February 11, 2016

Capital Region Energy Corridors Master Plan
Executive Summary

The Capital Region Board recently approved a vision statement for the first 5 year update to the Capital Region Growth Plan. Embedded in the vision are two elements at the core of energy corridor planning:

“The Edmonton Metropolitan Region is the dominant hub for northern Alberta”
and
“is globally recognized for its... leadership in energy development”.

If the Edmonton Metropolitan Region is the hub, then the petroleum pipelines and power transmission lines extending into and out of the Region are the spokes which drive the energy industry and the Canadian economy. Energy corridors are the essential networks that maintain the economic viability of the petrochemical energy cluster in Alberta’s Industrial Heartland and continued success of existing refining activities.

Over 40% of Alberta’s GDP is generated in the Edmonton Region. While the current low price of oil may result in a slowing of the economy over the next year or two, the Region is fully aware of the cyclical nature of a boom and bust resource industry. Planning for the next economic boom is critical to ensuring the region remains globally competitive and continues to prosper and thrive. This means planning for the people that are going to come to the Region to take advantage of the opportunities.

Between 2006 and 2011 the population of the Capital Region grew by over 12%, one of the fastest growing areas in Canada, driven mostly by the influx of skilled workers needed by the energy industry. Another 1 million people are expected to make the Capital Region their home in the next 30 years, increasing the population from 1.2 million to 2.2 million.

With the anticipated growth where are these people going to live? Work? Recreate? What is the plan for the efficient use of land? Maintaining a safe and healthy environment? All the while ensuring industry can continue to flourish.

Energy Corridors are needed to provide efficient and cost-effective access into and out of the Region from power and petroleum producing sources. As the ability to move and access power and petroleum products becomes more constrained in the Region, other potential petrochemical hubs such as Hardisty or Northeast British Columbia will become more attractive for related industrial development and economic growth.

The rational planning of energy corridors is also needed to maintain the quality of life of residential and commercial areas of the Region. Land fragmented by energy corridors limits efficient development of Priority Growth Areas and the ability of the Region to meet the objectives of the Growth Plan. However, there is little direction and policy to support the planning or integration of future corridors, energy or otherwise, into the land use fabric of the region.

The Regional Energy Corridors Master Plan establishes a policy framework and regional corridor strategy to protect energy corridors needed for future economic growth, and limit land fragmentation of growth areas in the Capital Region.
Policy Framework

The Policy Framework of the Master Plan is derived from the principles and policies of the Capital Region Growth Plan to support development and economic growth, and minimize land fragmentation. The Policy Framework establishes the following themes:

Policy Themes:
- Integrate energy corridors with the principles and policies of Growth Plan
- Minimize land use conflicts and the fragmentation of land
- Support the development of energy industrial clusters and economic development of the region
- Ensure effective coordination of energy corridors across and between municipal jurisdictions

The themes are used to guide the development of the energy corridor policies.

Corridor Strategy

The Regional Energy Corridors Strategy was developed to identify which corridors, existing and future, should be prioritized and what options are available for their protection. The Strategy sets out four steps for this process:

1. Identify existing regional corridors (e.g. the Transportation Utility Corridor)
2. Assess future corridor needs and options
3. Identify priority corridors
4. Identify approaches and management models to protect lands for priority Regional Energy Corridors

The Strategy identifies seven priority corridors for the CRB to review as part of its future growth planning (see Figures 2.0 and 4.0 in Appendix F):

Short Term – 0 to 5 years

North East Penetrator Corridor – Actions are necessary to increase corridor space and access needed for multiple projects into the Transportation and Utility Corridor (TUC), Refinery Row and Alberta’s Industrial Heartland.

Alberta’s Industrial Heartland Intersite Connector Corridor – An energy corridor(s) within Alberta’s Industrial Heartland to move product to and between the multiple energy facilities within the area.

Heartland East Connector Corridor – An increased focus on prioritizing corridor routing to the east corridor rather than the west corridor to limit land alienation.

Medium Term – 5 to 20 years

Edmonton Energy and Technology Park Connector – An energy corridor from Alberta’s Industrial Heartland to the Edmonton Energy and Technology Park (EETP) and TUC to provide product to EETP and an alternate route to Refinery Row to complement the North East Penetrator Corridor.

Redwater Bypass Corridor – An energy corridor from northeast Alberta to Alberta’s Industrial Heartland on north side of the North Saskatchewan River.
Northwest Alberta Connector – An energy corridor from northwest Alberta and northeast British Columbia to Alberta’s Industrial Heartland.

Long Term – 20 plus years

Southeast Heartland Ring Corridor – A multi-use corridor aligned along the east and south boundary of Alberta’s Industrial Heartland that supports access to all areas of the Heartland.

The Strategy also identifies potential protection options for the priority corridors. The approaches are based on a combination of potential land easement and ownership opportunities ranging from individual right-of-way easements to provincially owned corridors (e.g. TUC) and land use tools ranging from Growth Plan designated corridors to regulatory and/or bylaw tools to manage land uses on and adjacent to regional energy corridors.

Recommendations and Further Actions

The Master Plan establishes recommendations and identifies further actions to plan for the management of regional energy corridors in the Capital Region.

Recommendations

1. That the Capital Region Board endorse the Capital Region Energy Corridors Master Plan, and that its policies be integrated into the Growth Plan through the 2015/16 Growth Plan Update.

2. That the Capital Region Board facilitate the development of common best practices and approaches for the siting, right-of-way design, and protection of energy corridors by member municipalities in discussion with industry, the province and regulators.

3. That the Capital Region Board work with member municipalities to refine the locations and alignments of the Priority Energy Corridors as shown on the Maps of Energy Corridors in Appendix F.

Further Actions

1. That the Capital Region Board support and provide leadership in the development of a Capital Region Energy Corridors Stakeholder Forum. The purpose of the Forum will be to bring together the various stakeholders involved in policy development, regulation, planning, acquisition, infrastructure development, and monitoring of energy corridors in the Capital Region to:
   a. Meet on a periodic basis to review energy corridors and serve as a communications forum.
   b. Identify and facilitate energy corridor protection options for consideration.
   c. Review best practices for energy corridors development.
   d. Maintain an up-to-date map and summary of developed, approved, planned and anticipated energy corridors with a twenty-year outlook.
   e. Invite participation from key stakeholders including, but not limited to:
      i. Pipeline Companies with interests in the Capital Region
      ii. Transmission Line Companies with interests in the Capital Region
      iii. Alberta Industrial Heartland Association
      iv. Alberta Utilities Commission
      v. Alberta Electrical System Operator
      vi. Alberta Energy Regulator
      vii. Alberta Municipal Affairs
viii. Alberta Energy
ix. Alberta Infrastructure
x. Capital Region Board
xi. Capital Region Member Municipalities
dii. Capital Region Water and Wastewater Commissions
xiii. National Energy Board

2. That the Capital Region Board approach the Government of Alberta with a proposal to grant the CRB standing in Alberta Energy Regulator and Alberta Utilities Commission hearings related to the review of energy corridor projects and their routing within the Capital Region. Should standing be granted, the CRB will develop policy to guide intervening in hearings for proposed transmission lines and pipelines that are inconsistent with the Capital Region Growth Plan.

3. That the Capital Region Board seek industry and government support, participation and funding of a business case that defines, assesses and evaluates multi-use corridors versus individual rights-of-ways to support the protection and use of multi-use corridors for energy infrastructure.

4. That the Capital Region Board advocate to the Government of Alberta the coordination and integration of long range regional transportation and energy corridor planning in the Capital Region.

5. That the Capital Region Board request the Alberta Energy Regulator review options and alternatives to more effectively enable energy corridors within the Capital Region, including:
   a. Clarifying AER Directives to:
      i. further influence the use of multi-use energy corridors by pipeline proponents; and,
      ii. consider the level of project review for proponents using identified multi-use energy corridors.
   b. Considering the use of a Play Based Regulation Pilot for planned regional pipeline corridors to encourage applicants to collaborate on surface development plans in order to
      i. minimize the number of facilities and other surface impacts; and,
      ii. ensure that effective practices are used to minimize land alienation.
# Glossary of Terms and Abbreviations

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<tr>
<th>Term</th>
<th>Definition/Description</th>
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<tr>
<td>AER</td>
<td>Alberta Energy Regulator</td>
</tr>
<tr>
<td>AESO</td>
<td>Alberta Electrical System Operator</td>
</tr>
<tr>
<td>AUC</td>
<td>Alberta Utilities Commission</td>
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<tr>
<td>AIH</td>
<td>Alberta’s Industrial Heartland - A 582 km² heavy industrial zoned area northeast of Edmonton that has become the largest hydrocarbon processing region in Canada.</td>
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<td>Capital Region Growth Plan</td>
<td>The Growth Management Plan approved by the CRB and the Province pursuant to the Capital Region Board Regulation (AR 38/2012).</td>
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<tr>
<td>Corridor</td>
<td>Defined in the Growth Plan Addendum as ‘A corridor designed to accommodate multiple infrastructure facilities such as roads, transmission lines and pipelines within and beyond the Region’.</td>
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</table>
| Constraint    | • Physical constraints – constraints related to corridor capacity, or existing development footprint, airports, coal extraction areas  
                  • Policy constraints – growth areas (PGAs, CCRAs, Alberta’s Industrial Heartland), lands outside local jurisdiction (reserves, CFB Edmonton)  
                  • Natural constraints – hydrology, parks, protected areas, environmentally sensitive areas; would result in fragmentation/disturbance |
<p>| CRB           | Capital Region Board – is a non-profit corporation consisting of an elected official from the 24 member municipalities from within the Greater Edmonton Metropolitan Region. |
| Easement      | A right-of-way across land supported by regulatory approvals that grants the owner rights to install and operate their energy facility. |
| LTP           | Long-term Transmission Plan                                                             |
| Heartland Pipeline Corridor | Regionally significant corridors that are identified and protected as conceptual locations of multiple new energy sectors’ inter-connecting and intra-connecting pipelines necessary in conveying product to processors and to the market in Alberta’s Industrial Heartland. These corridors function to minimize risk, land fragmentation and the impact on the environment. |
| NEB           | National Energy Board                                                                  |
| NRCB          | Natural Resources Conservation Board                                                   |
| PGA           | Priority Growth Areas as defined in the Capital Region Growth Plan                     |
| Petroleum Pipeline Infrastructure | Petroleum Pipeline Infrastructure consists of Transmission Pipelines and Feeder Lines that move petroleum across the province and internationally and between storage and processing facilities. |
| Play Based Regulation | Through the play-based regulation initiative (PBR), the AER will be piloting a new framework to govern unconventional oil and gas development. The play-based regulation pilot project aims to encourage applicants to collaborate on surface development plans and participate in the pilot in order to minimize the number of facilities and other surface impacts during the pilot. |</p>
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<th><strong>Power Infrastructure</strong></th>
<th>Power Infrastructure consists of Electricity Transmission lines that provide the bulk transfer of electricity on regional 138, 240 and 500 kV Transmission Corridors and their Substations.</th>
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<td><strong>Protection</strong></td>
<td>A method to influence and/or protect lands for the location of energy corridors</td>
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<td><strong>Refinery Row</strong></td>
<td>The unofficial name given to the concentration of oil refineries in west Sherwood Park, Strathcona County, Alberta, just east of the city of Edmonton.</td>
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<td><strong>Regional Energy Corridor</strong></td>
<td>The identified Multi-Use Corridors for regional Power Infrastructure - Electricity Transmission (138kv and larger) and Bulk System Substations and regional Petroleum Pipeline Infrastructure - Transmission Pipelines and Feeder Lines within and beyond the Region.</td>
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<td><strong>Restricted Development Areas</strong></td>
<td>Restricted Development Areas are defined under regulation to enable the province to establish and maintain Multi-Use Corridors and are known as Transportation Utility Corridors (TUCs).</td>
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<tr>
<td><strong>Right of Way</strong></td>
<td>An easement across land supported by regulatory approvals that grants the owner rights to install and operate their energy facility</td>
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<td><strong>Setback</strong></td>
<td>A setback is the absolute minimum distance that must be maintained between any energy facility (for example, a drilling or producing well, a pipeline, or a gas plant) and a dwelling, rural housing development, urban centre, or public facility. Setbacks vary according to the type of development and whether the well, facility, or pipeline contains sour gas.</td>
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<tr>
<td><strong>TUC</strong></td>
<td>Transportation Utility Corridors - TUCs are Multi-Use Corridors designed for long-term alignment of ring roads and major linear utilities in urban areas. For the purposes of this report TUC refers to the Edmonton TUC.</td>
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1.0 Introduction

The Capital Region Board recently approved a vision statement for the first 5 year update to the Capital Region Growth Plan. Embedded in the vision are two elements at the core of energy corridor planning:

“The Edmonton Metropolitan Region is the dominant hub for northern Alberta”

and

“is globally recognized for its...leadership in energy development”.

If the Edmonton Metropolitan Region is the hub, then the petroleum pipelines and power transmission lines extending into and out of the Region are the spokes which drive the energy industry and the Canadian economy. Energy corridors are the essential networks that maintain the economic viability of the petrochemical energy cluster in Alberta’s Industrial Heartland and continued success of existing refining activities.

Over 40% of Alberta’s GDP is generated in the Edmonton Region. While the current low price of oil may result in a slowing of the economy over the next year or two, the Region is fully aware of the cyclical nature of a boom and bust resource industry. Planning for the next economic boom is critical to ensuring the region remains globally competitive and continues to prosper and thrive. This means planning for the people that are going to come to the Region to take advantage of the opportunities.

Between 2006 and 2011 the population of the Capital Region grew by over 12%, one of the fastest growing areas in Canada, driven mostly by the influx of skilled workers needed by the energy industry. Another 1 million people are expected to make the Capital Region their home in the next 30 years, increasing the population from 1.2 million to 2.2 million.

With the anticipated growth where are these people going to live? Work? Recreate? What is the plan for the efficient use of land? Maintaining a safe and healthy environment? All the while ensuring industry can continue to flourish.

Energy Corridors are needed to provide efficient and cost-effective access into and out of the Region from electrical and petroleum producing sources. As the ability to move and access electrical and petroleum products becomes more constrained in the Region, other potential petrochemical hubs such as Hardisty or Northeast British Columbia will become more attractive for related industrial development and economic growth.

The Capital Region Board Regulation (38/2012) directed the Capital Region Board (CRB) to prepare a comprehensive, integrated regional land use plan. The approved plan includes the location of municipal infrastructure, priority growth areas, and existing corridors for recreation, transportation, and intermunicipal transit. The Plan also identifies a limited number of existing energy and utility corridors within the Capital Region. However, there is little direction and policy to support the planning or integration of future corridors, energy or otherwise, into the land use fabric of the region.

The rational planning of energy corridors is needed to maintain the quality of life of residential and commercial areas of the Region. Land fragmented by energy corridors limits efficient development of Priority Growth Areas and the ability of the Region to meet the objectives of the Growth Plan.
To understand the scope and context of energy corridors, the Land Use and Planning Committee of the CRB undertook the preparation of a Regional Energy Corridors Policy Framework in 2014 to establish the groundwork for developing Growth Plan policies for energy corridors. The Framework concluded that there is a policy gap in the Growth Plan when it comes to energy corridors. The current approach “to identify and protect” existing corridors does not support the planning of future energy corridors, and as a result impacts the coordinated and strategic planning of growth areas.

The Capital Region Regional Energy Corridors Policy Framework Report was approved by the Board in October 2014. The Report contained two recommendations:

1. That the CRB develop a comprehensive master plan to guide the location and development of energy corridors within the Capital Region; and
2. That the CRB leads the development a comprehensive energy corridors advocacy strategy, in partnership with industry stakeholders, to communicate energy corridor issues and challenges in the Capital Region to the Provincial and Federal governments.

The Capital Region Energy Corridors Master Plan establishes a regional corridor strategy and policy framework to protect energy corridors needed for future economic growth, and limit land fragmentation of priority growth areas in the Capital Region. This Master Plan proposes energy corridor policies to guide the location and development of energy corridors within the Capital Region; a regional energy corridors strategy; and recommendations and further actions to implement the Master Plan.

1.1 Organization of the Master Plan

The Master Plan is organized into six sections:

Section 1.0 Introduction – Introduces this report and describes its purpose
Section 2.0 Background and Context – Describes the CRB Energy Corridor Policy Framework and the CRB Growth Plan context for energy corridors
Section 3.0 Energy Corridor Policy Framework – Identifies objectives and policies for the identification and protection of energy corridors within the Capital Region
Section 4.0 Regional Energy Corridor Strategy – Identifies the strategic approach for the identification, assessment and protection of regional energy corridors
Section 5.0 Recommendations and Further Actions – Recommendations and suggested further actions for the Capital Region Board to explore with key stakeholders of energy corridors
Appendices
2.0  Background and Context

2.1  Capital Region Board Mandate

The mandate of the Capital Region Board, as directed in the Capital Region Board Regulation, was to prepare a Capital Region Growth Plan. The Growth Plan was completed and approved in 2010. The mandate further directed the Board to facilitate the resolution of issues arising from the preparation and implementation of the Capital Region Growth Plan. A noticeable issue in the preparation and subsequent implementation of the Growth Plan was the lack of a regional transportation plan and energy corridors plan. Therefore, the CRB made it a priority after approval of the Plan to prepare and integrate a regional transportation master plan into the Growth Plan. Similarly, as the 5 year Growth Plan Update proceeds, it is evident that planning for energy corridors requires the same approach.

2.2  Growth Plan Objectives

The Capital Region Board Regulation states the objectives of the Capital Region Growth Plan:

- To promote an integrated and strategic approach to planning for future growth in the Capital Region
- To identify the overall development pattern and key future infrastructure investments that would best complement existing infrastructure, services and land uses in, and maximize benefits to the Capital Region
- To co-ordinate decisions in the Capital Region to sustain economic growth and ensure strong communities

The objectives clearly support the preparation of a Master Plan for energy corridors: A strategic approach to integrating land use and energy corridors is critical to planning for future growth in the Region; where to direct key infrastructure investments and locate energy corridors will complement and benefit the overall development pattern; and through the coordination and collaboration with key energy industry stakeholders the Board can ensure sustained economic growth and strong communities.

2.3  Growth Plan Principles and Policies

The purpose of the Growth Plan is to coordinate and manage growth to the benefit of the entire Region. The Growth Plan establishes a regional policy framework to integrate and manage growth across four priority areas – Land Use, Intermunicipal Transit, Housing and Geographic Information Services. The Plan’s foundation is based on a set of six guiding principles and numerous policies that support regional decision-making in the priority areas.

The following are the principles of the Capital Region Growth Plan to manage growth:

Protect the environment and resources

The Plan establishes appropriate policy to ensure a balance between resource-based activities and regional growth while minimizing the impacts on the surrounding natural environment and other uses.
Minimize the regional footprint

The Plan directs that lands identified for regional infrastructure such as energy transmission, highways, municipal infrastructure, etc. be protected from incompatible development and that priority growth areas be reviewed and planned in conjunction with new alignments or changes to alignments and/or location of major regional infrastructure.

Strengthen communities

Creating complete, compact and contiguous communities is a foundational objective of the Plan.

Increase transportation choice

Transportation choice is about more than just the movement of people – it is about moving goods and products into, through and out of the region in a variety of ways – pipelines, power lines, rail, air, etc.

Ensure efficient provision of services

One method of ensuring the efficient provision of services is identifying and protecting corridors for transportation, transit and infrastructure, now and in the future.

Support regional economic development

The Plan directs that an adequate supply of land be available for the future development of the Region’s industries and support for the further diversification of the regional economy.

2.4 Regional Energy Corridors Policy Framework

The CRB adopted the Regional Energy Corridors Policy Framework in October 2014 to help guide further work on the planning and integration of energy corridors in the Capital Region.

The Policy Framework called for a comprehensive Master Plan to guide the location and development of energy corridors within the Capital Region. A summary of the overall Policy Framework and recommendations are provided in Appendix A. However, the following specific themes from the policy framework are relevant to the development of an Energy Corridors Master Plan:

“The CRB will plan for energy corridors in the Growth Plan to ensure the needs of industry are supported and sustained”

The energy industry continues to grow in Alberta, and it is important to recognize the role of this sector in the provincial and regional economy. Therefore it is prudent that any planning for growth ensure the needs of industry are understood, acknowledged and sustained into the future, and are not prejudiced by the growth pattern of the Region.

“Growth Plan policies should recognize and seek to address existing and potential barriers to energy corridor development”

The growth of the Region has paralleled the growth of the energy industry. As the development footprint expands, the potential for conflict with the energy infrastructure increases resulting in incompatible development adjacent to pipeline rights-of-way and electrical transmission lines. These conflicts limit the ability of energy corridors to expand and accommodate new energy infrastructure,
requiring the development of costly new rights-of-way and utility corridors, and increase the requirement to establish safety and emergency measures. Further, unchecked energy infrastructure growth also impacts the ability to logically and efficiently extend municipal infrastructure and the overall development pattern.

“Policies in support of energy corridors shall align to the greatest extent possible with the Growth Plan principles and policies”

The principles and policies of the Capital Region Growth Plan are the framework that guides future growth and development in the Capital Region to achieve its vision. The Region has grown around energy infrastructure and will continue to expand together with the energy industry well into the future. Therefore, planning for energy corridors must also abide by the Growth Plan’s principles and policies.

2.5 Growth and Constraints

The population of the Capital Region is expected to grow from 1.2 million to 2.2 million over the next 30 years. To accommodate the growth in population, the Growth Plan has identified Priority Growth Areas (PGAs) wherein growth will be concentrated in order to maximize the use of infrastructure and public transit by incorporating mixed use and higher density development that establishes a growth pattern integrated with and complementary to the needs of communities and industry.

The coordinated approach to planning future energy corridors requires the accommodation of PGAs and an understanding of the constraints to locating power transmission lines and pipelines in the region.

The Regional Energy Corridors Policy Framework identified three types of constraints to the location of energy corridors:

Physical constraints – limited capacity in existing corridors; the existing development footprint; and other features and uses that impact the placement or expansion of corridors such as airports, coal extraction areas, etc.

Policy constraints – includes legislation and regulations that impact the location of corridors, such as designated growth areas in the Growth Plan (PGAs, CCRAs, Alberta’s Industrial Heartland), lands outside of local jurisdiction (reserves, CFB Edmonton), etc.

Natural constraints – hydrology, parks, protected areas, environmentally sensitive areas, etc.

2.6 Future Corridor Development

Future Power Transmission Projects

Electrical transmission growth forecast was based on the 2013 Alberta Electricity System Operator (AESO) Long Term Transmission Plan. AESO forecast nine large (138 kv or larger) transmission lines and three major power substations within the Region over the next twenty years. The geographical start and end points for these projects have been identified (reference Figure 9, CRB Regional Energy Corridors Policy Framework, October 2014).
Future Pipeline Projects

Pipeline project growth forecast was based on the ERCB 2013 Energy Reserves Supply/Demand Outlook and interviews with industry stakeholders. Over the next ten years (2014 – 2024) the Capital Region can anticipate eight to ten additional projects. Ten to twenty years out (2025 – 2034) the Capital Region can anticipate a further four to six projects. Eight of these anticipated projects have been publically announced and are at different stages of design, permitting or preliminary construction. These projects are described in more detail in the 2014 CRB Regional Energy Corridors Policy Framework Report.

2.7 Recent Energy Corridor Planning

The challenge of regional growth and the location of energy corridors is not new, and efforts have been made over the past ten years to address the issue. A number energy corridor planning documents were reviewed through the preparation of the Master Plan, including:

- Edmonton Energy and Technology Park Linear Corridor Feasibility Study (2015)
- Linear Infrastructure Corridor System Proposed Pipeline Corridors (2010)
- Regional Pipeline Corridor and Setback Study (2004)

The above studies provided an understanding of energy corridor needs to accommodate future growth and in context of existing constraints, and develop a policy framework to plan for that growth.

2.8 Municipal Legislative Limitations

Finally, member municipalities have few resources and rights under existing Federal and Provincial legislation to influence the location of corridors and rights-of-way used for the transmission of energy and movement of product in pipelines. They are limited to reacting to proposed corridors by intervening at regulatory hearings and are not the final arbiter of corridor location. The ability of municipalities to plan for, or direct the location of future corridors is restricted to those capabilities under the Municipal Government Act, and due to exemptions provided to pipelines in section 619(1) of the Act which:

- Recognizes NRCB, AER and AUC authorizations over any municipal statutory plan, land use bylaw, subdivision decision or development decision.
- Requires Municipal decisions to be consistent with NRCB, AER and AUC authorizations.
- Restricts municipalities from holding hearings covering issues already decided upon by the NRCB, AER and AUC.
3.0 Policy Framework

The Capital Region Growth Plan provides the current policy framework for energy corridors at the Regional level in an effort to protect growth areas from fragmentation. The Growth Plan provides the basis for an Energy Corridors Master Plan to plan for and protect future corridors.

Using the Growth Plan as a basis to extend policies specific to the Regional Energy Corridors Master Plan, key themes have been derived to guide policy development. They are identified below.

Policy Themes:
- Integrate energy corridors with the principles and policies of Growth Plan
- Minimize land use conflicts and the fragmentation of land
- Support the development of energy industrial clusters and economic development of the region
- Ensure effective coordination of energy corridors across and between municipal jurisdictions

3.1 Integrate Energy Corridors with Capital Region Growth Plan Principles and Policies

Principle 1 Preserve the Integrity of Priority Growth Areas

Preamble
Established by the Growth Plan, Priority Growth Areas (PGAs) are areas of planned concentrated growth within the Region, supported by higher urban densities and land uses, and major employment areas. In order to protect PGAs and major employment areas for growth, existing and future energy corridor needs must be identified and integrated into the Growth Plan.

Policy
A. Identified energy corridors will be integrated into Growth Plan policies and represented graphically.
B. In order to maintain the integrity of PGAs, new energy corridors will be identified and planned to avoid fragmenting and severing the contiguity of growth areas.
C. Existing Energy Corridors within PGAs will be considered first to accommodate additional pipelines or transmissions line rights-of-way in effort to reduce the creation of new corridors within PGAs.

Principle 2 Identify, Protect and Prioritize Lands for Existing and Future Energy Corridors

Preamble
The Growth Plan currently identifies existing regional infrastructure that member municipalities need to protect from incompatible development through their statutory plans; but energy corridors are not specifically addressed, nor is their growth. Future energy corridors must also be identified and protected from incompatible development.

Policy
A. Strategic entry points to access existing regional and future energy corridors shall be identified and protected through Growth Plan policy and through municipal statutory plans.
B. Member municipalities will protect regional energy corridors from incompatible development and facilitate the integration of energy corridors through policy or graphic representation in municipal statutory plans or amendments thereto.

C. Lands for energy corridors in and out of the region shall be identified, protected and prioritized to ensure access to key upstream sources and their product destination sites within and beyond the Region.

3.2 Minimize Land Use Conflicts and Fragmentation of Land

Principle 1 Reduce Land Use Conflicts Associated with Regional Energy Corridors

Preamble
PGAs are the focus for growth in the Capital Region. They are urban areas that consist of a mix of land uses, employment, and higher residential densities. There are increased probabilities of land use conflicts and risks associated with regional energy corridors. In order to reduce the potential for land use conflicts, the Region must strive to utilize existing infrastructure corridors to accommodate energy infrastructure, and they should be located minimally within PGAs, while acknowledging that there are major employment areas located within PGAs.

Growth within the Region is also to be accommodated in areas outside of PGAs. The ability of the Region to reduce land use conflicts is also closely tied to minimizing the fragmentation of growth areas. Co-location of energy infrastructure will reduce land use conflicts by enabling the Region and member municipalities to plan for compatible and complementary adjacent land uses.

Policies
A. Leverage existing regional multi-use corridors (e.g. TUC, NEPC) to address existing constraints and accommodate future energy infrastructure growth.
B. Locate and integrate regional energy infrastructure with existing linear infrastructure (e.g. highways, railway right-of-ways).
C. Identify regional energy corridors in the Growth Plan to enable member municipalities to plan for appropriate adjacent land uses to reduce possible land use conflicts.

Principle 2 Minimize Fragmentation of Growth Areas

Preamble
Fragmented land negatively impacts the ability to achieve Growth Plan principles and the efficient development of land. A considerable number of energy corridors transect the Region and impact the ability to efficiently develop land in the long term. In order to reduce the further fragmentation of growth areas, it is necessary to identify and protect land to address current and future energy corridor needs.

Policies
A. Encourage and advocate for energy sector stakeholders to accommodate energy infrastructure growth within existing and future multi-use corridors. Adjacent lands should be identified and protected to respond to existing constraints and accommodate future growth.
B. Regional energy corridors should:
   - integrate with existing linear infrastructure (e.g. highways, railway right-of-way).
   - be rationalized by demonstrating that the proposed Regional energy corridor:
     - addresses current constraints;
     - responds to future planned growth within the energy sector; and,
     - connects upstream sources, major employment areas within the Region, and markets.
C. Best practices should be developed and used to minimize corridor widths and ensure the efficient use of land within PGAs in order to avoid the severance of developable lands.

3.3 Support the Energy Sector Industrial Clusters and Economic Development of the Region

Principle 1  Support the Role of the Energy Sector in the Prosperity of the Regional Economy

Preamble

The prosperity of the Region and the viability of growth areas are dependent on the energy related industrial clusters throughout the Capital Region. The energy cluster within the AIH is one of the core drivers of the regional and provincial economy. The success of the clusters depends on movement of energy resources into, within, and beyond the Region. This includes those areas illustrated on Figure 1.0: Regional Pipeline Corridors, and Figure 3.0: Regional Power Transmission Corridors.

To support regional prosperity, a strategic and coordinated system of regional energy corridors that responds to existing conditions and anticipates future growth is necessary.

Policies

A. Regional energy corridors will establish connections to existing and future planned upstream sources, national and global energy markets, and major employment areas within the Region.
B. Regional energy corridor needs will be strategically prioritized in order to efficiently meet current and future demands to move upstream goods, and grow and strengthen the Regional economy.
C. The expansion of existing, and the identification of new regional energy corridors, will be supported by a business case that demonstrates the role of regional energy corridors as a key component of the success of the energy sector and the economic prosperity of the Capital Region. The business case will also be used to assist the Capital Region Board in identifying priorities for regional energy corridor growth.

3.4 Ensure Effective Coordination of Energy Corridors Across and Between Jurisdictions

Principle 1  Coordinate Energy Corridor Planning and Development between Jurisdictions

Preamble

In order to maintain and support the energy industry in the Capital Region, member municipalities, energy sector stakeholders, regulators and the Government of Alberta must work collaboratively to coordinate energy corridor activities that benefit the Region.
Policies

A. The Capital Region Board will work collaboratively with the Government of Alberta, member municipalities and energy sector stakeholders to investigate, identify, develop and strategically implement a regional energy corridor management model for the protection and administration of the energy corridors depicted in Figure 2.0: Priority Pipeline Corridors and Figure 4.0: Priority Power Transmission Corridors.

B. That the Capital Region Board work with the Government of Alberta, the Alberta Energy Regulator and the Alberta Utilities Commission to explore, identify, and implement amendments to relevant Acts, Regulations and processes to support the precedent use of regional energy corridors.

C. The Capital Region Board and stakeholders will identify, prioritize, and regularly confirm energy corridors needs to ensure current and future growth can be efficiently accommodated within the Region.

D. Adopt and maintain a CRB Regional Energy Corridors Master Plan strategy that identifies and protects regional energy corridors.
4.0 Regional Energy Corridor Strategy

The Regional Energy Corridors Strategy was developed to identify which corridors, existing and future, should be prioritized and what options are available for their protection. The Strategy sets out four steps for this process:

1. Identify existing regional corridors – the main corridors used now
2. Assess future energy corridor needs and options
   o amongst potential corridor routes within the Region
   o against the principles of the Growth Plan to assess the overall impact of the Region
3. Identify priority corridors
4. Identify protection approaches and models for priority corridors

4.1 Identify Existing Regional Energy Corridors

There are hundreds of existing power and petroleum based rights-of-way and corridors throughout the Capital Region. Many of these are spokes that emanate out of the Transportation Utility Corridor Hub around Edmonton, facilitating the movement of energy goods from outside of the Region into and around Edmonton and Alberta’s Industrial Heartland.

The primary existing Energy Corridors in the Region are depicted on Figure 1.0: Regional Pipeline Corridors and Figure 3.0: Regional Power Transmission Corridors. The Regional Corridors were identified by stakeholders and were selected to show the main corridor routes into and out of the Capital Region. Not all routes are identified. Regional Energy Corridors, Transportation Facilities, and Priority Growth Areas are outlined on Figure 5.0. (All Figures are provided in Appendix F).

Regional Corridors

Currently Defined Multi-Use Corridors:
Transportation Utility Corridor (TUC) – Hosting petroleum and power project access into and around Edmonton.
North East Penetrator Corridor (NEPC) - Hosting (mostly) petroleum and power project access into and from Refinery Row to Alberta’s Industrial Heartland.
Heartland Connector Corridors - Hosting (mostly) petroleum and power project access into and from the NEPC into Alberta’s Industrial Heartland.

Petroleum Pipeline Corridors
Brazeau/Drayton Valley – Shipping products from the Pembina and Drayton Valley fields and others into the refineries and storage facilities in Alberta’s Industrial Heartland.
Hardisty Connectors – Shipping products from refineries and storage facilities in Alberta’s Industrial Heartland to the United States and eastern Canada.
Cold Lake/Southern Athabasca Oilsands/Fort McMurray – Shipping bitumen into the refineries and storage facilities of Alberta’s Industrial Heartland and diluent in return.
Heartland – Fort McMurray - Shipping bitumen into the refineries and storage facilities of Alberta’s Industrial Heartland and diluent in return.
Vancouver – Shipping oil to Vancouver via Jasper from the refineries and storage facilities of Alberta’s Industrial Heartland.
4.2 Assess Priority Corridor Needs and Options

4.2.1 Corridor Needs

Corridor needs were addressed through previous assessments and a review of options with stakeholders. Based on past studies and the Stakeholder Workshop, a preliminary set of priority Regional Energy Corridors were identified.

The overall needs assessment is summarised on Table 1.0.

Other corridors that were identified in previous studies, through stakeholder interviews, and workshops include:

- **Transportation Utility Corridor** - The existing provincial TUC serves to enable large transmission line connections and connect the Leduc, Devon and Pembina oil and gas fields to the petrochemical complexes of Refinery Row and Alberta’s Industrial Heartland.

- **Hardisty Connector** - This corridor currently provides access from the Alberta’s Industrial Heartland to Hardisty north of Elk Island Park, following the Alliance Pipeline east.

- **Hardisty Connector (2)** - This corridor currently provides access from Refinery Row towards Hardisty south of Sherwood Park, paralleling existing Enbridge mainlines.

- **Southeast Heartland Ring Corridor** - This conceptual corridor was identified as a ring coming from the north and extending around the east side of the main Heartland Industrial Area east of Bruderheim and then circling west along the south border of AIH to connect with the Heartland Connectors.

- **Northern Gateway Corridor*** – An energy corridor to accommodate the planned twin pipeline from Alberta’s Industrial Heartland to Kitimat, B.C. (*Note – This corridor was added as a priority based on input received from the Land Use & Planning Committee and was not part of stakeholder discussions)*

- **Fort McMurray West 500kv Transmission Project** - A power transmission line corridor heading directly north from Sunnybrook (Genesee Area) past Barrhead to Fort McMurray is currently under study by ATCO.

- **Fort McMurray East 500kv Transmission Project** - A transmission line corridor heading directly north from the Heartland Transmission Line to Fort McMurray is in the planning stages by AESO.

The priority energy corridors depicted in Figures 2.0 and 4.0 have been evaluated against the Regional Growth Plan Principles. The results are shown in Appendix E.
### Table 1.0: Priority Regional Energy Corridor Needs Assessment

<table>
<thead>
<tr>
<th>Corridor Needs Assessment Summary</th>
<th>North East Penetrator Corridor</th>
<th>Heartland Connector(s)</th>
<th>Southeast Heartland Ring Corridor</th>
<th>AIH Intersite Connector Corridor</th>
<th>Redwater Bypass Corridor</th>
<th>Edmonton Energy and Technology Park Connector</th>
<th>NW Alberta Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address Constraint</strong></td>
<td>Specific land access constraints to access Refinery Row</td>
<td>To focus routing decisions</td>
<td>To route around oil and gas fields west of Bruderheim limit access through area</td>
<td>Multiple projects and facilities need corridor access Key River Crossing location</td>
<td>To route west of Redwater and access across the Sturgeon River</td>
<td>To ship oil, gas and liquids from Swan Hills, Rainbow Lake, Norman Wells etc. to the Heartland</td>
<td></td>
</tr>
<tr>
<td><strong>Project Access</strong></td>
<td>Multiple projects anticipated over next 20 years</td>
<td>Multiple projects anticipated over next 20 years</td>
<td>Multiple projects accessing and connecting facilities</td>
<td>Multiple projects accessing and connecting facilities</td>
<td>To connect the EETP to the Heartland north of the river</td>
<td>From the NW corner of the AIH north and west</td>
<td></td>
</tr>
<tr>
<td><strong>Facilitate Goods Movement</strong></td>
<td>Connecting Refinery Row and Storage facilities</td>
<td>Connecting Refinery Row and Storage facilities</td>
<td>Access into the Industrial Heartland from North-East Alberta</td>
<td>Accessing and connecting facilities within the Heartland</td>
<td>Access into Heartland from Northern Alberta</td>
<td>To connect the EETP to other industrial locations in the Heartland</td>
<td>Access into the Industrial Heartland from North-West Alberta</td>
</tr>
</tbody>
</table>
4.3 Identify Priority Energy Corridors

The identification of Priority Energy Corridors is based on the development of the hydrocarbon cluster in Alberta’s Industrial Heartland and Refinery Row. Priority Energy Corridors are selected to provide energy system access through existing constraint areas and reduce future land fragmentation.

The identified Priority Energy Corridors connect four key industrial areas in the northeast portion of the Capital Region:

1. Refinery Row – East of the North Saskatchewan River
2. Alberta’s Industrial Heartland – East of the North Saskatchewan River
3. Alberta’s Industrial Heartland – West of the North Saskatchewan River
4. Edmonton Energy and Technology Park - West of the North Saskatchewan River

Priority corridors are depicted on Figure 2.0: Priority Pipeline Corridors and Figure 4.0: Priority Power Transmission Corridors and described in Appendix D.

4.3.1 Priority Energy Corridors:

1. **North East Penetrator Corridor** - Connecting Refinery Row and the TUC to Alberta’s Industrial Heartland

2. **Heartland East Connector Corridor** - Connecting the NEPC into AIH following the southern edge of the Canadian Pacific Rail line

3. **Southeast Heartland Ring Corridor** – An energy corridor around the core of Alberta’s Industrial Heartland for raw products coming from the northeast portion of the province

4. **AIH Intersite Connector Corridor** - Connecting into and within the chemical cluster, storage and tank farms of the AIH. This is an internal AIH corridor network

5. **Redwater Bypass Corridor** - To provide access into the northern border of Sturgeon County into and out of the AIH on the west side of the North Saskatchewan River

6. **Edmonton Energy and Technology Park (EETP) Connector** - Connecting the EETP in northeast Edmonton to Alberta’s Industrial Heartland.

7. **Northwest Alberta Connector** – Shipping petroleum products from the Swan Hills, Rainbow Lake, Norman Wells fields and others in northwest Alberta to the Capital Region.

Of the seven identified corridors above, one project, a 240kv transmission line from Clover Bar to a new substation between Sherwood Park and Fort Saskatchewan has been identified by the AESO that follow similar routing along the NEPC Corridor. There are six other planned transmission lines/ sub-stations (see 2014 Capital Region Regional Energy Corridors Policy Framework). There are recognised co-location issues associated with pipelines and transmission lines. The utility of these corridors and potential integration of them needs to be reviewed with the electricity industry.
4.3.2 Corridor Timing

Through stakeholder interviews, review of previous energy corridor planning reports, and stakeholder workshops, timing for the development of priority corridors was considered. They are identified below:

**Short Term – 0 to 5 years**

- **North East Penetrator Corridor** – Actions are necessary to increase corridor space and access needed for multiple projects into the Transportation and Utility Corridor (TUC), Refinery Row and Alberta’s Industrial Heartland.

- **Alberta’s Industrial Heartland Intersite Connector Corridor** – An energy corridor(s) within Alberta’s Industrial Heartland to move product to and between the multiple energy facilities within the area.

- **Heartland East Connector Corridor** – An increased focus on prioritizing corridor routing to the east corridor rather than the west corridor to limit land alienation.

**Medium Term – 5 to 20 years**

- **Edmonton Energy and Technology Park Connector** – An energy corridor from Alberta’s Industrial Heartland to the Edmonton Energy and Technology Park (EETP) and TUC to provide product to EETP and an alternate route to Refinery Row to complement the North East Penetrator Corridor.

- **Redwater Bypass Corridor** – An energy corridor from northeast Alberta to Alberta’s Industrial Heartland on north side of the North Saskatchewan River.

- **Northwest Alberta Connector** - An energy corridor from northwest Alberta and northeast British Columbia to Alberta’s Industrial Heartland.

**Long Term – 20 plus years**

- **Southeast Heartland Ring Corridor** - A multi-use corridor aligned along the east and south boundary of Alberta’s Industrial Heartland that supports access to all areas of the Heartland.

4.4 Priority Corridor Protection Approaches and Strategy

Priority energy corridors can be protected using a range of regulatory and ownership tools. However, there is no one size fits all approach or model. Most projects currently use a variety of approaches to secure tenure along the length of its route as it moves through different jurisdictions, land ownership and landscapes. These will be represented through different corridor models over the length of the project. For example, a pipeline may use part of the TUC, a single right-of-way, and/or run parallel to other energy infrastructure to create an unofficial common corridor.

A corridor can be protected using a range of land use policy and ownership tools to influence how and where projects are located. Protection can include a combination of tools ranging from simple identification (map notation) to outright ownership (TUC). Municipal statutory plans and permits may provide some limited influence over corridors. However, municipal plans must comply with AER, AUC, AEUB and NRCB authorizations (Section 619, Municipal Government Act).

A summary of the current protection status of the priority energy corridors is provided in Appendix D.
4.4.1 Corridor Protection Approaches

The following types of approaches would most likely be used in combination to protect Priority Corridors:

**Land Easement/ Ownership**

- **Private Single Proponent Right-of-Way** – An easement supported by regulatory approvals that grants a single proponent development rights for their energy facility. (e.g. Transcanada Grand Rapids pipeline or AltaLink Heartland Transmission line north of the TUC.)

- **Private Common Corridor** – An easement supported by regulatory approvals that grants adjacent individual proponent development rights for their energy facilities. Current regulations recommend the development of corridors along existing corridors. (e.g. Pipeline Alley).

- **Municipal (Publicly Owned) Corridor** – Municipal land ownership of a corridor specifically to secure access (ie. Sturgeon County corridor in AIH). The City of Edmonton is currently considering this as one option to connect Alberta’s Industrial Heartland and the Edmonton Energy and Technology Park.

- **Provincial (Publically Owned) Corridor** – Provincial land ownership of a corridor specifically to secure access. Land protected by Restricted Development Area Regulation (e.g. Provincial Transportation Utility Corridors).

- **Options to Purchase** – Future options to purchase lands/easements on routes for corridors.

- **Special Purpose (Multiple private and public owners) Corridor** – A combination of private and public interests establishing a special purpose corporation for the securing of land for corridor access. There are no current examples in the Region - this is one option under consideration within the EETP.

**Land Use Tools**

- **Growth Plan Designated Corridor** – A policy statement and/or map designation without land use zoning protection.

- **Regulatory Protected Corridor** – A provincial regulation that limits land use such as the existing Restricted Development Area Regulation, which is used to regulate land uses within the TUC.

- **Bylaw Protected Corridor** – A specific municipal bylaw that assigns land use regulation through land use or zoning bylaws to protects land for energy corridor use.

- **Complementary Highway Alignment** – Integrate transportation and energy corridor planning and alignments.

- **Statutory Tools** – Recommend amendments to provincial acts and regulations to implement tools to protect and facilitate energy corridors such as easement tax, trade-offs and incentive options.

- **Corridor Right-of-Way Widths and Setbacks** – adjust land required for rights-of-way to incorporate future linear projects within existing rights-of-way.
4.4.2 Preferred Corridor Protection Strategy

A preferred corridor protection strategy will need to be developed for each priority corridor. The strategy will depend on the location and types of constraints that each corridor faces. There are many policy and ownership roles that different stakeholders play with every energy corridor.

A review of potential protection options was undertaken by stakeholder workshop participants. Feedback from stakeholders is outlined on Table 2.0: Corridor Protection Options, detailing potential methods and relative stakeholder preferences to protect each corridor.

**Table 2.0: Stakeholder Workshop Corridor Protection Options Feedback**

**Ranking Method and Summary Discussion**

- Protection Options were ranked as participants were asked to identify their top three protection options for each potential corridor option.
- Protection Options were scored with a simple formula: 1st choice = 3 points, 2nd choice = 2 points, 3rd choice = 1 point.
- The ranked results were tabulated and then colour coded to show differentiation using the coding table to the left.
- The darker colours show the preferred protection options for each corridor.

<table>
<thead>
<tr>
<th>Protection Option</th>
<th>NEPC</th>
<th>Heartland Connector Corridors</th>
<th>Southeast Heartland Ring</th>
<th>AIH Intersite Connector</th>
<th>Redwater Bypass</th>
<th>EEIP</th>
<th>NW Alberta Connector</th>
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<td>Growth Plan Identified Corridor</td>
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<td>8</td>
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<td>8</td>
<td>7</td>
<td>5</td>
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<td>6</td>
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<td>Special Purpose Corridor</td>
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<td>Regulation Protected Corridor (RDA model)</td>
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<td>Options to Purchase Rights</td>
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<td>3</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
5.0 **Recommendation and Further Actions**

5.1 **Recommendations**

The following recommendations have been identified within the mandate of the Capital Region Board:

1. That the Capital Region Board endorse the Capital Region Energy Corridors Master Plan, and that its policies be integrated into the Growth Plan through the 2015/16 Growth Plan Update.

2. That the Capital Region Board facilitate the development of common best practices and approaches for the siting, right-of-way design, and protection of energy corridors by member municipalities in discussion with industry, the province and regulators.

3. That the Capital Region Board work with member municipalities to refine the locations and alignments of the Priority Energy Corridors as shown on the Maps of Energy Corridors in Appendix F.

5.2 **Further Actions**

The following further actions have been identified by stakeholders throughout the process of the CRB Regional Energy Corridors Master Plan for future individual and/or collective action:

1. That the Capital Region Board support and provide leadership in the development of a Capital Region Energy Corridors Stakeholder Forum. The purpose of the Forum will be to bring together the various stakeholders involved in policy development, regulation, planning, acquisition, infrastructure development, and monitoring of energy corridors in the Capital Region to:
   a. Meet on a periodic basis to review energy corridors and serve as a communications forum.
   b. Identify and facilitate energy corridor protection options for consideration.
   c. Review best practices for energy corridor development.
   d. Maintain an up-to-date map and summary of developed, approved, planned and anticipated energy corridors with a twenty-year outlook.
   e. Invite participation from key stakeholders including, but not limited to:
      i. Pipeline Companies with interests in the Capital Region
      ii. Transmission Line Companies with interests in the Capital Region
      iii. Alberta Industrial Heartland Association
      iv. Alberta Utilities Commission
      v. Alberta Electrical System Operator
      vi. Alberta Energy Regulator
      vii. Alberta Municipal Affairs
      viii. Alberta Energy
      ix. Alberta Infrastructure
      x. Capital Region Board
      xi. Capital Region Member Municipalities
      xii. Capital Region Water and Wastewater Commissions
      xiii. National Energy Board
2. That the Capital Region Board approach the Government of Alberta with a proposal to grant the CRB standing in Alberta Energy Regulator and Alberta Utilities Commission hearings related to the development of new energy corridors within the Capital Region. Should standing be granted, the CRB will develop policy to guide intervening in hearings for proposed transmission lines and pipelines that are inconsistent with the Capital Region Growth Plan.

3. That the Capital Region Board seek industry and government support, participation and funding of a business case that defines, assesses and evaluates multi-use corridors versus single purpose corridors to support the protection and use of multi-use corridors for energy infrastructure.

4. That the Capital Region Board advocate to the Government of Alberta the coordination and integration of long range regional transportation and energy corridor planning in the Capital Region.

5. That the Capital Region Board request the Alberta Energy Regulator review options and alternatives to more effectively enable energy corridors within the Capital Region, including:
   c. Clarifying AER Directives to:
      i. further influence the use of multi-use energy corridors by pipeline proponents; and,
      ii. consider the level of project review for proponents using identified multi-use energy corridors.
   d. Considering the use of a Play Based Regulation Pilot for planned regional pipeline corridors to encourage applicants to collaborate on surface development plans in order to
      i. minimize the number of facilities and other surface impacts; and,
      ii. ensure that effective practices are used to minimize land alienation.
6.0 Appendices
# Appendix A Stakeholders and Workshop Participants

<table>
<thead>
<tr>
<th>Organization</th>
<th>Contact Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provincial</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alberta Infrastructure</td>
<td>Lyle Markovich</td>
<td>Director, Land Planning</td>
</tr>
<tr>
<td></td>
<td>Brian DeJong</td>
<td>Manager, Land Planning</td>
</tr>
<tr>
<td>Treasury Board Oil Sands Secretariat</td>
<td>Gary Haynes</td>
<td>Director, Community and Regional Planning</td>
</tr>
<tr>
<td></td>
<td>Patricia Hoyland</td>
<td>Policy Analyst</td>
</tr>
<tr>
<td>Alberta Transportation</td>
<td>Shaun Hammond</td>
<td>AOM Safety, Policy and Engineering</td>
</tr>
<tr>
<td>Municipal Affairs</td>
<td>Gary Sandberg</td>
<td>AOM Municipal Services and Legislation</td>
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<tr>
<td></td>
<td>Victoria Brown</td>
<td>Manager, Planning</td>
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<tr>
<td><strong>Regional</strong></td>
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<tr>
<td>Capital Region Board</td>
<td>Neal Samecki</td>
<td>Manager Regional Projects</td>
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<td></td>
<td>Stephanie Chai</td>
<td>Regional Planner</td>
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<td><strong>Municipalities</strong></td>
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<tr>
<td>City of Edmonton</td>
<td>Rick Sloan</td>
<td>Senior Policy Advisor, Office of the General Manager, Sustainable Development</td>
</tr>
<tr>
<td></td>
<td>Kate Gibson</td>
<td>Senior Consultant, Office of the General Manager, Sustainable Development</td>
</tr>
<tr>
<td></td>
<td>Kunal Sharma</td>
<td>Strategic Initiatives Coordinator, Business Strategy and Operations</td>
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<tr>
<td></td>
<td>Kelly Greenland</td>
<td>Principal Planner</td>
</tr>
<tr>
<td></td>
<td>Ken Mamczasz</td>
<td>Senior Development Engineer</td>
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<tr>
<td></td>
<td>Ian Morrison</td>
<td>Consultant, Senior Principal at Stantec</td>
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<td>Strathcona County</td>
<td>Gerry Gabinet</td>
<td>Director Economic Development</td>
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<td></td>
<td>Lori Mills</td>
<td>Energy Exploration Liaison</td>
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<td>Sturgeon County</td>
<td>Jordan Rumohr</td>
<td>Economic Development Officer</td>
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<td>Lamont County</td>
<td>Jim Newman</td>
<td>Economic Development Officer</td>
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<td>Parkland County</td>
<td>Paul Hanlan</td>
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<td>Leduc County</td>
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<td>Bill Strongman</td>
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</tr>
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<tr>
<td>Alberta Energy Regulator</td>
<td>Mark Taylor</td>
<td>Vice President, Industry Operations</td>
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<td>Maria Skog</td>
<td>Manager, Enforcement and Surveillance</td>
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<td>Director, Pipeline Sector</td>
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<td><strong>Industry Associations</strong></td>
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<tr>
<td>Alberta Industrial Heartland Association</td>
<td>Neil Shelly</td>
<td>Executive Director</td>
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<tr>
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<td>Garret Matteotti</td>
<td>Business Development Manager</td>
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<td>TransCanada Pipelines</td>
<td>Scott Clark</td>
<td>Capital Projects Land Manager</td>
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<td></td>
<td>Ryan Gugygalka</td>
<td>Sr Land Representative</td>
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<tr>
<td>Enbridge Pipelines Inc.</td>
<td>Brent Kaup</td>
<td>Sr. Manager, Land Services</td>
</tr>
<tr>
<td></td>
<td>Kara Schwebe</td>
<td>Sr Land and ROW Planner</td>
</tr>
<tr>
<td></td>
<td>Theresa Doolittle</td>
<td>Team Lead, Crossings</td>
</tr>
<tr>
<td>Keyera Energy</td>
<td>Jason Johnson</td>
<td>Commercial Manager</td>
</tr>
<tr>
<td>InterPipline Fund</td>
<td>Michelle Dawson</td>
<td>Director of Regulatory Affairs</td>
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<tr>
<td>Plains Midstream</td>
<td>Manuel Perez</td>
<td>Senior Project Engineer</td>
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<td></td>
<td>John Schwarz</td>
<td>Surface Landman</td>
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<tr>
<td>Access Pipelines</td>
<td>Michelle Wright</td>
<td>Director, HSE and Regulatory</td>
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<tr>
<td>Kinder Morgan</td>
<td></td>
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<td>Phoenix Land</td>
<td>Terry Jewel</td>
<td>President Phoenix Land</td>
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<td>AltaLink</td>
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<td>Britney Wickham</td>
<td>Right-of-Way Planner</td>
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<td>Ian Johnstone</td>
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<td>Phoenix Land</td>
<td>Terry Jewel</td>
<td>President Phoenix Land</td>
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<tr>
<td>Progress Land</td>
<td>Elliott Fredrichs</td>
<td>General Manager Progress Land</td>
</tr>
</tbody>
</table>
Appendix B  References

Note – All weblinks accessed March through June 2015.


ERCB Calgary, Alberta.  

Chapter 10.0: Pipelines.  


Scenarios to Strategy (2007) Alberta’s Industrial Heartland Corridors for Linear Infrastructure Stakeholders Infrastructure Priorities. 
http://www.municipalaffairs.alberta.ca/documents/CRIGMP_Core_Infrastructure_November_2007_Appendix_B.pdf

Stantec (2004) AIHA Regional Pipeline Corridor and Setback Study.  

Stewart Weir (2010) Linear Infrastructure Corridor (LIC) System Proposed Pipeline Corridors.
Appendix C  CRB Energy Corridors Policy Framework

The CRB Energy Corridors Policy Framework commitments are outlined below.

Policy Framework

- The CRB is committed to securing economic growth that creates jobs and prosperity for the Region.
- The CRB recognizes that power transmission lines and petroleum pipelines are vital infrastructure necessary to support sustainable growth and enable the Region to compete globally.
- Growth management planning by the CRB and within the Region should operate to encourage and facilitate, and not act as an impediment to, energy corridors.
- Regional planning of energy corridors shall ensure compatibility of land uses and minimize the impact on municipal growth.
- The CRB will plan for energy corridors in the Growth Plan to ensure the needs of industry are supported and sustained.
- Growth Plan policies should recognize and seek to address existing and potential barriers to energy corridor development.
- Policies in support of energy corridors shall align to the greatest extent possible with the Growth Plan principles and policies.
- The CRB will actively promote collaboration between members, industry and the province to facilitate and prioritize the location of future energy corridors within the Capital Region.

Recommendations

- Planning - That the CRB develop a comprehensive master plan to guide the location and development of energy corridors within the Capital Region.
- Advocacy - That the CRB leads the development a comprehensive energy corridors advocacy strategy, in partnership with industry stakeholders, to communicate energy corridor issues and challenges in the Capital Region to the Provincial and Federal governments.
## Appendix D  Priority Energy Corridor Descriptions

<table>
<thead>
<tr>
<th>1.0</th>
<th>North East Penetrator Corridor (NEPC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor</td>
<td>Connecting Refinery Row and the Transportation Utility Corridor (TUC) to Alberta’s Industrial Heartland (AIH)</td>
</tr>
</tbody>
</table>
| Purpose | - To provide access for raw, refined and finished products in the Refinery Row refineries, tank farms and plant sites to and from the AIH, Athabasca Oilsands and Cold Lake areas of Alberta  
- To provide access from the AIH to the chemical developments in the Joffre area of the province  
- To feed export lines in from storage in the Enbridge and Kinder Morgan pipeline systems |
| Constraints/Design Considerations | - Light/medium industrial development north of highway 16  
- Potential future developments in the Bremner/Cambrian areas  
- Limited capacity within the NEPC  
- Georgia Pacific plant site adjacent to Highway 16  
- Natural/environmental constraints including Oldman Creek  
- Alignment of 130th Avenue |
| Protection Status and Options | - NEPC is partially protected by provincial government crown land ownership  
- Existing linear right of ways will influence future development applications along corridor  
- Strathcona County MDP  
  o Bremner has been identified as a possible constraint to the expansion of the corridor, however, no development is contemplated in the MDP. Development is proposed in the area immediately west of Highway 21, Cambrian Crossing.  
  o Policy 7.24 – requires new pipelines or utilities to follow existing corridors, quarter sections or rights of way, in accordance with Map 2;  
  o Policy 7.25 – ensure that new or expanded pipelines or utility corridors do not impact high or medium priority environment management areas, wherever possible;  
  o Policy 16.2 – work with surrounding municipalities and utility companies to ensure integrated utility corridors are created and maintained;  
  o Policy 16.3 – support the rationalization and development of pipeline/utility corridors in consultation with industry, utility companies, federal, provincial and municipal governments;  
  o Policy 16.4 – Use pipeline/utility corridors as multiple use corridors to accommodate oil, natural gas, municipal utilities, electrical transmission lines, communications infrastructure, and pedestrian linkages;  
  o Policy 16.4(a) – encourage that regional corridors and infrastructure as identified in the Capital Region Growth Plan will be integrated into |
<table>
<thead>
<tr>
<th>1.0</th>
<th><strong>North East Penetrator Corridor (NEPC)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>common corridors wherever possible in order to protect these lands for their intended purpose.</td>
</tr>
<tr>
<td></td>
<td><strong>Edmonton MDP</strong></td>
</tr>
<tr>
<td></td>
<td>o Policy 8.1.6.4 – plan for regional corridors for transportation, utilities and pipelines within the context of the Capital Region Growth Plan (see map 16);</td>
</tr>
<tr>
<td></td>
<td>o Policy 9.3.1.3 – collaborate with Edmonton Area Pipeline and Utility Operators Committee (EAPUOC), Energy and Resources Conservation Board (ERCB), other jurisdictions and other industry operators as they plan and maintain pipeline corridors;</td>
</tr>
<tr>
<td></td>
<td>o Policy 9.3.1.5 – Plan pipelines in corridors with other utilities where possible.</td>
</tr>
</tbody>
</table>
### Heartland Connectors

**Corridor**

Connecting the NEPC into the AIH along two parallel Heartland Connector corridors:
- Heartland West – Connecting the NEPC to the SE corner of Fort Saskatchewan
- Heartland East – Following the southern edge of the CP Rail line north-east

**Purpose**

- To provide access for raw, refined and finished products to the NEPC and Refinery Row from the AIH linking Athabasca Oilsands and Cold Lake areas of Alberta
- To provide access to and from the NEPC to the AIH and to the chemical developments in the Joffre area of the province
- To feed export lines from the NEPC to the Enbridge and Kinder Morgan pipeline systems

**Constraints/Design Considerations**

- Capacity of existing corridors/linear disturbances to facilitate additional pipelines
- Potential future growth node for Sherwood Park adjacent to Highway 21
- Minimizing new routes on existing farm and acreages
- Impact on development in Fort Saskatchewan

**Protection Status and Options**

- Two main corridors supported by existing right of ways
- Existing linear right of ways will influence future development applications along corridors
- Strathcona County MDP
  - Policy 7.24 – requires new pipelines or utilities to follow existing corridors, quarter sections or rights of way, in accordance with Map 2;
  - Policy 7.25 – ensure that new or expanded pipelines or utility corridors do not impact high or medium priority environment management areas, wherever possible;
  - Policy 16.2 – work with surrounding municipalities and utility companies to ensure integrated utility corridors are created and maintained;
  - Policy 16.3 – support the rationalization and development of pipeline/utility corridors in consultation with industry, utility companies, federal, provincial and municipal governments;
  - Policy 16.4 – Use pipeline/utility corridors as multiple use corridors to accommodate oil, natural gas, municipal utilities, electrical transmission lines, communications infrastructure, and pedestrian linkages;
  - Policy 16.4(a) – encourage that regional corridors and infrastructure as identified in the Capital Region Growth Plan will be integrated into common corridors wherever possible in order to protect these lands for their intended purpose.
- Fort Saskatchewan MDP
  - No policies protecting a corridor within the MDP.
### 3.0 Southeast Heartland Ring Corridor

**Corridor**
A by-pass access around the core of the AIH area for raw products coming from the NE portion of the province

**Purpose**
- To provide access into the AIH for major pipelines in NE Alberta
- To bypass industrial activities in the AIH and access Refinery Row
- To connect to the Heartland Corridors

**Constraints/Design Considerations**
- To develop an economic and effective alignment into the AIH
- To find routes around existing oil and gas wells and gathering lines south and west of the Town of Bruderheim
- To find a suitable crossing of Beaverhill Creek
- To minimize disturbances and impact on alienation of farm land

**Protection Status and Options**
- Existing linear right of ways will influence future development applications along corridor
- Strathcona County MDP
  - Policy 7.24 – requires new pipelines or utilities to follow existing corridors, quarter sections or rights of way, in accordance with Map 2;
  - Policy 7.25 – ensure that new or expanded pipelines or utility corridors do not impact high or medium priority environment management areas, wherever possible;
  - Policy 16.2 – work with surrounding municipalities and utility companies to ensure integrated utility corridors are created and maintained;
  - Policy 16.3 – support the rationalization and development of pipeline/utility corridors in consultation with industry, utility companies, federal, provincial and municipal governments;
  - Policy 16.4 – Use pipeline/utility corridors as multiple use corridors to accommodate oil, natural gas, municipal utilities, electrical transmission lines, communications infrastructure, and pedestrian linkages;
  - Policy 16.4(a) – encourage that regional corridors and infrastructure as identified in the Capital Region Growth Plan will be integrated into common corridors wherever possible in order to protect these lands for their intended purpose.
- Lamont County MDP
  - Policy 10.8(d) – use corridors to integrate a number of utilities;
  - Policy 10.13 – when planning for future residential development in the areas near pipelines and powerlines, the County will require rights-of-way to contain sufficient width to ensure adequate buffers or setbacks between the proposed residential development and adjoining uses.
## 4.0 AIH Intersite Connector

<table>
<thead>
<tr>
<th><strong>Corridor</strong></th>
<th>Connecting into and within the chemical cluster, storage and tank farms of the AIH. This is an internal AIH corridor network</th>
</tr>
</thead>
</table>

### Purpose

- To provide external access to the AIH to connect to key points
  - East to connect to the NE pipeline corridors from the Oilsands and Cold Lake
  - Access through to the Suncor/ Fort Hills lands and the EETP
  - South to connect to the Heartland Connector
- To provide a main internal access corridor within the AIH

### Constraints/Design Considerations

- Working around existing oil and gas operations (East of river)
- Impact on Silica Sand operations – north of Bruderheim
- Future space to twin Highway 643
- North Saskatchewan River Crossing
- Access through existing industrial developments

### Protection Status and Options

- Existing linear right of ways will influence future development applications along corridor
- Strathcona County MDP
  - Policy 7.24 – requires new pipelines or utilities to follow existing corridors, quarter sections or rights of way, in accordance with Map 2;
  - Policy 7.25 – ensure that new or expanded pipelines or utility corridors do not impact high or medium priority environment management areas, wherever possible;
  - Policy 16.2 – work with surrounding municipalities and utility companies to ensure integrated utility corridors are created and maintained;
  - Policy 16.3 – support the rationalization and development of pipeline/utility corridors in consultation with industry, utility companies, federal, provincial and municipal governments;
  - Policy 16.4 – Use pipeline/utility corridors as multiple use corridors to accommodate oil, natural gas, municipal utilities, electrical transmission lines, communications infrastructure, and pedestrian linkages;
  - Policy 16.4(a) – encourage that regional corridors and infrastructure as identified in the Capital Region Growth Plan will be integrated into common corridors wherever possible in order to protect these lands for their intended purpose.
### 5.0 Redwater Bypass

<table>
<thead>
<tr>
<th>Corridor</th>
<th>To provide access into the northern border of Sturgeon County into and out of the Heartland on the west side of the North Saskatchewan River</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>• Providing access into the AIH, connecting north east Alberta, the Suncor/Fort Hills lands into the AIH and the EETP</td>
</tr>
</tbody>
</table>
| Constraints/Design Considerations | • Determining around the Redwater oil and gas fields  
• Redwater River crossing  
• Land alienation impact southeast of the Redwater Town site |
| Protection Status and Options | • Existing linear right of ways will influence future development applications along corridor  
• Strathcona County MDP  
  o Bremner has been identified as a possible constraint to the expansion of the corridor, however, it is believed that the possible constraint may be in the proposed Cambrian development to the west. An amendment is currently being reviewed by the County that would increase the population in this area from 10,000 to 13,500;  
  o Policy 7.24 – requires new pipelines or utilities to follow existing corridors, quarter sections or rights of way, in accordance with Map 2;  
  o Policy 7.25 – ensure that new or expanded pipelines or utility corridors do not impact high or medium priority environment management areas, wherever possible;  
  o Policy 16.2 – work with surrounding municipalities and utility companies to ensure integrated utility corridors are created and maintained;  
  o Policy 16.3 – support the rationalization and development of pipeline/utility corridors in consultation with industry, utility companies, federal, provincial and municipal governments;  
  o Policy 16.4 – Use pipeline/utility corridors as multiple use corridors to accommodate oil, natural gas, municipal utilities, electrical transmission lines, communications infrastructure, and pedestrian linkages;  
  o Policy 16.4(a) – encourage that regional corridors and infrastructure as identified in the Capital Region Growth Plan will be integrated into common corridors wherever possible in order to protect these lands for their intended purpose.  
• Sturgeon County MDP  
  o Policy 5.4.9 – should identify utility corridors that promote efficient use of land and that maximize development potential;  
  o Policy J.5(d) – working with the Province, the Energy Resources Conservation Board and regional partners to formulate a consolidated pipeline plan for locating new pipeline right-of-ways in the AIH region. |
<table>
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<th>6.0</th>
<th><strong>EETP Connector</strong></th>
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<td><strong>Corridor</strong></td>
<td>Connecting the EETP in NE Edmonton to the NW corner of the AIH</td>
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<tr>
<td><strong>Purpose</strong></td>
<td>• To link the EETP into the AIH</td>
</tr>
<tr>
<td><strong>Constraints/Design Considerations</strong></td>
<td>• Identification of connection to the AIH west of the North Saskatchewan River</td>
</tr>
<tr>
<td></td>
<td>• Topography of Sturgeon valley and river</td>
</tr>
<tr>
<td></td>
<td>• Future location of petrochemical facilities within the AIH</td>
</tr>
<tr>
<td><strong>Protection Status and Options</strong></td>
<td>• Corridor supported by existing Pembina ROW into NW corner of the EETP</td>
</tr>
<tr>
<td></td>
<td>• Existing linear right of ways will influence future development applications along corridor</td>
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</table>

<table>
<thead>
<tr>
<th>7.0</th>
<th><strong>Northwest Alberta Connector</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corridor</strong></td>
<td>Shipping oil, gas and natural gas lines from the Swan Hills, Rainbow Lake, Norman Wells fields and others.</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>• To link NW Alberta and NE BC into the AIH</td>
</tr>
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<td><strong>Constraints/Design Considerations</strong></td>
<td>• Identification of connection to the AIH west of the North Saskatchewan River</td>
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<td>• Future location of facilities within the AIH</td>
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<tr>
<td><strong>Protection Status and Options</strong></td>
<td>• Existing linear right of ways will influence future development applications along corridor</td>
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# Appendix E  Priority Energy Corridors - Growth Plan Land Use Principles and Policies Review

## Legend

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<tr>
<td>1</td>
<td>High</td>
<td>Corridor has a high level of consistence with Growth Plan Policies</td>
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<tr>
<td>2</td>
<td>Medium</td>
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<tr>
<td>3</td>
<td>Low</td>
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</table>

## Core Principle I: Protect the Environment and Resources

### Principle 1: Preserve and Protect the Environment

- **NEPC Heartland Connectors**: One creek crossing, potential North Saskatchewan river crossing (2)
- **Heartland Ring Corridor**: Three creek crossings (2)
- **Southeast Heartland Connectors**: One creek crossing (2)
- **AIH Intersite Connectors**: Three creek crossings (2)
- **Redwater Bypass**: Sturgeon River crossing (1)
- **EETP Connector**: 2
- **Northwest Alberta Connector**: 1

### Principle 2: Preserve Agricultural Lands

- **NEPC Heartland Connectors**: 3
- **Heartland Ring Corridor**: 3
- **Southeast Heartland Connectors**: 2
- **AIH Intersite Connectors**: 1
- **Redwater Bypass**: 3
- **EETP Connector**: 2
- **Northwest Alberta Connector**: 2

### Principle 3: Minimize the Impact of Heavy Industrial Developments

- **NEPC Heartland Connectors**: Only corridor outside of AIH (1)
- **Heartland Ring Corridor**: Will fragment heavy industrial land, but purpose is to serve industry in AIH (2)
- **Southeast Heartland Connectors**: Will fragment heavy industrial land, but purpose is to serve industry in AIH (2)
- **AIH Intersite Connectors**: Will fragment heavy industrial land, but purpose is to serve industry AIH (2)
- **Redwater Bypass**: Will fragment heavy industrial land, but purpose is to serve industry in AIH (2)
- **EETP Connector**: Will fragment heavy industrial land, but purpose is to serve industry in AIH (2)
- **Northwest Alberta Connector**: 1
Core Principle II: Minimize Regional Footprint

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<tr>
<td></td>
<td>NEPC</td>
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<tr>
<td>a. Identify, Protect and Prioritize Lands for Regional Infrastructure</td>
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</tr>
<tr>
<td>b. Concentrate New Growth Within Priority Growth Areas</td>
<td>3</td>
</tr>
<tr>
<td>Concentrate New Growth Within Priority Growth Areas</td>
<td>3</td>
</tr>
<tr>
<td>c. Allow Growth Outside of Priority Growth Areas</td>
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</tr>
<tr>
<td>Allow Growth Outside of Priority Growth Areas</td>
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### Core Principle V: Ensure Efficient Provision of Services

**Consistency with Growth Plan Policies**

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<th>Heartland Connectors</th>
<th>Southeast Heartland Ring Corridor</th>
<th>AIH Intersite Connectors</th>
<th>Redwater Bypass</th>
<th>EETP Connector</th>
<th>Northwest Alberta Connector</th>
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<tbody>
<tr>
<td>a. Design Integrated Physical Infrastructure with the Region</td>
<td>1</td>
<td>1</td>
<td>2 (Includes an existing power transmission corridor (north-south portion); no adjacent infrastructure on east-west portion)</td>
<td>2 (Adjacent to some existing pipeline corridors)</td>
<td>2 (Southern portion includes existing pipeline)</td>
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<td>1</td>
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<tr>
<td>b. Maximize Utilization of Existing Infrastructure</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2 (Adjacent to some existing pipeline corridors)</td>
<td>2 (Southern portion includes existing pipeline)</td>
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### Core Principle VI: Support Regional Economic Development

**Consistency with Growth Plan Policies**

<table>
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<th>Principle</th>
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<th>Heartland Connectors</th>
<th>Southeast Heartland Ring Corridor</th>
<th>AIH Intersite Connectors</th>
<th>Redwater Bypass</th>
<th>EETP Connector</th>
<th>Northwest Alberta Connector</th>
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<tbody>
<tr>
<td>a. Ensure a Supply of Land to Sustain a Variety of Economic Development Activities</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>b. Support Regional Prosperity</td>
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<td>1</td>
<td>1</td>
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<td>c. Position the Capital Region Competitively on the World Stage</td>
<td>1</td>
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</table>
Appendix F  Figures 1.0 – 5.0:  Maps of Energy Corridors
FIGURE 1.0: REGIONAL PIPELINE CORRIDORS

- Coordinate System: 3TM114-83
- Projection: Transverse Mercator
- Datum: North American 1983
- Central Meridian: -114.0000

- Priority Growth Area
- Alberta’s Industrial Heartland
- Refinery Row/Clover Bar
- Member Municipality (County)
- Member Municipality (Urban)
- Elk Island National Park
- Provincial Park/Protected Area
- Regional Road (Existing)
- Transportation Utility Corridor
- Heartland Priority Pipeline Corridors
  - From Swan Hills/Rainbow Lake/Norman Wells
  - From Brazeau/Pembina/Drayton Valley
  - To Eastern Canada/USA via Hardisty
  - To Vancouver via Jasper
  - From/To Fort McMurray (bitumen/diluent)
  - From/To Cold Lake/South Athabasca (bitumen/diluent)
- Northeast Pipeline Corridor
- Future Energy Corridor

km
FIGURE 2.0: PRIORITY PIPELINE CORRIDORS*

*Note - All corridor alignments are conceptual and subject to change based on further detailed investigation and study
FIGURE 4.0: PRIORITY POWER TRANSMISSION CORRIDORS

- Coordinate System: 3TM114-83
- Projection: Transverse Mercator
- Datum: North American 1983
- Central meridian: -114.0000 km

Legend:
- Alberta’s Industrial Heartland
- Refinery Row/Clover Bar
- Member Municipality (County)
- Member Municipality (Urban)
- Urban Service Area
- Elk Island National Park
- Provincial Park/Protected Area
- Regional Road (Existing)
- Rail Line
- Water Course
- Water Body
- Transportation Utility Corridor
- Heartland Transmission Corridor
- Existing Power Transmission Corridor
- Power Corridor Under Construction
- AESO Planned Major Transmission Line

Headwater Group
OPUS STEWART WEIR
FIGURE 5.0: REGIONAL ENERGY CORRIDORS, TRANSPORTATION FACILITIES AND GROWTH AREAS

Coordinate System: 3TM114-83
Projection: Transverse Mercator
Datum: North American 1983
central meridian: -114.0000