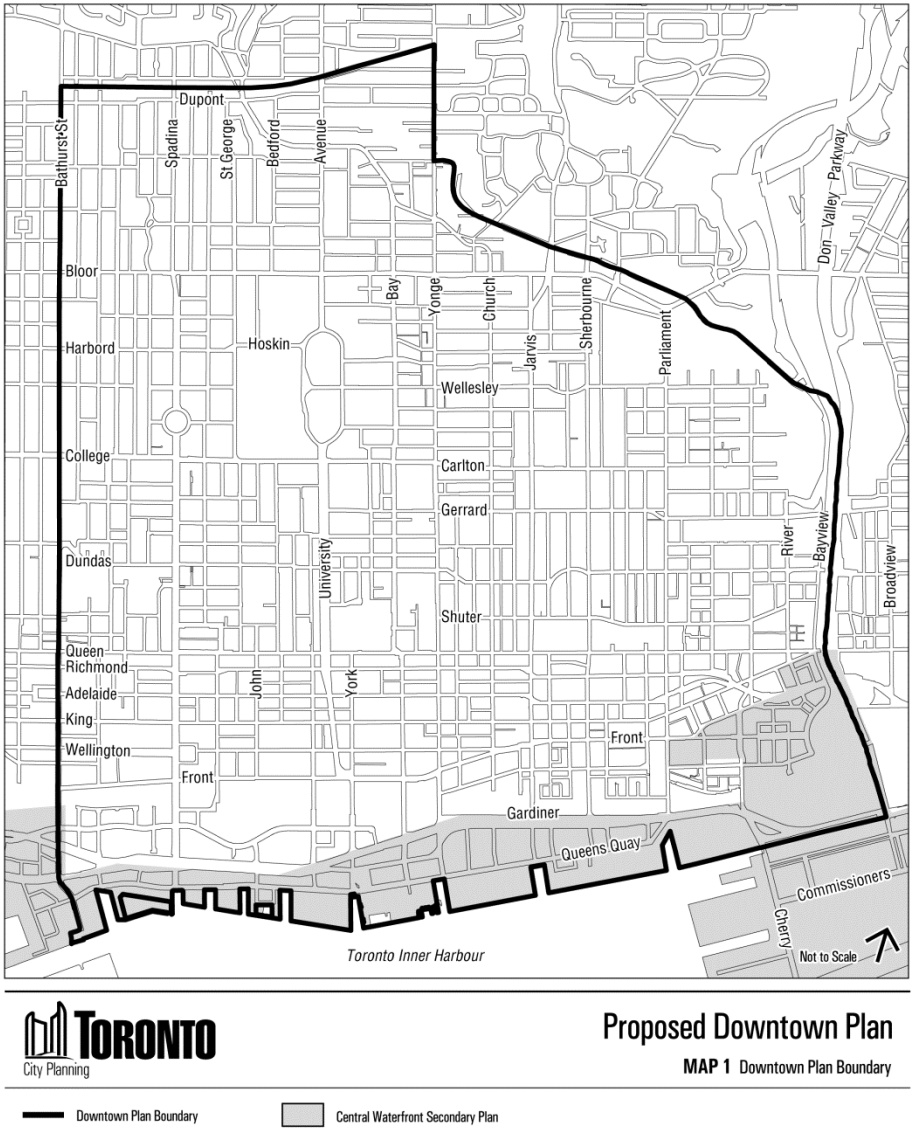
DOWNTOWN ENERGY STRATEGY SUMMARY

Proposed Downtown Plan

- The Proposed Downtown Plan is a **25-year vision** that sets the direction for the city centre as the cultural, civic, retail and economic heart of Toronto, and as a great place to live.
- The Plan is a **response to rapid growth** in the core that is placing **pressure on physical and social infrastructure**.
- The Plan will provide a renewed, comprehensive planning framework for 17 square kilometers – the **whole of the Downtown**.
- The Proposed Downtown Plan will be adopted as a **Secondary Plan** within the Toronto's Official Plan, with **five supporting Infrastructure Strategies**.



TOcore

TORONTO

Infrastructure Strategies

- **Five Infrastructure Strategies** will work together to implement the vision, goals, and policies of the Downtown Plan and ensure infrastructure planning is aligned with long-term growth.
- The **purpose** of the Infrastructure Strategies is to:
  - Set **priorities** for the infrastructure investment needed to support growth
  - Provide a **vision, ideas and guidance** for implementation
  - Promote **coordination** among corporate and community partners throughout implementation.
- Each Infrastructure Strategy:
  - Identifies infrastructure **challenges** facing a growing Downtown.
  - Recommends **implementation strategies and actions**
  - Advances **related initiatives**
  - Sets **priorities and timeframes**
  - Determines required **investments**.

Downtown Energy Strategy

What is the Downtown Energy Strategy?

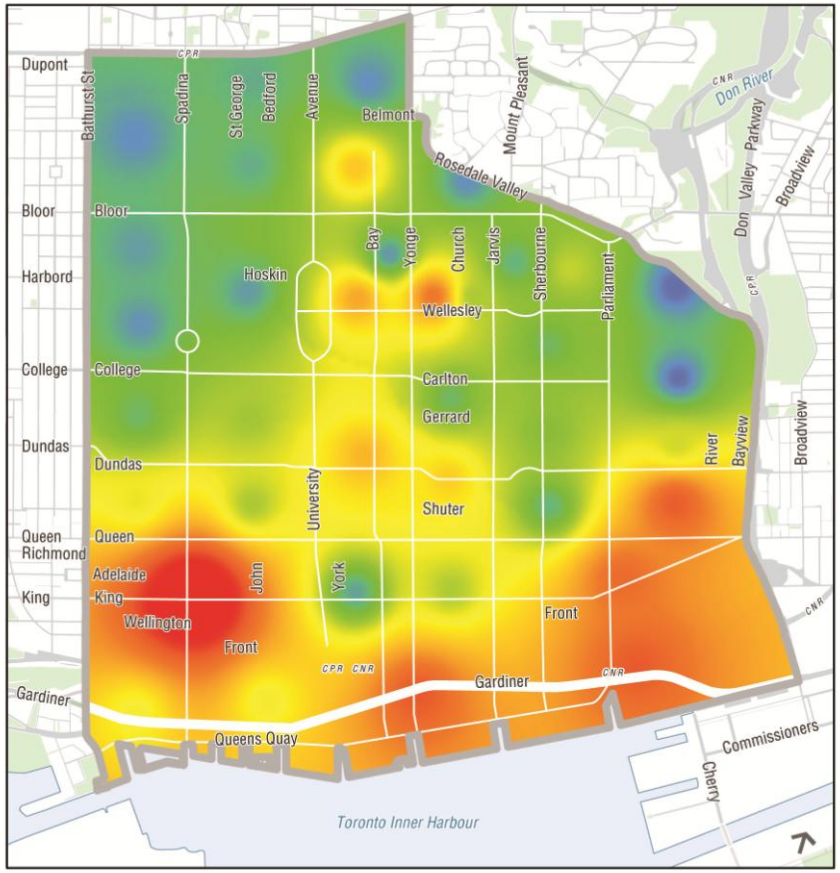
- The Energy Strategy identifies the specific actions necessary in Downtown to achieve the city-wide objectives of the TransformTO climate action plan, including:
  - Moving rapidly towards zero emissions new development;
  - Aggressively retrofitting existing buildings;
  - Supporting the expansion of Deep Lake Water Cooling;
  - Developing new low-carbon thermal energy networks; and
  - Supporting the provision of backup power in multi-unit residential buildings.

Addressing Challenges

The Strategy addresses **challenges** associated with a growing Downtown, including:

Growth Places Stress on Existing Infrastructure

- Population and employment growth in the Downtown is putting tremendous pressure on existing infrastructure.
- 2041 population and employment projections (not including visitors or students) estimate that Downtown will grow:
  - From 238,000 to 475,000+ Residents
  - From 500,000 to 850,000+ Jobs
- Growth and intensification provides the city with unique opportunities to improve resilience for residents and businesses in the core and to advance implementation of the TransformTO climate action plan.
- Planning for a liveable and competitive Downtown requires us to minimize emissions and build a resilient core that can withstand extreme weather and power outages.



Projected Population Change 2011 - 2041

Less than 100 | 5,000 | 7,500 | 15,000 | 25,000 or More

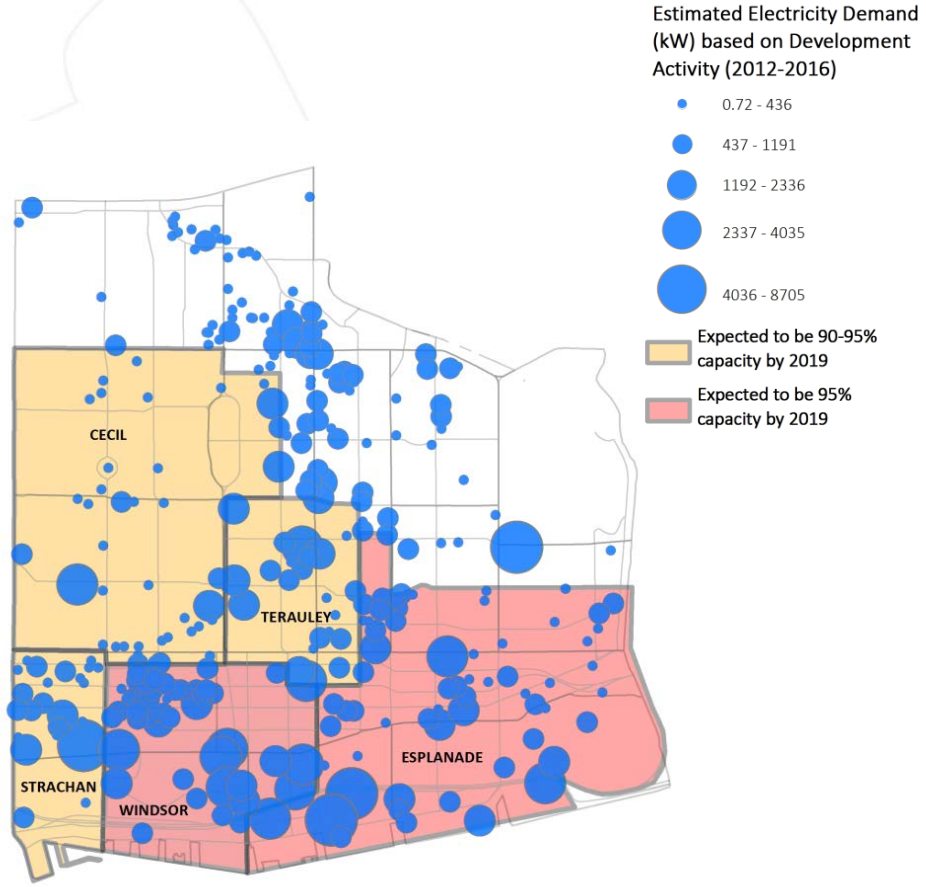
TOcore Study Area

Source: Toronto City Planning Division, Research and Information - October 2016

Addressing Challenges

Electricity Constraints in Downtown

- The estimated 22% increase in electricity demand from new development will challenge existing grid capacity.
- Electricity demand for transit could potentially double, and adoption of electric vehicles and heat pumps will accelerate.
- The default supply solution of a second natural gas-fired power plant next to the existing Portlands Energy Centre – the City's largest emitter – would make meeting long-term greenhouse gas (GHG) emissions reduction targets virtually impossible.



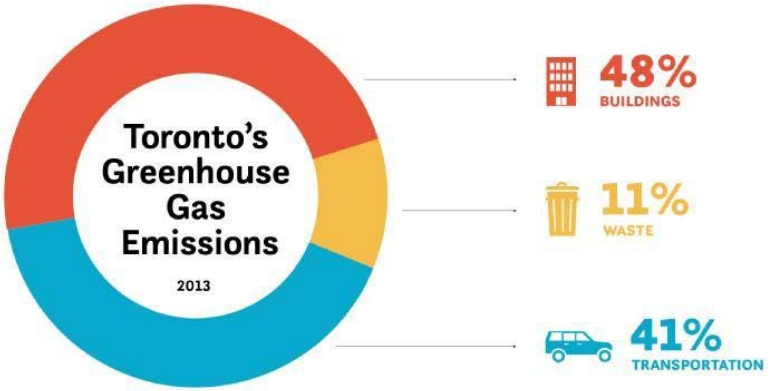
Increased electricity demand from new development will challenge the grid. Several Downtown **transformer stations** are approaching maximum capacity within the areas they service.

Addressing Challenges

Increasing Greenhouse Gas Emissions

- Buildings are responsible for nearly 50% of Toronto's GHG emissions (80% from natural gas use, and 20% from electricity use).

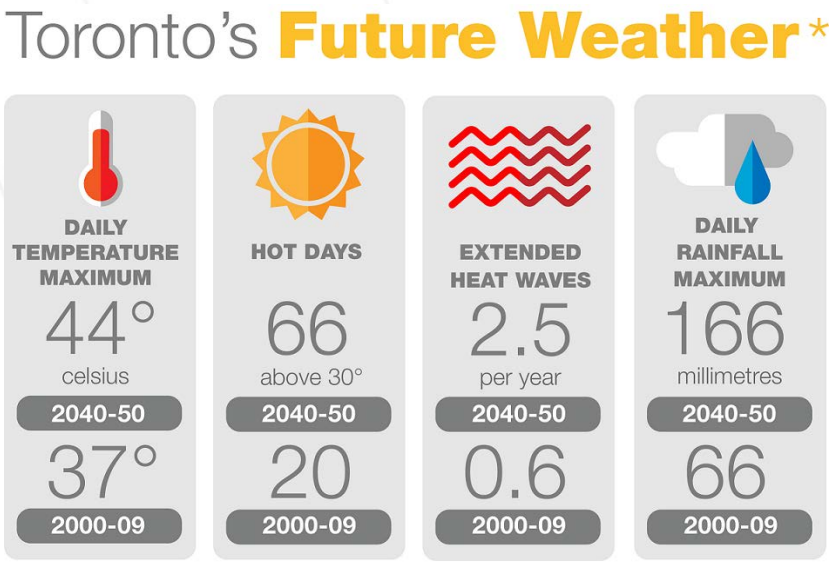
- New development could increase natural gas and electricity consumption by18% and 25%, respectively, leading to a 22% overall increase in GHG emissions.



Addressing Challenges

Changing Climate

- Recent severe weather events resulting in power outages have raised concerns about the resiliency of Downtown.
- Residents living higher up in buildings rely on electricity for water supply, heating, cooling and ventilation, and elevator use, making them particularly vulnerable.
- The electricity grid is also vulnerable – increasing temperatures have led to a 40% increase in electricity demand (cooling) over time. Peak energy use now occurs typically in the summertime, rather in the winter.



Climate models indicate increasing vulnerability due to more frequent severe weather events, as well as a six-fold increase in air conditioning (electricity) use by 2040.

Energy Goals

The Energy Strategy will advance the **goals** identified in the Proposed Downtown Plan:

Policy 3.13

Downtown will be more resilient to changing weather patterns, with improved back-up power systems in tall residential buildings helping residents withstand extreme weather events and area-wide power outages

Policy 3.14

Downtown will contribute to the achievement of the City's energy and emissions targets through development that is zero-emission ready and minimizes electricity demand by connecting to the deep lake water cooling system and new low-carbon thermal energy networks.

Transformative Ideas

The Downtown Energy Strategy outlines a series of implementation strategies and actions to achieve the vision, goals and policies of the Proposed Downtown Plan through **3 transformation ideas**:

1. Aggressive energy conservation and efficiency

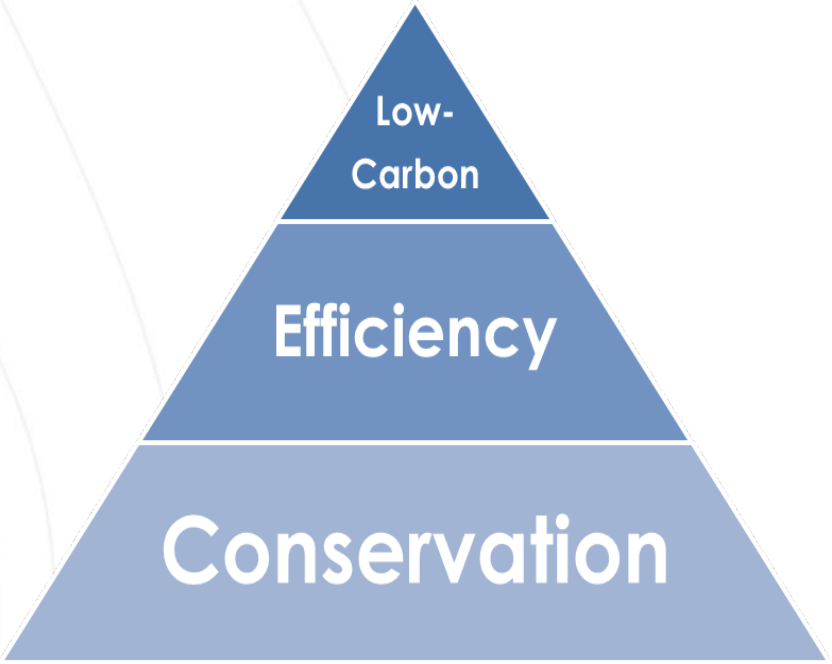
2. Local and low-carbon energy solutions

3. Strengthening resilience to power outages

Transformative Idea #1

Aggressive Energy Conservation and Efficiency

- New Downtown buildings are to be designed with a focus on achieving near-zero emissions
  - *TransformTO goal: 100% of new buildings are designed and built to be near zero GHG emissions by 2030*
- Existing Downtown buildings are to be aggressively retrofitted (e.g. upgrades to exterior insulation, equipment replacement, etc).
  - *TransformTO goal: 100% of existing buildings are retrofitted to the highest emission reduction technically feasible by 2050*



The approach of conservation first and then efficiency is both cost-effective and scalable because it ensures that the least amount of low-carbon energy is needed, and that the minimum amount is wasted.

Actions

- **Target Toronto Green Standard Version 3 Tier 4 for all new buildings**
  - The updated Toronto Green Standard establishes a framework to require "near zero emissions" buildings by 2030.
  - New development in the Downtown will be strongly encouraged to target Toronto Green Standard Tier 4
  - City staff will explore financial and other incentives for achieving Tier 4

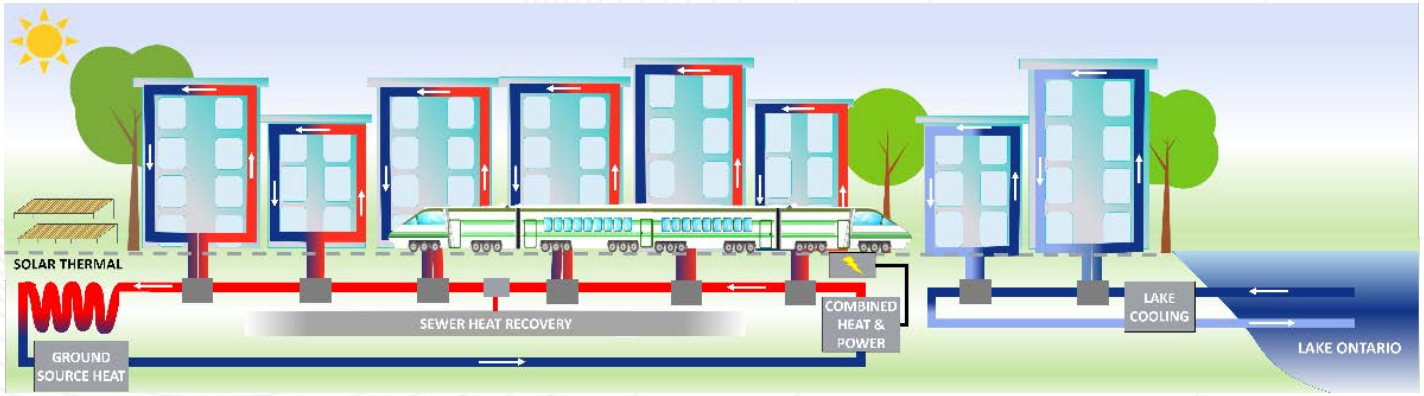
- **Focus enhanced Better Buildings Partnership conservation efforts on existing Downtown buildings**
  - The concentration of existing large buildings Downtown means energy conservation and emission reduction efforts must be prioritized here.
  - New funding was approved by City Council to enhance the Better Buildings Partnership, which provides expertise, resources and financial assistance to help building owners, managers and developers create buildings with high energy performance and low environmental impact.

Transformative Idea #2

Local and Low-Carbon Energy Solutions

- To increase electricity capacity, decrease emissions and strengthen resilience, it is essential that energy needs are met with local, low-carbon solutions.
  - *TransformTO goal: 75% of community-wide energy use is derived from renewable or low-carbon sources by 2050*

- In dense areas with substantial energy needs, which includes large parts of Downtown, low-carbon thermal energy networks (LCTEN) are the most flexible and cost-effective way to achieve targets. As a platform, they create the economies of scale required to integrate large low-carbon thermal energy sources over time.
  - *TransformTO goal: 30% of total floor space community-wide – residential and commercial – will be connected to low-carbon thermal energy by 2050*



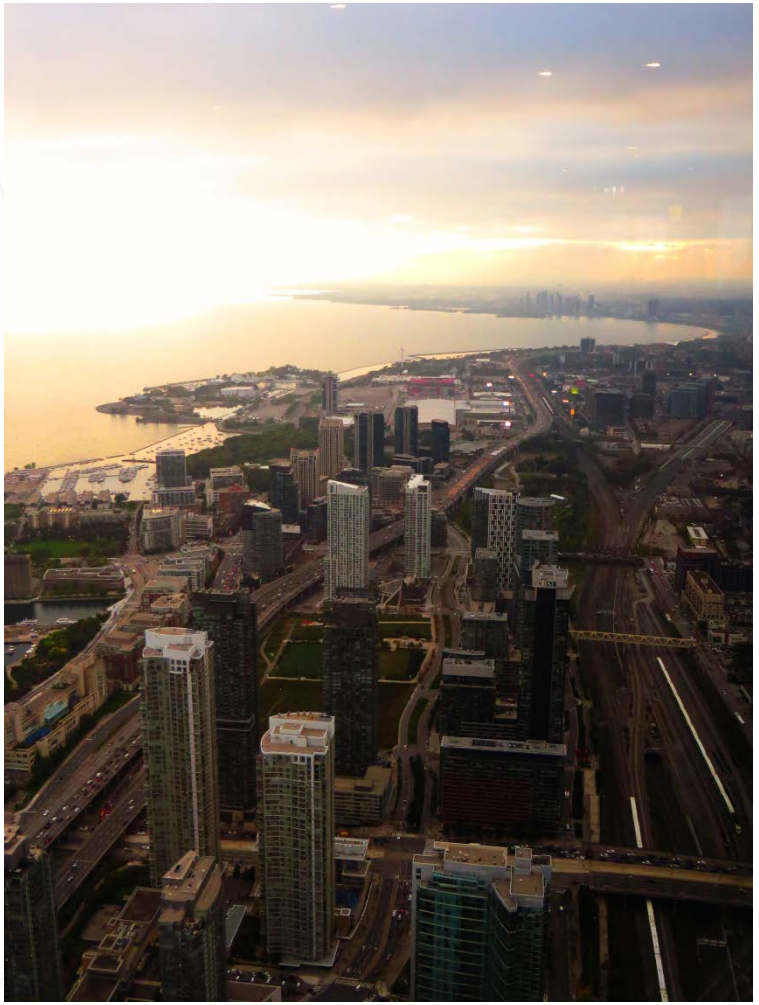
Actions

1. **Support expansion of the existing Deep Lake Water Cooling system**
   - Work with City Divisions to support Enwvave's planned 40% increase in capacity
2. **Develop a new Deep Lake Water Cooling system east of Yonge Street**
   - Work with Enwave through a new partnership to locate a new intake east of Yonge Street, which could be anchored by new development in the eastern waterfront
3. **Co-locate combined heat and power plants with new transit stations**
   - Work with the TTC to locate combined heat and power plants at new transit stations
4. **Co-locate heat pumps with new sewer infrastructure**
   - Work with Toronto Water to recover heat from planned sewer lines
5. **Support expansion and decarbonization of existing thermal energy networks**
   - Work with system owners to expand their networks and integrate renewables
6. **Develop new thermal networks connected to low-carbon thermal energy sources**
   - Work with thermal network developers, including through the new partnership with Enwave, to establish new low-carbon systems anchored by new development
7. **Provide guidance to developers on designing buildings mechanical systems to use low-temperature thermal energy sources**
   - Through the Energy Strategy required as part of a complete application, outline mechanical system designs that enable connection to a planned thermal network

Transformative Idea #3

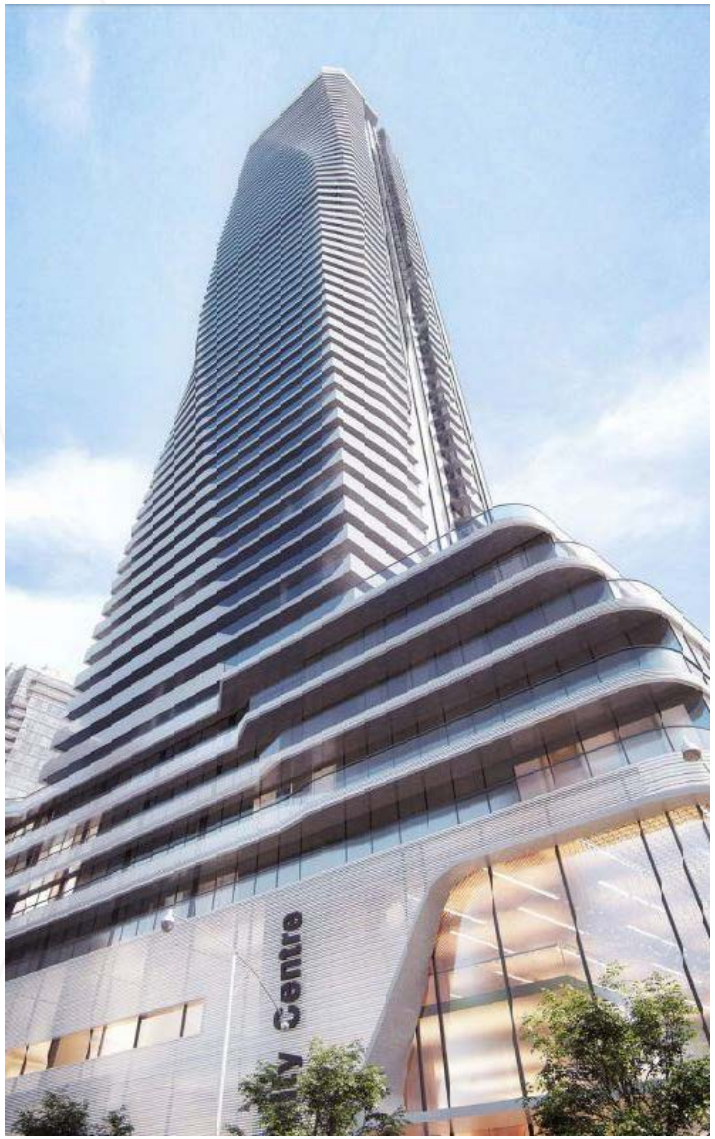
Strengthening Resilience to Power Outages

- With increasing frequency and intensity of extreme weather, it is essential to prepare for sustained, area-wide power outages.
- Residents living higher-up in multi-unit residential buildings are particularly vulnerable given their reliance on electricity for basic services such as water supply and elevators.
  - *TransformTO goal: Transition to a low-carbon Toronto by 2050 in a way that maximizes public benefit and minimizes harms by using the following guiding principles when designing and delivering climate actions:*
    - *create resilient communities and infrastructure.*



Actions

- **Support provision of backup power in multi-unit residential buildings**
  - Developers will be encouraged to apply the "Minimum Backup Power Guideline", which recommends:
    - Powering essential loads beyond life safety requirements, such as additional elevators, domestic water pumps, and common areas;
    - Ensuring backup power for at least 72 hours.
  - The guideline is provided to developers for voluntary implementation through the Energy Strategy required as part of a complete application.
  - City staff will work with the Province to recommend new requirements in the Ontario Building Code
- **Provide backup power to community & recreation centres**
  - City-owned community and recreation centres, especially those designated Emergency Reception Centres, will be considered for enhanced backup power.
  - The new Toronto Green Standard requires all new City facilities to provide 72 hours of back-up power to the refuge area and essential building systems.
  - The City will work with community organizations (e.g. YMCA) to implement enhanced backup power solutions in their facilities.

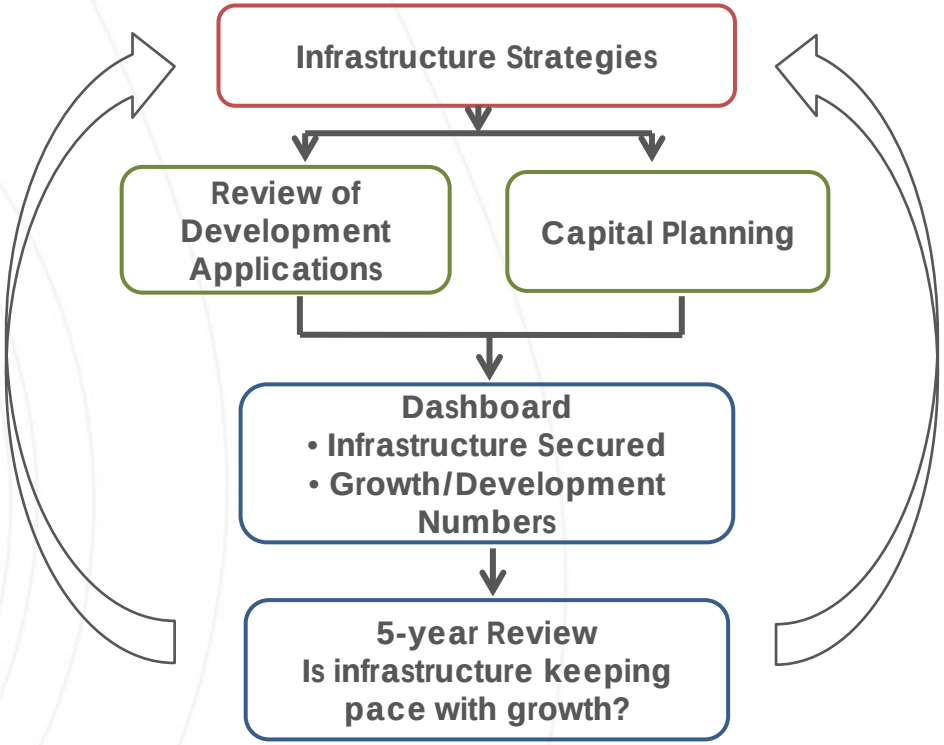


Monitoring & Implementation

How the Energy Strategy will be used

The infrastructure strategies are key to linking the timely provision of infrastructure to growth.

- Infrastructure Strategies will inform the review of development applications.
- The strategies will inform the annual capital planning process.
- A dashboard with metrics related to infrastructure secured as compared to our growth and development numbers will track how we are doing.
- A review of the strategies every five years will tell us whether infrastructure is keeping pace with growth



Related Projects

Aligned Initiatives

- Low-Carbon Thermal Energy Networks
  - Environment & Energy Division (EED) staff are currently negotiating with Enwave Energy Corporation on a joint development agreement to accelerate and scale-up low-carbon thermal energy network (LCTEN) development city-wide. Downtown, particularly the eastern waterfront, is a priority area.

- Energy Strategy required as part of a complete application
  - EED staff are responsible for reviewing Energy Strategy reports submitted by developers, which provides a key opportunity to engage with developers on the issues discussed here and how they might address them through their proposal. EED staff have received a number reports for Downtown proposals since June 2016.

- Coordinated energy planning
  - EED staff, with funding support from the Ontario Ministry of Energy, are in the process of developing a Municipal Energy Plan that will identify opportunities to coordinate with regional energy planning efforts (e.g. Integrated Regional Resource Plan).

Related Projects

Aligned Initiatives

- TOcore Mobility Strategy
  - The Mobility Strategy supports the Energy Strategy by recognizing that:
    - The transportation sector has a significant impact on the environment, including the production of greenhouse gases or criteria air pollutants.
    - There is an increasing awareness of the environmental and health impacts of transportation choices.
  - Through TransformTO Council adopted the long-term goals that 75% of trips under 5kms be active trips, and that all vehicles be low or zero-emissions by 2050

- TOcore Water Strategy
  - The TOcore Water Strategy will support the implementation of the Energy Strategy by coordinating efforts related to deep lake water cooling and the recovery of low-carbon energy from sewers.

- Better Buildings Partnership
  - Since 1996, the Better Buildings Partnership has retrofitted 566 million square feet, created over 60,000 years of person employment, and avoided 690kt of GHG emissions.
  - With new funding to increase technical resources, financial assistance, and coordination of incentives for property owners, the enhanced Better Buildings Partnership will deliver energy efficiency and resilience improvements in new and existing public and private buildings.

Related Projects

Aligned Initiatives

- TransformTO
  - TransformTO, Toronto's new and ambitious climate action plan, identifies how we'll reduce our greenhouse gas emissions and improve our health, grow our economy, and improve social equity. In July 2017 City Council unanimously approved a set of long-term, low-carbon goals, and strategies to reach them.

- ResilientTO
  - As a member of the 100 Resilient Cities Network (100RC), a global community of cities working together to build urban resilience, the City is working to improve our resilience to the physical, social, and economic challenges of the 21st century. In Toronto, these challenges include climate change and extreme weather, and a variety of issues specific to our city, such as inequality, aging infrastructure, housing, and transit.

Related Projects

Aligned Initiatives

- Waterfront Toronto
  - Waterfront Toronto employs global best practices and made-in-Toronto solutions to the city's new waterfront communities in order to protect and enhance Toronto's natural environment, and ultimately establish them as models for sustainability.

- Smart Commute
  - Smart Commute is a program of Metrolinx and the municipalities in the Greater Toronto and Hamilton Area. It helps anyone who is going from A to B explore and try out smart travel options such as walking, cycling, transit and carpooling. Its goal is to ease gridlock while helping you save time and money.

- Office of Emergency Management
  - Toronto's Office of Emergency Management works with emergency services partners and other City divisions, to help coordinate emergency response and recovery efforts, including emergency social services. The OEM is also responsible for the City's Emergency Plan and the Emergency Operations Centre.

Feedback

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