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City of Guelph Transportation Master Plan

Program Charters

November 2021 – 18-8919

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Glossary of Terms

- A -

Active Transportation – The transport of people or goods through human-powered means, including walking, cycling and skateboarding.

Active Transportation Network – On-road and off-road infrastructure network for pedestrians and cyclists.

All Ages and Abilities (AAA) facilities – Bicycle facilities which are comfortable and attractive to use for people of all ages and abilities (including barrier-free, age-friendly, and universal design), with an additional focus on intersection safety.

- C -

Complete Streets Design Guideline – A guide that provides policy and design guidance on the planning, design, and operation of roadways to help implement the City's Official Plan vision for complete streets and other city building objectives.

Cycling Spine Network – A network of cycling routes with high-quality on-street cycling facilities that connect all areas of the City, and designed to support and encourage cycling by people of all ages and abilities. These spine routes represent the core of the City's larger cycling network.

- G -

Goods Movement Strategy – A strategy to help determine the transportation infrastructure improvements need to be made to help the support the goods movement industry.

- I -

Intelligent Transportation Systems – A combination of information and communication technologies used in transportation and traffic management to improve the safety, efficiency, and sustainability of transportation networks, reduce traffic congestion, and to enhance drivers' experiences.

Internet of Things (IoT) – Interconnection of everyday devices via the internet.

- L -

Level of Service (LOS) – A qualitative measure used to determine how well a transportation facility is operating.

Low-Impact Development – A planning and engineering approach to storm water management to minimize storm water runoff and filter, store and return rainwater and snow melt to the ground

- M -

Major Transit Station Areas (MTSA) – The area including and around any existing or planned higher-order transit station within a settlement area, or the area including and around a major

bus depot in an urban core. Station areas generally are defined as the area within an approximate 500 metre radius of a transit station, representing about a 10-minute walk.

Micromobility – Refers to the use of light vehicles that can carry one or two passengers at a time, such as bicycles, scooters, and even small vehicles. Micromobility can be human-powered or powered by an electric motor.

Micro-transit – a form of demand responsive shared transport that offers flexible routing and/or scheduling.

Mobility-as-a-Service (MaaS)– An emerging user-oriented philosophy that takes advantage of digital platforms and real-time data to get a user of the service from point A to point B in the most convenient and personalized way possible for one single fee. MaaS leverages modern transportation options to optimize personal mobility. When planning a route, MaaS platforms can link transit, ride-hailing, car-sharing, micromobility, walking, and more to create one seamless trip for the user of this service.

Multimodal Level of Service Guidelines – A guide that provides policy and design guidance on the planning, design, and operation of roadways and intersection to help implement the City’s Official Plan vision for complete streets. It provides guidance on how to assess the *levels of service* for various modes of transportation and their impacts, and what the specific target service levels for each mode should be given the location and context the transportation project.

- O -

Official Plan – Sets out the City’s vision and goals for the future, and describes policies on how land in the City should be used. The Official Plan helps to ensure that future planning and development will meet the specific needs of your community.

- P -

Park-and-Ride facilities – Parking lots with public transport connections that allow commuters and other people to leave their vehicles and transfer to a bus, rail system, or carpool for the remainder of the journey.

Pedestrian Priority Network – A network of wide sidewalks and high-quality walking environments in areas of highest pedestrian activity in the city, such as Downtown Guelph, designed to support and encourage walking for people of all ages and abilities.

- S -

Smart signals – Traffic signals at intersections that detect traffic conditions and automatically adjust operations to optimize flow.

- T -

Transportation Demand Management (TDM) – A series of policies, programs and incentives intended to influence whether, when, where and how people travel, and encourage them to make more efficient use of the transportation system.

Transit Priority Measures – A collection of techniques and tools to reduce delay for public transit vehicles.

Transportation Systems Management (TSM) – uses operating strategies to increase capacity on the road network without increasing its physical size. Transportation system management includes measures such as transit signal priority at intersections, signal coordination, or dedicated lanes for high-occupancy vehicles.

-V-

Vision Zero – a global movement based on a safe systems approach to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all.



CITY OF GUELPH TRANSPORTATION MASTER PLAN
Active Transportation Program

November 2021 – 18-8919

1.0 Active Transportation

1.1 Definition

Active Transportation requires a person to move themselves to a destination through non-motorized means. Examples of active transportation include, walking, cycling, scooting, and rollerblading. It can also include electric-powered bicycles, scooters and other 'micro-mobility' devices that require human power to move them.

1.2 Background

1.2.1 Purpose

The City aims to reduce greenhouse gas emissions, promote healthy, active living amongst residents, and manage vehicle congestion. To achieve these goals, the City focuses on providing easily accessible active transportation infrastructure and resources.

1.2.2 Goal

The goal of Active Transportation Program is to support the mobility needs of a community in a manner that least damages the environment, while also balancing current and future transportation needs. The main actions include:

- Increase walking mode share target to 15% by 2051;
- Increase cycling mode share target to 10% by 2051;
- Design new and transform existing streets and pathways to meet All Ages and Abilities (AAA);
- Promote, facilitate, and design for micro-mobility;
- Update and implement the Cycling Master Plan, *Active Transportation Network* and Pedestrian Master Plan;
- Increase bicycle parking throughout the Downtown and other commercial/employment centres;
- Develop a comprehensive list of active transportation initiatives currently underway in the City;
- Support efforts to reduce annual community greenhouse gas emissions by 60% from 2007 levels to 7 tonnes of carbon dioxide (equivalent) per capita by 2031;
- Support City efforts toward 100% renewable energy for all City facilities and operations by 2050;
- Form partnerships and support advocacy groups to enhance cycling; and
- Fill connectivity gaps within the active transportation network.

1.2.3 Program Description:

Active transportation is part of the sustainable transportation group at the City of Guelph. The Active Transportation Program supports the mobility needs of a community in a manner that is the least harmful to the environment as possible, while also providing equitable and affordable options for getting around. The Active Transportation program is responsible for implementing context-appropriate cycling and pedestrian infrastructure for road corridors and intersections in the city to complete the planned cycling and sidewalk networks.

The mandate also includes data collection and analysis, network planning, policy development and development review. Active Transportation staff coordinate with Public Works, Parks Planning and Engineering Services regularly to implement the various master plans under its supervision.

The Active Transportation program was initiated with the City's 2013 Cycling Master Plan, and expanded to include the Active Transportation Network and Sidewalk Needs Assessment plans, along with the coordination efforts with other City departments to implement these plans.

In future, the Active Transportation Program will also encompass other forms of *micro-mobility* such as push-scooters and other technologies.

1.3 TMP Objectives for the Program

This section provides an overview of the key objectives the City should fulfill for the future of the Sustainable transportation program.

- Coordinate data collection to support evidence-based policy and planning decisions
- Coordinate the implementation and update of the various plans for active transportation, such as the cycling master plan, pedestrian plan and active transportation network with (Policies 1.1, 2.1.1.2, 2.1.1.3, and 2.1.1.7)
- Incorporate an equity lens into active transportation planning and strategy
- Provide input into road design projects to facilitate implementing the various active transportation networks
- Provide input into city policies such as master plans, zoning by-law, and secondary plans to support the goals of the Transportation Master Plan (TMP) for active transportation
- Review development applications and subdivision applications to ensure compliance with Official Plan and TMP policies that support active transportation
- Deliver *Multimodal Level of Service Guidelines* and *Complete Streets Design Guidelines* (Policy 1.2.1.2)
- Support efforts to expand winter maintenance of the *Cycling Spine Network* and active transportation network (Policy 2.1.2)

1.4 Potential Partnerships

- Community advocacy groups;
- Seniors associations;
- Guelph-Wellington Local Immigration Partnership;
- *Micro-mobility* service providers such as bike-shares or scooter-share programs;
- Local public health agency;
- Other levels of government for infrastructure funding opportunities;
- Chamber of Commerce; and
- Internal partnerships: Economic Development and Tourism, Solid Waste (bike reuse program), Public Works (maintenance and operations), Trails (off-road connectivity).

1.5 Resource Requirements

It is important to reflect the mode share targets in the proportionate staff and budget resourcing for the sustainable transportation program.

There are currently ten full-time positions in Transportation and Engineering Services dedicated to ensuring road design and traffic operations are maintained to support the current mode share of 80% of daily trips made by car. Two full time positions are currently dedicated to sustainable transportation, one of which is fully dedicated to Active Transportation and the other who offers some support but focuses on Transportation Demand Management (Chapter 2).

To support the mode shift to sustainable modes, it is recommended to grow the Sustainable transportation program staff complement between now and 2051 to six full-time positions. Two of these positions would be for supporting the planning, design, construction and use of active transportation facilities.



CITY OF GUELPH TRANSPORTATION MASTER PLAN
Transportation Demand Management (TDM) Program

November 2021 – 18-8919

2.0 Transportation Demand Management (TDM)

2.1 Definition

Transportation Demand Management (TDM) is a term used to describe a suite of initiatives aimed at reducing traffic volumes (demand) on the road network, particularly in the commuter peak hours, by targeting driver behaviour and mode choice. It is different than *Transportation System Management* (covered in Chapter 4.0), which focuses on reducing traffic volumes through physical changes to infrastructure.

TDM include such broad strategies as:

- Influencing how people travel and what mode they choose
- Influencing when people travel to reduce congestion during peak hours
- Influencing where people travel through land use and transportation planning decisions

Approaches to TDM include education, marketing and outreach, policies, development/land use, and travel incentives/disincentives.

2.2 Background

2.2.1 Purpose

TDM is the active management of travel demand in a transportation system to increase system efficiency and achieve a variety of objectives, such as reducing greenhouse gases or improving congestion, by influencing how, why, when, and where people travel. It is an economical and efficient way to maximize the return on investment for transportation services and infrastructure.

2.2.2 Goal

The goal of the Transportation Demand Management (TDM) program is to reduce congestion and shift more trips to sustainable options like walking, cycling, and taking the bus. The main actions include:

- Supporting the TMP's mode share target of 40% by non-auto modes by 2051;
- Develop robust TDM guidelines for development application approvals;
- To influence the shape of development, develop a TDM checklist for development applications;
- Incorporate an equity lens approach to TDM planning and strategy (Policy 3.1.2.2)
- Deliver effective communications and marketing about TDM ;
- Engage with businesses and organizations to encourage the development of TDM programs;
- Support the development and maintenance of a Connectivity Index to track the multimodal connectivity of the City's transportation networks; and
- Develop a comprehensive list of TDM initiatives currently underway in the City.

2.2.3 Program Description

The program targets education and outreach efforts related to walking and cycling, carshare and carpooling. It also participates in development application review to ensure new

development is built according to the Official Plan policies to support sustainable transportation and reduce trip generation where possible.

The 2005 Guelph-Wellington Transportation Strategy led to the creation of the TDM program in 2006. The program has covered educational outreach activities in schools and employers, This section reviews the TDM program in Guelph today, which operates as part of the larger Sustainable transportation program. This program is run by staff from Engineering and Transportation Services.

Both Guelph's *Official Plan* and the 2005 Guelph-Wellington Transportation Study mandate the development of a TDM program. As a result, the existing TDM program was launched in 2006 under the direction of the sustainable transportation program. Below are examples of a few of the initiatives.

Active and Safe Routes to School

Public Health and the TDM group have been co-leads on the Active and Safe Routes to School initiative since 2006. The consortium of stakeholders overseeing this initiative also includes local school boards and Guelph Police Service. As part of the initiative, the TDM group helps develop school travel plans and walk to school programs.

Development Reviews

The TDM group also helps apply a TDM lens to development reviews. Members of the TDM group review site layout and site-specific context in order to inform comments on site plans and development applications. They then use an internal TDM checklist to identify and recommend additional TDM measures if required (e.g. adding bicycle parking, limiting car parking).

In the future, the TDM program has a goal of providing more TDM resources to developers. It also intends to launch a TDM strategic plan that will provide context-sensitive strategies for different areas of Guelph, including industrial areas, institutional areas, and downtown. The strategic plan will identify performance metrics that will be regularly reported to identify the initiative's progress and areas for improvement.

Carshare

The TDM groups works with local carshare providers to help find convenient locations for them to park, and promote these services to the community.

2.3 TMP Objectives for the Program

This section provides an overview of the key objectives the City should fulfill for the future TDM program.

- Develop a comprehensive TDM strategic plan to guide the work of this program
- Update and implement TDM strategies that reflect the needs and opportunities of the community to achieve the TMP's mode share targets and maximize the efficient use of existing transportation infrastructure

- Form partnerships and support community collaborations to facilitate sustainable transportation and TDM initiatives
- Implement a coordinated branding, marketing and wayfinding strategies with active transportation, transit and trails
- Ensure that TDM is disseminated and effectively communicated to both Guelph staff, council and residents. (Policy 5.1.2.7)
- Ensure land use and urban design sustainable transportation include appropriate TDM measures through the development review process (Policy 5.1.2.7)
- Support the City's net zero carbon target by encouraging low or zero-emission transportation options including carsharing, ridesharing, and transit (Policy 5.4.2.1)
- Develop and maintain a TDM checklist for development applications (Policy 5.1.2.7)
- Increase the amount of park and ride and rideshare facilities near transit facilities
- Investigate micro-mobility options (Policy 5.6.1.1)
- Collaborate with regional TDM programs to support inter-city travel

2.4 Potential Partnerships

- School boards;
- University of Guelph and Conestoga College;
- Chamber of Guelph and Downtown Guelph Business Association;
- Guelph-Wellington Local Immigration Partnership;
- Large employers / Chamber of Commerce;
- Local environmental and transportation-related organizations;
- Our Energy Guelph;
- Internal partnerships: Economic Development and Tourism;
- Community advocacy groups;
- SmartCommute / Travelwise and
- Carshare providers

2.5 Resource Recommendations

It is important to reflect the mode share targets in the proportionate staff and budget resourcing for the sustainable transportation program. There are currently ten full-time positions in Transportation and Engineering Services dedicated to ensuring road design and traffic operations are maintained to support the current mode share of 80% of daily trips made by car. Two full time positions are currently dedicated to sustainable transportation.

There is currently one position dedicated to Transportation Demand Management, with some duties to support the Active Transportation program as well. To support the mode shift to sustainable modes, it is recommended to grow the Sustainable transportation program staff complement between now and 2051 to six full-time positions. Two of these positions would be for supporting the Transportation Demand Management program.



CITY OF GUELPH TRANSPORTATION MASTER PLAN
Strategic Transportation Planning Program

November 2021 – 18-8919

3.0 Strategic Transportation Planning

3.1 Definition

Strategic Transportation Planning is the process of designing the transportation network, facilities, and services to align with the Vision and Goals of the TMP. Strategic Transportation Planning requires a strong understanding of the impact of social and economic aspects that impact how, when, and why people move.

3.2 Background

3.2.1 Purpose

Strategic Transportation Planning is required to ensure population and employment growth can be accommodated by the transportation network. It considers regional and provincial policy and development impacts on the local transportation network.

3.2.2 Goal

The goal of Strategic Transportation Planning is to ensure people and goods can move safely and effectively throughout the City. It will inform policies, development and road design decisions through the collection, analysis, and interpretation of multimodal transportation data.

The main outcomes include:

- Confirm and prioritize streets, trails, and routes for improvements in the Capital budget;
- Develop a *Complete Streets Design Guide* to guide all future street design by 2023;
- Develop a *Multimodal Level of Service* Guideline to evaluate the multimodal performance of streets by 2023;
- Develop a comprehensive *Goods Movement Strategy*;
- Maintain the City's Travel Demand Forecasting Model;
- Approach transportation planning with an equity lens;
- Support the required studies and assessments to implement TMP road network improvements; and
- Ensure development is compatible with the road network and transportation safety regulations and guidelines.

3.2.3 Program Description

The City's (Strategic) Transportation Planning group is currently responsible for:

- Maintaining the City's Travel Demand Forecasting Model;
- Leading all transportation network planning studies and corridor studies / Environmental Assessments
- Providing City input to network planning studies and corridor studies/ Environmental Assessments that are of interest to the City that are led by others (e.g., Metrolinx, the Ministry of Transportation of Ontario, County of Wellington)
- Providing transportation planning expertise on multi-disciplined City projects (e.g., the Clair-Maltby Master Servicing Plan, the Downtown Secondary Plan, etc.)

- Review development applications to ensure the road network and road geometrics can support the development and that safety standards are met

Guelph has already begun implementing and incorporating many Transportation Planning network trends including complete streets, complete networks, place-making for transportation corridors, and equity-based initiatives.

3.3 TMP Objectives for the Program

This section provides an overview of the key objectives the City should fulfill for the future Transportation Planning program.

- Prepare and maintain the Comprehensive *Goods Movement Strategy* (Policy 4.1.1)
- Prepare and maintain a City-wide guideline for preventative road safety measures (Policy 5.3.1)
- Develop a city-wide strategy for roundabouts (Policy 5.3.1.3)
- Ensure all related City plans are periodically reviewed and updated to align with the TMP goals (Policy 5.5.1.1)
- Update and maintain the City's transportation model
- Incorporate an equity lens approach to strategic transportation planning (Policy 3.1.2.2)
- Support the completion of Environmental Assessments required to implement the TMP Sustainability and Resiliency network plan
- Review development applications to ensure compatibility with the road network and transportation safety regulations and guidelines
- Continue to ensure the road network and system safely accommodate new development (Policy 5.1.2)
- Review (and if necessary, update) the City's Downtown Parking Strategy to support park-and-ride opportunities;

3.4 Potential Partnerships

Strategic Transportation Planning has the following potential partnerships:

- Metrolinx
- Ministry of Transportation of Ontario
- Adjacent municipalities

3.5 Resource Recommendations

There is currently one Transportation Planning Engineer fulfilling these objectives. To effectively keep up with population and employment growth projections and resulting transportation planning needs, it is recommended that this program be staffed by two full-time strategic transportation planners.



CITY OF GUELPH TRANSPORTATION MASTER PLAN
Transportation System Management (TSM) Program

November 2021 – 18-8919

4.0 Transportation System Management (TSM)

4.1 Definition

Transportation System Management (TSM) uses operating strategies to increase capacity on the road network without increasing its physical size. TSM includes measures such as transit signal priority at intersections, signal coordination, or dedicated lanes for high-occupancy vehicles. It differs from *Transportation Demand Management* (TDM), which focuses on reducing traffic volumes by targeting driver behaviour and mode choice.

There is no formal TSM program at the City. However, groups and individuals fill many of the common TSM functions, including:

- Data collection
- Traffic signal design and operations
- Traffic investigations related to speed, driver behaviour, local congestion
- Intersection modifications and optimization
- Development review

4.2 Background

4.2.1 Purpose

Existing transportation infrastructure is not always equipped to manage an increase in traffic congestion. To make the transportation system as efficient as possible, communities often turn to TSM.

4.2.2 Goal

The goal of TSM is to increase the safety, capacity, efficiency, or level of service of a transportation facility without the need for new and expensive transportation infrastructure. The main actions include:

- Manage peak period congestion without increasing the physical size of the roadway
- Develop innovative intersection design to reduce delay and emissions from idling;
- Support *transit priority* measures to increase transit service and convenience;
- Accommodate all modes and reduce both delay and emissions by investing in selected capacity improvements to existing major street network operations; and
- Manage parking supply and demand both on- and off-street in the Downtown, and on-street city-wide
- Explore parking regulations and strategies city-wide and update the traffic and parking bylaws accordingly;
- Implement traffic flow improvements on regionally significant roads;
- Maintain the Traffic Bylaw to reflect changes to new infrastructure designs and standards that support active transportation and new technologies in micro-mobility.

4.2.3 Program Description

Transportation Systems Management uses various low-cost strategies to maintain or reduce travel time, maximize the efficiency of the transportation network, and improve the utilization of existing transportation facilities. Key examples include higher frequency public transit, eliminating on-street parking to add lanes, and making active transportation more convenient.

4.3 TMP Objectives for the Program

This section provides an overview of the key objectives the City should fulfill for the future TSM program.

- Develop a Transportation Systems Management Strategy and Action Plan that considers congestion management, access management, *transit priority*, *intelligent transportation systems* and *smart signals*, curbside management, and data collection (Policy 5.6)
- Manage congestion on road network during peak periods through signal optimization, smart signal technologies, alternative transportation facilities, and by maximizing the use of roadway before investing in new or expanded facilities
- Incorporate an equity lens approach to Transportation Systems Management planning and strategy
- Develop planning and design guidelines for roundabouts (Policy 5.3.1.3)
- Implement traffic flow improvements on important arterial roadways
- Collect and manage traffic count and turning movement data
- Coordinate the management of operational impacts of Metrolinx and other rail providers on the city's road network

4.4 Potential Partnerships

This section outlines the potential local partnerships the City can further develop or establish. It is recommended that Guelph continue to research, investigate, and implement Transportation Systems Management strategies. It is recommended that future partnerships be leveraged for engagement and public participation activities when TSM is a priority.

The following partnerships can be levied by the City:

- Wellington County;
- First Responder Committee / Guelph Police Services;
- Business Improvement Association / Downtown Guelph Business Association.
- Metrolinx

4.5 Resource Recommendations

It is recommended that the existing eight positions be maintained to continue to manage and operate the City's traffic signals, road operations and road safety programs.

An additional full-time employee is recommended to support expanding and maintaining the data collection program.



CITY OF GUELPH TRANSPORTATION MASTER PLAN

Road Safety Program

November 2021 – 18-8919

5.0 Road Safety

5.1 Definition

Road safety refers to the strategies, tools, and measures cities can use to prevent collisions resulting in injuries and deaths. All road users are impacted by road safety.

There are four important areas of focus in current industry discussions about improving safety of roads: street function and design, intersection design, designing cycling facilities for all ages and abilities (*AAA facilities*), and *Vision Zero*, a global movement based on a safe systems approach to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all.

Additionally the safe systems approach is a helpful framework for managing road safety and is based on the principles that life and health should not be compromised by the need to travel and that no level of death or serious injury is acceptable in our transportation network. According to the safe systems approach, safe transportation systems consist of four main elements: safer roads, safer road use, safer speeds, and safer vehicles.

5.2 Guelph's History with Road Safety

5.2.1 Purpose

Road-related incidents of injury and death continue to be a persistent challenge in many jurisdictions. Therefore, communities across Canada and around the world are emphasizing road safety in long-range planning and day-to-day operational decisions.

Many communities have developed road safety programs to address the safety concerns impacting all road users. For example, the Safe Roads Waterloo Region campaign is dedicated to reducing injuries and deaths caused by traffic collisions on roads. The program aligns with the global Vision Zero movement. More information can be found on the campaign [website](#).

5.2.2 Goal

The goal of road safety programs is to provide strategies that improve road safety to benefit all users, regardless of their age, ability, or mode of transportation. The main outcomes include:

- Recommend formal Council adoption of Vision Zero
- Reduce roadway speeds on selected streets, as required
- Improve cooperation, communication and collaboration among stakeholders in existing initiatives and programs;
- Reduce the number of collisions and collision severity on roadways;
- Implement safer road and intersection design practices;
- Update and follow the City's Traffic Calming Strategy; and
- Support the development of *Multimodal Level of Service* Guidelines that include safety analysis for links and intersections.

Although the City of Guelph has not formally adopted a Vision Zero approach, many of the safe systems principles and preferred strategies to address road safety are in line with Vision Zero.

5.2.3 Program Description

Guelph has several plans and strategies already in place to improve the safety on the roads for its communities, which are actively managed through a number of initiatives and programs.

These initiatives and programs are briefly described below:

- The City recently developed a Community Road Safety Strategy, which provides a high-level road safety plan that outlines emphasis areas and appropriate mitigation strategies for safety.
- The Community Speed Awareness Program installs temporary dynamic radar boards in residential neighbourhoods to raise awareness of speeding issues.
- The Guelph Road Safety Coalition coordinates and bolsters road safety efforts in the city through educating the public, raising awareness, building capacity, and sharing resources.
- The Active and Safe Routes to School Committee, established in 2009, supports the development and assessment of safe routes to school.

The Community Road Safety Strategy proactively and reactively reviews the operations of the road network and makes recommendations for localized modifications to improve road safety for all users and modes of travel. Three groups from the Engineering and Transportation Services department contribute to the City's Road Safety program. The groups include:

- Transportation Safety Specialists, who develop and update the City's strategy for improving road safety and associated policies like the City's Traffic Calming Policy;
- Traffic Investigations and Operations, who are responsible for the implementation and operation of smart signals and red light cameras. This group also reviews citizen concerns about road network operations, road marking plans, construction drawings, signage, etc. to recommend localized improvements
- Adult School Crossing Guard Program

5.3 TMP Objectives for the Program

This section provides an overview of the key objectives the City should fulfill for the future Road Safety program. To enhance the program further, it is recommended that Guelph formally adopt and endorse Vision Zero. The philosophies of Vision Zero will guide Guelph's objectives with the goal of improving road safety for all users by reducing collision severity and eliminating traffic fatalities.

Key objectives include:

- Formally endorse and adopt the Vision Zero approach to road design (Policy 5.3.1.1)
- Continue to implement the Community Road Safety Strategy, which forms part of Guelph's Vision Zero Plan, and update as necessary (Policy 5.3.1.1)
- Research and test new and innovative street function and design, and intersection design to reduce the likelihood of collisions

- Continue to work with the Ministry of Transportation of Ontario to replace all existing at-grade intersections on the Hanlon Expressway with interchanges, overpasses or underpasses. (Policy 5.3.1.2)
- Continue to review the need for grade-separations of existing at-grade rail crossings (Policy 5.3.1.4)
- Improve cooperation, communication and collaboration among stakeholders in existing initiatives and programs
- Continue to follow the City's Traffic Calming Strategy Policy to reduce collision severity, and improve road safety and update as necessary

5.4 Potential Partnerships

This City has already developed multiple partnerships throughout various communities in Guelph. It is recommended that future partnerships be leveraged for engagement and public participation activities when Road Safety is a priority.

The following partnerships can be leveraged by the City:

- Schools
- Neighbourhood groups
- Public Health Agencies
- Guelph Police and Ontario Provincial Police
- University of Guelph
- Ministry of Transportation

5.5 Resource Recommendations

To support the Vision Zero efforts, additional road safety staff will be required to support new road safety initiatives and expansions of existing programs as a part of a Vision Zero community.

One full-time Transportation Safety Supervisor and one full-time Road Safety Technologist is recommended to support expanding and maintaining the road safety program.



CITY OF GUELPH TRANSPORTATION MASTER PLAN
New Mobility and Emerging Technology Program

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6.0 New Mobility and Emerging Technology

6.1 Definition

New Mobility and Emerging Technology are becoming ever more relevant to today's transportation industry. Amidst the rapid evolution of digital technologies and ever improving connectivity, new transportation related innovations continue to emerge at an unprecedented rate, helping residents travel in a more personalized and seamless multimodal way. Specific new mobility and emerging technology examples in the transportation field include, but are not limited to, ride-hailing, micro-transit, micro-mobility, *Mobility-as-a-Service* (MaaS), e-commerce, electrification, self-driving technology, drone delivery and connected mobility.

Today, a common theme amongst municipalities and transit agencies is that they are becoming integrated mobility providers. This means that they are no longer focused on exclusively providing public transit service, but they are integrating public transit with other supporting modes such as car-share and subsidized ride-hailing. Similarly, there is also a call for municipalities and public transit agencies to develop partnerships with new private transportation providers with the goal of maximizing efficiencies and providing benefits to travelers.

6.2 Background

6.2.1 Purpose

The City of Guelph 2019-2023 Strategic Plan calls for Guelph to be “future-ready”. To ensure the City is prepared for opportune or disruptive new technologies or services in the transportation sector, the TMP recommends establishing an Emerging transportation technology office. This office is responsible for the study, analysis and recommendations of which technologies and services to pursue, test or avoid to protect the best interests of the community.

6.2.2 Goal

The goal of new mobility and emerging technology programs is to be a source of research, analysis, partnerships, testing and pilot projects for new transportation technologies and services. The main actions include:

- Support the implementation of smart signals and other emerging “smart” transportation technologies
- Explore opportunities to adopt *Mobility-as-a-Service* in Guelph;
- Monitor and recommend micro-mobility technologies and services suitable for Guelph;
- Develop curb space management strategies to support and develop policy and programs for e-commerce delivery services;
- Develop policy and programs to support future autonomous vehicle technology; and
- Develop a strategy to incorporate connected - or “smart” - features of transportation to make travel more convenient;

6.2.3 Program Description

To embrace the existing and future trends of New Mobility and Emerging Technology, the City will need to ensure a transition that is as seamless as possible and support the anticipated changes.

Micro-mobility

Bikeshare is an example of new transportation service model that changed how we move around cities. Many cities were on the cutting edge of providing Bikeshare services to their communities, but it turned out best adapted to larger cities with strong public transit.

E-scooters (push-scooters that have a small electric throttle) are another emerging popular trend in micro-mobility, and may have more potential for a mid-sized city like Guelph.

Micro-transit

Guelph Transit is currently using elements of *micro-transit* for Transit Mobility Services, its accessible transit service. For this service, Guelph Transit has partnered with a third-party technology provider for automated dispatch and routing to make the service more efficient.

Zero Emissions Vehicles

In 2018, Community Energy Initiative (CEI) set a target of having Guelph produce net zero carbon emissions by 2050. The CEI task force provided 20 potential actions for the City to help Guelph achieve this target. Guelph was one of the first Canadian communities to install an electric vehicle charging station. Today, there are over 20 city-owned public charging ports within 15 kilometres of the city. Most recently, Guelph Transit announced that it will replace 35 older diesel buses with electric buses, and add 30 brand new electric buses to their fleet by 2027.

Connected Mobility

Similar to many other municipalities, Guelph uses traffic signal preemption at select intersections for Fire Services emergency vehicles. Preemption is used to halt conflicting movements in advance of the emergency vehicle arriving at the intersection. This helps improve emergency response times and makes the roads safer for everyone. The City does not currently have any other forms of traffic signal priority measures. In 2020, the City piloted new traffic counting and detection technologies which enabled the City to have real-time traffic counts at select locations during all hours of the day. In the next 5 years, it is anticipated this technology will be installed at up to 50 intersections. Having real time traffic data will help the City make more informed operational decisions about its transportation network.

Mobility-as-a-Service

Mobility-as-a-Service is the integration of various forms of transport services into a single mobility service accessible on demand, usually through a digital platform. It enable users to access, pay for, and get real-time information on a range of public and private mobility options through the use of a single digital application, instead of multiple ticketing and information operations.

6.3 TMP Objectives for the Program

This section provides an overview of the key objectives the City should fulfill for the future New Mobility and Emerging Technology program.

- Review (and if necessary, update) the City's Municipal Zero Emissions Vehicle and Transit Fleet Strategy at regular intervals, to keep up to date with emerging technologies and practices (Policy 5.4.1.2)
- Develop a strategy for increasing the rate of consumer adoption of electric vehicles (Policy 5.4.1.1)
- Develop a strategy for appropriate locations of electric vehicle charging stations, including consideration for public transit facilities (Policies 5.4.1.3)
- Establish an Emerging Transportation Technologies office to assess new transportation modes and opportunities and position the City to respond (Policy 5.6.1.1)
- Consider opportunities for *Alternative Service Delivery and micro-transit*
- Explore opportunities to adopt *mobility-as-a-service* in Guelph and support its digital platforms through private partnerships (Policy 2.2.1.4 and 3.1.2.5)
- Develop and maintain a strategy for the implementation of smart signals and other emerging “smart” transportation technologies (Policy 5.6.1.3)
- Complete bi-annual reviews of autonomous vehicle technology for transit in order to identify the implications on the planning and operation of the transit system (Policy 4.1.1)

6.4 Potential Partnerships

The following partnerships can be leveraged by the City:

- the Ministry of Transportation of Ontario;
- Municipal Alliance for Connected & Autonomous Vehicles Ontario;
- Post-secondary institutions (research and development);
- Private industry;
- Large employers / Chamber of Commerce; and
- First Responder Committee / Guelph Police Association.

6.6 Resource Recommendations

There are no current positions that include researching and analysis of new technologies for the transportation sector. As such, it is recommended that two full-time employees be retained over the course of the next 30 years to resource this program. The *Guelph: Future Ready* strategic plan identifies this need, and the 2022 multi-year operating budget includes a request for one Emerging Transportation Technology analyst.

Appendix:
Alignment with TMP Problem Statements

Alignment with TMP Problem Statements: Active Transportation

This section of the TMP aims to align the TMP Goals and Problem Statements with the Sustainable transportation program. The Goals have been used to structure the Problems Statements. In the table below, a connection to the Sustainable transportation program has been identified for each Goal and the complimentary Problem Statements.

Goal	Problem Statements	Connection
Goal 1: People of all ages and physical ability will be able to travel safely using any transportation mode that they choose	<ul style="list-style-type: none"> ● We need to design our streets to serve the needs of a diverse group of people, of all ages and abilities. ● We need to design our streets to safely serve all modes of transportation, including walking, cycling and transit. 	<ul style="list-style-type: none"> ● Provide transportation to all through sustainable options
Goal 2: Guelph's transportation system will be easy-to-use, reliable and give people and businesses the options they want when they need them.	<ul style="list-style-type: none"> ● We need strong (i.e. fast and direct) transit connections to existing and future jobs ● We need more safe crossings of the rivers, rail lines and highways for people walking and cycling ● We need better walking and cycling connections to transit stops and hubs 	<ul style="list-style-type: none"> ● Support mode shift to sustainable modes
Goal 3: Transit service will provide travel times and traveler convenience at levels that are competitive with travel by car	<ul style="list-style-type: none"> ● We need to reduce transit travel times and improve traveler convenience to most destinations, particularly between neighbouring areas of the city 	<ul style="list-style-type: none"> ● Prioritize transit as a sustainable mode of transportation
Goal 4: The carbon footprint from the transportation sector will aim for net zero by 2050	<ul style="list-style-type: none"> ● We need to reduce the percentage of trips made by car. ● We need to update the downtown parking strategy to align with the objectives of the TMP to reduce downtown car use. ● We need to tap Guelph's unrealized potential for electric vehicles. 	<ul style="list-style-type: none"> ● Prioritize moving away from car dependency and move towards renewable energy for transportation
Goal 5: Guelph's streets, trails and rail networks will align with the City's land use objectives	<ul style="list-style-type: none"> ● We need to redesign streets in key growth areas to prioritize walking, cycling and transit. ● We need to update our road designs to reflect the unique priorities of different areas. 	<ul style="list-style-type: none"> ● Focus on active transportation and transit to support land use density
Goal 6: Investment decisions will be made considering the asset lifecycle costs	<ul style="list-style-type: none"> ● We need to account for lifecycle costs in financial decisions on transportation projects. 	<ul style="list-style-type: none"> ● Consider environmental impact of new

		purchases (i.e. diesel buses) <ul style="list-style-type: none"> • Plan future facilities to be sustainable and adaptable
Goal 7: Guelph's transportation system will plan for the changes of tomorrow, while delivering great service today	<ul style="list-style-type: none"> • We need to improve the resiliency of Guelph's transportation system. • We need to better prepare for the future of mobility. 	<ul style="list-style-type: none"> • Support shift to sustainable modes

Alignment with TMP Problem Statements: Transportation Demand Management

This section of the TMP aims to align the TMP Goals and Problem Statements with the TDM program. The Goals have been used to structure the Problems Statements. In the table below, a connection to the TDM program has been identified for each Goal and the complimentary Problem Statements.

Goal	Problem Statements	Connection
Goal 1: People of all ages and physical ability will be able to travel safely using any transportation mode that they choose	<ul style="list-style-type: none"> ● We need to design our streets to serve the needs of a diverse group of people, of all ages and abilities. ● We need to design our streets to safely serve all modes of transportation, including walking, cycling and transit. 	<ul style="list-style-type: none"> ● Make transportation more accessible to all
Goal 2: Guelph's transportation system will be easy-to-use, reliable and give people and businesses the options they want when they need them.	<ul style="list-style-type: none"> ● We need strong (i.e. fast and direct) transit connections to existing and future jobs ● We need more safe crossings of the rivers, rail lines and highways for people walking and cycling ● We need better walking and cycling connections to transit stops and hubs 	<ul style="list-style-type: none"> ● Design strategies, measures and tools to respond to changes in traveler behaviours ● Support mode shift to sustainable modes
Goal 3: Transit service will provide travel times and traveler convenience at levels that are competitive with travel by car	<ul style="list-style-type: none"> ● We need to reduce transit travel times and improve traveler convenience to most destinations, particularly between neighbouring areas of the city 	<ul style="list-style-type: none"> ● Support mode shift to sustainable modes ● Align demands with network development strategy
Goal 4: The carbon footprint from the transportation sector will aim for net zero by 2050	<ul style="list-style-type: none"> ● We need to reduce the percentage of trips made by car. ● We need to update the downtown parking strategy to align with the objectives of the TMP to reduce downtown car use. ● We need to tap Guelph's unrealized potential for electric vehicles. 	<ul style="list-style-type: none"> ● Reduce GHG and other environmental impacts
Goal 5: Guelph's streets, trails and rail networks will align with the City's land use objectives	<ul style="list-style-type: none"> ● We need to redesign streets in key growth areas to prioritize walking, cycling and transit. ● We need to update our road designs to reflect the unique priorities of different areas. 	<ul style="list-style-type: none"> ● Align demands with network development strategy
Goal 6: Investment decisions will be made	<ul style="list-style-type: none"> ● We need to account for lifecycle costs in financial decisions on transportation projects. 	<ul style="list-style-type: none"> ● Plan future facilities and infrastructure to

<p>considering the asset lifecycle costs</p>		<p>accommodate for demand</p> <ul style="list-style-type: none"> ● Make the network more affordable by reducing peak demands for travel
<p>Goal 7: Guelph's transportation system will plan for the changes of tomorrow, while delivering great service today</p>	<ul style="list-style-type: none"> ● We need to improve the resiliency of Guelph's transportation system. ● We need to better prepare for the future of mobility. 	<ul style="list-style-type: none"> ● Support mode shift to sustainable modes

Alignment with TMP Problem Statements: Strategic Transportation Planning

This section of the TMP aims to align the TMP Goals and Problem Statements with the Transportation Planning program. The Goals have been used to structure the Problems Statements. In the table below, a connection to the Transportation Planning program has been identified for each Goal and the complimentary Problem Statements.

Goal	Problem Statements	Connection
<p>Goal 1: People of all ages and physical ability will be able to travel safely using any transportation mode that they choose</p>	<ul style="list-style-type: none"> ● We need to design our streets to serve the needs of a diverse group of people, of all ages and abilities. ● We need to design our streets to safely serve all modes of transportation, including walking, cycling and transit. 	<ul style="list-style-type: none"> ● Provide access and mobility to everyone, regardless of abilities
<p>Goal 2: Guelph's transportation system will be easy-to-use, reliable and give people and businesses the options they want when they need them.</p>	<ul style="list-style-type: none"> ● We need strong (i.e. fast and direct) transit connections to existing and future jobs ● We need more safe crossings of the rivers, rail lines and highways for people walking and cycling ● We need better walking and cycling connections to transit stops and hubs 	<ul style="list-style-type: none"> ● Provide simple and safe connections for all modes
<p>Goal 3: Transit service will provide travel times and traveler convenience at levels that are competitive with travel by car</p>	<ul style="list-style-type: none"> ● We need to reduce transit travel times and improve traveler convenience to most destinations, particularly between neighbouring areas of the city 	<ul style="list-style-type: none"> ● Enable the transit system to be competitive with other modes
<p>Goal 4: The carbon footprint from the transportation sector will aim for net zero by 2050</p>	<ul style="list-style-type: none"> ● We need to reduce the percentage of trips made by car. ● We need to update the downtown parking strategy to align with the objectives of the TMP to reduce downtown car use. ● We need to tap Guelph's unrealized potential for electric vehicles. 	<ul style="list-style-type: none"> ● Build new connections and diversify modes to address climate change issues
<p>Goal 5: Guelph's streets, trails and rail networks will align with the City's land use objectives</p>	<ul style="list-style-type: none"> ● We need to redesign streets in key growth areas to prioritize walking, cycling and transit. ● We need to update our road designs to reflect the unique priorities of different areas. 	<ul style="list-style-type: none"> ● Respond to the changing interests of where people want to live and work through the road network planning

<p>Goal 6: Investment decisions will be made considering the asset lifecycle costs</p>	<ul style="list-style-type: none"> ● We need to account for lifecycle costs in financial decisions on transportation projects. 	<ul style="list-style-type: none"> ● Improve network planning facilities and services
<p>Goal 7: Guelph's transportation system will plan for the changes of tomorrow, while delivering great service today</p>	<ul style="list-style-type: none"> ● We need to improve the resiliency of Guelph's transportation system. ● We need to better prepare for the future of mobility. 	<ul style="list-style-type: none"> ● Track and respond to future trends for land use and transportation planning

Alignment with TMP Problem Statements: Transportation System Management

This section of the TMP aims to align the TMP Goals and Problem Statements with the Transportation Systems Management program. The Goals have been used to structure the Problems Statements. In the table below, a connection to the Transportation Systems Management program has been identified for each Goal and the complimentary Problem Statements.

Goal	Problem Statements	Connection
Goal 1: People of all ages and physical ability will be able to travel safely using any transportation mode that they choose	<ul style="list-style-type: none"> ● We need to design our streets to serve the needs of a diverse group of people, of all ages and abilities. ● We need to design our streets to safely serve all modes of transportation, including walking, cycling and transit. 	<ul style="list-style-type: none"> ● Monitor existing infrastructure to accommodate new growth
Goal 2: Guelph's transportation system will be easy-to-use, reliable and give people and businesses the options they want when they need them.	<ul style="list-style-type: none"> ● We need strong (i.e. fast and direct) transit connections to existing and future jobs ● We need more safe crossings of the rivers, rail lines and highways for people walking and cycling ● We need better walking and cycling connections to transit stops and hubs 	<ul style="list-style-type: none"> ● Safe and efficient infrastructure and services
Goal 3: Transit service will provide travel times and traveler convenience at levels that are competitive with travel by car	<ul style="list-style-type: none"> ● We need to reduce transit travel times and improve traveler convenience to most destinations, particularly between neighbouring areas of the city 	<ul style="list-style-type: none"> ● Provide higher level of service for public transit through low-cost strategies
Goal 4: The carbon footprint from the transportation sector will aim for net zero by 2050	<ul style="list-style-type: none"> ● We need to reduce the percentage of trips made by car. ● We need to update the downtown parking strategy to align with the objectives of the TMP to reduce downtown car use. ● We need to tap Guelph's unrealized potential for electric vehicles. 	<ul style="list-style-type: none"> ● Provide greater efficiency and reduce congestion, which would result in higher air pollution rates
Goal 5: Guelph's streets, trails and rail networks will align with the City's land use objectives	<ul style="list-style-type: none"> ● We need to redesign streets in key growth areas to prioritize walking, cycling and transit. ● We need to update our road designs to reflect the unique priorities of different areas. 	<ul style="list-style-type: none"> ● Change infrastructure to accommodate future growth
Goal 6: Investment decisions will be made considering the asset lifecycle costs	<ul style="list-style-type: none"> ● We need to account for lifecycle costs in financial decisions on transportation projects. 	<ul style="list-style-type: none"> ● Plan for low-cost changes

<p>Goal 7: Guelph's transportation system will plan for the changes of tomorrow, while delivering great service today</p>	<ul style="list-style-type: none">• We need to improve the resiliency of Guelph's transportation system.• We need to better prepare for the future of mobility.	<ul style="list-style-type: none">• Focus on developing strategies instead of changing infrastructure
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Alignment with TMP Problem Statements: Road Safety

This section of the TMP aims to align the TMP Goals and Problem Statements with the Road Safety program. The Goals have been used to structure the Problems Statements. In the table below, a connection to the Road Safety program has been identified for each Goal and the complimentary Problem Statements.

Goal	Problem Statements	Connection
Goal 1: People of all ages and physical ability will be able to travel safely using any transportation mode that they choose	<ul style="list-style-type: none"> ● We need to design our streets to serve the needs of a diverse group of people, of all ages and abilities. ● We need to design our streets to safely serve all modes of transportation, including walking, cycling and transit. 	<ul style="list-style-type: none"> ● Provide safe and easy to access facilities and infrastructure
Goal 2: Guelph's transportation system will be easy-to-use, reliable and give people and businesses the options they want when they need them.	<ul style="list-style-type: none"> ● We need strong (i.e. fast and direct) transit connections to existing and future jobs ● We need more safe crossings of the rivers, rail lines and highways for people walking and cycling ● We need better walking and cycling connections to transit stops and hubs 	<ul style="list-style-type: none"> ● Provide safe connections for all modes
Goal 3: Transit service will provide travel times and traveler convenience at levels that are competitive with travel by car	<ul style="list-style-type: none"> ● We need to reduce transit travel times and improve traveler convenience to most destinations, particularly between neighbouring areas of the city 	<ul style="list-style-type: none"> ● Provide safe transit options on board and street at stops
Goal 4: The carbon footprint from the transportation sector will aim for net zero by 2050	<ul style="list-style-type: none"> ● We need to reduce the percentage of trips made by car. ● We need to update the downtown parking strategy to align with the objectives of the TMP to reduce downtown car use. ● We need to tap Guelph's unrealized potential for electric vehicles. 	<ul style="list-style-type: none"> ● Rebalance mode share by improving safety of other sustainable modes
Goal 5: Guelph's streets, trails and rail networks will align with the City's land use objectives	<ul style="list-style-type: none"> ● We need to redesign streets in key growth areas to prioritize walking, cycling and transit. ● We need to update our road designs to reflect the unique priorities of different areas. 	<ul style="list-style-type: none"> ● Review how density impacts the usability and safety of surrounding road network
Goal 6: Investment decisions will be made considering the asset lifecycle costs	<ul style="list-style-type: none"> ● We need to account for lifecycle costs in financial decisions on transportation projects. 	<ul style="list-style-type: none"> ● Safety improvements need to be prioritized
Goal 7: Guelph's transportation system	<ul style="list-style-type: none"> ● We need to improve the resiliency of Guelph's transportation system. 	<ul style="list-style-type: none"> ● Future growth accommodated by

will plan for the changes of tomorrow, while delivering great service today	<ul style="list-style-type: none">• We need to better prepare for the future of mobility.	improved safety of network
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Alignment with TMP Problem Statements: New Mobility and Emerging Technology

This section of the TMP aims to align the TMP Goals and Problem Statements with the New Mobility and Emerging Technology program. The Goals have been used to structure the Problems Statements. In the table below, a connection to the New Mobility and Emerging Technology program has been identified for each Goal and the complimentary Problem Statements.

Goal	Problem Statements	Connection
<p>Goal 1: People of all ages and physical ability will be able to travel safely using any transportation mode that they choose</p>	<ul style="list-style-type: none"> ● We need to design our streets to serve the needs of a diverse group of people, of all ages and abilities. ● We need to design our streets to safely serve all modes of transportation, including walking, cycling and transit. 	<ul style="list-style-type: none"> ● Consideration of future modes
<p>Goal 2: Guelph's transportation system will be easy-to-use, reliable and give people and businesses the options they want when they need them.</p>	<ul style="list-style-type: none"> ● We need strong (i.e. fast and direct) transit connections to existing and future jobs ● We need more safe crossings of the rivers, rail lines and highways for people walking and cycling ● We need better walking and cycling connections to transit stops and hubs 	<ul style="list-style-type: none"> ● Diverse modes and new features are easy to use
<p>Goal 3: Transit service will provide travel times and traveler convenience at levels that are competitive with travel by car</p>	<ul style="list-style-type: none"> ● We need to reduce transit travel times and improve traveler convenience to most destinations, particularly between neighbouring areas of the city 	<ul style="list-style-type: none"> ● Newer technologies improve convenience and reliability
<p>Goal 4: The carbon footprint from the transportation sector will aim for net zero by 2050</p>	<ul style="list-style-type: none"> ● We need to reduce the percentage of trips made by car. ● We need to update the downtown parking strategy to align with the objectives of the TMP to reduce downtown car use. ● We need to tap Guelph's unrealized potential for electric vehicles. 	<ul style="list-style-type: none"> ● Electric vehicles and infrastructure considered ● Increased ridesharing minimizes need for parking ● Improved reliability of other modes to reduce trips by car
<p>Goal 5: Guelph's streets, trails and rail networks will align with the City's land use objectives</p>	<ul style="list-style-type: none"> ● We need to redesign streets in key growth areas to prioritize walking, cycling and transit. ● We need to update our road designs to reflect the unique priorities of different areas. 	<ul style="list-style-type: none"> ● New technology to improve functionality of existing network ● New tools to respond to changes in traveler behaviours

<p>Goal 6: Investment decisions will be made considering the asset lifecycle costs</p>	<ul style="list-style-type: none"> ● We need to account for lifecycle costs in financial decisions on transportation projects. 	<ul style="list-style-type: none"> ● Plan future facilities and infrastructure with new mobility and emerging technology in mind
<p>Goal 7: Guelph's transportation system will plan for the changes of tomorrow, while delivering great service today</p>	<ul style="list-style-type: none"> ● We need to improve the resiliency of Guelph's transportation system. ● We need to better prepare for the future of mobility. 	<ul style="list-style-type: none"> ● Support change in mode share shift with new and emerging trends