



Baselining for a Circular Toronto

Methods, Measurement, and Future Directions to Operationalize Circularity

Meaghan Davis

Manager, Circular Economy and Innovation

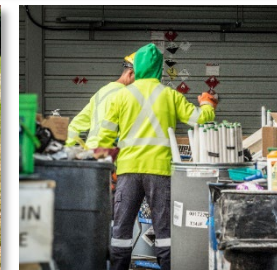
Solid Waste Management Services

City of Toronto

Toronto at a Glance

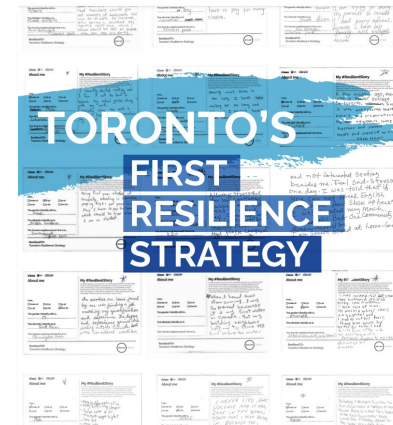
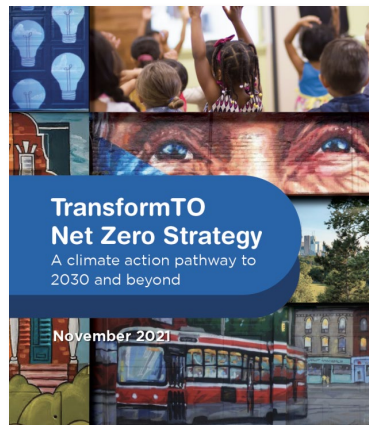
Land area:	630 km²
Population:	2.9 million
Visible minority population:	51.5%
Immigrant population:	51.2%
GDP:	\$158.7 billion
Number of businesses:	93,581
Unemployment rate:	6.4%

Waste managed:	786,000 tonnes/year
Customers served:	870,000
Residential diversion rate:	53%
Waste operating budget:	\$377 million
Waste 10-Year capital plan:	\$849 million



Working Toward a Circular Economy

- The City of Toronto's Long Term Waste Management Strategy set an **aspirational goal** of working toward zero waste and a circular economy
- Sustainable consumption and enhanced circularity have been recognized as key strategies to achieve Toronto's **net zero** and **resilience** goals
- *Baselining for a Circular Toronto* is Toronto's first major study to explore how to **operationalize** our aspirational goal



Research Questions

What is our current context for circularity?

1

How are materials being consumed, processed, and disposed in key sectors?

2

What will happen if we don't take action?

3

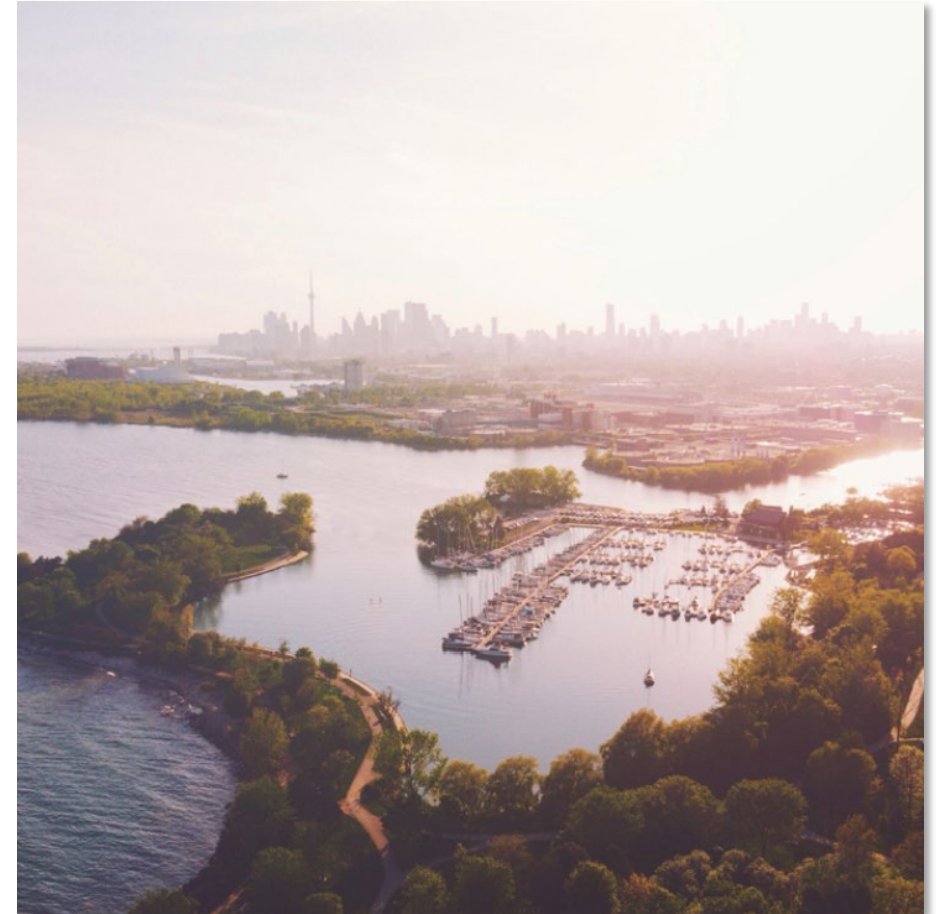
What high level next steps could mobilize a circular city transition?

4

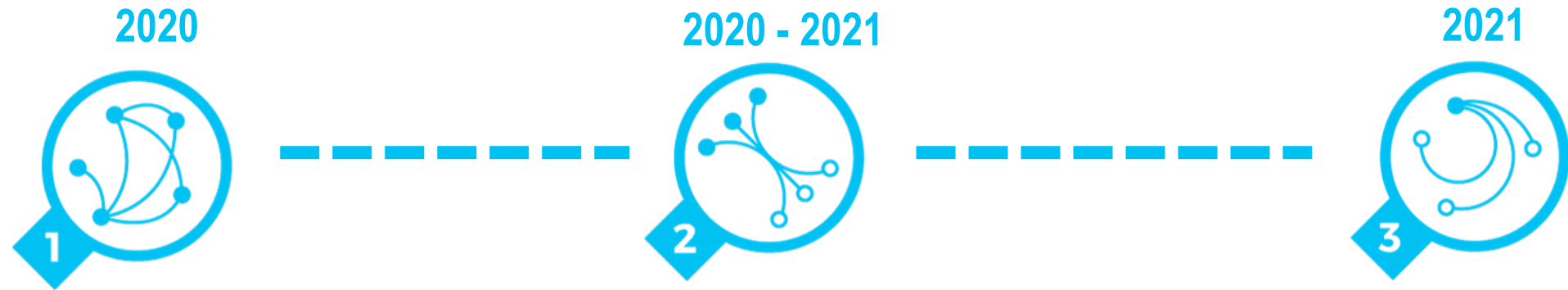
What is a Circular City?

What is a Circular City?

- No consensus on scope or measurement
- Emphasis on environmental indicators despite shift to more holistic strategies that consider social wellbeing and equity goals
- Emphasis on data-driven metrics, rather than outcome-oriented
- Global dialogue on circular economy measurement continues to evolve
- Importance of place-based analysis and goal-setting
- Data needs should be informed by the outcomes we are seeking to achieve



Project Phases



Landscape Analysis

What is our current context for circularity?

Assessed Toronto's current economic, environmental, social, and policy conditions related to a circular economy

Material Flow Analysis

How are materials being consumed and disposed of?

Modeled material consumption and disposal in three key economic sectors, and projects future consumption and disposal rates to 2030

Final Report

What are the key considerations moving forward?

Identified key focus areas and high level next steps for the City's circular transition

Material Flow Analysis

- Visualizes how resources are consumed, processed, and disposed of within a sector
- **Data sources:**
 - Local data wherever possible
 - National scale databases downscaled to local level (Exiobase and Statistics Canada)
 - Validation with subject matter experts
- **Benefits:**
 - Helps to identify where interventions could make linear flows more circular
 - Helps to shift thinking about waste to a design and consumption challenge
- **Limitations:**
 - Static snapshot in time
 - Accuracy dependant on data quality and availability, including localized data from national data sources



Biomass



Recyclables



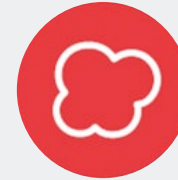
Minerals & Chemicals



Metals



Mixed Materials



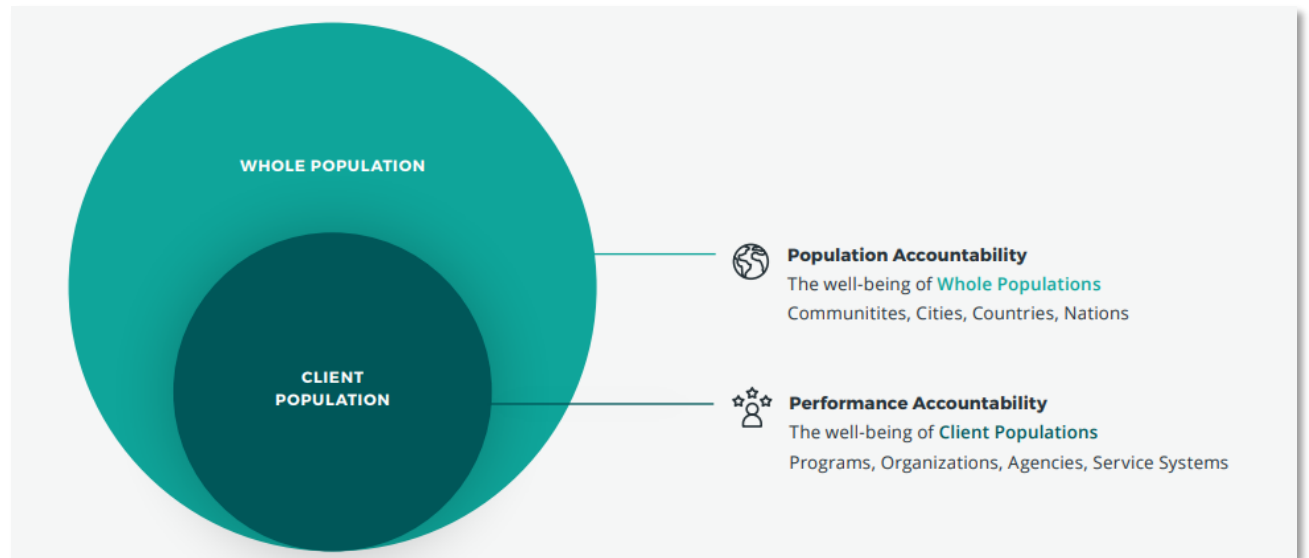
Emissions



Energy

Measuring Performance

- Difficult to identify a data agenda for circular economy before defining our goals
- Toronto is rethinking “circular city” as more than just an end goal – circularity is a means to achieve positive outcomes for the community, the economy, and the planet
- Results-Based Accountability (RBA) methodology has informed the City of Toronto’s goals and indicators for circularity, and correspondingly our data agenda



Circular Visions

A VISION FOR A CIRCULAR TORONTO

REGENERATIVE URBAN FOOD SYSTEMS

that protect and restore natural ecosystems, while preserving soil, air and water quality.

MORE EFFICIENT RESOURCE MANAGEMENT SYSTEMS

where waste from one industry is reused by another

CREATIVE DESIGN FOR THE BUILT ENVIRONMENT

to create long-lasting, adaptable and modular buildings and infrastructure that are easier to maintain and repurpose.

A CIRCULAR CITY OF TORONTO LEADING THE WAY

engaging, incentivizing, managing, and setting an enabling regulatory framework

A CIRCULAR SOCIETY that connects people, creates jobs and respects the planet.

AN ENABLING ENVIRONMENT FOR EMISSIONS REDUCTION

that combines the circular economy with other climate action strategies

Circular Goal Setting

COMMUNITY-WIDE CIRCULAR GOALS

1. Toronto reduces its overall material consumption
2. Toronto is a leader in attracting and supporting businesses that contribute to the circular economy
3. Toronto sustains a robust ecosystem of reuse, repair and donation



CONSTRUCTION CIRCULAR GOALS

1. Toronto develops a future-proof built environment aligned with circular economy principles
2. Toronto increases the quantity and quality of data on construction and demolition materials to recover as many materials embedded in its building stock as possible
3. Toronto promotes high value recycling and material recovery of construction and demolition waste



WASTE MANAGEMENT CIRCULAR GOALS

1. Toronto minimizes waste generation
2. Toronto stimulates a thriving market for secondary materials
3. Toronto improves the transparency, accessibility and verifiability of waste data throughout the city




FOOD SYSTEM CIRCULAR GOALS

1. Toronto promotes healthy and culturally-appropriate food for all, sourced as locally as possible, and as sustainably produced, processed, packaged and distributed as possible
2. Toronto minimizes avoidable food waste through food rescue and redistribution to interested partners and/or residents
3. Toronto promotes food waste avoidance



Circular Indicators

 GOALS	COMMUNITY-WIDE		
<p>Toronto reduces its over all material consumption</p>	<p>Total annual material consumption per capita</p>	<p>Number of City of Toronto procurements that include circular principles in the purchasing of goods, services and works</p>	<p>Number of local businesses and charities/ community groups adopting circular economy strategies or business models</p>
<p>Toronto is a leader in attracting and supporting businesses that contribute to the circular economy</p>	<p>Percentage of businesses in Toronto that apply circular principles</p>	<p>Percentage of Toronto's labour force working in the circular economy</p>	<p>Total amount of investments in circular-economy related Research & Development (R&D) and projects</p>
<p>Toronto sustains a robust ecosystem of reuse, repair and donation</p>	<p>Tonnes of materials repaired, reused, recovered and/ or upcycled by community-based activities</p>	<p>Number of charities, initiatives and organizations focused on donation and/or sharing</p>	<p>Percentage of neighbourhoods with a tool library or repair hub</p>





Concluding Thoughts

- When establishing a data agenda, look to how local-level actors will be using the information to understand the problem and design solutions
- National and global actors have a role to play in filling the data gaps identified in local-level analysis
- Working with cities to establish data agendas can help ensure national data is statistically relevant at the local level
- Cities can unlock community-based expertise and data that can support measuring circular progress and impact
- National and global actors can help address capacity challenges at the local level and ensure the sustainment of robust data collection and analysis
- Equity and social outcomes must be centered in the data agenda for circular economy



Thank you!

Meaghan Davis

Manager, Circular Economy and Innovation
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Meaghan.Davis@Toronto.ca