

Clause 5 in Report No. 6 of Committee of the Whole was adopted, without amendment, by the Council of The Regional Municipality of York at its meeting held on April 19, 2018.

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Partnering with University of Toronto and Other Agencies to
Prepare for the Future of Transportation in the Region

Committee of the Whole recommends adoption of the following recommendations contained in the report dated March 23, 2018 from the Commissioner of Transportation Services:

1. Council authorize the Commissioner of Transportation Services to provide funding to the University of Toronto's iCity Centre for Automated and Transformative Transportation Systems at a cost of \$75,000 per year to a total of \$300,000 over four years.
2. The Regional Clerk circulate this report to the clerks of the local municipalities.

Report dated March 23, 2018 from the Commissioner of Transportation Services now follows:

1. Recommendations

It is recommended that:

1. Council authorize the Commissioner of Transportation Services to provide funding to the University of Toronto's iCity Centre for Automated and Transformative Transportation Systems at a cost of \$75,000 per year to a total of \$300,000 over four years.
2. The Regional Clerk circulate this report to the clerks of the local municipalities.

2. Purpose

This report seeks Council authorization to fund a multi-year partnership with the University of Toronto's iCity Centre for Automated and Transformative Transportation Systems (iCity-CATTS) as part of a coordinated action plan to

prepare the Region for the impacts of technology on transportation. The iCity-CATTS Study (Study) also supports work the Region has already initiated to prepare for changes in transportation technology as well as initiatives in the approved 2016 Transportation Master Plan (TMP). This will impact the Region's role as a service provider, through York Region Transit, and as a transportation network owner. This may also potentially impact the way our communities function.

3. Background

Advancements in technology are rapidly transforming the way people travel in the Region

The way people travel in the Region is changing as a result of new technology as it affects the way travellers obtain information before or during their travel, the options for travel and the types of vehicles available. Travellers now have access to better information to assist in commuting throughout the Region. Smartphone applications, such as Waze or Apple Maps, provide travellers with real-time traffic information that can be used to make more informed travel choices whether by car, bus or cycling. These applications can also provide real-time information about traveller behaviour, which can be collected and shared to better plan future transportation investments.

In order to support these advancements, there is a critical need for access to high-speed and reliable internet that allows for the transfer and sharing of data between vehicles and infrastructure. The York Telecom Network (YTN) provides a network of broadband communications infrastructure to help share and store data. This infrastructure and connectivity allows the adoption of autonomous and connected vehicles within the Region to be more viable and will further support the Region as a Smart City.

Options for travel have also improved. Mobility-as-a-service refers to the concept of not owning a car but having access to on-demand travel through services such as Uber or Lyft. Mobility-as-a-service can also extend to other types of travel such as bike sharing, which is currently available in Toronto. With the exception of bike sharing at this time, these services are becoming more available and increasingly popular throughout the Region.

The types of vehicles travellers are using are also rapidly changing. Electric vehicles and alternative fuels are becoming more common, which may impact supporting infrastructure such as more charging stations and fewer gas stations. As an example of the Region's role as service provider, York Region Transit is piloting an electric bus in the Town of Aurora and City of Vaughan in 2018.

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The use of connected vehicles (those that can communicate with each other and infrastructure) and autonomous vehicles (those that control driving functions without input from the driver) is increasing, with testing of these vehicles permitted throughout the province. These changes have the potential to revolutionize the way we travel and the Region needs to be prepared for the potential impacts to the transportation network.

The Region is preparing for the future of transportation through a coordinated action plan

The Region acts both as a transportation service provider, through York Region Transit, and as an owner of the Region's transportation network. A coordinated action plan has been initiated to ensure the Region is prepared for the future of transportation. The plan includes four streams of action:

- Testing new technology in the field. An example is York Region Transit vehicles that are now communicating with traffic signals along a section of Jane Street through digital short range communications, which is the next advancement of Bluetooth. New technology has also been installed on Regional snow plows to minimize delays to traffic as the new rapidways are cleared of snow.
- Improved integration of transportation needs with land use policy decisions that support the future vision of the Region. There is an opportunity with the current Municipal Comprehensive Review process to update the transportation vision and land use planning policies with the implications of new technology.
- Create partnerships to leverage shared resources in response to new technology. Examples include a partnership with Waze, a community-based traffic and navigation application company, to provide more accurate information on the Region's road network. The Region is also a partner in the Municipal Alliance for Connected and Autonomous Vehicles in Ontario, an organization bringing together municipalities to facilitate connected and autonomous vehicle research, testing and integration within their respective jurisdictions.

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- Engage in academic research to better understand the possible impacts of new technology. Better understanding the impacts of new technology will inform transportation decisions to support growth and service delivery as recommended in the 2016 TMP. This is the stream that will be enhanced through the work being undertaken by the University of Toronto on the iCity-CATTS Study.

4. Analysis and Implications

The iCity-CATTS Study will help prepare the Region for the future of transportation

The University of Toronto Transportation Research Institute created the iCity Centre of Automated and Transformative Transportation Systems to bring together academia from the private and public sector to study the impacts of transformative transportation technologies. The partnership includes York Region, the Regions of Peel and Waterloo, the Cities of Mississauga and Toronto and academic, public sector and industry partners.

The Study will allow the Region to better understand and respond to the following questions:

- How will technology changes affect the Region?
- What is government's role?
- What does the Region need to do to prepare?
- What are the planning policy implications?

The Region can leverage this partnership to gain access to data, research and other partnerships that would be significantly more difficult to obtain if working alone. The findings from the study will help to guide important transportation policy and planning decisions for investment in infrastructure.

The Study outcomes will support the future transportation vision in the Region

The Study includes numerous projects over a five-year period that will develop tools. These include applications and smart infrastructure management, models that will measure the impacts of new transportation technologies on the Region's infrastructure and communities and a policy framework to guide the adoption of transportation technologies in the Region. The Study supports the five objectives of the 2016 Transportation Master Plan to deliver a multi-modal network and

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outcomes will assist Regional staff with implementing TMP action plans and developing the future transportation vision, including:

- Advancements in new logistics may inform policy decisions and strategies related to efficient movement of goods
- Data from new transportation models supporting first-mile and last-mile trips, such as car-share or bike-share models, may influence decisions regarding the need for parking

The Study is a key part of the Region's coordinated action plan that will initiate conversations with key stakeholders, advance discussions on policy requirements and gather industry insight. The Study will be led by a Steering Committee, comprised of representation from all partners, who will meet one to three times annually. Study progress and outcomes will be shared with the Steering Committee in the form of presentations or reports. Input and recommendations from the Committee will be considered by the Study's project team. The Steering Committee will also be made aware of potential opportunities to participate in pilot or field tests. Partners will also be invited to annual research days held throughout the year to share findings.

Staff will report back on key milestones of the Study and will work with partners in Planning and Economic Development to align initial findings with the Municipal Comprehensive Review, Regional Official Plan and future transportation vision for the Region.

Technology changes are going to affect transportation in the Region

New technology creates more questions than answers with respect to the impact on transportation, including:

- Will autonomous vehicles increase the number of vehicles on the road as residents who currently cannot drive, may now own a vehicle?
- Will autonomous vehicles increase demand for urban sprawl as commuters are able to use their commute times more productively?
- Will car ownership decrease as more residents become comfortable with the idea of mobility-as-a-service that may reduce the demand for parking?

The Study with the University of Toronto will help to better understand which technology advancements will have the greatest effect and what they mean for the future of the Region's transportation system.

Government has a role in supporting new transportation technology

Cities are using technology advancements to address congestion, create more dynamic, inter-connected and efficient transportation systems with increased potential for safety and cost savings. In Columbus, Ohio, digital short range communication units are being installed on traffic lights at intersections along heavily travelled corridors and city fleet. Operators can receive safety alerts, such as reduced speeds in school safety zones, increased pedestrian traffic, and collision and traffic incidents, resulting in improved operations and reduced emergency response times. The data collected from the units is shared with the City's traffic management center to optimize and improve traffic operations. It will not be long before the Region's infrastructure has these same capabilities.

Other jurisdictions are using ride-sharing companies as a revenue stream. In Chicago, a 15-cent fee on Uber, Lyft and other ride-sharing services is helping to pay for track, signal and electrical upgrades to make the City's trains run faster and smoother.

Uber and Lyft services are well-established in many Ontario municipalities, including York Region, and on-demand transit service, such as Uber-Pool, has been piloted in neighbouring Simcoe County as an alternative to implementing conventional transit service.

The Region needs to prepare for the Municipal Comprehensive Review, Regional Official Plan Update and updates to Vision 2051

Municipalities are quickly facing complex challenges associated with new transportation technologies ranging from new regulatory requirements, safety measures, ethical decisions, and service delivery options. York Region, along with other municipalities and government agencies, has a valuable role to play through the development of policies, guidelines, standards and regulations to best serve the interests of the travelling public. These advancements will need to be reflected in the MCR, Official Plan and review of long range goals articulated in Vision 2051.

As an example, the proposed permission to test driverless vehicles on all public roads, including Regional roads, requires research and studies to better understand the impacts to our infrastructure, transportation system and travel behaviour. As well, maintaining the privacy and security of traveller data collected, processed or stored on Regional facilities requires thorough investigation and planning.

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Understanding the technologies and how they will be applied is important to develop appropriate policies and tools to adapt current planning and operations to changing technology.

Funding the University of Toronto partnership allows the Region to cost-effectively leverage expertise and industry innovation

Investment in the iCity-CATTS Study is an opportunity to work with partner municipalities, leading-edge institutions, organizations and skilled researchers that will better position the Region to prepare for and be equipped to respond to advanced transportation technologies and the unknown impacts they bring. Working with these partners provides access to research and options that would otherwise not be accessible to the Region.

The Study includes numerous projects over a five-year period to develop a policy framework and tangible tools that will help the Region prepare for the impacts of technology. The investment in the Study supports the Region's initiatives to leverage technology to enhance transportation operations and safety by:

- Understanding how to leverage new technologies that will improve the management of travel across the Region and the Greater Toronto Area network
- Identifying the role of transit, while making non-conventional transit options more viable
- Leveraging additional data sources to improve the condition of our existing and future infrastructure assets to gain a better understanding of infrastructure needs to support new services
- Leveraging investment in Regional telecommunications infrastructure that will facilitate the sharing of real-time information for staff, residents and businesses

Funding of the research will be based on key principles that will guide the ongoing partnership

The iCity-CATTS Study funding will be based on key principles to protect the Region's investment in research of this strategic nature. The Region can decide to opt out of this commitment at any time. Staff will conduct an annual review of the research program to ensure the Region's needs are being met. The review will ensure that:

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- The data, findings and outputs of the research are accessible and can be used by York Region, as required by staff and/or Council
- York Region is identified as a key partner in the research program
- Regional data will not be sold or used by the University of Toronto iCity-CATTS for monetary gain

Investing in a research partnership with the University of Toronto supports the goals of Vision 2051, the objectives of the Strategic Plan and Municipal Comprehensive Review

Understanding the impacts of transportation technologies supports the goals of Vision 2051 of Creating Interconnected Systems of Mobility and Healthy Communities. The Study will help guide the planning, design and operation of our transportation network to move people more efficiently, safely and seamlessly across various modes. The objectives of the 2015 to 2019 Strategic Plan are also supported, including Strengthening the Region's Economy, Managing Environmentally Sustainable Growth and Providing Responsible and Efficient Public Service. The data and recommendations from the Study will also inform the Municipal Comprehensive Review and updated vision for the Region.

5. Financial Considerations

The financial contribution towards the University of Toronto iCity-CATTS research program provides access to research

A financial contribution of \$75,000 per year for four years, to a maximum of \$300,000, is reserved in the Transportation Services budget, starting in 2018, subject to Council's authorization of the partnership. The option to increase the term of partnership to five years is possible, subject to the next multi-year budget in 2023. The financial contribution represents good value based on past assignments the Region has procured for similar policy, transportation and infrastructure planning projects.

The iCity-CATTS research program is also eligible for fund matching from the Province through the Ontario Research Fund

In September 2017, iCity-CATTS submitted the Study to the Ontario Research Fund under the category of "Research Excellence". The Ontario Research Fund provides research institutions with funding to help support the operational costs of large-scale transformative research considered to be of strategic value to the Province. The Province will match a maximum one-third of the total cost of the

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project, between \$1 million to \$4 million. To date, the iCity-CATTS and its partners have committed a total financial contribution of approximately \$4 million, with some partners still confirming contributions. Announcement of the successful Ontario Research Fund applicants is anticipated by summer 2018.

6. Local Municipal Impact

Recommendations and tools can support integrated Regional and local municipal planning initiatives

In addition to supporting and improving Regional services, the deliverables of the Study, including modelling outcomes, tools and policy recommendations, can also be used to improve local municipal services and create healthier, resilient and adaptive communities. Information will be shared with local municipalities through regular meetings, such as the Public Works Liaison Committee.

7. Conclusion

Technology is rapidly transforming the way people travel, the types of vehicles people use and infrastructure that is used to travel. The Region is preparing for the future of transportation through a coordinated action plan including field testing, partnerships and academic research. Working with the University of Toronto is an opportunity to advance academic research for the Region.

The findings of the research will help prepare the Region for the impacts of technology on transportation systems and communities and inform future investments. Funding will be based on key principles that will guide the ongoing relationship. Investing in a research partnership with the University of Toronto supports the goals of Vision 2051 and the objectives of the Strategic Plan.

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For more information on this report, please contact Brian Titherington at 1-877-464-9675, ext. 75901.

The Senior Management Group has reviewed this report.

March 23, 2018

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