



GOAL FOUR

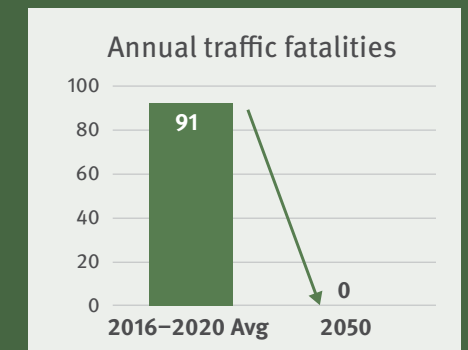
Safe & Comfortable Choices for Everyone

? WHERE WE ARE TODAY

“I often don’t feel safe or comfortable getting around, because of high-speed traffic, because of other people who might do me harm, and because of a lack of amenities that meet my needs.”

📍 WHERE WE WANT TO BE

We all have safe and comfortable choices that make us all healthier and happier, with serious traffic injuries and fatalities declining by at least 5% annually until we reach zero before 2050.



A feeling of being unsafe, uncomfortable, or unwelcome is a key barrier that limits freedom of movement and the ability to access the opportunities that people need to thrive.

For people walking, biking, or rolling — including pushing a stroller or being in a wheelchair — that means feeling anxious and unsafe being next to larger, faster-moving vehicles. For people with a disability, including those with diverse learning abilities or those who rely on mobility aids, it could mean challenges navigating transit systems, or being uncomfortable on streets with no or limited sidewalks or with curb cuts. As our population ages, seniors transitioning away from driving — and encountering new accessibility challenges — will require more safe and comfortable choices, particularly as more people “age in place”.

Many people, especially individuals with lower incomes who are more likely to live adjacent to major roads, live with constant and unsafe levels of transportation noise, vibrations, and air pollution,

leading to mental and physical health problems. And many people in Metro Vancouver experience discrimination, harassment, and outright hate while trying to get around the region — especially women, and people who present as Indigenous, Asian, Black, or non-white.

Through Transport 2050, the Metro Vancouver region is embracing the core belief that everyone has the right to live and move safely, comfortably, and free from harm in their communities, and is committing transportation system designers and policy-makers to share the responsibility to help make this aspiration a reality.

The following pages describe what it will take to make sure that our transportation system contributes in positive ways to our health, happiness, and well-being, helping everyone feel welcome, comfortable, and safe while getting around, including reducing **traffic fatalities and serious injuries by at least 5% annually until we reach zero before 2050.**

- A transition away from roads designed for cars towards people-first streets designed for everyone, featuring **reduced motor vehicle speeds** and **greater separation of different modes and speeds**; in the long run, **automation** can also play a major role in improving traffic safety and freeing up space to support more people-oriented streets.
- Making **everyone feel welcome**, included, and comfortable while getting around the region will require a multi-faceted and society-wide effort to **eliminate harassment, hate,**

and **systemic discrimination**; it will also require creating welcoming public spaces for everyone, including investment in programs and **amenities to support inclusion**.

- Making the transportation system **cleaner and quieter** to improve health and well-being for adjacent communities and ecosystems.
- Being prepared to **respond to and recover from disruptions and disasters** through robust safety and resiliency planning.

On Resilience and Safe & Comfortable Choices

Various shocks — whether environmental such as flooding or earthquakes, or technological such as power outages or cyberattacks — can bring unanticipated safety risks. Key resilience approaches to mitigate these impacts on safety include:

- Maintaining infrastructure in a state of good repair, robust asset management, and operational practices to enable infrastructure to better withstand climate or extreme weather impacts.
- Establishing standards for infrastructure development that prepare new projects for climate impacts such as excessive heat, floods, and temperature fluctuations.
- Prioritizing bus-based investments over fixed rail infrastructure in areas of high risk for flooding, seismic activity, or earthquakes;

buses can be more easily redeployed if local conditions change.

- Supporting a robust transition to autonomous vehicles that emphasizes safety — not only for drivers and car passengers, but also for vulnerable road users.
- Planning streets to mitigate potential conflicts between modes of transportation — conflicts that could increase when systems are under stress.

To better understand what tomorrow might bring, Metro Vancouver and TransLink partnered to develop the *Regional Long-Range Growth and Transportation Scenarios* report. This report examines four plausible futures for Metro Vancouver, which can help us identify measures to ensure that both transportation and the region are more resilient.

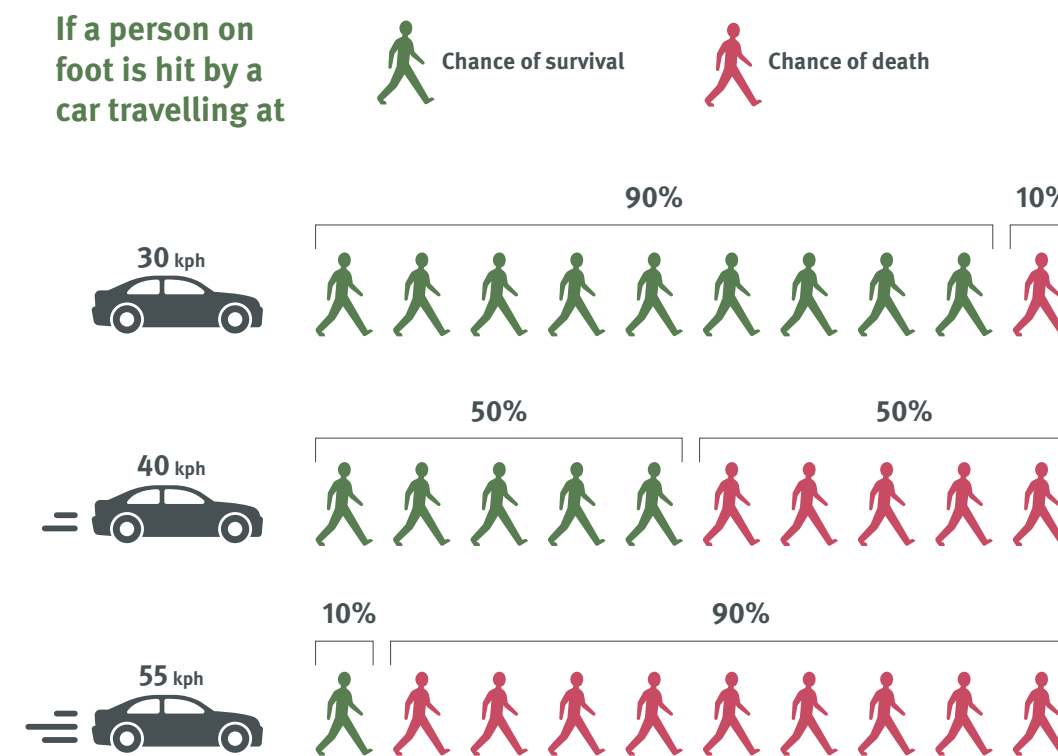
Strategies and Actions

Strategy 4.1: Eliminate traffic fatalities and serious injuries.

Streets are the lifeblood of our communities. Streets use about a third of the land area in urban Metro Vancouver and make up 80% of all public space. They have the potential to foster business activity, serve as a front yard for residents, and provide a safe place for people to get around on foot, by bicycle, by car, or on transit. However, most streets in our region were designed to prioritize high-speed car movement at the expense of other uses and users.

Each year, more than 100 people are needlessly killed on Metro Vancouver streets — typically, 40 of whom were walking, biking, or rolling while they were struck and killed. Tens of thousands more people are seriously injured every year. The key factor in these fatalities is speed. Based on the human body’s ability to withstand impact, as shown in Figure 10, the National Association of City Transportation Officials (NACTO) recommends the top design speed for urban streets should be no higher than 40 km/hr.

Figure 10: Risk of Death for a Person on Foot as a Function of Vehicle Impact Speed



At collision speeds above 35 km/hr, the probability that a person on foot will be fatally injured rises rapidly, with death almost certain at impact speeds of 55 km/hr or higher. (Source: P. Wramborg, “A new approach to a safe and sustainable road structure and street design for urban areas”, Road Safety on Four Continents Conference, 2005).

For too long, we've considered these persistent high levels of traffic deaths and severe injuries to be inevitable side effects of modern life. While often referred to as accidents, the reality is that we can prevent these tragedies by taking a proactive, preventive, and systematic approach that prioritizes traffic safety as a key public health issue.

The Vision Zero approach is a significant departure from status quo transportation system management in two major ways:

- Vision Zero recognizes that people will make mistakes, so the road system and related policies should be designed to ensure that those inevitable mistakes do not result in severe injuries or fatalities.
- Vision Zero is a multidisciplinary approach, bringing together local traffic planners and engineers, policy-makers, public health professionals, and the public to collaborate on problem-solving.

The arrival of advanced connected and automated vehicle technology could also provide substantial opportunities to move goods and people more safely throughout the region with fewer casualty collisions — 90% of which in 2016 were attributed to human error.¹⁴ However, given the challenges that automated vehicles will likely always have in urban environments when interacting with people on foot — as unpredictable as we humans are — cities seeking to bring automated vehicles to scale are likely to find two feasible design options:

1. Significantly reduce traffic speeds on urban streets so that automated vehicles can safely and efficiently interact with people on foot, or
2. Significantly restrict and channelize the movements of people on foot through barrier fences alongside sidewalks and down the middle of streets, together with pedestrian tunnels and overpasses that minimize interaction between automated vehicles and people on foot

While there will be a few limited locations within our region where the second design option may be necessary to contemplate, our region strongly prefers the first option — to design streets for slower traffic speeds. This option is significantly more favourable to advancing the five goals set out in Transport 2050.

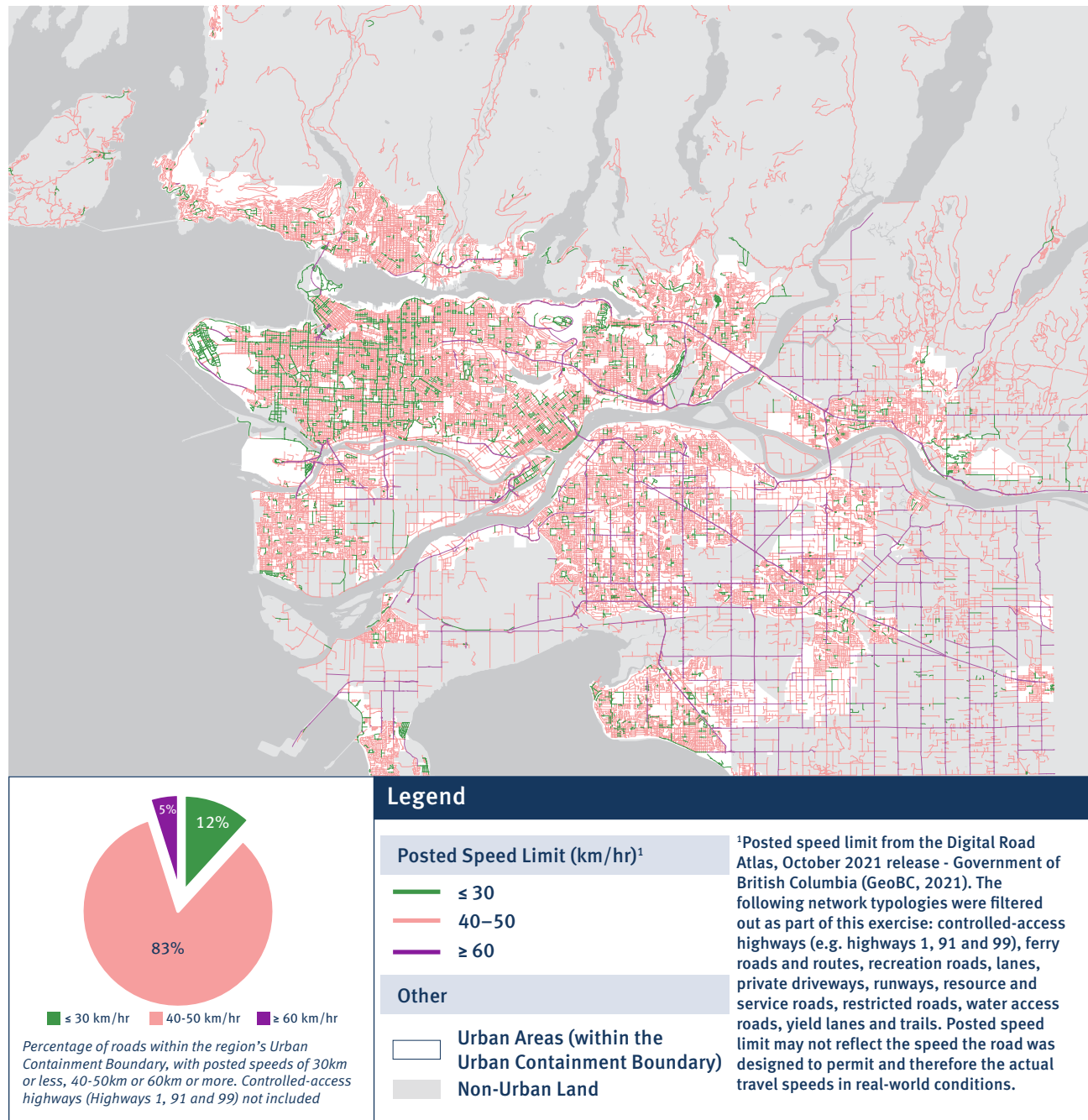
¹⁴ Information and Communications Technology Council, "Autonomous Vehicles and the Future of Work in Canada", January 2018, https://www.ictc-ctic.ca/wp-content/uploads/2018/01/ICTC_-Autonomous-Vehicles-and-The-Future-of-Work-in-Canada-1-1.pdf

Given the vastness of our region's street network and the length of time it will take to transform them, we need to take steps now to begin redesigning our streets for slower speeds and with more dedicated space for active transportation and transit. In this way, we will be more prepared to welcome connected and automated vehicles, whenever they are permitted on BC roads, in ways that advance our region's goals, rather than work at cross-purposes to them. In the meantime, even prior to the arrival of automated vehicles, such street transformations will make important progress towards eliminating traffic fatalities and serious injuries, and towards improving travel reliability, livability, street life, and street commerce.

Actions

- 4.1.1. **Reduce the default speed limits** and design speeds for urban streets to 30 km/hr or slower, depending on context, with speeds of 60 km/hr and above reserved for controlled-access highway environments characterized by complete separation from other modes and potentially much faster travel speeds ultimately dictated by the safe upper operating range of automated vehicles.
- 4.1.2. Transform our roads into **people-first streets** that are safe for everyone, with different streets prioritized for different uses and speeds, employing physical design and technology to achieve those speeds, including:
 - a. Walking and rolling priority streets, pathways, and car-free zones where motor vehicle traffic travels at walking speeds so that people feel safe and comfortable to choose these active modes.
 - b. Neighbourhood streets where motor vehicle traffic travels at cycling speeds, allowing for play and social activity in the street.
 - c. Neighbourhood main streets where it is still comfortable for cycles to ride in mixed traffic; this could include priority lanes, allowing transit to safely travel at somewhat higher speeds.
 - d. Major roads and boulevards that accommodate longer-distance vehicle trips could permit speeds of up to 50 km/hr in some cases, as long as they feature frequent signalized crossings, wider sidewalks, traffic-protected cycle tracks, and transit priority lanes.

Map 18: Posted Speed Limits in Metro Vancouver Today



Source: "Digital Road Atlas", GeoBC, October, 2021, <https://www2.gov.bc.ca/gov/content/data/geographic-data-services/topographic-data/roads>

- 4.1.3. **Reduce the frequency and severity of collisions** involving automobiles and vulnerable road users by working towards realizing a people-first street network typology as described in Actions 1.1.1 and 1.1.2.
- Welcome local motor vehicle traffic on low-speed local streets, but prevent high-speed cut-through traffic on local streets.
 - Make the resulting neighbourhood open space serve as a passage and crossover point for walkways and bikeways, as well as recreation and play areas and focal points for community activities.
 - Prepare Freight-Supportive Community Design Guidelines (as a reference for municipalities) that include guidance on particularly challenging issues, including complete street designs that provide safe and efficient networks for all users.
- 4.1.4. **Prioritize protection for those road users with the least physical protection** and who are most easily injured or killed in car-dominated environments (i.e., people walking, biking, and rolling; on motorized two-wheelers or horseback; children, seniors, and people with disabilities; and roadwork crews). 🌍
- Update legislation and bylaws to strengthen legal protections for these street users.
 - Strengthen enforcement practices to prioritize protection for these street users, including the use of automated traffic enforcement and increased penalties for speeding or unsafe driving.
 - Study the potential of allowing low-speed lane filtering for motorcycles and mopeds — where a motorcycle rider is permitted to move alongside vehicles that have either stopped or are moving very slowly — to confirm whether this measure improves the safety of motorcyclists (e.g., improving visibility, reducing the likelihood that they are rear-ended), and whether these safety improvements outweigh any potential added risks to motorcyclists or other road users.

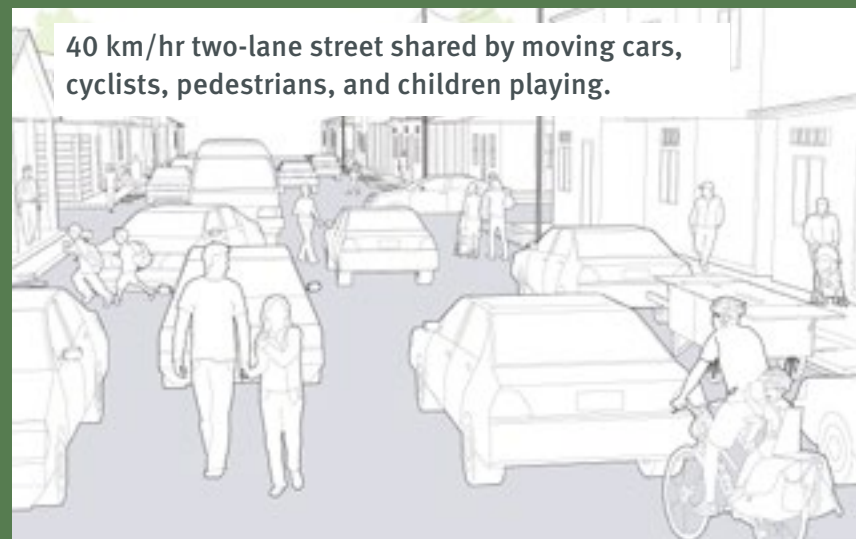
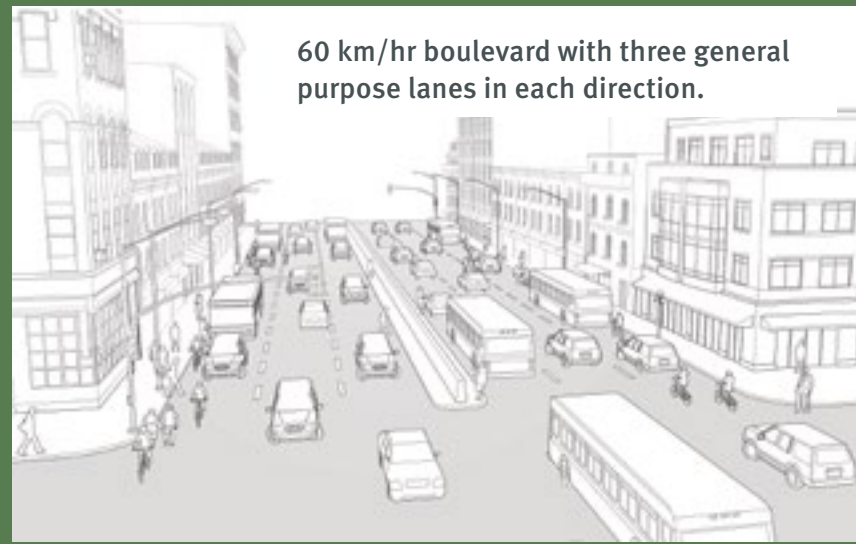
People-First Streets

Rethinking and evolving street design

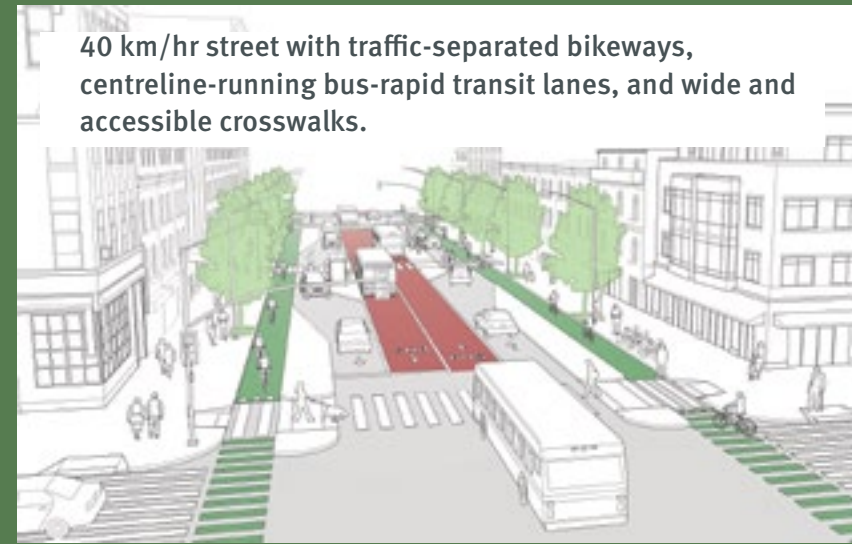
At one time, before the automobile came to the fore, city streets in many parts of the world were much more inviting to pedestrians, social gathering, and multiple modes of transportation.

A return to more people-first streets, which could be realized through a transformation of road space, could help the region meet multiple social, environmental, and economic objectives.

EXISTING CONDITIONS



REDESIGN



These images show a variety of ways streets can be transformed from focusing on moving vehicles to focusing on moving people in a safe and comfortable way.

The images are provided only as examples.

For implementation, a tailored approach unique to each location around the region would be needed.

Sources: "Global Street Design Guide", Global Designing Cities Initiative, December 21, 2021, <https://globaldesigningcities.org/>; "Designing Streets for Kids", Global Designing Cities Initiative, 2020, <https://nacto.org/publication/designing-streets-for-kids>

People-First Streets Rethinking and evolving street networks

Designing street networks that put people first is a key strategy for advancing goals related to convenience (Strategy 1.1) and safety (Strategy 4.1) of people walking, biking, or rolling.

Different types of street networks: A cul-de-sac and street grid network tend to prioritize the movement of vehicles over people walking, biking, or rolling. A modified grid restricts vehicular traffic at key locations within a neighbourhood, while maintaining through movements for active modes. Of these networks, the modified grid is the most convenient and safest street network for people walking, biking, or rolling.

LEGEND

- Access limited to people walking, biking, or rolling
- Motor vehicle journey
- Walking, biking, or rolling journey
- Median
- Destination
- Origin

Cul-de-sac	Grid	Modified Grid
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> Convenience ✗ </div> <div style="text-align: center;"> Safety ✓✓✓ </div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> Convenience ✓✓✓ </div> <div style="text-align: center;"> Safety ✓ </div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> Convenience ✓✓✓ </div> <div style="text-align: center;"> Safety ✓✓✓ </div> </div>
<p>Convenience:</p> <ul style="list-style-type: none"> Long walking, biking, or rolling distances Few route options 	<p>Convenience:</p> <ul style="list-style-type: none"> Shorter and more direct walking, biking, or rolling connections Greater choice of routes 	<p>Convenience:</p> <ul style="list-style-type: none"> Restricted vehicular through movements (traffic diversions or closing roads to vehicles) Shorter and more direct walking, biking, or rolling connections Greater choice of routes for active modes
<p>Safety</p> <ul style="list-style-type: none"> Encourage slower vehicular speeds More localized traffic Less conflict locations Sidewalks are often missing, forcing people to walk, roll, or bike on the street 	<p>Safety</p> <ul style="list-style-type: none"> More intersections/conflict points with vehicles Higher speeds and volumes of vehicles 	<p>Safety</p> <ul style="list-style-type: none"> Car-free environments Intersections/conflict points with vehicles Lower speeds and volumes of vehicles in places

Making physical changes to a network of neighbourhood streets.

Adding physical features to different types of street networks that restrict vehicular through movements while providing access and maintaining connectivity for people to walk, roll, and cycle increases the convenience factor for getting to and from destinations, and reduces the potential for conflict with vehicles.

Some of these features are illustrated in the pictures below from different locations in Metro Vancouver. These features can support people-first streets that transform a neighbourhood from focusing on moving vehicles to focusing on moving people in a safe and comfortable way.

Convenience

Safety

People-first streets support the goals of convenience, safety, and comfort, as well as other priorities


Photo credit: Google Maps







Cut-through at the end of a cul-de-sac

Traffic diverter


Pedestrian and cyclist access only

4.1.5. Make active transportation facilities **comfortable and enjoyable** for people of all ages, abilities, and backgrounds, consistent with the British Columbia Active Transportation Design Guide. In particular: 

- a. Provide low-speed pathways and street crossings for walking and rolling that are comfortable for people of all ages, abilities, and backgrounds, including spaces for rest, placemaking, and social connection. Explore the use of technology to allow for longer street crossing times for those who need it. 
- b. Make it safer and easier for people who roll (including wheelchairs or strollers) to safely get around by designing wider sidewalks, installing curb cuts, removing obstructions, and repairing sidewalks. 
- c. Provide low- and medium-speed bikeways that are comfortable and accessible for people of all ages, abilities, and backgrounds, including traffic-separated bikeways or shared street neighbourhood bikeways where there are sufficiently low vehicle speeds and volumes. 
- d. Ensure the needs of people with disabilities and others experiencing barriers to accessing opportunities are always considered in the design and execution of active transportation facilities. In locations where various modal priorities intersect (i.e., adjacency of protected bikeways, transit stops, and accessible crossings with curb letdowns), prioritize the needs of people with disabilities and traditionally marginalized people in the design. 
- e. Improve the completeness, accessibility, and safety of the walkway network, especially in and around transit stops and stations.

4.1.6. Plan to accommodate the needs of the wide variety of micromobility devices with active transportation **networks that support three different speed ranges**: walking speed, slow bicycle speed, and fast bicycle speed.

- a. Future-proof facility designs to transition from bikeways to active travel pathways that include adequate space to accommodate more and potentially different users, including sometimes faster and larger electric bikes, scooters, and trikes for freight and deliveries. This will allow adequate buffer space and separation between low-speed and medium-speed users.
- b. Conduct pilot projects and research to develop suitable people-first street and network designs to accommodate the wide and evolving variety of micromobility devices.

4.1.7. Make streets **vibrant, comfortable, inviting, and inclusive** public spaces for everyone, especially in Urban Centres and Frequent Transit Development Areas through actions that: 

- a. Design to maximize accessibility and inclusion for people of all ages, abilities, incomes, housing status, and backgrounds.
- b. Provide inclusive spaces for social interactions and gatherings, including publicly accessible and inclusive parklets, plazas, and patios.
- c. Plan for the use of streets for public spaces within the context of the transportation network.
- d. Increase the use of “dark-sky-friendly” street lighting to minimize light pollution to adjacent properties, but to evenly illuminate the public realm (including sidewalks, bus stops, and parking lots) — particularly in darker and less used areas, where personal safety may be a concern.
- e. Support access to a network of safe, non-gendered, and well-maintained publicly accessible washrooms, in public venues as well as in private establishments, that are freely available to everyone.
- f. Incorporate awnings and canopies into building facades to add shelter from the elements wherever possible.
- g. Plan street furniture design and locations to meet the required street activity and needs.
- h. Protect and enhance trees, plantings, and green infrastructure as an important part of making the pedestrian experience more comfortable, including by providing shelter and contributing to a softer street environment that better supports mental health and well-being.
- i. Ensure the placement of street furniture maintains clear paths for people walking, biking, and rolling to provide unobstructed and accessible movement.
- j. Protect and support existing local small businesses, especially those that serve disadvantaged or marginalized communities.

- 4.1.8. Increase **awareness and understanding** of how to operate vehicles safely around people walking and cycling, transit vehicles, heavy commercial vehicles and agricultural equipment, by:
- Working with partners to implement road safety public education campaigns.
 - Including this as a key element of substantially more rigorous driver's licence requirements for all vehicle licence classes in British Columbia.
- 4.1.9. Focus **traffic enforcement** resources on targeting dangerous motor vehicle drivers, including through automated speed and traffic enforcement at high-collision intersections around the region.

- 4.1.10. Advance a more unified regional program of **commercial vehicle safety inspections** on the region's roads coordinated with the provincial Commercial Vehicle Safety Enforcement (CVSE) branch.
- 4.1.11. Work with industry and regulators to encourage uptake of **Advanced Driver Assistance Systems (ADAS)** that include pedestrian and cyclist collision avoidance systems for heavy commercial vehicles, including buses, to help minimize collisions with vulnerable road users.
- 4.1.12. Ensure that safety and protection of vulnerable road users is prioritized in the algorithms of any **automated and connected vehicles** permitted to operate on our region's roads.



Strategy 4.2: Ensure everyone feels welcome, comfortable, and physically secure while getting around.


If people enjoy their transportation experience, they're more likely to travel. Walking, biking, rolling, and using transit should be inviting and enjoyable experiences.

A key part of this is feeling comfortable, safe, and secure when travelling. Although actions around safety and security often involve enforcement, it is important to recognize that enforcement does not provide a feeling of safety for everyone. At the same time, passengers may fear verbal, physical, and sexual harassment from others while travelling on public transit. To meet diverse individual and community needs for feeling safe on transit, the actions below focus on a community-based approach by training and educating front-line staff on unconscious bias and cultural awareness, providing appropriate support with health teams and community organizations, and having community safety officers to build trust and relationships with local communities.

While there are important actions we can take to support these ends, subtle and often inexpensive improvements can go a long way to creating a positive user experience. For example, planting trees along a walkway can mean the difference between a pleasant stroll or a sweltering walk in the mid-summer heat. Installing art in public spaces can spark joy, surprise, and delight in what otherwise might have been a routine journey.

Actions

4.2.1. **Improve wayfinding** to make it easier, less stressful, and more intuitive to move around the region through:


- a. Replacing the patchwork of inconsistent signage across the region with a consistent and coherent system of physical wayfinding and regulatory signage for walking, biking, rolling, transit, and shared mobility.
- b. Work with providers of digital trip-planning applications to ensure that digital iconography and mapping conventions are consistent with the physical wayfinding system.
- c. Provide wayfinding in languages other than English, consistent with the language needs of the community. 

4.2.2. Ensure transit passengers have **room to move** around and **room to sit** if they require it through actions such as:


- a. Increasing transit service frequencies on crowded routes.
- b. Providing improved real-time information about vehicle and station capacities to help users adjust their travel times and routes.





4.2.3. Provide a **comfortable transit** experience by: 

- a. Providing appropriate heating, ventilation, and air conditioning aboard all transit vehicles and passenger facilities to minimize user exposure to the elements and airborne contaminants.
- b. Ensuring ample room for comfortable vertical and horizontal circulation within transit stations and exchanges, including well-functioning and reliable escalators and elevators.
- c. Implementing the actions from TransLink's Customer Experience Action Plan, including a new Waterfront Customer Service Centre, escalator and elevator upgrades, and an app that informs customers of bus crowding levels.


4.2.4. Ensure that everyone, including marginalized or disadvantaged individuals and groups, feels **welcome and secure** when getting around, through: 

- a. Improving safety aboard the public transit system by maintaining a zero-tolerance policy for harassment from other passengers or from staff. This is supported by training, education, and consequences, in order to make the

system welcoming to all transit users, especially disadvantaged individuals and groups, and by creating a transit-riding culture of active bystanders who are comfortable to intervene for the sake of maintaining safe and welcoming spaces for all. 







- b. Training for all staff and decision-makers of mobility service providers, especially front-line and security staff, on Indigenous cultural awareness to improve cultural competency, anti-harassment, unconscious bias, equity, diversity, and inclusion, and understanding and mitigation of systemic racism, and supporting the mobility needs of riders with disabilities.  
- c. Technology, including emergency call buttons and security cameras in vehicles, at mobility hubs, and available via smartphone apps.
- d. A robust network of clean and safe washrooms available to the public, including at mobility hubs, at major destinations, and in shopping areas. 
- e. Implementation by each mobility service provider, including transit, of a strategy to recruit and retain employees who represent marginalized or disadvantaged individuals and groups into front-line positions as well as senior management positions so that all people see themselves reflected in the transportation workforce they rely on. 
- f. Ongoing dialogue with community members to ensure that the specific safety and security needs of all people, including disadvantaged individuals and groups, are considered in the planning and operation of the transit system.

4.2.5. Support an integrated, non-punitive **community-based approach to community safety** in the Metro Vancouver region with social workers, mental health workers, first responders, community ambassadors, and non-armed Community Safety Officers working alongside police officers from local forces and the Metro Vancouver Transit Police in order to:

- a. Reduce sexual offences that occur while people are trying to get around.
- b. Reduce racist harassment and hate-motivated crimes that occur while people are trying to get around.
- c. Make riding public transit alone safer for children, teenagers, and seniors. 
- d. Reduce assaults on front-line transportation workers while they are trying to do their jobs.



- e. Help vulnerable people in crisis with the most appropriate personnel and the most appropriate techniques to ensure those individuals feel culturally and psychologically safe, are treated with respect and dignity, and can minimize the risk of harm to themselves or others.
- f. Make using public transit in quieter areas, higher risk areas, or late at night safer by increasing staff presence.

4.2.6. Provide walking, cycling, and transit **skills training, resources, and support programs** that improve safety and confidence.

- a. Incorporate cycling skills and traffic safety training into the elementary school curriculum so that all children can walk and bike in a safe and confident manner before reaching high school. 
- b. Deliver regular cycling skills training courses for adults at multiple skill levels and in multiple languages, including courses for Indigenous Peoples (where desired), for women, and for newcomers to Canada.  
- c. Where desired by the Indigenous Nation, deliver transit system orientations for youth and elders from Indigenous communities to support utilization of an increasingly technology-driven transportation system. 
- d. Support transit system orientations and skills training in multiple languages for people with disabilities, neuro-atypical people, seniors, and newcomers to Canada. 
- e. Through the Regional Youth Travel Strategy, support child and youth-focused walking and cycling programs to encourage safe, independent travel skills with coordination and delivery by multi-level stakeholders and government. 

4.2.7. Foster a transportation system that connects people to their communities through **art, design, landscape, and cultural recognition**.

- a. Support programs that deliver public art, including as part of transportation investments.
- b. Incorporate beauty and design excellence as an objective when designing transportation facilities, in order to make the public realm and design investments that surprise and delight and that are well integrated into the local urban context.

- c. Increase greenery and native landscapes along and around transportation corridors and facilities. 
- d. Leverage the transit system as a platform for Indigenous cultural recognition, language revitalization, and education — promoting and celebrating the rich cultural heritage of Indigenous communities from this region through design, Indigenous art, and landscaping, and naming of networks, stations, and places. 

Strategy 4.3: Minimize transportation’s adverse impacts on local communities.




Transportation service and infrastructure, while providing critical access to opportunities, can also have a variety of adverse impacts on local communities and natural systems. Environmental impacts include air pollutants, noise and vibrations, and loss of tree canopy and green spaces (and, thus, loss of biodiversity and ecosystem robustness), as well as water pollution and soil contamination. Major transportation developments may impact Indigenous cultural heritage sites and traditional Indigenous cultural practices; therefore, as appropriate, TransLink engages communities to identify and mitigate potential impacts. TransLink follows Indigenous archaeological permitting requirements and provincial laws and guidelines as required.

These impacts are typically not equally distributed. Residents most burdened by environmental impacts are those living closest to the sources: oftentimes, residents with lower incomes who live in more affordable homes on major arterial roads, truck routes, or next to major rail corridors. For residents living along such major transportation corridors, air and noise pollution is a key concern. They can disrupt sleep and daily activities, increase stress, and adversely impact health and overall quality of life.

Community health and vitality also suffer when neighbourhoods are divided by wide roads, rail corridors, and high-traffic volumes and speeds. For instance, residents are less likely to know each other, visit neighbours, or spend time on the street in such high-traffic, high-noise environments.

By taking an integrated and community-based approach to mitigating transport’s adverse impacts, we can contribute to better physical, mental, community, and ecosystem health outcomes for everyone.

Actions

- 4.3.1. Conduct **health and environmental impact assessments** for major transportation projects. Assessment should consider air quality, climate change, noise, vibrations, urban heat, tree canopy, green spaces and natural systems, water and sewage, and soil contamination impacts, as well as physical activity, traffic safety, and social impacts — with specific attention to any disproportionate and/or cumulative impacts on marginalized or disadvantaged individuals and groups. 
- 4.3.2. Reduce **air emissions** from transportation through:
- Implementing greenhouse gas reduction measures described in Strategies 5.2 and 5.3. Greenhouse gas reduction measures that transition away from internal combustion also eliminate tailpipe emissions, which contributes to improved air quality.
 - Develop regulatory requirements for existing medium- and heavy-duty vehicles, initially targeting emissions of health-harming air contaminants. Consistent with RGMS 2.7.2, this could include an inspection and maintenance program that requires repairs on high emitting trucks, registration requirements targeting older trucks, a regional smoking vehicle hotline, and low- or zero-emission zones.
- 4.3.3. Reduce **water pollution** impacts from rainwater washing pollutants off road surfaces and into waterways through working with local road authorities to develop standards for stormwater management that include interventions such as rain gardens and bioswales to collect and treat stormwater at the street level.
- 4.3.4. Establish tree canopy standards and greenery targets for all streets and major transportation infrastructure and facility projects to reduce **urban heat island** and **biodiversity-loss** impacts of transportation. 
- Especially for key walking, biking, and rolling corridors, and at transit stations and mobility hubs, for the comfort of street users during increasingly hot summers driven by climate instability.
 - Especially with priority for neighbourhoods with higher proportions of lower-income residents and members of other disadvantaged groups. 
- 4.3.5. Reduce **noise and vibrations** associated with **road-based** transportation, through actions such as:
- Providing routine pavement maintenance of regional roads and truck routes to minimize uneven surfaces and potholes. These create a bumpy and uncomfortable experience for road users of all types, with the loudest and most jarring noises from heavy commercial vehicles.
 - Increasing enforcement of posted speed limits.
 - Accelerating the use of pavement types and treatments on regional roads that have been shown to reduce tire and pavement noise, and that have the same safety, durability, and cost characteristics as more conventional pavement materials.
 - Where new medium- or higher-density development is approved along the Major Transit Network or a regional road, including any truck route, requiring the developer to incorporate noise and vibration mitigation measures, including floorplans that minimize noise intrusion, especially to bedrooms; noise and vibration absorption through building and landscape design; and sound baffles or screens to cover building openings.
 - Encouraging the increased use of smaller-scale vehicles (handcarts, e-trikes, bikes, vans, and automated cargo pods of various sizes and configurations) for e-commerce deliveries in Urban Centres and denser urban neighbourhoods where appropriate, including through supporting industry and municipalities in the development of neighbourhood logistics hubs to better enable consolidation of parcels in central locations for pickup by customers or use of smaller, lighter, emissions-free freight vehicles for final-mile deliveries in low-speed and pedestrianized zones.

4.3.6. Reduce **noise and vibrations** associated with **rail-based** transportation, through actions such as:

- a. Regularly performing track maintenance for heavy rail and rail-based transit to reduce track noise.
- b. Grade-separating roads and heavy rail lines within the urban area, and undertaking other measures to mitigate the use of train whistles or horns in populated areas.
- c. Incorporating measures to minimize the shunting of railcars and the assembly of trains in heavily populated areas.
- d. Installing additional rail sidings to help reduce the amount of shunting and associated noise, and safety upgrades to enable whistle cessation.

4.3.7. **Reduce neighbourhood partition** and social isolation impacts associated with wide roads and rail corridors with high speeds and volumes through actions such as:

- a. Reducing the design speed for all roads currently 50 km/hr or over within the Urban Containment Boundary (consistent with the framework set out in Strategy 4.1.), especially along the Major Transit Growth Corridors (MTGCs).
- b. Minimizing urban development around high-speed corridors.
- c. Providing more frequent at-grade crossings of roads through urban areas, especially in Urban Centres and Frequent Transit Development Areas.
- d. Providing more frequent grade-separated crossings for people to make walking, biking, or rolling connections across freeways and rail corridors passing through urban areas, especially in Urban Centres and Frequent Transit Development Areas.



Urban tree canopies make travel by active transport more comfortable, especially in a world of intensifying climate impacts

Strategy 4.4: Safely respond to and recover from disruptions and disasters.

To ensure the safety and security of the public, as well as regional prosperity, recovery, and resilience, the transportation system must be available to support communities before, during, and after emergencies and disasters. The ability to respond when time is of the essence and when lives and property are at stake urgently requires that we work together.

Actions

- 4.4.1. Create, maintain, and audit **emergency and business continuity plans** and programs based on regional assessment of existing and changing hazards, risks, and vulnerabilities. 📄
- 4.4.2. Conduct periodic public-facing **emergency-response training** and exercises with the public, stakeholders, the media, and all levels of government. 📄
- 4.4.3. Maintain an **emergency operations framework** that enables intergovernmental partners to effectively respond and recover from emergencies and disasters, and that aligns with provincial and municipal response structures. 📄
- 4.4.4. Support an integrated **community-based approach to community safety**, as noted in Action 4.2.5., to build system resiliency to help: 📄
 - a. Manage major events with large crowds.
 - b. Respond and help manage in the immediate aftermath of disruptions and disasters.
- 4.4.5. Engage partners and stakeholders to identify **critical infrastructure interdependencies**, align response and recovery strategies, training and exercise plans, and establish partnership agreements so that these plans can be put into action directly when events occur or when additional flexibility is needed. 📄

4.4.6. Develop and implement a regional transportation **resiliency strategy and action plan** that will: 📄

- a. Develop policies and share information and data related to hazards, risks, and vulnerabilities.
- b. Develop a regional multi-hazard map and indicators to assess existing and changing hazards, risks, and vulnerabilities.
- c. Explicitly consider social equity in assessing risks and vulnerabilities and in developing actions and response strategies. 🌍
- d. Identify and consider critical regional infrastructure and system interdependencies.
- e. Coordinate interagency priority actions to address transportation vulnerabilities identified, including implementation and funding strategies.
- f. Develop post-event intervention and review processes.
- g. Integrate resilience and hazard, risk, and vulnerability analyses into long-range transportation planning, including climate-resilient transit-oriented communities including housing and other buildings.

4.4.7. Prioritize investment in modes, corridors, and technologies with the **greatest capacity to adapt** to shocks, stresses, and changing conditions. 📄

- a. Avoid locating fixed transportation infrastructure in areas with unmitigated climate or natural hazards.
- b. Avoid expansion of permanent transit infrastructure into hazardous areas. Where risk is unavoidable, such as in existing settlements, use risk-mitigation or climate change adaptation strategies in the expansion of transit infrastructure (M2050 1.2).
- c. Develop a more flexible and resilient transportation system by advancing low-cost, low-emission travel options, such as active transportation and transit (such as described under Goal 1), to create additional layers of transportation in the event of a disruption.
- d. Build in long-term flexibility for transportation facilities and corridors to be repurposed over time, such as unused rail corridors to multi-use paths, high-occupancy vehicle lanes to transit-only lanes, and underground parking to community amenity space.

4.4.8. Update **state of good repair** programs (see also Strategy 2.4) to account for resiliency that will: 📄

- a. Prioritize funding for seismic upgrades to bridges, guideways, and infrastructure.
- b. Establish a framework for consistent identification and prioritization of resilient investments when upgrading and building new transportation assets.
- c. Make informed decisions that include a full understanding of site hazards, risks, and vulnerabilities, including future environmental, social, economic, technological, and health risks.
- d. Prioritize bus-based transit investments over other inflexible investments in areas with known severe flood risk.
- e. Develop safe-to-fail protocols for regional infrastructure and assets.
- f. Identify, review, and develop actions to minimize gaps in addressing certain hazard areas, such as cybersecurity of automated systems and climate change impacts on infrastructure.
- g. Incorporate resiliency approaches into fleet operations by supporting long-term maintenance facility planning.
- h. Future-proof infrastructure designs to be prepared to respond to expected impacts of increased extreme weather events.

