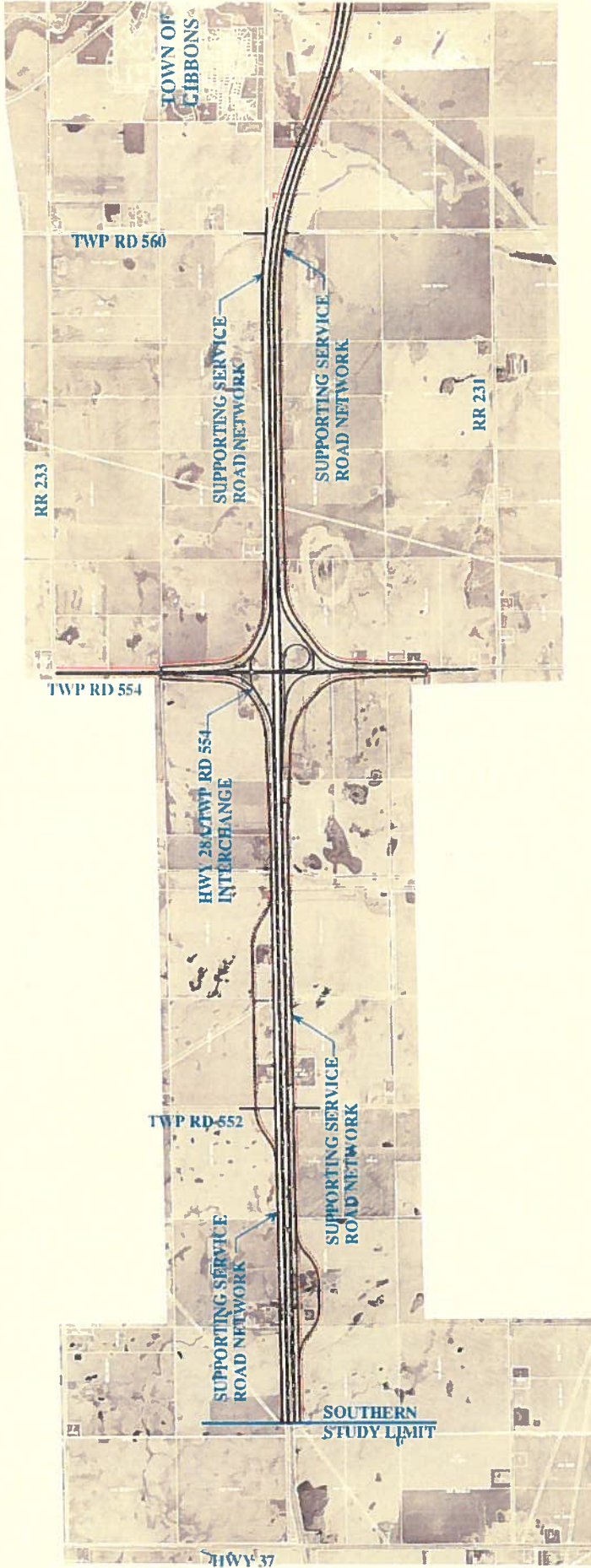
EXHIBIT: ES-1

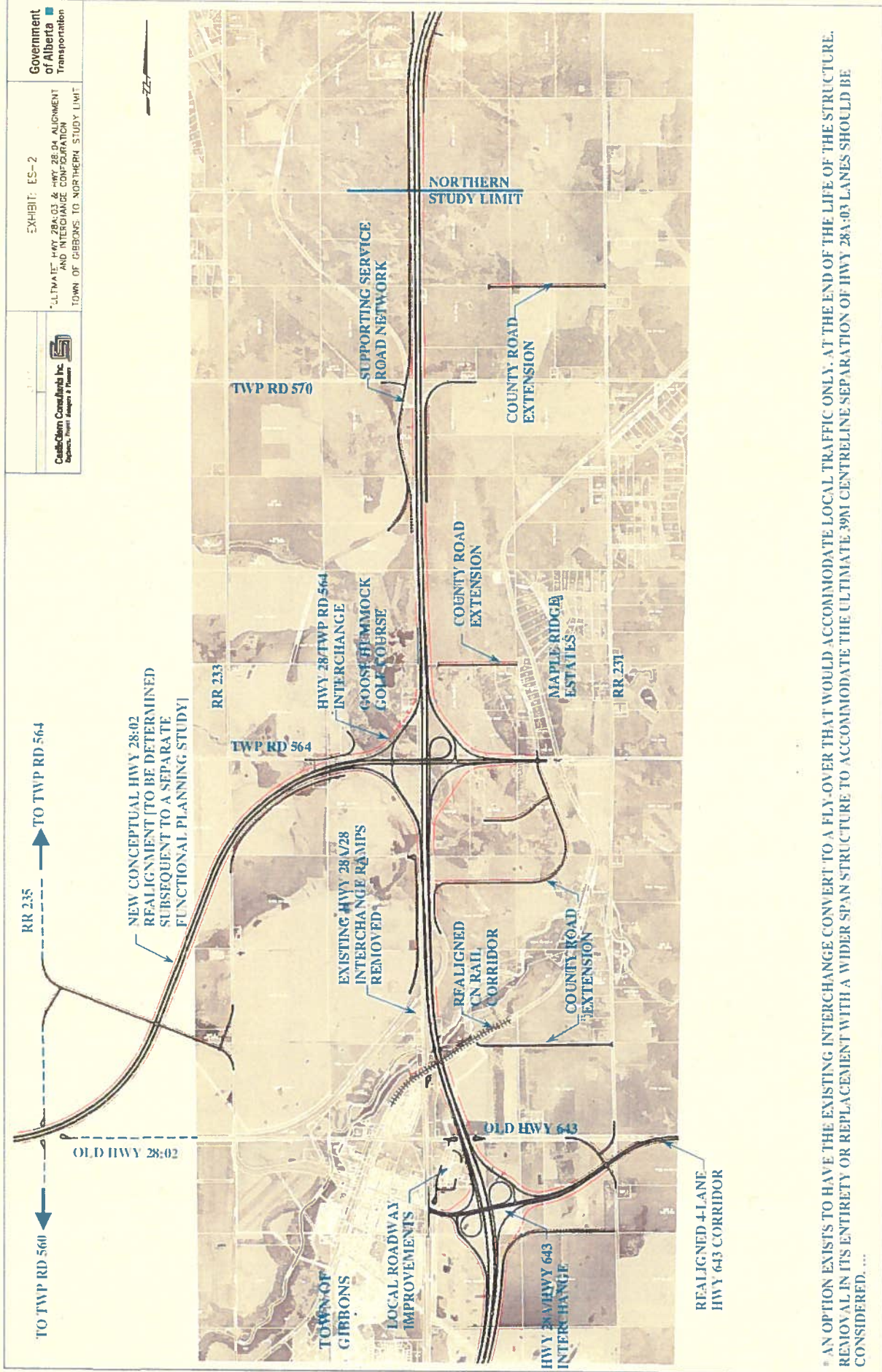
Government of Alberta
Transportation

ULTIMATE HWY 28A/28 & HWY 28/28 ALIGNMENT AND INTERCHANGE CONFIGURATION
SOUTHERN STUDY LIMIT TO THE TOWN OF GIBBONS



ZZ





* AN OPTION EXISTS TO HAVE THE EXISTING INTERCHANGE CONVERT TO A FLY-OVER THAT WOULD ACCOMMODATE LOCAL TRAFFIC ONLY. AT THE END OF THE LIFE OF THE STRUCTURE, REMOVAL IN ITS ENTIRETY OR REPLACEMENT WITH A WIDER SPAN STRUCTURE TO ACCOMMODATE THE ULTIMATE 39M CENTRELINE SEPARATION OF HWY 28A-03 LANES SHOULD BE CONSIDERED. ...

- 6-lanes (2-lane widening) from Twp Rd 554 to Twp Rd 564 when warranted; and
- 8-lanes (4-lane widening) from Hwy 37 to Twp Rd 554 when warranted.
- It was found that approximately 60% [12.3 km of 20.3 km] of the existing corridor can be incorporated into the preferred “ultimate” design;
- The following three interchanges were identified as being necessary to accommodate the ultimate demand requirements associated with the Hwy 28A:03/28:04 corridor:
 - The *Hwy 28A/28 Interchange* would be ultimately relocated approximately 2 km north of its existing location to connect with Twp Rd 564. A 7-lane bridge structure (4WB-3EB) with a double loop in the north-east quadrant was found to be required to satisfy the “ultimate” forecast traffic volumes;
 - The *Hwy 28A / Hwy 643 Interchange* would provide for a 6-lane bridge structure (3WB-3EB) with a single loop in northeast quadrant and southwest quadrant was found to be required to satisfy the “ultimate” forecast traffic volumes; and
 - The *Hwy 28A / Twp Rd 554 Interchange* would provide for a 4-lane bridge structure (2WB-2EB) with a single loop in the northeast quadrant;

Future Interchanges

An option exists to have the existing Hwy 28A/28 interchange structure revert to a fly-over that would accommodate local traffic only. [See Exhibit ES-2 Note.]

- All three interchanges would initially be developed as diamond configurations and ultimately expanded with the required loop ramp configurations when warranted. The three new interchanges would be spaced as follows:
 - Hwy 37 interchange to Twp Rd 554 interchange: 6.5 km
 - Twp Rd 554 interchange to Hwy 643/50th Avenue interchange: 5.8 km
 - Hwy 643/50th Avenue interchange to Twp Rd 564 interchange: 3.8 km
 - Twp Rd 564 to the next interchange: [To be determined as a result from adjacent FPS]
- Two new Sturgeon River Bridges would be required. The preferred R3000 alignment would require the new bridges to be 170m in length to accommodate the SB lanes and 215m in length to accommodate the NB lanes.
- The existing CN Rail structure would have to be replaced by a new structure that would traverse over the 39m CL realignment of the Hwy 28A:03 corridor.

Interchange Spacing

New Sturgeon River Bridges

New CN Rail Structure

Access Management

- At the time of twinning of the Hwy 28A:03/28:04 corridor:
 - 40 direct accesses onto the corridor would be closed 9 of which are agricultural;
 - 4 Township Road intersections (Twp Rd 552, 560, 563 and 570) would be closed; and
 - Intersections at Twp Rd 554, Hwy 643 and Twp Rd 564 would be upgraded to provide 55m centreline separation between the twinned lanes to facilitate heavy vehicle access.
- With the advent of three new interchanges at the time of “ultimate” development 19 additional accesses would be closed primarily effecting Twp Roads 554 and 564:

Access Management

- 8 direct accesses to individual dwellings;
- 10 accesses to agricultural properties; and
- 1 access to a recreational property.
- 43.4 km of 2-lane service road will ultimately be required.

Other Related Infrastructure Improvements

- The proposed Highway 28:02/Twp Rd 564 interchange depends on the realignment (approximately 5.5 km) of the Hwy 28:02 corridor to tie into the relocated interchange. The easterly extension of the interchange using Twp Rd 564 was found to provide accessibility to industrial traffic headed to/from Heartland Industrial Area and provide for a 10-15% diversion of traffic away from the Highway 643 corridor. Previous studies have recommended the ultimate twinning of the Hwy 28:02 corridor
- Hwy 643 currently extends eastward from the Town of Gibbons and transitions into 53rd Ave. This functional planning study proposes a realignment of Hwy 643 to the south to meet with a proposed new Hwy 28A/643 interchange and 50th Avenue in the Town of Gibbons. The need to provide for the “ultimate” twinning of the Highway 643 corridor was determined based on the land use forecasts.
- Sturgeon County would be advised to plan for:
 - the ultimate twinning of Twp Rd 554 east of the proposed Hwy 28A/ Twp Rd 554 interchange to a 4-lane standard to accommodate forecast travel demands;
 - an increase in travel demand as the Town of Gibbons expands to the south-west. This was determined to necessitate the upgrading of Range Road 233 to initially a 4-lane, and ultimately a 6-lane arterial standard as vehicle traffic would be destined to the proposed Hwy 28A:03/Twp Rd 554 interchange; and
 - the upgrading of the Twp Rd 564 corridor to an ultimate 4-lane arterial standard to accommodate forecast travel demands associated with development of the areas east of the Hwy 28:04 corridor.
- Sturgeon County in its letter of January 20th, 2011 acknowledged receipt of the Highway 28A/28 Functional Planning Study and did not express concerns regarding the studys findings. The County encouraged AT to consider the required modifications to existing County roadway accesses and proposed new service roads and suggested further consultaton with effected property owners.
- The roadway network within the business park would require upgrades that include:
 - a realignment of 51st Street (away from the ROW of the realigned Hwy 28A corridor),
 - the creation of a cul-de-sac at 49th Street; and
 - new Hwy 643 cul-de-sacs on either side of the realigned Hwy 28A:03 corridor.
- The access to the Gibbons Industrial Park would remain at its existing location. At the time of the realignment of the Hwy 28A:03 corridor an additional access to the Industrial Park could be considered in the vicinity of 51st Avenue and the existing Hwy 28A corridor.

*Hwy 28:02
Realignment &
Extension to
Twp Rd 564*

*Hwy 643
Realignment
and 50th Ave*

*Sturgeon
County
Roadway
Improvements*

*Town of
Gibbons
Roadway
Improvements*

- Gibbons Council of April 27th, 2011 passed a resolution endorsing the Draft Functional Planning Study – Highway 28A:03 with the provision that the 2-lane access road from Township Road 560 south to the new interchange at Township Road 554 be constructed with adequate shoulders, be designed to a 80kph designed speed and the road surface be paved before traffic volumes reach 300-to-400 vehicles per day. North Central Region of Alberta Transportation has endorsed this request as being reasonable in light of the intrusion that the new upgrading and realignment would have upon the Town's industrial and residential development.

Township
Road 560
Improvements

Property Impacts

- The project in its entirety inclusive of the ultimate interchange requirements was found to impact 854 acres (345.6 ha) and would impact 107 parcels of property including 9 building structures, 13 parcels involving a severance of property, business uses within the Gibbons Industrial Park and 76 other properties directly adjacent to the corridor/future interchanges.
- The “ultimate” functional plans would affect approximately 9 properties on 8.6 Acres (3.5 ha) and require the acquisition of 2 structures within the *Town of Gibbons Industrial Park*.
- The Twp Rd 564 interchange requires the existing Twp Rd 564 access to the *Goose Hemlock Golf Course* property to be relocated. The functional plans call for the realignment of the access to a new 400m gravel roadway that would connect to Twp Rd 564W. The right-of-way requirements to accommodate the future interchange would also require the acquisition of four residential lots located between the Golf course property and the existing Hwy 28:04 corridor. Upgrades to the existing SB Hwy 28:04 horizontal alignment result in the requirement of 0.26 hectares (0.64 acres) which would effect only the rough and not the green of the course.

Gibbons
Industrial
Park

Goose
Hummock
Golf Course

Cost

- The cost of the ultimate development of the Highway 28A:03/28:04 study corridor was determined to be approximately \$330M based upon the significant increases in structural costs denoted by 2009 unit prices. As well, staging of the project could easily run in the order of a 10% surcharge.
- The right-of-way requirements associated with property acquisition was estimated at \$22.2M. (This excludes property provisions for stormwater management facilities as the extent of property requirements remains to be determined at the time of detailed design.)
- It is recommended that AT twin the Hwy 28A corridor from N of the Hwy 37 to 1.8 km N of Twp 570 as the first stage of the ultimate improvement. This would achieve the desired “freeway” standard from N of Hwy 37 to the existing Hwy 28A/28 interchange by realigning the Hwy 28A corridor in the vicinity of the Town of Gibbons inclusive of new structures to traverse the Sturgeon River and the CN Rail Corridor and extend the existing twinning to N of Twp Rd 570. This initial stage has been estimated at \$142.3M. This approach is intended to achieve the desirable National Highway “freeway” design standard, avoid \$10.2M of throwaway costs associated with

improvements to existing infrastructure, avoid a lower standard interim facility within the vicinity of the Town of Gibbons and assure a fast-tracked completion of the project.

Recommendations

It is recommended that:

1. The infrastructure improvements consistent with the *Highway 28A:03/28:04 Functional Planning Study* be received by Alberta Infrastructure and Transportation;
2. Sturgeon County be informed that the *Highway 28A:03/28:04 Functional Planning Study* represents a planning document and highway intersection / widening / construction remains to be scheduled as part of the overall development of the highway corridors;
3. Sturgeon County Council and the Town of Gibbons Councils be requested to incorporate the *Highway 28A:03/28:04 Functional Plans* contained within this study within their municipal development plans;
4. AT be encouraged to initiate the functional planning for the Hwy 28:02 corridor necessary to assure a highway realignment linking to the planned interchange at Twp Rd 564.
5. Subsequent to AT's endorsement of the *Highway 28A:03/28:04 Functional Planning Study*, AT is encouraged to pursue the initiatives necessary to confirm the detailed engineering feasibility of the *interim* stage associated with the future twinning requirements from Hwy 37 around the Town of Gibbons as part of the NATC initiative.

These initiatives would likely include, but are not limited to:

- Presentation to the Sturgeon County Council and the Town of Gibbons Councils with the goal of seeking endorsement of those components of the functional plan that would proceed to detailed design;
- Undertake further environmental studies as recommended by the Environmental Overview prepared by AMEC Earth and Environmental prior to detailed design and construction to obtain the necessary clearance;
- Undertake those initiatives related to securing the required properties necessary to support the functional plans for the *ultimate* stage of the Highway 28A:03/28:04 corridors;
- Development of a construction staging strategy consistent with that of the overall Highway 28A:03/28:04 corridor which would see the twinning the entire corridor inclusive of a realignment of Highway 28A:03 around the Town of Gibbons and twinning in the vicinity of Twp Rd 751 as part of the initial twinning stage with an estimated cost of \$142.3 M; and
- Assure integration with the planned Hwy 37/Hwy 28A systems interchange design.