

Resilient Calgary



Preliminary Resilience Assessment

Executive Summary

#ResilientYYC

In partnership with

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100 RESILIENT CITIES



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Introduction

Welcome to Calgary!

A great place to make a living, a great place to make a life.

Calgary is a vibrant, young, energetic place with a diversity entrenched in our roots: traditional ways of living with the land, and of benefiting from the abundance of resources deep within our environment. People have historically come to this place to share information, to share culture, and to exchange goods and services in pursuit of a great life. Our city is approaching a new horizon of technological innovation, increased economic diversity, youthful enthusiasm supported by wisdom, experience and traditional knowledge, and increasingly complex decisions regarding our environment. We are facing these changes head on. Our nature is to be resilient: to face the stresses and shocks of our modern city with a collaborative interest in reaching our vision of Calgary as a great place to make a living, a great place to make a life.

Calgary is a member of 100 Resilient Cities (100RC)

Pioneered by The Rockefeller Foundation, 100RC is dedicated to helping cities around the world become more resilient to the social, economic and environmental challenges of the 21st century. 100RC supports the adoption and incorporation of a common definition of urban resilience that includes not just the shocks – earthquakes, fires, floods, etc. – but also the stresses that weaken the fabric of a city on a day to day or cyclical basis. By addressing both the stresses and shocks, a city better responds to adverse events, develops its potential for collective and individual resilience and enhances delivery to all its residents.

The City of Calgary was among the third and final cohort of cities invited by 100RC to embark on an exciting opportunity to examine city resilience and develop a strategy that is customized according to individualized needs and capacity.

Purpose of this Preliminary Resilience Assessment

- To describe the work that has been done to date to understand Calgary perceptions and opportunities to build resilience
- To identify emerging resilience cross cutting themes and discovery areas that will guide the development of a Resilience Strategy for Calgary

What is a Preliminary Resilience Assessment?

This **Preliminary Resilience Assessment (PRA)** describes the city profile, the main stresses and shocks in Calgary, perceptions of stakeholders and the public and the inventory of actions already in place. The information was drawn from surveys, individual meetings, and workshops with diverse stakeholders. These results led to the identification of four recommended discovery areas with one cross cutting theme that will serve as the basis for Calgary's resilience strategy.

The PRA is a living document that summarizes the method and principal results of the activities carried out by the resilience team in Phase I of the strategy development process.

“Never mistake the desire for compassion, kindness, mercy, love and humanity for weakness. It is strength.”

—CALGARY MAYOR NAHEED NENSHI

THE CITY RESILIENCE FRAMEWORK: 100 RESILIENT CITIES

LEADERSHIP & STRATEGY

Effective leadership, empowered stakeholders, and integrated planning

INFRASTRUCTURE & ENVIRONMENT

The way in which man-made & natural infrastructure provides critical services and protects urban residents

HEALTH & WELLBEING

The health & wellbeing of everyone living and working in the city

ECONOMY & SOCIETY

The social & financial systems that enable urban populations to live peacefully, and act collectively

This PRA supports Calgary to dive deeper in its discovery areas and to develop creative, bold and innovative initiatives during Phase II.

Stresses: weaken the fabric of a city on a daily or cyclical basis. Examples include high unemployment, an overtaxed or inefficient public transportation system, and chronic food and water shortages.

Shocks: sudden, sharp events that threaten a city. Examples include flood, fire, disease outbreaks and human-caused incidents.

“We must act now — and we must understand that if we do not manage this challenge with energy, commitment, skill and resources, this challenge will manage us to our great detriment.”

— JIM GRAY, CALGARY BUSINESSPERSON & PHILANTHROPIST

“This opportunity will allow Calgary to unify and strengthen the resilience initiatives already underway at The City, and help us become a Canadian leader in resilience planning.”

— BRAD STEVENS, CHIEF RESILIENCE OFFICER

Calgary Context





Pre-Treaty

The Blackfoot Confederacy (Siksika, Kainai & Piikani) and Métis peoples populated the foothills and plains surrounding Calgary

Arrival of the Tsuu T'ina Nation

North-West Mounted Police establish a fort at confluence of the Bow & Elbow Rivers

1877

Making of Treaty 7

1883

CP Rail reaches Calgary 1996

CP moves its headquarters to the city

1884

Calgary officially incorporated as Town of Calgary. George Murdoch elected Mayor

1894

Calgary officially incorporated as The City of Calgary

1912

Guy Weadick brings Stampede to Calgary

1915

Bow River flood washes away Centre St. Bridge 1130m³/s



1917

Annie Gale is elected the first woman in the British Empire to serve on municipal council

1929,1932

Bow & Elbow rivers flood due to heavy rain, damaging the Calgary Zoo 1320 & 1520 m³/s



The City of Calgary is situated on land adjacent to where the Bow River meets the Elbow River, and the traditional Blackfoot name of this place is “Mohkinstsis”. Calgary is traditional territory of the people of the Treaty 7 region in Southern Alberta, which includes: the Blackfoot Nation tribes of Siksika, Piikani, Kainai; the Stoney Nakoda Nation tribes of Wesley, Bearspaw, Chiniki; and the Tsuut’ina Nation. Calgary is also home to the Métis Nation of Alberta, Region III, the Inuit, and other urban Indigenous Peoples.

1933
The Glenmore Reservoir is completed. It controls the downstream flow of the Elbow River, thus allowing the city to develop property near the river's banks with less risk of flooding

1947
Leduc No.1 sparks oil boom in Alberta

1981
Global oil prices collapse leading to high unemployment and bankruptcy

1982
The Charter of Rights and Freedoms is signed into the Constitution

1988
With great community volunteerism, Calgary hosts the Winter Olympics

2009-2013
The City undertakes concerted effort to manage density – different from previous growth budgets

2010
Calgary elects 38 year old Naheed Nenshi as Mayor – first Muslim mayor in a major North American city

June 20, 2013
26 Calgary communities were evacuated as both the Bow & Elbow breach their banks

2014
Dropping oil prices leads to a provincial recession

2015
Left leaning New Democrats & Rachel Notley are elected to form a majority government after 44 years of Progressive Conservative leadership

2016
Calgary admitted 21,430 permanent residents

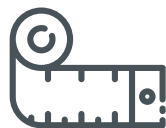


Calgary sits in the sunny eastern foothills of Canada's Rocky Mountains

4th largest city in Canada



848 square kilometres in size



Sits at an elevation of 1,048 metres above sea level

Calgary has more volunteers per capita than any other city in the world



Calgary is among the top 5 most livable cities on earth

1400
Settled Syrian
refugees in 2016

3.6%
Same sex
couples

7.2%
Unemployment rate
(Dec. 2017)

\$73,369
Average salary per
employee

17.7%
Graduates with
degrees in STEM

\$45M

Subsidy to freeze the
non-residential
tax rate

9.3%
Low income
population
(LIM-AT)

27%
Downtown office
vacancy rate
head & sub
lease

29.4%
Immigrants

\$2B
Annual capital
budget spend

14%
Lone-parent
families

11%
Seniors
(65 yrs & older)

36%
Visible minority

23,500
New full time jobs in 2017

Top 10
Most attractive cities
for
workers

9.7%
Disability prevalence
(2012 data)

3%
Indigenous
identity

1,239,220
Population of Calgary city (2016)

#1
In participation
rate and labour
productivity of
major cities
in Canada

37.6
Average age

**SNAPSHOT OF CALGARY
SOCIAL AND ECONOMIC***



10%

Land area—natural and manicured parks

100%

Rise in insurance premiums post 2013 Flood

100%

Return to pre-flood premiums 2017 due to resilience efforts

2°C

Expected rise in annual temp by 2030s

62%

Calgary's GHG emissions from operating all buildings in Calgary

7.2ha

Park space per 1,000 Calgarians

12%

Green space share of city area

40%

Impervious land cover as of 2010

18

Tonnes GHG emissions per household (estimated)

6000

Buildings in flood hazard areas

\$34M

"Snowtember" non-insurable losses

4°C

Expected rise in annual temp by 2060s

\$3.6B

YYC provides support to Fort McMurray after wildfires

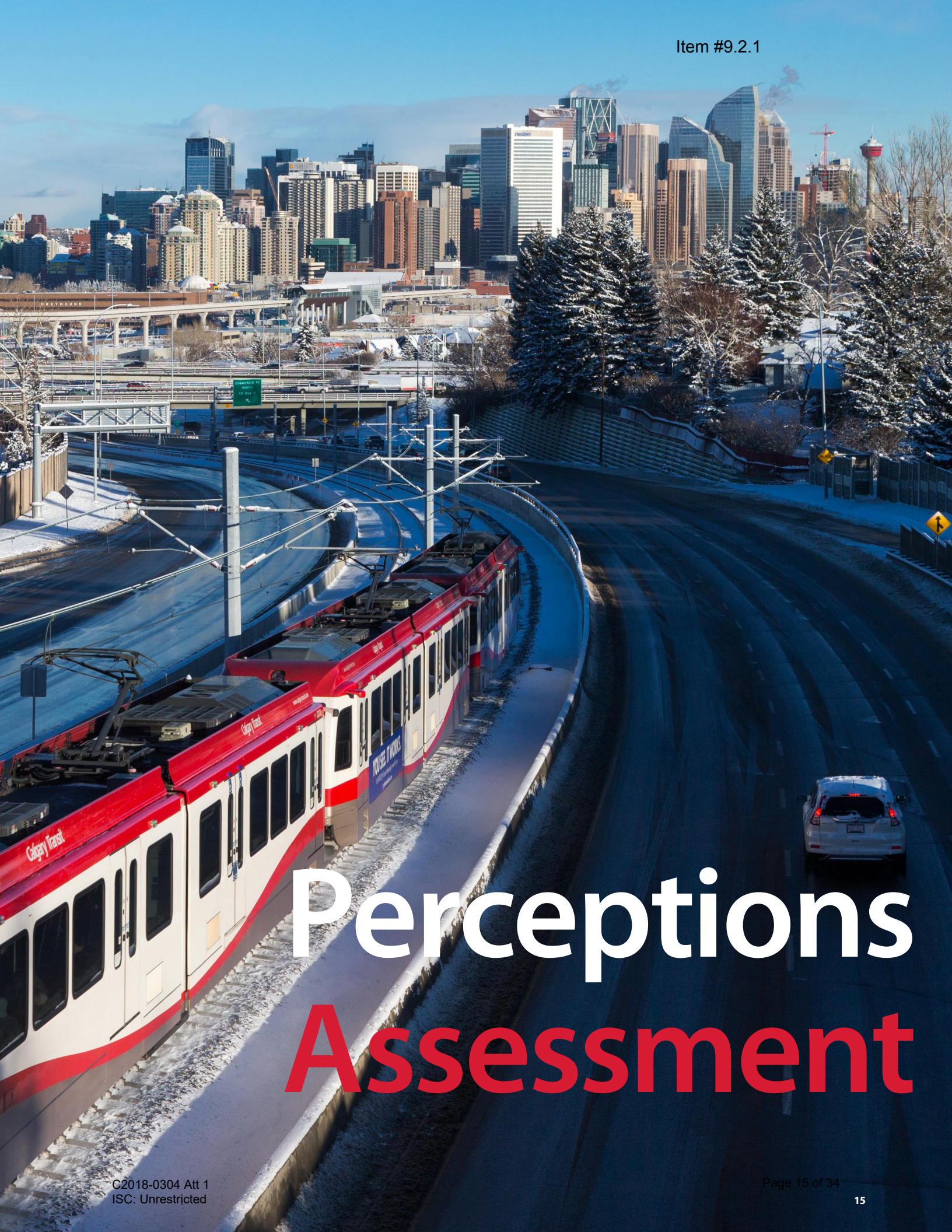
\$1.7B

2013 flood cost in Alberta

848

Square Kilometres for Calgary's Land Area (2010)

SNAPSHOT OF CALGARY ENVIRONMENT*

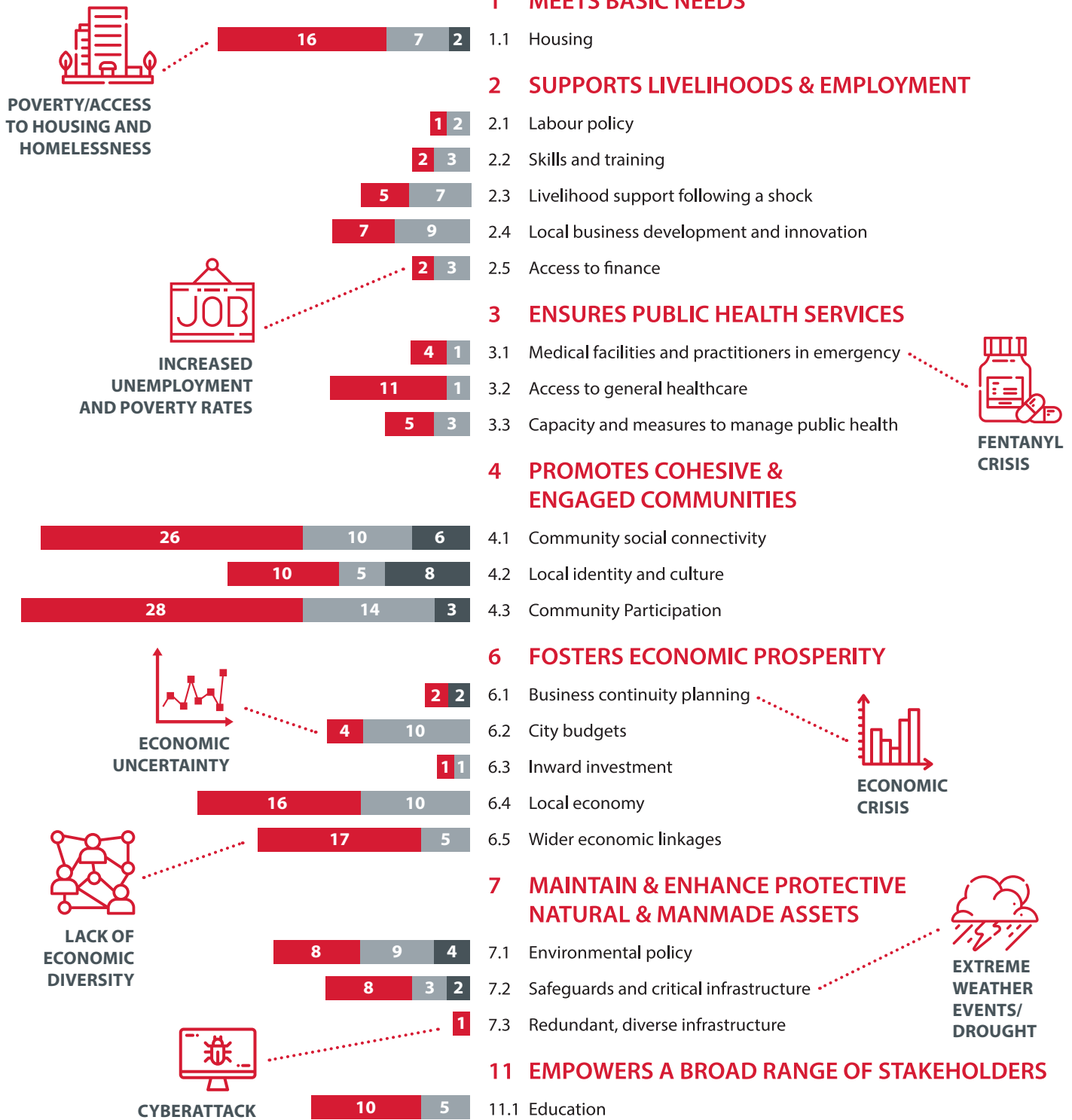


Perceptions Assessment



The perspectives and comments collected over the past two years through a variety of surveys, workshops, focus groups and interviews were reviewed, collated and analyzed using 100RC tools to develop a Preliminary Resilience Assessment. More than 15,000 Calgarians participated in this assessment process. These included representatives from a broad age spectrum—youth at Calgary’s Mayor Environmental Expo to focus groups with Seniors—a diverse economic context, and a variety of professional and personal perspectives.





PERCEPTIONS ALIGNMENT

The Agenda Setting Workshop (ASW) aligned well with overall perceptions analysis. Calgary residents surveyed were more likely to respond positively to City efforts to address shocks and stresses than ASW attendees or focus groups. The ASW and focus groups were driven to identify issues which may have resulted in the disparity of opinions. This graphic represents seven of the twelve key areas of need as identified through the perceptions tool.

LEGEND

- Need to do better
- Doing well, but can improve
- Area of Strength



Actions Inventory



100RC Tools Helped Us

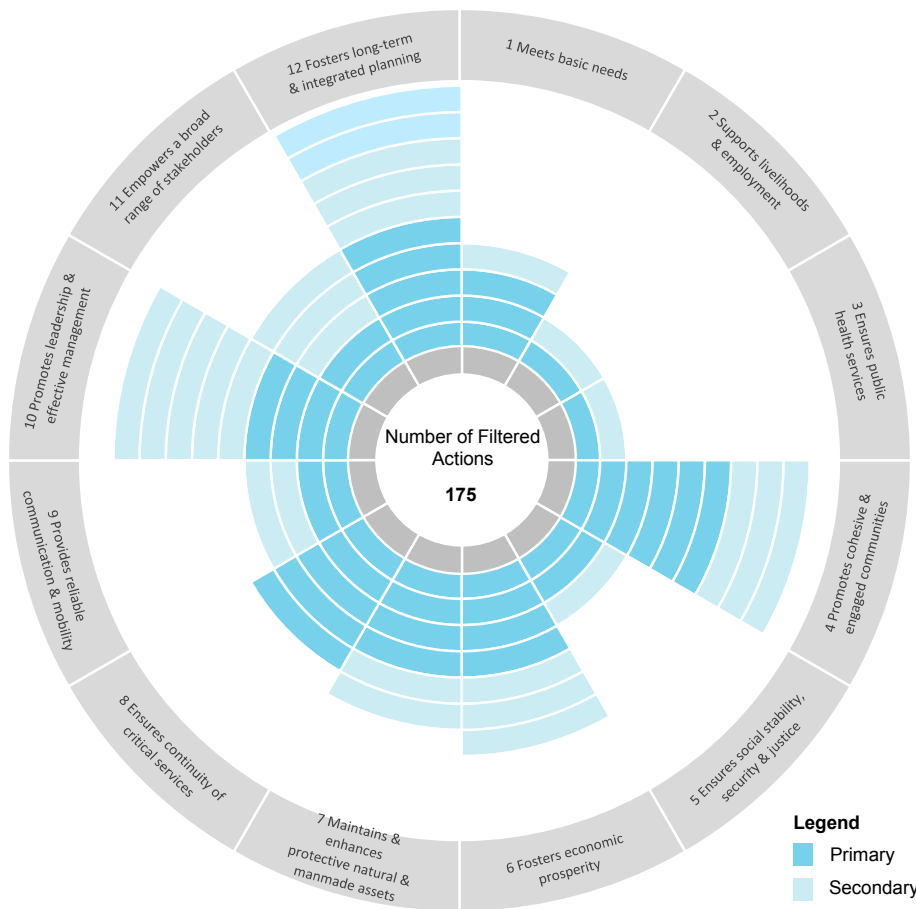
Take Stock of Our Resilience Work

Webinars and meetings were held to support more than one hundred business strategists, policy analysts, and executive advisors on the 100RC perceptions and actions tools. Those colleagues supported the comprehensive coding of The City of Calgary's strategies and plans. This coincided with a Corporate effort to identify plans and strategies across The City. This effort brought departmental planners together to identify and catalogue all guiding documents that impact our work within The City.

Vision Documents

Calgary is guided by long-range visionary plans. The objectives of the Municipal Development Plan (MDP) and the Calgary Transportation Plan (CTP) identify the land use and transportation framework for the future development of Calgary. The plans were developed around 12 sustainability principles and 8 key directions, rooted in supporting the 100-year community developed vision, imagineCALGARY. The imagineCALGARY

Vision reflects the community’s enduring aspirations for Calgary’s built and natural environment, social wellbeing, and strong government and governance. Working to build Calgary’s resilience against shocks and stresses is essential to enable The City of Calgary and community to realize the imagineCALGARY vision. ImagineCALGARY describes the Calgary of the future, and resilience is one of tools we need on our journey.



Actions

The 100RC Action tool enabled The City of Calgary to capture resilience activities. While internally focused, The City also reached out to Civic Partners to:

- Identify existing actions that increase the resilience within the city
- Identify resilience areas the actions relate to
- Identify gaps where resilience actions do not appear to address the need

Challenges and Opportunities





Our past experiences can help inform future decisions. There is value in bringing together a range of diverse systems and institutions. Calgary faces many challenges and can collectively create opportunities through the resilience strategy.

Challenges

- Economic participation is hindered by systemic and mobility barriers
- Difficulty attracting business, venture capital, and talent
- Economy
- Stronger business continuity required
- Address prolonged office space oversupply and mitigate tax impact on tax base
- Traditional funding models for infrastructure needs, including operating, capital maintenance, and capital growth, are at risk
- Understanding the financial impact of climate change
- Addressing impacts of a low carbon economy
- Managing urban water through flood and drought
- Growing risk of cyber-attack and telecommunications breakdown
- Insufficient appropriate infrastructure at the community level negatively impacts quality of life
- Living in a VUCA city (Volatile Uncertain Complex and Ambiguous)
- Growing prominence of regional governance model
- Organizational Effectiveness
- Lack of innovation due to a risk-adverse culture

Opportunities

- Leveraging social and intellectual capital of Calgary's diverse communities
- There is a pivotal point for inclusive leadership and decision making
- Capitalize on Biodiversity Action Program
- Capitalize on climate resilience & environmental well-being regulation
- Calgary's commitment to housing
- Leverage flood recovery and interest in business continuity to strengthen resilience in business and non-profit sectors
- Leverage the Community Economic and Development Investment

Discovery Areas

Economic Resilience

We strengthen our economic drivers to be better prepared for stresses and shocks.

Benefits

The resiliency of a city improves when all are encouraged and able to participate in a diverse and strong economy. This enhances the community's ability to attract business, talent and investment. Calgary has the opportunity to capitalize on its high quality of life, available commercial real-estate and educated workforce as it continues to find its way out of recession. The community is engaged and local businesses, other levels of government, and our City partners are cooperating and exploring opportunities to build a resilient economy. This requires reducing barriers to employment, including mobility and training, activating youth and Indigenous entrepreneurship, strategic academic programming, and the utilization of innovative finance tools and approaches to address the challenges and opportunities.

Questions for Further Study

What are the barriers to employment and economic participation for Calgarians and how can these barriers be best overcome, particularly for disadvantaged communities?

What governance structures, human resources, and other assets are required to enhance Calgary's ability to attract business and talent that benefits the community as a whole in the long run?

How can we best retrain and reutilize existing human and capital assets and resources as Calgary transitions to a more diversified economy less vulnerable to commodity price fluctuations?

Inclusive Leadership & Decision Making

Capitalizing on Calgary's diverse human assets

Benefits

Resilience of a city improves when diverse people have meaningful voices in decision making and leadership. By leveraging the untapped human and intellectual capital of existing and future residents who have different perspectives and experiences, Calgary can create a better-informed path forward, one that is innovative and responsive in a VUCA Calgary (Volatility, Uncertainty, Complexity, Ambiguity). This includes impacting employment, income and social inclusion outcomes with resilient system-based solutions. In addition, greater mutual understanding, acceptance and inclusion of others leads to increased bridging and linking social capital and more empowered residents in Calgary's communities, neighbourhoods, and city, resulting in greater resilience at all levels.

Questions for Further Study

What are the economic arguments for reducing underemployment of diverse target populations and how can this benefit these populations and the city more widely?

How can Calgary's civic institutions, businesses, and other influential organizations diversify their boards and senior leadership to ensure that the city's leadership reflects the needs and experiences of its residents?

How can The City of Calgary build relationships of mutual trust, respect, and understanding with Indigenous communities and other diverse target populations in order to foster their meaningful involvement in decision-making processes?

Cross Cutting Theme:

How do we encourage a trusting environment that supports intentional risk taking, innovation and co-creation?

Environment Resilience

We strengthen our natural assets and ecosystems within our city and region

Benefits

Natural or ecological systems provide social, economic and environmental benefits. They contribute to physical and mental well-being and can contribute to a robust economy, in part by making the city more attractive to a skilled workforce and, therefore, investment. Green, ecological or natural infrastructure can improve resilience to the gradual and sudden impacts of climate change and natural hazards. Healthy natural systems are self-adapting and require less intervention to thrive in changing conditions than more traditional hard infrastructure.

Challenges related to hard infrastructure (aging infrastructure, funding, adaptation to climate change) and opportunities related to the current regulatory environment, along with our commitment to biodiversity, and potential government funding for innovation and green infrastructure, all contribute to a unique circumstance in Calgary. An identified opportunity is to integrate natural assets, green infrastructure and innovative technologies into our traditional infrastructure and asset management frameworks and service delivery models.

There are many benefits to manage, conserve, integrate and enhance critical natural areas, and the hydrologic and ecosystem functions they provide. These include the reduced impact and cost of damage from extreme weather events and the increase of social and economic benefits for all Calgarians.

Questions for Further Study

How can Calgary better utilize our natural assets to support biodiversity, ecological function and resilience for the future?

How can we better understand our shared risk and co-create solutions that encompass the economic, ecological and social co-benefits of our natural assets and ecosystems?

How can we best integrate, implement and monitor climate adaptation and mitigation programs in support of a strong economy, environment and society?

Infrastructure Resilience

Calgary has infrastructure that supports an integrated, connected and well managed city

Benefits

Resilience of a city improves when the community has access to infrastructure. If the infrastructure is designed to accommodate the diverse and everchanging makeup of the community, it will serve the intended purposes. If adaptable, it will accommodate unintended uses. Harder working, multi-use and co-created infrastructure or retrofits may be solutions to consider in response to the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) state the municipality finds itself in.

Relationships and partnerships are paramount as the municipality builds upon past and future legislated regional and community connections. The future leadership and policies of the municipality must nurture and advance these relationships, encouraging collaboration and co-shared management of infrastructure. Identifying and aligning with the regional or community values and interests, and identifying the co-benefits and accessibility of those assets, is paramount to building a resilient community and region.

The changing funding models (all orders of government, region, community) impact everyone, and the global priorities/drivers/trends dictate a focus on resilience and the qualities of a resilient system. Strategic management of all infrastructure assets (hard, natural, community) will be one of the municipality's most challenging undertakings, and if well managed, will result in significant benefits to the community (return on investment) and improved community, regional and city resilience.

Questions for Further Study

How do we measure the value of infrastructure in enhancing quality of life and vibrant communities?

How do we strengthen capital resilience by lowering the financial exposure to infrastructure risks?

How do we strengthen partnerships, regional planning, and resourcing of infrastructure, including the operation of infrastructure in public spaces?

When does aging infrastructure limit or hinder the delivery of services?

CITIZEN PRIORITIES + COUNCIL DIRECTIVES

A PROSPEROUS CITY

A CITY OF SAFE +
INSPIRING NEIGHBOURHOODS

A CITY THAT MOVES

A HEALTHY AND GREEN CITY

A WELL-RUN CITY

QUALITIES OF A RESILIENT CITY



REFLECTIVE

Using past experience to inform future decisions



RESOURCEFUL

Recognizing alternative ways to use resources



REDUNDANT

Spare capacity purposely created to accommodate disruption



ROBUST

Well-conceived, constructed, and managed systems



FLEXIBLE

Willingness and ability to adopt alternative strategies in response to changing circumstances



INCLUSIVE

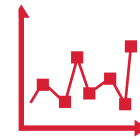
Prioritize broad consultation to create a sense of shared ownership in decision making



INTEGRATED

Bring together a range of distinct systems and institutions

DISCOVERY AREAS



ECONOMIC RESILIENCE

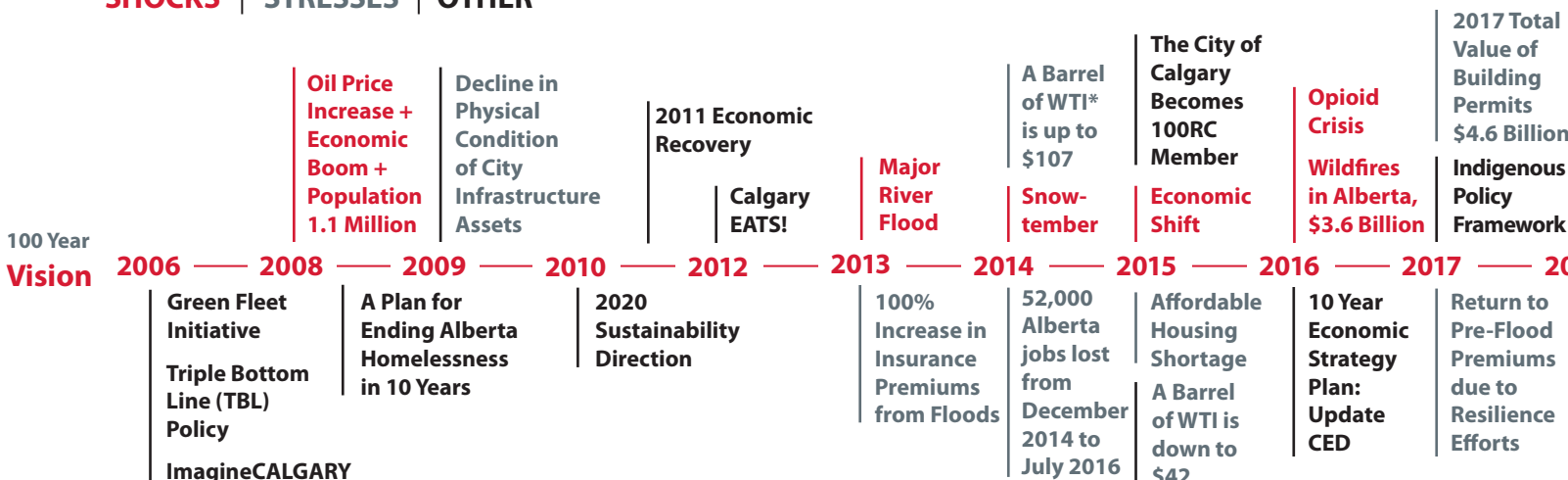
How does Calgary strengthen our economic drivers to be better prepared for shocks & stresses?

QUESTIONS FOR FURTHER STUDY

- What are the barriers to employment and economic participation, and how can these barriers be best overcome, particularly for disadvantaged communities?
- What government structures, human resources, and other assets are required to enhance Calgary's ability to attract business and talent that benefits the community as a whole in the long run?
- How can we best retrain and reutilize existing human and capital assets and resources as Calgary transitions to a more diversified economy less vulnerable to commodity price fluctuations?

CROSS CUTTING THEME: HOW DO WE MANAGE INTENTIONAL RISK TAKING, INNOVATION, AND CHANGE?

SHOCKS | STRESSES | OTHER



* WTI - West Texas Intermediate is a grade of crude oil used as a benchmark in oil pricing.

** The immigrant population in Canada is growing and will continue to grow. Calgary's total immigrant population (both Permanent and Non-permanent residents) is projected to reach almost half a million by 2020. Page 28 of 34

*** 2036 - Based on projections, one in two people in 2036 would be an immigrant or the child of an immigrant in Calgary (between 56.2% and 63.3%).

**** 2036 the proportion of the working-age population (aged 15 to 64) who belong to a visible minority group would increase in all areas of the country, in all the scenarios. This proportion would surpass 40% in Toronto, Vancouver, Edmonton, Calgary, Winnipeg and Abbotsford

GREAT PLACE TO MAKE A LIVING, A GREAT PLACE TO MAKE A LIFE



INFRASTRUCTURE RESILIENCE

How does Calgary grow an integrated, connected and well managed city?

QUESTIONS FOR FURTHER STUDY

- How do we measure the value of infrastructure in enhancing quality of life and vibrant communities?
- How do we strengthen capital resilience by lowering the financial exposure to infrastructure risks?
- How do we strengthen partnerships, regional planning, and resourcing of infrastructure, including the operation of infrastructure in public spaces?
- When does aging infrastructure limit or hinder the delivery services?



ENVIRONMENT RESILIENCE

How can Calgary strengthen our natural assets and ecosystems within our city and region?

QUESTIONS FOR FURTHER STUDY

- How can Calgary better utilize our natural assets to support biodiversity, ecological function and resilience for the future?
- How can we better understand our shared risk and co-create solutions that encompass the economic, ecological and social co-benefits of our natural assets and ecosystems?
- How can we best integrate, implement and monitor climate adaptation and mitigation programs in support of a strong economy, environment and society?



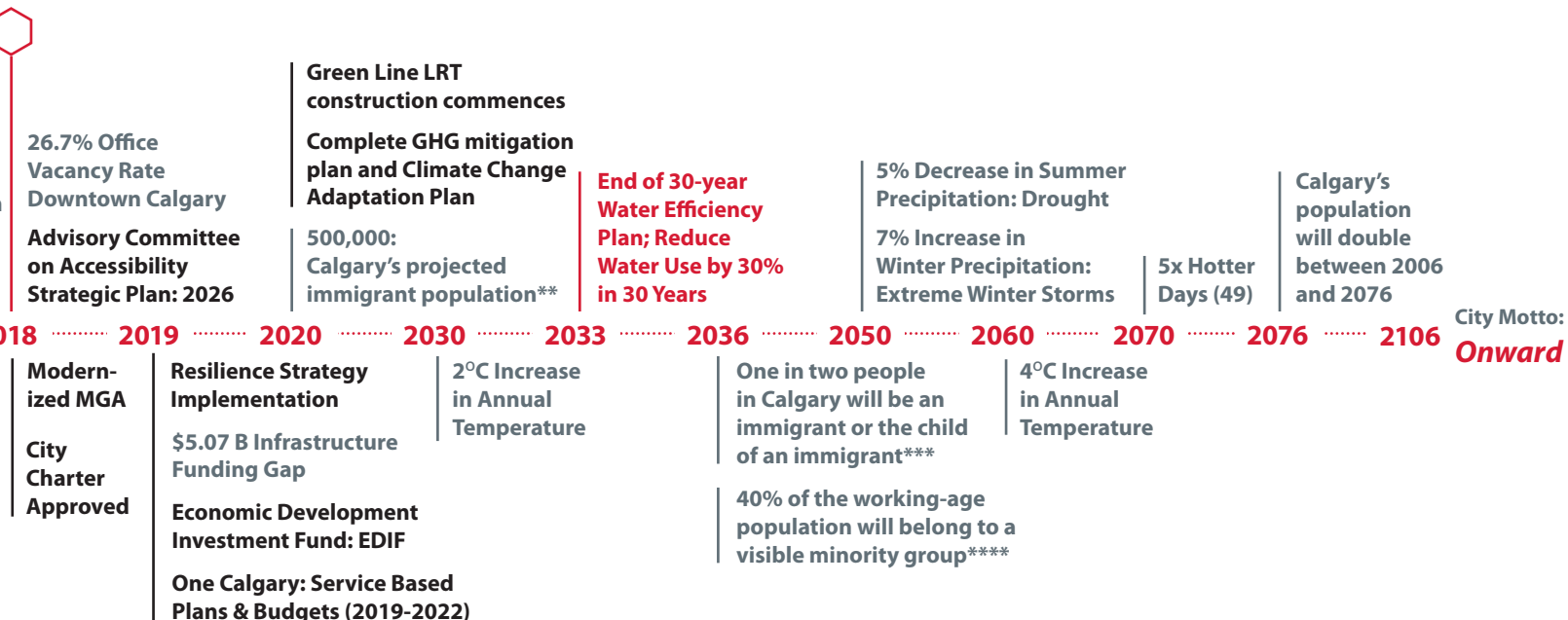
INCLUSIVE LEADERSHIP AND DECISION MAKING

How does Calgary capitalize on its diverse human assets?

QUESTIONS FOR FURTHER STUDY

- What are the economic arguments for reducing underemployment of diverse target populations, and how can this benefit these populations and the city more widely?
- How can Calgary's civic institutions, businesses, and other influential organizations diversify their boards and senior leadership to ensure that the city's leadership reflects the needs and experiences of its residents?
- How can The City of Calgary build relationships of mutual trust, respect, and understanding with Indigenous communities and other diverse target populations in order to foster their meaningful involvement in decision-making processes?

OW WE ENCOURAGE A TRUSTING ENVIRONMENT THAT SUPPORTS INOVATION AND CO-CREATION?



Acknowledgments



Resilient Calgary would like to acknowledge participants from the March 2017 Agenda- Setting Workshop along with The Office of the Mayor, The Office of the Councillors, City of Calgary business units, Civic Partners, business and community stakeholders, and 100 Resilient Cities.

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