Summary of Western North America Cities' GHG Reduction Strategies

Built Environment and Transportation

March 2014

This document summarizes greenhouse gas reduction strategies and actions related to the built environment and transportation, adopted by five cities in Western North America in their climate action plans. Those cities are: Vancouver, B.C.; Seattle, WA; Portland, OR, Berkeley, CA and Boulder, CO. These strategies were taken from each city's most recent climate action plan.

These strategies and actions are presented in two formats: a table format categorizing and summarizing each strategy/action.: Table 1 contains items related to the built environment, and Table 2 contains items related to transportation.

Building Energy Strategies

Table 1- *Comparison of Built Environment GHG Emission Reduction Strategies by Five US Cities*

	Seattle	Portland	Boulder	Berkeley	Vancouver
Built Environment					
General goals		By 2030, reduce total energy use of all buildings built before 2010 by 25 percent By 2030, achieve zero net greenhouse gas emissions in all new buildings and homes.	Green Building Strategic or Master Plan. Community Surveys.	Benchmark and report regularly on plan implementation Make green new construction & remodeling the market norm. Coordinate outreach between programs providing related services, such as child and low income health, energy efficiency, housing, and safety.	Reduce greenhouse gas emissions 33 per cent from 2007 levels. (Vancouver 2020) Reduce per capita ecological footprint by 33 per cent. (Vancouver 2020) Reduce energy use and greenhouse gas emissions in existing buildings by 20% over 2007 levels. (Vancouver 2020)
Land Use Planning	Develop tool to foster consistent consideration of opportunities to reduce emissions in transportation and land use planning. Implement neighborhood local area plans and urban design frameworks. Implement Challenge Grant strategies to				

	Seattle	Portland	Boulder	Berkeley	Vancouver
	prevent displacement and retain affordable housing near transit. Implement strategies to provide residents' daily needs within a convenient walk and create nodes well served by transit and non-motorized transportation. Develop equitable development policies to support growth and development near existing and planned high capacity transit without displacement. Develop coordinated land use and transportation plans in high-priority transit and bicycle corridors to shift more trips to low-carbon travel modes. Develop placemaking strategy to use public spaces to make streets and neighborhoods more vibrant and promote economic activity. Reallocate portions of the public right-of-way to public/pedestrian spaces				

	Seattle	Portland	Boulder	Berkeley	Vancouver
	such as plazas or parklets. Include health, safety, and equity outcomes in transportation and land use planning, building on the Healthy Living Assessment project.				
Low income housing	Weatherization program		Weatherization program	Green LEEP performance based low income energy efficiency program Identify duplicated services and ways to expand services for low-income households Expand and integrate home repair, weatherization and safety services (federally funded) Low cost solar Energy services for home-based care facilities.	EMBERS Green Restoration home weatherization service. (Vancouver 2020)
Renewable Technologies	Low to no-carbon energy sources through district energy on-site renewable energy systems Alternative energy master plan focused on low-carbon energy solutions Expand existing district energy systems	10% of County energy from on-site renewable sources and clean district energy systems by 2030.	Sign up 1,000 residential customers a year for wind power	Study wind energy potential within the city Investigate combined heat and power (CHP) systems Research potential for grid-connected wave energy system Evaluate effectiveness of	Pilot project to install solar thermal hot water systems on residential buildings. (Vancouver 2020) Parks and Recreation demonstration solar hot water in Stanley Park. (Vancouver 2020)

	Seattle	Portland	Boulder	Berkeley	Vancouver
	City utility's ongoing commitment to conservation and renewable sources, carbon neutral electricity. Continue utility's support for solar energy through net metering, Integrate land use and infrastructure planning to promote heat exchange among facilities. Develop incentive programs to capture and utilize waste heat. Allow alternative energy infrastructure (solar panels, geothermal wells) in public space.			a green waste anaerobic digester Install solar thermal systems on Berkeley Fire Stations Study solar parking lot and solar bus stop canopies. Install solar electric systems on Berkeley BART stations.	New district energy systems to allow new buildings to connect to a low-carbon energy source. (Vancouver 2020) Upgraded landfill gas capture systems (improve gas collection, install additional wells, and cap a recently filled area) (354,500 tCO2e was captured from the landfill in 2012, equivalent to taking 88,625 cars off the road for a year. Annual average gas capture rate in 2012 was 53 per cent—well on the way to the target of 75% efficiency by 2016. (Vancouver 2020)
Training for professionals		Work with partners to promote improved operation and maintenance practices in all commercial buildings.	Home Performance with ENERGY STAR program (HPwES) trains local contractors to employ the whole house approach and market it, providing marketing materials, technical assistance, and brand recognition, while local government, utilities, or other organizations provide contractor	Train energy service providers (e.g. organizations that can conduct comprehensive energy audits and upgrades) in Berkeley's energy standard.	Pilot deconstruction project provided green jobs training for at- risk youth and diverted 93 per cent of all building materials from the landfill (about 80 tonnes from each house) and informed development of a voluntary deconstruction permit program for houses and duplexes as an alternative to demolition.

	Seattle	Portland	Boulder	Berkeley	Vancouver
			training. Offer training and informational workshops with partners to builders, contractors, real estate agents, architects, designers, apartment building owners, rental property owners, landscaper/arborists, and homeowners.		Deconstruction permit is issued much faster than demolition permits and allows enough time for deconstruction and site preparation before building begins. Permit requires diverting at least 75 per cent of materials from disposal and offers a landfill discount. (Vancouver 2020)
Technical Assistance for Customers	Expand the Community Power Works - Home pilot to an established program that assists homeowners with home energy efficiency upgrades. Provide technical assistance to help owners retrofit historic buildings for energy conservation, recognizing the emission-reduction benefits of retaining existing buildings instead of building new ones.	Accelerate existing efforts to provide green building design assistance, education and technical resources to residents, developers, designers and builders.	Work with Center for Resource Conservation to help residents understand renewable energy options, receive Xcel solar rebates and federal tax credits. Neighborhood Climate Action Groups. (Boulder Community Update 2009)	Launch on-line Solar Map estimating solar potential for commercial and residential structures and allowing owners to estimate potential energy benefits and cost savings from solar panels. Provide energy-saving programs, resources, education, incentives, rebates and financing options to help property owners and tenants comply with local energy standard. Partner with real estate professional groups to conduct targeted outreach and education to new homeowners. Include use-related building energy education	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				in package for all new homebuyers & renters, including available rebates and incentives. Launch Smart Solar Program to have community agencies conduct marketing and outreach and offer personalized consultations to help property owners navigate the available technology options and incentives. (This is modeled after the highly successful Smart Lights Program.)	
Financing	Pass state legislation to authorize property tax exemption for rental housing owners who undertake significant upgrades to increase efficiency. Identify package of pricing, financing, and incentives to make efficiency upgrades obvious economic wins for many building types. (By 2030) Pilot utility incentive program to pay for actual	Establish investment fund of at least $50 million in public and private capital to provide low-cost financing to residents and businesses for energy improvements. Establish City business tax credit for installing solar panels and ecoroofs together. Provide resources and incentives to residents and businesses for carbon-reduction actions in existing buildings, including energy efficiency, renewable energy, choice of materials and	Promote available federal tax. Provide—or work with local banks to provide—low and/or no interest financing for the purchase or installation of efficiency measures or on-site renewable generation. (Ft. Collins "Zilch" (Zero Interest Loans for Conservation Help) program). Evaluate a city	Subsidize and eliminate solar permit fees for residential dwellings and lower fees for commercial buildings. Work with Rent Board to explore ways high quality energy and water efficiency measures can be paid for by both property owners and tenants. Launch an on-bill financing pilot with PG&E to let the City and School District pay for energy	Develop and promote financing tools that enable energy efficiency by bridging some of the gaps between when expenses are incurred and when cost savings are achieved. (Vancouver 2020) Create voluntary local Improvement charge system allowing City to pay for efficiency projects, with repayments by building owners over a period of years through charge on property tax bills. (Vancouver 2020)

	Seattle	Portland	Boulder	Berkeley	Vancouver
	energy savings over time instead of providing up-front payment for projected savings. Structures to allow repayment over time as efficiency measures reduce energy costs, or have loan stay with the building so future owners realizing the benefits of the investment pay back the loan (e.g. meter-based financing, Property Assessed Clean Energy financing). (By 2030) Partner with property owners and managers to identify most compelling financing tools for energy efficiency upgrades in commercial buildings and outline plan to help bring them to market. Identify new sources of funding for incentives to encourage deeper energy retrofits (e.g. property taxes). (By 2030) Establish City property tax exemption program for rental housing undergoing an energy retrofit. (By	building re-use.	incentive for PV systems. Attempt to leverage available utility rebates, federal tax credits, and private investment.	saving measures through the cost savings achieved by them. Senior and Disabled Home Rehabilitation Loans let qualified low-income senior and disabled homeowners get no interest loans up to $35,000 to repair their homes, eliminate threats to health and safety, and help preserve the City housing stock. Develop the Rental Housing Energy Efficiency Loan program to provide up to $10,000 per unit interest free, and repayable after ten years or when property is sold, to landlords of low-income residents for comprehensive energy analyses and upgrades. Collaborate with PG&E and state and federal government to provide financial incentives for compliance with local energy standards. Berkeley Financing Initiative for Renewable	Offer taxpayers an opportunity to volun-tarily offset their carbon emissions. (In Bogota, Colombia, 60,000 people responded to the inclusion of a voluntary contribution to a fund for civic restoration projects by adding 10 per cent to their tax bills). (Vancouver 2020) Work with BC Hydro and Terasen Gas to establish transferable utility bill fi-nancing (on-bill financing) in which the utility company or a third party pays retrofit costs, which are repaid over time through a surcharge on the utility bill. (Vancouver 2020) Home energy loan Program with a third-party energy assessment, a report detailing recommended energy- and cost-saving upgrades, and end-to-assistance in applying for the loan and selecting a contractor. (Vancouver 2020) Bundle large numbers of upgrade projects together to achieve economies of scale unavailable to single building owners.

	Seattle	Portland	Boulder	Berkeley	Vancouver
	2030) Strengthen energy price structures like rate design, commodity costs, and connection pricing for conservation that improve cost-effectiveness of deeper efficiency improvements. (By 2030)			and Solar Technology financing cost of major energy improvements in privately owned buildings and recouping it through 20-year assessment on owner's tax bill. If feasible, expand the program to include other renewable energy and efficiency improvements Explore feasibility of amending the existing program allowing a rebate of a portion of the City of Berkeley's transfer tax for seismic safety upgrades to also include major energy efficiency and solar improvements. Rather than having ratepayer funds for energy efficiency and other energy saving programs (Public Goods Charge) be distributed through utilities, consider giving them to the City or some other agency. Identify, catalog, and develop financial incentives and low-cost financing tools to enable increased green building	(Vancouver 2020)

	Seattle	Portland	Boulder	Berkeley	Vancouver
				in the private sector. Most of the actions in the plan will provide more savings – nearly $500 million in total by 2020 – than initial costs.	
Permitting process	Improve permitting processes to promote the most sustainable buildings, such as the Living Building and Deep Green Pilot Programs. Support adaptive reuse of existing buildings through flexible approaches to code compliance, and identify additional ways to facilitate building reuse where appropriate. (By 2030) Study how fees for permit review could be structured to incentivize energy efficiency. (By 2030)			Require re-roofing projects on City buildings to evaluate feasibility of incorporating "solar ready" features, including mounting posts for panels and roof penetrations for conduit and/or pipes. Applicants for discretionary projects must consult with a green building expert who explains and encourages green building practices. Large-scale projects and new buildings with one or more dwelling units must complete a "green building checklist" (either LEED or GreenPoint Rated) and update it throughout the project. Projects with over 10,000 square feet of nonresidential floor area must submit an "energy conservation analysis" (provided at no-cost by	Use price signals in permit fees for new construction as well as renovations to reward energy efficiency and greenhouse gas reductions. (Vancouver 2020) Priority permitting for low- to no- emission buildings. (Vancouver 2020)

	Seattle	Portland	Boulder	Berkeley	Vancouver
				PG&E). Dedicate a Senior Green Building Inspector to provide coordination and assistance for builders committed to high levels of green building, helping them use green building technologies under the code. Identify funding and other incentives to subsidize City permit fees for innovative or pilot green building projects. Adopt green building curriculum and provide ongoing training for zoning and building permit plan-checkers in Planning Department to educate them about latest green building techniques.	
Codes & Standards	Incentivize deep energy efficiency in construction through measures like density bonuses for green building practices including energy efficiency. (Seattle Plan, by 2030 Continue increasing energy efficiency	Participate actively in process to revise the Oregon building code to codify the performance targets of Architecture 2030. Adopt incentives for high performance new construction projects that consider life-cycle carbon emissions.	Green Points Program, requiring applicants to earn "points" by selecting green building measures to get a permit, applies to all new residential construction, as well as additions and remodels larger than 500 square feet.	In collaboration with energy service providers, community stakeholders and governments, develop and phase in a local energy standard for existing residential buildings designed to facilitate deep, cost-effective reductions in energy use.	Green Homes Program for 1 & 2 family homes will require additional insulation and better windows so new homes will use 50 per cent less energy than homes built to the 2012 Provincial code. (Vancouver 2020) Current policy of requiring LEED Silver

	Seattle	Portland	Boulder	Berkeley	Vancouver
	standards in the Seattle Energy Code over time. Create minimum energy performance standard to ensure improvement of entire building stock, focusing on most cost effective measures and ramping up after tools and incentives are available to help owners. (By 2030) Evaluate opportunities for the energy code to focus on total energy performance instead of prescriptive requirements. Allow greater diversity of housing types (e.g, duplex, triplex, cottages etc) in selected single and multi-family areas. (By 2030) Provide for retention and creation of affordable commercial space and family-sized housing in transit communities through expanded density and height bonuses, tax exemptions, joint development projects, or inclusionary zoning. (Last two require state action.)	Participate actively in state of Oregon code development processes to ensure codes support buildings that can adapt to higher temperatures, stronger storms, and other physical impacts of climate change.	Updated city residential codes for new construction, additions and re-models to require energy efficiency levels 30 to 75 percent higher than the 2006 International Energy Conservation Code (IECC). (2009 Update) Updated city commercial building codes to be at least 30 percent more efficient than the 2006 IECC. (2009 Update) Create RECOs that require landlords and/or homeowners to implement specific, prescriptive energy and water efficiency measures if their property doesn't meet a minimum standard. Policy for minimum efficiency standards in affordable housing program. Explore regulatory options, more	Phase in energy standards for existing residential buildings by requiring compliance for certain incentives and financing and by compliance requirement at events such as major renovations, point of sale, and condo conversions. Require LEED gold performance in new downtown construction. (2013 report) Establish and continually ratchet up minimum energy standards for residential and nonresidential buildings that exceed the current Title 24 energy code for various building types specific to Berkeley's climate zone, such as a requirement that all new multifamily buildings meet federal ENERGY STAR standards. Require new projects achieve a minimum point level on an appropriate green building checklist, such as the GreenPoint Rated or LEED checklists,	when private buildings are re-zoned should be upgraded in 2010 to require a minimum of LEED Gold. Cover five to seven per cent of the increased costs through a reduction in rezoning charges to the developer. (Vancouver 2020) The UK requires all new homes to be carbon neutral by 2016, Denmark by 2020. (Vancouver 2020) Updated building code to reduce energy use of all large multi-unit residential and commercial buildings by 15 per cent. (Vancouver 2020) Homes and businesses requiring a permit for renovations will have to obtain an energy assessment and, in some cases, undertake some low cost updates at the time of renovation. (Vancouver 2020) These updates will add less than 1 per cent to construction costs yet take a big step toward the 2020 goal of low-

	Seattle	Portland	Boulder	Berkeley	Vancouver
	(By 2030) Require that the energy performance of buildings undergoing major renovation or change of use come close to the requirements for new buildings. Require waste heat recovery in new buildings, where appropriate. (By 2030) Move toward an energy code focused on total energy performance, ultimately including a combination of prescriptive elements, performance requirements, and outcome-tracking. (By 2030) Integrate land use policies and building strategies to create highly efficient new construction, such as using codes to foster building designs that better capture passive heating and cooling opportunities. (By 2030)		aggressive building codes and standards, for future implementation.	and report projected emissions.	carbon new construction. (Vancouver 2020) Higher Buildings Policy grants additional building height for projects with excellence in architecture and a 40 to 50 per cent reduction in energy use. (Vancouver 2020) Require all buildings constructed from 2020 onward to be carbon neutral in operations. (Vancouver 2020)
Track performance/	Make information from the Energy Benchmarking	Require energy performance ratings for all homes so	Support or implement single and multi-family	Design program requiring applying an energy rating	Energy performance labeling of all buildings

	Seattle	Portland	Boulder	Berkeley	Vancouver
provide feedback ***	reports publicly accessible. (By 2030) Establish a requirement for disclosing home energy use or a home energy rating at the point of sale for single-family homes. (By 2030) Begin implementing a plan to deploy smart meters that provide real-time energy use information to all Seattle City Light customers. Develop and test program for rating home energy performance when a house is listed for sale. Make energy benchmarking scores of the City's municipal buildings publicly available. Require building energy audits for the largest and least efficient commercial and multifamily buildings to help identify cost effective improvements.	owners, tenants and buyers can make informed decisions. Require energy performance benchmarking for all commercial and multi-family buildings.	energy audit programs. Consider sharing the cost of ENERGY STAR audit and certification with owners of new and existing homes, providing performance based labeling that benchmarks energy performance against existing standards, and facilitate improvements necessary to earn an ENERGY STAR rating (e.g. by assisting homeowners with utility demand side management rebates). Create building efficiency standards or adopt existing standards, market the certification to landlords and building owners, and educate the public about its existence, meaning and value.	system to rental units upon vacancy, and informing future occupants of costs and relative energy and water efficiency of each unit. Develop and market a green landlord database. The database will include information about landlords that have implemented a defined set of energy and water saving measures. Expand and eventually require monitoring, testing and commissioning of residential and non-residential building systems to ensure they are performing as intended. Require all new multi-unit buildings be "sub-metered" to enable monitoring of energy and water consumption on a unit-by-unit basis. Benchmark and track public building energy performance through ENERGY STAR's	by 2015. (Vancouver 2020) Make Greenest City data available and encourage sharing it in innovative, useful ways. (Vancouver 2020)

	Seattle	Portland	Boulder	Berkeley	Vancouver
				Portfolio Manager. Initiate a voluntary home energy and water-monitoring program.	
Commissioning (efficiency tune-ups)	Develop Resource Conservation Management Plan to guide efficiency investments in City facilities, including a retro-commissioning strategy for routinely conducting "tune ups" of City facility energy systems. Pilot retro-commissioning incentive program to provide financial and technical assistance to tune up energy systems in existing commercial buildings. Require periodic retro-commissioning for the largest and least efficient commercial and multifamily buildings. (By 2030)				
Inter-jurisdictional collaboration				Increase green building throughout the region by sharing best practices with other area cities through such entities as the Green Building Public Agency Council (PAC).	
Showcase			Explore program to	Highlight existing green	Re-establish the Mayor's

	Seattle	Portland	Boulder	Berkeley	Vancouver
			recognize neighborhoods meeting a certain percentage of electricity needs through renewable energy.	buildings and cutting edge green technologies through green building tours.

Identify and catalogue existing energy efficiency showcases within the community.

Working with partner organizations and nearby jurisdictions, identify a sponsor and launch a green building awards competition.

Expand green building display in the City's Permit Service Center to showcase innovative green building materials and practices. | Greenest City Awards. (Vancouver 2020) |
| Program marketing | | Work with local retailers and contractors to promote high efficiency equipment and efficiency best practices to residents.

Collaborate with local renewable energy suppliers to maximize visibility and promotion.

Promote energy and climate change awareness through a regular appearance in one or | Work with Center for Resource Conservation to promote solar thermal and electric systems on homes, as well as contractor training. | | Business Energy Advisors provide free audits and advice on energy efficiency upgrades, providing customized report with recommended upgrades, available rebates, and estimated costs, helping coordinate work with pre-approved contractors and applying for rebates. To date, the program has reduced annual energy consumption by over 300,000 kWh, enough energy to power nine |

	Seattle	Portland	Boulder	Berkeley	Vancouver
		more of the local newspapers. Increase promotion of existing resources and services, such as Longs Peak Weatherization, Home Performance with ENERGY STAR, Xcel rebates and federal tax credits. Develop outreach campaign to maximize the utility demand service management funding used by residents for energy efficiency.			homes for a year. (Vancouver 2020) Offering attic cleanup as part of British insulation upgrade program increased upgrades 4.8 times, even when people paid for the service - Nudge article in NYTimes, 12/8/2013 ($300 charge for two people who bring stuff from attic, and help homeowners sort it to throw away, give to charity, and put back while insulation is installed. (Vancouver 2020) (conversableeconomist.blogspot.com/2013/10/rilchard-thaler-on-behavioral-economics.html) Partner with the provincial government, BC Hydro, Terasen Gas, and Solar BC on social marketing program to encourage uptake of federal rebates. (Vancouver 2020)
Lobbying				Support California Air Resources Board recommendation to increase the Renewable	Advocate for federal and provincial funding for green jobs training and energy retrofit financing.

	Seattle	Portland	Boulder	Berkeley	Vancouver
				Portfolio Standard to 33% by 2020. Urge PG&E to achieve that.	(Vancouver 2020)
				Urge Congress to maintain tax credits for renewable power developers.	
				Urge State to revise net metering rules to enable residential and commercial customers to earn refunds for excess energy generated.	
				Urge State to let utilities count decentralized energy sources toward the RPS requirement and raise the RPS a commensurate amount.	
				Work with State to modify the building code, if necessary.	
				Continue to consider Community Choice Energy (CCE), forming joint powers authority with other cities to purchase electricity; keep monitoring efforts of other jurisdictions, and PG&E's	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				ability to comply with their renewable energy requirements.	
Community education		City Repair Project: citizen-led neighborhood scale projects in Portland and beyond.			Offer Greenest City Neighbourhood Grants.(Vancouver 2020) Start neighborhood focused Greenest City pilot project. (Vancouver 2020) Fund community based organization working to support Greenest City targets. (Vancouver 2020) Deliver business engagement program to help businesses make measurable improvements in environmental performance and improve productivity and competitiveness. (Vancouver 2020)
Municipal infrastructure				Establish annual energy reduction target for each City department. Implement an Administrative Regulation for energy and water efficiency in all City buildings.	Pledge to make future municipal facilities net-zero or Living Buildings, which generate their own energy, collect and re-use their own water, and manage their own waste. (Vancouver 2020) Incorporate social cost of emissions into

	Seattle	Portland	Boulder	Berkeley	Vancouver
				Maintain and continually update City Capital Improvements Plan. Ensure City and school district purchase high efficiency office equipment and operate it as efficiently as possible. (Activating sleep settings on employee computers is reducing City government energy consumption by 238,680 kWh per year, and saving roughly $32,500. Replace the few remaining incandescent traffic signals with high efficiency LED lamps. Consider replacing streetlights with LED lamps.	procurement, policy, and capital planning and decisionmaking. (Vancouver 2020)
Events			Create at least one dedicated energy/GHG event per year, and seek to piggyback on existing events. October Energy Awareness Month.	Office of Energy & Sustainable Development should continue to produce and distribute information at community festivals and offer free energy education events and presentations.	
Contests and campaigns				Design and implement a "Lights Out at Night"	Sponsor a Greenest Neighbourhood Vision

	Seattle	Portland	Boulder	Berkeley	Vancouver
				campaign to reduce energy wasted by local institutions, City government, and businesses.	Contest. (Vancouver 2020)
					Co-sponsor a Children's Greenest City Art Contest. (Vancouver 2020)
				Launch an annual "Get Off Your Gas" contest to reduce natural gas consumption during winter months, with. prizes in several categories, including greatest reduction from the previous year, lowest overall bill and most creative efficiency strategy.	
Schools	Partner with school district to identify opportunities to build Living Building Challenge or Deep Green schools.		Work with Boulder schools to add energy and GHG activities and information to their curriculum.	Partner with KyotoUSA and other community groups and agencies to identify additional solar opportunities on schools. See Berkeley entries for workforce development below.	
Educational websites			Develop user-friendly website to educate residents about reducing emissions in homes and locating resources to implement measures.	Highlight green buildings in Berkeley through case studies at the Permit Service Center and on City and partnering websites. Showcase innovative projects on City and	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				partner agency websites.	
Bulk purchases (appliances & solar)			Partner with East Bay Municipal Utility District to identify additional opportunities for distribution of free water saving devices and education.	Accelerate removal of older refrigerators, especially in households with two or more by offering a $35 incentive. (In 2004, this program collected 700 appliances, saving 820 MWh of electricity and reducing GHG emissions by over 4,300 tons of CO2e, while JACO's recycling process kept 98% of the appliance materials out of the landfill while capturing and destroying the CFC.) Explore bulk purchase and installation program for common energy efficiency materials, such as insulation. Explore facilitating bulk purchases of solar thermal and PV equipment for neighborhoods. Continue giving away compact fluorescent light bulbs, programmable thermostats, low-flow showerheads, and clothes drying racks. (2009 Update) Work with authorized	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				contractors to arrange bulk-rate pricing for energy improvement installations. (Boulder Community Update, 2009) Conduct neighborhood sweeps, canvassing with hired teams distributing and installing information, CFLs, and low-flow showerheads, as well as educating people about adjusting thermostats, refrigerators, and hot water heaters. Distribute free efficiency kits to interested individuals and groups or wherever staff are communicating with the public (farmers market, community meetings, etc.). Work with insulation manufacturer and local contractors to install insulation in entire neighborhoods on home-to-home basis. Exchanged 3,700 incandescent holiday lights for LED light coupons. (Boulder	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				Community Guide, 2009)	
Workforce development			Work with CRC to promote contractor training.	Partner with Rising Sun Energy Center and others to implement a 3-tier energy efficiency and job-training program. Tier I: California Youth Energy Services sends two Youth Energy Specialists to homes through appointments for basic check of household electricity, natural gas and water consumption and to provide free energy, water and cost savings devices. CYES serves as an energy reduction program, as training and as employment for high school, community college and trade school students. Tier II: Green Energy Training Services provides energy efficiency training and internships for young adults between 18-35 with barriers to employment, building on CYES by developing analytic and installation skills, offering residents comprehensive energy audits, and working with RSEC's High Performance Homes (HPH) program to install advanced energy savings	Conference to ensure training offered by local post-secondary institutions matches the need for a growing green workforce. (Vancouver 2020) Seek partnerships with the province and trade unions to develop world-class green job training programs and apprenticeship opportunities. (Vancouver 2020)

	Seattle	Portland	Boulder	Berkeley	Vancouver
				measures in homes. Tier III: High Performance Homes program provides more comprehensive efficiency measures, including attic, wall and floor insulation, duct sealing and pipe wrapping. This professional level subsidized service helps residents make their home as energy efficient as possible. Trainees from GETS program work closely with HPH contractors as pre-apprentices, and Rising Sun engages contractors to leverage their work with low-income homeowners to provide additional energy efficiency measures. Tier IV: Pre-Apprenticeship Trades Training & Postsecondary Career Pathways program provides postsecondary classroom training and on-the-job training in the building trades, in business development and marketing, and in green energy and green building careers. Work with economic development agencies, local universities	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				community colleges, certified apprenticeship programs, workforce development and training programs, businesses, and community agencies to identify projected demand for skilled labor to implement Climate Action Plan and other sustainability strategies Integrate energy and climate-related education into school curriculum and after school learning programs and explore development of a high school Green Career Technical Academy Berkeley High's School of Justice and Ecology received funding to be a Community Partnership Academy incorporating career education and climate change education in their biology and environmental science courses. Office of Energy and Sustainable Development funded case study called Green Collar Jobs: An Analysis of the Capacity	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				of Green Businesses to Provide High Quality Jobs for Men and Women with Barriers to Employment. Expand job training partnerships and opportunities, including life and job readiness skills, career counseling, skilled labor training, help with placement and meeting apprenticeship requirements, and follow-up support to prepare young adults, many with barriers to employment, to seize green collar job opportunities. Help residents enroll in pre-apprenticeship trades training programs to prepare for jobs in green construction, energy retrofits, and solar photovoltaic installation by working with Rubicon Workforce Services, Berkeley Youth Alternative, City programs, and schools and community programs reaching out to South and	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				West Berkeley youth. Provide ongoing support for local green businesses and industries that provide green collar jobs by using procurement dollars and city contracts to support them; providing marketing assistance; and helping local green businesses access energy efficiency and renewable energy services. Stimulate demand for energy services and an energy service workforce by strengthening and improving City's First Source Employment Ordinance, which requires firms working on any public contract of $100,000 or more, developers of any commercial project of 7,500 square feet or greater, companies applying for small business loan or housing trust money, and future occupants of those buildings to participate in a local hiring program.	

	Seattle	Portland	Boulder	Berkeley	Vancouver
				Develop additional provisions and incentives to encourage green businesses to hire local and provide high-quality employment. Explore incentives for businesses and contractors that hire local. such as rebates on permits related to solar installation or energy efficiency improvements. Consider developing a Local Hire Ordinance to create additional opportunities for residents to get jobs.	
Urban forestry			Tree planting and maintenance programs through the Parks and Recreation Urban Forestry Section.		
Behavioral economics					Re-invigorate the One Day Vancouver Social Marketing Program. (Vancouver 2020)
Other					Establish Green Enterprise Zone to make the Downtown Eastside and False Creek Flats the "greenest place to work in the world" by focusing green companies and

	Seattle	Portland	Boulder	Berkeley	Vancouver
					organizations, green infrastructure, as well as innovations in building design and land use planning in one location. The lessons learned from this zone would then be applied city wide. (Vancouver 2020) Develop Campus-City Collaborative for green workforce development, faculty research to support targets, and City Studio—a program to connect student researchers with critical sustainability questions facing city. (Vancouver 2020)

Other built environment ideas:

- Require all buildings over 50,000 square feet to conduct an energy audit every ten years, make any improvements that pay for themselves within five years, and up- grade their lighting to more energy-efficient systems. (New York City)

- (San Francisco and Toronto have successful green neighbourhood grant programs, supporting a wide range of creative projects including geothermal energy systems for older buildings, net-zero energy retrofits, rooftop gardens, urban beehives, and community greenhouses.)

- Develop onsite renewable energy at high-profile locations (e.g. City Hall, Science World, schools, hospitals, and other public buildings).

Transportation Strategies

Table 2- Comparison of Transportation GHG Emission Reduction Strategies by Four US Cities

	Seattle (2013)	**Portland (2009)**	**Boulder (2007)**	**Berkeley (2013)**	**Vancouver (2012)**
Transportation					
General goals	Reduce passenger vehicle emissions 82% by 2030 and 97% by 2050. (Targets a 20% reduction in VMT and 75% reduction in GHG emissions per mile by 2030; currently projects a 43% reduction in VMT, but only a 59% reduction in emissions intensity.)	Reduce per capita daily vehicle-miles traveled (VMT) by 30 percent from 2008 levels. Increase average efficiency of passenger vehicles to 40 mpg and improve performance of the road system. Reduce lifecycle greenhouse gas emissions of transportation fuels by 20 percent.	Reduce vehicle miles traveled (VMT).	Transportation related GHG emissions must decline by approximately 30% by the year 2020.	At least 15 per cent of new vehicles in Vancouver should be fully electric, plug-in hybrids, or fuel cell vehicles by 2020. (Vancouver) Make over 50 per cent of trips on foot, bicycle, and public transit. (Vancouver 2020) Every person lives within a five-minute walk of a park, beach, greenway, or other natural space. (Vancouver 2020) Reduce average distance driven per resident by 20% from 2007

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
					levels. (Vancouver 2020) Meet GCAP green transportation targets for 2020 and set a 2040 target: at least two-thirds of all trips in the city will be on foot, bike, or transit. (Vancouver 2020)
Funding	Renew and extend the Bridging the Gap levy and prioritize investments. Create grant program that supports walking, biking, and transit projects in business districts with paid parking. Secure local or transit agency authority to levy a motor vehicle excise tax (MVET) at the City or County level.	Establish a sustainable funding source adequate to maintain the existing transportation system and to invest in transportation capital projects and programs that reduce carbon emissions.	Support state allocation of federal transportation funding to Congestion Mitigation and Air Quality projects.	Identify opportunities for generating sustained revenue for implementing community transportation demand management programs. Create additional strategic fees/taxes to build revenue for transportation demand management (TDM) efforts and to further discourage driving alone. Institute a "Transportation Services Fee" for new	Increased fees for parking used for transit improvements. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	With legislative authorization, expand parking policies to incorporate goals beyond customer access such as allowing spending of new revenue to support improvements in transit, bicycle, and pedestrian infrastructure and services. (2030) Work with regional and state partners to adopt a funding strategy to meet current and future transportation needs including mechanisms such as: a) A legislatively authorized city development authority that serves as an independent entity of Seattle government, or similar mechanism, forming public private partnerships in			development and utilize funds in part for alternative transportation programs. Institute an "In-Lieu Parking Fee" on new development. Encourage UC Berkeley to implement a "Transportation Services Fee" on new off-campus projects to mitigate the transportation impacts associated with new development. Support development of a regional "climate mitigation fee" applied to either gasoline or vehicle registration.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	order to use district-based funding mechanisms (e. g. tax increment financing, tax abatement, simplified local improvement districts). Legislatively authorized tax on unpaid off-street parking in commercial areas, to supplement the current commercial parking tax authority. Comprehensive congestion pricing on all limited access highways in Central Puget Sound and potentially non-highway arterials.				
Integrate shops and work with residential neighborhoods	Implement local area plans and urban design frameworks. Develop a	Develop a more balanced funding mechanism and adopt a schedule for public investments to make neighborhoods highly		In order to improve livability and reduce VMT in existing neighborhoods that are not well served by transit, consider where	Proximity to services and amenities through zoning for mixed land use and

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	placemaking strategy to use public spaces to make streets and neighborhoods more vibrant and promote economic activity. Implement strategies to provide residents' daily needs within a convenient walk.	walkable and bikeable, including sidewalks and improved access to transit for reaching destinations beyond a reasonable walking or biking distance. Create neighborhoods where 90 percent of Portland residents and 80 percent of Multnomah County residents can easily walk or bicycle to meet all basic daily, non-work needs and have safe pedestrian or bicycle access to transit.		in-fill neighborhood-serving retail, that is oriented to basic daily needs such as "corner stores" and small markets, may be feasible.	increased density. (Vancouver 2020) Plan for mixed-use areas with pedestrian-oriented public spaces so that goods and services are within a safe and enjoyable 10-minute walk, new development that supports existing and new transit, and new housing in existing walkable neighbourhoods. (Vancouver 2020)
Improve efficiency of freight movement within and through cities.	Preserve Seattle's industrial lands, which provide local jobs and efficient access to a deep water port, rail lines and highways. (2030) Develop a Master Plan that includes	Work with regional partners to develop a plan for reducing greenhouse gas emissions related to freight movement within and through the Portland region. Protect existing intermodal freight			Work with local and regional partners on a sustainable goods-movement strategy that supports a growing economy while reducing GhG

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	goals to make freight movement more efficient and reduce its impact on greenhouse gas emissions.	facilities and support centrally located and regionally significant industrial areas that may provide for future intermodal facilities and provide for efficient local deliveries.			emissions, protect key goods-movement corridors (especially rail), encourage low-impact goods movement such as low-carbon trucks and bicycle transportation, and encourage right-sizing of delivery and service vehicles. (Vancouver 2020)
Green Transportation Infrastructure	Use green stormwater infrastructure and low carbon materials when designing and building infrastructure. (2030)				
Demand management	Participate in multi-agency efforts working to support bike sharing, vehicle sharing and ride sharing.				

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	Work with Transportation Management Associations, property managers, employers, homeowners associations, and community groups to develop and market transit passes, car sharing and other programs that support travel options. Provide incentives, marketing, and innovative enhancements to make transit, walking, and bicycling more fun and appealing. (2030) Expand the existing Commute Trip Reduction (CTR) program beyond large employers to include outreach and services for smaller employers in select locations.				

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	(2030)				
Purchase vehicles	Expand the City's municipal electric vehicle (EV) fleet.	Green the vehicle fleet used by the City government and increase alternative transportation options for employees of public institutions. Purchase plug-in hybrids for City government when they become available and partner with car share organizations to provide plug-in hybrids to car share pods throughout the city.	Continue to lead by example by purchasing green vehicles for city fleet. Purchase alternative fuel vehicles (AFVs) and hybrids when possible.	Institute a City purchasing policy that requires the procurement of low-emissions vehicles whenever new vehicles need to be acquired. Green the vehicle fleet used by the City government and increase alternative transportation options for employees of public institutions. Purchase plug-in hybrids for City fleet when available.	Integrate electric vehicle use into City operations. (Vancouver 2020)
Increase fuel efficiency and use of alternative fuels in government fleets			Develop "Cool Fuel" Program for fleets and city employees. BP provides a corporate rebate to organizations based on the gallons of fuel purchased in the Cool Fuel program. The city then uses this rebate to purchase CO emission offsets	Retire underused and inefficient City fleet vehicles. Replace additional City fleet vehicles with City CarShare vehicles. Partner with City CarShare to integrate plug-in hybrid vehicles into the City's fleet. Ensure bio-fuel used by the City fleet is responsibly produced and creates a life-cycle	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
			which, in effect, zero out the impact.	GHG emissions reduction. Investigate using recycled grease from local restaurants as a fuel alternative. Consider increasing bio-fuel mix used by the City from B20 to B50 or higher. Convert Solid Waste trucks to low-emission engines; use route-efficiency software; and use a higher percentage of bio-diesel or other low carbon fuel.	
Produce biofuels	Explore ways to use Seattle waste to produce alternative fuels, such as liquid natural gas from anaerobic digesters. (2030)	Implement the second phase of the City's renewable fuels standard to require that diesel fuel sold in Portland include at least 10 percent biodiesel, half of which must be made from sources that can be produced in Oregon.	Promote local biodiesel and ethanol market development. Exceed Federal Clean Fuel Fleet Program mandate.	Partner with local organizations and bio-fuel providers to educate the community on the role responsibly produced bio-fuels can play to reduce local emissions. Initiate efforts to convert local restaurant grease into bio-fuel for City owned and private vehicles.	
Incentives	Create incentives		Support the	Ensure that transit	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	for high-efficiency vehicles, including electric vehicles and plug-in hybrids in the community. Develop a Green Fleets Plan for the City of Seattle fleet that encourages market adoption of next generation vehicles and fuels. Support the transition of taxi, for-hire, and limousine vehicles to low-carbon fuels and technologies.		adoption of the California Low Emission Vehicle II standards. Promote the use of hybrid technologies.	buses utilize alternative fuels.	
Increase efficiency of petroleum vehicles	Develop a network of fast charging stations to let vehicles charge in under 30 minutes, increasing vehicle range, expanding opportunities for charging, and providing commercial opportunities to business owners. (2030) Support programs	Support progressive strengthening of federal fuel efficiency standards.	Purchase vehicles that are more fuel-efficient. Reduce fleet vehicle emissions.	Evaluate opportunities to reduce parking rates in City-owned garages for vehicles that achieve a certain high threshold of fuel-efficiency. Ensure that transit buses are fuel-efficient and are appropriately sized. Provide incentives in City parking and transportation demand	Promote "eco-driving", i. e. reducing fuel-consumption by changing individual driving styles (Paris) Create and enforce prohibitions on engine idling. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	to help heavy duty truck owners and operators transition to more efficient vehicles and cleaner fuels. (2030) Develop a Green Fleets Plan for the City of Seattle fleet that encourages market adoption of next generation vehicles and fuels. Support the transition of taxi, for-hire, and limousine vehicles to low-carbon fuels and technologies.			management policies for buildings that provide plug-in locations for electric vehicles and plug-in hybrids. Include information about electric vehicles in broader marketing campaign.	
Support charging stations for EVs	Support private adoption of electric vehicles (EVs) by making it easier to get permits and by planning for access to charging stations and impacts on energy demand. Reduce barriers to electric vehicle use, including evaluating options	Support installation of a network of electric car charging stations.		Evaluate opportunities to create additional free parking and charging stations for electric and plug-in hybrid vehicles. Currently, the City provides an electric vehicle charging station in the Center Street garage and two dedicated on-street parking spaces for electric vehicles near City Hall.	Require wiring for future charging stations in new construction. (Vancouver 2020) Support electric vehicles with convenient charging stations and other infrastructure.

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	to provide access to charging infrastructure for households without off-street parking. (2030) Pursue grant funding and partners to develop a network of fast charging stations that will allow vehicles to charge in under 30 minutes - increasing vehicle range, expanding opportunities for charging, and providing commercial opportunities to business owners. (2030)				(Vancouver 2020) Require electric vehicle charging infrastructure in new residential parking spaces. (Vancouver 2020) Work with provincial and federal governments to find ways to promote the installation of charging infra-structure in existing homes. (Vancouver 2020)
Manage parking more effectively to minimize driving demand and to encourage and support alternatives	Work with neighborhood districts to develop on-street parking management and other access strategies. Expand the E-Park program in the Center City, using real time signs and	Help establish at least two new transportation management associations (coalitions to strengthen partnerships with businesses to reduce traffic congestion and pollution). Add parking			Better management of on-street parking. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	a smartphone app to reduce the need to drive around to find parking.	management districts, to allow neighborhood parking planning by residents and businesses.			
Reduce free parking				Except when staff like emergency personnel who work overnight have no alternative to driving to work, phase out free parking for their vehicles. Consider phasing out free parking assigned to City Councilmembers. Use parking strategies to create disincentives for driving – especially for single-occupancy commuting – and, where possible, to build revenue for transportation services such as expanded car sharing; improved bicycle infrastructure; bicycle-sharing; pedestrian improvements; and a local shuttle bus network. Encourage UC Berkeley, the City's	Unbundle cost of parking from housing. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				largest employer, to reduce its plans to build new parking spaces and revise its parking programs to support and invest in alternatives to driving. Identify areas in Berkeley in which increased parking rates would effectively discourage driving and generate new revenue while not having a significant negative effect on local businesses. Identify areas in Berkeley in which extending parking meter hours of enforcement would effectively discourage driving and build new revenue while not having a significant negative effect on local businesses. Consider the establishment of Parking Benefit Districts, which would receive a portion of parking revenues generated in the area.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				Evaluate redesigning the Residential Preferential Parking (RPP) Program to apply in every neighborhood and use the revenue to make alternative transportation options more accessible, convenient and attractive. Structure Residential Preferential Parking permit costs so that each additional permit acquired by a given household escalates in cost. Consider setting Residential Preferential Parking permit prices based on the fuel efficiency of the vehicle for which the permit is being acquired. Install Residential Preferential Parking permit holder-exempt parking meters in some Residential Preferential Parking zones. Make on-street parking	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				rates equivalent to or higher than off-street parking lot rates. Raise on- and off-street parking rates as appropriate. Put an Increase in the City's 10% tax on off-street parking revenue on the ballot. "Un-bundle" prices for housing and parking so parking spaces require separate payment and are not included in the rent or purchase price of a unit. Ensure local employers are abiding by state requirements to participate in the parking cash-out program. In popular destinations, employ signage to direct motorists to available off-street parking.	
Road Pricing	Research the benefits of pricing policies on climate protection,	Work with Oregon Department of Transportation and Metro to implement a		Conduct a feasibility analysis of a City of Berkeley "congestion pricing" program,	Full-cost pricing for road travel, tolls on Metro Vancouver

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	transportation and community goals (e.g. reduced congestion, improved air quality, revenue generation) and their potential social equity impacts. Secure legislative authorization to implement a comprehensive system of road pricing on all limited access highways in Central Puget Sound. (2030) Work to ensure the region has the legislative authority to set transportation planning objectives and rates to meet the objectives. (2030) Ensure the legislature authorizes the region to dedicate road pricing revenues to	congestion pricing pilot program that prioritizes movement of freight and non-single-occupancy vehicles.		charging motorists to use a given roadway a certain times in order to ease traffic congestion and promote alternative forms of transportation.	bridges to finance transit. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	multimodal transportation projects. (2030) Evaluate road pricing opportunities on non-highway arterials and develop pilot project to test whether road pricing can help reduce congestion while also reducing emissions and providing funding for transportation choices. (2030)				
Increase density in general	Allow a greater diversity of housing types (e.g. duplex, triplex, cottages etc) in selected single and mullti-family areas. (2030)	Advocate for accommodating all population and business growth within the existing Urban Growth Boundary, with the possible exception of industrial needs. Advocate for adopting the low end of the Urban Reserve designations of land for urban growth over the next 50 years to reflect the trends in demographics, climate			Support transportation and active transportation planning with land use policies that enable the City to meet mobility and transportation targets. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
		change, energy supply and infrastructure costs.			
Include emissions modeling in land-use decisions	Consider a transportation modal hierarchy as part of the 2015 Comprehensive Plan update in order to address greenhouse gas reductions, safety, mobility and funding priorities. Include health, safety, and equity outcomes in transportation and land use planning, building on the Healthy Living Assessment project.	Work with Oregon Department of Transportation to identify and fund the system and demand management projects that have the greatest potential to reduce emissions related to congestion, idling, and system performance. Require evaluations of major planning scenarios, Comprehensive Plan and Transportation System Plan decisions to include estimates of carbon emissions. Partner with Metro and regional jurisdictions to develop modeling tools for evaluating emissions impacts of land use and transportation decisions and monitoring carbon emissions. Partner with federal agencies on efforts	Promote changes in land-use planning for long term benefits.		

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
		like the joint Interagency Partnership for Sustainable Communities to apply new federal priorities around sustainable development. Seek funding to accelerate remediation of brownfields in the city and county to accommodate growth within the current Urban Growth Boundary. Work with Metro and other local governments to make reducing carbon emissions and adapting to climate change impacts a funding criteria for the Metro Policy Advisory Committee and the Joint Policy Advisory Committee on Transportation. Coordinate decisions about future streetcar investments with Portland Plan land use decisions. Facilitate the			

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
		aggregation of smaller land parcels that provide opportunities for industrial development. Account for emissions from investments in and the performance of the transportation system. Establish a method for projecting the life cycle carbon footprint of transportation investments, including embodied energy, operations (VMT and flow) and maintenance. Track transportation carbon emissions, using key performance measures such as commute mode share, VMT by vehicle type, traffic flow on major arterials and highways, fuel efficiency of vehicles and total carbon emissions to document progress toward emission reduction goals.			
Increase	Develop a land			Encourage the	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
density along transit corridors	use and transportation plan in a high-priority transit and bicycle corridor with a goal of shifting more trips to travel modes that reduce greenhouse gas emissions. Develop a citywide transit communities strategy that integrates neighborhoods with high capacity transit. Provide for the retention and creation of affordable commercial space and family-sized housing in transit communities through incentives like expanded density and height bonuses, tax exemptions, and legislatively authorized joint development projects or inclusionary			development of housing (including affordable housing) retail services, and employment centers in areas of Berkeley best served by transit. Conduct a "land use scenario study" to help visualize, quantify, and compare the impacts on VMT (and the associated GHG and local air pollutant emissions) of various scenarios. Implement zoning adjustments to facilitate a mix of housing and commercial development (including retail services and employment centers) in certain transit-served areas. Encourage car-lite and car-free development in transit-served areas by creating incentives and eventually requiring developers and business owners who work with the City	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	zoning. (2030) Implement the Challenge Grant strategies in the Rainier Valley to prevent displacement and retain affordable housing near transit. Develop a tool to foster consistent consideration of greenhouse gas emissions impacts and opportunities to reduce them when updating and implementing transportation and land use plans. Develop equitable development policies to support growth and development near existing and planned high capacity transit without displacement. Create nodes well served by transit and non-motorized transportation			and other agencies to develop a plan of action for reducing the impact of their development/business on VMT. Make parking requirements more flexible for developers and business owners that site near transit and provide services or infrastructure to reduce parking demand such as car share parking, bicycle parking, showers and changing rooms for cycling employees, dedicated parking for low-carbon vehicles, an Eco-Pass program for employees/tenants, or make mitigation payments to local transportation demand management projects. Establish parking maximums in transit-rich areas. Establish minimum building heights in certain transit-rich areas to prevent the underutilization of	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	options.			transit-served areas.	
				Ensure that dense transit-served corridors transition well into surrounding lower density residential zones in order to preserve the character of interior neighborhoods.	
				Consider and reduce the impact on GHG emissions of land use-related proposals, including reviewing proposals based on the impact they would have on local and regional emissions when administering the "non-detriment finding."	
				Require any changes that downzone certain areas close to transit undergo a thorough review for impact on local and regional GHG emissions.	
				Partner with UC Berkeley to develop staff, student and faculty housing near campus, subsidize others to do so, or	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				provide direct assistance for nearby housing to employees.	
				Partner with UC Berkeley and the school district to site affordable housing near transit for faculty and staff.	
				Provide enhanced permitting assistance for transit oriented development projects.	
				Encourage preservation and adaptive reuse of historic buildings to preserve the embodied energy in buildings and reduce the GHG emissions associated with demolishing a building, transporting demolition debris, and building a new building.	
				Existing buildings can be intensified to create additional housing or commercial space to help meet future demand.	
Increase and	Implement a			Allow multi-unit	Create

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
enhance urban green and open space to foster walking and cycling	project reallocating a portion of the public right-of-way to a public/pedestrian space such as a plaza or parklet.			residential projects to provide street-level public open space in lieu of some required on-site private open space. Consider policies to discourage removal of usable open space in private lots unless such space would be provided elsewhere on site or the property owner agrees to pay an "Open Space Fee" or similar mechanism to fund the maintenance creation of public open space. Promote tree planting, landscaping, and the creation of green and open space that is safe and attractive and that helps to restore natural processes. Maintain and protect mature trees wherever possible and maximize tree planting as part of public open space and street improvements. Consider developing street tree master	interesting streetscapes - art, street furniture, vegetation, community plazas. (Vancouver 2020) Create a new public plaza in every one of the city's 59 communities by reallocating pavement to people-friendly uses. (New York) Create more dedicated pedestrian-priority spaces. Close streets to cars for activities including badminton, salsa dancing, street hockey, art lessons,

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				plans for sub-areas within the City. Consider developing a tree preservation ordinance that would articulate strong standards for the preservation and replacement of trees in the public right of way. Identify opportunities for tree planting and to maintain existing and create new public open spaces in order to increase community access to parks and plazas. Ensure increasing development along certain transit corridors is accompanied by appropriate tree planting and green space enhancements. Ensure ecologically beneficial stormwater quality and water conservation features are integrated into the design of landscaping features on public and private land. Encourage the	choirs, food carts, lounging on couches, and much more. (Vancouver 2020) Expand Open Streets program to include five blocks of Granville Street creating more opportunities for community members to share the road. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				development of green roofs by providing outreach and guidelines consistent with the building code. Require new developments in specified areas to contribute to street level open space on site or in the public realm.	
Increase local food production and distribution				Encourage, support and add community gardens. Include community gardens and orchards in planning. Encourage local community gardens to donate excess produce to local food banks. Continue to provide compost to community and school gardens. In partnership with business associations and others create incentives for restaurants that feature local, organic	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				foods.	
				Support local educational institutions to continue educating students in growing and preparing their own food through garden and cooking classes, etc.	
				Promote purchase of food from local producers for schools, senior centers, after-school programs, the summer food program and others through criteria in RFPs for vendors to prepare and deliver food for such programs. (Currently 30% of the produce BUSD serves to students is sourced locally.)	
				Support state and federal legislation that prioritizes local food production.	
				Make street space available for farmers markets and explore opportunities for additional markets in Berkeley.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				Encourage and provide guidelines consistent with the building code for buildings to incorporate rooftop gardens that can be used for food production. Encourage residents to grow food in home and community gardens using methods that reduce GHG emissions, such as organic inputs and compost. Promote a less carbon-intensive diet, such as eating less meat and choosing vegetarian options. Support efforts to provide farming and gardening training to residents. Consider a program to provide reduced water rates for community gardens. Open up City-owned vacant land to encourage local food production for local	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				consumption. Support the development of local food distribution and processing facilities, by utilizing procurement dollars and City contracts to support local green businesses, providing marketing assistance, etc. Improve public transportation options to local food markets. Better tracking and reporting on the rate of local food production and consumption, cost sand GHG impacts, etc.	
Support local purchasing				In collaboration with local business associations and merchants, continue to expand and promote the Buy Local Berkeley Campaign. Consider developing and adopting a Buy Local Ordinance that would give preference to local businesses.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
Improve current bike & pedestrian infrastructure	Implement bicycle intersection safety improvements on heavily traveled bicycle corridors. Complete the pedestrian network within 1/2 mile of all High Capacity Transit and Bus Rapid Transit stations, schools, community centers, health care facilities, and Urban Centers and Urban Villages. (2030) Enhance sidewalks, crossings, and public places in Urban Centers and Urban Villages. (2030) Improve sidewalks and crossings on arterial streets to connect Urban Centers and Villages. Implement Safe Routes projects to	Construct two miles of sidewalks on arterials. Incorporate improved bicycle and pedestrian infrastructure in the redesign of the Sellwood Bridge.		Improve cross-jurisdictional bicycle route connections through signage, bikeway route modification, and physical improvements. Provide adequate sidewalk width, pedestrian crossing time, "count down" signals, and universal access signal features at all signalized crosswalks. Evaluate need for new mid-block pedestrian crosswalks where there are many pedestrians and long blocks. Modify City streets to better serve the safety and needs of pedestrians and cyclists.	Build safer and more convenient bike routes, better bike parking and end-of-trip facilities. (Vancouver 2020) Integrate buildings with green transport plans through the provision of parking spaces for car-sharing enterprises, bicycle infrastructure, and other requirements. (Vancouver 2020) Additional space for pedestrians to ensure safe sidewalks and crosswalks. (Vancouver 2020) Additional traffic calming measures. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	improve pedestrian connections to schools, transit and neighborhood business districts.				Pedestrian and cyclist friendly lighting. (Vancouver 2020) Downtown bike centre as the cornerstone of improved facilities for cyclists commuting to work. (Vancouver 2020) Improve connections between bikeways (e.g. filling gaps in the separated cycling route around the downtown peninsula, and, • target efforts in neighbourhoods with low scores on the Walkability Index. Connect all primary and secondary

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
					schools in Vancouver to the existing greenway system, in an effort to get children walking and cycling to school, and connect greenways to community centres, recreational fa-cilities, libraries, and other public services. Marin County, California implemented a "Safe Routes to School" program that increased the number of children walking to school by 64 per cent and cycling by 114 per cent. (Vancouver 2020) Improve bike and pedestrian safety through design, education and

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
					enforcement. (Vancouver 2020) Additional space for pedestrians to ensure safe sidewalks and crosswalks. (Vancouver 2020) Hornby Street and Dunsmuir Street separated bike lanes were recently made permanent to support the increase in sustainable mode share travel. (Early data shows bicycle ridership on the Dunsmuir route increased by 36 per cent in 2011 compared to 2010). Overall bike traffic has increased by 8 per cent for both the Dunsmuir and Burrard Bridge bike lanes. (Vancouver

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
					2020) Additional cycling infrastructure, from bike racks to covered parking to showers and lockers at end-of-trip locations. (Vancouver 2020)
Track bike and walking safety				Regularly update the Bicycle and Pedestrian Plans, including updating indicators of pedestrian and cyclist safety.	Completed first study to identify opportunities to improve pedestrian safety through education, enforcement and engineering measures. (Vancouver 2020)
Bike Sharing				Consider establishing a network of bicycle rental stations, conducting a feasibility analysis to help identify program design, costs and funding options.	Pursue development of a bike-share program, including a helmet dispensing and return system, in Vancouver's downtown and other high-potential cycling

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
					areas.(Vancouver 2020)
Promote biking and walking			Continue Walk and Bike Week—Boulder's largest annual celebration of great options in transportation, encouraging the use of alternative modes.	Promote participation in such bicycle promoting events as Bike to Work Day. Partner with local and regional organizations and agencies to promote and market cycling and walking as attractive alternatives to driving. Secure marketing firm to design a community-wide campaign to increase use of bicycles, walking, and other alternative transportation.	
Bike & Pedestrian Education		Expand Safe Routes to School, which supports walking and biking around our neighborhoods, to all schools.		Enhance bicycle and pedestrian safety outreach and education for cyclists, walkers and drivers.	
Promote cargo bikes				Promote the use of bicycle delivery services and bicycle cargo trailers to local businesses and residents.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
Support bikes on transit				Improve bicycle access on trains and buses and at stations and stops. Increase the capacity for bicycles on BART trains by removing some seats and making other changes to select cars.	
Create dedicated bike and pedestrian infrastructure	Build bicycle lanes that are physically separated from traffic in the Center City. Develop a citywide network of neighborhood greenways that prioritize walking and bicycling on residential streets. (2030) Develop a comprehensive, connected network of safe and comfortable bicycle facilities to, from and within the Center City and Urban Villages, and passing within 1/4	Build 15 miles of bicycle boulevards before 2010 and aggressively implement the City's Bicycle Master Plan.	Develop off-street bicycle paths, pedestrian paths and underpasses.	Integrate bicycle boulevards and pedestrian networks into broader alternative transportation system and identify gaps that could be addressed through additional bicycle/pedestrian infrastructure. Improve the flow of along bicycle boulevards, consistent with public safety, including consideration of replacing stop signs with yield signs at traffic circles on bicycle boulevards. Add bicycle lanes and boulevards, signage showing distance to various destinations, sidewalk lighting, etc.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
	mile of every home in Seattle. (2030) Connect Urban Centers and Villages with protected/buffered on-street bicycle lanes and greenways. (2030)			Explore funding from such programs as the "Safe Routes to Transit" program for this purpose. Extend Bicycle Boulevard network.	
Add bike parking	Expand on-street bicycle racks and facilitate provision of off-street bicycle parking and bike sharing.	Require a minimum amount of long-term bicycle parking spaces in areas other than the dwelling unit for multi-dwelling development.		Create additional bicycle parking, including near transit centers and other key destinations, at bus stops, and as part of any new development projects. Increase bicycle parking requirements for new development in Berkeley.	
Incorporate bicycles into municipal operations				Bicycle Fleet Pool for City employees. Secure bicycle parking near city employment sites. Bicycle fleet programs such as electric bicycles, cargo bikes, and mileage reimbursement for employee's personal	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				bicycle use for work.	
Add transit service	Add transit service to high demand routes to complete the Frequent Service Network. (2030)

Develop rail lines, dedicated bus lanes (many with Electric Trolley Bus service) and cycle tracks crisscrossing the City. (2030)

Implement four high capacity transit corridors identified in the Seattle Transit Master Plan. (2030)

Begin construction of 23rd Avenue priority bus corridor.

Collaborate with King County Metro to expand the electric trolley bus system. (2030) | Prioritize funding for low-carbon transportation and access projects, policies and programs that achieve emission reductions goals while balancing safety, maintenance and freight movement.

Build the Eastside Streetcar (3 miles of track) and complete the analysis of the next streetcar corridor.

Participate in a regional light rail system plan. | Develop Community Transit Network of high frequency buses. | Consider Bus Rapid Transit or light rail systems along major transportation corridors.

Partner with AC Transit to expand and enhance AC Transit bus service in Berkeley.

Integrate bus routes into broader alternative transportation system, identify gaps in bus service routes and potential scenarios for addressing such gaps, and improve frequency and reliability of bus service.

Improve access to public transportation in the Berkeley hills. Options include shuttle buses, on-demand transit, and more frequent and expanded AC Transit bus service. | Support transit improvements to increase capacity and ensure service is fast, frequent, reliable, fully accessible, and comfortable; protect future transit corridors; and expand measures to improve reliability of transit services. (Vancouver 2020)

Work with TransLink and the Province to advocate for high-capacity, fast, frequent and reliable rapid transit for the Broadway Corridor from Commercial Drive to the University of British Columbia. (Vancouver 2020) |

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
					Work with the Province and TransLink to enable new financing tools to help pay for expanded transit service. (Vancouver 2020)
Improve experience of transit users	Add electronic real-time bus schedule information and off-board payment options.	Implement SmartTrips Portland, to inform everyone who lives, works or runs a business in Portland about transportation options, to 30,000 households each year.	Work with Regional Transit District to implement a TravelSmart social marketing program.	Encourage more efficient payment systems such as "proof of payment" and level boarding to speed bus transit service. Install real-time transit signage at bus stations and stops. Install and improve bus shelters and benches, and ensure they are safe, well lit, and well maintained. Improve bus flow by removing stop signs and on-street parking spaces, by timing signals, and by creating "queue-jumper" lanes where delay occurs regularly.	Improve signal systems, intersection improvements and queue jumping for buses. (Vancouver 2020) Improve transit experience through better design of waiting areas. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				Inptrove transit service to meet MTC "Lifeline" service standards in low-income areas. Provide "universal access" level boarding that easily accommodates wheelchairs, walkers, and other individuals with mobility impairments.	
Provide incentives for transit use		Provide TriMet passes to all high-school students in Portland.	Bus pass program especially for neighborhoods called the Neighborhood Eco Pass. Eco Pass is a discounted annual bus pass purchased by employers and universities for all full-time employees and students, with an option to include part-time employees.	Continue to supply City employees with the Easy Pass (formerly Eco-Pass). Study providing fare-free zones in specified travel corridors or citywide. (Dependent upon the reprioritization of state and regional funding .) Encourage and eventually require all eligible employers to enroll in the Alameda County Congestion Management Authority Guaranteed Ride Home Program. Work to include BART ridership as part of the	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				Easy Pass benefit. Continue to supply City employees with pre-tax transit subsidies such as Commuter Check. Continue to offer deeply discounted carpool and vanpool monthly parking permits at City parking facilities. Partner with AC Transit, BART, UC Berkeley and other employers to provide subsidized transit passes and fare-free zones. Conduct a Citywide Mobility Study that analyzes the feasibility, efficacy, design, and benefits of providing free bus and BART passes, fare-free zones, and/or shuttles for individuals who live, work, and/ or study in Berkeley. The study will include an analysis of potential funding options to support improved and affordable transit, such	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				as parking revenues, a special tax and other options. Negotiate conditions of approval for all new residential multi-family developments to provide free or subsidized transit passes for tenants. Incentives can include reduced parking requirements for projects served by transit. Provide incentives for and eventually require all businesses to provide free or subsidized transit passes for employees.	
Improve connections to transit		Work with TriMet and Metro to revise the system service plan to reflect the mode share goals of this plan and to develop an investment strategy that includes infrastructure to support connectivity and safe routes to transit.		Improve the pedestrian, cyclist and transit connectivity at the Downtown Berkeley BART station by implementing the Downtown BART Plaza and Transit Area Design Plan. Continue timely assessment and development of proposed East Bay	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				Bus Rapid Transit (BRT) system. Partner with BART to expand and enhance BART service in Berkeley. Extend service hours and provide direct service from Berkeley to San Francisco in the evenings. Encourage UC Berkeley to require that transportation alternatives be provided for employees for new on- and off-campus building projects.	
Enhance and expand car sharing and ridesharing programs			Continue to promote and help expand Boulder CarShare, a non-profit carsharing organization serving the Denver-Boulder metro area.	Make car sharing convenient and available to all Berkeley residents by providing additional incentives and by removing disincentives to car sharing Require that developers of new residential and commercial projects of a certain size (to be specified) make spaces available for car share vehicles (provide decreased	Expand support for car sharing. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				parking requirements in return).	
				Enhance outreach to promote increased car sharing (include in broader marketing effort).	
				Place more car share pods near the transit network and in neighborhoods underserved by public transportation.	
				Designate on-street parking spaces for car share vehicles.	
				Site car share vehicles in private driveways by modifying business license and zoning requirements.	
				Provide car share subsidies for low-income residents.	
Provide incentives and remove disincentives to ridesharing				Market existing discounted parking for carpools and vanpools and site such parking spaces near transit when feasible. In collaboration with community partners,	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				include existing web and phone enabled ridesharing programs in comprehensive marketing and outreach effort. Telephone and computer technologies currently exist that enable the development of real-time, or dynamic, ride matching. Dynamic ridesharing can match passengers with drivers for individual adhoc trips as opposed to regularly scheduled trips. In collaboration with community partners, market and enhance existing casual carpool program.	
Expand capacity and service of local taxi fleets to provide an alternative to single-occupancy driving				ntegrate information about the role of taxi service in marketing and outreach efforts. In collaboration with regional agencies and local taxi companies, consider studying the feasibility of establishing a	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				discounted zone based fare or flat fees, especially for travel to/from transit stations. Support shared taxi use, including real-time dispatch and routing.	
Expand and integrate community shuttle bus networks				Design shuttle bus network to address transit gaps, better connect key destinations, and help customers access BART without driving. Enhance mobility options for people with disabilities by expanding paratransit, car share, and taxi services.	
Encourage additional passenger rail service and ridership				Pursue joint marketing strategies to promote trains. Improve bicycle and pedestrian access to passenger rail, including installing additional signage.	Support expansion of the regional passenger and freight rail system. (Vancouver 2020)
Continue to partner with relevant				Expand bus and other transit service to any ferry terminal	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
agencies to establish a ferry service to San Francisco and other locations				established at or near the Berkeley Marina so that there is consistent, coordinated, reliable transit service in conjunction with the ferry. Develop a parking strategy that discourages driving and longterm parking at any future ferry terminal and encourages using an alternative to reach the terminal.	
Support state and regional efforts to launch a high-speed rail system		Work with metro-area, state, regional, and federal agencies to develop a strategy for high-speed rail from Eugene to Vancouver, B.C.		Encourage state, regional, and local policy makers to support the development of a high-speed rail system that links all major California cities, including connecting service to Berkeley. Ensure that high-speed rail is fully integrated into existing transit services such as BART and AC Transit.	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
Enhance and expand outreach, marketing and education regarding land use and transportation				Work with regional and local community partners to provide sustained outreach and education to Berkeley citizens and visitors regarding alternative forms of transportation Launch marketing and branding campaign to informs people of their alternative transportation options. Include transportation-related education materials in a welcome package for new homebuyers/renters. Consider expanding existing TravelChoice-Berkeley, an innovative program aimed at reducing single occupancy vehicle trips and congestion while promoting healthy physical activity. Sustain and expand the Safe Routes to School Program, which promotes walking and cycling to	

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
				school and improving traffic safety around schools through education, incentives, increased law enforcement, and engineering measures. Create an annual 'Berkeley Car-Free Day' campaign. Actively promote and participate in annual Bike to Work Day. Partner with hotels, motels, and other visitor destinations to provide information about public transit, bicycle and pedestrian facilities. Partner with business associations to market the "Buy Local" campaign.	
Increase telecommuting and e-commerce		Support investments to provide high-performance broadband to every business and residence to enable widespread e-commerce, telecommuting and improved emergency		Collaborate with local businesses and community partners to identify incentives for telecommuting.	Work with partners to encourage work-from-home and other programs that reduce the need for vehicle trips. (Vancouver 2020)

	Seattle (2013)	Portland (2009)	Boulder (2007)	Berkeley (2013)	Vancouver (2012)
		response.			

Other ideas:

New EPA standards call for a combined average new car and light truck reduction from 295 g/mi of CO2 in 2012 to 250 g/mi by 2016 (roughly 15%). (It's 34.5 mpg by 2016, and 54.5 mpg by 2025, about a 36% reduction in gallons per mile, but there will be more cars.)

Plan for complete communities to encourage walking and cycling and to support improved transit.

Market Federal tax benefits of Commuter Choice programs http://www.commuterchoice.com/index.php?page=employers()

Include CO2 emissions in travel information applications.

Additional Resources for Ideas

Livermore Berkeley report – Delivering Energy Efficiency to Middle-Income Households