

Transportation accounts for 40% of BC's greenhouse gas emissions. This means we need to be rethinking our reliance on cars and trucks that burn fossil fuels. A central justice issue for transportation, which students understand well, is having access to a car. While electric vehicles are coming to the marketplace they are, at best, only part of the solution. Developing more complete communities – where people live closer to where they work, shop, access public services and play – is necessary if we want to see more walking, biking, public transit and car-sharing as alternative transportation modes.

This module draws on the Climate Justice Project report, Transportation Transformation: Building Complete Communities and a Zero-Emission Transportation System in BC www.policyalternatives.ca/transportationtransformation

OBJECTIVES

- Students will recognize how inequality affects access to transportation.
- Students will understand how urban and suburban design and infrastructure influences transportation choices and mobility.
- Students will explore low-carbon transportation alternatives, and ways in which we can change our systems and surroundings to make these alternatives more accessible.

COMPONENTS

- 1. Connecting transportation to community design
- 2. Considering transportation challenges and creating solutions
- 3. Transforming transportation: A path to a better and more equitable BC

CURRICULUM CONNECTIONS

Science and Technology 11 Social Studies 8, 9, 10, 11 Civic Studies 11 Social Justice 12 English Language Arts 8, 9, 10, 11, 12 Communications 11, 12 Applied Skills 11 Business Education 10 Economics 12 Home Economics: Family Studies 10, 11, 12 Technology Education: Drafting and Design 11, 12 Technology Education: Industrial Design 11, 12

Visit http://teachclimatejustice.ca/ the-lessons/PLOs to download a comprehensive list of BC Ministry of Education prescribed learning outcomes (PLOs) that may be addressed with this resource package.

TOTAL SUGGESTED TIME

1 hour 20 minutes

RESOURCES REQUIRED

- Digital projector and computer with internet access
- Whiteboard/chalkboard and markers/chalk
- Paper and pens/pencils
- PowerPoint: Transportation Transformation [Download at www.teachclimatejustice.ca]

Part 1 – Connecting transportation to community design

READ

Read aloud: In BC, 40% of the province's greenhouse gas emissions come from transportation – cars and trucks that burn fossil fuels to move people and goods around.

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Show PowerPoint slide:

"Transportation's share of BC's total GHG emissions"

Today we are going to be looking at how transportation works and how it can be re-imagined for a zero-carbon province. When we think about transportation, we often think of cars, which is a great place to start.





Brainstorm as a class:

- What are the advantages of owning or having access to a car? Possible responses: saves time; provides access to more activities or social opportunities; easier to do basic day-to-day things (e.g. errands); access to a wider range of job opportunities.
- What are the disadvantages of owning or having access to a car? Possible responses: cost (gas, insurance, maintenance); parking in busy places; traffic congestion; greenhouse gas emissions.

Questions:

- Is having access to a car an advantage where we live? What is
 it about how our community is set up that makes owning a car
 an advantage? What about other communities? (Consider the
 differences in urban, suburban and rural communities.)
 Possible responses: things are far away/spread out/non-centralized;
 people live far from where they work/play/access amenities and
 services; transportation systems (buses, trains, bicycle paths, etc.) may
 be underdeveloped or underfunded, so service is inadequate; getting
 around in rain, snow or cold conditions.
- Who has access to cars and their advantages, and who does not? Possible responses: people who cannot afford to own a car; people who are unable to drive (e.g. youth, some people who are elderly or have disabilities).
 - Dilemma: Low-income households may need access to a car if they live far from work. Housing farther from the city core is often more affordable.
- What are some of the impacts of not having access to a car? Possible responses: reduced access to work, services, or other amenities; exclusion from social activities; isolation; etc.

Part 2 – Considering transportation challenges and creating solutions



Brainstorm as a class:

What are some other transportation options or methods of low or zero carbon travel?

Record responses on the board. Students will probably come up with a list that looks like this (if they miss any, add them to the list):

- Bike/other person-powered transport, e.g. skateboard
- Carpool

• Walk

• Hybrid or electric cars

Car share/co-op

• Public transit (bus, train, etc.)



Activity: Separate the class class into small groups attached to each of the ideas generated above. Ask students to brainstorm and write down their thoughts on:

- What things might discourage people from utilizing this low carbon alternative? Be sure to include both personal and systemic factors.
- How could we change our cities or systems so people could more easily access this transportation option and more equitably reap the benefits?

Ask groups to report back to the class. Some elements to tease out during the debrief:

- Distance to work/play/amenities really affects a person's carbon footprint and their ability to choose alternatives like walking, biking or transit. Positive solutions include:
 - Providing people with a range of low or zero carbon options, including affordable, accessible and flexible public transit. People may choose differently depending on the weather, how rushed they are, whether they have items to transport, etc.
 - Developing "complete communities" so more people live closer to where they work, play, shop and access public services. Complete communities reduce transportation costs and level the playing field for those who don't drive their own car.
 - Rethinking how we design communities, e.g. turning suburban malls into town centres, building new housing and commercial space instead of parking lots.
 - Note: studies have shown that longer commute times negatively impact life satisfaction (www.statcan.gc.ca/pub/11-008-x/2011002/article/11531-eng.htm)
- Physical systems matter:
 - Improving public transit infrastructure and services (including affordability, accessibility, and frequency) would greatly encourage low carbon transportation use.
 - Metro Vancouver is making a point of building high-density areas around Skytrain stations, creating community hubs around mass public transit.
 - Having dedicated (safe) bike lanes greatly increases their use.
 - Car sharing programs are a great option when other low carbon transportation alternatives are not realistic – many people will use these programs if the infrastructure is there to support them.
 - Widespread internet access has made working from home a possibility for some people, which reduces their need to travel to and from work.

Part 3 – Transforming transportation: A path to a better and more equitable BC

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READ

Show video: *Transportation Transformation* http://vimeo.com/22916607

Read aloud: Thoughts to travel with:

• Improving public transportation, bike paths, density and community design will improve mobility and lower costs for all British Columbians.



- It is essential that we reduce our GHG emissions and redesign our cities for the realities of climate change.
- Building public transit lines and transportation infrastructure, and designing spaces for density and accessibility, require labour and vision and will create good paying jobs.

"A zero emissions transportation system by 2040 is both desirable and achievable." – CJP report, Transportation Transformation: Building Complete Communities and a Zero-Emission Transportation System in BC



Pair-share: What are some things we can do to make low carbon transportation options more accessible for our school and community, and move towards creating a more complete community?



QUESTIONS AND ACTIVITIES FOR FURTHER EXPLORATION

- 1. Choose one of the graphs or charts listed below (located in the PowerPoint slides for this module, available at www.teachclimatejustice.ca). Write about the implications of the information in this graph/chart. What changes to policy would you recommend based on this information?
 - Getting to Work In Metro Vancouver: Commuting by Transit, Walking and Biking, 2006
 - GHG Emissions from Private Vehicle Operation, by Income Group, 2007
 - Port Mann Bridge vs. light rail transit infrastructure







- 2. Visit Mapnificent: www.mapnificent.net/ [Lower mainland only as of July 2014]. Mapnificient is a website that shows you the areas than can be reached from any given destination, using public transit, in any given time. Move the flag to different parts of the lower mainland and notice how your mobility by public transit changes. How is access to amenities, work and cultural centres affected by geography? How is this tied to socio-economic status?
- 3. Using artwork and images, show how you would redesign your community for smarter, fairer, low-carbon transportation.
- 4. Create a video blog or map outlining or highlighting the low carbon transportation alternatives and infrastructure in your community (e.g. where are bike lanes, bus routes? Are there well-marked walking routes or crossing guards? Are there great walking routes that everyone should know about?).
- 5. Call your municipal or regional government office and find out about the transportation development plan in your community over the next few years.

ADDITIONAL RESOURCES

- Affordable EcoDensity: Making Affordable Housing a Core Principle of Vancouver's EcoDensity Charter www.policyalternatives.ca/publications/reports/affordable-ecodensity
- Seven Rules for Sustainable Communities: Design Strategies for the Post Carbon World www.sxd.sala.ubc.ca/10_publications.htm
- Cycling Metro Vancouver Route Planner www.cyclevancouver.ubc.ca/cv.aspx

The opinions and recommendations made in these lesson plans and the linked reports and resources, and any errors, are those of the authors, and do not necessarily reflect the views of the CCPA, BCTF or funders of the Climate Justice Project.

ABOUT THE PROJECT

Climate Justice in BC: Lessons for Transformation was designed to provide teachers with classroom-ready materials to engage their students with how climate action intersects with social justice ("climate justice"). The curriculum features eight modules designed for grade 8-12 students to explore climate justice within the context of BC's communities, history, economy and ecology. These lessons tie into subject matter and prescribed learning outcomes (PLOs) already in BC's curriculum (complete list at teachclimatejustice.ca/ the-lessons/PLOs), while providing a framework to unpack modern social and environmental issues.

The topics are based on reports from the Canadian Centre for Policy Alternatives' Climate Justice Project – a research project that looks at the two great inconvenient truths of our time: climate change and rising inequality. (Climate Justice reports, shorter pieces and videos available at www.climatejustice.ca.)

Visit teachclimatejustice.ca for downloadable and online components of this curriculum, including PowerPoint files, links to videos and resources, and individual lesson PDFs.

Teachers are encouraged to adapt these lessons to their particular classroom needs, or pull out specific activities as appropriate. Times allocated for each module are approximate and will vary greatly depending on the grade and composition of the class. While these lessons were designed for secondary students, most modules and activities are easily adaptable for upper intermediate students. Feedback is welcome and will help us refine these modules for subsequent editions.

MODULE SUMMARIES

Module 1: Introduction to Climate Justice Causes and effects of climate change through a fairness and equity lens.

Module 2: Reimagining our Food System

Climate change and our food systems, how climate change may affect food production in BC and elsewhere, and social justice issues, such as vulnerability to hunger and migrant farm labour.

Module 3: Transportation Transformation How community design encourages or

discourages car use, and what we can to do to better facilitate walking, biking and public transit options, create more complete communities and improve quality of life.

Module 4: Rethinking Waste

Moves beyond recycling and composting and looks at our culture of consumption and how it produces waste, both solid waste and airborne emissions like greenhouse gases.

Module 5: Fracking Town Hall

Uses a town hall simulation to explore the challenges of fossil fuel extraction and the bigger picture context of the push for a BC-based liquefied natural gas (LNG) industry.

Module 6: Green Industrial Revolution

Uses the mini-documentary Town At The End of the Road, to consider how resource sectors can be re-imagined as part of a green economy.

Module 7: Imagining the Future We Want Uses a storytelling exercise and themes of intergenerational justice to discuss the challenges we face today and imagine how we can move towards a better future.

Module 8: Challenges to Change Explores the essential elements of successful social change movements.

GLOSSARY

 $2^{\circ}C$ – The amount of global warming above pre-industrial levels (200 years ago), which could lead to catastrophic outcomes for human populations (and countless other animal and plant species). The Earth has already warmed by 0.8°C above pre-industrial levels.

Carbon dioxide (CO_2) – A heat-trapping molecule, and the principal greenhouse gas of concern to climate scientists. A growing concentration of CO_2 from burning fossil fuels is warming the Earth.

Carbon tax – A tax applied to the combustion of fossil fuels. BC currently has a carbon tax that amounts to about 7 cents per litre at the gas pump.

Climate change – The altering of climate patterns (e.g. more precipitation, more intense storms, floods or droughts) on Earth caused by the burning of fossil fuels.

Climate justice – A term for viewing climate change as an ethical issue and considering how its causes and effects relate to concepts of justice, particularly social justice and environmental justice. This can mean examining issues such as equality, human rights, collective rights and historical responsibility in relation to climate change.

Fossil fuels – Fossil fuels are the underground remains of plants and animals that lived millions of years ago, which can be processed and combusted for energy use. Examples include oil, bitumen, coal and natural gas.

Global carbon budget – An estimated maximum amount of carbon dioxide and other greenhouse gases we can emit into the atmosphere before passing the 2°C critical threshold of warming.

Global warming – The heating up of the Earth caused primarily by the burning of fossil fuels (oil, coal and natural gas), which releases heat-trapping carbon dioxide into the atmosphere.

Greenhouse gas (GHG) – A gas that traps heat and contributes to global climate change.

Liquefied Natural Gas (LNG) – Natural gas that has been converted into liquid for ease of storage and transportation.

Methane (CH₄) – A potent greenhouse gas, and the principal ingredient in "natural gas."

Renewable energy – Energy that comes from resources that are continually replenished, such as sunlight, wind, rain, tides, waves and geothermal heat.

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Complete project credits, biographies and acknowledgements at teachclimatejustice.ca/about



Canadian Centre for Policy Alternatives – BC Office

The CCPA is an independent, non-partisan research institute concerned with issues of social, economic and environmental justice. www.policyalternatives.ca



British Columbia Teachers' Federation

The British Columbia Teachers' Federation (BCTF), established in 1917, is a social justice union of professionals representing public school teachers in BC, Canada. www.bctf.ca

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