Castleglenn Consultants
Engineers, Project Managers & Planners

HIGHWAY 40

Transportation Network Review Study

Online Information Session #2

Date: February 10th, 2022
Time: 6:00 PM

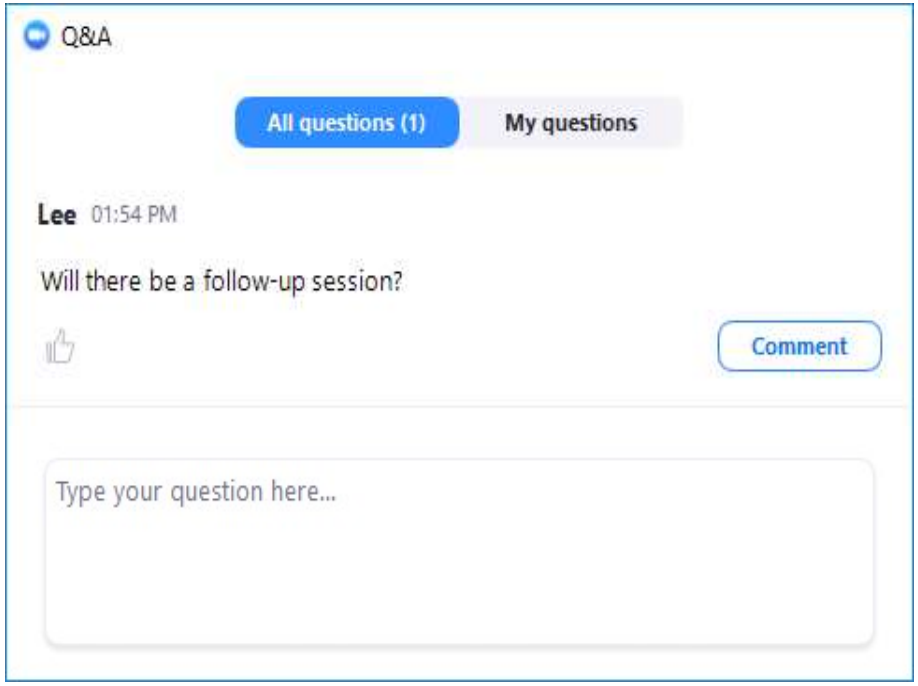
1. Welcome to the Highway 40 Public Engagement

How Can You Be Heard?

We want you to participate tonight and throughout the month of February.

Here are a few ways you can do so:

- Raise your hand during the Zoom Q&A and the host will call on you
- Ask us a question in the chat box ->
- Use our Social Pinpoint (Click Here!) webpage to add comments and fill out a survey
- Send our project team an email: akirillov@castleglenn.ca



Personal Information that you provide rm is protected under the Freedom of Information and Protection of Privacy Act of Alberta. The personal information that is collected on this form relates directly to programs being undertaken by the Alberta government and will be used to reply to your questions and concerns supplied on this form. No other use will be made of this information and it will not be released without your written approval.

1. Social Pinpoint Engagement Platform

Participate throughout the entire month of February!

Social Pinpoint is a website we're using to present our findings and collect your feedback on Castleglenn's plans for the Highway 40 corridor.

We want to:

- **familiarize you with the proposed plans,**
- **hear your feedback; and**
- **improve the safety and performance of the Highway 40 corridor.**

Social Pinpoint allows users to:

- Review Highway 40 resources and materials
- Share ideas on specific themes. Users can provide thoughts and ideas in a "sticky-note style" format.
- View other people's ideas.
- Use an interactive map to view proposed improvements and share thoughts on specific areas in along Highway 40.
- Fill in a survey to tell us what you think of transportation along Highway 40.
- Drop a comment or ask question during the month of February!

Access Social Pinpoint at: www.Highway40.ca

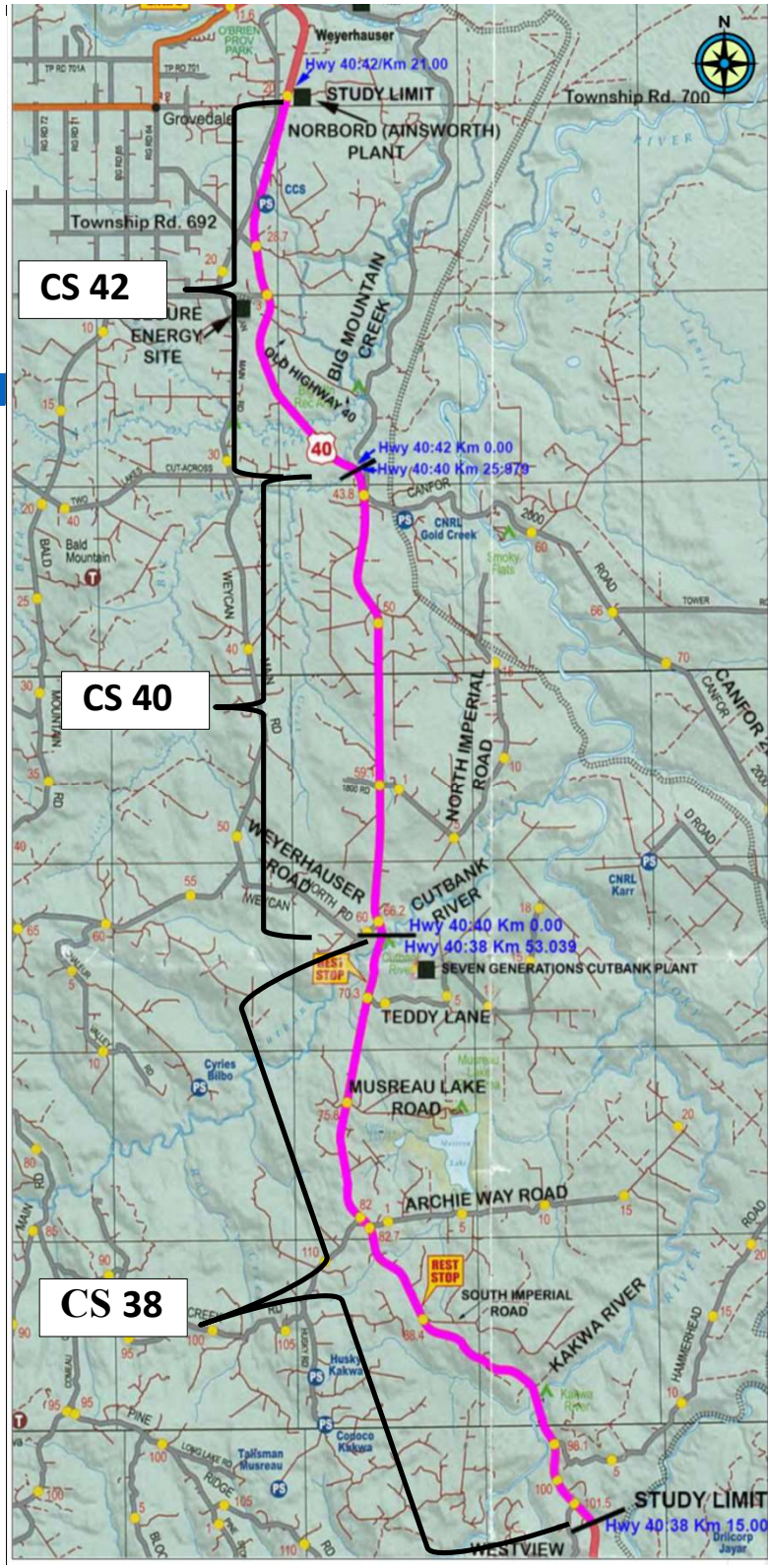
Presentation Items

1. Welcome and Introduction
2. Review of Study Area , Objectives and General Requirements of Study
3. Issues and Concerns
4. Historical Collision Information, Traffic Characteristics & Growth, Future Land Uses
5. Previous Public Engagement Summary (June 2021)
6. Environmental, Drainage, Bridge Planning and Geotechnical Findings
7. Draft Final Functional Plan Drawings
   - 7a. Northern Portion of Study Area: (Ultimate Twinning)
   - 7b. Southern Portion of Study Area:
   - 7c. Costs
8. General Questions and Answers
9. Remaining Project Tasks and Project Schedule
10. Next Steps

2. Review of Study Area

The Highway 40 Corridor …..

- 85 km section of Hwy 40 extends from the Norbord Access to south of the Kakwa River.
- Three control sections: 42 (21km), 40 (26km), and 38 (38km).
- is a heavily used active resource related highway with natural resource based developments in the oil & gas sector along with logging.
- is identified as a “Connector Route” within the Oversize/Overweight (OSOW) highway network (2018);
- Continues to experience growth and development of the industrial sector;
- Heavy truck traffic and commercial vehicles comprise approximately 30% of the traffic.



2. Objectives and Requirements

Study Goals, Objectives:

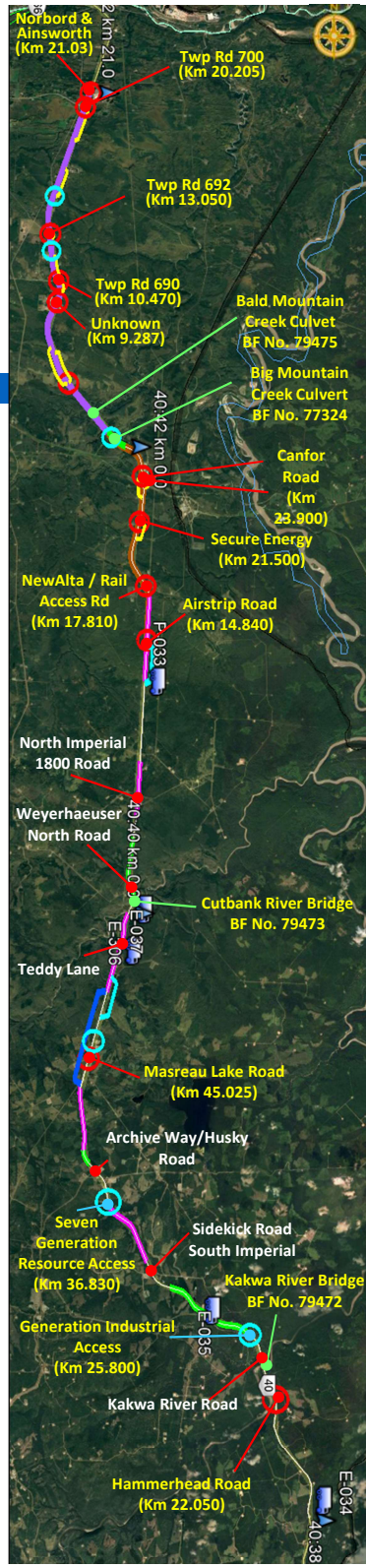
- Review safety and highway operations;
- Identify improvements;
- Develop functional plans for improvements and access management;
- Develop right of way requirements;

General Requirements of the Study:

- Address current and future safety;
- Identify future development plans;
- Determine improvements;

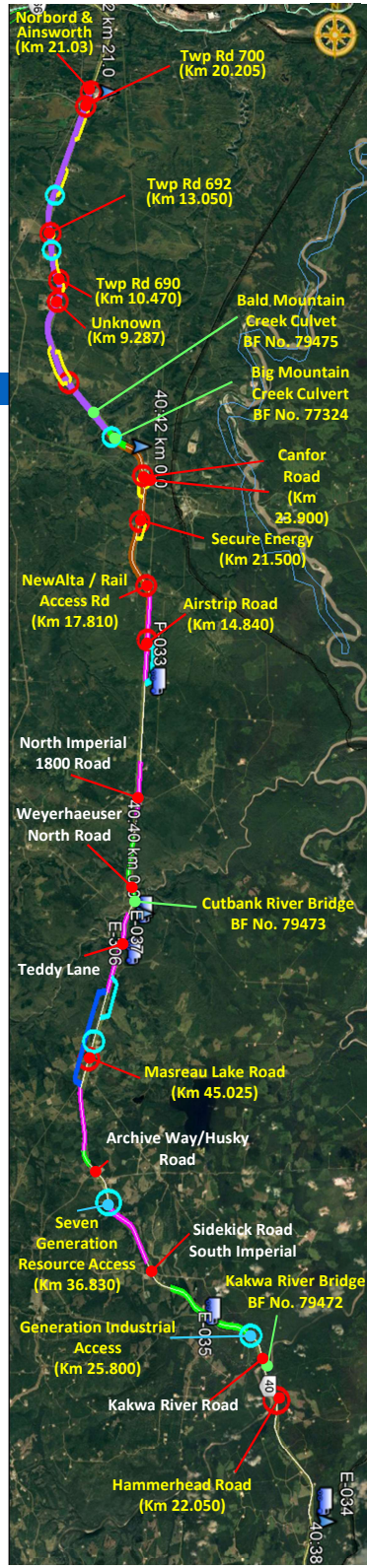
2. General Requirements of the Study

- Improvements to Highway 40 needs to ….
  - address safety concerns;
  - identify future development plans;
  - be developed in a safe and efficient manner; and
  - Assure that sufficient property is protected to accommodate proposed improvements.
- This network study is to ….
  - address current safety, future safety and access concerns;
  - determine short and longer term improvements that include:
    - intersection upgrades,
    - local road needs/upgrades,
    - service road requirements,
    - passing/climbing lanes,
    - pull outs; and
    - possible twinning.

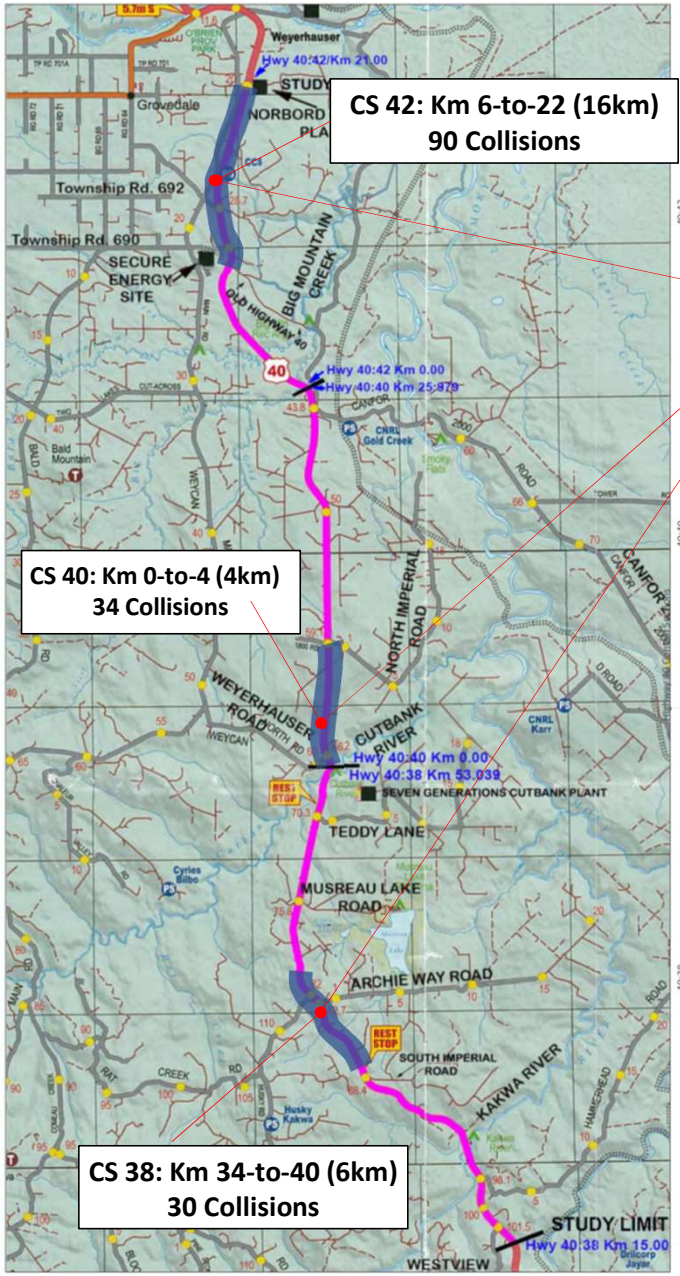


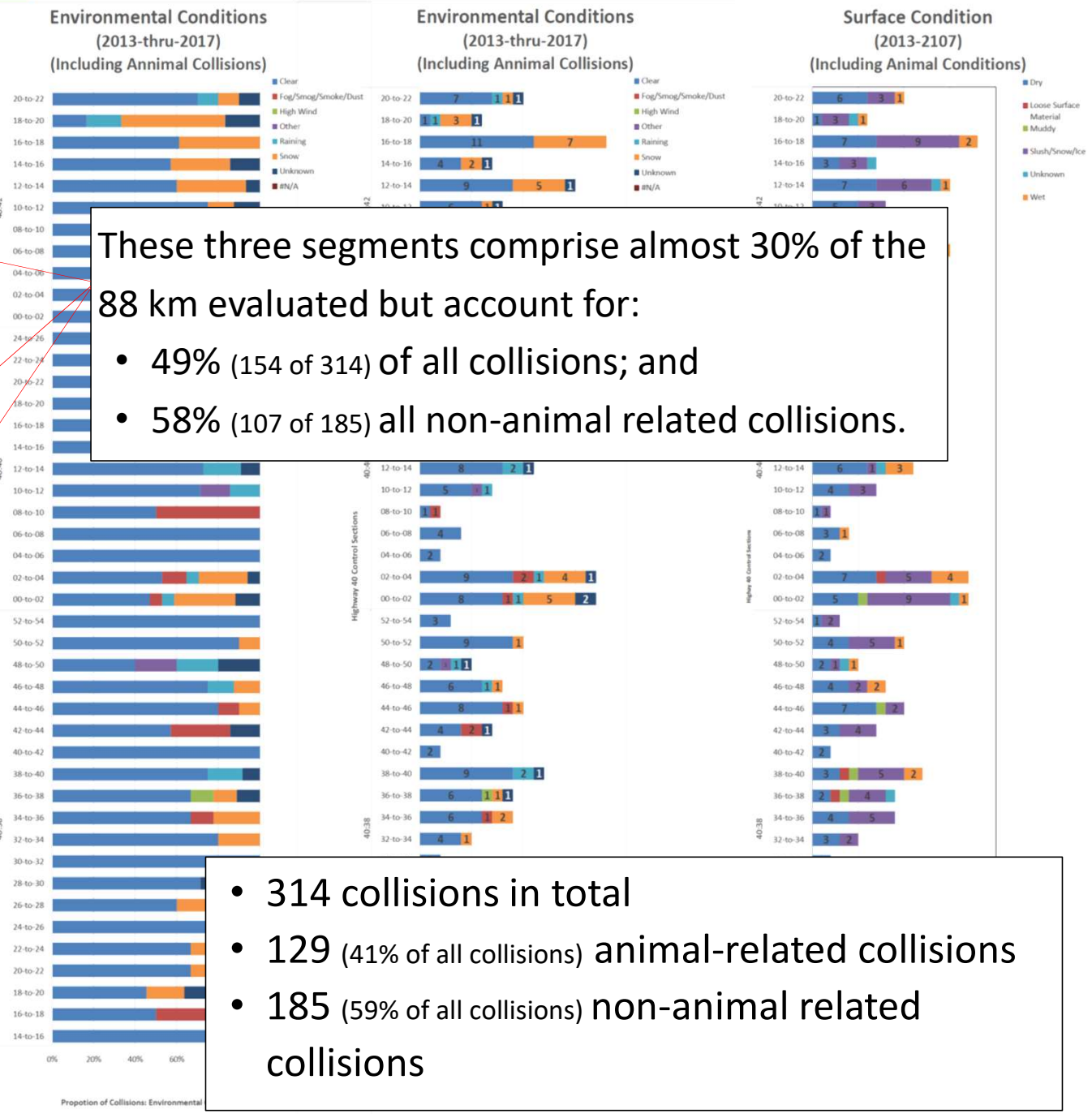
3. Issues and Concerns

- Highway 40:
  - provides the only link to the various developments in the area located between the Grande Cache and Grande Prairie;
  - is a heavily used active resource related highway with natural resource based developments in the oil & gas sector along with logging.
  - **is identified as a "Connector Route" within the Oversize/Overweight (OSOW) highway network (2018);**
  - Continues to experience growth and development of the industrial sector;
  - has heavy slow truck traffic mixing with faster passenger vehicles;
  - During the summer months there is a mix of recreational vehicles/tourism/trailers along Highway 40 accessing the wilderness areas.



4. Collision History



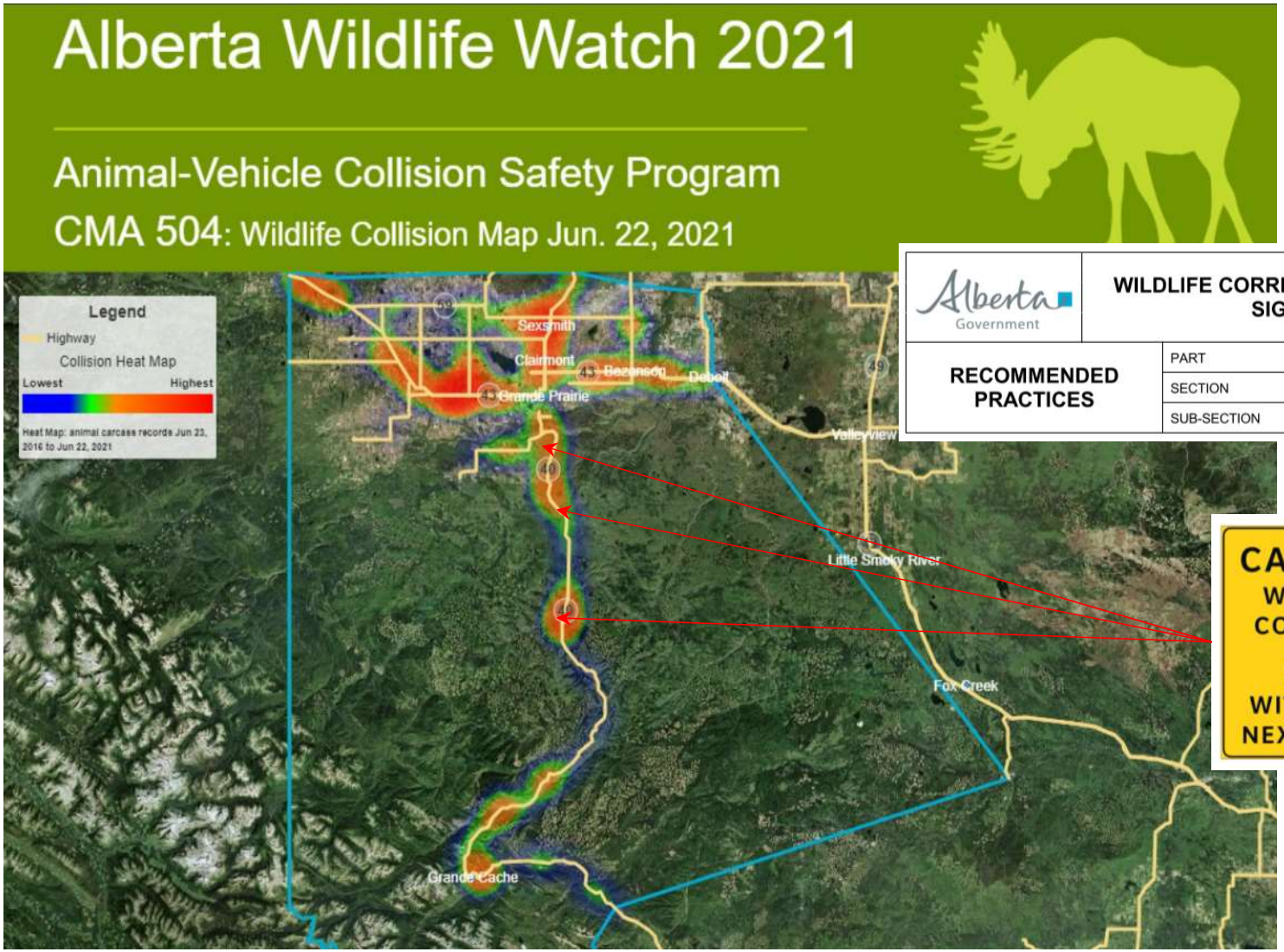


These three segments comprise almost 30% of the 88 km evaluated but account for:

- 49% (154 of 314) of all collisions; and
- 58% (107 of 185) all non-animal related collisions.

- 314 collisions in total
- 129 (41% of all collisions) animal-related collisions
- 185 (59% of all collisions) non-animal related collisions

Safety Improvement



Alberta Government	WILDLIFE CORRIDOR WARNING SIGN	Issued: DEC 2015
		Revised:
		Page 1 of 3
RECOMMENDED PRACTICES	PART	HIGHWAY SIGNS
	SECTION	WARNING SIGNS
	SUB-SECTION	

4. Traffic Characteristics

Hwy 40 CS	Traffic Profile	
	Average 2019 AADT	Proportion of Heavy Vehicle Traffic
42	5,380	1,670 (31%)
40	3,800	1,600 (42%)
38	2,060	900 (44%)

Proportion of Heavy Vehicle Traffic on Highway 40 exceeds 30% on a daily basis.

4. Historical Traffic Growth

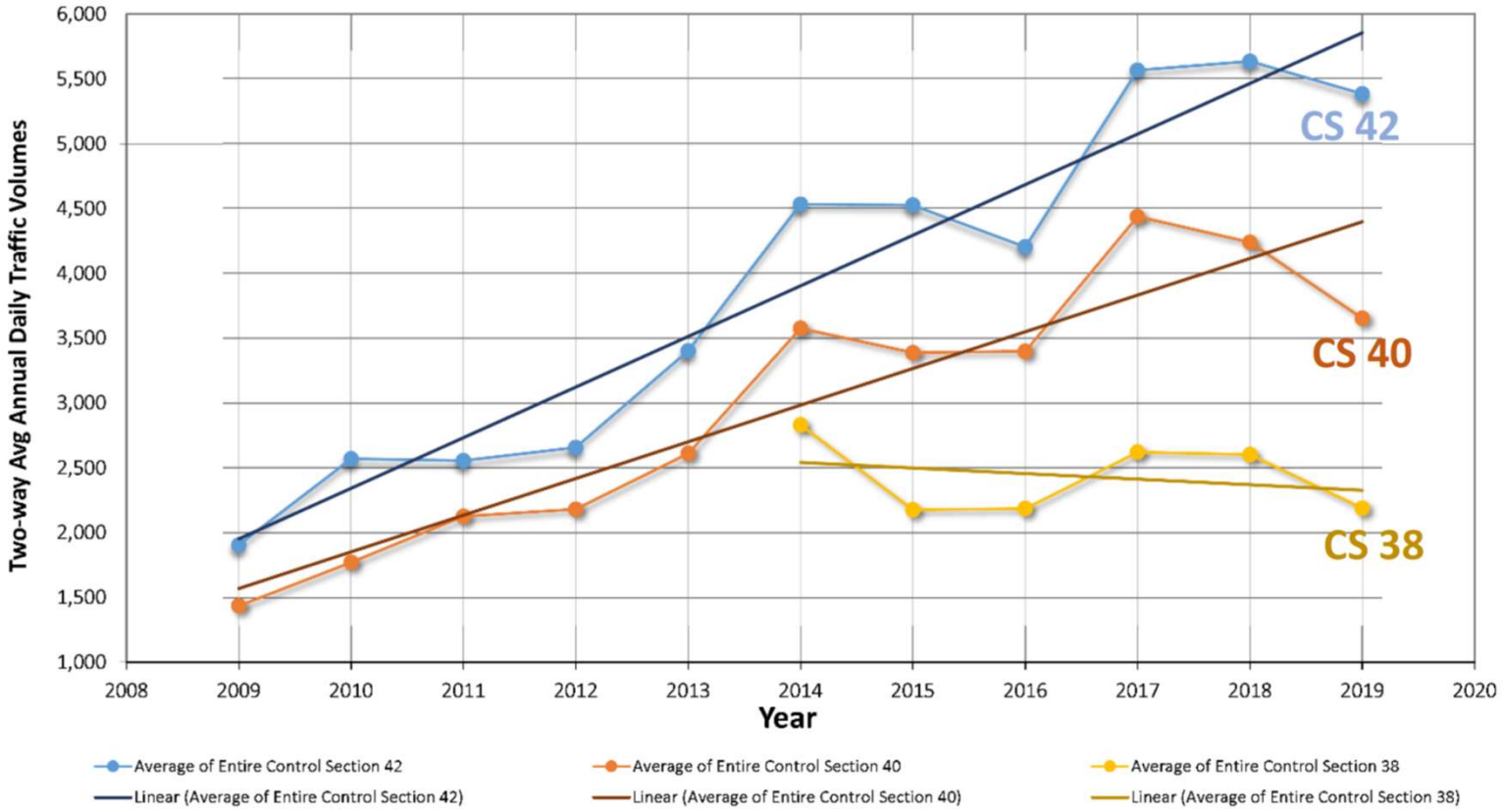
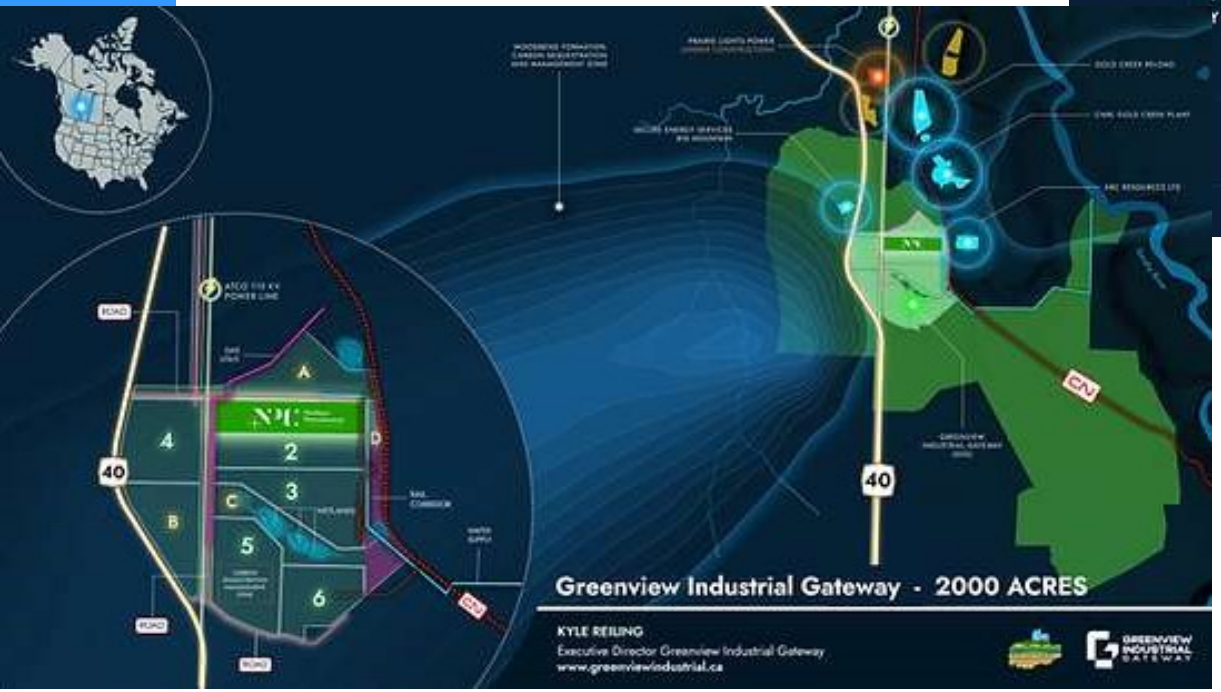


Table 3-2: Highway 40 Average Annual Historical Growth Rates

Control Section	Historical 5-Year Average (2014-to-2019)	Historical 10-Year Average (2010-to-2019)
42	4.5%	12.1%
40	2.1%	11.3%
38	-1.0%	Not available

4. Future Land Uses

- Greenview Industrial Gateway (GIG) development is one of the catalysts for the study
- Potential:
  - East side: 1,050 Hectares;
  - West side: 680 Hectares



Scenarios Evaluated

	Hectares /Year	Hectares Developed 10-Year Hectares	Hectares Developed 20-Year Hectares
Low Growth GIG Scenario	**23**	**230**	**460**
Medium Growth GIG Scenario	**45**	**450**	**900**
High Growth GIG Scenario	**80**	**800**	**1,600**

5. Previous (June 2021) Public Engagement Findings

- Presence of high volume, low speed vehicles, create an unsafe passing along Hwy 40 in locations with no passing lanes;
- The high speed of traffic flow can create unsafe situations, specifically in winter;
- There is a high number of wildlife collisions (129 over 5-year history);
- Inadequate safe gaps for making left-turns from Twp Rd 700 and 690 to Hwy 40 at peak time;
- Concerns about cattle crossing at Campbell Creek;
- The poor visibility caused by heavy equipment operators (i.e. graders) that leave behind dust storms causing a safety concern for vehicles tailing them;
- the addition of passing lanes in 2020/21 was very helpful. However, they don't go further past the north of Big Mountain Creek. Since unsafe passing is common in that area, it would be thoughtful to see more passing lanes;
- Highway maintenance should be increased – specifically for snow and mud.

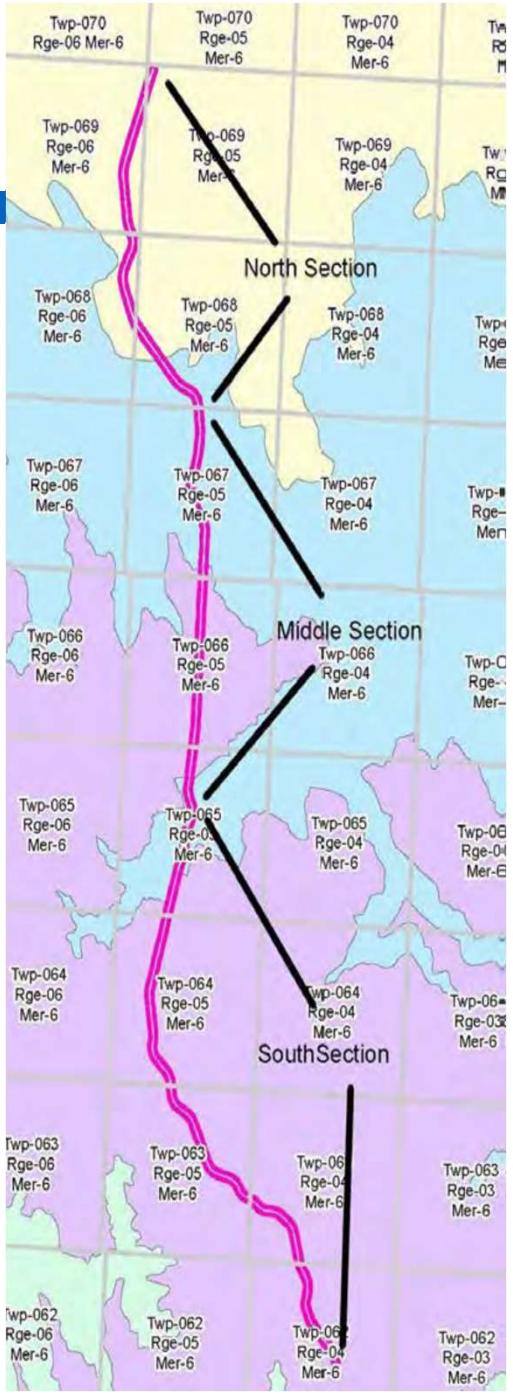
6. Environmental Evaluation

Desktop Review and Field Visit

- Conducted by Geoverra on September 30 & October 1, 2021.

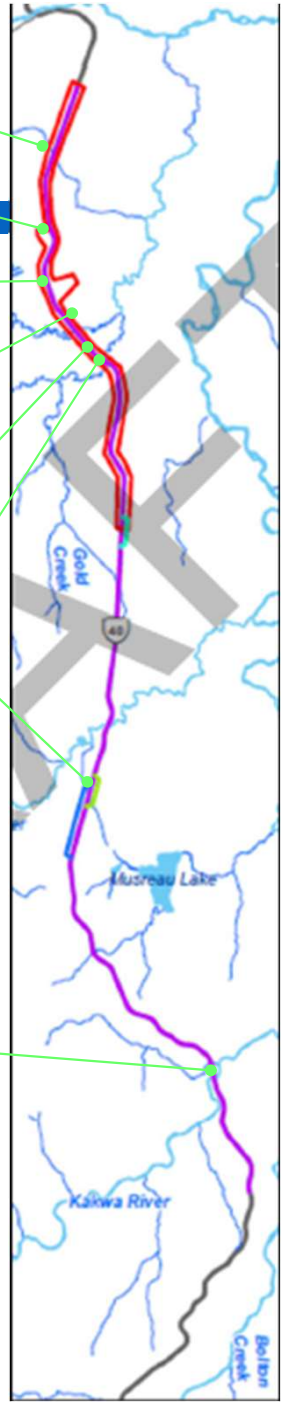
Valued Ecosystems VECs Addressed:

- Soil/Landforms (poorly-drained, moderately-well to imperfectly drained)
- Vegetation (mixedwood stands, tamarack dominated ferns & wooded swamps)
- Wildlife (Trumpeter Swan; Grizzly Bear; Key Wildlife and Bio-diversity Zone)
- Wetlands (148 Wetlands within a 200 m buffer)
- Fisheries (24 watercourses, 12 with fish species)
- Hydrology (Wapiti River & Smoky River subwater sheds, 44 drainage zones)
- Water Quality/Surface Water (AEP Surface Water Quality Data)
- Groundwater (from Alberta Water Wells Web Application)
- Navigation (Alberta's Drainage Basin and Navigated Streams 2014)



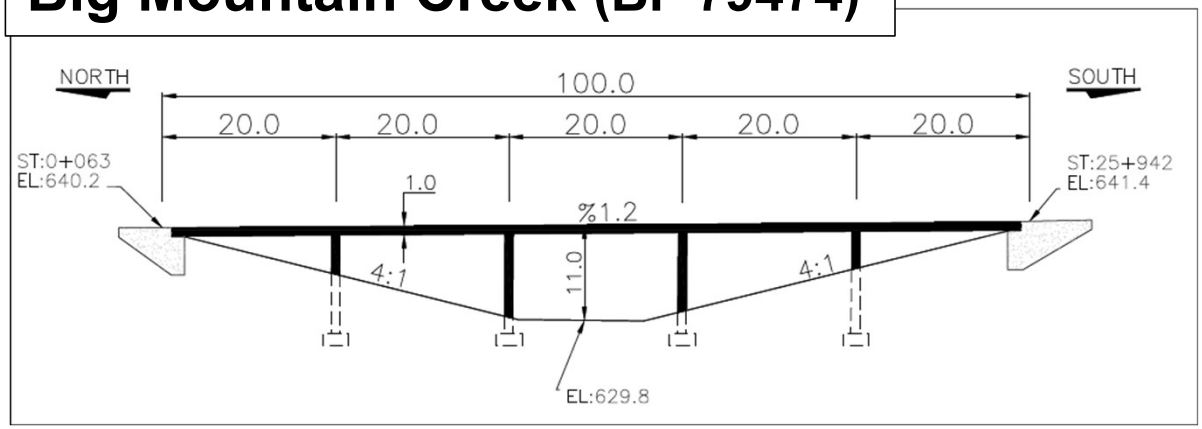
6. Drainage & Storm Water Recommendations

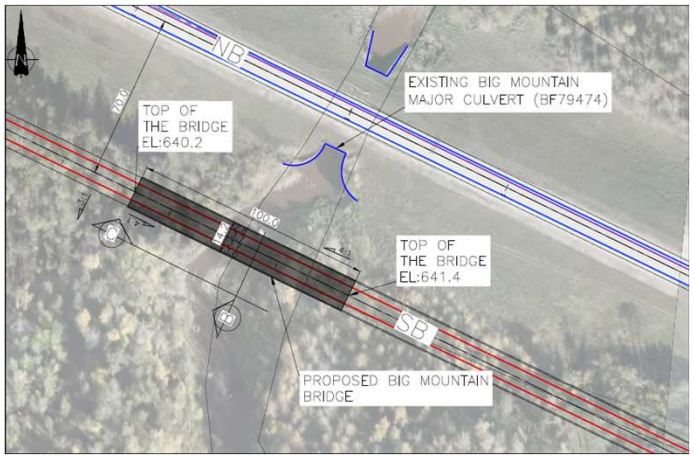
- Major watercourses identified in the Study Area:
  - Bald Mountain Creek;
  - Big Mountain Creek;
  - Cutbank River;
  - Kakwa River; and
  - Tributaries to:
    - Major watercourses;
    - Musreau Lake;
    - Gold Creek; and
    - McMillar Creek.
- 44 drainage zones modelled;
- 1:100 Years design return period;
- Surface runoff flows in general toward Hwy 40 from the west - mainly forest & industrial development runoff;
- Existing Structures have to be replaced with fish passage friendly structures and extended: (BF77324, BF79744, BF80673, BF80674, BF80778 and BF80694); and
- a slight realignment to reduce the slope of BF80694 will be required.
- new bridges are required to accommodate the twinning at BF79474 and BF79475.



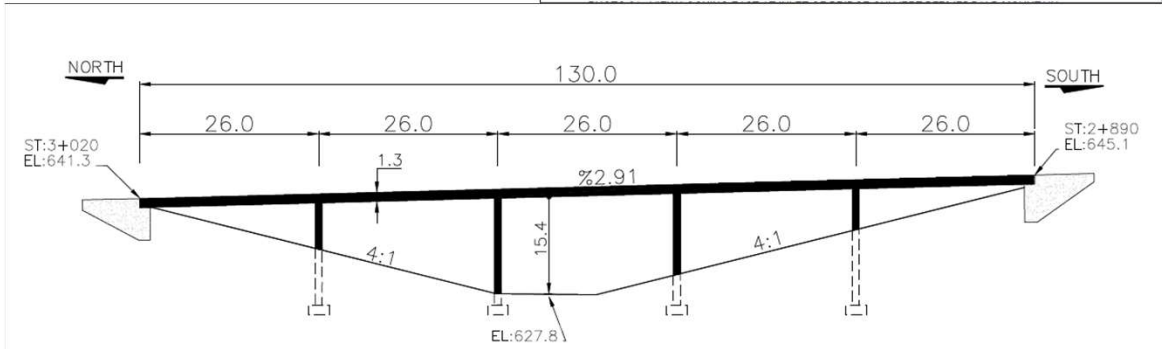
6. Bridge Planning Recommendations: Bald & Big Mountain Creeks

Big Mountain Creek (BF 79474)





Bald Mountain Creek (BF 79475)



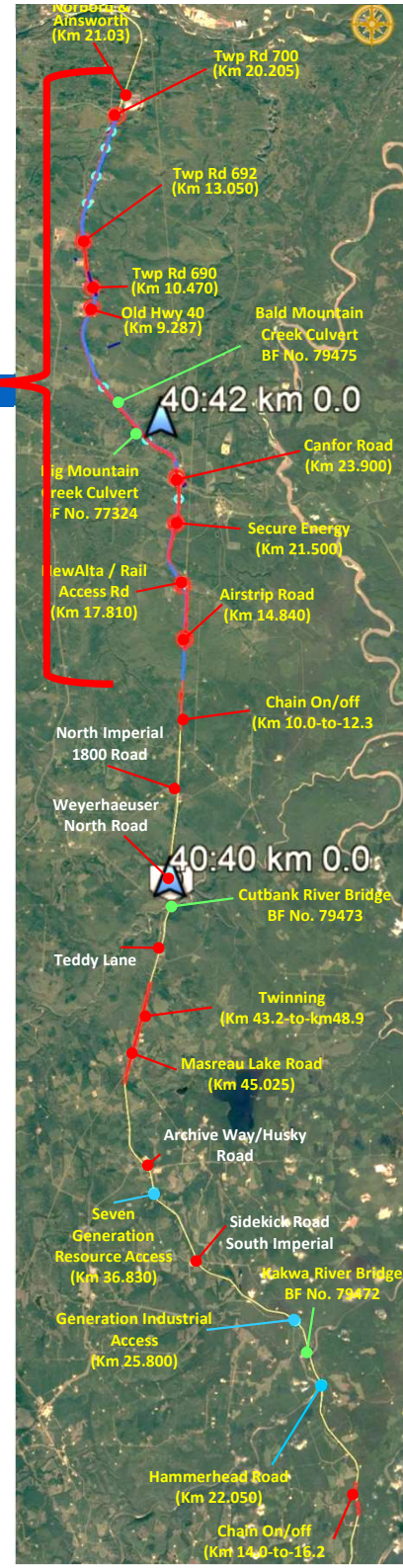
6. Geotechnical Recommendations

- A site-specific geotechnical review of the proposed changes should be completed
- Five major geohazard sites with a history of landslide and backslope issues have occurred in the study area;
- Slope instability is noted at various locations along the corridor. Widening of the existing highway alignment should be avoided unless further geotechnical work is completed to determine feasible stabilization measures;
- Where present and practical, organic deposits and underlying soft soil should be sub-excavated and removed from the roadway footprints and embankment;
- A possibility exists that old borrow pits present at the north end of the corridor might be considered as wetlands;
- Permanent cut and fill slopes should be topsoiled and revegetated;
- Where required, appropriate ditch erosion protection measures should be provided/installed.

7. Draft Final Functional Plan Drawings

7a. Northern Portion of Study Area

Northern Portion of Study Area
The Proposed Twinning



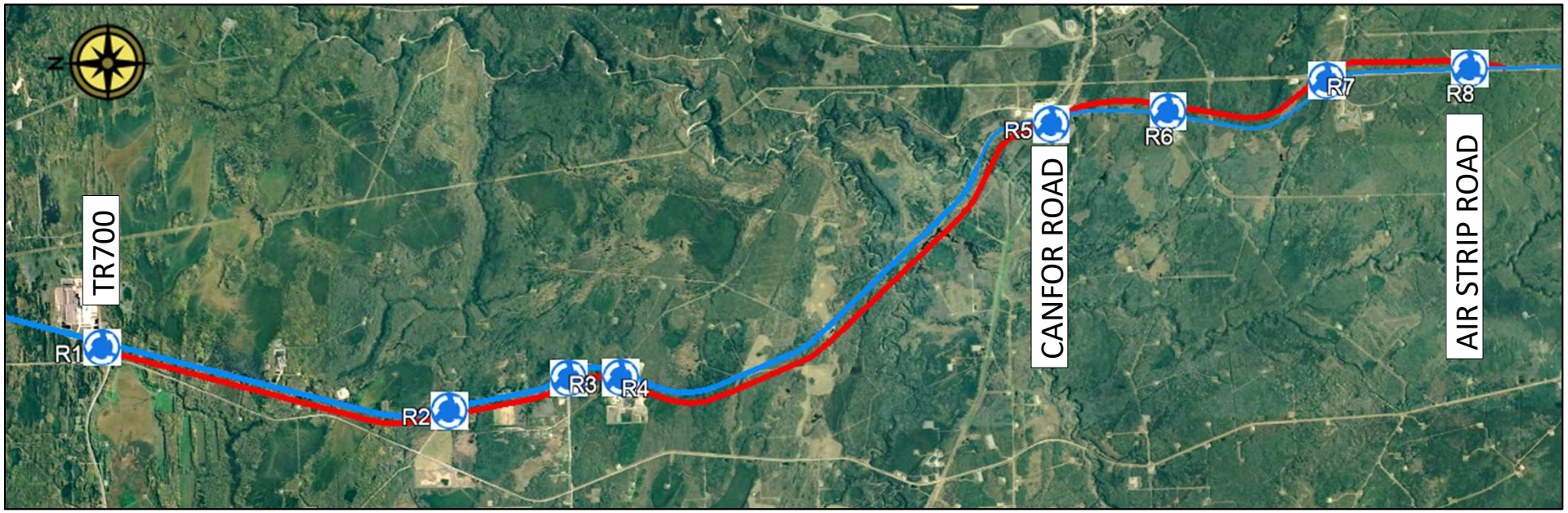
Proposed:

- **32.1 km Twinning could take place over 3 Stages**
- **8 Multilane Roundabouts as main Intersections**
- **6 Minor "T" Intersections**
- **1 Right In / Right Out Access**
- **6.44 km of Service Roads**

The staging is conditional upon the development in the GIG area and traffic growth.

Twinning Option (West Side vs East Side)

- Proposed Twinning on the West Side (SB): From CS40, km 23+500 to CS 42, km 20+500
- Proposed Twinning on the East Side (NB): From Cs40, km 14+000 to km 23+500



Existing Highway 40
Proposed Twinning

The evaluation of which side the twinned highway should be on considered:

- Use of the existing corridor to provide for one direction of travel.
- Impacts to utility corridors;
- Effects upon existing intersections and accesses;
- Impact to open water and water courses
- The presence of developing areas and existing service roads

Why Roundabouts

Comparison of Roundabout vs Traffic-Signal Controlled Intersection

Advantages	
Better traffic operational performance • Higher capacity • Lower delay • Shorter queues	+
Vehicle safety • Less conflict points • Less serious collisions	+
Low operational and maintenance cost	+
Self-Regulation	+
Environmental and sustainability • Less fuel consumption	+
Traffic calming	+
Aesthetics	+

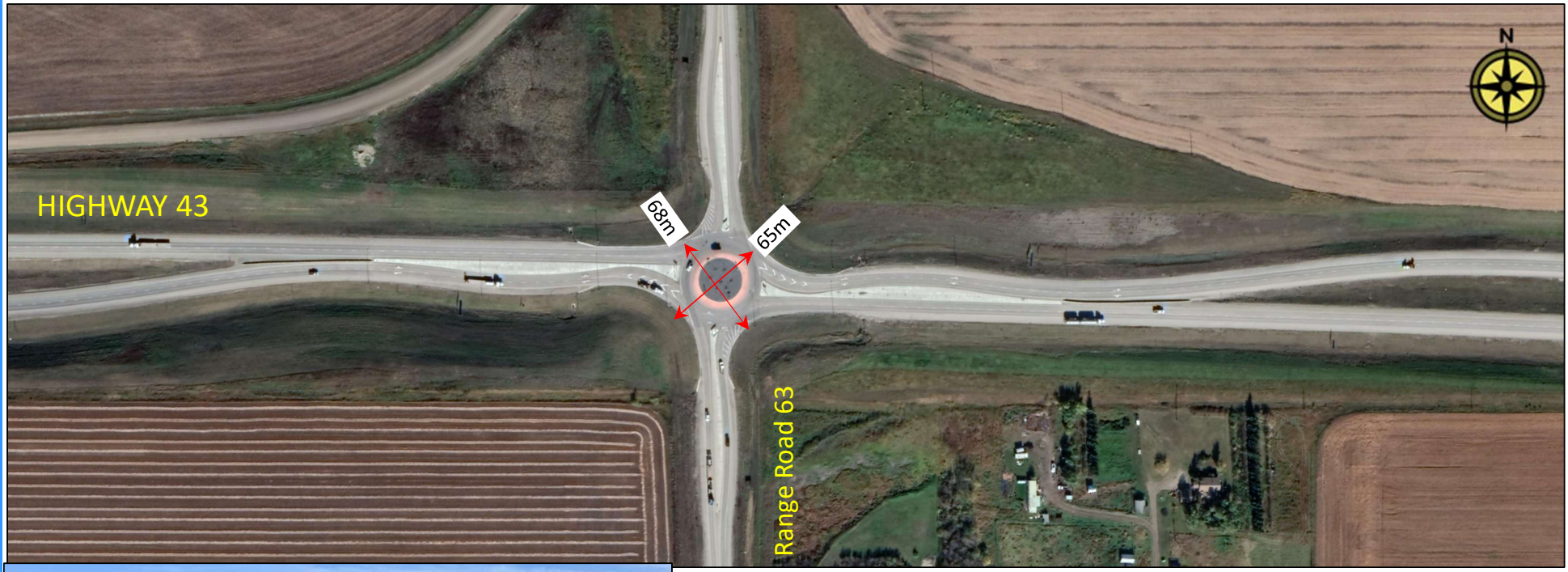
Disadvantages	
Driver familiarity	-
Require more right of way	-
Construction cost	-
Snow removal	-
Adding delay to heavy flows	-

Design Sources:

- Soltykevych, T. et al. (2014). Roundabout on Alberta highways. Conference of the Transportation Association of Canada
- TAC (2017). Canadian Roundabout Design Guide

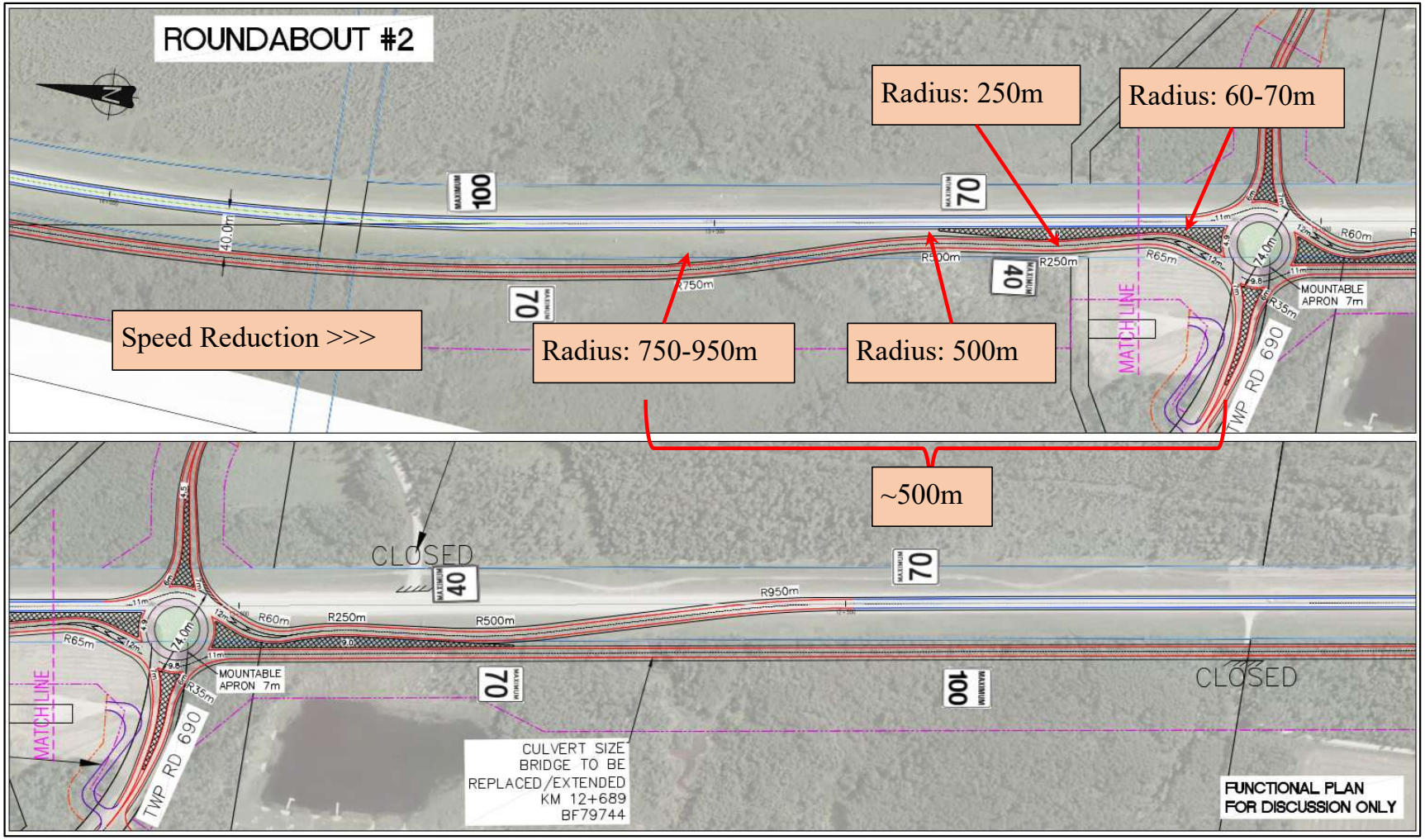
Why Roundabout ?

Existing Roundabout north of Grande Prairie on Highway 43 (Opened to traffic in September 2018)



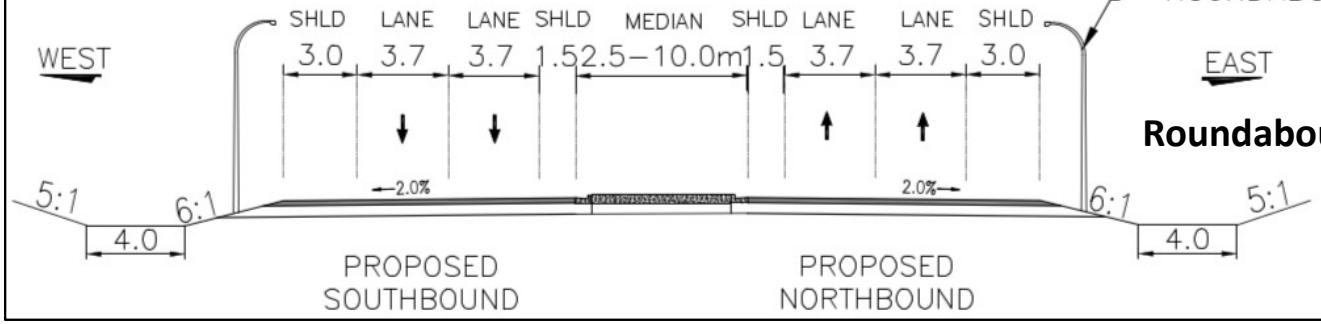
The Hwy 40 roundabouts were designed to accommodate heavy resource vehicle traffic and assumes a 74m wide diameter which is larger than the existing (illustrated) Hwy 43 roundabout.

A Sample of Roundabout Design



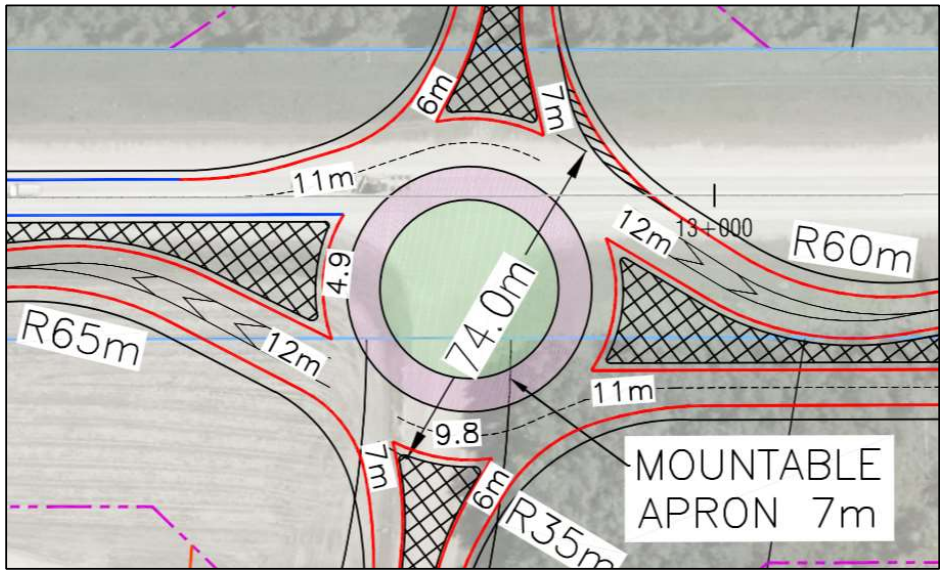
A Sample of Roundabout Design

Typical Cross-Section of Roundabout Approach



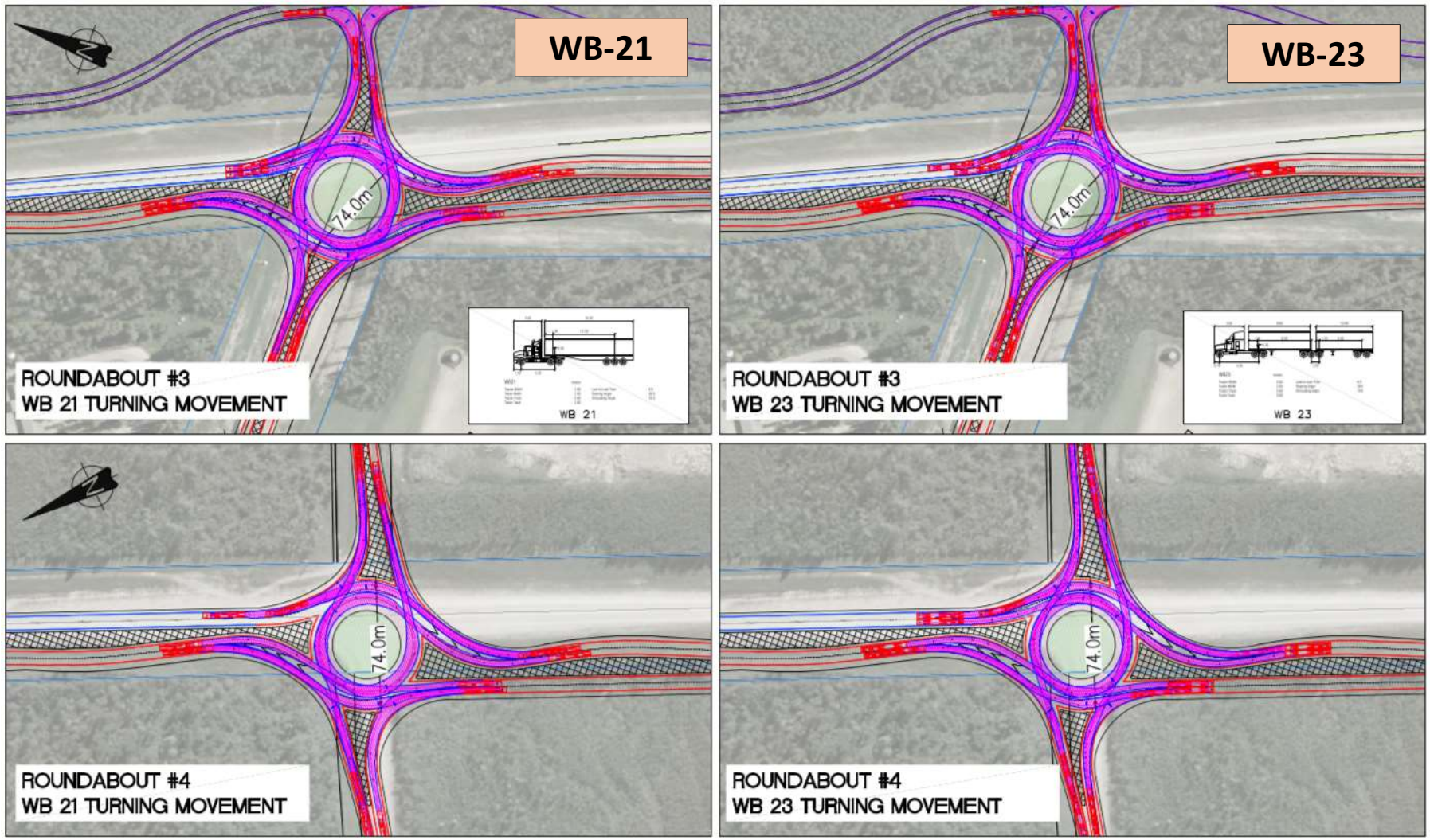
STREET LIGHTS SHALL BE PROVIDED AT LEAST 120m BEFORE THE ROUNDABOUT APPROACHES, AND TO BE LOCATED OUTSIDE THE ROUNDABOUT CLEAR ZONE.

Roundabout Approach Design



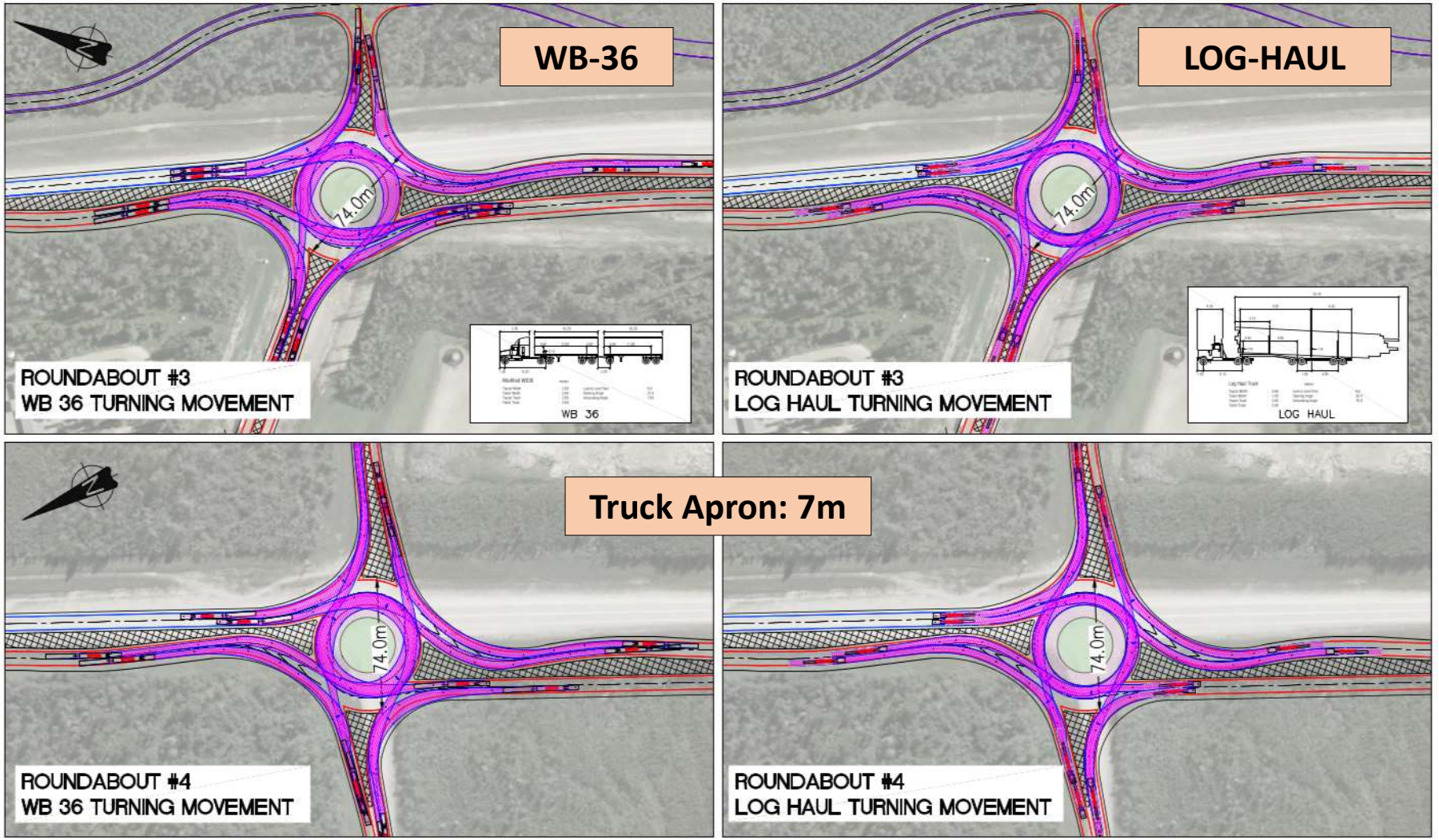
Turning Movements at Roundabouts

The Roundabouts are Designed to Carry Typical Truck Design Vehicles



Turning Movements at Roundabouts

The Roundabouts are Designed to Carry Oversize Design Vehicles



Roundabout Traffic Analysis

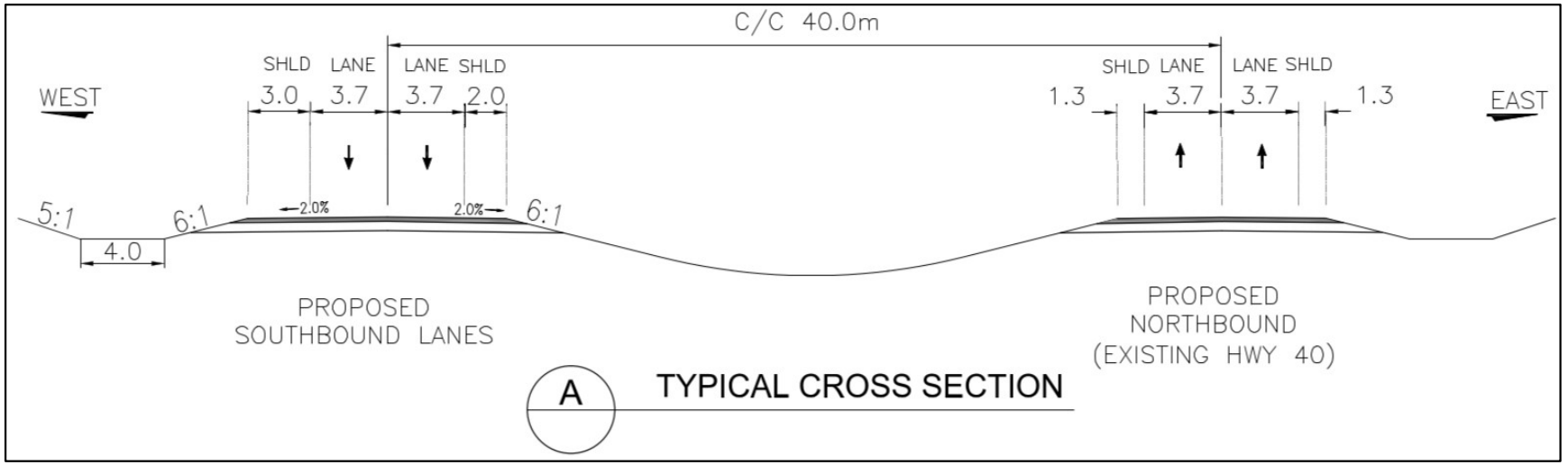
- Sidra™ intersection analysis software was used to analyze the proposed roundabouts.
- Morning and afternoon peak hour traffic conditions were analyzed at the 10-Year (2030) and 20-Year (2040) time horizons.
- Medium and High growth Scenarios for the Greenview Industrial Gateway Lands were assumed.
- All roundabouts were found to have a Level of Service of “B” or higher
- Average delays for critical movements are less than 15 seconds

Twenty-Year Forecast for GIG Development

	Medium Growth	High Growth
Number of Hectares per-Year	45 Hectares / 111 acres	80 Hectares / 198 acres
Developed Lands over 20 years	900 Hectares / 2,224 acres	1,600 Hectares / 3,954 acres
Forecast Two-Way Peak Hour Trips	408 trips	725 trips
West Side of GIG: (~680 Hectares)	25%	39%
East Side of GIG:(~1,050 Hectares)	75%	61%

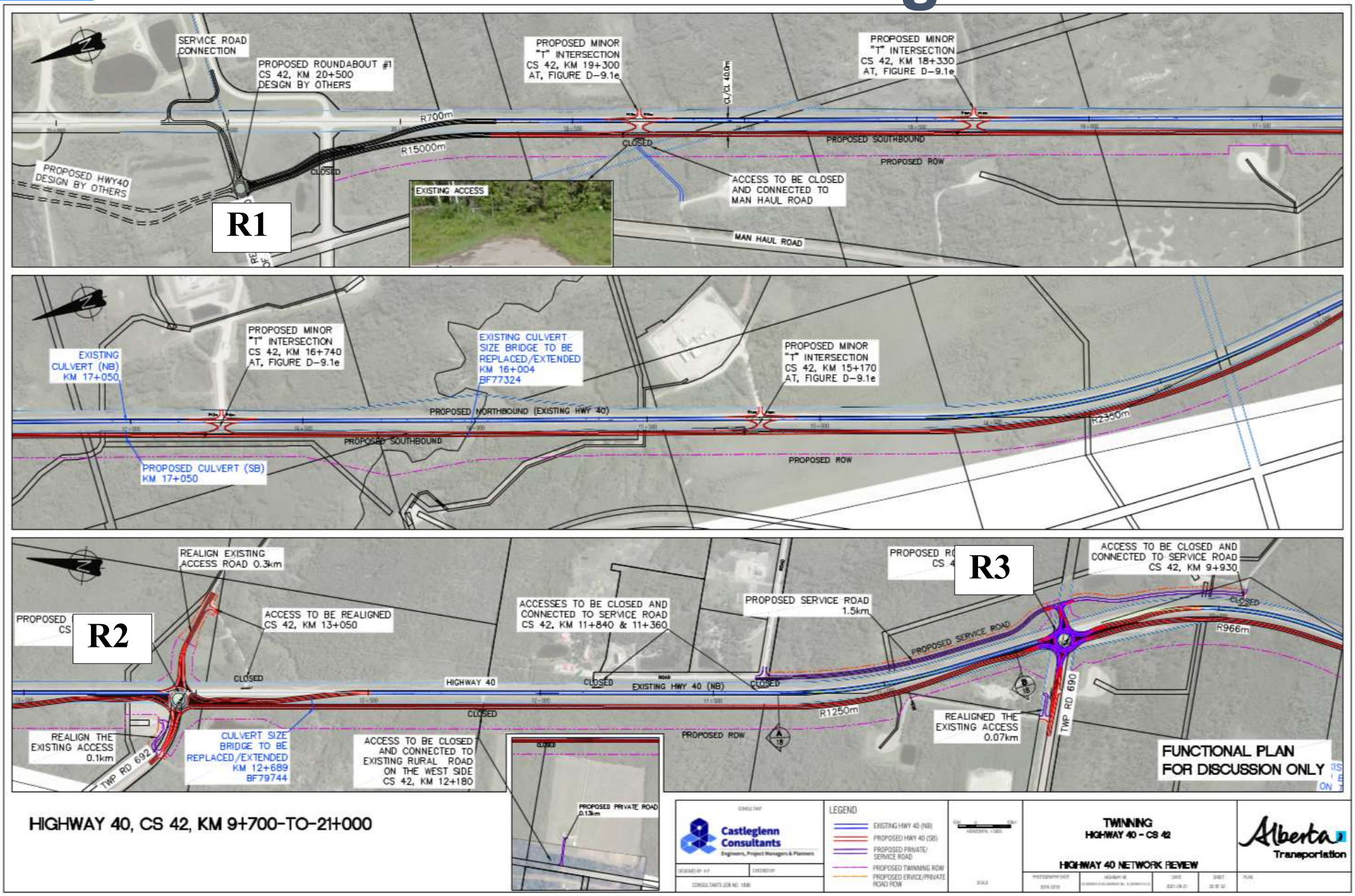
The Twinning Plan

Typical Cross-Section of Highway 40 Twinning

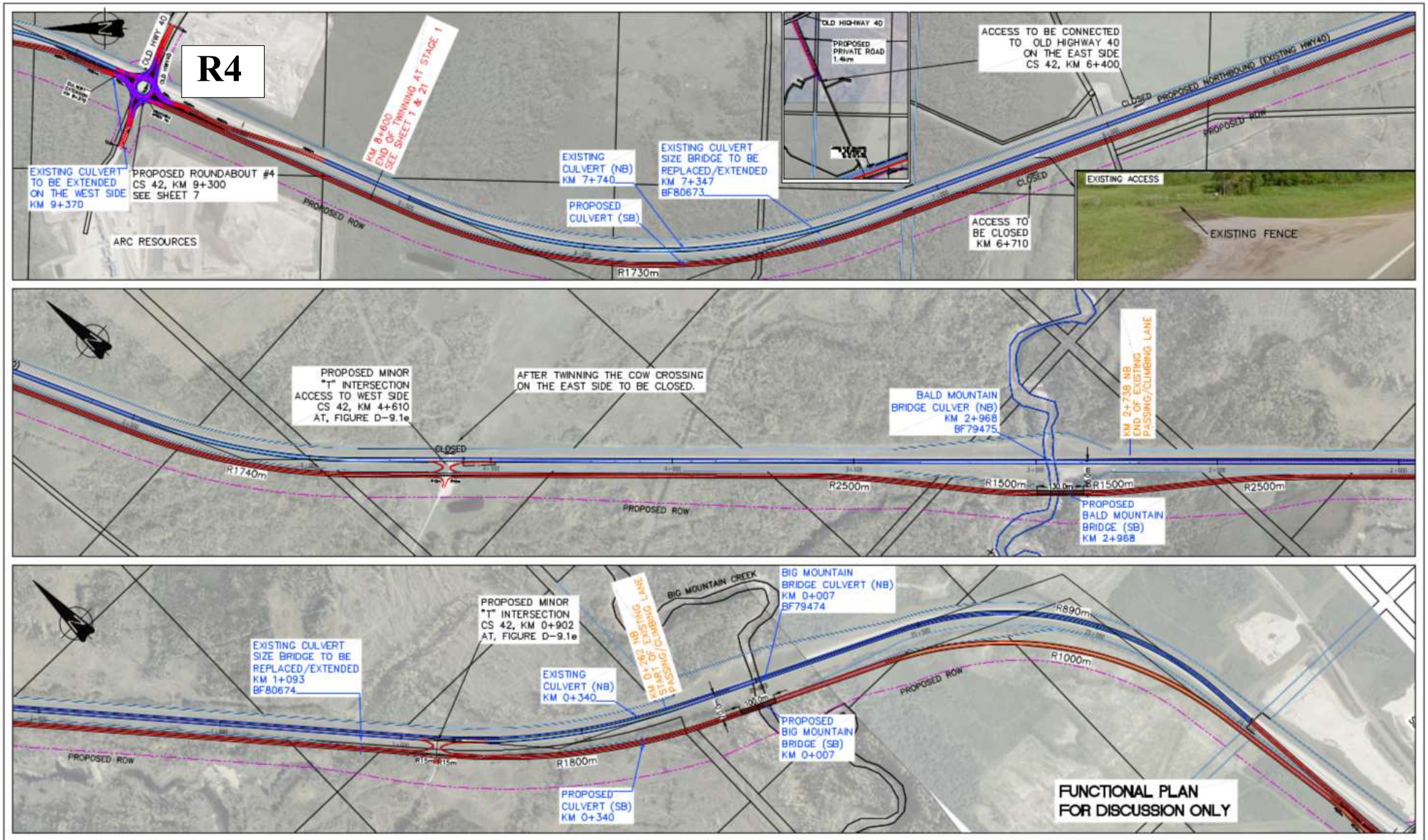


Proposed Horizontal Curves (AT Guideline Chapter "B")	
Design Speed	**Minimum Radius**
110 km/h (along with Hwy 40)	600 m
80 km/h (roundabout approaches)	250 m

The Twinning Plan



The Twinning Plan



HIGHWAY 40:

- CS 42, KM 9+700-TO-0+000
- CS 40, KM 26+000-TO-24+100

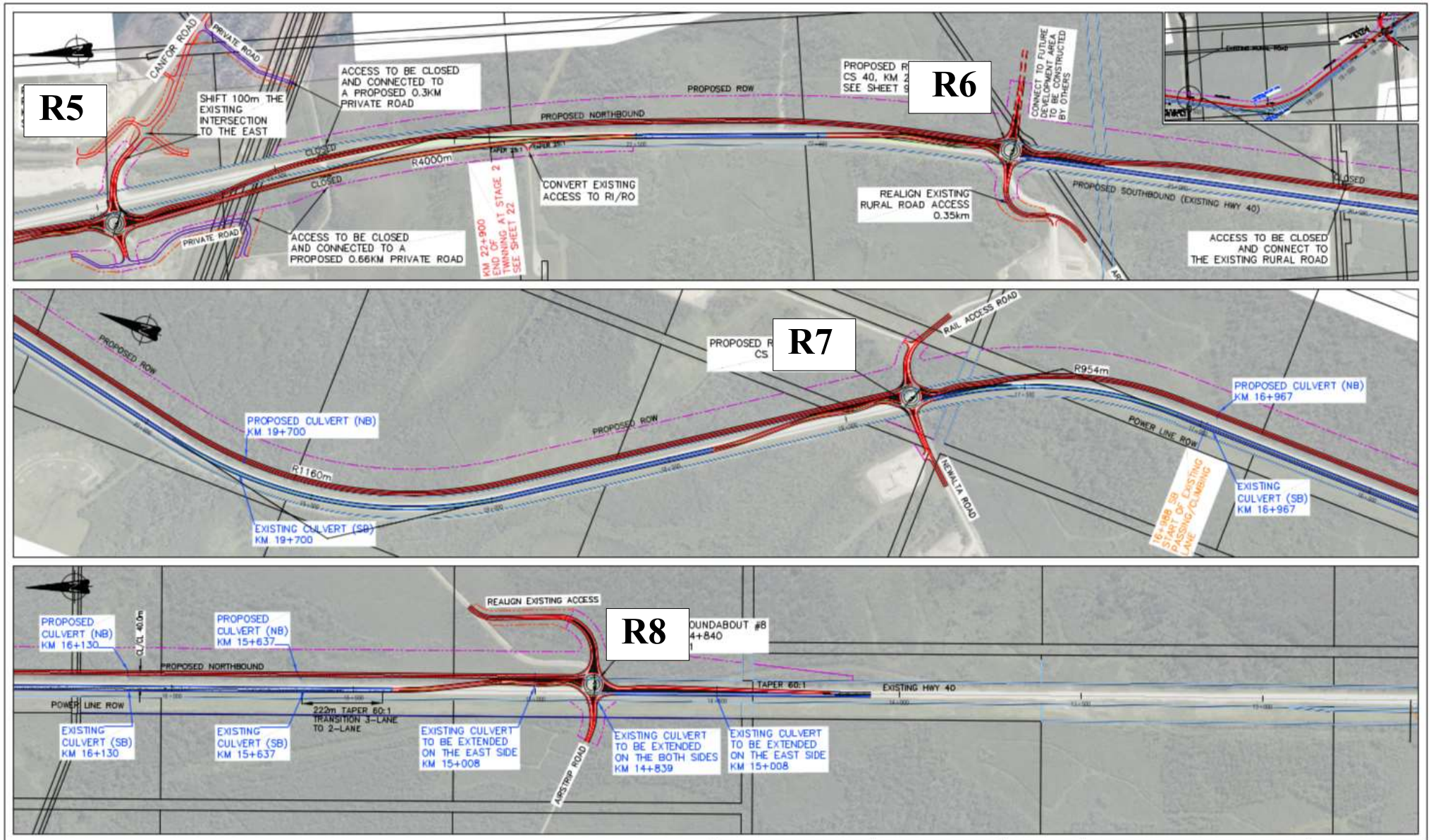
Castleglenn Consultants
Engineers, Project Managers & Planners

LEGEND
EXISTING HWY 40 (NB)
PROPOSED HWY 40 (SB)
PROPOSED PRIVATE/ SERVICE ROAD
PROPOSED TWINNING ROW
PROPOSED ERVICE/PRIVATE ROAD ROW

TWINNING
HIGHWAY 40 - CS 42/40
HIGHWAY 40 NETWORK REVIEW

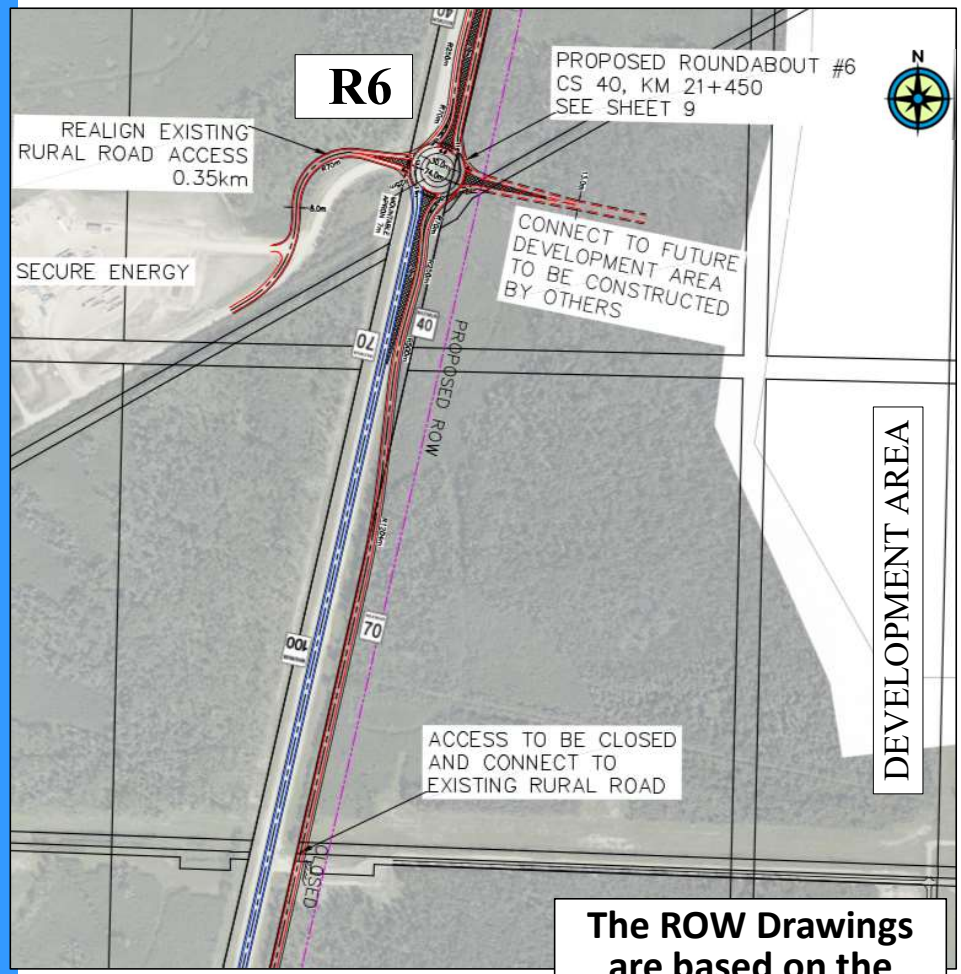
Alberta Transportation

The Twinning Plan



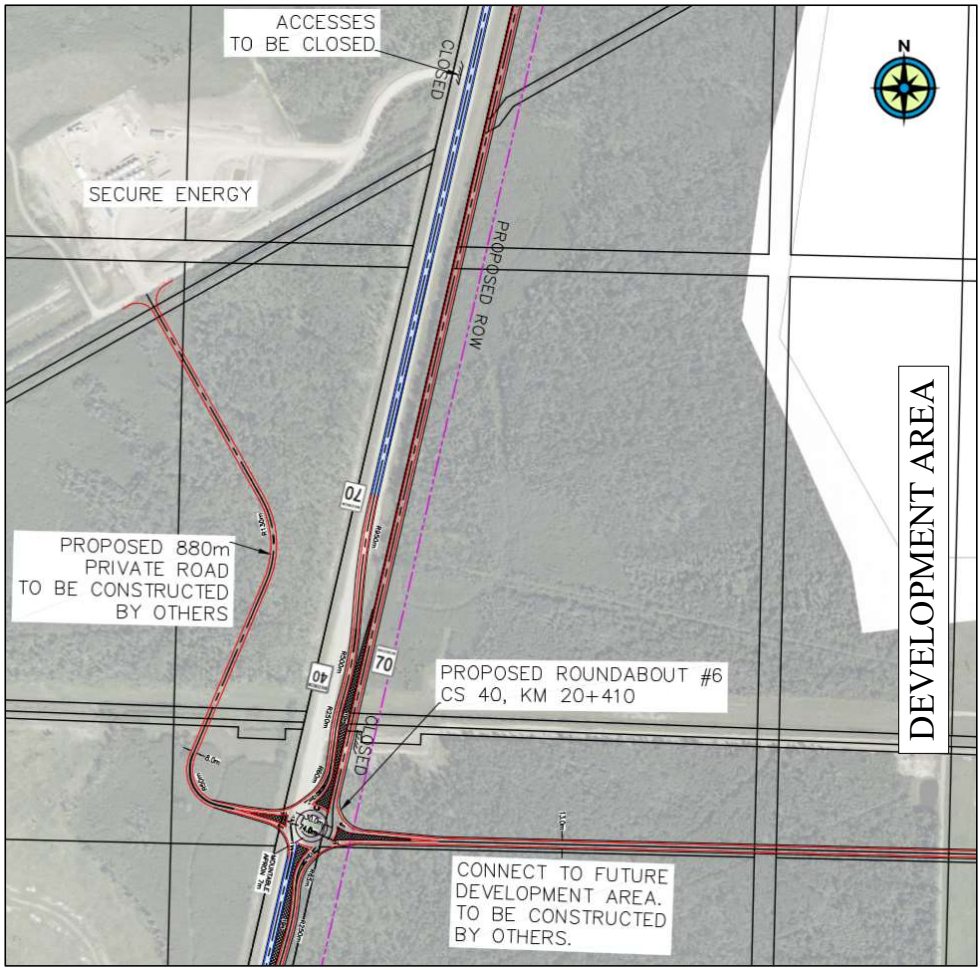
Two Concepts for Roundabout 6
(Adjacent GIG Development Area)

CONCEPT A



The ROW Drawings are based on the concept A

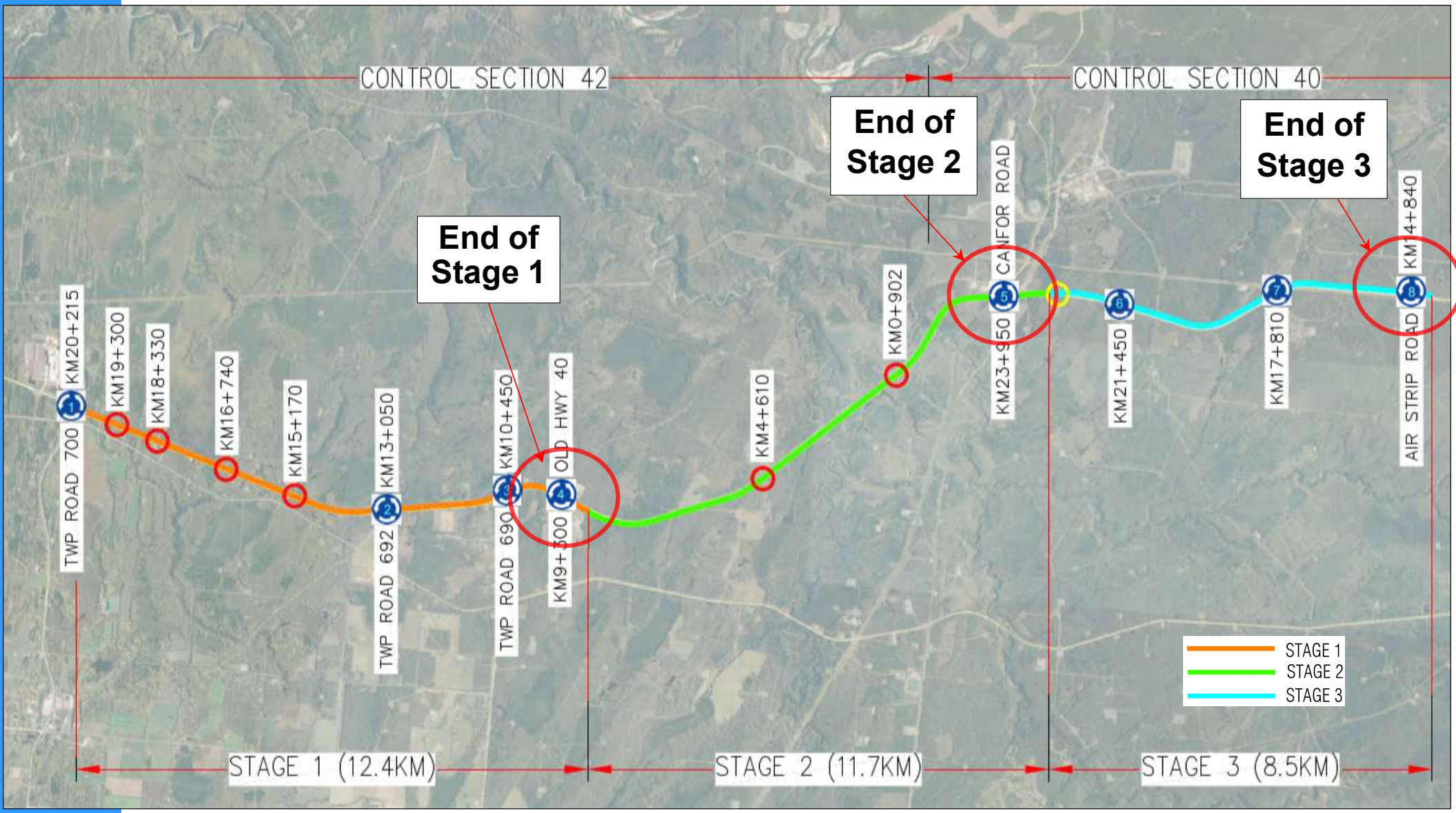
CONCEPT B



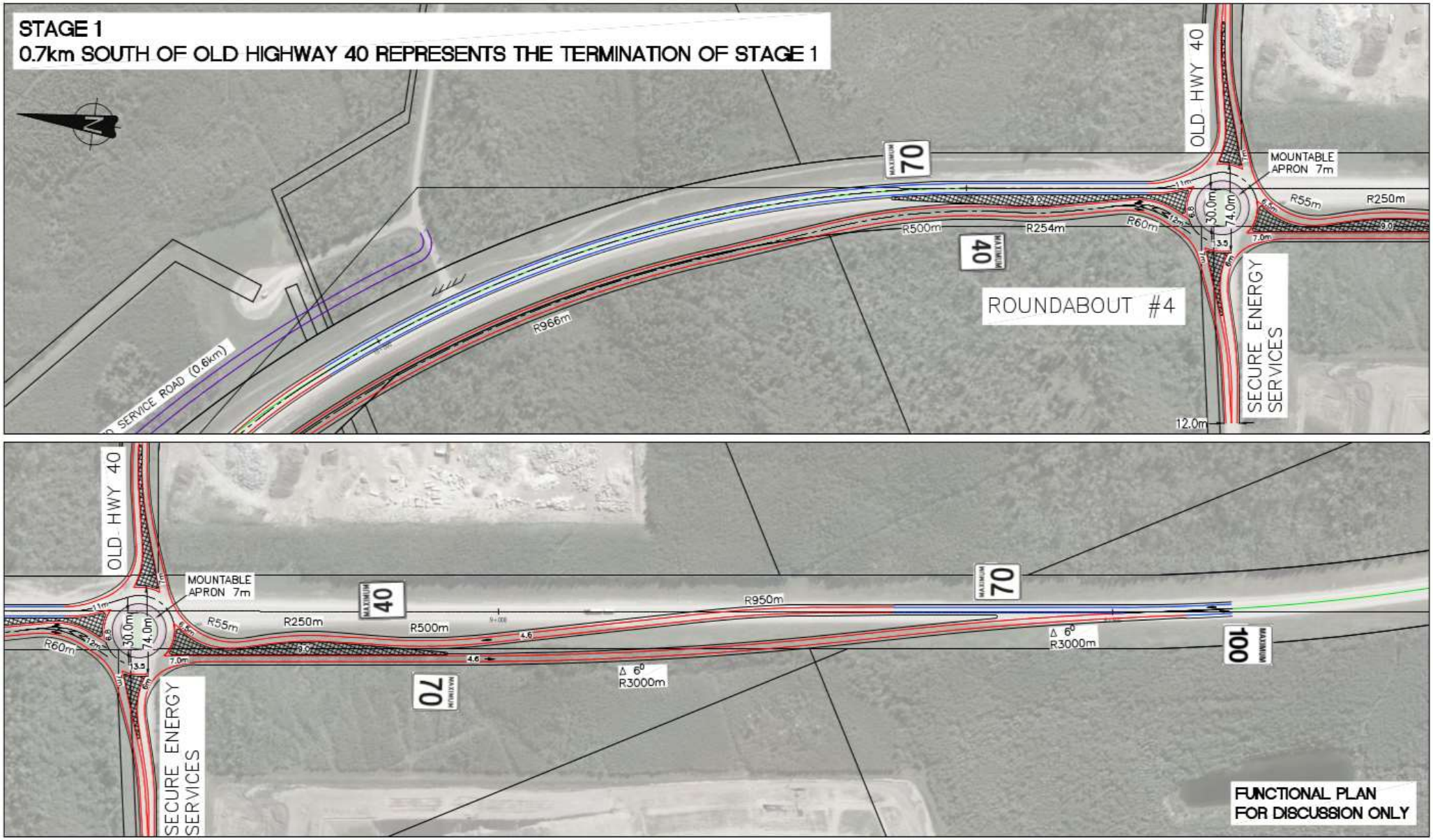
Access Management along Twinning Section

32.1 km:	Total Length of Proposed Twinning
8:	Proposed Roundabouts on Twinning Section
6:	Proposed Minor “T” Intersection
13:	Closed Accesses & Connected them to Proposed Private/Service Roads
1:	Access converted to RI/RO operation
6.44 km:	Total length of Proposed Service Roads

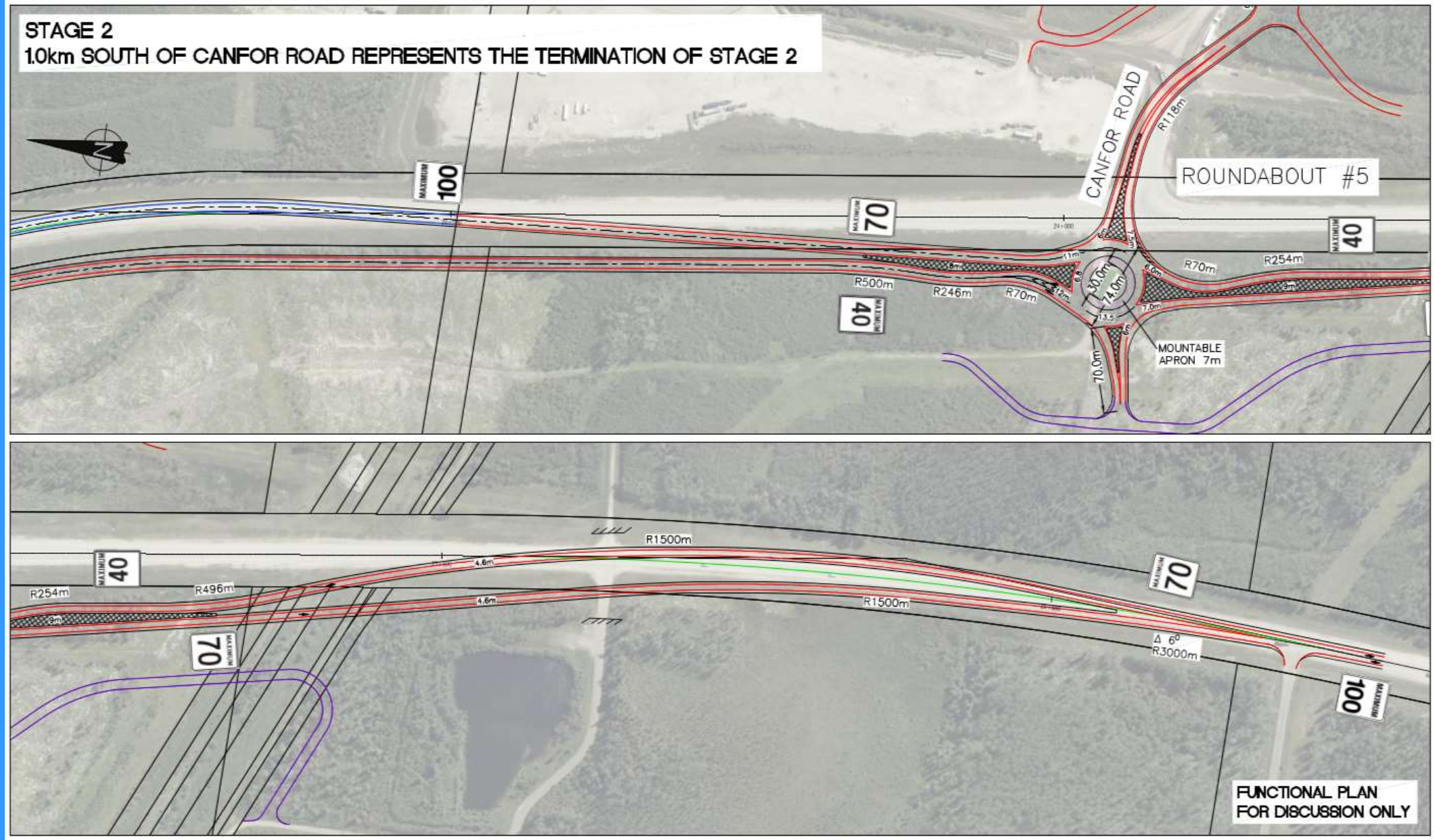
Twinning: The 3 Stage Plan



Stage 1 to 2 Transition Plan



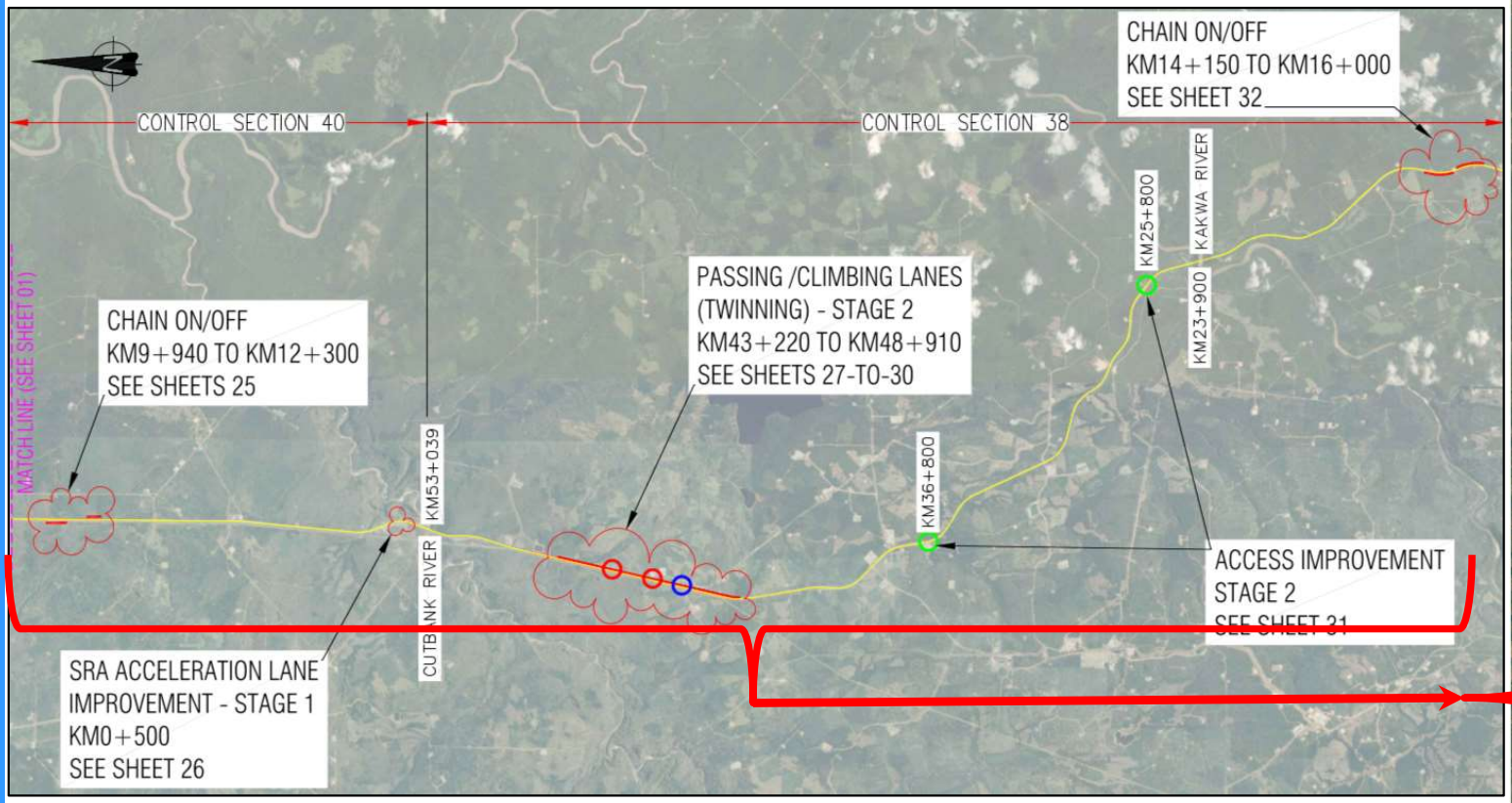
Stage 2 to 3 Transition Plan

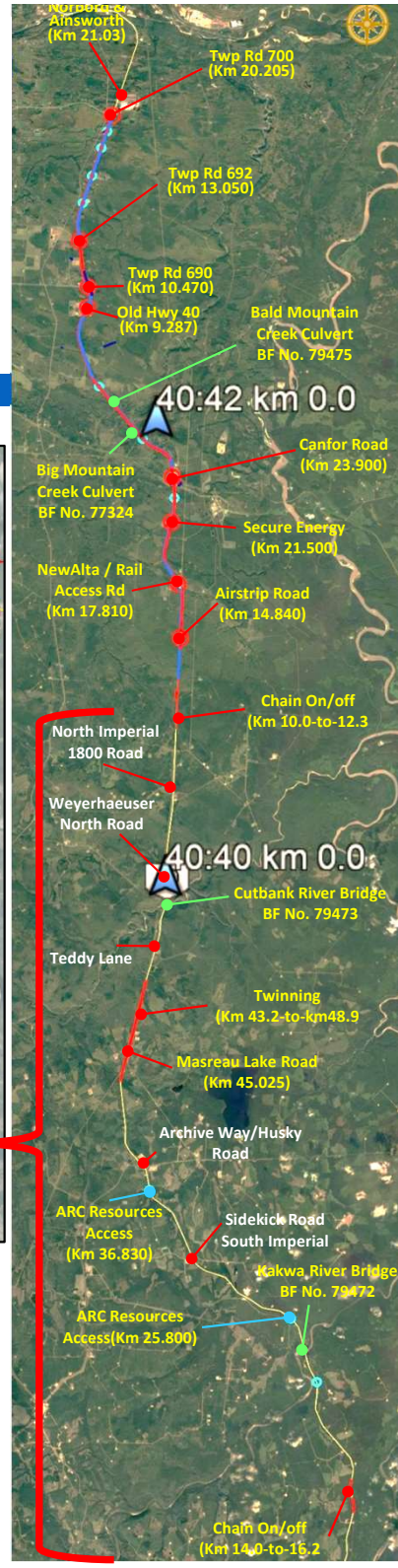


7. Draft Final Functional Plan Drawings

7b. Southern Portion of Study Area

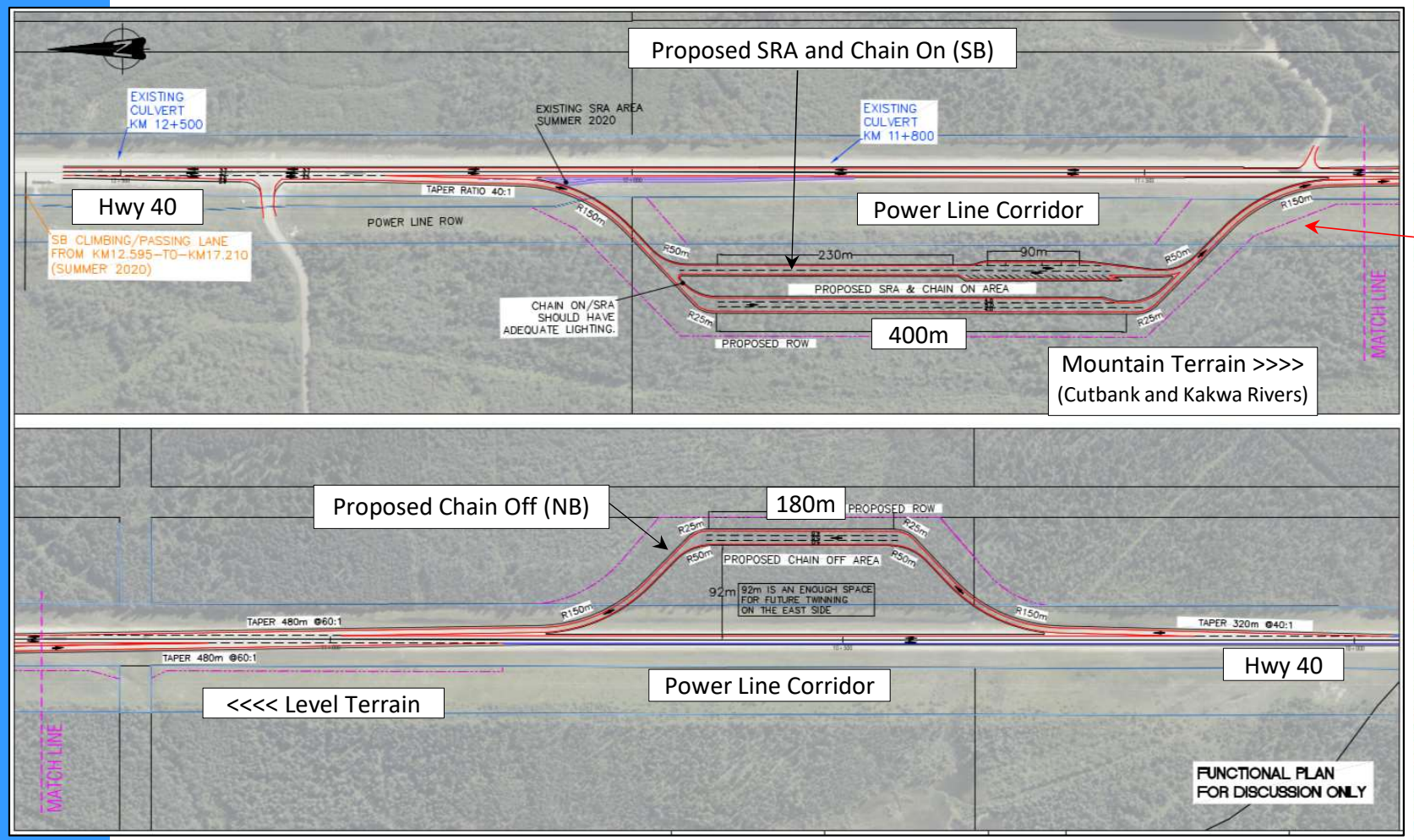
5b. Improvements on the Southern Portion of Study Area

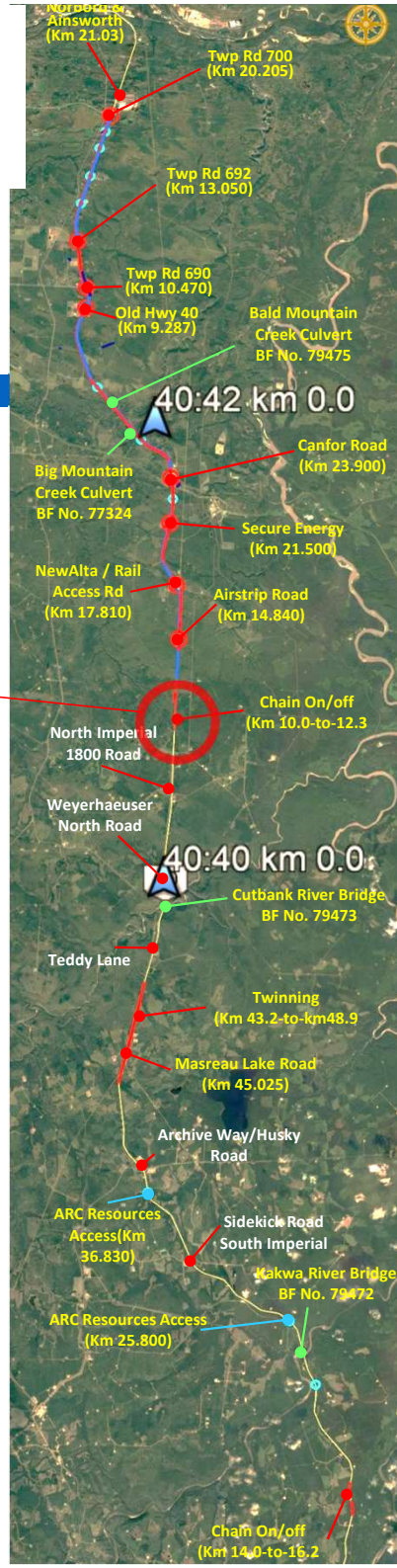




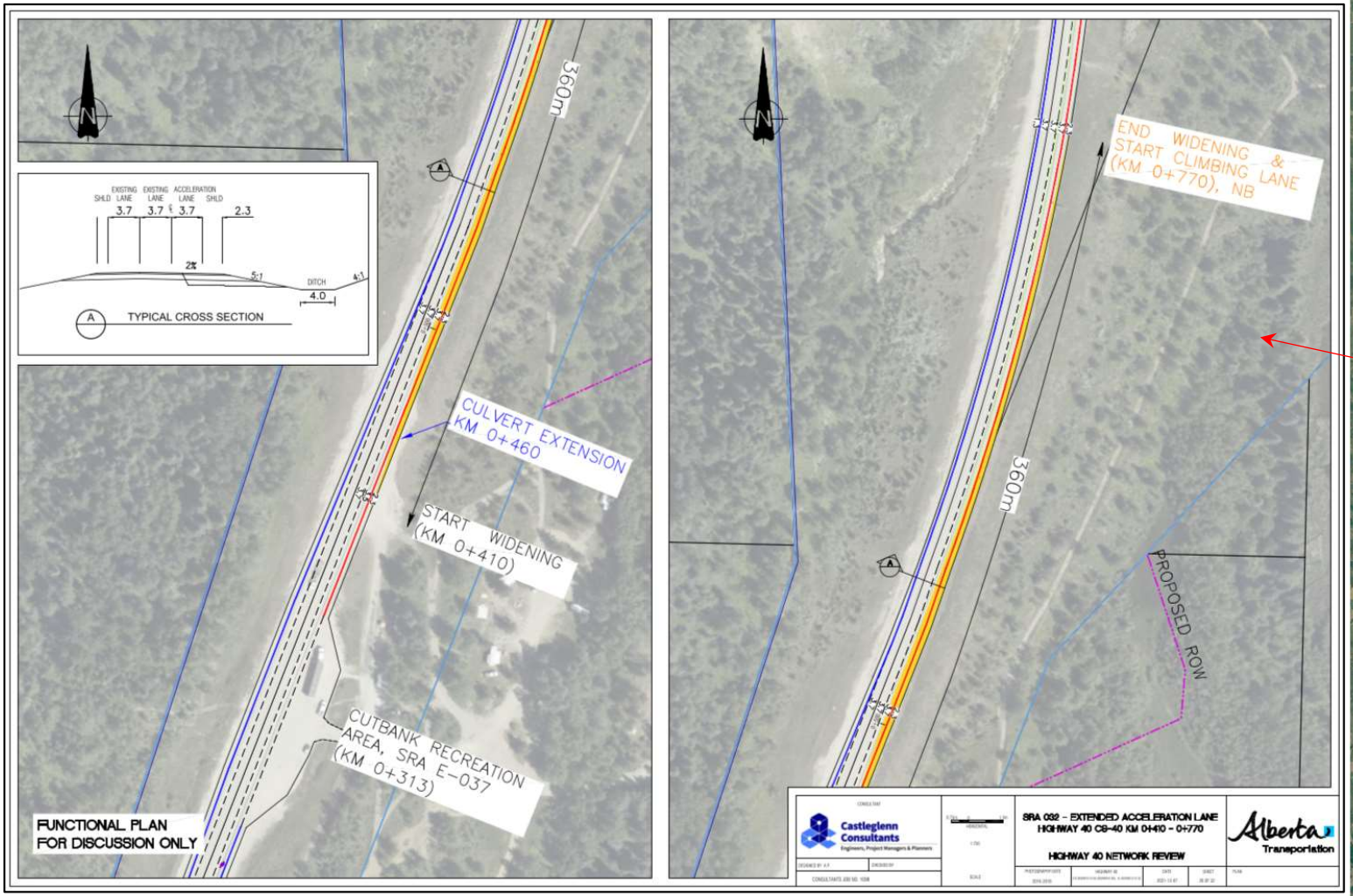
- **Chain-on/Chain-off sites,**
- **SRA sites improvement,**
- **A short section of Twinning**
- **Access/Intersection Improvements**

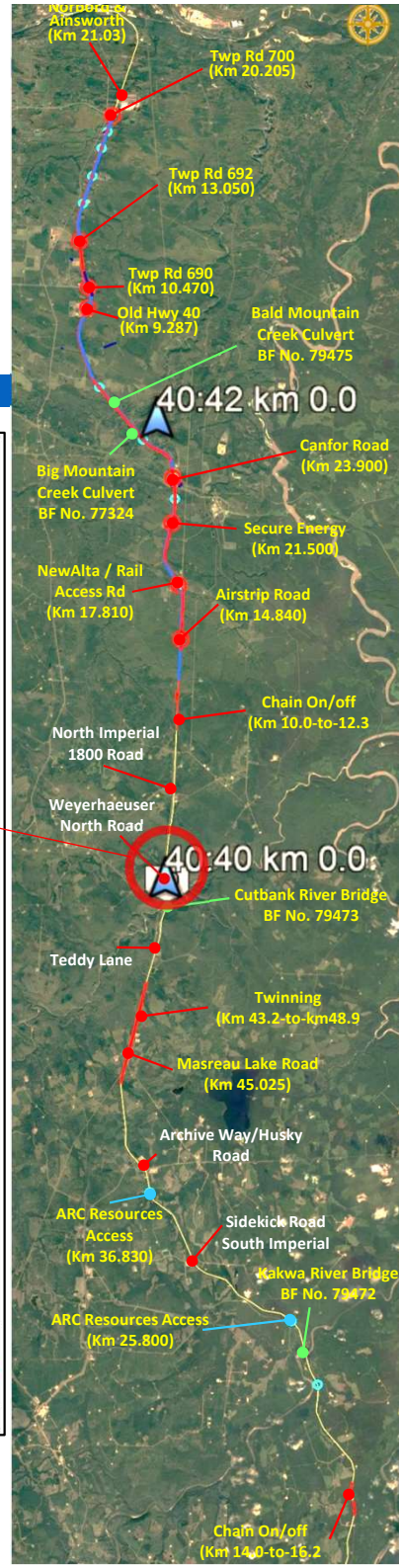
Chain On/Off/SRA (CS40)



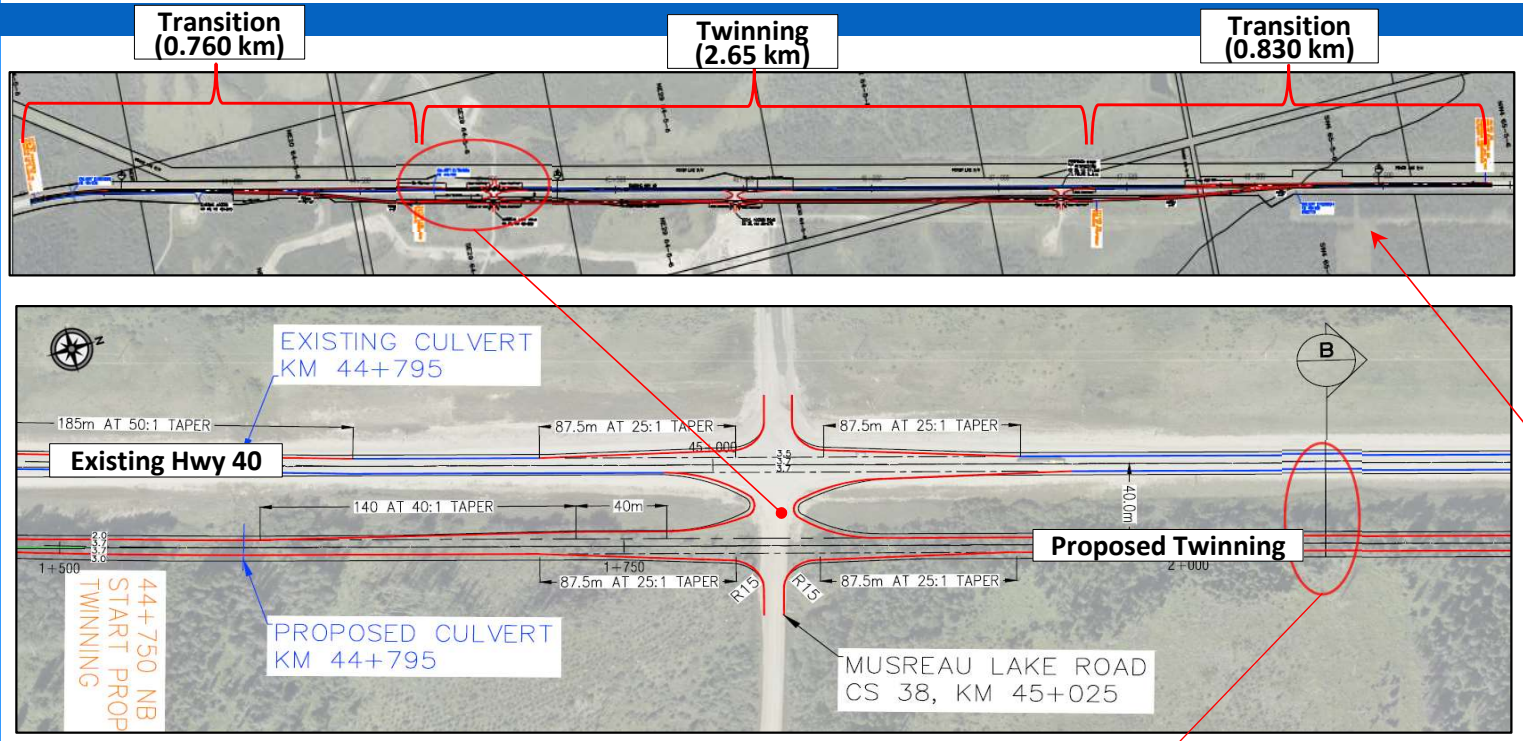


SRA –Acceleration Lane Improvements near Cutbank River

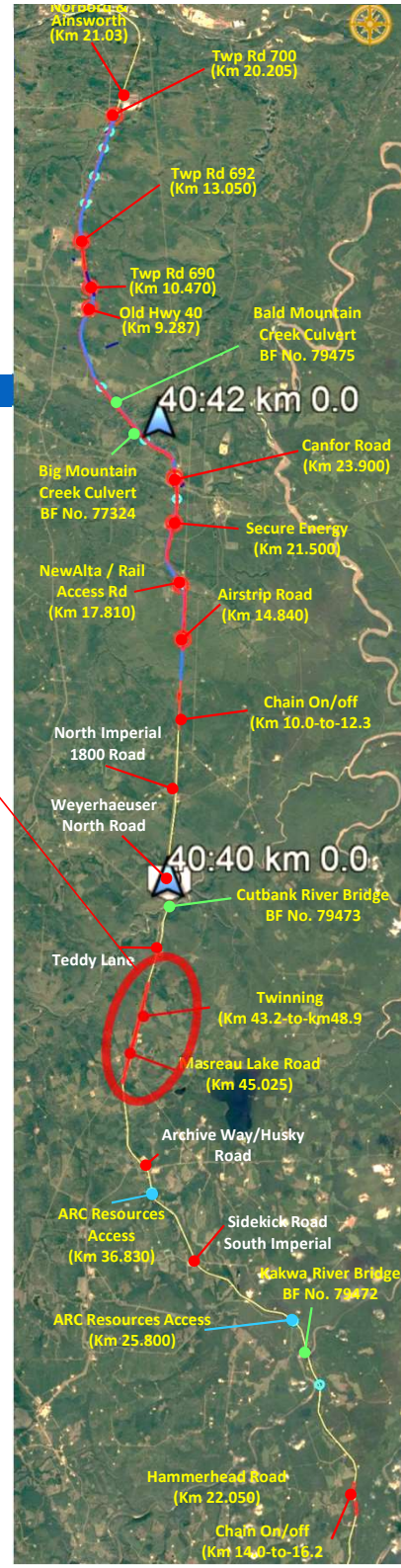




2.65 Km of Localized Twinning
(From km44+750 To km 47+400)

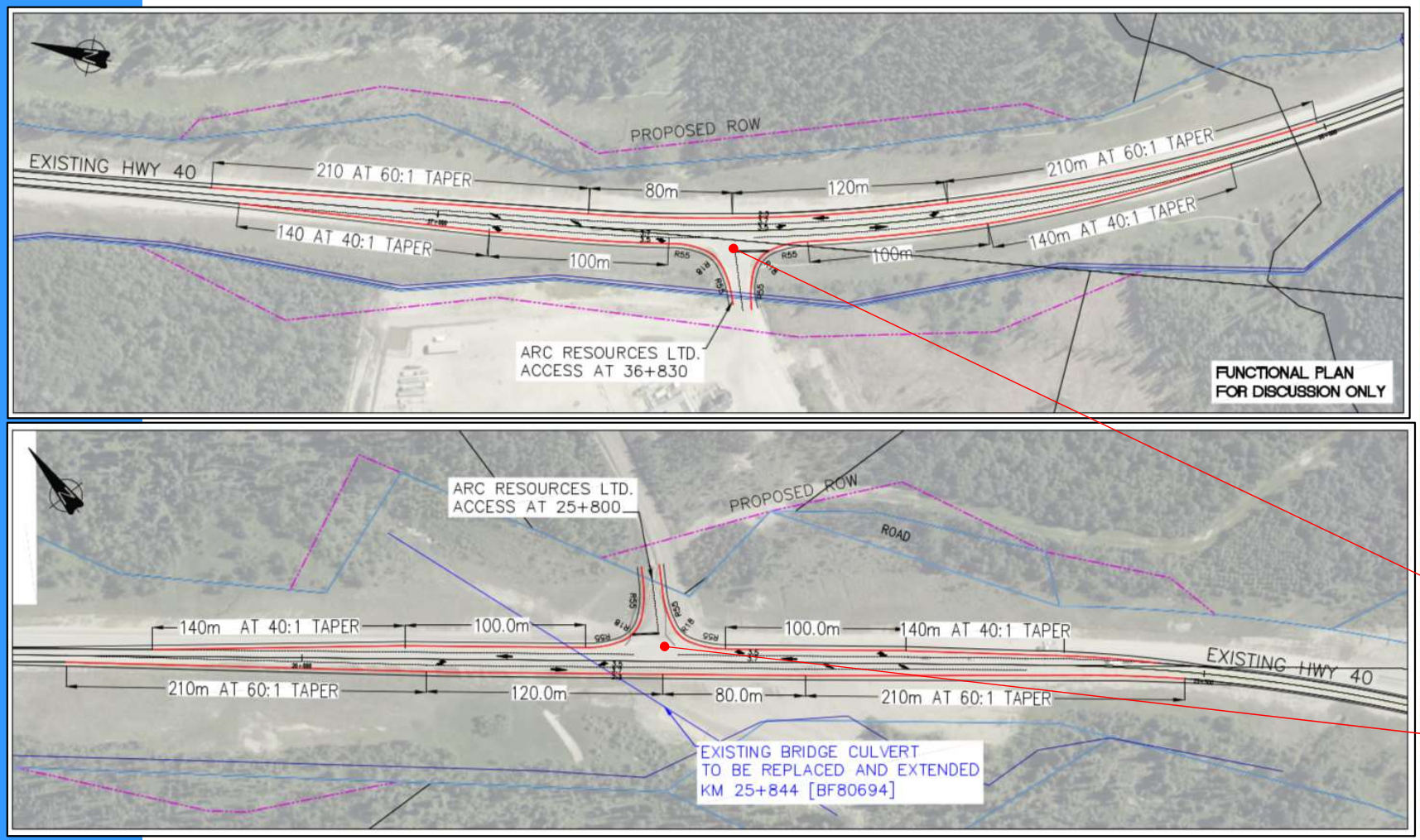


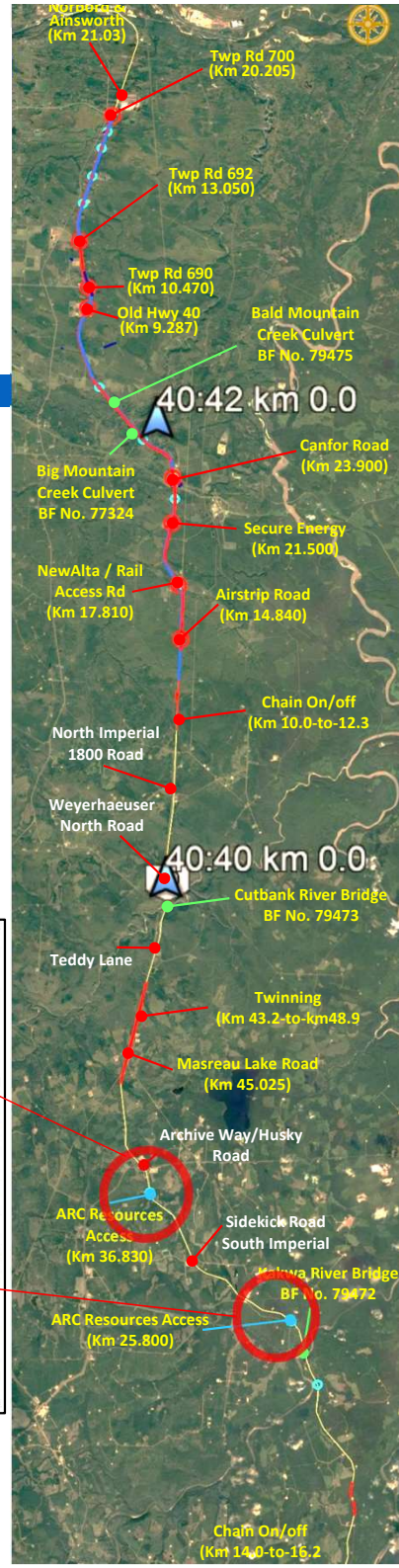
Typical Cross-Section of Highway 40 Short Twinning Section



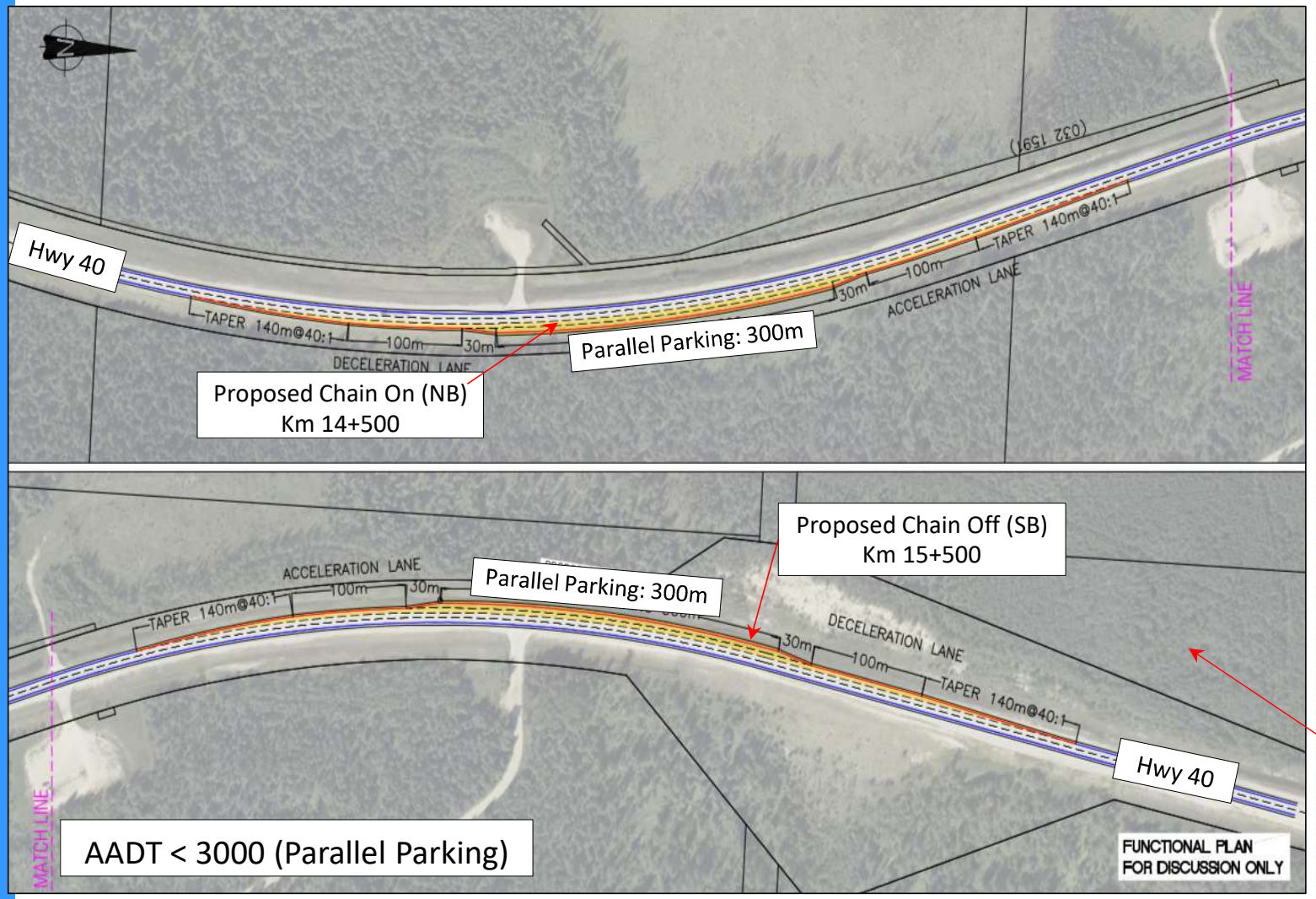
- **A short (2.65km) section of twinning is required as a passing lane is required in one direction and a climbing lane in the other.**

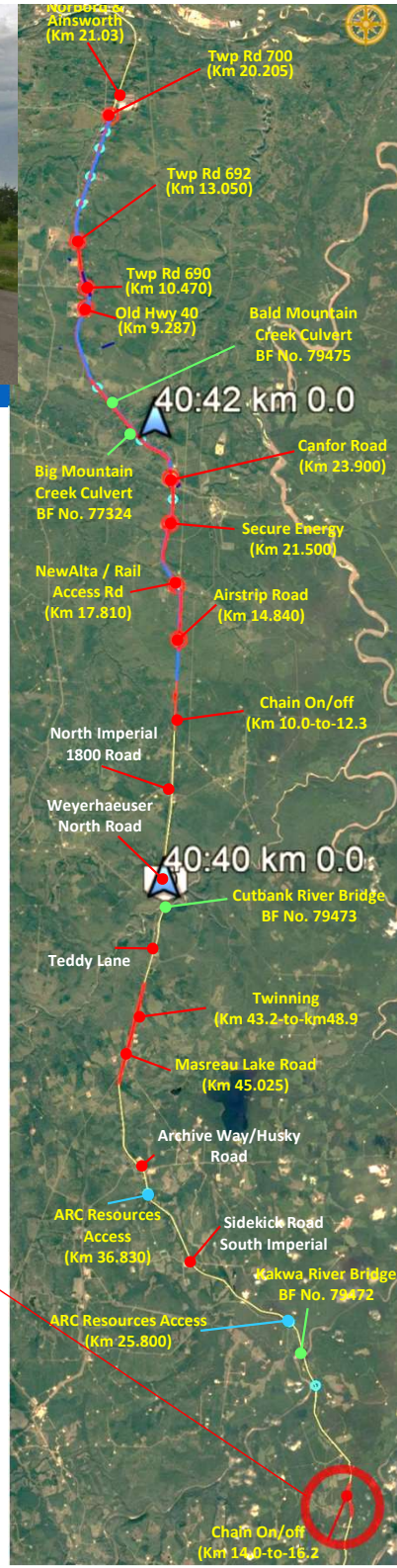
Localized Access Improvements





Chain On/Off (CS38)





Summary of Improvements: Southern Portion

1:	Upgrade Existing SRA to Chain On/SRA
3:	Proposed Chain On/Off facilities
1:	SRA - Acceleration Lane Improvement
2.65 km:	Total Length of Proposed Twinning
5:	Intersection and Access Improvements

7c. Conceptual Cost

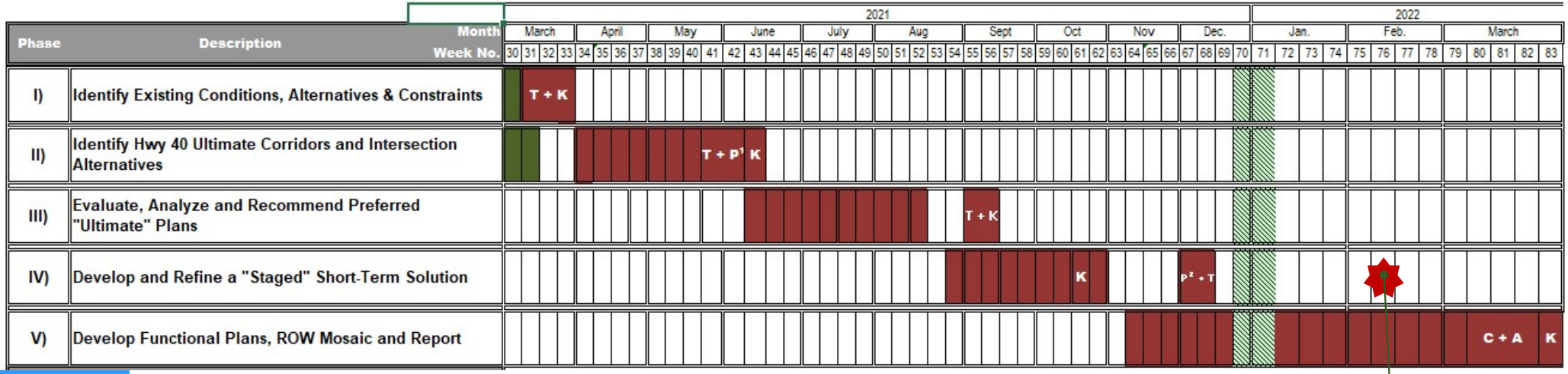
Summary of Estimated Construction Costs

	Staged Improvements	Estimated Construction Cost ($)	
Northern Portion [CS 42 Km 20+500-to-CS 40 Km 14+200]	**Northern Portion of Study Area:** Twinning Highway 40		$ 236.3M
	• **Stage 1 Twinning** from Norbord-to-Old Hwy 40: (CS42, km 20+500-to-Km 8+600) including 13.4km 2-lane roadway, three roundabouts, four minor "T" intersections, 1.2km private roads, 0.9km service roads, and replace/extension two culverts size bridge.	$86.6M	
	• **Stage 2 Twinning** from Old Hwy 40-to-Canfor Rd: (CS42, km 8+600 to CS40, Km 22+900) including 13.2km 2-lane roadway, one roundabout, two minor "T" intersections, 2.4km private roads, 0.77km minor road realignment, and replace/extend existing and install four new culverts/bridges.	$91.7M	
	• **Stage 3 Twinning** from Canfor Rd-to-Air strip Rd: (CS40, km 22+900 to Km 14+200) including 10.3km 2-lane roadway, three roundabouts, one RI/RO4 access, and 06km minor road realignment.	$58.0M	
Southern Portion [CS 40 Km 14+200-to-CS 38 Km 14+200]	**Southern Portion of Study Area:** SRA improvement, twinning, chain on/off, and access improvements		$48.6M
	• **Stage 1** SRA acceleration improvement, SRA032, north of Cutbank River (CS40, km 0+410-to-0+770), asphalt overlay for mud prevention, and install signage for warning wild animal passage.	$0.6M	
	• **Stage 2.1 Twinning:** (from CS38, km 43+220 to km 48+910) including 2.7km 2-lane roadway, 1.3km one lane widening, two minor intersections, one minor-major intersection, and replacing existing culvert.	$26.6M	
	• **Stage 2.2: Chain On/Off sites**: (CS40, km 10+0-to-km 12+500 & CS38, km 14+00-to-16+200) including 2.3km acceleration and deceleration lanes, 0.5km one lane widening, 0.6 km 2-lane widening, 0.8km connected ramps, 12,4k m^2 parking lot, and street lights.	$11.4M	
	• **Stage 2.3: Access Improvements**: ARC Resources Accesses (CS38, km 25+800 & Km 36+830) including 1.4km acceleration and deceleration lanes, 1.6km one lane widening, and replacing the existing culverts.	$10.0M	
Total			$284.9M

8. General Questions and Answers on Functional Plan Concepts

9. The Project Schedule

Condensed Milestone Schedule for Hwy 40 (Norbord Access to S of Hammerhead Rd) - Network Review Study (March



T TRC Meeting **C** MD Council Presentatio **M** MLA Presentation (If Required)
P Public Engagement **A** Final AT Presentation **K** Key Milestone

We are here.

- 1½ months are remaining in project schedule.
- The DRAFT Network Study is anticipated to be completed by end of March 2022.
- MD Council Presentation, MLA Presentation & Final AT presentation to be scheduled.

10. The Way Forward …

Conduct the 2nd Public Information Session (Feb 2022)

Confirm Historical Impacts for the Proposed Improvements

Finalize Cost-Estimate of the Ultimate Proposed Configurations

Complete Final Report including Public Consultation Results

This Way Forward

Thank You