



# S B I C

## SMALL BUSINESS INNOVATION CHALLENGE PARTNERING FORUM

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Ontario Centres of  
Excellence  
Where Next Happens



# Vehicle Occupancy Detection



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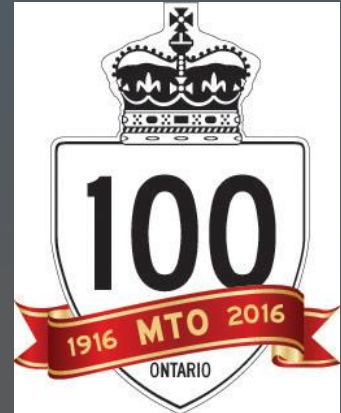
Ontario Ministry of Transportation

# Overview

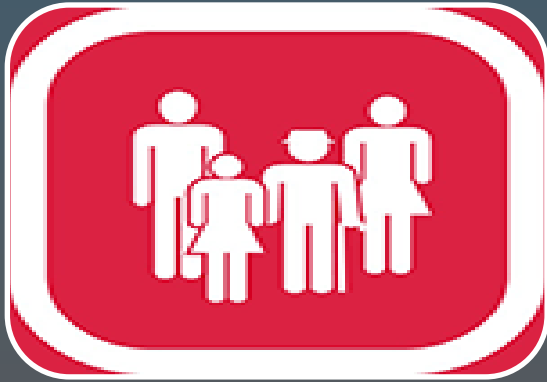
- About the Ministry of Transportation
- Introduce the Challenge Area and Ideal State
- Background Context and Current State
- Problem Statement
- Ideal Outcomes and Benefits
- Constraints

# MTO – 100 Years of Transportation

- Established on January 17, 1916, as the Department of Public Highways of Ontario, with 35 employees (3,575 today).
- In addition to our policy, planning and regulatory responsibilities, MTO manages and/or operates (not including Metrolinx, an agency of the Government of Ontario):
  - over 16,900 kilometres of provincial highway
  - 2,800 bridges
  - 9 ferry services
  - 29 remote airports
  - 23 highway service centres under private lease
  - 1 toll freeway under private lease
  - 2 toll freeways under provincial management
  - 1 High Occupancy Toll Lane



# Times are Changing...



Demographic  
Shifts



Disruptive  
Technologies



Sharing Economy  
& Shared Mobility

# New Ways of Managing Congestion are Needed

- Traffic demand in inter-urban roads is constantly increasing
- Socio-economic costs are increasing due to lost productivity from congestion
- Ontario needs to manage network demand and continue supporting the efficient movement of people and goods.

# High Occupancy Toll (HOT) Lanes

- High occupancy toll lanes aim to reduce traffic congestion by maximizing highway capacity while continuing to provide a carpooling incentive.
- Successive Ontario Budgets have committed to:
  - assessing the feasibility of building new and converting select HOV lanes into HOT lanes;
  - launching the HOT Lanes pilot project in summer 2016; and
  - implementing an all electronic HOT lane on Highway 427 by 2021.



# QEW HOT Lane Pilot

- Launched Sept. 15, 2016
- Pilot will be 2-4 years
- Permits valid for three months and cost \$180.





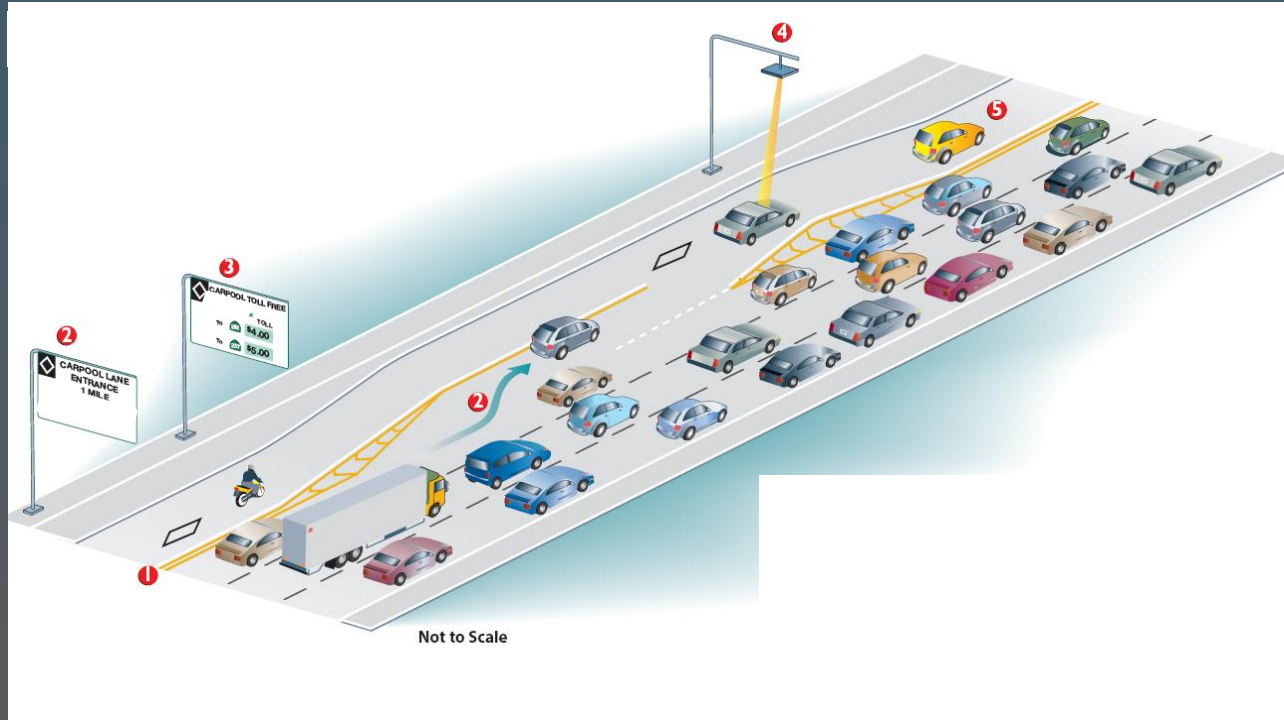
# QEW HOT Lane Pilot – Technology

- As part of the pilot, MTO is testing innovative technologies to support tolling, compliance and performance monitoring of HOT lanes.
- Participating in SBIC is part of the Pilot's efforts to look for technology solutions to deliver HOT lanes

# Typical All Electronic Tolling Highway Systems



# Typical HOT Lane Systems



# Problem Statement

- As high-occupancy toll (HOT) lanes are implemented in Ontario and abroad, there is a growing need for the development of an enforceable means to determine if a vehicle in a specific lane should be billed and/or fined based on the number of individuals in the vehicle.

# Current Challenges

- Solutions that exist today are reliant on:
  - visual/manual enforcement
  - significant infrastructure requirements
  - self-declaration of occupancy

# How Many Occupants?



# Ideal Outcomes

- A solution that is:
  - Enforceable and secure
  - Automated
  - Interoperable with other tolling technologies
  - Safe and convenient
  - Robust

# What it means for...

## HOT Lane Users

- Ease of use
- Privacy is protected

## Enforcement Agencies

- Less resource intensive
- Minimizes occupancy-based violations

## Operating Agencies

- Reduced revenue loss due to intentional or unintentional misuse
- Operational efficiencies in billing verification

## Public

- Increased confidence in the integrity and fairness of the system



# Potential Ideas for Future Application of Technology

- Other managed lanes
- Highway performance monitoring
- Security/border installations

ANY  
QUESTIONS?

