

Sustainable Transportation Partnership of the Central Okanagan (STPCO)

Regional Disruptive Mobility Strategy

Helping Central Okanagan Governments Prepare for Transportation Technology Change

Technology will disrupt how we move around the region. Are you ready?

November 2020

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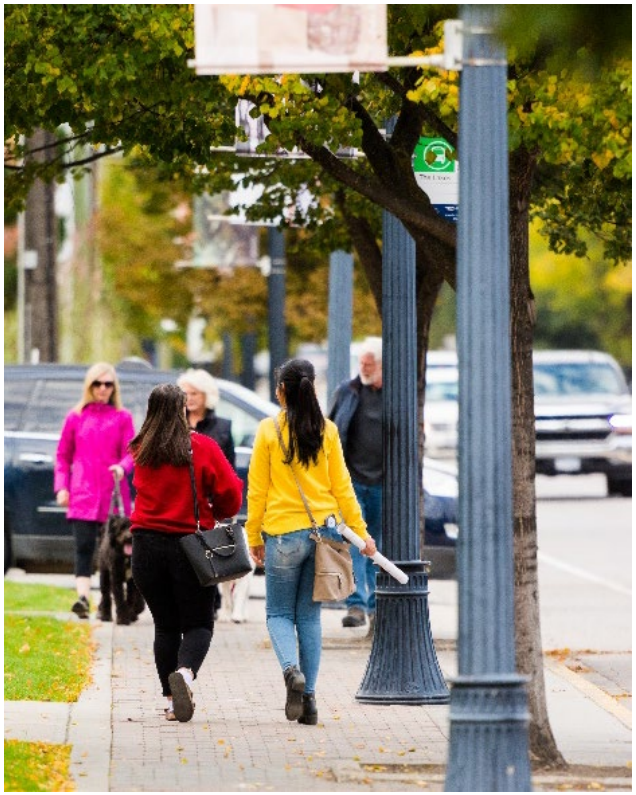
About the Regional Disruptive Mobility Strategy

The Regional Disruptive Mobility Strategy has been developed by the Sustainable Transportation Partnership for the Central Okanagan (STPCO), a partnership between the City of Kelowna, the City of West Kelowna, Districts of Peachland and Lake Country, Westbank First Nation and the Regional District of Central Okanagan.

This strategy is a component of *Connecting our Region*, the Central Okanagan's first *Regional Transportation Plan* (RTP). The *Regional Disruptive Mobility Strategy* has been developed in tandem with the RTP to ensure full coordination across both documents. While the RTP considers all modes, the *Regional Disruptive Mobility Strategy* focuses on how to best manage the impacts of new technology on transportation across the Central Okanagan.

What is Disruptive Mobility?

In business theory, disruption refers to an innovation that creates a new market while "disrupting" and displacing existing markets. Typical examples are the creation of the internet and smartphones, which revolutionized the communication industry. "Disruptive mobility" refers to changes in transportation technologies that will fundamentally change how people get around in the future. These changes are making transportation more connected, automated, shared, and electric. These changes can benefit the region; however negative impacts that work against current policy directions are possible. By proactively preparing for the changes coming our way, Central Okanagan governments can work together to harness the benefits of new technology while protecting our regional economic competitiveness and quality of life.



Purpose of the Disruptive Mobility Strategy

The *Regional Disruptive Mobility Strategy* has been designed as a toolkit for local governments in the Central Okanagan to help prepare for technology

change in transportation. It is a resource guide that will help each jurisdiction identify the strategies and tactics best suited for their community. It is recommended that each jurisdiction collaborates with community, nonprofit, and business leaders to carefully consider a range of practical and efficient solutions to the challenges and opportunities presented by rapidly changing mobility technologies.

By its very nature, the *Regional Disruptive Mobility Strategy* must be dynamic to respond to rapid changes in transportation. As such, this strategy is an ongoing and evolving effort to manage the impacts of new technology in transportation and identify tactics to successfully adapt. This strategy provides a foundation for future work and guidance as these changes accelerate. Coordination and collaboration among jurisdictions and partnerships with the private sector, nonprofit organizations, and other regional stakeholders are vital for success. Building upon the *Regional Transportation Plan*, this document shines a light on new technologies and transportation system adaptation tactics that will give the Central Okanagan a strategic advantage.

Transportation, Technology and our Changing Future

For the first time in nearly a century, transformative innovations are coming to transportation. Mobile technologies that enable new shared services will combine with self-driving electric vehicles to reshape our lives, how we move, and our communities for better—or worse. New transportation options and services will emerge and link together to create a mobility ecosystem that offers seamless, multi-modal travel on demand. Some of these coming changes have the potential to increase auto travel and congestion, or if we are proactive, to accelerate the pace towards achieving our shared vision for a more connected and sustainable future, as outlined in the Regional Transportation Plan.

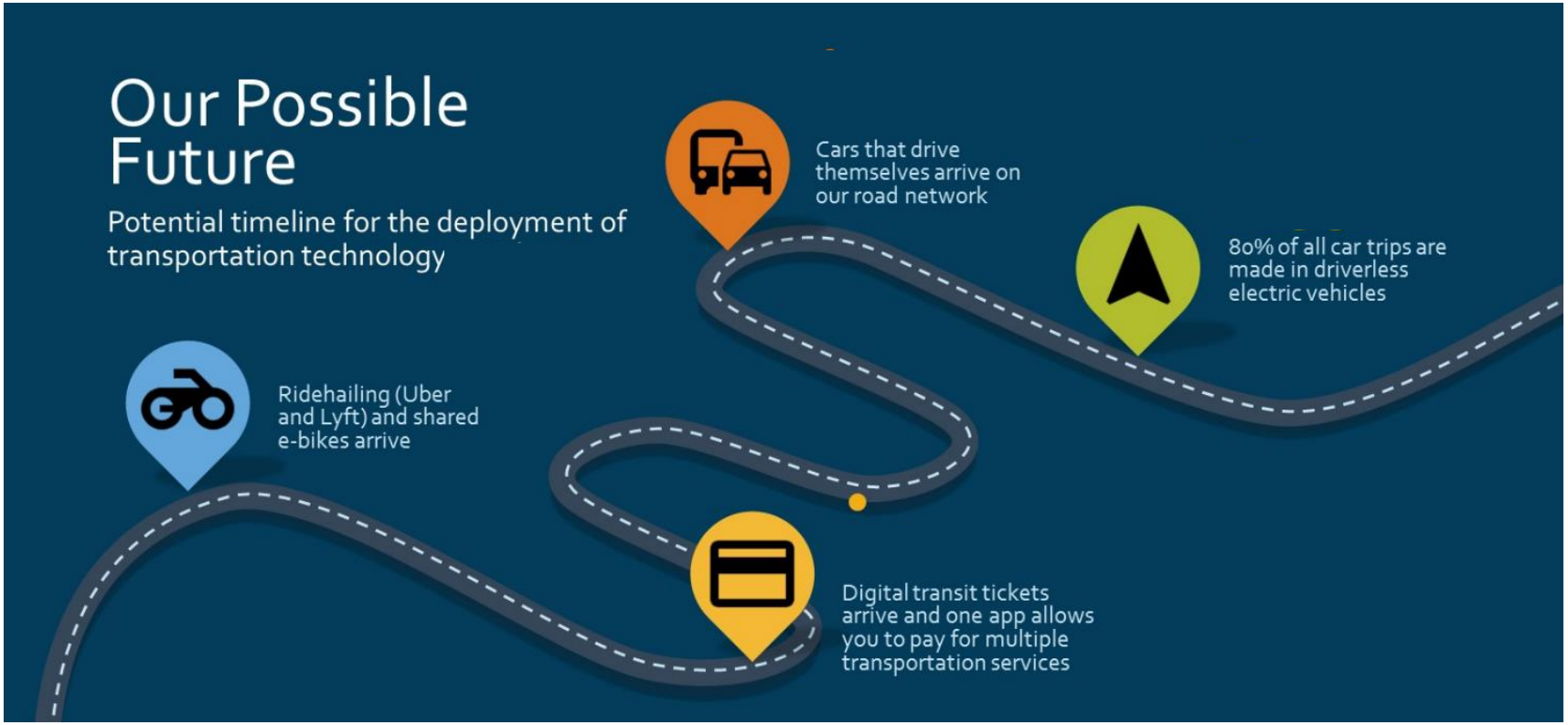


Figure 1 Timeline projection estimates are based on a variety of sources, including announced timelines from the private sector, research organizations, public sector analysis and the Central Okanagan's regulatory environment.[i]

We should view technological change in transportation as both an opportunity and a challenge. If we move quickly to shape new public policy, business models, and how they are deployed, we can leverage them to achieve our goals.

Looking forward, there are four distinct trends on the horizon: connected, self-driving, shared, and electric. These trends are described in the following section.

Connected

In the past few years, the number of everyday devices that can connect to the internet and communicate with each other has increased rapidly. This has enabled Central Okanagan residents to use mobile apps to avoid traffic delays, access real-time transit information, and reserve a carshare, bikeshare or other travel options on demand. In the future, improved communication between our smartphones, vehicles and infrastructure will increase our access to information and enhance our ability to choose how to get to where we need to go, in a way that best meets our needs, for any given trip.



Figure 1 Modo is a carshare provider in the Central Okanagan.

Self-driving

Our vehicles are likely to become increasingly automated, to the point where a human driver is not required most of the time.[ii] Self-driving technologies will enable changes in the demands that cars place on our cities. For example, self-driving vehicles could allow a commuter to send their car home rather than pay for parking at their workplace.[iii] This possibility would "unlink" parking demand from the locations of destinations, reducing the need for large amounts of parking in our city centres. However, this could create new challenges such as cars without any passengers (or "zero-occupancy" vehicles) on our roadways, increasing traffic congestion. We will need to adapt how we manage our streets as challenges arise.

While the timing of fully self-driving vehicles becoming commonplace is uncertain, the pace of development has been rapid. Self-driving cars have already navigated millions of kilometres on public roads in North America[iv], and self-driving taxi service is currently operating in Phoenix, Arizona.[v]

Shared

Shared vehicles are used to accommodate multiple people's travel throughout the day. They have the potential to eliminate the cost of ownership while retaining flexibility. In our region, we currently share buses, cars, and bikes through transit, taxi, carshare, and bikeshare networks. Shared vehicles can make it easier to shift travel modes in real-time. For example, a resident could take the bus to work, use a bikeshare for their lunch meeting, and then take a ride-hailing service back home. In the future, this will allow residents to choose the best travel mode for each segment of their trip.

Electric

The price of batteries is dropping, and their storage capacity is increasing. Electric vehicles are already on our streets today, including electric and hybrid cars, e-bikes and other small electric vehicles.[vi] The transportation sector is the largest GHG emitter in the Central Okanagan. As a result, shifting to electric will be one part of the solution in curbing our carbon emissions.

These four trends of connected, self-driving, shared and electric have the potential to reshape both transportation and our built environment between now and 2040. How we choose to prepare for these changes will influence how new transportation technologies shape our region.

Vision and Goals

The *Regional Disruptive Mobility Strategy* is grounded in the vision and goals developed as part of the *Regional Transportation Plan (RTP)*.

Together, the *Regional Transportation Plan*'s vision and goals help provide the strategic direction for the *Regional Disruptive Mobility Strategy*, defining the outcomes we are seeking as we plan and prepare for technology change across the Central Okanagan.

RTP Vision

A transportation system that connects people to regional destinations within the Central Okanagan and beyond, supporting and enhancing the region's economy, social networks, and natural ecosystem.

RTP Goals

SAFE – transports people and goods safely

EFFICIENT – minimizes energy, emissions and travel times

SUSTAINABLE – creates a net positive social, environmental, and economic benefit to the region and future generations

AFFORDABLE – provides value to all users while minimizing costs to users and taxpayers

ECONOMIC GROWTH – supports regional economic growth

EQUITABLE – addresses the transportation needs of all areas, ages and incomes

ACCESSIBILITY – applies the principles of universal access

QUALITY OF LIFE – minimizes noise, visual and community effects while supporting community cohesion

ENVIRONMENTALLY RESPONSIBLE – minimizes negative effects on the natural ecosystem

MULTI-MODAL – increases the variety of travel choices available

ADAPTABLE – can change in response to evolving technology and societal trends



Figure 2 We are increasingly making purchases online. At the beginning of 2020 roughly 10% of all retail purchases in Canada came from e-commerce. [vii] If numbers from the US are any indication, this figure will grow significantly as a result of COVID-19. This will represent a fundamental shift in how goods are distributed in the Central Okanagan and changing demands on the transportation system.

Glossary of Terms

New mobility technologies cover a broad spectrum of areas that affect transportation and land-use. As these technologies evolve, it becomes critically important to understand the concepts that are emerging and what impact they may have. This glossary, presented in alphabetical order within each category, defines the latest technologies, processes, business models and associated terms.

Shared Mobility

Shared mobility represents the full range of transportation options involving fleet ownership or fleet operation of various modes of transportation. It includes public transit, taxis, bikesharing; carsharing, ridesharing; ride-hailing; scooter sharing; shuttle services, microtransit, and more.

BIKESHARE – A service in which bicycles are made available for shared use to individuals on a short-term basis. Bicycles can either be located at docking stations, or dockless systems allow bicycles to be parked anywhere, usually within a defined service area.

CARSHARE – A service in which cars are made available for shared use to individuals on a short-term basis.

MICROMOBILITY – Refers to personally owned or shared vehicles like bicycles, mopeds, and e-scooters. Micromobility is often used to describe the many types of vehicles that are smaller and lighter than an automobile.

MICROTRANSIT – Microtransit is a form of demand-responsive transport. This transit service offers flexible routing and flexible scheduling of vehicles. Microtransit providers may build routes to match demand (trip) and supply (driven vehicle) and extend the efficiency and accessibility of more traditional fixed-route transit service.

RIDE-HAILING – Procuring a ride from a 'for-fare' driver pool accessible through an app-based platform. Ride-hailing can sometimes be referred to by its regulated name in British Columbia, Transportation Network Services (TNS).

SCOOTER SHARING – Similar to bikesharing, but the mode of transport is an electric scooter. Electric scooter sharing systems can be docked or dockless.

TAXI – A service whereby riders can hail vehicles from the street or an app like ride-hailing. Both ride-hailing and taxi regulations overlap in British Columbia. Over time there will likely be further changes to bring them into alignment.

Vehicle Technology

CONNECTED VEHICLES – Vehicles with the capacity to communicate with other vehicles and infrastructure through wireless communications.

SELF-DRIVING VEHICLES – Vehicles with a high degree of automated driver assistance features that allow no driver to be present in most situations. The Society of Automotive Engineers (SAE) has a classification scheme that categorizes self-driving vehicles into five levels. Self-driving vehicles, referenced in this report, indicates SAE levels 4 and 5.[ix]

V2I – Short for Vehicle to Infrastructure. Vehicles that are connected by smart technologies to infrastructure (I)

V2V – Short for Vehicle to Vehicle. Vehicles that are connected by smart technologies to other vehicles (V)

V2X – Short for Vehicle to Anything. Passing of information from a vehicle to any entity (X) may affect the vehicle and vice versa. V2X includes V2I and V2V.

Transportation System Optimization

SMART PARKING – A parking system that uses parking occupancy sensors or algorithms to provide stall availability information to users and to inform dynamic pricing.

TRANSIT SIGNAL PRIORITIZATION (TSP) – Adjusts traffic signal timings, if possible as transit approaches, to improve transit travel time and reliability.

Travel Info and Payment

MOBILE TICKETING – An app that allows transit riders to pay for fares with their smartphone, credit or debit card. This could evolve to include more forms of scheduled and on-demand transportation in a unified payment platform.

MOBILITY AS A SERVICE (MaaS) – Refers to a shift away from personally owned modes of transportation and towards mobility solutions that are consumed as a service. The full vision of Mobility as a Service (MaaS) combines planning and payment for a variety of travel modes within one application allowing for users to easily make multi-modal trips that are paid for through a single account.

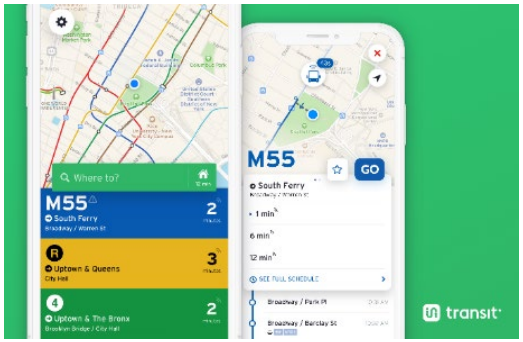


Figure 3 There are roughly the same number of opens of the Transit App as passengers on the Kelowna Regional Transit System (5.2 million/year)[viii]

Freight and Delivery

DRONE FREIGHT – Delivery of packages, food, or other products by an unmanned aerial vehicle or drone.

SELF-DRIVING FREIGHT – Self-driving vehicles that deliver packages, food, or other goods. The application of self-driving technology to freight will initially be focused on long-haul freight, but may incorporate individual package or food delivery in the future.

URBAN FREIGHT – Delivery of goods, packages, and a variety of merchandise within an urban area, with many deliveries to local businesses and restaurants. Urban freight often focuses on the right-sizing of delivery vehicles for safer and more successful operation within dense urban areas.

2040 Outlook: Potential Future Challenges and Opportunities

The coming changes in transportation have the potential to bring both opportunities and challenges in the future.

Key opportunities that transportation technology change could bring include:

- More affordable transportation options, enabled by Mobility-as-a-Service travel options, that provide people with ways to get around, without the expense of private vehicle ownership.
- More independence of mobility for youth, the elderly, and people with diverse abilities enabled by increased access to ride-hailing and self-driving vehicles.
- Reductions in impaired and distracted driving enabled by increased access to ride-hailing and self-driving cars, resulting in fewer collisions and safer streets.
- Less air pollution and greenhouse gas emissions as electric vehicles become more commonplace.
- An opportunity to repurpose high-value urban land due to self-driving cars being "sent home" rather than paying to park. This may also require adapting to changing parking revenue streams, as parkades could be left empty in urban areas downtown.

Potential challenges that transportation technology change could bring include:

- Increased traffic congestion and vehicle kilometers traveled (VKT) on our roadways from self-driving cars making "zero-occupancy" trips and ride-hailing vehicles making return trips and/or circling for passengers[x]
- Increased urban sprawl from self-driving cars enabling people to live farther from their jobs
- Increased demand for passenger loading on urban curb space from ride-hailing services[xi]
- Safety and ethical considerations as self-driving vehicle technologies are refined.

Proactive measures, policies and regulations, such as the tactics included in the Tactical Actions section could help to mitigate some of these challenges and improve our region's overall economy, quality of life and social equity.

In addition to the challenges and opportunities that transportation technology change may bring, changes in other key areas can potentially affect the success of emerging, new mobility options. For example, without a well-connected and safe active transportation network or widespread access to technology, emerging new mobility options will have more of a challenge being successfully adopted in our region. The following table provides a summary of these and other key areas that have the ability to impact the success of emerging, new mobility options.

Key Area	Potential Future Challenge	Potential Future Opportunity
 **Safety and Accessibility**	Without enough investment in sidewalks, bike lanes, and safety improvements, many people, including children, the elderly, and people with diverse abilities could be discouraged from walking, biking, and using small shared vehicles for short trips; this lack of mobility could result in social isolation for many residents. The cost of collisions in the Central Okanagan will result in less money spent in the local economy	If there are more mobility options available to serve the needs of residents, citizens of all ages and abilities would be able to choose the best way to travel based on their needs. Investment in safe streets would result in fewer vehicle collisions and make it more attractive for people to walk and bike.
 **Congestion**	Without providing a greater variety of transportation options that compete with the car, many people could have no choice but to drive, leading to additional traffic congestion and frustration on our roads.	If improvements are made to walking and biking infrastructure, transit, and policies that support shared mobility operators, residents would have plenty of alternatives to driving. This would result in fewer cars on the road and help reduce future traffic congestion.
 **Access to Technology**	With systems not designed for various types of user groups, including those without credit cards or without smartphone access, many already marginalized members of society could be shut out from accessing emerging, new mobility options.	If new and old transportation technologies become available in the same smartphone app and also remain accessible to those without smartphones and credit cards, technology will not become a barrier to access transportation.

Key Area	Potential Future Challenge	Potential Future Opportunity
Transportation Costs	In a car-focused transportation system without other convenient options, people could be locked into the expense of car ownership and maintenance, leading to transportation continuing to consume a significant portion of household income.	If more affordable transportation choices, such as transit, walking, biking, or shared mobility are provided, people will be able to save costs by not needing to own a private vehicle. This would make it easier for people to choose to live without a car if they desire, allowing them to save on the cost of car ownership, while not sacrificing their personal mobility.
Economy	If all the region's future residents drive as much as we do today, traffic congestion will get worse, resulting in more time in traffic and higher costs for the goods movement community.	If commuter trips can shift more to work from home, biking, walking and transit, road space can be freed up for goods movement. Additionally, curb management practices and urban freight strategies could help goods move more seamlessly, supporting the competitiveness of local businesses.
Well-being	Continuation of the status quo would mean travel mainly by gasoline-powered vehicles. This would result in continued air pollution and the acceleration of climate change. Obesity and illnesses resulting from exposure to air pollutants and a sedentary lifestyle would also become more prevalent.	Walking and biking are great ways to stay physically healthy while also getting people to their destination. Investments in biking and walking infrastructure can help people be more active and healthier. Additionally, shifting driving trips to walking and biking reduces air pollution and greenhouse gas emissions.
Privacy	If rapid technology change unfolds without regulatory preparation by governments, citizens could become more vulnerable to breaches of privacy (for example, payment and trip data could be exposed, allowing companies to exploit information on where people live and work).	Proactive work by governments will allow citizens to reap the benefits of transportation technologies while keeping their data secure.

Tactical Actions

The following section identifies tactical actions that local governments in the Central Okanagan may wish to take to prepare for technology change in transportation. The tactical actions were identified by reviewing existing trends and best practices, and informed by a broad literature review.[xii]

The tactical actions range in approach from shaping how new technologies are deployed to delivering transportation improvements that are adaptable and can evolve with rapid changes in technology. Other tactics focus on fundamentally resetting the web of incentives related to transportation choices as they exist today. It is worth noting that the tactical actions listed do not all belong in the typical wheelhouse of a municipal transportation department. Instead, they reflect how transportation works as a system tied to a variety of incentives from multiple levels of government, the private sector, nonprofit organizations, and the broader community.

The following themes organize the tactical actions listed below: connected, self-driving, shared mobility, electrification and funding and growth.

The funding and growth category attempts to group actions that are related to how we retain stable funding streams for transportation-related initiatives in the future and stay resilient in the face of significant workforce changes that may occur as a result of the disruptions coming to transportation.

Each tactical action includes a description, an action initiator, additional participants, and notes regarding related actions. The action initiator sub-heading refers to the lead government agency (local jurisdiction or regionally coordinated). The additional participants sub-heading identifies other agencies and key stakeholders that may be critical for successful implementation (e.g. provincial agencies such as the Ministry of Transportation and Infrastructure or BC Transit, the private sector, nonprofit organizations, or educational institutions).

Connected

1.1 Install bicycle and pedestrian detection at signalized crossing locations
1.2 Implement measures to improve customer service and speed up transit
1.3 Pilot improvements to roadways with modular and temporary materials
1.4 Engage universities in mobility technology research and development

Self-Driving

2.1 Eliminate parking minimums in zoning bylaws region-wide for all uses
2.2 Support legislative efforts to ensure that self-driving vehicles operate safely
2.3 Minimize zero occupant trips and encourage shared use of self-driving vehicles
2.4 Pilot self-driving transit
2.5 Develop incentives to optimize ride-hailing operations
2.6 Test assumptions on roadway capacity and utilization in a self-driving future
2.7 Invest in lane markings that enhance the effectiveness of lane departure warning and prevention systems
2.8 Structure public parking systems to limit large capital expenditures

Shared

3.1 Develop and implement a curb space management plan
3.2 Pilot mobility hubs at key transit exchanges
3.3 Partner with the private sector to provide transportation in mobility-challenged communities
3.4 Establish a mobility data platform
3.5 Establish data sharing requirements for private-sector mobility providers
3.6 Ensure equity in the Delivery of Mobility as a Service (MaaS)
3.7 Update regulations to include new and emerging modes
3.8 Protect public privacy
3.9 Launch a service that provides real-time infrastructure data to connected vehicles and trip planners
3.10 Make it easier to work with local jurisdictions to deploy and test new technologies related to transportation

Electric

4.1 Create a community electric vehicle strategy
4.2 Transition government fleets to electric or other zero-emission vehicles

Funding and Growth

5.1 Develop a mobility pricing study for the Central Okanagan

5.2 Support legislative efforts to ensure that self-driving vehicles generate appropriate funding

5.3 Develop a disruptive mobility innovation fund

5.4 Prepare the workforce for changes driven by innovation in transportation technology

5.5 Hire and train staff on new technologies and trends

1. Tactical Actions: Connected

1.1 Install bicycle and pedestrian detection at signalized crossing locations

Implement pedestrian and bicycle detection at signalized crossing locations on both local and regional active transportation networks.

Currently intersections across the region have minimal amounts of pedestrian and bicycle detection. This can make movements like left-hand turns more challenging for people on bikes if they are physically incapable of triggering a signal change or a required advance turn arrow. A similar situation occurs for those with accessibility challenges when it comes to pushing pedestrian buttons. This is important to deploy at key intersections within urban and town centres on routes that prioritize people walking and biking.

Action Initiator
Local governments

Additional Participants
MOTI

Related Actions
N/A



Figure 4 Intersection of Ethel and Sutherland in Kelowna where two protected bike lanes meet.

1.2. Implement measures to improve rider experience and speed up transit

A variety of different technologies and policies exist that can improve the transit rider experience, improve transit speed and reliability, and enhance customer satisfaction. Examples include:

- Digital payments that allow riders to pay for transit through credit, debit or mobile phone
- Proof of payment policies that enable all door boarding
- Establishing fare paid zones where payment is required in advance of boarding
- Digital displays at high use transit stops
- Providing WiFi on transit vehicles

These technologies and policies are a new piece of the puzzle to grow transit ridership into the future.

Action Initiator
Regional collaboration

Additional Participants
BC Transit

Related Actions
N/A

1.3. Pilot improvements to roadways with modular and temporary materials

Rapid prototyping and experimentation have arrived in departments of transportation across the world. As a way of painting a picture of what could be, these departments are shedding a concrete mindset for quickly learning and adapting using lighter and more temporary materials. Rapid implementation can be used to quickly remake streets, providing much of the value in the short term at a fraction of the cost. Testing ideas quickly can help unearth real-world challenges, bring much of the benefits sooner while building momentum around long term changes. Across the world changes to transportation infrastructure happened in a matter of days to allow more space for people during the COVID-19 pandemic, but this has been happening for quite some time. This approach proves useful in showing the speed at which local governments can move and deliver benefits to residents in a way that is flexible to changing needs or unforeseen circumstances.

Action Initiator
Local governments

Additional Participants
N/A

Related Actions
N/A

1.4. Engage universities in mobility technology research and development

Build capability around emerging mobility technologies by partnering with academic institutions to establish research related to transportation technology change. By partnering with educational institutions, local governments can aid them in accessing funding sources and allow them to securely access data to assess elements of the transportation network, opening the door to potential improvements.

This action is an ongoing effort.

Action Initiator
Local governments

Additional Participants
UBCO, Okanagan College

Related Actions
N/A

2. Tactical Actions: Self-Driving

2.1. Eliminate parking minimums in zoning bylaws region-wide for all uses

One of the most significant potential impacts of self-driving vehicle technology is the likelihood that drivers will send their cars elsewhere rather than pay for parking. Self-driving technology may fundamentally unlink a traveler's final destination with the destination of their vehicle. This and other changes may lead to a significant dampening in demand for parking onsite at destinations.

Currently, minimum parking requirements exist to help protect the availability of unmanaged curb parking. Unfortunately, these regulations also hinder the potential of the region by filling our developed areas with unproductive and costly parking infrastructure. They push homes and businesses further apart, impede the walkability of our neighbourhoods, raise the cost of housing, and place a costly burden on small business owners. Eliminating this requirement would allow new businesses to flourish and treat land as a valuable resource.

By eliminating required parking minimums, developers can still build parking—but will weigh its value against the other things they could do with the finite capital dollars and valuable land. These measures need to be implemented with a resourced parking management effort that manages public parking assets to maximize public benefit.

Action Initiator

Local governments

Additional Participants

N/A

Related Actions

2.8



Figure 5 Self-driving technology is getting better and now only needs human input roughly every 21,000 km on public roads.[xiii]

2.2. Support legislative efforts to ensure that self-driving vehicles operate safely

Develop recommendations for the Province on potential approaches to testing, licensing, and regulating private and shared self-driving vehicles to ensure the safe operation of such vehicles in the Central Okanagan region**.**

Action Initiator
Regional collaboration

Additional Participants
Local governments

Related Actions
2.3, 2.4, 2.6

2.3. Minimize zero occupant trips and encourage shared use of self-driving vehicles

Self-driving vehicles can operate without passengers, creating "zero-occupancy" trips. This presents a challenge as zero-occupant vehicles would increase the number of vehicle kilometers travelled (VKT) and increase traffic congestion.

Everyone values their time differently, and if congestion exists, some people will decide to travel earlier or later to avoid it, or they may choose to eliminate their trip altogether. However, self-driving vehicles do not have a value of time. Other than the cost of running the vehicle for the trip, the amount of time spent sitting in traffic is not a consideration. This has the potential to fundamentally reshape travel decisions and increase traffic congestion. If left unmanaged, this issue could cripple the Central Okanagan's road network.

This action recommends developing policies to discourage zero-occupant trips. Examples include:

- congestion pricing based on the number of vehicle occupants,
- placing limits on the amount of zero-occupant miles travelled, and
- regulating businesses that contribute significant zero occupant trips to the road network.

Incentivizing shared rides in self-driving vehicles as they enter the regional market would also be critical but may require some zero occupant trips. Zero occupant trips would be necessary for any shared vehicle fleets. Therefore, banning zero occupant trips could mean worse outcomes than ensuring there is a balance of zero occupant trips.

Action Initiator
Local governments

Additional Participants
Regional collaboration, Private sector

Related Actions
2.1, 2.2, 2.4, 2.6

2.4. Pilot self-driving transit

In the future, driverless transit services will allow the provision of more flexible service and could potentially lower the operating cost of transit service. This would allow transit to benefit more people and serve a greater variety of trips.

Microtransit (smaller) vehicles with self-driving technology are currently available. As a result, an initial test might involve deploying a service that improves first and last mile connections to higher-order transit. Deploying a more niche service initially will create more opportunities for the general public to experience self-driving vehicle technology firsthand and for staff to understand challenges and opportunities related to these vehicles.

Action Initiator
Regional collaboration

Additional Participants
BC Transit, Local governments, Private sector

Related Actions
2.2, 2.3, 2.6, 2.7

2.5. Develop incentives to optimize ride-hailing operations

Ride-hailing vehicles have a disproportionate impact on traffic congestion and air quality in urban areas, where it is felt most acutely. However, ride-hailing services are also beneficial since they provide mobility for people unable to drive (e.g. youth, seniors, people who have been drinking), mitigate the need for additional parking in town centres, and make it easier to get around without having the expense of owning a private vehicle.

This action recommends developing policies and incentives to encourage ride-hailing vehicles to:

- Use fleets with low carbon emissions[xiv]
- Ensure safe passenger pick-up and drop off procedures
- Offer "pooling" services to increase vehicle occupancy rates[xv]
- Integrate with the regional transit network
- Assist in mobility-challenged communities
- Minimize travel without a passenger, and
- Decrease idling times[xvi].

Action Initiator
Regional collaboration

Additional Participants
Local governments, Private sector

Related Actions
3.10

2.6. Test assumptions on roadway capacity and utilization in a self-driving future

There are many projections for how people would behave in a variety of service delivery models for self-driving vehicles. These include scenarios where self-driving vehicles are primarily operated as a shared subscription service or privately owned.

This action recommends working to gauge the window of possibilities for congestion on our road network across multiple scenarios.

Action Initiator
Academic institutions

Additional Participants
Regional collaboration, Local Governments, MoTI

Related Actions
2.2, 2.3, 2.4, 2.7

2.7. Invest in lane markings that enhance the effectiveness of lane departure warning and prevention systems

Currently, self-driving vehicles are being developed to operate without significant retrofits to existing local networks. However, this action recommends investing in high visibility lane markings now, since they can help improve the performance of existing systems, such as lane departure warning and improve the safe operation of self-driving vehicles in the future.

Action Initiator
Local governments

Additional Participants
MOTI, Private sector

Related Actions
2.2, 2.3, 2.4, 2.6

2.8. Structure public parking systems to limit large capital expenditures

As discussed in 2.1, one of the most significant potential impacts of self-driving vehicle technology is the likelihood that drivers will send their cars elsewhere rather than pay for parking. Self-driving technology may fundamentally unlink a traveler's final destination with the destination of their vehicle. In addition, ride-hailing and other shared transportation services may reduce parking demand. These changes will have a significant impact on public parking demand and expected revenues. This action recommends structuring public parking expenditures in favour of lower capital-intensive solutions that can be repurposed. This would be prudent in the near-term to avoid long-term capital obligations for single-use parking assets.

Investments in smart parking systems that manage parking using variable rates based on demand and provide availability information to users should continue to be pursued.

This action is an ongoing effort.

Action Initiator
Local governments

Additional Participants
N/A

Related Actions
1.6, 2.1



Figure 6 The figure above depicts the output of a LIDAR sensor installed in downtown Kelowna. LIDAR technology, which works similarly to radar, powers most self-driving vehicles. Within the Central Okanagan, LIDAR is currently being used in flood mapping and transportation studies among other applications.

3. Tactical Actions: Shared

3.1. Develop and implement a curb space management plan

Curb space is where mobility meets access. This valuable space is not always optimized to achieve a broad set of outcomes. Historically, regulating and managing curb space has been assembled bit-by-bit in response to residents or businesses, and has primarily been dedicated to the storage of private vehicles. The conversation about what uses should be allowed in curb space is quickly changing.

Curb space has a variety of possible uses including car parking, bike lanes, sidewalk cafés, transit stops, trash collection, landscaping, rain gardens, delivery zones, bicycle parking, shared mobility, widened sidewalks, ride-hailing drop-off, and taxi stands. This space is also often contested, and reassigning it is politically challenging.

New shared services like ride-hailing, bikeshare, and increasing deliveries (due to rises in online shopping) have intensified the demand for curb space and laid bare the urgency for this space to be governed flexibly to achieve a variety of outcomes.

This action recommends that Central Okanagan governments develop curb space management plans to prepare for increasing demands and proactively manage curb space as a lever to achieve stated policy goals. Additionally, it is recommended that tools to manage and optimize the usage of curb space in real-time be explored.

Action Initiator
Local governments

Additional Participants
Private sector

Related Actions
2.5



3.2 Pilot mobility hubs at key transit exchanges

A mobility hub consists of an area where different forms of transportation come together, often at a transit exchange. A mobility hub may include transportation services and amenities such as short and long-term bicycle parking, shared mobility options (e.g. bikeshare, scooter share, carshare), ride-hailing and taxi-stands, park and ride, electric vehicle charging stations and other services. Fixed-route transit service often lacks the ability to get a person directly to their destination (called the "last mile" challenge). Mobility hubs, where multiple forms of transportation come together, can bridge this gap and shorten overall transit travel times by making multi-modal trips seamless. As transit exchanges transform, they should function as mobility hubs in addition to a place to transfer between busses.

Action Initiator
Local governments

Additional Participants
BC Transit, Private sector

Related Actions
2.4



3.3 Partner with the private sector to provide transportation in mobility-challenged communities

The Central Okanagan region is in a unique position in Canada. In the majority of the country's heavily populated areas, outlying suburban areas often correspond with low-income communities and are where delivering transportation services can be the most challenging. However, in the Central Okanagan many of these outlying areas also happen to be some of the wealthiest. This makes the challenge of effectively delivering transportation options to these communities through the private sector potentially easier because residents may be able to pay higher costs for improved, or on-demand service.

This action recommends working with BC Transit and/or the private sector to deliver on-demand transit services in low-density areas that don't meet fixed-route bus service standards. Consider connections to and from senior housing, low-income neighbourhoods, and medical facilities as key focus areas.

Action Initiator
Local governments

Additional Participants
BC Transit, Private sector

Related Actions
3.6

3.4 Establish a mobility data platform

As multiple transportation service providers enter the market, it will be important to organize transportation data and facilitate access to ensure transparency and informed decision-making.

This action recommends creating a regional mobility data platform that houses transportation-related data from all transportation sources with access provided to all agencies. The platform would consolidate archived and real-time data from multiple agencies and private providers into a single data repository. Implementation of the data platform would involve:

- Establishing policy standards for data sharing between regional stakeholders for interoperability
- Setting security standards for maintaining privacy and data anonymity

Action Initiator
Regional collaboration

Additional Participants
Local governments, BC Transit, MOTI, Private sector

Related Actions
3.5

3.5 Establish data sharing requirements for private-sector mobility providers

This action recommends establishing standard data-sharing agreements with private sector mobility providers. The agreements should address use cases, privacy, and data security for mobility data to ensure it is handled and shared with local jurisdictions, other public agencies and academic institutions in the region. This would help manage the growing number of new mobility service providers and pull insights into how their services are performing and contributing to the regional transportation network.

Action Initiator
Regional collaboration

Additional Participants
Local governments, BC Transit, MOTI, Private sector

Related Actions
3.4

3.6 Ensure Equity in the Delivery of Mobility as a Service (MaaS)

Mobility as a Service (MaaS) offers a single point of access to public and private mobility services through which users travel across a variety of modes. Residents would be able to choose from a selection of travel pass packages or pay-as-you-go options with different price structures for peak and off-peak travel. This would make buying transportation services more like a cellphone plan where various services can be bundled or purchased on-demand, as appropriate, based on customer needs.

This action recommends that public agencies coordinate across the various private and public sector service providers to ensure social equity in how transportation services are provided. Specifically, MaaS should be delivered to all travelers equitably by developing subsidies or equal access policies that focus on low-income and unbanked individuals. Additionally, transit fares should be structured to allow for greater customization and flexibility for different market segments. For example, digital "smart" transit tickets could enable customers to choose from a menu such as off-peak usage or to buy a multi-modal trip through one purchase. This would afford the Kelowna Regional Transit System greater flexibility in pricing.

Action Initiator
Regional collaboration

Additional Participants
Local governments, BC Transit, MOTI, Private sector

Related Actions
3.3

3.7 Update regulations to include new and emerging modes

Local traffic and parks bylaws often unintentionally ban new modes by not explicitly mentioning them. Unfortunately, this presents challenges for the adoption of a variety of new mobility modes. As new vehicle types are released on the market, especially related to the electrification of active transportation, they may be added to the Motor Vehicle Act. These vehicle types should be considered candidates for inclusion in local bylaws that govern active transportation facilities to broaden the potential and appeal for low carbon and space-efficient transportation.

This action is an ongoing effort.

Action Initiator
Local governments

Additional Participants
Regional collaboration, MOTI

Related Actions
N/A



3.8 Protect public privacy

Data about an individual's transportation patterns can contain sensitive personally identifiable information (PII) even when anonymized correctly. Due to the risks associated with the collection and sharing of data between private industry and public agencies, this will be a new challenge for local governments. As a result, this will require staff to have a strong understanding of guarding privacy when handling or allowing for the collection of mobility data.

This action recommends robust mechanisms be put in place regarding the governance of data generated by shared mobility services in order to protect the privacy of transportation system users.

This action is an ongoing effort.

Action Initiator
Local governments

Additional Participants
Regional collaboration, MoTI, Private sector

Related Actions
N/A

3.9 Launch a service that provides real-time infrastructure data to connected vehicles and trip planners

In the future, the role of public agencies will involve not only physical infrastructure but also digital infrastructure that can be built to power a variety of different applications.

This tactical action recommends providing real-time digital outputs from transportation infrastructure to connected vehicles and trip planning apps. Connected vehicle technology is currently being sold on cars available for purchase in the Central Okanagan.

Action Initiator
Local governments

Additional Participants
Regional collaboration, MoTI, BC Transit

Related Actions
N/A

3.10 Make it easier to deploy and test new technologies related to transportation

As delivery mechanisms for transportation services change in the future, there is a trend to not require a significant reinvestment in the transportation network for new solutions to work well. There is a clear understanding that even small retrofits, when applied across the entire transportation network, is not feasible and can be challenging to accomplish for local governments with competing priorities. As a result, delivery of many transportation technologies does not require buy-in from local governments.

That said, some partnerships can be mutually beneficial. This action recommends local governments look to partner with the private sector, allowing them to utilize public assets to add value in new ways that may not have been fully considered in the past. Examples include providing dedicated on-street carshare spaces or allowing bikeshare systems to operate from within the right of way using public land. This benefits local governments with additional sustainable and space-efficient mobility choices for residents to choose from often at minimal public cost.

In the future, local governments will need to assess these opportunities and move on them quickly to leverage the opportunities they bring for low-cost achievement of public policy goals.

Action Initiator
Local governments

Additional Participants
UBCO, Private sector

Related Actions
N/A

4 Tactical Actions: Electric

4.1 Create a community electric vehicle strategy

Zero-emission vehicles help reduce tailpipe emissions of air pollutants and greenhouse gases, and improve public health. Additionally, the electrification of bicycles and other small vehicles has claimed an increasing market share.

This action recommends developing an electric vehicle strategy that would identify regulatory hurdles and develop recommendations to encourage the adoption of electric vehicles by public and private fleets. The strategy should identify opportunities to retrofit existing assets and provide new charging infrastructure for electric cars and small electric vehicles.

Action Initiator
Local governments

Additional Participants
Private sector, Regional collaboration

Related Actions
N/A



4.2 Transition local government fleets to electric vehicles

This action recommends creating goals for converting City fleets to zero-emission vehicles. The goals may be tailored to fleet types, as well as available vehicle technology. While the switch to alternative fuels for some fleet vehicles is a long way off, new purchases of light-duty fleet vehicles should prioritize electric vehicles. Fleet vehicles are operated much more extensively than personally owned vehicles and as a result, they create more GHG emissions.

Additional staff training and charging infrastructure would be needed as the fleet transitions.

Action Initiator
Local governments

Additional Participants
Private sector

Related Actions
4.1

5. Tactical Actions: Funding and Growth

5.1 Develop a mobility pricing study for the Central Okanagan

As new transportation technologies proliferate into the transportation network, new challenges like zero-occupancy trips and shared mobility services competing for road and curb space will emerge. In this future, a dynamic user pay system for access to the transportation network could become a critical tool to manage congestion and the use of curb space.

This action recommends working collaboratively across the region and with the Province to explore mobility pricing options or other transportation-related revenue tools that would enable a more dynamic, real-time management of regional transportation assets and infrastructure to help prepare for the future.

Action Initiator
Regional collaboration

Additional Participants
Province, local governments

Related Actions
5.2

5.2 Support legislative efforts to ensure that self-driving vehicles generate appropriate funding

Self-driving vehicles come with a significant potential for overuse of transportation infrastructure with zero-occupancy trips. Infrastructure has significant maintenance costs and traffic congestion presents significant negative impacts on society. While local governments are expected to manage traffic flow, it can be challenging to secure the needed funds to make improvements. It will be important to ensure that self-driving vehicles contribute revenues commensurate with their impact on the transportation network.

This action recommends developing partnerships with the Provincial and Federal governments (potentially through FCM and UBCM) on new user fees, registration fees, or other possible revenue streams to prepare the region for the arrival of self-driving vehicles.

Action Initiator
Regional collaboration

Additional Participants
Province, local governments

Related Actions
5.1

5.3 Develop a disruptive mobility innovation fund

Opportunities to test new and innovative ways of service delivery in transportation come up outside the normal government budget cycle.

This action recommends creating a fund for disruptive mobility projects and initiatives to seize new opportunities as they emerge. A specific fund would open the door to quickly act on emerging opportunities aligned with local policy direction. This would enable local governments to learn quickly, build expertise and adapt while implementing pilots more quickly.

Action Initiator
Local governments

Additional Participants
N/A

Related Actions
N/A

5.4 Prepare the workforce for changes driven by innovation in transportation technology

As automation disrupts transportation, it will impact the Central Okanagan's workforce. Transportation and warehousing accounted for 4% of regional employment in 2016. While the direct impacts of self-driving and other transportation technologies deployed locally will be significant, many other areas will see an indirect effect. The impact will likely be felt across the local economy with substantial effects on insurance, auto body repair, legal services, and property development.

This action recommends that local governments prepare for future changes in the needed skillsets and size of the transportation-related workforce in the Central Okanagan. It will be essential to prepare the local workforce to be ready for these shifts over the coming decades.

Action Initiator
Regional collaboration

Additional Participants
Private sector, Local governments

Related Actions
5.5

5.5 Hiring and Training Staff on New Technologies and Trends

As transportation rapidly evolves, it will be important to build staff capacity to address these changes in the Central Okanagan region.

This action recommends working collaboratively across the region, sharing expertise and resources, and building local government staff capacity in new transportation technologies, including emerging new mobility options, multimodal integration and active transportation and transit through training and hiring staff with the required skill sets.

Action Initiator
Local governments

Additional Participants
Regional collaboration

Related Actions
5.4



Phasing Strategy

Due to a large number of tactical actions and the magnitude of effort required, a phasing hierarchy has been developed to identify a rough approximation of priority. Timing for many actions will be impacted by the deployment of new technologies globally and therefore, a more flexible phasing and prioritization strategy is preferred.

The phasing strategy looks to two metrics to score each tactical action, "Ease of Implementation" and "Value".

> Ease of implementation: refers to the obstacles and structural change needed to enable the tactical action by the Action Initiator and Key Stakeholders. This may include staff effort, political capital, the level of public support required or a variety of other factors.
>
> Value: is a measure of the impact of a tactical action's implementation specifically related to moving the region toward the vision of the Regional Transportation Plan.

The table below provides a summary of the tactics sorted by the ease of implementation and overall value to give some guidance in terms of priority.

		Value		
		Low	Medium	High
Ease of Implementation	Hard			1.2 2.1, 2.3 3.3 5.1
	Medium	2.4 4.1	1.3 3.1, 3.6, 3.7, 3.8 5.3, 5.5	2.5, 2.8 3.2, 3.4, 3.5, 3.9
	Easy	1.4 2.2, 2.6, 2.7 4.2 5.2, 5.4	1.1 3.10	

Next Steps

Technology is being integrated into the transportation network in the Central Okanagan region today. The Next Ride real-time transit information, the piloting of bike and e-scooter share in Kelowna, the arrival of ride-hailing and the surge in food and grocery delivery during Covid-19 are just a few examples of how technology in transportation is already delivering benefits to our residents. This suite of transportation options will likely increase in the future.

Considering both the opportunities and challenges of these future transportation trends, there are steps that Central Okanagan governments can take to maximize the benefits of technology change while minimizing potential challenges.

By focusing on how future technologies are likely to roll out, and working to mitigate potential negative impacts, Central Okanagan governments can work together to maintain our region's economic prosperity and high quality of life. No one future technology will be the silver bullet, but by understanding the tradeoffs and proactively shaping our approach, we can keep people moving throughout the region.



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