Study of High Speed Rail Impacts on Rural Alberta

Final Report

prepared for:

Alberta Association of Municipal Districts and Counties

prepared by:

CPCS Transcom Limited

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Acronyms / Abbreviations

AADT	Annual Average Daily Traffic
AAMDC	Alberta Association of Municipal Districts and Counties
ASP	Area Structure Plan
AUMA	Alberta Urban Municipalities Association
CAEP	Central Alberta Economic Partnership
CP	Concept Plan
CPCS	CPCS Transcom Ltd.
CPR	Canadian Pacific Railway
dBA	Decibels
EIA	Edmonton International Airport
ERCB	Energy Resources Conservation Board
FRA	Federal Railroad Administration (US)
GMS	Growth Management Strategy
HSR	High Speed Rail
IDP	Intermunicipal Development Plan
IUCN	International Union for Conservation of Nature
LUF	Land-Use Framework
m	Metres
RGA	Rural Greenfield Alignment
SEL	Sound Exposure Level
TRANS	Alberta Transportation

Executive Summary

Project Background and Objectives

High speed rail[1] (HSR) has recently enjoyed a resurgence of public interest in both Canada and the United States. HSR has previously been proposed as a means of better connecting Calgary and Edmonton and potentially communities in-between.

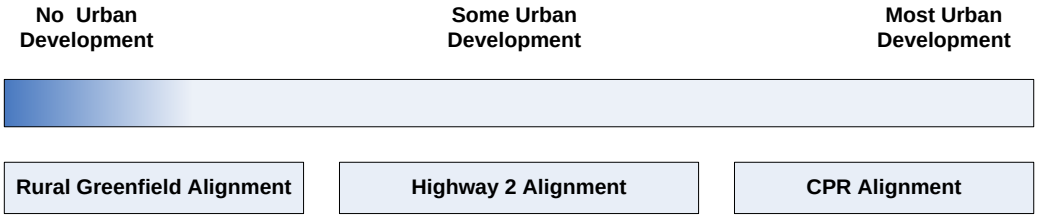
A number of studies have been undertaken in recent years to assess the feasibility and impacts of such an initiative. However, that analysis has been focused on implications for larger population centres. Impacts on rural communities[2] have not been adequately addressed.

CPCS has been engaged by the Alberta Association of Municipal Districts and Counties (AAMDC) to address this gap. The present study provides the AAMDC and its members with the necessary facts, insights, and supporting analysis to engage in an informed and productive fashion with the Government of Alberta and others regarding any future HSR planning, and to ensure that the interests of its member municipalities are well and clearly represented in this discussion.

Project Methodology & Limitations

The Government of Alberta has neither selected nor has a public position on an HSR alignment, or even criteria for selecting this alignment. For the purposes of this study, we have developed three "conceptual alignments" that allow us to assess the impacts of HSR under three different conceivable alignments (Figure A). Given their conceptual nature, our intent is not to analyze in detail each of these alignments; instead we use the conceptual alignments as a jumping-off point to discuss the issues that arise for rural Alberta in each case. By studying the three types of alignment we intend to capture the complete range of likely impacts on rural Alberta, regardless of where HSR is ultimately constructed.

Figure A: Three High Speed Rail Conceptual Alignments



In order to present realistic and meaningful analysis, this study makes a number of other assumptions about the technology and engineering characteristics of the potential HSR project. These assumptions are detailed in the body of the report.

[1] High speed rail is defined in this project as passenger trains operating at speeds in excess of 200 km/h.
[2] The impact of HSR on urban municipalities is not included in this study.

At no time in this project is it our intent to propose any specific alignment or to opine on the overall feasibility of a particularly alignment or the HSR project as a whole.

HSR Rural Impacts

While this study takes a comprehensive approach to identifying and analyzing the likely impacts of HSR on rural Alberta, Figure B presents a selection of those impacts that we have deemed to be of the greatest significance for the members of AAMDC and rural residents. These are the impacts that we recommend be taken into account by the HSR planning process to maximize the value of the HSR for rural communities (or otherwise minimize the negative impact of the HSR).

Figure B: Description of Key HSR Rural Impacts

Impact	Description
Road User Impacts	
Emergency vehicle access	Added cost of increased response time associated with the need to reroute emergency vehicles.
Traffic delays and forced travel time and routing changes	Added cost associated with the need to reroute traffic around roads severed by HSR.
Commercial and Economic Impacts	
Foregone land-use opportunities	Foregone opportunities caused by use of land for HSR and ancillary structures. Applies to residential, industrial, commercial, and agricultural land.
Farm severance psychological costs	The psychological costs associated with dividing real farm property to which owners may be very connected. These costs are in addition to financial damages, which we assume will be fully compensated by the proponent of HSR. These costs may extend to property beyond farms.
Farm equipment access	Added costs associated with having to move equipment over longer distances to access farm property.
Livestock access	Added costs associated with having to move livestock over longer distances to access farm property.
Social and Environmental Impacts	
Wildlife mobility	Disruption to the movement of wild animals.
Recreation	Disruption to recreational activities.
Noise and vibration	Noise and vibration caused by the movement of high speed trains.
Landscape and visual quality	Disruption to natural landscape associated with HSR.
Administrative and Planning Impacts	
Planning uncertainty	Cost of the risk that land will be required for the construction of the HSR and ancillary structures, i.e. associated adverse affect on investment.
Road maintenance costs	Change in road maintenance expenditures associated with the need to maintain additional access roads, cul de sacs, and grade-separated crossings over the HSR line.
Emergency services training	Added cost to train emergency services personnel to respond to emergencies along the HSR right-of-way.

We have selected impacts for inclusion in Figure B on the basis of our experience, a review of the literature, guidance from the steering committee, and consultations with stakeholders in

rural Alberta. In many instances, the magnitude of an impact is very much a subjective judgement by the individuals and communities affected.

Which rural impacts should be prioritized for mitigation depends to some extent on the conceptual alignment selected. Figure C shows that most impacts will be felt most strongly with the Rural Greenfield Alignment (RGA), while the Highway 2 Alignment would seem to offer the least impact.

Figure C: Summary of HSR Rural Impacts and Associated Relative Magnitudes by Conceptual Alignment

Impact	Magnitude of Issues by Conceptual Alignment		
	CPR	Highway 2	Rural Greenfield
Road User Impacts			
Emergency vehicle access	◆	◆◆	◆◆◆
Traffic delays and forced travel time and routing changes	◆◆	◆	◆◆◆
Commercial and Economic Impacts			
Foregone land-use opportunities	◆◆◆	◆◆◆	◆
Farm severance psychological costs	◆◆	◆	◆◆◆
Farm equipment access	◆◆	◆	◆◆◆
Livestock access	◆◆	◆	◆◆◆
Social and Environmental Impacts			
Wildlife mobility	◆◆	◆	◆◆◆
Recreation	◆◆	◆	◆◆◆
Noise and vibration	◆◆◆	◆◆	◆
Landscape and visual quality	◆◆	◆	◆◆◆
Administrative and Planning Impacts			
Planning uncertainty	◆◆◆	◆◆◆	◆
Road maintenance costs	◆◆	◆	◆◆◆
School bussing	◆◆	◆	◆◆◆
Emergency services training	Equal across all three conceptual alignments		
Scale: ◆ low impact; ◆◆ medium impact; ◆◆◆ high impact			

It is important to understand that given the synthesis presented in Figures B and C, it is clear that all 14 of the rural impacts identified will be more or less significant depending on the county and even the individuals affected.

Recommended Mitigation Strategy

Summary of the Needs and Objectives of Rural Communities

An assessment of how municipalities might best respond to HSR development must begin with an assessment of the needs and objectives of rural communities. These needs and objectives are perhaps best expressed by the representative planning goals of the counties affected by HSR, synthesized from the planning documents of the affected counties (Figure D).

Figure D: Representative Rural Planning Goals of Affected Counties

Planning Goals
Preserving agricultural land for agricultural uses.
Fostering economic development and protecting the tax base.
Optimizing road and utility infrastructure.
Avoiding land-use conflicts.
Protection of significant environmental areas and prevention of land, water, air, noise, and visual pollution. Promotion of recreation.
Fostering mutually beneficial relationships with neighbouring municipalities.
Fostering resource-extraction industries.

On the basis of these rural planning goals we recommend a pro-active, three-pronged strategy to simultaneously mitigate the negative impacts of HSR on rural Alberta, to capitalize on the potential benefits, and to engage with rural communities to ensure that information is available and communication is ongoing.

Mitigate Negative Impacts

The proposed mitigation strategy involves four groups of mitigating measures that are closely interconnected:

- **Design: Access and Mobility.** Minimize mobility and access impacts where possible across the alignment, including sections of elevated track where warranted.

- **Design: Location-Specific Mitigation.** Deploy special mitigation measures for areas sensitive to detrimental impacts on landscape and visual quality, and noise.

- **Alignment.** Develop the alignment away from populated areas, so long as sufficient access is provided across the alignment. This is not necessarily an endorsement of the RGA alignment, but it recognizes the potential to mitigate some of the adverse impacts of HSR on rural Alberta by avoiding areas that are planned for growth. This type of mitigation is particularly important as it pertains to the impacts of planning uncertainty and foregone land-use opportunities.

- **Mitigation Programs.** In some cases a new government program could be developed to minimize rural impacts. These programs would require some financial support.

Figure E connects each of these groups of mitigation measures with impact they would address.

Figure E: Mitigation Strategies

Impact	Design: Access & Mobility	Design: Loc.-Specific Mitigation	Alignment	Mitigation Program	Strategies
Road User Impacts					
Emergency vehicle access	✓			✓	-Increased access/mobility across the alignment. -HSR crossings near existing emergency response facilities. -Re-optimizing emergency services deployment patterns, without reducing service levels elsewhere.
Traffic delays and forced travel-routing changes	✓			✓	-Increased access/mobility across the alignment. -Improved signage to assist motorists in finding alternative routes.
Commercial and Economics Impacts					
Foregone land-use opportunities			✓	✓	-Compensation to landowners and government (for lost tax revenue, e.g. grants in lieu of taxes). -Avoid areas planned for development and/or use planned HSR right-of-ways. -Coordination of AAMDC member land-use planning in response to HSR project.
Farm severance psychological costs	✓			✓	-Clarity around financing mechanism for affected landowners and support in coordination of expropriation process. -Inform farmers and other affected landowners about rights and obligations vis-à-vis expropriation. -Minimize severance by providing increased access/mobility across the alignment, where required.
Farm equipment access	✓				-Ensure that access across the alignment accommodates the dimensions of farm vehicles. -Increased access/mobility across the alignment. -Appropriate signage to minimize the risk of collisions where clearances are insufficient.
Livestock access	✓		✓		-Accommodate foot-movement of livestock on crossing of the alignment. -Increased general access/mobility across the alignment.
Social and Environmental Impacts					
Wildlife mobility	✓		✓		-Avoid areas home to sensitive wildlife. -Increased access/mobility across the alignment, focused on wildlife.
Recreation		✓			-Increased access/mobility across the alignment, focused on recreation.
Noise and vibration		✓	✓		-Alignment away from populated areas. -Noise mitigation measures.

Landscape and visual quality		✓			-Below-grade alignment, visual-impact mitigation measures.
Administrative and Planning Impacts					
Road maintenance costs	✓				-Re-optimization of municipal maintenance operations. -Increased access/mobility across the alignment.
Planning uncertainty			✓	✓	-If HSR is to be built, alignment should be selected as soon as possible to allow maximum time for adjustment to plans -Avoid areas planned for development and/or use planned HSR right-of-ways.
Emergency services training costs				✓	-Seek financial and technical assistance from proponent for rural emergency-response training, specific to HSR incidents.

Capitalize on Potential Positive Impacts

HSR is not exclusively a negative for rural residents. To the extent that rural objectives around improving public transit, particularly for residents who for one reason or another are unable to drive, can be supported by HSR, rural Alberta could realize some positive impacts. In particular we see the potential for HSR to be integrated with rural transit initiatives, particularly around using the Red Deer HSR station as a rural transit hub. We also see an opportunity to use the development of HSR to consolidate transportation and utilities into a new Calgary-Edmonton transportation and utility corridor. Concretely, rural Alberta could benefit from re-aligning the existing CPR line away from more built-up areas near towns.

Early Engagement and Clear Communication

Helped by major advances in information and communications technology, proponents of major projects have come a long way in recent years in working with affected communities to mitigate adverse impacts and capitalize on positive impacts. Perhaps the most important factors in a successful mitigation strategy are early engagement and clear communication between project proponents, governments, and affected communities.

Communities affected by major transportation projects want information about where exactly the project will be constructed, how and when it will be constructed, and how they will be affected. In our experience, few project proponents object to consulting with affected communities, since community support is a key factor in the on-time and on-budget completion of a major infrastructure project.

We view the development and implementation of a robust and thorough program of community consultations as one of the most important mechanisms that could be put in place to minimize the adverse impact and capitalize on the positive impact of developing an HSR line in rural areas between Calgary and Edmonton. Ensuring that any HSR development has at its core such a program should be the highest priority of AAMDC with respect to HSR.

Furthermore, we see the potential for AAMDC itself to play a role in facilitating the engagement of rural municipalities and their residents in the HSR development and consultations process. AAMDC is well placed to allow rural Alberta to speak with one voice.

Order-of-Magnitude Cost Estimate for Mitigation

Figure F sets out the costs of the key strategies outlined above. Given the high-level scope of the present study, we estimate only the costs of selected mitigation measures. In general, the guiding principle we have used to determine fiscal responsibility is the legislative division of powers between the provincial government and the municipalities. We have also used our experience in the development of infrastructure projects, where relevant.

Figure F: Estimated Cost and Fiscal Responsibility for Key Mitigation Strategies

Mitigation Strategy Element	Cost Estimate	Fiscal Responsibility
Design: Mobility and Access		
Grade-separate all public roads.	$96-$360 million or $2.3-$3.2 million per crossing	Proponent
Grade-separate all public roads: operating cost	$0-$5.5 million per year	Municipality
Wildlife crossings.	$3.3 million per crossing[3]	Proponent
Construct HSR on an elevated track.	4-6 times the cost per km of at-grade track	Proponent
Additional construction costs for access roads, if necessary.	$400,000-$500,000 per km	Proponent
Additional annual operating costs for new access roads if necessary.	$5,000 per km per year	Municipality
Design: Location-Specific Mitigation		
Signage to mitigate traffic delays, forced travel time, and routing changes.	Unknown	Proponent
Noise and vibration mitigation, landscape and visual quality.	Highly location-specific	Proponent
Grade-separate recreational trails.	$1.2 million per crossing	Proponent
Alignment		
Additional length of track constructed.	At least $10 million per km	Proponent
Mitigation Programs		
Program to assist farmers with expropriation process.	Unknown	Need for negotiation to ensure proponent pays or cost is reasonably shared.
Emergency vehicle access and emergency services training costs.		
Signage for severed roads.		

[3] Based on the unit cost of constructing two wildlife overpasses in Banff National Park in 1997: http://www.mountainnature.com/Articles/CrossingStructures.htm. Costs would likely be higher today due to construction price inflation. 1997 cost of $1.9 million adjusted to 2010 dollars using the Statistics Canada's non-residential building construction price index for industrial buildings in Edmonton.

1 Introduction

1.1 Background

High speed rail (passenger trains operating at speeds in excess of 200 km/h) has recently enjoyed a resurgence of public interest in both Canada and the United States. High speed rail (HSR) has previously been proposed by politicians and others as a project to better connect Calgary and Edmonton and potentially communities in-between.

A number of studies have been undertaken in recent years to assess the feasibility and impacts of such an initiative. However, that analysis has been largely focused on implications for larger population centres. Impacts on rural communities have not been adequately addressed.

The present study addresses this gap. It provides AAMDC and its members with the necessary facts, insights, and supporting analysis to engage in an informed and productive fashion with the Government of Alberta and others regarding any future HSR planning, and ensure that the interests of its member municipalities are well and clearly represented in this discussion.

1.2 Objectives

Per Resolution 12-09F passed at the Fall 2009 AAMDC Convention, the study vision can be stated as follows:

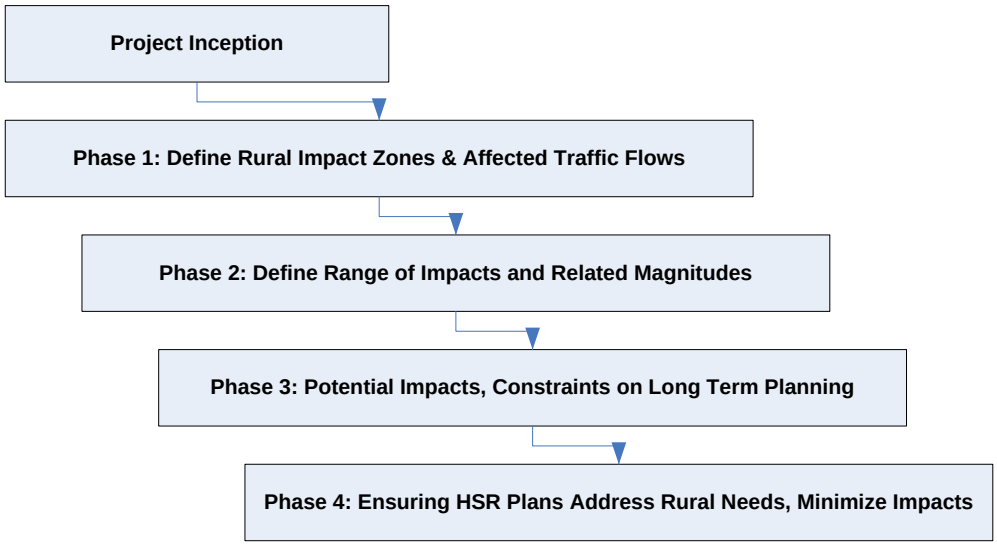
> To clearly identify, with supporting analysis, the potential impacts of the Calgary-Edmonton HSR on rural areas along and adjacent to its corridor, such that AAMDC can be well informed of related implications for its members and municipal long term planning and development, and advocate for their interests accordingly in the HSR planning process.

In line with this vision, the objective of this project is to develop a robust and well-articulated impact assessment detailing the full range of impacts of the Alberta HSR project on rural communities likely to be impacted by it, and related municipal long-term planning and development and matters ancillary thereto. This study will also make recommendations to the AAMDC on measures required to ensure that the interests of rural areas in question are upheld, or otherwise not negatively impacted by any developments of the HSR project.

1.3 Project Structure

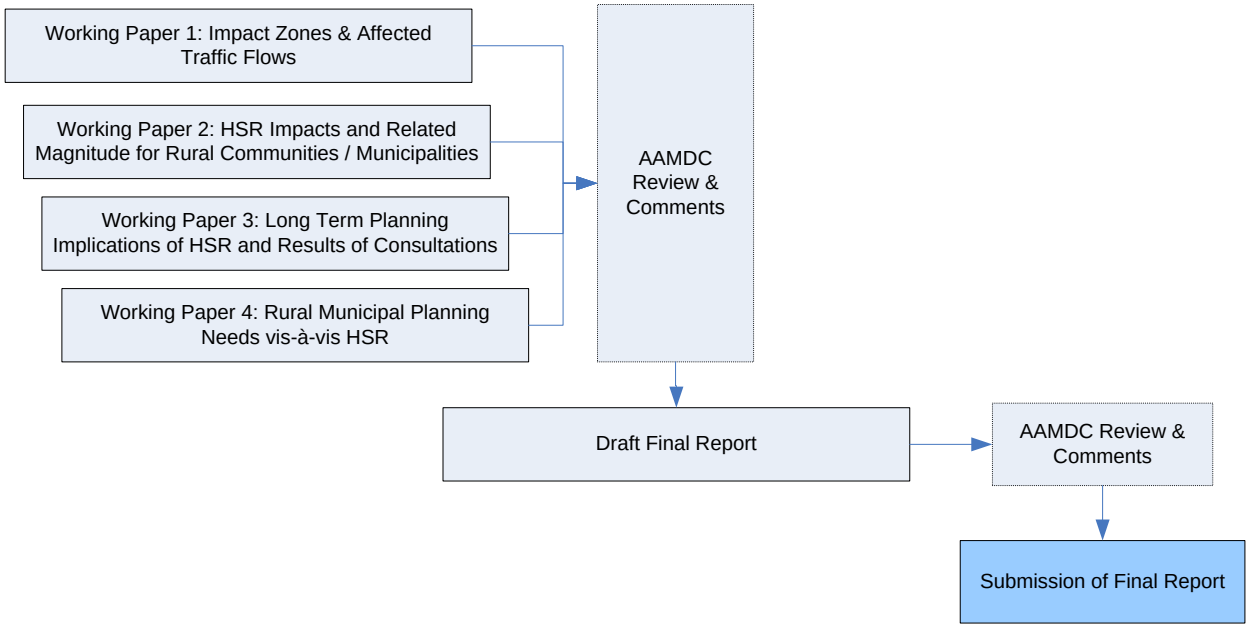
The project is to be developed in five broad steps, as set out in Figure 1-1.

Figure 1-1: Phased Approach to the Study



Each Phase of the project resulted in a Working Paper that presented the findings of the Phase. The Steering Committee has provided comments on all four working papers, and these comments have been incorporated into this final report (Figure 1-2).

Figure 1-2: Final Report Preparation Process



1.4 Methodology & Limitations

This study raises some methodological questions and limitations that the reader should bear in mind. These issues are discussed below.

1.4.1 Alignments

HSR is on the agenda of the Government of Alberta. Publicly, Minister of Transportation Luke Ouellette "said in a May 28 (2010) interview that his department is looking for about $9 million to fund a two-year study into the best route (for HSR between Calgary and Edmonton)."[4] However, Alberta Transportation has made it clear to us that thus far the Government of Alberta has neither selected nor has a public position on an HSR alignment, or even criteria for selecting this alignment.[5]

Clearly, the fact that no alignment has yet been defined precludes the possibility of undertaking an alignment-specific study of impacts on rural communities. Instead, we have developed three alternative "conceptual alignments" for the purposes of assessing the range of impacts that might result from the development of HSR between Calgary and Edmonton, wherever the alignment might ultimately end up.[6] Chapter 2 provides more detail on our approach to developing these conceptual alignments.

As noted above, the reader should bear in mind that at no time in this project is it our intent to propose any specific alignment or to opine on the overall feasibility of a particular alignment or the HSR project as a whole.

1.4.2 Types of HSR Technology

Throughout this study, many of the findings are dependent on what type of HSR technology is employed. In this report we define HSR to be passenger trains operating at speeds in excess of 125 mph[7] (200 km/h).[8]

Another important preliminary issue to be aware of is that HSR lines can be constructed entirely at grade (on the ground) with over or underpasses, below grade (in a trench) with overpasses, or on an elevated track, in which case all crossings would pass underneath the line. This characteristic is known as "vertical alignment."

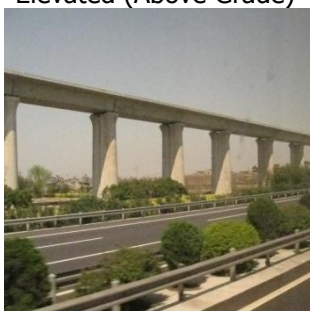
[4] "Inching closer," *Alberta Scan,* week ending 28 May 2010, Issue 742, womcom@shaw.ca.
[5] Meeting with Rod Thompson, Executive Director of Strategic Policy, Alberta Transportation, May 21, 2010
[6] Additional information on alignments previously studied was requested from the Van Horne Institute and from CP Rail. Neither organization was able to provide more detail than was publicly available, namely the 2004 report entitled *Calgary-Edmonton High Speed Rail: An Integrated Economic Region.*
[7] A note on terminology. It is conventional in Canada to use the US measurement system when referring to railways. This convention reflects the high degree of integration between the US and Canadian freight railways. For clarity and consistency, when discussing certain aspects of HSR, we will use both the US and metric (in parentheses) figures.
[8] Various definitions of HSR exist. Maximum operating speeds in excess of 125 mph (200 km/h) is a common and conservative (low bar) definition. See "http://www.uic.org/spip.php?article971" for an authoritative discussion of definitions.

Figure 1-3: Alternative Vertical Alignments for HSR

At Grade

Below Grade

Elevated (Above Grade)



Source: CPCS (left and right), http://www.crbasic.info/Alameda-Corridor-Trench.html (centre)

It should be readily apparent from the images in Figure 1-3 that the vertical alignment of the track will significantly affect the nature and magnitude of impacts on rural Alberta.

1.4.3 Geographic and Administrative Scope of Analysis

The present study is concerned with the impact of HSR on rural Alberta. For the purposes of this report, rural Alberta is defined to include the lands under the administration of the members of the AAMDC. All lands under the administration of the members of the Alberta Urban Municipalities Association (AUMA) are therefore not analyzed in this study.[9]

This absence of involvement from AUMA and its members does present some challenges in terms of assessing the impact of HSR on rural Alberta, since urban municipalities provide most of the services that are consumed in adjacent rural areas. Urban communities are also the major population centres in rural counties.

1.4.4 Mitigation Measures

Our discussion of municipal planning actions (mitigation measures) to address the impacts of HSR draws on a combination of our consultations with municipalities and other stakeholders, a review of the literature of mitigating HSR impacts in rural areas, and on the experience of our team. The outcomes are mitigation strategies for AAMDC and its members to consider in addressing HSR.

Our estimates of the costs of these mitigation strategies are based on engineering assessments of the costs constructing and operating various structures to mitigate certain impacts of HSR in rural areas. These engineering assessments were undertaken by the road and rail engineers on our team and are based on industry standard practices.

In our discussion of mitigation measures and strategies, we do not attempt to discuss in detail or in a comprehensive manner the specific measures that might be undertaken in specific locations. For instance, we do not discuss design aspects of structures used to cross watercourses, since the important point is that mitigation is required and not specifically how that mitigation is undertaken. In many cases we do, however, offer illustrative examples of the types of mitigation measures undertaken elsewhere.

[9] Note that the AUMA declined to participate in this study.

1.5 Organization of this Final Report

The remainder of this Final Report is organized in eight chapters as follows:

- Chapter 2: Mapping of HSR Alignments and Identification of Adjacent Municipalities
- Chapter 3: Road/Rail Crossings
- Chapter 4: Road User Impacts
- Chapter 5: Commercial and Economic Impacts
- Chapter 6: Social and Environmental Impacts
- Chapter 7: Administrative and Planning Impacts
- Chapter 8: Recommended Rural and Municipal Planning Actions to Address HSR
- Chapter 9: Order-of-Magnitude Cost Estimate for Recommended HSR Mitigation Strategy

2 Mapping of HSR Alignments and Identification of Adjacent Municipalities

This chapter first explains our approach to identifying and mapping HSR alignments for study. It then provides a map of the alignments and identifies those rural municipalities through which the alignments pass.

2.1 Approach

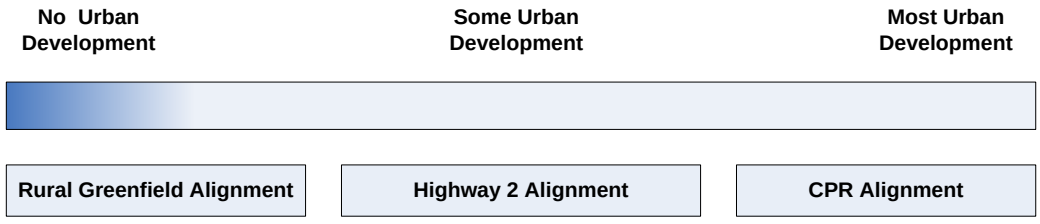
Two alternative alignments for HSR in the Calgary-Edmonton corridor have been proposed in recent publicly available studies (i.e. 2004 Van Horne study). One alignment would make use of the existing Canadian Pacific Railway (CPR) corridor between Calgary and Edmonton, while the other would follow Highway 2, where no rail currently exists.[10] Both of these alignments would involve five stations, two each in Calgary and Edmonton, and one in Red Deer. As set out below, two of the three alignments we consider are closely based on these two previously studied alignments.

As noted in the introduction, we approach this assignment by examining three conceptual alignments between Calgary and Edmonton. Based on a survey of what has been considered feasible in previous studies, we make three major assumptions about routing. All three conceptual alignments:

- will have endpoints within the city limits of Calgary and Edmonton;
- will include stops of Calgary International Airport and Edmonton International Airport; and
- will include a stop in or near the City of Red Deer.

We have selected the three conceptual alignments to construct scenarios where the alignment passes through the most urbanized area, a less urbanized area, and an area with little or no urban development (Figure 2-1).

Figure 2-1: Three High Speed Rail Conceptual Alignments



[10] Another publicly available proposal, developed by albertahighspeedrail.com shows an alignment running along the eastern side of Highway 2 for most of its length. (http://www.albertahighspeedrail.com/routeMap.html)

Two of the alignments were previously proposed in the 2004 study by the Van Horne Institute. One of these alignments would make use of the existing Canadian Pacific Railway (CPR) corridor between the two cities (CPR Alignment), while the other alignment would share the Highway 2 corridor (Highway 2 Alignment).

For the purposes of this study, we have also created a new alignment, the Rural Greenfield Alignment (RGA). By considering the impacts of the RGA alignment in addition to the other two alignments, we believe that we are better able to analyze the full range of impacts from HSR between Calgary and Edmonton, and more fully inform AAMDC on potential impacts, whatever alignment is ultimately selected, if any. We have developed the RGA with a view to avoiding any centres of population (urban areas), where reasonable in terms of routing. The benefit of examining such an alignment is that it passes through less densely populated areas than the two alignments proposed by the Van Horne Institute.

It is important to bear in mind that given the conceptual nature of these alignments, we do not intend to analyze each one in detail. Instead we want to draw out issues that arise for rural Alberta in each case. We also make no judgement as to the feasibility of any of the alignments discussed.

2.2 Overview of Conceptual HSR Alignments and Affected Counties

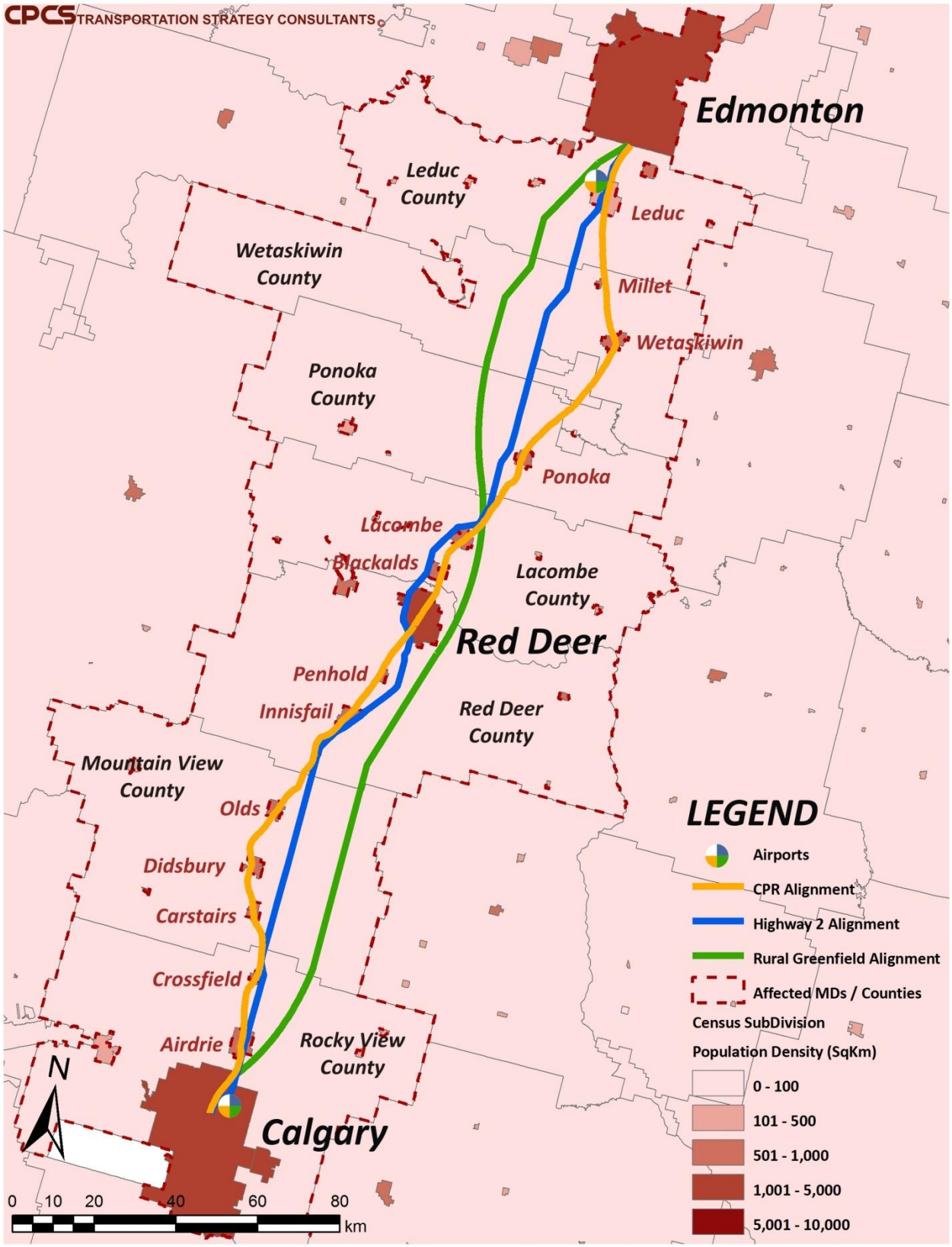
As set out in Figure 2-2, all three conceptual alignments run through the same seven counties: (from north to south) Leduc, Wetaskiwin, Ponoka, Lacombe, Red Deer, Mountain View, and Rocky View.[11]

[11] It is evident that most counties are elongated east/west and narrow north/south. This shape is a result of the establishment of towns and villages along the original Calgary-Edmonton Railway that is the current CPR right-of-way. The railway was soon followed by grain elevators (at about 12-mile spacing for hauling grain by horse-drawn wagons), and freight and passenger stations around which communities evolved.

Road connections and highways were extended to communities and rural areas further east and west, providing access to the railway for a larger population. As agricultural and resource development continued, improved road transportation was required and the province expanded the primary highway system with secondary highways, which reinforced the economic, social, and administrative relationships in the east/west alignments. Reflecting these relationships with the urban centres along the Calgary-Edmonton corridor, counties evolved into their present forms.

The original provincial Highway 2, parallel to the railway, connected the towns between Calgary and Edmonton. By the 1970s, this was realigned for most of the distance by the current Highway 2, thereby offering more convenient and quick connections.

Figure 2-2: Calgary-Edmonton High Speed Rail Conceptual Alignments



Source: CPCS

3 Road/Rail Crossings

This chapter identifies the location and number of road/rail crossings associated with each of the three conceptual alignments (as described in Chapter 2). The approach used in identifying the crossings is described in the following section.

3.1 Approach

Our approach to identifying potential road/rail crossings is similar to the methodology used in the Van Horne Institute (2004) *Calgary-Edmonton High Speed Rail Pre-Feasibility Study*. It is based on the following assumptions:

- HSR would be constructed largely at grade with overpasses and underpasses (see Section 1.4.2) for reasons of cost (as opposed to a below-grade or elevated track).
- Only grade-separated[12] crossings would be permitted due to the high speed (above 125 mph (200 km/h)) operations (no at-grade crossings).[13]
- The grade-separated crossings along each conceptual alignment include:
    - All roads that currently have grade-separated crossings at Highway 2, including all provincial highways and several municipal roadways;
    - All other provincial highways that cross the alignment, i.e. those that cross the alignment and not Highway 2.
- All other roads will be severed (i.e. will not cross the HSR tracks) for each of the alignments.

The road/rail crossings listed were identified for purpose of conducting a comparison between the alignments. The ultimate number of actual crossings may be higher or lower and the locations may vary.

[12] Vertical separation of two intersecting roadways or roadway and railway (example shown in Figure 3-1)
[13] There are currently no regulations in Canada with respect to standards for grade crossings on rail lines with operating speeds exceeding 125 mph (200 km/h). However, a grade-crossing regulation is being developed and, as it is currently proposed, it will forbid construction of any new grade crossings on a rail line with an operating speed exceeding 80 mph (128 km/h). (Communication with Daniel Lafontaine, Chief of Engineering, Grade Crossing & Access Control Programs, Transport Canada. 25 June 2010)

Our approach is also consistent with US Federal Railroad Administration (FRA) regulations that prohibit at-grade crossings on any lines with speeds of over 125 mph (200 km/h) (from http://www.fra.dot.gov/Pages/217.shtml). In France, at-grade crossings are prohibited for lines operating at more than 100 mph (160 km/h) (US FRA, "High-Speed Passenger Rail Safety Strategy," Version 1.0, November 2009, p. iii).

3.2 CPR Alignment

The CPR Alignment runs through many communities including cities, towns, and villages, which are not included in the present study (see discussion of this point in Section 1.4.2). Currently, at-grade crossings and grade-separated overpasses/underpasses are present along the alignment. A typical overpass is shown in Figure 3-1.

Figure 3-1: A Typical Overpass of the CPR Line

Source: CPCS
Note: Grade-separated crossing of the CPR Red Deer Subdivision in Bowden.

The vast majority of the existing crossings are at-grade. According to the Van Horne report,[14] approximately 200 vehicular at-grade crossings are present along the route, 125 of which are public and 75 of which are private farm crossings. In addition there are five pedestrian crossings.

A typical mid-size crossing with a municipal gravel road is shown in Figure 3-2. Crossing types range from provincial highway crossings with gates, bells, and flashers to uncontrolled private farm crossings (Figure 3-3).

[14] Van Horne Institute (2004) *Calgary-Edmonton High Speed Rail: An Integrated Economic Region,* pp. 32-33.

Figure 3-2: A Typical Crossing of a Township Road with the CPR Line

Source: CPCS
Note: Crossing of the CPR Red Deer Subdivision with Township Road 282 in Rocky View County

Figure 3-3: A Typical Private Crossing of the CPR Line

Source: CPCS
Note: Crossing of the CPR Red Deer Subdivision adjacent to Highway 2A, 2 km south of Bowden

Based on the approach described in Section 3.1, constructing HSR along the CPR Alignment would result in the construction of 36 grade-separated crossings. Eight of these are currently grade separated while 28 are at grade. These are listed in Figure 3-4. All roads not included in this figure, as well as all private crossings, would be severed.

Figure 3-4: Roads That Would Cross the CPR Alignment

Cross-Route	Existing Treatment
Leduc County	
Highway 216	Grade Separated
Ellerslie Road	At Grade
Highway 19/625	At Grade
International Airport Access	At Grade
50 Street	At Grade
Highway 39	Grade Separated
Highway 623	At Grade
Glen Park Road	At Grade
Township Road 482/616	At Grade
County of Wetaskiwin	
Highway 616	At Grade
Municipal Road 25111	At Grade
Highway 13	Grade Separated
Ponoka County	
Highway 611	At Grade
Menaik Road	At Grade
Township Road 435	At Grade
Highway 53	Grade Separated
Majetka Road	At Grade
Lacombe County	
Highway 604	At Grade
Highway 12	At Grade
Highway 597	Grade Separated

Cross-Route	Existing Treatment
Red Deer County	
Highway 11A	At Grade
Highway 11	Grade Separated
Township Road 381/32 St	Grade Separated
McKenzie Road	At Grade
Highway 592/42	At Grade
Highway 54/590	At Grade
Highway 54 Bypass	At Grade
Highway 587	Grade Separated
Mountain View County	
Highway 27	At Grade
Highway 582	At Grade
Highway 581	At Grade
Rocky View County	
Municipal Road 25118	At Grade
Highway 574/Twp Rd 285	At Grade
Highway 567	At Grade
Yankee Valley Boulevard	At Grade
Highway 566	At Grade

3.3 Highway 2 Alignment

Highway 2 is a north-south corridor that connects three major economic centres in Alberta: Calgary, Red Deer, and Edmonton.[15] Additional information on classification of roads in rural Alberta is provided in Appendix A. A typical overpass along Highway 2 is shown in Figure 3-5.

[15] Highway 2 is a part of the National Highway System (NHS) and the CANAMEX Trade Corridor that extends northwest to Alaska and south to the United States and Mexico. Its mandate is to facilitate the seamless and efficient movement of people, goods, and services inter-provincially and internationally. The section of Highway 2 between Calgary and Edmonton is often referred to as the Queen Elizabeth II Highway (or QE2).

The section between Calgary and Edmonton is approximately 300 km in length and has a four-lane, divided cross section with a wide and grassy median throughout most of its length. It includes both freeway and expressway segments. Freeway segments feature full access control and grade-separated crossings only, while at-grade intersections are permitted along expressway segments. At-grade intersections introduce conflict points between vehicles, and typically have a negative impact on safety and capacity as compared to grade-separated crossings.

Figure 3-5: A Typical Grade-Separated Crossing of Highway 2 between Calgary and Edmonton

Source: Opus
Note: Typical Crossings along Highway 2 Alignment

As per Alberta Transportation's 50-year horizon plans,[16] the service classification of Highway 2 is Level 1, which corresponds with restricted access and, ultimately, only grade-separated crossings.

Based on the approach described in Section 3.1, HSR construction along the Highway 2 Alignment would result in the construction of 43 grade-separated crossings. All these crossings are already in place as grade-separated interchanges and flyovers (an overpass without ramps). These are listed in Figure 3-6. All roads not included in this figure would be severed or would not cross the HSR alignment.

[16] Alberta Transportation Provincial Highway Service Classification Map 50 Year Horizon (Draft Version: November 2008). Accessed June 16, 2010 at: http://www.transportation.alberta.ca/Content/docType233/Production/50_year_service_class_mod_jan_2009.pdf

Figure 3-6: Roads that Would Cross the Highway 2 Alignment

Cross-Route	Existing Treatment
Leduc County	
Highway 216	Interchange
Ellerslie Road	Interchange
Highway 19/625	Interchange
International Airport Access	Interchange
50 Street	Interchange
Highway 39	Interchange
Highway 2A	Interchange
Glen Park Road	Interchange
Township Road 482/616	Flyover*
County of Wetaskiwin	
Highway 616	Interchange
Municipal Road 25111	Interchange
Highway 13	Interchange
Township Road 455	Flyover*
Ponoka County	
Highway 611	Interchange
Menaik Road	Interchange
Township Road 435	Flyover*
Highway 53	Interchange
Gee Road	Interchange
Majetka Road	Interchange
Lacombe County	
Highway 604	Interchange
Highway 2A	Interchange
Highway 2A	Interchange
Highway 12	Interchange
Highway 597	Interchange

Cross-Route	Existing Treatment
Red Deer County	
Highway 11A	Interchange
Highway 11	Interchange
Township Road 381/32 St	Interchange
Highway 2A	Interchange
50 (Gaetz) Avenue	Interchange
McKenzie Road	Interchange
Highway 592/42	Interchange
Highway 54/590	Interchange
Highway 54 Bypass	Interchange
Highway 587	Interchange
Mountain View County	
Highway 27	Interchange
Highway 582	Interchange
Highway 581	Interchange
Rocky View County	
Municipal Road 25118	Interchange
Highway 574/Twp Road 285	Flyover*
Highway 72	Interchange
Highway 567	Interchange
Yankee Valley Boulevard	Interchange
Highway 566	Interchange

*A flyover is as an overpass without ramps.

3.4 Rural Greenfield Alignment

The RGA has been developed as part of this study for illustrative purposes only to provide a contrast to the Highway 2 and CPR alignments. As described in Section 2.2, it is a brand-new rural alignment with no existing infrastructure and minimal surrounding development.

Based on the approach described in Section 3.1, constructing HSR along the RGA would result in the construction of 33 grade-separated crossings. These are listed in Figure 3-7. All roads not included in this figure would be severed or would not cross the HSR alignment.

Figure 3-7: Roads that Would Cross the Rural Greenfield Alignment

Cross-Route	Existing Treatment
Leduc County	
Highway 216	None
Ellerslie Road	None
Highway 19/625	None
International Airport Access	None
Highway 39	None
Glen Park Road	None
Township Road 482/616	None
County of Wetaskiwin	
Highway 616	None
Highway 13	None
Ponoka County	
Highway 611	None
Highway 795	None
Highway 53	None
Lacombe County	
Majetka Road	None
Highway 604	None
Highway 2	None
Highway 12	None

Cross-Route	Existing Treatment
Red Deer County	
Highway 597	None
Highway 11	None
Highway 595	None
McKenzie Road	None
Highway 592/42	None
Highway 54/590	None
Highway 791	None
Mountain View County	
Highway 587	None
Highway 27	None
Highway 582	None
Rocky View County	
Highway 581	None
Municipal Road 25118	None
574/Township Road 285	None
Highway 72	None
Highway 567	None
Yankee Valley Boulevard	None
Highway 566	None

3.5 Summary

Given our criteria for grade-separating road from the HSR line, the number of road crossings by alignment for each county is summarized in Figure 3-8. The corresponding number of roads that would be severed is reflected in Figure 3-9.

The alignment with the greatest number of crossings is Highway 2. All of these crossings are currently grade separated with Highway 2. A greater number of crossings would provide a higher level of access between the east and west sides of the province (Figure 3-8). Notably, in Leduc, Wetaskiwin, Ponoka, and Rocky View counties, no roads would be severed by the Highway 2 Alignment (Figure 3-9).

In four of the seven counties, the RGA would sever the most roads. In Lacombe, Red Deer, and Mountain View counties, the CPR Alignment would cut off more roads. Red Deer and Mountain View counties would see the highest total number of roads severed, owing to the greater number of minor roads in these counties.

Based on this analysis, the RGA would result in the greatest impact to east/west travel within the province because it would have the fewest crossings. It would have the fewest crossings because, using the criteria set out in Section 3.1, the number of roads that would cross the alignment is lower. This is because there are fewer roads in less densely populated areas, resulting in fewer east/west roads than in the area around Highway 2 or the CPR Alignment.

Each alignment has different implications for the municipalities. For example, although the Highway 2 Alignment has more crossings than the CPR Alignment in total, in both cases the number of crossings in the County of Leduc would be the same (nine).

Figure 3-8: Number of Road/Rail Crossings by Alignment and County

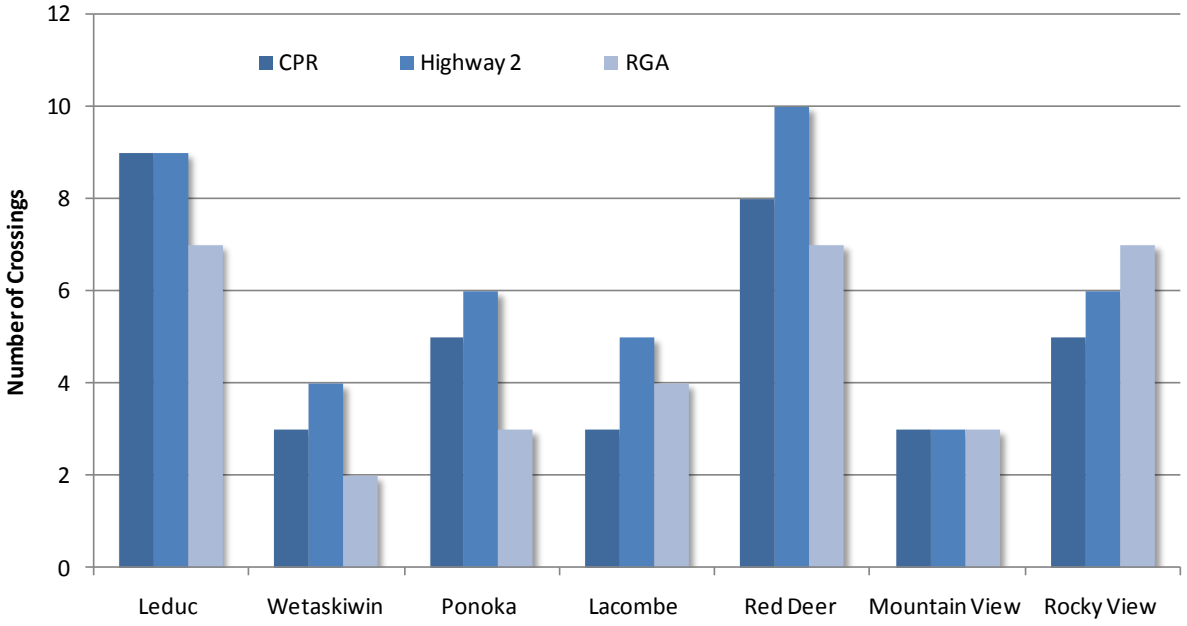
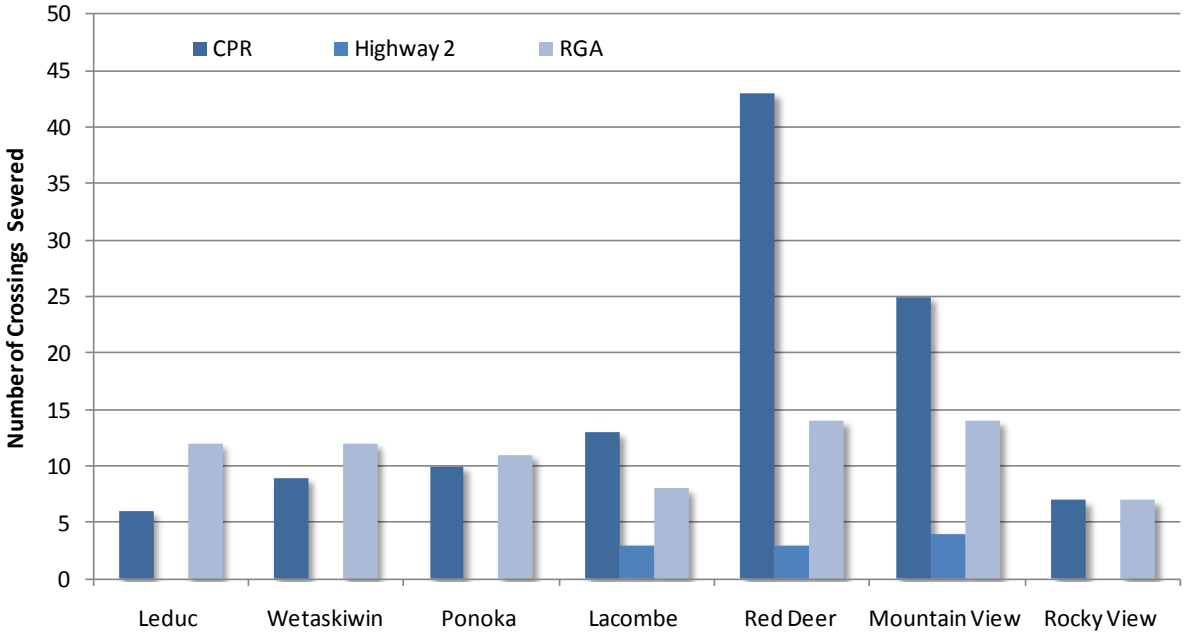


Figure 3-9: Number of Severed Roads by Alignment and County



Note: Approximation based using Google Earth.

4 Road User Impacts

This chapter analyzes the potential impacts that the development of HSR in the Calgary-Edmonton corridor would have on road users in rural Alberta.

4.1 Traffic Impacts

This section analyzes traffic impacts caused by the adjustments to the road network in central Alberta that will result from some roads being severed by HSR. Section 4.1.1 describes our approach, while the traffic impacts are presented in Sections 4.1.2 through 4.1.4 and summarized in Section 4.1.5.

4.1.1 Approach

We identify existing road traffic patterns at road/rail crossings based on 2009 traffic data obtained from Alberta Transportation. The Alberta Transportation data are presented in terms of annual average daily traffic (AADT)[17] volume for 2009. These data are available for all grade-separated crossings with Highway 2 and the majority of provincial highways. For locations where no data are available, we estimate AADT volumes based on data from nearby junctions.

The traffic likely to be rerouted due to road severance (total post-HSR construction AADT) is based on the assumptions listed below. The assumptions reference items in Figure 4-1.

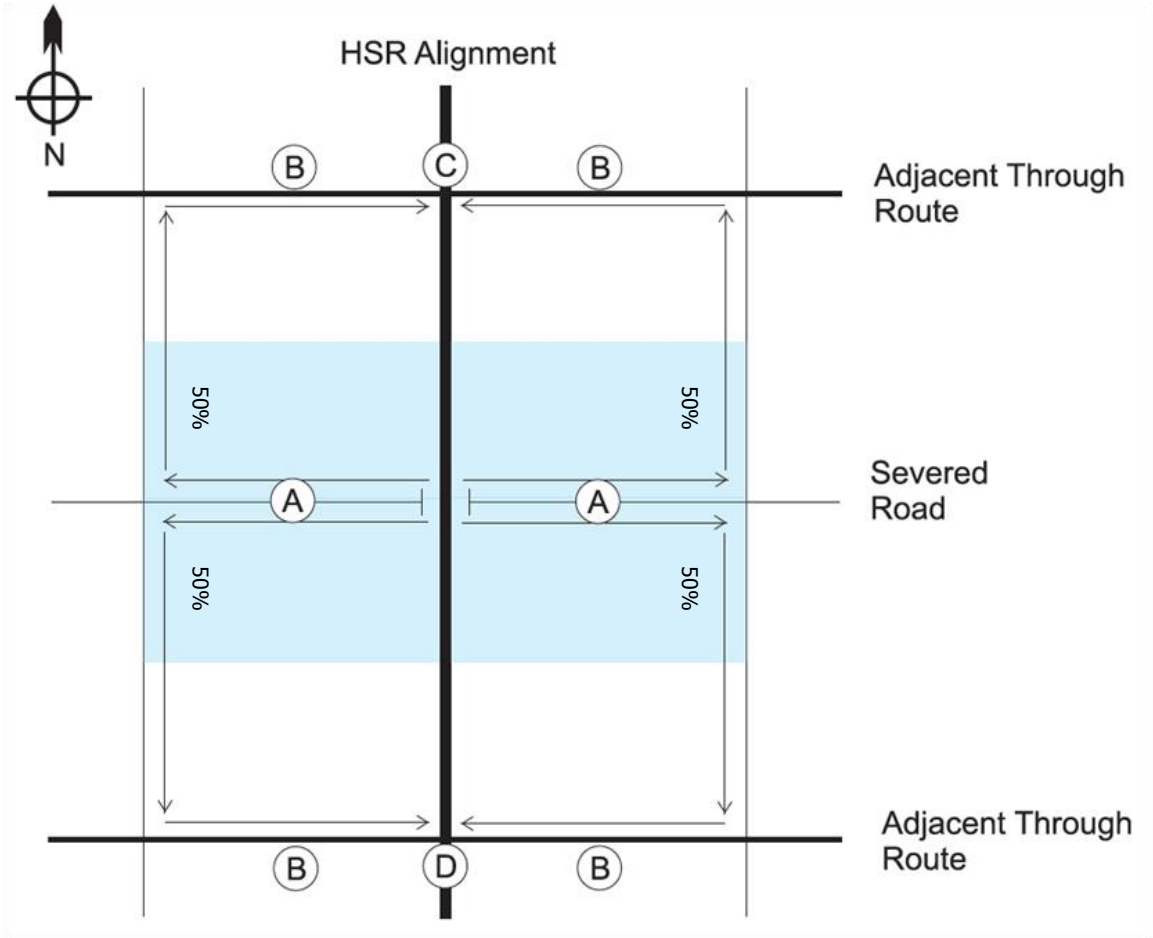
- Upon the closure of a *severed road* (see "A"), vehicles from the *immediate area* (see blue shading) will be rerouted to the next *adjacent through route* (see "B").
    - 50 percent of vehicles will divert to the north road/rail crossing (see "C")
    - 50 percent of vehicles will divert to the south road/rail crossing (see "D")
- The *zone of traffic impact* (see blue shading) encompasses the roadways in the vicinity of the severed roadway from which traffic would be diverted. It excludes the areas adjacent to road/rail crossings since this traffic most likely already uses this route and is included in the existing AADT volume data.
- The amount of traffic that may be rerouted for each area was determined using:
    - Average household density of 0.386 per km^2 (based on sample measurement of 50 samples)
    - Average of 10 trips per day per household (based on Alberta Transportation's estimates)

[17] The total volume of traffic passing a point or segment of a roadway, in both directions for one year, divided by the number of days in a year.

This traffic impact is not a forecast of future traffic, but rather a redistribution of existing traffic based on roads severed.

The existing traffic and rerouted traffic were then summed to represent the traffic potential at crossings of the HSR alignment. The findings are presented in the figures in the following sections for CPR Alignment, the Highway 2 Alignment and RGA.

Figure 4-1: Traffic Diversion Schematic



Source: Opus

4.1.2 CPR Alignment

The approach described in Section 4.1.1 is used to identify traffic patterns and traffic potential (post-HSR construction AADT) at road/rail crossings. This information is presented in Figure 4-2.

Figure 4-2: Traffic Patterns and Potential at CPR Alignment Crossings

County	Cross-Route	Existing AADT	Total Post-HSR Construction AADT
Leduc	Highway 216	49,384	49,386
	Ellerslie Road	23,100	23,117
	Highway 19/625	9,520	9,525
	International Airport Access	17,760	17,765
	50 Street	10,520	10,522
	Highway 39	8,420	8,422
	Highway 623	2,560	2,576
	Glen Park Road	730	771
	Township Road 482/616	460	495
Wetaskiwin	Highway 616	2,440	2,499
	Municipal Road 25111	310	356
	Highway 13	3,380	3,417
Ponoka	Highway 611	1,120	1,190
	Menaik Road	310	345
	Township Road 435	60	140
	Highway 53	4,570	4,604
	Majetka Road	680	695
Lacombe	Highway 604	630	880
	Highway 12	7,280	7,387
	Highway 597	5,180	5,209
Red Deer	Highway 11A	10,140	10,169
	Highway 11	24,130	24,139
	Township Road 381/32 St	15,130	15,144
	McKenzie Road	2,210	2,252
	Highway 592/42	1,990	2,075
	Highway 54/590	7,030	7,151
	Highway 54 Bypass	1,540	1,643
	Highway 587	1,000	1,075
Mountain View	Highway 27	7,290	7,386
	Highway 582	3,110	3,153
	Highway 581	1,880	1,999
Rocky View	Municipal Road 25118	520	542
	Highway 574/Township Road 285	3,310	3,355
	Highway 567	23,300	23,306
	Yankee Valley Boulevard	25,820	25,835
	Highway 566	8,450	8,470

Many of the provincial and local routes crossing the existing CPR alignment serve high volumes of traffic. This is reflective of the fact that the CPR tracks pass through many towns and cities between Calgary and Edmonton. Therefore, a large proportion of the traffic crossing the alignment may be local traffic.

4.1.3 Highway 2 Alignment

The approach described in Section 4.1.1 is used to identify traffic patterns and traffic potential (post-HSR construction AADT) at road/rail crossings. This information is presented in Figure 4-3.

Figure 4-3: Traffic Patterns and Potential at Highway 2 Alignment Crossings

County	Cross-Route	Existing AADT	Total Post-HSR Construction AADT
Leduc	Highway 216	49,384	49,384
	Ellerslie Road	23,100	23,100
	Highway 19/625	9,520	9,520
	International Airport Access	17,760	17,760
	50 Street	10,520	10,520
	Highway 39	8,420	8,423
	Highway 2A	7,190	7,190
	Glen Park Road	2,260	2,260
	Township Road 482/616	170	170
Wetaskiwin	Highway 616	2,440	2,440
	Municipal Road 25111	410	410
	Highway 13	3,380	3,380
	Township Road 455	60	60
Ponoka	Highway 611	1,120	1,120
	Menaik Road	470	470
	Township Road 435	60	60
	Highway 53	4,570	4,570
	Gee Road	180	180
	Majetka Road	220	220
Lacombe	Highway 604	630	630
	Highway 2A	7,190	7,190
	Highway 2A	7,190	7,190
	Highway 12	7,280	7,357
	Highway 597	5,180	5,253
Red Deer	Highway 11A	11,880	11,880
	Highway 11	29,850	29,850
	Township Road 381/32 St	15,130	15,130
	Highway 2A	7,190	7,190
	50 (Gaetz) Avenue	10,120	10,120
	McKenzie Road	10,740	10,740
	Highway 592/42	1,990	2,084
	Highway 54/590	11,410	11,410
	Highway 54 Bypass	1,540	1,540
	Highway 587	1,000	1,172
Mountain View	Highway 27	7,290	7,387
	Highway 582	3,110	3,212
	Highway 581	1,880	1,880

County	Cross-Route	Existing AADT	Total Post-HSR Construction AADT
Rocky View	Municipal Road 25118	3,920	3,920
	Highway 574/Township Road 285	660	660
	Highway 72	4,490	4,490
	Highway 567	23,300	23,300
	Yankee Valley Boulevard	25,820	25,820
	Highway 566	8,450	8,450

The traffic volumes on the cross-routes at the intersection with Highway 2 are generally relatively high compared to the other alignments. This is because Highway 2 is the major north/south route and serves high volumes of traffic. Despite these high existing volumes, the rerouting that would be caused by the construction of an HSR line along the Highway 2 alignment is minor. There are few sections of Highway 2 that currently have at-grade intersections. The limited proportion of these expressway sections means that few east/west links would be severed by an HSR line along this alignment. The potential for rerouting is limited by the small number of existing routes that cross Highway 2 at-grade.

4.1.4 Rural Greenfield Alignment

The approach described in Section 4.1.1 is used to identify traffic patterns and traffic potential (post-HSR construction AADT) at road/rail crossings. This information is presented in Figure 4-4.

Figure 4-4: Traffic Patterns and Potential at Greenfield Alignment Crossings

County	Cross-Route	Existing AADT	Total Post-HSR Construction AADT
Leduc	Highway 216	53,820	53,823
	Ellerslie Road	4,100	4,192
	Highway 19/625	9,520	9,540
	International Airport Access	No Data	No Data
	Highway 39	8,420	8,480
	Glen Park Road	1,905	1,951
	Township Road 482/616	No Data	No Data
Wetaskiwin	Highway 616	1,230	1,426
	Highway 13	3,180	3,209
	Highway 611	600	672
Ponoka	Highway 795	2,830	2,861
	Highway 53	1,860	1,943
	Majetka Road	220	272
	Highway 604	220	270
	Highway 2	26,120	26,164
Lacombe	Highway 12	3,270	3,306
	Highway 597	1,660	1,794

County	Cross-Route	Existing AADT	Total Post-HSR Construction AADT
	Highway 11	3,810	3,876
	Highway 595	3,200	3,225
Red Deer	McKenzie Road	9,720	9,785
	Highway 592/42	1,990	2,145
	Highway 54/590	2,680	2,741
	Highway 791	230	305
	Highway 587	410	481
	Highway 27	2,620	2,812
	Highway 582	1,170	1,250
Mountain View	Highway 581	670	772
	Municipal Road 25118 (Acme)	1,030	1,097
	574/Township Road 285	660	691
Rocky View	Highway 72	2,570	2,703
	Highway 567	2,300	2,795
	Yankee Valley Boulevard	6,780	6,839
	Highway 566	6,780	6,872

The traffic volumes along the RGA are slightly lower than for the other two alignments. This is due to the fact that this alignment is furthest removed from communities and important transportation corridors such as Highway 2 and Highway 2A.

4.1.5 Summary of Traffic Impact Potential

The potential traffic impacts (post-HSR construction) were presented in detail above. Figure 4-5 summarizes the potential traffic rerouted, by municipality for each alignment.

Figure 4-5: Potential Rerouted Traffic for Crossings

County	Vehicles Rerouted Daily Post-HSR Construction		
	CPR	Highway 2	RGA
Leduc	125	3	276
Wetaskiwin	142	0	225
Ponoka	233	0	361
Lacombe	387	150	264
Red Deer	478	266	518
Mountain View	258	199	374
Rocky View	109	0	877
Total	1,733	618	2,895

The RGA has the greatest potential for the forced rerouting of traffic. This is due to the fact that there are currently no access-limiting barriers along this alignment and so no forced rerouting at present. In other words, east-west travel is currently possible on every potential crossing of the RGA. If the HSR line were built on this alignment, many of these routes would be severed.

In contrast, there are fewer routes along the CPR Alignment, and even fewer along the Highway 2 Alignment, that will be severed due to the HSR. Most of the crossings along Highway 2 are already grade-separated, and would thus be unaffected by the construction of an HSR line along the same alignment. The construction of the HSR along the RGA would eliminate a larger portion of the existing crossings than would the other two alignments.

4.2 HSR Rural Traffic Impact Zones

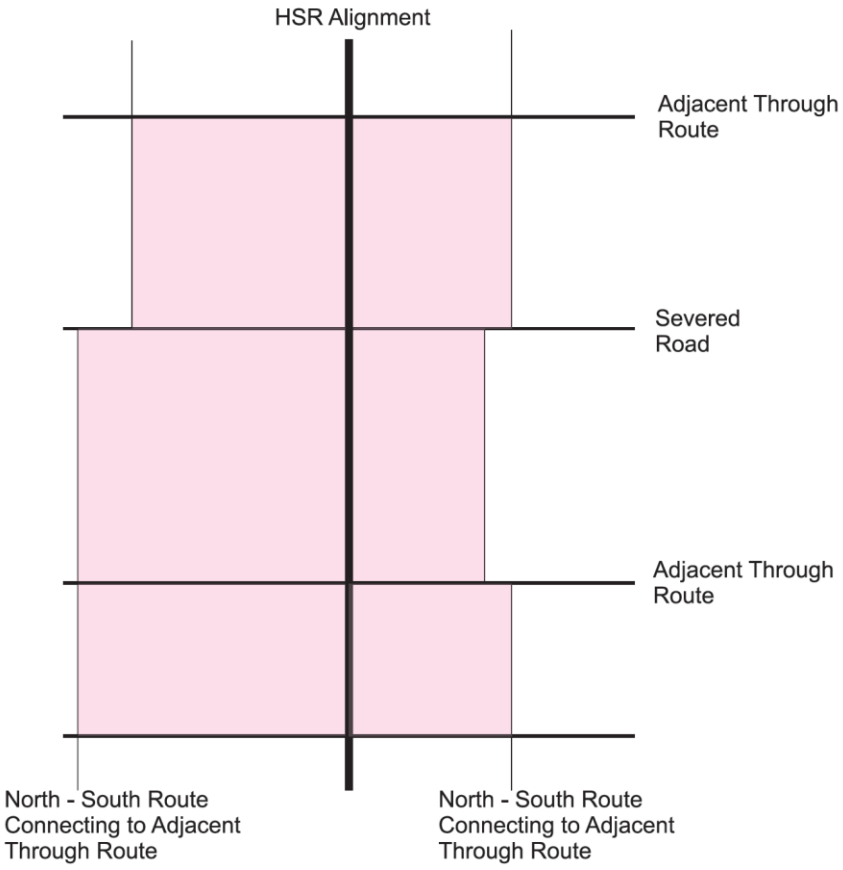
This section builds on the previous section to define zones in which road traffic flows would likely be impacted by the HSR in rural Alberta. The approach is described in Section 4.2.1, while the rural traffic impact zone map and discussion are presented in Section 4.2.2.

4.2.1 Approach

The HSR impacts on rural Alberta related to traffic (rural traffic impacts) were quantified based on the following assumptions:

- The primary consideration for traffic impacts was rerouting (as described in the previous chapter), caused by road severance.

Figure 4-6: Definition of Approach to Traffic Impact Zones



Source: Opus

- The definition of a rural traffic impact zone is the distance between north-south routes to the east and west of the HSR alignment that could provide an alternative link, as shown in Figure 4-6. The red shading indicates the impact zone, the area containing origins and destinations of trips that would be affected by HSR. This is directly related to the potential traffic delays and forced travel time changes that will be discussed in more detail in Section 4.3.

4.2.2 Rural Traffic Impact Zones

4.2.2.1 Overview of Rural Traffic Impact Zones

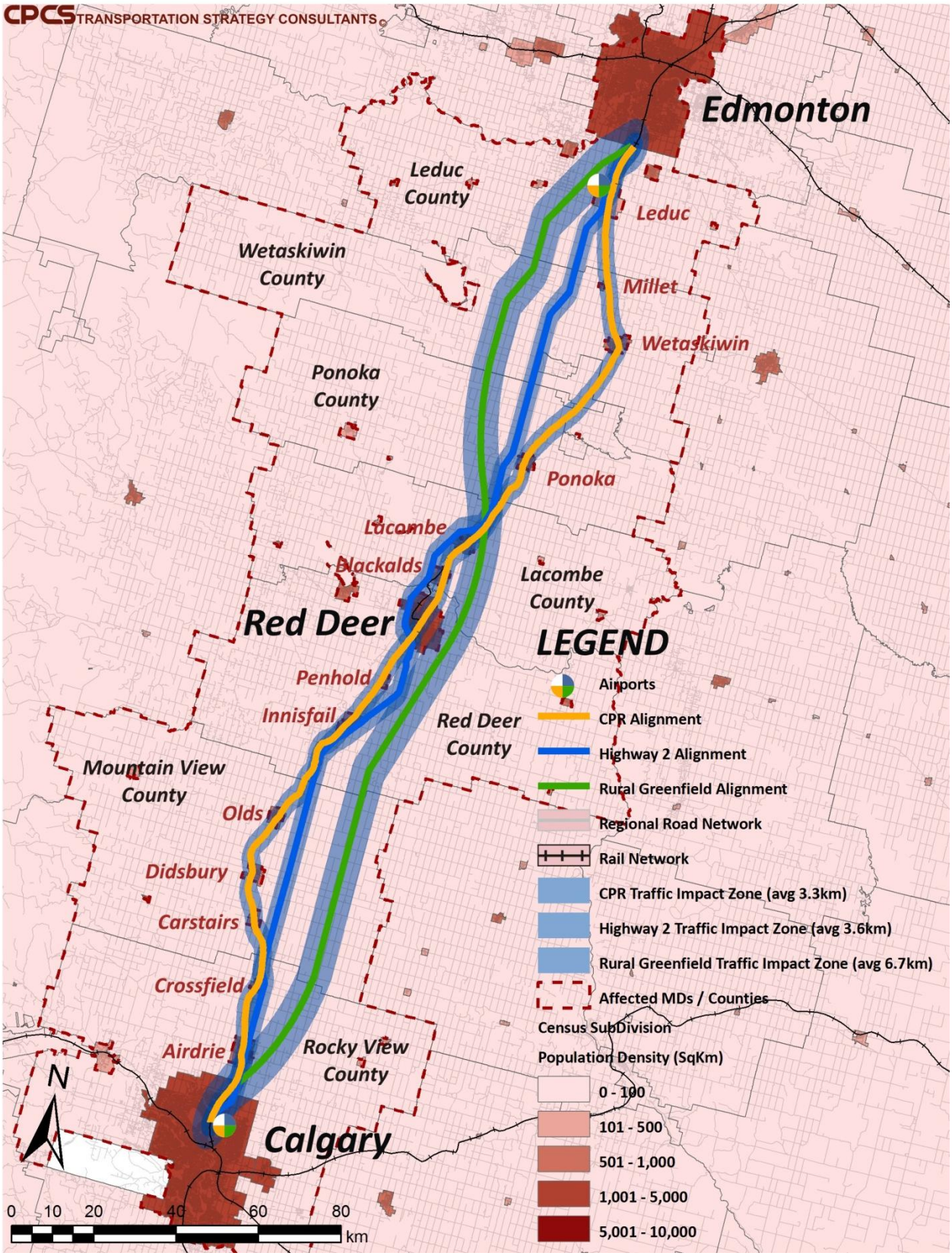
The approach described in Section 4.2.1 was used to identify rural Alberta HSR impact zones. The traffic impact zones for each of the three alignments are presented in Figure 4-7.

The HSR impact zone varies significantly with each conceptual alignment. The layout of surrounding provincial highways and local roadways coupled with the HSR alignment creates varying degrees of access to adjacent areas.

The alignment with the greatest impact on the east and west at any given point is the RGA, with an average swath width of impact zone of 6.7 km. This is significantly greater than that of the Highway 2 Alignment and CPR Alignment (3.6 and 3.3 km respectively).

The difference in the impact zones likely stems from the fact that the areas near the Highway 2 Alignment and CPR Alignment are more developed, due to the ease of access provided by the major highway and rail infrastructure. The increased development corresponds to more densely placed routes and increased connectivity to the remainder of the network. In the event of the closure of a given route along Highway 2 Alignment and CPR Alignment, there are more alternative routes in closer proximity, resulting in shorter detours.

Figure 4-7: Rural Traffic Impact Zones for High Speed Rail Conceptual Alignments



4.2.2.2 Illustrative Example of a Rural Traffic Impact Zone

Figure 4-8 illustrates a rural traffic impact zone at a much greater level of detail than was present in Figure 4-7. We have selected, for illustrative purposes only, the Highway 2 Alignment in Red Deer County.

Figure 4-8: Illustrative Example: Rural Traffic Impact Zone in Red Deer County for the Highway 2 Alignment

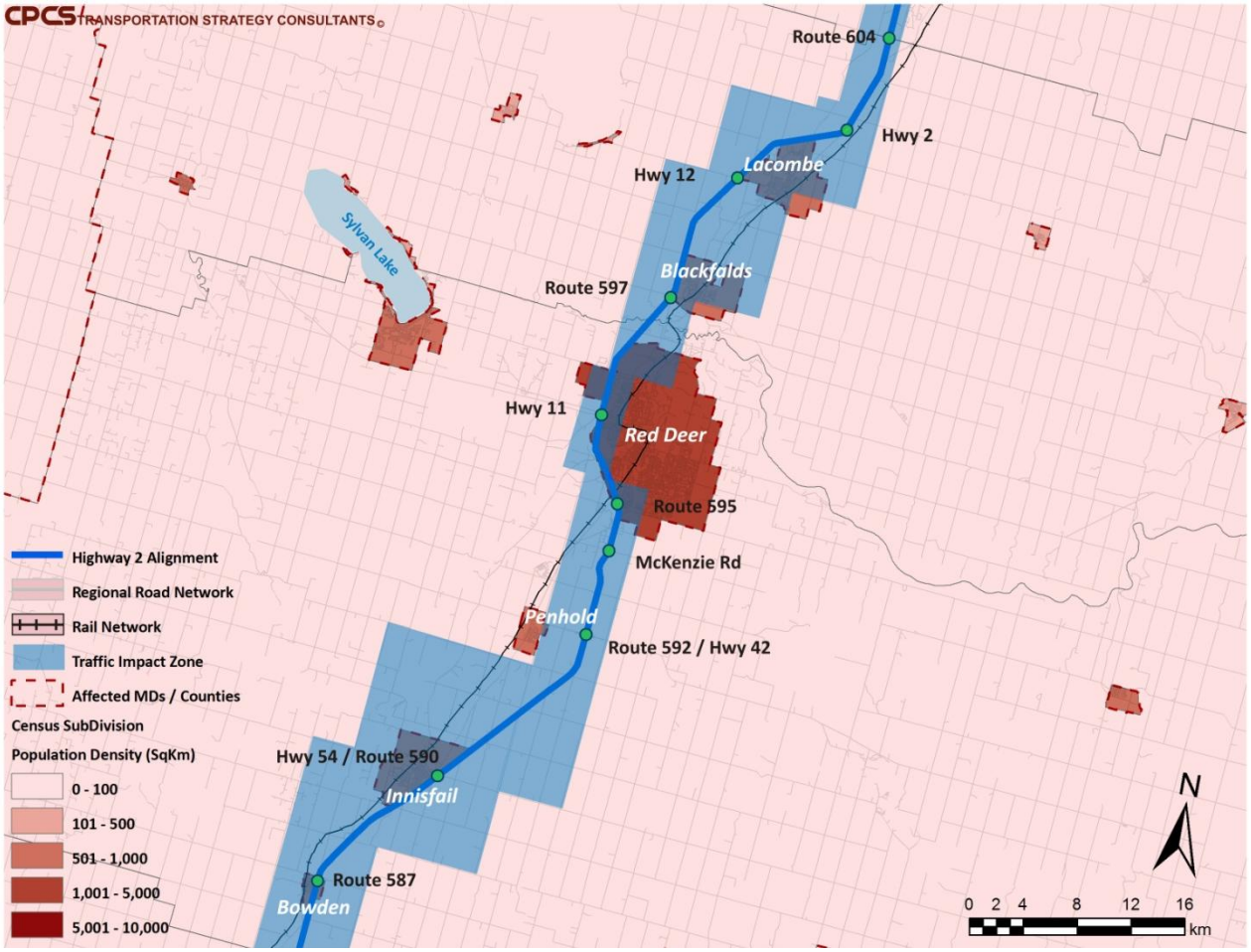


Figure 4-8 illustrates the concept set out in Figure 4-6, that is less visible in Figure 4-7 due to the larger area represented. One point of note is that the rural traffic impact zone is larger in areas with greater distances between crossings. This conclusion reflects longer average trips to reach a crossing of the alignment when fewer crossings are available. The impact zone is smallest when crossings are closely spaced together.

4.3 Impacts of HSR on Rural Traffic Patterns

This section describes the impacts on rural traffic patterns that we anticipate would result from each of the conceptual alignments.

4.3.1 Additional Driving Time

To quantify the impact of HSR on rural traffic, we estimate additional driving time resulting from the closure of roadways, which previously provided access across the HSR alignment, on motorists for each of the conceptual alignments (Figure 4-9). Our estimate of additional driving time is based on the distance that vehicles would be rerouted due to the development of HSR, and is measured in two ways.[18]

- Average additional driving time measures the average number of additional minutes of driving time required to reach a crossing.

- In order to provide a comparison of the overall disruption caused by each of the three alignments, Figure 4-9 also presents the annual total additional hours of driving time caused by rerouting.

The average additional driving time per trip would be greatest with the CPR Alignment, because of the large number of crossings of the CPR Alignment that would need to be closed if HSR was developed. While the CPR Alignment would result in the greatest additional driving time on the average trip, the RGA is expected to result in the greatest total annual additional driving time (227,000 hours) owing to the greater number of vehicles that would need to reroute in Rocky View County.

Figure 4-9 Additional Driving Time Due to Rerouting Caused by HSR

Municipality	Average Additional Minutes of Driving Time (Per Trip)			Total Additional Hours of Driving Time (Annual)		
	CPR	Highway 2	RGA	CPR	Highway 2	RGA
Leduc County	4	-	2	2,632	31	9,465
County of Wetaskiwin	6	-	4	4,071	0	12,819
Ponoka County	6	-	4	7,348	0	16,100
Lacombe County	5	2	4	22,018	5,243	12,258
Red Deer County	5	1	4	20,051	12,169	19,671
Mountain View County	6	4	6	9,977	7,406	16,659
Rocky View County	6	-	3	3,072	0	139,532
Total				69,000	25,000	227,000

Highway 2 Alignment is expected to cause the least additional driving time either on the average trip or in total for all motorists, because access to the Highway 2 Alignment is already restricted, and there are only a few places where crossings would be eliminated. There are no routes being severed in County of Wetaskiwin, Ponoka County, and Rocky View County; therefore, none of the traffic will be subjected to rerouting resulting in additional driving time.

[18] In both cases, the amount of additional driving time was estimated using the assumed travel speed of 80 km/h, which is the default speed limit for most municipal roads.

4.3.2 Specific Impacts on Traffic by Type

This section explores the impact of HSR on various types of road traffic. We discuss the impact on farming operations, including associated traffic with in Section 5.2.5. The impact on off-road traffic, including recreational users and wildlife, is discussed in Chapter 6.

4.3.2.1 Impacts on Longer Distance Rural Traffic

The impact of any of the conceptual alignments on longer distance east-west traffic would be relatively minor, since all provincial roadways and major municipal routes would be upgraded to grade-separated crossings. At locations with higher volumes of rerouted traffic, the expansion of existing grade-separated crossings may be required. If the additional traffic volumes are significant, the roadway may need to be upgraded.

4.3.2.2 Impacts on Local Rural Traffic

Local rural traffic is composed mainly of residents of rural areas and involves short-distance travel to access services in urban areas such as shopping, schools, and work. Local rural traffic includes school bus and emergency services, and farm and rural-industrial (i.e. oil and gas) traffic. The HSR alignment would be a barrier to east-west movement along minor roads for this type of traffic.

The Highway 2 Alignment would have the lowest incremental impact as a barrier, as it is already a barrier. Access to Highway 2 is controlled through a large portion of its length. Therefore, HSR in the Highway 2 Alignment would not have a significant incremental impact in terms of severing existing roadways. Most people living near Highway 2 are accustomed to diverting to grade-separated crossings.

The CPR Alignment and the RGA will have the greatest incremental traffic impact. Local rural traffic will be forced to reroute to access the grade-separated crossings. This trend is likely to redistribute rural traffic to minor routes with no access across the HSR alignment, depending on the location of the nearest grade-separated crossing and the location of the closest urban centre. The greatest impact would be experienced by residents on the side of the alignment opposite to an urban centre where no crossing exists.

School Bus Operations

HSR has the potential to impact school bus operations. Routes using existing local roads may be disrupted if those roads are severed by HSR. The worst-case scenario would be encountered by students living on the opposite side of the HSR alignment from their school, at a location midway between two crossings. Students in this situation could be exposed to the lengthiest detours. Nevertheless, the student pick-up/drop-off procedures should not change.

The RGA would likely have the greatest impact on school bus routes. It would sever the greatest number of local roads, which may be currently used for school bus routes, therefore requiring the most re-planning of routes. It is expected that the Highway 2 Alignment would have little or no effect on existing school bus routes, as very few roads would be closed. Any re-planning of school bus routes would be done using Alberta Education's School Bus *Route Assessment Checklist*. This checklist is primarily based on safety and therefore advocates

diverting if hazards cannot be mitigated. The presence of HSR may limit the options available for diverting.

Emergency Services Access

Some counties consulted as part of this study raised concerns about the potential disruption to emergency services operations as a potential impact of HSR. In spite of the relatively small number of people affected, emergency services access is a significant issue because the individual/family cost can be extremely high, e.g. minutes can make a large difference for patients suffering a heart attack. For this reason, we consider in more detail how emergency response times could be affected by HSR.

The zone affected by changes in emergency services access would be similar to the rural traffic impact zone presented in Section 4.2. While there may be local peculiarities in the road network and road severances that could lead to increased response times, given the number of crossings that would likely be constructed (see Chapter 3), this issue is not likely to impact large numbers of rural Albertans. The number of rural households affected by each of the alignments is presented in Figure 4-10.

Figure 4-10 Emergency Services Impacts on Rural Households Due to HSR

Municipality	Rural Households Impacted*		
	CPR	Highway 2	RGA
Leduc County	13	11	28
County of Wetaskiwin	14	22	22
Ponoka County	23	19	36
Lacombe County	39	27	26
Red Deer County	48	59	52
Mountain View County	26	33	37
Rocky View County	11	28	88
Total (Rounded)	**170**	**200**	**290**

*Urban households not included

This estimate is based on the traffic diversion methodology described in Section 4.1.1 with minor alternations to account for the fact that emergency services stations are located on either the east side or west side of the alignment and only the households on the opposite side of the alignment would be affected.

As with the school bus routes, the RGA is expected to have the greatest impact on emergency services operations due to the fact that it will sever the greatest number of routes. We expect that the CPR Alignment will have the smallest incremental impact, because of the existence of the CPR tracks. Currently, as the railway tracks bisect many of the towns and cities, emergency service stations already exist both east and west of the tracks. This practice has been adopted by emergency services, because trains may stop for 20 minutes or more, completely blocking east-west travel.

5 Commercial and Economic Impacts

A complete economic impact assessment is outside the scope of the present study. Instead, we have adapted to rural Alberta the analysis contained in existing estimates of the economic impact of HSR in the Calgary-Edmonton corridor from two recent studies, which we will refer to as the "Van Horne study" and the "2008 economic impact study."[19] Neither study explicitly addressed rural impacts as distinct from broader regional impacts.

5.1 Rural User Impacts

A key rationale for the development of HSR between Calgary and Edmonton is that it would save time and cost to travellers. The key question for rural Alberta is whether or not rural residents stand to benefit in a significant way from either. This section will attempt to answer that question.

5.1.1 Travel Time Savings and Frequency of Service

For rural Alberta between Calgary and Edmonton, those who might save time by using HSR are those living close enough to a station that they could save time relative to driving. However, travellers who could save the most time are those travelling from Edmonton to Calgary or Red Deer and living north of Edmonton, and those travelling from Calgary to Edmonton or Red Deer and living south of Calgary.

In order to make a meaningful comparison of travel time between different modes of transportation (car, air, bus, and HSR) we must look at total door-to-door travel time, not just the time spent in the car, bus, airplane, or train. An important difference across modes, and particularly between car and the public modes (bus, air, and rail), is terminal access time, the time required at each end of the journey to travel between an airport, railway, or bus station and the origin/destination. Another difference with car travel is the amount of time required in the terminal, e.g. airlines often require passengers to arrive at least 30 minutes prior to the departure of their flight.

Beyond the door-to-door travel time, frequency of service is also an important difference between car travel and travel on a public mode. In a car, one has the freedom to depart at any time; when travelling on a public mode, the schedule is pre-set. Frequency is particularly important for business travellers who may be travelling to attend a meeting and returning home the same day.

Figure 5-1 presents the door-to-door travel times and frequencies associated with alternative modes of travel between Calgary and Edmonton (travel between Red Deer and either Calgary or Edmonton would take approximately half the time). We assume that terminal access for the

[19] *Calgary/Edmonton High Speed Rail: An Integrated Economic Region,* prepared by the Van Horne Institute, October 2004 and *Economic Benefits for Development of High Speed Rail Service in the Calgary-Edmonton Corridor,* prepared for Alberta Infrastructure and Transportation by TEMS, Inc., February 2008. Both studies examined the impact of HSR in a number of scenarios involving different types of HSR technology.

public modes takes 10 minutes at each end of the journey and is by taxi. We assume in-terminal time is 30 minutes for all bus and rail travel and one hour for air travel, reflecting more stringent security and a requirement to check in well in advance of boarding an aircraft. In-vehicle times are based on the 2008 *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor*[20] (2008 ridership study) and our own research. Frequencies for HSR are based on the 2008 ridership study, and for other modes are based on our own research and reflect current (July 2010) weekday frequencies of service.

Figure 5-1: Travel Time Estimates for Downtown Calgary to Downtown Edmonton

Segment	Car[1]	Air[2]	Grey-hound[3]	Red Arrow[4]	High Speed Rail		
					125 mph	200 mph	300 mph
Terminal Access	0:20	1:00	0:20	0:20	0:20	0:20	0:20
Terminal	0:00	1:00	0:30	0:30	0:30	0:30	0:30
In-Vehicle	3:00	0:45	4:00	3:00	2:00	1:35	1:00
Total	3:20	2:45	4:50	3:50	3:20	2:55	2:20
Frequency (round trips per day)	n/a	24	7	7	8	14	17

Source: CPCS and *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor*, prepared for Alberta Infrastructure and Transportation by TEMS Inc. / Oliver Wyman, February 2008

Notes:

1. Assumes 10 minutes to park and walk to and from vehicle at each end.
2. Assumes access by car (taxi) from Edmonton International Airport to downtown (40 minutes) and from Calgary International Airport to downtown (20 minutes).
3. Assumes 10 minutes to get to the bus station at either end of the journey. Travel times vary between 5:35 and 3:40; 4:00 used as an average transit time.
4. Assumes 10 minutes to get to the bus station at either end of the journey. Assumes express service stops in downtown and suburban Calgary and Edmonton only, with no intermediate stop in Red Deer or elsewhere.

n/a: not applicable.

By definition, however, the greatest time savings (relative to car) will accrue from trips that originate near and are destined to locations in close proximity to stations, that is to passengers starting and completing trips near one of the station locations (Downtown Calgary, Calgary Airport, Red Deer, Edmonton Airport, and Downtown Edmonton). For potential passengers in rural Alberta, the time savings will be significantly less.[21]

[20] *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor*, prepared for Alberta Infrastructure and Transportation by TEMS Inc. / Oliver Wyman, February 2008.

[21] To exemplify the time savings for rural Alberta, someone living in Madden (18 km west of Crossfield) can drive to Calgary in 1:00, Red Deer in 1:35 and Edmonton in 3:25. This person could not save time using HSR to travel to Calgary or Red Deer and would be unlikely to save time boarding HSR in Red Deer for transit to Edmonton unless his or her destination was adjacent to a station in Edmonton (i.e. close enough to make having a personal vehicle in Edmonton of no time savings).

In another example, consider a trip from Hartell (intersection Highway 543 and Highway 22 in the Municipal District of Foothills) to downtown Edmonton. By car, this trip would take 4:20, depending on traffic, along Highway 2. Now assume that the trip was undertaken by car to Calgary, then by HSR to downtown Edmonton. The drive from Hartell to Calgary would take 1:20 including time to park. Including 30 minutes in terminal, the trip to Edmonton downtown would take between 1:30 and 2:30 depending on the HSR technology. Assuming a 10-minute walk or taxi ride in Edmonton to reach the final destination would result in a total trip time of between 3:00 and 4:00, a clear time savings over car (which took 4:20). To the extent that congestion increases the length of the car trip, the time savings gained from HSR would be greater, but to the extent the trip is destined to a part of Edmonton further away from the station, the savings would be smaller.

This analysis is obviously simplistic, but it illustrates that time savings are possible for rural residents. Just how many rural residents are likely to benefit from such savings is, however, a question that would require further study. At this point we can conclude that for those trips originating in rural areas north of Edmonton and south of Calgary, the time savings will be slight unless the final destination is in close proximity to a destination station, since the additional time required to reach a final destination after disembarking from the train could be lengthy without a personal vehicle. In sum, we see limited potential for HSR to save time for trips originating in or destined to rural Alberta. Similarly, travellers with trips originating in rural areas near the stations at the Edmonton and Calgary airports could also benefit if they had trips terminating near an HSR station.

A combination of increasing traffic congestion in the Highway 2 corridor and more effective and efficient public transportation connected to stations could increase time savings associated with the use of HSR for residents of rural Alberta.

5.1.2 Gain in Useable Time

One of the most important user benefits associated with HSR over car travel is the time available on the train for other activities, including work. In a car most other activities are limited. To the extent rural residents take the train, this gain in usable time would be an advantage, particularly over driving. The gain in usable time is even greater when the impact of the greater comfort (more space in particular) of rail over air and bus is taken into account.

5.1.3 Travel Cost Savings

The travel cost savings associated with HSR are the cost of an HSR trip (door-to-door) less the cost of the alternative mode(s) of travel for the same trip door-to-door. The cost of the HSR ticket (in-vehicle cost in Figure 5-2) is determined by the capital and operating costs of the mode in question, as well as any subsidy that is provided: the greater the subsidy, the greater the scope for the HSR operator to lower the cost of the ticket. Cost savings are more difficult to estimate than time savings, since transit times are easier to estimate than construction and operating costs of a new HSR line.

From Figure 5-2 we can see that few cost savings from HSR are likely over car, especially if car travel is valued closer to the variable cost estimate of $21 (a more appropriate valuation for leisure travellers). Further, Greyhound service offers a competitive alternative for travellers with lower willingness to pay. Nonetheless, for business travellers, it does appear that car travel costs closer to $63 (reflecting full ownership cost per km) and Red Arrow bus service could face direct competition from HSR.

Car travel is particularly attractive for groups of two or more people travelling together, since the added cost of another person is usually double for air or rail, but negligible for car. Some bus companies offer discounted "companion" fares for people travelling together to avoid this problem.[22]

[22] For instance, Greyhound currently (July 2010) offers a "Friends and Family" discount scheme whereby travellers can save 50 percent on up to three companions when they purchase one adult ticket at the regular price and in advance.

Figure 5-2: Travel Cost Estimates for Alberta HSR One-Way Trips

Segment	Car[1]	Air[2]	Grey-hound[3]	Red Arrow[4]	High Speed Rail[5]		
					125 mph	200 mph	300 mph
Calgary - Edmonton							
Terminal Access	n/a	$90	$24	$24	$24	$24	$24
In-Vehicle Cost	$42-$126	$200	$47	$63	$56	$90	$120
Total	$42-$126	$290	$71	$87	$80	$114	$144
Red Deer - Calgary/Edmonton							
Terminal Access	n/a	n/a	$12	$12	$12	$12	$12
In-Vehicle Cost	$21-$63	n/a	$31	$47	$28	$45	$60
Total	$21-$63	n/a	$43	$59	$40	$57	$72

Source: CPCS and *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor*, prepared for Alberta Infrastructure and Transportation by TEMS Inc. / Oliver Wyman, February 2008

Notes:

1. Cost depends on whether variable cost or full cost is used, based on *Calgary/Edmonton High Speed Rail: An Integrated Economic Region,* prepared by the Van Horne Institute, October 2004, p. 95.
2. Assumes taxi to and from downtown: $50 taxi fare in Edmonton and $40 fare in Calgary.
3. Assumes public transit to and from bus terminal.
4. Assumes $12 taxi fare to and from bus terminal
5. Assumes $12 taxi fare to and from station. Fares are drawn from *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor*, prepared for Alberta Infrastructure and Transportation by TEMS Inc./Oliver Wyman, February 2008, p. 67.

n/a: not applicable.

For travel originating in or destined to rural areas, HSR seems to offer few cost advantages, since a potentially lengthy drive to a station would always be required. While Figure 5-2 presents estimates of terminal access assuming taxis are used, in rural areas most users could be expected to drive to the station. In that case, parking could also present added direct costs. On the other hand, trips from rural areas to downtown Edmonton, Calgary, or Red Deer using HSR would have the advantage of not requiring costly downtown parking at destination. It is notable that most counties consulted for this study indicated that complementary rural "feeder" public transportation would be required for rural residents to realize the user benefits of HSR.

5.2 Non-User Impacts

The 2008 economic impact study assessed the non-user impacts of HSR development. In dollar terms the most significant impacts were on employment income and property values.[23] However, that study did not look specifically at what proportion of these benefits would likely accrue to rural Alberta.

5.2.1 Jobs and Income

Relative to the urban areas in the Calgary-Edmonton corridor, rural Alberta has little population, and therefore should not expect to receive a large share of the positive non-user impacts of HSR.

[23] The 2008 economic impact study estimated that the impacts would be realized within two or three years following the commencement of HSR service, once economic activities had adjusted to the presence of HSR. See Appendix A for more details.

5.2.1.1 HSR Construction and Operations

The construction and operations of HSR will result in jobs and employment income. The Van Horne study estimated that the construction phase of HSR would cost between $1.7 billion (CPR Alignment) and $3.4 billion (greenfield alignment; similar to the Highway 2 Alignment or Rural Greenfield Alignment considered in the present study).[24] Constructing HSR in the CPR Alignment was estimated to take four years and to generate 25,500 person-years of employment (average of 6,375 jobs per year for four years) and $973 million in employment income.[25] The Van Horne study estimated that constructing a greenfield alignment would take place over six years and generate 52,000 person-years of employment (average of 8,670 jobs per year for six years) and $1.95 billion in employment income. Some of these impacts would occur in rural Alberta, particularly to the extent that construction workers live in rural areas or suppliers to the construction projects are located in rural areas. Another significant impact of the construction phase would be incidental revenues that are generated by rural businesses (e.g. gas stations, convenience stores, restaurants) from construction crews as well as rental of land to support construction.

Once HSR is operational, it will continue to generate jobs and employment income. The Van Horne study[26] estimated that on an annual basis between 1,000 and 1,100 jobs and $491 million in employment income would be created to operate the CPR Alignment, while a greenfield alignment would generate between 1,350 and 1,450 jobs and $861 million in employment income. As with the impacts of the construction phase, rural Alberta would be affected to the extent the operating personnel live in rural areas.

Overall, we do not foresee that HSR would significantly impact either the number or nature of jobs or the level of income in rural Alberta. However, there are likely to be negative local impacts associated with the reduction of passenger vehicle traffic on Highway 2, and the associated reduction in stops for fuel, food, and tourism along that route. However, the loss is a missed opportunity rather than a loss of existing business, since even in the presence of HSR car traffic is projected to rise by around 20 percent after five years.[27] The positive employment effects associated with HSR operations will be somewhat offset by negative employment effects associated with a reduction in Red Arrow and airline traffic. In any case, most people affected would reside in urban areas, resulting in little impact on rural Alberta.

5.2.1.2 The Long Term Impact on Other Sectors of the Economy

The long-term impact of HSR relates to the jobs and income that would be gained as a result of having a more competitive economy in Alberta; the improvement in competitiveness having come from lower transportation costs due to HSR. The Van Horne study estimated that in the short to medium term, between 1,600 and 2,600 jobs would be drawn to the Calgary-Edmonton

[24] Van Horne, pp. 111-112. These costs are in 2004 dollars and the effect of inflation since that time would be to increase these costs in 2010-dollar terms. Given the high-level approach of the present project, updating these figures to 2010 dollars would not have an impact on conclusions.
[25] The impact estimates includes direct, indirect, and induced effects; multipliers used in this analysis are from *Alberta Economic Multipliers, 2000.*
[26] p. 112.
[27] 2008 economic impact study, pp. 68-71.

corridor resulting in between $49 million and $73 million per year in additional employment income.[28]

The 2008 economic impact study estimated the distribution of jobs and income to communities in proximity to stations in three regions: Calgary, Edmonton, and Red Deer (as defined in Appendix B). These regions include rural areas. Figure 5-3 presents our rough estimate of the upper-bound economic impact of HSR in rural parts of Alberta within each of the three regions.

Figure 5-3: Upper-Bound Estimates of the Impact of HSR on Jobs and Incomes in Rural Alberta

Region	Jobs	Household Income (millions 2006$)
Calgary	110 - 228	6 - 11
Edmonton	84 - 176	4 - 8
Red Deer	134 - 280	7 - 14
Total	**328 - 684**	**$17 - $33 million**

Source: Adapted from the *Economic Benefits for Development of High Speed Rail Service in the Calgary-Edmonton Corridor,* prepared for Alberta Infrastructure and Transportation by TEMS, Inc., February 2008, p. 58

5.2.2 Development Potential and Property Values

One potential impact of HSR is to attract development to the Calgary-Edmonton corridor. The development of a station in Red Deer is likely to attract considerable investment to the Red Deer area, potentially spilling over into adjacent counties (Red Deer, Lacombe, Mountain View, and Ponoka).

With HSR, the Red Deer area will gain easier access to the large markets in Edmonton and Calgary. The Van Horne study notes that Red Deer also has the advantage of relatively less costly land and labour than Calgary or Edmonton. As well, Red Deer would gain direct and rapid access to the airports of Calgary and Edmonton, effectively providing it with more transportation options than either of its larger neighbours. The Van Horne study estimated that between 1,500 and 2,600 jobs (numbers increase with faster types of HSR technology), would be created in Red Deer, half of them shifted from Calgary and Edmonton.[29] The Van Horne study did not estimate whether these jobs would be created in Red Deer or in adjacent rural areas.

Among other factors, property values are affected by accessibility. To the extent that HSR affects the accessibility of properties in rural Alberta, it is likely to affect their values. The 2008 economic impact study found that depending on the type of HSR technology used (speeds from 125 mph to 300 mph) residential property value could increase between $403 and $849 per dwelling unit.[30] However, that analysis did not allocate changes in dwelling values between urban and rural areas. It is certain that dwelling units located further from stations would see less increase in value to the point where the impact on rural dwelling values would be

[28] Van Horne, p. 97.
[29] Van Horne, p. 99.
[30] 2008 economic impact study, p. iv.

insignificant. Property values would be negatively affected to the extent that HSR makes them less accessible through its impact on the road network.

Based on the 2008 economic impact study, we estimate upper-bound overall increases in property values in rural Alberta of between $70 million and $150 million, with the higher estimates resulting from faster HSR technologies.[31] Again, we do not anticipate that such aggregate increases would be significant or even noticeable at the level of most individual properties in rural Alberta.

5.2.3 County Revenues

The 2008 economic impact study estimated that HSR would provide property tax revenue increases of between $3 million and $7 million per year outside of major urban areas; higher revenues are associated with faster HSR technologies.[32] Most of these revenues would accrue to municipalities immediately adjacent to stations, i.e. in Red Deer, Leduc, and Rocky View counties. On the other hand, there is the potential for foregone property tax revenues if land that had been planned for development is used for HSR, since the land required for HSR would not be liable to pay property taxes. Land used for HSR may, however, be liable to pay grants in lieu of taxes, as is discussed in more detailed in Section 8.2.2.1.

In Chapter 6 we will discuss how county expenditures are likely to be affected by HSR.

5.2.4 Foregone Land-Use Opportunities

Regardless of the conceptual alignment, technology, or vertical alignment selected, to the extent that HSR would pass through land not already provincially owned, an interest in land, be it an easement, lease, or outright ownership, would need to be acquired for the right-of-way. The fact that land will be acquired means that at least some land will no longer be available for other uses. Defining this lost opportunity is the focus of this section.

5.2.4.1 The Effect of Vertical Alignment

The land requirement would vary depending on technology and vertical alignment employed. A track at ground level (with the exception of bridges) would require the most land, and a fully elevated track would require the least land.

A track on the ground would require land for track, right-of-way protection (fencing, berms) and ancillary structures. For instance, the 2004 Van Horne study estimated that between 108 and 309 hectares of land would be required to develop HSR along the CPR Alignment.[33]

A fully elevated track (pictured in Figure 5-4) is more similar to an electrical power transmission line such as that being proposed by AltaLink for the Western Alberta Transmission Line. Such an HSR design could involve the outright purchase of the right-of-way or the purchase of an

[31] 2008 economic impact study, p. 58.
[32] 2008 economic impact study, p. 58.
[33] In some cases in the Van Horne study, the HSR CPR Alignment deviated from the existing CPR right-of-way. The variation (108-309 hectares) results from uncertainty over whether land between the existing CPR right-of-way and the new CPR Alignment would need to be acquired. Van Horne Institute, "Calgary-Edmonton High Speed Rail: An Integrated Economic Region," October 2004, p. viii.

easement (by means of a one-time payment) with an annual payment (called a structure payment in the case of the Western Alberta Transmission Line).[34] In principle, most activities currently carried out along the alignment could continue, although there would be significant disruption during construction and a certain amount of land required for piers would be unusable for other purposes. The structure may also have implications on farming activities due to interception of precipitation/sunlight.

Figure 5-4: Elevated High Speed Rail Tracks in Taiwan

5.2.4.2 Concepts: the Sterilization and Severance of Land

Sterilization is an important concept in this discussion. Land not acquired directly for the right-of-way could become sterilized should it no longer be accessible, for instance, due to it being confined between transportation facilities (rail line or highway) or between a transportation facility and a geographical feature that does not permit access, such as an Indian Reserve, lake, or watercourse.

Every county consulted for the present study identified the severance of land as a major impact of HSR development. In some cases, this could mean dividing farms and other private property into two or more parcels intersected by the HSR alignment. The impact of severance on agricultural operations is explored in the next section. Some counties interviewed indicated that foregone land-use opportunities could constrain growth, notably if lands used by or sterilized by HSR had significant alternative development potential.

5.2.4.3 Impact by Conceptual Alignment and County

Depending on the type of technology employed, the Highway 2 Alignment could potentially only require limited land acquisition. An elevated track that could be built relatively close to the existing roadway would have the minimum requirement, while an at-grade track parallel to, but separated from, the existing roadway would require the most land. In the scenario that requires the most land, the new right-of-way required would vary between 30 m and 150 m.

The RGA would require the greatest acquisition of new land. Indeed, almost all of the alignment would require land acquisition. How much land is required would again depend on the chosen technology and vertical alignment of the track. As noted above (Section 5.2.4.1), an elevated

[34] http://albertaelectricityfuture.com/alberta/?page_id=403

track could have fairly minimal requirements, while an at-grade alignment would require the most land, a new right-of-way of between 30 m and 150 m.

All counties will face the prospect of foregone land-use opportunities. Counties closest to the major urban areas, Rocky View, Leduc, and Red Deer, would seem at the greatest risk of losing high-potential development land to the HSR alignment. The CPR and Highway 2 Alignment would seem to present the greatest potential for foregone land-use opportunities, because they would be in closest proximity to areas that are being developed. In spite of requiring the most land, the RGA would primarily require agricultural land with less alternative development potential.

The greatest impact on land ownership would likely be associated with the RGA, because it would pass through areas with no other obstructions. The Highway 2 Alignment, being relatively close to Highway 2, would be unlikely to sever significant parcels of land, however, it could lead to a narrow strip of land between the highway and the railway, which may or may not need to be acquired by the province. The Highway 2 Alignment would seem to present the least impact in terms of land severance since, to a significant degree, lands on either side of the highway have already been severed. The CPR Alignment would likely have an impact on severance somewhere in between the impacts of the Highway 2 Alignment and the RGA.

5.2.5 Farming

By any measure, farming is one of the most important activities in rural Alberta. We foresee that the development of HSR would affect farming in many ways; the following subsections deal with what we view as the four most-important impacts.

5.2.5.1 Farm Severance

Farm severance would almost certainly be one of the most significant impacts of HSR development. As noted above, the RGA would present the greatest potential for farm severance, with the Highway 2 Alignment the least, and the CPR Alignment as a middle case.

The impact of farm severance should, at least in principle, not be financial. The *Expropriation Act* effectively requires that the expropriated landowner not be worse off after an expropriation. Financial compensation, however, is rarely viewed by farmers as sufficient compensation for the loss of some or all of their farm property. Farmers have a special connection with land that urban residents, or even many rural residents who are not farmers, do not have. In many cases farmers have farmed a particular parcel of land for many generations. These psychological issues would certainly be among the chief impacts of HSR development.

5.2.5.2 Farm Access and Equipment Mobility

Depending on the final alignment selected, and most importantly in the case of the RGA, HSR has the potential to create a major obstacle for farms and their support services. The movement of machinery and services from field to field is already difficult and producers are always looking for more efficiency in their operations. Over the past few decades, these efficiencies have come from farming greater acreage, improved crop production methods, and larger equipment. Similarly, given the capital cost of this machinery, it is preferable to make most use of each piece of equipment, which could mean using the same machinery on both sides of the HSR line regularly.

Currently, seeding equipment will cover some 25 m in a pass and harvesting equipment spans over 12 m. Moving machines of this size requires ingenuity in dismantling or folding for travel on public roads and highways. Restrictions placed by Alberta Transportation on sizes and speeds of highway travel are the limiting factors at present. Crossing overpasses and bridges is a particular problem because of the height of guardrails limiting machinery width. Underpasses pose a problem for height. Thus, obstacles like Highway 2 and rivers pose a difficulty for trucking farm equipment; however, minimum speeds on highways prohibit moving it under its own power. After consulting grain industry stakeholders, we determined the width and height taken up by farm machinery on highways as shown in Figure 5-5.

Figure 5-5: Dimensions of Farm Machinery for Travel on Highways

Type of Equipment	Width	Height
Air Seed Drills	6.4 m	5.5 m
Tractors	5.2 m	4.0 m
Combines	5.2 m	4.9 m

Source: CPCS stakeholder consultations

Changes are proposed to legislation concerning the size of farm vehicles allowed to travel on highways with no special permit.[35] These changes mean that certain farm vehicles (such as grain augers) travelling on highways may be up to 38 m in length, a substantial change from the existing length of 23 m allowable without a permit.

Figure 5-6: Typical Large-Dimension Farm Equipment

Source: John Deere

We expect that access across the HSR alignment would be provided by a combination of overpasses and underpasses, depending on the grades and available right-of-way at each location. HSR has the potential to create a major obstacle for farm machinery. In the case of both overpasses and underpasses, the typical lateral clearance[36] of a two-lane highway should be sufficient to accommodate the largest typical farming equipment (air seeders, combines). However, the standard vertical clearance for underpasses[37] of 5.35 m is too low to accommodate most air-seeding machines, which are typically up to 5.5 m tall.

5.2.5.3 Grain Terminal Access

Grain is now mostly marketed through larger terminals located along the CPR right-of-way. The terminals are large and expensive and would be difficult to relocate. Access to these is by truck

[35] AAMDC Membership Bulletin, May 15, 2009

[36] Lateral clearance is the width of the structure for movement along the roadway available. Lateral clearance may be restricted by barriers, bridge rails, piers/retaining walls, or pavement width.

[37] Alberta Roadside Design Guide (November, 2007), *FIGURE H7.1 Typical Details of Highway Grade Separation*.

and tractor-trailer units that are difficult to manoeuvre on substandard roads. Primary and secondary highway access is critical. Additional costs would be incurred if excessive diversion was encountered. Development of HSR along the CPR Alignment could have a major impact on grain terminal operations; however, the fact that grain is usually trucked along major routes suggests that any impacts on truck traffic routing would be local.

5.2.5.4 Livestock Access

Where possible and practical, ranchers prefer to move cattle for short distances on foot along quiet country roads, thus allowing access to new pastures at little cost. Often though, foot movement is not possible due to traffic conflicts, distances involved, or the presence of obstacles such as highways or railways. Then, the more expensive trucking option comes into play. All livestock shipped to market are transported by truck.

In the southern portion of the Highway 2 corridor, agricultural productivity is lessened as one approaches the foothills of the Rocky Mountains. From about Olds northward, productive farmland is on both sides of the highway. South of Olds and west of Highway 2A, it is more common to see cattle being trailed to new grass. In these areas, an additional obstacle such as an HSR right-of-way would present more of a problem unless adequate crossing provision was made.

Grain production tends to be favoured over livestock for areas where soil productivity is higher. Thus, much of the corridor is bordered by grain production while land further west has significant cattle production. Nevertheless, many farms also have livestock, including cattle, swine, sheep, poultry, and even exotics like elk, bison, and ostrich. However, HSR will have less effect on these producers unless their properties and operations are severed by the route.

5.2.6 Truck and Rail Freight Service

It is unlikely that trucking or rail freight service would be affected by the development of HSR. Canadian Pacific is unlikely to consent to the development of HSR along its right-of-way without adequate provision of infrastructure to ensure that freight rail operations are not significantly disrupted. This has been the approach of CN with respect to requests from VIA Rail to increase the frequency of passenger rail service in the Quebec City-Windsor corridor.[38]

Trucking operations will be affected in the same way as other road traffic (as discussed in Section 4.3). The largest impacts would be related to deviation of trips from roads where trucks previously travelled that become severed as a result of the HSR project. Overall, given that no major roads would be severed we foresee a negligible impact on long-haul trucking and a minor impact on local deliveries in rural areas. Routings used for farms deliveries and pick-ups would likely have to be altered at some cost to service providers.

[38] In that instance, the Government of Canada has financed the expansion of capacity in the CN corridor to accommodate faster and more frequent VIA service between Ottawa and Montreal (via Kingston) and Toronto. Improvements include additional track, lengthened sidings and improved signalling. (http://www.viarail.ca/en/about-via-rail/our-company/capital-investment/government-canada-and-via-rail-canada-launch-passenger-rail-improvement-project.)

5.2.7 Utilities and Oil and Gas Operations

The Calgary-Edmonton corridor is literally a latticework of pipelines carrying oil, gas, and their various by-products. While we anticipate that any HSR alignment could avoid most fixed installations, pipelines would doubtless need to cross the alignment. At such intersection points, reconstruction, involving disruptive shutdowns of pipelines, may be required. Water and sewer lines would likely be subject to similar disruption during construction.

6 Social and Environmental Impacts

The development of HSR brings with it significant potential social and environmental impacts for rural Alberta. This chapter explores the potential impact of HSR on safety, noise and vibration, air pollution, landscape and visual quality, watercourses, recreation, wildlife mobility, and on those people unable, for various reasons, to drive.

6.1 Safety

Given that we assume that no at-grade crossings would be permitted along the HSR alignment,[39] there is little risk of road-rail collisions.

High speed trains approach quickly and are therefore hard to see coming and can be almost silent until they arrive,[40] suggesting that trespasser safety could be a significant issue. However, we believe it is reasonable to assume that any HSR alignment would be fenced along its entire length, for both safety and operational (to avoid disruption of service) reasons. Fencing along the entire length should effectively eliminate trespassers.

HSR operations themselves require significant safety precautions and measures. Not only are alignments entirely fenced to avoid incursions by humans or animals, but the operations of HSR are precise and design standards are very high. The prospect of operations along the existing CPR tracks, co-mingled with freight, does raise the prospect of collisions. In our view, any development of the CPR right-of-way to accommodate HSR would require provision for the separation of freight and passenger operations. That said, there would remain safety risks associated with facilities handling hazardous materials in proximity to the CPR Alignment. An example of such a facility is the shipping depot for propane and petroleum products located north of Carstairs in Mountain View County.

From the perspective of rural Alberta, HSR would most likely have positive impact on safety. While it seems unlikely that HSR could actually reduce the volume vehicle-km travelled in Alberta (see Appendix B), there is no question that it would remove some cars from the highways, thereby reducing the potential for collisions beyond what it would otherwise have been. The Van Horne study estimated that the number of collisions in the Highway 2 corridor could be reduced by 11 percent relative to a scenario with no HSR.

From the perspective of the traveller, the US National Safety Council estimates that personal motor vehicle travel is between 12 and 20 times more likely to result in a fatality than

[39] This assumption is consistent with US Federal Railroad Administration (FRA) regulations which prohibit at-grade crossings on any lines with speeds of over 125 mph (200 km/h) (from http://www.fra.dot.gov/Pages/217.shtml). In France, at-grade crossings are prohibited for lines operating at more than 100 mph (160 km/h) (US FRA, "High-Speed Passenger Rail Safety Strategy," Version 1.0, November 2009, p. iii.

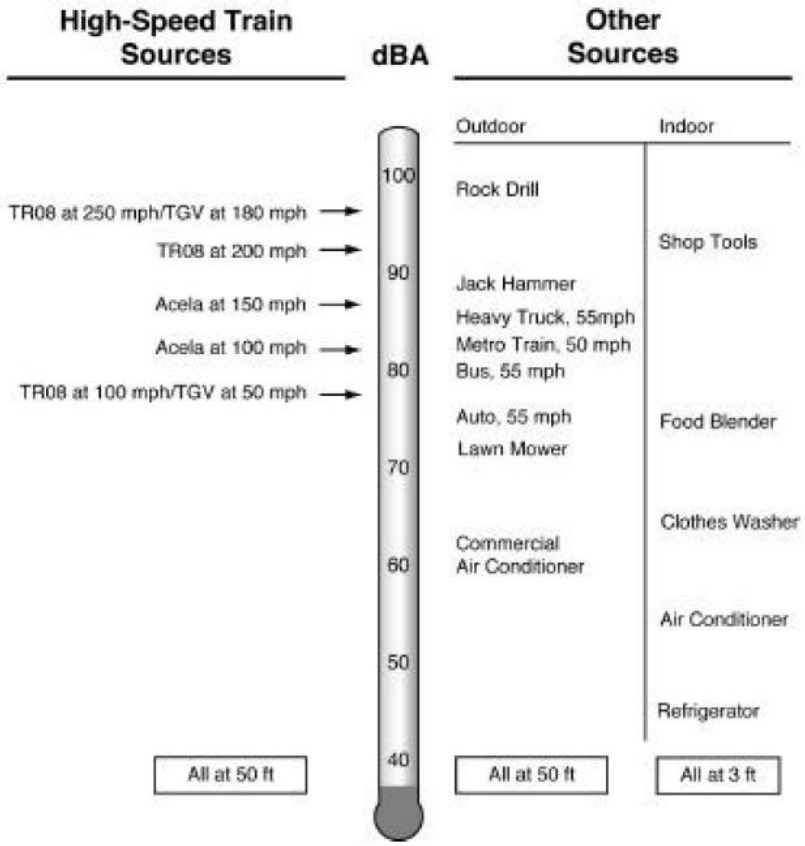
[40] US Department of Transportation, Federal Railroad Administration, Office of Railroad Safety and Office of Railroad Development, "Highway-Rail Grade Crossing Guidelines for High-Speed Passenger Rail," Version 1.0, November 2009, p. 13.

passenger rail travel.[41] At the same time, to the extent that rural traffic must take alternative routings around terminated roads, the additional vehicle-km travelled could add to the number of potential accidents on rural roads.

6.2 Noise and Vibration

HSR is an activity that generates noise. Noise impacts people and animals. Impacts on humans have to do with annoyance, which is usually assessed through surveys, while impacts on animals are more difficult to assess. In either case, impact is a combination of the intensity of the noise/vibration effect and the effect on humans or animals. The speed at which the noise develops (onset) is also a factor. After reviewing environmental impact studies, the US Federal Railroad Administration (FRA) noted that "noise and vibration are frequently among the potential impacts of most concern to residents in the vicinity of the proposed (HSR) project."[42]

Figure 6-1: Typical A-Weighted Sound Levels



Source: US Department of Transportation, Federal Railroad Administration, "High-Speed Ground Transportation Noise and Vibration Impact Assessment," October 2005, p. 2-3.

[41] US FRA, "High-Speed Passenger Rail Safety Strategy," Version 1.0, November 2009, p. 1.
[42] US Department of Transportation, Federal Railroad Administration, "High-Speed Ground Transportation Noise and Vibration Impact Assessment," October 2005, p. 1-1.

The level of noise and vibration depends on vertical alignment (elevated, below grade, at grade), the presence or absence of acoustic barriers, the type of HSR technology employed, and the speed and the length of the train.[43] The impact of noise/vibration depends on the proximity of humans and animals to the track, the species of animal, and whether these animals are housed inside or outside.[44] The level of existing or ambient noise, when no train is passing, is also a factor.

The standard way to describe noise is a measure called the A-weighted sound level. Figure 6-1 provides an example. This scale applies to the range of sounds people can hear, to the extent animals can hear different frequencies of sound, subjective loudness will be different (e.g. think of a dog whistle). On the A-weighted scale, on average an increase in sound of 10 decibels (dBA) corresponds to a doubling of subjective loudness.[45]

Keeping people and animals away from an HSR alignment is a key factor in reducing noise and vibration impact. By way of illustration, consider the Figure 6-2 which illustrates that surprise only occurs for recipients in very close proximity to tracks, e.g. 35-40 feet (10-12 m) for trains travelling at 175 mph (280 km/h).

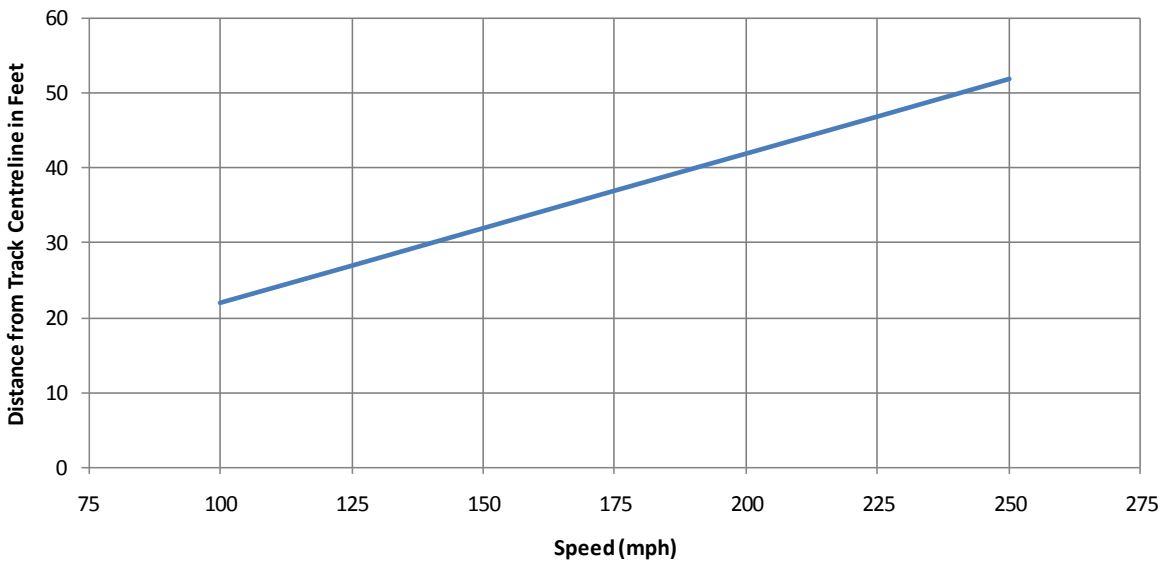
Given our assumption that all crossings will be grade-separated and that stations will only exist in urban areas and at airports, we do not anticipate that the noise from horns would have an impact on rural Alberta.

While there have been many studies of the noise generated by HSR, the impact on animals is still uncertain.[46] The FRA offers low overflights by aircraft as a similar type of noise event that has been studied. This research suggests impacts on domestic livestock and wildlife range from simply taking notice to changing body position and flight in panic. It seems that animals, like humans, can also get used to noise, thereby potentially reducing its impact.

The FRA has developed screening procedures to be applied early in an HSR development to identify all areas likely to be impacted by HSR noise. It provides a distance from the centreline of the track beyond which no additional noise studies need be conducted. In the case of HSR in rural areas, the FRA recommends a distance of 275 m (900 ft). Similarly, the FRA provides a screening method for vibration based on typical ground propagation conditions. This screen captures different types of buildings, based on vibration sensitivity. The distance beyond which even the most vibration-sensitive buildings (e.g. concert halls and research facilities) do not need to be considered is 225 m (750 ft).[47]

[43] Ancillary facilities such as storage and maintenance yards and substations can also be sources of noise.
[44] For the propagation of vibration, geological factors (type of ground) are also important.
[45] The Sound Exposure Level (SEL) describes a receiver's (human or animal) cumulative noise exposure from a single noise event, such as the passage of a high speed train. It is represented by the total A-weighted sound energy during the event, normalized to a one-second interval. This means that shorter but louder events could have the same SEL as longer but less loud events.
[46] Hanson, CE, "High Speed Train Noise Effects on Wildlife and Domestic Livestock," in B. Schulte-Werning et al. (Eds): *Noise and Vibration Mitigation,* 2008, offers a useful summary of some of the challenges and the current state of knowledge.
[47] California High Speed Rail Authority, *California High Speed Train Program Environmental Impact Report/Environmental Impact Statement: Noise and Vibration Technical Assessment*, January 2004, pp. 20-21.

Figure 6-2: Approximate Distance from Tracks Within Which Surprise Can Occur



Source: Adapted by CPCS from Federal Railroad Administration, *High Speed Ground Transportation Noise and Vibration Impact Assessment*, October 2005, Figure 4-2, p. 4-11.

Generally, we can conclude that the Highway 2 Alignment would offer the least incremental noise and vibration impact, because of the existing highway noise. The CPR Alignment would probably have the greatest impact, owing to the presence of people in proximity to the alignment. The RGA would offer the least impact, since residences could largely be avoided, livestock could be kept well away from the tracks with fencing, and acoustic barriers could be used with maximum flexibility.

6.3 Air Pollution

Assuming HSR uses electricity as a power source, there would be no local emissions of air pollution. To the extent that the electricity used is generated using polluting production technology (e.g. conventional coal-fired generation), air pollution would be created. On the other hand, to the extent that HSR is successful in removing cars from Highway 2, local air pollution from automobile emissions would be reduced. It is worth noting that HSR would also reduce the number of polluting flights between Edmonton and Calgary, thereby reducing pollution from aircraft. However, for rural Alberta, this type of pollution is less of a direct concern. Overall, HSR would have a net positive impact on air pollution in rural Alberta, because it would remove cars from Highway 2.

6.4 Landscape and Visual Quality

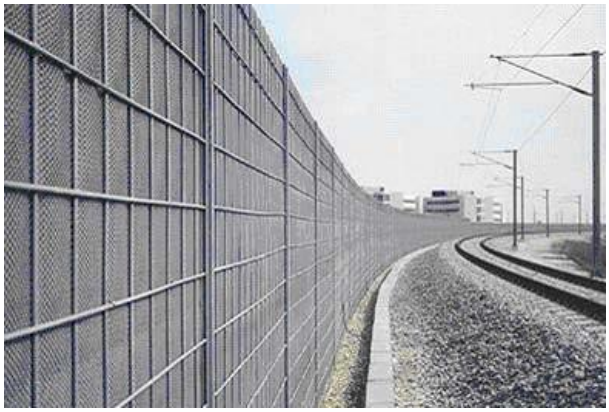
The visual impact of an HSR project can be significant, but is highly dependent on the technology used for the track and the vertical alignment of the track. For instance, at one extreme, a fully elevated track, like that pictured in Figure 6-3 (Shanghai-Hangzhou HSR Line

under construction in 2010), could be visible from several kilometres away and therefore could have a very significant impact on the character of the landscape. At the other extreme, a line constructed below grade would minimize visual impact.

Figure 6-3: Shanghai-Hangzhou Elevated High Speed Rail Line

Other sources of visual impact could result from some of the measures required to protect the alignment from incursions by people and animals and to reduce noise impact. Figure 6-4 demonstrates some right-of-way fencing and sound barriers that are typical of HSR in other countries.

Figure 6-4: Fencing Along High Speed Rail Alignments in China (left) and the United Kingdom (right)



6.5 Watercourses

There are a significant number of lakes, rivers, and streams in the Calgary-Edmonton corridor. In all cases these will need to be either avoided or separated from the HSR line with a structure (e.g. bridge, culvert). A number of counties noted that northwest-to-southeast valleys within the county are important for drainage.

6.6 Recreation

Rural Alberta offers recreational opportunities for both rural and urban residents. There are a number of potential impacts on recreational activities that could result from the development of HSR. Chief among these impacts is the potential to affect both formal/organized and informal recreational trails of various kinds including hiking, cycling, snowmobile, and all-terrain vehicle trails. To the extent that such trails cross the HSR right-of-way and are not immediately adjacent to roads that would be grade-separated, they would need to be re-routed, severed, or grade-separated.

As was the case with vehicle traffic in Section 4.3, the RGA and the CPR Alignment are most likely to come into conflict with recreational trails, since no crossings currently exist. The Highway 2 Alignment would employ whatever crossing structure is currently in place.

6.7 Wildlife Mobility

Given our assumption that the HSR alignment would be fenced along its entire length with the specific aim of keeping animals out, there is the potential for a significant impact on the mobility of wildlife.

Those animals most likely to be affected are those that travel relatively long distances and that typically would cross one of the conceptual alignments during movement:

- ungulates such as deer, elk, and moose
- other mammals such as coyotes, cougars, grizzly bears, wolves, and foxes

Counties consulted for the present study also raised animal mobility issues. In particular, a number of counties noted that many northwest-to-southeast valleys provide wildlife corridors for moose and deer.

Given that it would represent an entirely new barrier, the RGA would seem to have the greatest impact on wildlife mobility. The impact of the CPR and Highway 2 alignments would be less, given that barriers along these routes already exist in the form of fences, roads, and other development. We do not foresee major differences in impact across counties.

6.8 Impact on Rural Travellers Unable to Drive

For a variety reasons including age and disability, some rural residents are unable to drive. Some of those who are disabled have other mobility restrictions that impede their ability to easily use public transportation, particularly intercity buses. For these travellers, HSR could offer an affordable and convenient alternative to air travel.

7 Administrative and Planning Impacts

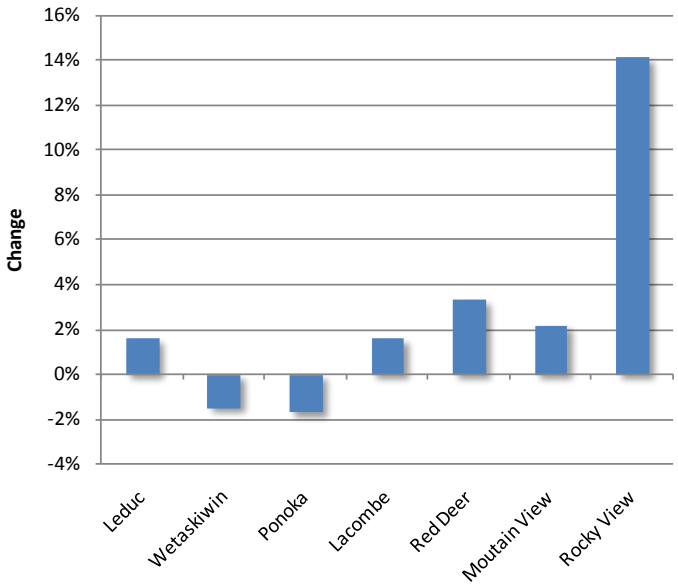
This chapter examines the likely impact of HSR development on county administration and planning. The first section identifies and analyzes the types of impact that are likely to occur. The second section examines how the planning objectives of the affected counties are likely to be impacted by the development of HSR.

7.1 Identification and Analysis of Administrative and Planning Impacts

While southern Alberta as a whole has been experiencing strong economic and population growth in recent years, the seven counties in the Calgary-Edmonton corridor have experienced a mix of negative, slow, and very rapid population growth (Figure 7-1). Rocky View County in particular saw very rapid growth of 14 percent between 2001 and 2006; at the same time Wetaskiwin and Ponoka both saw their populations decline.

There is a perceptual issue at play here as well. Many counties that we consulted for this study told us about significant development plans. In many cases these developments are commercial or industrial and would create employment not for residents of the county per se, but rather for residents of adjacent urban municipalities. As well urban municipalities have been growing quickly and are annexing land from adjacent counties to accommodate this growth, also potentially distorting growth estimates of the populations of counties.

Figure 7-1: Population Change in Rural Alberta, Calgary-Edmonton Corridor, 2001-2006



Source: CPCS analysis of estimates from Statistics Canada Census of Canada. The most recent census estimates are for 2006.

We see four types of impact on county administration and planning associated with HSR development:

- Increased planning uncertainty;
- Responding to emergencies along the HSR Alignment;
- Road maintenance; and
- The Central Alberta Economic Partnership Regional Transportation Strategy.

Each of these impacts is examined below.

7.1.1 Increased Planning Uncertainty

Uncertainty is a major disincentive to investment and land development. If and when HSR becomes fully operational, it is unlikely to cause uncertainty, but until that time, there will continue to be uncertainty both in terms of whether or not it will be constructed, and if so, what route it will take.

In the last few years, all seven counties between Calgary and Edmonton have designated economic growth areas along Highway 2 and Highway 2A with some being more advanced than others. Growth Management Strategies and Area Structure Plans have been or are being prepared to encourage and direct industrial, commercial, and business park development. Several counties have formalized working relationships with their urban communities aimed at presenting a unified voice to prospective business clients. Many counties consulted told us that the potential development of HSR is not being taken into account in their or their urban neighbours' growth plans. This approach is understandable given that the Government of Alberta has yet to study potential alignments. However, there will be a period between the announcement of a study of potential alignments and the start, or even completion, of HSR construction that will cause significant uncertainty for both landowners and developers, particularly in rural municipalities. It is conceivable that this uncertainty could delay or even completely frustrate development plans.

By way of example, the Lacombe County has designated a significant business development area on both sides of Highway 2 (from Aspelund Road in the south to north of Highway 12). Industrial, commercial, and institutional development is proceeding. Residential and recreational developments are concentrated along the Blindman River and in the moraine landscape along Wolf Creek in the north. None of these plans have been developed with any regard to potential need to accommodate an HSR alignment.

In another example, the County of Leduc and City of Leduc have designated growth areas on both sides of Highway 2 between the Edmonton International Airport and the City of Edmonton linking into the road network in the vicinity. This region is now being seen as an "Aerotropolis" within which an integration of several modes of transportation is planned. To the extent that HSR will alter these plans, costs could be incurred in terms of planning effort, investor expectations, and even project timelines and configurations, which may need to be modified.

We anticipate that the issue of planning uncertainty will affect all counties along the alignment. Those counties with the most extensive growth plans will likely be most significantly affected. All three conceptual alignments would present significant uncertainty. Given development along or near Highway 2 and Highway 2A, it seems that the CPR and Highway 2 Alignments would be more likely to cause uncertainty with an adverse impact on development. The RGA, on the other hand, would by definition run through areas with little or no planned development and limited prospects for development in the near future, suggesting that it would have the least impact in terms of planning uncertainty.

7.1.2 Responding to Emergencies Along the High Speed Rail Alignment

Emergency services operations could be affected by the introduction of HSR in the Calgary-Edmonton corridor through the need to prepare to respond to emergencies along the

alignment. It is certain that the HSR operator would be required to maintain safety plans in compliance with federal and provincial regulations and with good business practices. Moreover, HSR itself is extremely safe, as discussed in Section 6.1. However, there would be a need for HSR safety plans to interface with local emergency services and emergency management organizations. While any on-train emergency would be handled by emergency services at the next station, i.e. in an urban area, incidents could occur in rural areas.

For instance, incursions (by person or vehicle) into the HSR right-of-way would likely require a response from emergency services. While trespass would likely only require a response by police or even private security, should a vehicle penetrate the right-of-way there could be a requirement for response by police, fire, and ambulance services.

The requirement for emergency service intervention is most likely at points where the HSR right-of-way would cross under a road, and the design of such crossings would have a major influence on the likelihood of accidents. Counties with more crossings of the HSR alignment would face a higher risk of emergency response being required. On the basis of the analysis presented in Chapter 3, the counties with the largest number of the crossings (depending somewhat on which conceptual alignment is being considered) are Leduc, Red Deer, and Rocky View. Mountain View and Wetaskiwin counties have particularly few crossings.

In terms of conceptual alignments, the RGA would have the least exposure to incidents, with 33 crossings. The Highway 2 Alignment would have the greatest exposure, with 43 crossings, and the CPR Alignment would fall in the middle with 36 crossings. Given that the CPR and Highway 2 alignments pass through more populated areas, it also seems likely that they would present the greatest risk of need for response associated with pedestrian trespassing.

The key impact on rural municipalities and their emergency services would be the cost associated with special training required to respond appropriately to any emergencies associated with HSR.

7.1.3 Road Maintenance

As discussed in Section 5.2.4, in some cases the severance of roads may isolate an area that has only one existing access route. In these situations it may be necessary to construct new roadways to provide access from another direction. The impact of new road construction is dependent on the specifics of the alignment in that location. Other constraints such as rivers may introduce the need for additional river crossings. Access issues would likely be resolved at the HSR planning stage and capital costs for any new access roads would be incorporated into the cost of the HSR project and paid by the proponent. However, rural municipalities would most likely be responsible for maintenance expenditures on any new roads within their jurisdictions. These costs could, to some degree, be offset by reduced routine maintenance costs due to the closure of certain local roads; however, additional consideration must be given to the increased costs associated with maintaining turnarounds (at the end of severed roads) and additional signage at termination points.

Counties must also plan for the plowing of dead-end roadways. Plowing time is expected to increase due to the presence of cul de sacs and the resulting increase in back-tracking, which could add time and cost.

The Highway 2 Alignment has the lowest number of routes that would be severed, which results in the fewest maintenance considerations. Along the other alignments, many of the grade-separated crossings (all, in the case of the RGA) will be new. Although it is expected that the capital cost of these crossings will be funded within the HSR project, there could be expectations for counties to provide maintenance on bridges within their jurisdictions.

7.1.3.1 Cul de Sacs

For all road closures, a turn-around would need to be installed to accommodate the minimum turning radius required by vehicles that are likely to use the road. An unfamiliar truck driver who enters a severed road in error must be able to turn around in the surface area provided. Other large vehicles such as maintenance trucks and emergency services vehicles must also be accommodated. Vehicles that cannot turn around in the turn-around area may need to back up over a long distance before reaching a suitable location to turn around. Backing over an extended distance may be particularly difficult at night (when no headlight illumination is available) and in snow, when the edges of the roadway may be difficult for backing drivers to see. Backing over extended distances may be a particular concern for a fire truck in an emergency situation.

The Alberta Highway Geometric Design Guide provides various levels of turning radii for vehicles including minimum, medium and maximum. Providing the necessary radius will ensure that vehicles can turn around safely, without the risk of encroaching on to the roadside or overturning.

Figure 7-2: A Turn-Around Area Created by Highway 2 Northeast of Innisfail

Source: Google Earth

In all cases we anticipate that cul de sacs with turning bulbs would be developed and paid for as part of the HSR project. However, it is likely that their maintenance would be the responsibility of the municipality.

7.1.4 The Central Alberta Economic Partnership Regional Transportation Strategy

During our consultation with the counties in the Calgary-Edmonton Corridor, we frequently heard of the need for feeder transportation to improve the mobility of rural residents. Most counties also specifically mentioned feeder transportation as a means of improving rural access to HSR, since stations would most likely be located in urban areas (Calgary, Edmonton, Red Deer).

Since 2009, under its Regional Economic Development Strategy the Central Alberta Economic Partnership (CAEP) has been developing a Regional Transportation Strategy. CAEP is an economic development organization of which five of the seven counties along the HSR alignment are members: Wetaskiwin, Ponoka, Lacombe, Red Deer, and Mountain View.

The stated objectives of this strategy are generating economic development opportunities and helping "local communities retain businesses and residents by improving the quality of life and supporting participation in employment, recreational, social, health services, and educational opportunities across the region."[48] The strategy covers a number of different types of public transportation that are designed to be responsive to community needs and to be affordable. Rail, high speed or otherwise, is not mentioned. Proposed transportation options range from volunteer driver programs to car pooling, car sharing, and fixed route transit. Red Deer would act as the hub of the system and connections would be provided to most major communities within the Central Alberta region (Figure 7-3). In particular "spines" would be developed along the Highways 11 and 2A.

We believe the development of HSR would be a particularly useful addition to the CAEP Regional Transportation Strategy, since it would offer mobility into and out of the Central Alberta region on a mode of transportation that would be well aligned with the goals of the strategy. In particular, as noted in Section 6.8, HSR would offer a useful transportation alternative for those residents of rural Alberta who are unable to drive for a variety of reasons; presumably the same residents who would be making use of the various public transportation initiatives set out in the Regional Transportation Strategy.

As with other aspects of planning in rural Alberta, there would be a benefit in having plans for HSR integrated with the Regional Transportation Strategy. Such integration would come at the cost of a revision to the Regional Transportation Strategy and associated operational changes to optimize the integration of the strategy with HSR. This integration will entail some cost, since the Regional Transportation Strategy will likely be in place long before HSR is developed, and it will therefore need to be revised as appropriate later.

[48] CAEP Regional Transportation Strategy – Guide and Toolbox - 90% Draft, p. 1.1, http://www.centralalberta.ab.ca/index.cfm?page=RegionalTransportationStrategy

Figure 7-3: The Central Alberta Region

Source: CAEP

7.2 The Implications of High Speed Rail on Rural Growth and Development Planning

This chapter assesses the implications of HSR on rural growth and development plans in the counties in the Calgary-Edmonton corridor.

7.2.1 Framework for Analysis

7.2.1.1 How High Speed Rail Would be Developed

When the final HSR alignment is selected and right-of-way acquisition planned, it is expected that the counties will be advised. As was the case when the ring-roads were established around Calgary and Edmonton, the province designated Transportation and Utility Corridors and then set about acquiring the rights-of-way. Most acquisitions were through negotiation, but the province can also rely on expropriation as a final recourse. A similar process may be employed for HSR.

The Government of Alberta enacted the *Land Assembly Protection Act* in 2009 as a means to secure property for important public works. It is expected that this avenue may be used for HSR land acquisition. The *Act* allows land to be held in its current status while assembly processes are undertaken.

The province recently called for consulting proposals for a 40-year Strategic Transportation Plan. This project is scheduled for completion by the end of this year, likely before the HSR route selection process is initiated; route selection may be many months or years in the future.

If the route is integrated with other public works, such as electric transmission lines, the process could be lengthy and involve extensive public consultations.

At present, only one rural municipal planning document, prepared by Leduc County, shows a possible route for HSR. We expect that the longer the final alignment remains unknown, the more difficult it will become for the affected counties to make the required amendments to their plans. This opinion was also expressed by the counties. Due to intensive developments having commenced, some possibilities may involve very significant land costs for relocation.

The following statement has been paraphrased from that expressed by Mountain View County (quoted with permission) but it reflects the sentiment that all articulated:

> We view the routing and the timing of acquiring the lands for the routing as vital information to our landowners. If agricultural operations are severed by the route, sales and operational adjustments should be completed prior to construction, a process that will take at least a decade. This type of infrastructure will create sterilization of the lands, especially if the HSR route is separated by a narrow strip (i.e. one or two miles) from an existing north-south barrier such as Highway 2.

The potential development of HSR presents a dilemma for counties. On the one hand, they must move forward with plans to accommodate growth and development, on the other, they are concerned that these plans will require costly amendments should HSR development proceed. Many counties mentioned their interest in public transportation that would allow their residents and businesses easier access to HSR stations, in particular from new development nodes.

From the rural perspective, it is essential that the alignment for the proposed HSR be established and right-of-way purchased as soon as possible. The longer the delay, greater uncertainty will result and all the seven counties are likely to make land-use decisions and commence developments that will limit routing choices.

7.2.1.2 HSR Land Acquisition Process

The Government of Alberta has not yet stated whether or how it intends to acquire the land required for HSR development, but, if public ownership is intended, the *Land Assembly Project Area Act*[49] would likely be used. The *Act*, which has been assented to but not yet proclaimed, provides for the provincial government to designate land for public projects for the transportation of people or goods or for the conservation or management of water.

The land in the project area is then subject to regulations respecting the control, restriction, prohibition, or approval of land use, development, or occupation. This designation is subject to the Minister approving or consenting to any change to current uses, developments, or occupation. It provides for land to be acquired by the Crown providing that it has been subject of a plan not more than two years old and which has had adequate consultation with the landowners and to the public. Land may be acquired in a number of ways. The landowner may agree to the value of the acquisition, it may be referred to the provincial Land Compensation Board or, failing that, land may be expropriated by the province.

[49] http://www.qp.alberta.ca/574.cfm?page=L02P5.cfm&leg_type=Acts&isbncln=9780779742189.

If the HSR system is to be constructed and operated under private ownership, the property would need to be purchased on the open market.

7.2.2 Impacts of HSR on Rural Long Term Growth and Planning

This section reviews in more detail some of the municipal plans of the seven counties that could potentially be affected by the development of HSR. It also assesses the likely impact of HSR on municipal planning objectives.

In 2003, TD Bank released a report that stated:

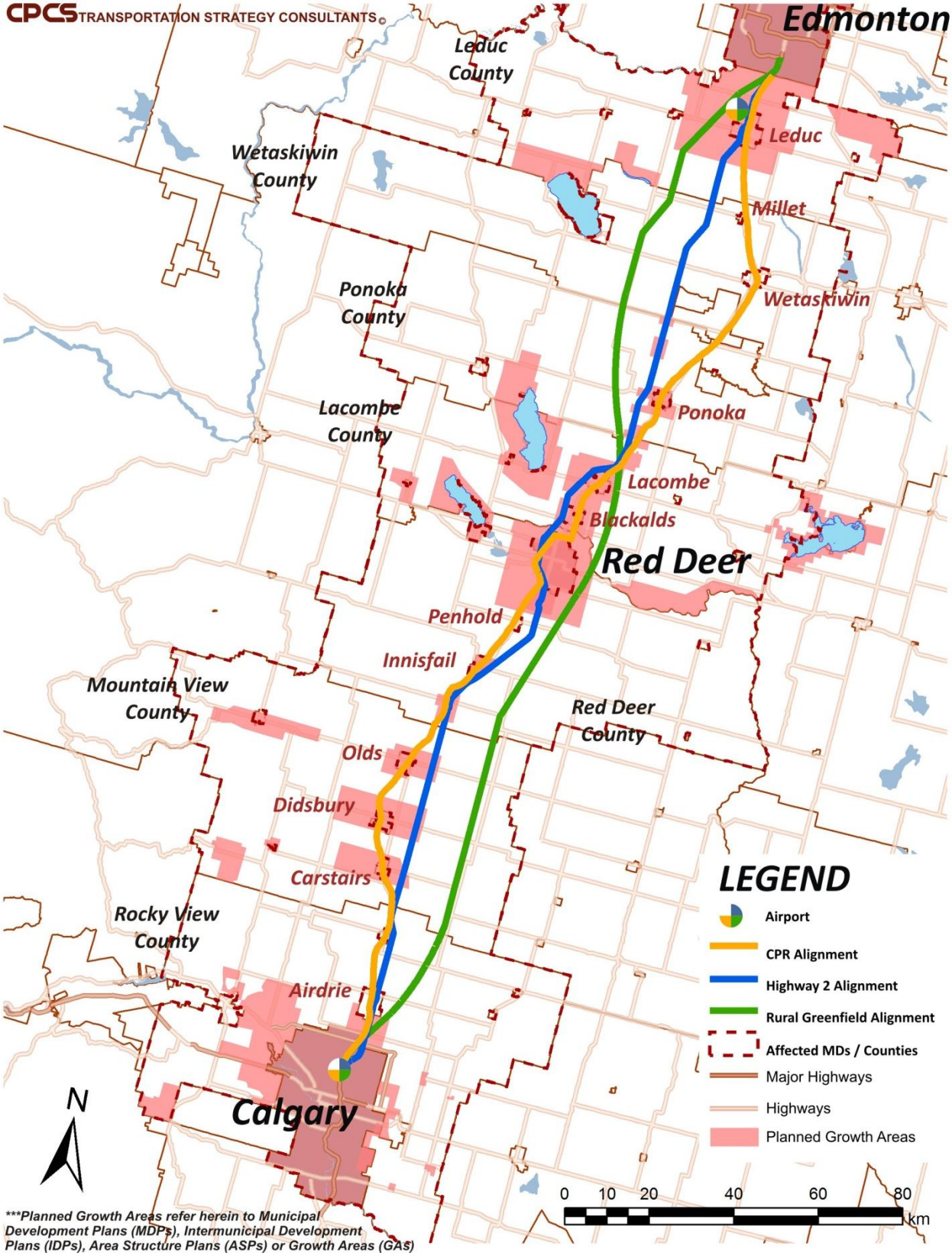
> The Calgary-Edmonton Corridor is in a unique position in Canada. Specifically, it is the only Canadian urban centre to amass a U.S.-level of wealth while preserving a Canadian-style quality of life.[50]

All seven counties within the corridor recognize the economic potential of the Calgary-Edmonton corridor and all have intentions to capture some of that energy. But uncertainty is by far the largest impact on long-term growth and planning. In the absence of an established route for HSR, the seven jurisdictions are proceeding with strategies and plans for industrial developments, transportation services, commercial services, and business parks. Figure 7-4 provides a compilation of the developments – some underway and some proposed.

The following sections summarize what we heard from the councillors, administrators, planners, engineers, public works staff, and economic development personnel from the seven counties. The particular focus of these sections is on planning issues of specific significance to the individual counties.

[50] TD Economics, *the Calgary-Edmonton Corridor: Take Action Now to Ensure the Tiger's Roar Doesn't Fade,* Special Report, April 22, 2003.

Figure 7-4: Planned Growth Areas in the Calgary-Edmonton Corridor



7.2.2.1 Leduc County

Leduc County is the only one of the seven counties, as far as we are aware, expected to have a direct link to HSR as the Edmonton International Airport (a potential station location) is within its boundary.

Figure 7-5: Analysis of the Impact of HSR on the Planning Goals of Leduc County

Planning Goal	Impact
Preservation and enhancement of the agricultural community.	Negative. HSR could consume productive agricultural land.
Population growth in desirable locations.	Neutral.
Rural and alternative life style choices.	Negative. HSR could affect recreation, wildlife and visual quality of the landscape.
A compatible and harmonious land development pattern.	Negative. HSR could disrupt existing plans and thereby create land-development conflicts.
Strong and sustained economic growth and tax base.	Neutral. While HSR could consume land that could be used for development purposes, a station located in the county could bring significant economic development. Payments in lieu of taxes on land used for HSR may have to be negotiated with the province.
Efficient and economic provision of municipal services and facilities.	Negative. A number of impacts including on roads, school bussing, and emergency services access.
Protection of significant environmental areas and prevention of land, water, air, noise, and visual pollution.	Negative. HSR is likely to create noise and visual pollution.
Mutually beneficial relationships with neighbouring municipalities and other authorities.	Neutral. Indirectly, intermunicipal cooperation around HSR development could improve cooperation.

Source: Leduc County MDP Planning Goals

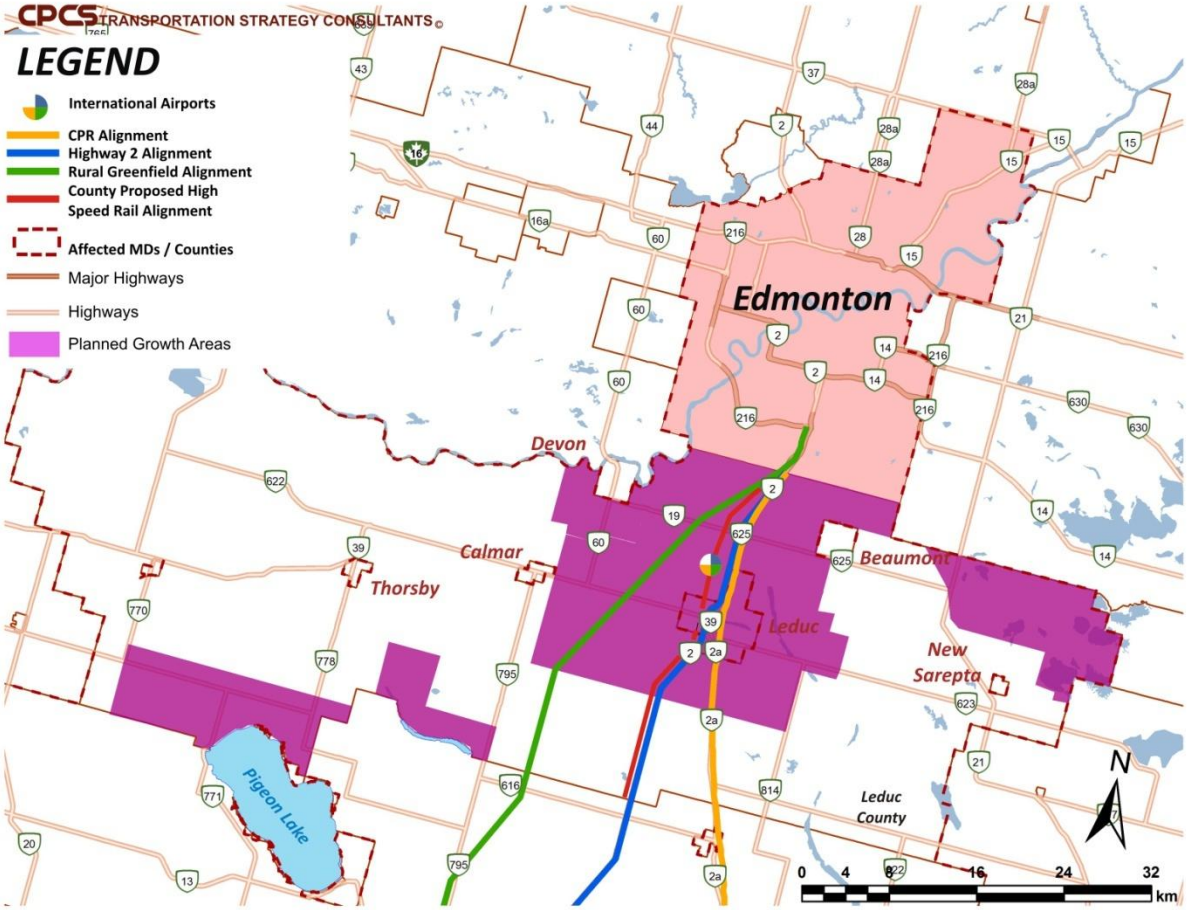
The County is working closely with the City of Leduc and towns in the area through a joint initiative entitled the International Region Economic Development Authority to enhance the economic viability of the Edmonton International Airport (EIA). The whole region is becoming more urban and the infrastructure requirements to allow this evolution must be met. The County feels that local infrastructure must be improved, including the extension of Light Rail Transit to the airport and improvements to Highway 2.

Given the likely alignment of HSR we anticipate that the North Major ASP will definitely be significantly affected by the development of HSR. The WAM[51] Local ASP and the Highway 19 ASP both also could potentially be affected by HSR development. Together these ASPs will guide the development of the whole area between Edmonton and Leduc. The other alternative is the Highway 2 and CPR corridors. Otherwise HSR would have to pass through land planned

[51] WAM is the name of a development enterprise and therefore not included in the list of abbreviations.

for residential development, aggravating planning difficulties. The Joint Growth Strategy of the City and County of Leduc shows a possible route for HSR through the county, which we have reflected in Figure 7-6.[52]

Figure 7-6: HSR and Planned Growth Areas in Leduc County



The Alberta Transportation (TRANS) is currently studying the potential realignment of Highway 2 through Leduc County. The study concerns a 10-km section of Highway 2 between Ellerslie Road (9 Avenue SW) in Edmonton and the Nisku interchange (Highway 19/625) in Leduc County. Within Leduc County, plans show a potential realignment of Highway 2 to the west to accommodate a major interchange with a new east-west freeway running across the northern portion of Leduc County. Dependent on timing, the development of these plans or the development of HSR could have strong mutual impacts. All three conceptual HSR alignments would have a similar impact on these plans or be similarly impacted by these plans, since we foresee all three alignments entering Edmonton via or in close proximity to the CPR/Highway 2 corridor.

[52] http://www.leduc-county.com/PDF/CityofLeducIDP/LeducCountyCityofLeducIDPMap.pdf

7.2.2.2 Wetaskiwin County

Wetaskiwin County is working closely with the City of Wetaskiwin and the Town of Millet on joint economic strategies to capture additional development opportunities. The three municipalities have established a Joint Economic Development Initiative for this purpose. The Highway 2 corridor is targeted for development of industrial and commercial zones but strategies are also being generated to attract more business to Highway 2A, into Millet, to Wetaskiwin and the local airport, and to the Reynolds Museum.

The County has designated business development nodes of about one square mile at the major intersections on Highway 2, including Highway 13, Secondary 611 and 616. Industrial, commercial, and institutional designation is proceeding. Residential and recreational developments are currently in the moraine landscape between Wetaskiwin and Millet and more are planned.

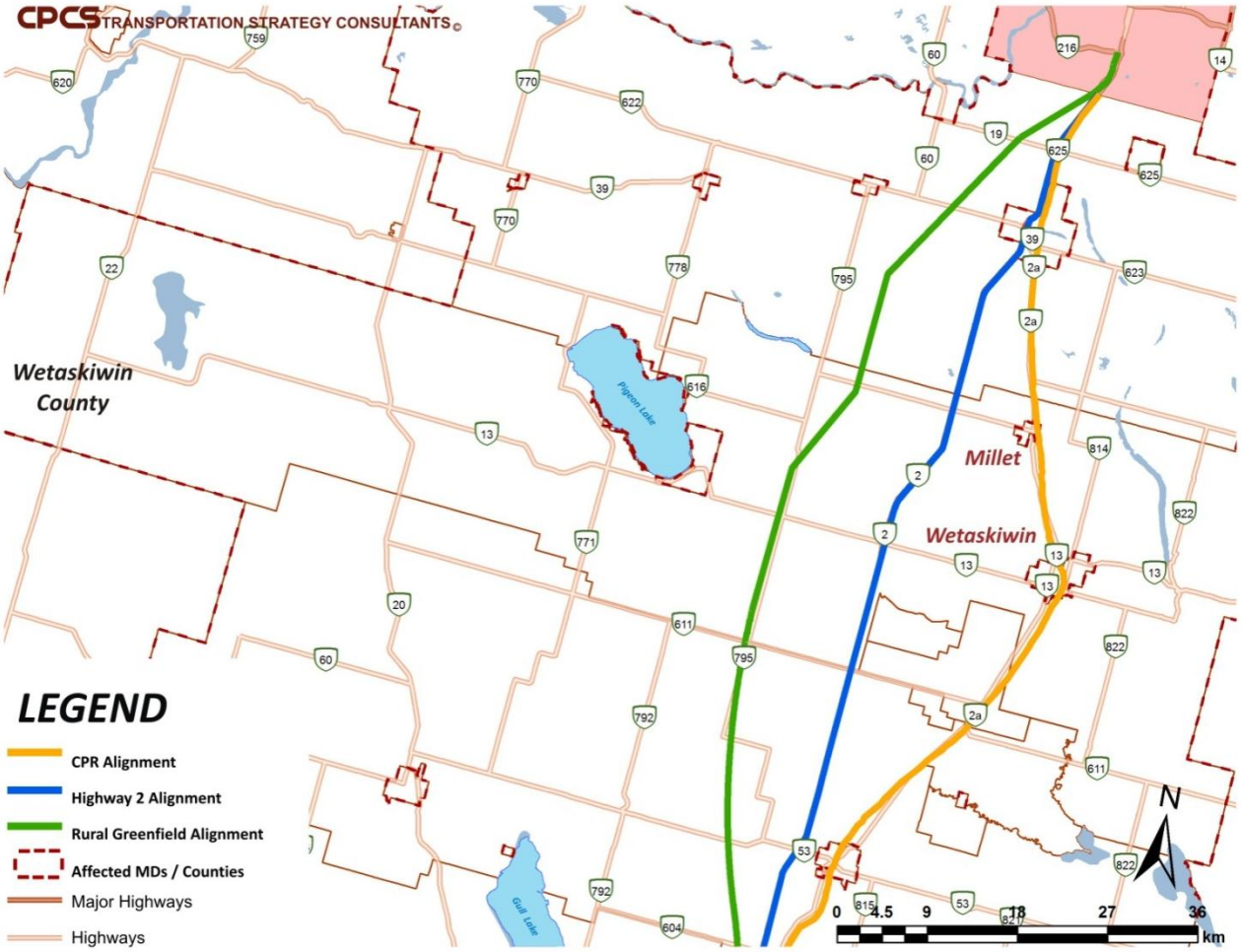
The west-to-east valleys in the County have a concentration of Country Residential development. These are effective drainage for the countryside and provide wildlife corridors. Tunnels are not effective for wildlife crossings. HSR could fragment wildlife populations and result in isolation of the gene pool for earth-bound species.

Figure 7-7: Analysis of the Impact of HSR on the Planning Goals of Wetaskiwin County

Planning Goal	Impact
To maintain a clean environment Plan policies support development so long as there is no negative impact on air natural resources, and water resources or soil quality.	Neutral.
To support and encourage economic growth and development in the County Plan policies support growth and development in appropriate locations, while avoiding inefficient utilization of resources (i.e. coal, oil, natural gas, and gravel reserves).	Negative. HSR could consume development land. The CPR and Highway 2 Alignments would be particularly detrimental to development in this regard.
To support a high quality of life in the County. While supporting growth and development, plan policies will weigh the needs of individuals in relation to the greater public interest.	Neutral. Most residents would not be significantly affected.

Source: Wetaskiwin County MDP Goals

Figure 7-8: HSR and Planned Growth Areas in Wetaskiwin County*



*Note: Wetaskiwin County has yet to complete and ratify its development plans. Therefore, a graphical representation is not available at this time.

7.2.2.3 Ponoka County

Ponoka County is only 20 miles north-to-south, so it would have less exposure to HSR than many other counties. The County has a policy to support agriculture and wishes to retain a quiet country lifestyle.

Two locations are currently being planned for development related to Highway 2 interchanges at Secondary 611 and at Highway 53. These are proposed for mixed industrial and highway commercial uses with access from the lateral roads. Disruption of these would leave the County with little opportunity for diversifying the local economy. The greatest impact on growth areas in Ponoka County would be associated with the Highway 2 and CPR Alignments.

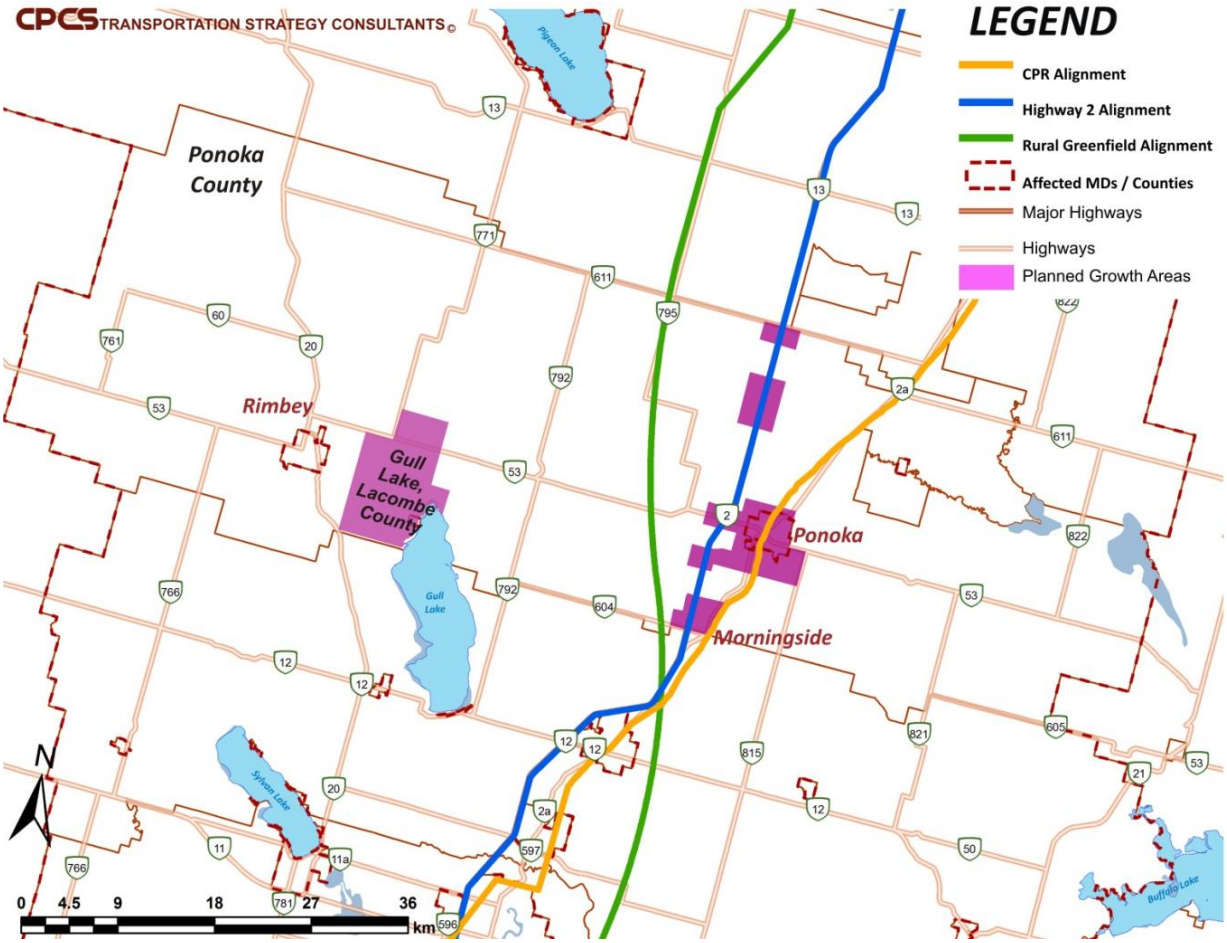
Figure 7-9: Analysis of the Impact of HSR on the Planning Goals of Ponoka County

Planning Goal	Impact
The County's over-riding priority is to maintain a healthy environment and the natural systems which support human life	Neutral.

Planning Goal	Impact
and activity, especially a dependable supply of clean water.	
The future of Ponoka County lies with a strong farm economy, and Council will do whatever is necessary to support farming as an industry and as a way of life. Other land uses will be allowed only if they are compatible with farming and a clean environment.	Negative. HSR will consume land that could most likely otherwise be used as productive farmland. The RGA in particular would have a negative impact.
The County will work with industry to ensure that non-renewable resources (oil, gas, coal, gravel, etc) are protected against development which might make extraction more difficult or dangerous or expensive.	Negative. HSR will make the extraction of resources more expensive, including the construction of pipelines across the alignment or any underground activities in proximity to the alignment that could be sensitive to vibration.
The county is part of a single local economy with the towns of Ponoka and Rimbey, and Council will ensure that its decisions do not stand in the ways of the towns' growth.	Neutral.
Subject to these over-riding priorities, the County will support diversification of the economy into non-agricultural activities, including non-farm residences, and appropriate commercial and industrial uses, resource development, and recreation.	Negative. HSR will consume land that could be used for economic diversification.

Source: Ponoka County MDP Development Priorities

Figure 7-10: HSR and Planned Growth Areas in Ponoka County



Ponoka County has yet to complete and ratify its development plans. Therefore, a graphical representation is not available at this time. Areas shown in Figure 7-10 are indicative of development nodes along the Highway 2 corridor.

7.2.2.4 Lacombe County

The County is working closely with the Town of Blackfalds and the City of Lacombe on joint economic strategies to capture some of the strength of the Highway 2 corridor. These are aimed at the development of industrial and commercial zones along Highway 2 and Highway 2A that will be able to compete with larger centres for business (Figure 7-12). If HSR impeded the development of these areas, the economic conditions of the county and the towns would suffer.

A major Agriculture Canada Research Centre is located in the County adjoining the south-western boundary of the City of Lacombe.

The County is a centre for world-scale petrochemical operations located between 6 and 10 miles east of Blackfalds. Operated by Agrium, Dow Chemical, Meglobal, Nova Chemical, and Procor, these facilities cover an area of about 10 square miles and are essential elements of the provincial and regional economy. They also present a potential hazard to the public and we assume HSR would avoid this location.

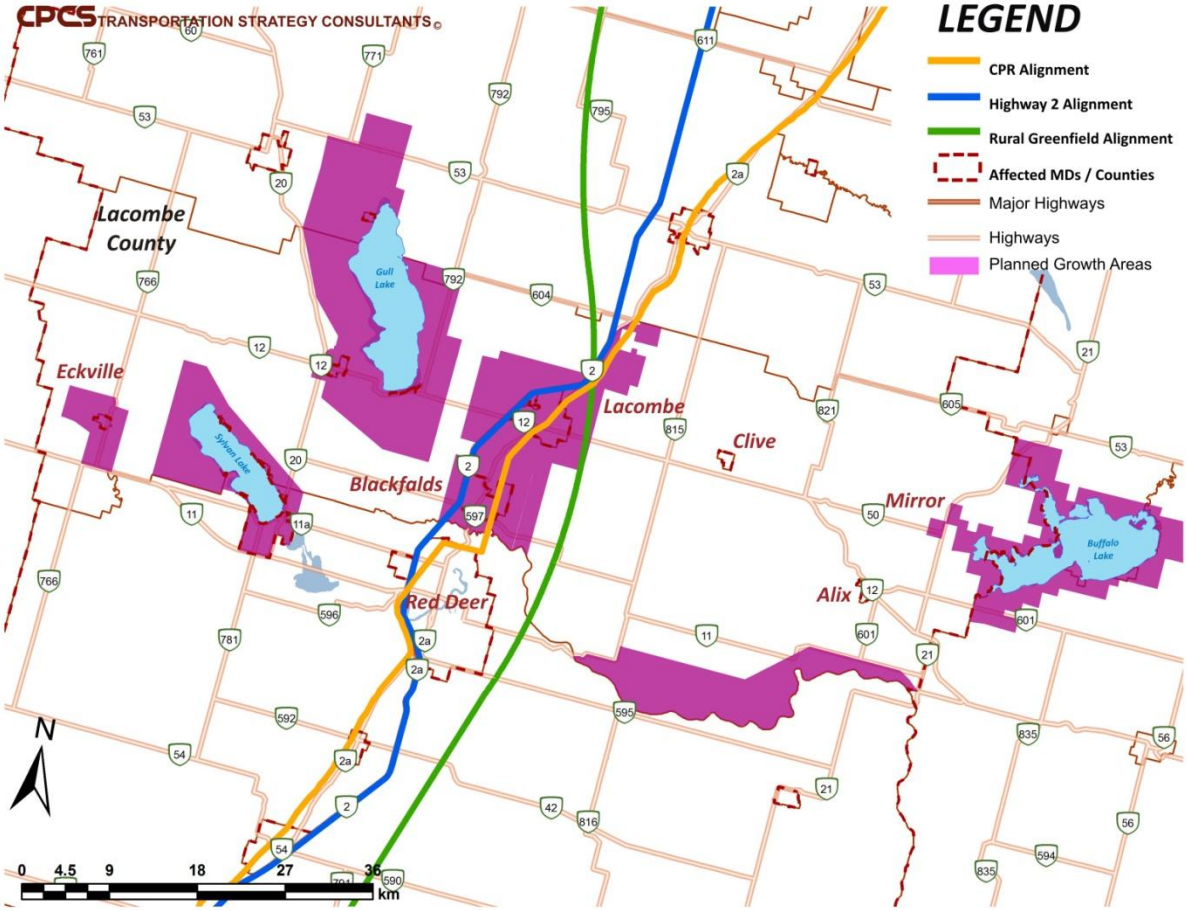
Figure 7-11: Analysis of the Impact of HSR on the Planning Goals of Lacombe County

Planning Goal	Impact
Support Agricultural Viability Preserve large areas of higher capability land and avoid land use conflicts between non-agricultural uses and agricultural operations.	Negative. HSR, particularly the RGA, could take significant amounts of agricultural land out of production.
Avoid Land-Use Conflicts Cluster compatible land uses to encourage compact, efficient development and separate incompatible uses with buffers and separation distances.	Negative. HSR could disrupt existing plans and thereby create land-use conflicts.
Enhance Economic Development Opportunities Provide land for industrial and commercial expansion and diversification of the County's economy.	Negative. HSR, particularly the Highway 2 and CPR Alignments, could take significant amounts of industrial and commercial land.
Increase Range of Housing Choice Accommodate a wider range of housing choice, in addition to conventional large lot country residential development.	Neutral.
Optimize Roadway and Utility Infrastructure Maximize use of provincial highways and paved county roads and existing or proposed regional water and wastewater lines.	Negative. HSR could further complicate the planning and maintenance of roadway and water infrastructure.
Protect Rural Landscape and Environmentally Sensitive Areas Protect the rural landscape and preserve environmentally sensitive and scenic natural areas (e.g. river valleys, lakeshores, ecologically unique areas).	Negative. HSR could have a negative impact on the visual quality of the rural landscape.

Planning Goal	Impact
Positive Fiscal Impact on the County's Tax Base Increase the proportion of industrial and commercial assessment that makes up the County's tax base, and at the same time, promote orderly and efficient land use patterns so as to reduce operating costs associated with providing municipal infrastructure and services.	Negative. HSR would remove land from taxpaying uses.
Enhance Cooperation with Neighbouring Urban Municipalities Achieve land use patterns that provide for future urban expansion and enhance partnership opportunities with neighbouring municipalities in the area of economic development and the delivery of regional services.	Neutral. Indirectly, intermunicipal cooperation around HSR development could improve cooperation.
Maintain and Enhance Community Appeal and the Quality of Life Expand the quality and range of recreation opportunities and other community facilities and services.	Negative, if HSR interferes with recreational opportunities, hiking trails, etc.

Source: Lacombe County MDP Guiding Principles

Figure 7-12: HSR and Planned Growth Areas in Lacombe County



7.2.2.5 Red Deer County

The County and City of Red Deer adopted an intermunicipal development plan (IDP) in 2007. The primary purpose of the IDP is to identify and accommodate the future growth needs of the City. The plan has identified a potential nodal location for a rail station to the west of the City, but this is purely conceptual. Beyond this conceptual plan, the county and city have not initiated any detailed planning or servicing studies relative to the potential HSR line.

Designated growth areas have been established at Gasoline Alley on the south side of the City, to the southwest along Highway 2A, westerly between Highway 11 and 11A and north along Highway 2A (Figure 7-14).

Intermunicipal Development Plans are in place for the towns of Innisfail and Bowden. If HSR impeded the development of these areas, the economic conditions for the County and the adjacent towns would suffer.

Red Deer County is proceeding with redevelopment of the former Penhold Canadian Forces Air Base, now called Springbrook, incorporating the Red Deer Regional Airport. Springbrook will contain associated residential, industrial, institutional, commercial and recreational developments. The airport is receiving greater traffic linking to oil and gas activity and is a regional service centre. The County is developing an expansion plan.

A highway commercial and industrial development node is being planned for the junction of Highways 2, 42 and 592 comprising 3 square miles. This node may have an agricultural focus.

The valleys of the Red Deer and Blindman Rivers west of Highway 2 are very deep, narrow and contain biological diversity. HSR development has at least the potential to interfere with wildlife and recreation. The valleys also have a concentration of country residential development.

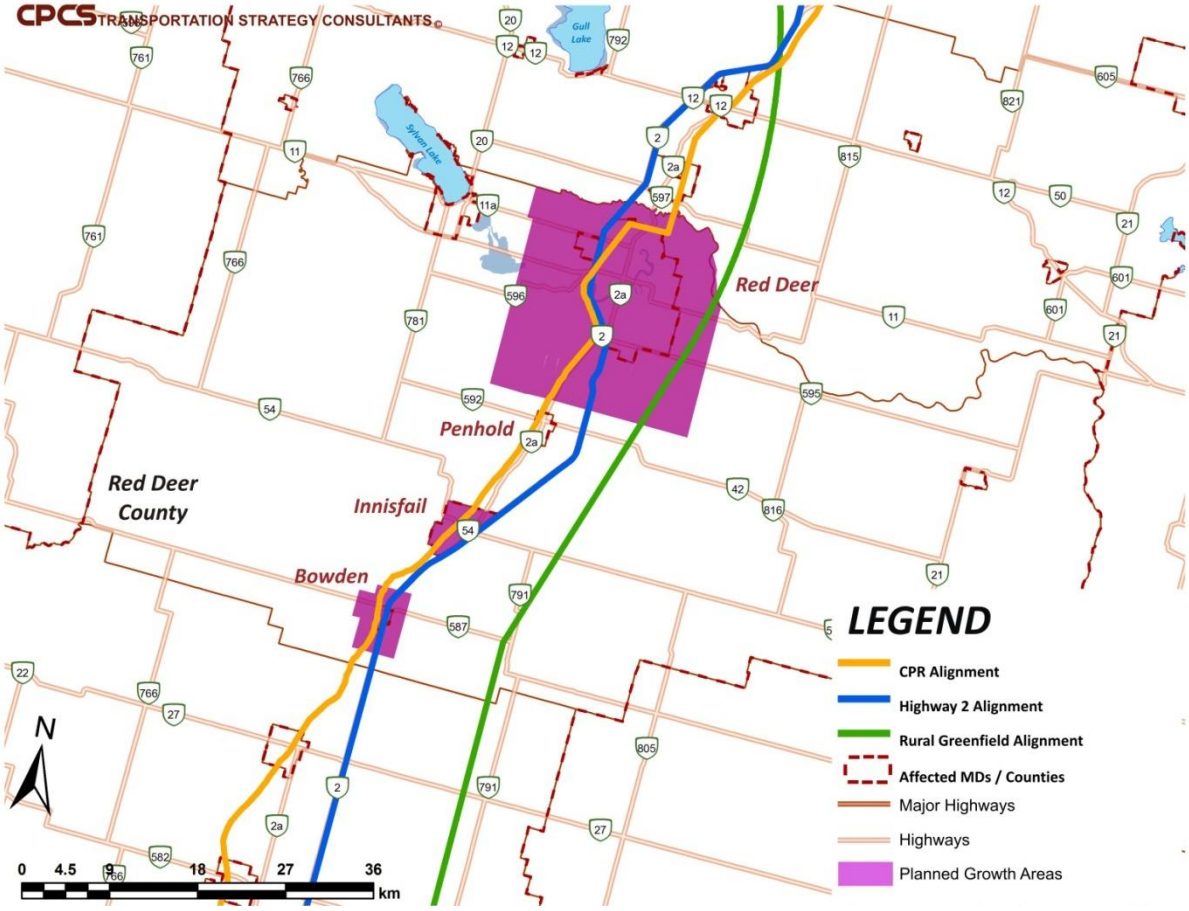
Figure 7-13: Analysis of the Impact of HSR on the Planning Goals of Red Deer County

Planning Goal	Impact
Natural Capital -The County supports protecting environmentally significant areas and, in particular, the environmental integrity of the County's rivers, streams and lakes. - The integrity of the County's agricultural land base and communities shall be maintained and enhanced while retaining the region's competitive position in the global marketplace.	Negative. HSR, particularly the RGA, could adversely affect the agricultural land base by consuming productive agricultural land.
Multi-Lot Country Residential **-**The County supports appropriately located and serviced country residential subdivisions as a residential option to meet the diverse housing and lifestyle needs of its residents.	Neutral.
Existing Hamlets, New Rural Hamlets and Recreational Residential -The County supports directing most future residential growth to existing or new hamlets that have a full range of utilities and services.	Neutral.
Industrial and Commercial Development and Resource Extraction	Negative. HSR, particularly the CPR and Highway 2 Alignments, could

Planning Goal	Impact
-The County supports new industrial and commercial development in existing and new industrial and business parks as a means of maintaining a competitive position in the global marketplace and in Central Alberta.	adversely affect industrial and commercial development by consuming land planned for that purpose.
Municipal Reserve The County usually take the municipal reserve as cash-in-lieu of land.	Neutral.
Recreation & Open Space and Community & Emergency Services -The County has an Open Space Master Plan that addresses the diverse needs of County residents, and to continue to provide and expand its provision of community and emergency services.	Negative. HSR, particularly the RGA, could negatively impact recreational opportunities and emergency-services access to various points within the county.
Transportation and Utilities -The County supports maintaining safe and efficient transportation and utilities systems.	Neutral.
Fringe Area Development -The County supports promoting compatible land use patterns and infrastructure in the fringe areas through joint cooperative planning initiatives.	Positive. Particularly around the City of Red Deer, HSR could benefit fringe area development plans if planned appropriately.

Source: Red Deer County MDP Goals

Figure 7-14: HSR and Planned Growth Areas in Red Deer County



7.2.2.6 Mountain View County

Mountain View County has designated growth areas around the Towns of Carstairs, Didsbury, Olds, and Sundre linked into the east-west highways intersecting Highway 2 (Figure 7-16). If HSR impeded the development of these areas, the economic conditions for the County and the adjacent towns would suffer.

The Olds-Didsbury Airport, located within Mountain View County between the two towns, is receiving greater traffic linking to oil and gas activity. Also, it is the service centre for hail suppression flights. The County has ratified an expansion plan.

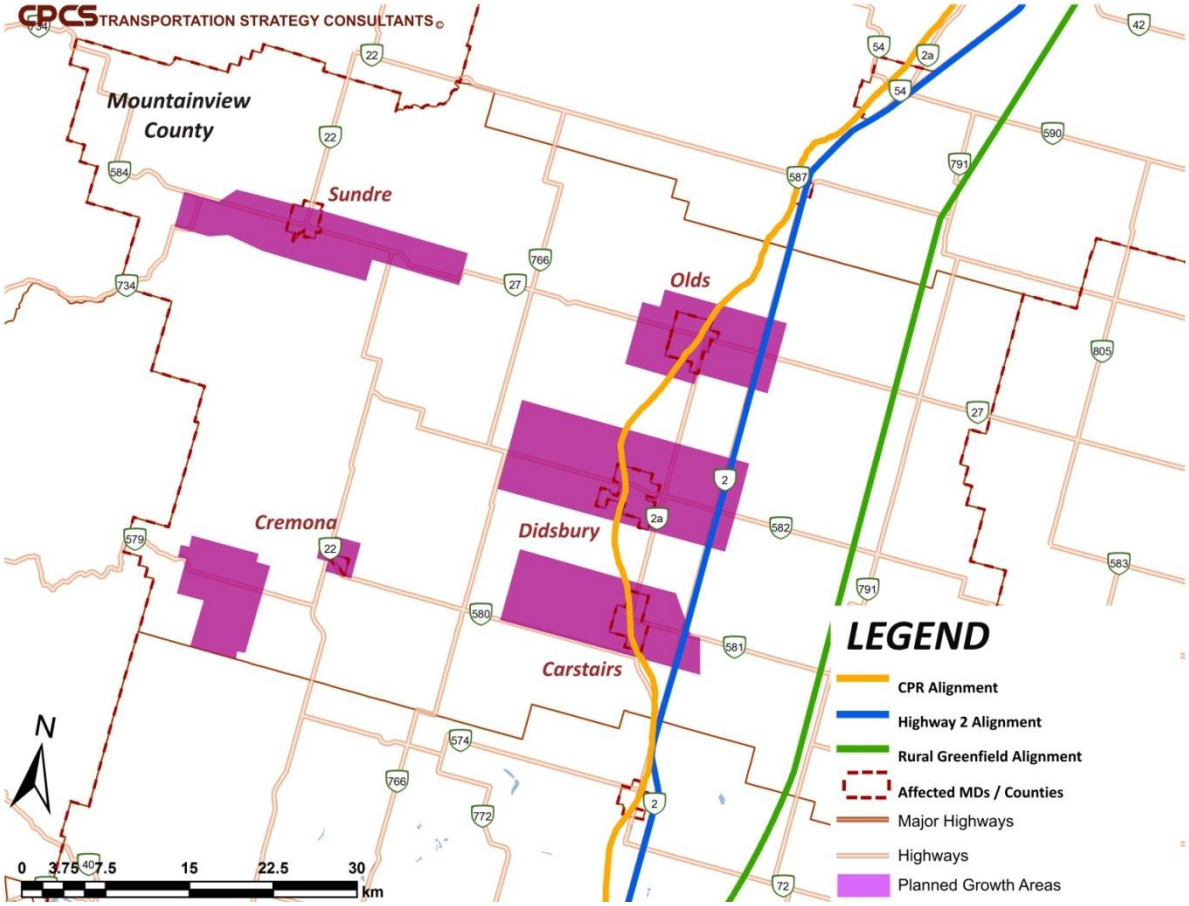
Northwest to southeast valleys drain the country and provide wildlife corridors for moose and deer. HSR has the potential to adversely impact these corridors.

Figure 7-15: Analysis of the Impact of HSR on the Planning Goals of Mountain View County

Planning Goal	Impact
Agricultural -To conserve agricultural land. -To encourage all agricultural operations to employ best management practices. -To encourage non-agricultural uses to maintain an agricultural rural image. -To ensure that agriculture remains an integral and viable component of the County's economy. -To encourage innovative, sustainable, and diversified agricultural activities.	Negative. HSR will consume agricultural land and disrupt agricultural operations. Visual impact of HSR could also locally adversely affect the "rural image" of the county.
Residential -To minimize land taken out of agricultural production and maximize the development on this land. -To make rural residential development economically sustainable for Mountain View County. -To allow for affordable housing options.	Neutral.
Economic Development -To establish opportunities for economic development that will provide variety and diversity in location, servicing standards, and types of uses. -To ensure that all future commercial and industrial development is developed in a manner that is beneficial to the community and does not create any undue negative impacts. To ensure the highest standards of development are achieved.	Neutral. HSR would consume land that could be used for economic development, particularly along the CPR and Highway 2 Alignments.
Intermunicipal Issues -To work cooperatively with the urban municipalities within MVC. -To work cooperatively with adjacent rural municipalities.	Neutral. Indirectly, intermunicipal cooperation around HSR development could improve cooperation.

Source: Mountain View County MDP Land-Use Policy Goals
Note: Mountain View County has far more goals than other counties. This is a result of a difference in presentation rather than a difference in the spirit of the underlying goals, which are similar to those of other counties. For succinctness we only include those goals with a meaningful relationship to HSR.

Figure 7-16: HSR and Planned Growth Areas in Mountain View County



7.2.2.7 Rocky View County

The County's Growth Management Strategy (GMS) has several Business Nodes proposed along Highway 2. The HSR routing may impact this anticipated growth. In particular the Balzac East ASP and Balzac West ASP seem likely to be affected by all three conceptual alignments (Figure 7-18).

Land values are highest near the City of Calgary and only somewhat less near Airdrie due to the accessibility afforded by the Highway 2 corridor.

The County has negotiated with the Cities of Calgary and Airdrie and the Town of Crossfield for annexation of lands to these urban centres. The route selected for HSR may disrupt these plans and require additional annexation to accommodate planned growth.

The Airdrie Airport, located within Rocky View County three miles east of Highway 2, is becoming a service centre for charter and smaller regional airlines. There are some discussions with Transport Canada about establishing a larger service role for jet aircraft and a heliport with capacity for dirigibles.

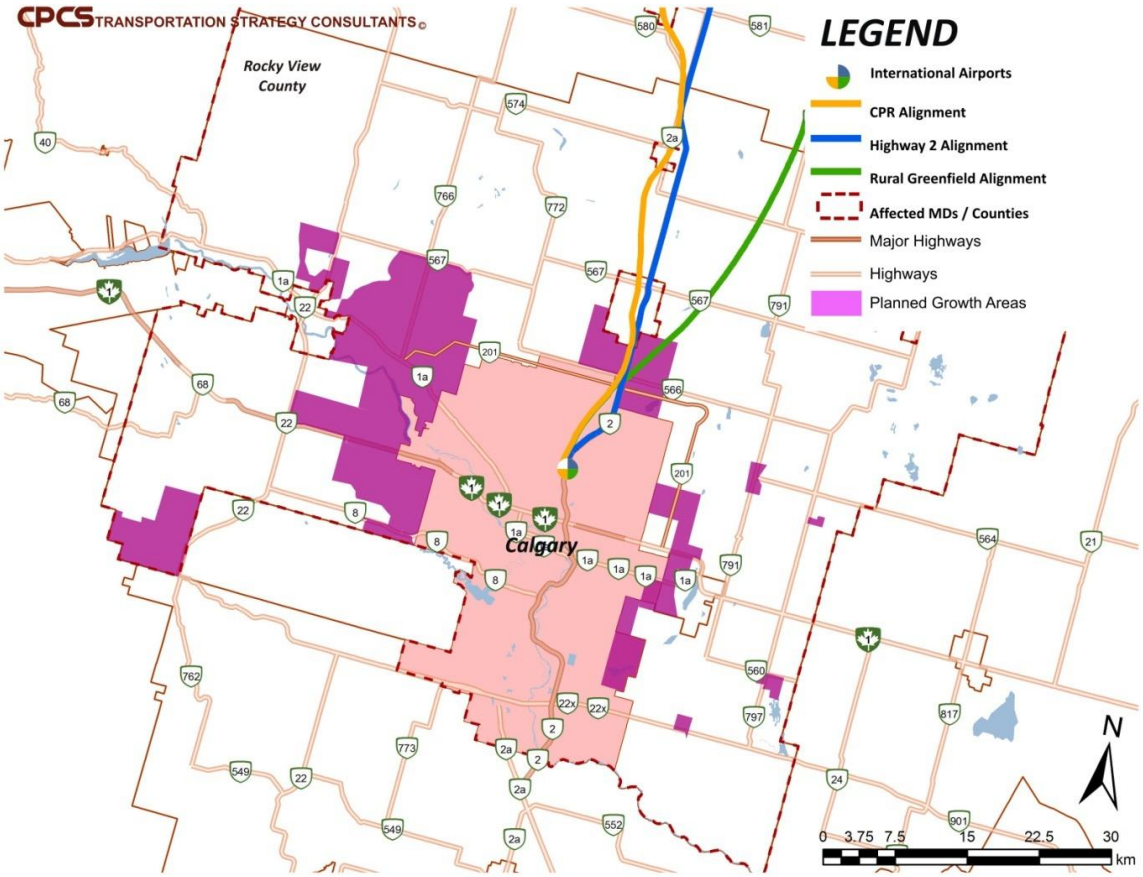
The GMS sets a policy of minimizing land fragmentation. HSR would likely exacerbate fragmentation.

Figure 7-17: Analysis of the Impact of HSR on the Planning Goals of Rocky View County

Planning Goal	Impact
Preserving the rural character of the municipality and fostering a sense of local community.	Negative, but can be mitigated. HSR will negatively affect the rural character of the county, particularly the along the RGA, since it will consume farmland and potentially adversely affect the visual quality of the landscape.
Recognizing and embracing the diversity of communities in Rocky View.	Neutral.
Protecting open spaces and the natural landscape, promoting water conservation and other environmental management practices, and supporting agricultural land conservation.	Negative, but can be mitigated. HSR, particularly the RGA, could have a negative impact on the visual quality of the landscape.
Building compact, vibrant, and complete communities with safe and walkable village centres, a diversity of housing choice, and mobility options.	Neutral.
Improving the quality of community services, facilities, and infrastructure.	Neutral.
Placing development where infrastructure exists and is anticipated.	Negative. Particularly the CPR and Highway 2 Alignments would be likely to consume serviced land that could otherwise be used for development.
Encouraging business development that will provide jobs and strengthen the financial sustainability of the municipality.	
Strengthening cooperative relationships with Rocky View's regional neighbours.	Neutral. Indirectly, intermunicipal cooperation around HSR development could improve cooperation.

Source: Rocky View County Growth Management Strategy (GMS)
Note: Because the GMS is higher in the hierarchy of plans for Rocky View County than the MDP, we have based our analysis on the "Growth Management Strategy Themes" as set out in the GMS. These "themes" are similar in character to the planning goals of other counties.

Figure 7-18: HSR and Planned Growth Areas in Rocky View County



7.2.3 Summary of the Needs and Objectives of Rural Communities

An assessment of how municipalities might best mitigate the negative aspects of HSR and capitalize on the positive aspects must begin with an assessment of the needs and objectives of rural communities. These needs and objectives are perhaps best expressed by the representative planning goals of the counties affected by HSR as presented in Section 7.2.

Figure 7-19: Representative Rural Planning Goals of Affected Counties

Planning Goals
Preserving agricultural land for agricultural uses.
Fostering economic development and protecting the tax base.
Optimizing road and utility infrastructure.
Avoiding land-use conflicts.
Protection of significant environmental areas and prevention of land, water, air, noise, and visual pollution. Promotion of recreation.
Fostering mutually beneficial relationships with neighbouring municipalities.
Fostering resource-extraction industries.

With these goals in mind, we are able to consider mitigation measures to address the negative impacts identified above. Mitigation measures are also developed with a view to mitigating adverse impacts on the well-being of rural residents as identified in the above county by county analyses.

8 Recommended Rural and Municipal Planning Actions to Address HSR

In the context of the needs and objectives of rural communities, this chapter examines how rural municipalities might adapt their plans to mitigate the adverse impacts of HSR and to seize the opportunities that HSR presents.

8.1 Summary of the Rural Impact of HSR

The analysis below synthesizes the analysis undertaken thus far to describe the major impacts that would most likely be associated with HSR. In many instances, the magnitude of an impact is very much a subjective judgement by the individuals and communities affected. For this reason, we have erred on the side of assessing more impacts rather than fewer.

Figure 8-1: Description of HSR Rural Impacts

Impact	Description
Road User Impacts	
Emergency vehicle access	Added cost of increased response time associated with the need to reroute emergency vehicles.
Traffic delays and forced travel time and routing changes	Added cost associated with the need to reroute traffic around roads severed by HSR.
Commercial and Economic Impacts	
Foregone land-use opportunities	Foregone opportunities caused by use of land for HSR and ancillary structures. Applies to residential, industrial, commercial, and agricultural land.
Farm severance psychological costs	The psychological costs associated with dividing real farm property to which owners may be very connected. These costs are in addition to financial damages, which we assume will be fully compensated by the proponent of HSR. These costs may extend to property beyond farms.
Farm equipment access	Added costs associated with having to move equipment over longer distances to access farm property.
Livestock access	Added costs associated with having to move livestock over longer distances to access farm property.
Social and Environmental Impacts	
Wildlife mobility	Disruption to the movement of wild animals.
Recreation	Disruption to recreational activities.
Noise and vibration	Noise and vibration caused by the movement of high speed trains.
Landscape and visual quality	Disruption to natural landscape associated with HSR.
Administrative and Planning Impacts	
Planning uncertainty	Cost of the risk that land will be required for the construction of the HSR and ancillary structures, i.e. associated adverse affect on investment.
Road maintenance costs	Change in road maintenance expenditures associated with the need to maintain additional access roads, cul de sacs, and grade-separated crossings over the HSR line.
Emergency services training	Added cost to train emergency services personnel to respond to emergencies along the HSR right-of-way.

Which rural impacts should be prioritized depends to some extent on the conceptual alignment selected. Figure 8-2 shows that most impacts will be felt most strongly with the RGA, while the Highway 2 Alignment would seem to offer the least impact.

Figure 8-2: Summary of HSR Rural Impacts and Associated Relative Magnitudes by Conceptual Alignment

Impact	Magnitude of Issues by Conceptual Alignment		
	CPR	Highway 2	Rural Greenfield
Road User Impacts			
Emergency vehicle access	◆	◆◆	◆◆◆
Traffic delays and forced travel time and routing changes	◆◆	◆	◆◆◆
Commercial and Economic Impacts			
Foregone land-use opportunities	◆◆◆	◆◆◆	◆
Farm severance psychological costs	◆◆	◆	◆◆◆
Farm equipment access	◆◆	◆	◆◆◆
Livestock access	◆◆	◆	◆◆◆
Social and Environmental Impacts			
Wildlife mobility	◆◆	◆	◆◆◆
Recreation	◆◆	◆	◆◆◆
Noise and vibration	◆◆◆	◆◆	◆
Landscape and visual quality	◆◆	◆	◆◆◆
Administrative and Planning Impacts			
Planning uncertainty	◆◆◆	◆◆◆	◆
Road maintenance costs	◆◆	◆	◆◆◆
School bussing	◆◆	◆	◆◆◆
Emergency services training	Equal across all three conceptual alignments		
Scale: ◆ low impact; ◆◆ medium impact; ◆◆◆ high impact			

We caution the reader not to jump to conclusions based on this analysis, since a more nuanced view will be developed below. In particular, it is important to understand that given the synthesis presented in Figure 8-1 and Figure 8-2, it is clear that all 14 of the rural impacts identified will be more or less significant depending on the county and even the individuals affected.

8.2 Impact-Specific Mitigation Measures

This section presents potential options for mitigating the impact of HSR on rural Alberta. These mitigation measures have been developed based on a review of the measures implemented on

HSR projects in other countries and based on our consultations with affected counties and key stakeholders.

All mitigations are developed under the assumption the HSR is developed. The relative implications for alternative alignments are also considered, as appropriate.

8.2.1 Road User Impacts

8.2.1.1 Emergency Vehicle Access

The HSR alignment may increase response times of emergency vehicles, including police, ambulances, fire trucks, etc., where these are required to cross the HSR alignment. Though additional travel time is not expected to be significant, a delay of even a few minutes can be critical. HSR plans should provide as much access as possible across the alignment to mitigate any delays in emergency response.

Another mitigating measure would be to plan for HSR crossings near existing hospitals, police and fire stations. The construction of new emergency services stations, where appropriate, be planned near crossings of the HSR alignment to ensure that the time required to respond is minimized. These measures would clearly entail significant costs, although such costs would be reduced if these changes were made in the normal course of lifecycle asset renewal.

8.2.1.2 Traffic Delays and Forced Travel Time and Routing Changes

This impact can be mitigated most effectively by ensuring that as much access and mobility as possible are provided across the HSR right-of-way. At its core, the principle of mitigation here is not severing existing roads. Not severing existing roads will involve either the construction of grade separations or the construction of a partially or fully elevated track.

Other steps that might be taken include the development of signage to assist motorists in navigating to routes that most efficiently take them around a road that has been severed. Financial assistance for such construction should be sought from the project proponent.

8.2.2 Commercial and Economic Impacts

8.2.2.1 Foregone Land-Use Opportunities

The most obvious, and arguably the most effective and efficient way to mitigate the adverse impact of foregone land-use opportunities is a fair compensation regime for both landowners, who stand to lose future income from land, and municipalities, which stand to lose future tax revenue. Non-compensable psychological costs of severing land (discussed above) aside, much of the lost potential of productive farmland and other lands with significant other development potential could be compensated financially as could foregone municipal tax revenues. Such compensation would also extend to temporary construction easements required for site access, equipment/material storage, and other requirements.

For municipalities the lost property-tax potential of land consumed for HSR could be addressed through an agreement with the province (payments or grants in lieu of taxes) or other proponent as appropriate. Discussions should address appropriate levels of compensation depending on the likely future alternative uses of the land consumed.

For existing businesses or municipal operations disrupted, compensation should be provided to relocate such operations to other locations of at least equal quality. It is important to acknowledge that in some cases, finding suitable relocation sites may be difficult or impossible, given the peculiarities of certain types of land use.

As was the case with planning uncertainty, avoiding areas planned for development would also be a helpful mitigation measure. Where development areas cannot be avoided, planned HSR corridors, such as in Leduc County, should be used. Municipalities should be engaged early on to designate such corridors.

In certain cases, below- or above-grade vertical alignments could preserve land-use opportunities that would be foregone if an at-grade alignment were used. Such mitigation is usually reserved for HSR projects through highly ecologically sensitive areas or highly developed urban areas. For instance, extensive tunnelling was used for segments of the London-Channel Tunnel-Europe HSR line that were closest to central London, while the line was constructed largely at grade in rural areas in southeast England.

8.2.2.2 Farm Severance Costs

Mitigating the psychological costs associated with farm severance is extremely difficult. In many cases families have farmed particular parcels of land for generations and have a strong attachment to the land.

The psychological costs of farm severance would seem to be most severe in instances where the Government of Alberta uses the statutory authority of the *Expropriation Act* to forcibly acquire property rights. The procedures of this *Act* must be strictly followed to be enforceable in court.

The overriding principle in expropriation undertaken under the *Act* is that the owner be made whole, i.e. not be out of pocket at the end of the process.[53] Compensation for the land is usually the fair market value on the date of the transfer of title. Fair market value is usually defined as the price that a willing seller and willing purchaser would arrive at on a particular day. Therein lies the problem, since sellers being expropriated are, by definition, not willing sellers.[54]

Importantly, any decrease in the value of land remaining after a piece of that land has been expropriated is compensable.

Since farmers are asset-rich and cash-poor, the financing of an expropriation process often involves the expropriation practitioner (lawyer, appraiser, accountant, or other expert as required) financing the action on behalf of the owner.[55] Having a mechanism that improves this process for liquidity-constrained farmers would be useful in the event that many expropriations are required to construct HSR. Such a mechanism could loan public funds to farmers and other

[53] Mallon, Donald P., Q.C., "Expropriation of Farmland in Alberta: A Presentation to the 3rd Annual Farm and Ranch Law Institute," 24 February 2007, p. 4.
[54] Ibid, p. 4.
[55] Ibid, p. 8.

affected landowners for the purposes of engaging in the expropriation process. Finally, a number of stakeholders raised with us the issue of uncompensated time that farmers must spend on the expropriation process. This time is also valuable and is a major concern for stakeholders.

One point to note is that many farmers will not be well-informed about the expropriation process. This lack of information causes distress and can lead to costly errors in decision making. Another mitigating measure that could be undertaken would be a campaign to educate farmers about the expropriation process and their rights and obligations well ahead of any expropriation action.

A more costly mitigation measure is to minimize severance by elevating the rail line where possible to avoid severing properties. Other important considerations, including clearances for farm equipment, would have to be appropriately addressed where the alignment may be elevated.

In order to ensure that mitigation is undertaken by the project proponent, it is critical that farmers and rural municipalities engage early on in the HSR planning process to ensure that the significance, risks, and concerns of farm severance are made clear and appropriately addressed.

8.2.2.3 Farm Equipment Access

As was described in detail in Section 5.2.5.2, HSR has the potential to create a major obstacle for farm machinery. Consistent with our assumption that the vertical alignment of the HSR line would be largely at grade, we expect that access across HSR alignment could be a combination of overpasses and underpasses, depending on the grades and available right-of-way at each location.

In order to mitigate adverse impacts on farm equipment movement, all overpasses and underpasses would need to be designed to accommodate even the largest farm equipment. In the case of both overpasses and underpasses, the typical lateral clearance of a two-lane highway (the available width of the structure, which may be restricted by barriers, bridge rails, piers/retaining walls, or pavement width) would have to be sufficient to accommodate the largest typical farming equipment (air seeders, combines). The vertical alignment of any overpasses and the placement of the bridges at underpasses would have to be verified to ensure that sight distances are adequate along the roadway, as large equipment may encroach into the lane of oncoming traffic. Vertical clearance would also need to be sufficient in all cases.

Another measure to mitigate the adverse impacts of HSR on the movement of farm machinery is to increase the number of roads that are grade-separated with the HSR alignment. A more costly, yet possibly more effective mitigation (effectiveness would depend on the final alignment selected), would be to build the HSR system along a largely or entirely elevated track, with sufficient underpass clearances to accommodate the movement of farm equipment.

8.2.2.4 Livestock Access

There are at least two options to mitigate the reduction in the potential to move livestock short distances by foot that was described in Section 5.2.5.4.

- Design crossing of the HSR alignment such that foot-movement of livestock can be accommodated with due regard to the safety, mobility, and access of other crossing users.

- Construct additional crossings of the HSR alignment or construct HSR on an elevated track in areas where livestock access is a particular concern.

8.2.3 Social and Environmental Impacts

8.2.3.1 Wildlife Mobility

In the past, land overpasses and underpasses have been used to minimize the effect of barriers on the migration patterns of regional wildlife. All bridges constructed would need to meet the Alberta Infrastructure wildlife habitat passage standards, which state that the construction of these bridges should consider the species crossing the bridges, the size of wildlife at maturity, and the timing of typical migration flows.

Two types of mitigation measures can be adopted to minimize the impact of HSR on wildlife movement. One measure is to ensure that the alignment avoids areas of local sensitivity, i.e. with rare or endangered species. The other measure is to provide access and mobility across the right-of-way. Access and mobility could be provided by road crossings, an elevated alignment, or special animal crossings, examples of which are depicted in Figure 8-3.

Locating the HSR alignment close to Highway 2 would also provide some mitigation as Highway 2, to some degree, already acts as a barrier to animal movement, thereby limiting incremental impact.

Figure 8-3: Wildlife Overpasses and Underpasses

Source: Parks Canada (left and right) and California High Speed Rail Authority (centre)

8.2.3.2 Recreation

Direct adverse impacts on recreational activities caused by HSR relate primarily to the reduction in access and mobility across the alignment, and can be mitigated by improving cross-alignment access and mobility. However, structures that provide cross-alignment vehicular access and mobility (e.g. highway bridges and underpasses) may be less suitable than recreation-specific crossings.

Example: The Caledon Trailway Overpass in Rural Southern Ontario

The Caledon Trailway Path overpass of Highway 10, depicted in Figure 8-4 provides an informative illustration of a measure used to mitigate rural recreational impacts and some of the challenges involved in putting it in place. In this instance, the five-lane highway existed before the trail was developed on a former railway right-of-way. When the trail was developed by the municipality in 1992, Highway 10 was identified as a major point of conflict between vehicles and people using the trail. Initially, a group of individuals attempted to raise private donations to construct a grade-separated crossing, but they were unsuccessful. Eventually the Town of Caledon applied for provincial government funding from an infrastructure program. The bridge was constructed in 2007 at a cost of between $1.0 million and $1.2 million. In this case, a bridge was the only option as the high water table in the area precluded the construction of a tunnel. It is also notable that the Town required an encroachment permit from the Ontario Ministry of Transportation and that this permit took two years to obtain.[56]

Figure 8-4: Caledon Trailway Path Overpass of Highway 10, Rural Southern Ontario

Source: Google Earth

We recommend that consideration be given to providing recreational crossings as a means of mitigating the impact of HSR on rural recreational activities. Such mitigation measures would be well-aligned with the rural planning objectives of economic development (tourism) and promoting recreation. The example of the Caledon Trailway Path crossing of Highway 10 demonstrates the significant delay between the identification of a need and the construction of the structure. Impact would be significantly lessened if provision were made during the development of the HSR project for recreational crossings as well as a process for the creation of future recreational crossings that offers municipalities clear processes, with timelines and engineering guidance.

A more costly mitigation measure would involve using an elevated track to allow for HSR to fly over areas that are important for recreational activities.

[56] The delay was in part the result of a novel bridge structure that used wood encased in fiberglass.

Figure 8-5: Examples of Elevated Structures for High Speed Rail Flying Over Areas That Could Support Recreational Activities

Source: California High Speed Rail Authority

8.2.3.3 Noise and Vibration

Train noise depends in part on vertical alignment (elevated, below grade, etc.) and other design features; and it can be controlled through modifications to the trains or tracks or through construction of noise barriers or berms/cuttings. At-grade or elevated tracks would tend to generate more noise impact than below-grade tracks or tracks behind sound barriers.

Figure 8-6: Acoustic Baffles (Left) and Berms (Right)

Source: (Right) TGV in France. Harris Miller Miller & Hanson Inc. "Summary of European High-Speed Rail Noise and Vibration Measurements," April 1996

During the construction phase, on which days and during which hours work is undertaken could have a significant effect on the impact of noise and vibration on rural areas. Similarly, once HSR is operational, the hours of operation of the system would have a significant effect on the magnitude of the noise and vibration impacts. For instance, if construction or train runs are scheduled at night, impacts would likely be much worse than if activity were restricted to daytime hours. Adjusting hours of operation to reduce negative impacts on rural areas is a clear mitigation measure.

Especially during construction, financial compensation could also be used to mitigate the negative impacts of temporary and disruptive activity such as pile driving and blasting, where relevant.

8.2.3.4 Landscape and Visual Quality

The adverse impact on the landscape and visual quality of the countryside can be mitigated in a number of ways. The core principle of mitigating adverse impacts on visual quality is to blend the HSR right-of-way and ancillary structures into the landscape with the use of aesthetic treatments, earthworks, and more elaborate mitigations in sensitive areas, up to and including tunnelling and rerouting of the right-of-way.

An elevated track presents a greater mitigation challenge, because it would be visible from further away, particularly where the landscape is flat. Such a vertical alignment would also limit the use of the types of mitigation measures noted above.

There is little that municipalities can do directly to mitigate the negative impact of HSR on the visual quality of the rural landscape. Rather, the focus should be ensuring that the HSR planning process takes into account the value placed by residents and other stakeholders on rural landscapes and sensitive areas.

8.2.4 Administrative and Planning Impacts

8.2.4.1 Planning Uncertainty

The uncertainty and the associated disincentive to invest in and develop land that could result from the development of HSR can be mitigated by developing an alignment that avoids areas that are likely to be developed in the near future. Such areas include those that municipalities have planned using area-structure plans or other planning tools.

In some cases it is unlikely that planned areas could be avoided by adjusting the alignment of HSR. This impact seems greatest in Leduc County, where significant plans covering the entire county, east to west, have been developed. However, the county is also the only municipality of which we are aware that has also planned to accommodate HSR within its current plans. If the proponents of HSR were to make use of the corridor planned by Leduc County, the resulting uncertainty to developers would be significantly reduced.

In any case, clarity on the future alignment and HSR project plans would help mitigate any issues arising from planning uncertainty.

8.2.4.2 Road Maintenance Costs

The construction of new roadways and service roads will result in increased road maintenance costs for the municipalities. This issue may be offset by reduced routine maintenance costs due to the closure of certain local roads; however, additional consideration must be given to the increased costs associated with maintaining new service roads (if any), turnarounds and additional signage at termination points.

Pavement deterioration will be shifted from the severed municipal roadways, which could see maintenance costs fall, to provincial through roadways, which could see maintenance costs increase. The result may be a reduced requirement for maintenance of municipal roads.

Plans must be developed for the plowing of dead-end roadways. Plowing time is expected to increase due to the presence of cul de sacs and increase back-tracking, which could add cost.

Two types of measures could be undertaken to mitigate these added costs:

- Road maintenance operations should be adapted to optimize around the configuration of roads resulting from HSR.
- Fewer roads should be severed, minimizing the need for additional access roads and minimizing incremental operating costs.

8.2.4.3 School Bussing

The rerouting of school buses could involve added time and cost for passengers and service providers.

School bussing issues could be mitigated through the construction of more grade-separated crossings, or locating HSR alignment crossings near schools.

As with road maintenance expenses, mitigation measures fall into two categories:

- School bus operations should be adapted to optimize around the configuration of roads resulting from HSR.
- Fewer roads should be severed, minimizing the need for changes to school bus operations.

8.2.4.4 Emergency Services Training Costs

Although the likelihood of an HSR train accident or derailment is not high, rural emergency response personnel and volunteers should be trained to respond to such an occurrence. The added cost and time of such additional and specialized training could represent an additional burden on rural municipalities and counties. The key to mitigating the added cost of additional training for emergency services personnel is to obtain financial support from the project proponent.

8.3 Opportunities to Capitalize on HSR Development to Solve Other Problems

HSR is not exclusively a negative for rural Alberta. It offers some opportunities. Taking advantage of these opportunities could help to offset some of the adverse impacts.

8.3.1 Planning for a Transportation and Utility Corridor

Because HSR would create a corridor between Edmonton and Calgary, it is reasonable to ask whether the creation of such a corridor could open up new possibilities for rural Alberta.

Alberta has a tradition of establishing transportation and utility corridors (TUCs) to protect lands required for strategic initiatives. For example, the Edmonton and Calgary ring roads were planned as TUCs. The Government of Alberta announced the creation of TUCs and gradually

acquired associated land, such that when the construction of the rings was justified, development could proceed expeditiously.

It may be worthwhile for the province to consider using the HSR initiative to establish a corridor for HSR that could also accommodate other transportation infrastructure (new highways and potentially a realigned CPR line), electrical transmission lines, and pipelines. Such a corridor would have the benefit of reducing planning uncertainty and potentially removing disruptive activities (such as traffic delays caused by freight trains blocking at-grade crossing) from urban and rural areas along the Calgary-Edmonton corridors. This suggestion was raised by stakeholders during the consultations for this project.

The Government of Alberta's 50-year transportation strategy, currently under development, could provide an opportunity to consider those issues raised in this section.

The Gore Strip as a Possible Routing

Mountain View: One mile east of Highway 2 through the County is the 5th Meridian, an important element governing the land survey system of Alberta. At the 5th Meridian, the north-south property lines are aligned. This has resulted in a narrow strip of surveyed land on the east side of the 5th Meridian through most of the County that is in a separate title from the adjacent farmland. This strip, referred to locally as the "Gore Strip", could be considered as a less invasive location for HSR as it would not interrupt ownership patterns as much.

8.3.2 Better Integrating High Speed Rail into Rural Development

As noted by many stakeholders, facilitating access to HSR for rural residents could help to spread the benefits of HSR to rural Alberta. The most apparent means of doing so would be to couple the development of HSR with investment in rural public transportation. We see strong potential here for a win-win situation. On the one hand, improved rural transit service would provide more passengers for HSR. On the other hand, improving rural transit at the same time that HSR is developed could help to build support for HSR in rural areas, which would otherwise see little benefit in the HSR project.

In particular, rural residents north of Edmonton and south of Calgary could see a real advantage in being able to access HSR. For rural residents living between Calgary and Edmonton, positive impacts could result from greater accessibility for those who are unable to drive.

Working from project inception with the proponents of HSR, including the Government of Alberta, to ensure that rural transportation needs are taken into account is the key to successfully creating a win-win scenario. Concretely, HSR would seem to offer the potential for financial support for the Central Alberta Economic Partnership Regional Transportation Strategy that was described in Section 7.1.4. One option for integrating this regional transportation strategy into the HSR project would be for the Red Deer HSR station to play a role as a hub in the rural public transit system. Having rural interests identified early on in the HSR development process would facilitate actions that would generate the most benefits for rural Alberta.

8.4 Recommended Mitigation Strategy

In line with the mitigation measures outlined in Section 8.2, we recommend a pro-active, three-pronged strategy to simultaneously mitigate the negative impacts of HSR on rural Alberta, to capitalize on the potential benefits, and to engage with rural communities to ensure that information is available and communication is ongoing.

8.4.1 Mitigate Negative Impacts

The proposed mitigation strategy involves four groups of measures that are closely interconnected:

- **Design: Access and Mobility.** Minimize mobility and access impacts where possible across the alignment, including sections of elevated track where warranted.

- **Design: Location-Specific Mitigation.** Deploy special mitigation measures for areas sensitive to detrimental impacts on landscape and visual quality, and noise.

- **Alignment.** Develop the alignment away from populated areas, so long as sufficient access is provided across the alignment. This is not necessarily an endorsement of the RGA alignment, but it recognizes the potential to mitigate some of the adverse impacts of HSR on rural Alberta by avoiding areas that are planned for growth. This type of mitigation is particularly important as it pertains to the impacts of planning uncertainty and foregone land-use opportunities.

- **Mitigation Programs.** In some cases a new government program could be developed to minimize rural impacts. These programs would require some financial support.

Figure 8-7 connects each of these groups of mitigation measures with impact they would address.

Figure 8-7: Mitigation Strategies

Impact	Design: Access & Mobility	Design: Loc.-Specific Mitigation	Alignment	Mitigation Program	Strategies
Road User Impacts					
Emergency vehicle access	✓			✓	-Increased access/mobility across the alignment. -HSR crossings near existing emergency response facilities. -Re-optimizing emergency services deployment patterns, without reducing service levels elsewhere.
Traffic delays and forced travel-routing changes	✓			✓	-Increased access/mobility across the alignment. -Improved signage to assist motorists in finding alternative routes.
Commercial and Economics Impacts					
Foregone land-use opportunities			✓	✓	-Compensation to landowners and government (for lost tax revenue, e.g. grants in lieu of taxes). -Avoid areas planned for development and/or use planned HSR right-of-ways. -Coordination of AAMDC member land-use planning in response to HSR project.
Farm severance psychological costs	✓			✓	-Clarity around financing mechanism for affected landowners and support in coordination of expropriation process. -Inform farmers and other affected landowners about rights and obligations vis-à-vis expropriation. -Minimize severance by providing increased access/mobility across the alignment, where required.
Farm equipment access	✓				-Ensure that access across the alignment accommodates the dimensions of farm vehicles. -Increased access/mobility across the alignment. -Appropriate signage to minimize the risk of collisions where clearances are insufficient.
Livestock access	✓		✓		-Accommodate foot-movement of livestock on crossing of the alignment. -Increased general access/mobility across the alignment.
Social and Environmental Impacts					
Wildlife mobility	✓		✓		-Avoid areas home to sensitive wildlife. -Increased access/mobility across the alignment, focused on wildlife.
Recreation		✓			-Increased access/mobility across the alignment, focused on recreation.
Noise and vibration		✓	✓		-Alignment away from populated areas. -Noise mitigation measures.

Landscape and visual quality		✓			-Below-grade alignment, visual-impact mitigation measures.
Administrative and Planning Impacts					
Road maintenance costs	✓				-Re-optimization of municipal maintenance operations. -Increased access/mobility across the alignment.
Planning uncertainty			✓	✓	-If HSR is to be built, alignment should be selected as soon as possible to allow maximum time for adjustment to plans -Avoid areas planned for development and/or use planned HSR right-of-ways.
Emergency services training costs				✓	-Seek financial and technical assistance from proponent for rural emergency-response training, specific to HSR incidents.

8.4.2 Early Engagement and Clear Communication

Helped by major advances in information and communications technology, proponents of major projects have come a long way in recent years in working with affected communities to mitigate adverse impacts and capitalize on positive impacts. Perhaps the most important factors in a successful mitigation strategy are early engagement and clear communication between project proponents, governments, and affected communities.

Communities affected by major transportation projects want information about where exactly the project will be constructed, how and when it will be constructed, and how they will be affected. In our experience, few project proponents object to consulting with affected communities, since community support is a key factor in the on-time and on-budget completion of a major infrastructure project.

We view the development and implementation of a robust and thorough program of community consultations as one of the most important mechanisms that could be put in place to minimize the adverse impact and capitalize on the positive impact of developing a HSR line in rural areas between Calgary and Edmonton. Ensuring that any HSR development has at its core such a program should be the highest priority of AAMDC with respect to HSR.

Furthermore, we see the potential for AAMDC itself to play a role in facilitating the engagement of rural municipalities, and their residents, in the HSR development and consultations process. AAMDC is well placed to allow rural Alberta to speak with one voice, while at the same time acting as a centre of expertise on HSR issues as they pertain to rural concerns.

9 Order-of-Magnitude Cost Estimate for Recommended HSR Mitigation Strategy

This chapter provides conceptual estimates for the costs associated with the mitigation strategies and associated measures that were proposed in Chapter 8. Given the high-level, non-alignment-specific focus of the present study, we do not attempt to estimate the costs of the mitigation programs, since such programs would be highly location- and county-specific.

9.1 Design: Access and Mobility - Additional Grade-Separated Crossings

9.1.1 Approach

This study has assumed that grade-separated crossings would be required at all intersections between a roadway and the HSR right-of-way (Section 3.1).

In an attempt to compare this scenario to the cost of maintaining the same level of public road access that currently exists, we have estimated the cost of grade-separating all other minor public roads that we have, up to this point, assumed would be severed. This information is presented in Section 9.1.2.

The costs of grade-separating the minor crossings are discussed in terms of the capital cost required for the initial construction of the grade-separated HSR crossing and the operating cost over the life of the structure. The operating cost includes the cost of maintenance and rehabilitation. The costs are shown in 2010 dollars and escalation is not included.

For the purposes of the development of these order-of-magnitude costs, several assumptions were made:

- The roadway features two 3.7-metre lanes, two 2.2-metre shoulders, and two 0.3-metre bridge rails;
- The clearance required for one train track is 8 metres;
- The HSR will be double-tracked;
- With the Highway 2 Alignment, the HSR will run offset outside of the interchange area;
- The length of bridge corresponds to the number of train tracks;
- Highway 2 Alignment and RGA have two tracks;
- The CPR alignment has three tracks: one old and two new;
- Minor roadways (potentially severed) are unsealed (gravel); and,
- The overpass design life is 50 years.

9.1.2 Cost of Additional Grade-Separated Crossings – Minor Roads

Up to this point, we have assumed that all minor roadways would be severed by HSR, and therefore not provide access across the alignment. This section explores the possibility of providing grade-separated access across the HSR alignment at all minor crossings. The aim of

this approach is to develop upper-bound costs for maintaining the same level of public-road access that currently exists, after the HSR has been developed.

The order-of-magnitude capital costs are presented in Figure 9-1 for each of the alignments by municipality. The estimates are based on:

- 113 crossings along the CPR Alignment,
- 10 crossings along the Highway 2 Alignment, and
- 78 crossings along the RGA.

These costs would typically be a part of the HSR construction cost and would therefore be borne by the project proponent.

Figure 9-1: HSR Minor Grade-Separated Crossings – Capital Cost

Municipality	Capital Cost ($Million)		
	CPR Alignment	Highway 2 Alignment	RGA
County of Wetaskiwin	29	0	27
Lacombe County	41	29	18
Leduc County	19	0	27
Mountain View County	80	38	32
Ponoka County	32	0	25
Red Deer County	137	29	32
Rocky View County	22	0	16
Total	**360**	**96**	**177**

Note: Included in the initial HSR construction budget

The highest cost is associated with the CPR Alignment, which is largely due to the number of existing at-grade crossings and communities along the alignment. The RGA would impact fewer crossings as it bypasses many of these communities and results in approximately one-half the cost. The Highway 2 Alignment costs would be lowest as it has the fewest minor at-grade crossings.

The order-of-magnitude operating costs (as distinct from capital/construction costs) are shown in Figure 9-2. In the case of the CPR Alignment and the RGA, the entire operating cost falls under municipal responsibility as all roads under provincial jurisdiction are considered major crossings for the purposes of this report. The operating cost along the Highway 2 Alignment would be the responsibility of the province.

Figure 9-2: HSR Minor Grade-Separated Crossings – Annual Operating Cost

Municipality	Annual Operating Cost (Thousands of Dollars)*					
	CPR Alignment		Highway 2 Alignment		RGA	
	Municipal	Provincial	Municipal	Provincial	Municipal	Provincial
County of Wetaskiwin	440	0	0	0	400	0
Lacombe County	640	0	0	100	260	0
Leduc County	300	0	0	0	400	0
Mountain View County	1,220	0	0	140	460	0
Ponoka County	500	0	0	0	360	0
Red Deer County	2,100	0	0	100	460	0
Rocky View County	340	0	0	0	240	0
Total	**5,540**	**0**	**0**	**340**	**2,580**	**0**

*Operating cost for the lifecycle of a bridge (based on two rehabilitations) for the assumed design life of a grade-separated crossing (50 years), on an annual basis.

The operating costs associated with the CPR Alignment are much higher than the cost of the RGA, due to both the larger number of crossings and higher cost per crossing.

Service roads may be necessary in the event that a grade-separated crossing is not provided and no other suitable access is available. The number of service roads that might need to be constructed depends greatly on specific local geography, as well as the number of grade-separated crossings that are ultimately planned. The order-of-magnitude cost of building service roads is $400,000-$500,000 per km and the operating cost is roughly $5,000 per km on an annual basis.[57]

9.2 Design: Access and Mobility - Elevated Track

One option for improving access and mobility across the HSR right-of-way is to construct sections of the line on an elevated structure. As noted in Figure 8-7, a number of impacts can be mitigated with improved access and mobility that would result from an elevated track:

- Farm severance psychological costs,
- Farm equipment access,
- Livestock access,
- Road maintenance costs,
- Emergency vehicle access,
- Wildlife mobility, and
- Traffic delays and forced travel-routing changes.

[57] It should be noted that the cost estimate presented takes into consideration the initial capital expenditures and the ongoing operating cost, but excludes the cost of structure replacement at the end of its life of approximately 50 years. As mentioned earlier, Alberta Transportation has a Bridge Program that provides cost-shared funding for eligible bridge projects under municipal jurisdiction that may offset the costs faced by municipalities. Both the construction and operations cost estimates assume a two-lane gravel road. Many factors could affect these estimates including terrain, availability of right-of-way, and availability of aggregate.

While estimating the cost of constructing HSR in Alberta is outside the scope of the present study, a recent international comparison of the construction costs of HSR projects found that the cost of constructing HSR on an elevated structure would be between four and six times more than if it was constructed on flat ground.[58]

9.3 Design: Location-Specific Measures

As documented in Chapter 8 a number of specific mitigation measures could be deployed to counter the negative impacts of HSR on rural Alberta. Most of these measures will have costs. Owing to the intrinsic specificity of such measures, attempting a cost estimate here would not be informative. As noted in Figure 8-7, a number of impacts can be mitigated with location-specific mitigation measures, including adverse impacts associated with:

- Recreational activities,
- Noise and vibration, and
- Landscape and visual quality.

9.4 Alignment

Avoiding areas that are populated, developed, subject to development plans, or otherwise sensitive to the construction of HSR could entail substantial costs, primarily driven by the requirement to construct additional length of track, likely costing at least $10 million per km to build, but cost can vary significantly depending on geography, topography, technology, vertical alignment, and other factors.[59] As noted in Figure 8-7, a number of impacts can be mitigated with adjustments to the alignment of the HSR line, including adverse impacts associated with:

- Livestock access,
- Planning uncertainty,
- Foregone land-use opportunities,
- Wildlife mobility, and
- Noise and vibration.

9.5 Summary

Figure 9-3 provides a summary of the cost and fiscal responsibility for the key cost elements of the mitigation strategies set out above. Note that given the high-level nature of the present study, the figure does not include detailed estimates of the costs of all proposed mitigation measures.

[58] *High Speed Rail: International Comparison*, prepared for the Commission for Integrated Transport by Steer Davies Gleave, February 2004. http://cfit.independent.gov.uk/pubs/2004/hsr/research/index.htm
[59] Ibid. The cost of construction of various HSR lines cited in this report ranges from €10 million to €70 million per km in 2004 prices (roughly $16 million to $112 million at 2004 rates).

In general, the guiding principle we have used to determine fiscal responsibility is the legislative division of powers between the provincial government and the municipalities. We have also used our experience in the development of infrastructure projects, where relevant.

Figure 9-3: Estimated Cost and Fiscal Responsibility for Key Mitigation Strategies

Mitigation Strategy Element	Cost Estimate	Fiscal Responsibility
Design: Mobility and Access		
Grade-separate all public roads: capital cost	$96-$360 million or $2.3-$3.2 million per crossing	Proponent
Grade-separate all public roads: operating cost	$0-$5.5 million per year	Municipality
Wildlife crossings.	$3.3 million per crossing[60]	Proponent
Construct HSR on an elevated track.	4-6 times the cost per km of at-grade track	Proponent
Additional construction costs for access roads, if necessary.	$400,000-$500,000 per km	Proponent
Additional annual operating costs for new access roads if necessary.	$5,000 per km per year	Municipality
Design: Location-Specific Mitigation		
Signage to mitigate traffic delays, forced travel time, and routing changes.	Unknown	Proponent
Noise and vibration mitigation, landscape and visual quality.	Highly location-specific	Proponent
Grade-separate recreational trails.	$1.2 million per crossing	Proponent
Alignment		
Additional length of track constructed.	At least $10 million per km	Proponent
Mitigation Programs		
Program to assist farmers with expropriation process.	Unknown	Need for negotiation to ensure proponent pays or cost is reasonably shared.
Emergency vehicle access and emergency services training costs.		
Signage for severed roads.		

[60] Based on the unit cost of constructing two wildlife overpasses in Banff National Park in 1997: http://www.mountainnature.com/Articles/CrossingStructures.htm. Costs would likely be higher today due to construction price inflation. 1997 cost of $1.9 million adjusted to 2010 dollars using the Statistics Canada's non-residential building construction price index for industrial buildings in Edmonton.

Appendix A: Classification of Roads in Rural Alberta

Highway
Synonymous with road (or route) and may include freeways, expressways, and undivided roads. A term generally applied to roadways in rural areas.

In this report provincial roads are referred to as highways while municipal roads (or roads in general) are referred to as roads and routes.

Expressway
A multi-lane divided highway having a minimum of two lanes of traffic for each direction. Access is provided through a combination of interchanges and at-grade intersections. Generally, this is an interim stage for divided highways being upgraded to a freeway.

Freeway
A multi-lane divided highway having a minimum of two lanes for exclusive use of traffic in each direction and full control of access and egress (exit) gained through interchanges. An interchange is a grade-separated intersection with one or more turning roadways (or ramps) for travel between the through roads.

Municipal Roads
Synonymous with route and includes paved or gravel-surface roadways under the municipal jurisdiction.

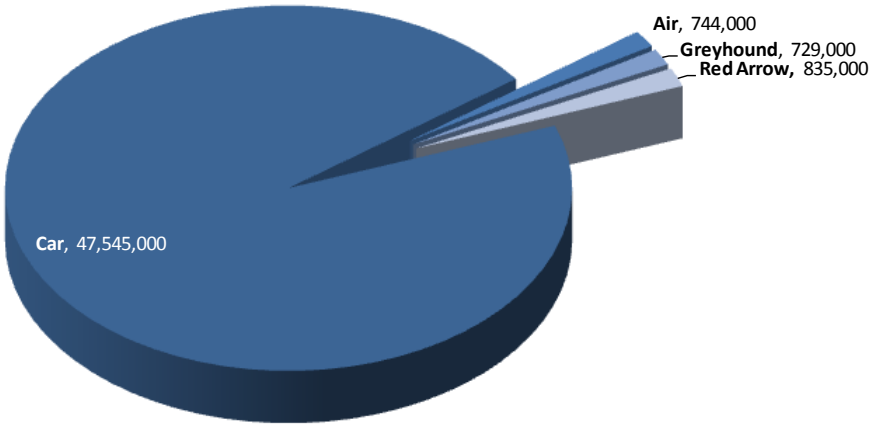
Appendix B: Economic Impact Analysis from Previous Studies

This appendix describes some of the previous work undertaken on HSR in Alberta. That work was not specifically related to rural Alberta, but does provide important contextual information for the present study.

The impacts of a new project must be assessed in terms of a base level of activity and new level of activity attributable to that project. The most recent estimate of the impact of travel patterns in Alberta resulting for Calgary-Edmonton HSR was completed in February 2008 for Alberta Transportation and Infrastructure, which we refer to as the "2008 ridership study".[61] That report included detailed ridership forecasts based on a survey of traffic on Highway 2.

Figure B-1 shows the current (as of 2006, the year for which the 2008 study was conducted) province-wide ridership for the various modes of transportation that are in the same market as HSR. Car was the dominant mode with 95 percent of the market; air, and the two modes of bus transport each had around 1.5 percent.

Figure B-1: Province-Wide Number of Passenger Trips of Potential Interest to High-Speed Rail, 2006



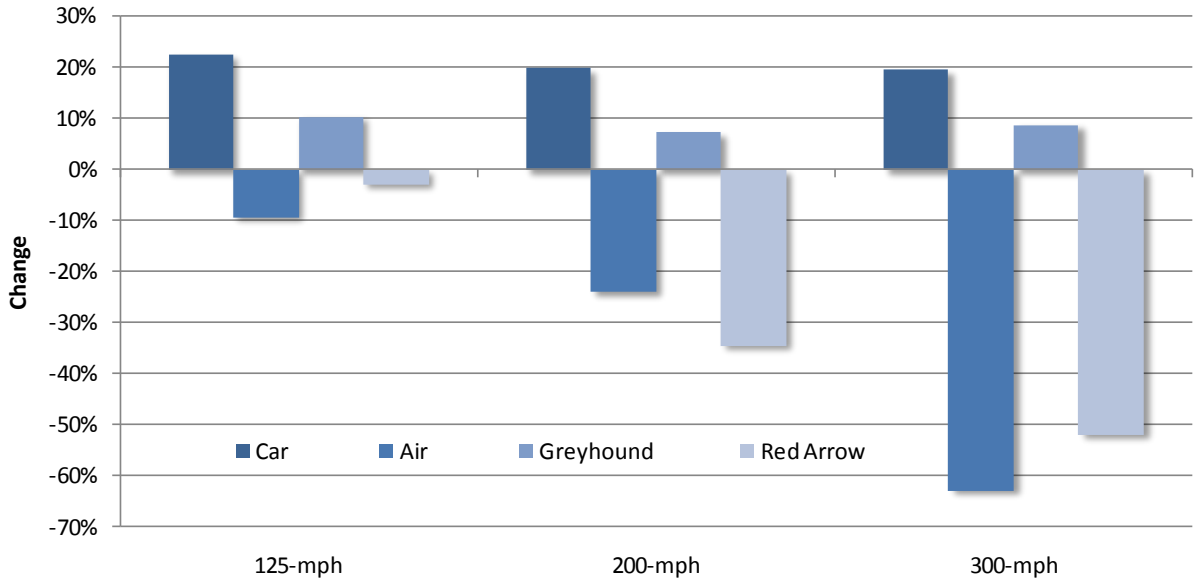
Source: CPCS analysis of *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor,* prepared for Alberta Infrastructure and Transportation by TEMS Inc. / Oliver Wyman, February 2008, p. 69

Figure B-2 presents estimates of the change in ridership, in percentage terms, associated with the three different HSR technologies considered in the present project (125 mph, 200 mph and 300 mph). These estimates are drawn from the 2008 ridership study. In that study, faster technologies charged higher fares. In percentage terms, the air and Red Arrow (an intercity bus service serving Calgary, Red Deer, and Edmonton) markets are most adversely affected by HSR. For instance under the assumption of 200-mph service, air suffers a reduction of 24 percent in

[61] *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor*, prepared for Alberta Infrastructure and Transportation by TEMS Inc. / Oliver Wyman, February 2008.

passenger traffic, while Red Arrow suffers a 35 percent drop. At the same time in spite of HSR, car travel continues to grow, albeit at reduced rates relative to a scenario with no HSR. Overall, car traffic is projected to rise between 19.7 and 22.6 percent from 2006 to 2011 depending on the HSR technology employed.

Figure B-2: Ridership Impact of Various High-Speed Rail Technologies, 2011 Forecast based on 2006 Traffic



Source: CPCS analysis of *Market Assessment of High Speed Rail in the Calgary-Edmonton Corridor,* prepared for Alberta Infrastructure and Transportation by TEMS Inc. / Oliver Wyman, February 2008, pp. 68-71

Figures B-3 and B-4 present estimates of the non-user impacts of HSR as calculated in the 2008 economic impact study. As noted above, these results do not pertain directly to rural Alberta, but are informative contextual information, because they demonstrate the types and relative magnitude of commercial and economic impacts that might be expected in the province more broadly. The impact of HSR on jobs and employment income is most notable.

Figure B-3: Estimated Non-User Impacts of High Speed Rail Development in the Calgary-Edmonton Corridor

Factor	High Speed Rail		
	125 mph	200 mph	300 mph
Jobs	3,400	6,407	7,162
Income (millions of 2006$)	$230	$436	$487
Provincial Income Tax (millions of 2006$)[1]	$12	$22	$24
Federal Income Tax (millions of 2006$)[2]	$18	$34	$38
Property Value (millions of 2006$)	$732	$1,381	$1,546
Property Tax (millions of 2006$)[3]	$3	$6	$7
Average Household Income (2006$)	$194	$365	$408
Average Dwelling Value (2006$)	$403	$759	$849

Source: Adapted from the *Economic Benefits for Development of High Speed Rail Service in the Calgary-Edmonton Corridor,* prepared for Alberta Infrastructure and Transportation by TEMS, Inc., February 2008, p. 58

Notes:
Provincial income tax impacts were calculated in the 2008 economic impact study applying the official 2007 provincial tax rate for Alberta (10 percent of taxable income) to the 50 percent of the overall increase in income estimated in the 2008 economic impact study.
Federal income tax impacts were calculated in the 2008 economic impact study by applying the minimum official federal tax rate for 2007 (15.5% of taxable income) to the 50 percent of the overall increase in income estimated in the 2008 economic impact study.
Property tax impacts were calculated in the 2008 economic impact study by estimating the share of property tax to be collected in 2006 in the 2006 equalized assessment (from Alberta Municipal Affairs) and multiplying this share by property value increase estimated in the 2008 economic impact study.

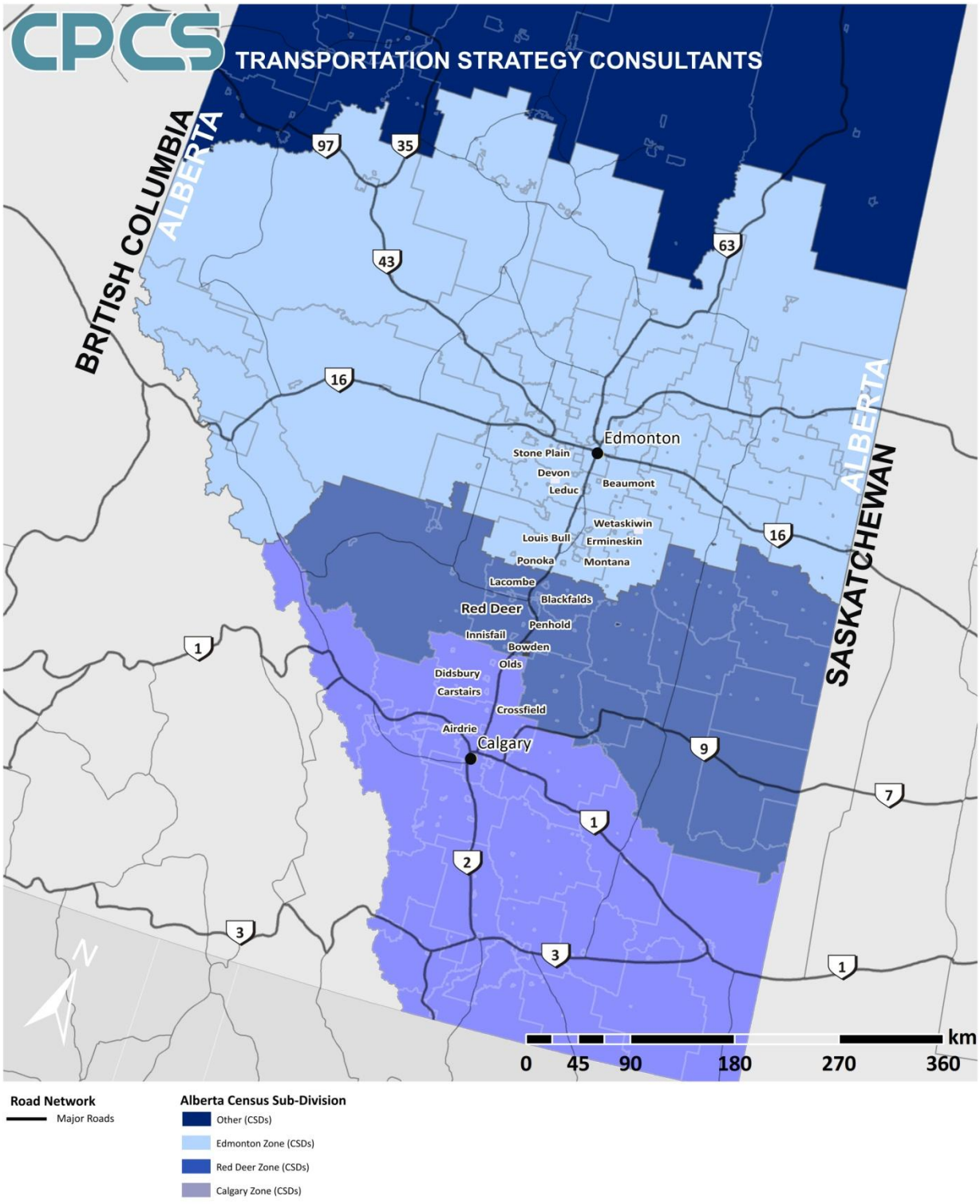
Figure B-4: Estimated Non-User Impacts of High Speed Rail Development in the Calgary-Edmonton Corridor, by Community

Community	Jobs	Household Income (millions 2006$)	Property Value (millions 2006$)
Calgary Region			
City of Calgary	1,084 - 2,313	88 - 188	259 - 553
Airdrie & Okotoks	170 - 361	9 -20	31 - 67
Cochrane	87 - 176	7 -15	27 - 54
Strathmore & Canmore	24 - 47	1 -2	8 - 16
Other areas in Calgary Region	110 - 228	6 - 11	23 - 46
Total	**1,475 - 3,125**	**$111 - $236**	**$348 - $736**
Edmonton Region			
City of Edmonton, St. Albert & Sherwood Park	735 - 1,556	57 - 120	165 - 351
Spruce Grove	33 - 70	3 - 6	9 - 20
Leduc & Fort Saskatchewan	68 - 146	3 - 7	14 - 30
Wetaskiwin & Camrose	48 - 102	2 - 5	8 - 16
Other areas in Edmonton Region	84 - 176	4 - 8	14 - 32
Total	**968 - 2,050**	**$69 - $146**	**$210 - $449**
Red Deer Region			
City of Red Deer	735 - 1,525	40 - 82	111 - 229
Lacombe	88 - 182	4 - 9	30 - 63
Other areas in Red Deer Region	134 - 280	7 - 14	33 - 69
Total	**957 - 1,987**	**$51 - $105**	**$174 - $361**

Source: Adapted from the *Economic Benefits for Development of High Speed Rail Service in the Calgary-Edmonton Corridor,* prepared for Alberta Infrastructure and Transportation by TEMS, Inc., February 2008, p. 58

Figure B-5 shows the regions of Alberta as defined in the 2008 study and as presented in Figure B-4. The Edmonton Region is the lightly shaded area around Edmonton; the Red Deer Region is a slightly darker shade; and the Calgary Region is also lightly shaded.

Figure B-5: Regions of Alberta



Appendix C: Rural Planning in Alberta

The History of Rural Planning in Alberta

Over the past few decades, planning in Alberta has undergone a substantial evolution. Before 1960, planning activities were mostly limited to preparing urban designs and zoning bylaws for the larger cities. But with growth in the provincial population and economy, coupled with progression in civic complexity and demands from better-educated people, land-use planning becomes more sophisticated. But most of the focus has been on urban areas.

The first planning provisions in Alberta came through the *Town Planning Act* proclaimed in 1913.[62] As indicated by the name, it was concerned with orderly settlement of urban centres. In 1950, the act was amended and renamed as the *Town and Rural Planning Act*, stimulated by conflicts between Edmonton and its rural neighbours. This resulted in the formation of the Edmonton District and the Calgary District Planning Commissions. Much of the motivation for these changes was generated by strong economic growth following World War II, the migration from farms to the cities and rapid expansion of oil and gas activity following the Leduc discovery in 1947.

Provincial interests were strongly represented by senior civil servant appointments, presumably to ensure that the commissions had adequate professional expertise. Up to 1953, the provincial government retained authority for subdivision of property, which was the most important means of controlling land use. By an amendment to the act, subdivision was assigned to the district commissions for land in rural areas and smaller centres but it was retained by the two cities for land within their boundaries. The cities also had greater representation on the commissions and had professional planners on staff to argue their positions. Thus, the two cities had significant planning influence over neighbouring rural municipalities. The expressed rationale was that urban centres were to be the focus of economic growth and rural areas were targeted for agriculture and resources development.[63]

In 1963, legislation was passed amending the planning system through a new *Alberta Planning Act* that saw the establishment of regional planning commissions throughout much of the province. Of relevance to this study, by 1971 all the counties between Calgary and Edmonton were represented by regional planning commissions.

The commissions were provided partial provincial funding to hire staff and carry out various planning functions. The commissions were centred at urban centres within the designated regions, including Red Deer and Wetaskiwin, along with Edmonton and Calgary.[1,2] Those located in the smaller centres developed rather amenable relationships with the rural jurisdictions while the compatibility between the two major cities and their rural neighbours was

[62] An analysis of the establishment of town and rural planning In Alberta is contained in: Dragushan, G.N.G.; *Regional Planning in Alberta: the Evolution of Alberta's System of Regional Planning Commissions;* UBC, 1979.
[63] Additional insights in: Bettison, D.G., Kenward, J.K., & Taylor, L.; *Urban Affairs in Alberta;* University of Alberta Press, 1975.

strained at best and often bordered on hostile. Planners were drawn mostly from urban planning schools and many had little understanding of or relationship to rural areas.

Economic growth and urbanization continued for another two decades and the regional commissions responded by increasing staff and responsibilities. Rural municipalities were now provided with professional planning services through the commissions but these services often had a strong urban bias, especially with respect to the significant growth around Edmonton and Calgary.

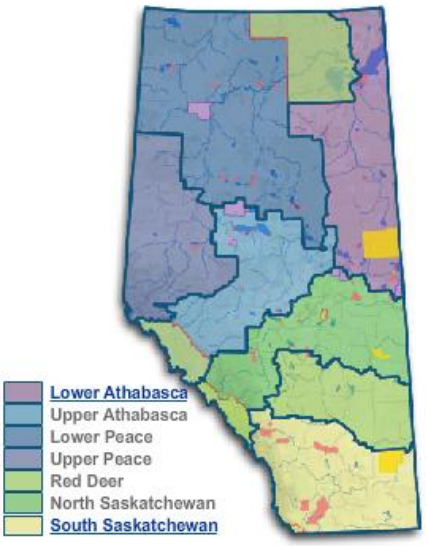
By 1995, a major shift in provincial strategy and fiscal constraint resulted in termination of regional planning commissions. This situation left many rural municipalities in a vacuum after they had come to rely on commission planning services. In some regions, such as Red Deer and Wetaskiwin counties, these services were replaced by regional services agencies, often with the same personnel but with costs borne entirely by the county. Others, like Rocky View and Leduc, quickly established their own planning departments.

How Rural Planning in Alberta Works

Over the past 15 years,[64] many counties have grown in administrative capacity and now retain in-house planning staff, many with specialized knowledge and understanding of rural situations. Many counties are now engaged in preparation of growth strategies and formulation of plans directed toward economic development and diversification. In the Highway 2 corridor, these activities have been underway for several years and, especially near Edmonton and Calgary, they have been successful in generating significant business expansion.

Meanwhile, the Alberta government has recently initiated a new structure aimed at better managing growth, ensuring its long term sustainability and improving distribution of the benefits.[65] The Alberta Land-Use Framework (LUF) was approved by the provincial cabinet in 2008 following two years of preparation and consultation. It sets out strategies for the preparation of land-use plans for seven watershed regions of the province and metropolitan plans for Edmonton (Capital Region) and Calgary (which include rural areas adjacent to the urban municipalities). An immediate start was made on the two metropolitan plans, followed by Regional Plans for the South Saskatchewan and Lower Athabasca river basins. There are

Figure C-1 Land-Use Regions of Alberta



[64] For about two decades, municipal authority for planning and land use in Alberta has been granted by the *Municipal Government Act* following on and expanding previous versions of the *Alberta Planning Act*. For more background on rural planning in Alberta, see Appendix A.

[65] http://www.landuse.alberta.ca/AboutLanduseFramework/LUFProgress/documents/LanduseFramework-FINAL-Dec3-2008.pdf

stated intentions in the LUF to develop transportation and utility corridors for the province and to enhance land stewardship and conservation. Under the LUF, regional plans will take precedence over municipal plans and strategies. Once the regional documents are in place, amendments to the municipal documents will be required if they are not in conformance.

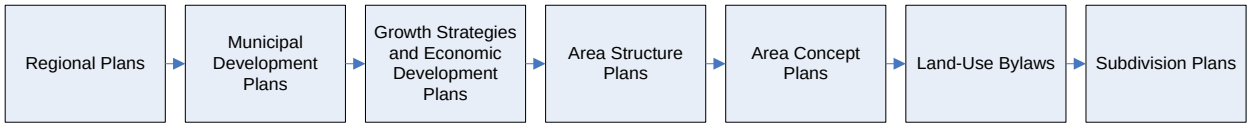
The Capital Region Metropolitan Plan has recently been ratified by the region's member municipalities, including Leduc County. The plan shows a band of residential development along the south side of Edmonton to Leduc and industrial development to the east side of Highway 2 and Leduc but it does not indicate a possible route for HSR.[66]

The Calgary Regional Partnership has prepared its plan but it has not been approved due to rural municipal fears that the City of Calgary, having the largest population, would have a veto over their decisions. It is not known how long it may take to resolve this issue.[67]

Apart from the area south of Edmonton to Leduc and the area north of Calgary that is contained in the yet-to-be-ratified Calgary Metropolitan Plan, the remaining Highway 2 corridor will be included in the South Saskatchewan, Red Deer or North Saskatchewan Regional Plans but these have not been started. In the meantime, the plans and strategies for the seven counties will remain in effect, whether these are currently in place or those that may be approved before the regional plans are completed. The process of amending the municipal documents has begun for the Capital Region and, if the Calgary Metropolitan Plan is approved, it will be initiated there as well. For the remaining counties in the corridor, it may be some time before the three regional plans are completed.

The municipal components include the hierarchy of statutory plans and associated strategies set out in Figure C-2.

Figure C-2: Hierarchy of Statutory Plans and Associated Strategies



Municipalities with populations over 3,500 are required by the Province to develop Municipal Development Plans (MDPs), which establish policies for land use within the municipality[68], and are encouraged to develop Area Structure Plans (ASPs) for areas undergoing significant new development, which establish a more detailed framework for transportation and other services.

Where planning and development issues overlap municipal boundaries, the *Municipal Government Act* provides for two or more municipalities to cooperate in the generation of an Intermunicipal Development Plan (IDP). These are passed by bylaw and commonly contain directions and policies guiding decisions within the designated area. The IDP is at the same level in the hierarchy as the Municipal Development Plan.

[66] ttp://www.municipalaffairs.alberta.ca/documents/CRIGMP_Land_Use_November_2007_section_5.pdf).
[67] http://www.calgaryregion.ca/crp/media/67136/june2010gapresentation.pdf.
[68] The Legislative Framework For Municipal Planning, Subdivision, And Development Control (Updated March 2002)

Appendix D: Completed Questionnaires

Alberta High Speed Rail Rural Impact Study – Questionnaire for Leduc County

Organization / Contact: **LEDUC COUNTY:** Marvin Molzan, Mayor; Betty Glassman, Councillor; Reinhold Ortlieb, Councillor; Vern Siemens, Councillor; John Whaley, Councillor; Doug Wright, County Manager; Phil Newman, Planning & Development Director; Mime MacLeanl, Public Works & Engineering Manager; Brian Bowles, Corporate Services Manager
Date : June 22, 2010

General Impressions of High Speed Rail
What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

Leduc County supports the development of HSR as it will likely benefit the Province and the region but it should be examined closely, after the route is selected, to determine the cost-benefit for each jurisdiction to ensure that the tax load will not be too extreme.

The County is working closely with the City of Leduc and area towns through a joint initiative entitled the International Region Economic Development Authority to enhance the economic viability of the Edmonton International Airport. But first, the County feels that local infrastructure must be improved, including the extension of LRT to the airport and improvements to Highway 2. The whole region is becoming more urban and the infrastructure requirements to allow this evolution must be met.

Types of Impact
We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

ownership • Truck and rail freight service		

Do you see any impacts missing from this list?

Magnitude and Distribution of Impacts
Which impacts would you say would be most significant, from your perspective? Why?

Impacts that we view as significant:

Severance of farms
Severance of road access
Constraints on Growth
Sterilization of Lands

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

The County and City of Leduc have designated growth areas on both sides of Highway 2 between the Airport and the City of Edmonton linking into the road network in the vicinity. This region is now being seen as an "Aerotropolis" within which an integration of several modes of transportation will be featured. The planning documents described in the Data Section are evidence of these initiatives

If HSR impeded the development of these areas, the economic conditions for the County, the City of Leduc and the adjacent towns would suffer.

A feeder transportation system would be warranted to link various developments.

Potential Impacts and Constraints on Long Term Planning
How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

If the route is not planned with consideration of the initiatives now in play, much effort would be lost and money wasted. The County and partners are proceeding to accommodate growth and development and would not want to have these plans and investments delayed or diverted.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts
What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

Construct local infrastructure first.
Early notification of route selection.
Consideration of benefits for small town and rural communities such as by feeder transportation.

Data:

1. City of Leduc/Leduc County Intermunicipal Development Plan
   http://www.leduc-county.com/PDF/CityofLeducIDP/LeducCountyCityofLeducIDPMap.pdf
   Possible HSR route shown

2. Planning Projects in the Vicinity
   http://www.leduc-county.com/PDF/ASPsCurrentProjects&FutureWork.pdf

3. County /Town of Beaumont Growth Study
   http://www.leduc-county.com/plan-beaumont.htm
   Currently in progress

4. County/ Town of Devon Intermunicipal Development Plan
   http://www.leduc-county.com/plan-devon.htm
   Currently in progress

5. Highway 19 Area Structure Plan
   http://www.leduc-county.com/PDF/Plans/Highway19ConceptualPlanMap.pdf

6. Saunders Lake Area Structure Plan
   http://www.leduc-county.com/PDF/Plans/SaundersLakeASPAugust2005.pdf
   See page 18

7. Blackmud Creek Area Structure Plan
   http://www.leduc-county.com/PDF/Plans/BlackmudCreekASPMar2004.pdf
   See page 14

8. WAM Area Structure Plan
   http://www.leduc-county.com/PDF/Plans/WAMASP.pdf
   See Figure 2

9. North Major Area Structure Plan
   http://www.leduc-county.com/PDF/Plans/NorthMajorASPJune2006.pdf
   See Map 6Land Use Strategy

10. East Vistas Local Area Structure Plan
    http://www.leduc-county.com/PDF/Plans/East%20Vistas/EastVistasLASP.pdf
    See Development Concept – page 19

11. Other than oil and gas facilities identified by the ERCB and the movement of hazardous goods on the highways and railway, no other hazard lands or facilities have been identified within the study area although depots for Anhydrous Ammonia fertilizer are located throughout the County.

Alberta High Speed Rail Rural Impact Study – Questionnaire for Wetaskiwin County

Organization / Contact: **WETASKIWIN COUNTY:** Garry Deering, Reeve; Barry Dunn, Councillor; Wayne Meyers, Councillor; Nancy Watson, Councillor; Frank Coutney, County Administrator; David Blades, Planning & Economic Development Director; Dave Dextraze, Public Works Director; Richard Horncastle, Joint Economic Development Initiative, Economic Development Director
Date : June 22, 2010

General Impressions of High Speed Rail

What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

Wetaskiwin County will supports HSR providing it will benefit the Province and not result in additional costs for local areas. The County is working closely with the City of Wetaskiwin and the Town of Millet on joint economic strategies to capture additional development and have established a Joint Economic Development Initiative for this purpose. The Highway 2 corridor is targeted for development of industrial and commercial zones but strategies are also being generated to attract more business onto Highway 2A, into Millet, the Wetaskiwin Airport and to the Reynolds Museum. The airport has become a satellite to the Edmonton International Airport and a feeder transportation service from these locations to HSR would provide benefits to the community.

Types of Impact

We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and ownership • Truck and rail freight service	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

Do you see any impacts missing from this list?

The route should not be through the Samson, Louis Bull or Ermineskin Indian Reserves – best along or on Highway 2 right-of-way. It should not go through towns and small cities due to safety issues and further severance of these communities.

If agricultural operations are severed by the route, additional costs will be required for movement of livestock and machinery.
HSR could fragment wildlife populations and result in isolation of the gene-pool for earth-bound species.

Magnitude and Distribution of Impacts

Which impacts would you say would be most significant, from your perspective? Why?

Impacts:
Severance of farms – machinery , livestock movements, additional cost to farmers, loss of income. Farming profit margins are small. Most land along this corridor is class 1 & 2.
Grade-separated road crossings cannot be under HSR as that results in obstructions for farm machinery.
Tunnels are not effective for wildlife crossings.
Severance of County roads – emergency services, school bussing, travel for rural people
Severance of valleys – west to east valleys drain the country and provide wildlife corridors. The HSR could interfere with wildlife.
The valleys have a concentration of Country Residential development.
Constraints on Growth
Sterilization of land between HSR and Highway 2 if a narrow strip.

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

The County and the City of Wetaskiwin and Town of Millet have designated growth areas along Highway 2 and 2A. A joint economic study has been prepared from which Area Structure Plans are now being developed to encourage business development.

The County has designated business development nodes of about one square mile at the major intersections on Highway 2, including Highway 13, Secondary 611 and 616. Industrial, commercial and institutional is proceeding. Residential and recreational developments are in the moraine landscape between Wetaskiwin and Millet.

If HSR impeded the development of these areas, the economic conditions for the County, the City and the adjacent towns would suffer.

It may be worthwhile for the province to consider using this initiative to establish a corridor for HSR and utilities.

Potential Impacts and Constraints on Long Term Planning

How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

Restricting growth options and limiting expansion of communities, industrial and commercial development and limiting opportunities for enjoyment of rural life. The County has negotiated with the Towns for expansion lands to these urban centres. The route selected for HSR may disrupt these plans and require additional annexation.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts

What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

Use Highway 2 for the route as this will be easier to sell to the public – already severed.
Early notification of route selection.
Consideration of benefits for rural people and communities such as by feeder transportation.

Data:

Little digital information is available on the website:
www.county.wetaskiwin.ab.ca

Apart from the above, oil and gas facilities identified by the ERCB and the movement of hazardous goods on the highways and railway, no other hazard lands or facilities have been identified within the study area although depots for Anhydrous Ammonia fertilizer are located throughout the County.

Alberta High Speed Rail Rural Impact Study – Questionnaire for Ponoka County

Organization / Contact: **PONOKA COUNTY** - Tom Webber, ACAO
Date : June 29, 2010

General Impressions of High Speed Rail

What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

A high speed rail link between Calgary-Edmonton would be beneficial for business and commerce. However, I communities between Calgary and Edmonton, excluding Red Deer would receive minimal benefit.
It's unlikely that if I was travelling to Calgary that I would drive to Red Deer, jump on a train to Calgary, rent a car or use public transit in Calgary and then return by rail to Red Deer and drive back to Ponoka. The convenience factor would be lost.

Types of Impact

We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and ownership • Truck and rail freight service	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

Do you see any impacts missing from this list?

A high speed rail system would undoubtedly have a lower carbon footprint than aircraft and/or

bus/auto traffic. More people could be transported faster, safer and at a lower cost (excluding initial capital costs).

Magnitude and Distribution of Impacts
Which impacts would you say would be most significant, from your perspective? Why?

Crossing of County roads would be the most significant. Disruption of our rural lifestyle and quiet country living would also be an issue.

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

Unless the high speed rail was to stop in Ponoka, the impact to our community would be minimal.

Potential Impacts and Constraints on Long Term Planning
How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

Ponoka County is only 20 miles deep, so we would only have to adjust our planning processes for a 1/2 mile on either side of the line.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts
What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

I think the rail line would have to be elevated to avoid conflict with ground traffic, wildlife and weather issues, i.e. fog, reduced visibility, winter storms, etc.
An elevated line would be safer.

Data:

1. County website - has little digital information
   http://www.ponokacounty.com/

2. County Map – poor resolution
   http://www.ponokacounty.com/Default.aspx?tabid=1189

3. Municipal Development Plan – proposed Business parks are at Highway 2 and Secondary 611, Highway 2 and 53
   http://www.ponokacounty.com/ - click on Development, then on Municipal Development Plan, then on Map 4.

4. Proposed Country Residential Expansion node is at Highway 2A and Secondary 604

5. No additional traffic data is available.

Alberta High Speed Rail Rural Impact Study – Questionnaire Lacombe County

Organization / Contact: **LACOMBE COUNTY:** Terry Hager, County Commissioner; Allan Williams, Planning Services Manager; Phil Lodermeier, Operations Manager
Date : May 20, 2010

General Impressions of High Speed Rail

What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

Lacombe County supports the development of HSR as it will benefit the Province and result in economic spin-offs for the region. In addition, it will reduce highway traffic and allow better access to regional services like health care. The County is working closely with the Towns of Blackfalds and Lacombe on joint economic strategies to capture some of the strength of the Highway 2 corridor aimed at development of industrial and commercial zones that will be able to compete with larger centres for business. Feeder transportation from these locations to HSR would provide benefits to the community.

Types of Impact

We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and ownership • Truck and rail freight service	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

Do you see any impacts missing from this list?

The route and the timing of acquiring land should proceed early in order that landowners are do not suffer from removal of opportunities. If agricultural operations are severed by the route, operational

adjustments will be required for movement of livestock and machinery. When Highway 2 was constructed, the rationalization process took about two decades.

It may be worthwhile for the province to consider using this initiative to establish a corridor for HSR and to relocate the CPR out of existing urban centres thereby freeing up considerable land for community growth. This corridor could accommodate utilities but it cannot be under the authority of the Canada Railways Act.

Magnitude and Distribution of Impacts

Which impacts would you say would be most significant, from your perspective? Why?

Impacts:
Severance of farms – machinery , livestock movements, additional cost to farmers, loss of income
Severance of County roads – emergency services, school bussing, travel for rural people
Severance of valleys – west to east valleys drain the country and provide wildlife corridors. The HSR could interfere with wildlife and recreation in these.
The valleys have a concentration of Country Residential development.
Constraints on Growth
Sterilization of Lands
Lacombe is the site of a major Agriculture Canada Research Centre. If this were to be interrupted, many years of research would be lost.

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

The County and Towns have designated growth areas along Highway 2 and 2A, A joint economic study has been prepared from which Area Structure Plans are now being developed to encourage economic development.

The County has designated a significant business development area on both sides of Highway 2 form Aspelund Road in the south to north of Highway 12. Industrial, commercial and institutional is proceeding. Residential and recreational developments are concentrated along the Blindman River and in the moraine landscape along Wolf Creek in the north.

If HSR impeded the development of these areas, the economic conditions for the County, the City and the adjacent towns would suffer.

The County is the centre for world-scale petrochemical operations located between 6 and 10 miles east of Blackfalds. Operated by Agrium, Dow Chemical, Meglobal, Nova Chemical and Procor, these facilities cover an area of about 10 square miles and are essential elements of the provincial and regional economy. They also present a hazard to the public. The industrial land use is shown on Map 2 of the County MDP.

Potential Impacts and Constraints on Long Term Planning

How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

Restricting growth options and limiting expansion of communities, industrial and commercial development and limiting opportunities for enjoyment of rural life. The County has negotiated with the Towns for expansion lands to these urban centres. The route selected for HSR may disrupt these plans and require additional annexation.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts

What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

Early notification of route selection.
Consideration of benefits for rural people and communities such as by feeder transportation.

Data:

1. Lacombe County Website
   http://www.lacombecounty.com//

2. For the Municipal Development Plan – go to the website, click on Departments, then on Planning & Development, then on Municipal Development Plan, then on Map 2.

3. For the County Map - go to the website, check "Highlighter" on right-hand side, then click on #4, then download.

4. Town of Lacombe/County Intermunicipal Development Plan
   -intermunicipal-development-plan&catid=169&Itemid=252
   Check Maps 2 & 3

5. Highway 2A Urban Corridor Area Structure Plan
   http://www.lacombecounty.com/index.php?option=com_content&view=article&id=302:highway-2a-urban-corridor-area-structure-plan&catid=160:general&Itemid=63
   Future Development Concept – Map 1, Page 3

6. Lacombe/Blackfalds Rural Fringe Area Structure Plan
   http://www.lacombecounty.com/index.php?option=com_content&view=article&id=107:lacombeblackfalds-rural-fringe-area-structure-plan&catid=170&Itemid=253
   Future Development Concept – Figure 1, page 3

7. Parkview Industrial Area Structure Plan
   http://www.lacombecounty.com/index.php?option=com_content&view=category&layout=blog&id=160&Itemid=63
   Future Land Use – page 15

8. West of Highway 2 Area Structure Plan – currently under development
   http://www.lacombecounty.com/index.php?option=com_content&view=article&id=131:highway-2-west-area-structure-plan&catid=91&Itemid=146
   See MDP Future Land Use Map – page 3 and Joint Economic Areas Map – page 10

9. Milton/Morningside Area Structure Plan
http://www.lacombecounty.com/index.php?option=com_content&view=article&id=122:miltonmorningside-area-structure-plan-&catid=170&Itemid=253
See Potential Multi-Lot Residential Development – Map 1, page 19

10. Highway 2 Corridor Economic Study
http://www.lacombecounty.com/index.php?option=com_content&view=category&layout=blog&id=93&Itemid=148
See Figure 2, page 5; Figure 3, page 10; Figure 4, page 12 and Figure 5, page 17

11. The petrochemical plants east of Blackfalds present public hazards.

12. Apart from the above, oil and gas facilities identified by the ERCB and the movement of hazardous goods on the highways and railway, no other hazard lands or facilities have been identified within the study area although depots for Anhydrous Ammonia fertilizer are located throughout the County.

Alberta High Speed Rail Rural Impact Study – Questionnaire for Red Deer County

Organization / Contact: **RED DEER COUNTY:** Curtis Herzberg, County Manager; Cynthia Cvik, Planning & Development Director; Marty Campbell, Engineering Manager; Evan Bedford, Engineering Coordinator; Doug Erdman, Economic Development Officer
Date : June 30, 2010

General Impressions of High Speed Rail

What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

Red Deer County supports the development of HSR as it will benefit the Province and the region. A feeder connection should also be made to the Red Deer Airport. The County is working closely with the City of Red Deer to complete a joint study into development of industrial and commercial zones that will be able to compete with larger centres for business.

Types of Impact

We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and ownership • Truck and rail freight service	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

Do you see any impacts missing from this list?

We view the routing and the timing of acquiring the lands for the routing as vital information to our landowners. If agricultural operations are severed by the route, sales and operational adjustments should be completed prior to construction, a process that will take at least a decade. This type of

infrastructure will create sterilization of the lands, especially if the HSR route is separated by a narrow strip (ie 1 or 2 miles) from an existing north-south barrier such as Highway 2.

The County and the City are preparing plans to accommodate HSR near Highway 11 in spite of the absence of a specific route. If a different route is chosen, considerable expense will have been wasted.

Magnitude and Distribution of Impacts

Which impacts would you say would be most significant, from your perspective? Why?

Impacts that we view as significant:

Severance of farms – machinery , livestock movements, additional cost to farmers
Severance of County roads – emergency services, school bussing, travel for rural people
Severance of valleys – northwest to southeast valleys drain the country and provide wildlife corridors. The valleys west of Red Deer are very deep and narrow. The HSR could interfere with wildlife and recreation.
The valleys have a concentration of Country Residential development.
Constraints on Growth
Sterilization of Lands

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

The County and City have designated growth areas along Gasoline Alley, to the southwest along Highway 2A, westerly between Highway 11 and 11A and north along Highway 2A. Ajoint planning study is now underway centred on Highway 11 that will provide for a link to HSR.

The County has a significant development area at the former Canadian Forces Air Base, now Springbrook and the Red Deer Regional Airport. Residential, industrial, institutional, commercial and recreational developments are now proceeding.

A highway commercial and industrial development node is being planned for the junction of Highway 2, 42 and 592 comprising 3 square miles.

Joint development plans are in place for Penhold, Innisfail and Bowden.

If HSR impeded the development of these areas, the economic conditions for the County, the City and the adjacent towns would suffer.

The Airport is receiving greater traffic linking to oil and gas activity and is a regional service centre. An expansion plan is being developed by the County. A feeder transportation system would be warranted.

Potential Impacts and Constraints on Long Term Planning

How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

The County has negotiated with the City and Towns for expansion lands to these urban centres. The

route selected for HSR may disrupt these plans and require additional annextation.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts

What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

Early notification of route selection.
Consideration of benefits for rural people and communities such as by feeder transportation.

Data:

2. City/County Intermunicipal Development Plan
   http://reddeercounty.civicweb.net/Documents/DocumentList.aspx?ID=703
   Growth Areas- page 20

3. Red Deer Regional Airport Master Plan – new Area Structure Plan now in process
   http://reddeercounty.civicweb.net/Documents/DocumentList.aspx?ID=5655

4. Springbrook Area Structure Plan
   http://reddeercounty.civicweb.net/Documents/DocumentList.aspx?ID=732
   Future Land Use – page 15
5. Bowden/County Intermunicipal Development Plan
   http://reddeercounty.civicweb.net/Documents/DocumentList.aspx?ID=783
   Future Land Use – page 28

6. Parkland Refinery/Bowden ASP
   http://reddeercounty.civicweb.net/Documents/DocumentList.aspx?ID=5212
   Future Land Use – Appendix A, Map 1

7. Innisfail/County IDP
   http://reddeercounty.civicweb.net/Documents/DocumentList.aspx?ID=704
   Map 1 – Future Land Use Concept – page 32

8. One hazardous location is currently in operation just north of Bowden between the CPR railway and Highway 2 where a former oil refinery is now used for storage of petroleum products and as a sales and shipping depot.

9. Other than oil and gas facilities identified by the ERCB and the movement of hazardous goods on the highways and railway, no other hazard lands or facilities have been identified within the study area although depots for Anhydrous Ammonia fertilizer are located throughout the County.

Alberta High Speed Rail Rural Impact Study – Questionnaire for Mountain View County

Organization / Contact: **MOUNTAIN VIEW COUNTY:** Liz Negropontes, Councillor; Doug Plamping, CAO; Ryan Morrison, Infrastructure Projects Manager; Ken Bellamy, Technical Services Manager; Doug Erdman, Economic Development Officer
Date : June 25, 2010

General Impressions of High Speed Rail

What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

Mountain View County supports the development of HSR even though the would be little direct benefit to the rural population. It would be best to begin with means to improve the economic conditions for rural areas so as to retain population in the country – perhaps by improving feeder transportation systems to the larger centres. Feeder connections should also be made to local airports.

Types of Impact

We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and ownership • Truck and rail freight service	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

Do you see any impacts missing from this list?

We view the routing and the timing of acquiring the lands for the routing as vital information to our

landowners. If agricultural operations are severed by the route, sales and operational adjustments can be completed prior to construction. These types of infrastructure create sterilization of the lands, especially if the HSR route is separated by a narrow strip (ie 1 or 2 miles) from an existing north-south barrier such as Highway 2.

Magnitude and Distribution of Impacts

Which impacts would you say would be most significant, from your perspective? Why?

Impacts that we view as significant:

Severance of farms – machinery movements, livestock movements, additional cost to farmers
Severance of County roads – emergency services, school bussing, travel for rural people
Severance of valleys – northwest to southeast valleys drain the country and provide wildlife corridors for moose and deer

Constraints on Growth
Sterilization of Lands

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

The County has designated growth areas around the Towns of Carstairs, Didsbury and Olds linked into the east-west highways intersecting Highway 2. If HSR impeded the development of these areas, the economic conditions for the County and the adjacent towns would suffer.

The Olds-Didsbury Airport, located within Mountain View County between the two towns, is receiving greater traffic linking to oil and gas activity and is the service centre for hail suppression flights. An expansion plan has been ratified by the County.

Potential Impacts and Constraints on Long Term Planning

How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

The County has negotiated with the Towns for expansion lands to these urban centres. The route selected for HSR may disrupt these plans and require additional annexation.

One mile east of Highway 2 through the County is the 5th Meridian, an important element governing the land survey system of Alberta. At the 5th Meridian, all of the north-south survey lines are corrected while on the east side the survey of townships defined by township roads and range roads prevails with corrections for the convergence of meridians of longitude requiring correction lines. This has resulted in a narrow strip of surveyed land on the east side of the 5th Meridian through most of the County that is in a separate title from the adjacent farmland. This strip, referred to locally as "The Gore Strip", could be considered as a less invasive location for HSR as it would not interrupt ownership patterns as much.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts

What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

Early notification of route selection.
Consideration of benefits for rural people such as by feeder transportation.

Data

1. Mountain View County Municipal Development Plan - http://www.mountainviewcounty.com/media/docs/Bylaw_17_07__-_CONSOLIDIATED_-_amended_Nov._25,_2009.pdf
   Figure 3, page 28, and Appendix B (b), (c) and (d)

2. Location of County-designated business parks - http://www.mountainviewcounty.com/businessparks

3. Netook Crossing Business Park - http://www.mountainviewcounty.com/netookcrossing

4. Netook North Concept Plan – residential and business park development now underway http://www.mountainviewcounty.com/media/docs/Netook%20North%20Concept%20Plan%20Bylaw.pdf
   Page 13 provides a Land Use Concept

5. Olds – Didsbury Airport & Mountain View County Airpark Area Structure Plan http://www.mountainviewcounty.com/media/docs/ExtractBylawLU2026_06_OldsDidsburyAirportFinal_R01_1.pdf

6. Didsbury East Area Structure Plan http://www.mountainviewcounty.com/media/docs/Bylaw_03-81_East_Didsbury_Area_Structure_Plan.pdf

7. One hazardous location is currently in operation on the CPR railway a few miles south from Carstairs where a shipping depot for propane and other petroleum products is adjacent to the railway at which tank cars often parked. Other than oil and gas facilities identified by the ERCB and the movement of hazardous goods on the highways and railway, no other hazard lands or facilities have been identified within the study area. although depots for Anhydrous Ammonia fertilizer are located throughout the County.

Alberta High Speed Rail Rural Impact Study – Questionnaire for Rocky View County

Organization / Contact: **ROCKY VIEW COUNTY:** Tim Dietzler, Agricultural Fieldman; David Kalinchuk, Economic Development Manager; Byron Riemann, Project Delivery Manager; Linda Ratzlaff, Policy & Land Use Manager
Date : May 20, June 8, June 9, June 17, 2010

General Impressions of High Speed Rail

What do you know about high speed rail? What is your initial reaction to the potential development of high speed rail in the Calgary-Edmonton corridor?

Although there is limited information to review, Rocky View County supports the intent of HSR. We would want to ensure that our organization and Council develop a firm understanding of the proposed routing so that growth areas can still move forward and not be affected by the routing.

Types of Impact

We are trying to catalogue the complete range of possible impacts (negative or positive) on rural communities adjacent to any future HSR development. The figure below presents some potential impacts.

Some Potential Rural Impacts Resulting from HSR

Commercial/Economic	Administrative/Planning	Social/Environmental
• Regional jobs, salaries and implications for commuters • Rural region investment climate • Property values • Sales in impacted communities • Municipal district and county revenues and expenditures • Farm operations and ownership • Truck and rail freight service	• Constraint to municipal growth, transportation corridor and land use planning • Road/highway access planning • Municipal land-use by-laws • Forgone land use opportunities • Uncertainty about long term impact of growth areas	• Safety (crossings) • Noise • Pollution • Traffic delays and forced travel time and routing changes • Landscape • Watercourses • Wildlife mobility • Emergency services access

Do you see any impacts missing from this list?

As an Administrative/Planning impact, we would view the routing and the timing of acquiring the lands as vital information to our landowners. The planning of this type of infrastructure creates sterilization of

the lands. Landowners will still pay applicable taxes on the lands but would not be provided the opportunity to move forward on future opportunities until rail rights-of-way have been selected and purchased.

Magnitude and Distribution of Impacts

Which impacts would you say would be most significant, from your perspective? Why?

Impacts that we would view as most significant:

Severance of farms – machinery movements, livestock movements, additional cost to farmers
Severance of County roads – emergency services, school bussing, travel for rural people
Severance of valleys – east/west valleys drain the county and provide wildlife corridors
Safety
Noise
Constraints on Growth
Sterilization of Lands

How do you think High Speed Rail would be likely to impact the growth and development of your municipality?

We would need to understand and review the routing in comparison to our Growth Management Study to make comments on this question. The Growth Management Strategy (GMS) sets a policy of minimizing land fragmentation. HSR would exacerbate fragmentation.

Land values are highest near the City of Calgary and only somewhat less near Airdrie due to the economic stimulus of the Highway 2 Corridor.

The Airdrie Airport, located within Rocky View County three miles east of Highway 2, is becoming a service centre for charter and smaller regional airlines. There are some discussions with Transport Canada about establishing a larger service centre for jet aircraft and a heliport - with capacity for dirigibles.

Potential Impacts and Constraints on Long Term Planning

How do you think High Speed Rail would be likely to impact your long term plans for growth and development?

To stimulate economic development and a balanced tax base, the County's GMS has several Business Nodes proposed along Highway 2. HSR routing may impact to this anticipated growth.

The County has negotiated with the Cities of Calgary and Airdrie and the Town of Crossfield for annexation of lands to these urban centres over the next few years. The route selected for HSR may disrupt these plans and require additional annextation.

Ensuring HSR Plans Address Rural Needs, Minimize Impacts

What actions should the proponents of high speed rail take to minimize the negative impacts and maximize the positive impacts on your community/operations?

Active Communication Public Understanding Development Understanding

Data

1. Growth Management Strategy: http://www.rockyview.ca/Top_Menu/Contact_Us.aspx then click on Growth Management Strategy. Page 13 provides a plan of the growth corridor along Highway 2.

2. The most advanced of the growth corridors is in the East Balzac area including the Cross Iron Mills regional shopping centre now in full operation. http://www.eastbalzac.ca/index.php?option=com_content&task=view&id=21&Itemid=17

3. Number 2 updates the earlier Area Structure Plan for the area east of Highway 2. http://www.rockyview.ca/LinkClick.aspx?fileticket=z9rgpfPSHSE%3d&tabid=446&mid=858.
Page 8 is the conceptual land use.

4. The area west of Highway 2 is now under construction guided by the Balzac West Area Structure Plan. http://www.rockyview.ca/LinkClick.aspx?fileticket=ssUniwpfIYo%3d&tabid=446&mid=858
Page 20 outlines the policy areas and Page 23 shows the arrangement of these. Page 57 provides a breakdown of the land uses.

5. The Crossfield North Growth Corridor does not yet have a more detailed Area Structure Plan.

6. Other than oil and gas facilities identified by the ERCB and the movement of hazardous goods on the highways and railway, no hazard lands or facilities have been identified within the study area although depots for Anhydrous Ammonia fertilizer are located throughout the County.