



A SUSTAINABLE MOBILITY FUTURE

Rethinking Transit Solutions

Presented by
Jonathan Chai & Elli Papaioannou



01 Meet Jonathan and Elli

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03 Why are New Mobility Solutions Needed?

04 So what are we doing about it?



01

MEET JONATHAN & ELLI AT HDR

THE PRESENTERS

Meet Jonathan...

- Project Manager at HDR with 12 years of experience
- Multimodal planning and TMPs
- Dreamed of owning my own car one day...



Meet Elli...

- Transportation Planner at HDR with 4 years of experience
- Works on MTO's Greater Golden Horseshoe Plan and brings strategic insight on Regional concerns
- Dreamed of living and working in a big City and walking, biking or taking transit to work...



A BIT ABOUT HDR

- HDR offers Engineering, Architecture, Environmental and Construction Services in Canada, US and worldwide
- 10,000 employees in 225 offices worldwide
- 250 employees in Toronto and Richmond Hill Offices
- Currently working across the GTA with MTO, Metrolinx, Upper and Lower Tier municipalities and transit agencies

TRANSPORTATION PLANNING

- Master Planning • Functional Planning
- Corridor planning • Complete Streets
- Macro-Modelling • Micro-Modelling
- Microsimulation • Pedestrian Simulation

TRANSIT PLANNING

- Transit Service Planning • Signal Priority
- Operational Reviews • Value Analysis
- Higher-order Transit Planning

DECISION ECONOMICS

- Funding Analysis • Risk Management
- Statistics and Data Analytics
- Sustainable Return on Investment

FREIGHT RAIL

- Bridge Inspection • Rail Modelling
- Cost-Benefit Analysis • Facility Design

TRANSIT ARCHITECTURE

- Sustainable Design • Structural Engineering
- Electrical Engineering • Design-Build
- Bus Service and Facility Planning

ROADWAY DESIGN

- Value Engineering • Utilities • Civil Engineering
- Construction Administration

PUBLIC ENGAGEMENT

- Facilitation • Media Strategy • Branding



Reconfiguration of Six Points Interchange



Calgary North Crosstown BRT



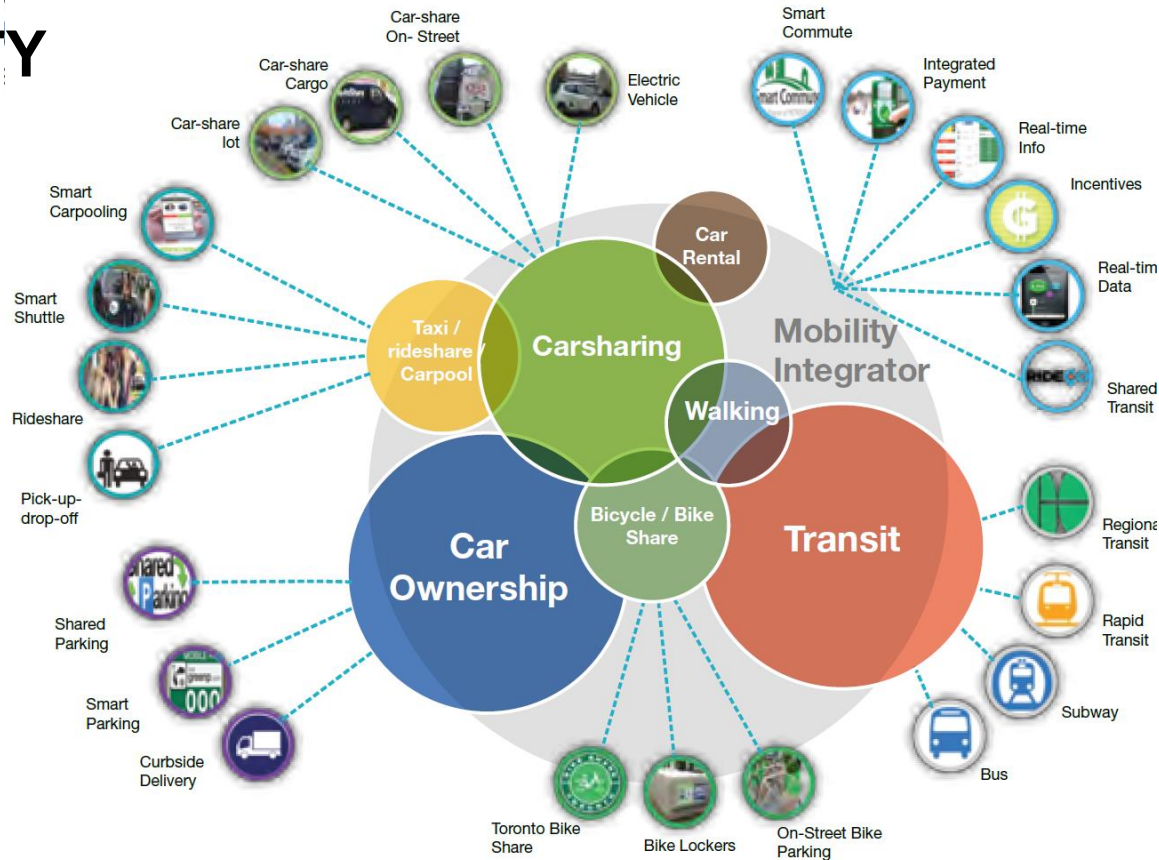


02

NEW MOBILITY...?

WHAT IS NEW MOBILITY

- New Mobility or Smart Mobility refers to the way we access and consume transportation services
 - On Demand Services
 - The changing concept of ownership
 - Sharing (is caring)
- Utilizes technological advances to facilitate operations
- Crucial component of New Mobility will be the concept of Mobility as a Service (MaaS)



NEW MOBILITY SERVICES



Individual Based Mobility

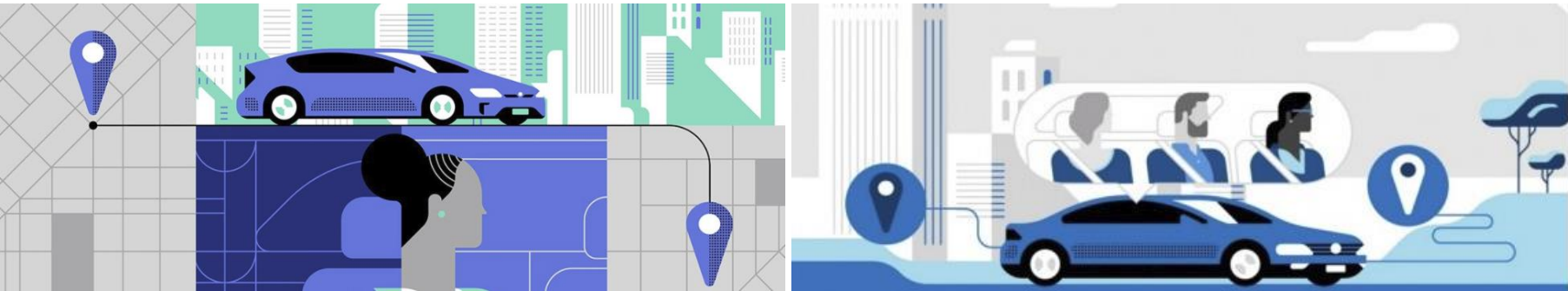
- Car Sharing
- Bike Sharing
- Ride Sharing



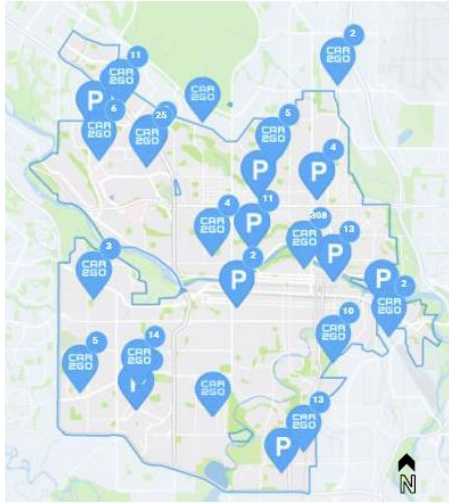
Group Based Mobility

- Shared Ride Sourcing
- Demand Responsive Transit
- Microtransit

*The On-Demand Concept
Mobility as a Service*

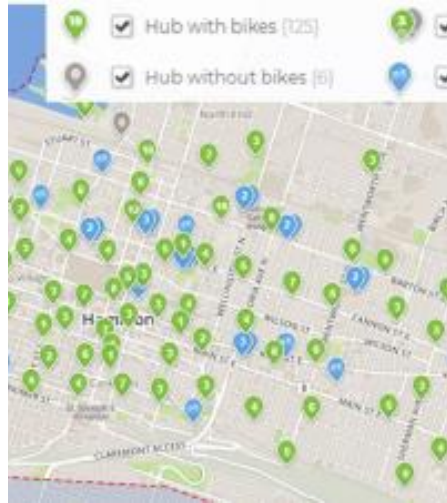


INDIVIDUAL-BASED MOBILITY



Car-Sharing

Example: Car2Go in Calgary



Bike-Sharing

Example: Sobi Hamilton

Transportation Network Companies

Ride-Sharing or Ride Sourcing

The Mobility Service is operated by individuals (e.g. uberx), by a company (e.g. taxi), or by a city/agency (Sobi Bike share)

GROUP-BASED MOBILITY



Shared Ride Sourcing

Source: Global News



**Demand Responsive
Transit- YRT Dial-A-Ride**



**Microtransit
Chariot San Francisco**

The Mobility Service is operated by individuals or a company (e.g. uberPOOL or Chariot), or by a city/agency (YRT DAR)

MOBILITY AS A SERVICE (MAAS)

**Journey
Planning**



**Ease of
Transaction**



**Flexible
Payment terms**



**User
Experience**



**Personalized
Service**



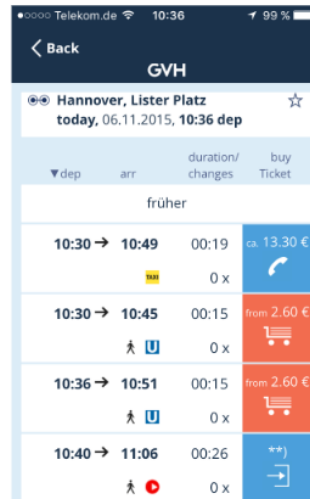
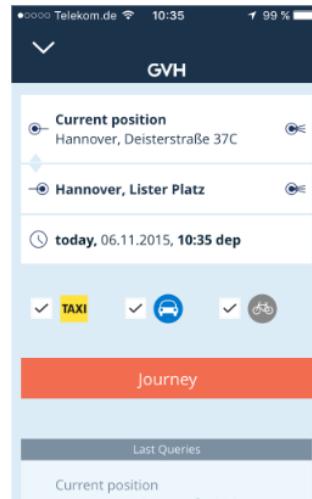
“MaaS is a provision of transport via a real-time personalized service model that integrates all types of mobility choices and presents them to the customer in a completely integrated manner to get them from A to B as easily as possible”

EXAMPLES OF MAAS

- Mobility Shop in Hannover, Germany
- Whim in Helsinki, Finland
- Combines all different memberships on one platform
- Different plans that offer a range of modes and number of trips

	Whim To Go	Whim Urban	Whim Unlimited
Monthly payment	Free	49€	499€
Local public transport	Pay per ride	Unlimited Single Tickets	Unlimited Single Tickets
Taxi (5km radius)	Pay per ride	10€ per ride	Unlimited
Car	Pay per ride	49€ per day	Unlimited
City Bike	Not included	Unlimited (30min)	Unlimited
Cancel anytime	✓	✓	✓
Add-ons incl regional HSL >			
Help	Read more	Read more	Read more

Mobility Shop Hanover: Multimodal Routing and Booking



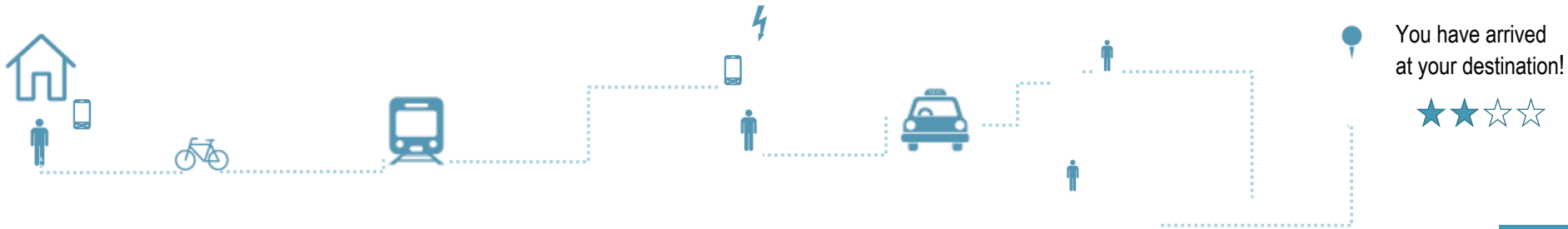
MOBILITY AS A SERVICE (MAAS)

Journey Planning

Using the optimal combination of modes

Receiving real-time information

Provide Feedback



“MaaS is a provision of transport via a real-time personalized service model that integrates all types of mobility choices and presents them to the customer in a completely integrated manner to get them from A to B as easily as possible”

WHERE

WHAT

WHEN

WHY

HOW

WHO

03

**WHY ARE NEW MOBILITY SOLUTIONS
NEEDED?**

WE LIVE IN AN EVER-CHANGING ENVIRONMENT

- Changing Region
 - Growing senior population
 - Millennials
- Growing Region
 - Growth in population and employment
 - Inter-suburb connections
 - Big employment areas ringing Toronto
 - Inequity
- Known Unknowns

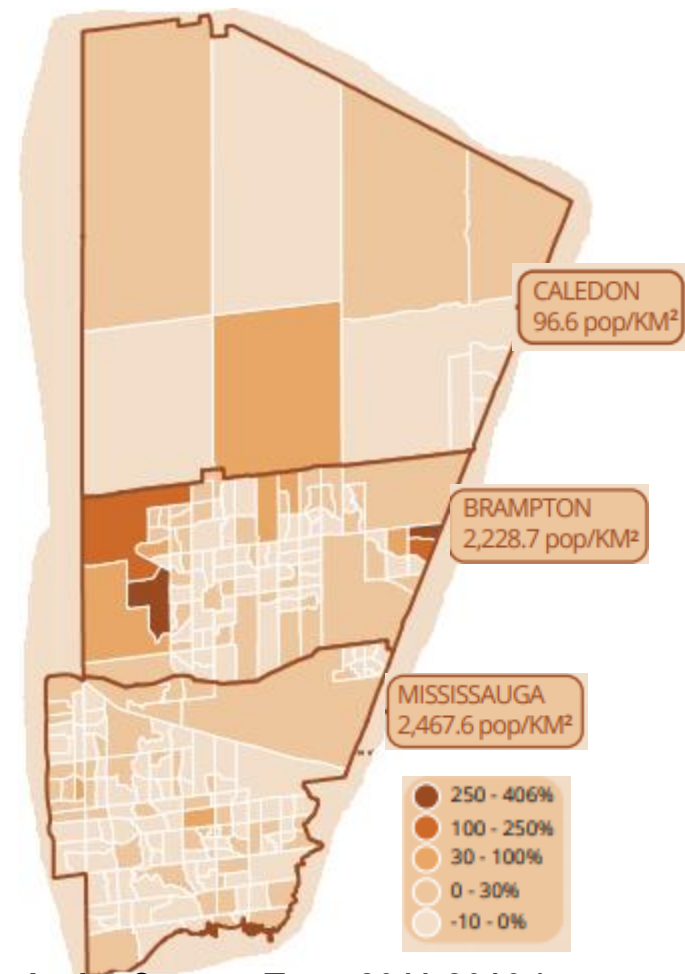


POPULATION GROWTH

- Peel's population grew by 6.5% from 2011 to 2016
- Is projected to grow to 1,970,000 by 2041 (according to the Growth Plan)

What does this mean for the way we move around?

Different densities require different services and can support different services



Peel Density by Census Tract 2011-2016 (POP/KM2)

60's ARE THE NEW 40's

- Seniors are the fastest growing age group in Canada
- The number of seniors in Ontario is projected to almost double from 2016 to 2041 from 16% to 25% of the population
- In Peel
 - 65+ was 1 out of 10 in 2011
 - 65+ is expected to be 1 out of 4 in 2041
- The need to make communities more age-friendly

What does this mean for the way we move around?

Personal mobility is important for accessing day-to-day destinations and to give a sense of independence



PLANNING FOR AN AGING POPULATION

Peel 2041: Regional Official Plan Review



**Discussion
Paper**

THE MILLENNIAL

Born between 1980 and 2000

- Have come of age during a time of technological changes, globalization and economic disruption
- Facing lower employment levels and smaller incomes compared to previous generations and they have more debt (...student loans)
- They want services that provide access without the burden of ownership

What does this mean for the way we move around?

In 25 years from now, car sharing will be the norm and car ownership an anomaly.

- Jeremy Rifkin



Source: Goldman Sachs Global Investment Research

CHANGE IN EMPLOYMENT

- Increase of knowledge-intensive and service-based economy, with growth of on-demand and peer-to-peer services and e-commerce
- Introduction of significant automation across multiple industries
- Growth in precarious and low-wage employment

What does this mean for the way we move around?

Not one fixed destination and fuzzy commuting patterns, which may be difficult to serve with conventional transit

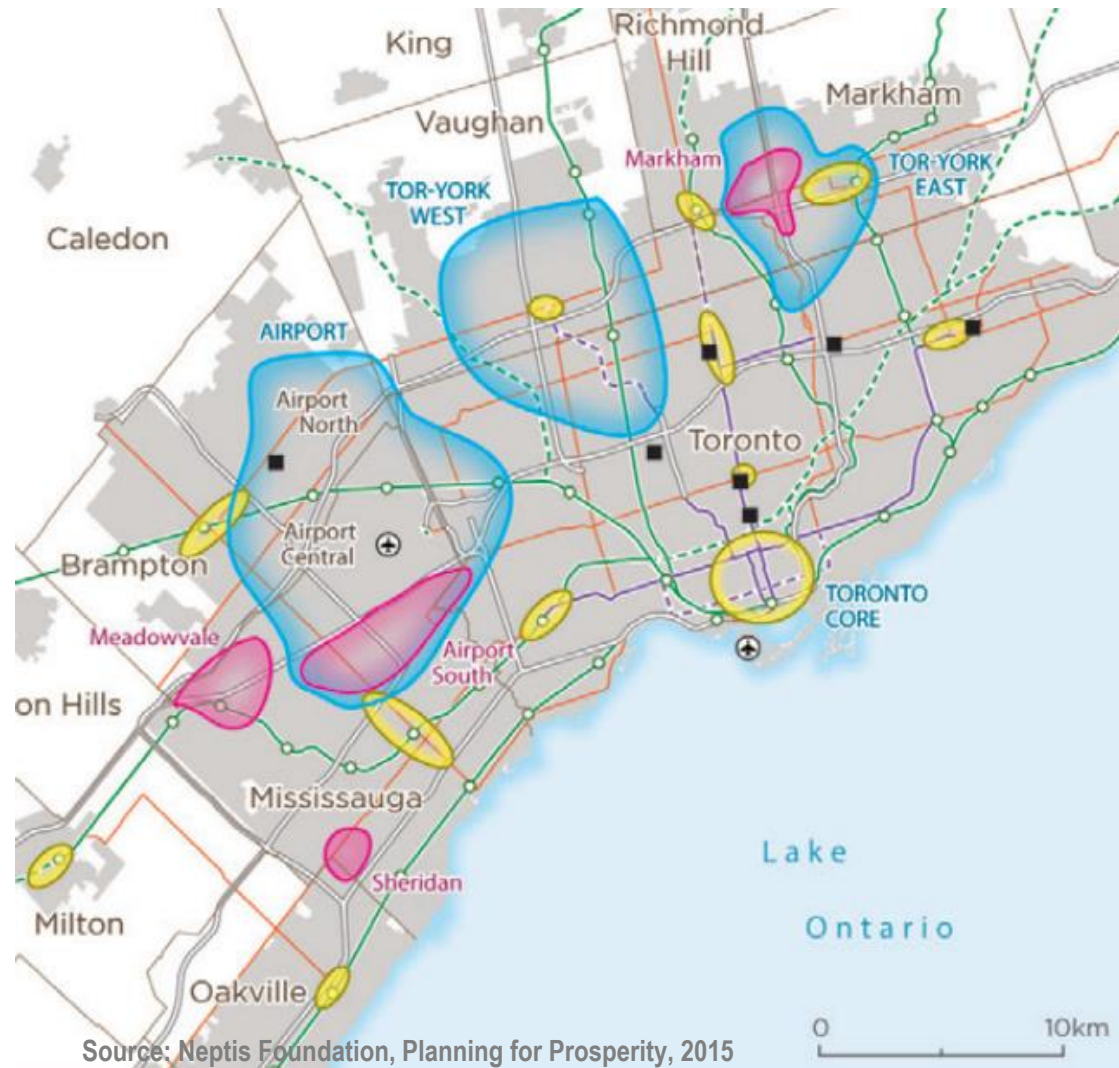


SUBURBAN EMPLOYMENT AREAS

- These three employment areas ringing Toronto cover over 500,000 jobs
- Nearly **95%** of commuting trips to these areas are made **by car**
- These large employment areas are poorly served by transit

What does this mean for the way we move around?

Most of these employment areas are in low density lands, making it difficult to walk or bike to for the first and last mile of the trip

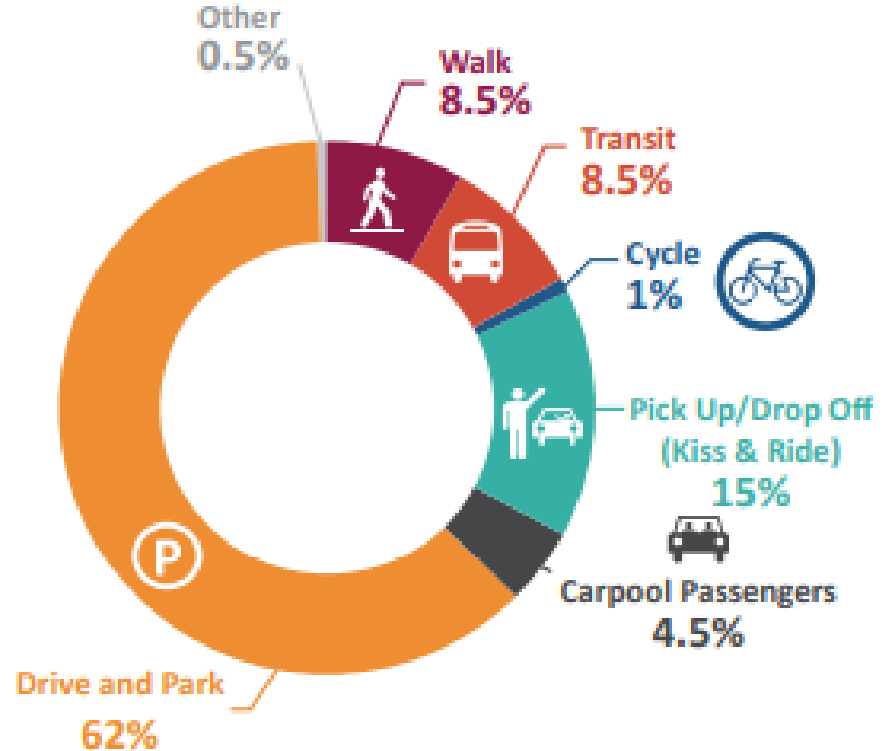


REGIONAL EXPRESS RAIL

- RER will bring frequent, all-day, two-way service to the GTA
- In 2015, 62% of GO Transit users accessed the stations by car
- By 2031, they want to see the drive and park share drop to 38%

What does this mean for the way we move around?

Many of the GO stations are in industrial lands, or close to low density residential neighbourhoods with poor transit connections



KNOWN UNKNOWNS

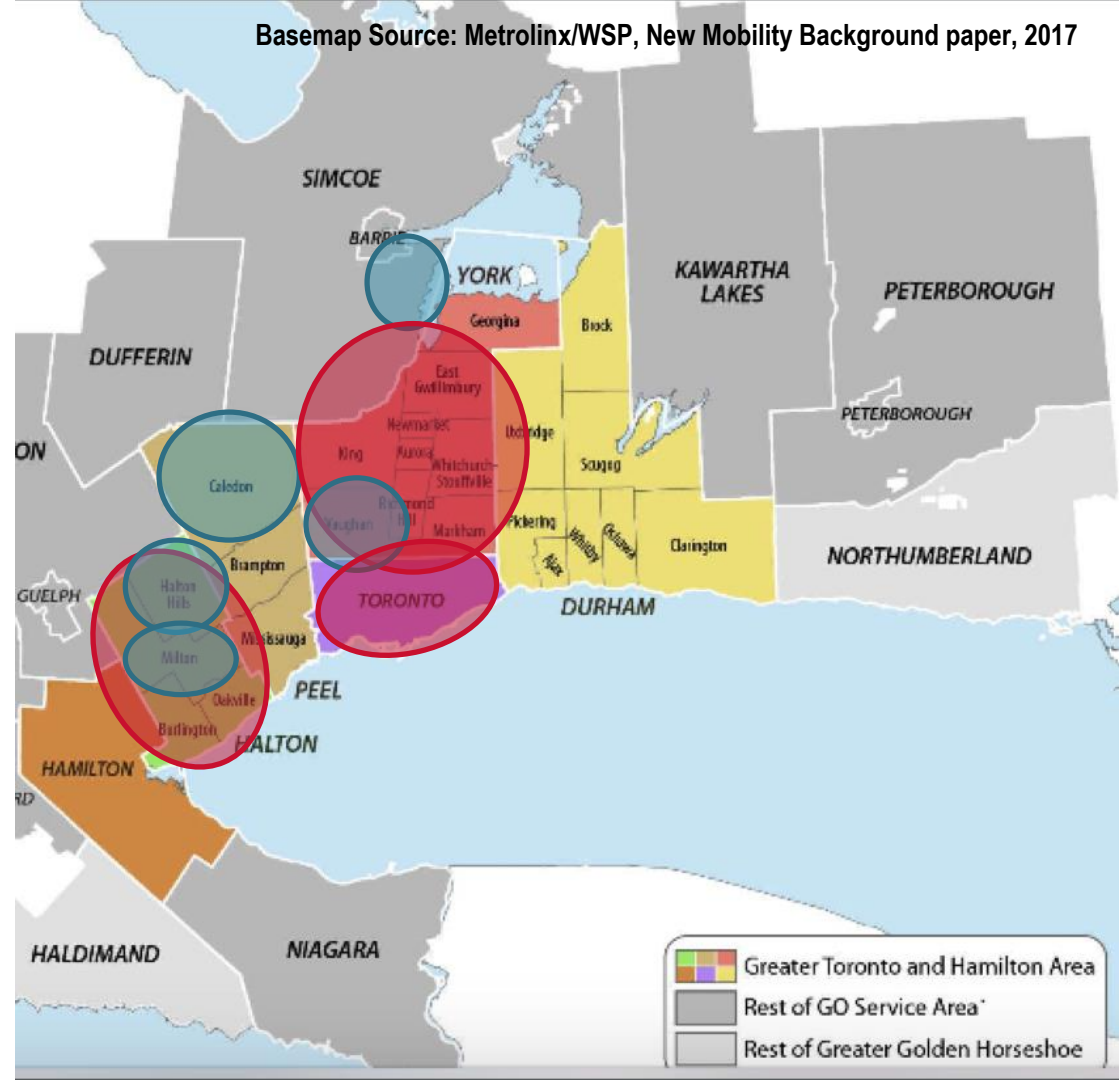


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SO WHAT ARE WE DOING ABOUT IT?

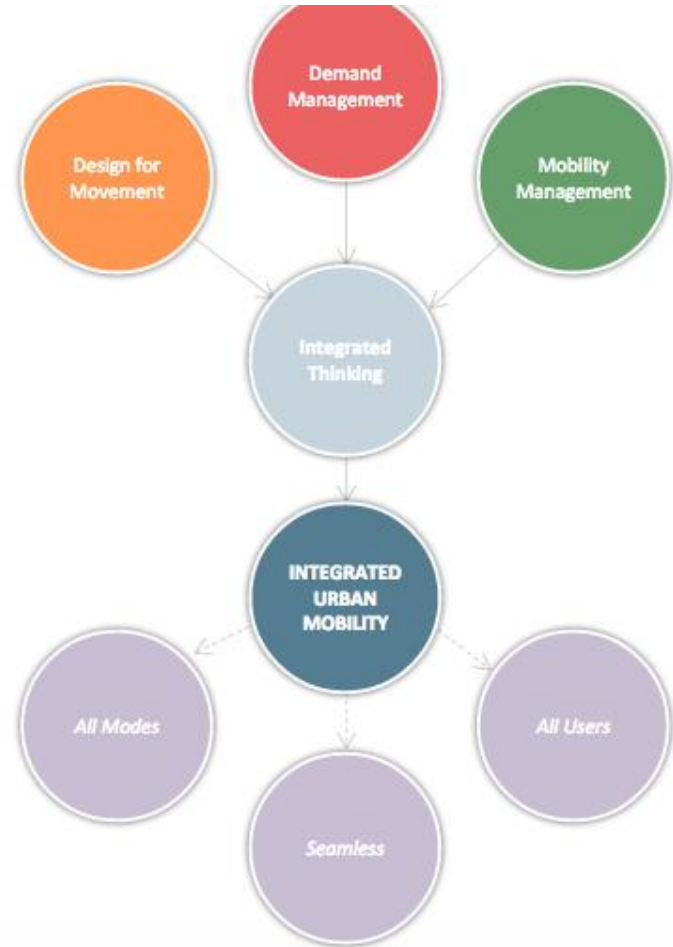
MUNICIPALITIES ARE ADAPTING

- Regional Direction:
 - CUTA Integrated Mobility Toolbox
 - MTO's GGH Transportation Plan
 - Metrolinx RTP/New Mobility
 - Metrolinx Station Access Plan
- Municipalities:
 - Milton GO Pilot project
 - Innisfil
 - Transit Feasibility Studies
 - EcoMobility Hubs



CUTA INTEGRATED MOBILITY TOOLBOX

- The toolbox is meant to be used by transit agencies
- Provides examples of integrated mobility solutions
- The toolbox covers three themes of integrated mobility
 - Design for Movement
 - Demand Management
 - Mobility Management



MTO'S GGH TRANSPORTATION PLAN

- Ongoing project for the Ministry of Transportation
- Long-term multimodal Plan
- For a 2051 Horizon with a Vision for 2071
- Takes into consideration new technologies, such as AVCV, drones, etc.

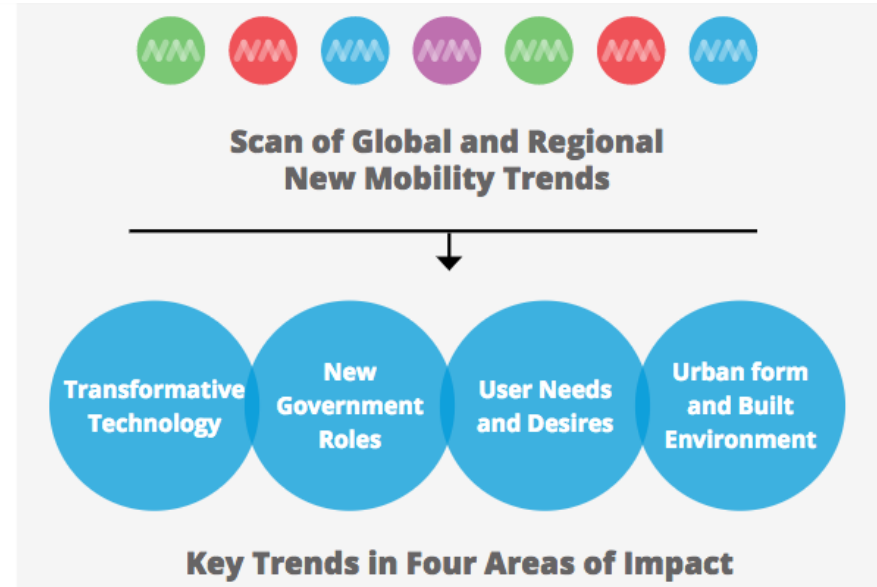


Ready for the Future

The GGH Transportation Plan will consider emerging mobility models and technologies such as automated vehicles, connected vehicles and mobility-as-a-service platforms and how these will change the way people and goods move around the region.

METROLINX RTP AND NEW MOBILITY BACKGROUND PAPER

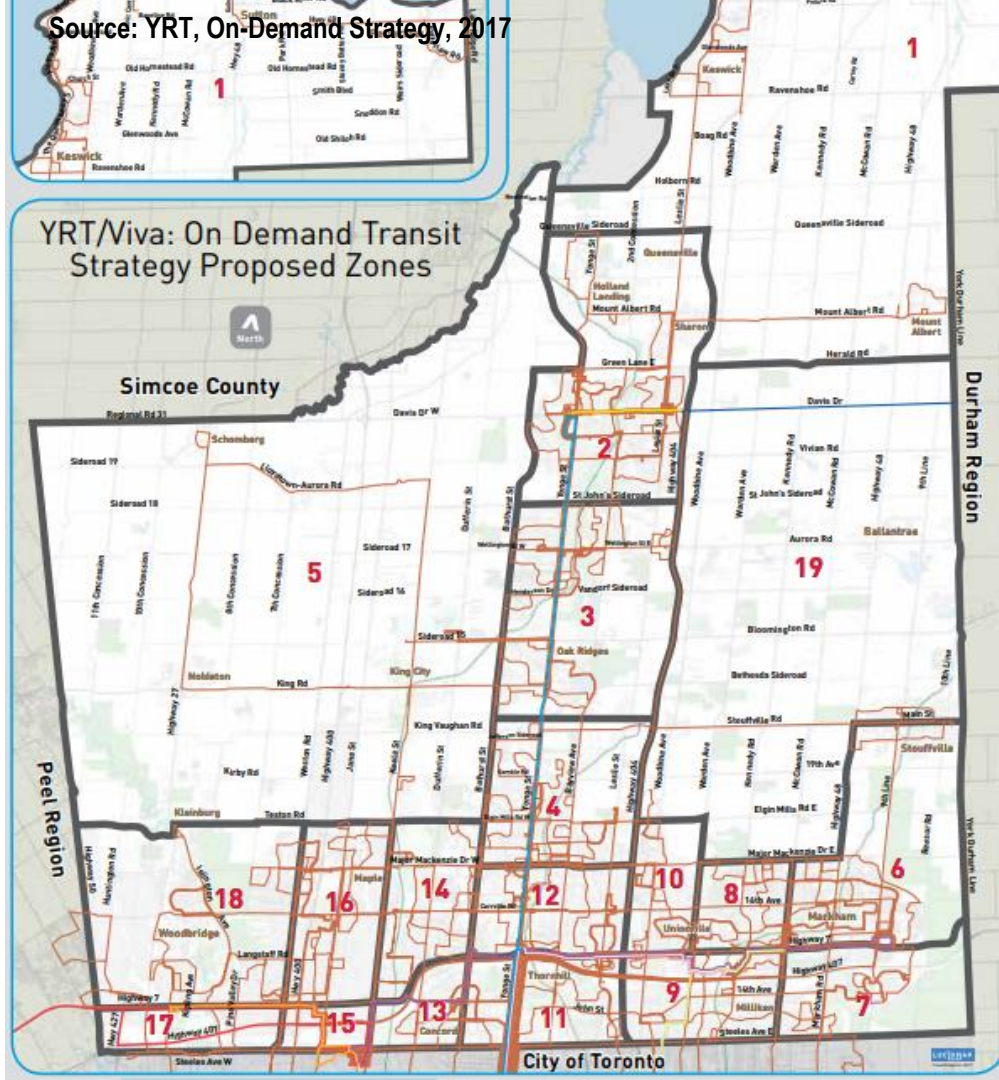
- Discussion paper was released as part of the RTP Update
- Describes new trends in mobility, opportunities and risks
- Sets out two paths for the adoption of new mobility
 - Governments take a proactive and highly regulated approach
 - Reactive approach where new mobility evolves organically



ON-DEMAND STRATEGY

York Region Transit

- YRT already operates a few Dial-A-Ride routes
- Local bus routes on low demand areas will be replaced by on-demand
- Small geographic service zones
- Each zone would contain at least one high-order transit bus route
- Users would book trips on a mobile app



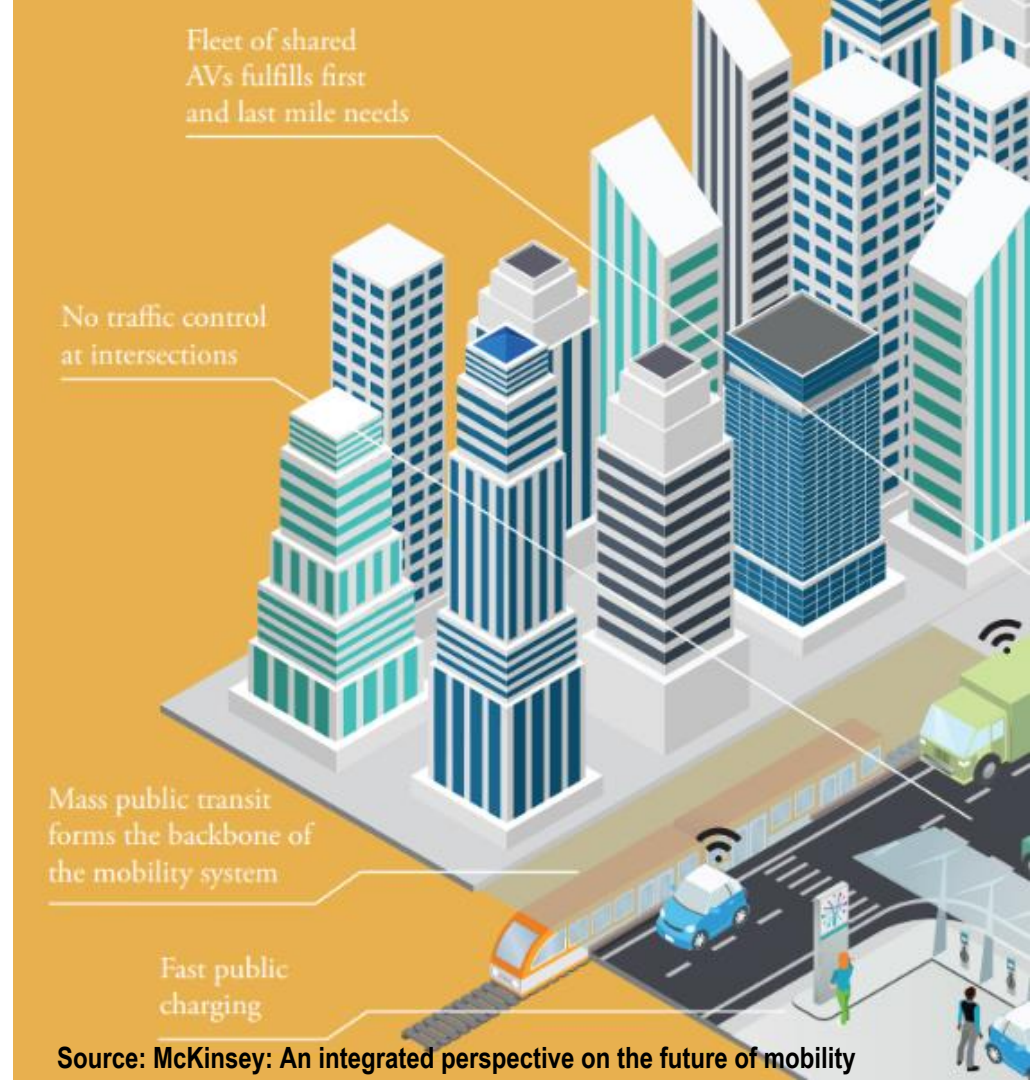
ECOMOBILITY HUBS- FACILITATING MOBILITY INTEGRATION

City of Toronto



WHAT DOES THE FUTURE LOOK LIKE?

- Highly unpredictable future
- We need to combine and use the range of tools and travel options that are available
- We need to make plans that are flexible and adaptable
- Companies and governments should take an integrated perspective and build strong partnerships



Source: McKinsey: An integrated perspective on the future of mobility

Thank you for listening!



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