

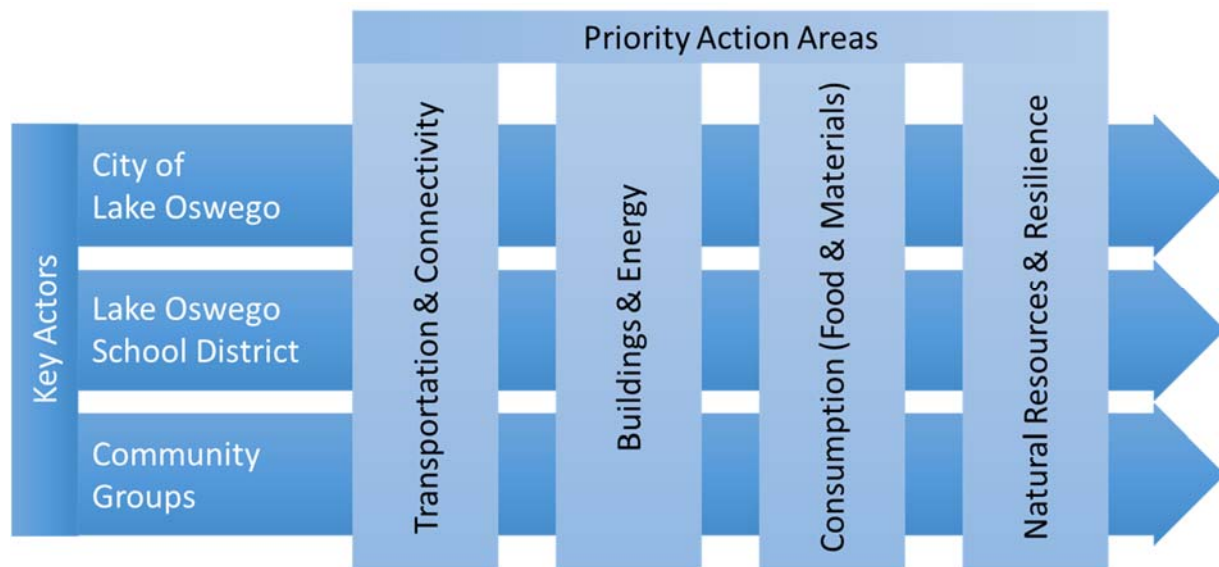
COVER NOTE: Practical Climate Actions for Lake Oswego

Changes in our climate—locally and globally—demand a smart response. The enclosed six-page summary and supporting appendices outline ideas for action in Lake Oswego.

The document is not meant to be a conventional or comprehensive “Climate Plan.” Rather, the recommendations offered in the attached should feed directly into existing plans or updated policies or new strategies that can take shape in 2018. This is a document designed to help leaders in Lake Oswego do something now.

Over the past several months, a team of advisors has compiled, reviewed, and prioritized a list of climate actions that make sense for Lake Oswego. The list draws on examples and experience from dozens of other small cities. It highlights emerging technologies and cost-effective strategies with multiple benefits for people in Lake Oswego. Importantly, it incorporates input from more than 60 local experts and stakeholders interested to see the city take smart action on climate change.

The document provides near-term inspiration and long-term direction for three key actors in Lake Oswego, across four priority action areas.



Respectfully submitted by:

Coordinating Committee Chair: Eliot Metzger, City of Lake Oswego’s Sustainability Advisory Board

Representing the Lake Oswego Sustainability Network: Lisa Adatto, Duke Castle

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Practical Climate Actions for Lake Oswego

A vibrant future for Lake Oswego will mean taking on a global challenge with solutions that make sense locally.

Climate change is already impacting daily life in Lake Oswego, with heat waves, floods, wind storms, and smoke from wildfires becoming more frequent. Any delays to global, national, and local responses to climate change will result in higher risks and long-term costs to our community (see Appendix A for more information). Credit rating agencies, for example, are now factoring climate change exposure and preparedness into cities' bond ratings.

Fortunately, there are actions that can preserve the quality of life that so many of us enjoy in Lake Oswego—and ensure more residents in Lake Oswego can enjoy that lifestyle today and in the future. In that spirit, the City Council included among its 2017 goals an ambition to:

Support the creation of a climate action plan based on advice from the Sustainability Advisory Board, consistent with Council policy direction.

In 2017, our team of advisors—with input from more than 60 local experts and stakeholders—developed a summary of 10 high-level recommendations, with additional details provided in the pages that follow.

Action Area	High-Level Recommendations
Transportation and Connectivity	<ol style="list-style-type: none">1. Electrify transportation2. Make public transit more convenient
Buildings and Energy	<ol style="list-style-type: none">3. Avoid energy waste4. Make clean energy more accessible
Consumption (Food and Materials)	<ol style="list-style-type: none">5. Increase sustainable food options6. Cut food waste in half7. Extend useful life of clothing, electronics, building materials
Resources and Resilience	<ol style="list-style-type: none">8. Plan for new climate extremes9. Manage water wisely10. Preserve and enhance our forests and natural areas

These recommendations are the product of a unique City-community collaboration. We—as representatives of the City of Lake Oswego, its Sustainability Advisory Board (SAB), and the Lake Oswego Sustainability Network—contributed 1,000+ hours in 2017 to identify opportunities for climate action. We reviewed climate plans from other cities, small and large, learning what has and has not worked elsewhere. We invited input from the community and look forward to more input as these ideas take shape.

Innovative solutions to climate change will come from people taking action, here and elsewhere. We see three sources of leadership in Lake Oswego and have organized this summary to inspire action from each in 2018 and beyond.

“Community Groups” = Lake Oswego citizen groups, in partnership with local and state organizations. There are non-profit organizations, local churches, and business coalitions interested to advance climate action.

“City” = Council, Boards, Commissions, and relevant staff of the City of Lake Oswego. The City can develop and advance goals, policies, and plans that help preserve a high-quality of life in a changing climate.

“LOSD” = Lake Oswego School District. Excellence in education will continue to define Lake Oswego. There are opportunities to advance climate action as the district upgrades its schools and prepares future leaders.

TRANSPORTATION AND CONNECTIVITY

Actions that make it easier and cleaner to get to, from, and around Lake Oswego. We recommend Lake Oswego support electric vehicles, advocate for improved public transit, and advance connected pathways for walking and biking to help eliminate harmful tailpipe emissions.

FAST FACTS (See Appendix C for additional detail and references)

Transportation accounts for nearly one-third of greenhouse gas (GHG) emissions in Lake Oswego (see Appendix B). Half of those emissions are from cars and light trucks.

Accelerating the market for electric vehicles (EVs) can reduce GHG emissions from Lake Oswego's cars and trucks by 60 percent by 2040.

Increasing ridership on public transit can further reduce GHG emissions and congestion as approximately 8,600 Lake Oswegans commute to Portland for work while only 300-400 commute by bus.

Recommendation 1: "Electrify" transportation. We recommend:

- **Community Groups** engage local residents, with support from local electric vehicle (EV) organizations and manufacturers, to increase EV market share to at least 50 percent by 2030 and 60 percent by 2040.
 - Promote EVs at Lake Oswego car and boat shows in 2018 and 2019, with the goal to have at least 1,000 Lake Oswego residents test drive an EV before 2020.
 - Develop materials tailored to Lake Oswego that promote EVs and incentives, including \$2,500 state rebates. Partner with the City to help disseminate EV information, for example via HelloLO.
- **The City** (with guidance from Planning Commission, Transportation Advisory Board, SAB and Community Groups) develop policies and identify code updates to ensure sufficient EV charging infrastructure. For example, encourage EV incentives and code updates for parking lots/spaces, City facilities/employees, commercial buildings and homes.
- **The City** update and implement its fleet procurement policy such that at least half of the City's fleet is EVs before 2030. For example, the city can explore and test electric motorcycles for the police.
- **LOSD** evaluate the potential for using electric school buses when it renews its transportation contract in 2020.

Recommendation 2: Make public transit more convenient. We recommend:

- **Community Groups** partner with TriMet, Metro, Clackamas County and others to triple transit ridership by 2025.
 - Organize local businesses to petition TriMet for transit options to address employee commuting challenges.
 - Test and increase access to transit via Universal Bus Passes and innovative on-demand transit programs.
- **The City** work with TriMet in 2018 to access available funds and implement proposals for increased service and additional bus shelters where needed (including upgrades to the Lake Oswego Transit Center on 4th Street). For example, provide additional park & ride facilities; and increase the frequency of service for Bus #35 (including an express option) with a minimum of 15-minute headways during the weekdays.
- **The City** (with Lake Oswego Chamber of Commerce and other business groups) study the potential benefits of a demand-responsive circulator or shuttle service, as proposed in the Lake Oswego Transportation System Plan. Survey Kruse Way commuters to understand demand and opportunity for additional transit service.
- **LOSD** work with parents and Community Groups to facilitate at least one field trip (per school per year) or a "Transit Day" where students take a trip via TriMet.

Other ideas to explore:

1. Create "Safe Routes to School" and "Complete Streets" (i.e., increased walkability and neighborhoods where local services are within 20 minutes by walking or biking).
2. Increase utilitarian biking (riding a bike instead of driving a car). As the City invests in bike and pedestrian pathways, it can expand options for residents and local employees with: efforts to support a bike path to Portland parallel to Highway 43 (while maintaining the option for a future rail line); new links between bike paths and transit; and bike sharing programs, including those offering electric bikes to "flatten" the hilly terrain of Lake Oswego.

BUILDINGS AND ENERGY

Actions to improve the energy performance of homes, schools, and workplaces. We recommend options that Lake Oswego can initiate to help building owners and homeowners reduce energy use, improve health and productivity, increase comfort

FAST FACTS

The energy that powers homes, schools, and workplaces in Lake Oswego accounts for more than 20 percent of GHG emissions in Lake Oswego (see Appendix B).

LED streetlight upgrades have reduced annual electricity costs by approximately \$180,000 (<http://bit.ly/2E79sKJ>).

The City is aiming to install 1 Megawatt of solar power by 2021.

and safety, and support local jobs.

Recommendation 3: Avoid energy waste. We recommend:

- High performance building standards for new construction. Encourage builders and developers to incorporate sustainable building practices to increase the quality, durability, and performance of new buildings in Lake Oswego.

The City update and expand its "High Performance Building Guidelines for City Facilities" to include guidelines for all new commercial and residential development.

- Encourage and incentivize (e.g., with lower permitting fees) commercial and residential developers to follow existing high performance building standards. Examples include LEED (including LEED for Homes), Earth Advantage, or Passive House.
- Require energy performance benchmarking (i.e., Energy Usage Index - EUI) to track efficiency of new commercial buildings over [5,000] square feet.

The City express its support for efforts to update energy efficiency standards in Oregon's building codes.

The City and LOSD target an EUI of 22 or less in all new construction projects.

- Energy efficiency upgrades to existing buildings. Help building owners and homeowners save money and increase comfort by taking advantage of state and local programs to help reduce energy use and costs (e.g., PGE time of use).

Community Groups engage local building industry to develop and facilitate a series of "home energy fairs" in 2018-2019 to showcase opportunities for energy savings (e.g., free energy audits, insulation upgrades, time of use billing).

The City develop a policy to provide homebuyers information on home energy performance as part of real estate sales transactions; partner with Oregon Department of Energy and local organizations to offer Home Energy Scores.

The City partner with local organizations to facilitate commercial, multifamily, and homeowners opportunities to do both seismic and energy upgrades at the same time.

LOSD work with local organizations to complete energy audits and efficiency upgrades at all schools by 2020.

Recommendation 4: Make clean energy more accessible. We recommend:

- **Community Groups** work with businesses, LOSD, and neighborhood groups to develop "community solar" installations to help achieve and surpass the City's 1 Megawatt goal by 2020.
 - Convene solar information sessions in 2018, with outreach and recruiting efforts along Kruse Way.
 - Partner with Clackamas County to recognize "solar champions" as part of Leaders in Sustainability program.
 - Support and develop local investment groups interested in local clean energy technology projects.
- **The City** streamline [and waive or reduce fees for] permitting of commercial and residential development and remodeling if the projects include installation of solar PV systems.
- **LOSD** continue to partner with Energy Trust to evaluate solar potential on existing schools and tap into financial incentives from Energy Trust's "Path to Net Zero" program for new school construction.

Other ideas to explore:

1. Promote deconstruction as a preferred alternative to demolition of older homes and businesses.
2. Continue to explore attainable housing concepts and identify site parameters conducive to its development (e.g., consider dropping fees for secondary dwelling units and finding opportunities for cottage development zoning).
3. Invite local businesses to pilot new clean energy and/or building technologies with local research universities.

CONSUMPTION (FOOD AND MATERIALS)

Actions to ensure Lake Oswego is maximizing the benefits of good food and durable products. We recommend Lake

FAST FACTS

Food and consumption accounts for more than 40 percent of Lake Oswego's total GHG emissions (see Appendix B).

We consume more food and protein than we need (2,900 calories and 90 grams of protein per day), putting our health at risk. A more balanced diet of 2,500 calories and 50 grams per day, which still includes animal-based food such as beef, could reduce agricultural GHG emissions by more than 40 percent (see Appendix C, page 22). Likewise, there are opportunities to reduce the amount of food produced with organic or regenerative farming methods.

Countries and companies around the world have embraced a global ambition to reduce food waste by 50 percent by 2030. Food-related GHG emissions – from farming to deforestation to food waste – are the number one global source of GHG emissions. There are many opportunities to address climate change by addressing how and what we grow and eat.

Oswego promote better health and reduce GHG emissions with low-impact food choices and waste management practices.

Recommendation 5: Increase sustainable food options. We recommend:

A food program to decrease agricultural GHG emissions by 30-50 percent. We recommend:

- **Community Groups** partner with the City, LOSD, local businesses to “nudge” residents toward food choices that are tastier, healthier, and low-impact (e.g., shifting consumption away from high impact foods such as beef).
- **The City** share recipes and tastings for healthy, low-impact meals via HelloLO and Adult Community Center.
- **LOSD** pilot, with support of parents and Community Groups, several healthier, low-impact school menus.

More local organic food options. We recommend:

- **Community Groups** promote the benefits of organic food and its availability through stores, restaurants and local produce stands.
- **The City** continue support for the Farmer's Market and Luscher Farm Community Supported Agriculture (CSA).
- **The City** explore expansion of community gardens beyond Luscher Farm for edible landscaping and gleaning.

Recommendation 6: Cut food waste in half. We recommend:

- **Community Groups** pilot test “ugly food” stands or other means of selling produce that is otherwise wasted.
- **The City** work with Clackamas County to provide a “best practices” guide and tools for households, schools, businesses and other institutions to reduce food waste (including food donation and commercial food composting).
- **LOSD** create “Share Tables” or similar programs at each school to ensure food that is otherwise wasted ends up in households that need it.

Recommendation 7: Extend useful life of clothing, electronics, building materials. We recommend:

- **The City** explore pilot projects to measure consumption and engage Republic Services or others to create better access to information about how to get usable goods (such as electronics and clothing) to those who need them.
- **The City** explore a “tool library” model at Lake Oswego library or Operations Center for residents to access shared tools or equipment, including electric power tools (rather than purchasing, owning, and disposing individually).
- **LOSD** preserve and reuse construction materials from facilities such as Lakeridge Junior High School by partnering with local organizations that help deconstruct and repurpose buildings.
- **Community Groups** explore opportunities to partner with LOSD and local businesses to create “Fix it Fairs” in 2018.

RESOURCES AND RESILIENCE

Actions to preserve Lake Oswego's air, land, and water resources in a changing climate. We recommend Lake Oswego continue with careful planning and responsible development so commercial districts and residential neighborhoods continue

FAST FACTS

According to Oregon State University, average temperatures in Oregon could rise by 3° to 7°F by 2050 and 5°F to 11°F by 2080.

Lake Oswego has been a "Tree City USA Community" for nearly 30 years, benefiting from trees' aesthetics, shade (lower heat exposure and cooling loads), carbon sequestration, increased property value, noise mitigation, improved air quality and local habitat.

to be safe and resilient to new climate extremes.

Recommendation 8: Plan for new extremes. We recommend:

- **The City** update disaster management policies and procedures in preparation for more frequent extreme weather events (e.g., heavy rain, floods, fires, droughts).
- **The City** assess where new rules, policies, or programs are needed in advance of extreme weather (e.g., sufficiency of existing heating/cooling centers, necessary updates to scheduling rules for construction and trash pickup).
- **LOSD**, with support from parent organizations and Community Groups, review and update policies for weather extreme preparedness (e.g., extreme heat policies for outdoor activities, indoor comfort, and air quality).

Recommendation 9: Manage water wisely. We recommend:

- **The City** increase promotion of free water audits through partnerships with Chamber of Commerce and LOSD and continue the promotion of highly efficient water fixtures and appliances.
- **The City** continue to explore and promote opportunities to use harvested rain water and grey water for irrigation.
- **The City** update flood zone maps, in particular for Foothills area.
- **The City** implement and assess effectiveness of new stormwater management goals and guidance.
- **The City** explore technologies that can reclaim water and energy waste at wastewater and water treatment facilities.

Recommendation 10: Preserve and enhance our forests and natural areas. We recommend:

- **Community Groups** plant 1,000 new trees a year for five years, in partnership with LOSD and local property owners, with an emphasis on native species, drought tolerance, fire protection, habitat restoration and biodiversity.
- **Community Groups** preserve trees and improve open space on private and LOSD properties, including removal of tree ivy, and other invasive plants, to improve fire protection and the health and viability of existing trees.
- **The City** partner with local organizations to buy and plant 500 trees on City-owned property (while taking into consideration watering and maintenance requirements) and invite sponsors to buy, and volunteers to plant, trees on City-owned land, or ODOT-owned land on which the City gains permission to plant the trees, such as along I-5.
- **The City** increase preservation of trees and improvement of open space, through review and update of the Development Code as relates to tree preservation, and enforcing tree preservation requirements on sites that are developed prior to annexing to the City.
- **The City** support a tree program with annual Habitat Enhancement Fund grants and explore potential "tree-bates" on water bills for residents that purchase trees to plant and maintain on their own property.
- **The City** advocate to update fire management processes in Tryon State Park and City-owned parks and natural areas.

Other ideas to explore:

1. Preserve air quality with a "Lawn Equipment Electrification" program for residents and lawn care businesses to trade gas-powered equipment for electric equipment (for example, see South Coast AQMD exchange program).
2. Preserve local air quality by enforcing anti-idling rules for delivery trucks and school pickup/dropoff; and promoting electrification of gas powered equipment and generators, such as seasonal events in the parks, food truck alleys, etc.

IMPLEMENTATION (AND MEASUREMENT)

Lake Oswego is committed to preserving and improving the quality of life of residents and the economic opportunities for businesses. To ensure the actions in this summary are implemented in line with that commitment, we recommend:

- **The City** use a “quality of life” dashboard (currently in development) to communicate progress on climate action areas and survey community opinion before/after.
- **The City** identify areas in its 2018 goals where the recommended climate actions can be implemented and adopt annual practice of reviewing progress on climate action.
- **The City** develop a periodic and comprehensive assessment of GHG impacts of City development plans and annual goals, including metrics that highlight Lake Oswego’s Carbon Productivity and consumption; hire interns to create open databases for City’s solar potential, tree planting, and financial resources available to residents.

We recommend that each recommended action have an “owner” to drive implementation in 2018 (see Appendix D for more detail).

Action Area	Recommended Actions, Owners, and Resources
Transportation and Connectivity	<p>1. Electrify transportation:</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> LOSN Transportation Team, LOSN School Team b. <i>City:</i> Public Works, Planning Department, Planning Commission, Sustainability, SAB, Transportation Advisory Board c. <i>Other organizations and resources:</i> FORTH, State of Oregon (https://www.afdc.energy.gov/laws/11865) <p>2. Make public transit more convenient</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> LOSN Transportation Team, LOSN School Team b. <i>City:</i> Engineering Department c. <i>Other organizations and resources:</i> Chariot, Portland State University, TriMet, Climate Solutions, local employers (Nike, Intel, Yakima)
Buildings and Energy	<p>3. Avoid energy waste</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> LOSN Energy Team, LOSN School Team b. <i>City:</i> Sustainability, SAB, Planning and Buildings Department c. <i>LOSD:</i> Randy Miller d. <i>Other organizations and resources:</i> PGE/NW Natural, Energy Trust of Oregon, Enhabit, local universities, local building industry <p>4. Make clean energy more accessible</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> LOSN Community Solar Team
Consumption (Food and Materials)	<p>5. Increase sustainable food options & 6. Cut food waste in half</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> LOSN Food Team, LOSN School Team b. <i>Resources:</i> Oakland sustainable food program (http://bit.ly/2CYdwgV) and Share tables (http://bit.ly/2CIWTJd) <p>7. Extend useful life of clothing, electronics, building materials</p> <ul style="list-style-type: none"> a. <i>Other organizations and resources:</i> Curb My Clutter, Rebuilding Center
Resources and Resilience	<p>8. Plan for new extremes</p> <p>9. Manage water wisely</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> LOSN Water Team, Lake Oswego Watershed Council b. <i>City:</i> Water Conservation c. <i>Other organizations and resources:</i> CoreLogic and NOAA flood risk maps <p>10. Preserve and enhance our forests and natural areas</p> <ul style="list-style-type: none"> a. <i>Community Groups:</i> Lake Oswego Watershed Council, Friends of Trees b. <i>City:</i> Parks Department, Parks, Recreation and Natural Resources Advisory Board, Planning Department, Planning Commission, Water c. <i>Other organizations and resources:</i> Clackamas Soil and Water District

Appendix A. Overview of approach.

In early 2017, the City of Lake Oswego’s Sustainability Advisory Board (SAB) established a small coordinating committee—drawing representatives from SAB, Lake Oswego Sustainability Network, and the City—to coordinate and advance recommendations. Together, the team developed a work plan for delivery of recommendations by the end of the year with an aim to:

Align with existing City goals, plans and policies, as well as community interests and programs.

- Instead of creating a new “plan” or additional programs, the recommendations focus on sensible policy updates or opportunities to incorporate climate actions into existing plans and programs.
- Specifically, many of the recommended actions in this draft should be incorporated into an updated “Sustainability and Climate Action Plan” (in coordination with the City’s Staff Sustainability Committee).

Update the City’s policies and infrastructure in a way that can be measured, managed, and adapted over time.

- Two questions will define success for each action: (1) Does this help preserve and improve quality of life in Lake Oswego? and (2) Can this be measured in a way that indicates whether the City is just ‘doing better’ or is ‘doing what is necessary’ to minimize and adapt to climate change?
- Specifically, this draft outlines the interventions, the metrics, and the “owners” to implement each action.

The team organized actions to focus on four primary areas for action: (1) transportation and connectivity; (2) buildings and energy; (3) food and material consumption; and (4) natural resources and resilience. Members of SAB and LOSN contributed ideas and analysis by completing assessment worksheets that asked several key questions (see template below). These worksheets informed the final set of recommendations.

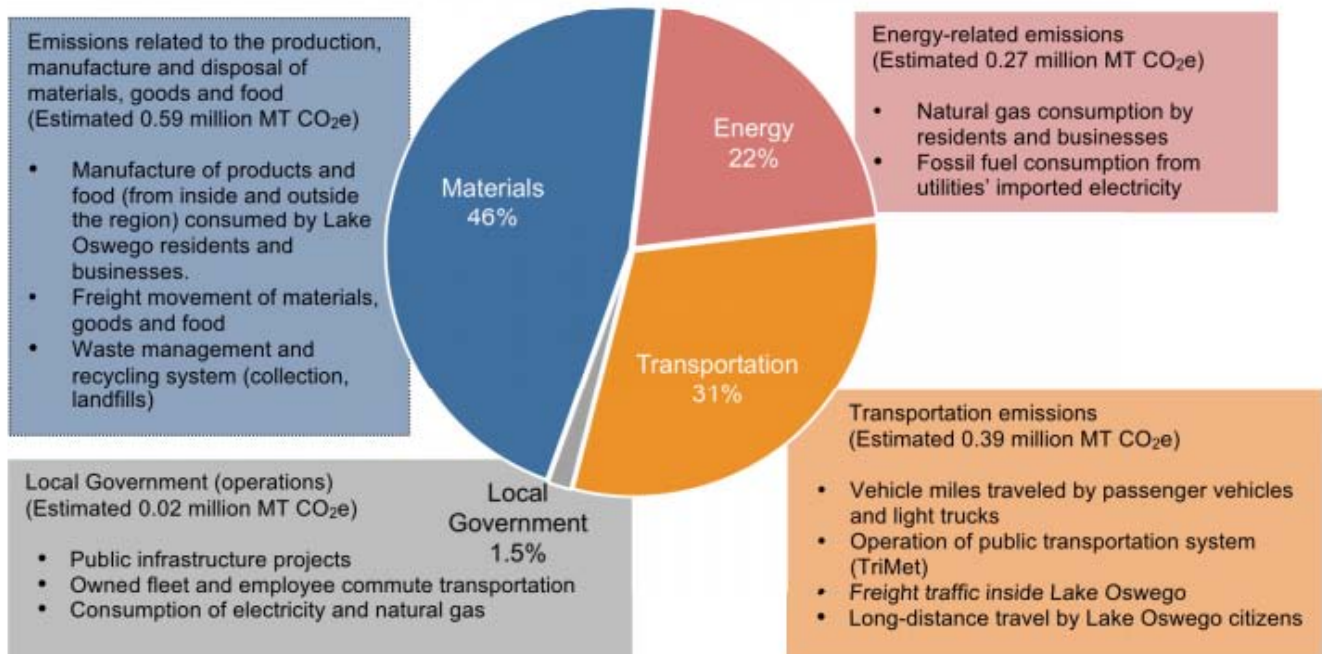
Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	[Insert Climate Action Title]
Timeframe <small>(near, medium, long term)</small>	[Timeframe]
Date	[Date]
Submitted by (Name)	[Name]
Criteria for Assessment:	
Climate Impact:	Greenhouse gas emission reduction potential
Community Benefits:	Who benefits, how is this measured?
Financial Implications:	Total cost, who pays? cost/benefit, payback period
Compatibility with the Lake Oswego lifestyle:	Does this action enhance the lives of 10% or more of current Lake Oswego residents? If yes, how? Does this action reduce livability for 10% or more Lake Oswego residents? If so, how?
Implementation Issues:	Who will implement this action? Do they have the willingness, resources and knowledge? Is there a designated “owner” and a designated “champion”?
Proposed Timing:	Is this near term, medium term, or long term?

Introduction
A short section describing key action(s) proposed, and why they should be included in the plan.
Which Focus Area does this action affect? (<i>Buildings/Energy, Transportation, Land Use/Planning, Food/Consumption</i>)
Financial Information
How much will this action cost?
Is there a payback? How long is it?
What is the cost/benefit analysis?
Who will pay?
Impact Information
What is the impact on greenhouse gas reduction? <i>Show your assumptions, include emissions factors and citations.</i>
How does this action help Lake Oswego meet its climate goals?
What are the community benefits of this action?
Actions
Describe your proposed action in more detail with specific targets about what will be achieved.
Describe how the action meets guiding principles related to consistency with Lake Oswego lifestyle.
Include any notes, resources or documentation required for understanding the action.
Implementation
The time frame of the action – can it be accomplished by the end of 2018?
How will this action be implemented?
Is there a person who is responsible for implementation, an “owner” willing and available to carry out the action? Is there a person who is passionate about this action, a “champion”?

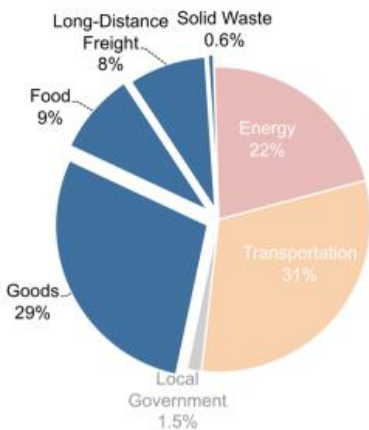
Lake Oswego Greenhouse Gas Emissions (2006)

1.27 Million Metric Tons Carbon Dioxide Equivalent (Millions of MT CO₂e)

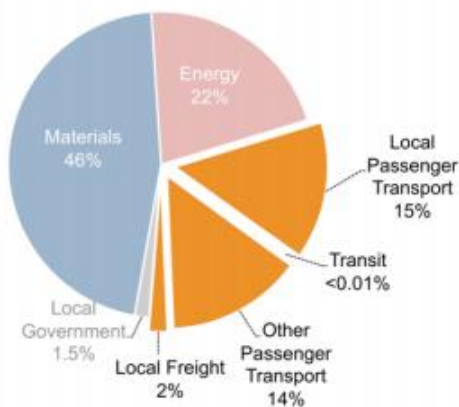
29.9 Metric Tons CO₂e per Lake Oswego Resident



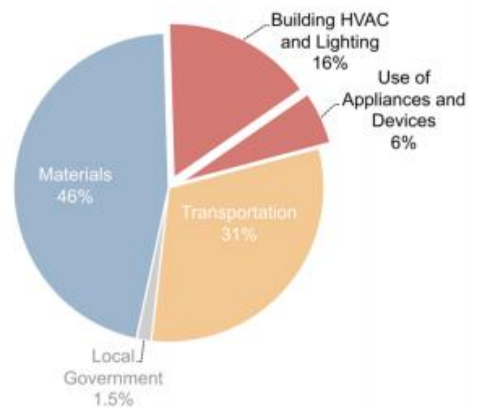
Lake Oswego Community Greenhouse Gas Emissions with Materials Split



Lake Oswego Community Greenhouse Gas Emissions with Transportation Split



Lake Oswego Community Greenhouse Gas Emissions with Energy Split



For further detail, see:

https://www.ci.oswego.or.us/sites/default/files/fileattachments/sustainability/webpage/13289/att_a_lakeoswego-commghginv-021612-final.pdf

Appendix C. Worksheets with additional information and analysis on select recommendations

Contents

Electric Vehicle Actions -- Assumptions & Analysis Worksheet..... 11

 Analysis of the Impact of Increasing the Purchase of EVs in Lake Oswego 14

 Electric Vehicle Frequently Asked Questions..... 16

 NYT Editorial on Electric Cars 18

Public Transit Actions -- Assumptions & Analysis Worksheet 20

Car-Sharing and Ride-Sharing Actions -- Assumptions & Analysis Worksheet 24

Utilitarian Biking Actions -- Assumptions & Analysis Worksheet 26

Food Awareness Actions -- Assumptions & Analysis Worksheet..... 27

Organic Food Actions -- Assumptions & Analysis Worksheet..... 30

Food Waste Actions -- Assumptions & Analysis Worksheet 33

Tree Planting Actions -- Assumptions & Analysis Worksheet..... 35

Electric Vehicle Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	Increase number of new electric vehicle purchases in LO to 50% by 2030
Timeframe (near, medium, long term)	Long term with short and medium actions
Date	October 2, 2017
Submitted by (Name)	Lisa Adatto, Duke Castle & Rob Heape

Criteria for Assessment:	
Climate Impact:	Can reduce GHG from 189 Mtons currently to 75 Mtons by 2040, a 60% reduction
Community Benefits:	Whole community enjoys cleaner air
Financial Implications:	Primary cost is borne by resident when they purchase a new car. City might decide to underwrite EV charging stations.
Compatibility with the Lake Oswego lifestyle:	Very little change in current auto lifestyle unless autonomous driving becomes prevalent.
Implementation Issues:	Education is required to demonstrate benefits and differences of electric vehicles over gas cars. There will also be a need to expand the EV charging network in LO.
Proposed Timing:	Near and medium term

Introduction
<p>15% of all Lake Oswego GHG emissions and 50% of all transportation GHG emissions are due to operating internal combustion vehicles. Motivating citizens to switch to electric vehicles will have the greatest impact in reducing GHG transportation emissions and one of the most impactful actions of all those being considered for the Lake Oswego climate action plan.</p> <p>Two of the biggest barriers to the acceptance of electric cars, price and driving range, are changing dramatically. This has caused a number of countries to ban the sale of internal combustion vehicles starting in 2025 and has caused several prognosticators to forecast that the sale of electric vehicles will dominate the auto market within 10 years or so.</p> <p>With its well-educated population, auto-oriented culture and above average incomes, Lake Oswego's citizens could be on the forefront of that transition. Actions that would support that include community education on the benefits and differences in electric vehicles and a greater proliferation of charging stations and options particularly for multifamily residences.</p> <p>Which Focus Area does this action affect? <i>Transportation</i></p>

Financial Information

How much will this action cost?

Educational activities could include periodic public EV fairs and resource information on the city's website. These costs would primarily be staff time.

There are EV charging network organizations such as Chargepoint and Tesla that could be incentivized to expand charging options in Lake Oswego. The cost of to the city to do so depends on how much the city wants to underwrite such an effort. More research would be needed to determine what the city would like to do.

Is there a payback? How long is it?

Electric vehicles are a lot less complex and cost less to maintain and operate than internal combustion vehicles making them cost competitive now to purchase and operate. Continued declining battery costs are projected to make EV purchase prices alone cost competitive with internal combustion vehicles by 2025.

What is the cost/benefit analysis?

In addition to a significant decrease in GHG emissions, there would also be a significant decrease in toxic emissions and increase in cleaner air. A study by MIT estimates that there are 58,000 deaths annually in the U.S. due to toxic vehicle emissions vs. 35,000 due to accidents. Additionally many EVs like Tesla and the GM Volt have Level 2 Partial Autonomy which can significantly reduce rear end collisions. Initial results of Level 4 fully autonomous driving indicates that EVs at that level could reduce accident rates by 10-40%

Lastly over time as enough electric cars are hooked to the grid they can be used by PGE to smooth out load demand through vehicle-to-grid (V2G) capability where the car batteries are used as a source of electricity. The same V2G capability can be used in emergencies for short term electric backup.

Who will pay?

The city would have some investment in staff time and possible financial outlay to underwrite expanding the EV charging network. The major costs though would be paid by the residents when they purchase a new car and residential charging equipment, and by the charging networks that decide to add public charging stations in the community.

Impact Information

What is the impact on greenhouse gas reduction?

Show your assumptions, include emissions factors and citations.

The GHG reductions of converting to electric cars are significant, with a possible GHG reduction of 60% in the next 25 years. See Appendix A for the assumptions and analysis.

How does this action help Lake Oswego meet its climate goals?

Actions

To meet the goal of significantly increasing the usage of electric vehicles in Lake Oswego our recommended actions focus on two areas: actions that support the purchase and usage of EVs and actions that support the increase and availability of EV charging stations.

Strategy: Actions that support purchase and usage of electric vehicles

1. Develop and execute a campaign to provide decision makers and the public opportunities to drive an EV and experience its benefits.
2. Develop and provide information about electric and hybrid vehicles and incentive programs on the City website.
3. Take advantage of the \$2500 rebate for new EV purchases under the new state transportation program. For some there is also an additional \$2500 rebate if the EV replaces a 20 year old car.
4. City purchase or contract for 50% electric vehicles
5. Encourage the Lake Oswego School District to contract for electric school busses

Strategy: Actions to support increased EV charging stations

6. Adopt building codes that promote EV charging infrastructure -- look at building in conduits as new streets and buildings are constructed
7. Take advantage of potential opportunities under the new state clean fuels program.
8. Advocate (as a city) at the state and regional level for better charging station infrastructure like standardized plug - ins, signage, standardized payment methodology, roadways and mapping strategy
9. Promote workplace charging
10. Increase charging infrastructure in Lake Oswego
 - Multi family pilot
 - HOA pilot
 - Along city streets
 - Electric Avenue

Implementation

The time frame of the action – can it be accomplished by the end of 2018

Activity on Actions #1-3 could take place in 2018. Actions #4 & 5 depend on when vehicle contracts for the city and school district will be renewed. Actions #7 & 8 require more research.

All of the charging station actions (#6 to 10) require research on the cost to implement, the interest in private charging networks to participate and research on what other policies other cities have implemented to promote more charging station availability.

How will these actions be implemented?

Much of the planning and research can be done by SAB, TAB, LOSN and the city sustainability coordinator. At some point the city maintenance, operations and planning departments would be involved.

Analysis of the Impact of Increasing the Purchase of EVs in Lake Oswego

Assumptions

Lake Oswego – June 2016

Total number of cars in Lake Oswego - 39,645

Total number of electric vehicles in Lake Oswego – 515

Source: PSU- Transportation Research and Education Center

New car sales calculation

2016 total number of cars in U.S. – 253 million

2016 new car sales in U.S. – 17.6 million

Percentage of new cars purchased – 7.0%

Source: IHS Automotive

Annual new car sales growth – 2%

Source: National Automotive Dealers Association

Greenhouse Gas Impact

Avg number of miles driven per year per vehicle – 13,474 – Source: U.S. Dept. of Transportation

Avg Miles per Gallon (2015) – 24.8 - Source: EPA

Total gallons purchased per year per vehicle – 543 gallons

CO2 emissions per gallon – 8.81 kilograms/gallon – Source: World Resources Institute

CO2 emissions per vehicle per year – 4.8 metric tons

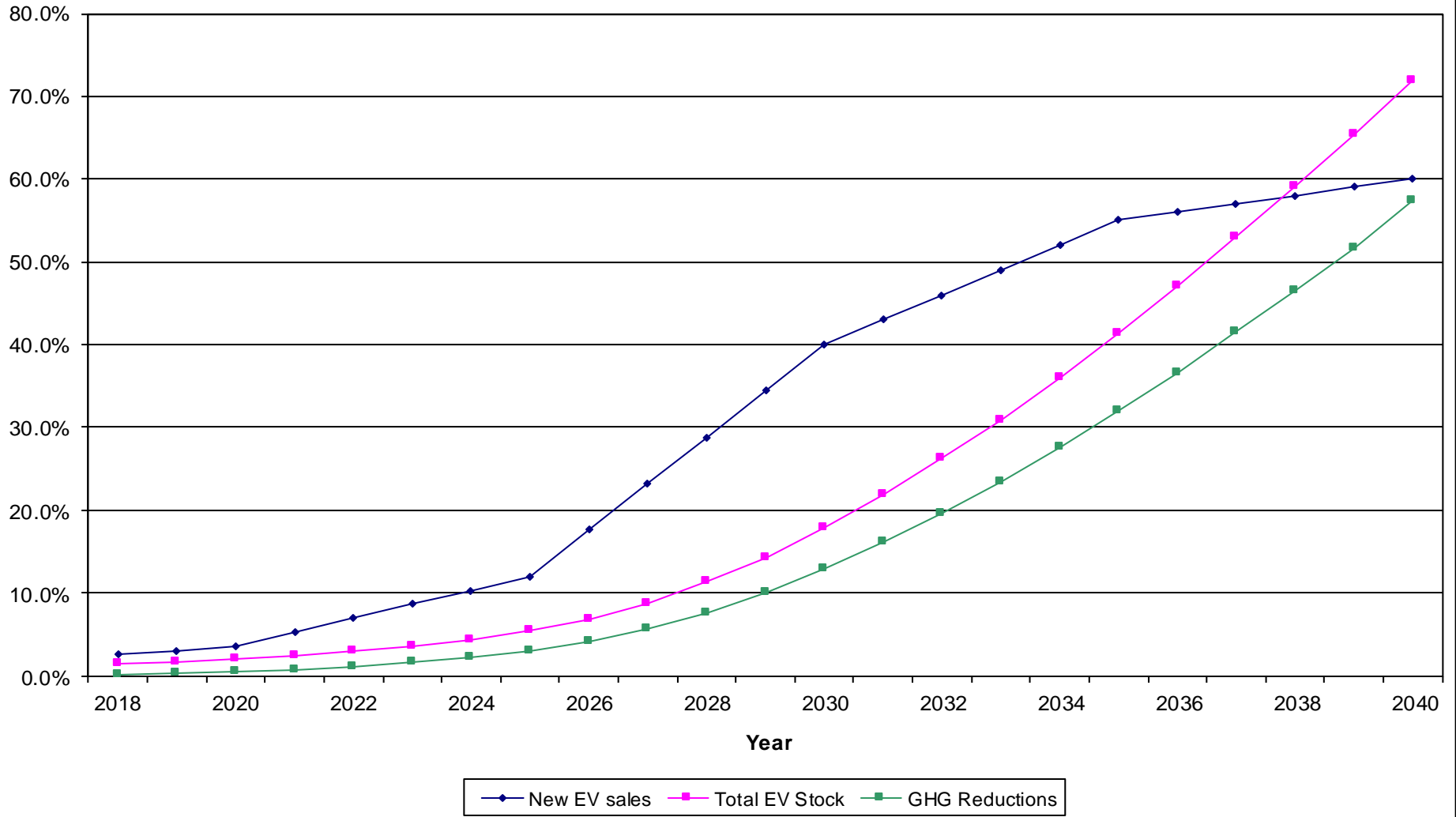
U.S. Electric Vehicle Sales Forecast – 2.5% in 2018 growing to 60% by 2040

Source: Bloomberg New Energy Finance

Projected Number of LO Electric Vehicles

<u>Year</u>	<u>LO New Car Sales</u>	<u>% EVs</u>	<u>New EV</u>	<u>Total EV</u>	<u>% Total Cars</u>	<u>Annual decrease in GHG emissions metric tons</u>	<u>Cumulative decrease in GHG emissions</u>	<u>Percent decrease in auto GHG</u>
2018	2813	2.5%	70	585	1.5%	337	190	0.1%
2019	2869	3.0%	86	671	1.7%	412	422	0.2%
2020	2927	3.5%	102	774	2.0%	490	799	0.4%
2021	2985	5.2%	155	929	2.3%	743	1,372	0.7%
2022	3045	6.9%	210	1139	2.9%	1,006	2,146	1.1%
2023	3106	8.6%	267	1406	3.5%	1,279	3,131	1.6%
2024	3168	10%	326	1733	4.4%	1,562	4,334	2.3%
2025	3231	12%	388	2120	5.3%	1,856	5,763	3.0%
2026	3296	18%	580	2700	6.8%	2,777	7,902	4.2%
2027	3362	23%	780	3480	8.8%	3,733	10,777	5.7%
2028	3429	29%	988	4468	11%	4,727	14,417	7.6%
2029	3498	34%	1203	5671	14%	5,759	18,853	10%
2030	3568	40%	1427	7098	18%	6,831	24,428	13%
2031	3639	43%	1565	8663	22%	7,490	30,540	16%
2032	3712	46%	1707	10370	26%	8,173	37,210	20%
2033	3786	49%	1855	12226	31%	8,880	44,457	23%
2034	3862	52%	2008	14234	36%	9,612	52,302	28%
2035	3939	55%	2166	16400	41%	10,370	60,765	32%
2036	4018	56%	2250	18650	47%	10,769	69,554	37%
2037	4098	57%	2336	20986	53%	11,181	78,680	41%
2038	4180	58%	2424	23410	59%	11,605	88,150	46%
2039	4264	59%	2516	25926	65%	12,041	97,977	52%
2040	4349	60%	2609	28535	72%	12,490	108,745	57%

Lake Oswego Electric Vehicle Growth



Electric Vehicle Frequently Asked Questions

Overview

Electric vehicles right now are a niche market, just about 1% of total U.S. new car sales in 2016. Yet some analysts are predicting that electric vehicle sales could reach 40% of U.S. new car sales by 2030 and close to 60% by 2040. What is causing such optimistic projections?

There are many factors in play. Some of them are:

- new, lower cost models due to rapidly decreases in battery costs
- automobile fuel efficiency regulations in the U.S. and globally that ultimately are best met through electrification
- continuing decline in the cost of batteries that will make EVs cost competitive with fossil fuel driven vehicles in some parts of the world within two years and in the U.S. within seven years.
- a growing number of countries that have set deadlines outlawing the sale of internal combustion engine autos starting as soon as 2025

They are too expensive!

If one looks at just the Tesla Model S and Model X, they indeed are expensive starting at around \$60,000 and fully loaded reaching \$120,000. However things are rapidly changing.

General Motors introduced the Chevy Bolt for \$37,000 in 2016 and Tesla just started shipping their Model 3 with a base price of \$35,000. Both qualify for a \$7500 federal tax credit and in 2018 will qualify for a \$2500 Oregon state rebate. Both cars will travel over 200 miles on a single charge. In certain cases there is also an additional \$2500 from the state if the EV is replacing a 20+ year old car.

However there are other models available such as the Nissan Leaf with a 100+ mile range that is selling for under \$30,000. The Ford C-MAX Energi plug-in hybrid with 20 mile battery range and 550 miles total sells for around \$25,000

And, the number of new models being offered is rapidly increasing. All car companies are developing EVs with Volvo stating that they will have electric versions of all of their vehicles after 2019. Bloomberg New Energy Finance group estimates that there will be over 200 different electric vehicle models by 2020. With the continued decline of battery costs Bloomberg projects that the selling price of EVs will reach parity in the U.S. with fossil fuel autos by 2024.

They take too long to charge

“Refueling” electric vehicles requires seeing the differences between refueling with fossil fuel and with electricity.

With fossil fuel you fill up your tank when it gets low. Some days you may have full tank. Other days it maybe low. Most people with electric vehicles will charge there car at home meaning that virtually everyday they will leave with a “full tank”. The only times they need to be concerned about charging is when they are driving beyond the range of their batteries. At this point they will want to plan to charge with a high voltage or super charger. Tesla has installed over 6000 [super charging stations](#) that will charge to about 80% of capacity in 20-30 minutes. A number of these are strategically placed at restaurants and other places where you can grab a bite to eat while you vehicle is being recharged.

There aren't enough charging stations around

The number of charging stations is continually growing. Tesla plans to triple the number of super chargers to 18,000 by the end of 2018. There are networks like [Chargepoint](#) that has just under 40,000 charging outlets available for public use. In addition apps such as [Plugshare](#) that shows a driver information on virtually all the public and private charging outlets available for use.

The number of charging stations will grow with time. However this is one of issues where a city like Lake Oswego can make a difference by encouraging the installation of chargers in businesses, public garages, multifamily housing and places accessible to those who might not have access to a home charger. Additionally the city could be in a position to negotiate and possibly subsidize charging fees with charging networks.

Since so much electricity is generated by coal, isn't pollution worse with EVs?

Actually, no, as utilities move toward more renewable sources of electricity generation. According to PGE 40% of their electricity currently comes from renewable sources and that will grow to at least 70% by 2040. This is not just happening in Oregon but through out the U.S. as the cost of renewable energy has become cheaper than fossil fuel causing utilities to move away from coal and eventually from natural gas.

Won't all of these batteries just end up in a landfill?

Electric car batteries can be recycled and one of the biggest uses is to [repurpose](#) them for other applications such as solar energy storage and data center backup. After that the materials such as lithium and cobalt can be extracted and reused. Auto manufacturers such as Nissan are setting up recycling programs and others options are emerging. So continuing to drive a fossil fuel-based car would not seem to be a good option while one waits for battery recycling to get better.

Won't EVs put a strain on utilities to produce enough electricity?

As more energy efficiency practices are put into effect, the per capita demand for electricity has decreased. Utilities see electric vehicles reversing that. Even so Bloomberg New Energy Finance group estimates that by 2040 when new electric vehicle sales may approach 60%, EVs will only require 5% of the total utility capacity.

Isn't the environment better off if I just keep driving my old car?

Not according to a [study done by the Union of Concerned Scientists](#). Their analysis shows that in a life cycle analysis the manufacturing of a fossil fueled automobile is only responsible for 8-12% of its total GHG emissions. The rest comes from burning fossil fuel to operate the vehicle.

Why not wait until these cars get cheaper and better?

The biggest cost of building an electric vehicle is the batteries. Electric vehicle [battery costs have declined 80% in the last six years](#) and are continuing to decline. So EV prices will go down over time. For those who are concerned about declining costs, one approach is to leave their EV and get a newer model later.

However electric cars are more than just fossil fuel-free vehicles. They are like a computer-on-wheels that can be improved and upgraded with software downloads. Tesla is constantly adding features at no additional cost with software downloads to owner's cars at night. So unlike internal combustion cars, EVs have the ability to get better over time.

What other benefits are there?

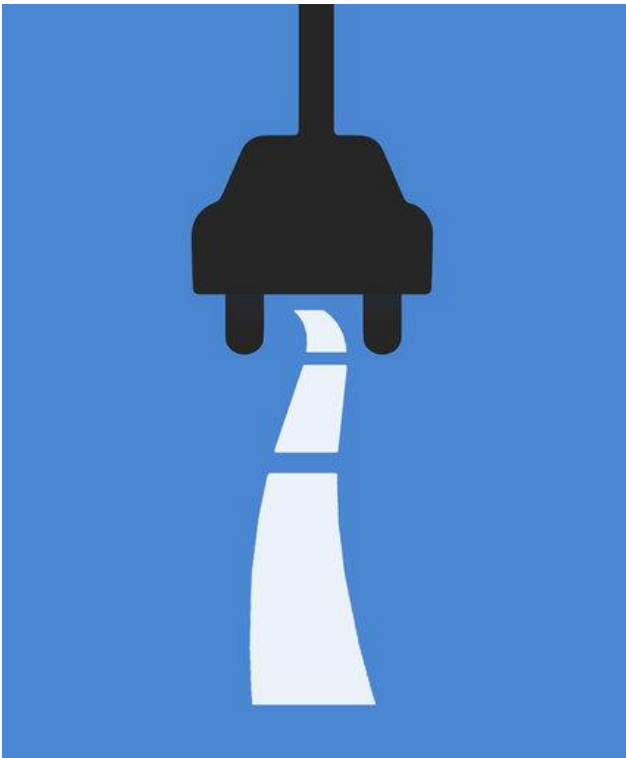
A significant additional benefit is cleaner air. A [study by MIT](#) calculated that increased air pollution from vehicles that burn fossil fuel contributes to 58,000 premature deaths annually in the U.S. This compares to 35,000 deaths caused by automobiles.

And, autonomously driven electric vehicles hold the promise of significantly reducing the number of automobile accidents and deaths. Data from [Google's Self Driving Program](#) suggests that fully autonomous cars are 10 times safer compared to the safest demographic of human driven vehicles (60-69 year olds) and 40 times safer than new drivers. In the meantime Level 2 semiautonomous software is available on Teslas and some General Motors cars that should significantly reduce rear end collisions.

A Brighter Future for Electric Cars and the Planet

By THE EDITORIAL BOARD

JULY 18, 2017



There is simply no credible way to address climate change without changing the way we get from here to there, meaning cars, trucks, planes and any other gas-guzzling forms of transportation. That is why it is so heartening to see electric cars, considered curios for the rich or eccentric or both not that long ago, now entering the mainstream.

A slew of recent announcements by researchers, auto companies and world leaders offer real promise. First up, a forecast by [Bloomberg New Energy Finance](#) said that electric cars would become cheaper than conventional cars without government subsidies between 2025 and 2030. At the same time, auto companies like Tesla, [General Motors](#) and [Volvo](#) are planning a slate of new models that they say will be not only more affordable but also more practical than earlier versions. And officials in such countries as France, India and Norway have set aggressive targets for putting these vehicles to use and phasing out emission-spewing gasoline and diesel cars.

Skeptics may see these announcements as wishful thinking. After all, just [1.1 percent of all cars](#) sold globally in 2016 were electrics or plug-in hybrids. And many popular models still cost much more than comparable fossil-fuel cars.

The skeptics, however, have consistently been overly pessimistic about this technology. Electric cars face challenges, yet they have caught on much faster than was thought likely just a few years ago. **There were two million of them on the world's roads last year, up 60 percent from 2015, according to the [International Energy Agency](#).** The cost of batteries, the single most expensive component of the cars, fell by more than half between 2012 and 2016, according to the [Department of Energy](#). Tesla [has indicated](#) that it can produce batteries for about \$125 per kilowatt-hour. Researchers say the cost of electric cars will be at parity with conventional vehicles when battery prices reach \$100 per kilowatt-hour, which experts say is just a few years away. Electric cars are more efficient, of course, but they also require less maintenance, which should make them cheaper to own over time.

The potential environmental benefits of electric vehicles are huge. The transportation sector accounts for 14 percent of [global greenhouse gas emissions](#) and 27 percent of [emissions in the United States](#). Moreover, countries have found it much more difficult to reduce planet-warming gases from transportation than from power plants. In America, for example, transportation emissions

again [regularly exceed](#) those from the electricity sector for the first time [since the late 1970s](#). The switch to electric cars is good for the climate because petroleum vehicles produce more greenhouse gas emissions per unit of energy than power plants fueled by natural gas, according to the Energy Information Administration.

Proponents say the growth of electric cars, when combined with the surge in renewable energy sources, like solar and wind, could lead to big reductions in emissions over time. These forces should also help reduce local air pollution in countries like China and India, which is why their leaders are getting behind these technologies in a big way. Government incentives have turned [China into the biggest market](#) for electric vehicles. And an [Indian government](#) minister says his country wants all cars sold there by 2030 to be electric. [France](#) says it wants to end sales of new diesel and gasoline cars by 2040, while [Norway's goal is 2025](#).

Government support could prove as crucial to the future of the technology as technical advances. If countries, states and localities encourage the spread of public charging stations, through tax breaks, other incentives or public spending, more people will take the plunge and convert. If the United States and other governments continue to spend money on research to help drive down battery costs, their economies and consumers will benefit.

Some parts of the fossil fuel industry will no doubt try to sabotage the electric car revolution. In the United States, the industry is [lobbying states](#) to eliminate subsidies for the vehicles. And many analysts expect the industry to seek similar changes at the federal level from President Trump and Republican leaders in Congress, who have already made clear that they do not see climate change as a major threat. They should know, though, that the most they can do is slow down the process. The electric car has already left the garage.

Public Transit Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan

Proposed Climate Action	Triple public transit ridership in ten years or less
Timeframe (near, medium, long term)	Medium (with some short term and long term aspects)
Date	June 24, 2017
Submitted by (Name)	Bob Sack

Criteria for Assessment:

Climate Impact:	GHG emission reduced by 17,105 tons over ten years
Community Benefits:	In addition to reduced GHG emissions, reduced traffic congestion.
Financial Implications:	Increasing public transit ridership is overall financially neutral.
Compatibility with the Lake Oswego lifestyle:	Doubling bus ridership will require converting about 900 current single-vehicle commuters into daily TriMet bus commuters.
Implementation Issues:	A number of actions are recommended aimed at increasing the attractiveness and convenience of public transit for current non-riders to incentivize them to leave their cars behind and become regular bus commuters.
Proposed Timing:	Near and medium term

Introduction

A census survey done in 2012 found that 38 percent of employed Lake Oswego residents (approximately 8,600 people) commute to Portland for their work (*Metro News*, Sept. 6, 2012). Currently, only about 300 - 400 commute by bus. Buses operate regularly even though average occupancy is about 25%. Thus, converting single vehicle commuters to public transit riders is an effective and pragmatic measure for reducing carbon emissions and is a logical feature for the climate action plan.

It will take a number of actions to incentivize people to leave their cars behind and to ride the bus (or in the future, light rail). In the accompanying document, we list 12 measures that would make public transit a more attractive alternative for Lake Oswego residents.

Financial Information

How much will this action cost?

Increasing public transit ridership is overall financially neutral. Bus riders pay fares but save on parking, fuel, and vehicle maintenance. Employers currently pay a TriMet tax and would like to see that money put to good use. The City of L.O. could invest some funds to make public transit more attractive.

Some future projects may involve tax increases to support public transportation.

The payback in reduced traffic congestion is immediate

The carbon offset benefits of increased bus ridership would be immediate.

What is the cost/benefit analysis?

Promoting public transit ridership is an effective and pragmatic measure for reducing carbon emissions and is a logical feature for the climate action plan.

Who will pay?

The city of Lake Oswego will need to fund some of the transit amenities described in the appendix, but public transit is primarily a function of TriMet that is funded from a variety of tax revenues.

Impact Information

What is the impact on greenhouse gas reduction?

	Number	Travel Distance	Total passenger miles per day	CO2 emissions			
				pounds per passenger mile *	pounds per day	pounds per year (300 days)	tons per year
Current solo car commuters converted to riding bus	90	24	2160	0.96	2073.6	622080	311.04

*Data from: *Public Transportation's Role in Responding to Climate Change*
www.transit.dot.gov/sites/fta.dot.gov/files/docs/.

Year	Riders	Tons per year	Cumulative (tons)
1	90	311	311
2	180	622	933
3	270	933	1866
4	360	1244	3110
5	450	1555	4665
6	540	1866	6531
7	630	2177	8708
8	720	2488	11196
9	810	2799	13995
10	900	3110	17105

How does this action help Lake Oswego meet its climate goals?

Transportation accounts for 31% of Lake Oswego's GHG emissions, almost all from automobiles. Thus, promoting public transit ridership is an effective and pragmatic measure for reducing carbon emissions and is a logical feature for the climate action plan.

What are the community benefits of this action?

In addition to reducing GHG emissions, a vibrant public transit system provides alternatives for people who cannot drive (youth, elderly, disabled). It reduces the need for parking. It is safer. Traffic congestion is decreased.

Actions

Describe your proposed action in more detail with specific targets about what will be achieved.

The following actions are aimed at increasing the attractiveness and convenience of public transit in order to

recruit non-riders to leave their cars behind and become regular bus commuters. These measures will also improve the experience for current regular bus riders.

1. Collaborate with TriMet to construct a new bus shelter at the Lake Oswego Transit Center on 4th Street. This will be part of the 4th Street remodel, currently in the planning stages.
2. Petition TriMet to increase the frequency of service on the primary Lake Oswego commuter bus (#35) to a minimum of 15-minute headways during the weekdays. This is a stated goal for TriMet, so the only question becomes when and how to accomplish this goal.
3. Have the City of L.O. provide bus passes for any city employees who desire to use TriMet's Employer Program. Encourage businesses in L.O to do the same.
4. Create a bike garage in the parking structure of the new city hall. This will provide a secure place for bus riders to park a bicycle before boarding the bus. Riding a bicycle from home to the transit station can reduce the "first and last mile problem" that inhibits public transit use.
5. A Park-and-Ride facility near the transit center would be an ideal amenity, but previous studies by the city have determined that it would be an unwarranted use of precious downtown property. However, if bus service frequency were increased on Country Club Road, the congregation at the Riverwest Church (across from Lake Oswego High School) might allow their large parking lot to be used as a Park-and-Ride.
6. Work with the L.O. Senior Center to provide education and assistance for senior citizens who would like to ride the bus. Make sure that seniors avail themselves of TriMet's special transport services.
7. Review the current bus route structure with TriMet officials and a committee of current bus riders to determine if efficiency and accessibility could be improved. For example, we might propose that #35 begin and end at the Tualatin Transit Center, rather than Oregon City Transit Center. This would provide a regular link between the east and west sides of the city, and link the primary commuter bus with a Park-and-Ride facility at the Riverwest Church (see above).
8. Bus #96 is essentially an express service line from Tigard Park and Ride to Portland. A more frequent feeder service on the west side of L.O. with a stop on Kruse Way would make this bus a convenient way for residents of Lake Grove to commute to Portland.

Long term

1. The Southwest Corridor Light Rail project (if built) will provide an exciting new public transit alternative for L.O., especially for people living on the west side. Proposed stations at Bonita Road, Upper Boones Ferry Road, and Bridgeport Village will be close by. After the light rail is operating, the bus system in L.O. will undoubtedly be reorganized to provide "feeders" to the Max stations. Businesses in the Kruse Way complex may provide private shuttles to the Max stations during rush hours. Amanda Owings, Traffic Engineering Technician for the city currently represents Lake Oswego on the Draft Environmental Impact Statement (DEIS) committee.
2. All-electric buses are becoming a reality and TriMet should be encouraged to take the lead to convert to this technology. The city may want to offer a re-charging station site near the transit center. All-electric school buses are also becoming to be available and the L.O. school district should consider this option for their next generation of school buses.
3. Low ridership buses drag down the average CO2 emissions for the transit system. Very different alternative transit services may someday need to replace the low-ridership service on Bus Lines #36 and #37. For example, a flexible route that could deviate from a fixed route would provide more convenient service and possibly increase ridership in less dense neighborhoods. Such a service has been operating in Salem for several years; however, it is scheduled to revert to regularly scheduled service in the near future. This kind of local demand-responsive circulator service was proposed in the 1997 Lake Oswego Transportation System Plan. Alternatively, it is possible that collaboration with a ride service such as *Lyft* would attract more riders than the current 36 and 37 bus service. Eventually autonomous vehicles may be available for these low-density routes.
4. A proposal to build a streetcar on the current excursion trolley line was rejected in 2012. However, substantial support remains for this concept.

Describe how the action meets the guiding principles related to consistency with the Lake Oswego lifestyle.
As an affluent suburban town, Lake Oswego is currently oriented to the automobile for most transportation. Nevertheless, the significant proportion commuters who work in Portland constitute a large potential market for public transit if it could be made more attractive.

Implementation

The time frame of the action – some proposals can it be accomplished by the end of 2018
--

Action item 1 is already in progress and will be monitored by the SAB. Quite a number of the action items above can be accomplished by the end of 2018; namely, 2, 3, 4 and 6. The rest will need to more time. A 100% increase in ridership by 2027 is ambitious but may be achievable given the large "market" of current single vehicle commuters; thus this goal will need to be re-evaluated every three years.
--

How will this action be implemented?

City Council action is required for items 1,2,3 and 4. The city has a representative on the DEIS committee for the Southwest Corridor Project (item 9); at some point, a citizen committee should be appointed to provide input regarding Lake Oswego interests in this project.
--

The Lake Oswego Sustainability Network may be able to provide significant citizen involvement to gather public support for these items.

Is there a person who is responsible for implementation, an “owner” who is willing and available to carry out the action?
--

There is presently an opportunity for a passionate advocate for public transportation to become a champion. In fact, a public campaign to raise awareness of the action items listed above, and to bring excitement to public transit will be necessary to overcome the bias against public transit.
--

Is there a person who is passionate about this action, a “champion”?

So far, the interest in public transit in Lake Oswego is modest. The mounting traffic congestion may stimulate more interest in finding solutions.
--

Car-Sharing and Ride-Sharing Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	Increase Car-Sharing and Ride-Sharing to L.O.
Timeframe (near, medium, long term)	Medium
Date	Aug 16, 2017
Submitted by (Name)	Bob Sack
Criteria for Assessment:	
Climate Impact:	Modest but significant
Community Benefits:	Alleviates parking and traffic congestion. Provides transportation option for people who cannot or don't want to drive.
Financial Implications:	Both car-sharing and ride-sharing reduce household transportation costs by eliminating the need to purchase and insure a car.
Compatibility with the Lake Oswego lifestyle:	Enhance transportation options for all residents.
Implementation Issues:	Ride-sharing thru <i>Lyft</i> and <i>Uber</i> is already available, but ridership could be increased with marketing and incentives. Private car-sharing companies <i>such as Car2Go, ZipCar</i> and <i>ReachNow</i> may need some specific incentives to locate in L.O. Car-pooling can be arranged thru on-line resources, and sometimes thru an employer.
Proposed Timing:	Medium

Introduction
A short section describing key action(s) that are being proposed, and why they should be included in the plan.
Both ride-sharing and car-sharing are reported to increase walking, biking, and use of public transportation. Therefore they augment the goals of the CAP
Which Focus Area does this action affect? (Buildings & Energy, Transportation, Land Use & Planning, or Food & Consumption)
Transportation

Financial Information
How much will this action cost?
There is minimal cost for the city as ride-sharing and car-sharing companies are privately owned and operated. If the city were to sponsor a car-sharing program such as ZipCar, the vehicles could be used by the city and could actually save the city money for purchase of vehicles. The city would bear some costs by providing for dedicated parking for car-sharing vehicles.
Is there a payback? How long is it?
The financial benefits/liabilities would be immediate.

Financial Information
What is the cost/benefit analysis?
The costs and benefits are mostly born by the users.
Who will pay?
The costs and benefits are mostly born by the users.

Impact Information
What is the impact on greenhouse gas reduction?
<i>Show your assumptions, include emissions factors and citations.</i>
Needs further study
How does this action help Lake Oswego meet its climate goals?
Needs further study
What are the community benefits of this action?
Needs further study

Actions
Describe your proposed action in more detail with specific targets about what will be achieved.
Provide Preferential Parking for car-pooling and car-sharing in city lots, work places, and educational facilities.
Provide designated parking slots for <i>Car2Go</i> , <i>ZipCar</i> , and <i>ReachNow</i> vehicles. <i>ReachNow</i> rents electric vehicles, providing users with an EV driving experience.
The city could sponsor ZipCar vehicles that could be used for city business and would reduce the need for city-owned cars,
The City could actively promote a "one car" philosophy ("your backup/second vehicle can be car-sharing, ride-sharing, public transit, bicycle, etc.") by educating the public on the personal (and environmental) costs of owning multiple vehicles.
An ambitious use of ride-sharing would involve subsidizing <i>Uber</i> and/or <i>Lyft</i> to provide "first and last mile" rides to public transit hubs; a policy that has been implemented in some other cities. This could be a collaboration with TriMet.
Learning to use car-sharing and ride-sharing requires some practice. The city could provide information and coaching services thru the Adult Community Center.
Describe how the action meets the guiding principles related to consistency with the Lake Oswego lifestyle.
As a suburban city, L.O. is heavily dependent on transportation. Ride-sharing and car-sharing provide options that reduced the need for parking as well as owning a second car (or even a first car).

Implementation
The time frame of the action – can it be accomplished by the end of 2018
Needs further study
How will this action be implemented?
Needs further study
Is there a person who is responsible for implementation, an “owner” who is willing and available to carry out the action?
The new <i>Windward Development</i> (Wizer Block) would be an excellent place to locate a car-sharing vehicle.
Is there a person who is passionate about this action, a “champion”?
Needs further study

Utilitarian Biking Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	Increase utilitarian biking
Timeframe (near, medium, long term)	Medium
Date	July 1, 2017
Submitted by (Name)	Bob Sack
Criteria for Assessment:	
Climate Impact:	Moderate
Community Benefits:	Decrease auto traffic, health benefits from biking
Financial Implications:	Bike infrastructure expense born by the city
Introduction	
A short section describing key action(s) that are being proposed, and why they should be included in the plan.	
<p>Currently bicycling is popular in Lake Oswego, but most of it is recreational. If bicycling is going to have a significant impact on greenhouse gas emissions, a larger proportion will need to be "utilitarian;" that is, riding a bicycle as alternative to driving a car for local transportation. Utilitarian bicycling includes commuting to work or school, as well as biking for shopping and errands such as visiting the library. Although recreational biking has little impact on GHG emissions, it needs to be supported because people who ride for fun are more likely to bike for utilitarian purposes as well. In any case, both recreational and utilitarian bicycling have a similar critical requirement; namely, a network of safe bike routes.</p>	
Which Focus Area does this action affect?	
Transportation	
Actions	
Describe your proposed action in more detail with specific targets about what will be achieved.	
<p>Because the city is responsible for streets, roads, and sidewalks, it has a crucial role in promoting bicycle infrastructure. Therefore the climate action plan should state that bicycling should be prioritized in the next and future Transportation System Plans. This could include building bike paths, limiting car traffic on some streets in favor of bikes, and providing safe lanes on city streets. Also it will be important to link bicycling to the public transit system is much as possible (see below).</p> <p>In the longer term, it will be very important for Lake Oswego to advocate for a safe bike path to Portland, paralleling Highway 43.</p> <p>Electric bikes (e-bikes) are becoming very popular in many parts of the world, especially for utilitarian biking (they can "flatten" the hilly terrain of L.O.) The city could install a bike-share program utilizing e-bikes as a way of encouraging e-bike use.</p>	

Food Awareness Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	Food awareness program to decrease agricultural GHG emissions by 30-50% through food choices.
Timeframe (near, medium, long term)	Near to long term
Date	August 2017
Submitted by (Name)	Duke Castle, Dave Hawley
Criteria for Assessment:	
Climate Impact:	GHG emissions could be reduced by almost 50% if over consumption of food was reduced from 2900 cal/day to 2500 cal/day and protein consumption by animals was cut by half
Community Benefits:	Improves health by reducing weight and decreasing risk of cancer & heart disease.
Financial Implications:	Impacts cattle ranching, one of Oregon's leading ag industries. Also impacts farming in general, with more consumption of high value produce and less of grains used for animal feed. Health benefits should be lead to major health cost reductions
Compatibility with the Lake Oswego lifestyle:	Should be fully consistent with community individuals desire to be healthy through making sound food choices.
Implementation Issues:	Requires broad community education effort organized by a citizen committee and/or SAB and a LOSN Action Team
Proposed Timing:	Near term to long term

Introduction

According to *Drawdown* food-related GHG emissions – from farming to deforestation to food waste – are the number one source of greenhouse gas emissions. The raising of livestock requires 80% of U.S. agricultural land, 70% of our grain and 50% of our water, and is responsible for 18 – 20% of greenhouse gases annually, second only to fossil fuel. WRI calculates that over 80% of those emissions in the U.S. are due to the raising of animal-based food sources and that 50% of the animal-based emissions are caused by the production of beef.

Land and water use by crops used for animal feed drives habitat loss throughout the world as forest and grasslands are converted to crop land. Major carbon emissions to the atmosphere accompany this conversion. In addition, the typically monocrop farming methods lead to overuse of fertilizers with the result in massive toxic runoff polluting ground water and oceanic deadzones.

There is a 5-10:1 caloric efficiency loss in converting grain to meat over directly eating the plants. We can easily feed the world on a plant based diet when meat is considered a condiment, not a primary food source.

At the same time Americans are consuming far more food and protein than they need – 2900 calories and 90 grams of protein per day versus desired levels of 2500 calories and 50 grams per day – putting their health at risk.

According to WRI a more balanced diet of 2500 calories and 50 grams per day that still includes some animal-based food such as beef, could reduce agricultural GHG emissions by more than 40% (see:

http://www.wri.org/sites/default/files/Shifting_Diets_for_a_Sustainable_Food_Future_0.pdf)

As an additional benefit, the Rodale Institute in a 30 year study have found that organic farming methods can match conventionally grown yields, suppress weeds without the need for GMOs seeds or pesticides, survive droughts better and sequester carbon in the soil. Their report “*Regenerative Organic Agriculture and Climate Change*” states that a very significant amount of current annual CO2 emissions could be sequestered through wide spread use of organic farming methods.

Which Focus Area does this action affect?

Food & Consumption

Financial Information

How much will this action cost?

The action is primarily one of education and its dissemination. It is imagined that the education research could be done by citizen groups such as SAB and LOSN. The dissemination of it could be through city sources such as Hello LO, the Farmer’s Market, library and adult community center along with other sources such as the LO Review, schools, LOSN newsletter, etc. With these activities in mind the cost to the city should be minimal.

Is there a payback? How long is it?

The reduction in GHG emissions from such an educational and marketing effort could be immediate and one of the few actions that citizens can take that has a direct immediate impact.

What is the cost/benefit analysis?

In addition to GHG reductions there are significant health benefits along with less expenditure on some of the most expensive food sources such as beef.

Who will pay?

The city would have some cost of staff time and out-of-pocket costs for publishing and disseminating printed material. It is probably useful to realize that one source of resistance to this activity will be the Oregon cattle industry. Cattle, dairy and hay to feed animals are three of the highest grossing agricultural commodities in Oregon.

Impact Information

What is the impact on greenhouse gas reduction?

Show your assumptions, include emissions factors and citations.

According to WRI, a more balanced and less consumptive daily diet of 2500 calories and 50 grams of protein per person could reduce GHG emissions by more than 40%.

How does this action help Lake Oswego meet its climate goals?

According to the Good Company study of 2006 greenhouse gas emissions in Lake Oswego, food was one of the highest sources. Reducing that impact is one of the most immediate and effective thing Lake Oswego citizens can do.

What are the community benefits of this action?

Reducing caloric intake and particularly animal-based has significant health benefits such as reduced obesity and risk from heart attacks.

Actions

1. Develop an educational program on the impact food choices for both humans and pets have on the environment and health, particularly moving toward more organic farming practices and reducing consumption of beef and other meat choices.
2. Publicize through city website, Hello LO, library, adult community center and Lake Oswego Review
3. Work with schools, local restaurants and senior care facilities such as Mary's Woods on ways to support and market this educational effort

Implementation

The time frame of the action – can it be accomplished by the end of 2018

The research, development and implementation of an educational and marketing program could be created by SAB, LOSN and other interested citizens could be accomplished by the end of 2018.

How will this action be implemented?

It could be implemented by a combination of work by SAB and LOSN.

Organic Food Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	Increase local organic food options
Timeframe (near, medium, long term)	near to long term
Date	August 2017
Submitted by (Name)	Heidi Schrimsher

Criteria for Assessment:	
Climate Impact:	Reduction of greenhouse gas emission 5-10%
Community Benefits:	The biggest benefits of locally grown food are social—providing an educational experience for the community whose members can participate directly in vegetable production, composting and rainwater harvesting. Lake Oswego residents value healthy lifestyles. Fresh locally grown food is highly valued in Lake Oswego.
Financial Implications:	For residence, growing food can save significant money. Neighborhood Community Gardens can be financially self sustaining. One expense that will need to be factored in is water. At Luscher well water is free, but in neighborhoods, city water will have to be utilized.
Compatibility with the Lake Oswego lifestyle:	Lake Oswego residents value our farmers market and access to fresh local food. Community gardens are valued by a growing segment of our population.
Implementation Issues:	The City needs to identify suitable locations for community gardens. There is limited park space available, so partnering with schools, businesses, senior care facilities and churches would offer increased opportunities. Portland has 51 community gardens (and a goal to offer a community garden within 1 mile radius of every resident) and is an excellent resource.
Proposed Timing:	near and medium term

Introduction
Ongoing City support is needed to promote local organic food options such as farmers markets, CSAs, produce stands and community gardens located throughout the city. In addition to public parks, schools, local businesses, senior care facilities and churches should be considered for locations to build community gardens.
During WWII, 40% of food in the US was grown in Victory Gardens. Today it is important to foster resilient in our community. In addition to the huge social benefits of community gardens, growing food in neighborhoods increases community resiliency in the event of a natural disaster. Having community gardens brings communities together, so if we do have a natural disaster, not only do gardens provide life sustaining food, but the connections neighbors make while tending their gardens fosters greater community connections.

Introduction

Which Focus Area does this action affect?

Food & Consumption

Financial Information

How much will this action cost?

The existing farmers market and the CSA are already established. Installing community gardens around the City have upfront costs, but once established, can be maintained through the cost of membership.

Is there a payback? How long is it?

Once gardens are created in neighborhoods, the social payback is immediate.

What is the cost/benefit analysis?

The cost of providing access to local organic food is minimal when compared to the health benefits offered to the community

Who will pay?

City government, community garden users

Impact Information

What is the impact on greenhouse gas reduction?

Show your assumptions, include emissions factors and citations.

Buying local food could reduce the average consumer's greenhouse gas emissions by 4-5 percent. (Weber, Christopher L. and H. Scott Matthews, "Food-Miles and the Relative Climate Impacts of Food Choices in the United States" *Environ. Sci. Technol.* (2008): 3508–3513)

How does this action help Lake Oswego meet its climate goals?

According to the Good Company study of 2006 greenhouse gas emissions in Lake Oswego, food was one of the highest sources. Reducing that impact is one of the most immediate and effective things Lake Oswego citizens can do.

What are the community benefits of this action?

Having greater access to locally sourced organic food can help making wiser food choices easier for residents. Gardening also reduces stress, decreases your risk of heart disease and diabetes, keeps your mind sharp and helps you sleep better.

Actions

Describe your proposed action in more detail with specific targets about what will be achieved.

Community gardens have been proposed in the Parks Plan 2025, however implementation has not occurred. Priority needs to be established and additional sites need to be identified. Usable park space is limited, so it is necessary to partner with businesses, schools, senior care facilities and churches.

Implementation

How will this action be implemented?

It could be implemented by a combination of work by SAB, Parks Board and LOSN.

Food Waste Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	Significantly reduce food waste going to landfills
Timeframe (near, medium, long term)	Near Term
Date	August 17, 2017
Submitted by (Name)	Duke Castle
Criteria for Assessment:	
Climate Impact:	Reducing food waste is ranked #3 in terms of GHG reduction by Drawdown
Community Benefits:	Most visible benefit is cost savings to businesses and consumers
Financial Implications:	Cost to create and disseminate educational material by the city could be minimal
Compatibility with the Lake Oswego lifestyle:	The cost savings would benefit all sectors of the community.
Implementation Issues:	Requires broad community education effort organized by a citizen committee and/or SAB and a LOSN Action Team
Proposed Timing:	Near term

Introduction
<p>According to Drawdown, up to 35% of food in high-income economies is thrown out by consumers. WRI estimates that 8% of GHG emissions are caused by food that is thrown out. If it were its own country it would be the third highest emitter after China and the U.S.</p> <p>The loss is not only the food but the money spent to purchase that food. WRI estimates for every \$1 spent on training restaurant and grocery store personnel can result in \$14 savings. Similarly a study in London showed that for every pound the city government spent on public education resulted in 250 pounds of savings by consumers and 92 pounds to the city in avoided food waste disposal costs.</p> <p>Which Focus Area does this action affect? <i>Food</i></p>

Financial Information
<p>How much will this action cost?</p> <p>The action is primarily one of education and its dissemination. It is imagined that the education research could be done by citizen groups such as SAB and LOSN. The dissemination of it could be through city sources such as Hello LO, the Farmer's Market, library and adult community center along with other sources such as the LO Review, schools, LOSN newsletter, etc. With these activities in mind the cost to the city should be minimal.</p>

Financial Information

Is there a payback? How long is it?

The reduction in GHG emissions from such an educational and marketing effort could be immediate and one of the few actions that citizens can take that has a direct immediate impact.

What is the cost/benefit analysis?

WRI research indicates that the payback for businesses can be 14 to 1 for every dollar privately invested. For consumers the WRI research indicates the return could be much higher, up to 250 to 1 for every public sector dollar invested.

Who will pay?

Businesses, schools and city government

Impact Information

What is the impact on greenhouse gas reduction?

Show your assumptions, include emissions factors and citations.

WRI estimates that 8% of GHG are attributed to food that is produced and not eaten.

How does this action help Lake Oswego meet its climate goals?

According to the Good Company study of 2006 greenhouse gas emissions in Lake Oswego, food was one of the highest sources. Reducing that impact is one of the most immediate and effective thing Lake Oswego citizens can do.

What are the community benefits of this action?

There are immediate economic benefits to all sectors of the community. Reducing food waste also allows Lake Oswego to do its part in food and resource conservation that the rest of society can use.

Actions

1. Provide a best practices guide to help households, schools, businesses and other institutions reduce food waste and consumption.
2. Support edible food donation.
3. Evaluate opportunities for recycling of commercial food waste prior to Metro's mandatory requirements

Implementation

The time frame of the action – can it be accomplished by the end of 2018

The research, development and implementation of an educational and marketing program could be created by SAB and LOSN with the help of businesses and institutions that could be affected. This could be accomplished by the end of 2018.

How will this action be implemented?

See above and below resources on potential food share programs, in schools and other institutions:

https://www.epa.gov/sites/production/files/2017-07/documents/washingtonschoolfoodshare5087717_a.pdf

<http://district.schoolnutritionandfitness.com/seymourcs/files/SharingTableNews.pdf>

https://fns-prod.azureedge.net/sites/default/files/cn/SP41_CACFP13_SFSP15_2016os.pdf

Tree Planting Actions -- Assumptions & Analysis Worksheet

Climate Action Assessment, Lake Oswego Climate Action Plan	
Proposed Climate Action	5,000 Trees in 5 years
Timeframe (near, medium, long term)	Near-term
Date	September 14, 2017
Submitted by (Name)	Stephanie Glazer, with inspiration from Jeff Gudman
Criteria for Assessment:	
Climate Impact:	Assuming 2500 Douglas Fir trees and 2500 Oregon Oak trees are planted within 5 years, the annual carbon sequestration starting in Year 10 would be: 92.78 mtons CO ₂ e/year
Community Benefits:	In addition to aesthetic value, trees provide many health and climate benefits across our community
Financial Implications:	\$10,000 to \$20,000 total across 5 years.
Compatibility with the Lake Oswego lifestyle:	Lake Oswego has been an active Tree City USA Community for more than 28 years, with a strong commitment to preserving and protecting our tree canopy as an essential part of the Lake Oswego character.
Implementation Issues:	Who will implement this action? Do they have the willingness, resources and knowledge? Is there a designated "owner" and a designated "champion"?
Proposed Timing:	2018-2023
Introduction	
A short section describing key action(s) that are being proposed, and why they should be included in the plan.	
<p>Lake Oswego has been an active Tree City USA Community for more than 28 years, with a strong commitment to preserving and protecting our tree canopy as an essential part of the Lake Oswego character. In addition to aesthetic value, trees provide many health and climate benefits across our community.</p> <p>Trees provide the following climate-related benefits:</p> <ul style="list-style-type: none"> • Reduced heat exposure, especially in sensitive segments of the population, by providing shade to buildings, parks, roads, and more. This means reduced health risk from increased heat waves. • Reduced cooling load by providing shade to buildings, which results in reduced energy consumption from A/C. • Carbon sequestration through creation of biomass. We propose to encourage the planting of native trees that are fast-growing and offer high rates of carbon sequestration. <p>Trees additionally provide the co-benefits of:</p> <ul style="list-style-type: none"> • Increased property value, • Noise mitigation near busy roads, and 	

- Improved air quality.

Recognizing the value of trees, the City will achieve a goal of planting 5000 trees in 5 years (by 2022). This action consists of 3 main components, each leveraging the City’s relationships with local nurseries and/or bulk discounts to obtain discounted pricing:

- The City will buy and plant 500 trees on City-owned property.
- The City will convene a forum for sponsors to buy, and volunteers to plant, trees on City-owned land (or ODOT-owned land on which the City gains permission to plant the trees; eg near I-5).
- The City will provide discounted trees to residents through a voluntary program, where residents may purchase discount priced trees to plant and maintain on their own property. To receive the discounted trees, residents would commit to planting them in Lake Oswego or the Lake Oswego Service District.

In keeping with the character of Lake Oswego, the City would include Douglas Fir trees and Oregon Oak as the primary tree species in this program.

Which Focus Area does this action affect?

(Buildings & Energy, Transportation, Land Use & Planning, or Food & Consumption)

Buildings & Energy
Land Use & Planning

Financial Information

How much will this action cost?

Direct cash outlay:

- The City would pay for and plant at least 500 trees in the next 5 years at a cost of [\$10,000 to \$20,000 total across 5 years].

No direct cash outlay, but some staff time:

- The City would create a forum to match up (a) residents that want to sponsor a tree (i.e. pay for the discounted trees), with (b) residents or other volunteers who want to plant the trees. The City’s convening role would apply to residents planting or sponsoring trees on City-owned property, (and ODOT-owned property on which the City gains permission to plant the trees – e.g. along I-5).
- The voluntary tree planting program would involve accepting the discounted payment for trees from residents that are willing to commit to planting the trees on their own property.

Is there a payback? How long is it?

For trees planted near City-owned buildings there would be some payback through reduced A/C energy costs. Additionally, trees are shown to improve property values so the City may benefit from increased revenues associated with higher property values.

Who will pay?

The City and resident tree sponsors who opt-in.

Impact Information

What is the impact on greenhouse gas reduction?

Show your assumptions, include emissions factors and citations.

- I. Assuming 2500 Douglas Fir trees and 2500 Oregon Oak trees are planted within 5 years, the annual carbon sequestration starting in Year 10 would be: [92.78 mtons CO₂e/year]

Calculations:

$0.563 \times ((0.5 \times 23.3) + (0.5 \times 16.3)) = 11.15$ lbs carbon per tree per year

Survival Factor x (Carbon from 50% Fast-growing Hardwood+ Carbon from 50% Fast growing Conifer)

$5000 \times 11.15 \times 3.67$ (convert to CO₂e) / 2204.62 (convert to metric tons) = 92.78 mtons CO₂e

Assumes that in Year 10, trees are average age of 12 years.

See attached tables from: <https://www3.epa.gov/climatechange/Downloads/method-calculating-carbon-sequestration-trees-urban-and-suburban-settings.pdf>)

- II. The reduced emissions associated with reduced cooling load would be 10% of residential energy use for the 4000 homes participating: XXXXX mtons CO₂e/year (equal to 2.5% of total residential energy).

Calculations:

Assume 4000 homes represents about 25% of residential energy, given approx. 16,000 households

In studies, reduced cooling load ranged from 10%-50%, based on number of and type of trees planted. To calculate the scale of impact for 5000 trees, we assumed one tree per each residence up to 4000, achieving 10% savings for those residences, as part of this goal.

From: POTENTIAL OF TREE SHADE FOR REDUCING RESIDENTIAL ENERGY USE IN CALIFORNIA. by James R. Simpson and E. Gregory McPherson

"In Sacramento (climate zone 12), annual savings due to a single, 24 foot tall, 15 year old tree to the west of the building was 12 percent (180 kWh, \$20) for an energy efficient house (Figure 2)."

Resources:

<https://energy.gov/downloads/energy-saver-101-landscaping>

https://www.auburn.edu/academic/forestry_wildlife/forest_policy_ctr/documents/energy-savings-ecol-econ.pdf

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.155.4488&rep=rep1&type=pdf>

How does this action help Lake Oswego meet its climate goals?

Trees provide the following climate-related benefits:

- Reduced heat exposure, especially in sensitive segments of the population, by providing shade to buildings, parks, roads, and more. This means reduced health risk from increased heat waves.
- Reduced cooling load by providing shade to buildings, which results in reduced energy consumption from A/C.
- Carbon sequestration through creation of biomass. We propose to encourage the planting of native trees that are fast-growing and offer high rates of carbon sequestration.

What are the community benefits of this action?

Trees additionally provide the co-benefits of:

- Increased property value,

- Noise mitigation near busy roads, and
- Improved air quality

Actions

Describe your proposed action in more detail with specific targets about what will be achieved.

See Above.

Describe how the action meets the guiding principles related to consistency with the Lake Oswego lifestyle.

Lake Oswego has been a participating Tree City USA for more than 28 years, with a strong commitment to preserving and protecting our tree canopy as an essential part of the Lake Oswego character.

Implementation

The time frame of the action – can it be accomplished by the end of 2018

The City can begin identifying nursery partners for discounted tree purchases (or they may already have such a relationship), and can begin identifying priority areas for planting. City planting could begin in 2018.

The voluntary resident engagement portions would likely require set-up time to create the forums / organizational structure for (a) the sponsor/volunteer planting on City-owned land and (b) the resident access to discounted trees for their own property. These programs could begin planting in 2018/2019.

How will this action be implemented?

The City would identify which department should oversee the program and allocate a small budget for tree purchase and for staff time.

Is there a person who is responsible for implementation, an “owner” who is willing and available to carry out the action?

Likely it would be someone in LO Parks and Recreation.

Is there a person who is passionate about this action, a “champion”?

Stephanie Wagner, Watershed Council

Table 2: Survival Factors and Annual Carbon Sequestration Rates for Common Urban Trees

Tree Age (yrs)	Survival Factors by Growth Rate			Annual Sequestration Rates by Tree Type and Growth Rate (lbs. carbon/tree/year)					
				Hardwood			Conifer		
	Slow	Moderate	Fast	Slow	Moderate	Fast	Slow	Moderate	Fast
0	0.873	0.873	0.873	1.3	1.9	2.7	0.7	1.0	1.4
1	0.798	0.798	0.798	1.6	2.7	4.0	0.9	1.5	2.2
2	0.736	0.736	0.736	2.0	3.5	5.4	1.1	2.0	3.1
3	0.706	0.706	0.706	2.4	4.3	6.9	1.4	2.5	4.1
4	0.678	0.678	0.678	2.8	5.2	8.5	1.6	3.1	5.2
5	0.658	0.658	0.658	3.2	6.1	10.1	1.9	3.7	6.4
6	0.639	0.639	0.644	3.7	7.1	11.8	2.2	4.4	7.6
7	0.621	0.621	0.630	4.1	8.1	13.6	2.5	5.1	8.9
8	0.603	0.603	0.616	4.6	9.1	15.5	2.8	5.8	10.2
9	0.585	0.589	0.602	5.0	10.2	17.4	3.1	6.6	11.7
10	0.568	0.576	0.589	5.5	11.2	19.3	3.5	7.4	13.2
11	0.552	0.564	0.576	6.0	12.3	21.3	3.8	8.2	14.7
12	0.536	0.551	0.563	6.5	13.5	23.3	4.2	9.1	16.3
13	0.524	0.539	0.551	7.0	14.6	25.4	4.6	9.9	17.9
14	0.512	0.527	0.539	7.5	15.8	27.5	4.9	10.8	19.6
15	0.501	0.516	0.527	8.1	16.9	29.7	5.3	11.8	21.4
16	0.490	0.504	0.516	8.6	18.1	31.9	5.7	12.7	23.2
17	0.479	0.493	0.505	9.1	19.4	34.1	6.1	13.7	25.0
18	0.469	0.483	0.495	9.7	20.6	36.3	6.6	14.7	26.9
19	0.459	0.472	0.484	10.2	21.9	38.6	7.0	15.7	28.8
20	0.448	0.462	0.474	10.8	23.2	41.0	7.4	16.7	30.8
21	0.439	0.452	0.464	11.4	24.4	43.3	7.9	17.8	32.8
22	0.429	0.442	0.454	12.0	25.8	45.7	8.3	18.9	34.9
23	0.419	0.433	0.445	12.5	27.1	48.1	8.8	20.0	37.0
24	0.410	0.424	0.435	13.1	28.4	50.6	9.2	21.1	39.1
25	0.401	0.415	0.426	13.7	29.8	53.1	9.7	22.2	41.3
26	0.392	0.406	0.417	14.3	31.2	55.6	10.2	23.4	43.5
27	0.384	0.398	0.409	15.0	32.5	58.1	10.7	24.6	45.7
28	0.375	0.389	0.400	15.6	33.9	60.7	11.2	25.8	48.0
29	0.367	0.381	0.392	16.2	35.3	63.3	11.7	27.0	50.3
30	0.359	0.373	0.383	16.8	36.8	65.9	12.2	28.2	52.7
31	0.352	0.365	0.375	17.5	38.2	68.5	12.7	29.5	55.1
32	0.344	0.358	0.367	18.1	39.7	71.2	13.3	30.7	57.5
33	0.337	0.350	0.360	18.7	41.1	73.8	13.8	32.0	59.9
34	0.330	0.343	0.349	19.4	42.6	76.5	14.3	33.3	62.4
35	0.323	0.336	0.339	20.0	44.1	79.3	14.9	34.7	64.9

Table 1. Common Urban Tree Species

Species	Type	Growth Rate	Species	Type	Growth Rate
Ailanthus, <i>Ailanthus altissima</i>	H	F	Maple, bigleaf, <i>Acer macrophyllum</i>	H	S
Alder, European, <i>Alnus glutinosa</i>	H	F	Maple, Norway, <i>Acer platanoides</i>	H	M
Ash, green, <i>Fraxinus pennsylvanica</i>	H	F	Maple, red, <i>Acer rubrum</i>	H	M
Ash, mountain, American, <i>Sorbus americana</i>	H	M	Maple, silver, <i>Acer saccharinum</i>	H	M
Ash, white, <i>Fraxinus americana</i>	H	F	Maple, sugar, <i>Acer saccharum</i>	H	S
Aspen, bigtooth, <i>Populus grandidentata</i>	H	M	Mulberry, red, <i>Morus rubra</i>	H	F
Aspen, quaking, <i>Populus tremuloides</i>	H	F	Oak, black, <i>Quercus velutina</i>	H	M
Baldcypress, <i>Taxodium distichum</i>	C	F	Oak, blue, <i>Quercus douglasii</i>	H	M
Basswood, American, <i>Tilia americana</i>	H	F	Oak, bur, <i>Quercus macrocarpa</i>	H	S
Beech, American, <i>Fagus grandifolia</i>	H	S	Oak, California black, <i>Quercus kelloggii</i>	H	S
Birch, paper (white), <i>Betula papyrifera</i>	H	M	Oak, California White, <i>Quercus lobata</i>	H	M
Birch, river, <i>Betula nigra</i>	H	M	Oak, canyon live, <i>Quercus chrysolepis</i>	H	S
Birch, yellow, <i>Betula alleghaniensis</i>	H	S	Oak, chestnut, <i>Quercus prinus</i>	H	S
Boxelder, <i>Acer negundo</i>	H	F	Oak, Chinkapin, <i>Quercus muehlenbergii</i>	H	M
Buckeye, Ohio, <i>Aesculus glabra</i>	H	S	Oak, Laurel, <i>Quercus laurifolia</i>	H	F
Catalpa, northern, <i>Catalpa speciosa</i>	H	F	Oak, live, <i>Quercus virginiana</i>	H	F
Cedar-red, eastern, <i>Juniperus virginiana</i>	C	M	Oak, northern red, <i>Quercus rubra</i>	H	F
Cedar-white, northern, <i>Thuja occidentalis</i>	C	M	Oak, overcup, <i>Quercus lyrata</i>	H	S
Cherry, black, <i>Prunus serotina</i>	H	F	Oak, pin, <i>Quercus palustris</i>	H	F
Cherry, pin, <i>Prunus pennsylvanica</i>	H	M	Oak, scarlet, <i>Quercus coccinea</i>	H	F
Cottonwood, eastern, <i>Populus deltoides</i>	H	M	Oak, swamp white, <i>Quercus bicolor</i>	H	M
Crabapple, <i>Malus</i> spp.	H	M	Oak, water, <i>Quercus nigra</i>	H	M
Cucumbertree, <i>Magnolia acuminata</i>	H	F	Oak, white, <i>Quercus alba</i>	H	S
Dogwood, flowering, <i>Cornus florida</i>	H	S	Oak, willow, <i>Quercus phellos</i>	H	M
Elm, American, <i>Ulmus americana</i>	H	F	Pecan, <i>Carya illinoensis</i>	H	S
Elm, Chinese, <i>Ulmus parvifolia</i>	H	M	Pine, European black, <i>Pinus nigra</i>	C	S
Elm, rock, <i>Ulmus thomasi</i>	H	S	Pine, jack, <i>Pinus banksiana</i>	C	F
Elm, September, <i>Ulmus serotina</i>	H	F	Pine, loblolly, <i>Pinus taeda</i>	C	F
Elm, Siberian, <i>Ulmus pumila</i>	H	F	Pine, longleaf, <i>Pinus palustris</i>	C	F
Elm, slippery, <i>Ulmus rubra</i>	H	M	Pine, ponderosa, <i>Pinus ponderosa</i>	C	F
Fir, balsam, <i>Abies balsamea</i>	C	S	Pine, red, <i>Pinus resinosa</i>	C	F
Fir, Douglas, <i>Pseudotsuga menziesii</i>	C	F	Pine, Scotch, <i>Pinus sylvestris</i>	C	S
Ginkgo, <i>Ginkgo biloba</i>	H	S	Pine, shortleaf, <i>Pinus echinata</i>	C	F
Hackberry, <i>Celtis occidentalis</i>	H	F	Pine, slash, <i>Pinus elliottii</i>	C	F
Hawthorne, <i>Crataegus</i> spp.	H	M	Pine, Virginia, <i>Pinus virginiana</i>	C	M
Hemlock, eastern, <i>Tsuga canadensis</i>	C	M	Pine, white eastern, <i>Pinus strobus</i>	C	F
Hickory, bitternut, <i>Carya cordiformis</i>	H	S	Poplar, yellow, <i>Liriodendron tulipifera</i>	H	F
Hickory, mockernut, <i>Carya tomentosa</i>	H	M	Redbud, eastern, <i>Cercis canadensis</i>	H	M
Hickory, shagbark, <i>Carya ovata</i>	H	S	Sassafras, <i>Sassafras albidum</i>	H	M
Hickory, shellbark, <i>Carya laciniosa</i>	H	S	Spruce, black, <i>Picea mariana</i>	C	S
Hickory, pignut, <i>Carya glabra</i>	H	M	Spruce, blue, <i>Picea pungens</i>	C	M
Holly, American, <i>Ilex opaca</i>	H	S	Spruce, Norway, <i>Picea abies</i>	C	M
Honeylocust, <i>Gleditsia triacanthos</i>	H	F	Spruce, red, <i>Picea rubens</i>	C	S
Hophornbeam, eastern, <i>Ostrya virginiana</i>	H	S	Spruce, white, <i>Picea glauca</i>	C	M
Horsechestnut, common, <i>Aesculus hippocastanum</i>	H	F	Sugarberry, <i>Celtis laevigata</i>	H	F
Kentucky coffeetree, <i>Gymnocladus dioica</i>	C	F	Sweetgum, <i>Liquidambar styraciflua</i>	H	F
Linden, little-leaf, <i>Tilia cordata</i>	H	F	Sycamore, <i>Platanus occidentalis</i>	H	F
Locust, black, <i>Robinia pseudoacacia</i>	H	F	Tamarack, <i>Larix laricina</i>	C	F
London plane tree <i>Platanus X acerifolia</i>	H	F	Walnut, black, <i>Juglans nigra</i>	H	F
Magnolia, southern, <i>Magnolia grandifolia</i>	H	M	Willow, black, <i>Salix nigra</i>	H	F

Type: H = Hardwood, C = Conifer Growth Rate: S = Slow, M = Moderate, F = Fast

Appendix D: 2018 Action Implementation List

Transportation

Recommendation 1: "Electrify" transportation.

- **Community Groups** engage local residents, with support from local electric vehicle (EV) organizations and manufacturers, to increase EV market share to at least 50 percent by 2030 and 60 percent by 2040.
 - Promote EVs at the 2018 and 2019 car shows, with the goal to have at least 1,000 Lake Oswego residents test drive an EV before 2020
 - Develop materials tailored to Lake Oswego that promote EVs and incentives, including \$2,500 state rebates. Partner with the City to help disseminate EV information, for example via HelloLO
- **The City** (with guidance from Planning Commission, Transportation Advisory Board, SAB and Community Groups) develop policies and identify code updates to ensure sufficient EV charging infrastructure. For example, encourage EV incentives and code updates for parking lots/spaces, City facilities/employees, commercial buildings and homes.
- **The City** update and implement its fleet procurement policy such that at least half of the City's fleet is EVs before 2030. For example, the city can explore and test electric motorcycles for the police.
- **LOSD** evaluate the potential for using electric school buses when it renews its transportation contract in 2020.

Recommendation 2: Make public transit more convenient.

- **Community Groups** partner with TriMet, Metro, Clackamas County and others to triple transit ridership by 2025
 - Organize local businesses to petition TriMet for transit options to address employee commuting challenges.
 - Test and increase access to transit via Universal Bus Passes and innovative on-demand transit programs.
- **The City** work with TriMet to implement proposals for increased service and additional bus shelters where needed (including upgrades to the Lake Oswego Transit Center on 4th Street). For example, provide additional park & ride facilities; and increase the frequency of service for Bus #35 (including an express option) with a minimum of 15-minute headways during the weekdays.
- **The City** (with Lake Oswego Chamber of Commerce and other business groups) study the potential benefits of a demand-responsive circulator or shuttle service, as proposed in the Lake Oswego Transportation System Plan.
- **LOSD** work with parents and Community Groups to facilitate at least one field trip (per school per year) or a "Transit Day" when students are encouraged to commute via TriMet.

Buildings and Energy

Recommendation 3: Avoid energy waste.

- High performance building standards for new construction. Encourage builders and developers to incorporate sustainable building practices to increase the quality, durability, and performance of new buildings in Lake Oswego.

The City update and expand its "High Performance Building Guidelines for City Facilities" to include guidelines for all new commercial and residential development.

- Encourage and incentivize (e.g., with lower permitting fees) commercial and residential developers to follow existing high performance building standards. Examples include LEED (including LEED for Homes), Earth Advantage, or Passive House.

Potential Implementers

Bold=Primary Action Owner

LOSN Transportation Team (Lisa Adatto, Duke Castle), SAB, City, FORTH

Planning Commission, Transportation Advisory Board, SAB and LOSN Transportation Team (Lisa Adatto, Duke Castle) City (Sustainability), SAB, Police Dept.

LOSN School Team (Dorothy Atwood, Courtney Clements)

LOSN Transportation Team (Bob Sack), City, TAB,

City staff, TAB, SAB, LOSN Transportation Team (Bob Sack), City, TAB

City staff, TAB, SAB, LOSN Transportation Team (Bob Sack), City, TAB

LOSN School Team (Dorothy Atwood, Courtney Clements)

SAB (Eliot Metzger, Paul Soper), City (Sustainability)

Planning Dept, SAB

- o Require energy performance benchmarking (i.e., Energy Usage Index - EUI) to track efficiency of new commercial buildings over [5,000] square feet.

The City express its support for efforts to update energy efficiency standards in Oregon's building codes.

LOSD target an EUI of 22 or less in all new construction projects.

Planning Dept, SAB

City

LOSN School Team (Dorothy Atwood, Courtney Clements), Randy Miller

- Energy efficiency upgrades to existing buildings. Help building owners and homeowners save money and increase comfort by taking advantage of state and local programs to help them reduce energy use.

Community Groups engage local building industry to develop and facilitate a series of "home energy fairs" in 2018-2019 that showcase opportunities for energy savings (e.g., free energy audits, discounts on insulation).

The City develop a policy to provide homebuyers information on home energy performance as part of real estate sales transactions; partner with Oregon Department of Energy and local organizations to offer Home Energy Scores.

The City partner with local organizations to facilitate commercial, multifamily, and homeowners opportunities to do both seismic and energy upgrades at the same time.

LOSD work with local organizations to complete energy audits and efficiency upgrades at all schools by 2020.

LOSN Energy Action Team, SAB, city

Planning Dept, SAB

City, SAB, LOSN Energy and Emergency Preparedness Teams

LOSN School Team (Dorothy Atwood, Courtney Clements), Randy Miller

Recommendation 4: Make clean energy more accessible

- **Community Groups** work with businesses, LOSD, and neighborhood groups to develop "community solar" installations to help achieve and surpass the City's 1 Megawatt goal by 2020
 - o Convening solar information sessions in 2018, along with an outreach and recruiting effort among building owners along Kruse Way
 - o Partnering with Clackamas County to publicly recognize "solar champions" as part of the Leaders in Sustainability program.
 - o Support and develop local investment groups interested in local clean energy technology projects
- **The City** streamline [and waive fees] permitting for commercial and residential development and remodeling if the project include installation of solar PV systems.
- **LOSD** continue to partner with Energy Trust to evaluate solar potential on existing schools and tap into financial incentives from Energy Trust's Path to Net Zero" program for new school construction.

LOSN Community Solar (Doug Rich), OCPC, Chamber of Commerce, LOSD

LOSN Community Solar (Doug Rich), OCPC, Chamber of Commerce,

LOSN Economic Vitality Team, Clackamas Sustainability Office

SAB (Karl Friesen)

Planning Dept, SAB

LOSD, LOSN Energy Action Team

FOOD AND CONSUMPTION

Recommendation 5: Increase sustainable food options.

A food program to decrease agricultural GHG emissions by 30-50 percent.

- **Community Groups** partner with the City, LOSD, local businesses to “nudge” residents toward food choices that are tastier, healthier, and low-impact (e.g., shifting consumption away from high impact foods such as beef).
- **The City** share recipes and tastings for healthy, low-impact meals via HelloLO and Adult Community Center
- **LOSD** pilot, with support of parents and Community Groups, several healthier, low-impact school menus

LOSN Food & School Teams (Dorothy Atwood, Courtney Clements, Natalie Bennon), City

City (Sustainability), ACC

LOSN Food & School Teams (Dorothy Atwood, Courtney Clements, Natalie Bennon)

More local organic food options.

- **Community Groups** promote the benefits of organic food and its availability through stores, restaurants and local produce stands
- **The City** will continue support for the Farmer's Market and Luscher Farm Community Supported Agriculture (CSA)
- **The City** support the expansion of community gardens beyond Luscher Farm that include the promotion of edible landscaping and gleaning.

LOSN Food Team (Dorothy Atwood, Courtney Clements), City, PRAB

City, PRAB, LOSN Food Team (Dorothy Atwood, Courtney Clements),

City, PRAB, LOSN Food Team (Dorothy Atwood, Courtney Clements)

Recommendation 6: Cut food waste in half

- **Community Groups** pilot test “ugly food” stands or other means of selling produce that is otherwise wasted.
- **City** work with Clackamas County to provide a “best practices” guide and tools for households, schools, businesses and other institutions to reduce food waste (including food donation and commercial food composting).
- **LOSD** create “Share Tables” or similar programs at each school to ensure food that is otherwise wasted ends up in households that need it.

City, Clackamas County, LOSN Food Team (Dorothy Atwood, Courtney Clements, Natalie Bennon), Chamber of Commerce

LOSN Food & School Teams (Dorothy Atwood, Courtney Clements, Natalie Bennon)

Recommendation 7: Extend useful life of clothing, electronics and building materials.

- **The City** explore pilot projects with Republic Services or others to leverage mobile technology in creating better access to information about how to get usable goods (such as electronics and clothing) to those who need them.
The City explore a “tool library” model at Lake Oswego library or Operations Center for residents to access shared tools or equipment, including electric power tools (rather than purchasing, owning, and disposing individually).

City (Sustainability), SAB, Republic Services

City (Sustainability), SAB

LOSD preserve and reuse construction materials from facilities such as Lakeridge Junior High School by partnering with local organizations that help deconstruct and repurpose buildings.

LOSN School Team (Dorothy Atwood, Courtney Clements)

- **Community Groups** explore opportunities to partner with LOSD and local businesses to create “Fix it Fairs” in 2018

LOSN School Team (Dorothy Atwood, Courtney Clements)

Natural Resources and Resilience

Recommendation 8: Plan for new extremes

- **The City** update disaster management policies and procedures in preparation for more frequent extreme weather events (e.g., heavy rain, floods, fires, droughts).
- **The City** assess where new rules, policies, or programs are needed in advance of extreme weather (e.g., sufficiency of existing heating/cooling centers, necessary updates to scheduling rules for construction and trash pickup).
- **LOSD**, with support from parent organizations and Community Groups, review and update policies for weather extreme preparedness (e.g., extreme heat policies for outdoor activities, indoor comfort, and air quality).

City, city disaster preparedness team

City, city disaster preparedness team

LOSN School Team (Dorothy Atwood, Courtney Clements), LOSD staff

Recommendation 9: Manage water wisely.

- **The City** increase promotion of free water audits through partnerships with Chamber of Commerce and Lake Oswego School District and continue the promotion of highly efficient water fixtures and appliances
- **The City** continue to explore and promote opportunities to use harvested rain water and grey water for irrigation
- **The City** review updated flood zones, in particular for Foothills area.
- **The City** implement and assess effectiveness of new stormwater management goals and guidance.
- **The City** explore technologies that can reclaim water and energy waste at the Tryon Creek Waste Treatment Plant and other water treatment facilities.

City, LOSN Water Action Team

Planning Dept, Planning Commission

Planning Dept

Planning Dept, SAB

City Parks Dept, LOSN Water Action Team

Recommendation 10: Preserve and enhance our forests and natural areas.

- **Community Groups** plant 1,000 new trees a year for five years, in partnership with LOSD and local property owners, with an emphasis on opportunities for native species, habitat restoration and biodiversity.
- **Community Groups** preserve trees and improve open space on private and LOSD properties, including removal of tree ivy, and other invasive plants, to improve the viability of existing trees.
- **The City** buy and plant 500 trees on City-owned property and convene a forum for sponsors to buy, and volunteers to plant, trees on City-owned land, or ODOT-owned land on which the City gains permission to plant the trees, such as along I-5.
- **The City** increase preservation of trees and improvement of open space, through review and update of the Development Code as relates to tree preservation, and enforcing tree preservation requirements on sites that are developed prior to annexing to the City.
- **The City** support a tree program with annual Habitat Enhancement Fund grants and potential “tree-bates” on water bills for residents that purchase trees to plant and maintain on their own property.
- **The City** advocate to update fire management processes in Tryon State Park and City-owned parks and natural areas.

Oswego Watershed Council, Friends of Trees

Oswego Watershed Council, Friends of Trees

City Parks Dept

Planning Commission, City Parks Dept

City Parks Dept. Friends of Trees

City (Sustainability), City Parks Dept

Appendix E. Initial compiled matrix of actions

SAB Climate Action Planning: Focus Areas and Actions			
Focus Area	Climate Action Goals	Climate Action Strategies	GHG Impact
Buildings + Energy	Achieve and surpass current LO solar goal (1 MW)	Programs and pilots to demonstrate community solar	Reduced GHG intensity of energy
		Solar workshops for residential and commercial installations	
		City map of solar 'hot spots'	
		Compilation of solar 'references' in the City (neighbors that have installed solar) via Next Door or Facebook or other means	
	Ensure all new public buildings in LO meet high performance buildings criteria	Full implementation of the City's High Performance Building Standard	Reduce energy demand
		Net-zero schools	
		Energy performance benchmarking (city and/or community)	
	Identify energy savings measures in at least 50% of LO homes and businesses	XX commercial and residential buildings audited (via Energy Trust, may target big energy users)	Reduce energy demand
		Pilot energy efficiency incentives (including multi-family): green leases, weatherization, insulation, windows, etc.	
	Electrify all generators in LO	Programs to help local businesses (e.g., food trucks) install cleaner, electric generators	Reduce GHG intensity of energy / cleaner air
	Showcase energy-efficient, climate-resilient design in new developments	Incentives to encourage deconstruction instead of demolition of older homes	
		Identify at least two areas for demonstrating attainable housing designs	
		Outline recommended criteria to allow for energy-efficient design and clean energy technologies in new commercial development	
		Establish LO investment fund in energy efficiency or clean energy technologies	
Create high school STEM program for energy efficiency and clean energy			
Invite local businesses to pilot new clean energy or efficiency technologies in partnership with local university			
Explore voluntary energy ratings for homes			
Transportation	Biking Goal -- increase the amount of biking in LO	Safe biking routes to school, promote biking to school	Reduce VMT
		Public forum on bike paths -- educate the public, rally enthusiasm and get input on priorities	
		Create LO bike map	
		Increase bike paths	

	<p>Create a approach to bike paths that includes separated paths that are safe for older people and kids</p> <p>Bike path to Portland</p> <p>Bike path on the side of hwy 43</p> <p>Bridge across the river</p> <p>Public "campaign" of letter writing and meetings with Councilors etc</p> <p>Provide incentives for employer-sponsored bicycle programs, including for City employees.</p> <p>Conduct a community survey to understand barriers to biking.</p> <p>Implement projects that reallocate a portion of the right-of-way to spaces that are friendly to people walking</p> <p>Improve biking amenities at City facilities such as showers, lockers, and covered/secured bike parking.</p> <p>Offer bike sharing like Portland BIKETOWN</p> <p>Consider electric bike sharing (e.g., Bewegan ®)</p> <p>Set up electric bike demonstrations</p> <p>Try to promote bicycling as "utilitarian" as well as "recreational." (e.g., you don't need to dress in lycra to ride a bike to the grocery store)</p>	
Mass transit-- goal-- increase the % of total trips that occur on public transportation	<p>Create better shelters - Use shelters to purify surrounding air</p> <p>Create a park and ride, or better parking options near Safeway (I think this has been ruled out in a previous study)</p> <p>Increase the frequency of service</p> <p>Create a bike barn at the city -- so that people can ride bikes to transit</p> <p>Promote employer sponsored bus passes--City of LO should sponsor bike passes for employees</p> <p>Promote the trolley--create commuter system</p> <p>Promote electric busses</p> <p>Offer training at the senior center -- how to use public transportation</p> <p>Provide shuttles to SW corridor light rail</p> <p>Recruit a citizens committee to advocate for transit</p> <p>Coordinate with neighboring local governments to promote use of transit, carpooling, and car-sharing.</p> <p>Affiliate with the Westside Transportation Alliance to coordinate advocacy for public transit</p>	Reduce VMT

		Provide additional park-and-ride lots to promote public transit and reduce downtown congestion.	
		Develop ridesharing (e.g., Lyft, Uber, Bridj) for low density neighborhoods to provide links to public transit	
		Integrate transit with land-use planning	
		Promote one or more new high density neighborhoods (e.g., Foothills) as "transit oriented developments"	
		Consider an L.O. owned and operated frequent shuttle between Lake Grove and downtown L.O.	
	Electric vehicles - Increase number of new electric vehicle purchases in LO to 50% by 2030	Strategy: Actions that support purchase and usage of electric vehicles	Significantly reduce GHG emissions and air pollution from burning fossil fuel
		Develop and execute a campaign to provide decision makers and the public opportunities to drive an EV and experience its benefits.	
		Develop and provide information about electric and hybrid vehicles and incentive programs on the City website.	
		Work with local automobile dealerships to increase electric vehicle stock, and improve training and incentives for EV sales.	
		Take advantage of the \$2500 rebate for new EV purchases under the new state transportation program.	
		City purchase or contract for X% electric vehicles	
Transportation (cont)	Electric vehicles - Increase number of new electric vehicle purchases in LO to 50% by 2030 (cont)	School District contract with electric school busses	
		Aggregate and incentivize bulk purchases of electric vehicles for fleet, car-sharing, or individual use to drive prices lower.	
		Promote carsharing companies that utilize EV's (e.g., ReachNow).	
		Strategy: Actions to support increased EV charging stations	
		Adopt building codes that promote EV charging infrastructure -- look at building in conduits as new streets and buildings are constructed	
		Take advantage of potential opportunities under the new state clean fuels program.	
		Advocate (as a city) at the state and regional level for better charging station infrastructure like standardized plug - ins, signage, standardized payment methodology, roadways and mapping strategy	
		Promote workplace charging	
		Increase charging infrastructure in Lake Oswego; multifamily, HOA, public right-of-way, Electric Avenue	
			Car-Sharing--bring more car sharing to LO/reduce number of
	Training on how to use Uber and Lyft		

	cars	Look into private vans	purchased
		Increase incentives for sustainable City employee commuting such as through competitions or cost shares.	Reduced congestion (less idling)
		Separate Parking and Housing Cost	
		Provide Preferential Parking for car pooling, car sharing in work place and educational facilities	Promote cleaner & more fuel efficient cars
		Evaluate parking requirements	
		Implement parking pricing	
		Evaluate approaches such as retrofitting, charging for, and reducing on-street parking	
		Examine guaranteed ride home programs for commercial property owners	
		Campaign to increase awareness of how transportation costs factor into the total cost of living	
		Promote virtual meetings through high speed internet (1 G)	
		Educate on carbon offsets for air travel	
		Explore incentives for less polluting commercial truck traffic	
Food + Consumption	Food Awareness	Begin a community campaign to educate the public about food choice as part of a climate-friendly lifestyle (such as, through cooking classes or school curriculum).	
		Specifically encourage reduced consumption of red meat and dairy products and other carbon-intensive foods (such as, through school menu changes)	
	Food Purchasing	Increase purchasing of local, low carbon content food alternatives throughout the community.	Reduced GHG intensity of food
		Partner with nonprofit organizations to promote the purchase of climate-friendly food and products.	
		Implement a "Buy climate-friendly first" food purchasing policy for public institutions including city and county governments, schools, and hospitals	
	Food Production Methods	Reduce GHG intensive inputs and retain carbon and other nutrients on agricultural land.	Reduced GHG intensity of food
		Transition to agricultural methods that reduce GHGs. Support efforts of Oregon Department of Agriculture, Oregon Tilth, Oregon State University, Willamette Farm and Food Coalition, and other partners.	
		Strengthen land use regulations which protect farm lands, particularly those on high-value agricultural soils.	
		Support acquisition or protection of land for local agriculture and food production that results in net carbon benefits through decreased transportation or production emissions.	

		Remove barriers to using greywater in agriculture. Work with state lawmakers to find solutions for greywater re-use.	
	Local Food System	Increase participation in and accessibility to local food programs, including community supported agriculture (CSA) programs, and encourage neighborhood-scale food production.	Reduced GHG intensity of food
		Expand community gardening and urban agriculture.	
		Develop an updated regional emergency food distribution plan that accounts for climate- and energy-based disruptions.	
		Expand community gardens on public and private lands including school campuses, City lands, and church properties.	
		Encourage planting of non-invasive food-bearing trees and shrubs on public and private lands.	
		Reevaluate limitations on numbers and types of animals permitted under the city's code to allow, where appropriate, an increase in the number and variety of food-producing animals that can be kept by urban residents.	
	Edible Landscapes	Model and promote edible landscaping and gleaning.	Reduced GHG intensity of food
	Waste Reduction-- Food	Support edible food donation.	materials mgmt/ reduced consumption
		Provide a best practices guide to help households and businesses reduce food waste and consumption.	
		Evaluate opportunities for recycling/composting of commercial food waste.	
	Public Awareness Strategy: Reduce consumption of carbon-intensive goods and services.	Determine and implement effective ways to reduce and track consumption based emissions.	materials mgmt/ reduced consumption
		Implement an education campaign for waste and consumption reduction strategies.	
		An education kit on waste reduction, collection, and separation should be provided to all residents and businesses upon initial occupancy.	
		Support a culture change by applying community-based social marketing and providing other outreach and education	
		Support "collaborative consumption" community projects.	
	Public Awareness Strategy: Expand community recycling and composting.	Improve recycling programs, implement new education and outreach, and expand public space recycling.	materials mgmt/ reduced consumption
		Update the multi-family recycling ordinance to encourage more diversion.	
		Increase resource efficiency in schools and other organizations.	
		Promote materials reuse by construction of a re-use warehouse	
Food +	Public Awareness	Introduce environmentally preferable purchasing (EPP) guidelines for City	materials

Consumption (cont)	Strategy: Improve the sustainability of City operations and purchases.	procurement.	mgmt/ reduced consumption
		Assess the feasibility of co-digesting food waste and biosolids at the wastewater treatment facility	
	Construction and Demolition Debris Recycling	Enact an ordinance that requires all construction and demolition waste materials to be sorted for reusable or recyclable materials.	materials mgmt/ reduced consumption
	Reuse and Repair	Promote reuse and repair.	materials mgmt/ reduced consumption
	Purchasing	Evaluate elements of supply chain that have highest impact to carbon footprint - prioritize efforts accordingly.	reduced GHG intensity of goods
		Increase purchasing of materials containing recycled material content, that have reduced packaging, and that can be returned to the manufacturer for remanufacturing, reuse, or full recycling.	
		Establish a local forum for sharing best low carbon purchasing practices (include purchasing experts from major institutions like hospital, schools, and county).	
	Federal / State Policy Advocacy	Support state efforts to develop a consumption-based GHG inventory methodology and to adopt standards, incentives, and / or mandates for carbon foot-printing and labeling of products.	reduced GHG intensity of goods
		Participate actively in the process to develop state and federal product stewardship programs and legislation. Support opportunities for producers to develop responsible manufacturing, product and package design and reuse of recovered materials.	
	Increase product stewardship	Actively support new state and national product stewardship legislation that requires producers to be involved in end-of-product-life management, either through product design changes (e.g. compostable snack bags), investing in take back programs (e.g. Oregon E-cycles), or placing a fee on the sale of products to support diversion (e.g. Oregon Bottle Bill).	materials mgmt/ reduced consumption
		Promote policies at the local, state and federal level that implement carbon pricing related to product and materials life cycles (e.g., emissions cap or carbon tax), including imports (border adjustment mechanism / carbon tariff if necessary).	
		Lobby at the state level for better product labeling that includes information about greenhouse gas emissions associated with products.	
		Pursue a regional approach to developing infrastructure for Zero Waste activities	
		Coordinate and participate in regional land conservation efforts that will provide greater opportunities for carbon sequestration.	

	Conduct research to determine the most effective next steps in the area of consumption and waste.	Follow research being conducted by 1) the EPA's West Coast Forum on Climate Change and Materials Management, 2) Action Item recommendations from the Materials Management subcommittee of the Oregon Governor's Global Warming Committee's Roadmap 2020 plan, and 3) Oregon Department of Environmental Quality systems-based GHG inventory, to determine highest priority and most cost effective measures to address GHG production in the materials management sector.	reduced GHG intensity of goods
		Determine the greenhouse gas emissions profile from the current solid waste collection system and provide recommendations on how to reduce carbon emissions within the system.	
Land Use + Planning	Walkable/bikeable neighborhoods and Land Use patterns to reduce congestion (increased density and TOD) <i>Example goal: By 2030, 90% of households will be within 20 minutes' reach of basic, daily non-work needs by bike or foot.</i>	Create 20-minute neighborhoods: Encourage neighborhood villages (e.g. First Addition, Boones Ferry @ Kruse commercial district, etc) with access by walking/biking paths from surrounding neighborhoods.	Reduce VMT / reduce congestion (and reduce idling)
		Increase activity and destinations in neighborhood villages	
		Increase density near the neighborhood villages.	
		Change zoning standards as needed to allow neighborhood cafes, food stands, and small-business retail.	
		Change zoning standards as needed to allow for increased housing density in urban core and transit corridors.	
		Develop quality medium- and high-density owner-occupied and rental housing for all income brackets.	
Complete Streets		Improve the biking/walking infrastructure; use street trees to separate bike lanes and sidewalks from traffic	Reduce VMT
		Design neighborhood streets to calm traffic, increase water absorption, and increase green space. Change city street standards to encourage this.	
		Improve accessibility for people of different ages and physical mobility (eg include benches, ADA compliant, etc)	
		Improve access and orientation for all users: auto drivers, pedestrians, and bicyclists	
Safe Routes to Schools		TBD	Reduce VMT
Open Space Management		Increase acreage of City green space to improve carbon sequestration; (incorporate into walkable/bikeable infrastructure)	carbon sequestration
Electrify Lawn Equipment		Lawn equipment - voluntary trade-in, Parks Dept, businesses	Reduced GHG intensity of lawn care / cleaner air

	Protect trees	Outreach to County to support tree codes in unincorporated LO and enforcement of existing LO tree ordinances relating to development and annexation.	carbon sequestration
		Continued participation in Tree City USA	
		Inventory LO trees	
		Consider trees as part of City's assets	
		Increase acreage of protected areas	
	Plant 5000 trees in 5 years	City to plant trees in parks, along streets, in parking lots	carbon sequestration
		Program to include resident participation in a voluntary tree planting effort, in which the City subsidizes tree cost through bulk purchase agreement with supplier	
		Plant trees along Highway 5 to minimize noise and air quality impacts to nearby neighborhoods.	

APPENDIX F. Summary Record of Public Comments

Inputs/Ideas Received via Email:

Tree Code and Solar

You might consider changing the LO tree code to take into account the problem of global warming.

The amount of carbon sequestered by trees blocking a solar array is approximately 10% of the atmospheric carbon production permanently eliminated by the solar array.

Roads and Heat Island Effect

Our streets are being "paved" with a black slurry that not only is an ugly mess still after a month (even after one thorough street sweep) but most importantly, **it has created a measurable heat increase that radiates over my yard and home.**

I've always trusted LO to use best practices and materials, but this is just an awful change. I would like to know if you have an idea who would be best suited for me to take my concerns to. My immediate concern is that my own efforts to be sustainable/low water/low energy use homeowner are wiped away by this one act that I had no say in, and my deepest foundational concern is that these heat islands are being created all over town.

I live in the Westlake neighborhood. I've seen the same material recently being put down all over Village on the Lake.

Tree Planting and Preservation

In regard to planting trees: Promote proper stewardship of the urban forest by informing people how to properly plant and water trees. - this is included below. Plant the right tree in the correct place to help establish healthy trees and increase the tree canopy. Look at recently developed areas to increase the planting of trees.

Planting trees, especially tall-growing native trees because these trees help to maintain and moderate climate. The majestic trees comprising the LO urban forest are disappearing at a rapid pace.

It is critical that the Development Code be reviewed and updated as it relates to tree preservation. This should be a top priority since many native old growth/ big trees are being removed with the building of new homes.

Make sure mitigation trees are planted and maintained and not removed.

Inventory of neighborhood trees with the count and species. Included in this inventory should be the health of the tree.

Tree removal requests for any large "invasion list tree" should go through the type II tree removal process. The current list of "invasive" trees should be reviewed and revised.

Inputs/Ideas Received via Open House in March 2018:

(attached)

Resources & Resilience

Comments

CONCENTRATE ON TREE HEALTH - maintenance for healthy trees - REMOVE INVASIVES like ivy & Clematis.

Possibly plant (w/ hydration plan) 2500 trees; "Restore" 2500 current.

CONCENTRATE ON fire prevention in critical areas - like steep forested slopes.

ALL PLANTING COULD/SHOULD BE COORDINATED WITH THE BACKYARD HABITAT PROGRAM.

Plant drought tolerant natives - white oak + western Ponderosa -

Appropriate place / appropriate tree

Resources & Resilience

Comments

Survey opinion on climate action
before/after campaigns to measure
Success of outreach.

what could LO do that would
serve as a demonstration
of success for replicability?

(eg. climate change as part
of LOSD curriculum) broad
focus on accelerating transition
to low carbon economy.

Transportation Comments

- Enforce Anti Idling System
for Delivery trucks

Install
"Share power" electric power
on loading
use to have food delivery
and other diesel emissions
Reduced.

Upgrade All school buses,
and other stop vehicles.
with matching grants and
a definite goal.

Transportation Comments

TAP into how to
use "DRIVE LESS SAVE MORE"
TRIMET TAX

Use a SURVEY INSTRUMENT
to get input from KRUSE WAY
employees + employers.

Try a BUS ROUTE -
"BRIDGEPORT" Area would be
ideal.

Resources & Resilience

Comments

- In terms of actual tree species the city should use local expertise (Oswego Lake Watershed Council) for species that will be drought tolerant / low maintenance w/ regard to climate change projections → by 2050 the climate of the Willamette Valley is slated to be similar to the central Valley of California. From a diversity / financial standpoint - planting species that are going to survive warmer temperatures and less water is **CRITICAL** for longevity of a successful tree program!
- With regard to invasive pests (emerald Ash borer) Ash species should NOT be considered for plantings
- Financial Funding for the tree program should contract to local agencies (Oswego Lake Watershed Council) - overall would cost the city less money to pay \$xx/year to an organization rather than paying a city employee with tree implementation.
- A centralized database that would allow anyone to input tree planting data as an open source resource would allow for easier input / tracking of what's happening. This would allow for ease in tracking / reporting to partners and the public. Metrics could be tied to this that also illustrate # trees, lbs of CO₂ sequestered to date, ~~water~~ solar radiation reduction (lower stream temps), trees saved from ivy, etc.

- Patrick Blanchard
Oswego Lake Watershed Council
program coordinator

Buildings & Energy Comments

1. SECONDARY DWELLING UNITS (SDU'S, ADU'S)

- DROP THE FEES THAT OCCUR WHEN A SDU/RANGE IS INSTALLED THE BUILDING FEES FOR PLUMBING, ELECTRICAL, ETC AT \$500 RANGE, EXPLODE TO OVER \$12000-\$14000 BECAUSE THE UNIT IS CONSIDERED A NEW HOME (NOT A SDU). CITY OF PORTLAND HAS DROPPED THESE EXCESS FEES.

2. COTTAGE DEVELOPMENT ZONING

COTTAGE PROPERTIES HAVE BEEN VERY SUCCESSFUL IN SEATTLE, TACOMA, OLYMPIA AND VANCOUVER B.C. COTTAGES AT \$200-1200 SF MEET THE NEEDS OF SENIORS, SINGLE, YOUNG FAMILIES.

TAX REVENUES TO THE CITY AND COUNTY WOULD BE COMPARABLE TO A LARGE WITH 6-8 COTTAGES AS TO ONE LARGE HOME.

PROPERTY NEEDS TO BE RESIDENTIAL-COMMERCIAL IS TOO EXPENSIVE - AND CLOSE TO PUBLIC ACCESS OR BUS SERVICE AND SHOPPING.

KING COUNTY - SEATTLE - HAS DEVELOPED A CASE STUDY ON HOW A CITY CAN MODIFY ITS CODE TO ALLOW SUCH COTTAGE DEVELOPMENT

- PAUL LYONS

Rotary Speaker
Hans

Tony Zaba
Delhi Univ.

Buildings & Energy Comments

- How much solar PV capacity does L.O. have?
- Tesla @ Fair
- Energy Trust @ Fair
- Time of use sign ups w/ PGE retro active analysis
- solar info
- Green Button data
- Simpler solar instant info

Hans Energy Fair w/ EV Fair

Neil Kelly
Sponsoring

Same time as boat/car show

AUG

Consumption Comments

Bombardment of Education on Food +
Consumption through every avenue.

Consumption Comments

Replace plastic containers / clamshells @ grocery stores

What are we doing at front end / air now

What ~~are~~ can we do now?

blw now + the goals set in this plan