



Preparing the City of Toronto for Automated Vehicles

Toronto Accessibility Advisory Committee, June 4, 2019

City of Toronto and AVs

The City of Toronto does not have an official policy or position on automated and/or autonomous vehicles.

The views and opinions contained in this presentation do not represent those of the City of Toronto.



Status of AVs in Toronto

- Staff discussions and strategizing
 - Interdivisional Working Group
- City Council direction
 - 2016: Request to staff to report on staff preparations, potential implications, public acceptance.
 - 2018: Report to Public Works and Infrastructure Committee & City Council
 - Explore partnerships with other governments
 - Join Municipal Alliance for Connected and Autonomous Vehicles in Ontario
 - Request Federation of Canadian Municipalities to include in annual conference
 - Explore opportunities to collaborate with Sidewalk Toronto
 - Report back in 2019-Q1 on Automated Vehicle Tactical Plan 2019-2021



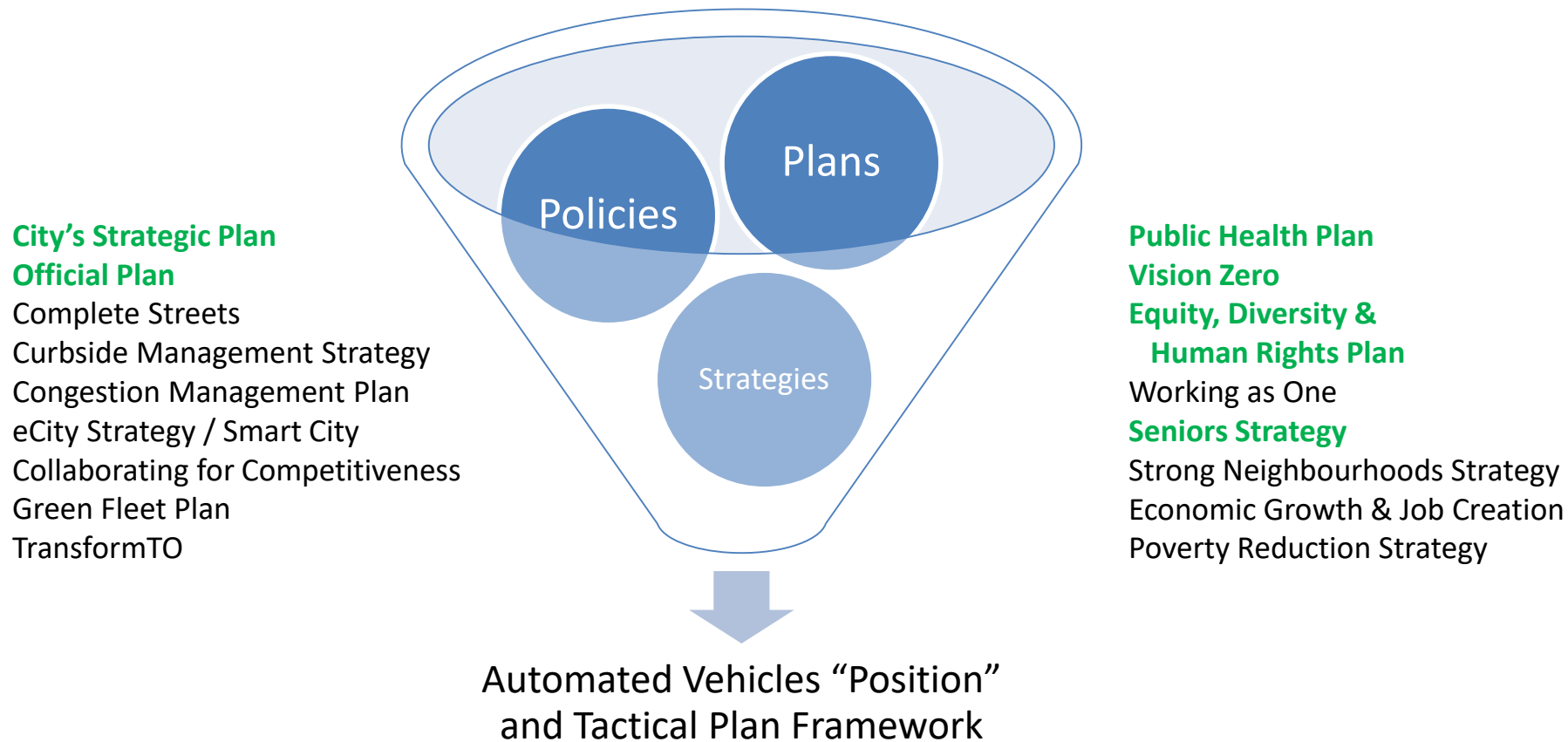
AV 101: What is an Automated Vehicle?

Level of Automation		"Driver"	System Control
Partial	0	Human	None
	1	Human	 OR  +  One feature
	2		 AND  +  Two+ features
	3	Vehicle	 AND  AND  +  Chaperoned
	4		 AND  AND  Limited
High	5 (Full)		 AND  AND  Unlimited

Interdivisional Working Group on AVs

- City Clerk's Office
- City Manager's Office
 - People, Equity and Human Rights
 - Office of the Chief of Staff
 - Civic Innovation Office
 - Strategic and Corporate Policy
 - Transformation Office
- City Planning
- Corporate Finance
- Economic Development & Culture
- Engineering & Construction Services
- Environment & Energy
- Exhibition Place
- Financial Planning
- Fire Services
 - Office of Emergency Management
- Fleet Services
- Information & Technology
- Legal Services
- Municipal Licensing & Standards
- Revenue Services
- Social Development, Finance & Admin
- Solid Waste Management
- Toronto Building
- Toronto Employment & Social Services
- Toronto Office of Partnerships
- Toronto Paramedic Services
- Toronto Parking Authority
- Toronto Police Service
- Toronto Public Health
- Toronto Transit Commission
- Transportation Services

A “Tactical Plan” on AVs



Consultation

- City staff
- Working Group
- Senior Management
- Public, Industry, and Stakeholder Consultation
- March 2018:
 - Nine workshops
 - 150 attendees from 73 orgs



Accessibility Stakeholders – March 21

Invited over 17 organizations for the Accessibility & Equity Workshop, with at least 11 in attendance:

Attended	Invited
• Alliance for Equality for Blind Canadians • Arrive alive DRIVE SOBER • Canadian National Institute for the Blind • CivicAction • CodeRedTO • Ontario Traffic Council • The Learning Disabilities Association of Toronto • Toronto Centre for Active Transportation • Toronto Rehabilitation Institute • Walk Toronto	• Canadian Association of Retired Persons • Canadian Council of the Blind • City of Toronto Disability Issues Committee • Community Living Toronto • Community Recreation For All • Toronto Seniors Forum

Tactical Plan – Structure

SAMPLE – FOR DISCUSSION ONLY

Level	Sample		
Direction	1. Social Equity & Health: The City of Toronto will encourage the adoption of driving automation systems in a manner that improves social equity and health.		
2050 Goal [2050 horizon]	1.1 Ensure Barrier-Free Access: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure all users have barrier-free access to personal mobility services.		
Tactic	1.1.1 Access for Individuals with Disabilities: Develop and implement a policy to ensure that shared automated vehicle fleet companies provide an appropriate level of barrier-free access and ensure that unnecessary limitations (e.g. visual, auditory) are avoided. Approaches should consider the safety needs of individuals who require the assistance of an attendant or service animal, and boarding needs of seniors, families with children, and individuals with mobility impairments.		
Initiative [2022 horizon]	0. Do Nothing 1. Research and learn 2. Identify the issues and scope 3. Engage and consult with stakeholders	4. Generate policy options 5. Assess options and select preferred solution 6. Design and develop a solution	7. Test the solution 8. Implement the solution 9. Evaluate the effectiveness 10. Maintain the solution

Tactical Plan

1. Social Equity & Health

- Ensure Barrier-Free Access
- Increase Mobility Equity
- Promote Health

4. Privacy

- Protect Public Privacy

2. Environmental Sustainability

- Reduce Vehicle Emissions
- Reduce Vehicle Waste

5. Road Safety & Security

- Prevent Collisions
- Update Infrastructure
- Update Emergency Response

3. Economic Sustainability

- Expand Sectors
- Expand Employment Opportunities
- Demonstrate Sector Leadership

6. Integrated Mobility

- Increase Space Efficiency
- Design Smart Streets
- Increase System Seamlessness

Tactical Plan

7. Transportation System Efficiency

- Increase System Capacity
- Manage System Demand

Additional Research & Future-Proofing

- Additional Research
- Future-Proofing

Public Service Vehicles

- Safety & Effectiveness
- Service Delivery

Governance

- Data Collection
- Data Tools
- Monitoring Indicators

Tactical Plan: Social Equity & Health

SOCIAL EQUITY & HEALTH: The City of Toronto will encourage the adoption of driving automation systems in a manner that improves social equity and health.

Ensure Barrier-Free Access: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure all users have barrier-free access to personal mobility services.

Key Performance Indicators:

- Percentage of population able to access automated vehicle services

1.1.1

Access for
Individuals with
Disabilities

1.1.2

Access to Transit
for Individuals
with Disabilities

1.1.3

Access for
Unbanked
Individuals

1.1.4

Access for Low-
Income
Individuals

1.1.5

Access for Non-
Anglophones

Increase Mobility Equity: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure reasonably equitable service levels to all neighbourhoods regardless of trip type, vehicle class or ownership.

Key Performance Indicators:

- Median wait time for barrier-free AVs versus standard AVs by geographic area (neighbourhood)

1.2.1

Equitable Service Coverage

1.2.2

Equitable Performance
Standards

1.2.3

Mobility Neutrality

Tactical Plan: Social Equity & Health

SOCIAL EQUITY & HEALTH: The City of Toronto will encourage the adoption of driving automation systems in a manner that improves social equity and health.

Promote Health: In 2050, the City will have harnessed the widespread adoption of automated vehicles to promote equitable health outcomes.

Key Performance Indicators:

- The City of Toronto will be determining the required key performance indicators from 2019-2022

1.3.1
Healthy Mobility

Tactical Plan: Road Safety & Security

ROAD SAFETY & SECURITY: The City of Toronto will encourage the adoption of driving automation systems that are proven to create a net benefit to road safety and security.

Prevent Collisions: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure that traffic-related injuries and deaths from automated vehicles are zero.

Key Performance Indicators	• Number of killed/ seriously injured involving AVs per VKT (vs. non-automated vehicles) • Number of non-KSI collisions involving AVs per VKT (vs. non-automated vehicles)
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5.1.1
Transition to AVs - Transit

5.1.6
Vulnerable Road Users

Update Infrastructure: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure that all appropriate transportation infrastructure facilitates their use.

Key Performance Indicators	• Number of infrastructural barriers to AV use eliminated
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5.2.2
AV Integration - Transit

Tactical Plan: Integrated Mobility

INTEGRATED MOBILITY: The City of Toronto will encourage the adoption of driving automation systems that further integrate space-efficient and active modes of travel, and better manage all traffic impacts from the movement of goods.

Increase Space Efficiency: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure a greater proportion of intraurban travel will be by more space-efficient and active modes of travel.

Key Performance Indicators	• Throughput in persons per hour per unit area of public right-of-way • Percentage change in mode share for: active transportation, transit, 2+ occupant vehicles, combined-purpose vehicles
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6.1.1
Transit Priority

6.1.2
Active Transportation Priority

Increase System Seamlessness: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure that Toronto's transportation system is seamless to the user.

Key Performance Indicators	• Percentage of ridership satisfied with system seamlessness
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6.3.1
Transit Centric
Mobility-as-a-Service (MaaS)

6.3.2
Microtransit

Tactical Plan: Transportation System Efficiency & Public Service Vehicles

TRANSPORTATION SYSTEM EFFICIENCY: The City of Toronto will enhance its ability to manage traffic in real-time through driving automation systems for the purpose of increasing the efficiency of moving people and goods.

Manage System Demand: In 2050, the City will have harnessed the widespread adoption of automated vehicles to ensure less acute demand across the transportation system.

Key Performance Indicators:

- Proportion of daily traffic outside AM/ PM peaks

7.2.2

Transit Incentives and Pricing

PUBLIC SERVICE VEHICLES: The City of Toronto will encourage the development and adoption of driving automation systems for municipal and other public service vehicles for the purpose of improving safety and public service delivery.

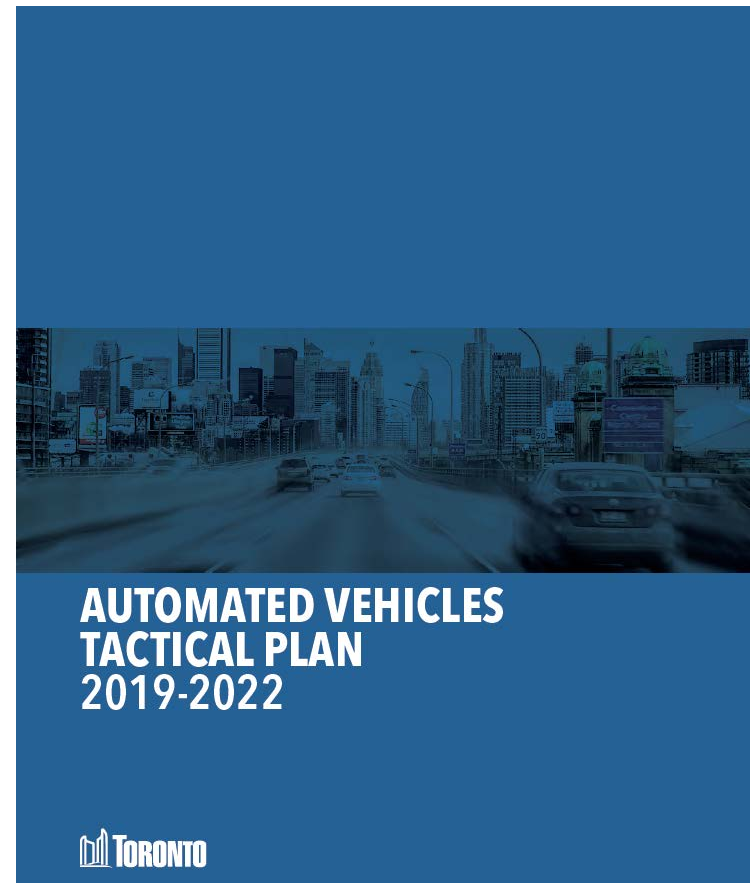
Service Delivery

PSV 2.1

AV Fleet- Transit

Tactical Plan Development – Next Steps

- May-June 2019: Public posting of Tactical Plan Report for consultation
 - Circulation to all internal and external stakeholders, industry, public
 - Please provide your detailed feedback via comment at this time
- Fall 2019: Committee and Council consideration





Questions?

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