

## Vancouver as a Sustainable Settlement – Case Study – Dr Paul McKenzie, Ulster University

### Geography

- Situated in Southwest corner of Canada in British Columbia
- 120 miles between Vancouver & Seattle (USA)
- Approximately 27 miles from Vancouver to US border
- City surrounded by rivers (Fraser River), sea (Pacific Ocean), mountains (North Shore mountains) & land reserves.
- Constrained metropolitan area leads to vertical building.
- Mixed land use with retail, accommodation, entertainment etc often built on same land across different levels/stories with views and green areas maintained (**Vancouverism**).
- Situated near the junction of three tectonic plates (Juan de Fuca, North American & Pacific). Cascadia Trench is a subduction zone.
- Risks of sea-level rise, flooding, earthquake and, to some extent, wildfires

### Population

- Area owned by American Indian until 1800s +
- Population in city area approximately 631,486 (2021/22)
- 8<sup>th</sup> largest city in Canada, and the largest in British Columbia.
- Diverse population with >50% from 'minority' groups. Chinese account for ~26% of total population
- Rapid growth due to strong immigration policies

### Labour Market

- In 2021 "Professional, scientific and technical services" (15.4%), "Health care and social assistance" (12.4%) and "Retail trade" (10.0%) were main industry sectors.
- Dominated by tertiary (service provision) and quaternary (knowledge-based or high-tech) sectors.
- According to Globalization and World Cities Research Network ([GaWC](#)), Vancouver is a Beta + city (important world city that links their region into world economy)
- Unemployment in 2021 was 17.5% (15-24 years), 7.9% (25-64 years) and 10.6% (65+ years). Each age group had higher unemployment in 2021 than in 2016.
- 3<sup>rd</sup> largest film production centre in North America (behind Los Angeles and New York)

### Transport

- City built around a grid structure used by electric streetcars.
- Vancouver blocked plans to put a freeway (motorway) through city centre in 1967.
- Development of bus network (1950s +)
- An integrated transport system (multi-modal transport system) with airport, neighbourhoods, employers linked with SkyTrain, SeaBus, commuter rail.
- Car pooling popular and private cars discouraged.
- Active Travel popular through bike paths and walking routes.
- Push towards sustainable transport and increased electrification of fleets

### Greenspaces

- High provision of greenspaces and urban parks throughout city
- Examples include Stanley Park, Queen Elizabeth Park and Lynn Canyon
- Diversification of greenspace with community gardens, green roofs, pollination areas, saltmarshes, repurposed railway lines (Arbutus Greenway)
- Approximately 93% of city within 5-minute walk of greenspace
- Greenspaces offer many **ecosystem services** such as urban cooling, water storage, carbon storage, pollution reduction, increased biodiversity, improved physical & mental health, increased house prices, community cohesion, views etc!

### Housing

- Large proportion of older homes (1960s) therefore aggressive strategy of retrofitting (making older inefficient homes more efficient and sustainable)

- House prices abnormally high (housing price bubble) due to incentivised foreign investment (mainly China)
- Previous housing market bubble burst in 1980s
- Policy was to build 'up' like Hong Kong (extreme stacking) with mixed-use developments.
- Urban resurgence and gentrification occurred.
- Suburbanisation occurring to some extent due to transport links.
- Detached properties outside CBD can have up to 6 residential properties per lot (laneway houses, coachway houses, basement suites)
- Demand slowed by policies like Foreign Buyers Tax (20%) & Empty Homes Tax (1% of property value)
- Inclusionary Zoning requires developers to offer affordable housing in rezoned neighbourhoods.
- Vancouver Affordable Housing Agency promote "access to affordable, safe, and quality homes".
- Policies restricting domestic heating activities such as wood burning stoves that reduce air quality.

## Energy

- Vancouver has > 95% of electricity from renewable energy sources
- Hydroelectric plants and district heating dominate but solar PV also important.
- Focus to reduce demand through better building standards & electrification of transport/buildings.
- "Passiv Haus" (Passive House) standards are very well insulated & require small amounts of energy for heating & cooling – focus on Zero Emissions Building (ZEB).

## Waste

- 2010 Olympic Village at False Creek – waste heat (showers, toilets...) extracted and transferred to clean water, radiant heat and hot water – GHG emissions reduced >75%
- Zero Waste 2040 Plan
- Strong community networks, education, demonstration of innovation
- Systems approach and circular economy
- Avoid, Reduce, Reuse, Recycle and Energy Recovery and Dispose
- Reduce single-use items (bags, cups etc)

## Water

- Water supply gap predicted by 2030 due to increased population, reduced snowpack on mountains (56% decrease by 2050) and less rainfall in the summer (13% decrease by 2100).
- Nearby reservoirs at Capilano, Seymour and Coquitlam + 22 additional in-system reservoirs
- Water filtration at [Seymour-Capilano](#) water filtration plant – 1.8 bn litres per day
- Energy recovery facility, ground source heat pumps, green roofs and EcoSmart concrete + LEED Gold building (Leadership in Energy and Environmental Design, a green building standard)
- UV disinfection, chlorination and ozonation with aim to reduce chlorine
- Restrictions on watering domestic lawns (summer) with rates for water and sewage
- Active policies to harvest rain water, reduce (not watering lawns, user-activated systems), low flush toilets, allow absorption, education

## Progress

- Air Quality Reports suggest air quality is improving over time though fluctuations occur.
- Water consumption decreased and less residential waste diverted to land fill.
- In one year, 18 buildings (>800 units) reduced 650 tCO<sub>2</sub>e and saved 28 million litres of water through "Operation Co\$t Cutter".
- Emissions decreasing
- Per Capita CO<sub>2</sub> emissions decreasing
- Economist Intelligence Unit Global Liveability Index 2022 – Vancouver 5<sup>th</sup>, Calgary 3<sup>rd</sup> (with Zurich)
- WWF - first winner of Earth Hour City Challenge 2013
- Arcadis Sustainable Cities Index 2022 (17<sup>th</sup> out of 100 – Oslo 1<sup>st</sup>; London 5<sup>th</sup>)
- Signatory of "C40" scheme, network of ~100 mayors against climate crisis.