

MEMORANDUM

To: Members of Committee of the Whole

From: Ann-Marie Carroll
Acting Commissioner of Transportation Services

Date: August 13, 2021

Re: Canadian Urban Transit Research and Innovation Consortium National Smart Vehicle Joint Procurement Initiative

This memorandum advises Council that staff are investigating a partnership opportunity with the City of Markham to participate in the Canadian Urban Transit Research and Innovation Consortium (CUTRIC) National Smart Vehicle Joint Procurement Initiative (Initiative). This initiative is like the CUTRIC Pan-Canadian Electric Bus Trial and Integration Pilot, of which Council approved the Region's participation in [2017](#).

CUTRIC's objective is to help drive innovation in transportation across Canada, leading to job growth and economic development. CUTRIC conducts research, development and innovation work, including electric vehicle/bus technology and autonomous software.

The CUTRIC Initiative aims to standardize and deploy electric low-speed automated shuttle (e-LSAs) technologies and intends to deploy e-LSAs across multiple Canadian cities to achieve shared mobility applications for transit agencies and airport authorities.

An e-LSAs is a connected and autonomous vehicle shuttle that is an electric, self-driving vehicle, capable of sensing its environment using artificial intelligence, cameras, sensors and a global positioning system to drive itself without human input.

This initiative would support Council-approved strategic plans and documents, including Vision 2051, York Region Transit 2021- 2024 Strategic Plan, York Region Official Plan, Transportation Master Plan and Energy Conservation and Demand Management Plan.

York Region and City of Markham staff both completed autonomous vehicle feasibility studies, creating a partnership opportunity

In 2019, staff began researching connected and autonomous vehicle technology. A comprehensive industry scan was completed that included autonomous shuttle pilots undertaken in North America, technology and best practices, and evaluation of potential solutions and opportunities to pilot autonomous vehicle technology. Staff also held workshops and meetings with municipal partners, including the Cities of Markham, Vaughan and Richmond Hill.

The City of Markham initiated a study to help prepare a roadmap for an automated future, which includes planning for the use of automated technologies, automated vehicle shuttles and other related opportunities through pilots or permanent programs. As part of the study, a comprehensive review of background documents from the City of Markham, York Region and best practices from peer agencies was conducted, including a review of automated shuttle pilots undertaken in North America. The background review provided information and shaped the content of the City of Markham implementation plan.

Both studies identified Markham City Centre as a prime location to operate an autonomous shuttle pilot. This area includes high density residential along with desirable destinations such as employment, commercial, future York University Campus, PanAM Centre, and connections to YRT/Viva service and Unionville GO Station. The proposed pilot route area is shown on Attachment 1.

This pilot opportunity would be open to other interested York Region municipalities. Staff would work with local municipal partners to develop a feasibility study.

Participation in the CUTRIC pilot creates an opportunity to assess and potentially implement a full-service electric low-speed automated shuttle in Markham City Centre

Through participation in the pilot, staff would learn what is needed to implement and operate an e-LSAs in an urban environment informed by industry experts and lessons learned by several public and private organizations across North America. Anticipated learnings would include:

- Feasibility of operating an autonomous shuttle in mixed traffic and semi-dedicated lanes with permanent roadside infrastructure equipment, such as guiding magnets and communication systems
- Operational efficiency and cost savings that may result from fully-automated shuttles, i.e. reducing the need for conventional transit services to connect travellers to the greater YRT and GO Train services
- Pedestrian and traveller safety, including customer service and accessibility

- Environmental benefits, including noise and greenhouse gas emission reductions and a decreased need for parking at transit terminals
- Industry offerings related to technology, vehicles and operation and maintenance
- Vehicle and technology reliability throughout the various seasons
- Longer-term infrastructure needs, including but not limited to landscape design and roadway configuration
- Cyber security and data protection requirement
- Overall cost associated with the implementation of and e-LSAs pilot and potential funding opportunities
- Roadblock identification such a provincial and municipal laws

The implementation of electric low-speed automated vehicles is anticipated to be more complex than electric buses and the pilot could take several years to implement

For the remainder of 2021, CUTRIC, Regional and City of Markham staff propose to develop the pilot scope and identify legislative and local requirements. Funding opportunities would be identified and sought when available. Funding programs and timelines may be affected by upcoming elections. Transit has secured \$50K through the electric bus trial data analytics fund, which is identified for smart vehicle modelling.

As the project progresses, staff would continue to provide Council with updates. Reports would be provided where Council approvals are required.



Ann-Marie Carroll
Acting Commissioner of Transportation Services



Bruce Macgregor
Chief Administrative Officer

Attachment (1)

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