

Land Use, Transportation and Air Quality: Making Healthier Decisions

October 27th, 2009

Hilton Metrotown ♦ Burnaby, British Columbia

Conference Proceedings

The first of its kind in British Columbia, this workshop attracted a diverse audience of 133 land use and transportation planners, engineers, health and air quality experts, from all levels of government, academia, industry and consulting. Conference Co-Chairs Scott McDonald (BC Lung Association) and Marion Town (Fraser Basin Council) welcomed workshop attendees and provided context. Marion Town introduced the keynote speaker and chaired the overall program.

KEYNOTE PRESENTATION

Henry Hilken – Director of Planning, Bay Area Air Quality Management

Land Use, Transportation and Air Quality in the San Francisco Bay Area

Biography: Henry Hilken is the Director of Planning and Research at the Bay Area Air Quality Management District. The Air District is responsible for assuring clean air in the nine-county San Francisco Bay Area. Mr. Hilken oversees preparation of regional air quality plans, transportation and land use programs, climate protection activities, amendments to Air District regulations, air quality modeling analyses, preparation of emission inventories, and the Community Air Risk Evaluation program. Mr. Hilken has a Masters of City Planning from UC Berkeley and has worked at the Air District since 1988.

- Overview of Bay Area Air District and issues affecting air quality
- High vehicle miles travelled everyday, low transit / cycling / walking trips. Forecast to exceed 20 million trips per day in 2025.
- 7 million population in San Francisco Bay area
- Legislative and enforcement includes State, Regional and Local government responsibilities and mandate. Various orgs, groups and agencies involved in various aspects of air quality management, regulation and enforcement. Land use, planning and decision making done at local government level
- Mobile sources (vehicles) most significant contributor to air pollution. Diesel particulate matter is significant air quality issue for region – lots of regulation and focus on this aspect. Also increasing focus on greenhouse gases and climate change implications. Approximately 40% of all greenhouse gas emissions come from transportation
- Ozone & particulate matter (PM) objectives have not been attained at State or Federal level.
- Toxic / health risk closely linked to roadways and transportation corridors
- Rethinking development to address health and air quality issues essential to improve liveability of region. Specific focus on ways to get people out of cars and into transit / walking / cycling – especially for short trips.

This conference would not have been possible without support from the following organizations:



- There is leadership and innovation in policy, tech and social aspects within the State – leading by example to address greenhouse gas and air quality issues. Significant level of activity, planning at local government level to address greenhouse gases / climate change. Little coordination between air district / local government initiatives. Climate Action web portal developed to enhance coordination / reduce duplication of efforts across local governments.
- SF Bay area has a high level of existing built communities (densely populated) – the challenge is to retrofit buildings to meet or exceed greenhouse gas standards. They have identified priority development areas to promote infill development and create more transit / walking friendly communities, while protecting quality of life.
- State level California Environmental Quality Act guidelines being reviewed / updated to assist local govt in environmental review and air quality impact assessment for development options.
- The Clean Air Communities Initiative has been created to focus on high risk / impacted communities.
- Regional Transportation Plan 2035 sets aggressive performance targets for vehicle miles travelled (10% reduction), particulate matter (45% reduction), greenhouse gas (40% below 1990), while taking into account population increase. Identifies transit and infill development as highest priority for \$\$ to reduce VMT.
- Fear of change is a significant issue in developing higher density, walkable, transit oriented communities – even in liberal communities such as Berkley.
- Moving forward is challenging – need to set sights high, share successes, don't reinvent the wheel and need to recognize one-size does not fit all. Need to be positive and focus on benefits and ways to enhance communities through smart growth, infill planning to create less vehicle dependent communities. Looking to the benefits and needs of future generations essential!

QUESTIONS:

1. City Ordinance implementation experience? Planning department supportive of CO, but not much movement or on-ground implementation yet.
2. Community Engagement strategies – what's been done to garner community support? A focused process has conducted various workshops and outreach at local level. Essential to get support at local level / community. Public engagement is vital to success. Can't do it from a regional level – must be local government / community led to ensure ownership and support for smart growth developments.

MORNING SESSION A: Transportation and Land Use Planning

(Chaired by Jennie Moore, BCIT)

Christina DeMarco, Metro Vancouver

Connecting Land Use, Transportation and Climate Change Regionally

Biography: Christina DeMarco is the Manager of Regional Development with Metro Vancouver. She has worked as a city and regional planner in Ontario, BC, and in Australia. She specializes in the relationship between land use and transportation planning, with particular emphasis on how job location shapes regions and cities. During her ten years in Australia she worked on the metropolitan plans for Sydney, Canberra, and Perth. As a planner with the City of Vancouver she was author of the City's Industrial Land Strategy and a team member on the City's Transportation Plan and CityPlan. Among her projects at Metro Vancouver, she created a comprehensive regional industrial land inventory. She is now leading a team to prepare a new regional growth strategy for the Metro Vancouver.

The time horizon for the new strategy is 2040, by which time the region's population could add over 1,000,000 people and 500,000 jobs bringing the population to 3.2 million people and 1.6 million jobs. Chris is the co-author of two planning books and numerous articles. She has a MSc in Urban and Regional Planning from the University of Toronto.

- There are connections at various levels that are essential to the success of transportation planning – community, local & regional levels.
- 2.2 million people in Metro Vancouver. Forecast is for another 1.1 million population increase by 2041.
- Share of trips to work: transit, walk, cycle carpool (census 2006 data). Increasing density = increasing use of transit / walk / cycle.
- Forecast 2040 reduce trips by vehicle to 43%, while increasing: 22% walk, 30% transit, 5% bike.
- Preventing “Job Sprawl” essential to activate the Regional Growth Strategy (RGS). Need to increase office location / jobs in areas with good transit and dense communities. Dispersed office park space on industrial land is difficult to service with transit, does not encourage reduction in vehicle trips. Commuting trips more significant impact on reducing greenhouse gases than building green buildings.
- RGS to provide unified approach to urban planning and development issues across 21 municipalities.
- Metro Vancouver has 2% of BC's farmland, but 30% of farm gate sales – essential to protect agricultural land from urban and industrial development.
- RGS sets transportation targets for Vehicle kilometres travelled and mode share of trips.
- Municipal level engagement and dialogue important to ensure support, buy-in and effective on-ground implementation of RGS.
- *“The best way to predict the future is to create it”*

Dr Larry Frank, University of British Columbia

The Environment, Our Health and How We Grow

Biography: Dr. Frank is the Bombardier Chairholder in Sustainable Transportation at the University of British Columbia and a Senior Non-resident Fellow of the Brookings Institution. He specializes in the interaction between land use, travel behaviour, air quality, and health. He has co-authored numerous papers and two books on these topics: *Health and Community Design: The Impacts of the Built Environment on Physical Activity*, and *Urban Sprawl and Public Health*. In June of 2004, his study "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars" was released documenting for the first time relationships between travel habits, neighbourhood design characteristics, and the odds of being obese and was featured in Time Magazine, on CNN, ABC news, and over 300 media outlets worldwide. More recently, Dr. Frank and his colleagues have been evaluating relationships between community design, travel patterns, air quality, fuel consumption, and climate change. He has also been conducting research to document a causal link between community design, travel choice, health, and the environment.

- We currently externalize environmental and social costs of air pollution and poor planning. Need to internalize these costs to effectively plan and deliver transportation-oriented communities.
- Proximity, connectivity, density affect behaviour.
- Community scale research into urban form and household / individual emissions – how the built form impacts or enhances air quality.
- Air pollution exposure in creating walkable communities – impacts on elderly and youth in particular

- NOx significant concentrations have been observed in dense / more walkable communities (eg downtown and west end). Impacts on health and need to identify ways to reduce NOx and other PM pollutants.
- I-Places – tool for predicting air pollution and health impacts from different planning / development options
- Move funding from cars to transit! Important to link regional funding to MV Regional Growth Strategy goals and objectives – no point creating vision and setting targets if no funding to support implementation.

Todd Litman, Victoria Transport Policy Institute

Land Use, Transportation and Air Quality: Making Healthy Decisions

Biography: Todd Litman is founder and executive director of the Victoria Transport Policy Institute, an independent research organization dedicated to developing innovative solutions to transport problems. His work helps expand the range of impacts and options considered in transportation decision-making, improve evaluation methods, and make specialized technical concepts accessible to a larger audience. His research is used worldwide in transport planning and policy analysis.

- Broader social, environmental and economic benefits of walkable communities. Support for local economies, walking friendly communities with open space, clean air instead of busy roads with space for parking and increased PM exposure.
- Need to balance environmental, economic, social objectives – identify options that maximize benefits for all three, rather than focusing on one specific aspect. Win, Win, Win transportation solutions exist and need to be optimized.
- Futures planning – what do we want to have in 20 years to live comfortable, healthy and fulfilled lives and how do we get there? Not just “best case scenario” but also planning for other less desirable scenarios. “Plan for the Best, but Prepare for the Worst”.
- Vancouver plans are good (eco-density, decreasing vehicle trips, increasing cycling, walking and transit)
- Obstacle to achieving the visions and goals of good plans is fear. People are afraid of change. Need to tell positive stories to show average citizens that a walkable, dense, transit oriented community is achievable and desirable. Not just politicians and planners telling stats and how it should be, but average people talking with average people. Increased community buy-in and support for change.
- Focus on safety benefits: Living in smart growth community has ¼ of traffic fatality rate than living in urban sprawl community
- www.vtppi.org for more info

QUESTIONS

1. Transportation efficient lending: live in walkable communities spend less on transportation costs – idea is to enable people to borrow more \$\$ as there is more household finance available to service mortgage as less spent on automobile costs. Vancity was close to piloting this concept. Also concept of distance based vehicle insurance. **More info on Online Transportation Demand Management Encyclopaedia (www.vtppi.org). Foreclosure rates much higher in automobile dependent communities in US. Support business case for more sustainable community development
2. Living in Fraser Valley / rural areas (Agassiz, Chilliwack) see traffic congestion from through traffic / weekend travel. Still need to own a car even if living in walkable communities to do weekend travel. Focus is on reducing trips that can be supported by transit, not stopping people from owning cars. Predictor for walking trips by children – number of cars in household highly correlated.

MORNING SESSION B: Air Quality and Health
(Chaired by Roger Quan, Metro Vancouver)

Glen Okrainetz, BC Ministry of Healthy Living and Sport

Overview of Provincial Legislation

Biography: Glen Okrainetz is the Director of Air Quality in the Ministry of Healthy Living and Sport. Prior to accepting this position, Glen worked for 14 years in the Ministry of Environment. Glen started with the Ministry as a senior policy analyst with a focus on intergovernmental relations. It was in this capacity that he played a number of roles in the activities of the Canadian Council of Ministers of Environment such as being the chair of the development committee for the Canada-Wide Standards for dioxins and furans, and co-chair of the national committee that oversaw the implementation of the Canada-Wide Standards for PM and Ozone. Since 2002, he has been manager of the provincial ambient air quality program. Glen has a Masters degree in environmental studies, and a Bachelor degree in physical geography.

- Industrial point sources initial focus of air pollution / air quality management. Now also focus on mobile and built environment as pollution sources.
- Province influences land use planning and air quality through funding transit and infrastructure grants (e.g., cycling); support Regional Growth Strategy; building codes; model bylaws; guidelines and best management practices.
- Various BC Healthy Living and Sport funded / supported community initiatives: Smart Planning for Communities etc
- BC developing vehicle emissions standards based on Californian standards
- Air Action Plan (2008) supports various initiatives to address air quality issues – including idle free ambassadors, SCRAir pollution IT program, retrofitting buses, financial support for community airshed planning, Hub for Action on School Transportation Emissions (HASTE).
- Focus on airshed management / planning rather than at individual municipal scale.
- More info at www.bcairquality.ca

Dr Michael Brauer, University of British Columbia

Linking Air Quality, Transportation and Health Impacts

Biography: Dr. Michael Brauer is a professor in the School of Environmental Health at UBC. He is recognized internationally for his air quality research in environmental and occupational exposure assessment, health effects, transportation, vegetation fires, indoor air pollution, air quality in Asia, and development of sampling and analysis methods for air pollutants.

- Health cost / benefit from reduced air pollution through the implementation of air management policies – e.g. Dublin, Ireland banned sale of coal reduced # of respiratory deaths by 15.5% and cardiovascular deaths by 10.3%.
- Improving air quality reduces risk of death from air pollution related illness. Shown that reductions in air pollution account for 15% increase in life expectancy
- Increasing vehicle kilometres travelled – more cars, more people, longer commutes as more urban sprawl. Also global transportation impacts on air quality (especially marine and port traffic)
- Traffic proximity relationship to health impacts – varies by pollutant and season. Overall emissions from road – number and type of vehicle / speed traveled / congestion etc.

- Specific research into effects of air pollution / proximity of roadways on children's' health (especially low birth weight, asthma, bronchiolitis, infections, flu/colds).
- Need for education and awareness to understand where high pollution areas are. What are the factors that create healthy neighbourhoods? New online tool available to help cyclists and pedestrians plan least traffic polluted cycle or walking route.
- Living in cities / neighbourhoods / locations with lower air pollution reduces health impacts – specific location relative to road/ air pollution sources important to level of impact

Dr Tom Kosatsky, British Columbia Centre for Disease Control

The Role of Public Health - Risk Assessment and Mitigative Approaches

Biography: Tom Kosatsky, MD, MPH is Acting Director, Environmental Health Services Division, BC Centre for Disease Control, Acting Scientific Director, National Collaborating Centre for Environmental Health, and Clinical Associate Professor, UBC. His work at BCCDC involves support for regional public health providers, and the BC Health Ministry, in both service and research. The focus of his work with the NCCEH involves identifying quality evidence to support environmental public health activities across Canada, assessing programme effectiveness, and supporting education and training. Current research highlights the assessment of population vulnerability to temperature extremes throughout BC.

Prior to his March 2008 arrival in BC, Dr. Kosatsky was consultant in environmental health to the Montreal Public Health program, and Associate Professor of Epidemiology at McGill University. Recent Montreal research included studies into the effect of socio-economic disparity in the use of services by children for asthma, the impact of petrochemical emissions on asthma exacerbations in children living nearby, and cardiovascular markers of high-level metal fume exposure among persons exposed to firework events.

Dr. Kosatsky, a trained occupational physician, has also worked for the US Centers for Disease Control and for the World Health organization.

- Modification / modernization of Rue Notre Dam – Montreal: highway option versus comprehensive public transit alternative. Both had benefits and costs. No decision made or plan implemented.
- Urban heat island – microclimate mapping in Montreal: neighbourhood scale variations observed. Linking temperature related deaths to urban heat sources (asphalt, factories). Social implications associated with land use (household make up, location, socioeconomic status etc) also linked to risk of dying during heat waves.
- 3 key roles for public health to be involved in air quality and land use planning: enforcement, regulation and advocacy. All called for within BC Public Health Act (2008).

QUESTIONS:

1. Anti Idling – how can this be enforced in areas with high stop-go traffic (e.g. borders, ferry traffic)? Recently implemented red light-system at border so drivers know that they'll be waiting for a while and to turn engine off... enforcement is a challenge. Provincial program is about outreach and education rather than enforcement. BC Ferries has implemented an anti-idling policy – signage at major terminals – discourage people from idling while waiting for ferries.
2. NRC – clean diesel vehicles – what are the benefits or implications? Ultra fine Particulate Matter is most significant. Unsure about actual health benefits – evidence for reduced greenhouse gas emissions, but not so much research into PM benefits.

Newer diesel vehicles are much cleaner. Older vehicles are the problem – especially off-road diesel vehicles (tractors).

3. New biodiesel requirements – is this expected to bring air quality benefits? Designed mainly to address climate change issue rather than PM issue. Unsure what the overall health benefits will be from biodiesel use.

AFTERNOON SESSION A: Making the Connection **(Chaired by Mayor James Atebe, District of Mission)**

Heather Deal – Councillor, City of Vancouver

Municipal scale advocacy and decision making for air quality and health

Biography: Heather Deal was first elected to Vancouver City Council in 2005 and was re-elected in 2008. She currently sits on the Metro Vancouver Environment and Energy Committee. Heather is a professional biologist and an environmental educator and activist. She received her bachelor's degree in Biology from Oberlin College in Ohio in 1982, and moved from Cleveland to Vancouver for a medical research job in 1984. After receiving her Master of Science degree from the University of British Columbia in Microbiology/Immunology in 1988, she conducted cancer research for several years before changing her career path to focus on environmental issues. Heather developed science/environmental programs for UBC Continuing Studies and designed and taught classes for people restoring fish habitat in rivers for the Province of BC. In 2002, she started working on marine habitat issues with the David Suzuki Foundation, and continues to work part time for the Foundation.

- Port Metro Vancouver large source of air pollution.
- Federal infrastructure funding should be directed towards transit infrastructure.
- Rail expansion for sea to sky corridor would improve air quality and health.
- \$130m plan recently approved by TransLink Board for next x years – will result in slight reduction in service while increasing fare cost.
- City of Vancouver has one of the greenest building codes in the world – includes new buildings and retrofitting existing buildings.
- Realized increased density doesn't necessarily lead to increased affordability. Need to address this in ways other than just creating more condo towers (e.g., coach houses, suites).
- Transit hubs and creating complete communities – zoning issues need to be addressed.
- Municipal can also address urban planning and air quality through road width, creating walking and cycling friendly spaces.
- Solid waste management implications for air quality and Health – significant issue for entire MV region.
- At municipal level look for areas that can make a difference, recognize the need to advocate for change and take risks to create healthy communities.

Stephen Brydon, BC Transit

Making the Connection: Climate Action, Provincial Transit Plan and BC Transit

Biography: Stephen joined BC Transit in December 2006 as Clean Transportation Technology Development Officer. In October 2008 Stephen was appointed Manager, Climate Action, responsible for ensuring the transit agency meets its obligations as a public sector organization under British Columbia's Carbon Neutral Government Regulation. It is a legislated requirement that BC Transit measure, reduce and publicly account for its emissions. Prior to joining BC Transit Stephen worked for 16 years in the BC Public Service

in a number of Provincial Government Ministries with a focus on energy, clean transportation technologies, economic development, trade and investment.

- Transit buses contribute less than 1% of greenhouse gas emissions within transportation category, while providing 10% of daily trips taken.
- Focus on increasing transit ridership across province, reducing greenhouse gas emissions, supporting transit hubs, corridors and increasing community density.
- Goal to increase ridership to 80 million trips per year from 50 million trips by 2020.
- Challenges with becoming carbon neutral - need to assess emissions and address emissions wherever possible – and invest in projects through Pacific Carbon Trust. Not required to offset emissions as govt recognized transit is “part of the solution...”
- BC Transit emits approx 56,000 tonnes of greenhouse gas from diesel + ~2,000tonnes (carbon dioxide equivalent) from buildings
- Innovation: Hydrogen fuel cell, clean diesel and hybrid buses in trial
- Need to build on community engagement and dialogue to ensure transit is key component in creating more liveable communities.

Natalie Suzuki, BC Ministry of Healthy Living and Sport

Air quality best management practices in BC and other jurisdictions

Biography: Natalie Suzuki is an Air Quality Science Specialist with the Ministry of Healthy Living and Sports, which she joined in 2008. Prior to that, Natalie spent 15 years with the Ministry of Environment in Victoria, working on various air quality projects, including the development of tools and provincial policy to support airshed planning in B.C. She has a Master's degree in Atmospheric Science and a Bachelor's degree in Applied Science (Chemical Engineering), both from UBC.

- Land and transport planning should reduce the amount of emissions as well as exposure to air pollution.
- Various guidelines created by province: e.g., Develop With Care guide – outlines key objectives for community planning with specific reference to improving air quality. Links to Official Community Plans, bylaw development, creating transportation setbacks from major roads, guidelines for building location.
- California air quality and land use handbook useful reference – has identified sensitive land uses, with specific focus on protecting children's health.
- Important to avoid incompatible land uses through planning and bylaw development, use transportation setbacks to create buffer.

AFTERNOON SESSION B - Workshop

Discussion about recommendations for a path forward to ensure effective collaboration and implementation of healthier, air quality friendly decisions

Facilitated by Gordon Price, Simon Fraser University

Biography: Gordon Price is the Director of The City Program at Simon Fraser University. He is also an Adjunct Professor in the School of Community and Regional Planning at the University of British Columbia, where he developed and teaches the course 'Vancouver and Its Times.' In 2002, he finished his sixth term as a City Councillor in Vancouver, BC. He also served on the Board of the Greater Vancouver Regional District and was appointed to the first board of the Greater Vancouver Transportation Authority (TransLink) in 1999. Mr. Price is also a regular lecturer on transportation and land use for the City of Portland, Oregon and Portland State University. He has written several extensive essays on Vancouver and transportation issues - The Deceptive City, Local Politician's Guide to Urban Transportation - and has been published in numerous journals, including those of the

American and Canadian Planning Associations. He has spoken at numerous conventions and conferences in many countries, writes a monthly column for Business in Vancouver on civic issues, and conducts tours and seminars on the development of Vancouver. He also publishes an electronic magazine on urban issues, with a focus on Vancouver, called "Price Tags" - www.pricetags.ca.

Question: What is the Path Forward? A high level vision – not necessarily an action-oriented approach OR perhaps a focus on spending priorities. What's the next step to take?

The facilitator then asked participants to provide success story examples to make it "real" – help link the idea with reality

GOOD IDEAS / "AHA!" moments?

Figure out finances – the full equation – internalize the broader environmental, economic and social cost

Perhaps removing sulphur from diesel. Currently CEPA regulations are under development to ensure sulphur content is reduced.

Infill housing as approach for enhanced density, but need to ensure siting is not in locations with existing bad air quality.

Thought eco-friendly Berkley would be the "holy grail" for community buy-in, but quite a bit of resistance to densification. Maybe other not-so-cohesive communities will be more receptive (e.g. Detroit).

Transit provision and air quality-friendly commuter behaviour leads to benefits in other areas of individual life (health, wellness, community building).

Where has investment in road infrastructure reduced congestion?

- Use of spiderweb / transport corridors in European cities rather than Grid system

Where has increasing transit ridership successfully reduced traffic congestion?

- Victoria corridor to university – largely due to U-Pass program (based on models and assumptions, not real data).
- Downtown Vancouver – increased density, increased ridership, walking, cycling accompanied by decrease in car trips.

Canada Line ridership and vehicle traffic being monitored in Vancouver and Richmond. Many dynamic issues involved – not simple equation.

GM Place – skytrain should relieve congestion, but congestion still exists...

Translink implementing smart card system to track ridership activity – where on, where off, transfers, etc. Allows for better data gathering.

Khazzoom–Brookes postulate: Increases in efficiency are spent in increases in consumption. Need to slow consumption.

Need to collaborate with economists – people are motivated by money at an individual scale. Engage community on improving air quality through money / economic lens.

Congestion pricing needs to be coupled with enhanced transit service and improved housing affordability.

Currently, driving is too convenient. Transit / alternatives to driving need to be made more convenient and pleasant, vehicle use made less convenient.

Develop communities that do not depend on transportation – walkable communities as priority. First step: recommendations to governments about conclusions at today's event.

Can social media be used to engage communities in air quality and health?

Get information out about true costs of land and transportation development and air quality and health – step toward internalizing true costs.

Need to start with clean slate – throw out integrated transportation handbook.

At present our communities are created around vehicle use. Need incentives to get people out of cars – not just saying NO to cars / making vehicles inconvenient.

Urban dream that quality of life is improved with a large house, picket fence, multiple cars and a backyard – “dream” not seen as increased density / condo living. Need to change this impression.

Ensure industry / business provides employees with transit options – taxed for greenhouse gases and air pollutants.

Heavy duty diesel trucks cause lots of pollution and congestion. Can they be replaced with alternatives (e.g., rail)?

Accurate statistics are essential to decision making. Need more so than just a policy statement or workshop recommendations. Facts and figures are needed to convince politicians to take action.

Would like to compile future scenarios (e.g., “business as usual”, low emission zones, bridge tolls) and assess these scenarios against criteria such as exposure and greenhouse gas emission reduction potential, including full cost/benefit accounting (internal and external, including avoided health costs). Let's generate the figures and put them in front of decision makers.

It is very difficult for decision makers to go against the advice of experts. Need to provide tangible examples of where communities have seen success using alternatives to vehicle-based planning.

Need to continue to improve communication between all levels of government, and invite more people to the table.

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Attendee List

Iona To	AECOM Ltd.
Henry Hilken	Bay Area Air Quality Management District
Tom Kosatsky	BC Centre for Disease Control
Greg Peterson	BC Ferries
Menn Biagtan	BC Lung Association
Scott McDonald	BC Lung Association
Jacquay Foyle	BC Ministry of Agriculture and Lands
Glen Okrainetz	BC Ministry of Healthy Living and Sport
Natalie Suzuki	BC Ministry of Healthy Living and Sport
Stephen Brydon	BC Transit
Kai Chak	BC Institute of Technology
Robert Cheung	BC Institute of Technology
Jin Choi	BC Institute of Technology
Olga Petrov	BC Institute of Technology
Vatsi Trivedi	BC Institute of Technology
Jennie Moore	BC Institute of Technology
Antony Abin	BC Institute of Technology
Acharya Parshuram	BC Institute of Technology
Geoff Hatch	BC Institute of Technology
Wen Kong	BC Institute of Technology
Arun Amatya	BC Institute of Technology
Rory Chudley	BC Institute of Technology
Alpha Sheriff	BC Institute of Technology
Raphael Schurmann	BC Institute of Technology
Ranate Pernsteiner	BC Institute of Technology
Maria Makovetski	BC Institute of Technology
Lynnette Bosch	BC Institute of Technology
Tony Lai	BC Institute of Technology
Pastor Paa	BC Institute of Technology
Tolga Durmaz	BC Institute of Technology
Arvind Chowdhari	BC Institute of Technology
Fernanda Cunha	BC Institute of Technology
Afroz Hedayati	BC Institute of Technology
Karen Tso	BC Institute of Technology
Francis Chiu	BC Institute of Technology
Albert Ginting	BC Institute of Technology
Shane Laye	BC Institute of Technology
Kaveh Taheri	BC Institute of Technology
David Zhang	BC Institute of Technology
Giuseppe Chew	BC Institute of Technology
Julia Ihnatovich	BC Institute of Technology
Jason Grafstrom	BC Institute of Technology
Megan Fitzgerald	Cambie Corridor Consortium
Chani Joseph	Canada Green Building Council
Robyn McLean	City of Burnaby
Johannes Schumann	City of Burnaby
Rod Sanderson	City of Chilliwack
Karen Stanton	City of Chilliwack
Bruce Anderson	City of Nanaimo
Tom Hickey	City of Nanaimo

Bev Grieve	City of New Westminster
Jennifer Lukianchuk	City of New Westminster
Daniel Watson	City of North Vancouver
Sherry Carroll	City of Port Coquitlam
Kristen Tiede	City of Surrey
Heather Deal	City of Vancouver
Haley Cole	Coast Mountain Bus
Gavin Roome	Coast Mountain Bus
Harjit Sidhu-Kambo	Coast Mountain Bus
Gavin Roome	Coast Mountain Bus
Patricia Bell	Community Energy Association
Anne Peterson	Corporation of Delta
Blane Grann	Dalhousie University
Ken Schwaerzle	District of Kent
Jason Steely	EnvironChem Services
Richard Holt	Environment Canada
Rita So	Environment Canada
Roxanne Vingarzan	Environment Canada
Ed Theobald	Envirotest Canada
Rashpal Rai	Envirotest Canada/AirCare program
Jennifer Wilson	Environment Canada
Marion Town	Fraser Basin Council
Lindsay Gardner	Fraser Basin Council
Amy Greenwood	Fraser Basin Council
Dr. Goran Krstic	Fraser Health
Svend Andersen	GHG Accounting Services Ltd.
Katherine Guidon	Health Canada
Herbert Antill	Health Canada
Patti Dodds	Health Canada
Yota Hatziantoniou	Health Canada
Markey Johnson	Health Canada
Jack Nickel	Health Canada
Christie Nelson	Health Canada, Safe Environments
Mona Fadl	Keystone Environmental Ltd.
Ana Booth	Levelton Consultants Ltd
Alex Schutte	Levelton Consultants Ltd.
James Abete	Mayor of Mission
Laurie Bates-Frymel	Metro Vancouver
Christina DeMarco	Metro Vancouver
Ali Ergudenler	Metro Vancouver
Eve Hou	Metro Vancouver
Raymond Kan	Metro Vancouver
Roger Quan	Metro Vancouver
Trudi Trask	Metro Vancouver
Shelina Sidi	Metro Vancouver
Earle Plain	Ministry of Environment
Tammy Liu	N/A
Crystal Brown	Northern Health
Yvonne Liang	Northern Health
Barbara Oke	Northern Health Authority
Marcus Siu	Opus International Consultants
Darrell Desjardin	Port Metro Vancouver
Christine Rigby	Port Metro Vancouver
Daniela Fisher	Prince George Air Improvement Roundtable (PG AIR)
Dan Jarratt	Rescan Environmental Services Ltd.
Mark Milner	RWDI Air
Geoff Doerksen	RWDI Air
Gordon Price	Simon Fraser University
Hannah Moffatt	Simon Fraser University

Cam Brewer	Smart Growth
Nepeya Botta	Student
Tanya Paz	The Company Car (The Car Co-op)
Greg Yeomans	TransLink
Geoff Cross	TransLink (Greater Vancouver Transportation Authority)
Gina Aitchison	Transport Canada
Danielle Wensauer	Transport Canada
Christian Reuten	University of British Columbia
Larry Frank	University of British Columbia
Youngmin Kim	University of British Columbia
Rongrong Wang	University of British Columbia
Michael Brauer	University of British Columbia
Susan Dean	University of British Columbia
Andrew Devlin	University of British Columbia
Luisa Giles	University of British Columbia
Brian Gouge	University of British Columbia
Youngseok Kim	University of British Columbia
Francis Ries	University of British Columbia
Alisha Mody	University of British Columbia SCARP
Jennifer Alderson	Vancouver Airport Authority
Randy Ash	Vancouver Coastal Health
Cynthia Watson	Vancouver Coastal Health
Todd Litman	Victoria Policy Institute
Larry Burk	Village of Harrison Hot Springs