"In a quality city, a person should be able to live their entire life without a car, and not feel deprived"

Paul Bedford

Mobility

Sustainability by Design Research Roundtable

by Lauren English

Introduction

Mobility refers to the systems that facilitate the movement of goods, people, and services. It encompasses all available modes of transportation, including active transportation, and supporting infrastructure.

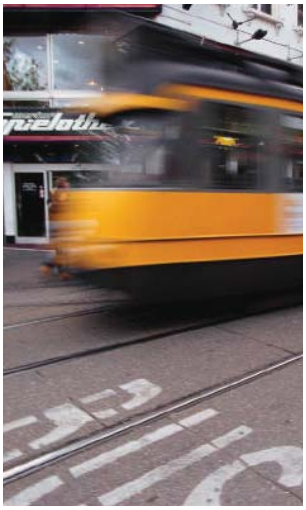
The Sustainability by Design Research Roundtable Working Group on Mobility will investigate the demand, supply and distribution of regional mobility. The group will identify trends and drivers and explore key indicators that help to define the relationship between mobility, infrastructure and urban form. The group will also provide recommendations on how the region's mobility systems can contribute to the Province's target of an 80% reduction in greenhouse gas emissions by 2050.

History

Economic concerns have long-shaped regional development. First Nations villages and original European settlements strategically located on river and ocean shores to access natural resources and facilitate people and goods mobility. Mid-nineteenth century regional planning by Colonel Richard Moody's Royal Engineers developed a road and trail network linking inland settlements with ports to support commercial activity, local industry, and small-scale manufacturing. Funds raised through the 1872 Municipality Act further expanded and improved roads (Hayes 2005). In 1886, Vancouver became the terminus of the Canadian Pacific Railway, prompting the rise of transportation-based industries and large-scale manufacturing. Local shipping needs and new development drove regional expansion of the Interurban rail service in the early twentieth century (Hayes 2005).

More recent planning has established economic focus on regional town centres. The Greater Vancouver Regional District's Livable Region Plan (1975) concentrated future commercial and residential growth around eight town centres. The 1996 Livable Region Strategic Plan expanded planning to the Langleys, Pitt Meadows, and Maple Ridge, and established a long term transportation vision to enhance human mobility while accommodating shipping needs (Metro Vancouver 2005).

As a port city with rail and road links to the rest of the continent, the Metro Vancouver region continues to serve as an import/ export hub for goods and resources. Roughly 30% of shipments are used locally (citiesPLUS – Speck 2002). Industrial activities continue to transform sections of waterfront, while recent residential and commercial developments are reinventing former industrial sites as new communities and amenities.



Current Context

Mobility systems in Metro Vancouver provide access to the region, and between and within communities.

Regional Mobility

Access to the region is by air, water, rail, and road. Located in Richmond, the Vancouver International Airport (YVR) is one of Canada's busiest airports and the second largest passenger gateway on the west coast of North America. The airport accommodates over 17 millions passengers and 226,200 tonnes of cargo annually, and continues to expand (YVR, 2008).

Two primary passenger ferry terminals connect Metro Vancouver to Vancouver Island, the Gulf Islands, and the coastal mainland. Vancouver is the fourth largest port in North America.

The Vancouver Fraser Port Authority oversees 25 major marine cargo terminals, and has experienced an average annual increase in cargo activity of 4% over the past five years (VFPA 2007).

Three passenger and cargo railways support Metro Vancouver: Canadian National (CN), Canadian Pacific Railway (CPR), and Burlington Northern and Sante Fe (BNSF).

The region is also accessible by major highways from the east (Hwy 1), the north (Hwy 99), and the south (I-5, Hwy 99 and Hwy 15). Situated close to the American border, Vancouver experiences heavy border traffic.

Mobility Between Communities

Together, Metro Vancouver, the BC Ministry of Transportation, and the South Coast British Columbia Transportation Authority (TransLink) guide development of freeways, roads, greenways, bridges, and transit between communities. Metro's 1976 Livable Region Strategic Plan (LRSP) addressed mobility between town centres with a variety of transportation options. On February 27, 2009 the Metro Vancouver Board released the draft Regional Growth Strategy titled "Metro Vancouver 2040: Shaping our Future." A key goal of this update to the LRSP is to support regional sustainable transportation choices with the creation of compact urban centers connected through frequent transit development corridors (Metro Vancouver, 2007).

Translink also offers four transit options between communities: bus

service, SkyTrain, SeaBus, and the West Coast Express rail line. Presently under construction, the inter-urban Central Valley Greenway – a 25km cycling and pedestrian route will link 11 SkyTrain Stations, 23 bus routes, 16 existing bike routes, and 11 greenways across Vancouver, Burnaby, and New Westminster (City of Vancouver 2005). Metro Vancouver's 2005 Parks and Greenways plan spurred expansion of this initiative with four regional greenways totaling 100 km in length currently under development: Brunette-Fraser, Delta-South Surrey, Pitt River, and Seymour River (Metro Vancouver 2009). However, despite cycling infrastructure expansion, only 2% of Metro Vancouver citizens claim biking as their sole form of transportation (Metro Vancouver, 2007).

Mobility Within Communities

Mobility within Metro Vancouver communities varies according to urban form. Coupled with development and expansion of pedestrian and bicycle infrastructure, pathways, and lanes, the compact design of town and city centres, as well as older neighbourhoods, supports more sustainable modes of transport such as cycling, walking and public transit. The region has experienced significant growth in its edge cities of Richmond, Burnaby and Surrey resulting in an increase of nearby employment opportunities, public amenities, and transit options. These areas are gradually seeing a decrease in private automobile use and an increase in public transportation ridership. A recent regional push for complete communities has led to an increase in mixed use zoning, offering more employment in regional centres while reducing long commutes. However, recent suburban construction in the District of Langley, Maple Ridge and Coquitlam has created segregated, low-density development. The separation of social amenities, employment, and housing – combined with a lack of public transit options – has increased private automobile ownership and commuting distances.

	North Shore	Vancouver UEL-UBC	Burnaby, New West	Richmond	North East Sector	Maple Ridge Pitt Meadows	Langley	Surrey, Delta,White Rock	MetroVan Average
Primary Transport:									
Car	82%	61%	74%	86%	86%	86%	91%	86%	*77%*
Transit	6%	20%	15%	5%	6%	4%	1%	5%	*11%*
Walk/Bike	12%	19%	11%	9%	8%	1%	8%	9%	*12%*
% of Daily Trips Lv. Region	20%	21%	41%	29%	31%	26%	30%	19%	
Avg. # of Cars	1.34	1.04	1.19	1.74	1.45	1.38	1.23	1.44	*1.28*

Table 1: Comparative mode shares for portions of the Metro Vancouver Region (Metro Vancouver 2007).

Future Trends

Current trends suggest the following projections: Firstly, if private auto use continues to be the preferred form of mobility between communities, there will be a 23% increase in automobile traffic by 2031 (DCS, 2006). Secondly, if global commodities continue to arrive in Vancouver ports there will be a 300% growth in container traffic by 2020 (DCS, 2006).

The Ministry and TransLink announced the Gateway Project in 2003. The project entails wider highways and bridges to accommodate existing and future growth, increase efficiency, and decrease congestion-related idling. The Gateway Project estimates congestion on Metro Vancouver's roads and bridges cost the region $1.5 billion annually in lost productivity (Gateway Program, 2007).

There is growing interest in the City of Vancouver reintroducing streetcars. In Fall 2008, the City announced the introduction of a demonstration streetcar for the 2010 Olympic and Paralympic games. The route will connect the Olympic Village in Southeast False Creek to Granville Island. Future phases will extend routes to the Vancouver Convention Centre and Stanley Park (City of Vancouver, 2008).

Synergies with other themes

Food

Transportation of food is a key factor in affordability, and regional greenhouse gas emissions. The current popularity of the "100-Mile Diet" and farmer's markets reflects regional desire for locally produced, often organic, food that requires short farm to market travel distances. However, big box grocery stores remain a mainstay, and these as well as local food producers require accessible and efficient distribution systems. The rise of biofuels will have great impact on food production, transportation, and price.

Energy

Land use and transportation planning play a crucial role in meeting Provincial greenhouse gas (GHG) emissions targets. Of total Metro Vancouver GHG emissions, cars and light trucks currently produce 32%; air, marine, and non-road transport 11%; and heavy trucks 6% (Metro Vancouver, 2007). Recent studies indicate that urban form can decrease per capita vehicle travel by 20% to 40% while increasing the viability and convenience of alternative forms of transportation (Ewing et al 2007). With new fuel and hybrid technologies it will be possible to achieve further reductions.

Water

Metro Vancouver mobility systems cross numerous rivers and inlets. The Fraser River, Burrard Inlet, and False Creek are criss-crossed with bridge infrastructure that is expanding to accommodate the transportation needs of a growing and commuting Metro Vancouver. Ferries run regularly between downtown Vancouver, the North Shore, and Bowen Island, and

private and public marinas facilitate heavy recreational boating traffic. These mobility systems generate heavy water pollution and disturb aquatic ecosystems.

Natural Habitat

Transit and highway expansion require a balance between transportation needs and ecosystem integrity. While conventional mobility systems often bisect natural habitat and agricultural areas, creating a barrier for wildlife and segregating populations, greenway street networks can play an important role in restoring and maintaining healthy and highly interconnected natural habitat and systems.

Economy

Transportation of goods and people is fundamental to economic prosperity, and efficient mobility systems save both energy and revenue. The increase in transit-oriented development has placed homes, work, services and amenities all within walking distance in many neighbourhoods, locating people where they can readily access and support local businesses. However increased transit use often requires costly network expansion, decreasing transit affordability. Recently, high fuel prices have influenced private and commercial transportation costs. More recently, the shrinking global economy has reduced exports/imports of goods, with Statistics Canada reports indicating that exports dropped nine per cent to $31.7 billion in January and imports declined 7.9 per cent to $32.7 billion (Vancouver Sun 2009).

Questions

What would a sustainable regional mobility network look like?

Are there optimal urban forms or patterns to support mobility efficiency and accessibility?

How does development that supports sustainable transportation conflict with or contribute to other sustainability goals?

What mobility modes are most feasible for the region and what urban forms or development patterns support or limit these modes?

How can Metro Vancouver affect reductions in transportation-related GHG emissions in sectors outside its jurisdiction (e.g. air and sea traffic)?

Are there synergies between transportation demand and supply that should be developed?

What regulatory/ political/ social/ economic/ technological barriers exist to creating optimal regional conditions for reducing vehicle kilometers traveled and increasing sustainable transportation mode share?

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