### POLICY BRIEF CLIMATE JUSTICE IN TRANSPORTATION PLANNING



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# INTRODUCTION

Transportation in the Metro Vancouver region is the single largest source of greenhouse gas emissions, and is the second highest category of emissions at the University of British Columbia (UBC). These are core issues for UBC, which has targeted a 45% reduction in commuting emissions over this decade in Climate Action Plan 2030 (CAP 2030). UBC is also in the midst of developing Campus Vision 2050 to guide campus land use planning for the next 3 decades. Additionally, the UBC Neighbourhood Climate Action Plan (NCAP) is in progress, to address both mitigation and adaptation strategies for reducing carbon emissions in residential neighbourhoods on the Point Grey campus. A growing campus community would hence benefit from the active and meaningful integration of climate justice considerations into planning work, particularly in the transportation sector.

This policy brief seeks to outline and explore how climate justice principles are operationalised in the transportation planning context across different jurisdictions. It will:

- Explore key climate justice frameworks, both broadly and specifically in relation to transportation planning.
- Outline the regional transportation planning policy context, including key strategies and plans by neighbouring jurisdictions and institutions, e.g. City of Vancouver, TransLink.
- Summarise key recommendations for integrating climate justice in transportation planning at different scales and steps.
- Discuss key dimensions of transportation planning that are especially liable to be guided by climate justice considerations.



### DEFINING CLIMATE JUSTICE, BROADLY

Note: A motion to implement the Climate Justice Charter was rejected by the Vancouver City Council on February 18, 2023.

Drawing from A Climate Justice Charter for Vancouver (2022) produced by the Climate Equity Working Group, we may envision climate justice in the City of Vancouver to look like "a city of interconnected communities collectively advancing climate action, Indigenous sovereignty, intersectionality, equity, and social justice towards a shared future of healing and hope." Such a vision is situated in a context in which the experience of climate change by Vancouver residents increasingly includes:

- Extreme heat events, which could lead to loss in quantity and quality of life, as well as impact the affordability of basic living needs.
- Wildfire and air quality impacts, which are particularly challenging for older adults, people with existing respiratory conditions and outdoor workers to navigate.
- Storms and urban and coastal flooding, which could damage infrastructure and sources of food and water, displace and injure people (especially those experiencing poverty and general housing insecurity).
- Changes to ecosystems, which in turn exacerbates and impacts other phenomena, such as water safety, forest conditions and Indigenous community practices.

The Charter hence outlines 6 key goals for implementation, several of which could be especially important to transportation planning work and the context of planning at large on the UBC campus.

- Goal 2: Ensure climate change mitigation and adaptation solutions are guided by those who are most impacted by systemic oppression and climate change.
- Goal 3: Support the equitable redistribution of the burdens and benefits of climate response.
- Goal 5: Respond to the need for accountability and resulting repair work related to climate injustices.
- Goal 6: Catalyze systems change within climate policy and practice.

# **KEY PRINCIPLES**



Justice. Resilience. Equity.

In the context of transportation planning, climate justice entails ensuring that benefits and burdens of transportation infrastructure and policies are distributed fairly, with a focus on reducing emissions and improving accessibility and mobility for all communities. Transportation is a major contributor to greenhouse gas emissions, and the impacts of transportation infrastructure and policies are not evenly distributed across communities. For example, lowincome communities and communities of color often bear a disproportionate burden of the negative impacts of transportation, such as air pollution, noise pollution, and safety risks. They may also frequently experience limited access to affordable and convenient transportation options, which would hinder the accessibility of low-carbon mobility options.

Climate justice in transportation planning seeks to address these disparities by <u>prioritizing</u> <u>investments in sustainable and equitable transportation options</u>, such as public transit, walking, and biking infrastructure. This can involve strategies like increasing access to affordable transit, prioritizing transit investments in historically marginalized neighborhoods, and creating safer and more accessible pedestrian and bike networks. It also involves <u>working to reduce emissions</u> from transportation, such as by promoting electric vehicles and alternative fuels. In addition to these specific strategies, climate justice in transportation planning requires <u>engaging with</u> <u>communities directly to understand their needs and priorities</u>, and involving them in decision-making processes. This can help to ensure that transportation policies and investments are tailored to the unique needs of each community and that they are designed with equity and fairness in mind. By prioritizing climate justice in transportation planning, we can create more sustainable and equitable communities, while reducing the negative impacts of transportation on the environment and public health.

## THE GREATER POLICY CONTEXT

Transportation planning at UBC is situated in the larger policy context of surrounding local, regional and provincial institutions and stakeholders. Strategic plans and programming formulated in these larger spaces will potentially influence the speed and accessibility of connected and complete transit and active transportation networks, in addition to setting precedents for systematically integrating climate justice values and concerns in processes and procedures.

At the City of Vancouver level, key strategic plans and programming include:



### A Climate Justice Charter for Vancouver (2022)

The Charter serves as a high-level guiding document for planners and policymakers, with broad recommendations that are applicable to an extent in transportation planning (but does not draw explicit references to what equity in transportation would look like, or make recommendations that are specific to transportation).



### Climate Emergency Action Plan (2019)

The CEAP outlines key visions for climate-oriented transportation development and targets for 2030, for example: 90% of people will be living within an easy walk or roll to their daily needs, 2/3 of trips will be undertaken by active transportation and transit, 50% of the km driven on Vancouver's roads will be by zero-emission vehicles.



### **CEAP 2022 Indicator & Financial Dashboard**

The report indicates that the City of Vancouver is, as of 2022, unlikely to reach its targets for Complete, Walkable Neighbourhoods and Active Transportation & Transit by 2030, and while it is performing better in meeting the Zero Emissions Vehicles target, progress remains 'at risk'. That said, the process of progress tracking is representative of an accountability-driven workflow that could be implementable at the campus level.



### Climate Change Adaptation Strategy (2018)

Developed by Green Vancouver, the report outlines five Core Action areas and seventeen Enabling Actions to boost the robustness of adaptability measures. Among the Core Action areas, of particular proximity to transportation planning are the Climate Robust Infrastructure and Connected and Prepared Communities areas.

### THE GREATER POLICY CONTEXT, CONT'D

At the City of Vancouver level, key strategic plans and programming include:



### Zero Emissions Economic Transition Action Plan (2022)

Via ZEETAP, the Vancouver Economic Commission outlines 6 primary directions that are potentially applicable to transportation planning: notably including making climate solutions and their impacts just and equitable, increasing the affordability of climate solutions, ensuring that they scale effectively and removing barriers to accessing information regarding decarbonization.

At the Metro Vancouver level, key strategic plans and programming include:



### TransLink: Transportation 2050 (2022)

Using the strategic lenses of Reconciliation, Social Equity and Resilience, Transport 2050 outlines five key goals for transportation and 100+ proposed actions—including supporting walkable, complete and affordable communities, transforming roads into people-first streets, delivering frequent local transit service to within a 5-minute walk of nearly all urban communities in the region, and others.

The five key goals are:

- **Convenience** Elevating active transportation and enhancing convenience of transit for longer trips, car accessibility for occasional trips without ownership, with seamless connections across.
- **Reliability** Making transit, goods movement, driving and parking more reliable, and maintaining infrastructure.
- Affordability Making living close to frequent transit affordable, investing in modes that are lowest cost and most affordable, ensuring affordability of transportation fees and taxes.
- **Safety and comfort** Eliminating traffic fatalities and serious injuries, ensuring a welcoming, comfortable and physically secure environment for all, minimising adverse impacts on local communities, allowing safe recovery from disruptions and disasters.
- **Carbon-free** Reducing energy requirements, transitioning to zero-emissions vehicles, support ready access to low-carbon fuels and account for and reduce upstream and downstream emissions.

### THE GREATER POLICY CONTEXT, CONT'D

At the provincial level, key strategic plans and programming include:



### CleanBC Roadmap to 2030 (2021)

Foundational Roadmap actions outlined include stronger pricing on carbon pollution in alignment with / exceeding federal requirements, increased clean fuel requirements and acceleration of zero-emission vehicle laws, targeting 10,000 public EV charging stations and modal shift towards active transportation and transit. The roadmap also recognises the importance of early and meaningful engagement with Indigenous peoples to develop sustainable solutions in partnership.

Figure 1. Roadmap to 2030: Transportation Sector Actions, pg. 34.





### Zero-Emission Vehicles Act (2019)

The ZEV Act requires automakers to meet an increasing annual percentage of new light-duty ZEV sales and leases, reaching: 10% of light-duty vehicle sales by 2025, 30% by 2030 and 100% by 2040, complemented by ZEV Regulation that outlines compliance requirements for automakers, with a technical review to be held at regular intervals to review trends and update progress targets. The ZEV Advisory Council includes industry experts, local governments, First Nations and others



### ClimateReady BC

The online platform hosts data on climate risks and resources for hazard-mapping, in preparation of disaster events like floods, wildfires, extreme heat, tsunamis, earthquakes and extreme cold. It outlines the need for the B.C. government to learn from past crises, address ongoing disaster risk, build capacity and resilience—and continually evolving through engagement with First Nations, local governments and other partners.

## SUMMARY OF PLANNING MOVES

To enable the seamless and thorough operationalisation of climate justice principles within transportation planning, various actions ('moves') can be undertaken at different levels and scales of planning, with the intention of impacting different user and institutional outcomes, processes and experiences. These recommendations were sourced from different toolkits, articles, papers and policy reports, as produced by regional and global planning institutions. They are intended to outline a wide variety of potential areas for action that UBC planning efforts may consider applying in tandem within their work.

### Strategic Moves

This level of planning move involves systemic changes at the broadest level, including modifying the fundamental principles or values that ground strategies, plans and visions for communities and institutions.

### Programming Moves

This level of planning move includes adapting programs, services, tools, processes, networks, relationships and other dimensions of planning institutions and departments. Both broader directions for action and their respective subset recommendations are outlined in the policy brief.

Design Moves This level of planning move focuses on the human scale of planning interventions, specifically direct and indirect user experiences that are impacted by design choices in implementing planning processes and programming.

## SUMMARY OF PLANNING MOVES

Strategic Moves	Programming Moves	Design Moves
Ensure climate change mitigation and adaptation solutions are guided by those who are most impacted by systemic oppression and climate change.	Build Climate Robustness and Resilience	Require public participation and creating accessible participatory workshops (considering formats, timings, locations, ways to collect feedback).
Strengthen community resilience while ensuring that equity is embedded in policies and practices.	Reduce Carbon Emissions from Transportation	Address physical, sensory, cognitive and social barriers for physical and social environments.
Support the equitable redistribution of the burdens and benefits of climate response.	Facilitate Active Transportation Use and Network Development	Using power of new digital tools to ensure seamless multi-modal integration.
Respond to the need for accountability and resulting repair work related to climate injustices.	Build Accessibility for All	Ensure universal basic mobility where fares and fees are based on individual ability to pay.
Catalyze systems change within climate policy and practice.	Prepare for Future Potential Challenges to Transportation Equity	Create safe road experiences, safe and direct cycle lanes, integration with public transport, bicycle retail and repair shops.
		Implement shading features, e.g. trees, structures for public parks, greenways etc

### PROGRAMMING MOVES, EXPANDED

### **Programming Moves** Systematically conduct risk assessments and vulnerability studies. **Build Climate Robustness** and Resilience Measure and track climate resilience performance measures (e.g. condition ratings of infrastructure, resilience upgrades). Implement workflows for identifying, tracking and using the performance measures. Establish Low Emission Zones. **Reduce Carbon Emissions** from Transportation Develop compact cities for active transportation and undertake a rapid strategic transition to electrified vehicles. Improve convenience, reliability, affordability, safety and comfort of active transportation and transit. **Facilitate Active Transportation Use and** Create minimum data requirements for local population Network Development mobility patterns. Develop 5-year Walking Priority Map and 5-year Cycling Network Plan. Expand bike-share network and accompanying equity programs. Change Parking by-laws to eliminate parking minimums without losing sight of accessibility needs. Consider other transportation-disadvantaged groups beyond low-income and minority populations in equity analysis. Adopt new performance measures—beyond active transportation facility distribution, looking at facility quality, safety, cost, etc.

### PROGRAMMING MOVES, EXPANDED

### **Programming Moves**

Facilitate Active Transportation Use and	Increase inter-agency coordination.	
Network Development	Distinguish between walking and bicycling equity, since potential cyclists may be uniquely challenged by cost, inexperience, physical limitations.	
Build Accessibility for All	Set minimum standards of accessibility to key destinations. Implement policies to support the use of transit and reduce financial burden of mobility for People With Disabilities (PWD). Include universal design criteria in designing spaces. Establish an institutional body or dedicated accessibility officers, technical and capacity-building training, building administrative capacity with ICT like platforms or applications for coordination.	
Prepare for Future Potential Challenges to Transportation Equity	Critically reflect on and boost algorithmic transparency to analyse biases of AI and big data predictive modelling. Limited reliance on transportation network companies and private mobility providers (microtransit). Significant investments in charging infrastructure and accelerate electrification of medium- and heavy-duty vehicles.	

## CLIMATE ADAPTATION

#### **Embedding Equity in Climate Adaptation**

One key frontier for climate justice is supporting the implementation of climate adaptation strategies, to prepare communities to manage and live despite existing changes to the climate, and to build capacity within communities to withstand and recover from increasingly frequent and intense extreme weather events.

According to the Equitable Adaptation Legal & Policy Toolkit designed in 2020 by Georgetown Climate Center, equitable processes and equitable outcomes should be integrated in the course of strengthening community resilience.

#### **Strategic Moves**

• Strengthen community resilience while ensuring that equity is embedded in policies and practices.

### **Programming Moves**

• Systematically conduct risk assessments and vulnerability studies.

#### What does Equity look like?

- <u>Procedural Equity</u> addresses the commitment to representing the voices of communities within decision-making processes, with the incorporation of diverse and inclusive engagement processes.
- <u>Substantive Equitable Outcomes</u> are sought through implementing policies and programming that fairly distribute access to its benefits, as well as addressing historically under-served communities.

#### **Equity in Practice**

Risk Assessments and Vulnerability Studies are utilised to map a community's specific climate hazards under future climate scenarios and related impacts—as well as evaluate the ability of its residents to adapt to and recover from those very hazards. This can include both primary hazards (e.g. coastal flooding) and secondary hazards (e.g. disease, toxin exposure), to assess and identify strategies to prepare built infrastructure and community resources for the impacts of climate change.



Case Study: Vancouver Coastal Health and Fraser Health

Following direct engagement with First Nations of the region, several key climate-sensitive hazards were systematically identified (incl. extreme heat, poor air quality from wildfires etc.) alongside solutions and opportunities for partnerships among health authorities, municipal and regional governments and First Nations. Additionally, under-served and vulnerable groups and their estimated population sizes were identified to characterize their sensitivity to climate change impacts.

Figure 2. Cover page of report.

Vancouver

校 fraserhealth

## CLIMATE ADAPTATION

### Tracking Climate Resilience as Part of Climate Adaptation

In 2022, the Minnesota Department of Transportation undertook a strategic approach to measuring and tracking how climate change affects the state's transportation system. In the process, it sought to examine tools and processes used by other state departments, with specific interest in identifying:

- Climate-related resiliency database or suite of databases that these state DOTs and other organisations are using, or if they only track measures qualitatively.
- Performance measures that are tracked and whether they include design, construction and maintenance costs related to increasing climate resilience.
- Workflows employed to track and use these measures.

#### **Programming Moves**

- Measure and track climate resilience performance measures (e.g. condition ratings of infrastructure, resilience upgrades).
- Implement workflows for identifying, tracking and using the performance measures.

Of the state departments surveyed, MnDOT noted that Arizona DOT in particular had developed and is currently using climate resilience performance measures to track flooding, extreme precipitation events and rising temperatures. Nine other DOTs (incl. Delaware, Hawaii, Michigan, Washington) were currently in the process of developing measures, or intending to do so soon.

Several sample indicators and their tracking status are included in the following table.

TrackingSignificant weather-related damage to infrastructure. Use of emergency relief funds for repair/rebuild. Culvert condition rating.Existing, But Not Tracked with ResiliencePavement condition rating. Slope vulnerability rating.Partially Existing, But Not Tracked with ResilienceBridge overtopping location and frequency.Not Currently Tracked• Resiliency upgrades, such as slope armouring and raising roadways. • Pavement performance during extreme heat. • Installation of green infrastructure.	Tracking Status	Sample Performance Measures
Existing, But Not Tracked with ResiliencePavement condition rating. Slope vulnerability rating.Partially Existing, But Not Tracked with ResilienceBridge overtopping location and frequency.Not Currently TrackedResiliency upgrades, such as slope armouring and raising roadways. Broad closure location and frequency (weather-related). Pavement performance during extreme heat. Installation of green infrastructure.	Tracking	<ul> <li>Significant weather-related damage to infrastructure.</li> <li>Use of emergency relief funds for repair/rebuild.</li> <li>Culvert condition rating.</li> </ul>
Partially Existing, But Not Tracked with ResilienceBridge overtopping location and frequency.Not Currently Tracked• Resiliency upgrades, such as slope armouring and raising roadways. • Road closure location and frequency (weather-related). • Pavement performance during extreme heat. • Installation of green infrastructure.	Existing, But Not Tracked with Resilience	<ul><li>Pavement condition rating.</li><li>Slope vulnerability rating.</li></ul>
<ul> <li>Resiliency upgrades, such as slope armouring and raising roadways.</li> <li>Road closure location and frequency (weather-related).</li> <li>Pavement performance during extreme heat.</li> <li>Installation of green infrastructure.</li> </ul>	Partially Existing, But Not Tracked with Resilience	• Bridge overtopping location and frequency.
	Not Currently Tracked	<ul> <li>Resiliency upgrades, such as slope armouring and raising roadways.</li> <li>Road closure location and frequency (weather-related).</li> <li>Pavement performance during extreme heat.</li> <li>Installation of green infrastructure.</li> </ul>

### ACCESSIBILITY STANDARDS

### Developing a Comprehensive Understanding of Accessibility in Transportation Policy

Climate justice approaches to transportation planning consistently entail prioritising accessibility as a key goal within promoting mobility, wherein accessibility refers to fundamental human capability. Policy evaluation should consider the establishment of minimum standards of accessibility to key destinations, as well as the extent to which these policies uphold individuals' rights, prioritise marginalised groups, reduce inequality in opportunities, and address transport-related externalities. Going beyond what traditional approaches have accomplished, a full and comprehensive understanding of transport requires a more holistic perspective on accessibility. Additionally, transportation justice must understand both the role of participatory planning processes and the historical, social and political context (incl. power imbalances) that have contributed to current policies.

#### **Programming Moves**

• Set minimum standards of accessibility to key destinations.

#### **Design Moves**

Address physical, sensory, cognitive
 and social barriers for physical and
 social environments.



### Accessibility as: One's Capability to Reach and Use Mobility Technology & Transport Systems

This dimension of accessibility could be affected by personal factors—including physical and mental fitness, motor and cognitive skills, sufficient financial resources—and external factors, such as the social environment (harassment-free), the physical design of transportation systems and the availability of travel information.



### Accessibility as: Enhancing One's Capabilities via Interactions Between Transport Systems and Land-Use Patterns

This dimension of accessibility accounts for time-budget restrictions of individuals and land-use patterns, including the distribution of transportation network across the city relative to the distribution of the 'desirable' activities and spaces that people are transporting themselves to. It also accounts for service frequency, reliability and speed, and may be enhanced through strategic use of information and communicating technologies allowing opportunity access without physical movement.

## ACCESSIBILITY STANDARDS

#### Serving Transportation-Disadvantaged Groups

According to the Institute for Transportation and Development Policy, when cities orient planning around accessibility for people with disabilities, those cities end up better for all. Beyond impacting people with disabilities, issues like increasing motorisation, congestion, pollution, safety concerns and insufficient transportation supply effectively affect multiple other marginalised groups—including persons with mobility limitations such as older people, pregnant people, young children and caregivers.

The ITDP hence recommends that urban design standards should address physical, sensory, cognitive, and social barriers for physical and social environments. Inclusive land use design should include strong walking and cycling networks, compact and diverse developments well-connected with universally accessible 10-minute active transportation networks, public and green spaces, and urban design that ensures public spaces and commercial/residential developments are accessible to all.

Figure 3. Examples of physical, sensory and other barriers faced by People with Disabilities as they navigate a non-conducive urban environment.

### **Programming Moves**

- Include universal design criteria in designing spaces.
- Consider other transportationdisadvantaged groups beyond lowincome and minority populations in equity analysis.

#### **Design Moves**

• Address physical, sensory, cognitive and social barriers for physical and social environments.



## ACCESSIBILITY STANDARDS

### Comprehensive Implementation of Accessibility Standards

Transportation planning systems and processes can be transformed at several levels and scales to ensure that accessibility is implemented in a thorough and sustainable manner, where these standards can continue to be revised and updated to leverage changes to technology, land use patterns and other trends impacting the accessibility experiences of transportation users.

Area for Action	Recommendations
Laws	<ul> <li>Integrating universal accessibility in policies, legislation, regulations and standards.</li> <li>Creating minimum data requirements for local population mobility patterns.</li> <li>Implementing policies to support the use of transit and reduce financial burden of mobility for PWD.</li> </ul>
Leadership	<ul> <li>Electing and appointing PWD to powerful leadership positions in transport and land-use planning.</li> <li>Educating leaders and policymakers.</li> <li>Collaborating with partners to foster change.</li> </ul>
Institutional Capacity	<ul> <li>Establish an institutional body or dedicated accessibility officers.</li> <li>Establishing technical and capacity-building training.</li> <li>Building administrative capacity with ICT like platforms or applications for coordination.</li> <li>Ensuring maintenance of networks.</li> </ul>
Participation	<ul> <li>Sourcing public feedback in developing Planning and Evaluation tools.</li> <li>Requiring public participation and creating accessible participatory workshops (considering formats, timings, locations, ways to collect feedback).</li> </ul>

### REDUCING CARBON EMISSIONS

Minimising carbon emissions is a critical piece to the climate justice approach, in part to remedy an unequal distribution of benefits and burdens caused by climate change, as well as to fundamentally curtail the extent of climate change and its resulting outcomes.

### Reducing Carbon Emissions Through Developing Low Emission Zones (LEZs)

Low emission zones (LEZs) are an increasingly utilised approach for cities to improve air quality while activating a speedy transition towards a low-emissions future via EVs and compact development: They are premised on the establishment of a defined zone to restrict the use of polluting vehicles, which may include passenger vehicles, public transit vehicles, vans and small trucks and heavy-duty freight vehicles. Over 320 LEZs have been implemented in Europe, representing a 40% growth between 2019 and 2022. Haifa, Seoul and several Chinese cities have also successfully implemented LEZs.

Planning Dimensions	Examples	Sample Images
Street Redesigns	<ul> <li>Car-free areas</li> <li>Complete streets</li> <li>Safe routes to School programs</li> </ul>	
Service Improvements	<ul><li>Frequent bus and rail service</li><li>Multimodal integration</li></ul>	
Incentives	<ul> <li>Low- and zero-emission vehicle purchase subsidies</li> <li>Public transportation discounts</li> </ul>	TheMayorEU     Negatives themps early view r public transport in [     Public transport in Brussels becomes free for under-25s     dan 4, 2021 — has announced that its services will be free of charge for travelers under 25     years of age starting Beylember 2021.
Land Use Reforms	<ul> <li>On-street parking pricing</li> <li>Transit-oriented development</li> <li>15-minute neighborhoods</li> </ul>	
Stricter Sub-zones	<ul><li>Zero-emission Area (ZEA)</li><li>Congestion pricing zones</li></ul>	

Source: ITDP: The Opportunity of Low Emission Zones (2023)

### REDUCING CARBON EMISSIONS

In The Compact City Scenario — Electrified, the Institute for Transportation and Development Policy posits that for the urban transportation sector, the path to staying below 1.5°C of global warming involves both compact cities developed for walking, cycling and public transit, as well as a rapid and strategic transition to electrified vehicles. When implemented in tandem, the ITDP believes that the policy changes may potentially lower cumulative greenhouse gas emissions from urban passenger transport by 59 gigatonnes (Gt) CO2-eq by 2050, hence reducing sector-based emissions by about 50%. A minimum reduction of 53 Gt has to be met for compliance with the Paris Agreement terms and estimates.



Figure 4. ITDP Calculations of Different Scenarios. \*BAU: Business As Usual

### ACTIVE TRANSPORTATION

#### **Prioritising Equitable Active Transportation**

Active transportation modes like walking, cycling and 'rolling' are incredibly aligned with climate justice given their low-emissions nature, and are increasingly being acknowledged for their individual and societal benefits. Accordingly, increased investments in pedestrian and bicycle infrastructure across cities have been made. However, the distribution of the benefits and costs of active transportation are often inequitably distributed because pedestrian and bicycle equity impacts are poorly considered.

#### **Strategic Moves**

• Support the equitable redistribution of the burdens and benefits of climate response.

#### **Programming Moves**

- Adopt new performance measures.
- Increase inter-agency coordination.
   Distinguish between walking and bicycling equity, since potential cyclists may be uniquely challenged by cost, inexperience, physical limitations.

Key recommendations are as follows:



### No. 01 - Other Performance Measures

Beyond facility distribution, consider: Facility quality, safety, cost, level of active transportation project funding, and accessibility to employment or necessary services via active modes.



### No. 02 – Addressing Bicycling Equity

Notably, the socio-demographic traits and equity concerns of bicyclists and pedestrians are not the same. For example, pedestrians may be uncomfortable cycling because of cost, inexperience, or physical limitations.



### No. 03 - Integration With Larger Policy Moves

The mere presence of sidewalks or bicycle facilities where there were previously none does not necessarily influence travel behaviours: Integration with supportive land-use policies must also occur.



### No. 04 – Increasing Inter-Agency Coordination

Transportation experiences are not exclusively impacted by transportation systems: Policy measures must also integrate land use, housing, health and welfare programming and infrastructure for better outcomes.



### No. 05 - Greater Public Representation

Travel-disadvantaged groups must be actively identified and meaningful included in policy and decision-making processes, particularly travellers that are older, physically-impaired or vehicle-deprived, or from low-income and/or minority communities.

### ACTIVE TRANSPORTATION

Key Elements of A Cycling City



Figure 5. Car-free day in Jakarta. Source: Yanocha & Cisneros (2023)

- Safe & Direct Cycle Lanes
- Safe Roads
- Gender Balance in Cycling
- Child-friendly Cycling
- Integration with Public Transport
- Dedicated Funding for Cycling
- Car-free Demonstrations
- Bicycle Retail and Repair Shops

### Case Study: TACES E-Bike Equity Pilot

With the intention of expanding the bike-sharing network and accompanying equity programs, the municipality Saanich, B.C. piloted the TACES e-bike incentive program—the first of its kind to deliberately incorporate equity in its design. TACES refers to the Transportation Access, Climate and Economic Security project, supported by multi-lateral partners including B.C. Transit, Community Social Planning Council and Camosun College.

### **Equity-driven Design**

- Progressive: Three different incentive levels based on household income (\$350, \$800, \$1600) were adopted.
- Low-barrier Assessment Process: Discounted e-bike skills courses were provided.

### Interim Outcomes

- Overwhelmingly positive feedback from participants and positive feedback from vendors.
- People used their e-bikes regularly for commutes to work, school, and errands.

### **Strategic Moves**

• Catalyse systems change within climate policy and practice.

#### **Programming Moves**

• Expand the bike-sharing network and accompanying equity programs.

#### **Design Moves**

• Ensure universal basic mobility where fares and fees are based on individual ability to pay.

### THE FUTURE OF TRANSPORTATION EQUITY

To build a sustainable future of equity-focused transportation it is important to be mindful of the potential benefits and limitations to trends or developments that influence mainstream transportation modes, platforms, services and planning processes.

### Algorithm Usage and Big Data in Transportation Planning

With the transportation industry increasingly relying on algorithms to support planning, management and allocated of automated vehicles and mobility services, it is critical to be conscious of the ways that big data and algorithmic modelling reflect biases of sociopolitical processes. For example, artificial intelligence and big data predictive modelling may be used to develop flexible routing and scheduling of services. Without critical reflection and algorithmic transparency, the distribution of services may inadvertently reflect these biases and consequently reinforce injustices.

### **Connected and Automated Vehicles**

While much of the current research on automated vehicles and shared mobility systems focuses on how to make them commercially viable, more research is needed to understand how these changes in technology and governance will reshape who gets access, when, and how, and what implications they might have for questions of equity, public health and environmental justice.

### Microtransit and On-Demand Transit Services

Transportation Network Companies are not a panacea, given that microtransit services (e.g. EVsharing) fundamentally do not scale well and may be viable in primarily first- or last-mile journeys. Over-use and over-reliance on on-demand transit services could potentially result in congestion and reduced public transit ridership. For these reasons, hailing microtransit as an example of 'disruption' of the public transit business model is not particularly accurate both in terms of economies of scale and equity-orientation.

### **Rapid Transition to Electrified Fleets**

Significant investments in charging infrastructure are necessary to support a zero-emission transportation system, while equitably delivering public health and climate benefits, creating jobs, and stimulating private investments in clean energy technology. These investments must also be integrated with intentional planning and coordination to maximise benefits and minimise costs, particularly in the opportunity for government investments in accelerating the electrification of medium- and heavy-duty vehicles, including trucks, buses, and port equipment—which are significant sources of harmful air pollution, such as ozone, nitrogen oxides, and particulate matter.

### CASE STUDY: LANGLEY TOWNSHIP

The Climate Action Strategy (2021) promotes 5 Big Moves and 140+ actions.

These Big Moves include

- Safe and Sustainable Transportation More than half of current passenger vehicle trips are to be made by sustainable modes of transportation (active mobility, transit, EVs) by 2030.
- Zero Emission New Buildings
- Zero Emission Existing Buildings
- Zero Emission Corporate Operations Achieve zero emission corporate operations through zero emission new facilities, facility upgrades, and zero emission fleet vehicles by 2040
- Resilient Natural Systems

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Across the Big Moves, suggested actions that relate to transportation include:

TM-1 Develop a Transportation and Mobility Strategy to increase opportunities for active mobility and transit

TM-5 Improve bike and ebike network

TM-16 Ensure new developments are 'EV Ready' e.g. electric charging capabilities, dedicated charging spaces, etc. TM-2 Enhance and expand existing multi-use trail network to connect neighbourhood centres and transportation corridors

TM-7 Advocate for expansion of the transit network with an update of TransLink's South of Fraser Area Transit Plan (SOFATP)

GE-2 Implement shading features e.g. trees, structures for public parks, greenways and active transportation corridors

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While conducted under the mentorship of UBC Sustainability Hub staff, the opinions in this policy brief, as well as any errors, are those of the author and do not necessarily reflect the views of the University of British Columbia.

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