



CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
Transportation Operations & Maintenance Division

TO:	Chair and Members Public Works Committee
COMMITTEE DATE:	November 18, 2019
SUBJECT/REPORT NO:	Connected & Autonomous Vehicles Test Bed (PW19097) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Chris King (905) 546-2424 Ext. 5421
SUBMITTED BY:	Edward Soldo Director, Transportation Operations & Maintenance Public Works Department
SIGNATURE:	

RECOMMENDATION

That the General Manager of Public Works or designate be authorized and directed to execute, on behalf of the City of Hamilton, any agreements necessary to formalize the partnership between the City of Hamilton and the Centre for Integrated Transportation and Mobility to assist with their deployment of a Connected and Autonomous Vehicle Test Bed, in a form satisfactory to the City Solicitor.

EXECUTIVE SUMMARY

The Province's Autonomous Vehicle Innovation Network (AVIN), has selected Hamilton as one of six Regional Technology Demonstration Sites through the Innovation Factory's (iF) Centre for Integrated Transportation and Mobility (CITM) as a smart mobility site.

The CITM has proposed to implement a live urban test bed with state of the art sensors and communication equipment installed on municipal roadways (the "Test Bed"), with the area being utilized as a platform for testing, demonstration and innovation development.

The Test Bed is anticipated to be in operation in Q2 of 2020 and will allow start-ups and CITM partners to test technology in a live urban environment without impacting live city

OUR Vision: To be the best place to raise a child and age successfully.

OUR Mission: To provide high quality cost conscious public services that contribute to a healthy, safe and prosperous community, in a sustainable manner.

OUR Culture: Collective Ownership, Steadfast Integrity, Courageous Change, Sensational Service, Engaged Empowered Employees.

service. The Test Bed will also allow City of Hamilton staff an opportunity to have a first look at emerging technologies and consider future integrations into the traffic signal system and road network.

The purpose of this report is to give staff the authority to execute any necessary agreement(s) with CITM as well as to continue supporting CITM in the development of a Test Bed utilizing City roads and infrastructure.

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: N/A

Staffing: N/A

Legal: Legal Services will be required to assist in the preparation of the necessary agreement(s) with CITM. All agreements will be in a form satisfactory to the City Solicitor.

HISTORICAL BACKGROUND

In 2016 the Ministry of Transportation passed Regulation 306/15: Pilot Project – Autonomous Vehicles allowing for the testing of autonomous vehicles in Ontario. Vehicles with SAE Level 3 technology (Conditional Automation: the vehicle becomes a co-pilot and manages most safety-critical driving functions, but the driver must be ready to take control of the vehicle at all times) can be driven on any Ontario roads.

As the province continues to focus on innovation in the realm of Connected and Autonomous Vehicles (“CAV”), Hamilton is well positioned to capitalize on the opportunity to become a leader, particularly given McMaster University’s extensive experience in this area which includes one of the largest automotive electrification programs in North America.

Hamilton’s Regional Innovation Centre, the Innovation Factory’s (iF) Centre for Integrated Transportation (CITM) chose to focus their centre on “mobility and goods movement”.

The AVIN program, announced by the Province in 2017, builds upon Ontario’s position as a world-leading automotive manufacturing and supply jurisdiction, in addition to the large cluster of information and communication technology companies operating in the province. The AVIN initiative represents an investment of \$10.5 million in the community from the Province and industry. Through resources such as research and development

funding, talent development, technology acceleration, business and technical supports and demonstration grounds, AVIN provides a competitive advantage to Ontario-based CAV companies, allowing Ontario to reinforce its position as a North American leader in transformative automotive technologies, as well as transportation and infrastructure systems.

The CITM engaged the City of Hamilton to participate in this project in the fall of 2018.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

N/A

RELEVANT CONSULTATION

City of Hamilton Legal Services, and the Chief Digital Officer, in addition to the CITM, were consulted in the preparation of this report.

ANALYSIS AND RATIONALE FOR RECOMMENDATIONS

The CITM provides advisory services and resources to Ontario-based start-ups and small-to-medium sized enterprises. CITM aims to accelerate the development of CAV's, multi-modal and integrated mobility technology solutions.

The CITM smart mobility program is intended to support the commercialization of CAV system technologies, while helping Ontario plan for emerging related technologies. With this comes the additional opportunity to support provincially funded research and development pilots within the city, as well as leveraging the CITM's Smart City assets for additional test cases.

Part of the CITM smart mobility program includes the development of a Test Bed on public roads (the "public Test Bed"). The public Test Bed incorporates a vehicle to vehicle communication network as well as several other types of sensors.

The public Test Bed, is proposed to be generally located along the following roads:

- Stone Church Road from Upper Gage Avenue to Dartnall Road;
- Rymal Road from Upper Gage Avenue to Dartnall Road;
- Upper Gage Avenue from Stone Church Road to Rymal Road;
- Upper Ottawa Street from Stone Church Road to Rymal Road; and
- Dartnall Road from Stone Church Road to Rymal Road.

While this report focuses on the public Test Bed, CITM is also working to implement a private test bed located at the McMaster Innovation Park and Can-Met building which will be deployed in advance of the public Test Bed. CITM is anticipated the public Test

Bed will be operational in Q2 2020. The public Test Bed is currently funded by AVIN until 2022. Additional AVIN funding is being released on a yearly basis. It is anticipated that the public Test Bed will continue until funding expires.

This public Test Bed will allow start-ups and CITM to test communication and sensor technology in a live urban environment without impacting live city service. Examples of such technology include:

- Artificial intelligence (“AI”) to analyze data and interactions between vehicles, pedestrians and cyclists;
- AI and sensors to analyze types of vehicles and usage patterns along the public Test Bed;
- Noise tracking technology;
- Vehicle to vehicle communication testing;
- Vehicle to infrastructure communication testing; and
- Smart traffic signal technology.

Regarding the data collected by the equipment on the public Test Bed, safeguards will be in place to ensure no personally identifiable data will be collected. Such safeguards will form part of any agreement(s) between the City of Hamilton and CITM. CITM will own the collected data and such data will be accessible to the City and other third-party stakeholders. The manufacturer of the equipment will only have access to data that is required for purposes of evaluating the performance of the equipment.

More use cases will be defined as innovators invent new products, services and as CAV and communication technologies are developed and solidified.

The public Test Bed project will provide the City of Hamilton with:

- The ability to better understand the requirements, impacts, risks and the opportunities/benefits of future technology integration into the City of Hamilton’s Advanced Traffic Management System (ATMS) and Traffic Signal Network;
- The potential to integrate the City of Hamilton’s ATMS into the public Test Bed once the public Test Bed is deployed (based on the above);
- A better understanding of the data and communication requirements and capabilities as they relate to CAV technology, smart traffic signal technologies and vehicle to infrastructure communications;
- The opportunity to experience and assess emerging CAV technologies and their applications and capabilities in real world conditions. This includes how such technologies will benefit and impact the public and the City of Hamilton in the near and long term;
- The opportunity for the City of Hamilton to be on the forefront of testing current and emerging Smart Mobility technologies; and

- The opportunity for the City of Hamilton to retain all public Test Bed equipment at the end of the AVIN funding period.

The public Test Bed will require CITM to install hardware on City owned street lighting and traffic poles, which will require an agreement to be executed detailing the use of City assets. CITM is currently investigating the logistics of implementing the public Test Bed in coordination with HCE Telecom, Alectra and City of Hamilton staff. Although the public Test Bed will initially operate independent of the City of Hamilton's ATMS, staff will investigate opportunities to integrate the public Test Bed technologies with the ATMS during the project.

This project is managed and will be implemented by the CITM. Any costs to the City, relating to the deployment, maintenance and operation of the Test Bed, will be covered by the CITM. Approved capital funding is available if an integration of City systems (i.e. The ATMS/Traffic signal system) occurs during the project.

As a result, an agreement between the City of Hamilton and Innovation Factory is required for the installation and maintenance of the technology on City of Hamilton infrastructure along the public Test Bed.

ALTERNATIVES FOR CONSIDERATION

N/A

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Economic Prosperity and Growth

Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Built Environment and Infrastructure

Hamilton is supported by state of the art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

APPENDICES AND SCHEDULES ATTACHED

None