APPENDIX J

2018 Regional Transportation Plan

Climate Smart Strategy implementation and monitoring

December 6, 2018

Metro respects civil rights

Metro fully complies with Title VI of the Civil Rights Act of 1964 that requires that no person be excluded from the participation in, be denied the benefits of, or be otherwise subjected to discrimination on the basis of race, color or national origin under any program or activity for which Metro receives federal financial assistance.

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If any person believes they have been discriminated against regarding the receipt of benefits or services because of race, color, national origin, sex, age or disability, they have the right to file a complaint with Metro. For information on Metro's civil rights program, or to obtain a discrimination complaint form, visit oregonmetro.gov/civilrights or call 503-797-1536.

Metro provides services or accommodations upon request to persons with disabilities and people who need an interpreter at public meetings. If you need a sign language interpreter, communication aid or language assistance, call 503-797-1700 or TDD/TTY 503-797-1804 (8 a.m. to 5 p.m. weekdays) 5 business days before the meeting. All Metro meetings are wheelchair accessible. For up-to-date public transportation information, visit TriMet's website at trimet.org.

Metro is the federally mandated metropolitan planning organization designated by the governor to develop an overall transportation plan and to allocate federal funds for the region.

The Joint Policy Advisory Committee on Transportation (JPACT) is a 17-member committee that provides a forum for elected officials and representatives of agencies involved in transportation to evaluate transportation needs in the region and to make recommendations to the Metro Council. The established decision-making process assures a well-balanced regional transportation system and involves local elected officials directly in decisions that help the Metro Council develop regional transportation policies, including allocating transportation funds.

Regional Transportation Plan website: **oregonmetro.gov/rtp**

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PURPOSE

Climate change is the defining challenge of this century. Global climate change poses a growing threat to our communities, our environment and our economy, creating uncertainties for the agricultural, forestry and fishing industries as well as winter recreation. Documented effects include warmer temperatures and sea levels, shrinking glaciers, shifting rainfall patterns and changes to growing seasons and the distribution of plants and animals. Warmer temperatures will affect the service life of transportation infrastructure, and the more severe storms that are predicted will increase the frequency of landslides and flooding. Consequent damage to roads and rail infrastructure will compromise system safety, disrupt mobility and hurt the region's economic competitiveness and quality of life.

Recognizing the significant impact the transportation sector has on overall greenhouse gas emissions, there are a number of actions that can be pursued to lessen the carbon footprint of transportation. This appendix summarizes the key mitigation approaches adopted in the region's Climate Smart Strategy as well as implementation activities since 2014 and monitoring and analysis conducted through the 2018 Regional Transportation Plan update.

CLIMATE SMART STRATEGY (2014)

As directed by the Oregon Legislature in 2009, the Metro Council and the Joint Policy Advisory Committee on Transportation (JPACT) developed and adopted a regional strategy to reduce per capita greenhouse gas emissions from cars and small trucks (light-duty vehicles) by 2035 to meet state targets. Adopted by the Metro Council and JPACT in December 2014 with broad support from community, business and elected leaders, the Climate Smart Strategy relies on policies and investments that have already been identified as local priorities in communities across the greater Portland region. Adoption of the strategy affirmed the region's shared commitment to provide more transportation choices, keep our air clean, build healthy and equitable communities, and grow our economy – all while reducing greenhouse gas emissions.

As part of the process, Metro, in partnership with the Oregon Department of Transportation, conducted a detailed modeling analysis of various greenhouse gas scenarios and identified the types of transportation-related mitigation strategies that would have the greatest potential for reducing greenhouse gas emissions in the long term. This informed the final strategy.

The analysis of the adopted strategy demonstrated that with an increase in transportation funding for all modes, particularly transit operations, the region can provide more safe and reliable transportation choices, keep our air clean, build healthy and equitable communities and grow our economy while reducing greenhouse gas emissions from light-duty vehicles as directed by the Oregon Legislature. It also showed that a lack of investment in needed transportation infrastructure will result in falling short of our greenhouse gas emissions reduction goal and other desired outcomes. The Land Conservation and Development Commission approved the region's strategy in May 2015.
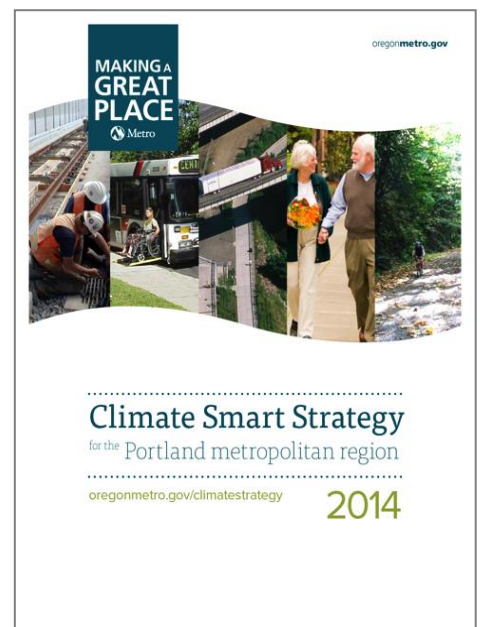
The 2018 Regional Transportation Plan is a key tool for the greater Portland region to implement the adopted Climate Smart Strategy.

For more information, visit
http://www.oregonmetro.gov/climatesmart

Strategies Evaluated and Findings

Climate Smart Strategy | Largest potential carbon reduction impact*

Vehicles and Fuels (Investment)
- Newer, more fuel efficient vehicles
- Low- and zero-emission vehicles
- Reduced carbon intensity of fuels

Pricing (Policy)
- Carbon pricing
- Gas taxes
- Per-mile road usage charges (e.g., OReGO)
- Parking management and pricing
- Pay-as-you-drive private vehicle insurance

Community Design (Policy with Investment)
- Walkable communities and job centers facilitated by compact land use in combination with walking, biking and transit connections

Transit (Investment)
- Expanded transit coverage
- Expanded frequency of service
- Improvements in right-of-way to increase speed and reliability of buses and MAX

Climate Smart Strategy | Moderate potential carbon reduction impact*

Active Transportation (Investment)
- New biking and walking connections to schools, jobs, downtowns and other community places

Travel Information and Incentives (Investment)
- Commuter travel options programs
- Household individualized marketing programs
- Car-sharing and eco-driving techniques

System Management and Operations (Investment)
- Variable message signs and speed limits
- Signal timing and ramp metering
- Transit signal priority, bus-only lanes, bus pull-outs
- Incident response detection and clearance

Climate Smart Strategy | Low potential carbon reduction impact*

Street and Highway Capacity (Investment)
- New lane miles (e.g, general purpose lanes, auxiliary lanes)

Source: *Understanding Our Land Use and Transportation Choices Phase 1 Findings* (January 2012), Metro.

Climate Smart Strategy Implementation Since 2014

Responsibility for implementation of the Climate Smart Strategy does not rest solely with Metro. Continued partnerships, collaboration and increased funding from all levels of government will be essential. To that end, the Climate Smart Strategy also identified actions that can be taken by the state, Metro, cities, counties and others to enable the region to monitor performance and report on progress in implementation. An overview of Metro implementation activities follows.

Metro implementation actions taken since adoption of Climate Smart Strategy

- Expanded Community Planning and Development Grant program criteria and eligibility to include Climate Smart policies and actions in local plans (2015)

- Advocated for increased funding for transit operations, transportation investment, transition to cleaner, low-carbon fuels and more fuel-efficient vehicles, cap-and-invest program and other Climate Smart Strategy actions in legislative agendas (2015-ongoing)

- Expanded Regional Travel Options Grant Program criteria and emphasis on climate smart investments and actions for FY 15-17 and FY 17-19 grant cycles (2015-17)

- Increased funding for effective Climate Smart investments, including optimizing built road capacity, bike and pedestrian safety retrofits, and new MAX and enhanced transit service through 2019-21 regional flexible fund allocation process (April 2017)

- Adopted new Regional Travel Options Strategy that further advances Climate Smart Strategy investments and related activities, including trip reduction services for commuters, vanpools and carpools, Safe Routes to Schools and tools to connect people to demand-responsive transit options (May 2018)

- Initiated activities to support regional efforts to secure needed funding to build planned transportation investments needed to serve our growing and changing region (2018)

- Adopted 2018 Regional Transportation Plan and supporting Regional Transit Strategy, Regional Transportation Safety Strategy, Regional Freight Strategy and Emerging Technology Strategy that further advance Climate Smart Strategy investments and related policies and actions to reduce greenhouse gas emissions from all vehicles (Dec. 2018)

CLIMATE SMART STRATEGY MONITORING

The Climate Smart Strategy and the more recent update to the Regional Transportation Plan presented opportunities for the region to work together to demonstrate leadership on reducing greenhouse gas emissions while addressing the need to identify funding to implement adopted local and regional plans. The Climate Smart Strategy adopted by JPACT and the Metro Council in 2014 included a set of performance measures and performance monitoring targets for tracking implementation and progress. The purpose of the performance measures and targets is to monitor and assess whether key elements or actions that make up the strategy are being implemented, and whether the strategy is achieving expected outcomes.

The 2018 Regional Transportation Plan addresses most aspects of transportation-related data reporting required under Oregon Revised Statutes (ORS) 197.301(i) (metropolitan service district performance measures) and Climate Smart Strategy monitoring required under Oregon Administrative Rules (OAR) 660-044-0060. The 2018 Urban Growth Report reports data required under ORS 197.296 and addresses most aspects of land use-related data required under ORS 197.301, including ORS 197.301(a) through (g). Metro delivers biennial reports to the Department of Land Conservation and Development (DLCD) that address ORS 197.301(h) and (i).

Climate Smart Strategy performance measures, monitoring targets and analysis tools

The Climate Smart Strategy performance measures and targets adopted for monitoring implementation were drawn from the Regional Transportation Plan and the Urban Growth Report that, together, track existing land use and transportation policies and expected outcomes. The Climate Smart Strategy performance monitoring targets are not policy targets, but instead reflect a combination of the planning assumptions used to evaluate the Climate Smart Strategy and outputs from the evaluation of the adopted strategy using a metropolitan version of ODOT's GreenSTEP software package (now called VisionEval).

The Climate Smart Strategy performance measures and monitoring targets were adopted with an acknowledgement that they will be reviewed during development of the 2018 Regional Transportation Plan to address new information, such as federal transportation performance-based planning rulemaking. At the time of adoption, Metro also anticipated transitioning from using ODOT's GreenSTEP software tool (VisionEval) to the Environmental Protection Agency's MOVES model for forecasting on-road mobile source greenhouse gas emissions in the region. This transition was anticipated because Metro maintains and implements MOVES to conduct federally-required air quality and other on-road vehicle emissions analysis, and does not have the expertise nor the resources necessary to maintain and implement VisionEval on an on-going basis. Further, significant methodological differences in how VisionEval and MOVES estimate on-road vehicle emissions do not allow for direct comparison of forecasted on-road vehicle emissions results.

More detailed information about the fleet and technology assumptions used in the 2018 RTP on-road vehicle emissions analysis and a comparative assessment of VisionEval and MOVES emissions estimation methodologies is provided in **Table 1** of this appendix.

2018 Regional Transportation Plan

As required by the Land Conservation and Development Commission, the Climate Smart Strategy includes a set of performance monitoring targets for tracking progress through periodic updates to the Regional Transportation Plan (now every five years). The performance monitoring targets are not policy targets, but instead reflect a combination of the planning assumptions used to evaluate the Climate Smart Strategy and outputs from the evaluation to monitor and assess whether key elements or actions that make up the strategy are being implemented.

The measures and performance monitoring targets were reviewed before being incorporated in **Table 2** of this appendix. Table 2 documents progress implementing the strategy since 2014, using observed data sources to the extent possible for the 2015 Base Year, and expected progress that would be achieved if planned projects included in the 2018 Regional Transportation Plan financially constrained list are fully implemented by 2040.

For more information, visit
http://www.oregonmetro.gov/rtp
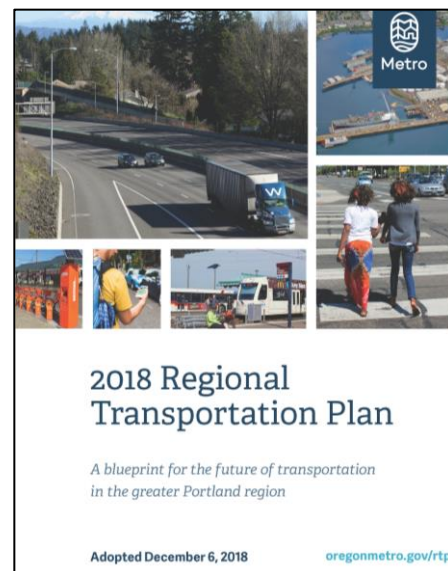
Key findings from the 2018 Regional Transportation Plan

The 2018 Regional Transportation Plan makes satisfactory progress towards implementing the Climate Smart Strategy and, if fully funded and implemented, can reasonably be expected to meet the state-mandated targets for reducing per capita greenhouse gas emissions from cars and small trucks (light-duty vehicles) for 2035 and 2040.

Key findings include:

1. **The RTP exceeds most Climate Smart Strategy performance monitoring targets as shown in Table 2.**

   o By 2040, the plan is expected to **exceed the target for transit service hours** resulting from significantly expanded coverage and frequency of transit service throughout the region.

   o By 2040, the plan is expected to **exceed the target for households living in walkable mixed-use areas**.

   o By 2040, the plan is expected to **exceed the target for new housing built through infill and redevelopment** in the urban growth boundary.

   o By 2040, the plan is expected to **exceed the target for trips made biking** each day and **makes progress toward the target for trips made walking** each day.

   o By 2040, the plan is expected to **exceed the target for miles of biking each day** per capita and **make progress toward the target for miles walking each day per capita.**

   o By 2040, the plan is expected to **exceed the target for work trips occuring in areas with actively managed parking** and **makes progress toward the target for non-work trips.**

2. **The RTP makes progress toward the Climate Smart Strategy performance monitoring targets, but is not expected to meet regional policy targets for vehicle miles of travel, mode share and completion of the active transportation network by 2040, as shown in Chapter 7 of the plan.**

   o By 2040, the plan is expected to **achieve a 4 percent reduction in daily vehicle miles traveled** (VMT) per person, making progress toward the 10 percent per capita VMT reduction target in the RTP.

   o By 2040, the plan is expected to **complete 69 percent of the planned regional sidewalk network and 63 percent of the planned on-street regional bikeway network**. Significant gaps will remain within 2040 centers and on arterial roadways in the region.

   o By 2040, **all designated 2040 regional centers** are expected to experience relatively large increases in biking, walking, transit and shared ride mode share, and **meet or exceed their respective mode share targets**.

   o By 2040, **the plan is not expected to achieve RTP policy targets to triple biking, walking and transit mode share region-wide.** However, the City of Portland is expected to experience a relatively large increase in biking, walking and transit mode share for travel within the City of Portland, increasing from 26 percent to 32 percent between 2015 to 2040.

   Other parts of the region are expected to experience more modest increases in biking, walking and transit mode share. East Multnomah County (outside the city of Portland) biking, walking and transit mode share is expected to grow from 13.6 percent in 2015 to 15.1 percent in 2040. Urban Clackamas County biking, walking and transit mode share is expected to grow from 12 percent in 2015 to nearly 14 percent in 2040. Urban Washington County biking, walking and transit mode share is expected to grow from 11 percent in 2015 to 13 percent in 2040.

3. **The RTP supports state goals to reduce greenhouse gas emissions from all sources and is expected to meet state-mandated targets for reducing per capita greenhouse gas emissions from cars and small trucks for 2035 and 2040.**

   o By 2040, the plan, together with advancements in fleet and technology, is expected to **reduce total annual greenhouse gas emissions from all on-road vehicles by 19 percent** (compared to 2015 levels) and **annual per capita greenhouse gas emissions from all on-road vehicles by 40 percent** (compared to 2015 levels).

   o By 2040, the plan, together with advancements in fleet and technology, is expected to **reduce total annual greenhouse gas emissions from passenger cars and passenger trucks by 27 percent** (compared to 2015 levels) and **reduce annual per capita greenhouse gas emissions from passenger cars and passenger trucks by 46 percent** (compared to 2015 levels).

The above findings are all described in Chapter 7 of the 2018 RTP. Due to differences in emissions analysis tools, the 2018 RTP greenhouse gas emissions estimates are not directly comparable to the state-mandated greenhouse gas emissions reduction targets that were set using VisionEval. However, the findings above demonstrate the region is making satisfactory progress implementing the Climate Smart Strategy. The findings also demonstrate that more investment, actions and resources will be needed to ensure the region achieves the mandated greenhouse gas emissions reductions defined in OAR 660-044-0060. In particular, additional funding and prioritization of Climate Smart Strategy investments and policies that substantially reduce greenhouse gas emissions will be needed.

Overview of Fleet and Technology Assumptions Used in 2018 Regional Transportation Plan Emissions Analysis

This section provides an overview of the fleet and technology assumptions used in the 2018 RTP on-road vehicle emissions analysis. The emissions reported are for vehicle travel occurring within the federally-designated metropolitan planning area boundary (MPA) regardless of where trips begin or end. The on-road vehicle emissions estimates published in association with the 2018 RTP update were produced within a software framework that combines the regional transportation model with EPA's MOVES model, version MOVES2014a. A newer version of MOVES (MOVES2014b) has since been released, but it should be noted that the improvements incorporated into this update pertain almost exclusively to estimates of non-road emissions and are, therefore, not relevant to this analysis.

Metro's current implementation of MOVES was developed for air quality conformity purposes in accordance with all pertinent EPA guidance included in the document, "Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b" (April 2012). The sections below describe several key assumptions regarding the regional on-road vehicle fleet and its emissions characteristics.

Fleet composition
The MOVES input files representing the makeup and age of the fleet (Source Type Population, Age Type Distribution) were developed using:

1. passenger car and light truck registration data from an Oregon Department of Motor Vehicles fleet database provided by Oregon Department of Environmental Quality; and

2. a MOVES run at the national scale to develop estimates for non-passenger vehicles.

These are assumed to be constant over time.

Fuels

The MOVES input files representing the fuels in use in the region (Fuel Formulation, Fuel Supply) were provided by Oregon DEQ and account for the Oregon Clean Fuels Program.

Fuel economy

The assumed average fuel economy of the fleet is based on federal regulations in place at the time of release of the current version of MOVES, July 2014.[1] Most notable among these are:

- Tier 3 emission standards that phase in beginning in 2017 for cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty trucks, and Tier 3 fuel standards that require lower sulfur gasoline beginning in 2017.

- Heavy-duty engine and vehicle greenhouse gas regulations that phase in during model years 2014-2018.

- The second phase of light-duty vehicle greenhouse gas regulations that phase in for model years 2017-2025 cars and light trucks.

While no additional fuel economy improvements are assumed beyond model year 2025, the average fuel economy of the fleet is assumed to increase continually due to anticipated fleet turnover.

Metro will monitor future changes to federal greenhouse gas regulations and Corporate Average Fuel Economy (CAFE) standards in collaboration with DLCD, DOE, DEQ and ODOT to identify and recommend any necessary adjustments for future analysis.

Inspection/maintenance programs

Metro's emissions estimates account for the presence of vehicles in the region subject to Oregon and Washington's inspection/maintenance programs as well as non-inspected vehicles.

Hybrid/electric vehicles

Metro's emissions estimates do not account for the presence of hybrid, electric, or hybrid electric vehicles in the region. No reliable base year data were available at the time to inform development of fleet composition inputs and, with respect to future year estimates, EPA conformity-related guidance does not allow for assumed increases in market penetration of vehicles powered by "alternate fuels" absent specific regulatory requirements.

Metro will work with DLCD, DOE, DEQ and ODOT to better account for these vehicles in future analysis consistent with Oregon's Electric Vehicle Strategy and Executive Order No. 17-21, signed by Governor Brown on November 6, 2017. [2]

California LEV/ZEV standards

Metro's emissions estimates account for Oregon's adoption of the California low emission vehicle (LEV) standards and zero emission vehicle (ZEV) program. [3]

The latest zero emission regulations apply to new cars and light-duty trucks and will significantly

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[1] Information derived from "*EPA Releases MOVES2014 Mobile Source Emissions Model, Questions and Answers," July 2014.*

[2] Information about the strategy can be found at: www.goelectric.oregon.gov/our-strategy

[3] Information about Oregon's Low Emission Vehicles Regulations can be found at: www.oregon.gov/deq/aq/programs/Pages/ORLEV.aspx

increase the number of emission-free vehicles delivered to Oregon beginning with the 2018 model year. It is difficult to predict how many zero emission vehicles the rules will bring to Oregon. At the same time Oregon's Environmental Quality Commission adopted the zero emission vehicle rules, the commission also adopted California's Low Emission Vehicle III regulations. These rules mirror regulations adopted nationwide by the U.S. Environmental Protection Agency. Both state and federal rules require the greenhouse gas emissions of new light-duty vehicles to average an equivalent of 54.5 miles per gallon by 2025.

Metro will monitor future changes to these standards in collaboration with DLCD, DOE, DEQ and ODOT to identify and recommend any necessary adjustments for future analysis.

Comparative Evaluation of VisionEval and MOVES Emissions Estimation Methodologies

The greenhouse gas emissions targets were set for the Portland metropolitan region using ODOT's VisionEval (previously called GreenSTEP or RSPM) software tool. Given that methodological differences exist between VisionEval and Metro's approach that combines the regional transportation model (RTM) with MOVES (henceforth referred to as "RTM + MOVES"), it is important to compare and contrast key assumptions and inputs.

At the most fundamental level, VisionEval and RTM + MOVES operate at different analytical scales and have different core sensitivities. The level of analysis at which VisionEval is situated can be described as strategic, wherein certain input data and behavioral responses are handled in a relatively generalized fashion in order to facilitate analysis of a wide range of potential policies and scenarios within reasonable setup and run times. VisionEval is intended primarily for assessment of aspirational policies, as well as exploration of potential effects of major shifts in travel preferences and behavior, that would be needed to reach statewide greenhouse gas emissions reduction goals (i.e. "what would it take?").

VisonEval relies on a combination of national data sources, such as the National Household Travel Survey and U.S. Census data and peer-reviewed research in establishing its central logic and assumptions regarding household travel choices. It represents regional transportation system performance by way of aggregate metrics rather than network-level simulations. VisionEval estimates potential effects of a number of policy mechanisms and emerging technologies, including transportation demand management and individualized marketing programs, eco-driving initiatives and participation, car sharing, pay-as-you-drive insurance and system management and operations strategies that can reduce system delays, such as ramp metering, incident response, variable speed limits and traffic signal optimization.

In contrast, RTM + MOVES operates at a more targeted scale and is intended primarily for analysis of proposed transportation projects at the regional and corridor levels. The regional transportation model includes auto, transit, freight and bicycle networks that explicitly represent travel conditions based on specified packages of projects as well as policies related to parking charges, transit fares, and land use characteristics. The model uses a robust regional household travel survey, last completed in 2011 in partnership with ODOT and other Oregon metropolitan planning organizations, as the basis for its representations of traveler preferences and sensitivities.

In accordance with established national best practice on appropriate use of models of this type, a fundamental assumption in RTM + MOVES is that attitudes influencing travel decision-making remain constant over time. Further, without observed data as scientific evidence, it is not considered appropriate to estimate effects of previously nonexistent policies, programs, or travel modes in the regional transportation model. As a result, RTM+MOVES does not currently account for the types of policies, programs and technological advances discussed previously that were assumed in VisionEval when setting the region's greenhouse gas emission reduction targets for 2035 and 2040.

MOVES, for its part, is configured for use in conformity determinations in the current RTM + MOVES framework, resulting in a series of fleet and technology assumptions that are collectively somewhat conservative when compared to VisionEval. The fleet mix and vehicle age distributions do not change over time, hybrid and/or electric vehicles are not currently accounted for and assumptions regarding average fuel economy are limited to standards and policies set forth in existing federal and state legislation.

Table 1 outlines key inputs to, and fundamental definitional differences between, the VisonEval and RTM + MOVES tool sets where the analysis of greenhouse gas emissions reduction strategies is concerned.

Table 1. Comparison of Key Greenhouse Gas Emissions Estimation Assumptions and Inputs

	Year	VisionEval / RSPM	Regional Transportation Model + MOVES	
Model version(s)		RSPM v3.0	Kate v2.0 (transportation model), MOVES2014a	
Vehicle activity captured		VMT from households that live within the MPA boundary regardless of where driving occurs	All VMT occurring within the MPA boundary regardless of where trips begin and end	
GHG emissions captured		Fuel production, including EV/PHEV electricity generation, and vehicle operation ("well to wheel")	Vehicle operation ("tank to wheel")	
Vehicles analyzed		Light-duty- vehicles only	Passenger vehicles, light-duty trucks and freight trucks	
Fleet mix			Passenger vehicles	All vehicles
	2010	54.5% passenger car 45.5% light truck	58.0% passenger car	49.3% passenger car
	2015	-	42.0% passenger truck	47.6% light truck
	2027	-		3.1% freight truck
	2035	70% passenger car 30% light truck	(assumed to be constant over time)	(assumed to be constant over time)
	2040	-		
Average vehicle age (age distributions available upon request)	2010	10.5 years light-duty vehicle	9.5 years passenger car 9.7 years passenger truck (assumed to be constant over time)	
	2015	-		
	2027	-		
	2035	8.4 years light-duty vehicle		
	2040	-		
Fuel mix VisionEval: 2035 shares unavailable but are assumed to reflect a 10% reduction in carbon intensity from 2015 and a 4.4% share of electric and plug-in hybrid electric vehicles	2010	88% gas, 2.2% diesel, 9.8% ethanol	-	
	2015	-	97.7% gas, 0.7% diesel, 1.6% E-85	
	2027	-	91.3% gas, 1.1% diesel, 7.6% E-85	
	2035	-	-	
	2040	-	86.9% gas, 1.5% diesel, 11.6% E-85	

	Year	VisionEval / RSPM	Regional Transportation Model + MOVES	
Average fuel economy (miles/gallon) MOVES: internal combustion engines only VisionEval: internal combustion, electric and hybrid engines			Passenger vehicles	All vehicles
	2010	21.8	-	-
	2015	-	20.9	18.3
	2027	-	28.3	23.7
	2035	54.0	-	-
	2040	-	35.9	28.4
Fuel carbon intensity MOVES: grams CO_2/Mj VisionEval: grams CO_2 Equivalent/Mj	2010	90.4	71.82 gas, 73.98 diesel, 71.09 E-85 (baseline national average; values specific to local fuels and modeled years unavailable)	
	2015	-		
	2027	-		
	2035	72.3		
	2040	-		
Average GHG emissions rate (grams CO_2 Equivalent/mile) Rates are fleet-wide composites			Passenger vehicles	All vehicles
	2010	504	-	-
	2015	-	419	487
	2027	-	303	368
	2035	168	-	-
	2040	-	234	303

Source: ODOT and Metro

Recommendations for future performance monitoring

To monitor and assess implementation of the Climate Smart Strategy, Metro will continue to use observed data sources and existing regional performance monitoring and reporting processes to the extent possible. These processes include regularly scheduled updates to the Regional Transportation Plan and Urban Growth Report and reporting in response to ORS 197.301 and ORS 197.296. When observed data is not available, data from regional or state models may be reported.

If future assessments find the region is deviating significantly from the Climate Smart Strategy performance monitoring targets, then Metro will work with local, regional and state partners to consider the revision or replacement of policies and actions to ensure the region remains on track with meeting adopted targets for reducing greenhouse gas emissions.

In addition, Metro staff will monitor future changes to fleet and technology assumptions in collaboration with DLCD, DOE, DEQ and ODOT and continue to improve emissions analysis methods, data and tools through its air quality and climate change program.

Table 2. Climate Smart Strategy Implementation and Performance Monitoring

This table documents expected progress implementing the Climate Smart Strategy, using observed data sources to the extent possible for the RTP 2015 Base Year, and expected progress that would be achieved by 2040 if planned projects included in the 2018 RTP financially constrained list are fully implemented together with anticipated improvements in fleet and technology. Fleet and technology assumptions used in the analysis are described in the previous section.

	Climate Smart Strategy Baseline (2010)	Climate Smart Strategy Monitoring Target (2035)	2018 RTP Base year (2015)	2018 RTP Constrained (2040)	2018 RTP Strategic (2040)
1. Implement the 2040 Growth Concept and local adopted land use and transportation plans					
a. Share of households living in a walkable mixed used development in the UGB[1]	26%	37%	41%	47%	48%
b. New residential units built through infill and redevelopment in the UGB	58%	65%	76%	78%	78%
c. New residential units built on vacant land in the UGB	42%	35%	24%	22%	22%
d. Acres of urban reserves	Not applicable	12,000	Not applicable	4,739	4,739
e. Daily vehicle miles per capita[2]	19	17	13	12.4	12.3
2. Make transit convenient, frequent, accessible and affordable					
a. Daily transit service revenue hours (excluding C-TRAN service hours)	4,900	9,400	5,700	9,500	11,700
b. Share of households within 1/4-mile all day frequent transit service[3]	30%	37%	48%	65%	71%
c. Share of low-income households within 1/4-mile all day frequent transit service[3]	39%	49%	59%	74%	79%
d. Share of employment within 1/4-mile all day frequent transit service[3]	41%	52%	58%	76%	82%
3. Make biking and walking safe and convenient					
a(1). Daily trips made walking	505,000	768,000	461,000	650,000	647,000
a(2). Daily trips made biking	179,000	280,000	232,000	348,000	344,000
b(1). Per capita biking miles per week	2.1	3.4	3.5	4.2	4.2
b(2). Per capita pedestrian miles per week	1.3	1.8	1.4	1.4	1.4
c(1 and 2). *See 4a(2) and 4a(3) below*	See 4a(2) and 4a(3) below				
d(1). New miles of bikeways[4]	623 existing miles	421	760 existing miles	243	320
d(2). New miles of sidewalks (on at least one side of street)[4]	5072 existing miles	Data not available	5072 existing miles	360	500
d(3). New miles of regional trails[4]	229 existing miles	140	250 existing miles	174	253
4. Make streets and highways safe, reliable					
a(1). Fatal and severe injury crashes - motor vehicles[5]	398	199	406	No forecast data	No forecast data
a(2). Fatal and severe injuries - pedestrians[5]	63	32	78	No forecast data	No forecast data
a(3). Fatal and severe injuries - bicyclists[5]	35	17	35	No forecast data	No forecast data
b. Change in travel time and reliability in regional mobility corridors	Data not available	Not evaluated	Data not available	No forecast data	No forecast data
c. Share of freeway lanes blocking crashes cleared within 90 minutes	Data not available	100%	Data not available	No forecast data	No forecast data
5. Use technology to actively manage the transportation system					
a. Share of arterial delay reduced by traffic management strategies	10%	35%	Data not available	No forecast data	No forecast data
b. Share of regional transportation system covered with system management/TSMO	Data not available	Data not available	Data not available	No forecast data	No forecast data
6. Provide information and incentives to expand the use of travel options					
a. Share of households participating in individual marketing	9%	45%	9%	No forecast data	No forecast data
b. Share of workforce participating in commuter programs	20%	30%	20%	No forecast data	No forecast data

	Climate Smart Strategy Baseline (2010)	Climate Smart Strategy Monitoring Target (2035)	2018 RTP Base year (2015)	2018 RTP Constrained (2040)	2018 RTP Strategic (2040)
7. Manage parking to make efficient use of vehice parking and land dedicated to parking					
a(1). Share of work trips occurring in areas with actively managed parking	13%	30%	25%	32%	32%
a(2). Share of nonwork trips occurring in areas with actively managed parking	8%	30%	7%	23%	23%
8. Suppport transition to cleaner, low carbon fuels, effcent fuels and pay-as-you-go insurance					
a(1). Share of registered passenger cars that are electric or plug-in-hybrid electric	1%	8%	Data not available	Not evaluated	Not evaluated
a(2). Share of registered light trucks that are electric or plug-in-hybrid electric	1%	2%	Data not available	Not evaluated	Not evaluated
b. Share of households using pay-as-you-go insurance	1%	40%	Data not available	Not evaluated	Not evaluated
9. Secure adequate funding for transportation investments					
a. Address local, regional, and state transportation funding gap	Not evaluated		Regional funding discussions are under way		
10. Demonstrate leadership on climate change					
a. Region-wide annual tons per capita greenhouse gas emissions (MTCO2e) from all on-road vehicles within the metropolitan planning area boundary	Not evaluated		3.28	1.95	1.94
b. Region-wide annual tons per capita greenhouse gas emissions (MTCO2e) from passenger vehicles within the metropolitan planning area boundary [6]	Not evaluated		2.61	1.40	1.39

Table Notes

1 Climate Smart Strategy values are derived from ODOT's GreenSTEP model (VisionEval).

2 Direct comparisons between Climate Smart Strategy values and 2018 RTP values should not be made because different analytic tools have been used to derive these values. Climate Smart Strategy values are derived from ODOT's GreenSTEP model (VisionEval); 2018 RTP values are derived from Metro's regional travel model.

3 2018 RTP values reflect households within 1/4-mile bus, 1/3-mile streetcar, and 1/2-mile light rail.

4 Climate Smart target reflects number of miles of new bikeways and trails for projects identified as 'active transportation' projects in the 2014 RTP. RTP 2040 Constrained and Strategic miles of new bikeways, sidewalks and trails reflect all miles of bikeways, sidewalks and trails from any investment category that includes these elements, and irrespective if the project helps complete the regional active transportation network.

5 Climate Smart Strategy target reflects the 50% reduction target adopted in 2014 RTP. The 2018 RTP includes a target of zero fatal and severe injury crashes by 2035. The region does not currently have a safety predictive model to forecast this information, but will track progress toward the target through periodic RTP updates as required by federal tranportation performance management requirements. Data shown for 2018 RTP Base Year (2015) reflects the annual average number of fatal and severe injury crashes reported by the Oregon Department of Transportation for the years 2011-2015.

6 Direct comparisons between Climate Smart Strategy values and 2018 RTP values should not be made because different analytic tools. Climate Smart Strategy values are derived from ODOT's GreenSTEP model (VIsionEval) and include passenger cars, passenger trucks and light commercial vehicles; 2018 RTP values are derived from Metro's regional travel demand model and EPA-approved MOVES2014a model and include passenger cars and passenger trucks.

If you picnic at Blue Lake or take your kids to the Oregon Zoo, enjoy symphonies at the Schnitz or auto shows at the convention center, put out your trash or drive your car – we've already crossed paths.

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