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LANE TRANSIT DISTRICT
SPECIAL BOARD MEETING/WORK SESSION

Wednesday, June 23, 2010
5:30 p.m.

LTD BOARD ROOM
3500 E. 17th Avenue, Eugene
(off Glenwood Boulevard in Glenwood)

A G E N D A

Page No.

I. CALL TO ORDER

II. ROLL CALL

Dubick _____ Eyster _____ Gillespie _____ Kortge _____
Towery _____ Necker _____ Evans _____

III. PRELIMINARY REMARKS BY BOARD PRESIDENT

IV. ANNOUNCEMENTS AND ADDITIONS TO AGENDA 3

V. WORK SESSION

A. City of Eugene Presentation: Draft Climate and Energy Action Plan (20 minutes) 4/36

B. RideSource Call Center Second Year Report (20 minutes) 6

C. West Eugene EmX Extension Project: Refinement of the Range of Alternatives (45 minutes) 8

VI. AUDIENCE PARTICIPATION

- *Public Comment Note: This part of the agenda is reserved for members of the public to address the Board on any issue. The person speaking is requested to sign-in on the Audience Participation form for submittal to the Clerk of the Board. When your name is called, please step up to the podium and give your name and address for the audio record. If you are unable to utilize the podium, you may address the Board from your seat.*
- *Citizens testifying are asked to limit testimony to three minutes.*

VII. ITEMS FOR ACTION

A. West Eugene EmX Extension Project Refinement of the Range of Alternatives (5 minutes) 34

VIII. ADDENDA 36

A. A Community Climate and Energy Action Plan for Eugene (Page 37)

B. Compiled Priority Action Items (Page 114)

IX. ADJOURNMENT

The facility used for this meeting is wheelchair accessible. If you require any special physical or language accommodations, including alternative formats of printed materials, please contact LTD's Administration office as far in advance of the meeting as possible and no later than 48 hours prior to the meeting. To request these arrangements, please call 682-6100 (voice) or 1-800-735-2900 (TTY, through Oregon Relay, for persons with hearing impairments).

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AGENDA ITEM SUMMARY

DATE OF MEETING: June 23, 2010

ITEM TITLE: ANNOUNCEMENTS AND ADDITIONS TO AGENDA

PREPARED BY: Jeanne Schapper, Administrative Services Manager/Clerk of the Board

ACTION REQUESTED: None

BACKGROUND: This agenda item provides a formal opportunity for Board members to make announcements or to suggest topics for current or future Board meetings.

ATTACHMENT: None

PROPOSED MOTION: None

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AGENDA ITEM SUMMARY

DATE OF MEETING: June 23, 2010

ITEM TITLE: CITY OF EUGENE PRESENTATION: DRAFT CLIMATE AND ENERGY ACTION PLAN

PREPARED BY: Tom Schwetz, Director of Planning and Development

ACTION REQUESTED: None. Information only.

BACKGROUND: The City of Eugene recently completed a Draft Climate and Energy Action Plan (CEAP), likely to be adopted by the City Council later this year. The Plan will set forth strategies to reduce total, current, community-wide, fossil fuel consumption by 50 percent by the year 2030 and identify targets along the way to help measure progress. In addition, the Plan will help prepare the Eugene community for impacts resulting from climate change and will help the community respond to the effects of changes in energy price and supply. City of Eugene Climate and Energy Action Coordinator Matt McRae will provide an overview of the Plan and the planning process.

LTD participated in the development of the Plan during the past year, which resulted in several recommendations, noted in Attachment 1, pertaining to public transit.

ATTACHMENT: Land Use and Transportation Objectives Pertaining to Public Transit

ADDENDA: 1. Draft Climate and Energy Action Plan
2. Compiled Climate and Energy Action Items

(*These items are being included as enclosures with the LTD Board agenda packet to Board members only. Interested others may obtain a copy by contacting LTD.)*

PROPOSED MOTION: None.

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ATTACHMENT 1

Land Use and Transportation Objectives Pertaining to Public Transit
From City of Eugene's Draft Climate, Energy Action Plan

Land Use and Transportation Objective 2: Increase density around the urban core and along transit corridors.

1. Zone future commercial and high residential densities in and around the urban core and along EMX and other high-capacity transit corridors to accommodate future urban growth.

Land Use and Transportation Objective 5: Increase the supply of frequent, reliable, integrated, and convenient public transit.

8. Diversify funding sources for Lane Transit District (LTD) to increase the long-term reliability of mass transit service.
9. Align City of Eugene Transportation System Plan and LTD Long-Range Transit Plan to integrate bus routes into the broader alternative transportation system.
    a. Create special setbacks along future Bus Rapid Transit (BRT) or other mass transit corridors to accommodate future right-of way expansion.
    b. Work with LTD in developing the Long-Range Transit Plan to determine the role of mass transit in accomplishing greenhouse gas emission reduction goals.
10. Invest in transit infrastructure that meets future access and mobility needs while consuming less fossil fuel.
    a. Maximize electrification of transportation system.
    b. Create special setbacks along future BRT or mass transit corridors to accommodate future right-of-way expansion.

Land Use and Transportation Objective 6: Expand outreach, marketing, and education regarding climate-friendly transportation alternatives.

11. Increase promotion of bicycling, walking, bus riding, car-pooling, telecommuting, utilizing high-occupancy vehicles, and using emergency ride home as attractive alternatives to driving in order to increase the mode-share alternatives to the single occupancy vehicle.
12. Increase promotion of fuel-efficient driving techniques.

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AGENDA ITEM SUMMARY

DATE OF MEETING: June 23, 2010

ITEM TITLE: RIDE*SOURCE* CALL CENTER SECOND YEAR REPORT

PREPARED BY: Terry Parker, Accessible Services Program Manager

ACTION REQUESTED: None. Information Only.

BACKGROUND: In 1994 the Oregon Department of Human Services recognized that transportation, especially in rural areas, was a critical need of its Medicaid clientele. An important aspect of providing transportation to needed medical appointments was to find the most appropriate and least expensive resource to provide the ride. The transportation brokerage model emerged as the most successful way to coordinate and provide these rides.

As of 2008 all counties in Oregon, with the exception of Lane County, utilized a brokerage/call center to provide non-emergency medical rides for Oregon Health Plan Plus (Medicaid) eligible recipients only. Planning began at LTD in 2006 for an integrated human services transportation call center within Lane County. The resulting Ride*Source* Call Center takes the state model one step further by grouping Medicaid rides with other human service trips, including Americans with Disabilities Act (ADA) complementary paratransit. This approach allows LTD to incorporate Medicaid transportation with the existing array of Ride*Source* services. And, to address state and federal coordination initiatives by creating a "one-stop" call center for human services customers to arrange transportation for any one of a number of different transportation programs.

The Ride*Source* Call Center began full operation on May 19, 2008. Since the opening of the Call Center, call volume has ranged between 14,000 and 19,000 calls per month. Prior to the start of the Call Center, from July 2007 through May 2008, Ride*Source* directly provided 705 Medicaid rides and 117,212 rides for all other programs. During the corresponding period this year, 5,759 Medicaid rides and 130,316 rides for all other programs were provided.

The first year of the Ride*Source* Call Center's operation was dedicated to getting the Center up and running while smoothing out the rough edges and refining the system. This second year largely has been focused in two areas: (1) developing and implementing a new cost allocation model to fairly and accurately distribute expenses across all of the programs

served through the Call Center; and (2) fully implementing an in-person transportation assessment program utilizing staff from two partner agencies, Senior & Disabled Services and Alternative Work Concepts. Additional projects have included the renewal of the contract with the Oregon Department of Human Services; on-going discussions at the state level with regard to brokerage and transportation provider insurance coverage and changes in state tort liability; and the development of interested commercial contractors as potential ADA paratransit trip providers.

In the coming year, three new projects will have priority. First is the development of a cost allocation model to fairly distribute the costs of the in-person transportation assessment program. Second, the Call Center will be moving forward in researching new software that will bring the technological areas of operation more into line with current developments and provide enhanced customer service. Third will be the development and implementation of a gas voucher program that will add another cost-effective transportation alternative for some customers.

ATTACHMENTS: None.

RESULTS OF RECOM-MENDED ACTION: None.

PROPOSED MOTION: None.

Q:\Reference\Board Packet\2010\06\Work Ssn 06-23-10\Call Center Summary.doc

AGENDA ITEM SUMMARY

DATE OF MEETING: June 23, 2010

ITEM TITLE: WEST EUGENE EmX EXTENSION PROJECT: REFINEMENT OF THE RANGE OF ALTERNATIVES

PREPARED BY: Tom Schwetz, Director of Planning and Development

ACTION REQUESTED: During the Items for Action portion of the meeting, the Board will be asked to adopt a refined set of alternatives contained in the West Eugene EmX Extension (WEEE) Alternatives Analysis Refinement Evaluation to be used in the preparation of an Alternatives Analysis Report for the WEEE Project.

BACKGROUND: Through the extensive outreach conducted in the refinement of the alternative alignments for the West Eugene EmX Extension (WEEE) project, 58 distinct alternatives have emerged for evaluation. Not only is this a large number for the community to sort out in the process of selecting a Locally Preferred Alternative (LPA), it is a large number to take into the currently defined federal process.

New information from the technical analyses completed to date suggests that certain alternatives may no longer be viable. This information is detailed and summarized within the three attachments.

As in previous EmX development efforts, the general approach has been to balance the operational needs for EmX operations in a corridor with the intent to develop design options that avoid and minimize negative impacts where possible. This has resulted in a wide range of alternative permutations (56 distinct build alternatives in addition to the No Build and Transportation System Management alternatives); making 58 alternatives in all.

In discussions with Board members, city councilors, members of various committees involved in the project, and members of the public, there is general agreement that it would be confusing and difficult for the community to try and sort out differences among 58 alternatives. Federal Transit Administration staff have indicated that there is a way of working through a project development process that better fits LTD's needs given this number of alternatives.

The process used for the project to date has been a combined Alternatives Analysis (required by FTA) and Draft Environmental Impact Statement (required for use of federal capital funds). FTA provides for a sequential process where the alternatives analysis can be prepared first using the same original technical analysis. This analysis will be used to reduce the number of alternatives down to a more manageable number. The alternatives analysis would be followed by a process of selecting a preferred alternative to be taken into the preparation of the Draft Environmental Impact Statement.

This has the benefit of breaking the overall decision into more manageable pieces, which will assist in facilitating the community's decision-making on the project. It also puts the first part, the selection of the Locally Preferred Alternative, into this calendar year.

In addition to the No-Build and Transportation System Management (TSM) alternatives, LTD staff are recommending further consideration of the remaining build alternative alignments. These alternatives include:

- West 13th Avenue between the Downtown Eugene Station to West 11th Avenue via Chambers Street (this alternative includes two design options: a two-lane transitway, or a frontage alley design option on West 13th between Polk and Tyler Streets)
- West 6th/7th Avenues between the Downtown Eugene Station to West 11th Avenue via Garfield (this alternative includes four design options: a Lincoln/Charnelton couplet or a two-way bus lane on Charnelton; and either adding or reassigning an existing lane on West 6th and West 7th Streets between Blair and Fillmore Streets)
- West 11th Avenue (Between Garfield Street and the Commerce Street terminus)

This is a total of 12 alternatives to be taken into the Alternatives Analysis Report. At its June 15 special meeting, the WEEE Corridor Committee concurred with the staff recommendation, with one addition: the Committee indicated a preference to add the 7th Place alternative to the build alternatives that will be carried into the Alternatives Analysis Report. This would add an additional 4 alternatives, bringing the total up to 12 alternatives to be taken into the Alternatives Analysis Report. Staff concur with this addition.

ATTACHMENTS:

1. West Eugene EmX Extension Alternatives Analysis Refinement Evaluation
2. West Eugene EmX Extension Alternatives Analysis: Key Preliminary Results (summary table)
3. West Eugene EmX Extension Alternatives Analysis: Potential Significant Adverse and Beneficial Effects by Mode and Length Alternatives (data table)

PROPOSED MOTION: None.

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West Eugene EmX Extension
Alternatives Analysis Refinement Evaluation

Evaluation Framework for Refinement of Alternatives

The West Eugene EmX Extension project's evaluation framework consists of the project's Purpose and Need Statement and the project's Goal and Objectives (provided as a separate handout). The same evaluation criteria and measures used during the project's screening evaluation phase are being used during the project's Alternatives Analysis phase.

The Alternatives Analysis is a determination of whether or not the alignment alternatives are reasonable or promising alternatives based on the project's evaluation measures. Following is a summary of the evaluation criteria and measures:

1. Improve customer convenience by reducing travel time, increasing service reliability, and making other service improvements.
   - Round-trip transit travel time between select origins and destinations
   - Ridership information
2. Improve operating and other efficiencies to maximize the use of scarce resources.
   - Operating service hours (round-trip travel time proposed service frequency)
   - Operating hours of regular service replaced by EmX within the corridor
3. Support development that is consistent with planned land use documents and serve as a catalyst for planned transit-oriented development.
   - Vacant and redevelopable land value near the alignment
   - Number of mixed-use centers (land-use nodes) served by the alignment
4. Help accommodate future growth in travel by increasing public transportation's share of trips.
   - Population and employment density near alignment
   - Transportation mode shift
5. Consider the mobility and safety needs of pedestrians, bicyclists, and motorists.
   - General assessment of alternative's interface with pedestrian, bicycle, and vehicle facilities
6. Provide for a fiscally stable public transportation system.
   - General assessment of alternatives affect on the fiscal stability of the public transportation system
7. Design the project in a way that protects resources in the natural and built environment.
   - Potential for acquisitions and/or displacement of residents, businesses and parking
   - Potential impacts to street, landscape, and charter trees
   - Likelihood of adverse impact to environmentally-sensitive natural resources (i.e., wetlands, parklands, historic resources, critical habitat, endangered species)
8. Support LTD's sustainability policy and the City of Eugene's efforts to reduce greenhouse gas emissions.
   - General assessment on the alternative's ability to support LTD's sustainability policy
   - Potential for alternative to attract an increase in public transportation's share of trips and the concurrent reduction in vehicle miles traveled and/or single occupancy vehicle use.

Summary of Evaluation Results

This section summarizes the evaluation results, which is a determination of whether or not the proposed alignment alternatives and terminus options selected for further study in March 2008 are reasonable or promising alternatives based on the initial technical findings and the project's evaluation measures. Key findings from the preliminary draft technical reports related to project's evaluation measures are summarized in Tables 1A through 1D below. Additional data from the preliminary draft technical reports are provided in two tables provided separately ("Potential significant Adverse and Beneficial Effects by Mode and Length" and "Alternatives Analysis: Key Preliminary Results"). The technical reports will be available upon request from LTD as they become finalized, and they will be posted to the project website at http://weemx.ltd.org.

Summary of Mode and Length Alternatives by Evaluation Criteria

Evaluation Criteria

●	Still meets WEEE Project's Purpose and Need for that Evaluation Criteria
◖	Probably will meet WEEE Project's Purpose and Need and Evaluation Criteria with modifications and / or mitigation
D	Probably *will not* meet WEEE Project's Purpose and Need and Evaluation Criteria with modifications and / or mitigation
○	Does not meet WEEE Project's Purpose and Need for that Evaluation Criteria
NA	Not Applicable
⚠	Relatively higher number of significant adverse impacts identified

Table 1A. Summary of Mode and Length Alternatives by Evaluation Criteria: *Bus Alternatives*

		Evaluation Criteria								
		1	2	3	4	5	6	7	8	R/E
Alt #	Alternative / Design Option / Terminus Option	Improve customer convenience	Improve operating and other efficiencies	Support planned land use / catalyst for planned transit-oriented development	Accommodate future growth in travel	Consider mobility and safety needs	Provide for fiscally stable system	Sensitive to natural and built resources	Support sustainability and efforts to reduce GHG	Recommendation to Retain or Eliminate the Alternative or Design Option
Bus Alternatives										
No-Build Alternative										
1	Full Length Alternatives	NA	NA	NA	NA	NA	NA	NA	NA	R
TSM Alternative										
2	Full Length Alternatives	NA	NA	NA	NA	NA	NA	NA	NA	R

Table 1B. Summary of Mode and Length Alternatives by Evaluation Criteria:
Seneca Road Terminus Alternatives

		Evaluation Criteria								
		1	2	3	4	5	6	7	8	R/E
Alt #	Alternative / Design Option / Terminus Option	Improve customer convenience	Improve operating and other efficiencies	Support planned land use / catalyst for planned transit-oriented development	Accommodate future growth in travel	Consider mobility and safety needs	Provide for fiscally stable system	Sensitive to natural and built resources	Support sustainability and efforts to reduce GHG	Recommendation to Retain or Eliminate the Alternative or Design Option
BRT Alternatives										
With Seneca Road Terminus										
W 13th Avenue – Amazon via North of Amazon Design Option										
3	– Frontage Alley Design Option	◖	◖	◖	◖	●	●	⚠	●	E
4	– Two-Lane Transitway Design Option	◖	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – Amazon via Amazon Restoration Design Option										
5	– Frontage Alley Design Option	◖	◖	◖	◖	●	●	⚠	●	E
6	– Two-Lane Transitway Design Option	◖	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – W 11th Avenue										
7	– Frontage Alley Design Option	◖	◖	◖	○	●	●	●	●	E
8	– Two-Lane Transitway Design Option	◖	◖	◖	◖	●	●	○	●	E
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet Design Option										
9	– Add-A-Lane Design Option	D	D	◖	◖	●	○	◖	◖	E
10	– Reassign-A-Lane Design Option	D	D	◖	○	●	○	◖	◖	E
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way Design Option										
11	– Add-A-Lane Design Option	D	D	◖	○	●	○	◖	◖	E
12	– Reassign-A-Lane Design Option	D	D	◖	○	●	○	◖	◖	E
W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet Design Option										
13	– Add-A-Lane Design Option	○	○	○	◖	●	○	◖	◖	E
14	– Reassign-A-Lane Design Option	○	○	○	◖	●	○	◖	◖	E
W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way Design Option										
15	– Add-A-Lane Design Option	○	○	○	●	●	○	◖	◖	E
16	– Reassign-A-Lane Design Option	○	○	○	●	●	○	◖	◖	E

Table 1C. Summary of Mode and Length Alternatives by Evaluation Criteria:
Commerce Street Terminus Alternatives

		Evaluation Criteria								
		1	2	3	4	5	6	7	8	R/E
Alt #	Alternative / Design Option / Terminus Option	Improve customer convenience	Improve operating and other efficiencies	Support planned land use / catalyst for planned transit-oriented development	Accommodate future growth in travel	Consider mobility and safety needs	Provide for fiscally stable system	Sensitive to natural and built resources	Support sustainability and efforts to reduce GHG	Recommendation to Retain or Eliminate the Alternative or Design Option
BRT Alternatives										
With Commerce Street Terminus										
W 13th Avenue – Amazon via North of Amazon Design Option										
17	– Frontage Alley Design Option	●	◖	◖	◖	●	●	⚠	●	E
18	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – Amazon via Amazon Restoration Design Option										
19	– Frontage Alley Design Option	●	◖	◖	◖	●	◖	⚠	●	E
20	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	◖	⚠	●	E
W 13th Avenue – W 11th Avenue										
21	– Frontage Alley Design Option	●	●	●	●	●	●	●	●	R
22	– Two-Lane Transitway Design Option	●	●	●	●	●	●	○	●	**?**
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet Design Option										
23	– Add-A-Lane Design Option	D	D	●	●	●	D	◖	◖	R
24	– Reassign-A-Lane Design Option	D	D	●	●	●	D	◖	◖	R
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way Design Option										
25	– Add-A-Lane Design Option	D	D	●	●	●	D	◖	◖	R
26	– Reassign-A-Lane Design Option	D	D	●	●	●	D	◖	◖	R
W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet Design Option										
27	– Add-A-Lane Design Option	○	○	○	◖	●	○	◖	◖	E
28	– Reassign-A-Lane Design Option	○	○	○	◖	●	○	◖	◖	E
W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way Design Option										
29	– Add-A-Lane Design Option	○	○	○	●	●	○	◖	◖	E
30	– Reassign-A-Lane Design Option	○	○	○	●	●	○	◖	◖	E

Table 1D. Summary of Mode and Length Alternatives by Evaluation Criteria:
Full-Length Cone Terminus Alternatives

		Evaluation Criteria								
		1	2	3	4	5	6	7	8	R/E
Alt #	Alternative / Design Option / Terminus Option	Improve customer convenience	Improve operating and other efficiencies	Support planned land use / catalyst for planned transit-oriented development	Accommodate future growth in travel	Consider mobility and safety needs	Provide for fiscally stable system	Sensitive to natural and built resources	Support sustainability and efforts to reduce GHG	Recommendation to Retain or Eliminate the Alternative or Design Option
BRT Alternatives										
With Full-Length Alternative – Cone Terminus										
W 13th Avenue – Amazon via North of Amazon Design Option – W 11th Avenue										
31	– Frontage Alley Design Option	●	◖	◖	◖	●	●	⚠	●	E
32	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – Amazon via Amazon Restoration Design Option – W 11th Avenue										
33	– Frontage Alley Design Option	●	◖	◖	◖	●	●	⚠	●	E
34	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – W 11th Avenue										
35	– Frontage Alley Design Option	◖	◖	◖	◖	●	●	⚠	●	E
36	– Two-Lane Transitway Design Option	◖	◖	◖	◖	●	●	⚠	●	E
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet Design Option										
37	– Add-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
38	– Reassign-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way Design Option										
39	– Add-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
40	– Reassign-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Lincoln / Charnelton Couplet Design Option										
41	– Add-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E
42	– Reassign-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Charnelton Two-Way Design Option										
43	– Add-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E
44	– Reassign-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E

Table 1E. Summary of Mode and Length Alternatives by Evaluation Criteria:
Full-Length Cone / Willow Creek Terminus Alternatives

		Evaluation Criteria								
		1	2	3	4	5	6	7	8	R/E
Alt #	Alternative / Design Option / Terminus Option	Improve customer convenience	Improve operating and other efficiencies	Support planned land use / catalyst for planned transit-oriented development	Accommodate future growth in travel	Consider mobility and safety needs	Provide for fiscally stable system	Sensitive to natural and built resources	Support sustainability and efforts to reduce GHG	Recommendation to Retain or Eliminate the Alternative or Design Option
BRT Alternatives										
With Full-Length Alternative – Cone / Willow Creek Terminus										
W 13th Avenue – Amazon via North of Amazon Design Option – W 11th Avenue										
45	– Frontage Alley Design Option	●	◖	◖	◖	●	●	⚠	●	E
46	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – Amazon via Amazon Restoration Design Option – W 11th Avenue										
47	– Frontage Alley Design Option	●	◖	◖	◖	●	●	⚠	●	E
48	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	●	⚠	●	E
W 13th Avenue – W 11th Avenue										
49	– Frontage Alley Design Option	●	◖	◖	◖	●	●	⚠	●	E
50	– Two-Lane Transitway Design Option	●	◖	◖	◖	●	●	⚠	●	E
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet Design Option										
51	– Add-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
52	– Reassign-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way Design Option										
53	– Add-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
54	– Reassign-A-Lane Design Option	D	D	◖	◖	●	D	⚠	◖	E
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Lincoln / Charnelton Couplet Design Option										
55	– Add-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E
56	– Reassign-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Charnelton Two-Way Design Option										
57	– Add-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E
58	– Reassign-A-Lane Design Option	○	○	○	◖	●	○	⚠	◖	E

West Eugene EmX Extension Alternatives Analysis: Key Preliminary Results [1]

Alternative Number(s)	*Alternative(s) Name*	Annual Ridership: Corridor Ridership (without downtown)	Annual Ridership: EmX System Ridership: All EmX Routes	Annual Ridership: Systemwide Ridership	Average Transit Travel Times (in minutes) from Downtown Eugene [2]	Capital Cost (in millions)	Annual System Operating Cost: 2009 Dollars (in millions)	Systemwide Operating Cost per Trip	Potential Property Acquisitions: Partial	Potential Property Acquisitions: Full	Route Length by EmX Lane Type Total/BAT/ Transitway/ Mixed Traffic (in miles) [3]	On-Street Parking Displaced	Trees Potentially Removed: Under 8" Diameter	Trees Potentially Removed: Over 8" Diameter	Potential Impacts to Endangered Plants & Animals	Potential Parkland Impacts	Potential Wetlands Impacts	Potential Impacts to Low Income/ Minority Households
1	**No-Build (full length)**	3,028,200	4,898,700	14,392,200	17.5	$0.0	$39.07	$2.71	0	0		0	0	0				
2	**TSM (full length)**	3,081,300	4,918,800	14,520,000	16.4	$22.2	$40.47	$2.79	40	2		0	89	2	✓		✓	
	Seneca Terminus																	
3-6	W 13th to Amazon Alternative [4]	3,285,300	6,299,100	14,744,100	15.5	$63.0-$65.1	$40.46	$2.74	39-45	4-14	5.4/1.3/2.9/1.2	129	599-854	308-494	✓	✓	✓	✓
7-8	W 13th Avenue to W 11th Avenue [5]	3,277,200	5,979,000	14,732,400	15.5	$66.1-$66.5	$40.13	$2.72	77-81	4-8	5.5/3.0/1.5/0.9	101	59	73				
9-12	W 6th/7th Avenue to W 11th Avenue [6]	3,303,900	6,246,300	14,738,700	18.8	$76.3-$84.0	$40.76	$2.77	111-174	6-9	6.1/5.1/0.0/1.0	11-39	46-56	102-213				
13-16	W 6th/7th Avenue to W 7th Place [7]	3,213,000	5,971,500	14,639,400	18.8	$62.4-$70.1	$40.83	$2.79	87-150	3-6	5.7/5.2/0.0/0.5	11-39	18-28	91-202			✓	
	Commerce Terminus																	
17-20	W 13th to Amazon Alternative [4]	3,408,600	6,477,600	14,922,600	14.4	$92.0-$94.0	$40.27	$2.70	74-80	5-15	8.2/4.1/2.9/1.2	147	611-866	328-504	✓	✓	✓	✓
21-22	W 13th Avenue to W 11th Avenue [5]	3,400,500	6,422,700	14,910,900	14.5	$95.0-$95.4	$39.95	$2.68	112-116	5-9	8.3/5.9/1.5/0.9	119	71	93			✓	
23-26	W 6th/7th Avenue to W 11th Avenue [6]	3,427,200	6,424,800	14,917,200	17.8	$105.2-$113.0	$40.57	$2.72	146-209	7-10	8.8/7.8/0.0/1.0	29-57	58-68	122-233			✓	
27-30	W 6th/7th Avenue to W 7th Place [7]	3,336,300	6,150,000	14,817,900	17.8	$102.1-$109.8	$40.65	$2.74	124-187	4-7	8.7/8.0/0.0/0.7	29-57	30-40	111-222			✓	
31-34 & 45-48	**Full Length Terminus (Cone & Cone + Willow)** W 13th to Amazon Alternative [4]	3,464,700	6,572,400	15,017,400	14.4	$113.6-$119.1	$40.33	$2.69	80-88	5-15	13.0/5.9/2.9/4.2	147-161	708-963	335-511	✓	✓	✓	✓
39-42 & 44-50	W 13th Avenue to W 11th Avenue [5]	3,456,600	6,538,500	15,005,700	14.5	$120.9-$124.5	$40.00	$2.67	118-124	5-9	13.1/7.7/1.5/3.9/	119-133	168	100	✓		✓	
43-50 & 51-54	W 6th/7th Avenue to W 11th Avenue [6]	3,483,300	6,519,600	15,012,000	17.8	$131.1-$142.1	$40.63	$2.71	154-217	7-10	13.6/9.6/0.0/4.0	29-71	155-165	129-240	✓		✓	
50-58 & 55-58	W 6th/7th Avenue to W 7th Place [7]	3,392,400	6,244,800	14,912,700	17.8	$128.0-$138.9	$40.70	$2.73	132-195	4-7	13.5/9.8/0.0/3.7	29-71	127-137	118-229	✓		✓	

Notes

(1) These data represent information summarized from preliminary draft technical subject reports on the West Eugene EmX Extension project as of June 8th, 2010 and are subject to final verification and revision. Individual technical subject reports will be available on the project website (http://weemx.ltd.org) as the reports are finalized.

(2) Average of total travel time for transit trips from downtown Eugene to 16 locations between the Eugene Downtown Station and the Commerce Terminus. Time includes both in-vehicle and walking/waiting time.

(3) Route lenghts and type: Total Length of alternative/length in miles of BAT lane, lenght in miles of exclusive transitway/ lenght in miles of mixed traffic

BAT Lane= Bus and Business Access: An EmX priority lane; generally a concrete lane, separated from general purpose lanes by a paint stripe and signage, shared with right or left-turning general purpose vehicle traffic.

Transitway= EmX only; generally with a concrete lane or concrete tracks with grass-strip divider; traversed by general-purpose vehicles at signalized intersections only. Sections of transitway on W 13th are additionally separated by a curb with various traversable curb breaks at intersections.

Mixed Traffic: EmX or bus travels with other vehicles in normal traffic lanes

(4) Design options for the W. 13th Avenue to Amazon Alignment are: Frontage Alley or Two-Way Transitway on 13th east of Polk and the North Amazon and Amazon Restoration for the Amazon Channel section.

(5) Design option for the W. 13th Avenue to W. 11th Avenue Alignment is: Frontage Alley or Two-Way Transitway on 13th east of Polk.

(6) Design options for the W. 6th/7th Avenues to W. 11th Avenue Alignment are: Charnelton/Lincoln Couplet and Charnelton Two-Way in the downtown Eugene area and Add-A-Lane and Reassign-A-Lane on 6th and 7th Avenues..

(7) Design options for the W. 6th/7th Avenues to W. 7th Place Alignment are: Charnelton/Lincoln Couplet and Charnelton Two-Way in the downtown Eugene area and Add-A-Lane and Reassign-A-Lane on 6th and 7th Avenues..

Potential Significant Adverse and Beneficial Effects by Mode and Length Alternatives

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
Bus Alternatives														
No-Build Alternative														
1	Full Length MOS	• None	• None	• None	• None	$0M	• None	Sites of Potential Concern 0: • High Risk 0: • Medium Risk 0: • Low Risk 0: • Open LUST 0:	• None	• Increased traffic congestion could have long-term negative effects on regional economics, employers' and their ability to find employees, finding reliable and affordable access to good jobs, education and job training, affordable housing, childcare and other services and opportunities, mobility to /from neighborhoods, & ability to efficiently deliver emergency services • Does not support future nodal development • Shift in neighborhood investments to other areas, declining neighborhood vitality, segregation of low-income households • Decrease in level of service for public facilities and emergency response times	• None	• Possible increased noise and lower air quality due to higher traffic on major arterials – W 11th Ave and W 6th/7thAve	• 15 signalized intersection approaches would operate with congested conditions • No roadway capacity changes	
TSM Alternative														
2	Full Length MOS	• Loss of riparian habitat • Widening W 11th Ave and the bridge at Willow Creek increases habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to (development of) designated Willamette daisy critical habitat • Tree and shrub planting along new pedestrian crossings of Amazon and Willow Creeks • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon and Willow Creeks	• Temporary impacts to 7 wetlands • 0.063 ac wetland impacts • Permanent loss of wetland / waters mitigated by replacement	• Pollutant Generating Impervious Surfaces (PGIS): 5.77 ac • Total New Impervious Area – curb to curb (NI): 3.07 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$22.3M	Property Acquisitions: • 2 Full • 40 Partial • 0 On-street parking spaces (0%) • 105 Off-street parking spaces (20.08%) Potential Displacements: • 0 Residential • 0 Public / Institutional • 2 Commercial / Industrial	Sites of Potential Concern 22: • High Risk 7: • Medium Risk 6: • Low Risk 2: • Open LUST 7:	• None	• Transit services and access for employees improved over No-Build • Displaces 1 business with approx. 15 employees • Improved transit options for EJ and Title VI populations • Est. loss of $16k annual tax revenue	Total: 3 Non-contributing: 2 Eligible contributing: 1 • 1 No effect • 0 No adverse effect • 0 Adverse effect Eligible significant: 0 • 0 No effect • 0 No adverse effect • 0 Adverse effect	• 4 Parks near alignment would experience improved access o All 4 are potential 4(f) resources o 3 would experience improved pedestrian access resulting from proposed pedestrian facilities on surrounding streets o 2 would experience improved access from facilitated travel from Eugene Station to Western Terminus	• 17 signalized intersection approaches would operate with congested conditions • Bus only lane added at select locations on 11th Avenue to avoid traffic congestion	
BRT Alternatives														
Seneca Road Terminus MOS														
W 13th Avenue – Amazon via North of Amazon DO														
3	Frontage Alley DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• 0.043 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 6.13 ac • NI: 3.24 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$63.05M	Property Acquisitions: • 4 Full • 43 Partial • 129 On-street parking spaces (32%) • 157 Off-street parking spaces (5.16%) Potential Displacements: • 0 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 10 (2 sites mapped on W 11th, ~ 250 N of 'North of Amazon DO) • High Risk: 2 • Medium Risk: 3 • Low Risk:0 • Open LUST: 5	Potential trees removed: • 94 street trees o 33 possible charter trees • 419 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 2 businesses with approx. 18 employees • Est. loss of $33k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 19 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Seneca Road	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
4	Two-Lane Transitway DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• 0.043 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 5.76 ac • NI: 3.47 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$64.5M	Property Acquisitions: • 8 Full • 39 Partial • 129 On-street parking spaces (32%) • 157 Off-street parking spaces (5.16%) Potential Displacements: • 4 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 10 (2 sites mapped on W 11th, ~ 250 N of 'North of Amazon DO) • High Risk:2 • Medium Risk: 3 • Low Risk: 0 • Open LUST: 5	Potential trees removed: • 94 street trees o 33 possible charter trees • 417 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 2 businesses with approx. 18 employees • Displaces residents • Est. loss of $38k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 19 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Seneca Road	
W 13th Avenue – Amazon via Amazon Restoration DO														
5	Frontage Alley DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• 0.043 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 6.13 ac • NI: 3.29 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$64.6M	Property Acquisitions: • 10 Full • 45 Partial • 129 On-street parking spaces (32%) • 146 Off-street parking spaces (4.99%) Potential Displacements: • 8 Residential • 0 Public / Institutional • 2 Commercial / Industrial	Sites of Potential Concern: 10 (2 sites mapped on W 11th, ~ 250 N of 'North of Amazon DO) • High Risk: 2 • Medium Risk: 3 • Low Risk: 0 • Open LUST: 5	Potential trees removed: • 94 street trees o 33 possible charter trees • 641 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 1 business with approx. 15 employees • Displaces residents • Est. loss of $28k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 19 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Seneca Road	
6	Two-Lane Transitway DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• 0.043 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 5.76 ac • NI: 3.52 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$65.1M	Property Acquisitions: • 14 Full • 41 Partial • 129 On-street parking spaces (32%) • 146 Off-street parking spaces (4.99%) Potential Displacements: • 12 Residential • 0 Public / Institutional • 2 Commercial / Industrial	Sites of Potential Concern: 10 (2 sites mapped on W 11th, ~ 250 N of 'North of Amazon DO) • High Risk: 2 • Medium Risk: 3 • Low Risk: 0 • Open LUST: 5	Potential trees removed: • 94 street trees o 33 possible charter trees • 642 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 1 business with approx. 15 employees • Displaces residents • Est. loss of $31k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 19 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Seneca Road	
W 13th Avenue – W 11th Avenue														
7	Frontage Alley DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian	• Potential alterations to hydrologic regimes and plant communities	• PGIS: 10.45 ac • NI: 5.21 ac • Proposed project conditions will create larger amount of runoff, and increase flow	$66.1M	Property Acquisitions: • 4 Full • 81 Partial • 101 On-street parking spaces (32%) • 218 Off-street parking spaces (5.90%)	Sites of Potential Concern: 18 • High Risk: 6 • Medium Risk: 3 • Low Risk: 1	Potential trees removed: • 98 street trees o 33 possible charter trees • 32 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development	Total: 161 Non-contributing: 67 Eligible contributing: 86 • 83 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8	• 18 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment	• 15 signalized intersection approaches would operate with congested conditions	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
			crossings of Amazon Creek		volumes to receiving waters • Potential to introduce pollutants		Potential Displacements: • 1 Residential • 0 Public / Institutional • 3 Commercial / Industrial	• Open LUST: 9		• Improved transit options for EJ and Title VI populations • Displaces 3 businesses with approx. 24 employees • Displaces residents • Est. loss of $26k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	• 7 No effect • 1 No adverse effect • 0 Adverse effect		• Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
8	Two-Lane Transitway DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Potential alterations to hydrologic regimes and plant communities	• PGIS: 10.08 ac • NI: 5.42 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$66.5M	Property Acquisitions: • 8 Full • 77 Partial • 101 On-street parking spaces (32%) • 218 Off-street parking spaces (12.37%) Potential Displacements: • 5 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 18 • High Risk: 6 • Medium Risk: 3 • Low Risk: 1 • Open LUST: 9	Potential trees removed: • 98 street trees o 33 possible charter trees • 30 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 3 businesses with approx. 24 employees • Displaces residents • Est. loss of $29k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	Total: 161 Non-contributing: 67 Eligible contributing: 86 • 83 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect • 1 No adverse effect • 0 Adverse effect	• 18 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO														
9	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Potential alterations to hydrologic regimes and plant communities	• PGIS: 14.25 ac • NI: 5.97 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$84.0M	Property Acquisitions: • 10 Full • 173 Partial • 11 On-street parking spaces (9%) • 309 Off-street parking spaces (12.37%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 7 Commercial / Industrial	Sites of Potential Concern: 22 • High Risk:9 • Medium Risk: 5 • Low Risk:0 • Open LUST: 8	Potential trees removed: • 256 street trees o 5 possible charter trees • 13 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 9 businesses with approx. 48 employees • Displaces residents • Est. loss of $47k annual tax revenue	Total: 102 Non-contributing: 33 Eligible contributing: 61 • 49 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 12 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
10	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Potential alterations to hydrologic regimes and plant communities	• PGIS: 13.19 ac • NI: 4.68 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$77.4M	Property Acquisitions: • 7 Full • 111 Partial • 11 On-street parking spaces (9%) • 237 Off-street parking spaces (11.92%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 9 • Medium Risk: 5 • Low Risk 0 • Open LUST: 6	Potential trees removed: • 137 street trees o 5 possible charter trees • 11 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 6 businesses with approx. 34 employees • Displaces residents • Est. loss of $39k annual tax revenue • Potential impact to police response to non-emergency incidences	Total: 102 Non-contributing: 33 Eligible contributing: 61 • 54 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 12 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO														
11	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting	• Potential alterations to hydrologic regimes and plant communities	• PGIS: 14.11 ac • NI: 5.97 ac • Proposed project conditions will create larger amount of runoff,	$83.0M	Property Acquisitions: • 10 Full • 172 Partial • 39 On-street parking spaces (51%) • 309 Off-street parking	Sites of Potential Concern: 22 • High Risk: 9 • Medium Risk: 5 • Low Risk:0	Potential trees removed: • 249 street trees o 7 possible charter trees • 14 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources	Total: 89 Non-contributing: 33 Eligible contributing: 50 • 40 No effect • 9 No adverse effect • 1 Adverse effect	• 12 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
			along new pedestrian crossings of Amazon Creek		and increase flow volumes to receiving waters • Potential to introduce pollutants		spaces (12.37%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 7 Commercial / Industrial	• Open LUST: 8		• Supports nodal development • Improved transit options for EJ and Title VI populations • Serves greatest relative percentage of low-income households and households without vehicles • Displaces 9 businesses with approx. 48 employees • Displaces residents • Est. loss of $47k annual tax revenue • Addition of new bike lanes on Charnelton	Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect		conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
12	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Potential alterations to hydrologic regimes and plant communities	• PGIS: 13.05 ac • NI: 4.68 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$76.3M	Property Acquisitions: • 7 Full • 110 Partial • 39 On-street parking spaces (51%) • 237 Off-street parking spaces (11.92%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 9 • Medium Risk: 5 • Low Risk: 0 • Open LUST: 6	Potential trees removed: • 130 street trees o 7 possible charter trees • 10 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Serves greatest relative percentage of low-income households and households without vehicles • Displaces 6 businesses with approx. 34 employees • Displaces residents • Est. loss of $37k annual tax revenue • Addition of new bike lanes on Charnelton • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 89 Non-contributing: 33 Eligible contributing: 50 • 45 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 12 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet DO														
13	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• 0.009 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 12.21 ac • NI: 4.59 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$70.1M	Property Acquisitions: • 6 Full • 150 Partial • 11 On-street parking spaces (9%) • 125 Off-street parking spaces (12.87%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 16 • High Risk: 6 • Medium Risk:5 • Low Risk: 0 • Open LUST: 5	Potential trees removed: • 221 street trees o 5 possible charter trees • 9 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 6 businesses with approx. 24 employees • Displaces residents • Est. loss of $24k annual tax revenue •	Total: 101 Non-contributing: 32 Eligible contributing: 61 • 49 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 9 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
14	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• 0.009 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 11.14 ac • NI: 3.31 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$63.5M	Property Acquisitions: • 4 Full • 87 Partial • 11 On-street parking spaces (9%) • 53 Off-street parking spaces (11.45%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 2 Commercial / Industrial	Sites of Potential Concern: 14 • High Risk: 6 • Medium Risk: 5 • Low Risk:0 • Open LUST: 3	Potential trees removed: • 102 street trees o 5 possible charter trees • 7 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 3 businesses with approx. 104 employees • Displaces residents • Est. loss of $16k annual tax revenue • Addition of new bike lanes on Charnelton • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 101 Non-contributing: 32 Eligible contributing: 61 • 54 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 9 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way DO														

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
15	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• 0.009 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 12.07 ac • NI: 4.59 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$69.1M	Property Acquisitions: • 7 Full • 148 Partial • 39 On-street parking spaces (51%) • 125 Off-street parking spaces (12.87%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 16 • High Risk: 6 • Medium Risk: 5 • Low Risk:0 • Open LUST: 5	Potential trees removed: • 214 street trees o 7 possible charter trees • 10 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Serves greatest relative number of employees • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 6 businesses with approx. 24 employees • Displaces residents • Est. loss of $24k annual tax revenue	Total: 88 Non-contributing: 32 Eligible contributing: 50 • 40 No effect • 9 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 9 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
16	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• 0.009 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 11.00 ac • NI: 3.31 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$62.4M	Property Acquisitions: • 4 Full • 86 Partial • 39 On-street parking spaces (51%) • 53 Off-street parking spaces (11.45%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 2 Commercial / Industrial	Sites of Potential Concern: 14 • High Risk: 6 • Medium Risk: 5 • Low Risk:0 • Open LUST: 3	Potential trees removed: • 95 street trees o 7 possible charter trees • 6 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Serves greatest relative number of employees • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 3 businesses with approx. 104 employees • Displaces residents • Est. loss of $16k annual tax revenue • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 88 Non-contributing: 32 Eligible contributing: 50 • 45 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 9 Parks within ¼ mile of stations • 1 Park within 100 feet of alignment o 1 6(f) resource	• Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Seneca Road	
Commerce Street Terminus MOS														
W 13th Avenue – Amazon via North of Amazon DO														
17	Frontage Alley DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• Temporary construction impacts to 1 wetland • 0.091 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 6.13 ac • NI: 3.24 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$92.0M	Property Acquisitions: • 5 Full • 78 Partial • 147 On-street parking spaces (32%) • 199 Off-street parking spaces (6.14%) Potential Displacements: • 0 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 15 (includes 2 sites mapped ~ 250 N of 'North of Amazon DO) • High Risk: 4 • Medium Risk: 5 • Low Risk: 1 • Open LUST:5	Potential trees removed: • 103 street trees o 33 possible charter trees • 444 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 4 businesses with approx. 36 employees • Est. loss of $53k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Commerce Street	
18	Two-Lane Transitway DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• Temporary construction impacts to 1 wetland • 0.091 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 5.76 ac • NI: 3.47 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$92.4M	Property Acquisitions: • 9 Full • 74 Partial • 147 On-street parking spaces (32%) • 199 Off-street parking spaces (6.14%) Potential Displacements: • 4 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 15 (includes 2 sites mapped ~ 250 N of 'North of Amazon DO) • High Risk: 4 • Medium Risk: 5 • Low Risk: 1 • Open LUST: 5	Potential trees removed: • 103 street trees o 33 possible charter trees • 442 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 4 businesses with approx. 36 employees • Displaces residents • Est. loss of $56k annual tax revenue • Impacts to neighborhood	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Commerce Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
										• character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center				
W 13th Avenue – Amazon via Amazon Restoration DO														
19	Frontage Alley DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Temporary construction impacts to 1 wetland • 0.091 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 6.13 ac • NI: 3.29 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$93.6M	Property Acquisitions: • 11 Full • 80 Partial • 147 On-street parking spaces (32%) • 188 Off-street parking spaces (6.01%) Potential Displacements: • 8 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 15 (includes 2 sites mapped on W 11th, ~ 250 N of 'North of Amazon DO) • High Risk: 4 • Medium Risk: 5 • Low Risk: 1 • Open LUST: 5	Potential trees removed: • 103 street trees o 33 possible charter trees • 641 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 3 businesses with approx. 33 employees • Displaces residents • Est. loss of $48k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 87 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Commerce Street	
20	Two-Lane Transitway DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Temporary construction impacts to 1 wetland • 0.091 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 5.76 ac • NI: 3.52 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$94.0M	Property Acquisitions: • 15 Full • 76 Partial • 147 On-street parking spaces (32%) • 188 Off-street parking spaces (6.01%) Potential Displacements: • 12 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 2 (the sites mapped on W 11th, ~ 250 N of 'North of Amazon DO) • High Risk: 4 • Medium Risk: 5 • Low Risk: 1 • Open LUST: 5	Potential trees removed: • 103 street trees o 33 possible charter trees • 642 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 3 businesses with approx. 33 employees • Displaces residents • Est. loss of $51k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Commerce Street	
W 13th Avenue – W 11th Avenue														
21	Frontage Alley DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.048 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 17.54 ac • NI: 8.96 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$95.0M	Property Acquisitions: • 5 Full • 116 Partial • 119 On-street parking spaces (32%) • 260 Off-street parking spaces (6.67%) Potential Displacements: • 1 Residential • 0 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 23 • High Risk: 8 • Medium Risk: 5 • Low Risk: 1 • Open LUST: 9	Potential trees removed: • 107 street trees o 33 possible charter trees • 57 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 42 employees • Displaces residents • Est. loss of $46k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	Total: 161 Non-contributing: 67 Eligible contributing: 86 • 83 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect • 1 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment	• 12 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
22	Two-Lane Transitway DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon	• Temporary construction impacts to 1 wetland • 0.048 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of	• PGIS: 171.17 ac • NI: 8.96 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving	$95.4M	Property Acquisitions: • 9 Full • 112 Partial • 119 On-street parking spaces (32%) • 260 Off-street parking spaces (6.67%) Potential Displacements:	Sites of Potential Concern: 23 • High Risk: 8 • Medium Risk: 5 • Low Risk: 1 • Open LUST: 9	Potential trees removed: • 107 street trees o 33 possible charter trees • 55 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ	Total: 161 Non-contributing: 67 Eligible contributing: 86 • 83 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment	• 12 signalized intersection approaches would operate with congested conditions • Roadway capacity	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
			Creek	wetland / waters mitigated by replacement	waters • Potential to introduce pollutants		• 5 Residential • 0 Public / Institutional • 4 Commercial / Industrial			and Title VI populations • Displaces 5 businesses with approx. 42 employees • Displaces residents • Est. loss of $49k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	• 1 No adverse effect • 0 Adverse effect		added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO														
23	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.048 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 21.52 ac • NI: 9.72 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$113.0M	Property Acquisitions: • 11 Full • 208 Partial • 29 On-street parking spaces (16%) • 351 Off-street parking spaces (13%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 8 Commercial / Industrial	Sites of Potential Concern: 27 • High Risk: 11 • Medium Risk: 7 • Low Risk:1 • Open LUST: 8	Potential trees removed: • 268 street trees o No charter trees • 38 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 11 businesses with approx. 66 employees • Displaces residents • Est. loss of $67k annual tax revenue	Total: 102 Non-contributing: 33 Eligible contributing: 61 • 49 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
24	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.048 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 20.46 ac • NI: 8.43 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$106.3M	Property Acquisitions: • 7 Full • 147 Partial • 29 On-street parking spaces (16%) • 279 Off-street parking spaces (12.73%) Potential Displacements: • 1 Residential • 0 Public / Institutional • 6 Commercial / Industrial	Sites of Potential Concern: 25 • High Risk: 11 • Medium Risk: 7 • Low Risk: 1 • Open LUST: 6	Potential trees removed: • 149 street trees o No charter trees • 36 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 52 employees • Displaces residents • Est. loss of $59k annual tax revenue • Potential impact to police response to non-emergency incidences	Total: 102 Non-contributing: 33 Eligible contributing: 61 • 54 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO														
25	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.048 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 21.38 ac • NI: 9.72 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$111.9M	Property Acquisitions: • 11 Full • 207 Partial • 57 On-street parking spaces (42%) • 351 Off-street parking spaces (13%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 8 Commercial / Industrial	Sites of Potential Concern: 27 • High Risk: 11 • Medium Risk: 7 • Low Risk:1 • Open LUST: 8	Potential trees removed: • 264 street trees o No charter trees • 39 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 11 businesses with approx. 66 employees • Displaces residents • Est. loss of $67k annual tax revenue • Addition of new bike lanes on Charnelton	Total: 89 Non-contributing: 33 Eligible contributing: 50 • 40 No effect • 9 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• 12 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
26	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.048 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 20.32 ac • NI: 8.43 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$105.2M	Property Acquisitions: • 8 Full • 145 Partial • 57 On-street parking spaces (42%) • 279 Off-street parking spaces (12.73%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 6 Commercial / Industrial	Sites of Potential Concern: 25 • High Risk: 11 • Medium Risk: 7 • Low Risk: 1 • Open LUST: 6	Potential trees removed: • 146 street trees o No charter trees • 35 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 52 employees • Displaces residents • Est. loss of $59k annual tax	Total: 89 Non-contributing: 33 Eligible contributing: 50 • 45 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• 12 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
										revenue			Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet DO														
27	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.057 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 13.28 ac • NI: 5.20 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$109.8M	Property Acquisitions: • 8 Full • 186 Partial • 29 On-street parking spaces (16%) • 167 Off-street parking spaces (14.24%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 21 • High Risk: 8 • Medium Risk: 7 • Low Risk: 1 • Open LUST: 5	Potential trees removed: • 233 street trees o No charter trees • 34 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 42 employees • Displaces residents • Est. loss of $45k annual tax revenue	Total: 101 Non-contributing: 32 Eligible contributing: 61 • 49 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
28	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.057 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 12.21 ac • NI: 3.92 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$103.2M	Property Acquisitions: • 5 Full • 124 Partial • 29 On-street parking spaces (16%) • 95 Off-street parking spaces (14.29%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 21 • High Risk: 8 • Medium Risk: 7 • Low Risk: 1 • Open LUST: 3	Potential trees removed: • 114 street trees o No charter trees • 32 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 28 employees • Displaces residents • Est. loss of $36k annual tax revenue	Total: 101 Non-contributing: 32 Eligible contributing: 61 • 54 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way DO														
29	Add-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.057 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 13.14 ac • NI: 5.20 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$108.8M	Property Acquisitions: • 8 Full • 185 Partial • 57 On-street parking spaces (42%) • 167 Off-street parking spaces (14.24%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 21 • High Risk: 8 • Medium Risk: 7 • Low Risk: 2 • Open LUST: 5	Potential trees removed: • 229 street trees o No charter trees • 35 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Serves greatest relative number of employees • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 42 employees • Displaces residents • Est. loss of $45k annual tax revenue	Total: 88 Non-contributing: 32 Eligible contributing: 50 • 40 No effect • 9 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	
30	Reassign-A-Lane DO	• Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 1 wetland • 0.057 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 12.07 ac • NI: 3.92 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$102.1M	Property Acquisitions: • 5 Full • 123 Partial • 57 On-street parking spaces (42%) • 95 Off-street parking spaces (14.29%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 11 • High Risk: 8 • Medium Risk: 7 • Low Risk:2 • Open LUST: 3	Potential trees removed: • 110 street trees o No charter trees • 31 landscaped trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Serves greatest relative number of employees • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 28 employees • Displaces residents • Est. loss of $36k annual tax revenue • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 88 Non-contributing: 32 Eligible contributing: 50 • 45 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 20 Parks within ¼ mile of stations • 3 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Commerce Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
Full Length MOS – Cone Terminus														
W 13th Avenue – Amazon via North of Amazon DO – W 11th Avenue														
31	Frontage Alley DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek and new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 13.37 ac • NI: 5.35 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$113.6M	Property Acquisitions: • 5 Full • 84 Partial • 147 On-street parking spaces (32%) • 203 Off-street parking spaces (6.18%) Potential Displacements: • 0 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk: 8 • Low Risk: 2 • Open LUST: 6	Potential trees removed: • 176 street trees o 33 possible charter trees • 474 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 4 businesses with approx. 36 employees • Est. loss of $53k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 23 Parks within ¼ mile of stations • 6 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	
32	Two-Lane Transitway DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek and new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 13.00 ac • NI: 5.58 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$113.6M	Property Acquisitions: • 9 Full • 80 Partial • 147 On-street parking spaces (32%) • 203 Off-street parking spaces (6.18%) Potential Displacements: • 4 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk: 8 • Low Risk: 2 • Open LUST: 6	Potential trees removed: • 176 street trees o 33 possible charter trees • 472 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 4 businesses with approx. 36 employees • Displaces residents • Est. loss of $56k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 23 Parks within ¼ mile of stations • 6 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	
W 13th Avenue – Amazon via Amazon Restoration DO – W 11th Avenue														
33	Frontage Alley DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 13.37 ac • NI: 5.35 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$115.4M	Property Acquisitions: • 11 Full • 86 Partial • 147 On-street parking spaces (32%) • 192 Off-street parking spaces (6.05%) Potential Displacements: • 8 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk: 8 • Low Risk: 2 • Open LUST: 6	Potential trees removed: • 176 landscape trees o 33 possible charter trees • 691 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 3 businesses with approx. 33 employees • Displaces residents • Est. loss of $49k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 23 Parks within ¼ mile of stations • 6 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		regime of sensitive and listed plant species habitat due to stormwater discharge												
34	Two-Lane Transitway DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 13.00 ac • NI: 5.58 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$115.9M	Property Acquisitions: • 15 Full • 82 Partial • 147 On-street parking spaces (32%) • 192 Off-street parking spaces (6.05%) Potential Displacements: • 12 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk:8 • Low Risk:2 • Open LUST: 6	Potential trees removed: • 176 street trees o 33 possible charter trees • 692 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 3 businesses with approx. 33 employees • Displaces residents • Est. loss of $51k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 23 Parks within ¼ mile of stations • 6 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	
W 13th Avenue – W 11th Avenue														
35	Frontage Alley DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 25.19 ac • NI: 11.42 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$120.9M	Property Acquisitions: • 5 Full • 122 Partial • 119 On-street parking spaces (32%) • 264 Off-street parking spaces (6.70%) Potential Displacements: • 1 Residential • 0 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 28 • High Risk: 8 • Medium Risk: 8 • Low Risk: 2 • Open LUST: 10	Potential trees removed: • 180 street trees o 33 possible charter trees • 78 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 42 employees • Displaces residents • Loss of $46k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	Total: 161 Non-contributing: 67 Eligible contributing: 86 • 83 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect • 1 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
36	Two-Lane Transitway DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 24.82 ac • NI: 11.63 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$121.3M	Property Acquisitions: • 9 Full • 118 Partial • 119 On-street parking spaces (32%) • 264 Off-street parking spaces (6.70%) Potential Displacements: • 5 Residential • 0 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 28 • High Risk: 8 • Medium Risk: 8 • Low Risk: 2 • Open LUST: 10	Potential trees removed: • 180 street trees o 33 possible charter trees • 76 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 42 employees • Displaces residents • Est. loss of $49k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	Total: 161 Non-contributing: 67 Eligible contributing: 86 • 83 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect • 1 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO														
37	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat	• Potential transport of sediments into waterway • Increased impervious area	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts	• PGIS: 28.99 ac • NI: 12.18 ac • Proposed project	$138.9M	Property Acquisitions: • 11 Full • 214 Partial • 29 On-street parking	Sites of Potential Concern: 32 • High Risk: 11 • Medium Risk:	Potential trees removed: • 341 street trees o No charter trees • 59 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and	Total: 102 Non-contributing: 33 Eligible contributing: 61 • 49 No effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment	• 15 signalized intersection approaches would operate with	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		• Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands		spaces (16%) • 355 Off-street parking spaces (12.94%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 8 Commercial / Industrial	10 • Low Risk: 2 • Open LUST: 9		community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 11 businesses with approx. 66 employees • Displaces residents • Est. loss of $67k annual tax revenue	• 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	o 1 6(f) resource	congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
38	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 27.93 ac • NI: 10.89 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$132.2M	Property Acquisitions: • 8 Full • 152 Partial • 29 On-street parking spaces (16%) • 283 Off-street parking spaces (12.66%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 6 Commercial / Industrial	Sites of Potential Concern: 30 • High Risk: 11 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 7	Potential trees removed: • 222 street trees o No charter trees • 57 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 52 employees • Displaces residents • Est. loss of $59k annual tax revenue • Potential impact to police response to non-emergency incidences	Total: 102 Non-contributing: 33 Eligible contributing: 61 • 54 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO														
39	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 28.85 ac • NI: 12.18 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$137.8M	Property Acquisitions: • 11 Full • 213 Partial • 57 On-street parking spaces (42%) • 355 Off-street parking spaces (12.94%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 8 Commercial / Industrial	Sites of Potential Concern: 32 • High Risk: 11 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 9	Potential trees removed: • 337 street trees o No charter trees • 60 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 11 businesses with approx. 66 employees • Displaces residents • Est. loss of $67k annual tax revenue • Addition of new bike lanes on Charnelton	Total: 89 Non-contributing: 33 Eligible contributing: 50 • 40 No effect • 9 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
40	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 27.79 ac • NI: 10.89 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$131.1M	Property Acquisitions: • 8 Full • 151 Partial • 57 On-street parking spaces (42%) • 283 Off-street parking spaces (12.66%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 6 Commercial / Industrial	Sites of Potential Concern: 30 • High Risk: 11 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 7	Potential trees removed: • 218 street trees o No charter trees • 56 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 52 employees • Displaces residents • Est. loss of $59k annual tax revenue • Addition of new bike lanes on Charnelton • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 89 Non-contributing: 33 Eligible contributing: 50 • 45 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Lincoln / Charnelton Couplet DO														
41	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 30.75 ac • NI: 7.69 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$135.7M	Property Acquisitions: • 8 Full • 192 Partial • 29 On-street parking spaces (16%) • 171 Off-street parking spaces (14.05%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 26 • High Risk: 8 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 6	Potential trees removed: • 306 street trees o No charter trees • 39 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 42 employees • Displaces residents • Est. loss of $45k annual tax revenue	Total: 101 Non-contributing: 32 Eligible contributing: 61 • 49 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
42	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 29.68 ac • NI: 6.41 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$129.1M	Property Acquisitions: • 5 Full • 130 Partial • 29 On-street parking spaces (16%) • 99 Off-street parking spaces (13.96%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 24 • High Risk: 8 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 4	Potential trees removed: • 187 street trees o No charter trees • 37 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 28 employees • Displaces residents • Est. loss of $36k annual tax revenue • Addition of new bike lanes on Charnelton • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 101 Non-contributing: 32 Eligible contributing: 61 • 54 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Charnelton Two-Way DO														
43	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 30.61 ac • NI: 7.69 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$134.7M	Property Acquisitions: • 8 Full • 191 Partial • 57 On-street parking spaces (42%) • 171 Off-street parking spaces (14.05%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 26 • High Risk: 8 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 6	Potential trees removed: • 302 street trees o No charter trees • 40 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 42 employees • Displaces residents • Est. loss of $45k annual tax revenue	Total: 88 Non-contributing: 32 Eligible contributing: 50 • 40 No effect • 9 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
44	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 29.54 ac • NI: 6.41 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward	$128.0M	Property Acquisitions: • 5 Full • 129 Partial • 57 On-street parking spaces (42%) • 99 Off-street parking spaces (13.96%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 24 • High Risk: 8 • Medium Risk: 10 • Low Risk: 2 • Open LUST: 4	Potential trees removed: • 183 street trees o No charter trees • 36 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 28 employees • Displaces residents • Est. loss of $36k annual tax revenue • Reduction in lanes on W 6th / 7th could result in delayed police	Total: 88 Non-contributing: 32 Eligible contributing: 50 • 45 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 21 Parks within ¼ mile of stations • 4 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		plant species habitat due to stormwater discharge			wetlands, environmentally sensitive areas, and BLM-owned lands					response times to non-emergency incidences				
Full Length MOS – Cone / Willow Creek Terminus														
W 13th Avenue – Amazon via North of Amazon DO – W 11th Avenue														
45	Frontage Alley DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek and new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 908 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 16.91 ac • NI: 6.17 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$116.4M	Property Acquisitions: • 5 Full • 86 Partial • 161 On-street parking spaces (28%) • 203 Off-street parking spaces (6.18%) Potential Displacements: • 0 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk: 8 • Low Risk: 3 • Open LUST: 6	Potential trees removed: • 186 street trees o 32 possible charter trees • 474 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 4 businesses with approx. 36 employees • Est. loss of $53k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 24 Parks within ¼ mile of stations • 7 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	
46	Two-Lane Transitway DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek and new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 908 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 16.54 ac • NI: 6.40 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$116.8M	Property Acquisitions: • 9 Full • 82 Partial • 161 On-street parking spaces (28%) • 203 Off-street parking spaces (6.18%) Potential Displacements: • 4 Residential • 1 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk: 8 • Low Risk: 3 • Open LUST: 6	Potential trees removed: • 186 street trees o 32 possible charter trees • 472 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 4 businesses with approx. 36 employees • Displaces residents • Est. loss of $56k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 24 Parks within ¼ mile of stations • 7 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	
W 13th Avenue – Amazon via Amazon Restoration DO – W 11th Avenue														
47	Frontage Alley DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 16.91 ac • NI: 6.17 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$118.6M	Property Acquisitions: • 11 Full • 88 Partial • 161 On-street parking spaces (28%) • 192 Off-street parking spaces (6.05%) Potential Displacements: • 8 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk: 8 • Low Risk: 3 • Open LUST: 6	Potential trees removed: • 186 street trees o 32 possible charter trees • 691 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 3 businesses with approx. 33 employees • Displaces residents • Est. loss of $49k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St	Total: 187 Non-contributing: 92 Eligible contributing: 90 • 87 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 24 Parks within ¼ mile of stations • 7 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		• Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge								• Delayed emergency vehicle response times and Lane Events Center				
48	Two-Lane Transitway DO	• Direct take of endangered plant species and its habitat (Bradshaw's desert parsley) • Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased opportunities for plantings, shading, and creating habitat complexity along Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.585 ac wetland impacts • 2,389 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 16.54 ac • NI: 6.40 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$119.1M	Property Acquisitions: • 15 Full • 84 Partial • 161 On-street parking spaces 28(%) • 192 Off-street parking spaces (6.05%) Potential Displacements: • 12 Residential • 0 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 20 • High Risk: 4 • Medium Risk:8 • Low Risk: 3 • Open LUST: 6	Potential trees removed: • 186 street trees o 32 possible charter trees • 692 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 3 businesses with approx. 33 employees • Displaces residents • Est. loss of $51k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 92 Eligible contributing: 90 • 87 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 24 Parks within ¼ mile of stations • 7 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 17 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyinn Street to Terry Street	
W 13th Avenue – W 11th Avenue														
49	Frontage Alley DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 28.73 ac • NI: 12.24 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$124.1M	Property Acquisitions: • 5 Full • 124 Partial • 133 On-street parking spaces (27%) • 264 Off-street parking spaces (6.70%) Potential Displacements: • 1 Residential • 0 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 28 • High Risk: 8 • Medium Risk: 8 • Low Risk: 3 • Open LUST: 10	Potential trees removed: • 190 street trees o 32 possible charter trees • 78 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 42 employees • Displaces residents • Est. loss of $46k annual tax revenue • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 92 Eligible contributing: 90 • 87 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
50	Two-Lane Transitway DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 28.36 ac • NI: 12.45 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road	$124.5M	Property Acquisitions: • 9 Full • 120 Partial • 133 On-street parking spaces (27%) • 264 Off-street parking spaces (6.70%) Potential Displacements: • 5 Residential • 0 Public / Institutional • 4 Commercial / Industrial	Sites of Potential Concern: 28 • High Risk: 8 • Medium Risk: 8 • Low Risk: 3 • Open LUST: 10	Potential trees removed: • 190 street trees o 32 possible charter trees • 76 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 42 employees • Displaces residents • Est. loss of $49k annual tax revenue	Total: 187 Non-contributing: 92 Eligible contributing: 90 • 87 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		• Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge			• Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands					• Delayed emergency vehicle response times and Lane Events Center				
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO														
51	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 32.53 ac • NI: 13.00 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$142.1M	Property Acquisitions: • 11 Full • 216 Partial • 43 On-street parking spaces (15%) • 355 Off-street parking spaces (13%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 8 Commercial / Industrial	Sites of Potential Concern: 32 • High Risk: 11 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 9	Potential trees removed: • 351 street trees o No charter trees • 59 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 11 businesses with approx. 66 employees • Displaces residents • Est. loss of $67k annual tax revenue	Total: 161 Non-contributing: 70 Eligible contributing: 87 • 84 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
52	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 31.47 ac • NI: 11.71 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$135.4M	Property Acquisitions: • 8 Full • 154 Partial • 43 On-street parking spaces (15%) • 283 Off-street parking spaces (12.66%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 6 Commercial / Industrial	Sites of Potential Concern: 30 • High Risk: 11 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 7	Potential trees removed: • 232 street trees o No charter trees • 57 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 52 employees • Displaces residents • Est. loss of $59k annual tax revenue • Potential impact to police response to non-emergency incidences	Total: 161 Non-contributing: 70 Eligible contributing: 87 • 84 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 8 • 7 No effect • 1 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO														
53	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 32.06 ac • NI: 13.00 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$141.0M	Property Acquisitions: • 11 Full • 215 Partial • 71 On-street parking spaces (28%) • 355 Off-street parking spaces (12.94%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 8 Commercial / Industrial	Sites of Potential Concern: 32 • High Risk: 11 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 9	Potential trees removed: • 347 street trees o No charter trees • 60 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 11 businesses with approx. 66 employees • Displaces residents • Est. loss of $67k annual tax revenue • Addition of new bike lanes on Charnelton	Total: 102 Non-contributing: 36 Eligible contributing: 62 • 50 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
54	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.542 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters	• PGIS: 31.33 ac • NI: 11.71 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters	$134.3M	Property Acquisitions: • 8 Full • 153 Partial • 71 On-street parking spaces (28%) • 283 Off-street parking spaces (12.66%) Potential Displacements: • 1 Residential • 1 Public / Institutional	Sites of Potential Concern: 30 • High Risk: 11 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 7	Potential trees removed: • 228 street trees o No charter trees • 56 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations	Total: 102 Non-contributing: 36 Eligible contributing: 62 • 55 No effect • 6 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		• Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge		mitigated by replacement	• Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands		• 6 Commercial / Industrial			• Displaces 8 businesses with approx. 52 employees • Displaces residents • Est. loss of $59k annual tax revenue • Addition of new bike lanes on Charnelton • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	• 0 Adverse effect		added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Lincoln / Charnelton Couplet DO														
55	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 24.29 ac • NI: 8.51 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$138.9M	Property Acquisitions: • 8 Full • 194 Partial • 43 On-street parking spaces (15%) • 171 Off-street parking spaces (14.05%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 26 • High Risk: 8 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 6	Potential trees removed: • 316 street trees o No charter trees • 39 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 42 employees • Displaces residents • Est. loss of $45k annual tax revenue	Total: 89 Non-contributing: 36 Eligible contributing: 51 • 41 No effect • 9 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
56	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 23.22 ac • NI: 7.23 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$132.3M	Property Acquisitions: • 5 Full • 132 Partial • 43 On-street parking spaces (15%) • 99 Off-street parking spaces (13.96%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 24 • High Risk: 8 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 4	Potential trees removed: • 197 street trees o No charter trees • 37 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 28 employees • Displaces residents • Est. loss of $36k annual tax revenue • Addition of new bike lanes on Charnelton • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	Total: 89 Non-contributing: 36 Eligible contributing: 51 • 46 No effect • 4 No adverse effect • 1 Adverse effect Eligible significant: 6 • 6 No effect • 0 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity reduced on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Charnelton Two-Way DO														
57	Add-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 24.15 ac • NI: 8.51 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands	$137.9M	Property Acquisitions: • 8 Full • 193 Partial • 71 On-street parking spaces (28%) • 171 Off-street parking spaces (14.05%) Potential Displacements: • 1 Residential • 2 Public / Institutional • 5 Commercial / Industrial	Sites of Potential Concern: 26 • High Risk: 8 • Medium Risk: 10 • Low Risk: 3 • Open LUST: 6	Potential trees removed: • 342 street trees o No charter trees • 40 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 8 businesses with approx. 42 employees • Displaces residents • Est. loss of $45k tax revenue	Total: 101 Non-contributing: 35 Eligible contributing: 62 • 50 No effect • 11 No adverse effect • 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity added on 6th and 7th Avenue from Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	
58	Reassign-A-Lane DO	• Loss of riparian habitat • Increased habitat fragmentation within Fender's blue butterfly critical habitat	• Potential transport of sediments into waterway • Increased impervious area	• Temporary construction impacts to 5 wetlands • 0.551 ac wetland impacts • Potential alterations to	• PGIS: 23.08 ac • NI: 7.23 ac • Proposed project conditions will create	$131.2M	Property Acquisitions: • 5 Full • 131 Partial • 71 On-street parking spaces (28%)	Sites of Potential Concern: 24 • High Risk: 8 • Medium Risk:	Potential trees removed: • 193 street trees o No charter trees • 36 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources	Total: 101 Non-contributing: 35 Eligible contributing: 62 • 55 No effect • 6 No adverse effect	• 22 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 1 6(f) resource	• Roadway capacity reduced on 6th and 7th Avenue from	

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands / 4(f) / 6(f)	Traffic	Transit
		• Impacts to designated Willamette daisy critical habitat – slightly higher than Cone Terminus Option • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along new waterway crossings • Tree removal • Potential to modify hydrologic regime of sensitive and listed plant species habitat due to stormwater discharge	• Tree and shrub planting along new pedestrian crossings of Amazon Creek	hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants to nearby environmentally sensitive areas if drainage is discharged at low point in road • Conveyance system directs runoff toward wetlands, environmentally sensitive areas, and BLM-owned lands		• 99 Off-street parking spaces (13.96%) Potential Displacements: • 1 Residential • 1 Public / Institutional • 3 Commercial / Industrial	10 • Low Risk: 3 • Open LUST: 4		• Supports nodal development • Improved transit options for EJ and Title VI populations • Displaces 5 businesses with approx. 28 employees • Displaces residents • Est. loss of $36k annual tax revenue • Reduction in lanes on W 6th / 7th could result in delayed police response times to non-emergency incidences	• 1 Adverse effect Eligible significant: 8 • 8 No effect • 0 No adverse effect • 0 Adverse effect		Blair Blvd to Chambers Street • Roadway capacity added by BAT lane on 11th Avenue from Garfield Street to Terry Street	

Table Notes (by discipline)

- Property Acquisitions
  - Potential Displacement counts for Commercial/Industrial properties reflect the number of parcels affected, and do not necessarily match the number of displaced businesses listed under the Socio-economics column.
- Socio-economics
  - Displaced business counts are based on the actual number of businesses affected, and do not necessarily match the number of Potentially Displaced Commercial/Industrial parcels listed under the Property Acquisitions column.

AGENDA ITEM SUMMARY

DATE OF MEETING: June 23, 2010

ITEM TITLE: WEST EUGENE EmX EXTENSION (WEEE) PROJECT REFINEMENT OF THE RANGE OF ALTERNATIVES

PREPARED BY: Tom Schwetz, Director of Planning and Development

ACTION REQUESTED: Adopt a refined set of alternatives contained in the West Eugene EmX Extension (WEEE) Alternatives Analysis Refinement Evaluation to be used in the preparation of an Alternatives Analysis Report for the WEEE Project

BACKGROUND: Detailed background information is provided in the Work Session Agenda Item Summary on page 34 of the meeting packet.

RESULTS OF RECOMMENDED ACTION: The proposed action would reduce the range of alternatives for the WEEE project from 58 to 12.

ATTACHMENT: Resolution No. 2010-026

PROPOSED MOTION: I move approval of LTD Resolution No. 2010-026, adopting actions related to the West Eugene EmX Extension Project as outlined in the Resolution.

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Lane Transit District
Resolution No. 2010-026

WHEREAS, Lane Transit District (LTD) is engaged in an alternatives analysis process for the West Eugene EmX Extension (WEEE) project and is the lead local agency for that process.

WHEREAS, LTD has conducted this process in accordance with federal requirements.

WHEREAS, the LTD Board of Directors directed staff to schedule a check-in during the Alternatives Analysis phase to verify the viability of the range of alternatives identified for further study in the Range of Alternatives Report.

WHEREAS, LTD has completed preliminary analysis which concludes that several alternatives now being considered are no longer viable.

WHEREAS, the LTD Board of Directors has adopted a revised Final Purpose and Need Statement and Goal and Objectives as proposed by the Federal Transit Administration.

THEREFORE, it is hereby resolved that the LTD Board of Directors:

Adopts a refined set of alternatives contained in the West Eugene EmX Extension (WEEE) Alternatives Analysis Refinement Evaluation to be used in the preparation of an Alternatives Analysis Report for the WEEE Project.

Adopted by the Lane Transit District Board of Directors on the _____ day of June, 2010.

_____
Board President

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Lane Transit District
P. O. Box 7070
Eugene, Oregon 97401

(541) 682-6100
Fax: (541) 682-6111

ADDENDA TO JUNE 23, 2010
LTD BOARD AGENDA PACKET

CITY OF EUGENE PRESENTATION:
DRAFT CLIMATE AND ENERGY ACTION PLAN

1. Draft Climate and Energy Action Plan

2. Compiled Climate and Energy Action Items

A Community Climate and Energy Action Plan for Eugene

5/3/10 Draft

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CONTENTS

Executive Summary (not included in 5/3/10 Draft Plan)

Chapter 1: Introduction

Chapter 2: Buildings and Energy

Chapter 3: Food and Agriculture

Chapter 4: Land Use and Transportation

Chapter 5: Consumption and Waste

Chapter 6: Health and Social Services

Chapter 7: Urban Natural Resources

APPENDICES:

Included in the 5/3/10 draft plan:

Appendix 1: Compiled Priority Action Items- (Draft submitted as Attachment B for the May 12, 2010 Council packet)

Appendix 2: Glossary

Appendix 3: List of topic specialists

Appendix 5: CEAP Health Impact Assessment

Appendix 6: Bibliography

Appendix 7: Metro Greenhouse Gas Inventory

The following additional appendices will be included in the final plan:

Appendix 4: Draft City of Eugene Internal Climate Action Plan

Appendix 8: City of Eugene Community GHG Inventory

Appendix 9: Policy background

Appendix 10: Architecture 2030 targets

Chapter 1

INTRODUCTION: PREPARING FOR CHANGE

In the winter of 2008/2009, Eugene's City Council acted unanimously to direct staff to develop a Community Climate and Energy Action Plan (CEAP)[1]. The Council directed that all City operations and City-owned facilities be carbon neutral by 2020. The same year the Council committed the City to work with its partners to develop a community climate action plan to set carbon emission goals, suggest effective emission reduction strategies, and identify ways in which the community can adapt to the anticipated changes. Four months later the Council expanded the action plan to include development of a plan to reduce community-wide fossil fuel consumption by 50 per cent by 2030. This plan is the product of those efforts to understand what climate change and fuel cost increases could mean for Eugene and to find ways that we can lessen the expected impacts of the changes and meet the emission reduction/fossil fuel consumption reduction goals.

We acknowledge that there is considerable discussion and debate on the issues of climate change in the community and beyond. This plan was undertaken in response to Council direction and aligns with the scientific evidence available at the time of its publishing.

THE COMMUNITY CLIMATE AND ENERGY ACTION PLAN (CEAP)

Goals:
The goals of this plan are to: 1) reduce community-wide greenhouse gas emissions, 2) reduce community-wide fossil fuel use 50% by 2030, and 3) identify strategies that will help the community adapt to both changing climate and increasing fossil fuel prices.[2]

Geographic scope and timeline:
The goal of the planning process was to develop a plan and strategies for the broader community and the public engagement process involved citizens, topic experts and partners from inside and outside of the City of Eugene. The process has identified challenges and opportunities that exist throughout the broader Eugene community and the plan presents options and action items that will require partnerships and joint efforts across the community.

The CEAP is intended to establish general directions and offered specific actions for the Eugene community over the next three to five years. However, the scientific and general community's understanding of climate and energy challenges are evolving rapidly and Eugene's direction and goals will likely need to be revisited and updated.

How Was the Plan Developed?

[1] More policy detail and background can be found in Appendix 9.
[2] The full text of the City Council directives related to the CEAP can be found in Appendix 9.

The Climate and Energy Action Plan Advisory Team

The CEAP advisory team was assembled in May 2009 and composed of 11 community members and representatives of partner agencies. The team began its work in June 2009, providing input on the public outreach process and the general planning process. The advisory team brought expertise to the public meetings, observed and participated in topic discussions, provided feedback on the development of the plan and the plan document, and provided background data.

Team Member	**Partner Agency/Group**
Chuck Gottfried	City of Springfield
Sarah Mazze	Resource Innovation Group and The UO Climate Leadership Initiative
Joshua Proudfoot	Eugene Area Chamber of Commerce
Jason Heuser	Eugene Water and Electric Board
David Hinkley	Friends of Eugene
Lorraine Kerwood/Twila Souers	Eugene Human Rights Commission
Joe McCormack	Lane Transit District
Mike McKenzie-Bahr	Lane County
Jan Wostmann	Neighborhood Leaders Council
Heidi Beierle/Bill Randall	City of Eugene Planning Commission
Shawn Boles	City of Eugene Sustainability Commission

The Public Engagement Process

News releases, print and online calendars, website announcements, and emails invited members of the public to participate in seven public forums for the Community Climate and Energy Action plan process. A kickoff event was held in September 2009 and one public forum was held on each of the six topics between October 2009 and March 2010. More than500 members of the public participated in the forums, shared concerns about climate uncertainty and fuel price volatility and weighed in on what should be the community's highest priorities in preparing for the changes. The six topics or action areas are:

- Buildings and Energy
- Food and Agriculture
- Land Use and Transportation
- Consumption and Waste
- Health and Social Services
- Urban Natural Resources

The process for identifying action items for each of the six topic areas was as follows:

1. **A strategy list was compiled** using information submitted by regional experts and gleaned from municipal- and state-level climate and energy plans from across the nation. Strategies were organized into a list which was reviewed by

the topic specialists, refined, and then used as a starting place for the public forums.

2. **Topic specialists were identified** from across the community. Eight to twelve expert community members with broad knowledge of the topic and the ability to bring a variety of perspectives to the public forums were invited to assist with the plan. The topic specialists contributed to the development of the strategy lists, provided expert-level information support at the public forums, and assisted with the ranking of strategies**.** A complete list of Topic Specialists can be found in Appendix 3.

3. **Public forums were held** to engage members of the community who are interested in climate and energy challenges as they relate to each of the six topics. The forums were attended by between 50 and 120 community members, including topic specialists, CEAP advisory team members, neighborhood leaders, and Sustainability Commissioners. Forum participants reviewed the strategy list for the subject topic, provided perspectives on which actions should be given the highest priority, identified missing actions or strategies, and provided detail on how individual actions could be implemented.

4. **Topic specialists reviewed proposed actions** in greater detail, provided input on priorities, and helped to ground the process in the unique economic, social, and environmental conditions of the community.

5. **Advisory team members weighed information** from background documents, input from the public forums and the topic specialist meetings, and they offered their varied perspectives on the issues. The team completed a final review of the strategies for each topic area and they reviewed and commented on this draft Community Climate and Energy Action Plan.

The outcomes

Several hundred possible action items were suggested, reviewed, and discussed in the public engagement process. However, the objective of the process, and of the CEAP, is to identify the highest priority actions for Eugene. The actions proposed in each of the following chapters are those that will best reduce fossil fuel consumption and GHG emissions and prepare Eugene for the impacts of energy price volatility and climate uncertainty. A strict cost-benefit analysis based on the three goals is probably impossible, but the project team designed a process that weighs the relative importance of potential actions in the context of the three stated goals.

What Happens Next?

Following the review of the draft Community Climate and Energy Action Plan by Eugene City Council in May 2010 the project team will continue to meet with partner agencies, topic area experts, interest groups, neighborhood groups and the general public to get their input on the draft plan and on specific action items.

Confirmation research and data collection, where appropriate, are currently being conducted for each action. The final plan will include targets (how far do we need to go and by when?); establish measures (what can we measure to tell us if we're getting

there?); identify financial impacts (what will this action cost and who will pay?); and estimate the relative effectiveness of greenhouse gas reduction strategies. This work will continue for the next three months, at which time the plan will be finalized and published.

How is the Community Climate and Energy Action Plan Organized?

The strategies in this plan are organized into six action areas. These action areas are sectors of our economy, systems, and categories that help to organize objectives and actions. The first four action areas are the primary targets for greenhouse gas emissions and fossil fuel reductions. The last two, Health and Social Services and Urban Natural Resources, are action areas where steps must to be taken to adapt to climate change and rising fuel prices.

- Buildings and Energy
- Food and Agriculture
- Land Use and Transportation
- Consumption and Waste
- Health and Social Services
- Urban Natural Resources

The draft plan includes some targets, measures, estimated financial impacts, and estimated greenhouse gas reductions for some action items. The final plan will provide this information for each high priority action item.

A table containing all of the actions and associated data is available in the Compiled Priority Action Items Tables in Appendix 1.

Terms in *italics* are defined in the glossary located in the Appendix 2.

HOW WILL CLIMATE UNCERTAINTY AND FUEL PRICE VOLATILITY AFFECT EUGENE?

How Do Greenhouse Gasses Contribute to Climate Change?

The earth receives radiant energy from the sun, part of which is reflected back to space. Greenhouse gases, including carbon dioxide, methane, and nitrous oxide, surround the earth and trap some of this energy—keeping the surface warm and making life on earth possible (see Figure 1). For decades we have been driving cars, heating our homes and businesses, and creating electricity by burning fossil fuels such as oil, coal, and natural gas. These activities have increased the amount of greenhouse gases in the atmosphere, causing more of the sun's energy to be trapped. The trapped energy warms the earth and changes our climate. Climate scientists have been telling us that we need to reduce our greenhouse gas emissions to avoid further intensifying the greenhouse effect and its impact on our climate. It is becoming

increasingly clear that nations, states, and communities must work to decrease greenhouse gas emissions, and plan for climate change.

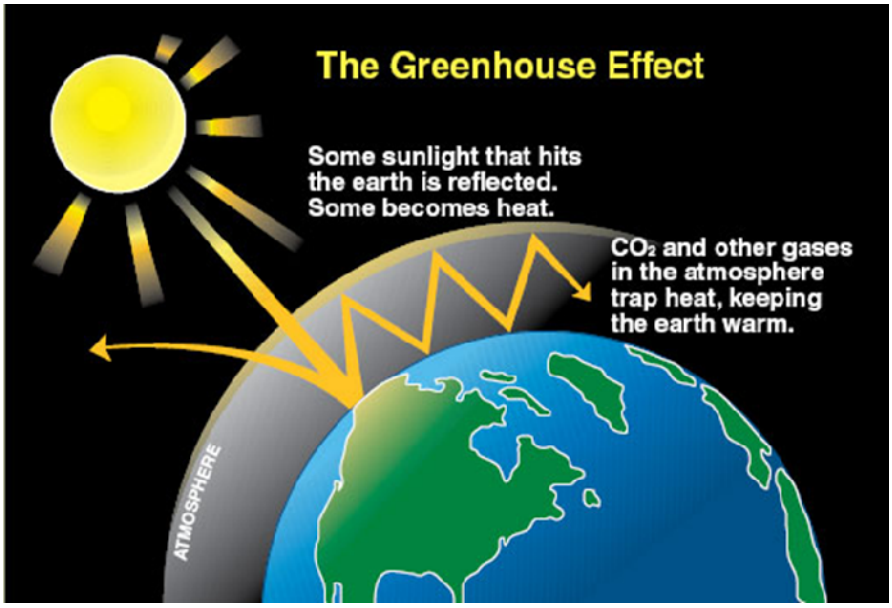

Figure 1 - Source: State of Washington Dept. of Ecology

How Will Our Climate Change?

Carbon dioxide and other greenhouse gases produced today will remain in the atmosphere and continue to affect the climate for decades to come. However, reducing greenhouse gas emissions now is expected to decrease the magnitude of climate change over time. "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon: Co-Beneficial Planning for Communities and Ecosystems," [3] published in 2009, identifies several important changes expected to affect our community, including:

- Average annual temperatures increase by 8 to 12° F by around 2080
- Reduced snowpack and resultant lower stream flows in summer
- Increased demand for water for agricultural uses
- Reduced summer hydroelectric power generation capacity (due to lower stream flows in summer) and increased summer demand for electricity
- Increased storm intensity, flooding, and wildfires
- Higher rates of heat-related illness , exhaustion, asthma, and respiratory diseases

How Will Rising Fuel Prices Affect Eugene?

Global demand for oil and natural gas has increased rapidly over the last 30 years. The supply of these non-renewable resources is limited, and over the last decade there has been increasing concern about the shrinking supply and rising cost of these fossil fuels. Gas prices over $4 per gallon during the summer of 2008 reminded consumers of how dependent Eugene's economy is on these fuels for our daily activities. The increased costs of fuel, transportation, food, and consumer goods had a significant impact on many consumers and businesses and hit small businesses and lower- and fixed-income households the hardest.

[3] "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon: Co-Beneficial Planning for Communities and Ecosystems," US Department of Agriculture, Climate Leadership Initiative, and National Center for Conservation Science and Policy, 2009.

The City of Portland Peak Oil Task Force studied the likely impacts of rising fuel prices and in 2007, published their findings in, "Descending the Oil Peak: Navigating the Transition from Oil and Natural Gas."[4] The report identifies a number of ways in which northwest communities such as Eugene are vulnerable to changes in global energy markets. For example, transportation of freight via air and truck is expected to become more costly and food prices are expected to rise as a result. Increased costs for fertilizer, animal feed, and processing will also put upward pressure on food costs. Likewise, heating and cooling buildings will become significantly more expensive. Rising costs and shrinking disposable incomes will result in economic weakness, increased unemployment, and higher demand for social services. As is the case with the effects of climate change, the impacts of rising costs and a weakening economy will be felt broadly across the region and those hardest hit by the changes will be community members with lower or fixed incomes.

WHAT HAS EUGENE DONE TO PREPARE FOR CLIMATE CHANGE AND RISING FUEL PRICES?

The Community Greenhouse Gas Emissions Inventory

In 2007, as a first step toward creating a climate and energy action plan, City staff and community partners compiled an inventory of the community's greenhouse gas (GHG) emissions. The Eugene Community Greenhouse Gas Emissions Inventory Report[5] (Eugene GHG Report) provides useful detail about the community's emissions related to buildings, energy use, and transportation.

However, the Eugene GHG Report does not account for the energy, and associated emissions, that are "embodied" in consumer goods, energy and services. *Embodied energy* is all of the energy, including electricity, oil and natural gas, used in the making, transporting, storing, distributing and disposing of the consumer goods we use; from drinking cups and lawn furniture, to refrigerators and cars. It is the energy used to mine the metal, harvest the wood, grow the cotton, extract the oil to make the plastic, then to manufacture and distribute these items, and finally to dispose of them. Many products today are made of components which come from several places and they may have been shipped around the world before we encounter them. For this reason, it is very difficult to calculate the amount of energy in any one item and the data and methodology for this type of analysis have been developed relatively recently.

In addition to the Eugene GHG Report, the City of Eugene has prepared an Internal Climate Action Plan (ICAP) and is implementing strategies to reduce greenhouse gas emissions from City operations and City-owned facilities.[6]

A Greenhouse Gas Inventory for the Metro Portland Region

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[4] "Descending the Oil Peak: Navigating the Transition from Oil and Natural Gas," City of Portland Peak Oil Task Force, 2007.

[5] See Appendix 8 for the full text of the "Eugene Community Greenhouse Gas Emissions Inventory Report", July 2007.

[6] The draft ICAP can be found in Appendix 4 and on the City's website.

In April 2010, Metro, the regional government for the metropolitan Portland area, published "*Regional Greenhouse Gas Inventory*; *The Carbon Footprint of Residents and Businesses Inside the Portland Metropolitan Region*." The report is based on analysis which considered the embodied energy of all of the goods, services, transportation modes, and energy consumed in the metro area and it is the first report of its kind in the nation.

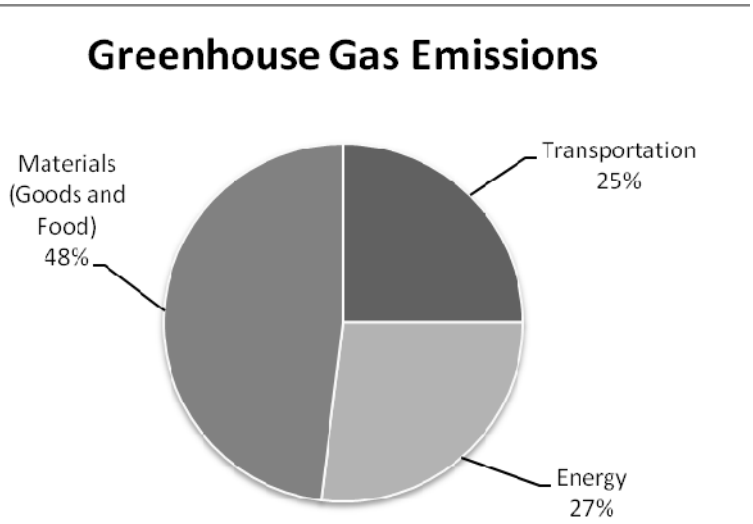

Figure 2- Greenhouse gas emissions by system - source Metro regional greenhouse gas inventory

Metro's GHG inventory reveals additional information, which along with the Eugene GHG Report, provides a more complete picture of the community's greenhouse gas emissions. For example, Metro's study revealed that 48% of greenhouse gas emissions are related to the production, manufacture and disposal of materials, goods and food. Note that these are emissions which were not estimated in Eugene's GHG Report. According to Metro's study, 25% of emissions are associated with transportation, including the use of passenger vehicles, light trucks, and the operation of mass transit services. The final 27% of metro Portland's GHG emissions are produced by residential, commercial, and industrial consumption of natural gas and electricity.

This new analysis provides consumers, planners and others, with valuable information about the real emissions impacts of particular choices and strategies - businesses and residents now have even greater control over their greenhouse gas footprint.

Chapter 2

BUILDINGS AND ENERGY

What is the Buildings and Energy Action Area?

Buildings and Energy, for the purposes of this plan, includes the energy used in all the residential, commercial and industrial buildings in Eugene and the greenhouse gasses that are emitted as a result of that use. Residential energy uses include heating and cooling homes, heating water for bathing and other washing; refrigerating and freezing food; lighting; powering appliances such as washers, driers, televisions and other entertainment devices; etc. Commercial energy uses include heating and cooling buildings; lighting; heating water; cooking and refrigerating food; running processing equipment; and other commercial activities. Industrial energy uses include heating and cooling buildings; and running industrial manufacturing and processing machinery from saw mills to high-tech production facilities.

What Part of Eugene's GHG Footprint Comes From Buildings and Energy?

The vast majority of residential, commercial, and industrial buildings in Eugene rely upon fossil fuels to supply them with energy. According to the Regional Greenhouse Gas Inventory created by the Metro Regional Government[1], 27 per cent of community emissions come from energy use in buildings. The energy sources which produce these emissions are primarily natural gas and electricity.

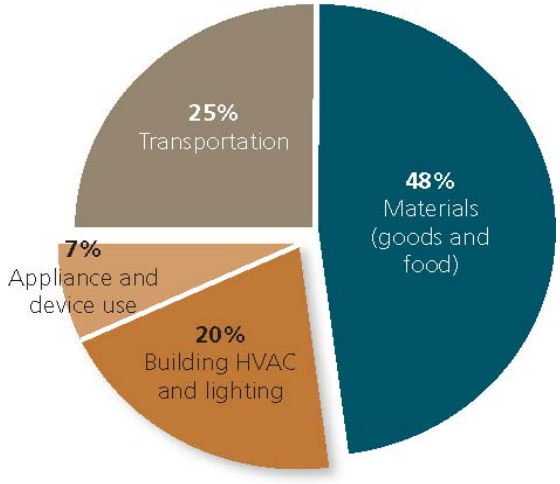

Figure 1: Greenhouse gas emissions by system: Source: Metro Regional GHG inventory

How Do Buildings and Energy Contribute to Greenhouse Gas Emissions?

[1] "*Regional Greenhouse Gas Inventory*; *The Carbon Footprint of Residents and Businesses Inside the Portland Metropolitan Region*," Metro Regional Government, April 2010.

Many of the buildings in Eugene, as well as the appliances, fixtures, and heating and cooling systems within them, do not meet modern energy efficiency standards. There is a significant opportunity to reduce greenhouse gas emissions by retrofitting existing buildings for energy efficiency and maximizing efficiency in new buildings.

The 2007 community greenhouse gas inventory completed by the City of Eugene[2] provides additional detail about energy use in the buildings and energy sector. Nearly 75% of the greenhouse gas emissions associated with residential, commercial, and industrial energy use in Eugene come from burning natural gas—mainly for heating buildings and water and to provide energy for industrial processes. Though it does not produce some of the other pollutants that are created by the burning of coal and oil, natural gas produces significant amounts of greenhouse gasses. Projections show that if current trends continue, natural gas will be the largest contributor to Eugene's greenhouse gas emissions in 2020[3].

Only about 11% of the community's greenhouse gas emissions are a result of electricity generation and use - largely because Eugene Water and Electric Board (EWEB), Eugene's largest electric utility, produces most of its electricity from hydroelectric generators and other low-GHG-emitting energy sources. Continuing to reduce the greenhouse gas emissions from our local electricity mix by increasing conservation and including more renewable energy sources will ensure a low-carbon electricity mix well into the future. Note that even "green energy" sources such as wind and solar power, have some associated GHGs - primarily from construction of the required infrastructure - however the amounts are minimal compared to burning fossil fuels to generate electricity.

The production of building materials also generates greenhouse gas emissions. The mining, logging, processing, manufacturing, and transporting of construction materials such as flooring, roofing, drywall, and concrete are energy intensive[4] and will result in the generation of large amounts of greenhouse gasses. This energy used in the production and transportation of a material is referred to as "embodied" energy. For a more thorough discussion of embodied energy, see the "Consumption and Waste" chapter of this plan.

How Will Rising Fuel Prices Impact Buildings and Energy?

In order to significantly reduce fossil fuel use and greenhouse gas emissions in the buildings and energy sector, the community must make structural and behavioral changes. The increase in fuel costs associated with the projected increase in demand and decreased supply of oil will have considerable impacts on the ability of individual residents and business owners to heat and power their homes and businesses. Buildings that are less energy-efficient, such as many older homes and non-residential structures, will become increasingly expensive to operate. Rising fuel prices will also increase the cost of constructing new buildings and retrofitting existing ones, especially as the costs to extract

[2] "Eugene Greenhouse Gas Emissions Inventory Report" City of Eugene, July 2007.
[3] "Eugene Greenhouse Gas Emissions Inventory Report" City of Eugene, July 2007. Pg.9.
[4] "A Life Cycle Assessment Based Approach to Prioritizing Methods of Preventing Waste from Residential Building Construction, Remodeling, and Demolition in the State of Oregon," Oregon Department of Environmental Quality, October, 2009.

and process raw materials and transport goods increases. This increase in the price of raw materials is likely to encourage the reuse of buildings and building materials.

How Can We Prepare the Buildings and Energy Sector for Climate Change?

While Eugene takes steps to reduce the community's greenhouse gas emissions, we must also prepare for the projected impacts of climate change. Many predicted changes, such as more intense storms, reduced snowpack, lower summertime stream flow, and more extreme summertime heat events, will have tangible impacts on buildings and energy resources. Some of the changes can be mitigated through the application of adaptation strategies such as:

- Maximizing energy and water efficiency in buildings.
- Designing buildings, and locating them on the land in ways that take advantage of the sun and natural ventilation
- Using landscaping to increase summer shading and minimize the need to use air conditioning
- Reducing the urban heat island effect, by planting trees and incorporating reflective roofs and light-colored pavement.
- Designing buildings to be more durable and able to withstand more intense storm events
- Incorporating stormwater management strategies such as green roofs, bioswales and raingardens.
- Conserving potable water

Fortunately, many adaptation strategies will help the community to reduce both energy use and greenhouse gas emissions.

Efforts Currently Underway

There are several organizations working to increase energy efficiency and reduce greenhouse gas emissions in Eugene. The local utilities have effective conservation programs which have had a very significant impact on energy consumption in the community. For example, EWEB has offered energy conservation programs for its customers for over thirty years and the annual energy savings from these programs now exceeds 500 million kWh per year – more than the combined output of the utility's six hydroelectric projects[5]. Other efforts underway include:

- The City of Eugene offers assistance for energy efficiency through housing rehabilitation loans, business loans, and the Green Building Incentive Program.
- The University of Oregon's Climate Leadership Initiative Climate Master™ program
- Services offered through the Housing and Community Services Agency (HACSA)
- The ReThink Business program offered through BRING Recycling

[5] "2008 Facts & Figures", Eugene Water and Electric Board. 2009.

- The City of Eugene is implementing its Internal Climate Action Plan to reduce GHG emissions from City-owned buildings and City operations.

OBJECTIVES AND ACTIONS FOR BUILDINGS AND ENERGY:

Objective I: Reduce total greenhouse gas emissions from existing buildings by 25% by 2030.

According to the Metro Regional Greenhouse Gas Inventory, residential, commercial, and industrial energy use in existing buildings accounts for about 27% of all greenhouse gas emissions, presenting a significant opportunity to reduce both energy costs and GHG emissions. Expanding the successful programs offered by EWEB and other partners will accelerate the retrofitting of existing buildings and further improve energy efficiency. Educational and outreach programs will continue to be an important tool to reduce energy use by changing the behavior of building occupants. For example, requiring that information about a building's energy use be made available at the time of sale of will empower building owners, renters and purchasers to make informed choices and will increase market demand for more energy-efficient buildings.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: In general, targets will establish a degree of change per unit of time.

Measures: Will provide evidence that actions are effective.

Estimated financial impacts: In general, estimates will provide information about relative costs and savings for each proposed action.

HIGH PRIORITY ACTIONS:

1. Identify the most cost-effective opportunities for increasing efficiency in existing buildings. Support the existing efforts of local utilities to find these opportunities.

2. Expand assistance and incentive programs for building retrofits that increase energy efficiency and reduce the carbon footprint of existing buildings. Partners include EWEB, Emerald People's Utility District, Lane Electric, Springfield Utility Board, Blachly-Lane Co-op, and The Energy Trust of Oregon

    a. Work with Energy Trust of Oregon to focus on improving efficiency in buildings that are heated with natural gas.

3. Establish a project fund to expand financing mechanisms for residential and commercial energy efficiency and/or renewable energy system installations. Partners include EWEB, Energy Trust of Oregon, Lane County, private lending institutions, and Oregon Department of Energy.

4. Target occupant behavior in order to reduce energy use in all types of buildings.

a. Promote and expand energy conservation strategies by EWEB, Emerald People's Utility District, Springfield Utility Board, and Lane Electric, etc., that target *occupant behavior* including Advanced Meter and Smart Grid Infrastructure and community-based social marketing programs.

5. Adopt an energy performance score program for existing and new buildings to help buyers and renters better understand the energy use of a building before they purchase or occupy it. It is expected that this action will also help to create a stronger market for energy-efficient buildings. Work with EWEB, Energy Trust of Oregon, Earth Advantage Institute and other partners.

Objective II: Reduce greenhouse gas emissions from new construction by 50% by 2030.

Advances in technology and emphasis on *whole building design* and *integrated design* are enabling construction of buildings that can achieve far greater energy efficiency than previously imagined. New construction also provides an opportunity to incorporate adaptation strategies that allow buildings to work effectively in a changing climate. Facilitating construction of high-performing new buildings can play a significant role in reducing greenhouse gas emissions. The actions listed below are aimed at improving efficiency standards and increasing assistance for energy efficiency and climate adaptation strategies in new buildings.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

6. Lobby for adoption, and actively participate in development, of building code amendments that meet the Architecture 2030 standards for energy efficiency (See Appendix 10).

7. Increase incentives for highly energy-efficient new buildings, aiming toward *zero net energy* and *carbon neutral* buildings.

8. Develop incentives to encourage the use of passive heating and cooling systems and other strategies that reduce energy demand and better adapt buildings for a changing climate.

9. Increase incentives to encourage smaller homes that use less energy to operate and fewer building materials to construct.

Objective III: Expand Development of Renewable and *District Energy* Systems.

Renewable energy comes from resources such as wind, hydroelectric, and solar that can be naturally replenished – in contrast to fossil fuels such as coal and oil which are not replenished. Renewable energy sources have the added advantage that their use typically produces much lower greenhouse gas emissions than does the use of fossil fuels. Transitioning the community to using more renewable energy will reduce fossil fuel

consumption, decrease greenhouse gas emissions, provide opportunities to generate green jobs, and increase local energy self-sufficiency.

In a *district energy system*, steam, or hot or chilled water is produced in a central plant and distributed to multiple buildings in a defined area through underground pipes. These systems eliminate the need for on-site heating or cooling equipment, which reduces costs, saves space and can make buildings more energy efficient. Compared to on-site systems, district energy systems offer more flexibility in the type of fuel used, and these systems are therefore easier to transition from fossil fuel. An additional value of district systems is the distribution of expenses across all users for the system's operations, maintenance and/or retrofitting, thereby reducing the customer cost over the lifetime of the utility. District energy systems, especially those that use renewable fuel sources, could play an important role in reducing the carbon footprint of Eugene's buildings.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

10. Increase the use of on-site renewable energy systems, such as solar hot water, photovoltaic, and ground-source heat pumps, by removing barriers (e.g. financial, infrastructural, regulatory, and perception) to such systems.

    a. Invest in EWEB's downtown network to facilitate *net metering,* a program which would allow connection to photovoltaic systems on downtown buildings. Any surplus energy generated by the systems would flow back into EWEB's electricity grid.

    b. Address the financial barriers to onsite renewable energy by expanding financing options such as long-term loans and property-assessed clean energy bonds.

    c. Dispel the myth that solar energy isn't viable in Western Oregon.

11. Develop at least one community renewable-energy pilot project by 2015.

12. Develop at least one clean district energy, or shared energy, system pilot project by 2015.

Objective IV: Increase the implementation of climate change preparation strategies for the built environment.

While Eugene takes steps to lower greenhouse gas emissions, the community must also prepare for the likely impacts of climate change. Since buildings constructed today will be in use for decades, it is imperative that state building codes be changed to facilitate climate preparation strategies. Strategies that improve energy efficiency will also help the community adapt to the effects of climate change. In addition, increasing efforts to conserve water resources will help to reduce the amount of energy used to treat and distribute water, and will also improve Eugene's ability to adapt to the anticipated reductions in water supply.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

13. Lobby for state building code amendments that facilitate passive design strategies in addition to mechanical solutions to climate control, water delivery, and energy consumption and incorporate climate change preparation strategies into building design and construction. For example: optimizing day lighting, limiting the area of east and west –facing windows, incorporating exterior shading devices above windows, including reflecting roofing, and using landscaping to control heat gain and minimize cooling requirements.

14. Provide education, assistance and incentives to reduce consumption of potable water in new and existing buildings and landscaping. For example, encourage the use of low-flow fixtures, appropriate (e.g. xeriscape) landscaping approaches, *greywater systems,* and onsite rainwater catchment systems.

Chapter 3

FOOD AND AGRICULTURE

What is the Food and Agriculture Action Area?

As used in the Community Climate and Energy Action Plan, the food and agriculture sector includes everything related to our food production and delivery, from the agricultural field to grocery store shelves. This includes the systems, infrastructure and activities which produce and process food, the systems used to transport and distribute food, and the systems that dispose of the waste from food production, processing and consumption.

What Part of Eugene's GHG Footprint Comes From Food and Agriculture?

Eugene's 2007 greenhouse gas inventory does not specifically identify greenhouse gas associated with food production and distribution. However, Metro's regional greenhouse gas inventory[1] indicates that food provision accounts for roughly 14% of total greenhouse gas emissions for the Metro area. This figure does not include the GHG emissions associated with transportation of the food and disposal of the solid waste generated by food and its production.

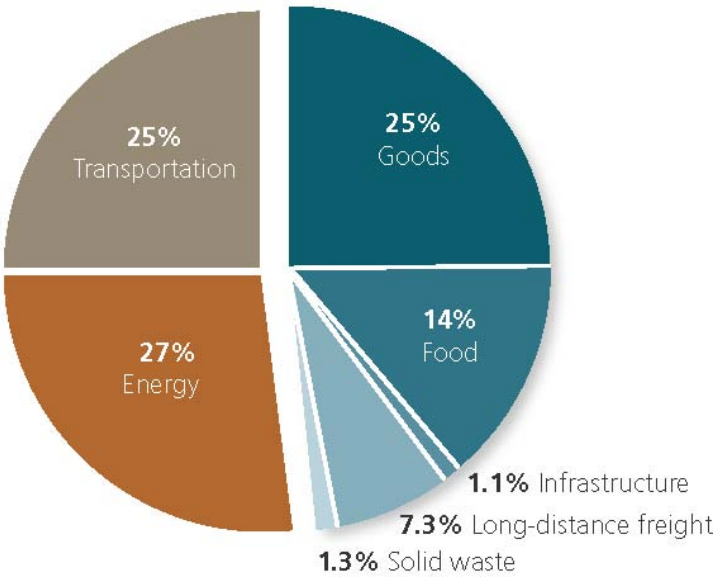

Figure 1: Greenhouse gas emissions by system. Source: Metro Regional GHG Inventory

How Do Food and Agriculture Systems Contribute to GHG Emissions?

[1] *"Regional Greenhouse Gas Inventory*; *The Carbon Footprint of Residents and Businesses Inside the Portland Metropolitan Region*," Metro Regional Government, April 2010. See Appendix 7 of this document.

It is a popular misconception that transportation is the largest source of greenhouse gasses associated with our food supply. In fact, GHG emissions associated with our food come primarily from the food production phase[2] - a result of energy use by: farming and processing equipment, the manufacture of fertilizers and other agricultural chemicals, production of animal feed, provision of irrigation water, etc. In addition, a very significant amount of GHGs, largely in the form of methane, are generated by animals and their wastes.

While there is growing national interest in buying locally-produced foods and there are many good reasons to support local growers, when it comes to reducing GHG emissions associated with food, the most effective approach is to reduce the consumption of carbon-intensive foods such as dairy products and red meat. It turns out that the methods used to grow our food, and the amount of meat and dairy products that we eat, have a much more significant impact on total greenhouse gas emissions than do typical transportation methods or distances.

How Will Rising Fossil Fuel Prices Impact Food and Agriculture Systems?

Fossil fuels are used extensively in most food and agriculture systems for powering agricultural, processing and refrigeration machinery; manufacturing fertilizers, pesticides, and other agricultural chemicals; transporting and distributing products; and producing agricultural equipment and materials. Increasing costs for fuel, including diesel, gas and natural gas, will impact the food and agricultural systems at all of these points and are expected to have a significant impact on the price of food.

How Can We Prepare Our Food and Agriculture Systems for Climate Change?

While steps must be taken to reduce the carbon footprint of the food and agriculture systems, the systems must also be prepared for the projected impacts of climate change. "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon,"[3] identifies several likely climatic changes expected in the Eugene area. As the valley climate changes, the area will likely experience warmer, wetter winters and warmer, drier summers, factors that will undoubtedly affect the agricultural productivity of the valley. Some adaptive strategies that will enable the food and agriculture systems to maintain productivity in the face of climate change include:

- Growing a wider diversity of food crops
- Developing drought-tolerant food crops for this region
- Reducing the agricultural consumption of freshwater, and using *greywater* where appropriate

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[2] "Food Miles and the Relative Climate Impact of Food Choices in the United States," Weber and Matthews. (Need citation date)

[3] "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon: Co-Beneficial Planning for Communities and Ecosystems," US Department of Agriculture, Climate Leadership Initiative, and National Center for Conservation Science and Policy, 2009.

Efforts Currently Underway

Many organizations and members of the Eugene community are working to improve access to locally grown foods and to raise awareness about the importance of food security for the community. Willamette Food and Farm Coalition, the Farm to School program, Lane Food Policy Council, Food for Lane County, the Extension Service, neighborhood sustainability and farming groups, and many others are working to strengthen supplies, improve storage capacity, encourage local agriculture, facilitate home gardening and otherwise improve the resiliency of the local food systems.

OBJECTIVES AND ACTIONS FOR FOOD AND AGRICULTURE:

Objective I: Reduce consumption of carbon-intensive foods.

There is growing evidence that what kind of food we eat makes a significant difference in the greenhouse gas emissions that are associated with our food. The facts and choices are not always intuitive and it is important that education and outreach programs are developed to inform the community about the importance of food choice as a strategy to reduce greenhouse gas emissions.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: In general, targets will establish a degree of change per unit of time.

Measures: Will provide evidence that actions are effective.

Estimated financial impacts: In general, estimates will provide information about relative costs and savings for each proposed action.

HIGH PRIORITY ACTIONS:

1. Begin a community campaign to educate the public about food choice as part of a climate-friendly lifestyle.

    a. Specifically encourage reduced consumption of carbon-intensive foods including red meat and dairy products. Partner with local food advocacy organizations, OSU extension, local restaurants, and food wholesalers.

2. Implement a "*Buy climate-friendly first" food purchasing* policy for public institutions including city and county governments, schools, and hospitals.

Objective II: Reduce greenhouse gas emissions associated with agriculture and food waste.

While most agricultural production occurs outside of Eugene's urban areas, local governments and citizens can encourage growers and state leaders to reduce the greenhouse gases associated with agriculture. A waste digesting system for the community would provide methane from decomposing food waste for use as a locally-generated fuel source.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

3. Transition to agricultural methods that reduce greenhouse gas emissions. Support efforts of Oregon Department of Agriculture, Oregon State University, Willamette Farm and Food Coalition, and other partners.

4. Create a local waste digester that can capture methane from food wastes and other organic materials that are currently being dumped in landfills. (See Consumption and Waste section for details.

Objective III: Preserve the productive capacity of the local and regional *foodsheds*.

In order to increase the resilience of Eugene's food supply, local and regional agriculture systems must maintain the capacity to grow a significant percentage of the community's food.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

5. Strengthen current land use regulations which protect farm lands, particularly those on high-value agricultural soils.

    a. Strengthen City and County land use protections to prevent urban growth onto prime farmlands.

6. Strengthen current farmland protections at state levels

    a. Lobby state agencies to strengthen protections for high-value farmlands

Objective IV: Prepare our food systems for the uncertainties created by climate change and rising energy prices.

Eugene can take action now to ensure that the community's food supply is resilient to the system-destabilizing effects of climate change. In addition, by reducing the energy inputs

required by the food supply system, the community can reduce the impacts that increasing energy costs will have on the cost of food.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

7. Implement the following recommendations from Eugene's Food Security Scoping and Resource Plan[4]

    a. Identify a City of Eugene liaison for food-system related programming

    b. Develop a comprehensive Community Food Security Assessment and implement changes to improve food security.

8. Develop an updated regional emergency food distribution plan that accounts for climate- and energy-based disruptions. (This action is also addressed through the "vulnerability assessment" outlined in the Health and Social Services section).

9. Increase the diversity and drought resistance of food crops grown in the upper Willamette Valley.

    a. Support the efforts of food-advocacy organizations, food growers, and Oregon State University to develop appropriate crops.

    b. Prioritize development of vegetable protein crops such as beans and legumes which are suited to the Willamette Valley.

10. Remove impediments to using greywater in agriculture. Work with state lawmakers to find solutions for greywater re-use.

Objective V: Increase availability of home-grown, and locally-sourced food in Eugene

Many Eugene community members are interested in growing their own food, to reduce the energy intensity of their food, gain new skills, enjoy the recreational benefits of growing food, and reduce the cost of their household's food. Food gardening can also be an important community-building activity strengthening neighborhoods and social groups and the increased social cohesion it encourages can improve the community's resilience in times of change and challenge. Home-grown and locally-grown food can provide security and resilience during short- and longer-term emergencies by reducing reliance on food imported from long distances.

[4] "City of Eugene Food Security Scoping and Resource Plan." City of Eugene Planning and Development Department, April, 2010.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

11. Expand community gardens on public and private lands including school campuses, City lands, and church properties.

    a. Assess opportunities for community garden locations within the city.

12. Encourage planting of food-bearing trees and shrubs on public and private lands. Support urban tree food programs of such advocates as Tree by Tree, and the Eugene Tree Foundation.

13. Reevaluate limitations on numbers and types of animals permitted under Eugene's code to allow, where appropriate, an increase in the number and variety of food-producing animals that can be kept by urban residents.

Chapter 4

LAND USE AND TRANSPORTATION

What is the Land Use and Transportation Action Area?

This section of the Community Climate and Energy Action plan considers land use and transportation – how the community is spatially organized, and how that organization affects transportation needs. The transportation systems included in this section are those that are used to move people and local freight: the passenger vehicles, bicycles, mass transit systems, air transport and local freight distribution systems, and the roads and other infrastructure required for the function of these systems. The transportation of goods is discussed in Chapter 4: Consumption and Waste section.

Although a particular land use may directly impact consumption of fossil fuels and emission of greenhouse gasses, (is it a home or a factory?), in most cases, the more important impacts of land uses are their impacts on the demand for transportation systems. Land use directly impacts transportation system needs and transportation systems contribute significantly to fossil fuel consumption and GHG emissions. As the two are so connected, this plan will consider land use and transportation issues together and will outline action items for each that will have an affect on the other.

What Part of Eugene's GHG Footprint Comes From Land Use and Transportation?

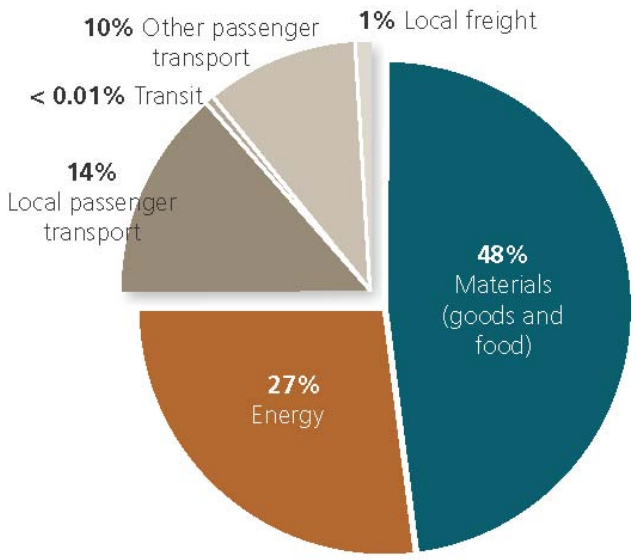

Figure 1: Greenhouse gas emissions by system. Source: Metro Regional GHG Inventory

According to the analysis completed for the Metro Regional Greenhouse Gas Inventory[1], about 25 percent of the region's greenhouse gas emissions are associated with the transportation systems. The majority of the emissions come from on-road commercial vehicles, private cars and air travel, with rail, marine and mass transit contributing smaller amounts of greenhouse gasses. See figure 1.

How Do Land Use and Transportation Contribute to Greenhouse Gas Emissions?

Land use decisions influence where people live and do business, and where the community locates schools, services and industry. The distances, and available transportation modes, between home, stores, work and school have a significant impact on the transportation needs of the community and are a major driver of greenhouse gas outputs for the community.

Metro's study found that local passenger transportation accounts for 14% of greenhouse gas emissions in the region. Other passenger transport, primarily long distance ground transportation (e.g. rail) and air travel, accounts for 10% of total regional GHG emissions and mass transit accounts for less than 0.01% of regional emissions. As stated above, the emissions from long-distance freight are associated with transporting goods rather than people, and these emissions, their scope, impacts, and strategies for reducing them, are discussed in Chapter 5 of this plan: Consumption and Waste.

How Will Rising Fuel Prices Impact Land Use and Transportation?

Increases in fuel prices will discourage the use of less fuel-efficient transportation modes such as the single-occupancy vehicle. At the same time, as it becomes more expensive to operate a private vehicle, Eugene will see an increase in demand for mass transit and other transportation options. As transportation becomes more expensive, demand for housing nearer to employment will likely increase. This economic pressure on the transporation systems will likely lead to denser land use patterns to meet the changing demand.

How Can Eugene Prepare Land Use and Transportation Systems for Rising Fuel Prices?

Fuel prices and demand for transportation alternatives can rise more quickly, as they did in 2008, than the transportation systems can be expanded to accommodate the demand. If investments are made in alternatives to the single-occupant vehicle, the community will be better prepared for future increases in the price of fuel and the subsequent shifts in transportation demand. With alternatives in place such as improved mass transit, bicycling, and electric vehicle infrastructure, the community can shift more easily away from automobile use when the cost of fuel becomes too burdensome. Improved mass-transit and other low-capital outlay alternatives will be particularly important for those members of the community who cannot afford to purchase newer, more fuel-efficient or electric-powered automobiles in response to rising fuel costs.

Making fuel-wise land use decisions that reduce dependence on single-occupant vehicles, such as facilitating infill development and the development of walkable neighborhoods,

[1] *"Regional Greenhouse Gas Inventory*; *The Carbon Footprint of Residents and Businesses Inside the Portland Metropolitan Region*," Metro Regional Government, April 2010.

will also decrease Eugene's demand for transportation and vulnerability to increases in fuel prices. By encouraging land use patterns and transportation systems which increase busing, walking, and biking, Eugene will realize the added benefit of reducing transportation-related GHG emissions.

Preparing Eugene's Land Use and Transportation Systems for Climate Change.

A recent study of likely climate change scenarios for the Eugene area concluded that the community is likely to experience more severe storm events and resultant flooding, as well as an increase in forest fires.[2] This analysis suggests that the the storm events and fires will impact the transportation systems, especially roads and railroads, and those along rivers and streams, or on unstable slopes will be especially vulnerable. Increased storms and smoke from wildfire may also impact air travel and transport of goods. In order to minimize the impacts to the transportation system, planning and design efforts for those systems must consider the likely impacts of climate change.

In addition to impacts on the transportation system, the same study suggests that the Eugene area could experience an influx of *climate refugees*, people moving away from areas that are becoming less livable due to climate change. Some people moving from areas that are affected by sea level rise, severe storms, or prolonged drought may settle in the Eugene area and it is important that the community's land use and tranporation planning processes consider the possible impacts on the community.

Efforts Currently Underway

A number of government agencies, business, and non-profit organizations are working to reduce the community's dependency on fossil fuels for transportation. For years Eugene has developed and implemented land use regulations, such as the Urban Growth Boundary, which facilitate compact growth and reduce transportation demand. The community has nationally-recognized mass transit, and bicycle infrastructure systems which decrease the community's dependence on single-occupant vehicles. Likewise, alternate modes advocacy, undertaken by City staff and partners such as Point 2 Point Solutions, Lane Coalition for Healthy Active Youth, Bike Lane Coalition, Greater Eugene Area Riders, and many others, continues to press for more non-vehicle transportation infrastructure for Eugene. It is clear however, that the community must do more in order to meet the Eugene City Council's goal of reducing fossil fuel use 50% by 2030. Below is a list of objectives, and related action items, which will further reduce Eugene's transportation-related fossil fuel use.

OBJECTIVES AND ACTIONS FOR LAND USE AND TRANSPORTATION:

Objective I: Create 20-minute neighborhoods, where 90% of Eugene residents can safely walk or bicycle to meet most basic daily, non-work needs, and also have safe pedestrian and bicycle routes which connect to mass transit.

[2] "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon: Co-Beneficial Planning for Communities and Ecosystems," US Department of Agriculture, Climate Leadership Initiative, and National Center for Conservation Science and Policy, 2009.

"Twenty-minute neighborhoods" are those in which a significant number of regular trips can be made in 20 minutes, without using a personal automobile. In a neighborhood a resident might walk to the grocery store or school and can meet many of their recreational and social needs without using a car. Creating these neighborhoods is an important step toward meeting our greenhouse gas and fossil fuel reduction goals. This objective cannot be achieved by local government alone and success will depend on partnerships with neighborhoods, businesses, Lane Transit District, the school districts, and others.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: In general, targets will establish a degree of change per unit of time.

Measures: Including walkability scores, will provide evidence that actions are effective.

Estimated financial impacts: In general, estimates will provide information about relative costs and savings for each proposed action.

HIGH PRIORITY ACTIONS:

1. Make the creation of 20-minute neighborhoods a core component of the EugenePlan and the Eugene Bicycle Pedestrian Master Plan.

2. By 2013, complete and implement a 20-minute neighborhoods plan:

    a. Identify funding for necessary planning effort.

    b. Identify key accessibility components for 20-minute neighborhoods, e.g. schools, parks, grocery store, retail services, etc.

    c. Conduct a network gap analysis to determine needs.

    d. Coordinate with *opportunity siting* and *infill compatibility standards* planning.

Objective II: Increase density around the urban core and along transit corridors

There is growing evidence that increasing the density of development around the urban center, and transit corridors, is an effective strategy for reducing fossil fuel use. Several recent studies have found that by making transit more effective, and reducing single-occupant automobile trips, greenhouse gas emissions will also be reduced. [3],[4]

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

[3] "Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices: An economic case for investment of cap-and-trade revenues", Center for Clean Air Policy, July 2009

[4] "Moving Cooler: An analysis of transportation strategies for reducing greenhouse gas emissions", Urban Land Institute, 2009

HIGH PRIORITY ACTIONS:

3. Zone future commercial and high- density residential uses in and around the urban core, and along EmX and other high-capacity transit corridors to accommodate future urban growth.

    a. Coordinate with *opportunity siting* and *infill compatibility standards* planning efforts

Objective III: Consider the potential for climate refugees when doing land use planning.

Planning efforts for Eugene must consider the possibility that population change may not be as predictable as it has in the past. Regional economic and climate changes might bring about rapid movements of *climate refugees* seeking less-impacted areas. In order to ensure that these possible impacts are anticipated, city and community planning activities must be increasingly flexible and broad-thinking.[5]

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

4. Closely monitor the community's population growth rate to gauge whether population projections are accurate.

    a. Set population thresholds that would trigger review of plans. For example if growth rates are higher than 10% of projections for two years in a row.

    b. If trends show a significantly higher rate of population increase than was assumed in the planning process, Eugene may need to update its planning model sooner than legally required.

Objective IV: Continue to expand and improve Eugene's bicycle and pedestrian infrastructure and connectivity to increase the percentage of trips made by bike and on foot.

In order to increase the number of trips taken by bike or on foot, gaps in bicycle and pedestrian transportation systems must be identified and necessary improvements must be made. In May 2010, the City of Eugene will begin work on a Eugene Pedestrian and Bicycle master plan. This project will identify gaps in the bike and pedestrian networks and will enable the community to focus resources for infrastructure where they are most needed. To the extent that the master planning process results in a systematic approach to improving bike and pedestrian transportation networks, the process will advance Eugene toward meeting community fossil fuel and greenhouse gas reduction targets.

NOTE: Complete targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

[5] The City of Eugene is currently undergoing a land use planning process, to be completed in early 2011, that will determine how population growth will be accommodated in the community.

Financial impacts: Expected cost: $160,000. Funds already allocated.

HIGH PRIORITY ACTIONS:

5. Create a pedestrian and bicycle master plan that will:

    a. Identify mobility gaps in the bicycle and pedestrian transportation system.

    b. Recommend improvements to increase safety (both real and perceived), comfort, speed, and convenience for users of all ages and skill levels.

    c. Create a plan for implementing the necessary system improvements.

    d. Identify funding sources for implementation.

6. Increase the mileage and connectivity of bicycle boulevards and shared-use paths to encourage cyclists of various skill levels to commute by bike.

7. Create a "Complete Streets" policy that requires all new transportation projects and rehabilitation projects to incorporate infrastructure for bicycles, pedestrians, and mass transit service.

Objective V: Increase the supply of frequent, reliable, integrated and convenient public transit.

Mass transit is one of the more effective strategies to reduce transportation reliance on single-occupant vehicles. Not only does increased use of transit reduce GHGs[6] but it can provide a lower-cost, accessible transportation alternative when fuel prices increase.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Possible measures include:

- passenger boardings (measuring use)
- Service hours per capita (measuring supply)
- % of service on time (measuring short term reliability)
- Stability/Diversity of funding sources (a measure of long term reliability)
- Service frequency between buses (measuring frequency and convenience)
- Hours of operation (another measure of convenience)

HIGH PRIORITY ACTIONS:

8. Diversify funding sources for Lane Transit District (LTD) to increase the long-term reliability of mass transit service.

    a. Partner with Springfield, Lane County, LTD, and businesses to develop strategies for providing mass transit for the Eugene community

[6]" Moving Cooler: An Analysis of Transportation Strategies for Reducing GHGs," The Urban Land Institute, 2009.

9. Align City of Eugene Transportation System Plan and LTD long-range transit plan to integrate bus routes into the broader alternative transportation system.

    a. Partner with LTD to help inform service changes and improvements.

    b. Create special *setbacks* along future *Bus Rapid Transit (BRT)* or other mass transit corridors to accommodate future right-of-way expansion.

    c. Work with LTD in developing the Long Range Transit Plan to determine the role of mass transit in accomplishing greenhouse gas emission reduction goals.

10. Invest in transit infrastructure that meets future access and mobility needs while consuming less fossil fuel. Recommended actions include:

    a. Maximize electrification of the regional transportation systems.

    b. Increase use of hybrid vehicles, including buses and other heavy vehicles.

Objective VI: Expand outreach, marketing and education about climate-friendly transportation alternatives.

In order to be motivated to change their behavior, community members must understand the effects of their transportation choices on overall greenhouse gas emissions and they must also understand what alternatives to the single-occupant vehicle are available to them. Emissions reductions can be realized by reducing the number of people who drive in single-occupant vehicles and by educating the community about how to be more fuel-efficient when they do drive their automobiles.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

11. Increase promotion of bicycling, walking, mass transit, car-pooling, telecommuting, high-occupancy vehicles, and emergency ride home programs as attractive alternatives to driving, in order to increase the mode share of alternatives to the single-occupant vehicle. Partner with Point 2 Point Solutions, Lane Transit District, Greater Eugene Area RiderS (GEARS), BikeLane Coalition, local businesses, the City of Eugene's Smart Trips program, Safe Routes to School, Lane Coalition for Healthy Active Youth, Lane County Public Health, Climate Masters at home™, and others.

12. Increase the community's understanding of fuel-efficient driving techniques.

Objective VII: Ensure maximum efficiency in current and future freight systems.

The movement of goods is important for Eugene's economy, and it is also an activity which produces significant greenhouse gas emissions[7]. As Eugene makes changes to the transportation systems in order to be less reliant on fossil fuels, it will be important to maintain the efficiency of the local system that moves freight, such as food, consumer goods, and other materials.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

13. Plan for efficient freight transportation that minimizes greenhouse gas emissions and fossil fuel consumption, and:

    a. Connects multiple modes (train, truck, van, car, bicycle);

    b. Accommodates regional (upper Willamette Valley) commercial, industrial and agricultural freight needs; and

    c. Facilitates efficient local deliveries.

Objective VII: Increase the use of low-carbon vehicles and fuels to improve overall fuel-efficiency and reduce vulnerability to fluctuating oil prices.

In order to meet the stated fossil fuel reduction target (reduced 50% by 2030), it will be necessary to transition some of the current automobile transportation from fossil fuels to electricity. This transition will require considerable new infrastucture, some of which is now in the planning phase. According to the Oregon Department of Transportation, "Reducing on-road vehicle GHG emissions by 75 percent from 1990 levels would be equivalent to reducing Oregonian's per capita annual consumption of petroleum fuels from 567 gallons to 68 gallons. This will not be achievable without transformative changes in vehicle fleets and fuels such as electrification of the light vehicle fleet.[8]"

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Financial impacts: Residential 220 volt charging stations cost approximately $1,500 - $3,000 each. A typical public/commercial charging station, such as the 10 being proposed for Eugene/Springfield, cost $25,000 to $50,000 each and can charge a vehicle in 20-40 minutes.

HIGH PRIORITY ACTIONS:

14. Accelerate the transition to plug-in hybrids and electric vehicles. Partner with Lane County, EWEB, auto retailers, electrical contractors, UO, LCC, and others

    a. Support the installation of a network of electric car charging stations.

[7] "Moving Cooler: An analysis of transportation strategies for reducing greenhouse gas emissions", Urban Land Institute, July 2009

[8] "Background Report:The Status of Oregon Greenhouse Gas Emissions and Analysis", Oregon Department of Transportation, October 2009.

b. Require installation of electric car charging stations in new multifamily housing.

c. Use guidance provided by the University of Oregon Electric Vehicle strategy.

15. Conduct research to understand what role biofuels can play in decreasing Eugene's vulnerability to energy markets. Work with partners at LTD, the Oregon Department of Energy, etc.

    a. Complete research by 2013 so that outcomes can inform the next CEAP.

Chapter 5

CONSUMPTION AND WASTE

What is the Consumption and Waste Action Area?

For the purposes of this plan, consumption and waste includes everything in the *lifecycle* of consumer goods from chairs to cars, from building materials to strollers. The lifecycle of those goods begins with the mining or extraction of raw materials, and includes the manufacturing, packaging, distribution, and the use of the goods. The lifecycle of the goods ends with their final disposal.

What Part of Eugene's GHG Footprint Comes From Consumption and Waste?

Until very recently many inventories of greenhouse gas emissions, including the City of Eugene's inventory, have focused on the direct emissions that come from the use of fossil fuels. Using this methodology, these analyses have consistently shown that transportation and energy systems are the major contributors to GHG emissions. However, more thorough analyses have recently been completed, including a study by the Environmental Protection Agency (EPA)[1] which suggests that emissions resulting from the production of material goods also comprise a large share of our emissions - roughly equal to the emissions from the transportation and energy systems.

The Metro GHG inventory[2] considered these indirect emissions and developed estimates for the metropolitan Portland region's total GHG emissions, using regionally adjusted consumption data. Metro's report estimates that the provision of goods accounts for 25% of greenhouse gas emissions in the region. However, when the emissions from long-distance freight and the disposal of the waste are included, the total GHG emissions related to consumption and waste are closer to one third of the region's total emissions. According to Metro's study, consumption and waste has a greater share of total emissions than either transportation or energy use in buildings. It seems highly likely that Eugene's consumption habits are like those of other communities in the region with a similar standard of living, and the Eugene community's emissions that come from *life cycle* GHG emissions of consumer goods such as cars, clothes, furniture and household goods, are probably very much like Metro's.

How Do Consumption and Waste Contribute to Greenhouse Gas Emissions?

Resource extraction activities such as mining and logging, the transporting and processing of raw materials, and the manufacturing, and packaging and distribution of consumer goods consume large amounts coal, oil and natural gas and consequently are responsible for a significant amount of the community's GHG emissions.

Waste disposal also produces GHG emissions, including methane, which is produced by the breakdown of organic material in solid waste and waste water.

[1] EPA Citation here.

[2] *"Regional Greenhouse Gas Inventory*; *The Carbon Footprint of Residents and Businesses Inside the Portland Metropolitan Region*," Metro Regional Government, April 2010.

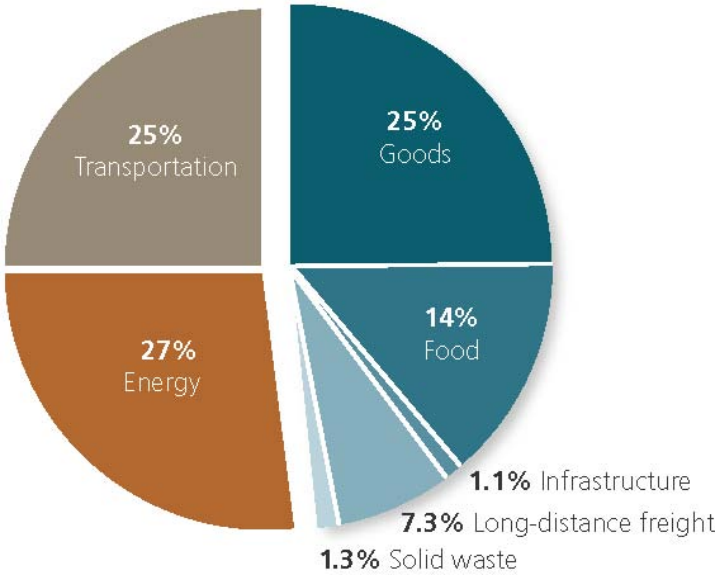

Figure1: Greenhouse gas sources by system. Source: Metro Regional GHG Inventory

How Will Rising Fossil Fuel Prices Impact Consumption and Waste Systems?

Because so much fuel is consumed in the production and distribution of consumer goods, rises in the price of fossil fuel will have a considerable impact on the cost of those goods. The price of most goods including building materials such as wood, concrete, and steel, and consumer goods such as cars, clothing and appliances will be affected by the increased cost of fuel for extracting and processing as well as the higher costs of oil-derived materials such as plastics and synthetic fibers.

In general, it is expected that the financial pressures that accompany increasing energy prices are likely to encourage repair, reuse, and the longer use of goods, ultimately reducing the purchase of new items. Any decrease in consumer purchasing will also exert downward pressure on the local, regional and national economy as the market for consumer products shrinks.

How Can We Prepare Consumption and Waste Systems for Climate Change?

While climate change will likely have some impact on the consumption and waste systems, it not expected to be as significant as the impact forecasted for other systems and sectors. Therefore, this plan does not focus on adaptation or preparation strategies for the consumption and waste systems.

Efforts Currently Underway

Eugene has a strong history of implementing reduce, reuse, and recycle programs. Currently, over 95% of Eugene households participate in recycling services and roughly 53% of the waste produced in the area is diverted from the landfill. Solid waste from Eugene is taken to the Short Mountain landfill, operated by Lane County, where75% of the methane released from decomposing waste at is captured and used to generate electricity.

In addition to curbside recycling, the community supports a wide variety of recycling and reuse businesses from the industrial scale at Schnitzer Steel to the home scale at St. Vincent de Paul and Goodwill Industries. BRING Recycling has been a leader in the community for the reuse of building materials for over 30 years and NextStep Recycling has provided electronics reuse and recycling for over 10 years.

OBJECTIVES AND ACTIONS FOR CONSUMPTION AND WASTE:

Objective I: Reduce greenhouse gas emissions by reducing consumption of goods.

The actions in this objective are aimed at working with community partners to educate citizens about the greenhouse gases associated with consumer goods.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: In general, targets will establish a degree of change per unit of time.

Measures: Will provide evidence that actions are effective.

Estimated financial impacts: In general, estimates will provide information about relative costs and savings for each proposed action.

HIGH PRIORITY ACTIONS:

1. Educate businesses and residents about the important role of consumption in producing greenhouse gas emissions.

    a. Partner with organizations including BRING Recycling, NextStep Recycling, Lane County Waste Management, Oregon Department of Environmental Quality, private sector businesses, neighborhood associations, and others, to encourage businesses and residents to:

        i. purchase durable, repairable and reusable goods;

        ii. reduce the amount of materials that go to waste, including food;

        iii. reduce consumption of carbon-intensive consumer goods and services.

2. Lobby at the state level for better product labeling that includes information about the greenhouse gas emissions associated with products.

3. Provide information for the public on when to replace high energy-use appliances. Where/If this information is already available, increase its distribution and accessibility. Partner with EWEB and other local utilities.

4. Actively advocate for the development of local, state, and federal *product* legislation that results in design changes.

Objective II: Increase waste diversion by improving recycling and composting.

Recycling, reusing, and repurposing materials can reduce greenhouse gas emissions by reducing the energy used to mine or harvest virgin materials. There is a significant opportunity to increase recycling of waste from building construction and demolition, activities that currently generate roughly 30% of the total waste generated in Oregon.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

5. Target expanded recycling outreach and services to commercial and multi-family residential buildings, including local businesses, apartment buildings, and student and cooperative housing.

6. Enact a local ordinance to increase waste recovery rates from commercial and multi-family buildings.

7. Assist businesses in improving paper, metal and glass recycling with a goal of supporting 5% of the community's businesses each year. Aid partners by promoting events or trainings, providing space for trainings, assist with funding, etc. Partner with Chamber of Commerce, BRING Recycling, Re:Think Business, LCC Climate Masters at Work™ and others.

8. Enact an ordinance that requires all construction and demolition waste materials to be sorted for reusable or recyclable materials. Partner with Lane County Solid Waste.

Objective III: Increase the diversion rate for organic wastes

The 2002 Waste Composition Study by the Oregon Department of Environmental Quality (DEQ) found that 34% of the total waste being disposed at Short Mountain Landfill from the city of Eugene was compostable organic waste. The majority of methane emissions generated in a landfill system come from the decomposition of organic materials, and methane is a potent greenhouse gas with more than 21 times the global warming potential of carbon dioxide. Although an estimated 75% of methane generated from the landfill gas system is recovered, the remainder is emitted into the atmosphere.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: Decrease organic material being disposed in landfill by 50% by 2020.

Measures: Utilize 2010 Waste Composition Study data to set baseline and evaluate through updates every 3-5 years in cooperation with DEQ statewide composition studies.

HIGH PRIORITY ACTIONS:

9. Conduct a pilot project at the River Avenue Waste Water Treatment Plant to determine the system ability for co-digestion of food waste and biosolids.

Objective IV: Conduct research to determine the most effective next steps in the area of consumption and waste.

There are many actions that may have significant benefits but the scale of benefits is largely unknown at present. Below are two such actions that were identified as potential solutions, but further research is needed. These research efforts must be completed by 2013 so that findings can be used to inform the next Climate and Energy Action Plan.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

10. Follow research being conducted by the EPA's West Coast Forum on Climate Change, Waste Prevention, Recovery and Disposal3, to determine highest priority and most cost effective measures to address GHG production in the materials management sector.

11. Conduct study to determine the efficiency of maintaining a multiple-hauler garbage collection system as regards greenhouse gas emissions. Use the outcome of the research to inform the next Community Climate and Energy Action Plan.

Objective V: Reduce greenhouse gases in municipal operations by changing purchasing practices and reducing waste.

It is important that local governments lead by example. In 2009, in response to direction from Eugene's City Council, City staff prepared an Internal Climate Action Plan[4] to make City operations *climate neutral* by the year 2020. In order to accomplish this goal, the City's purchasing practices must be changed to reflect the current understanding of greenhouse gas sources.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Target: Update purchasing policies by 2012.

HIGH PRIORITY ACTIONS:

12. By 2012, improve the procurement policies of public agencies to require:

    a. Reuse products and materials whenever possible, and

    b. Avoid disposable, and purchase durable, goods whenever possible

13. The City of Eugene purchasing policies currently reflect the priorities above.

[3] Citation for "West Coast Forum on Climate Change, Waste Prevention, Recovery and Disposal", United States Environmental Protection Agency,

[4] ICAP citation

a. Set targets for these procurement policies

b. Identify measurements to monitor the impacts of these procurement policies

c. Increase efforts to implement these purchasing policies throughout the organization

14. Reduce public agency purchase of greenhouse gas-intensive goods by 2014:

    a. Identify City-purchased goods with the highest associated greenhouse gas emissions by 2012.

    b. Create a plan to reduce the purchase of the 5 most greenhouse gas intensive goods.

    c. Annually report the quantity of these goods being purchased.

15. Implement the steps outlined in the City waste reduction plan to reduce waste at City buildings, events, and ongoing operations.

Chapter 6

HEALTH AND SOCIAL SERVICES

What is the Health and Social Services System?

The Health and Social Services system includes the public, private and not-for-profit service agencies which provide a broad spectrum of support programs in the community, including: mental and physical health care; assistance for low-income community members; addiction prevention and treatment programs; and child abuse prevention programs. These services are included in the Community Climate and Energy Action plan, not because they are significant sources of greenhouse gases, but because they are an important safety net for our community and they are very vulnerable to the impacts of climate change and rising fuel costs. Likewise, to a large extent, the populations that are assisted by the services are themselves very vulnerable to the affects of climate change and fuel price volatility.

What Part of Eugene's GHG Footprint Comes From Health and Social Services?

The provision of health and social services involves transportation of people and goods, and consumption of materials and energy and therefore the services are associated with some greenhouse gas emissions. However, in this plan the GHG emissions, and the methods to reduce them, are discussed in the preceeding chapters on buildings and energy, food and agriculture, land use and transportation, and consumption and waste. The primary focus of the Health and Social Services chapter of The Plan is on adapting to changing climate and rising fuel prices, not specifically on reducing greenhouse gases

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illustrating
Preparation/
Adaptation

How Will Increasing Fuel Prices Impact Health and Social Services?

Increasing global demand for a finite amount of oil and natural gas has led to rising fuel prices and will likely continue to do so. As stated elsewhere in this plan, as the cost of fossil fuels rise, low-income and other disadvantaged community members will be most affected by the changes. With less financial resiliency, these vulnerable populations will have the most difficulty adapting to the rising costs. As the impacts of the rising fuel costs spread throughout the economy, the number of economically disadvantaged in Eugene will likely grow as more community members are unable to meet the increasing financial challenge.

Some of the anticipated challenges posed by increasing fuel prices include:

- Increasing costs of fuel for transportation and home heating

- Rising food prices
- Higher costs for medical services and public health services
- Increasing demand for social services
- Increasing demand for public school services – at the same time that costs of maintaining school facilities will be increasing.
- Vulnerable and marginalized populations will likely grow and be the hardest hit by these conditions.

In order to avoid the most severe impacts of rising fuel prices, Eugene must prepare the local and regional health and social service systems for these changes, and create systems that can adapt to a different energy and climate future.

How will climate change affect our health and social services?

In the Eugene/Springfield area, climate change is expected to cause warmer, drier summers and wetter, stormier winters1. Other challenges posed by climate change may include:

- Increased risks of flooding and consequent impacts on transportation infrastructure, housing stock, etc.
- Increased wildfire resulting in reduced air quality
- Higher rates of asthma and other respiratory diseases
- Disruptions to transportation systems due to severe storm events
- Negative impacts on the drinking water supply
- Increased energy prices
- Increased incidence of heat-related illness

These impacts could result in: more displaced and homeless community members; economic strains for vulnerable populations; disruptions in the transportation systems, and resultant food emergencies; and increased demand for public health, and other social, services by a community strained by social, economic and environmental changes.

Efforts Currently Underway

The University of Oregon Climate Leadership Initiative, in coordination with the Oregon Coalition of Local Health Officials (CLHO), is coordinating a statewide response to health issues related to climate change. Lane County Public Health actively addresses health concerns likely to be exacerbated by climate change, including vector-borne diseases and heat related illnesses. Many public, private and not-for-profit social service agencies are currently providing support for members of the community who are vulnerable to economic change, loss of their housing, food insecurity, health crises, and other conditions which challenge the resiliency of their families and households. The major challenge for this sector, as outlined above, is the expected increase in demand for health and social services as climate change and rising fuel prices exceed many individuals' and households' ability to adapt.

[1] "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon: Co-Beneficial Planning for Communities and Ecosystems," US Department of Agriculture, Climate Leadership Initiative, and National Center for Conservation Science and Policy, 2009.

OBJECTIVES AND ACTIONS FOR HEALTH AND SOCIAL SERVICES:

Objective I: Prepare community systems for longer-term climate and energy challenges including fuel shortages, increased summer drought and increased storm intensity.

The community's current local emergency management programs are well prepared to manage unexpected and relatively short-term emergencies including urban forest fires, heat waves, and localized flooding. The water supply and health systems' vulnerability to longer-term emergencies and system inadequacies need to be assessed.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: In general, targets will establish a degree of change per unit of time.

Measures: Will provide evidence that actions are effective.

Estimated financial impacts: In general, estimates will provide information about relative costs and savings for each proposed action.

HIGH PRIORITY ACTIONS:

1. Conduct a climate and energy vulnerability assessment that addresses the mid-term, and longer-term climate and energy vulnerabilities of the community – specifically regarding: energy, water, food, health, shelter, and sanitation. Partner with EWEB, Springfield, Lane County, the University of Oregon, the Red Cross, the National Guard, social services agencies, and medical professionals.

    a) Build on existing emergency management efforts.

    b) Identify local solutions and estimate costs of reducing the vulnerabilities.

    c) Estimate capacity needs and costs for implementing preparation and adaptation strategies.

    d) Continue to monitor emerging data on climate-change-related health risks and revise adaptation plans as necessary.

2. Strengthen current hunger relief systems to handle increased short-term and long-term demand.

    a) Work with the local food bank to develop plans to prepare for increased food demand from a higher percentage of the population.

b) Remove barriers to, and encourage, development of home-grown food sources such as backyard and community gardens, urban food orchards, etc. This action item is also identified in Food and Agriculture section.

3. Expand energy assistance programs: Work with local utilities to increase financial assistance so that marginalized populations can maintain utility service, thereby preventing health or infrastructure problems that can occur when water, gas or electricity are shut off.

    a) Target rental properties and property managers.

4. Conduct a food security assessment, as outlined in the Food and Agriculture section, and take action to increase the security of the community's food supply.

Objective II: Reduce the exposure of human populations to climate-related disasters.

The frequency of forest fires and flooding are expected to increase in the upper Willamette valley as a result of likely higher summertime temperatures and changes in precipitation patterns.[2] Existing local emergency plans contain provisions for managing the impacts of both of these emergencies at the scale and frequency that they occur now. However, the frequency of these events is expected to increase and Eugene must develop expanded strategies to reduce the negative impacts of frequent flooding and wildfire.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

5. Reduce risk of home fires due to wildfires in and around the urban area.

    a. Increase efforts to educate homeowners about creating defensible space around their homes

6. Ensure essential services are not located within the 100 year flood zone

    a. Identify essential emergency and non-emergency services which are located in flood zones or which could be isolated by flooding

    b. Develop a plan to move essential services out of the flood zone and/or decrease their vulnerability to flood damage and flood isolation.

[2] "Preparing for Climate Change in the Upper Willamette River Basin of Western Oregon: Co-Beneficial Planning for Communities and Ecosystems," US Department of Agriculture, Climate Leadership Initiative, and National Center for Conservation Science and Policy, 2009.

Objective III: Increase the capacity of Eugene's health sector, and the community at large, to meet the health-related challenges of climate change and rising fuel prices by fostering greater public health system involvement in climate change and energy planning.

Public health professionals are already working to address many of the challenges that climate change and increasing energy prices are likely to exacerbate. As the professionals who are most directly involved with this work, they are a critical part of raising community awareness about the challenges. Public health professionals will play a critical role in planning adaptation strategies for mitigating the impacts of climate change and energy cost volatility.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

7. Assist local health agencies in educating employees and the public about the health risks posed by climate change.

    a. Prioritize local public health resources to emphasize educating the public, staff, and administration about climate change, energy price volatility and the related system impacts and health risks.

    b. Pursue funding for development of a climate change preparation strategy for the public health system.

Chapter 7

URBAN NATURAL RESOURCES

What is the Urban Natural Resources Action Area?

Urban Natural Resources, as the term is used in this plan, include the soil, air, water, plants, and animals that occur in the suburban and urbanized areas of the community. These resources include *stormwater*, drinking water, and all the vegetation including trees, shrubs, grasses and other plants that are scattered across the community on public and private lands including residential backyards, along streets, and throughout Eugene's parks and open spaces.

What Part of Eugene's GHG Footprint Comes From Urban Natural Resources?

Maintenance activities which are necessary to protect and manage urban natural resources produce some greenhouse gases, for example when fossil fuels are used to power machinery and maintenance vehicles. However, the amount of GHG produced is a very minimal percentage of the total produced in the community. In fact, most greenhouse gas inventories do not include natural resources as a source of greenhouse gas emissions, and many describe plants and soils as *carbon sinks,* a place where greenhouse gases, such as carbon dioxide, are taken out of the atmosphere by trees and other plants and stored in their leaves, stems and roots.

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How Will Rising Fuel Prices Impact Urban Natural Resources?

It is likely that increasing fuel prices will encourage community members to seek more recreational opportunities closer to home. This may increase the use of City and close-in County parks and open spaces including neighborhood parks, the Ridgeline Trail, the West Eugene Wetlands, and Riverfront paths, as well as other facilities such as the Howard Buford Recreation Area and the waters of the Willamette River in and around Eugene.

While demand for these recreational resources may increase, the same increase in fuel prices are likely to drive up the cost of park maintenance, tree care, riparian restoration, and weed control. These challenges may be compounded as these services compete for resources when home, business, and local government budgets will also be under the economic pressure of increasing energy prices.

How Can We Prepare Our Urban Natural Resources for Climate Change?

The impacts of climate change on the community's urban natural resources are likely to result in:

- lower summer stream flows,
- increased stream temperatures,

- warmer terrestrial temperatures,
- increased summer drought and risk of wildfire, and
- increased number and scale of problems caused by invasive species.

The projected changes in temperatures, rainfall patterns, stream flow and wildfire incidence will likely result in shifts in hydrology and in the habitat types. As the region gets hotter and drier in summer, plants and animals that are adapted to the current conditions will be less competitive than other species that will move into the region and displace some resident species. Some plants and animals will likely no longer be found in the community and some will be found in different places than they are now.

The way that the community's land is developed affects the resiliency of Eugene's infrastructure. Low Impact Development (LID) is a design approach that strives to maintain and enhance the natural water movement, both within a developing site and more broadly throughout urban areas. Some LID strategies include: preventing unnecessary soil compaction whenever possible, retaining rainwater (also known as stormwater) on site and designing stormwater systems to put water back into the soil instead of piping it out to the curb and into the storm drain. LID approaches to development can protect soil and increase the resiliency of the community's stormwater systems.

To increase the adaptability of Eugene's natural resource systems, management approaches must be inclusive and consider the variety of natural resources, such as soil, trees, wildlife, and water, and manage them together across the urban landscape[1],[2]. Similarly, natural resource planning will need to be flexible, holistic, and considerate of the dynamic biological systems and the potential impacts that climate change can bring.

Efforts Currently Underway

The community of Eugene values its natural areas including parks, rivers, forests, and wetlands. Several natural resource area plans, including the Ridgeline Vision and Action Plan, the Willamette Vision Plan, and the Metro Waterways Plan have been developed to identify the best strategies to preserve the quality of these resources. In addition, the local utilities which manage the community's drinking water supply are considering, and planning for, the likely impacts of climate change.

The Eugene Fire Department and Parks and Open Space staff are managing City lands near residential areas to reduce fuels and minimize wildfire risks.

OBJECTIVES AND ACTIONS FOR URBAN NATURAL RESOURCES:

Objective I: Manage urban natural resources for multiple benefits

Many of the adaptation goals of this section, including increased shading, decreased flooding, and improved wildlife habitat, can be met by managing for multiple benefits. These natural resources are interdependent and success with one goal can mean

[1]" Preparing for climate change in the upper Willamette river basin of Western Oregon", Climate Leadership Initiative, USDA Forest Service, National Center for Conservation Science and Policy, 2009

[2] "A new era for conservation: Review of climate change adaptation", National Wildlife Federation. 2009

success with multiple goals. In area where soils are protected from compaction, for example, trees that provide shade grow healthier and are more resilient, and storm water can better infiltrate into the soil, thus reducing flooding. When streamside flood zones are protected from development, there is less concern about flooding of buildings, and stream banks can grow trees that shade and cool the stream and provide maximum wildlife habitat value.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Targets: In general, targets will establish a degree of change per unit of time.

Measures: Will provide evidence that actions are effective.

Estimated financial impacts: In general, estimates will provide information about relative costs and savings for each proposed action

HIGH PRIORITY ACTIONS:

1. Protect sensitive natural resource areas:

    a. Include urban riparian areas, wetlands and floodplains, and other areas that improve resilience and that clean stormwater, cool streams, reduce air temperatures, clean the air, and reduce the impacts of flooding.

2. Increase funding for public acquisitions of property to facilitate the combined goals of stormwater management, flood abatement, stream shading, headwaters protection, and increased connectivity between wildlife corridors. Many of these priorities are outlined in the Ridgeline Vision and Action Plan, the Willamette Vision Plan, and the Metro Waterways Plan

3. Update urban forestry management plans to promote urban forest management on a city-wide scale, expanding beyond individual lots or streets.

4. Identify and remove barriers that may discourage or prevent use of Low Impact Development (LID) practices during construction.

Objective II: Manage and update urban natural resource information to reflect current knowledge. Make data available to public and policy-makers.

Information on climate change and fuel price volatility is evolving rapidly and it is important that relevant, up to date information is readily available and accessible so that planners, managers, policy makers, and the public are able to respond to changes with well-informed decisions. Basic information about urban natural resources must be centralized and accessible. This information will also assist in setting future targets and measuring success among a variety of natural resource goals.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

5. Compile and maintain an inventory of urban natural resources that is current and accessible to the public and policy-makers.

    a. Create a list of climate-sensitive urban natural resources that should be tracked, such as: inventories of City-managed trees, stormwater resources, riparian buffers, opportunities for food production, solar resources, soil classifications, publicly-owned land, etc.

    b. Identify a central coordinator of information, such as Lane Council Of Governments (LCOG).

    c. Utilize existing inventories wherever possible

    d. By 2013, identify any information gaps and create a plan to fill those gaps.

    e. Fill any information gaps by 2015.

Objective III: Update vegetation management plans to prepare for changes in climate

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

6. Plan for increased fires in the forests surrounding the urban area.

    a. Re-examine urban forest management policies to ensure that focus is placed on reducing susceptibility to the likely increase in wildfires brought about by climate change.

Objective IV: Educate community members about the importance of urban natural resources

It is important that community members remain informed about the importance of stormwater, urban trees, watershed health, and water quality as these resources relate to a changing climate

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

7. Provide educational resources to students, teachers, residents, and businesses about the benefits of trees, watershed health, and water quality.

    a. Build on existing community efforts

    b. Partner with government agencies, non-profits, and businesses including arborists, landscapers, landscape architects, designers, and architects.

Objective V: Manage rainfall (stormwater) to reduce flooding, recharge groundwater, and improve water quality.

Climate change is expected to bring more intense winter storm events including increased downpours. In order to minimize local flooding during these events, stormwater must be slowed and allowed to infiltrate into the soil whenever and wherever possible. Existing City policy requires this type of stormwater management on new or redeveloped sites[3] and can include the use of tools such as *bioswales*, *pervious pavement*, and *rain gardens* among others. This type of stormwater management is not being actively encouraged for existing buildings. Because a high percentage of the buildings that will be standing in Eugene in 2020 exist today, making stormwater improvements to existing building sites is an important strategy for improving the resiliency of the community's stormwater system.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

8. Manage stormwater and riparian areas to meet multiple goals: improved water quality, lowered stream temperatures, increased infiltration, increased capacity, and improved plant and wildlife habitat.

9. Develop a program to encourage onsite treatment of stormwater from existing buildings and facilities.

    a. Consider using the reduction of stormwater fees to encourage property owners to retrofit existing structures and facilities.

Objective VI: Expand public and private programs to manage, and invest in, trees to cool buildings, pavement, and waterways.

Mature trees can help meet several natural resource goals by reducing flooding, improving air quality, cooling streams and cooling the *urban heat island,* a condition that occurs when the urban area is warmed by dark pavement, roof shingles, and buildings. The greatest benefits will come from shading roadways, buildings (the south and west sides), and streams. Because trees frequently take ten to twenty years before they provide a significant amount of shade, tree planting is an investment in the future livability of our community. It is also an inexpensive measure that can be taken on by just about anyone.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

Measures: Annual report from the Public Works Department tracks the numbers of public trees planted in the City rights-of-way.

[3] "Stormwater Management Manual", City of Eugene, 2008.

HIGH PRIORITY ACTIONS:

10. Increase planting, preservation, and maintenance of trees and shrubs.

    a. Build on existing initiatives and partnerships.

    b. Seek additional financial and volunteer resources.

    c. Plant a diversity of species to increase the percentage of survivors under changing future conditions.

11. Control invasive species, such as English ivy, on public lands including City and County parks in order to maintain the health of existing urban area habitats.

12. Create incentives to encourage residents and businesses to plant trees.

Objective VII: Encourage ongoing water conservation.

HIGH PRIORITY ACTIONS:

13. Increase existing water conservation education and water quality initiatives as mentioned in the Buildings and Energy section.

Objective VIII: Strengthen protections of potable water sources.

When considering the impacts that climate change will bring, water quantity and quality will both continue to be critically important to the livability of Eugene. Fortunately, the McKenzie River provides residents of Eugene with a seasonally stable, ample, high-quality water supply[4]. Continued protection of the quality and availability of this resource is essential.

NOTE: Targets, measures and financial impacts will be finalized between the draft and final stages of the plan development.

HIGH PRIORITY ACTIONS:

14. Strengthen and expand water quality protections to protect surface water quality and prevent the contamination of shallow wells.

[4] "Deep groundwater mediates streamflow response to climate warming in the Oregon Cascades" Tague, C. et al., 2008.

Appendix 2: Glossary

Adaptation: Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustments in response to actual or expected climatic stimuli or their effects, which lessens harm or exploits beneficial opportunities. Various types of adaptation include anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation.

Adaptation benefits: The avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures.

Adaptation costs: Costs of planning, preparing for, facilitating, and implementing adaptation measures.

Albedo: The amount of solar radiation reflected by a surface or object. Snow covered surfaces have a high albedo; the albedo of soils ranges from high to low; vegetation covered surfaces and oceans have a low albedo.

Alternative energy: Energy derived from nontraditional sources (e.g., compressed natural gas, solar, hydroelectric, wind).

Anthropogenic: Made by people or resulting from human activities. Usually used in the context of emissions that are produced as a result of human activities.

Architecture 2030: Architecture 2030 is a non-profit, non-partisan and independent organization, established in response to the global-warming crisis by architect Edward Mazria in 2002. 2030's mission is to rapidly transform the US and global Building Sector from the major contributor of greenhouse gas emissions to a central part of the solution to the global-warming crisis. (Description from website: www.architecture2030.org). More detail about Architecture 2030 and proposed targets in Appendix 11

Atmosphere: The gaseous envelope surrounding the Earth. The dry atmosphere consists almost entirely of nitrogen (78.1% volume mixing ratio) and oxygen (20.9% volume mixing ratio), together with a number of trace gases, such as argon (0.93% volume mixing ratio), helium, radiatively active greenhouse gases such as carbon dioxide (0.035% volume mixing ratio), and ozone.

Barrier: Any obstacle to reaching a potential that can be overcome by a policy, program, or measure.

Biofuel: A fuel produced from dry organic matter or combustible oils produced by plants. Examples include alcohol (from fermented sugar), black liquor from the paper manufacturing process, wood, and soybean oil.

Biomass: When referring to fuel, plant-derived fuel including clean and untreated wood such as brush, stumps, lumber ends and trimmings, wood pallets, bark, wood chips or pellets, shavings, sawdust and slash, agricultural crops, biogas, or liquid

biofuels, but shall exclude materials derived in whole or part from construction and demolition debris.

BRT: Bus Rapid Transit: A BRT system emulates the efficiencies and operations of light-rail at a fraction of the costs. Attributes of a BRT system are:
Exclusive right-of-way - guarantees travel time, Signal priority – Giving buses priority through intersections, Level boarding – making boarding easier and quicker, Off-Board Fare Collection – no fumbling with change; boarding at all doors, not just the front, Less frequent stops – improves travel time, Improved stations – station amenities for passenger comfort, Park & Ride connections – Vehicle Image (Source Lane Transit District)

CAFE: The federal Corporate Average Fuel Economy program, which sets minimum fuel economy for cars and light trucks, including sport utility vehicles.

Capacity: The maximum power capability of a system.

Carbon Credits:

Carbon cycle: All reserves and fluxes of carbon. The cycle is usually thought of as four main reservoirs—the atmosphere, terrestrial biosphere (usually includes freshwater systems), oceans, and sediments (includes fossil fuels)—of carbon interconnected by pathways of exchange.

Carbon dioxide (CO2): The major heat-trapping gas whose atmospheric concentration is being increased by human activities. It also serves as the yardstick for all other greenhouse gases. The major source of CO2 emissions is fuel combustion. Carbon dioxide emissions also result from clearing forests and burning biomass. Atmospheric concentrations of CO2 have been increasing at a rate of about 0.5 percent a year, and are now more than 30 percent above pre-industrial levels.

CO2e:

Carbon intensity: The amount of carbon emitted for each unit of energy consumed.

Carbon neutral: (also climate neutral) when greenhouse gas emissions are net zero. A building is carbon neutral when it doesn't generate any more greenhouse gas emissions than it sequesters. This can also be accomplished by "offsetting" emissions with "carbon credits".

Carbon Offsets:

Carbon sequestration: The uptake and storage of carbon. Trees and other plants, for example, absorb CO2 then release the oxygen while storing the carbon.

Carbon sinks: The processes or ecological systems that take in and store more carbon than they release. This process is called carbon sequestration. Forests and oceans are large carbon sinks.

Climate: The average state of the atmosphere, including typical weather patterns for a particular region and time period (usually 30 years). Climate is not the same as weather, but is rather the average pattern of weather for a particular region. Weather describes the short-term state of the atmosphere; climate describes the longer-term. Climatic events include average precipitation, temperature, wind, and seasonal phenomena such as length of the growing season, among others.

Climate change: A significant change from one climatic condition to another, often used in reference to climate changes caused by the increase in heat-trapping gases since the end of the 19th century.

Climate feedback: An interaction mechanism between processes in the climate system that happens when the result of an initial process triggers changes in a second process that in turn influences the initial one. A positive feedback intensifies the original process, and a negative feedback reduces it.

Climate model: A quantitative way of representing the interactions of the atmosphere, oceans, land surface, and ice.

Climate neutral: see carbon neutral

Climate projection: A projection of the response of the climate system to emission or concentration scenarios of greenhouse gases and aerosols, or radiative forcing scenarios, often based on climate models simulations.

Climate refugees: People displaced from their homes or lands by significant changes in climate such as increased drought, sea level rise, or increased storm intensity.

Climate system: The climate system is a complex system consisting of five major components: the atmosphere, the hydrosphere, the cryosphere, the land surface and the biosphere, and the interactions between them. The climate system evolves in time under the influence of its own internal dynamics and because of external forcings such as volcanic eruptions, solar variations, and human-induced forcings such as the changing composition of the atmosphere and land-use change.

Climate variability: Climate variability refers to changes in the average state and other aspects of the climate over space and time beyond that of individual weather events. Variability can be due to natural climate processes (internal variability), or natural or human-induced external changes (external variability). See also climate change.

Co-benefits: The benefits of policies that are implemented for various reasons at the same time – including climate change mitigation. Most policies aimed at mitigating greenhouse gas emissions also have other, often at least equally important, benefits (e.g., related to development, sustainability, and equity).

Community-scale renewable energy:

Concentration: Amount of a chemical in a particular volume or weight of air, water, soil, or other medium. See also PPM (parts per million).

Cost-effective: A criterion that specifies that a technology or measure delivers a good or service at equal or lower cost than current practice, or the least-cost alternative for reaching a given target.

DSM: Demand-side management. Includes measures targeting users that conserve electricity such as energy efficient products and design, and load management strategies.

Deforestation: Practices or processes that result in the conversion of forested lands for non-forest uses. This is often cited as one of the major causes of the enhanced greenhouse effect for two reasons: 1) the burning or decomposition of the wood releases carbon dioxide; and 2) trees that once removed carbon dioxide from the atmosphere via photosynthesis are no longer present.

Desertification: Land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities.

District energy: In a district energy system, steam, hot water or chilled water is produced in a central plant and distributed to multiple buildings in a defined area through underground pipes.

Earth Advantage:

Ecosystem: Any natural unit including living and non-living parts that interact to produce a stable system through cyclic exchange of materials.

Ecosystem services: Ecological processes or functions that have value to individuals or society.

Embodied (greenhouse gas) Emissions: Greenhouse gas emissions associated with embodied energy (below)

Embodied energy: The total expenditure of energy involved in the creation of a product. This includes the energy to extract raw materials (lumber, iron, etc.), process, package, transport, install, and recycle or dispose of products.

Emissions: The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Energy efficiency: Ratio of energy output of a conversion process or of a system to its energy input.

Energy intensity: Energy consumption per measure of demand for services (e.g., number of buildings, total floorspace, floorspace-hours, number of employees).

Energy Trust of Oregon:

Environmentally Sound Technologies (ESTs): Technologies that protect the environment are less polluting, use all resources in a more sustainable manner,

recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they are substitutes and are compatible with nationally determined socio-economic, cultural, and environmental priorities.

EWEB: Eugene Water and Electric Board – Eugene's largest utility.

EPA: The United States Environmental Protection Agency.

EPUD: Emerald People's Utility District – Provides electricity to some Eugene residents and businesses.

Exposure: The nature and degree to which a system is exposed to significant climatic variations.

External cost: The costs arising from any human activity, when the agent responsible for the activity does not take full account of the impacts on others of his or her actions. When the impacts are positive and not accounted for in the actions of the agent responsible they are called external benefits.

Extreme weather event: An event that is rare within its statistical reference distribution at a particular place.

Feedback mechanisms: Factors that increase or amplify (positive feedback) or decrease (negative feedback) the rate of a process. An example of positive climatic feedback is the ice-albedo feedback. See climate feedback.

Food insecurity: A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level and can be chronic, seasonal, or transitory.

Foodshed:

Fossil Fuel: A general term for combustible geologic deposits of carbon in reduced (organic) form. Fossil fuels are of biological origin and include coal, oil, natural gas, oil shales and tar sands. A major concern is that they emit CO2 when burned, significantly enhancing the greenhouse effect.

GHG: Abbreviation for greenhouse gas, the term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide. Others include, but are not limited to, water vapor, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Generation: The process of making electricity. The term may also refer to energy supply.

Global Warming: Global warming is an average increase in the temperature of the Earth's atmosphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities. See climate change, greenhouse effect.

Greenhouse Effect: The thermal effect that results from heat-trapping gases allowing incoming solar radiation to pass through the Earth's atmosphere, but preventing most of the outgoing infrared radiation from the surface and lower atmosphere from escaping into outer space.

Greenhouse Gas: Commonly abbreviated GHG, a term used for gases that trap heat in the atmosphere. The principal greenhouse gases that enter the atmosphere as a result of human activity are carbon dioxide, methane, and nitrous oxide. Others include, but are not limited to, water vapor, chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), ozone (O3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Greywater:

GWh: Gigawatt-hours (1 million kilowatt-hours).

HFC: Hydrofluorocarbon compounds; a human-made greenhouse gas generated by industrial processes.

IPCC: Intergovernmental Panel on Climate Change. Established in 1988, the IPCC assesses information in the scientific and technical literature related to all significant components of the issue of climate change. It draws on hundreds of the world's leading scientists to serve as authors, and thousands as reviewers. Key experts on climate change and the environmental, social and economic sciences from some 60 nations have helped the IPCC prepare periodic assessments of the scientific underpinnings of global climate change and its consequences. The IPCC is also looked to as the official advisory body to the world's governments on the state of the science of the climate change issue.

Implementation: The realization of an idea, or execution of a plan, by groups or individuals, public or private.

Implementation costs: Costs involved in the implementation of mitigation options, associated with the necessary institutional changes, information requirements, market size, opportunities for technology gain and learning, and economic incentives.

Industrial Revolution: A period of rapid industrial growth with far-reaching social and economic consequences, beginning in England during the second half of the 18th century and eventually spreading to the United States. The invention of the steam engine was an important trigger of this development. The Industrial Revolution marks the beginning of a strong increase in the use of fossil fuels and emission of, in particular, carbon dioxide.

Infill compatibility standards: A City of Eugene planning effort with a stated goal to create and adopt land use code standards and processes that: (a) Prevent residential infill that would significantly threaten or diminish the stability, quality, positive character, livability or natural resources of residential neighborhoods; and (b) Encourage residential infill that would enhance the stability, quality, positive character, livability or natural resources of residential neighborhoods; and (c) So long as the goal stated in (a) is met, allow for increased density, a variety of housing types, affordable housing, and mixed-use development; and (d) Improve the appearance of buildings and landscapes.

Integrated design:

Invasive species: An introduced species that invades natural habitats.

LCOG: Lane Council of Governments, a voluntary association of local governments in Lane County, Oregon. The agency is a regional planning, coordination, program-development, and service-delivery organization. LCOG helps area cities, Lane County, educational districts, and special-purpose districts reach their common goals.

LTD: Lane Transit District

Land use: Human-determined arrangements, activities, and inputs undertaken in a certain land type, the social and economic purposes for which land is managed (e.g., grazing, timber extraction, and conservation).

Land-use change: A change in the use or management of land by humans, which may lead to a change in land cover. Land cover and land-use change may have an impact on the albedo, evapotranspiration, sources, and sinks of greenhouse gases, or other properties of the climate system, and may thus have an impact on climate, locally or globally.

KWh: Kilowatt-hour.

LEED: Leadership in Energy and Environmental Design, a program of the United States Green Building Council and a commonly used green building standard.

MMtCOe: Million metric tons of CO equivalent.

MW: Megawatt, a measure of electricity capacity. One MW is sufficient to provide power to 700 to 1,000 homes.

MWh: Megawatt-hours (1 thousand kilowatt-hours).

Maladaptation: An adaptation that does not lower vulnerability to climatic stimuli but inadvertently increases it instead.

Market-based incentives: Measures using price mechanisms (e.g., taxes and tradable permits) to reduce greenhouse gas emissions.

Methane (CH4): A hydrocarbon that is a heat-trapping gas carrying a global warming potential recently estimated at 24.5. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and oil, coal production and incomplete combustion of fossil fuels.

Metric Ton (Mt): Common measurement for the quantity of greenhouse gas emissions. A metric ton is equal to 2205 lbs or 1.1 short tons.

Mitigation: An intervention to reduce the sources or enhance the sinks of greenhouse gases.

Natural Gas: A fossil fuel which occurs as underground deposits of gases consisting of 50 to 90 percent methane (CH4) and small amounts of heavier gaseous hydrocarbon compounds such as propane (C3H8) and butane (C4H10).

Net carbon dioxide emissions: Difference between sources and sinks of carbon dioxide in a given period and specific area or region.

Net metering:

Net Zero Energy Buildings: A building that achieves maximum energy efficiency so that any remaining energy needs can be met through onsite renewable energy systems, such as solar water and space heating, solar electricity, or wind energy

Nitrous Oxide (N_2O): A powerful greenhouse gas. Major sources include soil cultivation – especially from use of commercial and organic fertilizers – fossil fuel combustion in vehicles, nitric acid production and the combustion of biomass.

NOx: Oxides of nitrogen, which are important components of ground-level ozone smog, and contribute to acid rain and particulate pollution (how do the N gasses contribute to particulate pollution?).

Non-point-source pollution: Pollution from sources such as areas of crop production, timber, surface mining, disposal of refuse, and construction, which cannot be defined as discrete source points. See also point-source pollution.

NWN: Northwest Natural Gas

Occupant behavior: The behavior of building occupants such as residents and employees. Relevant occupant behaviors include how occupants operate thermostats, open and close windows, and use water and electricity.

ODOT: Oregon Department of Transportation

Oregon DEQ: Oregon Department of Environmental Quality

Oregon DOE: Oregon Department of Energy

Opportunity costs: The cost of an economic activity forgone by the choice of another

activity.
Opportunity Siting: A City of Eugene planning effort with the stated goal of 1) Creating a planning process for finding specific sites that can feasibly accommodate high density residential development that is compatible with and has the support of nearby residents. 2)Facilitate development on those sites.

PFCs: Perfluorocarbons; a human-made greenhouse gas generated by industrial processes.

PPM: Parts per million.

Photovoltaic (PV): A solar power technology that converts sunlight into electricity.

Peak Oil: A term used to describe the transition from many decades in which the available supply of oil grew each year to a period in which the rate of oil production enters it terminal decline.

Photosynthesis: The process by which plants make sugars, taking carbon dioxide (CO2) from the air, and releasing oxygen (O2) in the process.

Point-source pollution: Pollution resulting from any confined, discrete source, such as a pipe, ditch, tunnel, well, container, concentrated animal-feeding operation, or floating craft. See also non-point-source pollution.

Product Stewardship: Calls on those in the product lifecycle—manufacturers, retailers, users, and disposers—to share responsibility for reducing the environmental impacts of products (definition from EPA website). Ideally, this would result in changes in design so that products create less waste, can be re-used or disassembled for easier recycling, or are otherwise redesigned.

REC: Renewable energy certificates which are marketable/tradable entities that represents one megawatt hour (1,000 kWh) of power generation from a renewable energy source.

Radiation: Energy transfer in the form of electromagnetic waves or particles that release energy when absorbed by an object.

Reforestation: Planting of forests on lands that have previously contained forests but that have been converted to some other use.

Renewables: Energy sources that are, within a short time frame relative to the Earth's natural cycles, sustainable, and include non-carbon technologies such as solar energy, hydropower, and wind, as well as carbon-neutral technologies such as biomass.

Resilience: Amount of change a system can undergo without changing state.

Setbacks: Land use code that requires buildings or facilities to be a certain distance back (setback) from a roadway or other defined object.

Sink: Removals of carbon from the atmosphere, with the carbon stored in forests, soils, landfills, wood structures, or other biomass-related products.

Snowpack: A seasonal accumulation of slow-melting snow

Solar Radiation: Radiation emitted by the sun.

Solar thermal: A technology that captures solar energy for heat

Source: Any process or activity that releases into the atmosphere a greenhouse gas, an aerosol or a precursor to a greenhouse gas.

Special setback: (relative to transit route planning)
Stakeholder: A person or entity that would be affected by a particular action or policy.

Streamflow: Water within a river channel, usually expressed in cubic meters per second.

SUB: Springfield Utility Board

SUV: Sport utility vehicle, considered under federal gas mileage standards to be a light-duty truck, and subject to a lower average mile per gallon requirement ,(20.7 mpg)< than other passenger vehicles.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Urbanization: The conversion of land from a natural state or managed natural state (such as agriculture) to cities.

Urban Heat Island: The increased temperatures experienced in urban areas due to dark-colored pavement, roofs, buildings, etc.

VMT: Vehicle-miles traveled. A measurement to determine the amount of automobile traffic – can also be used to calculate greenhouse gas emissions.

Vector: An organism, such as an insect, that transmits a pathogen from one host to another. See also vector-borne diseases.

Vector-borne disease: Disease that is transmitted between hosts by a vector organism such as a mosquito or tick**.**

Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

Wastewater: Water that has been used and contains dissolved or suspended waste materials.

Weather: Atmospheric condition at any given time or place. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and

precipitation. In most places, weather can change from hour-to-hour, day-to-day, and season-to-season. Climate is usually defined as the "average weather."

Whole building design:

zero net energy:

Sources:

Berkeley CAP
Energy Information Administration's Energy Glossary
IPCC Third Assessment Report
NASA's Earth Observatory library

Buildings and Energy		
Name	**Representing**	Organization
John Rowell	architecture	Rowell Brokaw Architects
Bill Welch	energy	EWEB
Rudy Berg	architecture	Common Practice Building Design
Mike Hatten	architecture	solarc
Kip Much	natural gas	NWN
Dean Foor	renewable energy	Essential Consulting Oregon
Brian McCarthy	landscape	CMGS: landscape/roofs/swales
Anne Delaney	architecture/aff hsg	Bergsund Delaney Architects
Mark Miksis	development	Arlie & Co.
Larry Banks	architecture	Pivot Architecture
Eric Nill	solar energy	Advanced Energy Systems
Marcus Kauffman	energy	Resource Innovations

Food and Agriculture		
Name	**Representing**	**Organization**
Deb Johnson-Shelton-	Food Policy	Lane County Food Policy Council
Megan Kemple	Farmers Coalitions	Willamette Farm and Food Coalition
Ross Penhallegon	Agricultural Extension Service	OSU Extension Service - Lane County
Jean-Paul Cunningham	Farmers Market	OSU Extension Service - Lane County
Karl Morgenstern	EWEB	Eugene Water and Electric Board
Jan Spencer	Neighborhoods/Permaculture	River Road Neighborhood Snap Program
Sarah Cantril	Latino Community	Heurto de la Familia
Will Shaver	Processor	Sustainability Commission/Grain Millers
Rick Wright/Michael Scott	Retail (Supermarkets)	Market of Choice
Mary Wood	Law	UO Env. Law
Natalie Reitman-White	Wholesaler	Organically Grown Company
Kelly Hoell	Good Company	
Sarah Mazze	CLI	
Stephanie Page	ODA	

Land Use and Transportation		
Name	**Representing**	
Rob Zako	biking/walking	transportation consultant
Josh Skov	sustainability consultant	sustainability commissioner
Andrea Riner	Regional transportation planner	LCOG
Steve Nystrom	Land Use policy	City Land Use
Lisa Gardner	Land Use policy	City Land Use
David Roth	Transportation policy	City Transportation
Jon Lauch	Schools	4J school district (facilities)
Heidi Beierly	Citizen planning commission	Planning Commissioner
Tom Schwetz	Transit	LTD
shane rhodes	bike ped	Safe Routes to School/ 4J
Kevin Mathews	environmental group	Friends of Eugene
Ian Hill	biofuel/transportation	Sequential Biofuels
Rusty Rexius	Business/local trucking	Rexius
Sally Markos	air quality	LRAPA

Consumption and Waste		
Name	**Representing**	Organization
David Allaway	State of Oregon Government	DEQ
Sarah Grimm	County Waste Management/Recycl	Lane County Solid Waste
Julie Daniel	Local Reuse Non-Profit	Bring Recycling
Ethan Nelson	City of Eugene Solid Waste Prograr	City of Eugene
Rick Wichmann	Largest City of Eugene licensed Ha	Sanipac
Lorena Young	Regional expert on recycling marke	International Paper
Lorraine Kerwood	Recycling Industry	NextStep
Tom Bowerman	Durable consumption	The Green Store
Ian Hill	Biofuels	SeQuential
Richie Weinman	Social Justice Issues	City of Eugene

Health and Social Services		
Name	**Representing**	**Organization**
Karen Edmonds	Food Bank	FOOD for Lane County
Sally Markos	Air Quality Monitoring	Lane Regional Air Protection AgencyRAPA
Stacy Vynne	Climate Research	Climate Leadership Initiative
Laurie Trieger	Community Health Non-Profit	Lane Coalition for Healthy Active Youth
Phil Farrington	Health	Peace Health
Brian Johnson	Emergency Preparedness	Lane County Public Health
Richie Weinman	City Development	City of Eugene
Jennifer Jordan	Chronic Disease Prevention	Lane County Public Health
Al Levine	Mental Health	Lane County Health and Human Services
Juan Carlos Valle	Latino support	Centro Latino Americano/Police commission
Kari Lyons		Portland/Metro Public Health
Donna Butera	School district	Bethel School District

Natural Resources

Name	**Representing**	**Organization**
Pat Boylen	Wildlife Biology	Lane Community College
Trevor Taylor	urban parks natural area managem	City of Eugene Parks and Open Space
Joe Zaludek (or substitute)	Fire safety	Eugene Fire
Lori Hennings	Metro (Portland) Urban Natural Res	Metro - natural Resources
Billy Curtis	Stormwater management	City of Eugene Stormwater Management
Therese Walch	Stormwater management	City of Eugene Stormwater Management
Nancy Toth/Karl Morgenste	potable water management	EWEB
Craig Smith	City Recreation	City of Eugene recreation
Erik Burke	Urban Forestry - non-profit	Eugene Tree Foundation
Larry Six	Watershed council - non-profit	McKenzie Watershed Council
Mark Snyder	urban forestry - local government	City of Eugene Urban Forestry
Scott Altenhoff	urban forestry - local government	City of Eugene Urban Forestry
Jason Stein	urban forestry - business	Private Urban Forestry Business
Kristin Ramstad	Community Assistance Forester	Oregon Dept. of Forestry
Bill Hatton	Federal Land Management Agency	US Bureau of Land Mgmt

Appendix 3 - Topic Specialists

Appendix 3 - Topic Specialists

APPENDIX 5: Health Impact Assessment

Background
The City of Eugene Climate and Energy Action Plan (CEAP) will foster significant emissions reductions on a local level by providing specific actions to mitigate and adapt to climate changes. The implementation of certain CEAP actions can be directly linked to health benefits and could ultimately reduce some health risks associated with Climate Change.

Health Impact Assessments (HIAs) can evaluate the health impacts of plans using quantitative and qualitative information. The HIA for the CEAP will provide a basis for which the impacts of climate change can be assessed. The CEAP HIA will demonstrate direct health benefits that could result from the adoption of certain CEAP actions. CEAP actions that can be associated with health benefits will be highlighted in the plan. Detailed information related to the health benefits of the actions will be located in an Appendix of the CEAP.

Project Scope
The CEAP HIA will evaluate several actions proposed in the plan. Similar to the CEAP, the HIA will be divided among various sectors: Land Use and Transportation, Food and Agriculture, Consumption and Waste, Natural Resources, and Buildings and Energy. Because there is little precedent for HIA's on climate and energy action plans, obtaining information related to quantifiable health benefits to Climate Change mitigation and adaption actions is challenging. Due to the limited amount of existing information and human resources available for analysis, the HIA analysis for each CEAP sector will vary. Specially, new research will be conducted to determine quantifiable health benefits to some actions in the CEAP Land Use and Transportation sector. For the remaining sectors of the CEAP (Food and Agriculture, Consumption and Waste, Natural Resources, and Buildings and Energy) existing analysis will be collected and used to describe qualitative health benefits to the adoption of certain CEAP actions.

PHASE I: Project Development
Tasks:
- Develop project partners and establish responsibilities
- Determine list of CEAP actions for health benefit assessment
- Finalize project scope

Timeline: February 1, 2010 – April 1, 2010

PHASE II: Research
Tasks:
- Collect existing data from partners
- Conduct technical analysis of quantifiable health benefits to CEAP Land Use and Transportation actions
- Conduct literature reviews for analysis of qualitative health benefits to CEAP Food and Agriculture, Buildings and Energy and Consumption and Waste actions

Timeline: April 1, 2010 – June 1, 2010

PHASE III: Assessment & Report Writing

Tasks:

- Assess data analysis and report findings to CEAP Land Use and Transportation actions
- Assess literature reviews and report findings to CEAP Food and Agriculture, Buildings and Energy, Natural Resources, and Consumption and Waste actions
- Develop HIA Draft report to serve as an Appendix in the CEAP
- Develop HIA final report to serve as an Appendix in the CEAP

Timeline: June 1, 2010 - July 1, 2010

Partners

Expertise for CEAP HIA research, report writing and guidance is provided by various health organizations and agencies including:

- Upstream Public Health, Mel Rader
    - *Conducting technical analysis for the Land Use & Transportation CEAP actions*
    - *Providing project guidance and serving as a resource for existing data*
- Kaiser Center for Health Research, Leslie Perdue
    - *Conducting technical analysis of the Land Use & Transportation CEAP actions*
- Lane County Public Health, Jennifer Jordan
    - *Reporting results of technical analysis of the Land Use & Transportation CEAP actions*
    - *Providing project guidance and serving as a resource for existing data*
- Lane Regional Air Protection Agency, Sally Markos
    - *Serving as a resource for existing data*
- Lane Coalition for Healthy Active Youth, Laurie Trieger
    - *Serving as a resource for existing data*
- Climate Leadership Initiative, Stacy Vynne
    - *Serving as a resource for existing data*
- Lane Council of Governments, Susan Payne
    - *Serving as a resource for existing data*
- Department of Human Services, Sujata Joshi, Julie Early-Alberts, Lesa Dixon-Gray
    - *Providing project guidance and serving as a resource for existing data*

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Spring 2010

www.oregon**metro.gov**

Regional greenhouse gas inventory

The carbon footprint of residents and businesses inside the Portland metropolitan region

The Portland metropolitan region is a national leader in arresting the rise in greenhouse gas emissions; however, our current efforts fall far short of what is needed to meet carbon reduction goals established in state law. Moreover, within 25 years, we can expect to be joined by one million new neighbors. Energy instability and climate change require us to rethink everything from where we live to where we get our food to how we get around.

To refocus the region's efforts to address climate change, Metro conducted a Regional Greenhouse Gas Inventory for the Portland metropolitan region. The inventory was intended to establish a snapshot of the region's greenhouse gas emission sources in order to make investment decisions that can have the greatest effect in reducing greenhouse gas (GHG) emissions.

The chart below summarizes the greenhouse gas emissions from residential and business activities throughout the Portland metropolitan area. Emissions stemming from activities within the Metro boundary are estimated at 31 million metric tons for 2006. As detailed in the following pages, these emissions are in some cases:

Direct – such as gasoline combustion;

Indirect – from beyond our borders in the region such as electricity imports; and,

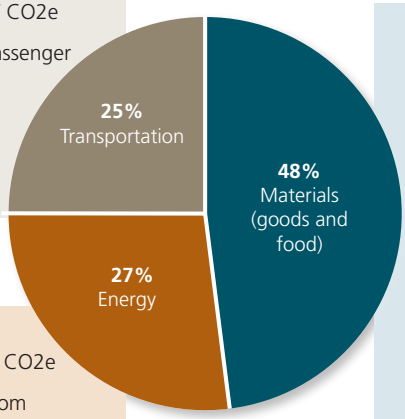
Remote – associated with activities that end with final consumption here in the community, such as the production of many goods and much of our food.

Metro Area Greenhouse Gas Emissions

31 Million Metric Tons Carbon Dioxide Equivalent (MMT CO2e)

Transportation
Estimated emissions: 7.8 MMT CO2e

- Vehicle miles traveled by passenger vehicles and light trucks
- Operation of public transportation system (TriMet)



Materials (goods and food)
Emissions related to the production, manufacture and disposal of materials, goods and food
Estimated emissions 14.9 MMT CO2e

- Manufacture of products and food (from inside and outside the region) consumed by metro residents and businesses
- Freight movement of materials, goods and food (heavy truck, rail, air)
- Waste management and recycling system (collection, landfills)

Energy
Estimated emissions: 8.2 MMT CO2e

- Natural gas consumption from residents and businesses
- Fossil fuel consumption from utilities' imported electricity

For additional details, contact Mike Hoglund at Mike.Hoglund@oregonmetro.gov.

Good Company performed this analysis, in partnership with Metro staff.

Metro

Methodology

The inventory estimates the greenhouse gas emissions of residents and businesses inside the Metro boundary, which includes nearly 1.5 million people in Multnomah, Washington and Clackamas counties.

Most analyses[1] of the Northwest and of cities in the region focus on direct emissions from the use of fossil fuels and therefore have focused on energy and transportation systems. However, recent Environmental Protection Agency (EPA) research[2] suggests that those emissions for which we are indirectly responsible– especially those resulting from the production of material goods – comprise a large share of our emissions and are ignored by conventional analyses. There are trade-offs in the approach used here. The calculations related to material flows (goods, food and waste) rely on national data with regional adjustments, rather than direct measurements. The Portland metropolitan region's material consumption, however, is not so different from national averages and the methodology provides a sense of scale with a clear message: consumption matters as much as energy and transportation.

It is important to stress that these results are estimates. This analysis builds on recent work by EPA to assemble a new kind of emissions inventory, but it is an evolving process based on the current state of the data and clarity around what type of information is needed. The inventory uses regional data for the consumption of energy and transportation, and makes regional adjustments to national data related to the consumption of materials and food.[3]

1 *"2008 Seattle Community Greenhouse Gas Inventory," City of Seattle, www.seattle.gov/climate/docs/2008-community-summary.pdf or "CO2 Emissions from Fossil Fuels by Sector," Sightline Institute www.sightline.org/maps/charts/Climate-EmBySector.*

2 *"Opportunities to Reduce Greenhouse Gas Emissions through Materials and Land Management Practices," EPA (2009), www.epa.gov/oswer/docs/ghg_land_and_materials_management.pdf.*

3 *This analysis is focused on final consumption that happens in residential and commercial contexts. Industrial emissions resulting from the manufacture of goods for export to and consumption by other communities do not appear in these numbers, as that inclusion would have produced confusing double-counting. However, there is room for future analysis to provide a complementary set of accounts to look at the carbon footprint of employment and production in the Metro region.*

Metro's role in managing the region's greenhouse gas emissions

As a regional government with responsibility for land use and transportation planning, as well as waste reduction and disposal, there are many ways in which Metro can provide leadership in reducing greenhouse gas emissions. Metro has three distinct, but overlapping, roles related to GHG management:

Legislative obligations Under legislation passed in 2009 (House Bill 2001)[4], Metro, as the Metropolitan Planning Organization (MPO) for the Portland metropolitan area, must plan for reductions in transportation-related carbon emissions. The State of Oregon will provide Metro with greenhouse gas reduction targets in 2011.

Planning authority Metro has a central role in planning and/or operating the systems of waste management, transportation and land use for the region. Many stakeholders and elected officials in the Metro region increasingly seek to incorporate GHG concerns into decision making.

Education and data provision Metro plans to include insights from this analysis to inform its on-going collaborations with other regional partners in resource efficiency, economic development, planning for livability and climate action.

Metro provides planning, policy making, and services to preserve and enhance the region's quality of life. Our regional vision for Making the Greatest Place, based on values established by residents in the 2040 Growth Concept, includes:

VIBRANT COMMUNITIES People live and work in vibrant communities where they can choose to walk for pleasure and to meet their everyday needs.

ECONOMIC PROSPERITY Current and future residents benefit from the region's sustained economic competitiveness and prosperity.

SAFE AND RELIABLE TRANSPORTATION
People have safe and reliable transportation choices that enhance their quality of life.

ENVIRONMENTAL LEADERSHIP
The region is a leader in minimizing contributions to global warming.

CLEAN AIR AND WATER Current and future generations enjoy clean air, clean water and healthy ecosystems.

EQUITY
The benefits and burdens of growth and change are distributed equitably.

4 *Oregon House Bill 2001, also known as the Oregon Jobs and Transportation Act, is the transportation funding plan adopted by the 2009 Legislature. www.leg.state.or.us/09reg/measures/hb2000.dir/hb2001.en.html*

SOURCE-BY-SOURCE SUMMARY OF GREENHOUSE GAS EMISSIONS

Energy (natural gas and electricity)

Energy used in buildings is the source of 27 percent of the region's greenhouse gas emissions.

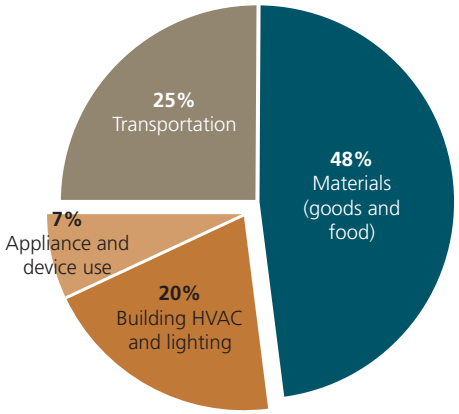
Lighting, heating and cooling buildings and the operation of appliances by residences, commercial establishments, and industrial buildings account for 8.2 million metric tons of carbon dioxide equivalent.

For many long-time residents of the Northwest, it may come as a surprise that electricity consumption is responsible for so much of the carbon footprint, considering a large portion of our energy is derived from hydropower. Yet as the region's economy and population have grown, the hydroelectric system has not been able to completely serve the region's needs – and coal and gas have, for the most part, filled the gap. Renewable energy sources are still a small share of total greenhouse gas emissions (2.1 percent), though growing rapidly.[5]

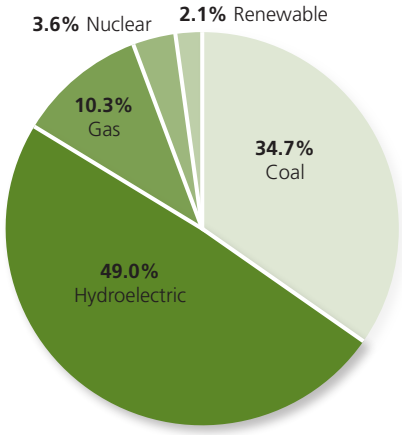
The electric utilities serving the Portland metro area, Portland General Electric (PGE) and Pacific Power, have made investments in renewable energy and energy efficiency. The pie chart below shows the mix of energy for the Northwest Power Pool. A state-mandated Renewable Portfolio Standard (RPS) will require the largest utilities in Oregon to provide 25 percent of their retail sales of electricity from renewable sources of energy in 2025.[6] Implementation of the standards will result in commensurate reductions in GHG emissions from Northwest power supplies.

Currently, the energy use documented in this section happens almost entirely in buildings, but the distinction between building energy and transportation energy is likely to blur somewhat with the introduction of electric vehicles.

Metropolitan area greenhouse gas emissions with energy split



Regional sources of electricity Northwest Power Pool (NWPP)



5 *The discussion of the regional electric grid draws on the most recent eGRID data from EPA , which reflects the electric power industry's structure as of December 31, 2007. http://cfpub.epa.gov/egridweb/*

6 *A Renewable Portfolio Standard for Oregon www.oregon.gov/ENERGY/RENEW/RPS_home.shtml*

Transportation

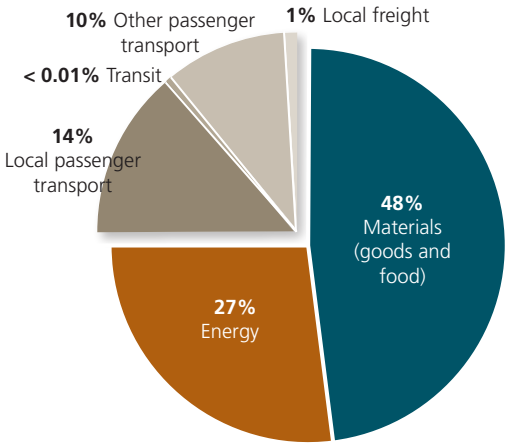
Transportation is responsible for about 25 percent of the region's greenhouse gas emissions. These emissions come mainly from on-road commercial and individual vehicles and air travel, with small shares from rail, marine and transit sources.

One impetus for this analysis is the state mandated goal for emissions reductions from light-duty vehicles[7] by 2035 (to be determined by the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development in 2011). The segment labeled "Local passenger transport" (14 percent of total regional emissions) is the share of Metro-area emissions that will be addressed by this goal.

Commuter trains and buses account for less than 0.1 percent. The 10 percent share labeled "Other passenger transport" consists of long-distance ground transportation (e.g. rail) and air travel.[8]

While local freight is accounted for in this transportation analysis, it is important to note that some of the transportation on which we rely is long-distance transportation of goods from far beyond the region's borders. The emissions from freight movement of these goods are calculated in emissions associated with material consumption and not within the transportation section of emissions.

Metropolitan area greenhouse gas emissions with transportation split



7 *The legislation specifies that the emissions goal applies to vehicles weighing up to 10,000 pounds.*

8 *This analysis uses national per capita averages from the EPA report previously cited, in the absence of local data or explicit guidance from any widely accepted protocol or methodology.*

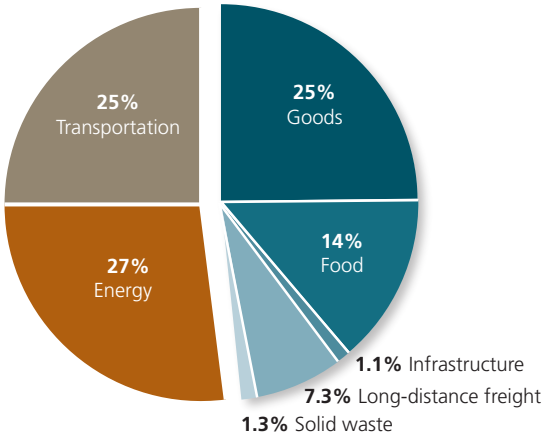
Materials, goods and food (production, movement and disposal)

Nearly 48 percent of community greenhouse gas emissions are estimated to come from the resource extraction, manufacture and distribution of materials, goods, and food for final use and consumption by residents and business operators. A small component of these emissions is also associated with the landfill disposal of food and products. These life-cycle stages of manufacturing and distribution, which are generally invisible to consumers, are a large and important part of our carbon footprint and are excluded from most GHG inventories.

"Goods" (25 percent) and "food" (14 percent) include the life cycle greenhouse gas emissions of items such as clothing, furniture, cars, food and beverages. It also includes packaging of products and single-use items that are quickly relegated to the waste stream.

The movement of goods and food (7 percent) from distant United States production sites to the Portland metropolitan area are quantified as long-distance freight. This long-distance movement of materials often looms large in our perception, but depending on the item, may in fact be a smaller slice of the item's overall carbon footprint. For example, freight-related emissions contribute only one-eighth of the total emissions related to the provision of food. Most food-related emissions result from the growing of food (especially feed for animals) and, to a lesser extent, food processing.

Metropolitan area greenhouse gas emissions with materials split



Traditional greenhouse gas emissions analyses exclude the emissions associated with the production and transport of materials, goods and food. When these "upstream" emissions related to material consumption are included (cargo ships, planes, and trucks), the total emissions assigned to our region increase significantly.

The relatively small solid waste slice represents the emissions associated with the "end-of-life" disposal of goods and foods. While this emissions source is a small share of total emissions, several things should be noted. First, the success of regional waste reduction programs in keeping this slice small should not be underestimated. Reuse and recycling that diverts materials from disposal and back into use has significant net carbon reduction impacts compared with use of virgin materials – even when transportation impacts of material collection and hauling are counted. Second, the management of the more "upstream" portion of material flows offers many potential GHG-reducing opportunities, such as promoting new green purchasing strategies for businesses and consumers, reducing energy use, and supporting the internalization of the lifecycle carbon costs of goods into their price. While Metro's role in materials management has traditionally focused on recycling and disposal, the relationships Metro has developed with households and businesses throughout the region may present collaborative opportunities to lower the region's greenhouse gas emissions from material use.

The infrastructure section of the chart represents the emissions associated with the construction and maintenance of highways, streets, bridges, tunnels, sewers and pipelines. Most of this slice is in the manufacture, distribution and installation of materials into the built environment.

The aggregate estimate for the Materials, Goods and Food section does not include international trade due to lack of consistent international production data. However, estimates of our "imported carbon footprint" suggest that the materials emissions could in fact be significantly larger, increasing our national carbon footprint by as much as 20 percent.[9]

9 *See "Embodied Environmental Emissions in U.S. International Trade, 1997–2004," Christopher L. Weber and H. Scott Matthews (2007).*

SUMMARY OF CALCULATION ASSUMPTIONS AND METHODS

A summary of the data sources, assumptions and methods is highlighted below. The technical analysis should be referenced for additional information.

Energy

Assumptions for natural gas emissions:

- Per capita figures within the Metro jurisdiction were extrapolated from the greenhouse gas inventory in the City of Portland/Multnomah County Climate Action Plan.

Assumptions for electricity emissions:

- Per capita figures within the Metro jurisdiction were extrapolated from the greenhouse gas inventory in the City of Portland/Multnomah County Climate Action Plan.

Other details:

- The regional split between HVAC/lighting and appliances/devices was assumed to be the same as the national split.
- Industrial energy use is only the energy used for the operation of industrial buildings, not for the local manufacture of goods and services. The split of industrial energy (separating building operation from product manufacture) comes from the EPA (2009).

Transportation

Method for local passenger transportation:

- Emissions were estimated using EPA's MOBILE6 model, with inputs from Metro's regional travel forecast model.

Assumptions for freight:

- A fixed share (15 percent) of freight emissions associated with goods and food was assigned to transportation inside the Metro boundary.

Assumptions for transit:

- Emissions were calculated from TriMet data on electricity consumption for the operation of light rail, and diesel and biodiesel for the operation of buses.

Assumptions for long distance/other:

- Per capita assumptions from EPA's analysis were adjusted by the ratio of local per capita income to national per capita income.

Materials, Goods and Food (Production, Movement and Disposal)

Per-capita emissions from material goods and food for the United States were attributed to the Metro region, with a few adjustments.

Assumptions

- A certain share (20 percent) of goods and food production was assigned to the region. Emissions from electricity for that share were adjusted by the region's lower carbon intensity (for the electricity component of production).
- Median household income for the Portland metropolitan area is greater than the national average. It is assumed that this difference results in more purchased goods by residents.
- The estimates do not account for international trade due to lack of information on foreign production and supply chains, which would, according to several studies, raise the greenhouse gas emissions related to material consumption.

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Spring 2010

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High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
Buildings & Energy Use																									
Objective 1: Reduce total green house gas emissions from existing buildings by 25% by 2030																									
1. Identify the most cost-effective opportunities for increasing efficiency in existing buildings.	HI	HI	FF	$	x	L	x			x	x	x	x	x					x					complete when EWEB completes analysis of priority efficiency opportunities	Reduces reliance on natural gas to generate electricity.
2. Expand assistance programs for retrofits that increase energy efficiency and reduce the carbon footprint of existing buildings.	HI	HI	FF	$$/$$$	x	L								x				x							Reduces reliance on natural gas to generate electricity.
3. Establish a project fund to expand financing mechanisms for residential energy efficiency and/ or renewable energy system installations.	Med	Med	FF	$$$	x	L								x		x			x	x					Reduces reliance on natural gas to generate electricity.
4. Target occupant behavior in order to reduce energy use in all types of buildings.	Med	Med	FF	$	x	L	x	x		x	x	x	x	x		x		x							Reduces reliance on hydroelectric power, the availability of which is expected to diminish with
5. Adopt an Energy Performance Score program for existing and new buildings to help buyers and renters to better understand the energy use of a building before they purchase or occupy it.	low	low	N	$	L	x	x							x		x			x	x					
Objective 2: Reduce greenhouse gas emissions from new construction 50% by 2030																									
6. Lobby for adoption, and actively participate in development, of building code amendments that meet the Architecture 2030 standards for energy efficiency.	low	low	FF	$	L	x	x	x			x					x					x				Reduces reliance on natural gas to generate electricity.
7. Increase incentives for highly energy-efficient new buildings, aiming toward zero net energy and carbon neutral buildings.	low	low	FF	$$/$$$	L	x	x							x				x							Reduces reliance on natural gas to generate electricity.
8. Develop incentives to encourage the use of passive heating and cooling systems and other strategies that reduce energy demand and better adapt buildings for a changing climate.	low	low	CC/FF	$$/$$$	L	x													x	x					Reduces reliance on natural gas to generate electricity.
9. Increase incentives to encourage smaller homes that use less energy to operate and fewer building materials to construct.	Med	Med	CC/FF	$$	L	x								x					x	x					Reduces reliance on natural gas to generate electricity.

$ = Dollars saved
$ = $0 - $99,000
$$ = $100k - $999k
$$$ = 1 million +

* An action has adaptation value when it prepares the community or a system for for climate change (CC) and/or volatile or increasing fuel prices (FF)

	High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
	Objective 3: Expand use of Renewable and District Energy Systems																									
	10. Increase the use of on-site renewable energy systems, such as solar hot water, photovoltaic, and ground-source heat pumps, by removing barriers to such systems.	**med**	**med**	**CC/FF**	**$$$**	**x**	**L**	**x**	**x**		**x**	**x**	**x**	**x**	**x**				**x**							list barriers to on-site renewable energy systems	Reduces reliance on hydroelectric power, the availability of which is expected to diminish with climate change. Also reduces reliance on fossil fuels to
Buildings and Energy Use	**a.** Invest in EWEB's downtown network to facilitate net metering, a program which would allow connection to photovoltaic systems on downtown buildings.	**med**	**Med**	**CC/FF**	**$$**	**x**	**L**	**x**				**x**		**x**	**x**					**x**	**x**	**x**				completed when network facilitates net metering	Reduces reliance on hydroelectric power, the availability of which is expected to diminish with climate change. Also reduces reliance on fossil fuels to
	b. Address the financial barriers to onsite renewable energy by expanding financing options such as long-term loans and property-assessed clean energy bonds.	**med**	**med**	**CC/FF**	**$$**	**x**	**L**								**x**			**Banks**				**x**	**x**		measure financing options available for renewables	
	11. Develop at least one community scale renewable energy pilot by 2015.	**low**	**low**	**CC/FF**	**$$$**	**x**	**L**	**x**	**x**		**x**	**x**			**x**		**x**			**x**	**x**	**x**	**x**		Completed when project is developed	Reduces reliance on hydroelectric power, the availability of which is expected to diminish with
	12. Develop at least one clean *district energy or shared energy* system pilot project by 2015.	**low**	**low**	**CC/FF**	**$$$**	**x**	**L**	**x**	**x**		**x**	**x**			**x**		**x**			**x**	**x**	**x**	**x**		Completed when project is developed	Reduces reliance on hydroelectric power, the availability of which is expected to diminish with
	Objective 4: Increase the implementation of climate change preparation strategies for the built environment.																									
	13. Lobby for state building code amendments to incorporate climate change preparation strategies into building design and construction.	**low**	**low**	**CC**	**$**	**L**	**x**		**x**						**x**		**x**		**x**							
	14. Provide education, assistance and incentives to reduce potable water use in new and existing buildings and landscaping.	**low**	**low**	**CC**	**$$**	**x**	**L**	**x**			**x**		**x**	**x**	**x**		**x**		**x**							

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High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
Food and Agriculture																									
Objective 1: Reduce consumption of carbon-intensive foods.																									
1. Begin a community campaign to educate the public about food choice as part of a climate-friendly lifestyle	med	med	n	low	x		x	x		x	x	x	x	x	L	x	OSU	x							
a. Specifically encourage reduced consumption of carbon intensive foods including red meat and dairy.	med	med	n	$	x		x			x		x	x	x	L			x							
2. Implement a "Buy climate-friendly first" food purchasing policy for public institutions - schools, hospitals, city and county governments.	med	med	n	$$	x	x	x			x	x	x	x	x	L	x			x	x					
Objective 2: Reduce the greenhouse gas emissions associated with agriculture and food waste.																									
3. Transition to agriculture methods that reduce greenhouse gas emissions.	Med	low	FF								x			L			OSU	x							likely to reduce dependence on fossil fuels in agricultural systems
4. Create a local organic waste digester that can capture methane from food wastes that are currently being dumped in landfills.	low	med	FF	$	L	x	x			x		x							x	x	x	x			additional energy supply will help reduce dependence on fossil fuel for electricity generation
Objective 3: Preserve the productive capacity of the local and regional foodshed																									
5. Strengthen current farmland protections, particularly around high-value agriculture soils.	n/a	n/a	CC	$	x			x			L			x			OSU	x							Likely to help increase resilience of local food systems
a. Strengthen City and County land use protections to prevent urban growth onto prime farmlands.	n/a	n/a	CC	$	L			x			x							x							Likely to help increase resilience of local food systems
2. Strengthen current farmland protections at state levels.	n/a	n/a	CC	$	x			x			x			L		x		x							likely to help increase resilience of local food systems
a. Lobbying state agencies to strengthen protections.	n/a	n/a	CC	$	x		x	x					L	x		x		x							Likely to help increase resilience of local food systems

Food and Agriculture

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	Objective 4: Prepare our food systems for the uncertainties created by climate change and rising energy prices																									
	7. Implement the following recommendations from Eugene's Food Security Scoping and Resource Plan	low	low	CC/FF	$$																					
	a. Identify City of Eugene liaison for food system related programming.	low	low	Y	$	L													x						Completed April, 2010	Helps to increases home-based food production and resilience
	b. Create a comprehensive Community Food Security Assessment.	n/a	n/a	CC/FF	$	x	x					x	x				L	OSU		x	x				complete when assessment is completed	Identifies the next steps needed to increase relilience in local food systems
Food and Agriculture	**8.** Develop an updated a regional emergency food distribution plan that accounts for climate and energy based disruptions.	n/a	n/a	CC/FF	$	L						x	x								x	x				
Food and Agriculture	**9.** Increase the diversity and drought resistance of food crops grown in the upper Willamette Valley	n/a	n/a	CC	$			L							x				x							
Food and Agriculture	**a.** Support the efforts of food advocacy organizations, food growers, and Oregon State University.	n/a	n/a	Y	$	x	x	x			x	x	x	x	x		x	(L) OSU	x							
Food and Agriculture	**b.** Specifically target vegetable protein crops such as beans and legumes	low	n/a	CC	$			L									x		x							likely to increase resilience in local food systems
Food and Agriculture	**10.** Remove impediments to using greywater in agriculture. Work with state lawmakers to find solutions for greywater re-use.	low	low	CC	$			x				x		x	L		x	OSU								reduces use of freshwater, a resource likely to be diminished with climate change
	Objective 5: Increase availability of home-grown, and locally sourced food in Eugene.																									
	11. Expand Community gardens on public, private, and community lands including City land, school campuses, and church properties.	low	low	CC/FF	$	x	x	x		x	x	x	x	x			L		x							
	a. Assess opportunities for community garden locations within the city.	n/a	n/a		$	L							x				x									
	12. Encourage planting of food-bearing trees and shrubs on public and private lands. Support urban tree food programs of such advocates as Tree by Tree, and the Eugene Tree	low	low	CC/FF	$	x	x	x	x		x	x	x				L		x							Done at a large scale, this could add resilience to the local food system and reduce importation of fruit crops from out of state or overseas
	13. Reevaluate limitations on numbers and types of animals permitted under Eugene's code to allow, where appropriate, an increase in the number and variety of food-producing animals	low	low	CC	$	L			x			x					x			x						Done at a large scale, this could add resilience to the local food system.

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	Land Use and Transportation																									
	Objective 1: Create 20-minute neighborhoods, where 90% of Eugene residents can safely walk or bicycle to meet most basic daily, non-work needs, and also have safe pedestrian and bicycle routes which connect to mass transit.																									
Land Use and Transportation	**1.** Make the creation of 20-minute neighborhoods a core component of the EugenePlan and the Eugene Bicycle Pedestrian Master Plan.	H	H	Y	$	L							x				x	LCOG	x							
	2. By 2013, complete and implement a 20-minute neighborhoods plan	H	H	Y	$$	L														x	x	x	x			
	a. Identify funding for planning (estimate $ amount)	n/a	n/a	n/a	$	L														x						
	b. Identify key components for 20 minute neighborhoods (i.e. schools, parks, grocery store, retail services)	n/a	n/a	n/a	$	L														x						
	c. Conduct a network gap analysis to determine needs (coordinated with Opportunity Sitting)	n/a	n/a	n/a	$	L												LCOG			x	x				
	Objective 2: Increase density around the urban core and along transit corridors.																									
	1. Zone future commercial and high residential densities in and around the urban core, and along EMX and other high-capacity transit corridors to accommodate future urban growth.	H	H	FF	$$	L		x	x	x	x	x				x			x	x						aids in adapting to high fuel prices by reducing dependance on fossil fuel for transportation
	Objective 3: Consider the potential for climate refuges when conducting land use planning activities.																									
	4. Closely monitor the community's population growth rate to gauge whether population projections are accurate.	n/a	n/a	CC	$	L												LCOG	x	x					complete when targets are set and annual monitoring of targets is in place	aids in anticipating community changes and needs due to "climate refugees"

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	Objective 4: Continue to expand and improve Eugene's bicycle and pedestrian infrastructure and connectivity to increase the percentage of trips made by bike and on foot.																									
	5. Create a pedestrian and bicycle master plan:	n/a	n/a	FF	$$	L		x	x	x	x	x	x	x	x	x	x			x						aids in adapting to high fuel prices by reducing dependance on fossil fuel for transportation
	a. Identify mobility gaps in the bicycle and pedestrian transportation system,	n/a	n/a			L		x	x	x	x					x	x	BPAC		x						
	b. Recommend needed improvements to bicycle and pedestrian infrastructure	n/a	n/a			L		x	x	x	x					x	x			x						
	c. Create an implementation plan	n/a	n/a			L														x						
Land Use and Transpo	**d.** Identify funding sources for implementation	n/a	n/a			L									x	x	x		x	x						
	6. Increase the connectivity of bicycle boulevards and shared-use paths to accommodate bicyclists of varying abilities.	med	med	FF	$$$	L													x							aids in adapting to high fuel prices by reducing dependance on fossil fuel for transportation
	7. Create a complete streets policy that requires all new transportation projects and rehabilitation projects to accommodate bicycles, pedestrians, and transit service.	n/a	n/a	FF	$	L														x						aids in adapting to high fuel prices by reducing dependance on fossil fuel for transportation
	Objective 5: Increase the supply of frequent, reliable, integrated and convenient public transit.																									
	8. Diversify funding sources for Lane Transit District (LTD) to increase the long-term reliability of mass transit service.	med	High	Y	$											L				x	x					
	9. Align City of Eugene Transportation System Plan and LTD long-range transit plan to integrate bus routes into the broader alternative transportation system.	med	med	Y	$	x										L			x							
	a. Create special setbacks along future Bus Rapid Transit (BRT) or other mass transit corridors to accommodate future right-of-way expansion.	n/a	n/a	Y	$	L									x	x			x							
	b. Work with LTD in developing the Long Range Transit Plan to determine the role of mass transit in accomplishing greenhouse gas emission reduction goals.	n/a	n/a	Y	$	L										x			x	x	x					
	10. Invest in transit infrastructure that meets future access and mobility needs while consuming less fossil fuel.					x		x	x		x	x			x	L										
tion	**a.** Electrification of transportation system	med	med	Y	$$$	x	x	x	x						x	L									x	

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Land Use and Transportation	**Objective 6: Expand outreach, marketing and education regarding climate-friendly transportation alternatives.**																									
	11. Increase promotion of bicycling, walking, transit, car-pooling, telecommuting, high occupancy vehicles, and emergency ride home as attractive alternatives to driving in order to increase the mode share alternatives to the single occupancy vehicle.	**High**	**High**	**Y**	**$$**	**x**		**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**(L) Point2point**	**x**							
	12. Increase promotion of fuel-efficient driving techniques.	**High**	**High**	**Y**	**$$**	**L**		**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**Point2Point**	**x**							
	Objective 7: Ensure maximum efficiency in current and future freight systems.																									
	13. Plan for efficient freight transportation that minimizes greenhouse gas emissions and fossil fuel consumption, and	**med**	**med**	**Y**	**$$**	**L**		**x**							**x**				**x**							
	a. Connects multiple modes (train, truck, van, car, bicycle); Accommodates regional (upper Willamette Valley) commercial, industrial and agricultural freight needs; and facilitates efficient local deliveries.					**L**																				
Land Use and Transportation	**Objective 8: Increase the use of low-carbon vehicles and fuels to improve overall fuel efficiency and reduce vulnerability to fluctuating oil prices.**																									
	14. Accelerate the transition to plug in hybrids and electric vehicles	**Med**	**med**	**Y**	**$$**	**x**	**L**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**x**				**x**							
	a. Support the installation of a network of electric car charging stations.	**n/a**	**n/a**	**Y**	**$$**		**L**						**x**							**x**	**x**	**x**				
	b. Require installation of electric car charging stations in new multifamily housing	**n/a**	**n/a**	**Y**	**$**	**L**	**x**	**x**	**x**																	
	15. Conduct research to understand what role biofuels can play in decreasing Eugene's vulnerability to energy markets. Use outcomes of research to inform the next CEAP and appropriately promote local use and production of biofuels.	**n/a**	**n/a**	**Y**	**$**	**x**		**x**						**L**		**x**										

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Consumption and Waste																									
Objective 1: Reduce greenhouse gas emissions by reducing consumption of goods.																									
1. Educate businesses and residents about the role of consumption in GHG emissions.	High	n/a	N	$$	x		x	x	x	x	x	x	x	x		L		x							
a. Encourage businesses and residents to: purchase durable, repairable and reusable goods; reduce the amount of materials that go to waste, including food; Reduce consumption of carbon-intensive consumer goods and services.	high	low	N	$	x		x	x	x	x		x	x			L		x							
2. Lobby at state level for better product labeling that includes information about greenhouse gas emissions associated with products.	n/a	n/a	N	$	L		x	x																	
3. Provide information for the public on when to replace high energy-use appliances. Where/ If this information is already available, increase the distribution and accessibility.	med	low	Y	$	x	L	x							x		x		x							reduced electricity use reduces demand on hydroelectric generation
4. Participate actively in the process to develop local, state, and federal product stewardship legislation that drive design changes.	n/a	n/a	N	$	L		x	x						x		x		x							
Objective 2: Increase waste recovery rate by improving recycling and composting.																									
5. Target expanded recycling outreach and services to commercial and multi-family residential buildings, including local businesses, apartment buildings, student and cooperative housing.	low	low	N	$	L		x	x	x		x	x	x			x		x							
6. Enact a local ordinance to increase waste recovery rates from commercial and multi-family buildings.	low	low	N	$	L			x									(L) BRING				x	x			
7. Assist businesses in improving paper, metal and glass recycling with a goal of supporting 5% of businesses each year.	med	med	N	$$	x						x		x	x				x						% of businesses being assisted	
8. Enact an ordinance that requires all construction and demolition waste materials to be sorted for reusable or recyclable materials.	med	med	N	$$	L						x					x					x	x		Complete when ordinance has been enacted	

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	High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x)												Timing						Measures	Adaptation Explanation
						City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future		
	Objective 3: Increase the diversion rate for organic wastes.																								
	9. Conduct a pilot project at the River Avenue Waste Water Treatment Plant to determine the system ability for co-digestion of food waste and biosolids.	**med**	**med**	**Y**	**$$**	**L**	**x**	**x**	**x**									**waste haulers**		**x**	**x**				Complete when pilot has been conducted	provides a locally sourced, clean burning renewable energy supply - reducing vulnerability to volatile fuel prices
	Objective 4: Conduct research to determine next steps																								
Consumption and Waste	**10.** Follow research being conducted by the EPA's West Coast Forum on Climate Change, Waste Prevention, Recovery and Disposal, to determine highest priority and most cost effective measures to address GHG production in the waste management sector.	**n/a**	**n/a**	**N**	**$**	**L**														**x**	**x**				complete when priority measures are identified	
	11. Conduct study to determine the efficiency of maintaining a multiple-hauler garbage collection system as regards greenhouse gas emissions. Use the outcome of the research to inform the next Community Climate and Energy Action Plan.	**n/a**	**n/a**	**N**	**$**	**L**							**x**												complete when study is completed	
	Objective 5: Reduce GHGs in municipal operations by improving purchasing practice and reducing waste.																								
	12. By 2012, improve the procurements policies of public agencies to require:	**low**	**low**	**N**	**$**	**L**	**x**					**x**	**x**	**x**	**x**	**x**				**x**	**x**					
	a. Reuse whenever possible	**low**	**low**	**N**	**$**	**L**	**x**					**x**	**x**	**x**	**x**	**x**			**x**							
	b. Avoid disposable and purchase durable goods whenever possible			**N**	**$$**	**L**	**x**					**x**	**x**	**x**	**x**	**x**			**x**							
	c. Set targets on re-use			**N**		**L**	**x**					**x**	**x**	**x**	**x**	**x**			**x**							
	d. Measure whether this is occurring (identify measurements)			**N**		**L**	**x**					**x**	**x**	**x**	**x**	**x**			**x**							
	2. Reduce public agency purchase of GHG-intensive goods by 2014	**med**	**med**	**FF**	**$**	**L**																			The price of high-GHG materials such as asphalt, concrete, and steel fluxuate with the price of oil. Reducing the demand for these items reduces
	a. Identify city-purchased goods with the highest associated GHG emissions by 2012	**n/a**	**n/a**		**$**	**L**																				
	b. Create a plan to reduce the purchase of the 5 most GHG intensive goods (through substitutions, efficiencies, etc.)	**med**	**med**	**FF**	**$**	**L**																			The price of high-GHG materials such as asphalt, concrete, and steel fluxuate with the price of oil.	
	c. Annually repot the quantity of these goods being purchased	**n/a**	**n/a**	**N**	**$**	**L**																				
	3. Implement the steps in the City waste reduction plan to reduce waste at City buildings, events, and ongoing operations	**low**	**low**	**N**	**$/$**	**L**													**x**						measure city waste being avoided and diverted from the landfill	

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Health and Social Services

High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
Health and Social Services																									
Objective 1: Prepare community systems for longer-term climate and energy challenges including fuel shortages, increased summer drought and increased storm intensity.																									
1. Conduct a climate and energy vulnerability assessment that addresses the mid- term, and longer-term climate and energy vulnerabilities of the community – specifically regarding: energy, water, food, health, shelter, and sanitation.	n/a	n/a	CC/FF	$$	L	x	x	x	x	x		x		x	x	x			x	x					
a. Build on existing emergency management efforts.	n/a	n/a																	x						
b. Include EWEB, Springfield, Lane Co., UO, Red Cross, National Guard, and others	n/a	n/a															L		x						
c. Estimate costs of mitigating the identified vulnerabilities	n/a	n/a		$	L	x	x			x	x	x	x	x	x					x					
d. Estimate capacity needs and costs for implementing preparation and adaptation strategies.	n/a	n/a																		x					
e. Continue to monitor emerging data on climate change related health risks and revise adaption plans when necessary.	n/a	n/a		$														x							
2. Strengthen current hunger relief systems to handle increased short-term and long-term demand.	n/a	n/a	Y																						
a. Develop plans to prepare for increased food demand from a higher percentage of the population.	n/a	n/a	Y		x											(L)FFLC									
b. Remove barriers to, and encourage, development of home-grown food sources such as backyard and community gardens, urban food orchards, etc. This action item is also identified in Food and Agriculture section.	n/a	n/a	Y	$	x		x	L		x	x			x		x		x							
3. Expand energy assistance programs: Work with the local utilities (e.g. EWEB/EPUD/NWN) to increase financial assistance so that marginalized populations can maintain utility service	n/a	n/a	Y	$$		L	x	x							x	x									
a. Target rental properties/landlords	n/a	n/a	Y																						
4. Conduct a food security assessment, as outlined in the Food and Agriculture section, and take action to increase the security of the community's food supply.	n/a	n/a	Y	$$																					
Objective 2: Reduce the exposure of human populations to climate and energy related disasters.																									

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High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
5. Reduce risk of home fires due to wildfires in and around the urban area.	n/a	n/a	CC	$	x	x		L	x	x								x							
a. Increase efforts to educate homeowners about creating defensible space around their homes	n/a	n/a	CC	$	L	x	x	x	x	x	x	x	x	x			CERT	x						measure dollars or other resources spent locally to educate homeowners about creating defensible space	
6. Ensure no essential services are located within the 100 year flood zone.	n/a	n/a	CC	$	L	x	x				x			x	x		Hospitals	x						complete when plan (step b) is completed	increases resilience during flooding events which are expected to increase with climate change.
a. identify essential emergency and non-emergency services	n/a	n/a	CC	$	L														x						
b. Create a plan to move essential services out of the flood zone over time.	n/a	n/a	CC	$	L	x					x					x	health								
Urban Natural Resources **Objective 3: Increase the capacity of Eugene's health and social services sectors, and the community at large, to meet the health-related challenges of climate change and peak oil by fostering greater public health involvement in climate change and energy planning.**																									
7. Assist local health agencies in educating employees and the public about the health risks posed by climate change.	n/a	n/a	CC	$	x		x	x	x	x	L	x	x	x		x	CLI	x							
a. Prioritize local public health resources to emphasize educating the public, staff, and administration about climate change, energy price volatility and the related system impacts and health risks.	n/a	n/a	CC/FF	$	x					x	L			x			CLI	x							
b. Pursue funding for development of a climate change preparation strategy for the public health system	n/a	n/a	CC	$	x					x	L			x		x	CLI		x	x					
Urban Natural Resources																									

$ = Dollars saved
$ = $0 - $99,000
$$ = $100k - $999k
$$$ = 1 million +

* An action has adaptation value when it prepares the community or a system for for climate change (CC) and/or volatile or increasing fuel prices (FF)

High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
Objective 1: Manage urban natural resources for multiple benefits																									
1. Protect sensitive natural resource areas	low	n/a	CC	$$	L	x	x	x	x	x	x	x	x	x	x	x		x							
2. Increase funding for public acquisitions of property to facilitate the combined goals of stormwater management, flood abatement, stream shading, headwaters protection, and increased connectivity between wildlife corridors.	n/a	n/a	CC	$$	L	x				x	x	x	x	x		x		x						Measure dollars or other resources used to purchase land or otherwise protect water resources	increases resilience of urban natural systems by reducing flooding, improving water quality, and increasing or improving wildlife habitat
3. Update urban forestry management plans to promote urban forest management on a city-wide scale, expanding beyond individual lots or streets.	n/a	n/a	CC	$	L	x	x	x	x	x	x	x	x	x	x	x			x	x				Complete when municipal urban forestry mgmt. plans are updated to accommodate the broader urban forest	increases the resilience of urban trees by proactively planning for the more broadly defined urban forest.
4. Identify and remove barriers that may discourage or prevent use of Low Impact Development (LID) practices during construction.	low	n/a	CC	$	L	x					x			x					x	x				complete when barriers to LID are 1)identified and 2)removed where possible	increases resilience of urban vegetation by protecting soils and protecting natural site hydrology. Reduces urban local flooding.
Objective 2: Manage and update urban natural resource information to reflect current knowledge. Make data available to public and policy-makers.																									
5. Compile and maintain an inventory of urban natural resources that is current and accessible to the public and policy-makers.	n/a	n/a	Y	$$	L	x	x			x	x	x	x	x	x	x	LCOG							Complete when an inventory is compiled and information is centralized and accessible	Provides tools for quicker response and informed decision making to increase adaptability of natural systems and resource management programs
Objective 3: Update vegetation management plans																									
6. Plan for increased fires in forests surrounding the urban area	n/a	n/a	CC	$$	L	x	x	x	x	x	x					x									reduces risks presented by forest fires - a risk expected to increase with climate change
Objective 4: Educate community about the importance of urban natural resources																									
7. Provide educational resources to students, teachers, residents, and businesses about the benefits of trees, watershed health, and water quality.	n/a	n/a	CC	$												x								measure dollars and other resources spent to provide educational resources to students, teachers, residents, and businesses	
Objective 5: Manage rainfall (stormwater) to reduce flooding, recharge groundwater, and improve water quality.																									

n Natural Resources

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$ = Dollars saved
$ = $0 - $99,000
$$ = $100k - $999k
$$$ = 1 million +

Urba

High Priority Action Areas	GHG Reduction	Fossil Fuel Reduction	Adaptation Value*	Resource Implications	Leader (L) / Partners (x): City of Eugene	Utilities	Business Sector	Residents	Neighborhoods	School Districts	Lane County	U of O	Lane CC	State of Oregon	Lane Transit Dist	Non-Profits	Other	Timing: Ongoing	1st Half, 2011	2nd half, 2011	1st half, 2012	2nd half, 2012	Future	Measures	Adaptation Explanation
8. Manage stormwater and riparian areas to meet multiple goals: improved water quality, lowered stream temperatures, increased infiltration, increased capacity, and improved plant and wildlife habitat.	n/a	n/a	CC	$	L	x	x	x	x	x	x	x	x	x	x	x		x							
9. Develop a program to encourage onsite treatment of stormwater from existing buildings and facilities.	n/a	n/a	CC	$$	L		x	x	x	x		x	x				Planning C	x	x	x				Complete when a program is established and operational resources are identified.	Reduces peak stream flows and localized flooding -which are expected to increase with climate change
Objective 6: Expand public and private programs to manage, and invest in, trees to cool buildings, pavement, and waterways.																									
10. Increase planting, preservation, and maintenance of trees and shrubs	low	low	CC	$$																				Measure dollars spent by municipalities and non-profits on 1)tree preservation, and 2)maintenance. Measure # of trees planted	new and existing trees cool the urban area (streets, waterways, buildings) - reducing urban summertime peak temperatures. Trees reduce
11. Control invasive species on public lands including City and County parks in order to maintain the health of existing urban area habitats.	low	low	CC	$$	L	x	x	x	x	x		x	x	x		x		x						Measure City and County dollars spent on invasive weed control, and # of acres treated annually.	existing trees cool the urban area (streets, waterways, buildings) - reducing urban summertime peak temperatures. Trees reduce
12. Create incentives to encourage residents and businesses to plant trees.	low	low	CC	$	x	x	x	x	x	x	x	x	x			L		x						Identify municipal and other incentives offered to individuals or groups who plant trees	new trees cool the urban area (streets, waterways, buildings) - reducing urban summertime peak temperatures. Trees reduce local flooding during
Objective 7: Encourage ongoing water conservation																									
13. Increase water conservation as outlined in buildings and energy	low	low	CC	$	x	L	x	x	x	x	x		x			x		x						see buildings and energy section	reduces demand for fresh water, the availability of which is expected to decrease with climate change
Objective 8: Strengthen protections of potable water																									
14. Strengthen and expand water quality protections to protect surface water quality and prevent the contamination of shallow wells.	n/a	n/a	CC	$$	x	L	x	x	x		x			x				x							Protects fresh water supply - the availability of which is expected to decrease with climate change

$ = Dollars saved
$ = $0 - $99,000
$$ = $100k - $999k
$$$ = 1 million +

* An action has adaptation value when it prepares the community or a system for for climate change (CC) and/or volatile or increasing fuel prices (FF)

LTD Board Work Session
West Eugene EmX Extension
June 23, 2010

The Story of 58

How did we get to 58 different alternatives to study?

Alt #	Bus Alternatives
	No-Build Alternative
1	Full Length MOS
	TSM Alternative
2	Full Length MOS
	BRT Alternatives
	Seneca Road Terminus MOS
	W 13th Avenue – Amazon via North of Amazon DO
3	– Frontage Alley DO
4	– Two-Lane Transitway DO
	W 13th Avenue – Amazon via Amazon Restoration DO
5	– Frontage Alley DO
6	– Two-Lane Transitway DO
	W 13th Avenue – W 11th Avenue
7	– Frontage Alley DO
8	– Two-Lane Transitway DO
	W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO
9	– Add-A-Lane DO
10	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO
11	– Add-A-Lane DO
12	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet DO
13	– Add-A-Lane DO
14	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way DO
15	– Add-A-Lane DO
16	– Reassign-A-Lane DO

	Commerce Street Terminus MOS
	W 13th Avenue – Amazon via North of Amazon DO
17	– Frontage Alley DO
18	– Two-Lane Transitway DO
	W 13th Avenue – Amazon via Amazon Restoration DO
19	– Frontage Alley DO
20	– Two-Lane Transitway DO
	W 13th Avenue – W 11th Avenue
21	– Frontage Alley DO
22	– Two-Lane Transitway DO
	W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO
23	– Add-A-Lane DO
24	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO
25	– Add-A-Lane DO
26	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet DO
27	– Add-A-Lane DO
28	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way DO
29	– Add-A-Lane DO
30	– Reassign-A-Lane DO

	Full Length MOS – Cone Terminus
	W 13th Avenue – Amazon via North of Amazon DO – W 11th Avenue
31	– Frontage Alley DO
32	– Two-Lane Transitway DO
	W 13th Avenue – Amazon via Amazon Restoration DO – W 11th Avenue
33	– Frontage Alley DO
34	– Two-Lane Transitway DO
	W 13th Avenue – W 11th Avenue
35	– Frontage Alley DO
36	– Two-Lane Transitway DO
	W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO
37	– Add-A-Lane DO
38	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO
39	– Add-A-Lane DO
40	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Lincoln / Charnelton Couplet DO
41	– Add-A-Lane DO
42	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Charnelton Two-Way DO
43	– Add-A-Lane DO
44	– Reassign-A-Lane DO

	Full Length MOS – Cone / Willow Creek Terminus
	W 13th Avenue – Amazon via North of Amazon DO – W 11th Avenue
45	– Frontage Alley DO
46	– Two-Lane Transitway DO
	W 13th Avenue – Amazon via Amazon Restoration DO – W 11th Avenue
47	– Frontage Alley DO
48	– Two-Lane Transitway DO
	W 13th Avenue – W 11th Avenue
49	– Frontage Alley DO
50	– Two-Lane Transitway DO
	W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO
51	– Add-A-Lane DO
52	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO
53	– Add-A-Lane DO
54	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Lincoln / Charnelton Couplet DO
55	– Add-A-Lane DO
56	– Reassign-A-Lane DO
	W 6th / 7th Avenues – W 7th Place – W 11th Avenue via Charnelton Two-Way DO
57	– Add-A-Lane DO
58	– Reassign-A-Lane DO

Need to Achieve a Balance

Operational Needs

Avoid & Minimize Negative Impacts

Process Change and Alternatives Refinement
OPEN HOUSE

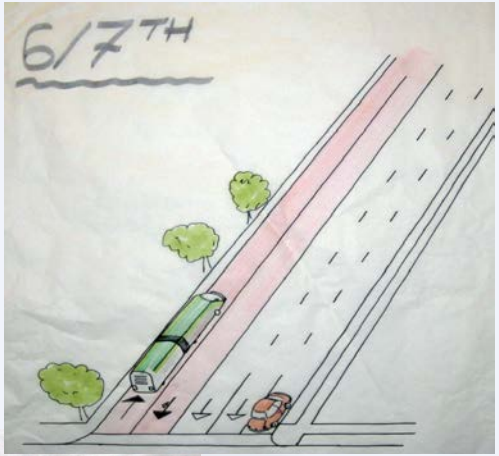
Public Input

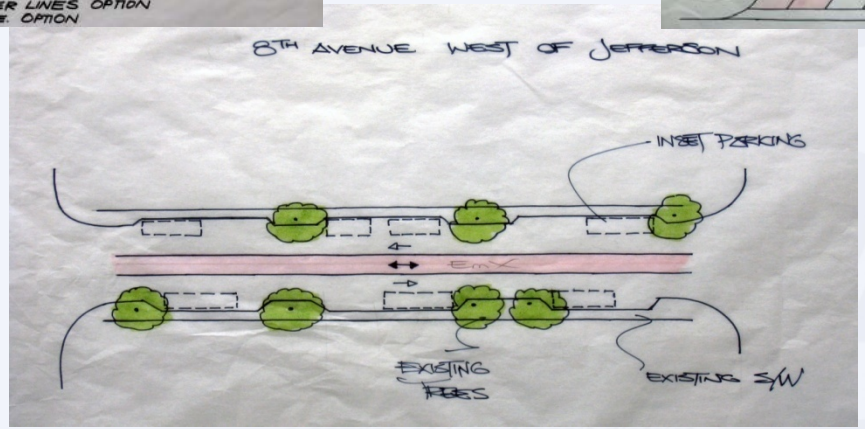
Stakeholder Tours

Agency Input

Fieldwork

Design Refinement





Challenges

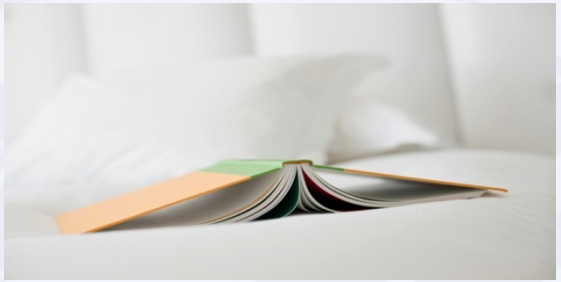
- Analysis for 58 alternatives difficult to communicate in meaningful way
- Have talked with FTA – review time substantial
- Release of preliminary analyses to community dependant of FTA review approval

Process Change

From -
Major Federal Study
(AA/DEIS to LPA)

To -

Sequential Alternatives Analysis to Locally Preferred Alternative to NEPA



Sequential AA to LPA to NEPA

Advantages

- *AA Report is a **local** planning document and can be more focused and easier to understand*
- *Procedure change only – still using same technical information and public outreach/LPA decision process*
- *Better able to collaborate with community on preliminary findings*

June Outreach

- Steering Committee — June 1
- Corridor Committee — June 2
- WEEEDO Open House — June 3
- WEEEDO TAC & LAC — June 9
- Public Open House — June 9
- Corridor Committee — June 15
- MPO Citizen Advisory Committee — June 17

New Information

Results of analysis completed so far suggests …

Some alternatives appear no longer feasible

- *No longer meet PN/GO*
  - *Environmental show-stoppers*
  - *Cost*
  - *Projected ridership*
- *Refine range of alternatives based on this information*

Today…

Review of Alternatives by Evaluation Criteria

- Criteria developed from Purpose and Need Statement
- Summary evaluation based on current technical data
- Identify alternatives that no longer meet project's Purpose and Need

Draft Alternative Refinement Tables

Alt #	Alternative / Design Option / Terminus Option	Evaluation Criteria: 1 Improve customer convenience	2 Improve operating and other efficiencies	3 Support planned land use / catalyst for planned transit-oriented development	4 Accommodate future growth in travel	5 Consider mobility and safety needs	6 Provide for fiscally stable system	7 Sensitive to natural and built resources	8 Support sustainability and efforts to reduce GHG	R/E Recommendation to Retain or Eliminate the Alternative or Design Option
BRT Alternatives										
Seneca Road Terminus MOS										
W 13th Avenue – Amazon via North of Amazon DO										
3	– Frontage Alley DO	◖	◖	◖	◖	●	◖		●	
4	– Two-Lane Transitway DO	◖	◖	◖	◖	●	◖		●	
W 13th Avenue – Amazon via Amazon Restoration DO										
5	– Frontage Alley DO	◖	◖	◖	◖	●	◖		●	
6	– Two-Lane Transitway DO	◖	◖	◖	◖	●	◖		●	
W 13th Avenue – W 11th Avenue										
7	– Frontage Alley DO	◖	○	◖	○	●	●	●	●	
8	– Two-Lane Transitway DO	◖	○	◖	○	●	●	○	●	
W 6th / 7th Avenues – W 11th Avenue via Lincoln / Charnelton Couplet DO										
9	– Add-A-Lane DO	◖	○	◖	○	●	○	◖	◖	
10	– Reassign-A-Lane DO	◖	○	◖	○	●	○	◖	◖	
W 6th / 7th Avenues – W 11th Avenue via Charnelton Two-Way DO										
11	– Add-A-Lane DO	◖	○	◖	○	●	○	◖	◖	
12	– Reassign-A-Lane DO	◖	○	◖	○	●	○	◖	◖	
W 6th / 7th Avenues – W 7th Place via Lincoln / Charnelton Couplet DO										
13	– Add-A-Lane DO	○	○	○	◖	●	○	◖	◖	
14	– Reassign-A-Lane DO	○	○	○	◖	●	○	◖	◖	
W 6th / 7th Avenues – W 7th Place via Charnelton Two-Way DO										
15	– Add-A-Lane DO	○	○	○	●	●	○	◖	◖	E
16	– Reassign-A-Lane DO	○	○	○	●	●	○	◖	◖	E

Three levels of preliminary information

- **“Consumers Reports” Summary**
- **Data Summary Table**
- **Detailed Adverse and Beneficial Effects Table**

West Eugene EmX Extension Alternatives Analysis: Key Preliminary Results *Compared to No-Build* [1]

Alternative Number(s)	*Alternative(s) Name*	Annual Ridership: Corridor Ridership: Increase compared to No-Build	Annual Ridership: EmX System Ridership: Increase compared to No-Build	Annual Ridership: Systemwide Ridership: Increase compared to No-Build	Average Transit Travel Times (in minutes) from Downtown Eugene [2]	Capital Cost (in millions)	Annual System Operating Cost: 2009 Dollars (in millions)	Annual System Operating Cost: Increase compared to No-Build (in millions)	Systemwide Operating Cost per Trip	Potential Property Acquisitions: Partial	Potential Property Acquisitions: Full	Route Length by EmX Lane Type Total/BAT/ Transitway/ Mixed Traffic (in miles) [3]	On-Street Parking Displaced	Trees Potentially Removed: Under 8" Diameter	Trees Potentially Removed: Over 8" Diameter	Potential Impacts to Endangered Plants & Animals	Potential Parkland Impacts	Potential Wetlands Impacts	Potential Impacts to Low Income/ Minority Households
1	**No-Build (full length)**	0	0	0	17.5	$0.0	$39,070,000	0	$2.71	0	0		0	0	0				
2	**TSM (full length)**	53,100	20,100	127,800	16.4	$22.2	$40,470,000	1,400,000	$2.79	40	2		0	89	2	✓		✓	
	Seneca Terminus																		
3-6	W 13th to Amazon Alternative [4]	257,100	1,400,400	351,900	15.5	$63.0-$65.1	$40,460,000	1,390,000	$2.74	39-45	4-14	5.4/1.3/2.9/1.2	129	329-452	191-268	✓	✓	✓	✓
7-8	W 13th Avenue to W 11th Avenue [5]	249,000	1,080,300	340,200	15.5	$66.1-$66.5	$40,130,000	1,060,000	$2.72	77-81	4-8	5.5/3.0/1.5/0.9	101	59	73				
9-12	W 6th/7th Avenue to W 11th Avenue [6]	275,700	1,347,600	346,500	18.8	$76.3-$84.0	$40,760,000	1,690,000	$2.77	111-174	6-9	6.1/5.1/0.0/1.0	11-39	46-56	102-213				
13-16	W 6th/7th Avenue to W 7th Place [7]	184,800	1,072,800	247,200	18.8	$62.4-$70.1	$40,830,000	1,760,000	$2.79	87-150	3-6	5.7/5.2/0.0/0.5	11-39	18-28	91-202			✓	
	Commerce Terminus																		
17-20	W 13th to Amazon Alternative [4]	380,400	1,578,900	530,400	14.4	$92.0-$94.0	$40,270,000	1,200,000	$2.70	74-80	5-15	8.2/4.1/2.9/1.2	147	341-464	211-288	✓	✓	✓	✓
21-22	W 13th Avenue to W 11th Avenue [5]	372,300	1,524,000	518,700	14.5	$95.0-$95.4	$39,950,000	880,000	$2.68	112-116	5-9	8.3/5.9/1.5/0.9	119	71	93			✓	
23-26	W 6th/7th Avenue to W 11th Avenue [6]	399,000	1,526,100	525,000	17.8	$105.2-$113.0	$40,570,000	1,500,000	$2.72	146-209	7-10	8.8/7.8/0.0/1.0	29-57	58-68	122-233			✓	
27-30	W 6th/7th Avenue to W 7th Place [7]	308,100	1,251,300	425,700	17.8	$102.1-$109.8	$40,650,000	1,580,000	$2.74	124-187	4-7	8.7/8.0/0.0/0.7	29-57	30-40	111-222			✓	
	Full Length Terminus (Cone & Cone + Willow)																		
31-34 & 45-48	W 13th to Amazon Alternative [4]	436,500	1,673,700	625,200	14.4	$113.6-$119.1	$40,330,000	1,260,000	$2.69	80-88	5-15	13.0/5.9/2.9/4.2	147-161	428-551	218-295	✓	✓	✓	✓
39-42 & 44-50	W 13th Avenue to W 11th Avenue [5]	428,400	1,639,800	613,500	14.5	$120.9-$124.5	$40,000,000	930,000	$2.67	118-124	5-9	13.1/7.7/1.5/3.9/	119-133	168	100	✓		✓	
43-50 & 51-54	W 6th/7th Avenue to W 11th Avenue [6]	455,100	1,620,900	619,800	17.8	$131.1-$142.1	$40,630,000	1,560,000	$2.71	154-217	7-10	13.6/9.6/0.0/4.0	29-71	155-165	129-240	✓		✓	
50-58 & 55-58	W 6th/7th Avenue to W 7th Place [7]	364,200	1,346,100	520,500	17.8	$128.0-$138.9	$40,970,000	1,900,000	$2.75	132-195	4-7	13.5/9.8/0.0/3.7	29-71	127-137	118-229	✓		✓	

Notes

(1) These data represent information summarized from preliminary draft technical subject reports on the West Eugene EmX Extension project as of June 8th, 2010 and are subject to final verification and revision. Individual technical subject reports will be available on the project website (http://weemx.ltd.org) as the reports are finalized.

(2) Average of total travel time for transit trips from downtown Eugene to 16 locations between the Eugene Downtown Station and the Commerce Terminus. Time includes both in-vehicle and walking/waiting time.

(3) Route lengths and type: Total Length of alternative/length in miles of BAT lane, length in miles of exclusive transitway/ length in miles of mixed traffic
BAT Lane= Bus and Business Access: An EmX priority lane; generally a concrete lane, separated from general purpose lanes by a paint stripe and signage, shared with right or left-turning general purpose vehicle traffic.
Transitway= EmX only; generally with a concrete lane or concrete tracks with grass-strip divider; traversed by general-purpose vehicles at signalized intersections only. Sections of transitway on W 13th are additionally separated by a curb with various traversable curb breaks at intersections.
Mixed Traffic: EmX or bus travels with other vehicles in normal traffic lanes

(4) Design options for the W. 13th Avenue to Amazon Alignment are: Frontage Alley or Two-Way Transitway on 13th east of Polk and the North Amazon and Amazon Restoration for the Amazon Channel section.

(5) Design option for the W. 13th Avenue to W. 11th Avenue Alignment is: Frontage Alley or Two-Way Transitway on 13th east of Polk.

(6) Design options for the W. 6th/7th Avenues to W. 11th Avenue Alignment are: Charnelton/Lincoln Couplet and Charnelton Two-Way in the downtown Eugene area and Add-A-Lane and Reassign-A-Lane on 6th and 7th Avenues..

(7) Design options for the W. 6th/7th Avenues to W. 7th Place Alignment are: Charnelton/Lincoln Couplet and Charnelton Two-Way in the downtown Eugene area and Add-A-Lane and Reassign-A-Lane on 6th and 7th Avenues..

Potential Significant Adverse and Beneficial Effects by Mode and Length Alternatives

Alt #		Biological Resources	Fish Ecology	Wetlands	Water Quality	Capital Costs	Property Acquisitions	Hazardous Materials	Street and Landscape Trees	Socio-economics	Section 106	Parklands f 4(f) / 6(f)	Traffic	Transit
Bus Alternatives														
No-Build Alternative														
1	Full Length MOS	• None	• None	• None	• None	$0M	• None	Sites of Potential Concern 0 • High Risk 0 • Medium Risk 0 • Low Risk 0 • Open LUST 0	• None	• Increased traffic congestion could have long-term negative effects on regional economics, employers' and their ability to find employees, finding reliable and affordable access to good jobs, education and job training, affordable housing, childcare and other services and opportunities, mobility to /from neighborhoods, & ability to efficiently deliver emergency services • Does not support future model development • Shift in neighborhood investments to other areas; declining neighborhood vitality, segregation of low-income households • Decrease in level of service for public facilities and emergency response times	• None	• Possible increased noise and lower air quality due to higher traffic on major arterials – W 11th Ave and W 8th/7th Ave	• 15 signalized intersection approaches would operate with congested conditions • No roadway capacity changes	
TSM Alternative														
2	Full Length MOS	• Loss of riparian habitat • Widening W 11th Ave and the bridge at Willow Creek increases habitat fragmentation within Fender's blue butterfly critical habitat • Impacts to idevelopment of designated Willamette daisy critical habitat • Tree and shrub planting along new pedestrian crossings of Amazon and Willow Creeks • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon and Willow Creeks	• Temporary impacts to 7 wetlands • 0.063 ac wetland impacts • Permanent loss of wetland / waters mitigated by replacement	• Pollutant Generating Impervious Surfaces (PGIS): 5.77 ac • Total New Impervious Area – curb to curb (NI): 3.07 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$22.3M	Property Acquisitions: • 2 Full • 40 Partial • 0 On-street parking spaces (0%) • 105 Off-street parking spaces (20.09%) Potential Displacements: • 0 Residential • 0 Public / Institutional • 2 Commercial / Industrial	Sites of Potential Concern 22 • High Risk 7 • Medium Risk 6 • Low Risk 2 • Open LUST 7	• None	• Transit services and access for employees improved over No-Build • Displaces 1 business with approx. 15 employees • Improved transit options for EJ and Title VI populations • Est. loss of $16k annual tax revenue	Total: 3 Non-contributing: 2 Eligible contributing: 1 • 1 No effect • 0 No adverse effect • 0 Adverse effect Eligible significant: 0 • 0 No effect • 0 No adverse effect • 0 Adverse effect	• 4 Parks near alignment would experience improved access o All 4 are potential 4(f) resources o 3 would experience improved pedestrian access resulting from proposed pedestrian facilities on surrounding streets o 2 would experience improved access from facilitated travel from Eugene Station to Western Terminus	• 17 signalized intersection approaches would operate with congested conditions • Bus only lane added at select locations on 11th Avenue to avoid traffic congestion	
BRT Alternatives														
Seneca Road Terminus MOS														
W 13th Avenue – Amazon via North of Amazon DO														
3	Frontage Alley DO	• Increased likelihood of mortality of Northern Pacific pond turtles and other wildlife along Amazon Channel due to collisions with BRT vehicles • Loss of riparian habitat • Potential transport of sediments and pollutants into wetlands and waterways • Increased opportunities for plantings along Amazon Creek • Tree removal	• Potential transport of sediments into waterway • Increased impervious area • Tree and shrub planting along new pedestrian crossings of Amazon Creek • Increased channelization of Amazon via retaining walls • Increased opportunities for plantings along Amazon Creek	• 0.043 ac wetland impacts • 733 LF impact to Amazon Creek • Potential to increase velocity, erosion and sedimentation of Amazon Creek • Potential alterations to hydrologic regimes and plant communities • Permanent loss of wetland / waters mitigated by replacement	• PGIS: 6.13 ac • NI: 3.24 ac • Proposed project conditions will create larger amount of runoff, and increase flow volumes to receiving waters • Potential to introduce pollutants	$63.09M	Property Acquisitions: • 4 Full • 43 Partial • 129 On-street parking spaces (82%) • 157 Off-street parking spaces (5.10%) Potential Displacements: • 0 Residential • 1 Public / Institutional • 3 Commercial / Industrial	Sites of Potential Concern: 10 (2 sites mapped on W 11th – 250 N of North of Amazon DO) • High Risk: 2 • Medium Risk: 3 • Low Risk 0 • Open LUST: 5	Potential trees removed • 94 street trees o 33 possible charter trees • 419 landscape trees	• Improved access, transit opportunities, and connectivity between employment centers and between communities and community resources • Supports model development • Improved transit options for EJ and Title VI populations • Disrupts residential character of Fir Woods Apartments (subsidized housing) • Displaces 2 businesses with approx. 18 employees • Est. loss of $30k annual tax revenue • Impacts to neighborhood character and livability along W 13th Ave west of Arthur St • Delayed emergency vehicle response times and Lane Events Center	Total: 187 Non-contributing: 89 Eligible contributing: 89 • 86 No effect • 3 No adverse effect • 0 Adverse effect Eligible significant: 9 • 8 No effect • 1 No adverse effect • 0 Adverse effect	• 19 Parks within ¼ mile of stations • 5 Parks within 100 feet of alignment o 3 potential 4(f) resources	• 15 signalized intersection approaches would operate with congested conditions • Roadway capacity added by BAT lane on 11th Avenue from Tyler Street to Seneca Road	

West Eugene EmX Extension

Alternatives Analysis Refinement Evaluation Criteria for Refinement of Alternatives

1. **Improve customer convenience by reducing travel time, increasing service reliability, and making other service improvements.**

2. **Improve operating and other efficiencies to maximize the use of scarce resources.**

3. **Support development that is consistent with planned land use documents and serve as a catalyst for planned transit-oriented development.**

4. **Help accommodate future growth in travel by increasing public transportation's share of trips.**

5. **Consider the mobility and safety needs of pedestrians, bicyclists, and motorists.**

6. **Provide for a fiscally stable public transportation system.**

7. **Design the project in a way that protects resources in the natural and built environment**.

8. **Support LTD's sustainability policy and the City of Eugene's efforts to reduce greenhouse gas emissions.**

Major Adverse Effects From Preliminary Technical Analyses

Terminus Options

Full Length – West of Beltline (Cone and Cone/Willow)

- Stormwater runoff impacts to protected plant species and BLM wetlands
- Costs projected to exceed available funding
- Relatively low ridership projections

Terminus Options

Seneca
(Fred Meyers)

- Would create transfers for riders from west of Seneca
- EmX would not serve large part of developed corridor

Major Adverse Effects From Preliminary Technical Analyses

Alternatives/Design Options

Amazon
(North of Channel and Restoration)

- Potential impacts to endangered plant species, historic resources (the channel), low income housing, and park land
- The Amazon restoration design option would require eight residential displacements and relocations
- Highest public concern

Major Adverse Effects From Preliminary Technical Analyses

Alternatives/Design Options

West 7th Place

- Projection of only 64 boardings per day on 7th Place (less than 1 boarding for every two buses passing the stop)
- Lowest projected ridership of the BRT Alternatives (93,000 to 104,000 fewer annual boardings than the other BRT Alternatives)

Major Adverse Effects From Preliminary Technical Analyses

Alternatives/Design Options

West 7th Place

- Numerous strip commercial property acquisitions; thereby not a feasible alternative to avoid similar acquisitions along the more direct West 11th alterative
- Longest travel time of the BRT Alternatives (more than No-Build for most trips)

Major Adverse Effects From Preliminary Technical Analyses

Alternatives/Design Options

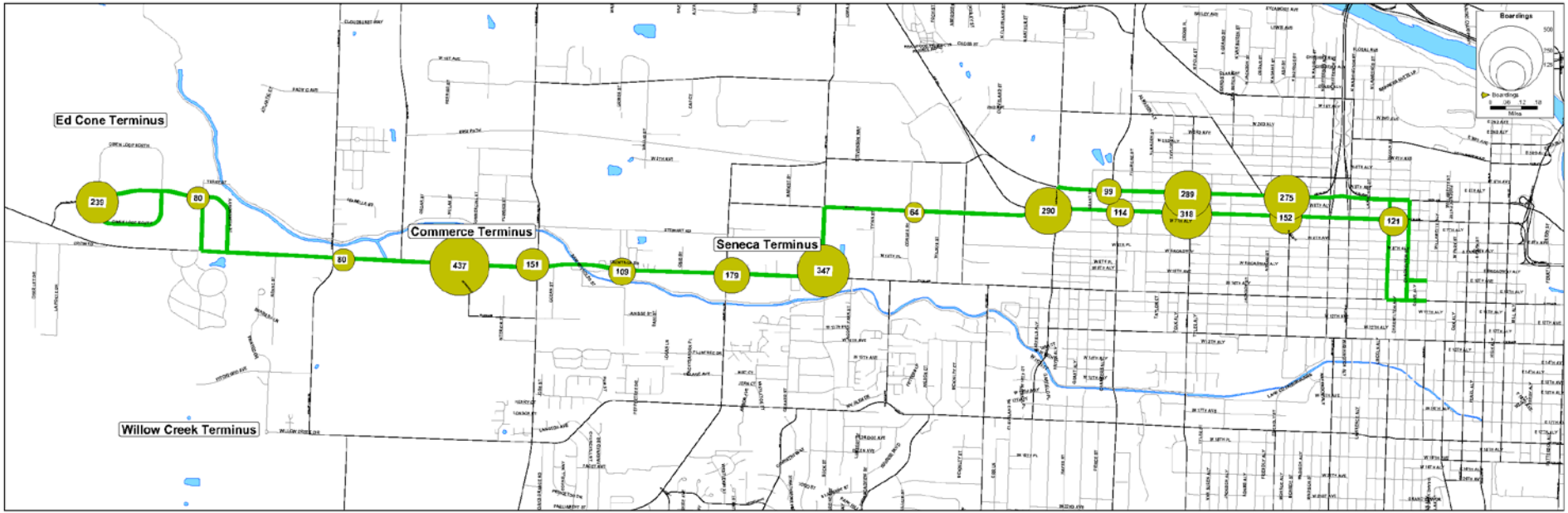
West 7th Place

- Relatively high construction cost
- Highest operating cost of any of the alternatives as much as $700,000 more per year than the other BRT Alternatives)

West 7th Place

2031 Projected EmX Station Boardings

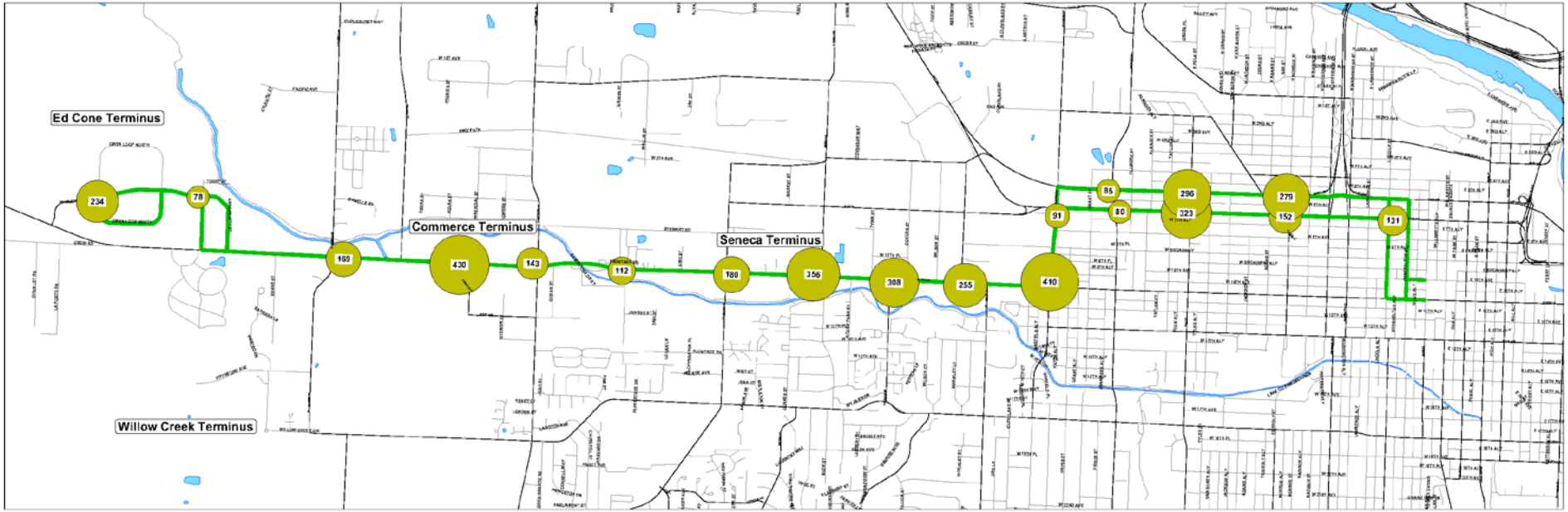
W 6th/7th Avenue to W 7th Place Alternative



W 6/7th to W 11th

2031 Projected Station Boardings

W 6th/7th Avenue to W 11th Avenue Alternative



W 11th Ave: Options West of Garfield

- Current Design
- Address specific property impacts through detailed design modifications
- Use of Transportation Systems Management (TSM) designs on specific segments
- No-build

Recommended Alternatives to Retain

- No-Build
- Transportation System Management (TSM)

Recommended Alternatives to Retain

- **West 6th/7th Avenues between the Downtown Eugene Station to West 11th Avenue via Garfield**

  Includes four design options:

  1. Lincoln/Charnelton couplet or
  2. A two-way bus lane on Charnelton;
  3. Adding an existing lane on 6th and 7th Streets
  4. Reassigning a lane on portions of 6th and 7th Streets

Recommended Alternatives to Retain

- **West 13th Avenue between the Downtown Eugene Station to West 11th Avenue via Chambers Street** (includes two design options: a two-lane transitway or a frontage alley design option on West 13th between Polk and Tyler Streets)
- **West 11th Avenue** (Between Garfield Street and the Commerce Street terminus).

Next Steps

Tonight– Formal Approval of Reduced Set of Alternatives

July – September Complete Draft Alternatives Analysis Report on reduced set of alternatives

September – December Joint LPA Committe Recommend LPA, ECC, MPC, LTD Board Select LPA

Lane Transit District
Resolution No. 2010-026

WHEREAS, Lane Transit District (LTD) is engaged in an alternatives analysis process for the West Eugene EmX Extension (WEEE) project and is the lead local agency for that process.

WHEREAS, LTD has conducted this process in accordance with federal requirements.

WHEREAS, the LTD Board of Directors directed staff to schedule a check-in during the Alternatives Analysis phase to verify the viability of the range of alternatives identified for further study in the Range of Alternatives Report.

WHEREAS, LTD has completed preliminary analysis which concludes that several alternatives now being considered are no longer viable.

WHEREAS, the LTD Board of Directors has adopted a revised Final Purpose and Need Statement and Goal and Objectives as proposed by the Federal Transit Administration.

THEREFORE, it is hereby resolved that the LTD Board of Directors:

Adopts a refined set of alternatives contained in the West Eugene EmX Extension (WEEE) Alternatives Analysis Refinement Evaluation to be used in the preparation of an Alternatives Analysis Report for the WEEE Project.

Adopted by the Lane Transit District Board of Directors on the _____ day of June, 2010.

_____
Board President


EmX EUGENE STA
6102

Exhibit A

Lane Area Commission on Transportation (LACT)

Proposed Bylaws

~~FACT-LC Consensus~~ Candidate Final Draft, ~~4/16/~~5/18/2010

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Recognizing the importance of transportation to the long-term livability of the area and the desirability of speaking with one voice on major transportation issues, and in fulfillment of the requirements of Senate Bill 944 (Section 1, Chapter 509, Oregon Laws 2009), the Board of County Commissioners of Lane County is submitting to the Oregon Transportation Commission (OTC) this proposal for the formation of an area commission on transportation (ACT) for Lane County.

I. PURPOSE

The Lane Area Commission on Transportation (LACT) is an advisory body established to provide a forum for stakeholders to collaborate on transportation issues affecting Oregon Department of Transportation Region 2, Area 5 ("Area") and to strengthen state/local partnerships in transportation.

II. MISSION

The mission of LACT is to:

1. Provide a local forum for sharing information, understanding, coordinating, and gaining consensus around transportation plans, policies, projects and funding;
2. Engage key stakeholders and the general public with a process consistent with state and federal laws, regulations and policies;
3. As applicable, consider all modes and aspects of the transportation system, including air, marine, rail (freight and passenger), road, transit, bicycle, pedestrian, and pipelines;
4. Review and monitor the condition of the Area's transportation system, using appropriate benchmarks;
5. Recommend short- and long-term transportation investment priorities based on state and local plans and addressing identified needs of the Area's transportation system while balancing local, regional and statewide perspectives; and
6. Communicate and coordinate regional recommendations, priorities and activities, and collaborate with other organizations and interests, including as applicable the Central Lane Metropolitan Planning Organization (CLMPO), other ACTs, the OTC, ODOT advisory committees, the Governor's Economic Revitalization Team (ERT), regional partnerships and investment boards, state legislators, Oregon's congressional delegation, and other agencies and stakeholders.

III. AUTHORITY

LACT is an advisory body chartered under authority of the OTC. ORS 184.610 to 184.666 gives the OTC the authority to establish policies for the operation of ODOT and for the administration of programs related to transportation. The OTC may charter an ACT when it demonstrates, and as long as it maintains, a structure consistent with the requirements of the *Policy on Formation and Operations of ACTs*. The OTC retains oversight and final decision-making authority to assure efficient management of the state transportation system. ACTs provide valuable input and recommendations to that process.

LACT is a voluntary association of government and non-government transportation stakeholders and has no legal regulatory, policy or administrative authority. LACT processes and resulting recommendations shall comply with relevant laws, regulations and policies. As an advisory body to the OTC with authority to make recommendations on policy or administration, LACT meets the definition of a "Governing Body" and falls under the requirements of the Public Meetings Law, ORS 192.610 to 192.690. LACT members shall comply with the requirements of Oregon Government Standards and Practices laws concerning conflict of interest.

IV. ORGANIZATION

A. Voting Members

LACT is comprised of up to 27 voting members, determined as follows:

1. **Counties and Cities:** The governing bodies of Lane County and the incorporated cities within the Area (Coburg, Cottage Grove, Creswell, Dunes City, Eugene, Florence, Junction City, Lowell, Oakridge, Springfield, Veneta and Westfir) are each invited to designate a primary representative and an alternate representative to LACT. A primary representative shall be an *elected official* but an alternate need not be. In order to facilitate better coordination between LACT and CLMPO, each city that is part of CLMPO is encouraged to appoint a primary representative that is also a member of the CLMPO policy board. (13 members)
2. **Tribes, Ports and Transit Districts:** The governing bodies of the Confederated Tribes of the Coos, Lower Umpqua & Siuslaw Indians ("Tribes"); the Port of Siuslaw ("Port"); and Lane Transit District (LTD) are each invited to designate a primary representative and an alternate representative to LACT. A primary representative shall be an *appointed or elected official* but an alternate need not be. (3 members)
3. **MPOs:** CLMPO is invited to designate a primary representative and an alternate representative to LACT. Such representatives need not be *elected officials*, but should be well versed in federal MPO requirements. (1 member)
4. **Transportation Advisory Committees:** The Lane County Roads Advisory Committee (LCRAC) and the CLMPO Citizen Advisory Committee (CAC), with the approval of the CLMPO, are each invited to designate a primary representative and an alternate representative to LACT. (2 members)
5. **Highway 126 East:** The Lane County commissioners shall appoint a primary representative and an alternate representative for the Highway 126 corridor east of Springfield. (1 member)
6. **Citizens (Private Sector):** Following public advertisement, LACT shall appoint up to six (6) citizens as members of LACT. The citizens should be selected to represent a diversity of interests, which may include airports, rail (passenger & freight), trucking, public transit (bus & rail) riders, bicyclists and pedestrians, business, freight, tourism, public safety, public health, schools, neighborhoods, senior citizens, special transportation needs, minorities, environment, land use, parts of Lane County not otherwise well represented on LACT, and other interests. Citizen (Private Sector) members shall reside in the Area or represent a business or organization that operates in the Area. (up to 6 members)
7. **ODOT:** The ODOT Lane County Area Manager is a voting member of LACT and shall designate an alternate. (1 member)

Alternates: In order to ensure good representation, when a primary member is unable to attend a meeting, he/she should contact his/her alternate to serve in his/her place. An alternate member may attend and participate in any meeting, but may vote only when the primary member is absent. In rare cases when both primary and alternate members are unable to attend a meeting, someone else may vote by written authority from the member jurisdiction/entity. Citizen (Private Sector) representatives shall not have alternates.

~~**Multiple Representation**~~**Balance:** The seven categories of voting members are designed as a whole to provide an extensive diversity of interests and representation. Thus, there should be no overlap of membership between each of these categories such that any entity or interest is able to exercise an undue voice in relation to others. In particular, a~~A~~ Highway 126 East or Citizen (Private Sector) member may not be someone who could be a voting member representing one of the other jurisdictions/entities, i.e., a county, a tribe, a port, a transit district, a MPO, the LCRAC, the CAC or ODOT. Moreover, the Highway 126 East and Citizen (Private Sector) members shall be appointed to balance out other members of LACT and provide a greater diversity of interests and geographic areas.

Terms: Highway 126 East and Citizen (Private Sector) members will serve two-year terms and may be reappointed. All other voting members may be designated or replaced at any time by their represented jurisdictions/entities.

Repeated Absences: All voting members of LACT are expected to participate in all meetings, or to send an alternate if applicable. If a voting member fails to participate in three (3) consecutive meetings, or to send an alternate, his/her position shall be deemed eliminated for the purposes of a quorum and decision-making, until such time as the position is filled and someone in that position participates (again) in a meeting. The responsible jurisdiction/entity may replace its own repeatedly absent voting member, even if his/her term has not yet expired. The LACT may replace a repeatedly absent Citizen (Private Sector) member.

B. Non-Voting Members

The following officials are invited to be non-voting, *ex officio* members of LACT or participate in any LACT meetings:

- ODOT Area Managers for Areas adjacent to Lane County.
- Oregon Transportation Commissioners.
- The member of the Governor's Economic Revitalization Team responsible for Lane County.
- State legislators representing parts of Lane County.
- Members of Congress representing parts of Lane County.

Space and time permitting, staff to jurisdictions or entities that are members of LACT are invited to participate in discussions as non-voting members.

LACT may invite other non-voting members to represent relevant areas of interest or expertise and to participate in discussions, on either an *ad hoc* or ongoing basis.

C. Staffing and Financial Support

ODOT will arrange staff support for LACT, with funding provided by ODOT. Specific responsibilities shall be determined by mutual agreement between LACT and ODOT.

Ed. Note: ODOT will arrange for initial staffing support in advance of the first meeting of LACT.

V. OPERATION

A. Decision-Making

Quorum: All voting members of LACT are expected to participate in all meetings, or to send an alternate if applicable. A quorum for decision-making purposes will be two-thirds (2/3) of the voting membership. A quorum may include teleconferencing of members, if feasible. LACT may consider purely informational items with less than a quorum present.

Ed. Note: For example, if the total number of voting members were 27, then a quorum of 18 would be needed to make decisions.

Consensus: LACT will use a consensus decision-making process and will foster mutual respect and a collaborative approach to problem solving. Members will seek to advance broad interests and look for win-win solutions. Consensus means that *all* voting members present can live with the decision. Members are encouraged to voice and have recorded all views. Once a consensus decision has been reached, all members agree to support that decision.

Supermajority Vote: In rare cases where consensus cannot be reached, decisions will be made by a 80% supermajority of the voting members present. A simple majority of voting members present may call for the end of discussion and a supermajority vote.

Ed. Note: For example, if the number of voting members present was 18, then those 18 voting members could make a decision by consensus. Alternatively, a supermajority of 15 or more voting members could make a decision.

Basis for Making Decisions: ~~LACT shall develop criteria for making recommendations based on local, state, and federal adopted transportation plans, policies and procedures.~~ LACT shall function as an advisory body to the OTC, which has final decision authority. LACT deliberation processes and resulting recommendations shall comply with relevant laws, regulations and policies. Recommendations shall be based on local, state, and federal adopted transportation plans, policies and procedures including, but not limited to:

- Oregon Transportation Plan and supporting mode plans (e.g., Oregon Highway Plan and Oregon Public Transportation Plan)
- Oregon Public Meetings Law, ORS 192.610 to 192.690 (See State of Oregon, Department of Justice, *Attorney General's Public Records and Meetings Manual*)
- State corridor and facility plans
- Transportation Planning Rule, OAR 660-012
- Transportation system plans
- MPO regional transportation plans
- Federal transportation planning regulations
- Local government plans, regulations, and ordinances
- Project selection criteria and prioritization factors approved by the OTC, including Oregon Transportation Management System data
- State Agency Coordination Program, OAR 731-15
- Additional criteria established by the OTC

- Oregon Government Standards and Practices, ORS Chapter 244 (See *Oregon Government Standards and Practices Laws, a Guide for Public Officials*, by the Oregon Government Standards and Practices Commission)

LACT may use additional criteria to select and rank projects provided the criteria do not conflict with any criteria established by the OTC. If LACT chooses to use additional criteria, they must inform those developing project proposals about the criteria. LACT shall apply regional and statewide perspectives to their considerations, refining recommendations after consultation with any affected MPO.

Recommendations to the OTC shall be documented and forwarded to the OTC with the factors used to develop the recommendation, including any additional criteria used by LACT in forming its recommendation. Documentation developed by a member whose recommendations were not incorporated into the final LACT recommendations will be forwarded to the OTC with other materials documenting LACT recommendations. Recommendations to the OTC will be made in accordance with the approved STIP Development Timeline.

B. Officers

Chair and Vice-Chair: A Chair and Vice-Chair shall be elected by the voting members. The Chair shall preside at all meetings attended, sign documents and correspondence, orient new members, approve agendas, represent LACT in other venues and serve as LACT's official spokesperson. The Vice-Chair shall serve as the Chair's primary alternate and shall preside at LACT meetings in the Chair's absence and assist the Chair in new member orientations as needed.

Ambassador(s): Optionally, LACT may elect one or more Ambassadors to represent it, in place of the Chair or Vice-Chair, when coordinating with the OTC, other ACTs and other entities.

~~**Elections**~~**Terms:** Officers shall serve one-year terms starting at the first meeting of the calendar year. Officers may be elected to more than one term of office. ~~Decision-making~~ Elections shall be decided as described in Section V.A, Decision Making.

C. Committees

LACT may establish a Steering Committee. The Steering Committee shall consist of the Chair, Vice-Chair, the ODOT Area 5 Manager and up to five (5) other primary voting members of LACT elected by the voting members of LACT. Duties of the Steering Committee include development of meeting agendas, development and monitoring of a Work Plan, and mentoring of new members.

LACT may form other standing or *ad hoc* committees as needed, for example, a Technical Advisory Committee. Committees may develop options and make recommendations, but policy decisions must be made by the voting members of LACT.

D. Work Plan & Report

LACT shall develop and adopt a Work Plan. The Work Plan can be amended at any time.

Accomplishments, based on the Work Plan and other achievements, shall be reviewed at least once every two years and a Report prepared. The Report shall review how well LACT is functioning, including staffing, public participation, and coordination with other entities. The Report shall be provided to the OTC.

E. Meetings

LACT will hold monthly meetings at a regularly scheduled time, unless it determines there is no need to meet.

All meetings will be held within the geographic boundaries of LACT. Meetings can sometimes be held at different locations in the Area in order to experience transportation issues first hand. Meeting field trips may be made a part of the regular meeting to allow greater community input on local issues and priorities.

When urgent business must be conducted, the Steering Committee may call a special meeting with 10 days advance notice.

F. Public Involvement

LACT will develop a Public Participation Plan. At least once every two years as part of its regular Report, LACT shall review the effectiveness of its public participation efforts.

In order to fulfill its advisory role in prioritizing transportation problems and solutions and recommending projects, the LACT will involve the public and stakeholders in its decision making process, as prescribed in its Public Involvement Plan. As LACT considers local, regional and statewide transportation issues, it will provide public information and involves the public in its deliberations. To comply with federal environmental justice requirements, the public involvement process will include a strategy for engaging minority and low-income populations in transportation decision-making.

LACT will look for opportunities to engage representatives of key interests as voting members, non-voting members, or invited guests, as appropriate.

VI. COORDINATION

LACT will communicate and coordinate with others that may have transportation related knowledge or interest in the Area. Working with a broad representation of stakeholder groups will help provide a balance between local/regional priorities and statewide priorities.

LACT will jointly develop Coordination Protocols with CLMPO.

LACT will provide regular notice to nearby ACTs, and look for opportunities to coordinate. LACT supports a joint annual meeting of all ACTs within ODOT Region 2.

As part of its regular Report, LACT shall review how it coordinates with other bodies and interests.

VII. AMENDMENTS

LACT defines its manner of conducting business through agreed upon Bylaws. Recommendations to repeal, amend, add to or replace these Bylaws may be made by consensus—or by an 80% supermajority—of all voting members. Such changes shall be presented at one LACT meeting, and acted upon at the subsequent meeting~~, and effective the following meeting~~. All amendments shall be reported to the OTC. Administrative amendments shall take effect immediately; other amendments shall take effect upon approval by the OTC.

VIII. GLOSSARY