

The Development of the Calgary Metropolitan Plan 2007-2009



Introduction

The Calgary Regional Partnership (CRP) is a collaboration of municipalities that understands the synergistic relationship of local governments in the region. CRP takes a proactive approach to regional growth and planning issues. The partnership currently includes fifteen communities in the Calgary area from Banff to Strathmore, Crossfield to Nanton, with Calgary and other municipalities in between. CRP represents 1.2 million residents of unique landscape.

The Calgary Metropolitan Plan is a vision for a sustainable region. It includes statements of regional outcomes, integrated strategies, policies as well as conceptual maps that will help the region achieve its vision over the next 60 to 70 years. The Calgary Metropolitan Plan process was officially launched by CRP at the June 2007 General Assembly when Members of the CRP signed an historic charter called, “Terms of Agreement for Working Together: A Commitment to Develop a Regional Land-use Plan for the Calgary Region.” This document included a vision for the future of the region, and a set of planning principles to guide the development of a regional plan.

Over the next two years, a variety of project sub-committees, made up of elected officials, CRP staff, municipal staff and consultants, helped to steer the development of the Calgary Metropolitan Plan. Extensive consultation with CRP member municipalities, stakeholders and citizens occurred throughout the two-year process. The Calgary Metropolitan Plan was approved by a majority of CRP members at the June 19th 2009 General Assembly. The 15 member municipalities that approved the plan are now moving forward to implement the plan by aligning local municipal plans with the Calgary Metropolitan Plan.

This report documents the planning assumptions, methods and process that led to the final Calgary Metropolitan Plan. The report is organized in two parts:

Part I - Towards a Regional Plan - the general process, philosophy, and assumptions that guided the development of the Calgary Metropolitan Plan.

Part II - Calgary Metropolitan Plan Methods - the technical methods and assumptions used to estimate and distribute future growth.

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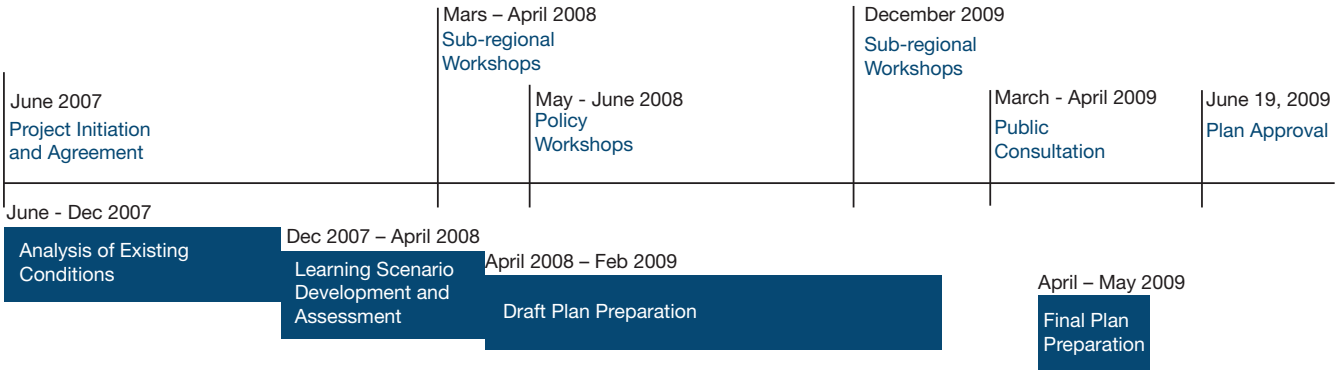
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PART I - TOWARDS A REGIONAL PLAN

Calgary Metropolitan Plan Timeline





1.0 Planning for Growth

CRP began exploring the idea of a regional planning in early 2006. A situation assessment, a public survey, and a revised CRP mission and vision statement laid the groundwork to launch a regional planning initiative. These early activities confirmed that some issues and opportunities associated with growth could not be adequately addressed by individual municipalities, and would be managed best by working proactively and collaboratively.

1.1 Need for a Regional Plan

Experts project an additional 1.5 to 2 million people will come to the Calgary region over the next 60 to 70 years. Strong levels of growth are expected to continue. Dramatic and rapid growth brings challenges. As the region expanded, lower density residential, industrial and commercial land uses radiated towards smaller urban centres— north to Airdrie, south to Okotoks, northwest to Cochrane and east to Chestermere. Citizens are concerned about the future of the things they value most – the natural environment, the water supply, the safe, welcoming communities. Troubling trends resulting from rapid growth are cause for concern— less affordable housing, increasing traffic, continuing labor shortages, and growing economic inequity.

The benefits and challenges that come with growth extend beyond individual municipal boundaries. In order to accommodate growth in a sustainable way, it is important to be intentional about where new residents might live, work and recreate across the region. Existing and new communities could benefit from being better connected to each other by regional transit services, and cost effective regional water and wastewater systems. Some lands in the region may require a degree of protection from the impacts of growth - lands needed for agriculture, recreation, environmental and watershed protection.

The future of the region's beautiful landscapes, clean water, fresh air and healthy communities depend on a collective vision for the region, and a determination to pursue that vision together. Continued economic development and the protection of the qualities that make the Calgary region so attractive is possible, but is more likely to be achieved if planned.

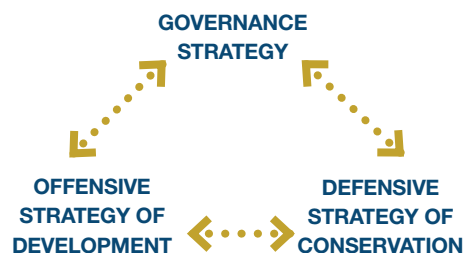
1.2 Organizational Structure

To undertake this ambitious planning effort, the CRP created a structure to ensure broad participation and accountability. The existing CRP Executive Committee assumed oversight of the planning initiative. CRP also formed new entities specifically to support the plan and move it forward.

- An **Executive Committee**, comprised of representatives from 2 Towns, 2 Cities and 2 Municipal Districts, was responsible for steering the overall development of the Calgary Metropolitan Plan. Specifically, this committee approved key proposals, work plans, communications, outcomes and implementation strategies.
- An **Elected Sub-committee**, consisting of 2 Towns, 2 Cities and 2 Municipal Districts, met with the Staff Sub-committee and Core Planning Team as appropriate to approve the work as it moved forward and to review the progress and outcomes. The chief role of the Elected Sub-committee is to present recommendations from time to time regarding key developments of the regional plan, and related governance and implementation strategies to the CRP Executive Committee and ultimately the CRP General Assembly.
- A **Staff Sub-committee**, consisting of senior planning representatives from each of the member municipalities, directed and advised the Core Planning Team regarding the technical development of the plan. The Staff Committee reviewed the progress and plans of the Core Planning Team, approved and/or recommended revisions, and provided recommendations to the Elected Sub-committee for approval. Sub-committee members attended planning workshops and stakeholder sessions and provided planning expertise directly to the Core Planning Team wherever possible.
- A **Core Planning Team**, a multi-disciplinary group of planners and consultants supported by academic researchers and technical specialists, was responsible for moving the process forward. This team developed and implemented the methodology and work plan; undertook all related technical planning and scenario preparation activities; implemented stakeholder participation; developed internal and external communications; presented and circulated outcomes and deliverables of the plan to CRP committees; and produced the final plan document. The team included the CRP Regional Land Use Manager, the CRP Senior Strategic Planner, Land Information Mapping at the City of Calgary, and O2 Planning and Design. Starting in June 2007, the Core Planning Team began to work with CRP committees to analyze existing conditions, refine planning principles, develop measurable indicators, draft policies, create scenarios and conceptual maps.

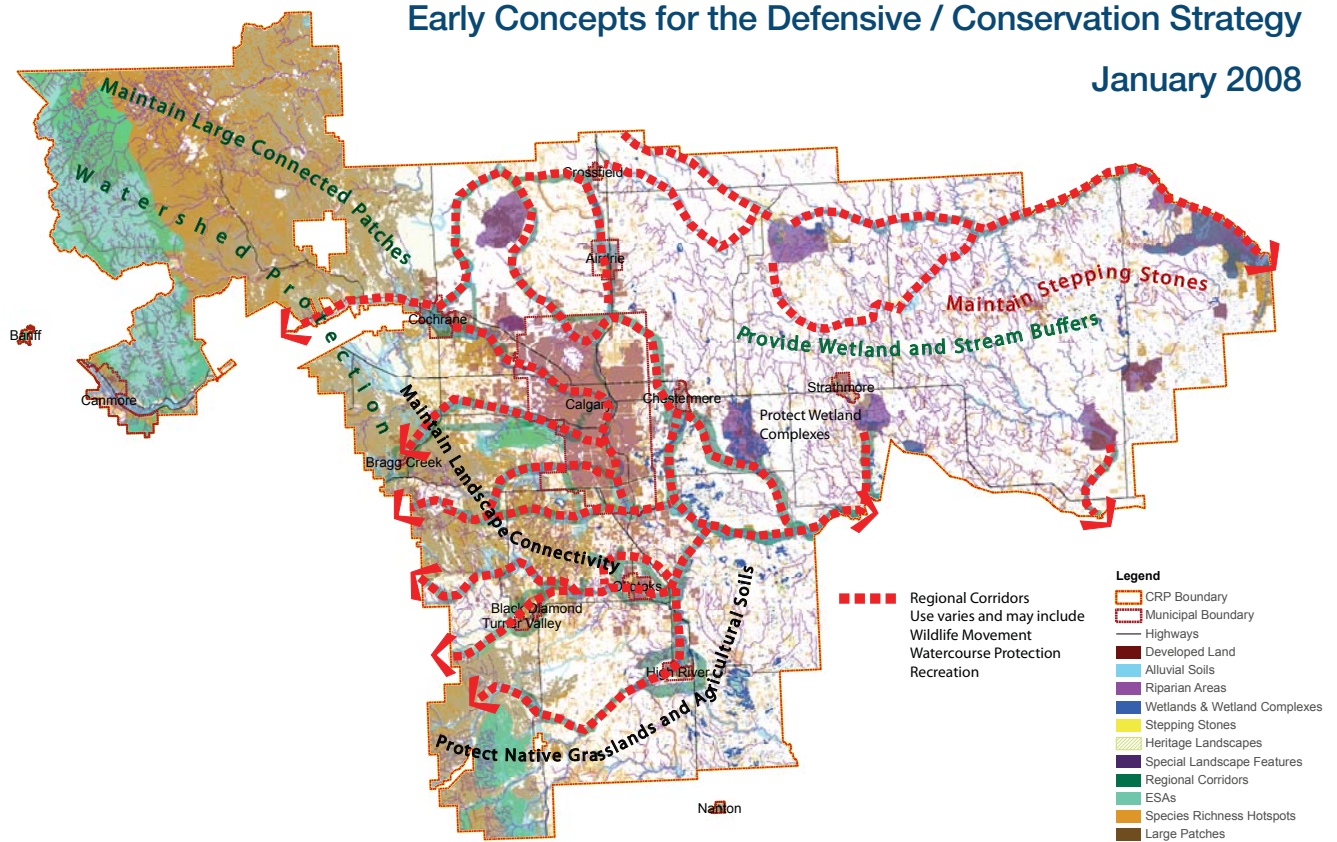
1.3 Core Approach to Regional Planning - Three Strategies

From the start, the planning process relied on three related strategies to ensure the final Calgary Metropolitan Plan would be effective and sustainable. The strategies simultaneously address development and environmental conservation objectives while also considering the required government and servicing arrangements.



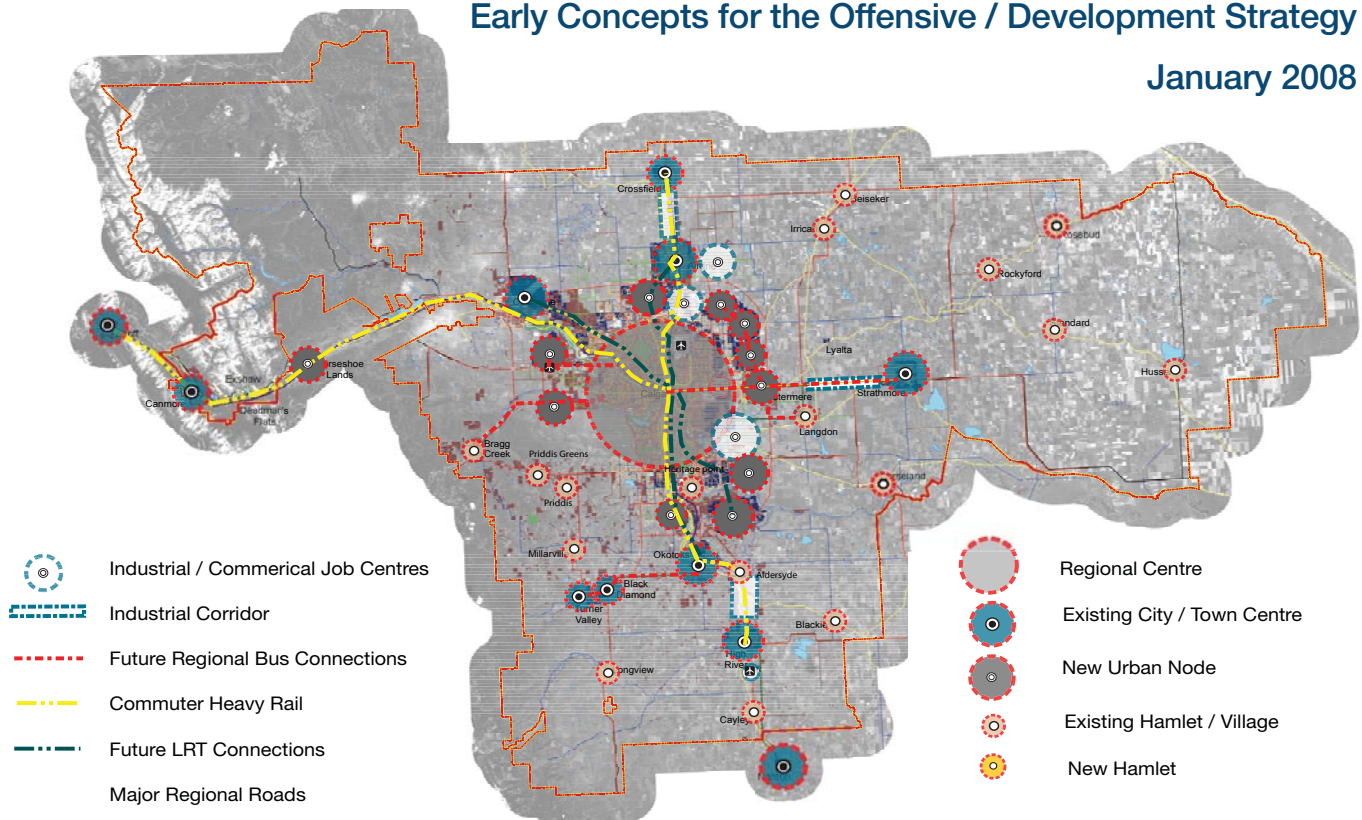
Early Concepts for the Defensive / Conservation Strategy

January 2008



Early Concepts for the Offensive / Development Strategy

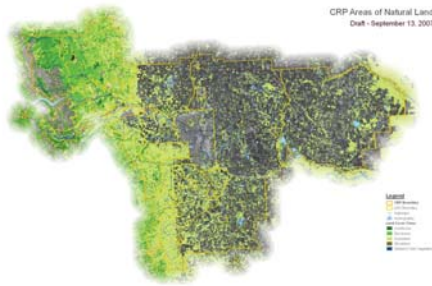
January 2008



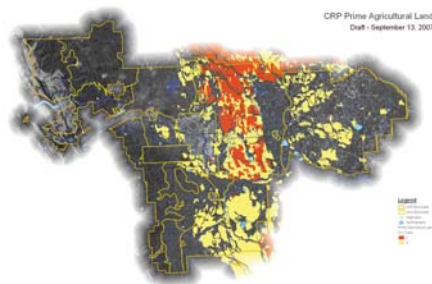
“We totally take our environment for granted. We need to pay much more attention to air quality, water management, green space, the over development of agricultural land for urban settlement, and especially water management.”

2006 Survey by CRP

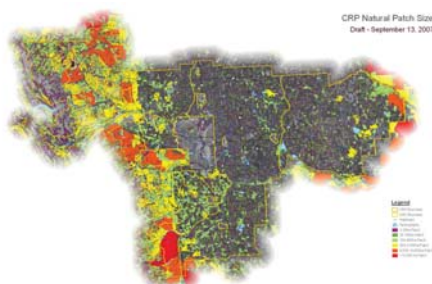
CPR Areas of Natural Land



CPR Prime Agricultural Land



CPR Natural Patch Size



Additional maps of Existing Conditions are contained in a separate report “Calgary Metropolitan Plan Environment Report: Strategies and Actions.”

The **Defensive (Conservation) Strategy** identifies areas vulnerable to development. It identifies where conservation is required and development should be discouraged, where development should be avoided, and what mitigation is required if it does occur. The conservation strategy must be identified prior to identifying the development strategy. Otherwise, it will be unlikely, if not impossible to achieve. Sensitive or valued elements are identified, including, among others, aquifer recharge areas, steep, unstable slopes and erodible soils, productive agricultural land, special natural and cultural elements, ecologically sensitive, rare or unique areas, flood inundation areas, fragile lands, and important landscape ecological patterns.

The **Offensive (Development) Strategy** identifies the type, amount, form and location of new development. It considers the attractiveness of the land for various land uses, as well as the infrastructure needed to support development such as solid waste disposal, potable water, waste water treatment, a variety of transit and transportation options (Commuter Rail, Light Rail Transit, Bus Rapid Transit, roads and pathways).

The **Governance Strategy** considers government mandates, authorities, regulations and policies. Institutional arrangements and decision-making processes, as well as relationships with the community are examined. Without an effective governance strategy, the plan will lack authority, and its promise will be unfulfilled.

1.4 Existing Conditions

Each region has a unique set of issues and opportunities. Therefore, each regional plan must begin with rigorous analysis of the existing conditions within the region that includes environmental, social and economic conditions.

1.4.1 Natural and Built Environment

The Calgary region occupies 17,000 square kilometers (1.7 million hectares) of land. Currently, only about 6% of the land area is developed, mostly in the City of Calgary. The majority of undeveloped land is traditional working landscapes—cattle ranches and farms. Prime agricultural lands lie to the east where class 1 and 2 soils are concentrated. Ranches predominate in the southwest where grasslands are well suited to grazing and hay production. These working landscapes are important not only economically, but as a link to the history and spirit of region. The regional plan must recognize that good stewardship of ranches and farms provides environmental services to adjacent urban areas—cleaning and protecting air and water.

The mountainous terrain of Banff National Park and Kananaskis Country are major tourist destinations and the region’s most outstanding topographic feature. These protected lands limited urban growth to the west. But, the broad native grassland prairies east of Calgary have been heavily altered—replaced by agriculture or urban land uses. Traditional high-value agricultural lands are being transformed into new country residential, golf courses, industrial parks, neighborhoods, and other urban uses.

As the land has been cultivated and developed, native grasslands are increasingly fragmented. A system of large patches and smaller stepping-stones has evolved that help wildlife move across the landscape and ensure their survival. Some large patches are the only remaining undisturbed rough fescue grasslands. A regional plan that maintains these large landscape patches will not only help wildlife survive, but will help connect urban residents to the nature, and engender respect for the land and natural processes.

The western part of the region contains dramatic mountain terrains of snow-capped peaks, deeply incised canyons and river valleys. For both longtime residents and footloose newcomers, the mountains are a powerful attraction. Mountain views, an extremely desirable amenity, and have a considerable impact on development patterns.

Water is a precious resource in the Calgary region. The semiarid region receives relatively low rainfall and has low humidity. The major rivers are a source of water for both drinking and irrigation. The region includes parts of three watersheds: Bow, Red Deer, and Oldman. The Elbow, Sheep and Highwood rivers are distinct and important sub-basins within the Bow River watershed. Major rivers, smaller tributaries and intermittent streams form a dense network of riparian corridors that improve water quality and replenish the underlying aquifers.

Wetlands scattered across the landscape help absorb and hold rainfall so it can filter down through layers of alluvial soils into the underlying aquifers. This filtering process improves the quality of both surface and ground water. Riparian corridors provide a similar benefit, but also help wildlife species migrate across the landscape. These functions become even more important as the region urbanizes.

Water is anticipated to be a constraint to future development in the region. Alberta Environment has stopped accepting new water license applications from potential users in the region. Even with aggressive water conservation, many municipalities will not have sufficient water to support anticipated growth. Studies suggest that a regional system would better meet the needs of both agricultural and urban communities.

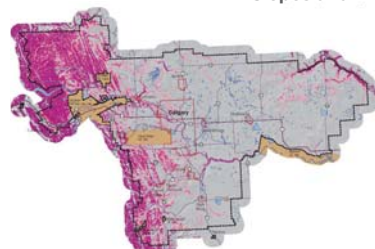
Wetlands and Wetlands Complexes



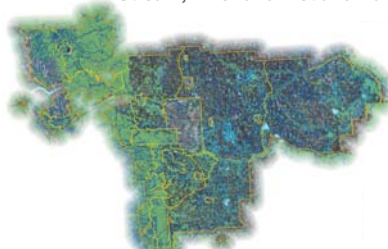
Regional Corridors



Slopes and Ridges



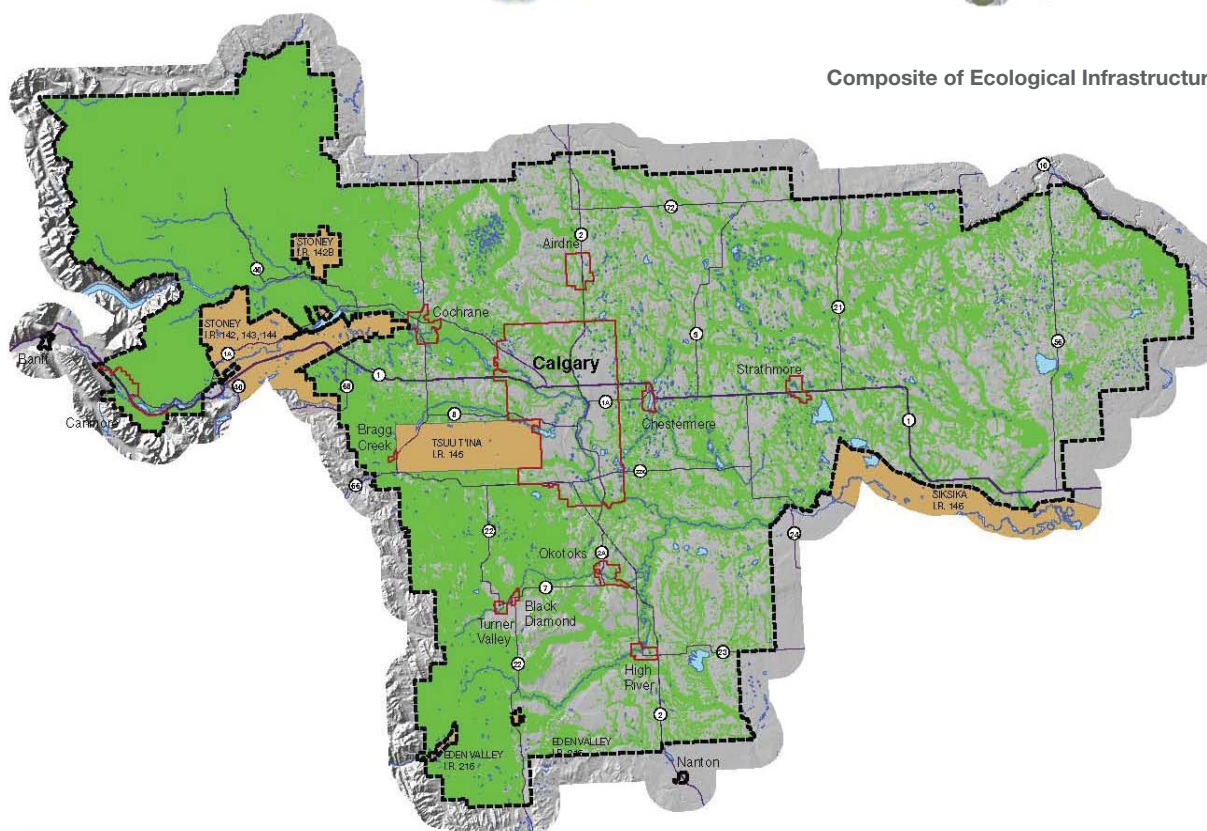
Stream, River and Wetland Buffers



Large Natural Vegetation



Composite of Ecological Infrastructure

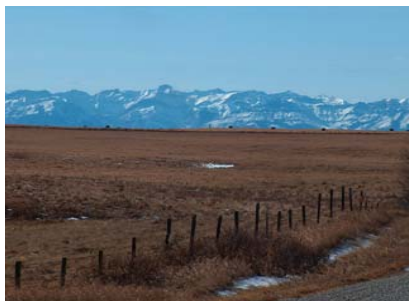


“Living here offers me access to excellent services and entertainment while staying connected to the land.”

2006 Survey by CRP

“I love living in the Calgary region. It has big city features, yet a small town atmosphere. How picturesque it is to see the Rocky Mountains on your way to work.”

2006 Survey by CRP



In order to develop a regional conservation strategy, the Core Planning Team identified and mapped areas of potential ecological infrastructure. Additional information about the region's ecological infrastructure is detailed in a separate report, *Calgary Metropolitan Plan, Environment Report: Strategies and Actions*.

The built environment and urban land uses are shaped by existing infrastructure—roads, transit, and water service. The region has a well-established transportation network including national highways, regional ring roads and extensive transit within the City of Calgary. However, transit connecting the city to subregional centres (i.e., Airdrie, Cochrane and Chestermere) is limited.

1.4.2 Social

The region's 1.2 million citizens enjoy an enviable lifestyle and quality of life. Just over 1 million people live within city of Calgary, making it the most populous and urbanized centre in the region.

In a 2006 survey conducted by CRP, residents spoke most frequently of the parks, natural areas and open space as treasured attributes. Other important qualities were the small-town, friendly atmosphere of local communities, the western heritage, as well as, the economic and social advantages of being near a large metropolitan city. The region is known for its healthy, safe and clean neighborhoods. With an array of cultural attractions—world renowned professional theatre, opera, ballet, symphony, museums, arts and cultural festivals—Calgary ranks as one of the top five Canadian destinations for arts and culture. The region enjoys the most sunny days of any major city in Canada, and plentiful recreation destinations including national, provincial, and local parks. Access to a variety of outdoor pursuits in the Rocky Mountains is excellent—skiing, camping, hiking, biking, fly fishing and water skiing. *The Economist* magazine ranks the City of Calgary as the fifth most livable city in the world.

A combination of a high standard of living and plentiful jobs is attracting new residents. From 1996 to 2006, Calgary experienced stronger population growth than the rest of Canada. This decade of rapid economic and job growth attracted 290,014 people, an increase of 32.3%. During this period housing starts averaged 20,384 per year, an all time high. Most new residents came from other parts of Canada. However, an increasing number of immigrant from other countries, especially East and South Asia, are moving to the city. The result—Calgary has the third highest diversity rate in Canada.

Another significant demographic trend is the graying of the population. As the baby boomer generations ages, there will be more retirees and fewer working adults to support the local economy. This trend will exacerbate the existing tight supply of skilled labor. It will also affect the type of housing, services, communities and amenities needed in the future.

1.4.3 Economy

Since the discovery of oil and gas in nearby Turner Valley in 1914, Calgary has become a centre of Canada's energy resource industry, and one of Canada's most important business centres. Over the past decade, the Calgary region has experienced tremendous growth and economic prosperity fueled by the expanding oil and gas business. Calgary's economy was the strongest in Canada by any measure:

- Fastest growing economy
- Highest concentration of head offices (per capita)
- Largest concentration of entrepreneurs

- Highest percentage of post-secondary educated citizens
- Lowest unemployment rate
- Lowest tax rates
- Highest personal income
- Highest employment rate for newcomers
- Fastest job allocation in the country for immigrants

Economic forecasts suggest that the Calgary Economic Region will retain its position as one of the leading economic regions in Canada based on the presence of the energy sector and the continued investment activity associated with the oil sands. Over 90,000 new jobs are expected to be generated over the next five years, the highest in Canada.

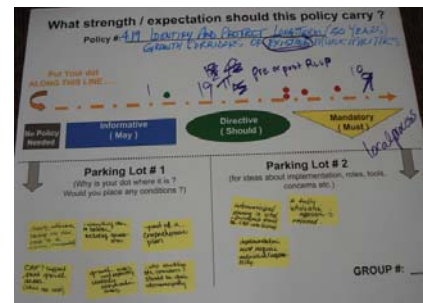
Within the Calgary Metropolitan Area, the city's share of total jobs is expected to decline from 86% in 2001 to 82% by 2035, while regional jobs outside the city are projected to increase from 14% to 18%. As more jobs are created in other regional locations, commuting patterns will become more complex. Regional jobs held by city residents are forecast to increase from 11,000 in 2001 to 24,700 by 2035. Regional residents commuting to city jobs are forecast to increase from 28,250 in 2001 to 66,000 by 2035.

1.5 Consultation and Engagement

A successful regional planning process requires an ongoing and meaningful regional dialogue to establish a vision, evaluate options, discuss and resolve any difficult issues. The Calgary Metropolitan Plan was shaped by an extensive consultation program. Internally, the various CRP Committees (Executive Committee, Elected Sub-committee, Staff Sub-committee and Core Planning Team) provided direction, advice, technical assistance, and other support to develop the Plan's recommendations.

The Calgary Metropolitan Plan was further revised and refined through over 320 meetings, working sessions, and public symposiums held between 2007 and 2009 that worked through various aspects of the plan. This included a number of focused workshops to actively engage for CRP members and others at key points in the regional planning process.

- Scenario Building Workshops, Sept. 20, 2007 and Sept. 21, 2007 (total of nine sessions)
- Economic Development Workshop, January 10, 2008
- Regional Servicing Workshop, January 17, 2008
- Water and Ecology Workshop, January 24, 2008
- Regional Transportation Workshop, January 31, 2008
- Development Forms Workshop, February 14, 2008
- Agriculture Workshop February 28, 2008
- Urban Rural Perspectives Workshop, March 5, 2008
- South Sub-regional Mapping Workshop, April 9, 2008
- East Sub-regional Mapping Workshop, April 9, 2008
- West Sub-regional Mapping Workshop, April 10, 2008
- North Sub-regional Mapping Workshop, April 10, 2008
- Policy Development Workshop, May 30, 2008 and June 6, 2008
- Plan Review Workshops, December 10, 2008 and December 15, 2008



Following the release of the Draft Calgary Metropolitan Plan, a series of public events and meetings were held in March and April of 2009 to increase public awareness of the Draft Plan, to gauge the level of public and stakeholder support for the policies and strategic directions, and to provide opportunities for stakeholders to identify any areas of concern, new ideas or questions. A separate report, *Report On Public And Stakeholder Consultation*, contains details of consultations and summarizes the feedback received. Major outreach activities targeting the general public included:

- Media articles, opportunity editorials and advertisements were developed to ensure that citizens could become involved in reviewing and commenting on the draft plan.
- 53 separate public open houses and presentations were made, covering all municipalities and in a range of locations to reach as many of the region's residents as possible.
- A formal survey was undertaken by ENRG Research Group with responses provided by open house attendees and through the CRP website.
- Presentations on the Draft Plan were given to a range of interest groups, including the Urban Development Institute, Calgary Chamber of Commerce, Cochrane Realtors, Calgary and Region Home Builders Association and the University of Calgary.

1.5.1 Final Plan Development and Approval

Following public consultation on the draft Plan, a series of ten dialogue sessions with internal working elected committee were held to work through the remaining issues, and to develop the final Plan. In addition, over thirty information sessions were held with CRP member municipal councils between March and May of 2009. The final Calgary Metropolitan Plan was presented to CRP General Assembly in June 2009 and was subsequently approved by the majority of CRP members.



Calgary Metropolitan Plan

As revised and approved
at the June 19, 2009 CRP General Assembly



Calgary Metropolitan Plan
June 2009





***We are working together
to live in balance with a
healthy environment, in
enriched communities,
with sustainable
infrastructure and a
prosperous economy.***

CRP Vision Statement

2.0 Regional Vision

The vision for the region that drove the planning process is a simple, yet powerful statement that describes where the region wants to be now and in the future. CRP members challenged themselves to create a plan that would move the region towards their vision. CRP adopted six “aspirations” that act as pillars of the regional planning process.

Working Together

We, the citizens and leaders of the Region, will feel connected and work proactively together to realize a common vision.

Balance

The Citizens and leaders of the region will support each other to achieve community environmental and economic balance.

Healthy Environment

We will protect natural areas that support biodiversity and rural/urban landscape forms to sustain clean air, water, healthy soil and habitat. The beauty of the Region will be preserved through a culture of conservation and a network of local and regional parks.

Enriched Communities

We will live in diverse communities that have access to services and opportunities. We will be healthy, engaged and educated. Residents will have access to diverse housing options in a safe environment that is inclusive, supportive and connected.

Sustainable Infrastructure

We will have regional development, infrastructure, transportation and waste management systems that are cost effective, efficient and minimize environmental impact. Services will be diverse, accessible and will seek to achieve net zero waste and reduce consumption both municipally and regionally. Development patterns will reflect responsible and well-coordinated land-use planning.

Prosperous Economy

We will have connected diversified urban and rural economies with a workforce that are globally competitive. Our vibrant economy provides sustainable livelihood opportunities. Development patterns are environmentally, socially, and financially sustainable.

2.1 Connecting Regional and Provincial Efforts

In response to Alberta's remarkable growth over the past decade, the Government of Alberta, under the leadership of Sustainable Resource Development, commenced a comprehensive initiative to develop a new land-use system for the province. The Land-use Framework is intended to provide the province with a blueprint to guide land-use planning across the Province. One of the five priority actions for the Land-use Framework is the development of a metropolitan plan for the Calgary region.

The Calgary Metropolitan Plan has been carefully developed, and is well positioned to implement what is required under the Alberta Land Stewardship Act and the Provincial Land Use Framework's - South Saskatchewan Regional Plan. The Calgary Metropolitan Plan successfully delivers the six provincial directives for Metropolitan Plans:

1. A vision of the region's pattern of development in the short-, medium- and long-term.
2. A transportation and utility plan that identifies the infrastructure and services that are of regional benefit, and protect transportation and utility corridors from encroachment and development.
3. A long-range regional perspective on the plans developed for key infrastructure, such as water and sewer systems, road and transit.
4. Complementary policies between municipalities to eliminate conflicts before they occur, and manage them where they already exist.
5. Support for higher density, infill development across the region, which preserves the natural environment, preserves agricultural land and makes more efficient use of existing infrastructure.
6. Future growth areas, and areas where growth would be limited, and environmentally and fiscally sound infrastructure plan should be developed to support the type and scale of future development before that development occurs.



3.0 Learning Scenarios

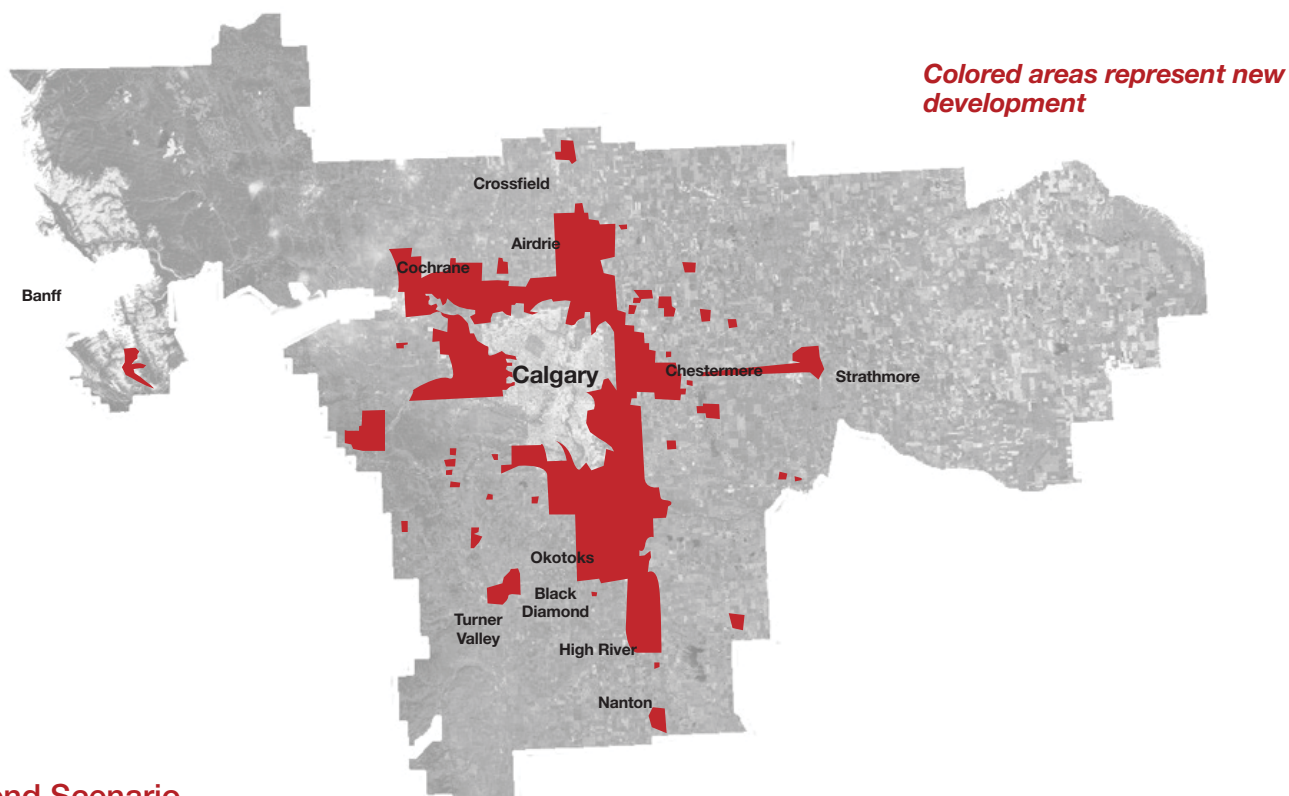
A key phase of the regional planning process was the development and analysis of growth scenarios. Three preliminary “learning scenarios,” each exploring different principles for conservation, development, transportation, utilities and environmental management were created by the Core Planning Team. Over 700 stakeholders from across the region participated in one of nine public working sessions. They discussed and assessed the three regional growth scenarios, and used their conclusions to develop regional planning goals. Participants included elected officials, municipal staff, citizens, developers, ranchers/agriculturists, as well as, experts in transportation, water servicing, economic development, environment, planning, rural and urban development.

The three scenarios (Trend, Ecological and Nodes & Corridors) are purely hypothetical—not real alternatives. The scenarios were designed to show the choices and trade-offs that might be needed to move towards the regional vision. By assuming a singular position, the scenarios allowed workshop participants to better understand the choices that must be made, and the impact of different potential policies on the future development of the region. Creating a real, workable regional land-use plan, required balancing different points of view, trade-offs and compromises. Through this learning process, a realistic plan began to emerge.

A major conclusion from the Learning Scenarios exercise was that the Trend Scenario was not an acceptable future. This and other lessons learned at these sessions led to the development of a fourth scenario, the Hybrid Scenario, that combined the most desired elements of the Ecological Scenario and the Nodes and Corridors Scenario. This scenario, the preferred approach, was carried forward and served as the base for the development of the Calgary Metropolitan Plan.

All four scenarios are summarized on the following pages.

What if we continue to grow as we do now?



3.1 Trend Scenario

New development = 125,000 hectares

The Trend Scenario reflects a continuation of current policies and trends.

Assumptions for Future Growth

- Continuation of current policies, trends and development types including single use urban residential, industrial employment lands and low density country residential
- 10% of all new development occurs as intensification (redevelopment and up-zoning of existing developed land); 90% is greenfield development
- Build-out all approved ASPs, IDPs, MDPs and other projects in the planning stages
- Build out all planned or proposed transportation corridors and systems: highways, rail, transit, pathways, etc.
- Allocation of existing water license distributions and projected capacities
- Conceptual distribution of public services

What We Learned

Healthy Environment

- Footprint of new development is over 2x the footprint of Nodes and Corridors, and 3x the footprint of Ecological
- Country residential is widely accommodated, accounting for 595 km² (48%) of new development. Ability of urban areas to grow is constrained

- Impacts on the ecological infrastructure—important grasslands, large patches, and river corridors— is the highest of all scenarios
- Development in Bow and Elbow watersheds leads to lower surface and ground water quality

Sustainable Infrastructure

- Least efficient, highest cost servicing footprint; highest trunk and non-trunk infrastructure costs due to low density residential extending in all directions
- High reliance on wells and septic fields—water quality more vulnerable
- Auto-dependency increases, thus transportation investment favors auto-oriented infrastructure
- Land uses are separated, and travel distances increase
- Licensing and governance agreements are required
- Water for new development in Sheep and Highwood is drawn from Bow River
- Wastewater return flows to Sheep River and Frank Lake for some areas

Transit

- Majority of new development does not support transit
- Any rapid transit expansion continues in a radial pattern with a city centre hub
- The low density development precludes public transit in much of the greenfield development

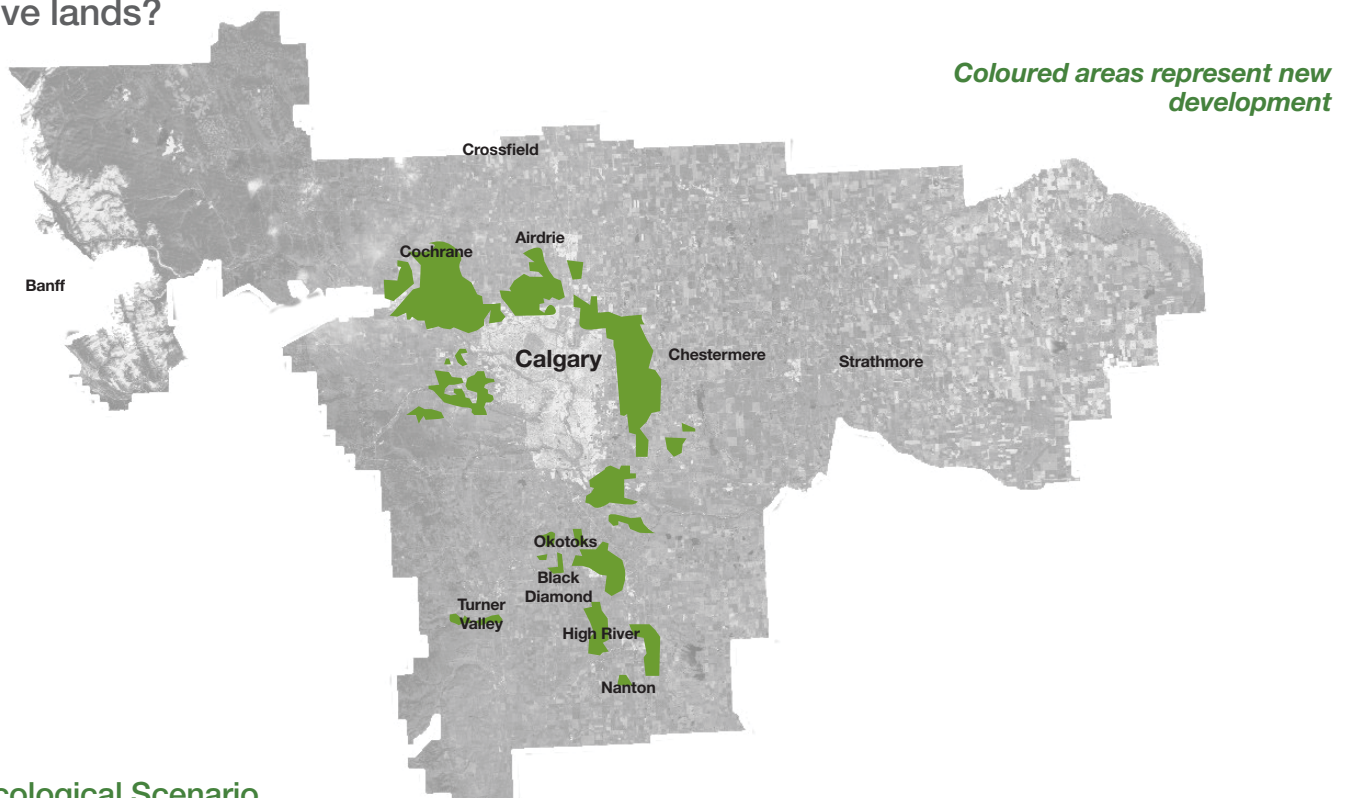
Economy

- Development consumes over 1,000 km² of agricultural soils and grasslands
- Agricultural water sources potentially impacted
- Jobs disassociated from where people live— outlying communities largely residential
- Employment lands are limited to a few corridors in Rocky View and Foothills

Enriched Communities

- Integration of jobs and residential is NOT achieved
- Distance to services is highest average of all scenarios
- Services are not clustered, making access more demanding

What if we exclude development from ecologically and culturally sensitive lands?



3.2 Ecological Scenario

New development = 39,000 hectares

The Ecological Scenario minimizes the impact on the environment and develops the least amount of land. Ecologically and culturally sensitive lands are identified using remote sensing, GIS analyses and other mapped data. Development is located where it does the least harm to these resources.

Assumptions for Future Growth

- 25% of all new development occurs as intensification (redevelopment and up-zoning of existing developed land); 75% is greenfield development.
- Development is excluded from areas of important ecological infrastructure.
- Greenfield development is aggregated and clustered on already disturbed land or in areas least impact to historic, cultural, scenic and ecological resources
- No new low-density country residential is used, in order to reduce landscape fragmentation and protect scenic quality
- Development consists of mixed-use medium density nodes and corridors; no industrial or major employment occurs outside these nodes

What We Learned

Healthy Environment

- Least amount of land consumed by new development
- Most compact footprint with the least impact on ecology and water resources

Sustainable Infrastructure

- Most efficient, lowest cost servicing footprint; lowest trunk and non-trunk infrastructure costs
- New development located in easy-to-service geographies
- Few areas of inefficient, low density rural residential, or remote outlying communities
- Proposed infrastructure will not serve all existing communities; limited infrastructure to west and north
- Lowest impact on existing infrastructure
- Requires centralized water supply and treatment plants, so licensing agreements will be required
- Limited development in upper watersheds— protects water quality
- Water for new development in Sheep and Highwood drawn from Bow River
- Wastewater return flows to Sheep River and Frank Lake

Transit

- Development supports a range of rapid transit including commuter rail, bus rapid transit (BRT) and light rail transit (LRT) as well as regular bus service
- Jobs are located near residential areas; unnecessary travel is reduced
- New and existing communities are designed / redeveloped to incorporate transit, walking and cycling
- Environmental infrastructure is maximized for corridors and roads.
- Transit-only links may cross natural barriers such as river valleys

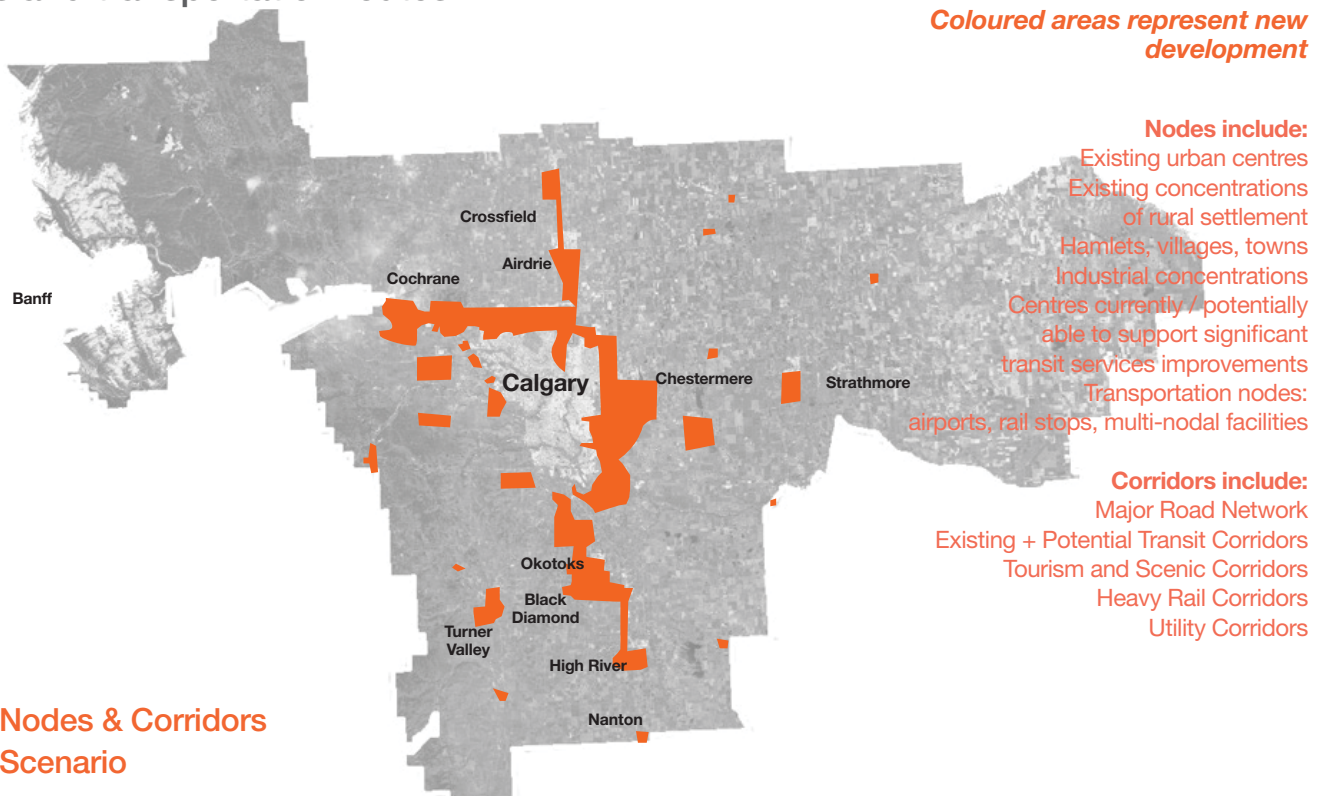
Prosperous Economy

- Impact on agricultural lands is low
- Pollination services in riparian corridors and remnant patches are improved
- Protected grasslands aid drought protection
- Job locations are more concentrated than in the Trend, but less than Nodes & Corridors

Enriched Communities

- Development is more compact than Trend, and Node & Corridors
- Services are provided efficiently
- Scenic resources are protected

What if we direct new development to existing developed areas and transportation routes?



3.3 Nodes & Corridors Scenario

New development = 56,000 hectares

The Nodes & Corridors Scenario identifies existing developed areas (nodes) and transportation routes (corridors) that can receive new and/or intensified development.

Assumptions for Future Growth

- Growth and new development is focused in existing urban centres and along transportation/ utility corridors
- 25% of all new development will occur as intensification (redevelopment and up-zoning of existing developed land); 75% is greenfield development
- Nodes that support light rail transit (LRT) and bus rapid transit (BRT) have 40,000 to 60,000 people within the catchment area.
- Transit Oriented Development (TOD) Nodes that support commuter rail transit have about 75,000 people within the catchment area
- New industrial and employment areas are accommodated
- Residential population growth is focused in locations that can be serviced by transit
- No additional country residential allowed

What We Learned

Healthy Environment

- New development has a larger footprint than Ecological—to allow for large

industrial and employment areas

- Less impact than Trend, but still impacts some riparian corridors and native grasslands

Sustainable Infrastructure

- More efficient, lower cost servicing footprint than the Trend; lower trunk and non-trunk infrastructure costs due to no low density rural residential
- Requires centralized water supply and treatment plants; licensing agreements required
- Outlying communities are served; longer pipelines, higher cost of servicing than Ecological
- Development occurs in the Elbow watershed (???)
- Water for new development in Sheep and Highwood drawn from Bow River
- Wastewater return flows to Sheep River and Frank Lake for some areas

Transit

- Development supports a range of rapid transit including commuter rail, bus rapid transit (BRT) and light rail transit (LRT) as well as regular bus service
- Transit access is improved to and from major activity concentrations (e.g., towns,

jobs, hospitals, post-secondary institutions) across the region

- Employment opportunities / job types are identified that could situate within transit-supportive towns / centres and adjacent to transit corridors.
- Economic development is supported along existing road and heavy rail corridors that now serve the industrial and goods movement sectors (e.g., focusing employment areas along major highways and rail lines).

Prosperous Economy

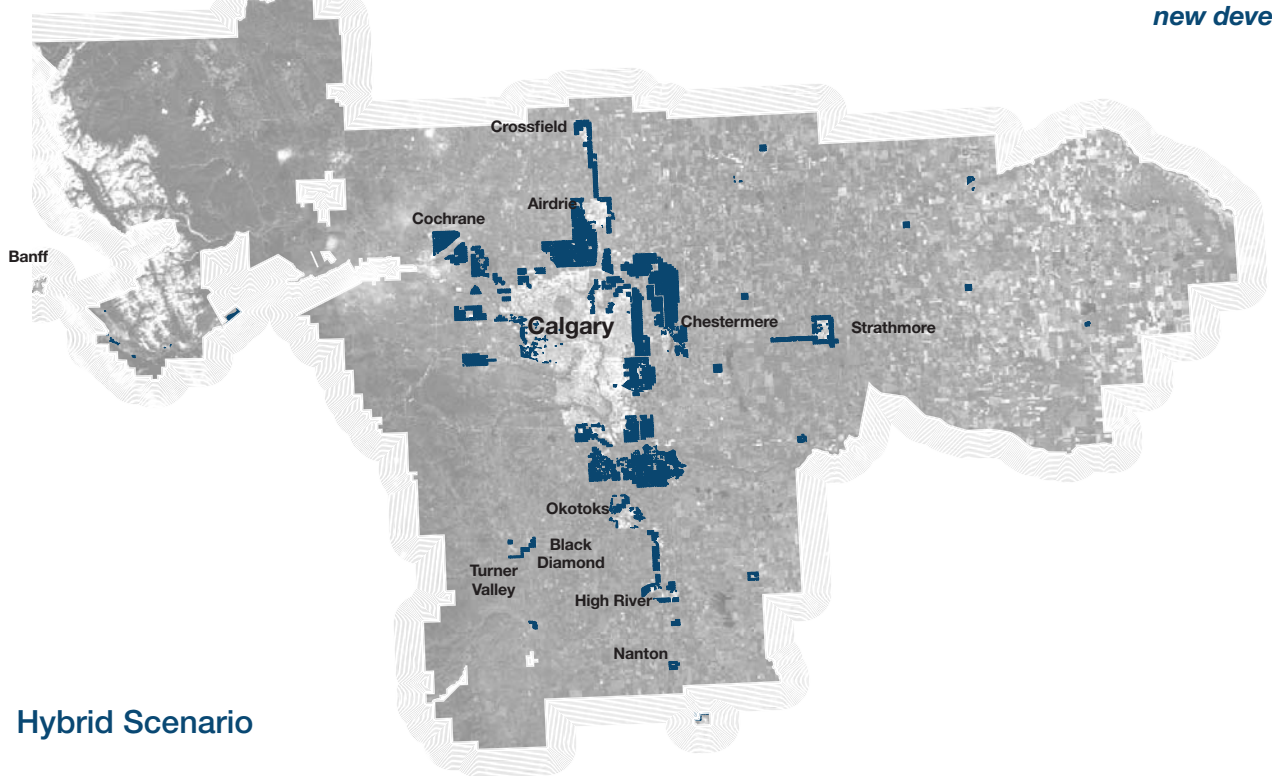
- Impact on agricultural lands is less than the Trend, but still substantial
- Important soils to the east of Calgary are heavily impacted
- Jobs are closely aligned with residential; jobs in nodes and corridors region-wide
- Employment lands are distributed throughout the municipalities in a nodal form accessible, in large part, by transit

Enriched Communities

- Mixed-use forms the majority of new development in both nodes and corridors
- Provision of services efficiently provided
- Scenic visual quality is impacted as development expands into agricultural lands, especially new centres in the west

What if we develop a future plan which builds on what we have learned so far?

Colored areas represent new development



3.4 Hybrid Scenario

New development = 48,000 hectares

The Hybrid Scenario reflects a balanced and efficient development pattern that supports five key “regional systems”: a green ecological network, water, transportation, waste management and emergency/protective services. 25% of all new development will occur as densification of existing developed land. The remaining 75% is greenfield development. The Hybrid respects important ecological elements and processes while providing for growth and the efficient provision of infrastructure and transit.

Assumptions for Future Growth

The Hybrid first identifies what we want to keep in the region forever. This “defensive conservation strategy” defines and maps the ecological and scenic elements in the region that ought to be conserved. These include:

- Water quality and watershed protection (rivers, lakes, wetlands, recharge areas)
- Important ecological features (corridors, native grasslands and other natural vegetation, landscape connectivity)
- Biodiversity
- Important regional vistas / viewsheds
- The “offensive development strategy” of the Hybrid identifies the locations and forms of development together with supporting infrastructure. The Hybrid Scenario:

- Utilizes a higher density, nodal form of development to efficiently provide services and infrastructure.
- Builds on the attractiveness of existing communities while encouraging compact development in and around existing cities, towns villages and hamlets
- Connects living areas and employment centres work with regional transit
- Identifies long-term growth areas that could be efficiently supported by regional-level water, wastewater and transit infrastructure
- Accommodates country residential development in locations that support broader regional conservation and growth management strategies. Low density development is excluded from areas identified as long range, future higher density growth corridors

What We Learned

Healthy Environment

- New development has larger footprint than the Ecological, but significantly less than other scenarios
- Ecologically important lands are preserved
- Development guidelines are needed to allow some development in areas of ecological infrastructure

Sustainable Infrastructure

- Infrastructure is efficiently provided
- Strict adherence to land-use plan is required
- Licensing, serving and cost sharing agreements are necessary
- Transit is limited to designated high density growth areas

Prosperous Economy

- Compact development reduces the impact on prime soils and native grasslands; working landscapes remain viable
- Land for industrial/commercial development is provided near major roads, rail and airport locations

Enriched Communities

- Complete communities are encouraged
- The character of existing communities and scenic views are protected

3.5 What We Heard

The Learning Scenarios demonstrated that the Trend Scenario was not an acceptable future. There were many areas of common ground, but also issues that needed more discussion and dialogue.

3.5.1 Strong and Clear Support For:

- Creating a regional plan together, especially connecting land use planning to the development and protection of transportation, water/waste water utilities, watershed protection and other conditions.
- Minimizing the region's "development footprint" — considering more compact development, and mixed-use land patterns.
- Respecting and protecting key ecological features, natural systems, and the viability of farming and ranching activities.
- Protecting the watershed and the region's impact on downstream water conditions.
- Understanding the cumulative effect of development activities over time, and over larger areas.
- Taking climate change seriously.
- The culture and uniqueness of regional communities is very important — holding onto the sense of identity as the region changes and grows.

3.5.2 Areas of Tension and Trade-offs:

- Implementing the plan and keeping all municipalities "rowing in the same direction."
- Getting jobs to locate in targeted areas (e.g., on the west side of the region at transit nodes and in existing towns).
- Making intensification happen.
- Focusing growth into areas that have the least impact on the environment and water.
- Compensating landowners for their efforts in protecting the watershed and natural environment (e.g., transferable development credits).
- Finding the will to protect very long-term options for transit corridors.
- Determining how large existing towns want to become.
- Moving forward to implement a Regional Plan together — interdependence, yet valuing local autonomy.



Key learnings from the evaluation sessions were reviewed at an intensive 2-day retreat of the CRP Elected Sub-Committee. By building on the best ideas evolving out of the evaluation process, a Draft Plan began to emerge. The Draft Plan was refined through spring 2009 by municipal staff and elected representatives.



3.6 Comparison of Learning Scenarios

A ranking based on regional goals and vision

	Trend	Ecological	Nodes & Corridors	Hybrid
HEALTHY ENVIRONMENT				
Natural and Permanent Vegetative Cover (area of natural vegetation)				
Natural Patch Size (area in natural patch classes)				
Matrix Connectivity between Patches and Stepping Stones (length of path and number of connection nodes)				
Effectiveness of Riparian Buffers (development within riparian buffers)				
Wetlands and Wetland Complexes (development within wetlands)				
Groundwater Protection (development on alluvial soils)				
Impact on Green Infrastructure (development with green infrastructure)				
SUSTAINABLE INFRASTRUCTURE				
Amount of Impervious Cover (total impervious area)				
Water Requirements (population per area)				
Efficient Use of Existing Infrastructure (population density within radius)				
Access to Transit (% population within service area)				
Efficiency of Transit & Infrastructure (population served per kilometre of infrastructure)				
PROSPEROUS ECONOMY				
Pollination Services (% natural vegetation within radius of agricultural lands)				
Loss of Agricultural Lands (area of class 1 agricultural lands)				
Distribution of Industrial and Commercial Lands (job density)				
Number of Jobs				
ENRICHED COMMUNITIES				
Integrated and Mixed Land Use (deviation from ideal population to job ratio)				
Access to Services (population within radius of services)				
Development within Scenic Corridors and Viewsheds (development area within visually sensitive areas)				

BEST MID WORST



4.0 The Calgary Metropolitan Plan

The lessons from the Learning Scenarios and the Hybrid Plan laid the foundation for drafting the Calgary Metropolitan Plan. The Calgary Metropolitan Plan contains regional outcomes, integrated strategies, policies and conceptual maps that guide how and where future growth will be accommodated across the region. The Plan focuses on what is most important from a regional perspective. The integration of the regional landscape, settlement pattern, and infrastructure and services are all of fundamental “regional” interest. The Plan’s framework includes four main elements outlined below. The complete Calgary Metropolitan Plan can be found on the CRP website at www.calgaryregion.ca.

4.1 Regional Landscape

The interconnected, complex, natural systems define the Calgary region’s physical character—the land, water, air, vegetation, habitats, and land forms. The Calgary Metropolitan Plan includes policies about the Regional Landscape that will protect natural systems by:

- Recognizing the five priority elements of the ecological infrastructure: wetlands, riparian buffers, regional corridors, large patches of natural vegetation, ridges and escarpments.
- Committing to understand, respect and enhance the integrity of the region’s ecological infrastructure.
- Reflecting a shared responsibility for the protection, conservation and enhancement of the natural environment.
- Working with the province to create new legislative and funding tools to support conservation.

4.2 Regional Settlement Patterns

Overlaying the natural systems are built systems—communities, settlement patterns, economic activities, transportation networks, municipal infrastructure and services. The Calgary Metropolitan Plan includes policies about Regional Settlement pattern that minimizes the future human footprint by:

- Intensifying development in existing developed rural and urban areas.
- Intensifying development in the existing developed rural and urban areas
- Organizing the future new urban growth around transit-based nodes
- Organizing new rural growth in clusters of small lots

- Locating rural-based commercial and industrial uses near major corridors
- Organizing
- Directing a substantial portion of growth into intensification and renewal of existing communities in locations and forms determined through local planning
- Encouraging rural areas to infill existing developments and cluster new developments in locations and forms determined through local planning process

4.3 Regional Infrastructure and Services

The regional settlement pattern is supported by regional infrastructure and services—roads, transit, water, sewer, trash collection. The Calgary Metropolitan Plan includes policies about Regional Infrastructure and Services that improve access to better infrastructure and services for more people and economic activities by:

- Identifying, mapping and planning for three regional systems: water (potable, wastewater and storm water), transportation and transit, and waste management (organic and solid) .
- Encouraging future urban/suburban growth in locations, forms and densities that can be supported by the efficient provision of viable region-wide water, wastewater and regional transit services over time
- Making provision for the possibility of extending regional wastewater infrastructure to address existing environmental problems and risks associated with existing development
- Providing a consistent picture of future settlement pattern showing where population and job growth should occur (areas that can be supported by efficient regional infrastructure and services), and should not be encouraged (natural areas to be conserved/ protected).
- Using the provision of regional infrastructure and services as a tool to guide and enable the development of major urban areas.



4.4 Working Together to Achieve Shared Regional Outcomes

By adopting the Calgary Metropolitan Plan local municipalities are pursuing common strategic directions at the metropolitan level, and are aligning with a priority of the Provincial Land Use Framework. The Calgary Metropolitan Plan includes policies about Working Together that enables all partners to begin the task of implementation individually, and collaboratively, by:

- Determining local approaches to policy implementation and addressing more detailed local planning by both retaining local authority and identifying collective (regional) actions for regional strategies, systems and infrastructure
- Determining processes for setting short-term targets and priorities around the provision of regional services and infrastructure
- Working with the Province to ensure alignment between the Calgary Metropolitan Plan and the emerging South Saskatchewan Regional Plan.



PART II - CALGARY METROPOLITAN PLAN METHODS



5.0 Methods Overview

The Calgary Metropolitan Plan is a long-range plan that looks 60 to 70 years into the future. Anticipating a future land-use pattern required technical planning work using estimates, projections and assumptions. Part II of this report details the technical assumptions and methods used to create and refine the Calgary Metropolitan Plan. While the responsibility for technical planning fell to the Core Planning Team, they worked closely with the CRP Staff Sub-committee to define methods and assumptions. The following sections review the key steps in the technical planning process:

- Regional Population and Job Projections
- Development and Conservation Strategies
- Future Land Use Categories and Density Assumptions
- Future Development Footprint—Distributing Growth



6.0 Regional Population and Job Projections

Predicting the number of people and jobs in the future is a speculative endeavour. The Core Planning Team considered a number of inputs, assumptions and approaches to estimate the population and job growth likely to occur over the next 60 to 70 years. These predictions began at the regional scale. Additional assumptions led to more detailed estimates for specific geographic areas within the region.

6.1 Urban Futures - Context for Change Management

The CRP, in collaboration with The City of Calgary, engaged the demographic forecasting firm Urban Futures to produce a series of demographic and economic projections over the 2006 to 2076 period to support planning efforts at the regional level and for the City of Calgary's Sustainable City Project (PlanIt).

This analysis, *A Context for Change Management in the Calgary Regional Partnership Area: Changing People in a Changing Region*, provided a very detailed and independent analysis of demographic and economic trends and forecasts for the region. The study, released in January 2008, projected three levels of regional population and job growth for 2076 based on broader economic conditions. Although this analysis did not provide projections for specific municipalities or subareas within the region, it was useful in setting broad growth targets for the region.

Table 1 Urban / Rural Population

Projection Scenario	Population (millions)	Employment (millions)
Hard Times	2,788,931	1,455,094
Baseline	2,969,354	1,554,581
Good times	3,192,209	1,675,595

Source: Core Planning Team

6.2 City of Calgary “Long Range Scenario”

The City of Calgary Geodemographics Business Unit also developed a Long Range Scenario for regional growth that included population projections. This Long Range Scenario estimated population would grow to approximately 2.8 million people over a 60- to 70-year timeframe, very similar to the projection by Urban Futures.

6.3 Assumed Share of the Regional Population

In 2006, the regional population totaled 1.17 million people. “Urban” land uses represent approximately 94% of the regional population, 1.11 million people. Calgary hosted 84% of the region’s population and other urban municipalities accounted for 10%. The “rural” population was approximately 64,500 people, representing the remaining 6% of the region’s population.



The Core Planning Team initiated discussions with urban and rural municipal planners within the region to predict how the distribution of urban and rural population within the region might change. Rural municipalities expected that traditional rural settlement forms (e.g., acreages, farmsteads and hamlets) would likely continue to maintain a “more or less similar” share of regional population over the long-term, as more country residential acreages are approved and hamlets expand. As such, the total rural population for 2076 reflects just over 6% of the region’s population. Future share of the regional population for individual municipalities was assumed to remain at the 2006 share. For example, MD Foothills has a current population of approximately 20,000 persons, representing 1.7% of the region’s total population in 2006. If population growth of roughly 30,000 is assumed for Foothills, its rural population would total roughly 50,000, maintaining its current 2% share of the region’s population for the planning horizon, 60 to 70 years.

Provision for “urban” development forms (i.e., urban intensification and Compact Urban Nodes) is assumed to continue to account for a 94% share of the region population.

Table 2 Urban Centres Population

	2006 Population		2076 Population Targets	
	#	%	#	%
Urban	1,110,002	94.5%	2,643,000	93.5%
Rural	64,476	5.5%	185,500	6.5%
Total	1,174,478	100%	2,828,500	100%

Source: Core Planning Team

However, within urban areas, the Core Planning Team and planners assumed that Calgary’s long-term share of the region’s “urban” population would fall from the current 89% to 83%. This means that smaller urban centres are expected to grow faster than Calgary and increase their share of the regional population.

Table 3 Population and Employment Projections

	2006 Actual Population		2076 Population Targets	
	#	%	#	%
Calgary	988,193	89.0%	2,200,000	83.2%
Other Urban Centres	121,809	11.0%	443,000	16.8%
Total Urban	1,110,002	100%	2,643,000	100%

Source: Urban Futures

6.4 Population Targets for Future Urban Areas and Rural Areas

Applying assumptions for intensification and share of regional growth allowed the Core Planning Team to generate more detailed population estimates for each of 14 Urban Areas and 3 Rural Areas (Appendix A). Urban Areas are geographic areas that include future urban developed lands within or contiguous to existing urban municipalities. Residential growth in Urban Areas assumed to occur in the form of Intensification, Compact Urban Nodes and Potential Compact Urban Nodes.

The remaining non-urban lands are within the three rural municipal districts. Rural growth was assumed to occur through intensification and greenfield development in hamlets and country-residential developments. Definitions and information sources for the population estimates included in Appendix A are detailed below. Ultimately, the Greenfield Target (Column 3) was used to “paint” the development footprint for Compact Urban Nodes illustrated in the Calgary Metropolitan Plan Map (described in Section 5.0).

Table 4 Definitions

Column	Title	Definition	Source
1	2006 Population	Reflects 2006 existing population within existing municipal boundaries.	Urban Futures - Context for Change Management
2	Intensification	According to CRP Policy 3.1, member municipalities “will strive to accommodate at least 25% of new population growth across the region through intensification of existing developed areas.” (Note that estimates shown on the table for the Canmore Urban Area reflect greater than 25% intensification based on the limited amount of developable land and capacity information provided by the Town of Canmore.)	CRP Policy
3	Greenfield Target	Reflects the Target (mid-point) established for future population growth that will be accommodated on currently undeveloped lands within or contiguous to existing urban municipalities. Note that this population target is for greenfield development associated with Compact Urban Nodes and does not include population associated with Potential Compact Urban Nodes, Hamlets or other greenfield development in rural areas.	Core Planning Team
4	O2 Calculation of Total Greenfield Population	Reflects the amount of population growth O2 calculated using the GIS tool based on the amount of land area shown as Compact Urban Node on the Calgary Metropolitan Plan Map.	O2 Planning + Design, Inc.
5	Horizon Range	Reflect the range of expected population growth (both greenfields and intensification) to recognize the uncertainty of population projections.	Core Planning Team
7	Target	The midpoint of the Horizon Range reflecting population growth, both greenfields and intensification.	Core Planning Team

Note: The existing 2006 population (Column 1) is calculated based on 2008 municipal boundaries. Future population capacities (Columns 2–9) are calculated for a larger geographic area, one that includes the existing urban municipality plus adjacent areas.



7.0 Development and Conservation Strategies

The Calgary Metropolitan Plan reflects the integration of two distinct strategies—development and conservation strategies. The Conservation Strategy identifies where development should be avoided—the ecological infrastructure. The Development Strategy identifies where development should occur and in what form.

7.1 Ecological Infrastructure - Where Development Should Be Avoided

Calgary Metropolitan Plan Policy 2.1 states that CRP and member municipalities “will align and coordinate local regional and intermunicipal plans to protect five key elements of the region’s ecological infrastructure.” A series of maps were developed to show the location of these five key elements to be protected. The Calgary Metropolitan Plan Map shows a composite of the five elements of ecological infrastructure: wetlands and wetland buffers, streams and riparian buffers, large patches, ridges, and a regional corridor. The Calgary Metropolitan Plan Map assumes future greenfield development will avoid these areas. Details of data and methods used by O2 to map the regional ecological infrastructure are described in a separate report, *Calgary Metropolitan Plan Environment Report: Actions and Strategies*.

7.2 Nodes and Corridors - Where Development Should Occur

The Development Strategy considers the attractiveness of the land for various land uses, as well as the infrastructural components needed to support development such as solid waste disposal, wastewater treatment, potable water, and transportation. The Calgary Metropolitan Plan’s development strategy reflects a “nodes and corridors” approach to accommodate future growth in the region. It focuses new development in and around existing urban centres; along current and future corridors (roads, transit, water and wastewater), and along identified regional employment corridors.

Residential population growth, in particular, was focused in locations that could be served by improved transit access to and from well-connected major regional activity concentrations across the region, and that locations could be efficiently serviced by existing and/or extended water and wastewater infrastructure.



8.0 Future Land Use

Land uses and associated densities used to create the Calgary Metropolitan Plan Map were discussed and refined over many months of consultation and discussion with Core Planning Team, CRP committees and member municipalities.

(See Map on page 12)

8.1 Land-use Categories

Four land-use categories appear on the final June 2009 version of the Calgary Metropolitan Plan Map:

- Current Developed Land (shown in pink on the Calgary Metropolitan Plan Map) – Extent of the current development footprint. This is also the location of growth that will occur through intensification.
- Compact Urban Node (shown in blue on the Calgary Metropolitan Plan Map) – Greenfield mixed-use development on lands within or adjacent to existing urban municipalities.
- Potential Compact Urban Nodes (shown as a blue double circle on the Calgary Metropolitan Plan Map) – Greenfield mixed-use development on lands that are NOT adjacent to existing urban municipalities. Five areas were identified by municipal districts and counties that may evolve into compact urban nodes: Cochrane Lake, Harmony, Highway 8, Conrich, Langdon. Note: these nodes are shown generally, and not with a measurable development footprint.
- Future Industrial/ Commercial Development (shown in purple on the Calgary Metropolitan Plan Map) – Greenfield development to accommodate a variety of industrial uses. Uses expected to locate these areas include: light industrial, transportation and logistics, high tech, regional commercial and agricultural services. Core Planning Team and member municipalities determined the amount and location of future industrial development to be shown on the Calgary Metropolitan Plan Map.

The Calgary Metropolitan Plan Map spatially locates future urban growth areas, shown as “Compact Urban Nodes” or “Future Industrial/ Commercial Development.” Future rural growth areas are assumed to occur adjacent to existing hamlets or as new country-residential development. While the Calgary Metropolitan Plan has a small number of policies related to rural residential development, the location of new country-residential developments outside of the Compact Urban Nodes is at the discretion of the rural municipalities.

Therefore, the location of future rural residential development is not identified on the Calgary Metropolitan Plan Map. Intensification, infill or redevelopment of previously developed lands, is assumed to occur within Current Developed Land across the region at the discretion of the local municipality.

8.2 Population Density Assumptions

In order to show the development footprint associated with population growth, a population density assumption for the Compact Urban Node land-use category was needed. There is an inverse relationship between density and development footprint—the higher the density assumed, the smaller the development footprint created. O2 developed a GIS mapping tool to locate future development spatially and calculate population associated with this development. A density assumption (people per hectare of gross residential area) is built into the GIS tool to calculate the population associated with the proposed areas for Compact Urban Nodes.

This density assumption, developed by the Core Planning Team, was guided by the City of Calgary's publication "Suburban Residential Growth 2008-2012" (Appendix B). The following assumptions were used to estimate the density for Compact Urban Nodes that included very minor changes to assumptions used by the City of Calgary:

- Gross total area includes 12% non-developable land, 16% regional land uses and 72% residential area. The percentage of non-developable land is slightly lower than the City's assumption of 14% to reflect the exclusion of ecological infrastructure from gross developable area.
- Residential density equals 8 units per gross residential acre.
- 25% of population growth is accommodated as intensification on already developed lands.

These assumptions yielded a gross population density of approximately 39.1 people per hectare. However, the Core Planning Team decided to include a 20% contingency factor to create a slightly larger footprint. This represents additional land that may be needed to accommodate growth if the region does not meet its 25% intensification goal. Therefore, the gross population density of 32.6 people per hectare was built into the GIS tool to calculate the population associated with the development footprint for Compact Urban Nodes. See Appendix C for detailed calculations.

Note: The Core Planning Team discussed using a lower density of 7 units per gross residential acre for undeveloped urban lands with approved Area Structure Plans, Outline Plans and/or Land-use designations in place, instead of 8 units per gross residential acre. However, a single density assumption was applied to for ALL urban compact node development areas regardless of plans in place.



8.3 Job Density Assumptions

The GIS tool also calculated employment associated with Compact Urban Nodes and Future Industrial/ Commercial Development. Currently, assumptions to estimate the total number of future jobs associated with development are incomplete. The estimated number of jobs appearing in Appendix D, Column 6 only reflects community-based jobs.

- Jobs associated with Community Uses in Compact Urban Nodes (5 jobs per hectare). This estimate was provided by the Core Planning Team and assumes 8 community-based jobs (local retail, services, schools, etc and 3 home-based jobs are generated per 100 residents—a total of 11 jobs per 100 residents (0.11 jobs per resident). O2 applied this ratio to the development footprint and population estimate for Compact Urban Nodes to come up with an average of 4.3 jobs per hectare. $[39.1 \text{ people / hectare} \times 0.11 \text{ jobs per person} = 4.3 \text{ jobs per hectare}]$. In order to reflect the 20% land contingency, the job density built into the GIS tool was increased to 5 jobs per hectare. See Appendix D Column 6.

The following additional job estimates were discussed over the course of the project, but were not included in the calculation of Greenfield Jobs (Appendix D, Column 6).

- Jobs associated with Regional Uses within Compact Urban Nodes. Currently there is no estimate for the number of jobs associated with Regional Uses. Calculations associated with residential density of Compact Urban Nodes assumed that 16% of the total residential land area would be used for Regional Uses. The types of jobs associated with Regional Uses could include those at major institutions (regional high schools, universities, health and research centres), regional shopping areas, office parks or new Transit Oriented Centres (see below)
- Jobs associated with Transit Oriented Centres (10 to 310 jobs per hectare). Regional jobs could also include office and retail, and service jobs associated with denser Transit Oriented Centres. O2 previously recommended creating a hierarchy of mixed-use centres and spatially locating centres on the map. O2 estimated the number of jobs per hectare associated with mixed-use centres might range from 10 jobs per hectare in a Minor Urban Centre to 310 jobs per hectare in a Metropolitan Centre. O2 assumed that many centres would occur through intensification (located within the existing development footprint), but some would develop on greenfields. The Calgary Metropolitan Plan Map shows the location of approximately 20 Transit Oriented Centres. According to Policy 3.9, each new Transit Oriented Centre should achieve “a minimum intensity threshold of 100 people or jobs per gross developable hectare within walking distance of regional transit services. Specific estimates of jobs associated with Transit Oriented Centres have not yet been addressed.
- Jobs associated with Industrial Development (30 jobs per hectare). This job estimate is based on O2’s calculation of existing job density for Calgary’s industrial area using current Transit Zone employment data supplied by the City of Calgary.
- Jobs associated with Airport Industrial Development (56 jobs per hectare). This job estimate is based on O2’s calculation of existing job density for industrial area surrounding Calgary International Airport (excluding the actual airport) using current Transit Zone employment data supplied by the City of Calgary.



9.0 Future Development Footprint

O2 created a GIS mapping tool that allows the GIS user to “paint” different land uses in specific spatial locations. The tool will calculate the land area developed as well as population and jobs associated with specific land-use types.

9.1 Compact Urban Nodes

The development footprint for Compact Urban Nodes illustrates the location and amount of land needed to accommodate future population growth for 14 future Urban Areas.

The Calgary Metropolitan Plan Map reflects a total population (existing population and growth) of 2.6 million within the 14 future Compact Urban Areas. Using the GIS tool, O2 filled developable lands with the Compact Urban Node land-use type to reach the Greenfield Population targets provided by the Core Planning Team (Appendix A, Column 7) for each of the 14 Urban Areas. The Core Planning Team, CRP members and other stakeholders refined the general location of this development footprint through meetings and workshops (described in Section 1.5). In places where the individual urban areas are contiguous to each other (e.g., Airdrie Area and Calgary Area), the Core Planning Team in consultation with CRP members determined the proportion of population growth driven by each of the existing urban municipalities and the associated population was allocated accordingly.

The land area and population associated with Compact Urban Nodes for 14 future Urban Areas and 32 Node Areas within larger Urban Areas are detailed in Appendix D and mapped in Appendix E. Because the development footprint was developed at a very coarse regional scale, these figures should be considered a general approximation of the future development footprint.

Note: The future development footprint for Compact Urban Nodes does not include all approved or pending Area Structure Plans.

9.2 Other Residential Development

O2 did not create development footprints or calculate population using the GIS tool for any residential development outside of Compact Urban Nodes shown on the Calgary Metropolitan Plan Map, such as Potential Compact Urban Nodes, Hamlets or other residential development at non-urban densities. The Core Planning Team provided Population Horizon Ranges and Targets for Municipal Districts and Counties shown in Appendix A.

9.3 Industrial/ Commercial Development

The location and amount of Future Industrial/ Commercial Development reflects the input of the Core Planning Team and the CRP Staff Sub-committee. Most development is located near the existing east Calgary industrial district, or adjacent to Highways 1, 2 and 2A. No targets for industrial/ commercial lands or jobs were established. A rationale for the total amount of industrial land needs to be developed.

Note: The development footprint does not include all approved or pending Area Structure Plans for this type of development.



Appendices

Appendix A -	Population for Urban Areas, Municipal Districts and Counties
Appendix B -	Suburban Residential Growth 2008-2012, City of Calgary
Appendix C -	Density and Land Requirement Calculations
Appendix D -	O2 Calculations of Population Growth and Land Areas Based on <i>Calgary Metropolitan Plan</i> Calgary Metropolitan Plan Map (32 Compact Urban Node Areas)
Appendix E -	Calgary Metropolitan Plan Map Showing Current Municipal Boundaries Relative to Compact Urban Node Areas
Appendix F -	Calgary Metropolitan Plan

Population for Urban Areas

Urban Areas	2006 Pop.*	Intensification (at 25%)*	Greenfield Target*	O2 Calculation of Total Greenfield Population	Horizon Range*	Assumed Growth Added by 2076*	Target*	O2 Calculation of Total Population	Difference Between Target & O2 Calculation
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9
		Col 6 * 0.25				Col 7-1		Col 1 + 2 + 4	Col 7 - 8
Airdrie Area	29663	15084	45254	45143	75-110000	60337	90000	89890	110
Banff Townsite	6894	3107	0	0	10000	3106	10000	10001	-1
Black Diamond Area	1987	1256	3767	3654	5-12000	5013	7000	6897	103
Calgary Area	988193	302952	908855	909859	2-2.5 M	1211807	2200000	2201004	-1,004
Canmore Area**	12298	11064	13277	5691	30000	17702	30000	29053	947
Chestermere Area	9748	13813	31439	29463	45-65000	45252	55000	53024	1,976
Cochrane Area	14004	13999	41997	41718	60-90000	55996	70000	69721	279
Crossfield Area	2731	4317	12952	11559	15-25000	17269	20000	18607	1,393
High River Area	10944	7264	21792	23364	30-50000	29056	40000	41572	-1,572
Nanton Area	2115	1221	3654	3616	5-12000	4885	7000	6952	48
Okotoks Area	17498	10626	31877	30214	45-75000	42502	60000	58338	1,662
Strathmore Area	10458	4886	25000	22892	30-50000	29542	40000	38236	1,764
Turner Valley Area	1969	1258	3815	4081	5-12000	5031	7000	7308	-308
Irricana Area	1500	375	5125	7322	5-7000	5500	7000	9197	-2,197
Total	1110002	391221.5	1148812	1138576			2643000	2639799	3,201

*Numbers provided by the City of Calgary on November 13, 2008

** Higher than 25% Intensification

Population for Municipal Districts & Counties

Municipal Districts & County	2006 Pop.***		Horizon Range****	Target (mid-point)****	
M.D. of Rockyview*	34738		95-120000	107500	
M.D. of Foothills*	20067		40-60000	50000	
M.D. of Bighorn*	1311		25-3500	3000	
Wheatland County*	8360		20-30000	25000	
Total	64476			185500	

***Numbers from Baxter report

****Numbers provided by the City of Calgary on January 19, 2009

SUBURBAN RESIDENTIAL GROWTH 2008-2012 MONITORING GROWTH AND CHANGE SERIES



Table 22: Calculation of Density

Density = Number of Units divided by Gross Residential Area

GROSS TOTAL AREA LESS NON DEVELOPABLE AREA EQUALS **GROSS DEVELOPABLE AREA**

GROSS DEVELOPABLE AREA LESS REGIONAL LAND USES EQUALS **GROSS RESIDENTIAL AREA**

Sample Density Calculation		Definitions	
(Figures are for sample density calculation only)		(The information below may not represent all possible uses)	
A sample community with 259 hectares (640 acres) of total land area, 37 hectares (91 acres) of non-developable lands, 43 hectares (106 acres) of regional land uses and 3,050 units (multi unit or single unit), would result in a housing density of 17 units per hectare (7 units per acre).			
GROSS TOTAL AREA:	259 hectares	"Gross Total Area" include:	259 hectares
Less		All lands within a physical boundary or total area	
NON DEVELOPABLE AREA:	37 hectares	"Non-Developable Area" include:	37 hectares
Equals		Environmental Reserve	20
GROSS DEVELOPABLE AREA	222 hectares	Expressways	8
GROSS DEVELOPABLE AREA:	222 hectares	Railways	4
Less		Other Non-Developable Lands	5
REGIONAL LAND USES:	43 hectares	"Gross Developable Area" Include:	222 hectares
Equals		Regional and Local Uses (lands that can be built on)	
GROSS RESIDENTIAL AREA	179 hectares	"Regional Land Uses" Include:	43 hectares
NUMBERS OF UNITS:	3,050 Units	Regional Open Spaces	5
Divided by Gross Residential Area:	179 hectares	Major Commercial Centres > 4.0 ha or 10 acres	10
		Major Institutional Sites	3
		Senior High Schools	9
		Industrial areas	2
		Public Lakes/water bodies	10
		Other Regional Uses	4
Equals: DENSITY	17 UPH	"Gross Residential Area" Include:	179 hectares
or	7 UPA	Single Unit Residential	91
		Multi Unit Residential	4
		Local Commercial	5
		Local Parks & Open Space	18
		Elementary & Junior High School Sites	7
		Local Roads including Majors & Lanes	41
		Church Sites	1
		Daycare Centres	1
		Community Centres	2
		Small Indoor Recreation Centre	1
		Small Site Fire & Police Stations	1
		Private Lakes, Wet/Dry Ponds & Public Utility Sites	2
		Other Local Use	5

Units per hectare - UPH

Unit per acre- UPA

While the density criteria noted in this document provides general direction for a consistent approach in calculating density on a community-wide basis, it cannot address the unique and often disparate components associated with individual ownership areas and specific Outline Plan and Land Use applications. A comprehensive review will be required at the Outline Plan and Land Use stage to ensure that the mathematical density calculation accurately reflects the intent of policy initiatives and achieves City of Calgary objectives.

"Slopes that may be part of the Environmental Reserve are determined not to be developable only if they are considered geo-technically unstable"

Source: Planning Development & Assessment, 2006

Density and Land Requirement Calculations Modified November 15, 2008				Total Regional Growth
Gross Total Area (GTA)	100.0%	259.00		50000
Non Developable Area (NDA)	Percent of Area	Example Area Reduction (ha)		
Environmental Reserve	5.5%	14.25		2750
Expressways, Rail and other Transportation Corridors	4.5%	11.66		2250
Other Non-developable Areas	2.0%	5.18		1000
Subtotal (NDA)	12.0%	31.08		6000
Regional Land Uses (RLU)				
Regional Open space	2.0%	5.18		1000
Major Commercial Centres	4.0%	10.36		2000
Major Institutional Centres	1.0%	2.59		500
High Schools	3.5%	9.07		1750
Industrial Areas	1.0%	2.59		500
Public Lakes and Waterbodies	3.0%	7.77		1500
Other Regional Uses	1.5%	3.89		750
Subtotal (RLU)	16.0%	41.44		8000
Gross Residential Area (GRA)				
Residential Areas				
Single Unit	35.0%	90.65		17500
Multi Family	1.5%	3.89		750
Local Commercial	2.0%	5.18		1000
Local Parks and Open Space	7.0%	18.13		3500
Elementary and Junior High Schools	2.7%	6.99		1350
Local Roads	18.5%	47.92		9250
Local Community Uses	2.3%	5.96		1150
Private Lakes Wet & dry Ponds, Public Utilities	1.0%	2.59		500
Other Local Uses	2.0%	5.18		1000
Subtotal (GRA)	72.0%	186.48		36000
Total	100.0%	259.00		50000
Gross Residential Density Calculations				
	7.00 Units per acre (UPA)=		17.30 Units per hectare (UPH)	
	8.00 Units per acre (UPA)=		19.77 Units per hectare (UPH)	
Population Per Household Assumption	2.75			
Population Densities for Gross Residential Area (GRA)				
Population per Hectare of GRA at 7 UPA	47.57			
Population per Acre of GRA at 7 UPA	19.25			
Population per Hectare of GRA at 8 UPA	54.36			
Population per Acre of GSA at 8 UPA	23.00			
Population Densities for Gross Total Area (GTA)				
Population per Hectare of GTA at 7 UPA (calculated on GRA)	34.25			
Population per Acre of GTA at 7 UPA (calculated on GRA)	13.86			
Population per Hectare of GTA at 8 UPA (calculated on GRA)	39.14			
Population per Acre of GTA at 8 UPA (calculated on GRA)	16.56			
Required Greenfield Land Calculations				
Future Population Additions	1,600,000			
Potential Intensification Assumptions	Intensification Population	Greenfield Population		
25%	400,000	1,200,000		
10%	160,000	1,440,000		
0%	0	1,600,000		
Mixed Use Areas	At 7 UPA Required Area (ha)	Contingency Assumption	Total Area needed with contingency	
25%	35,038	20%	42,046	
10%	42,046	20%	50,455	
0%	46,718	20%	56,062	
	At 8 UPA Required Area (ha)	Contingency Assumption	Total Area needed with contingency	
25%	30,659	20%	36,790	
10%	36,790	10%	40,469	
0%	40,878	0%	40,878	
NOTE: These numbers do NOT include pure industrial lands				
Area at 8 UPA + 25% intensification	30658.67 ha			
Average Density for Compact Urban Nodes	39.14 pop / hectare			
Area at 8 UPA + 25% intensification + 20% contingency lands	36790.41 ha			
Density used for O2 GIS tool to create larger footprint	32.62 pop / hectare			

Appendix D

CMP Population Growth and Land Area Required for Compact Urban Nodes (inside and outside of current urban municipal boundaries)									
Letter	Compact Node Area	Inside Current Urban Boundaries		Outside of Current Urban Municipal Boundaries but Contiguous to Current Urban Municipal Boundaries		Total Compact Node Area			Comments
		Greenfield Population Within Current Urban Boundaries	Area (ha) Within Current Urban Municipal Boundaries	Greenfield Population Outside of Current Urban Municipal Boundaries	Area (ha) Outside of Current Urban Municipal Boundaries	Total Greenfield Population	Total Greenfield Jobs*	Total Area (ha)**	
		Column 1	Column 2	Column 3	Column 4	Column 5 1 + 3	Column 6	Column 7 2 + 4	
I	Airdrie Area	20605	632.1	23896	733.0	44501	6825	1365.1	
BB	Black Diamond Area	902	27.7	2743	84.1	3645	559	111.8	
D	Calgary Area	0	0.0	5707	175.1	5707	875	175.1	
E	Calgary Area	21374	655.6	315	9.7	21689	3327	665.3	
F	Calgary Area	36423	1117.3	48567	1489.8	84990	13035	2607.1	
G	Calgary Area	42983	1318.5	23406	718.0	66389	10182	2036.5	
H	Calgary Area	0	0.0	68333	2096.1	68333	10481	2096.1	
K	Calgary Area	75792	2324.9	0	0.0	75792	11624	2324.9	
M	Calgary Area	31437	964.3	17293	530.5	48730	7474	1494.8	
O	Calgary Area	86439	2651.5	3936	120.7	90375	13861	2772.2	
Q	Calgary Area	50051	1535.3	0	0.0	50051	7677	1535.3	
R	Calgary Area	28516	874.7	17812	546.4	46328	7106	1421.1	
S	Calgary Area	6265	192.2	39210	1202.8	45475	6975	1394.9	
T	Calgary Area	0	0.0	22292	683.8	22292	3419	683.8	
V	Calgary Area	0	0.0	27131	832.2	27131	4161	832.2	
W	Calgary Area	17509	537.1	0	0.0	17509	2685	537.1	
	Calgary Subtotal	396789	12171.4	274002	8404.9	670790	102882	20576.3	
FF	Canmore Area	4521	138.7	0	0.0	4521	693	138.7	
N	Chestermere Area	546	16.7	27856	854.5	28402	4356	871.2	
A	Cochrane Area	3314	101.7	23289	714.4	26603	4080	816.0	
B	Cochrane Area	2690	82.5	0	0.0	2690	413	82.5	
C	Cochrane Area	6047	185.5	5837	179.0	11884	1823	364.5	
	Cochrane Subtotal		369.7	41177	893.4	41177	6315	1263.1	
J	Crossfield Area	1665	51.1	9269	284.3	10934	1677	335.4	
Y	High River Area	283	8.7	17089	524.2	17372	2664	532.9	
Z	High River Area	9446	291.8	6756	207.3	16202	2495	499.0	
	High River Subtotal		300.4	23845.4	731.5	33574	5159	1031.9	
DD	Irricana Area	5131	157.4	990	30.4	6121	939	187.8	
EE	Nanton Area	75	2.3	3534	108.4	3609	554	110.7	
X	Okotoks Area	11544	354.1	19620	601.8	31163	4780	955.9	
CC	Strathmore Area	2506	76.9	21657	664.3	24163	3706	741.2	
AA	Turner Valley Area	1910	58.6	2145	65.8	4055	622	124.4	
Total		468034.0	14356.9	438689	13456.7	906723	139068	27813.6	

* Jobs for residential portion of compact urban node only. Does not include industrial jobs or commercial jobs associated with non-neighborhood centres or TOD.

** Area of Compact Urban Node development footprint only. Includes 20% contingency.

*** Compact Node areas are named Calgary "Area" or Cochrane "Area" as a reference to contiguous urban development and population distribution but this does not presume jurisdiction





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