PREPARING FOR AUTONOMOUS VEHICLES

Divisional Workplan 2016-2018
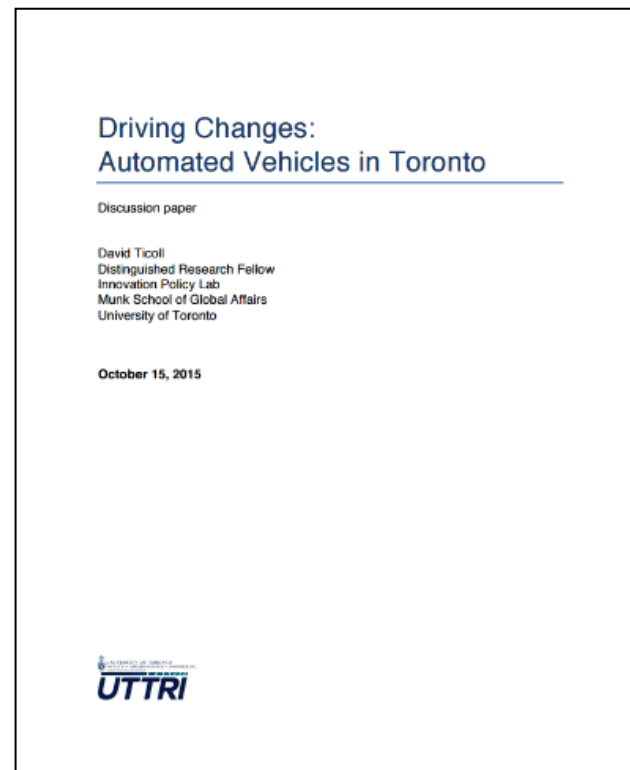
TORONTO Transportation Services

CONTENTS

INTRODUCTION

The introduction of automation into commercial and passenger vehicles is an exciting development in urban transportation. By removing the human component from driving, conventional wisdom is that traffic safety will improve, there will be greater access to mobility for those who do not or cannot drive, and efficiencies in the transportation network will be realized through improved traffic management. Whether any of these benefits come to pass will only be told through time. But what can be said today is that the convergence of 'smart' technology and vehicles is happening, and that it will have a significant impact on how municipalities operate their transportation systems.

The City of Toronto, the largest municipality in both population and number of vehicles in Canada, does not currently have an official position or policy regarding automated and autonomous vehicles (AVs); however, that does not mean the City has been sitting idly by. The Transportation Services Division has been actively monitoring AV developments, and working with various stakeholders to improve understanding of what they could mean for all Divisions within the City of Toronto.

In 2015, Transportation Services commissioned David Ticoll of the University of Toronto to write a white paper entitled, "Driving Changes" – that paper served as the basis for important discussions within the municipality on mobility, safety, and equity; the built environment; information and data; and economic development and impact. From those discussions, an interdivisional working group on AVs was established by senior management, and this workplan was initiated.

A key realization from those discussions was that the City of Toronto already has a vision for how it will grow and change – guided by a Strategic Plan that focuses on city building, economic vitality, environmental sustainability, social development, good governance, and fiscal sustainability – and that the potential disruption of AVs should be harnessed to advance this vision.

Driving Changes: Automated Vehicles in Toronto

Discussion paper

David Ticoll
Distinguished Research Fellow
Innovation Policy Lab
Munk School of Global Affairs
University of Toronto

October 15, 2015

UTTRI

The development of this workplan is a first step in tackling the uncertainty presented by AVs and preparing for any and all possible ways in which they might be introduced on streets in a significant way. This workplan also goes one step further, to begin to guide and influence the introduction of AVs with key strategies relating to the functions of Transportation Services, as well as serving as a model for more fulsome exploration across all services provided by the City of Toronto.

PURPOSE OF THE PLAN

The course ahead for municipalities is unclear; what is the best way to respond to autonomous vehicles? How do we navigate through this uncharted and continually changing territory? This plan intends to lay the groundwork for moving ahead, without predetermining the answers. The plan's goals and objectives are based on a strategy of being as technologically agnostic as possible to improve services in a manner that benefits today, but also facilitates improvements for tomorrow. This plan will create a framework that will prepare Transportation Services to take a leadership role in understanding the potential implications of automation, guiding policy analysis, and identifying ways to expand safe mobility for all users. Over the next three years, Transportation Services will focus on determining the role of a municipal transportation department in preparing for AVs, while taking a leadership role amongst the rest of the City of Toronto's divisions, agencies, boards, and commissions. Transportation Services will also prepare a foundation for automation, identifying opportunities to integrate AVs and their needs into both internal operations and public-facing services.

Public and Private Sector Roles in AV Development

As with most public policy issues, various orders of government will be involved and must work together to best serve the public interest. Regulations around the design and use of vehicles are spread across all three jurisdictions, as are responsibilities relating to the outcome of vehicle use. The table below illustrates current thinking on how AVs will be managed by all orders of government, as well as the lead roles likely to be taken by the private sector:

Area of Responsibility	Federal Government	Provincial Government	City of Toronto	Private Sector
Vehicle Safety and Emissions	X			
Vehicle Insurance and Licensing		X		
Vehicle Movement and Enforcement		X	X	
Supporting Infrastructure	X	X	X	
Communications, Security and Traffic Control	X	X	X	
Business Models and Commercial Applications		X	X	X
Public Transit Applications		X	X	X
Municipal Fleet Applications		X	X	X

LEADERSHIP AND ENGAGEMENT

To demonstrate leadership in guiding and influencing the arrival of AVs on Toronto's streets.

Objectives	2016	2017	2018
1.1 Internal			
1.1.1 Establish Transportation Services as the lead division for AV knowledge, preparedness, and coordination.			
1.1.1.1 Monitor developments in technology and policy, and share knowledge with other divisions.			
1.1.2 Establish an interdivisional working group to serve as a forum for discussion, collaboration, and coordination on AVs with representatives from key impacted City divisions.			
1.1.1.2 Identify potential opportunities and implications of AVs and potential mitigating options for other divisions.			
1.1.1.3 Lead the creation of the City's corporate vision and approach to AVs.			
1.1.1.4 Develop a SWOT analysis and workplan for all City divisions to prepare for AVs.			
1.1.3 Provide opportunities for City staff to learn about AVs.			
1.2 External			
1.2.1 Establish the City of Toronto as an international leader in municipal/local government AV preparedness.			
1.2.2 Establish a single point of contact for external agencies to engage with Transportation Services on AVs.			
1.2.3 Develop a communications strategy which includes key messages for all divisions, a public web space on toronto.ca, designation of spokespersons, and identification of key audiences to reach.			
1.2.4 Influence and guide the development and implementation of AVs by undertaking the following actions:			
1.2.4.1 Engage partner organizations and industry associations to jointly monitor and consider undertaking AV standards and policy development.			
1.2.4.2 Continue dialogue and partnerships with the Ministry of Transportation and Transport Canada to ensure consultation, coordination, and collaboration.			
1.2.5 Conduct a stakeholder mapping exercise to assess stakeholder interests and positions on vehicle automation.			

PREPARATION

To prepare for the arrival of AVs no matter when and how they are introduced and adopted.

Objectives	2016	2017	2018
2.1 Improve Understanding and Clarity			
2.1.1 Create and maintain a common lexicon of terms and concepts for consistent understanding among municipal partners.			
2.1.2 Identify and understand the broad range of potential opportunities and implications of AVs and in relation to achieving the City's Strategic Plan.			
2.1.3 Define the interests of Transportation Services in vehicle automation across all Divisional functions.			
2.1.4 Undertake public opinion research to assess and establish baseline attitudes toward AVs and how AVs may influence travel behaviour and modal choice.			
2.1.5 In partnership with the Organization for Economic Cooperation and Development's International Transportation Forum, undertake a modelling exercise to further develop and refine potential scenarios.			
2.1.6 Develop detailed scenarios – ranging from no change, to a completely new transportation paradigm – for consistent forecasting and planning pathways; use these scenarios on a scale of possible to probable.			
2.2 Prepare a Foundation			
2.2.1 Improve the management and function of traffic control elements.			
2.2.1.1 Develop asset management systems for signage and pavement markings.			
2.2.1.2 Review and consider the need for pavement markings on local streets.			
2.2.1.3 Improve the visibility of traffic control devices under all weather conditions.			
2.2.2 Research and investigate the potential costs and benefits, as well as methodologies and technologies, for broadcasting traffic signals.			
2.2.3 Research and investigate the potential role and implications of the introduction of non-passenger AVs.			
2.2.4 Work with mapping providers to investigate the potential for AV-supportive mapping to be conducted in Toronto, and determine the appropriate role for Transportation Services and the City.			
2.2.5 Begin to engage with technology providers, automobile manufacturers, and transportation network companies to discuss municipal preparations and potential pathways.			
2.2.6 Assess which parts of the Municipal Code could relate to AVs.			

INTEGRATION

To begin to integrate AV-supportive measures into the operations of Transportation Services.

Objectives	2016	2017	2018
3.1.Internal			
3.1.1 Assess potential opportunities and impacts of AVs in all Transportation Services topic-specific strategic plan updates, such as:			
3.1.1.1 Congestion Management Plan, HOV Network Plan, Transportation IT Strategic Plan			
3.1.1.2 Complete Streets Guidelines, Curbside Management Strategy, Road Safety Plan, Wayfinding Strategy, Cycling Network Plan, Walking Strategy			
3.1.2 Identify when AVs would need to be considered for new fleet procurement.			
3.1.3 Develop an AV-specific Open Data strategy for Transportation Services, including existing and potential data sources that could support the use of AVs.			

PROGRESS

Transportation Services has been closely monitoring the development of automated and autonomous vehicles since 2014, and hosted the City of Toronto's first formal discussion on the topic in March 2015. A half-day research workshop was conducted by the Canadian Automated Vehicles Centre of Excellence (CAVCOE) with representatives from more than a dozen divisions and agencies of the City.

From this first discussion, Transportation Services formed an internal working group to address automated vehicles, and engaged the University of Toronto to undertake further research. That partnership led to the creation of the "Driving Changes", along with a series of workshops in late 2015 that provided an opportunity for deeper discussion with staff from across the City.

Since then, heads of interested divisions have become further engaged in automated vehicle issues, and formally created an Interdivisional Working Group in June of 2016, under the leadership of Transportation Services. This Group will move the City of Toronto forward in assessing opportunities to lead, prepare, and integrate automated and autonomous vehicles with the services and operations of all divisions.

While efforts are coordinated across the City government, Transportation Services is moving forward to advance learning and development. Partnerships are in development with local, national, and international organizations, and the Provincial and Federal departments of transportation have been engaged. The division has also been reaching out to peer cities and organizations, in order to share learnings and jointly develop policy – such as the recently released policy recommendations by the National Association of City Transportation Officials (NACTO).

Preparing and integrating automated and autonomous vehicles into regional transportation systems is not something that can be done alone, but when all orders of government, and jurisdictions across the world, work together to advance the best possible future for urban mobility.

For more information, contact automatedvehicles@toronto.ca.