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Day, David L.

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**EXPLORING DIMENSIONS OF
SUSTAINABLE URBAN DEVELOPMENT PLANNING
AND THEIR POTENTIAL IMPACT ON PARKS IN THE CALGARY REGION**

David L. Day

**Director, Environmental & Safety Management
City of Calgary**

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PARKS FOR TOMORROW

**Conference on Canadian Parks and Protected Areas
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Abstract

Globally, and nowhere more so than in Canada, cities are increasing their focus on "sustainable" forms of urban development to cope with rising concerns that cut equally across the Triple Bottom Line values of environmental quality, social justice, and economics and costs. The City of Calgary, coupled with its surrounding region, faces forecasts of population growth of an additional 1.75 million residents (a 150% increase) in the 50-75 year planning horizon. The Calgary region already faces costs of housing and business among Canada's highest; the dubious distinction of Canada's largest per capita ecological footprint; water supply and quality issues; and genuine social inclusion issues. It is no surprise therefore that The City and the Calgary Regional Partnership have

put their focus on elaborating principles of sustainable development as central to long range urban development planning.

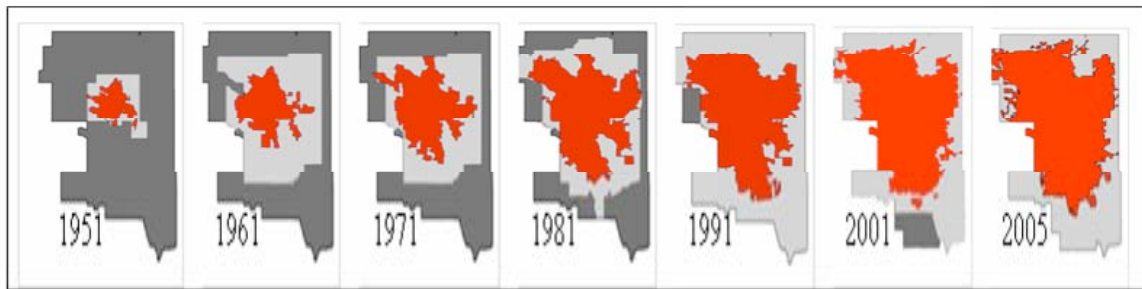
Banff National Park and Kananaskis Country together welcome in excess of 7 million visitation days each year. It is essential that the parks community (research, planning, and operational management) understand not only the sheer impact of projected population growth on regional parks, but also gain a basic understanding of the new dimensions of demand on regional parks systems impacts that significant increases in urban density may create. This paper brings to the Parks for Tomorrow series, a real-time discussion of on-going regional and city planning, and explores the potential linkages between the core characteristics of "sustainable" urban planning and residents' perceptions and expectations for their parks.

The author's intent with this paper is to inform participants about the anticipated population growth within the Calgary region, and about key planning processes that will significantly define land use, mobility, and sustainability characteristics. The impact of population growth will directly affect the efforts of park agencies to provide facilities and services to meet increase recreational demand, and to ensure protection for natural and cultural resources.

This paper also describes the City of Calgary's system of parks and open spaces, including major natural and regional parks, and identifies and discusses the potential impacts of growth and major challenges identified by park planners and managers. Finally, the paper presents information about contemporary efforts by municipal planners and administrators to promote more "sustainable" forms of urban growth, and reports on the focus of early research to consider the impact of increasing urban density on urban and regional park systems.

A. Dimensions of Growth in the Calgary Region

In 2007, the population of the City of Calgary reached the one million mark, the result of two decades of rapid growth. The impacts of growth reached throughout the Calgary region. Between 1981 and 2001 alone, Calgary's built-up area (developed urban land) expanded by more than 160 square km¹. Today, the City occupies a total of 726 square km. The following visual illustrates the geographic footprint growth that has occurred since 1951 at which time Calgary's population was approaching 200,000 residents.



Situated 128 km west of Calgary, Banff is considered by many Calgarians as one of several key regional destinations for recreational and heritage tourism. As Calgary and its region have grown, so has visitation demand on all regional parks and recreational facilities. In 1950, less than 460,000 visitors entered the gates of Banff National Park². By 2006-07, that number had multiplied by more than 800% to 3,297,000 (itself a 4% increase over the previous year). Since the late 1990's, in most years, annual skier days at Banff's three commercial ski areas exceeds one million visitors.

At nearby Kananaskis Country, annual visitation reached the 3 million mark by 2006. K-Country includes a mix of protected areas, a Provincial Park, recreational and mixed use areas. K-Country is just 90 km west of Calgary, and like Banff National Park, it includes a village that can accommodate business and tourism travel, an alpine ski area and popular year-round trails.

Planning initiatives now underway in the City of Calgary, and regionally by the Calgary Regional Partnership, anticipate that the population of the City of Calgary alone will more than double by an additional 1.3 million residents within a 50-70 year time frame. Parallel growth estimates for the Calgary Region anticipate that the regional population will swell to as much as 2.8 million by 2060. Calgary's present population of approximately 1 million residents was anticipated by the Banff Bow Valley Study team, although their estimate saw that figure being reached only in 2010. One of the more controversial findings of the BBVS team was their forecast that visitation to Banff National Park could rise to 19 million people per year by 2020.

B. Plan IT Calgary – The Calgary Integrated Land Use and Mobility Plan

The City Plan IT Calgary project, initiated in 2007 with City Council endorsement, will result in a long-term integrated land use and mobility plan for the City. City and regional planners project that Calgary's urban population will swell by an additional 1.3 million people over the next 50 to 70 years. Plan IT will be used by Council and Administration as the City's official plan to guide municipal growth

The City Plan IT team established 11 "Sustainability Principles" that are being used as a basis for decision-making. The team used three sources of information to develop these sustainability principles. These included established principles of Smart Growth; current City of Calgary policy including the Municipal Development Plan (1997) and the Calgary Transportation Plan (1995); and the imagineCALGARY Long Range Urban Sustainability Plan (2005).

Transportation goals were selected from the Calgary Transportation Plan (1995), which represents current City of Calgary policy. In February 2004, a public survey was conducted to determine if Calgarians still supported the 1995 Calgary Transportation Plan (CTP). The results indicated that Calgarians support the vision and land use strategies of the 1995 Calgary Transportation Plan.

The imagineCALGARY project was a community-led long-range visioning process which created both a 100-year vision for sustainable community development, and over 115 shorter-term strategic and tactical goals and targets. ImagineCALGARY goals and targets provided additional direction and clarity to the Sustainability Principles. By incorporating the specific targets created through imagineCALGARY, the Sustainability Principles will offer more direction and create a "made-in-Calgary" approach to the broadly recognized Smart Growth principles.

(1) Plan IT Sustainability Principles:

- Principle 1: Create a range of housing opportunities and choices
- Principle 2: Create walkable environments
- Principle 3: Foster distinctive, attractive communities with a strong sense of place
- Principle 4: Provide a variety of transportation options
- Principle 5: Preserve open space, agricultural land, natural beauty and critical environmental areas
- Principle 6: Mix land uses
- Principle 7: Strategically direct and manage redevelopment opportunities within existing areas
- Principle 8: Support compact development
- Principle 9: Connect people, goods and services locally, regionally and globally.
- Principle 10: Provide transportation services in a safe, effective, affordable and efficient manner that ensures reasonable accessibility to all areas of the city for all citizens.
- Principle 11: Utilize green infrastructure and buildings

These principles focus on land use and mobility, and will be complemented by additional, more specific principles and policies that the City is preparing to address environmental, social and economic needs. Considered together, these principles and policies reflect the City's established commitment to pursue a Triple Bottom Line approach to decision-making. In reality, The City of Calgary has begun to define how the broader notion of "sustainability" will be fostered on a community-wide basis. Plan IT and associated sustainability policies and programs define how The City of Calgary is responding to imagineCALGARY goals for which it is wholly or partially responsible.

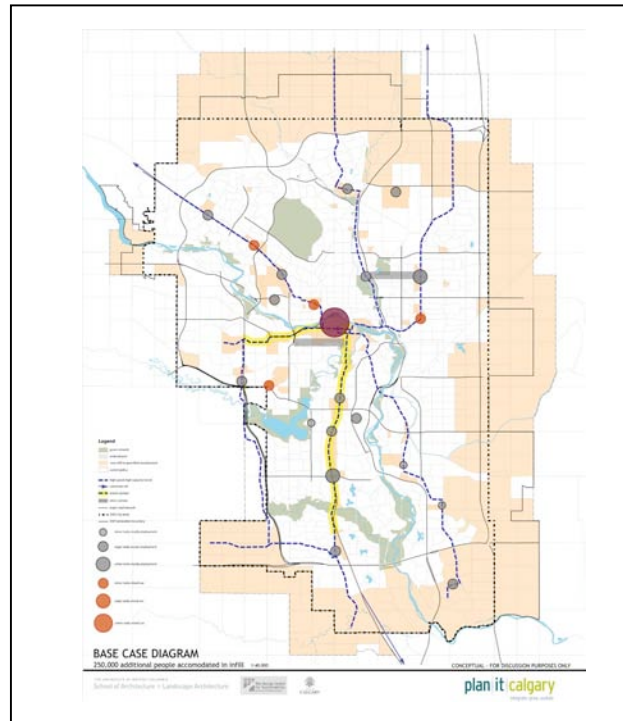
The following planning scenarios illustrate the important changes that Plan IT Calgary signals in the way in which Calgary's urban form will evolve to accommodate growth over the next several decades.

The three scenarios illustrate:

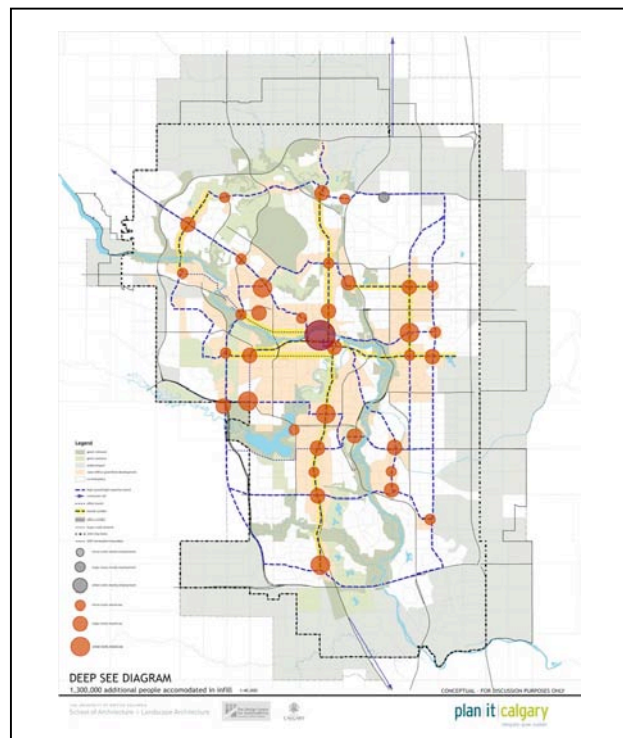
- Continued low-density (arguably unsustainable) suburban growth;
- A more compact form of growth characterized by high-density growth clusters that are defined by expanded transit capacity and the development of employment centres away from the downtown;
- A model that bridges the former scenarios.

Alternate scenarios will be explored as engagement continues in 2008 with citizens and key stakeholders. Plan IT is scheduled to be completed by the end of 2008.

(2) Plan IT Illustration of Alternate Growth Scenarios:



Base Case Scenario - Continued Low-Density Suburban Growth



Compact Growth Scenario – Includes Clusters of Increased Density

creation of high-density nodes that combine job centres with high-density residential units such as town houses and apartments. Each node may also serve as a transit connection, with the higher population density financially supporting transit linkages between and across corridors. The growth focus is no longer on the downtown, but is widely distributed, meaning that people live and play closer to their job, and can obtain many of their daily need within walking distance or short transit connection to their homes. Infrastructure is equally compact, reducing per capita capital and operating costs, and holding tax increases down. The promise of increased urban density must be balanced against the potential loss of private open space – a characteristic of the majority of Calgary residences which are of single family home design.

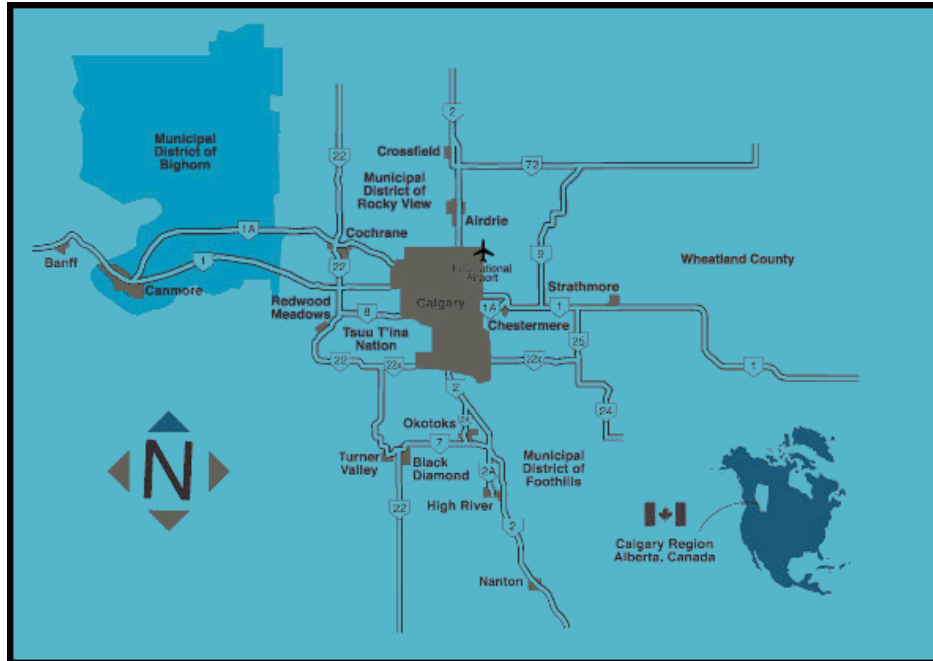
The third scenario represents a possible hybrid between the two extremes. Redevelopment of existing communities is focused in nodes or clusters strung like beads on a necklace on major transportation corridors. Outside these clusters, existing suburban residential communities see only gradual density increases. New communities might incorporate as much as 50% multi-family housing, supporting cost sustainability for major services, while reducing the City's geographic footprint.

C. Calgary Regional Partnership Regional Land Use Plan Project

Established in 1999 to fill a gap created by the closure of the Calgary Regional Planning Authority, the Calgary Regional Partnership (CRP) comprises a region that encompasses 18 municipal governments, including the City of Calgary and one aboriginal first nation. The CRP's boundaries (refer to map, following page) extend from Banff to the west, to Wheatland County in the east, from Crossfield and Airdrie in the north to the MD of Foothills and Nanton in the south. Unlike its predecessor, the CRP lacks "authority" over its member governments, based rather on cooperation and collaboration.

The accelerated growth experienced by Calgary in the past decade has been matched in the surrounding region. In total, the regional population has grown from approximately 200,000 people in 1950 to 1.1 million in 2008. That population is expected to grow by an additional 1.75 million residents within a 50 to 75 year time frame.

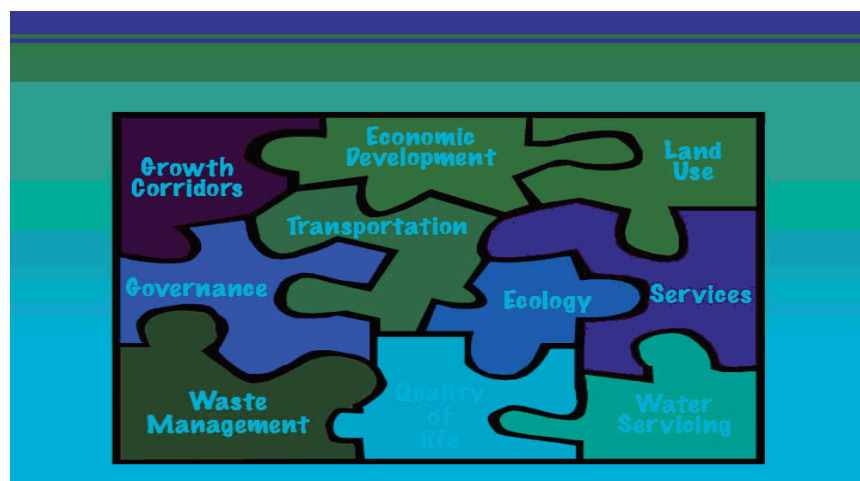
All sectors of the region have shared this growth including Municipal District country residential homes, larger acreages, and rural municipalities. All have experienced rapid growth that has put considerable strain on infrastructure and on all sectors of the service industry including health care and education facilities and services. Natural resources, parks, and protected areas have all come under pressure as total regional population has grown.



Source: CRP www.calgaryregion.ca "Regional Land Use Plan Update", 2008.

The regional land use plan is intended to help CRP member governments to determine a logical way forward for the sustainable development of infrastructure, land and community services across the region. The CRP vision supports this goal: "Working together for healthy environment, enriched communities, sustainable infrastructure, and prosperous economy".

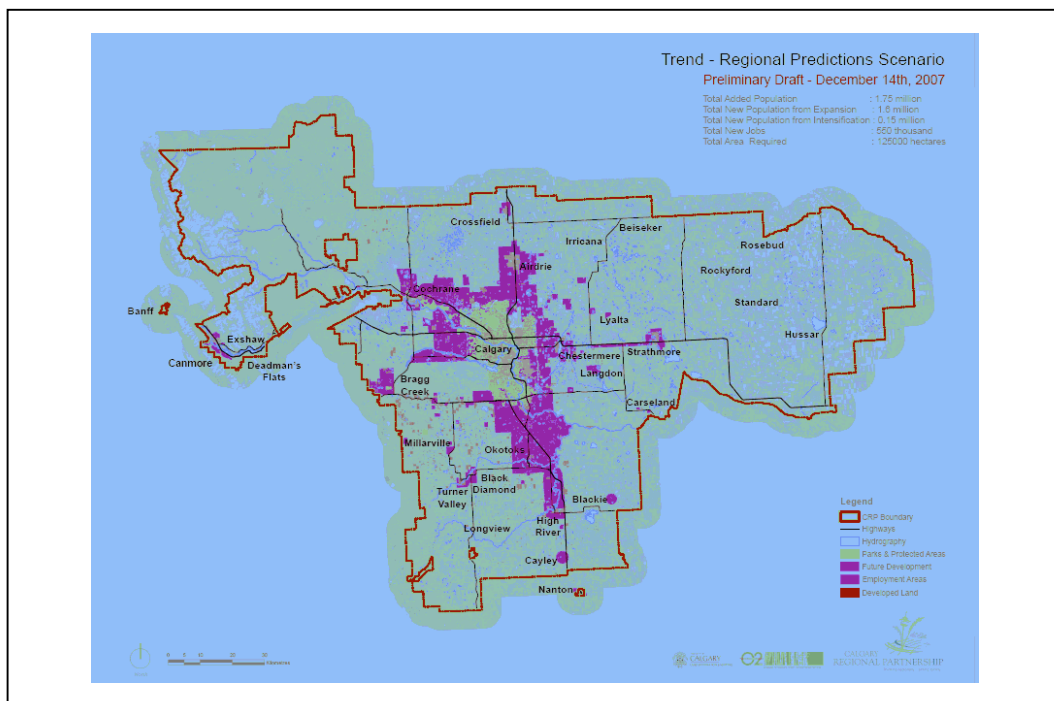
The regional plan will address a wide range of vital issues as illustrated in the following CRP diagram. Cooperation is seen as vital in realizing effective solutions to such a diverse range of municipal governance issues.



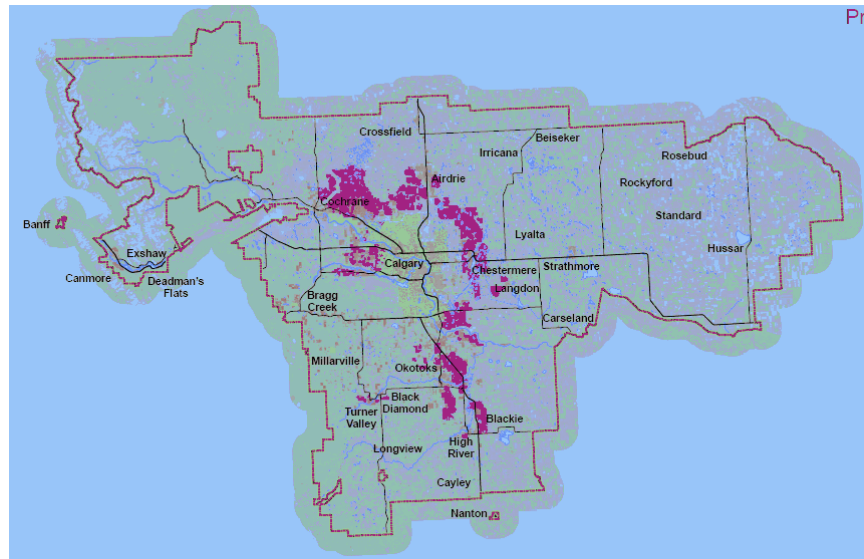
With its regional vision as the key reference point, the Calgary regional partnership has developed three learning scenarios for discussion. Each scenario emphasizes different planning principles. Using each scenario to guide conversations, CRP planners recognize that each scenario implies it's a unique set of assumptions and decisions that affect land use, transportation and services In the Calgary region.

The following three scenarios are intended to be learning tools to help citizens better understand the choices that need to be made to realize a desired future state. Each of the three scenarios goes to an extreme end to test the outcomes of various planning decisions and to assist regional governments assess their effectiveness in achieving the regional vision.

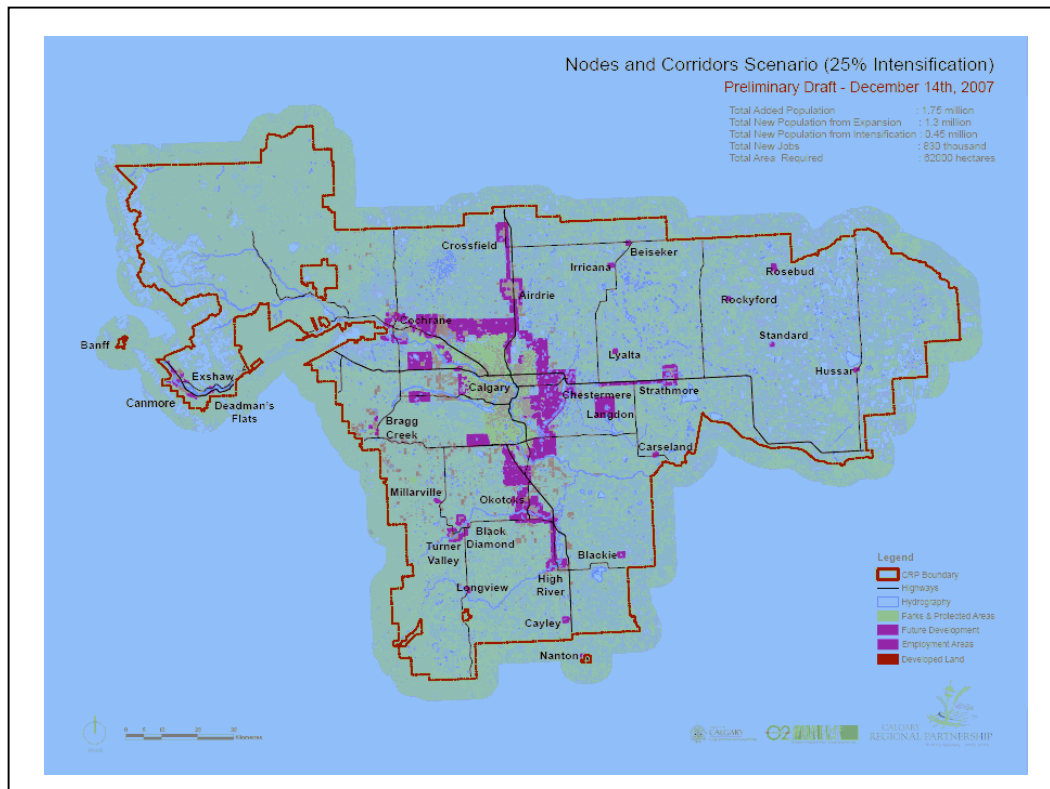
(1) Regional Planning Scenarios (Population 2.8 million in 50 Years)



“Trend” Scenario



“Eco-Cultural” Scenario



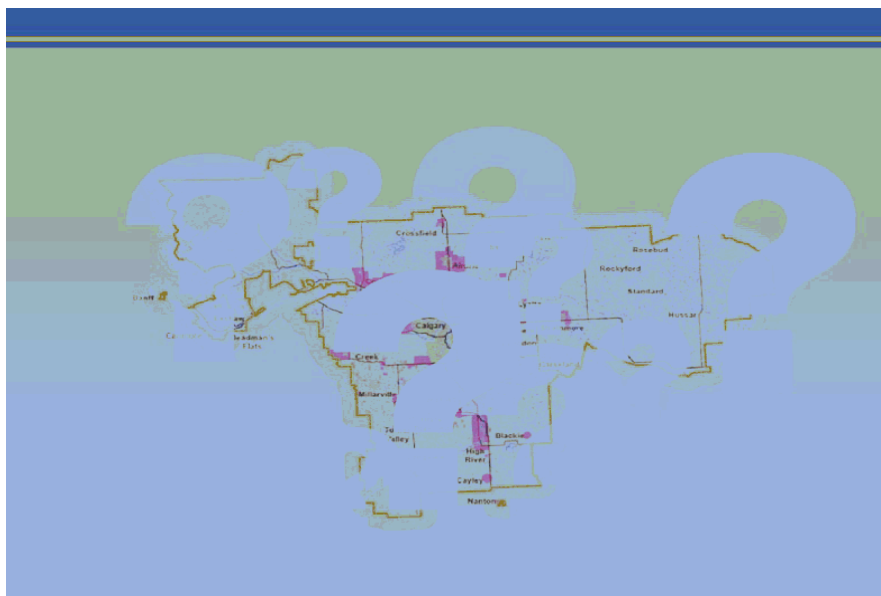
“Nodes & Corridors” Scenario

Discussion:

The Trends Scenario assumes growth as we have it now and no regional plan. The anticipated results of this scenario include continuation of the same development types we see today including low density urban and country residential. The regional footprint would expand greatly. Varying impacts would occur on important ecological features and functions. There would be limited public transit and mobility options due to low density thresholds resulting in increased travel times to work and play, and potential loss of landscape connectivity and agriculturally significant areas. A total of 125,000 hectares of additional development land would be required to accommodate this growth scenario.

The Eco-Cultural scenario shrinks the growth footprint to 45,000 additional ha. Development would occur in intensified forms in areas of least ecological impact. No low density country residential would be supported; natural areas that support biodiversity and important watershed functions would be protected; prime agricultural lands would be protected; areas of high visual value will be enhanced; and new communities would be designed with employment centers to incorporate better mobility and reduced ecological impacts.

The Nodes and Corridors Scenario emphasizes creating land use patterns to support more efficient regional transportation and transit options and well integrated water and wastewater servicing systems. In 50 – 75 years a network of regionally connected nodes and corridors would enable more complete communities with better mobility choices. Existing developed areas would be intensified. Most new urban growth would occur as extensions to existing urban centres. A total of 62,000 additional hectares of land would be required to support this growth scenario.

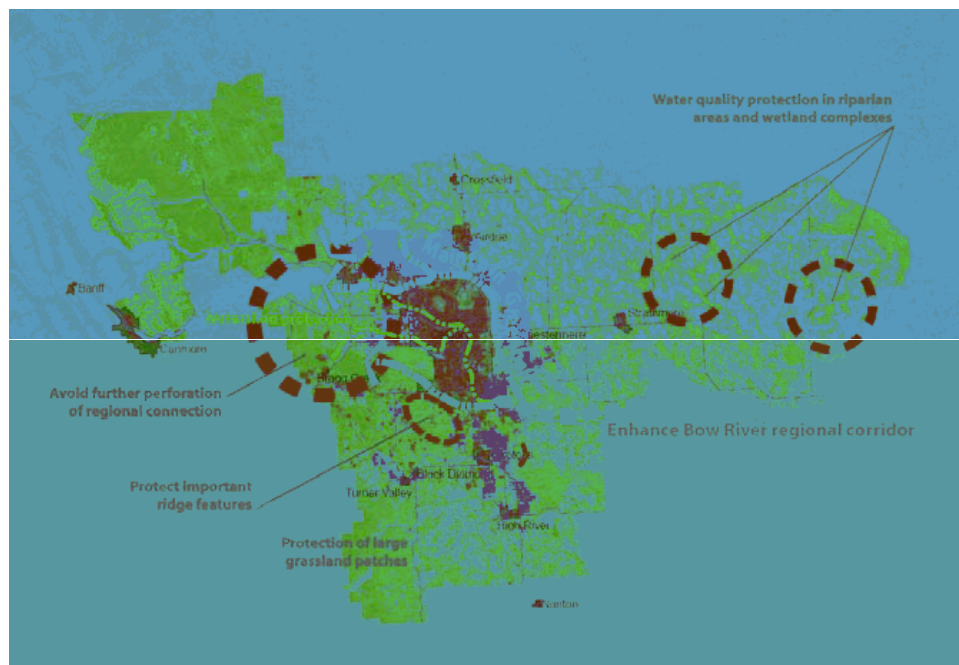


(2) Results to Date

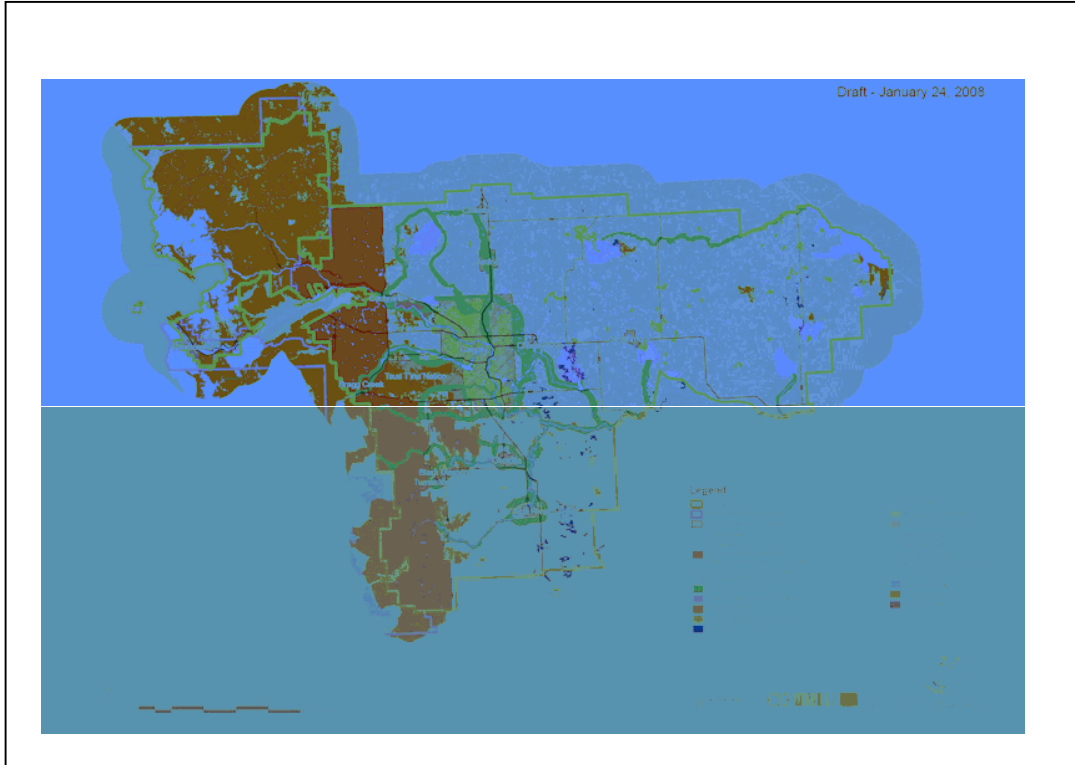
Many CRP participants expect that a hybrid scenario will develop that incorporates core values of the three alternative scenarios, or that new scenarios will be identified through the public engagement process. A number of specialized workshops are being held with experts on issues such as ecology, transportation, urban and rural planning, and agriculture and community services. The result is learning about the priorities and impacts that will have to be considered and balanced in the regional land use plan.

Of key interest to this conference are the emerging directions that are already appearing from discussions held to date. Strong support is emerging for regional systems. It is evident that the regional land use plan must define and build-on the regional-scale systems that affect and serve the region as a whole including ecological and watershed systems, and natural areas needing protection. The region's network of open spaces is another emerging direction that supports regional water supply and servicing needs, and protects the Bow River watershed.

EMERGING DIRECTIONS



Potential Regional Open Space Network



D. City of Calgary Parks

Although City parks will never satisfy Calgarians' keen appetite for travel to and recreation in the Canadian Rocky Mountains, a growing system of regional, community and natural parks, connected by 635 km of paved pathways meet Calgarians' basic demands for outdoor recreation and associated pastimes. The present City parks system embraces over 3,400 open spaces. This includes 40 regional parks; 29 variously-classified major recreation parks, protected sensitive sites, and hundreds of smaller community green spaces and tot lots. In total, Calgary's urban system of parks and open spaces spans over 8,000 hectares – about 8 h / 1000 residents.

To that, add 456 school yards, most with outdoor recreational and open spaces, and Fish Creek Provincial Park, and a growing system of leisure centres, and indoor and outdoor community and private recreational facilities. Some of Calgary's major parks and natural areas occupy large upland tracts of land (i.e. Nose Hill and Strathcona Ravines); many occupy key shoreline areas along the Bow and Elbow Rivers and wetlands (i.e. Weaselhead and Beaverdam Flats, Bowness Lagoon, and Shepard Wetland). A full list of Calgary's system of major parks, natural areas and Legacy Parks can be accessed at the City of Calgary web site - www.calgary.ca.

No comprehensive data could be found to summarize annual visitation to Calgary's system of parks and pathways, however, a 2002 Pathwatch Survey 3 provided the following insights into pathway use by Calgarians:

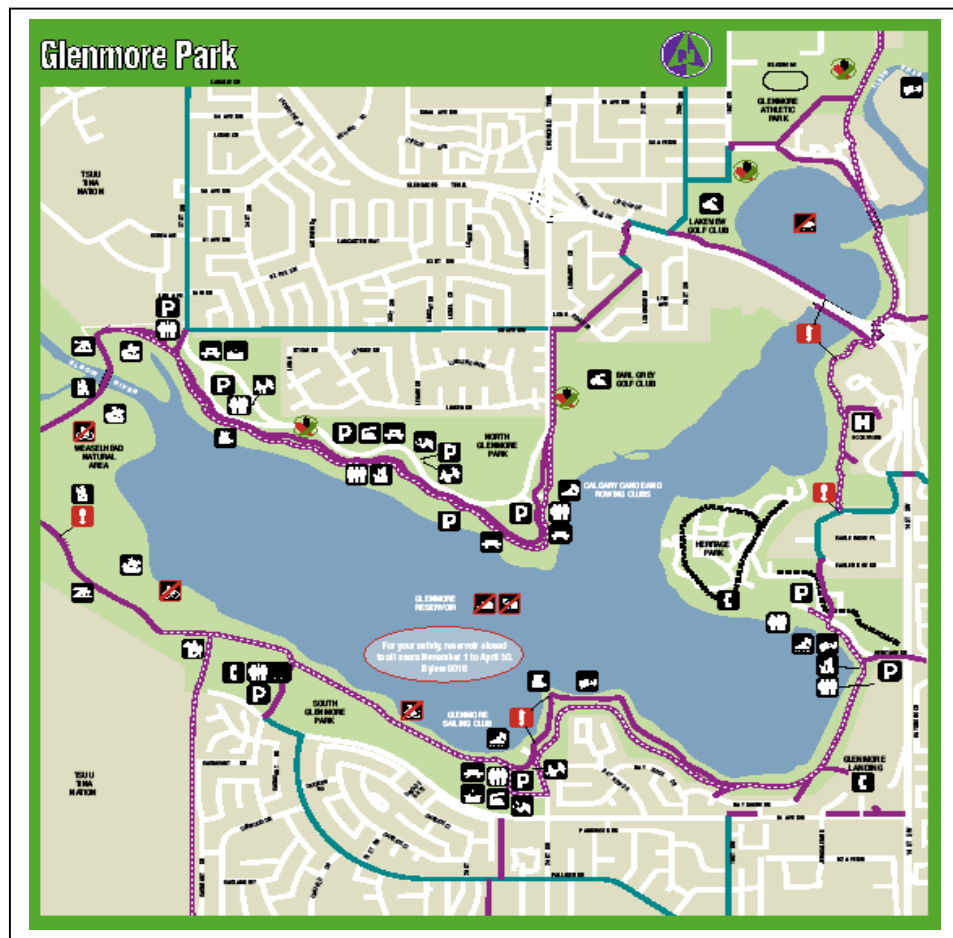
- From 1994 to 2002, a 55% increase in pathway use observed (population increase during this period was 22%);
- The three top pathway uses were exercise walking (41%); bicycle commuting (38%); and recreational running (21%)'
- Dog walking on pathways doubled to 4%;
- Pathways larger proportion of pathway users is male (58%);
- Adults and seniors comprise 88% of all users;
- Average pathways use at 16 sites, observed over a 5-week period was 119 users per hour;
- Use of downtown river-edge trails (Eau Clair) increased by 265%;
- The three top reasons cited by users for pathway use were extensiveness; scenery / nature / green spaces / proximity to river; and quality and cleanliness of pathways.

Calgary's system of parks and natural areas continues to grow as new developments are approved. In areas of suburban greenfield development, City policy requires that developers dedicate 10% of developable subdivision area as "Reserve" land for park and educational purposes⁴. The Legacy parks Program is a new initiative by the City to dedicate profits from its wholly-owned energy utility (ENMAX) to the creation of three major new regional parks, and the restoration and improvement of seven existing high-use parks.

Under the terms of the Legacy Parks Program, the City recently announced the acquisition of 145 ha of prime parkland located on the north shore of the Bow River near Bearspaw (west and up river from Calgary). The land was formerly owned by the Haskayne family and the University of Calgary, and includes a substantial donation by the Haskaynes. Protecting waterways and river valleys, and naturalizing riparian shorelines has long been a priority for the City. Many of the City's 635 km of paved trails parallel Calgary's waterways.

The Legacy Parks Program will focus on creating three major regional parks adjacent to and outside the City in the Shepard, Clearwater and Bearspaw areas. The seven existing parks that will benefit from this \$60 + million program are Reader Rock Garden, Nose Hill Park (11.27 km², one of Canada's largest municipal parks), Inglewood Bird Sanctuary's Col. Walker House, McHugh Bluffs, Shepard Wetland, Paskapoo Slopes, and Bowness Lagoon. Several of these parks are popular sites whose levels of use exceed original design parameters. The Program emphasizes education programs to communicate to Calgarians the importance of protecting parks and open spaces, acquiring and preserving key areas for future growth while protecting watershed areas, and the creation of open space buffers along the Bow and Elbow Rivers.

The following map illustrates the City's Glenmore Park and surrounding area. The man-made Glenmore Reservoir, on the Elbow River is dedicated for Calgary's drinking water supply. Although water sports abound, the use of motors is prohibited. The complex of recreational facilities, inter-connected parks and open spaces includes the Weaselhead Natural Area, North and South Glenmore Parks, the Earl Grey and Lakeview Golf Courses, Heritage Park (a redeveloped collection of heritage buildings), the Glenmore Athletic Park and a system of pathways that circle the reservoir. Such mixed uses are typical of larger urban parks and open spaces. Of critical importance is the ability for the community to maintain most shorelands in a natural state.



(1) Issues and Key Open Space Policy Directions

The principal issues facing the City's team of park planners and managers are typical of those experienced by Canada's larger, growing cities. Population growth and changing expectations for open space and nature recreation, fitness, children's programs, and education programs are juxtaposed on an urban canvas that is being rapidly re-drawn as younger adults and couples are attracted to condominium life closer to the City core; as families continue to pursue suburban forms of life; and seniors downsize to afford second homes or travel.

Balancing residents' expectations for safe access to and use of City parks, natural areas and open spaces is a key challenge facing park planners. As the population has increased, overall pressure on the parks system has increased with the result that many of the City's older and special parks are reaching or have exceeded their threshold carrying capacity. In such cases, threats to parks are both to the park resources themselves and to the quality of experience Calgarians have grown to expect ⁴. In fact, the potential impacts of rapid population growth on a wide range of City services and facilities, including parks, is cited by Calgarians as their primary concern in recent citizen surveys ⁵.

Despite such concerns, recent Citizen Satisfaction Survey results indicated that public satisfaction levels for our Parks and Pathways have increased significantly the past couple of years ⁵. Visible progress with the City's Legacy Parks Program, including the 2006 announcement about the Bearspaw Legacy Park, and the fact that the City has acquired more new land dedicated to open space in the past year than in any previous decade may explain this outcome.

Other issues cited to the author in confidence by a number of long-term park staff include:

1. Water management including use of irrigation, storm water storage and wetland conservation;
2. Pesticide use. City Council is presently considering imposing a city-wide ban on cosmetic use of pesticides, but this concern extends to the impacts of applying pesticides on pollinators, air, and water quality;
3. Supply of land for off-leash dog use;
4. Multi-user conflict management; and
5. Budgetary challenges.

The City of Calgary 2006 Final Report "*Open Space Strategy for established Communities*" ⁶ provides important insights into future park and open space planning directions. The study is an extensive examination of the adequacy and role of local and regional open space in established Calgary communities. It includes a review of best practice by other cities, a literature review, an open space inventory and qualitative analysis, census data and public input.

Key policy recommendations include:

- Establishing Standard Specifications and functional guidelines for local parks to achieve an equitable balance of parks and functions between communities;
- A minimum quantity guideline of 2 hectares / 1000 population of local open space including parks and school yards;
- A guideline of 1 hectare / 1000 population for the existing, densely developed Beltline community;
- Higher standards for parks in the Downtown and Beltline communities;

- Improvements to regional parks, and strategic land acquisitions to meet future needs;
- Criteria for the acquisition of lands held by schools scheduled for closure and the sale of dysfunctional smaller open space holdings; and
- Recognition that adopting higher standards of park development and quality is a suitable strategy to compensate communities that have less park land.

(E) The Emergence of Urban Sustainability and Possible Impacts on Parks and Protected Areas

Contemporary notions of global or urban sustainability trace their origins to the 1987 report of the World Commission on Environment and Development "Our Common Future." The Brundtland Commission, so-named in honor of its Chair, then Norwegian Prime Minister Dr. Gro Brundtland, developed the broad political concept of sustainable development, and the need to harmonize the often competing interests of environment, economy and social justice. The Commission's definition of sustainable economic development as "Economic development that meets the needs of the present without compromising the ability of future generations to meet their needs" has become well established in governance practice. Dr. Brundtland subsequently served as Director-General of the World Health Organization from 1998 to 2003.

The linkage between cities and sustainability has been the focus of subsequent global forums. The Earth Summit, held Rio de Janeiro in 1992, crystallized the important role that the world's cities should play to champion sustainable development. At the Rio and subsequent Johannesburg earth summits⁷, three programs have emerged as the focus for advancing sustainability:

- Agenda 21 – a framework for sustainable urban planning;
- Convention for Biological Diversity; and
- Convention for Climate Change.

Under the auspices of the United Nations Environment Program, organizational leadership for sustainable cities has been provided by ICLEI - Local Governments for Sustainability. ICLEI is an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development⁸. More than 815 cities, towns, counties, and their associations worldwide comprise ICLEI's growing membership. ICLEI works with these and hundreds of other local governments through international performance-based, results-oriented campaigns and programs, providing technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level.

Toronto-based ICLEI has 12 offices globally. In Alberta, the cities of Calgary and Edmonton are founding members of ICLEI Canada which will hold its next global conference in Edmonton in 2008. ICLEI programs are linked to UN global strategies for reducing poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women.

In the past five years the City of Calgary has undertaken four other activities to help shape its long-term community sustainability programs:

1. In 2004, Calgary became the second Canadian city to become a member of the Sustainable Cities: PLUS *Network*. The network catalyzes action on urban sustainability through integrated long-term planning and demonstration projects in over 30 cities around the world including 12 in Canada. Member cities share their learning and best practices about integrated long-term planning for sustainability. Each commits to building on existing planning processes through the use of a long-term (50 to 100 year) lens, developing 30 year community sustainability strategies and shorter-term implementation plans⁹.
2. Between 2005 and 2007, the City undertook a 100-year sustainable community visioning process “*imagineCALGARY*”¹⁰. The plan includes a long range vision and goals which reflect the diversity of aspirations and interests of the community for the future. It also includes a series of targets which provide useful reference points for organizations and individuals to determine what action can be taken to reach the goals.
3. In 2005, City Council assigned priority to research and development that would lead to a long-term program to reduce Calgarians per-capita Ecological Footprint. Ecological footprint is a measure of people's demand on nature. It compares the amount of resources we consume with nature's ability to provide resources and absorb waste. It is not a measure of the physical size of the municipality¹¹, calculating human consumption and comparing this to the Earth's capacity. Council's action was motivated by a 2005 report by the Federation of Canadian Municipalities¹² which identified Calgary's per capita ecological footprint as Canada's largest. The Calgary Ecological Footprint project measures Calgary's Footprint and engages citizens, business, government and organizations to take action.
4. The City is undertaking Plan IT Calgary and participating in the Calgary Regional Partnership Sustainability Planning Program. These planning processes are intended to develop a future land use and transportation planning framework for a more sustainable city and region. These programs are described in more detail in this report.

The events of the past five years will propel the City of Calgary toward a more sustainable future; however key strategies to achieving community sustainability need to be defined. The Imagine Calgary Plan has informed several recent key policy initiatives including the recently-released Calgary Economic Development Strategy¹³.

(1) How Sustainability May Impact Parks

To understand how the movement toward urban sustainability may impact demand for and use of urban and regional parks, it is important to identify its central attributes of sustainable cities ¹⁴.

Sustainable cities are:

- Resilient and self sufficient. They decrease reliance on externally-provided natural resources by becoming a conserver society and by reducing energy and other inputs and the production of waste;
- Respectful of environmental resources. They adopt strategies to protect the natural environment and promote human health (air, land and water). They pursue policies that reduce energy use and associated emissions;
- Compact and efficient in land use. They stress more dense forms of urban development, emphasize transit use and non-vehicular travel (walkability);
- Lively, creative and engaged. They emphasize the value of arts, inclusiveness, public engagement with sustainability programs;
- Equitable and inclusive. They consider the impact of their programs and developments on the social, environmental and economic conditions of their citizens. They include policies for ethical and green purchasing;
- Leaders in green building technologies. They are open to innovation to reduce the energy needs of buildings, the durability of building materials, and the health of building occupants;
- Rich in parks and open spaces. Sustainable cities sustain regional biodiversity, key habitats and ecological processes. They feature parks systems and facilities that meet the expectations of residents for recreation, fitness, health and family fun;
- Safe, respectful, welcoming.

The link between urban sustainability and the need for parks and green spaces has become apparent in planning and municipal governance literature. New York City's sustainability plan features the banner line, "....A Bold Greenprint for the City's Future" ¹⁵. New York's sustainability plan includes 10 goals to achieve clean air, and create a system of parks within a ten minute walk of every citizen. The New York plan, championed by Mayor Bloomberg, aims to follow the lead of the City of London, England to reduce traffic congestion and associated air pollution by charging a "congestion price" for vehicle use in the city.

Several international and national associations rank cities for their sustainability. Long-established Mercer International includes sustainability criteria in its international ratings that measure the attractiveness of cities as work locations for business professionals. SustainLane ¹⁶ is a US-based group that reports extensively on environmental products and rates the sustainability of the 50 largest US cities. SustainLane's approach addresses combined environmental, economic, and social issues, while environmental management approaches tend

to focus on issues like pollution or habitat restoration in isolation. SustainLane's 2006 ratings selected Portland as the US cities leader.

Corporate Knights Magazine evaluates five categories to create its sustainability ranking for Canada's 23 largest cities. The categories it considers are ecological integrity, green mobility, economic security, empowerment, and social well-being. Corporate Knights Magazine considers that a sustainable city has a viable economy fuelled by a healthy population and leaves the smallest environmental footprint possible. Their bottom-line indicator of sustainability for a city is its ability to maintain its population. A sustainable city must be a place where people want to live, work, play, and build their lives ¹⁷.

The vision of Corporate Knights is to create a global organization that is trusted as the Canadian and global source for who is good in the corporate world and who is not. Their 2008 survey selected Ottawa as Canada's most sustainable large city. However, they reported that most Canadian cities have or are in the process of implementing sustainability plans and have sustainability staff.

All systems for evaluating and ranking the sustainability of cities place a primary emphasis on ecological integrity. Vital components of all such measures include biodiversity, habitat protection, park and open space systems, respect for and conservation of natural resources, and a measure of urban ecological footprint.

Research linking sustainability and urban parks and natural areas is primarily emerging in response to growing interest in the importance of urban nature in providing for citizens' well-being, the role of cities in protecting biodiversity and habitats, and the impact of urban nature on planning urban spatial structure. A useful assessment exploring the implications of urban nature on city sustainability was undertaken by Chiesura ¹⁸. Chiesura's review supports empirical evidence that natural areas in cities (parks, forests, green belts) are contribute to the quality of urban life. She argues that such features are crucial for the livability of modern cities, a key sustainability criterion ¹⁴.

Calgary's effort to strengthen the quality of existing parks to increase their attractiveness to urban residents is supported in a classic research paper by Hayward and Weitzer ¹⁹. Their research established the link between public perception of urban parks and natural areas and public use. They demonstrated that park image is a constant predictor of decisions to use a park. Wu and Plantinga examined the influence of public open space on urban spatial structure, another key criterion of urban sustainability ²⁰. Their research confirmed the importance of open space to urban residents, but concluded that without public policies supporting more compact forms of urban development, open space creation can cause leapfrog development which may undermine efforts for urban sustainability.

Peter Newman, now Sustainability Commissioner for New South Wales, Australia (which includes Sydney) attributes the development of the City of Perth's sustainability strategy to a preceding "green" election ²¹. He argues that Citizens' insistence that the City of Perth's natural areas and parks plan protect old growth forests and biodiversity (another key sustainability criterion) set the stage for a shift in urban focus to sustainability. Newman concludes that tackling automobile dependence, increasing density around centres, protecting natural areas, and placing local priority on walkability and livability are the keys to urban sustainability.

Research linking urban sustainability to the planning and operations of park and natural area systems has broadened to cover a wide range of themes. Examples include examination of the role and impact of urban parks in:

- Energy conservation and pollution reduction;
- Groundwater and watershed protection and management;
- The protection of habitats and biodiversity;
- Acting as boundary landscapes and buffers separating urban communities from transportation corridors and industrial / commercial land uses;
- Establishing property values and attracting high-density residential developments;
- Achieving policy goals for the urban spatial context.

Although there is a growing research interest in establishing the links between urban form and condition, and sustainable cities criteria, the links between demand for and use of city and regional parks and open spaces, and contemporary trends for increasing the form of urban density are not well understood. Questions which will warrant additional consideration as the pace of urban sustainability progresses in the City of Calgary and outlying region include:

1. What measures are needed to ensure that public policy makers understand the expectations of an increasingly urban society?
2. In areas that feature compact urban form, with residential density reaching 25, 50 or more units per hectare, how will the lack of individual green space (the yard) and recreational facilities affect expectations for access to and use of urban, regional and national parks?
3. What are the changing expectations of the principal age cohorts in Calgary where increases in numbers of seniors and young professional area being observed? Do increases reflected in pathway use ³ signal a general trend in expectations?
4. What measures must be taken by parks, recreation, and open space agencies to ensure that existing urban, regional and national parks can appropriately accommodate the expected doubling of regional population within 30 to 50 years?

References:

1. *Plan IT Calgary, Toward a Sustainable City, 2008. City of Calgary Report.*
2. *Banff Bow Valley: At the Crossroads, 1996, Canada Department of Heritage.*
3. *City of Calgary Pathwatch Survey 2002, The City of Calgary, Parks, 2002.*
4. *Gae VanSiri, Parks Planner, Parks Planning & Development Services, Parks Business unit, City of Calgary, pers. Comm.. 2008.*
5. *2007 Citizen Satisfaction Survey, City of Calgary.*
6. *Open Space Strategy for Established Communities - Final Report, 2006. City of Calgary.*
7. *Earth Summit 2002, Building Partnerships for Sustainable Development, UN Dept. of Economic & Social Affairs, 2003 at www.earthsummit2002.org.*
8. *About ICLEI, 2008. www.iclei.org.*
9. *CitiesPLUS, 2008. About us at www.plusnetwork.iscs.ca.*
10. *imagineCALGARY Plan for Long Range Urban Sustainability, 2007. City of Calgary. Available at www.imaginecalgary.ca.*
11. *Reducing Calgary's Ecological Footprint – Living within the means of what nature can provide, 2007, Environmental & Safety Management, City of Calgary. Available at www.calgary.ca.*
12. *Anielski, M., The Ecological Footprint of Canadian Municipalities and Regions, 2005, Federation of Canadian Municipalities, Quality of Life Reporting System, Ottawa.*
13. *Imagine Calgary Update. April 2008. Imagine Calgary Newsletter.*
14. *Day, Dave, 2008, Sustainable Community Development - The Municipal Government Role, Presented to the 2008 Calgary Gaining Ground Conference, Calgary.*
15. *Darrell, Andy, 2007. In Policy News, Environmental Defense Living Cities Web Program.*
16. *SustainLane, 2007. The SustainLane 2006 US City Rankings. Available at website www.sustainlane.com.*
17. *Corporate Knights Magazine, 2007. Sustainable City Ranking, in Urbanization & Investment Double Issue, Toronto.*
18. *Chiesura, Anna, May 2004. The Role of Urban Parks for the Sustainable City, Landscape and Urban Planning, Vol. 68, Issue 1.*
19. *Hayward, Geoffrey and William Weitzer, Oct. 1984. The Public's Image of Urban Parks: Past Amenity, Present Ambivalence, Uncertain Future, Urban Ecology, Vol. 8, Issue 3.*
20. *Wu, JunJie and Andrew Plantinga, Sep. 2003. The Influence of Public Open Space on Urban Spatial Structure, Journal of Environmental Economics and Management, Vol. 46, Issue 2.*
21. *Newman, Peter, 2004. Keynote Address to the Sydney Futures Forum, Sydney, NSW.*