



The Sustainable Cities Challenge in Canada

A research study addressing sustainability and infrastructure issues facing Canadians.

A research project conducted by GlobeScan. Sponsored by Siemens Canada.

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Acknowledgements

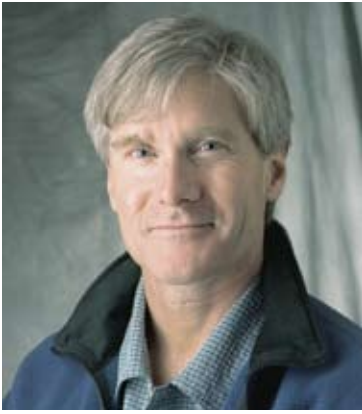
This report was written based on research conducted by GlobeScan.

We would like to thank all those who participated in the survey for their valuable insights and time.



Content

About this Report	6
Executive Summary	8
The Context of Infrastructure Decision-making	14
Five Infrastructures	24
Transportation	26
Energy	32
Water and Waste Water	38
Healthcare	44
Safety and Security	50
City Governance and Finance	56
Appendix: Methodology	62



Natural capital assets

The key to sustainability

Urban sprawl, intensive farming, and other land use threaten not only biodiversity, like songbirds and wild flowers, but also the health and wellbeing of our families and our communities. Many of our development activities affect the goods and services that nature provides for free. These goods and services are resources that are provided for by the earth's natural capital—ecosystems, such as forests, wetlands, and rivers. Nature provides valuable economic commodities like the food we eat, the timber we use to build our homes, and the medicines we use to heal ourselves.

Ecosystems also provide non-market services that regulate the climate, disease outbreaks and wastes; cultural services that provide aesthetic, recreational and spiritual value; and supporting services, such as nutrient cycling and water purification. Forests in urban settings, between cities and in the countryside illustrate the importance of natural capital. They ensure that steep slopes remain stable, that flood risks are lower, and that drinking water comes out of the tap filtered and clean. Recognition of the irreplaceable value of ecosystem services and the impact of human development on them is emerging globally.

The rapid increase in population and intensity of land use in major Canadian cities and the subsequent development of so-called megacities, such as Vancouver and Toronto, are placing unprecedented pressure on natural capital assets, such as forest, wetlands and rivers. The consequences of this pressure are not only the degradation of ecological integrity, such as reduced soil quality, increased lake pollution and species loss, but also declining human health and other aspects of community wellbeing.

At the foundation, we believe that investments to protect and enhance natural capital are urgently needed. In particular, the projected impact of global warming will place additional pressure on the ecosystems, in and around Canadian cities where remaining natural areas are already stressed and in decline. Human pressures on the natural capital need to be reduced to ensure our ecological systems can cope and adapt in the face of climate change. This is why we have to align our approaches when it comes to evaluating solutions.

The David Suzuki Foundation encourages companies like Siemens Canada to continue their efforts to work towards a sustainable future. We encourage everyone to stop and think about the importance of our natural capital assets as being the key to sustainability, and the interdependency between striking a balance between quality of human life and the quality and protection of our home—the biosphere.

Peter Robinson
CEO David Suzuki Foundation

Sustainability

Not just a buzz word at Siemens

Read any newspaper, listen to any talk radio station or catch the evening news and chances are you will hear the word “sustainability.” Whether we are talking about the environment, business results, recruitment practices, or a sports team for that matter, sustainability seems to be making the headlines daily. At Siemens, sustainability is an important part of our vocabulary too—but for Siemens, sustainability is not new and it is definitely not a “flavour of the month”—it is more like a flavour of the century.

For the past several years, we have taken a close look at our strategy and now Siemens is in a strong position to meet tomorrow’s business challenges—today. By concentrating our activities in the three Sectors—Industry, Energy and Healthcare—we have a structure that enables us to focus on four key megatrends—demographic change, urbanization, climate change and globalization. And, with our environmental portfolio, we have an exceptionally broad spectrum of products and solutions for environmental and climate protection that’s unmatched worldwide.

However, even though we are in a strong position, we still have to ask ourselves if society is really willing to take the next steps. For sustainability to be realized, future-oriented business decisions need to take place today. In a lot of cases, I know that it is easier said than done. It basically comes down to the political will and a new mindset or way of thinking. The political environment in Canada (like many countries) is such that a lot of short-term decisions are driven by mandates and terms of office—usually four years or less. So how do we drive change when the kind of change we are talking about takes years to implement before anyone can see a return on the investment? The answer is leading by example. A lot of our technology, already widely used today, significantly reduces greenhouse gas emissions, pollution and carbon footprints. We need to work with our customers and encourage governments to look beyond the obvious and invest in the future—the future of our youth and our planet.

And that is why we committed the necessary resources to commission this research study and publish this report. We are very interested in knowing what Canadian city leaders and key stakeholders are thinking. We want to engage Canadians alike in dialogue about sustainable cities and working with organizations like the David Suzuki Foundation, we want to increase awareness of the subject and we want to encourage more people to think about the future today.

I encourage you to use this report to connect your city, your organization or your family and friends and transform discussion into action. Many say it is too late. We at Siemens don’t think so. We are committed to be responsible, excellent and innovative when it comes to the environment and sustainable cities, and want to work with Canadians across this great country to make a “sustainable” difference.

Roland Aurich
President & CEO
Siemens Canada Limited







About this Report

This report examines the challenges facing Canada's largest and most important cities in city management and five important infrastructure areas. They include Transportation, Energy, Water and Waste Water, Healthcare and, Safety and Security.

The report is based on the results of a survey of 243 stakeholders across 12 cities. In order to have broad geographic representation, the research included several smaller cities such as Saskatoon, St. John's, and Halifax, and omitted larger cities in regions already well covered in the survey, among them Hamilton, Kitchener, Windsor, St. Catherines-Niagara, and Victoria.

Stakeholders are grouped into the following categories:

- City employees, both unelected and elected senior officials
- Senior level staff at private sector companies working in areas related to urban infrastructure
- Senior managers and heads of non-governmental organizations
- Professors or department heads at major universities and think tanks

All survey participants hold senior roles in their respective organizations and are familiar with at least one of the five infrastructure areas or with city management generally. The survey included general questions

on the broad theme of urban infrastructure that were addressed to all 243 experts. More detailed questions on the specific infrastructure areas, as well as city management, were asked to those stakeholders with the appropriate knowledge and experience. Sample sizes range from 113 experts in transportation to 26 in healthcare.

For the purposes of analysis, the cities have been grouped into the following regions:

- Atlantic: Halifax, St. John's
- Quebec: Montreal, Quebec City
- Ontario: London, Ottawa, Toronto
- Prairies: Saskatoon, Winnipeg
- Alberta: Edmonton, Calgary
- British Columbia: Vancouver





Executive Summary

While recognizing that cities are much more than their infrastructure, this research deals with five urban infrastructure areas. They include transportation, energy, water and waste water, healthcare, and safety and security. The research also probes experts' views on city governance.

This report discusses GlobeScan's quantitative research with a total survey sample of 243 respondents, all of whom are experienced and knowledgeable about urban infrastructure. In order to present a balanced view, the research explores the opinions of stakeholders representing several sectors including government, the private sector, research/academe, non-governmental organizations, and healthcare. The

research was conducted in 12 of Canada's largest cities between February 22 and April 6, 2010.

Cities face a number of challenges. From an environmental perspective, the experts surveyed consider transportation, water, and urban sprawl the most important. On the social front, they cite housing and poverty, while urban funding and finances are considered their major economic issues. As for infrastructure, the cities' most serious challenges are renewal and upgrade, transportation issues, and infrastructure funding.

Canadian cities are generally perceived to place high importance on making themselves competitive to attract private invest-

ment when making infrastructure investments. But, they are not considered very progressive in terms of understanding and managing the linkages between infrastructure, environment, and sustainable development. Experts are divided on how effectively their cities are adopting sustainable infrastructure solutions. Moreover, less than a majority thinks that their city's leaders recognize the vital role that infrastructure decisions can play in protecting the environment and addressing climate change. It seems that, while the concept of sustainable infrastructure is not foreign to cities, implementation is lagging. Even less encouraging is the perception that cities will continue to compromise environment for growth. While four in ten experts



predict that cities will protect the environment from excessive infrastructure growth, three in ten disagree that they will.

Experts think that transportation is the most important infrastructural system for attracting investment to their cities and predict that it will require the lion's share of infrastructure investment.

Survey respondents are very positive about their own city's quality of life compared to other large cities in Canada. Surprisingly though, less than a majority is optimistic about their city's ability to successfully manage its future, even over the next five to ten years.

Transportation

Expected to dominate infrastructure debates during the next decade, transportation is at the root of the most serious urban environmental problems. It is a key determinant of city competitiveness, and places the biggest demand on cities' investment dollars.

Transportation faces significant challenges. Principal among them are aging infrastructure, public awareness, lack of planning,

and inadequate capacity. Up-front capital costs and political influence are seen as the most important factors in transportation infrastructure decision-making.

Cities are expected to lean heavily toward mass transit infrastructure rather than personal transportation. But high capital costs will likely cause cities to focus more on improving current systems than on implementing new ones. Cities will likely place increasing emphasis on technology that takes into account urban environmental aspects, signalling a need for newer approaches and, potentially, more up-front capital investment. In spite of the challenges, experts predict that cities will maintain ownership of urban transportation infrastructure.

Energy

Poor long-term planning and public awareness and behaviour are viewed as the biggest challenges facing cities' energy infrastructure. Energy experts in Ontario cities are especially critical of energy planning and capacity. Interestingly, experts are not very concerned about environmental damage caused by our energy infrastructure.



Energy infrastructure decisions are largely driven by up-front capital costs and type of energy source, making choices between fossil, nuclear, and renewables difficult. Impacts on economy and employment are also important decision-making factors, as is political influence. While experts predict more emphasis on renewable sources than on fossil fuels, they expect far more emphasis on fossil fuels (e.g., gas) than on nuclear, probably because of capital costs. However, they prefer nuclear to fossil fuels, likely seeing nuclear as a solution to climate change and a better long-term energy source. The findings suggest a politically charged file and a contentious debate over energy generation technologies.

Other predictions for the next five to ten years include greater emphasis on demand management over new capacity (a longstanding and largely ignored recommendation by energy experts), free market over subsidized pricing, local generation over large grids, and proven over new technologies. Experts envisage a stronger role for the private sector in energy than in other infrastructure areas.

Water and Waste Water

Water ranks among our cities' most important environmental challenges. The environmental impacts of waste water systems are considered to be especially serious. More-

over, water infrastructure is getting old. But, few experts consider water as one of the most serious challenges facing city infrastructure, an indication that water and waste water systems still work fairly well and, unlike transportation, are not considered to be a major factor in driving city competitiveness. Not surprisingly, water quality and regulations are the most important factors in cities' decision-making about water, but cost is also a critical consideration. Experts predict that Canadian cities will increasingly look to water reuse as a source of water and will focus more on increasing efficiencies than investing in new capacity. Rather than encourage private sector participation, cities are expected to own and operate their water services.

Healthcare

Experts, not to mention the general public, can feel very strongly about healthcare issues, more so than about other infrastructure areas. Lack of capacity is seen as the most serious issue facing Canada's healthcare system. With capital cost, in addition to political influence, being a major factor in decision-making, it is expected that our healthcare systems will be encouraged to become more efficient rather than increase in capacity. To that end, experts foresee more emphasis on centralized hospital workflow management, electronic documentation systems, and shared services.

While the Canadian healthcare system is expected to remain largely publicly owned and operated, experts foresee a transition to more fee-based services from the current emphasis on a free-for-all approach.

Safety and Security

Canadian cities are relatively free from dangers such as terrorism and ethnic conflicts affecting other large cities around the world. In fact, road safety is considered their most important safety and security challenge, followed by public behaviour generally and lack of strategic planning on security.

To enhance safety and security, experts think that the most effective measures will involve improved communications, coordination, and planning. Rather than merely add manpower, cities will lean toward adopting better technology. While the use of gated communities will likely continue to increase, cities will favour open approaches to development. In the debate between personal privacy and public surveillance, experts foresee increasing acceptance of surveillance. Even though there is a beneficial role for public security resources, Canadian cities will emphasize the use of resources owned and operated by the public.

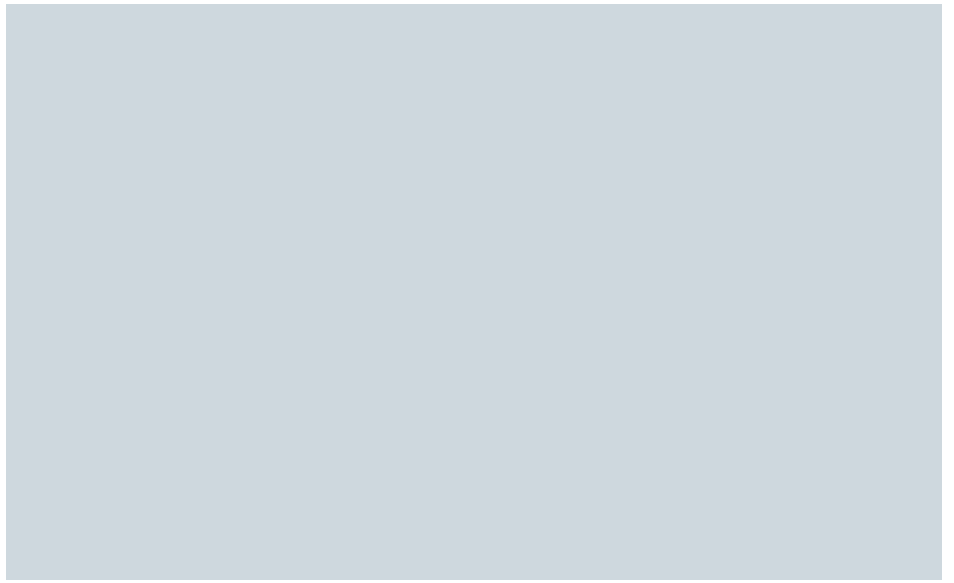


Governance

As cities have expanded, some into large metropolitan areas, city governance has become more complex. The biggest challenge facing city management is the overall aging of its infrastructure, followed distantly by awareness and behaviour on the part of urban residents. With up-front capital cost, economic impacts, and politics playing key roles in city decision-making, wise urban governance is not easy.

Experts are critical of city decision-making on infrastructure investments both for its lack of transparency/consistency and for its excessive focus on short-term needs at the expense of long-term sustainability. Clearly, more effective leadership and strategic planning at the city level are required. The key challenge may be encouraging public constituents to endorse long-term planning.

City management experts foresee a number of mainly positive trends in governance. They predict that cities will lean toward growth based on good planning and control, an approach that may, in part, address urban sprawl. Cities will attempt to break down silo-based management and adopt a more holistic approach, ideally across infrastructure areas. They will also become more responsive to their citizens rather than continue with a more authoritative approach. However, rather than take significant steps to de-regulate, cities will retain regulations as their principal tools. To address inefficiency and boost competitiveness, cities are predicted to become “smarter” and will increasingly embrace digitization and e-government technologies.



Role of the private sector

Across the five infrastructure areas surveyed, experts predict only slightly more emphasis on public ownership, operations, and financing, rather than on private. This is an indication that compared to the actual situation today, there will be opportunities for the private sector. Experts see more of a role for the private sector in energy than in water, healthcare, security, and transportation. They primarily see the private sector participating in economic development initiatives but have less enthusiasm for public-private partnerships and the privatization of public tasks. Interestingly, only one in five experts thinks that privatization of their city's infrastructure would increase its efficiency.

The fact that experts frequently cite public awareness and behaviour as issues of concern suggests a possible need for more effective public engagement and education about urban infrastructure and consumption patterns.

Attracting the investments and people who drive modern economies, protecting the natural environment, and providing a superior quality of life will require Canadian cities to take a longer view, put in place more comprehensive and efficient governance structures, and invest in modern, greener infrastructure solutions—a tall order but well worth tackling, given the survey respondents' prognosis of our cities' futures.

The cities surveyed were selected for their size and geography. They include important cities in all regions from east to west, but not Canada's northern cities. Aggregate findings are sound, but analyses of smaller samples, such as at an individual city level or individual infrastructure area, are prone to higher levels of statistical variation.



Key findings

- Transportation and water/waste water management issues are considered the most serious environmental problems facing cities.
- Housing and poverty are the most pressing social issues, while financial issues and economic diversification rank as the top economic problems.
- The most serious challenges facing city infrastructure include transportation, funding, and general upgrading and maintenance.
- It is far from certain that cities will protect their environment from excessive infrastructure growth.
- Only one-half of experts think that when making infrastructure investments, their cities place high importance on making the city competitive to attract private investment.
- Experts are divided on whether city leaders recognize the vital role that infrastructure decisions can play in protecting the environment.
- Most experts, by far, think that investing in transportation is most important in attracting investment to their cities.
- Transportation will take the lion's share of infrastructure investment.
- A strong majority of experts believes the quality life in their city is better than average, but far fewer are confident that their city will successfully manage its future.



The Context of Infrastructure Decision-making

Approximately 81 percent of Canada's population lives in urban areas, up about 5 percent since 1980. Together, the cities included in this study have a population of 18.2 million and account for about 53 percent of the total population of Canada. Among them, these cities drive Canada's economy, house its universities, and attract new arrivals from across Canada and abroad.¹

Challenges facing cities

Experts were asked, without prompting, to name separately the most serious environmental, social, and economic challenges facing Canada's large cities.

¹ Statistics Canada. 2010.



“Reversing [urban] sprawl, shifting focus from car-dependent, segregated development in outlying areas to intensify existing urban areas.”
 –Stakeholder in Calgary

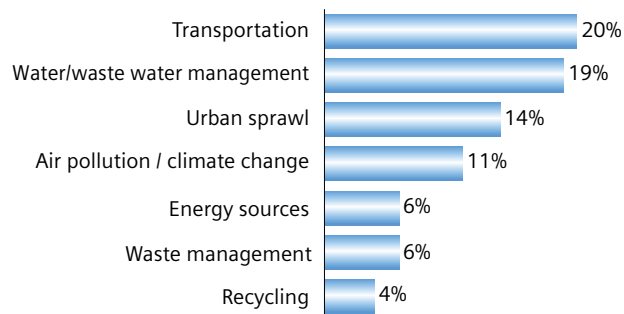
Environment

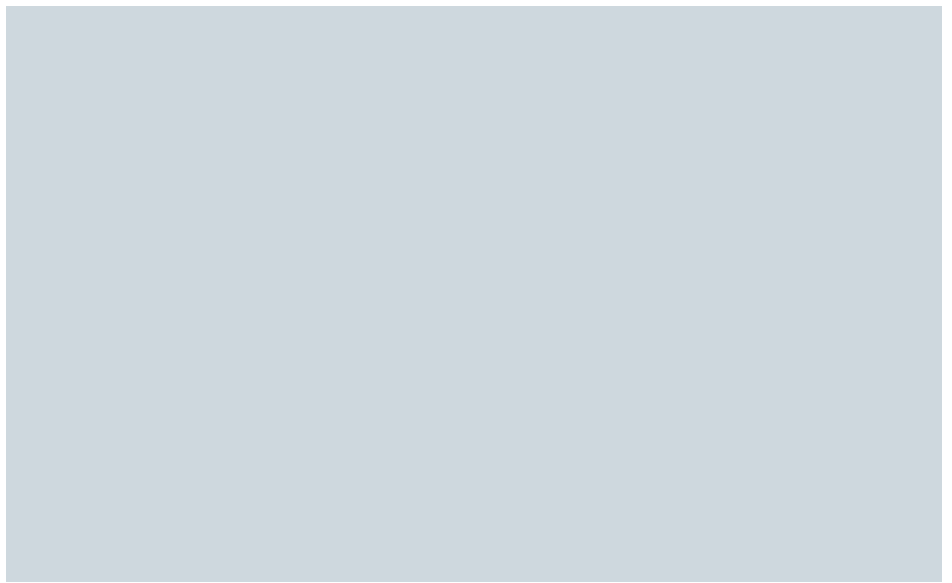
When it comes to environmental challenges, stakeholders most mention transportation-related issues (20% of experts) and water/waste water (19%), followed by urban sprawl (14%), and atmospheric issues such as air pollution and climate change.

Energy sources and waste management are seen as far less serious, suggesting the latter is considered well managed.

Across regions there is differentiation. Experts in Quebec and British Columbia perceive transportation to be the most serious, while in Ontario and Prairie cities water challenges hold the number one position. Experts in Atlantic Canada consider both transportation and water to be equally serious, while urban sprawl is the most serious for Alberta cities.

Most serious environmental challenge
 % of respondents mentioning





Social

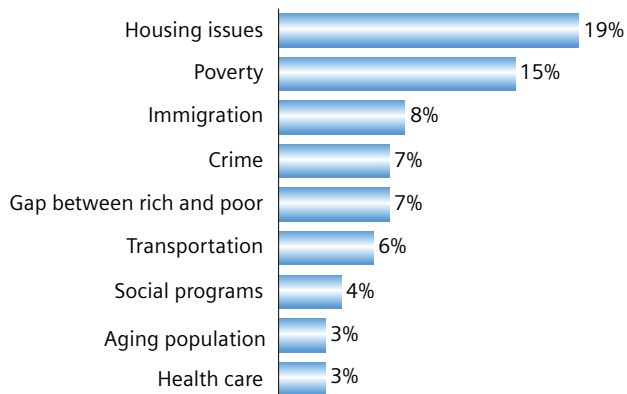
The most serious social issues identified by experts involve housing (19%) and poverty (15%). Other issues are viewed as far less serious. Across regions there are slight differences. In Atlantic Canada, as well as Ontario cities and Vancouver, housing is considered to be the most serious social challenge. However, in Alberta and Prairie cities, poverty is the greatest concern. In Quebec, immigration issues stand out as most serious.

Economic

Overall, the most challenging economic problems involve financial issues, including funding, budgets, and taxes (22%), followed by economic diversification (17%), and the availability of jobs (12%). Experts in Prairie, Alberta, and Atlantic cities tend more than others to worry about finances, while those in Alberta also continue to be especially concerned about economic diversification. Reacting to the manufacturing downturn, Ontario experts point to availability of jobs.

Most serious social challenge

% of respondents mentioning





“The GTA [Greater Toronto Area] needs a transport governance structure that combines democratic decision-making and the capacity to act boldly at a regional scale. It needs a massive influx of funding to build new transit routes. It needs a major shift in planning and development policies and patterns.”
 –Stakeholder in Toronto

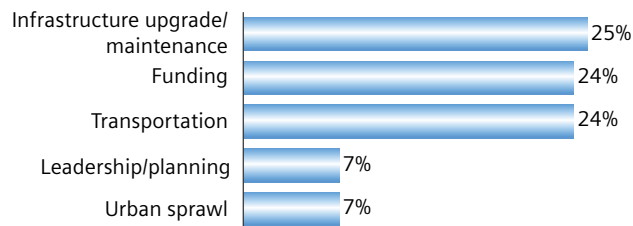
Infrastructure challenges

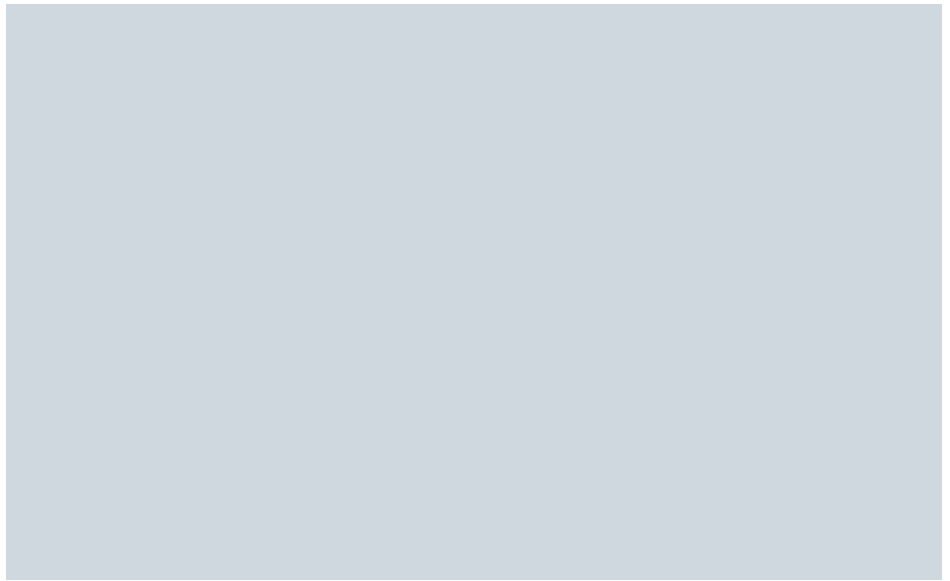
When asked specifically, again unprompted, about the most serious challenges facing city infrastructure, stakeholders point to renewal and upgrade, transportation issues, and infrastructure funding. Although the top three challenges remain largely the same across regions, infrastructure renewal and upgrade top the list in the Atlantic region, while transportation is prominent for Quebec cities. Infrastructure funding is

seen as the most serious challenge for cities in Alberta and Ontario, where budget deficits are significant.

With the exception of inadequate leadership and planning in Ontario cities (mentioned by 18% of experts), other challenges are cited much less often. Challenges surrounding water and waste water are rarely mentioned.

Most serious challenge facing city's infrastructure
 % of respondents mentioning





Environment and infrastructure

Experts are divided about how well their cities perform on adopting sustainable infrastructure solutions. Less than one-third (30%) of experts consider their city to be above average or among the very best on this score, while slightly more think they are below average or among the worst. The balance consider their cities average.

Stakeholders in Vancouver are especially positive about their city adopting green infrastructure (71% rate above average or among the best). Stakeholders in Montreal and Quebec are at the other end of the spectrum, with almost no one rating their cities above average and one-half rating them below average.

Experts give a mildly positive verdict on whether their city's leaders recognize the vital role that infrastructure decisions can play in protecting the environment and addressing climate change. Four in ten experts (mainly in government) think that their cities recognize this role, while three in ten (mainly in NGOs) disagree. Experts in Edmonton tend to be more positive than others.

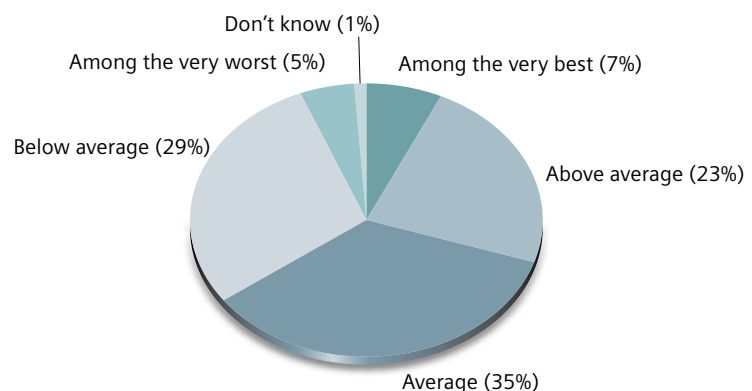
Experts are not convinced that cities will protect the environment from excessive infrastructure growth. While four in ten predict that their cities will not sacrifice the environment for growth, as many as three in ten disagree. Not surprisingly, government experts, again, are more likely than NGO experts to give cities credit for environmental protection.

Overall, the research suggests that Canadian cities have substantial room for improvement

in terms of understanding and managing the linkages between infrastructure and environment. The 2007 Megacities Challenge research² showed that cities in developed countries recognize how good infrastructure decision-making can contribute to environmental protection (68% agreed; 20% disagreed) and do more to protect the environment from excessive infrastructure growth (68% disagreed that their cities would increase infrastructure at the expense of the environment and only 14% agreed).

Rating city on adopting sustainable infrastructure solutions

% of respondents selecting



² *MegaCity Challenges: A Stakeholder's Perspective*, Siemens AG Corporate Communications, 2006.



Investment needs

Experts were asked to rate the need for investment in a number of infrastructure areas in their city over the next five to ten years. The top tier issue is clearly transportation, with 90 percent of experts believing that requirements will be high in this area.

Forecasted investment requirements are far less for other areas. The second tier of areas, with about six in ten or more experts saying there is a high need for investment, include environmental protection, public housing and civic buildings, and water supply and waste water treatment.

The third tier includes social areas, such as healthcare, education, and other social services, as well as solid waste management, all with at least a majority predicting high investment requirements. This list of priorities above echoes approximately the ranking of environmental and social problems identified by stakeholders.

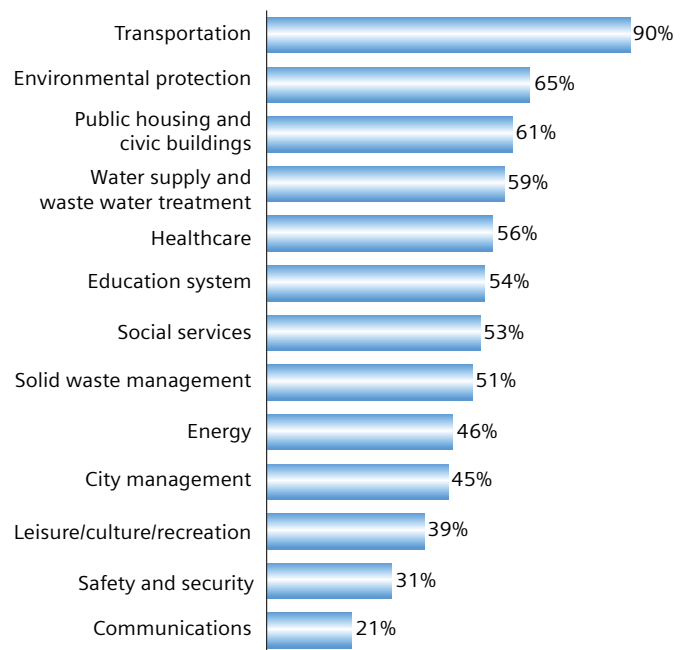
Bottom-tier issues (where, overall, less than one-half of stakeholders identify a high need for investment) include energy, city management, leisure, safety and security, and communications. That being said, six in ten or more experts in Toronto and Halifax express strong need for energy investments. A majority of NGOs also see high requirements for investments in energy, presumably in renewable sources.

Regarding communications, including the Internet, the findings suggest that Canada's principal cities are well served. This is likely

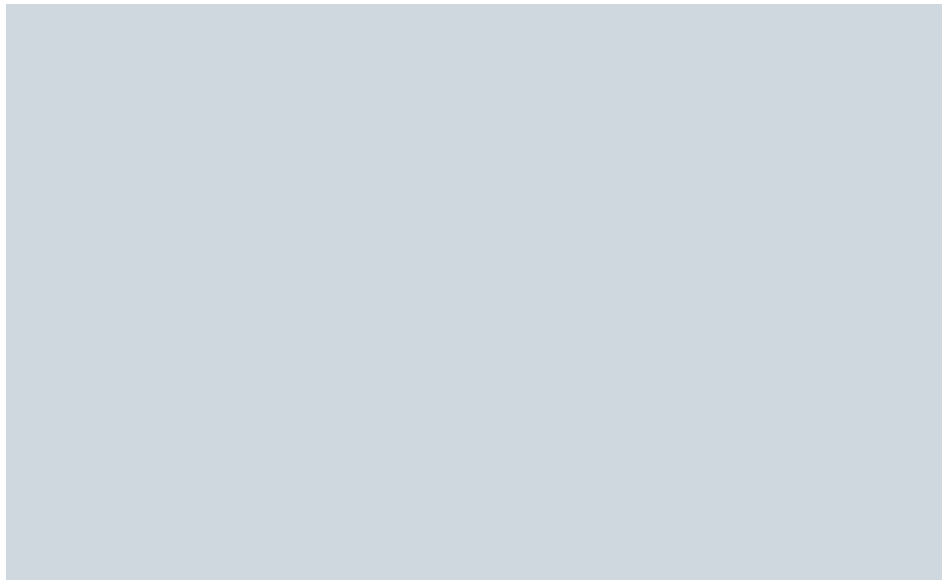
not the view held by residents in smaller communities and rural areas.

Need for investment in infrastructure over the next five to ten years

% of respondents saying high need



"High" represents rating of 4 or 5 on a scale of 1 to 5 where 1 means "Very low" and 5 means "Very high."



Infrastructure and city competitiveness

One-half of experts (51%) believes that when making infrastructure investments, their cities place high importance on making the city competitive to attract private investment. Fewer than two in ten disagree (the balance neither agree nor disagree). Interestingly, government sector experts are significantly more inclined than those in the private sector to agree that their cities make the connection between infrastructure and competitiveness. Also, those in Edmonton, London, Quebec, and Saskatoon tend more than others to acknowledge their cities' acumen here.

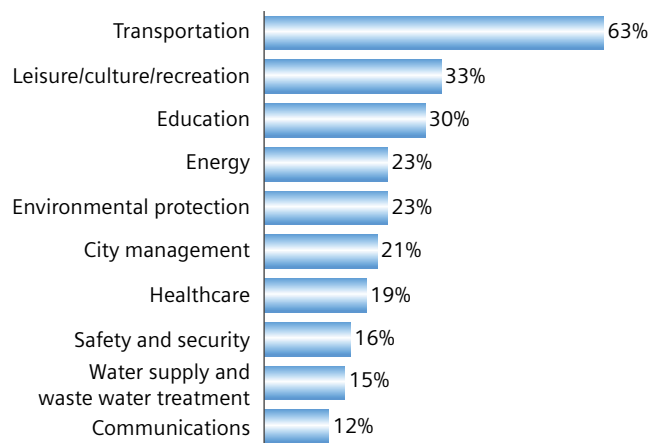
When asked to select from a list which kind of infrastructure is the most important in attracting investment to their cities, most experts, by far, across the 12 cities point to transportation (63%). Generally, across all cities, transportation is followed by a second tier of "softer" infrastructure areas, including leisure, culture and recreation, and the education system (mentioned by about three in ten experts), as well as energy and environmental infrastructure. Experts in the Atlantic region put emphasis not only on transportation, but also on leisure, culture, and recreation.

Stakeholders in all cities consider infrastructure areas such as communications, water supply, safety, and healthcare to be less important drivers of competitiveness

in attracting private investment. Infrastructure such as social services, solid waste management, and public housing are considered even less important factors.

Infrastructure area most important in attracting economic investment

Combined mentions, % of respondents mentioning

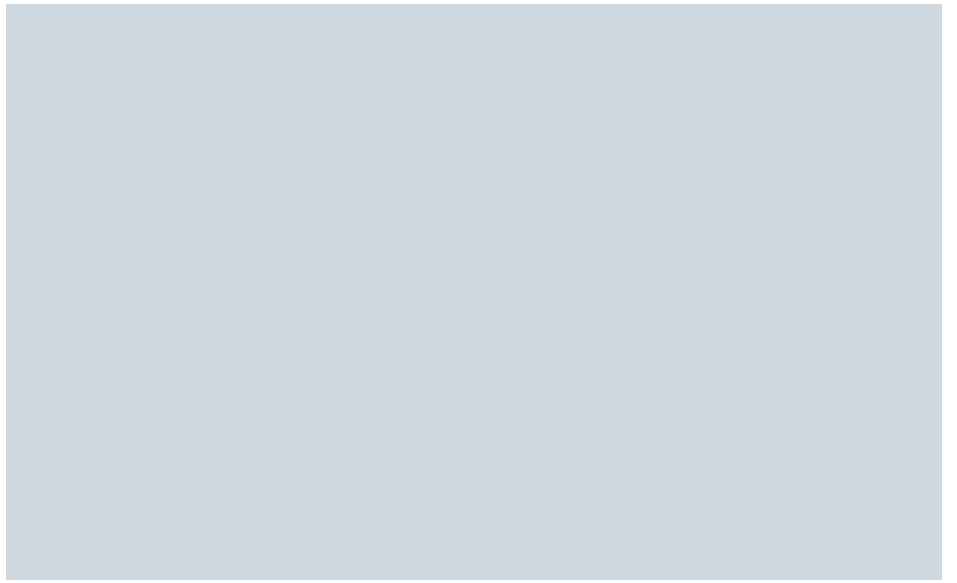




Stakeholder outlook

Across all cities involved in this study, three-quarters of stakeholders rate the quality of life in their respective cities as “above average” or “among the very best” compared to other large cities in Canada. This view is optimistic given what the survey data show about the challenges facing these cities. Stakeholders in Vancouver are the most optimistic—58 percent say their quality of life is among the very best—while those in the Prairie cities tend to be a lot less optimistic (18%).

Notwithstanding today’s optimistic assessment, when asked to rate their city’s probability of successfully managing its future in the next five to ten years, less than a majority of stakeholders (44%) responds positively. While no regional differences are apparent, there is a difference between government (both elected and non-elected) and other experts. Across all cities, nearly two-thirds of government stakeholders express a positive outlook, while NGO and private sector stakeholders are less optimistic.







Five Infrastructures

All cities require high-quality infrastructure to enable the safe and efficient movement of people, goods, and information and to provide essential services to their residents. The following section of this report deals with five major infrastructure areas: trans-

portation, energy, water and waste water, healthcare, and safety and security. For each infrastructure area, survey questions were answered primarily by those stakeholders with the most relevant knowledge of the area, unless otherwise noted in the text.



Key findings

- Transportation is considered the most important infrastructure issue facing Canadian cities and will require the most funding.
- Solving transportation challenges will not be easy; they include public awareness and behaviour, aging infrastructure, lack of planning, and inadequate capacity.
- Up-front capital costs and political influence are the most important factors in transportation infrastructure decision-making.
- Cities will lean heavily toward mass transit infrastructure rather than personal transportation.
- To address current transportation challenges, experts strongly recommend both improving and expanding the current infrastructure, but cities are expected to focus more on incremental improvements than on new systems.
- Experts predict that cities will maintain ownership of urban transportation infrastructure.



Transportation

In this report, transportation refers to the movement of people in cities, not to goods or to transportation outside of cities.

Much of the transportation infrastructure in Canadian cities was built in the 1970's and 80's with little thought about how it would perform 30 years later. In the meantime, urban populations have grown and cities have sprawled to join neighbouring municipalities. Resulting low population densities and different administrative bodies have made it difficult to provide effective public transit. Canada's urban transit infrastructure has probably fallen behind many large cities in both developed and

developing countries. Rising car use, combined with many people living far from their workplaces, has led to urban congestion and some of the longest commutes among major cities in the world. The Organization for Economic Co-operation and Development estimates traffic congestion in Toronto alone costs the country more than \$5-billion annually in lost productivity.³ In addition to productivity issues, transportation is linked directly to a number of environmental issues, most notably urban air pollution and climate change. According to 2009 Greendex research,⁴ Canadians' transportation behaviour is among the worst in the world because of poor use

of public transit, driving large vehicles, and driving alone.

Expanding and upgrading public transit is expensive and difficult. However, there has been significant emphasis on infrastructure expansion, in terms of mass transit facilities and road capacity in Canada's large cities. Moreover, Toronto and Calgary are planning large expansions, with smaller developments proposed for Vancouver, Edmonton, and Ottawa. In addition to expanding mass transit, cities are also being encouraged to make their streets safer and more useful for bicyclists and pedestrians.

³ OCED Territorial Review: Toronto, Canada, January 2010.

⁴ Finding from GlobeScan and *National Geographic* 2009 Greendex study. <http://www.nationalgeographic.com/greendex>



Challenges

Transportation is an important issue for all experts compared to other infrastructure challenges. Not only are transportation-related issues among the most serious environmental challenges facing cities, transportation is the most serious problem facing municipal infrastructure, generally, across the country.

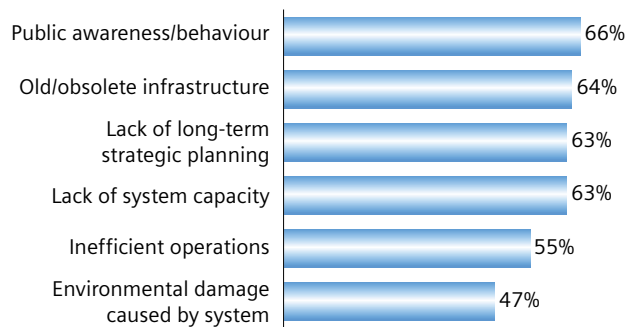
Stakeholders familiar with transportation infrastructure believe that it faces a number of equally serious challenges; namely,

general public awareness and behaviour, old or obsolete infrastructure, lack of long-term strategic planning, and inadequate system capacity. At least six in ten experts rate all four of these challenges as serious.

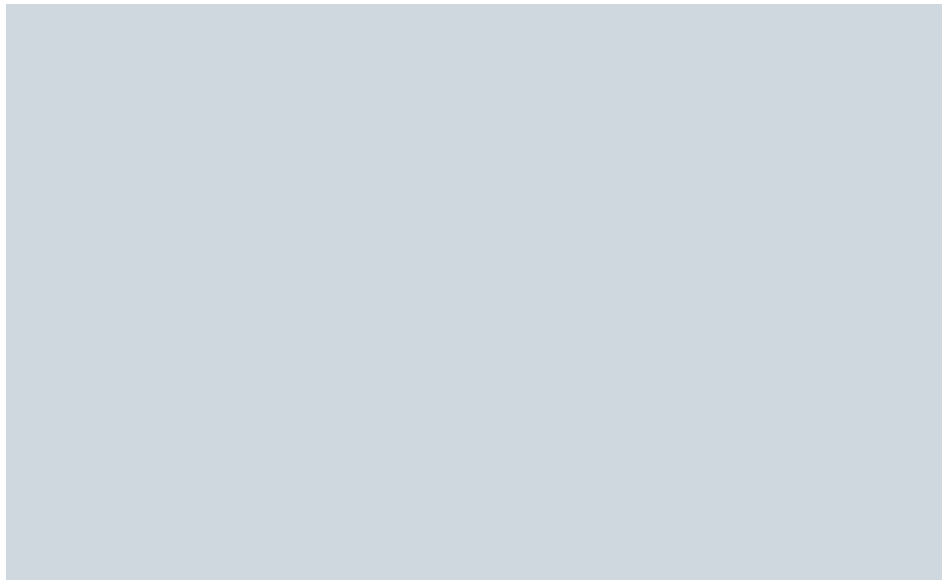
Experts in Alberta show the least concern about old infrastructure and inefficient operations, while those in the Prairie and Atlantic regions are the most concerned about these aspects of their city's transportation infrastructure.

Most serious transportation challenge

% saying serious challenge



“Serious” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not serious at all” and 5 means “Very serious.”



Transportation choices

When stakeholders are asked how their cities will approach transportation development in the next five to ten years, they foresee far more emphasis on mass transit than on individual motorized transportation (69% vs 31%).

Experts also predict that cities will lean toward “green” technology vs “brown” technology (62% vs 36%). Both of these approaches would mean significant opportunities for technology development and

implementation, as well as the need for significant up-front capital investment, and an element of risk.

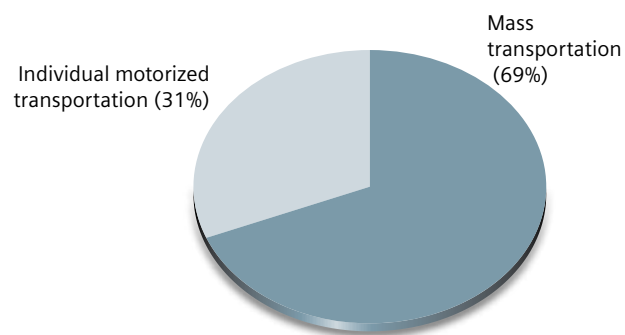
On other transportation choices, such as financing transportation with user fees or taxes, there is less consensus as experts are split on the issue (user fees 51% vs taxes 49%). Of course, higher user fees can lead to reduced transit use and reversion to automobiles. Stakeholders are more decisive on ownership—they predict more em-

phasis on public ownership than on private ownership (71% vs 29%).

Interestingly, on some issues, experts’ predictions differ significantly from their *preferences*. For example, they prefer far more emphasis on mass transit than they predict (84% compared to 69%). They would also like to see more “green” technology than they predict will be used.

Transportation experts predict

% predicting emphasis





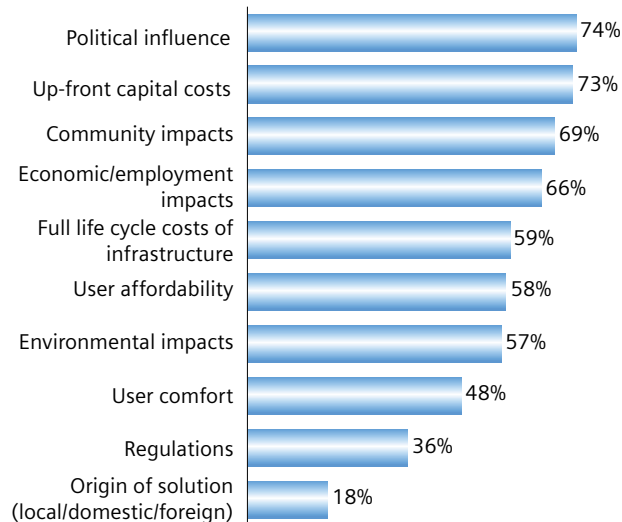
Decision-making factors

Although transportation is seen as a serious challenge for the environment, the environmental impact of transportation is not seen as the number one influencer of city decision-making. Up-front capital costs and political influence are clearly the most important factors, with nearly three-quarters of stakeholders agreeing.

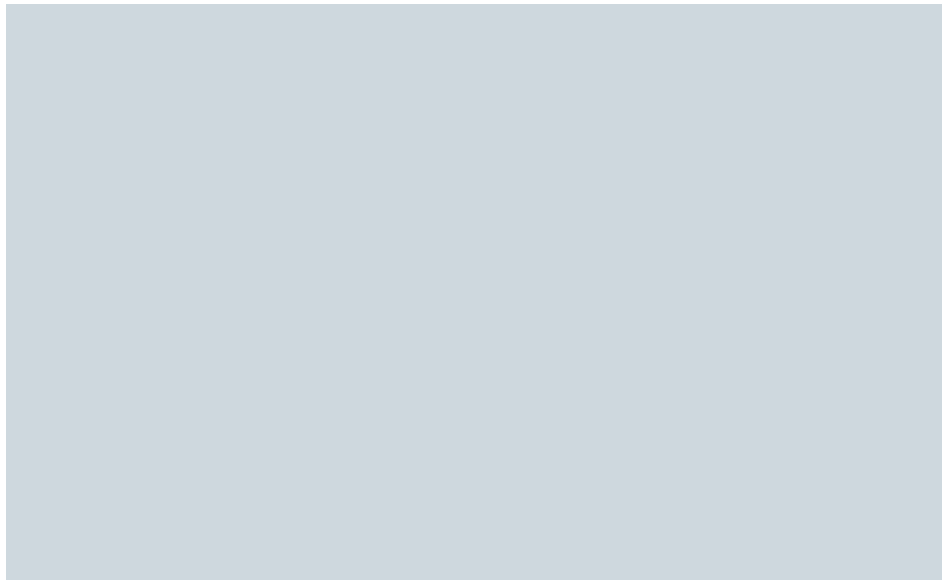
Impacts on the community and economic and employment impacts group together as the next most important factors, followed by life cycle costs. Regulations and the country of origin of solutions are seen as far less important factors in transportation decision-making.

Factors influencing the city's decision-making on transportation

% saying important impact



“Important” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not at all important” and 5 means “Very important.”



“Build an efficient, coherent, and attractive public transport system that could really be an alternative to a car. We must go beyond the current limited capacity of buses.”

—Stakeholder in Quebec City

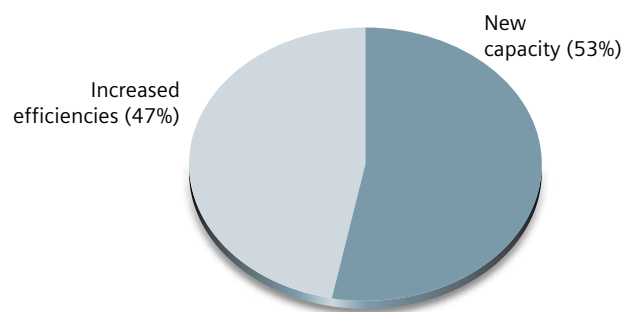
Most effective measures to address transportation challenges

When asked, unprompted, for the most effective measure cities could take to address their transportation challenges, 43 percent of experts recommend improving and expanding current transportation infrastructure. However, when asked spe-

cifically about what approaches cities will emphasize in the next five to ten years, stakeholders are divided on whether cities will focus on new transport capacity or increasing efficiencies of existing infrastructure (53% vs 47%).

Transportation experts predict

% predicting emphasis





Key findings

- Public awareness and inadequate long-term planning are the principal energy challenges facing Canadian cities. Environmental damage is far less of a concern.
- Energy source (e.g., fossil, nuclear, renewables) is a significant factor in energy choices. Experts predict more emphasis on fossil fuels than on nuclear.
- Cities are expected to move more toward decentralized generation, demand management, free market pricing, and renewables.
- The role of the private sector is more acceptable in energy than in water.



Energy

On energy use per capita, Canada ranks 27th out of 29 OECD nations. Canadians annually consume 6.19 tonnes of oil equivalent per capita, almost double the OECD average. Canada uses much more energy to produce a unit of goods and services than other OECD countries.⁵ In terms of electricity consumption alone, in 1960 Canadians consumed 5,631 kWh per capita. Consumption increased steadily to 16,578 kWh in 1988, after which time growth leveled off reaching 16,995 kWh per capita in 2007. By comparison, Americans consumed 13,652 kWh per capita and the UK 6,120 in 2007.⁶

Canada has a diverse portfolio of electrical energy resources. Nationally, hydroelectricity accounts for over 55 percent of electricity generation, followed by all fossil sources at about 26 percent, then nuclear at 15 percent. Biomass and other renewable sources account for the balance of electricity generation. Industry consumes 40 percent of Canada's electricity, followed by residential use at 30 percent, and commercial and public services at 27 percent.⁷

While Canada's provinces play an important role in energy policy, they coordinate with the federal government in developing long-term

priorities and targets. These include a commitment to achieving a 20 percent increase in energy efficiency by 2020, mainly through improvements to building codes, regulation of energy-consuming products, and home energy audits and retrofit assistance. The federal government is also committed to ensure that 90 percent of electricity needs come from non-emitting sources by 2020. In January 2010, Canada announced an economy-wide 17 percent reduction from 2005 emissions levels as its 2020 emissions reduction target under the Copenhagen Accord.

This section deals primarily with electricity.

⁵ Boyd, David R. *Canada vs. the OECD: An Environmental Comparison*, 2001.

⁶ World Bank, *World Development Indicators*, 2009.

⁷ International Energy Agency. *Electricity/Heat in Canada*, 2007.



Challenges

According to energy experts surveyed, the top challenges facing cities on energy are public awareness and behaviour and lack of long-term strategic planning. Nearly six in ten experts, especially those in the research and NGO communities, consider the public the root of Canada’s energy problems, presumably in terms of excessive consumption and not understanding the impacts of energy generation. Interestingly, all experts in the three Ontario cities surveyed are critical of energy planning. The current debate over coal, nuclear, and renewables is undoubtedly a factor.

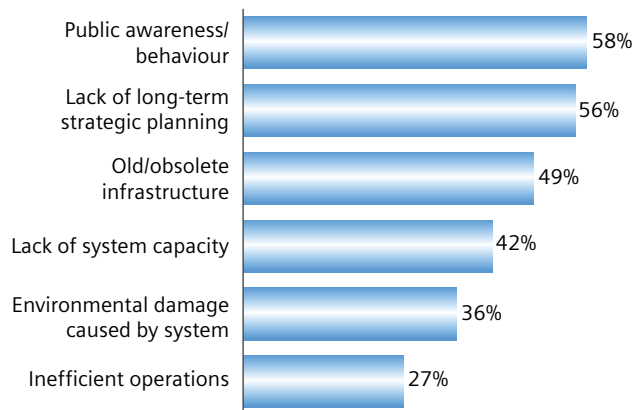
Overall, lack of system capacity is not viewed as a serious challenge (four in ten rate it as serious). However, experts in Ontario and British Columbia cities are more concerned than average about capacity (more than six in ten), findings that are consistent with recent announcements about renewables in Ontario and a new large dam in BC. Also, experts who are more familiar or have more years of experience with municipal infrastructure tend to be more concerned than others about capacity.

Fewer than four in ten think that environmental damage caused by our energy infrastructure is serious, in spite of atmospheric

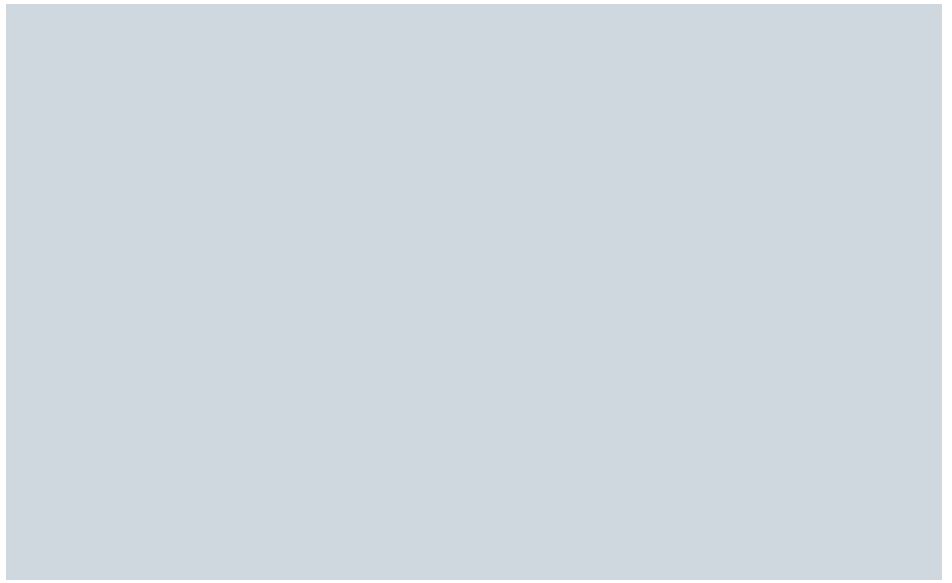
pollution and impacts on land use due to large dams (e.g., in northern Manitoba and Quebec).

Most serious energy challenge

% saying serious challenge



“Serious” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not serious at all” and 5 means “Very serious.”



Energy choices

Experts were asked which approach their city will likely take across a number of important energy variables. For example, when it comes to local generation or large grids, experts emphasize the former by a margin of 61 to 39 percent. They also predict a leaning more toward free market as opposed to subsidized pricing (57% vs 43%).

Interestingly, experts predict more emphasis on demand management than on new capacity (57% vs 43%). This would be a significant departure from past and current approaches. When asked what they prefer, experts would like the emphasis to be even more pronounced in favour of demand management (68% vs 32%).

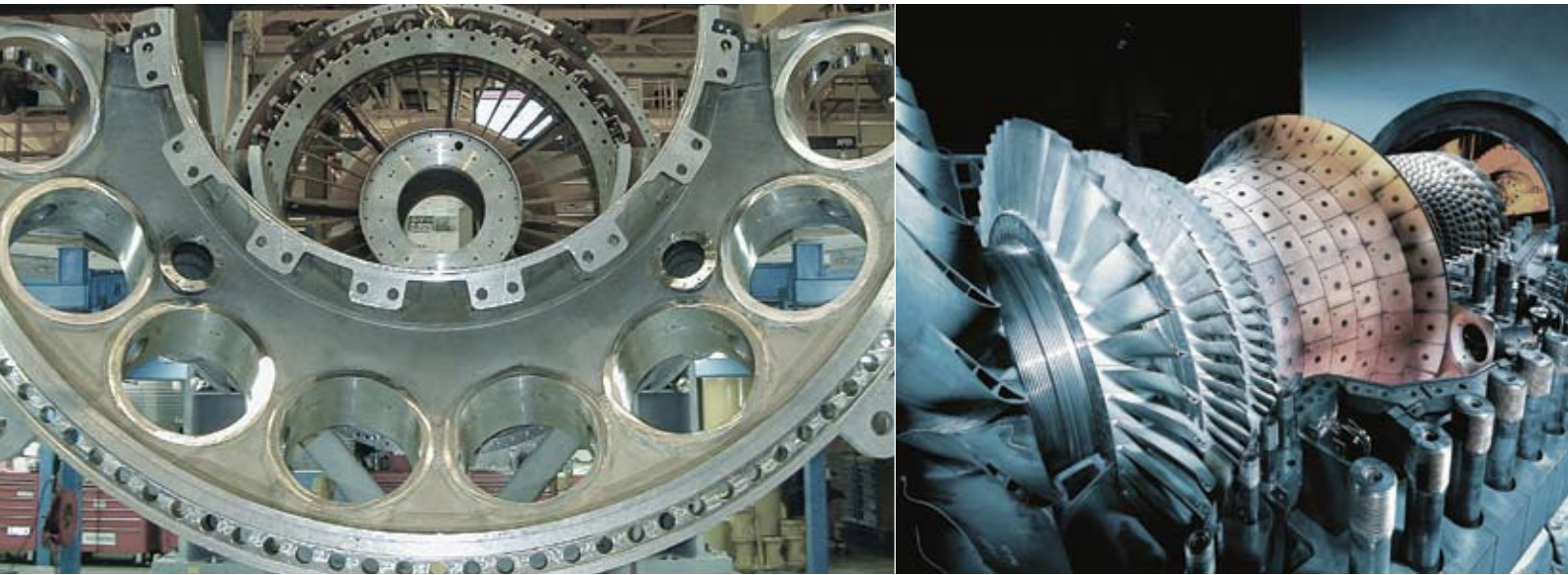
Not surprisingly, experts expect a strong bias for renewable energy technologies at the expense of fossil fuels (61% vs 39%), but not nearly to the extent that they would like it to be: experts prefer an emphasis of 81 percent to 19 percent in favour of renewables.

Interestingly, for the choice between fossil fuels and nuclear, experts foresee the em-

phasis in favour of fossil vs nuclear (63% vs 37%). But experts prefer a markedly different future from their prediction; they would like majority emphasis on nuclear over fossil fuels (57% vs 43%). The findings suggest a contentious debate over energy generation technologies.

When it comes to choosing new vs proven technology, experts predict the safe approach will prevail (59% vs 41%). However, they prefer a more progressive approach with relatively strong emphasis on using the newest technology (57%) rather than proven technology (43%). The findings here support experts' preference for renewables.

The likely role of the private sector is much stronger in energy than in water infrastructure, with experts foreseeing a balanced approach (51% emphasis on public vs 49% on private). Experts expect only a 32 percent emphasis on private operation of water infrastructure. The enhanced role of the private sector in energy is probably, in part, related to a more distributed generation system and fewer health risks in energy than in water infrastructure.



Decision-making factors

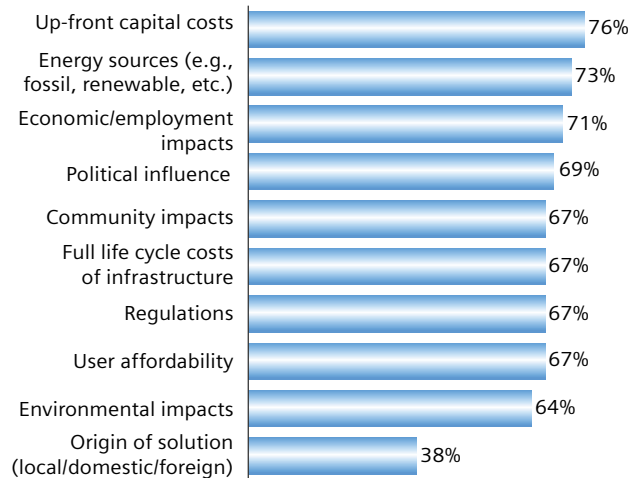
Up-front capital costs and energy sources are the most important factors affecting decisions about energy. Both of these factors are considered important by more than seven in ten experts; moreover, more than four in ten believe that energy source is “very important,” perhaps suggesting passionate views on this subject.

Impacts on economy and employment rank third, with seven in ten considering this important. Political influence is ranked a close fourth, but the fact that four in ten experts see it as “very important” suggests its potency in decision-making.

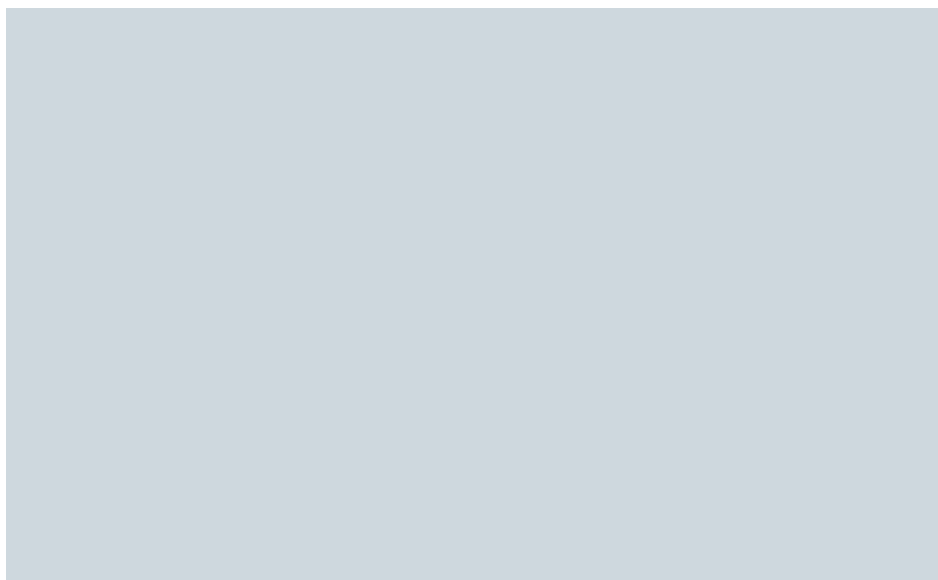
Experts rate other factors such as life cycle cost, regulations, user affordability, community impacts, and environmental impacts similarly (two-thirds rate each as important). As in other infrastructure areas, the origin of solutions is decidedly not an important factor when it comes to energy decisions.

Factors influencing city’s decision-making on energy

% saying important impact



“Important” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not at all important” and 5 means “Very important.”



Most effective measures to address energy challenges

Four in ten experts suggest that the best way for cities to address their energy challenges is to pursue renewable energy sources and other “green” technologies, including conservation and tougher energy efficiency standards. Experts in the research and NGO communities tend more than others to endorse renewables and green technologies. One in ten experts points to more

public education and awareness—recommendations that are consistent with survey findings that public awareness is one of the major energy challenges.

Almost four in ten suggest other measures such as demand management, carbon taxes, and system decentralization.



Key findings

- Aging infrastructure and poor public awareness are the principal challenges facing cities' water infrastructure.
- Canadian cities are expected to own and operate their water services.
- Expect growing debate about water reuse as a source of city water.
- Water quality and regulations are the most important factors in decision-making, but cost is also a critical consideration.



Water and Waste Water

Canada's wealth of water enables Canadian cities to enjoy among the best water supply and sanitation services in the world. Residential water use in Canada is about 340 litres per person per day, which is very high compared to Europe and most other industrialized countries. Although usage is high, prices are low, making conservation initiatives challenging. Only about one-half of the cost of providing water services is currently recouped in user fees, the rest being borne by government subsidies.

Municipalities are responsible for providing water and sanitation services but depend heavily on provincial support. Much of the vast infrastructure supporting Canada's

water services is old and requires many billions of dollars of investment in the next one or two decades. Funding requirements of this magnitude are encouraging a transition toward more full-cost pricing (i.e., prices that include the total costs of providing water).

While some cities, for example in Ontario and Quebec, rely on the surface water of the Great Lakes and St. Lawrence, others rely on smaller river systems (e.g., Calgary and Edmonton) and others like Vancouver depend on precipitation. This creates a dynamic in Canada in which water issues vary across the country and a need exists for different solutions depending on the local context.



Challenges

When all survey experts are asked about their city's greatest environmental challenge, one in five (19%) mentions water and waste water management, equivalent to their mention of transportation-related environmental issues. Then, when asked about the most serious challenge facing city infrastructure, fewer than 10 percent mention water or waste water specifically, suggesting that our pumps and pipes are considered to work fairly well and are invisible compared to other infrastructure such as transportation and even energy.

Nonetheless, age matters. When asked to rate a variety of water supply challenges facing Canadian cities, almost six in ten stakeholders think that old or obsolete infrastructure is a serious problem. One-half feel the same about public awareness and behaviour. Private sector stakeholders and experts in Ontario are especially inclined to worry about the age of water infrastructure. Stakeholders in BC, Quebec, and Ontario focus on public awareness, the second biggest challenge.

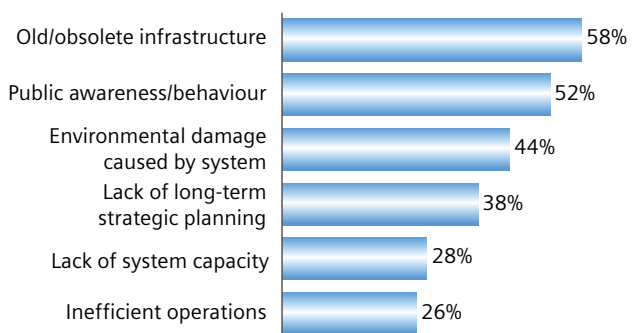
Environmental damage is ranked as third most serious, with eight in ten in Quebec being concerned. Lack of capacity and inefficient operations are not considered as problematic. Overall, the findings point to a need for capital investment and for public education and engagement.

When it comes to managing waste water, aging infrastructure is again the most serious issue, with six in ten respondents (especially those in government) considering it so. But environmental damage, presumably because of the impacts of pollutants in the effluent, and public awareness/behaviour

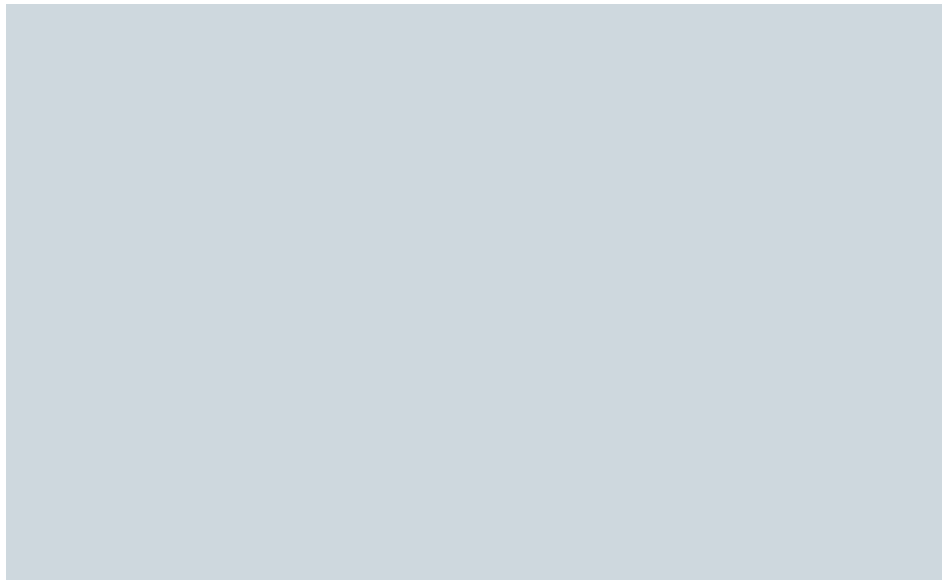
are both rated nearly as serious. As with water supply, inefficiency in waste water operations is not considered a serious challenge. So, the main message is consistent: more capital investment and greater public engagement are needed, as is environmental protection on the waste water side.

Most serious water supply challenge

% saying serious challenge



"Serious" represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means "Not serious at all" and 5 means "Very serious."



Water and Waste Water choices

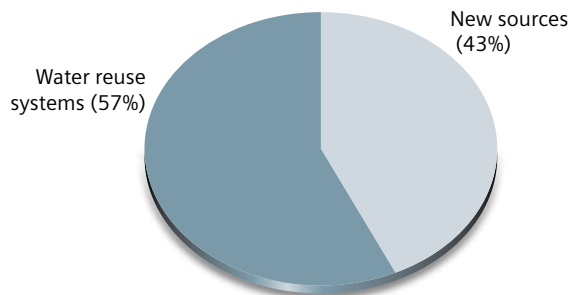
When asked which approaches their city will take on water and waste water management in the next five to ten years, experts predict (and recommend) a strong preference for public vs private operations (68% vs 32%) and, interestingly more water re-use vs developing new sources (57% vs 43%). Stakeholders in water-deprived Calgary and in Montreal tend more than others to support water reuse. In spite of concerns about old infrastructure, experts predict continuing efforts to increase efficiencies

rather than investment in new water and waste water capacity (58% vs 42%).

While the research indicates that city water management will evolve largely in line with experts' preferences, it also reveals emerging tension in a number of areas. Most notably, experts want more focus on prevention of contamination, greener technology, and water re-use than they predict will occur.

Water experts predict

% predicting emphasis





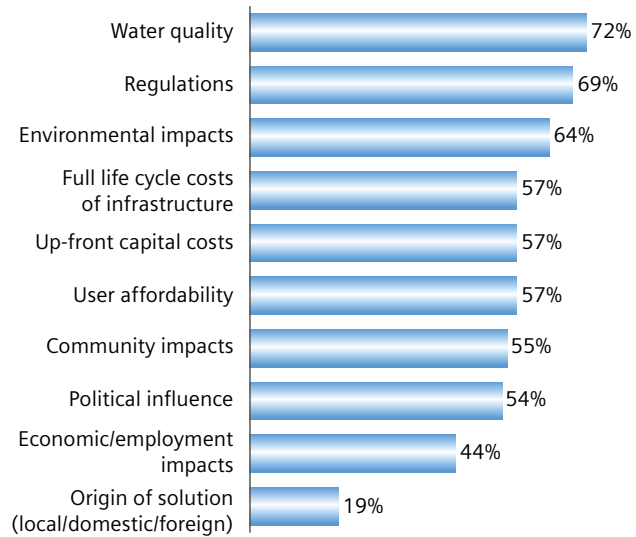
Decision-making factors

Water quality and regulations are clearly the most important factors in making decisions about water and waste water management, with seven in ten experts agreeing. Quality is particularly significant for experts in the private sector and in London, Ottawa, Saskatoon, and Vancouver. Environmental impacts are a close third in terms of importance, especially in Vancouver. The majority of experts acknowledge the importance of cost, both up-front and life cycle costs.

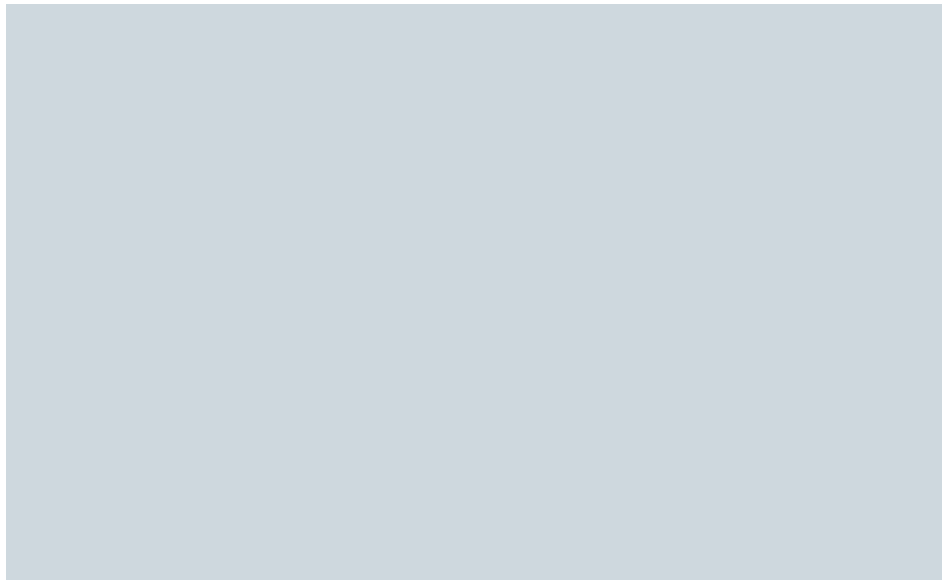
Experts consider the origins of water solutions (i.e., domestic or foreign) and impacts on economy and employment far less important factors in determining the course of city water management.

Factors influencing the city's decision-making on water

% saying important impact



“Important” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not at all important” and 5 means “Very important.”



"[The City should] replace old infrastructure to minimize water lost in the system. This would save on water treatment costs, energy costs for pumping, and of course would use less water."

—Respondent in Saskatoon

Most effective measures to address water challenges

When asked what their city could do to most effectively address its water challenges, upgrading or maintaining the water infrastructure is the most common response, at one in four. Other suggestions are far less popular, including public education and communication (12%), improv-

ing waste water and sewage management (10%), and demand management measures such as taxes, price increases, and usage monitoring. Interestingly, a full one in four suggests other remedies including funding, watershed management, and improved planning.



Key findings

- Lack of capacity is the most serious issue facing Canada's healthcare system.
- Capital cost and political influence are the most important factors in decision-making.
- Experts, not to mention the general public, tend to feel very strongly about healthcare issues, more so than other infrastructure areas.
- Healthcare systems will be encouraged to become more efficient rather than expand capacity.
- Experts foresee a transition to more fee-based services from the current emphasis on a free-for-all approach.
- The Canadian healthcare system is expected to remain largely publicly owned and operated.



Healthcare

Canadians are among the healthiest people in the world. The life expectancy of Canadians continues to rise, from 78 years in 1996 to 81 years in 2006.⁸ However, large inequalities in health persist across socioeconomic groups. The country has an aging population and one that increasingly suffers from obesity, diabetes, and high blood pressure.

Canada spends far more on its health care system than on upstream efforts to improve health status at the population level. In 2008, \$172 billion was spent on health care—in real terms, nearly 60% more than

a decade ago. About half of this increase is attributable to population growth, aging, and inflation. The remaining money bought more personnel, technology, innovation, and services. Technological developments include a move toward less invasive surgery, increased use of diagnostic imaging, and the utilization of biological and tailored drug therapies. The number of cardiovascular drug prescriptions has increased dramatically, as have age-standardized joint replacement rates.⁹ Healthcare is a frequent top-of-mind issue in Canadian public polling.

Many strategies to better measure and manage wait times have been put in place. Information has become much more decentralized and democratized through the technology explosion of digitization and the World Wide Web.

Policy recommendations include a greater focus on prevention through reduced poverty, early child development programs, and tapping opportunities to increase “value for money” in the current system.

⁸ Canadian Institute for Health Information, *Healthcare in Canada 2009: A Decade in Review*. (Ottawa, Ontario: CIHI, 2009).

⁹ Institute for Research on Public Policy (IRPP), *Canadian Priorities Agenda: Improving Health Outcomes in Canada*. (Montreal, Quebec: IPP, 2008)



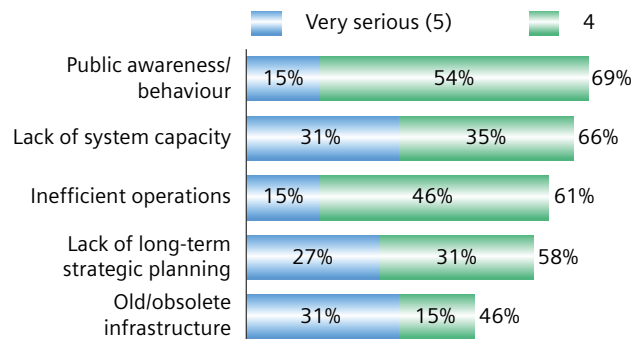
Challenges

According to the 26 experts surveyed on this area,¹⁰ the biggest challenges facing healthcare in Canadian cities are lack of system capacity and, interestingly, public awareness and behaviour. Approximately two-thirds of experts rate each of these issues as serious, but proportions considering them “very serious” differ greatly. Three in ten, especially those in Ontario, note that lack of capacity is “very serious,” while fewer than one in six experts overall feel the same about lack of public awareness.

Six in ten respondents consider inefficient operations and lack of strategic planning to be important problems, but lack of planning is considered especially problematic with more than one in four saying that it is “very serious.” The age of facilities is considered to be the least worrisome among issues listed, with fewer than one-half of experts considering this to be serious, but again, many (one in three) view the situation as “very serious.”

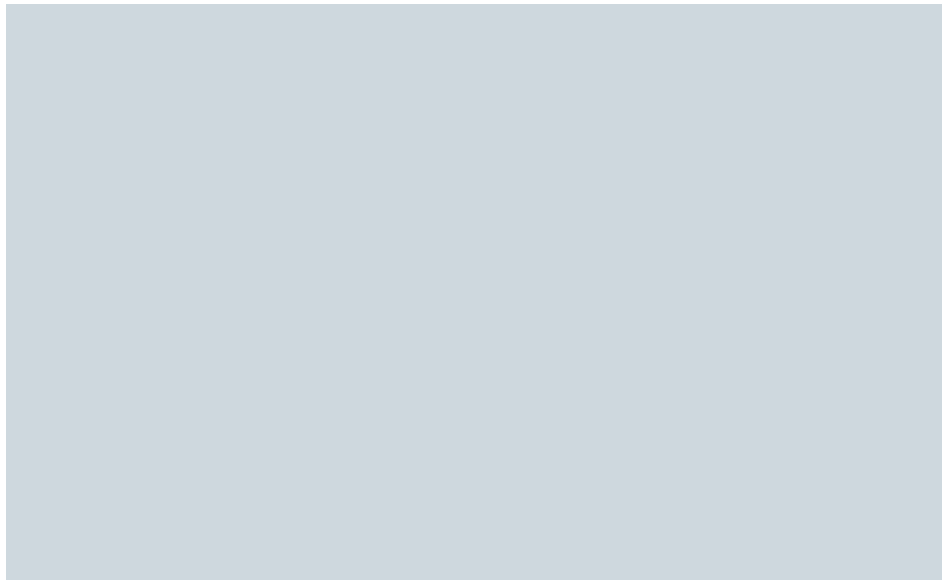
Most serious healthcare challenge

% saying serious challenge



“Serious” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not serious at all” and 5 means “Very serious.”

¹⁰ Note: Questions on healthcare were answered by 26 experts. Due to small sample size the differences may not be statistically significant.



Healthcare choices

Experts believe that their cities will lean more toward increasing efficiency than toward adding new capacity by a ratio of 59 percent to 41 percent. However, they think that society will focus somewhat more on increased physical infrastructure (not necessarily capacity) than on hiring more medical staff (55% vs 45%). Experts' preferences differ from their predictions: experts would like to see more emphasis on efficiency improvements vs new capacity and on increased staffing than on more infrastructure.

Likewise, experts foresee more emphasis on centralized hospital workflow manage-

ment and documentation systems (e.g., E-Patient cards) (67%) than on decentralized approaches based on departmental workflow solutions and individual documentation systems (33%). They also predict a tendency toward a common healthcare infrastructure with shared services (68%) as opposed to having every institution owning its technical services independently (32%).

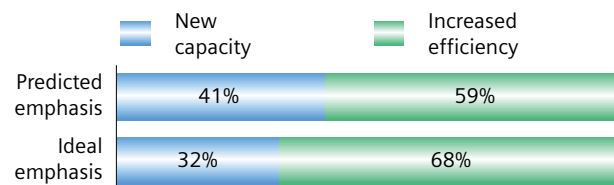
When it comes to prevention vs cure, experts foresee relatively equal emphasis (52% on prevention vs 48% on acute care). However, they endorse a marked shift to prevention (80% vs 20%). While they pre-

dict more emphasis on ambulatory care centres than on tertiary care centres (55% vs 45%), experts would prefer even more (64% vs 36%).

Experts are split on whether the healthcare system will retain a free-for-all approach or move toward a patient-pays system (51% for free service vs 49% for fee-based services), but they favour the former (66% vs 34%). They foresee continuing emphasis on public ownership and operation rather than private (57% vs 43%).

Future emphasis of city healthcare

% of respondents selecting





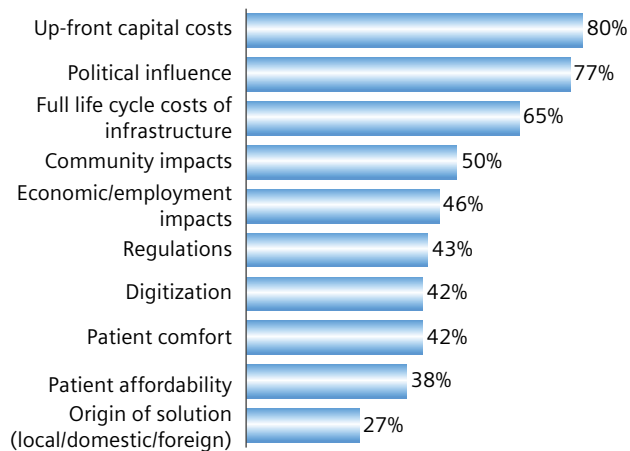
Decision-making factors

When it comes to decision-making on healthcare, two factors stand out for their importance: up-front capital cost and political influence. A full eight in ten experts rate cost as important, with four in ten saying it is “very important.” In close second place is political influence, which three-quarters of experts rate as important (almost one-half say it is “very important”).

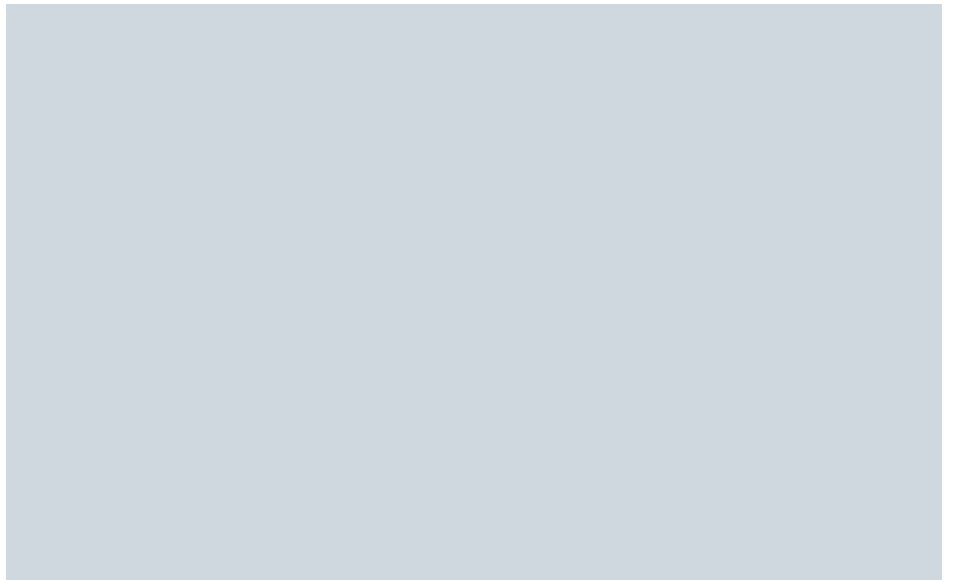
Neither patient comfort nor patient affordability is considered a relatively significant factor in healthcare decision-making (only four in ten experts rate each as important). Digitization, regulations, and economic impacts are all rated about the same in terms of importance (i.e., four in ten). The country of origin of healthcare solutions is a non-issue when it comes to decision-making.

Factors influencing the city’s decision-making on healthcare

% saying important impact



“Important” represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means “Not at all important” and 5 means “Very important.”



Most effective measures to address healthcare challenges

When asked, unprompted, to recommend the most effective measure that their cities could take to address their healthcare challenges, the most experts (one in four) mention expanding facilities. Less frequent sug-

gestions include more financial assistance and public education and awareness-raising about healthcare. In addition, experts suggest more focus on prevention and a more candid public review of the system.



Key findings

- Road safety is considered the most important safety and security challenge in Canadian cities, far more serious than terrorism and ethnic conflicts.
- Canadian cities will emphasize the use of public security resources rather than private organizations.
- Personal privacy will be sacrificed in the interest of greater public surveillance.
- Cities will adopt better technology to enhance safety and security, rather than merely add manpower.
- The use of gated communities will increase, but cities will continue to favour open approaches to development.
- The most effective measures for cities to enhance safety and security involve improved communications, coordination, and planning.



Safety and Security

This section of the report deals with crime, civil unrest, terrorism, and natural disasters. During the period 2000 to 2010, Canada had a total of 57 registered “disasters.” Three-quarters of these were floods, forest fires, and storms, with the remainder being industrial fires, chemical leaks, train derailments, etc.¹¹ Many of the 57 disasters occurred well outside Canada’s major cities. There have been few incidents of domestic terrorism, the most recent involving natural gas pipelines, a Jewish school library, and fire-bombings in Quebec related to language or separatist issues.

There were 2.5 million crimes reported in 2006, of which 13 percent were violent crimes and almost one-half were property-

related. After increasing steadily throughout the 1960s, 70s, and 80s, the crime rate has decreased by about 30 percent. However, recently, there have been increases in serious violent crimes. Ontario and Quebec have the lowest overall crime rates, while Saskatchewan has the highest rate among the provinces.¹²

Road safety, Canadians’ major risk, has improved, with reduced collisions and casualties on a national basis since the 1990’s. In 2007, there were 900 fatal collisions and 97,115 personal injury collisions in all of Canada’s urban areas.¹³

The provinces are responsible for law enforcement, although provincial policing

in many jurisdictions is contracted to the Royal Canadian Mounted Police (RCMP). In 2005 there were 61,050 police officers in Canada, equating to one officer per 529 persons:¹⁴ a substantially lower rate than in most developed countries. Electronic surveillance, including the use of surveillance cameras on city streets, is on the rise, but the public does not appear concerned.

According to GlobeScan’s most recent public opinion research, when asked to name the most serious problem facing the world today, very few people in the general public in Canada (1%) mention crime and violence, while 14 percent point to terrorism, war, and conflict.

¹¹ Public Safety Canada, 2010. ¹² Statistics Canada, 2010.
¹⁵ The GlobeScan Report on Issues and Reputation 2009.

¹³ Transport Canada. Canadian Motor Vehicle Collision Statistics: 2007. ¹⁴ Statistics Canada, 2010.



Challenges

Experts¹⁶ consider Canadian cities to be relatively peaceful and free from some of the risks experienced in cities in other countries. Instead, they consider our cities' greatest public safety and security challenge to be road accidents, with six in ten experts rating them as important. Further, five in ten experts think that public behaviour, generally, is a serious security issue. The same proportion of experts thinks that cities' lack of long-term strategic planning on security is problematic.

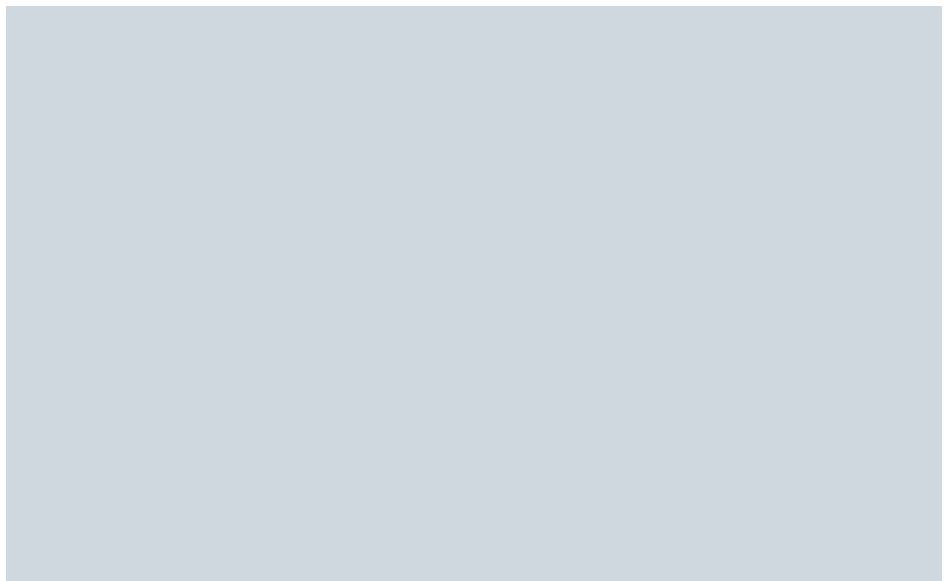
Other normally high-profile issues are rated less important, some far less important. Less than one-half of experts thinks that organized crime is a significant safety risk.

Fire safety is also considered an important risk by the same proportion. Four in ten view natural disasters (e.g., earthquakes, floods, storms, and related notification and mass evacuation) to be significant risks to their cities.

Experts consider mass events, such as sports venues and parades, and especially terrorism, and ethnic conflicts to be significantly less serious risks in their cities.

Overall, fewer than two in ten experts rate **any** of the issues as "very serious," an indication that public safety and security is not a major issue in Canadian cities relative to other challenges explored in this research.

¹⁶ Note: Questions on public safety and security were answered by 33 experts. Due to small sample size the differences may not be statistically significant.



Safety and Security choices

As a first line of defense, society usually counts on public resources to ensure safety, but when those are not perceived to be adequate, private security organizations are engaged. Experts surveyed think that cities will continue to strongly emphasize the use of public security authorities over private (63% vs 37%). That being said, Toronto's hosting of the 2010 G20 summit will require the use of private security forces to satisfy one of the largest security undertakings in Canada.

In the debate between prevention and cure, as it applies to public safety, experts

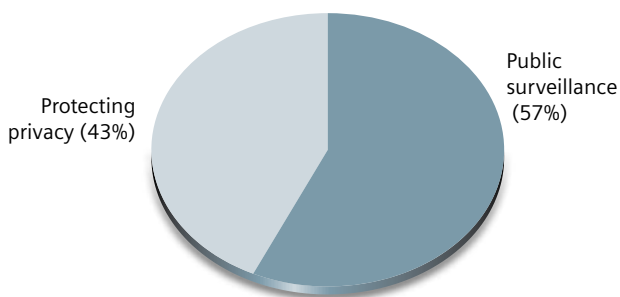
predict slightly more emphasis on prevention of problems (54%) than on protection from them (46%). However, they strongly support more use of prevention techniques (77% vs 23%).

Rather than emphasize adding more people (e.g., police) to solve the problem (46% emphasis), experts think that our cities will focus more on better security technology (54%). In the debate on public surveillance vs personal privacy, experts foresee society leaning more toward surveillance by a margin of 57 percent to 43 percent. Experts' preferences echo this prediction. So,

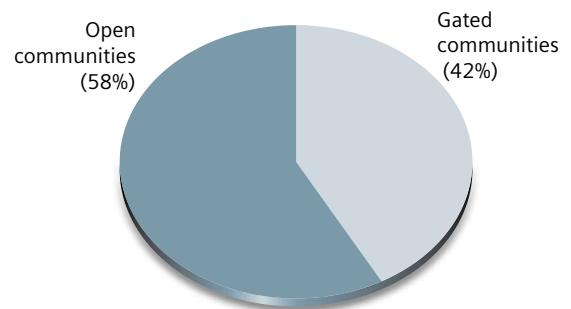
it seems that security cameras and other surveillance technology will increasingly be part of our lives.

Experts predict more emphasis on open communities than on gated communities (58% vs 42%), but even this ratio suggests that cities will be building more closed neighbourhoods in the coming years. Certainly, the preference of security experts surveyed is more heavily weighted toward open communities, with three-quarters suggesting this approach.

Public safety and security experts predict % predicting emphasis



Public safety and security experts predict % predicting emphasis





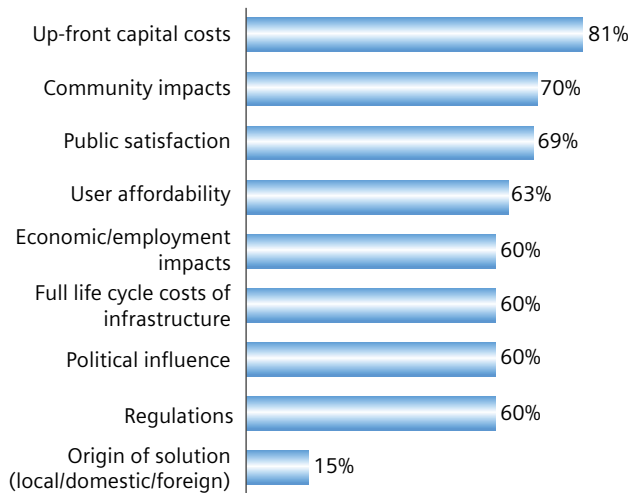
Decision-making factors

Experts were asked to rate nine possible factors used in making decisions about city safety and security. Experts' responses cluster into three tiers. Up-front capital cost, alone, is clearly the most important, with eight in ten experts rating it important, including almost four in ten who consider cost "very important."

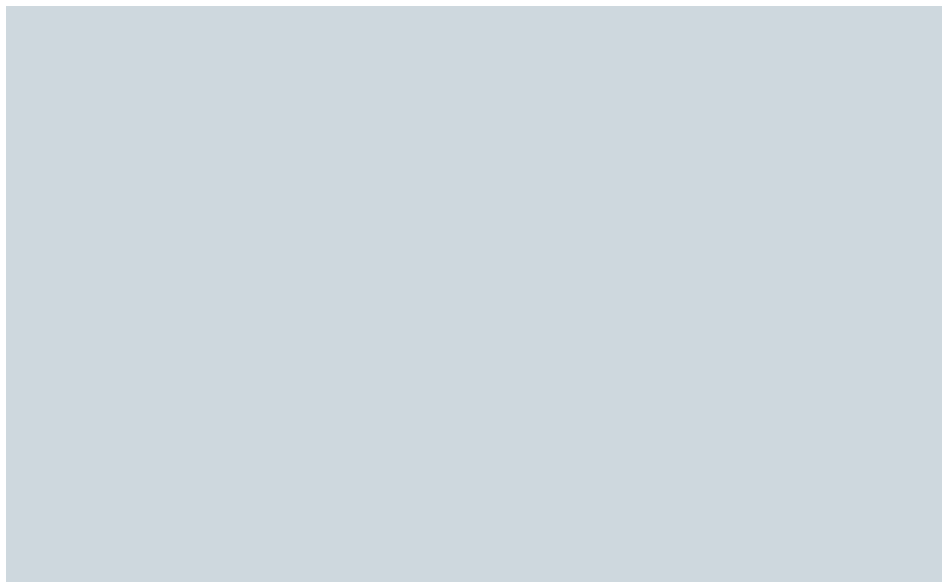
Occupying the second tier are community impacts and public satisfaction, both rated as important by seven in ten experts. The third tier, rated important by six in ten experts, includes user affordability, life cycle cost, regulations, economic impacts, as well as political influence, the last being considered "very important" by almost four in ten respondents.

Factors influencing the city's decision-making on safety and security

% saying important impact



"Important" represents ratings of 4 or 5 on a scale of 1 to 5 where 1 means "Not at all important" and 5 means "Very important."



Most effective measure to address security challenges

When asked, unprompted, to name the most effective measure that their city could take to address its public safety and security challenges, most experts (one in four) mention improved communications, coordination, and planning. The second most frequent response deals with increasing financing and resources for safety

and security. Very few experts suggest a review of the justice system or public education and awareness raising (only one in ten each). A further one in four experts makes other recommendations, including more policing (especially of venues that are prone to violence) and crime prevention by reducing urban poverty.



Key findings

- Aging infrastructure is the biggest challenge facing city management.
- Up-front capital cost and political influence are the most important factors in city management decisions.
- Cities will try to break down silo-based management to a more holistic approach.
- Digitization and e-government will become more important as cities address inefficiency and boost competitiveness.
- Cities' infrastructure decision-making should become more transparent and adopt longer term planning horizons.
- The private sector will play a greater role, primarily in economic development initiatives, rather than in privatizing city tasks.



City Governance and Finance

City governance has become increasingly complex as cities expand into large metropolitan areas encompassing multiple jurisdictions and administrative organizations. While responsibility for provision of services is often borne by municipalities, they rely very much on senior levels of government for financing.

One hundred experts in city management responded to questions on governance and finance, providing robust results. In this section, we have also included related findings on decision-making and the role of the private sector based on the total sample of 243 respondents.



Addressing the challenges

The biggest challenge facing city management is clearly old or obsolete infrastructure, as rated by seven in ten experts, especially those in Atlantic Canada and the Prairies. Public awareness and behaviour is a distant second concern, while lack of capacity, inadequate long-term planning, and inefficiency are all rated as serious by fewer than one-half of experts.

There are three especially significant factors that influence decisions about city governance: political influence, up-front capital cost, and impacts on economy and employment—all rated important by at least two-thirds of experts surveyed. Transparency, community impacts, and life cycle costs are all considered less important.

Experts suggest that the most effective measure that their cities could take to address their management challenges would be to do more strategic planning and demonstrate more effective leadership. Improving finances and funding is also recommended.

The need for better decision-making

The research explored, with the full respondent sample, a number of issues deal-

ing with city decision-making, including transparency and consistency, considering the metropolitan area's needs, long-term vs short-term planning horizons, and quality of implementation.

Transparency and consistency lacking

Almost one-half of experts think that their city does not have transparent and consistent decision-making processes on infrastructure investments. The critics outnumber those who score their city positively by more than two to one (47% vs 21%). Experts in Vancouver and Quebec City tend to be especially critical. Respondents in government give themselves better, but not high, marks on running transparent and consistent processes than their counterparts in research organizations, NGOs, and the private sector give them. Clearly, infrastructure decision-making could use some improvement.

Considering the metropolitan area

Experts are divided, but tend to give somewhat poor marks to cities' performance in balancing their own needs with the needs of the greater metropolitan area. Thirty-seven percent of respondents give their city poor marks compared to 26 percent giving good marks. NGO respondents and experts

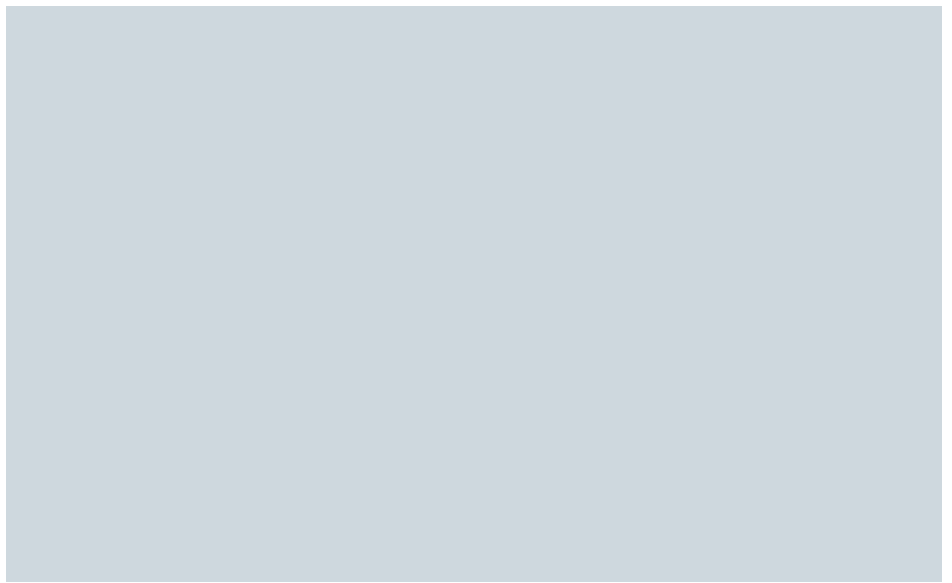
in Calgary tend to be more critical than other experts. Given the growth in metropolitan areas, this shortcoming is becoming increasingly important, especially in the context of transportation infrastructure.

The need for long-term planning

A small majority of experts (55%), especially those in the research and NGO sectors, thinks that their city's infrastructure planning focuses too much on short-term needs at the expense of long-term sustainability. Only one in four respondents thinks that their city's planning horizon is adequate. Making good infrastructure decisions requires a long-term perspective because of the time-frame of implementation and use.

Divided on implementation

As most people know, planning is easy and implementation is difficult. In this research, stakeholders are deeply divided on whether their city does a good job implementing infrastructure investment decisions. About one-third each give good (34%), average (30%), and bad (31%) marks on city performance (the remaining 5% do not know). Government respondents and those in Saskatoon and St. John's tend to give higher marks than others.



Management options

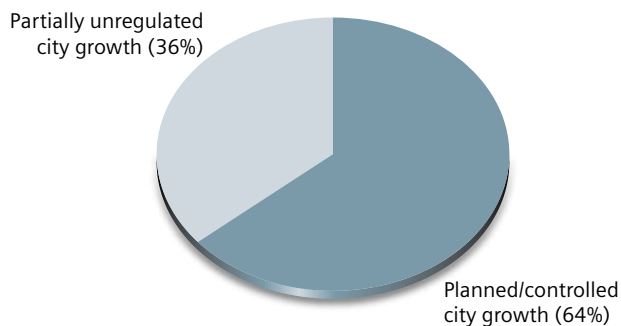
City management experts predict that Canadian cities will emphasize planned and controlled city growth more than allowing partially unregulated growth by a ratio of 64 percent to 36 percent. This will help address the problem of urban sprawl, which is mentioned as one of the most serious challenges facing cities. In fact, experts endorse even stronger focus on controlled growth. Experts foresee cities relying primarily on regulatory tools rather than taking significant steps to de-regulate (56% vs 44%).

While anecdotally cities are sometimes criticized for managing in a silo environment, where one department's policies counter another's, the survey findings predict an emphasis on more holistic management as opposed to being based on separated responsibilities (57% vs 43%). Not surprisingly, experts surveyed strongly support such a transition (71% for holistic management vs 29% separated responsibilities).

Experts foresee more city responsiveness to citizens in the coming years rather than reliance on authoritative administration (58% vs 42%). Certainly, communications technology allows increasingly cost-effective consultation with the general public. Cities are predicted to become "smarter" in terms of more digitization and e-government in order to improve efficiency, rather than adding staff (62% vs 38%).

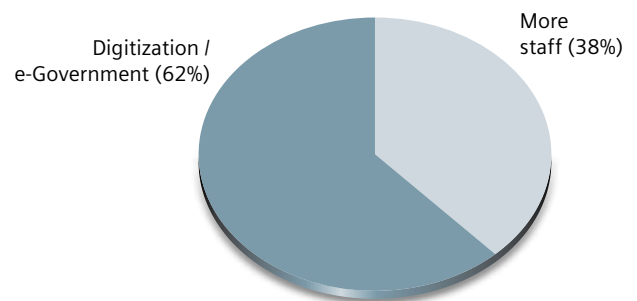
Predicted approach on city management

% predicting emphasis

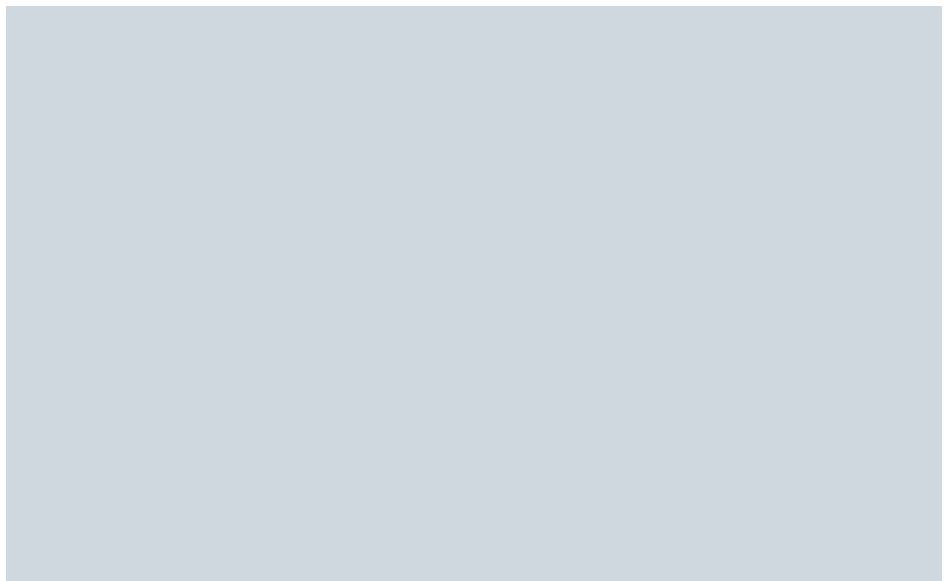


Predicted approach on city management

% predicting emphasis







The Role of the Private Sector

Experts foresee a role, albeit limited, for the private sector in urban governance and finance. For example, they predict greater emphasis on the private sector in economic development initiatives (56%) than on public development initiatives (44%). However, experts are less enthusiastic about opportunities for public-private partnerships (PPPs) and privatization of public tasks. Regarding PPPs, experts think that cities will place essentially equal emphasis on PPPs and public financing (52% vs 48%). But, when it comes to privatizing public tasks, experts foresee slightly more emphasis on cities acting in a sovereign capacity than on privatization (52% vs 48%). Experts are strong proponents of cities doing their work on their own behalf (61%).

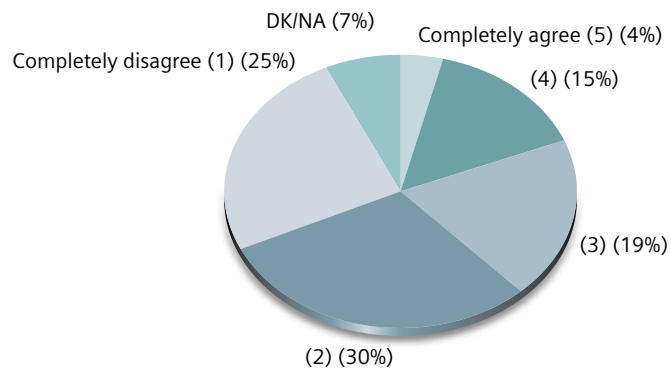
Across the infrastructure areas surveyed, experts predict more emphasis on public (rather than private) ownership, operations, and financing, but the margin over the private sector is usually very small. For example, in energy, experts foresee emphasis on the public role vs private role on ownership, operations, and financing of about 51 percent vs 49 percent, suggesting significant opportunities for business in the energy sector, compared to the status quo. But it is different on water, security, and health. For water, experts predict two-thirds emphasis on public operations,

on security 63 percent, and on health 57 percent. So, while there are private sector opportunities compared to the current situation, they differ by infrastructure area.

Overall, a majority (55%) of the full sample of experts disagree that privatization of their city's infrastructure would increase its efficiency. Only one in five thinks it would boost efficiency. Majorities in government,

NGO, and academic / think tank stakeholder groups are skeptical of privatization's benefits. In fact, slightly fewer than one-half (47%) of private sector respondents believe that infrastructure privatization would result in better efficiency. Experts in Calgary, London, and Halifax and those with the greatest familiarity with infrastructure tend to be the most skeptical of privatization's efficiency benefits.

Privatization of city infrastructure will increase efficiency
% of respondents selecting



Ratings on a scale from 1 to 5 where 1 means "Completely disagree" and 5 means "Completely agree."

Methodology

This report is sponsored by Siemens in Canada in partnership with the David Suzuki Foundation and Canadian Business. The report has been prepared for The Sustainable Cities Challenge, a panel discussion on the sustainability of infrastructure in Canadian cities, held on May 18, 2010. The report is based on online survey research conducted with 243 stakeholders by GlobeScan between February 22nd and April 6th, 2010. Stakeholders were selected to participate by GlobeScan based on their knowledge of infrastructure in their respective cities. To ensure respondents were knowledgeable on the subject, a number of questions were asked about level of familiarity with and involvement in specific infrastructure areas, as well as geographical location. Thirty-four percent of the experts who participated in this study describe their role as influencing infrastructure decisions, and 20 percent describe their role as being part of planning and decision-making. The balance of experts describes their role as implementation, or a combination of all three: influencing, planning, and implementation.

Seventy percent have high or very high familiarity with the various infrastructure areas. No respondents with less than “average” familiarity were included in the survey.

Seventy-five percent of experts have at least five years experience working with or being involved in municipal infrastructure. Of that seventy-five percent, more than one-half have at least 15 years experience.

The stakeholders surveyed are from 12 Canadian cities (Calgary, Edmonton, Halifax, London, Montreal, Ottawa, Quebec City, Saskatoon, St. John’s, Toronto, Vancouver, Winnipeg).

Stakeholders are senior-level staff working for:

- City municipalities—both unelected and elected senior officials
- Non-governmental organizations—senior managers or heads of NGOs working for organizations related to urban issues

- Private sector—senior level staff at private sector companies that work in areas related to urban infrastructure
- Research/academia—professors or department heads at major universities and think tanks working in related discipline areas

All stakeholders either work in or are experts in at least one of the following areas:

- Transportation
- Energy
- Water supply and waste water management
- Healthcare
- Public safety & security
- City management

The survey includes general questions on the broad theme of infrastructure that were addressed to all 243 experts. More detailed questions on the specific infrastructure areas, as well as city management, were asked to those stakeholders with the appropriate knowledge and experience. Below is a table outlining the sample sizes for each infrastructure area. Some stakeholders were knowledgeable in more than one area and responded to questions about infrastructure areas.

Stakeholders with knowledge of the transportation sector demonstrated higher participation in the survey and, therefore, are better represented in the surveyed sample. The data is not weighted as the over-representation of transportation experts does not significantly affect the reported research findings.

For the purposes of analysis, cities have been group by region. The groupings are listed below:


- Atlantic: Halifax, St. John’s
- Quebec: Montreal, Quebec City
- Ontario: London, Ottawa, Toronto
- Prairies: Saskatoon, Winnipeg
- Alberta: Edmonton, Calgary
- British Columbia: Vancouver

Breakdown of Respondents by Infrastructure Area

Total	243
City management	100
Energy	45
Healthcare	26
Public safety & security	33
Transportation	113
Water supply & waste water management	58

Breakdown of Respondents by City

Total	243
Vancouver	24
Edmonton	24
Calgary	20
Saskatoon	17
Winnipeg	22
London	17
Toronto	23
Ottawa	25
Montreal	15
Quebec City	16
Halifax	23
St. John’s	17

A scenic landscape featuring a large body of water in the middle ground, with dark, silhouetted mountains and hills in the background. The foreground is dominated by a dense forest of evergreen trees, also in silhouette. The sky is filled with large, white, fluffy clouds against a darker, overcast background. The overall mood is serene and natural.

We would like to thank all those
who participated in the survey for
their valuable insights and time.

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