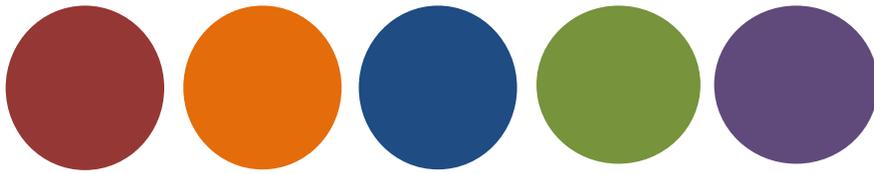


# Strategic Assessment Phase II: Scenario Analysis



*Corvallis Area Metropolitan Planning Organization*  
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## About This Report

This report was prepared by staff from the Corvallis Area Planning Organization (CAMPO), working with staff from the Oregon Department of Transportation (ODOT) and the Department of Land Conservation and Development (DLCD) with input from the CAMPO Technical Advisory Committee. The report summarizes the purpose, scope, and key findings from a scenario analysis of the region's adopted land use and transportation plans prepared using ODOT's Regional Strategic Planning Model (RSPM). The report is intended to help inform decision-makers and the public as they consider how to update the region's land use and transportation plans.

### **The Corvallis Area Metropolitan Planning Organization (CAMPO)**

coordinates regional transportation planning and programming for the Corvallis Metropolitan Planning Area which includes the cities of Corvallis, Philomath and Adair Village, as well as portions of Benton County.

*Further information about CAMPO is available on the web at:*  
[www.corvallisareampo.org](http://www.corvallisareampo.org)

*Please note that this report is for informational purposes only and is not intended to make or express policy decisions by either the Metropolitan Planning Organization or its member local governments.*

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## Executive Summary

The Corvallis Area Metropolitan Planning Organization (CAMPO) completed a voluntary planning process called Strategic Assessment, which estimated the travel and emissions likely to result if the region implements its currently adopted plans. Scenario Analysis is the second phase of that process, intended to provide an in-depth analysis of specific land use and transportation policies choices that the region can consider when updating local and regional plans. Through estimating outcomes from these policy choices, both in isolation and in combination relative to current adopted regional plans, the report identifies the value of potential actions across an array of indicators. The analysis explores the interactions of land use and transportation policies, and highlights the benefits of implementing complementary policies in the CAMPO region.

The CAMPO Policy Board identified four scenario policy areas with corresponding evaluation criteria to be investigated in the analysis: land use changes, parking fee changes, alternative modes, and transportation options. The scenarios and the evaluation criteria were then refined by local planners, using ambitious but realistic funding assumptions that could potentially be implemented by the jurisdictions within the region. The results reflect the incremental nature of fiscally constrained actions.

The findings show that if the proposed policies are pursued, the region will be better positioned to achieve its long term planning goals. The results range from up to 5% above adopted plans levels when policies are implemented in combination, while individual policies result in smaller changes. This illustrates the importance of combining supportive policies in order to gain the most benefit from investments.

Compact mixed use growth strategies supported by transit service are able to create walkable, bikeable destinations for obtaining goods and services, and can minimize the equity impacts of transportation policies that raise household transportation costs. Mixed use development and alternative mode investments are best complemented with supportive parking management and transportation options programs to shift travel to alternative modes. This is especially effective and equitable when building upon the region's success in establishing a multi-modal region in central Corvallis, or extending it to other areas. Through enacting combinations of policies investigated during this analysis, the CAMPO region could experience many of the benefits provided by these types of policies.

### Policy Considerations for Region

- Compact mixed use development reduces the distance that individuals travel to access daily needs.
- Transit enhancements have the greatest impact across each community goal area.
- Pairing transit investments with mixed use development results in the largest benefits.
- Transportation and land use investments in the city core provides the most benefit to lower income households.
- Providing alternative modes of transportation in parking fees areas reduces equity impacts.
- Transportation Options programs are most effective when targeted and combined with supportive policies.
- Parking fees have a larger benefit on goal areas when paired with residential parking permit programs.
- Car share, compact mixed use growth, and transit policies showed the largest reductions in auto ownership; parking policies had the least effect.
- A slight increase in benefits across all goal areas is found in the scenarios that concentrate growth within the City of Corvallis.

## Background

As a follow up to the Strategic Assessment of Land Use and Transportation Plans, the Corvallis Area Metropolitan Planning Organization (CAMPO) - working with staff from the Oregon Department of Transportation (ODOT) and the Department of Land Conservation and Development (DLCD) - has prepared a second phase Scenario Analysis. The analysis was prepared using a model developed by ODOT to estimate the likely outcomes of adopted plans and current trends over the next 20 years – to the year 2040. The analysis estimates the likely effects of these policies on greenhouse gas emissions, public health, sustainability, and equity. It is a second phase building on Strategic Assessment, with an increased emphasis on local input on the development of scenarios and evaluation criteria. This report outlines how the analysis was prepared and the results of the analysis. The report is intended to inform local officials and policy makers as they update land use and transportation plans, and to help provide a strategic, regional level understanding of the relative impacts resulting from transportation and land use policy options.

## Strategic Assessment

In 2014, CAMPO in partnership with ODOT and DLCD, engaged in a voluntary planning effort, known as a Strategic Assessment. The Strategic Assessment estimates how close the region's existing adopted plans come to reaching greenhouse gas (GHG) emissions reduction targets, and other regional planning goals, including changes to vehicle miles traveled (VMT) and air pollutants. The assessment results demonstrated the likely outcomes of implementing existing adopted plans in CAMPO combined with other demographic and technology changes expected over the next 20 years. The assessment also identified potential actions the region could consider to achieve important regional outcomes in transportation and land use decisions.

## Strategic Assessment Key Findings

The Strategic Assessment demonstrated that the region's past investments, existing plans and recent trends are moving CAMPO in the right direction. Implementation of local plans are expected to result in several positive benefits for the region, including a sharp decline in the use of transportation energy, increased population in mixed use areas with access to multi-modal transportation options, and several public health improvements. However, the assessment showed that more ambitious actions are needed to reach important regional goals, including the state-set target on reductions in GHG emissions. The assessment found a variety of more ambitious policies and actions that the region could pursue that would enable it to meet the state-set target on reducing GHG emissions, with significant co-benefits to other desired community outcomes. The assessment also highlighted other issues that the region may want to consider, including a projected increase in VMT per capita and an increase in household transportation costs. Implementation of the region's adopted plans is expected to result in the following benefits for the region:

- Relative to the 21% 2035 target, Greenhouse gas emissions per capita beyond vehicle and fuels, can be reduced by 2.1% with local adopted plans alone, and up to 18.5%, when including allowed ambitious state actions, like a carbon tax. This highlights the importance of state-led pricing and ambitious vehicles and fuels programs in reaching the target.

- Total fuel consumption per capita is expected to drop by 53%
- Criteria air pollutants are expected to drop by 60%
- Walking and cycling trips will continue to increase
- Improvements to air quality and expanded options for transportation are likely to improve public health and reduce health care costs for area residents
- Household transportation costs are expected to increase, due to increases in vehicle ownership and parking costs
- Vehicle miles traveled per capita are expected to increase by 3%
- More ambitious policies provide a mix of co-benefits including:
  - Pricing strategies (e.g. road user fee) reduce VMT, help to improve air quality, as well as address funding issues
  - More mixed-use and transit helps to reduce travel costs and increases use of active modes
  - New vehicles improves air quality and safety

## Scenario Analysis Overview

Scenario analysis is the second phase of the strategic assessment process, it allows for a deeper analysis of possible policy scenarios that Metropolitan Planning Organizations (MPO) can consider to incorporate into future planning processes. CAMPO will use this scenario analysis to inform stakeholders and decision makers during the MPO’s Regional Transportation Plan (RTP) update. The CAMPO Policy Board can use the results of the analysis to guide policy decisions during the RTP development process.

## Concurrent Planning Efforts

Within the next three years, multiple planning projects will be underway in the CAMPO region sponsored by various federal, state, county, and city agencies. The Scenario Analysis project is a technical exercise and the findings are meant to inform planning efforts in the region. As such, the process was guided by input from each of the agencies identified below working through the CAMPO Technical Advisory Committee (TAC).

- CAMPO Regional Transportation Plan (RTP)
- CAMPO Regional Transportation Systems Plan (RTSP)
- Benton County Transportation Systems Plan (TSP)
- City of Corvallis Transportation Systems Plan (TSP)
- City of Corvallis Transit Development Plan (TDP)
- City of Corvallis Imagine Corvallis 2040
- City of Corvallis Comprehensive Plan
- City of Corvallis Climate Action Plan
- City of Philomath Transportation Systems Plan (TSP)
- Oregon State University (OSU) Transportation Plan and Campus District Plan

## Scenario Development & Testing

The Scenario Analysis project solicited input from the staff of regional agencies through the following methods:

**CAMPO Technical Advisory Committee (TAC):** The TAC represents a broad range of regional interests and served an advisory role to ensure that the project reflects realistic assumptions about future plans and policies. The project was guided by the CAMPO TAC,

comprised of staff from Corvallis, Philomath, Adair Village, Benton County, CAMPO, and ODOT and was expanded to include land use planning staff from Corvallis, Oregon State University (OSU), and Benton County. The expanded TAC served as a project advisory committee for CAMPO's Scenario Analysis and guided the scenario development and interpretation of results through the criteria evaluation framework.

**Local Jurisdiction Staff:** During the course of the project, the team worked with staff from the local jurisdictions to document existing program levels, adopted plans, and potential future programs to develop policy options for analysis. Interviews were conducted with transportation and land use planning staff from City of Corvallis, City of Philomath, City of Adair Village, Benton County, Oregon State University, and Cascades West Council of Governments.

## Policy Options

Potential policy choices and transportation investments investigated in this analysis are described as policy options, which represent potential and reasonable policies that could be implemented in the region. Policy options are analyzed in isolation and in combination to determine their relative effect on regional land use and transportation planning goals. Policies are investigated relative to the baseline of current regional adopted plans to determine the extent these policies help meet state and local planning goals. In addition to the policy areas identified by the CAMPO Policy Board, a hypothetical scenario was tested to evaluate the impacts of mass migration of climate refugees from the drought stricken parts of the nation into the region.

The CAMPO Policy Board identified the following policy options to be investigated in this analysis. These broad policy areas were refined into specific policy actions that could potentially be implemented by one or more of the agencies within the CAMPO area.

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### Land Use Changes

- Decrease development in central area and direct development to outer areas
- Increase development in central area
- Most new development is concentrated near alternative mode facilities
- New developments in form of mixed use

### Parking Fee Changes

- Expand parking fee coverage areas
- Increase parking fees
- Cash-out parking programs

### Alternative Modes

- Expand transit service
- Expand bicycle & pedestrian facilities

### Transportation Options

- Work based marketing programs
- Home based marketing programs
- Expand car-sharing
- Telecommuting
- Transit rider subsidies

## Scenario Evaluation Criteria

The CAMPO Policy Board identified four issue areas of local importance to be used in evaluating the policy options and scenarios for their ability to achieve local planning goals; GHG emission reductions, public health, sustainability, and equity. The CAMPO TAC developed a set of indicators for each of the evaluation criteria categories. The evaluation criteria are used to compare the effectiveness of policy options and scenarios relative to the trend scenario of adopted land use and transportation plans.

The results of policy options in isolation and the scenarios are presented in the findings section using the follow evaluation criteria framework:

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### GHG Emissions Reduction

- Greenhouse gas emissions

### Public Health

- Air quality (criteria air pollutants)
- Walk and bike trips
- Social costs (e.g., safety, pollution, energy security)
- Accident rates

### Sustainability

- Population in urban mixed use areas
- Vehicle delay
- Vehicle miles traveled
- Short trip diversion to bikes

### Equity

- Household transportation costs
  - Auto ownership
  - Job accessibility
- 

## Analysis

Both the Strategic Assessment and Scenario Analysis use ODOT's Regional Strategic Planning Model (RSPM), developed specifically for metropolitan areas. The RSPM enables smaller geographic areas, like metropolitan planning areas, to evaluate the potential effects of existing or new policies and investments. This modeling tool is strategic, in that it supports planning when there are a number of unknowns about the future. It can help develop regional visions and identify actions needed to meet greenhouse gas reduction targets and other regional planning goals. In addition to the RSPM, the Rapid Policy Assessment Tool (RPAT), an alternate version of the RSPM model adopted by the Federal Highway Administration (FHWA), was tested to evaluate policy areas not previously available in the RSPM.

## Trend Scenario- Adopted Plans

The trend scenario consists of a future year that assumes full implementation of transportation projects and land use patterns found in currently adopted local plans, taking into account the population growth forecast for the region. Additional assumptions about future fleet, fuels, and technology and associated travel costs, as well as assumptions on income growth and fuel price forecasts, are sourced from ODOT's Statewide Transportation Strategy and are consistent across each scenario. The findings for each policy scenario tested are measured as the change from the trend scenario baseline, the findings indicate the results of additional incremental change to current plans. Inputs and assumptions for the trend scenario were collected from the CAMPO Strategic Assessment, as well as a number of additional sources, including:

- CAMPO Regional Transportation Plan (RTP)
  - Roadway and Transit service levels
  - Parking fee areas
- 2040 Corvallis Albany Lebanon Model (CALM) regional travel demand model
- 2040 Population Forecast including Oregon State University group quarters
- Public Transit bus fuel mix
- Implementation plans or anticipated funding levels for:
  - Transportation Demand Management programs
  - Car-Sharing programs
  - Bicycle infrastructure and promotion
  - Intelligent Transportation System (ITS) programs
- Adopted local plans, including:
  - Comprehensive plans and zoning from Adair Village, Corvallis, Philomath, and Benton County
  - Oregon State University Campus Master Plan

# Policy in Isolation Findings

## Land Use

Land use patterns determine the locations of housing and employment within a region. These patterns then influence the transportation choices that individuals make and affect the overall amount of vehicle travel in the region. Three regional land use patterns were identified by the CAMPO Policy Board for inclusion in the analysis; decentralized growth, centralized growth, and concentrating growth near alternative mode facilities. Each scenario assumes a share of future regional household growth and redirects it to areas identified through consultation with planning staff from each jurisdiction. Each of the scenarios have the same amount of household growth (consistent with the trend scenario) but redistributes a portion of the growth differently to represent the various land use scenarios. When redistributing growth to new areas, each scenario also identifies areas to pull growth from to retain a consistent regional total.

### Decrease Developments in Central Areas

This scenario redistributes 914 households to Philomath and 1,333 households to Adair Village from projected growth areas in central and the outer west side of Corvallis. The project team worked with staff from Philomath and Adair Village to identify likely areas to assume new growth under this scenario.

### Increase Developments in Central Areas

This scenario redistributes 1,283 new households from fringe growth areas targeted for growth in south Corvallis and redirects the growth to more centralized areas of the city. As a result the net population density is increased. The project team worked with staff from the City of Corvallis to identify areas capable of receiving increased residential development.

### South Corvallis Transit Oriented Design

This scenario redistributes 3,863 households to a Transit Oriented Design (TOD) in south Corvallis. The household growth was taken from the same growth areas in central and the outer west side of Corvallis as the decentralized growth scenario. This scenario assumes a higher level of the population living in a mixed-use development than the adopted plans land use pattern.

TABLE 1 LAND USE INPUTS

Policy Option	Trend Scenario 2040	Scenario Analysis 2040
1 Decrease developments in central area and direct new developments to outer areas	363 new households to Philomath 600 new households to Adair Village	914 new households to Philomath 1,333 new households to Adair Village
2 Increase developments in central areas	374 new households in central/downtown Corvallis	1,657 new households in central/downtown Corvallis
3 Most new development is concentrated near south Corvallis TOD	2,580 new households in south Corvallis area	3,863 new households in south Corvallis area

## Land Use Key Findings

Increased density and mixed uses are important for achieving regional planning goals. When land use changes result in denser core areas or in compact mixed use development, households drive less. The analysis assumed that as residential densities increase, so do the mix of land use types, and that increased densities are accompanied by associated services. The results demonstrate the importance of central city housing on housing affordability, as well as the role that jobs and services in satellite cities play in reducing travel demand from outlying areas.

## Greenhouse Gas Emissions Reductions

Each of the land use policies reduce GHG emissions over the adopted plans baseline. Increasing compact mixed use areas in core areas of each city of the region is an effective strategy to reduce VMT and GHG emissions. The most benefits result from bringing densities above a minimum threshold that enable shorter trips and alternative travel modes. However, the preponderance of the existing housing stock coupled with planned growth on the periphery of city limits, compared with the relatively small amount of future housing moved under this analysis, resulted in small overall reductions.

## Public Health

Land use policies are the most effective of the policies analyzed at increasing walk trips. Higher densities that enable shorter trip lengths result in an increased amount of walk trips, and a decreased amount of automobile crashes (largest impact of all policies tested). Reduced VMT also leads to lower air quality pollutants and associated social costs. The greatest impact on public health is from the Adair-Philomath growth scenarios due to the largest amount of population living in mixed use areas.

## Sustainability

The impacts of land use policies are highly influenced by population densities, particularly the share of households living in mixed use areas. Higher densities and mixed use development allow households to shift from auto to alternative modes, as more households are living in close proximity to essential goods and services that make these modes more attractive. Increases in population living in mixed use areas, with higher accessibility and thus shorter trips to everyday destinations, demonstrates a corresponding shift to alternative modes, decreases in VMT and delay, and increases in transit ridership. The Adair/Philomath growth scenario results in the highest increase in populations above the minimum density threshold of mixed use areas as more growth was channeled into a relatively small areas.

## Equity

Each of the land use patterns result in reductions in household transportation costs and increased use of alternative modes as more individuals reside in mixed uses areas. Job accessibility also increases as development becomes denser, as well as the number of zero vehicle households. The central Corvallis growth scenario provides the most benefit to low income households and has the largest increase in zero vehicle households.

## Parking Management

Parking policies influence the amount of trips individuals make and what type of modes they choose for their trips. Parking regulation controls what type, where, when, and for how long vehicles may park in a district or area. Policies that include increased regulation and fees shift the monetary cost of storing a vehicle to the driver, which in turn can cause some individuals to utilize alternative modes, reducing the demand on roadway and parking infrastructure capacity. Parking policies must also be thoughtfully implemented as these types of actions cause an increase in transportation costs for individuals. Three different types of parking policies are tested in the scenario analysis; expanding parking district regulation to reduce parking fee evasion, increased parking pricing, and Cash-out parking programs.

### Expanded Parking Districts

The existing neighborhood parking permit districts surrounding downtown and OSU are expanded to fully surround the OSU campus. No fees are associated with trips to the district, as it is a time limited parking restriction. Multiple parking fee evasion levels are evaluated using information from the 2015 City of Corvallis-OSU Parking Utilization study, which assessed parking in the neighborhoods that border the fee areas downtown and at the university. The final analysis assumes a mid-level value where roughly 10% of trips attracted to the area avoid paying parking fees in the base year, which is either retained in the trend scenario, or assumed to drop to zero with the expansion of the neighborhood parking district system.

### Increase Parking Fees Downtown

Under this scenario, parking fees for the existing paid areas of downtown Corvallis are increased from \$1.20 per day to \$5 per day, matching the existing parking rates at OSU. The parking fee district coverage area is left unchanged. Parking fees are represented in the model as the daily average across the entire region.

### Cash-out Parking Programs

Cash-out parking programs are an employer sponsored parking management policy, in which employers who provide subsidized parking at work for their employees offer a cash allowance as an alternative to using the parking space. The policy's intent is to reduce driving by offering employees the option of "cashing-out" their subsidized parking space and taking an alternative mode to work. Less than one percent of work trips are subject to a cash-out parking program per current adopted plans. Under the scenario analysis cash-out parking is tested at a rate of 6.7% of work trips having a cash-out option.

TABLE 2 PARKING MANAGEMENT INPUTS

<b>Policy Option</b>	<b>Trend Scenario 2040</b>	<b>Scenario Analysis 2040</b>
<b>1</b> Expanded parking districts	Existing Neighborhood Parking Districts	Expands coverage surrounding University
<b>2</b> Increase parking fees downtown	\$1.20/\$5 per day	\$5 per day
<b>3</b> Cash-out parking programs	Less than 1% work trips	6.7% work trips

## Parking Management Key Findings

Parking management options can be an effective method to achieve regional policy goals by managing the space that parking consumes and encouraging alternative modes. Implementing increased regulation and pricing can reduce VMT and increase alternative mode use, providing many benefits for the region. However, parking pricing directly influences household transportation costs and may result in equity challenges for low income households if alternative mode choices are not adequately provided. Implementing parking management solutions will require cooperation among stakeholders from the community. Providing cost effective alternative modes of transportation will be necessary to offset the rise in transportation costs.

## Greenhouse Gas Emissions Reductions

Parking policies are particularly effective in reducing GHG emissions, as increased fees will reduce VMT and cause individuals to make trips using other modes. The policy option that includes increased fees in the downtown core, along with higher university prices and implementing residential parking permit districts in adjacent communities has the strongest effect on reducing GHG. The fee increase alone had similar impacts as work-based parking cash-out programs in GHG reduction and other measures. However, parking fees had a larger synergistic effect when paired with residential parking permit programs.

## Public Health

Public health for the region will improve as decreased VMT reduces air pollutants, although parking did not increase the use of alternative mode found with other policies. Crashes and associated social costs are also reduced as individuals make fewer trips by automobile.

## Sustainability

Parking also has an impact on sustainability. When individuals make fewer trips by automobile sustainability indicators increase. Increasing parking fees, especially when paired with residential parking permits, is a strong lever for reducing VMT in the region, as it directly influences auto travel choice. Cash-out parking programs are another strategy to reduce VMT as individuals are incentivized to transition to alternative modes. Parking policies had a strong effect on reducing automobile congestion and delay by reducing roadway demand.

## Equity

Parking costs, unlike the other policies, have a negative impact on household transportation costs, particularly to low income individuals where they represent a larger share of household budgets. The impacts of parking policies in isolation are relatively low, and no parking policy in the analysis raised transportation costs more than 2%. The negative equity impacts of increased parking fees can potentially be offset through the continued affordability of the regional transit system and expansion of alternative mode infrastructure. Cash-out parking programs can result in individuals using the cash incentive to pay the parking fee in order to continue to drive. While this would have no impact on their budget initially, it would shift the cost to their budget, providing an incentive for them to choose alternative modes as they become more viable. Parking policies also show no effect in reducing auto ownership in the region.

## Alternative Modes of Transportation

Alternative modes such as public transit and bicycles are active modes of transportation that can provide many benefits, including; increased public health, decreased VMT, and more efficient use of transportation system capacity. Placing alternative mode facilities in locations that have higher density and more connectivity will increase accessibility for individuals utilizing these modes, making these modes faster and more effective for every day travel. For this analysis three different alternative mode policy choices were identified by the CAMPO Policy Board; increasing frequency of existing transit system, expanding the transit system with increased frequency to new development in Philomath and Adair Village, and expanding bicycle facilities surrounding the university area.

### Increase Transit Frequencies

Under this scenario, existing transit service frequencies are increased from the 30 minute pm peak headways in the adopted plans to a 15 minute headway in the am and pm peak periods on weekdays.

### Expand Transit to Philomath and Adair Village

This scenario envisions expanded transit routes to Philomath and Adair Village, at the higher frequency 15 minute headways in peak periods. This increases transit service levels in the region from roughly 6 service miles per capita under adopted plans to 12 service miles per capita.

### Expand Bicycle Facilities

As a strategic, household-based model, the RSPM evaluates the effect of short trips being diverted from driving to bicycles or other light vehicles. Bike diversion is a number reflecting the percentage of trips under 20 miles roundtrip that are diverted from auto to bike modes. This diversion level was estimated based on anticipated regional investment in cycling facilities and promotional efforts. The expanded facilities scenario assumes the 12% regional average diversion rate of the trend scenario is increased to 15% with up to 24% diversion within areas surrounding the OSU campus.

TABLE 3 ALTERNATIVE MODES INPUTS

Policy Option		Trend Scenario 2040	Scenario Analysis 2040
1	Increase transit frequency	15 & 30 min headways (pm peak)	15 min headways (pm peak)
2	Expand transit to Philomath and Adair Village	11.94 service miles per capita	12.24 service miles per capita
3	Expand bicycle facilities	20% diversion	12-24% diversion (higher surrounding OSU)

## Alternative Mode Key Findings

Alternative mode enhancements have the largest positive impact on the evaluation criteria above the trend scenario of any policy area, and result in positive impacts across the board in each indicator. Combining alternative mode infrastructure investments with supportive development and land use patterns works synergistically to result in greater benefits. Enhancing alternative modes of transportation is an effective method to increase mobility and connectivity while keeping transportation costs down. While the benefits are many, there are challenges to implement these policies that require more capital investment. The region will have to identify opportunities to increase funding for expansion of the transit system and bicycle-pedestrian facilities.

## Greenhouse Gas Emissions Reductions

Increasing transit frequency and expanding service has the greatest impact in reducing GHG emissions and air quality pollutants above the trend scenario of all the policies evaluated, although the impacts are still less than 2%. Transit investment typically resulted in greater impacts in the central Corvallis area where a dense network of transit routes exist. Expanding the region's transit and cycling facilities are also a good complement to other policies in reducing auto use, and resulting emissions.

## Public Health

As the use of transit and active transportation increases, public health across the region will improve. The greatest public health improvement results from increasing transit frequency and expanding the service area, which reduces air pollution and vehicle crashes across the region. Expanding bicycle facilities also results in public health improvements, but on a smaller scale as the improvements were targeted in the central Corvallis area. Expanding bike facilities did however have a larger impact than transit on reducing crashes.

## Sustainability

Increasing transit frequency and expanding the service area has the greatest impact of all policies evaluated above the trend scenario on improved sustainability for the region. As infrastructure and service is expanded, individuals have the ability to transition to alternative modes for their everyday travel activities, thereby reducing VMT and automobile delay. Although biking improvements result in only half of the impact of transit on VMT reduction, bike improvements still produce significant impacts, with results similar to the most ambitious parking policies.

## Equity

Transit and biking policies contribute to making travel more affordable, especially for low income households. Across each equity measure, alternative mode policies provide positive benefits to low income households. Transit policies also have the most impact on reducing auto ownership as the increased frequency and service area enables more areas to access affordable transit options.

## Transportation Options Programs

Transportation Options programs and investments (also referred to as Transportation Demand Management or TDM) create more choice in transportation systems, encouraging people to bike, walk, take transit, share rides, and telecommute. They are intended to reduce the demand for single occupant vehicle trips in order to maximize transportation system efficiency, manage congestion, improve reliability, as well as reduce travel costs and provide accessibility to those who may not otherwise be able to access the transportation system. The two Transportation Options program areas identified by the CAMPO Policy Board are home and work based individualized marketing campaigns and car sharing.

### Home/Work-based Marketing

Marketing programs are analyzed based on assumptions of what percentage of households participate in the program. Marketing programs can be run as either home-based, where specific neighborhoods are targeted, or as work-based, where specific employment sites are targeted. The Oregon Cascades West Council of Governments currently runs the transportation options marketing programs for the CAMPO area, who identified the areas where an expanded program should be targeted.

### Expanded Car Sharing

Car sharing programs give households the option of owning fewer or no cars by providing an alternative to car ownership. This scenario increases car sharing vehicles from 50 to 59 in the region. Car share is currently operated on the OSU campus by Enterprise Carshare.

TABLE 4 TRANSPORTATION OPTIONS INPUTS

	<b>Policy Option</b>	<b>Trend Scenario 2040</b>	<b>Scenario Analysis 2040</b>
<b>1</b>	Home/Work-based marketing programs	5% home based/3% work based	5.2% home based/5.4% work based (home based expands IMP pilot in 3 districts)
<b>2</b>	Expanded car sharing	50 vehicles	59 vehicles

## Transportation Options Programs Key Findings

Expansion of the Transportation Options programs beyond the trend scenario, such as increased funding of marketing programs at work and home and supportive car-sharing programs, result in positive impacts for the region as these programs enable individuals to make less trips and utilize alternative modes for routine travel activity. In isolation the lower levels of policy implementation analyzed result in relatively small impacts relative to the trend scenario. Strategically targeted Transportation Options investments are most effective when combined with supportive transit, alternative mode, and land use policies. The findings demonstrate the value of existing Transportation Options programs and the importance of identifying funding opportunities for expansion of the programs at the household and workplace level. In addition there appears to be an opportunity to explore expansion of the limited car share network in the region, and leverage public-private sector partnerships.

### Greenhouse Gas Emissions Reductions

Transportation demand management programs and car-sharing programs result in a slight GHG emissions reduction above trend scenario levels (less than 1%) as individuals make less trips and utilize alternative modes.

### Public Health

Air Quality pollutants and crash rates are also reduced beyond the trend scenario as a result of reduced single occupancy vehicle trips. Car-sharing results in less air pollution, while transportation demand management programs have a larger impact on reducing crashes.

### Sustainability

Vehicle miles traveled and annual travel delay per capita are reduced through increased alternative mode use and car-sharing activities. Car-sharing may also increase regional travel and accessibility slightly by increasing auto availability to households that own few or no autos.

### Equity

Each of the Transportation Options policies results in reductions in household transportation costs beyond the trend scenario. Expansion of car-sharing programs create the greatest reduction in transportation costs for low income households. Car-sharing programs also have the greatest impact of all policies analyzed on reducing auto dependence, enabling a lower number of automobiles owned per household and increasing the amount of zero vehicle households.

## Key Findings Policy Options in Isolation

Part one of the analysis tests each policy option against the trend scenario reference case to understand how implementing each policy option alone would impact the region relative to the implementation of adopted plans. It is important to note that the levels of policy ambition analyzed here are reflective of an overall incremental step towards policy implementation, and consist of small-scale changes in order to understand the effects of fiscally constrained policy. The policy inputs are intended to represent realistic implementation of policies and programs that could potentially be implemented in the near future. While each of the policy options impact the evaluation criteria, impacts are relatively small when testing the individual policies in isolation. Combining supportive policies results in larger impacts on the evaluation criteria.

### Maximum Policy Impact

The plots below show the relative impact of the policies on the evaluation criteria for GHG reduction, Public Health, Sustainability, and Equity. A single representative indicator has been chosen to represent each evaluation criteria category. The bars show the policy within that category with the most impact (e.g., transit vs. bike policies under alternative modes). These charts identify where each policy category has the most impact in reaching the desired outcome. For example, when considering equity, transit, bikes and car share programs do the most for reducing low income travel costs. Other key findings illustrated on the charts are:

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#### Land Use –

- Valuable policy for reducing crashes & travel costs
- Adair-Philomath growth scenario has the largest impact on most measures, except for the low income travel costs, which are the Corvallis (central or south) growth scenarios

#### Parking –

- Valuable policy for reducing delay, but all negatively impact travel costs
- Of the parking policies, the most impact comes from the combined permits/fees; except for travel costs, where permits and cash-out are easiest on budgets

#### Alternative Modes –

- Valuable policy for reducing GHG emissions and delay
- Transit has the maximum impact of all policies on all measures, but bike is also significant for reducing crashes and travel costs

#### Transportation Options Programs –

- Least impact (and implementation costs) of all policies, but valuable for reducing crashes & travel costs (similar to land use)
  - The Transportation Options policies best contribution is to public health measures; while car share is also helpful in reducing household travel costs
-

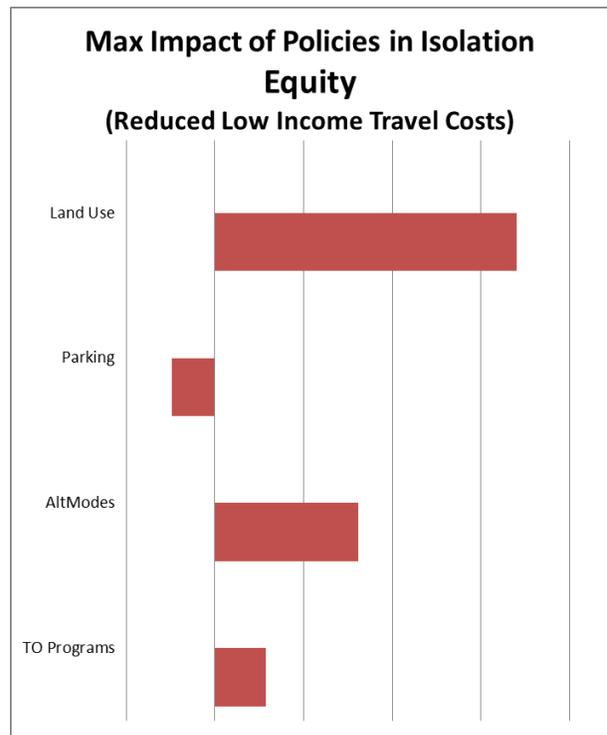
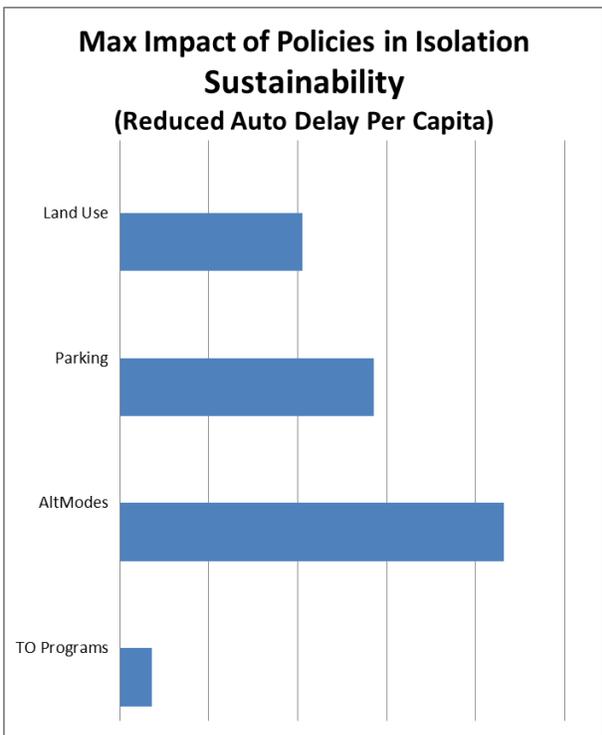
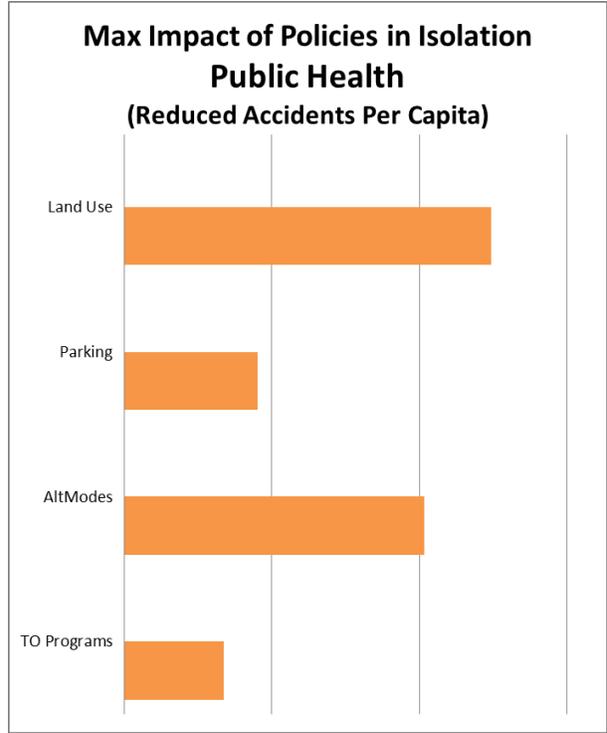
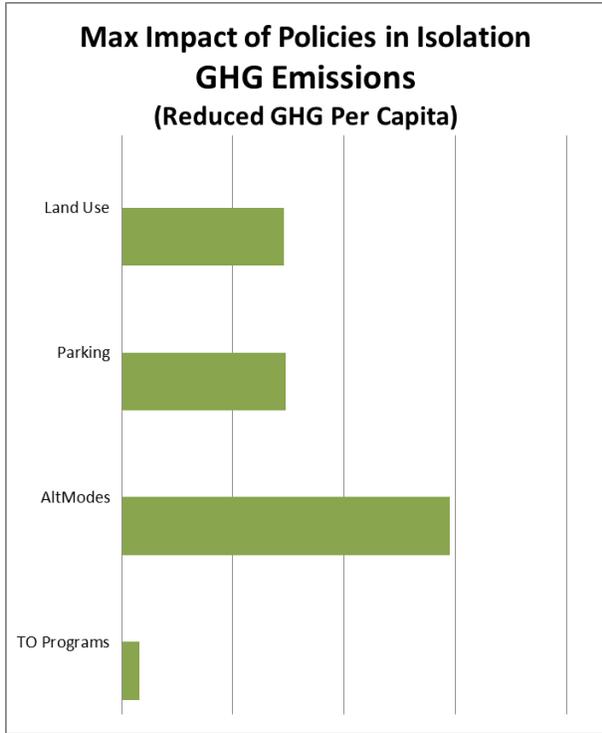


FIGURE 1 MAXIMUM IMPACT OF POLICIES ON SELECTED EVALUATION CRITERIA

## Policy Bundles Findings

Part two of the analysis combines policy options into bundles to test various scenarios of implementation. Testing of scenarios allows for the cumulative effects and benefits that result from complementary policies to be better understood. The impact of the policy bundles is greater when compared to the impacts of policies in isolation, indicating complementary policies provide greater benefits and that the region cannot rely on one type of policy to achieve its planning goals. The CAMPO TAC identified five policy bundles to test the impacts of implementing combined potential policy scenarios in the future. The TAC also created an additional sixth policy Climate Refugee bundle to test the potential impacts of increased population growth that could result as an influx of individuals moving to the region due to the effects of climate change. The policy bundles are organized around the land use policy options with various complementary transportation policies applied. The findings from these policy bundles are presented in general below, followed by individual results.

TABLE 5 POLICY BUNDLES

	Land Use	Parking	Alternative Modes	Transportation Options
<b>A</b>	Trend Scenario	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> <li>Cash-out parking</li> </ul>	<ul style="list-style-type: none"> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based marketing</li> <li>Car Sharing</li> </ul>
<b>B</b>	Trend Scenario	<ul style="list-style-type: none"> <li>Cash-out Parking</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>
<b>C</b>	Decrease developments in central area and direct new developments to outer areas	<ul style="list-style-type: none"> <li>Expanded parking districts</li> </ul>	<ul style="list-style-type: none"> <li>Expand high frequency transit to Philomath and Adair Village</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> </ul>
<b>D</b>	Increase development in central areas	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>
<b>E</b>	Most new development is concentrated near south Corvallis TOD	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> <li>Cash-out parking</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>

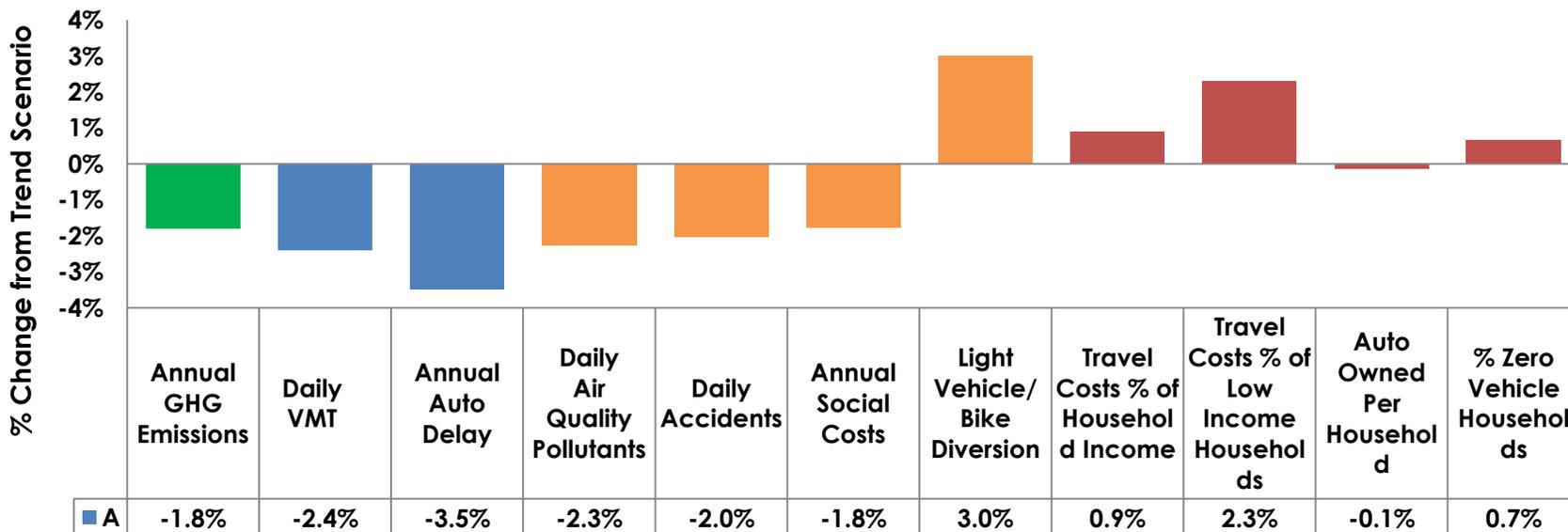
# Policy Bundle- Scenario A

This policy bundle uses the land use pattern from the adopted plans reference case, and combines the highest levels of parking with bicycle and Transportation Options policies. This scenario serves to give an understanding of the likely effects of implementing a more comprehensive set of transportation policies in the region with adopted land use plans.

Land Use	Parking	Alternative Modes	Transportation Options
Trend Scenario	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> <li>Cash-out parking</li> </ul>	<ul style="list-style-type: none"> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based marketing</li> <li>Car Sharing</li> </ul>

## Findings

Most of the evaluation criteria are trending in the right direction, however it under performs on most indicators in comparison to other scenarios. Inclusion of transit in Scenario B, leads to larger impacts on reducing driving than the parking policies in this bundle. Parking policies are much more aggressive than the parking policies tested in Scenario B and would require much more work to realize. Given the small differences between the outcomes, parking policies had a relatively small impact. Equity measures show that travel costs, mostly due to parking cost increase, have a disproportionate burden on poorer households. Walk and transit trips remain unchanged, primarily as a result of the unchanged population living in mixed use development.



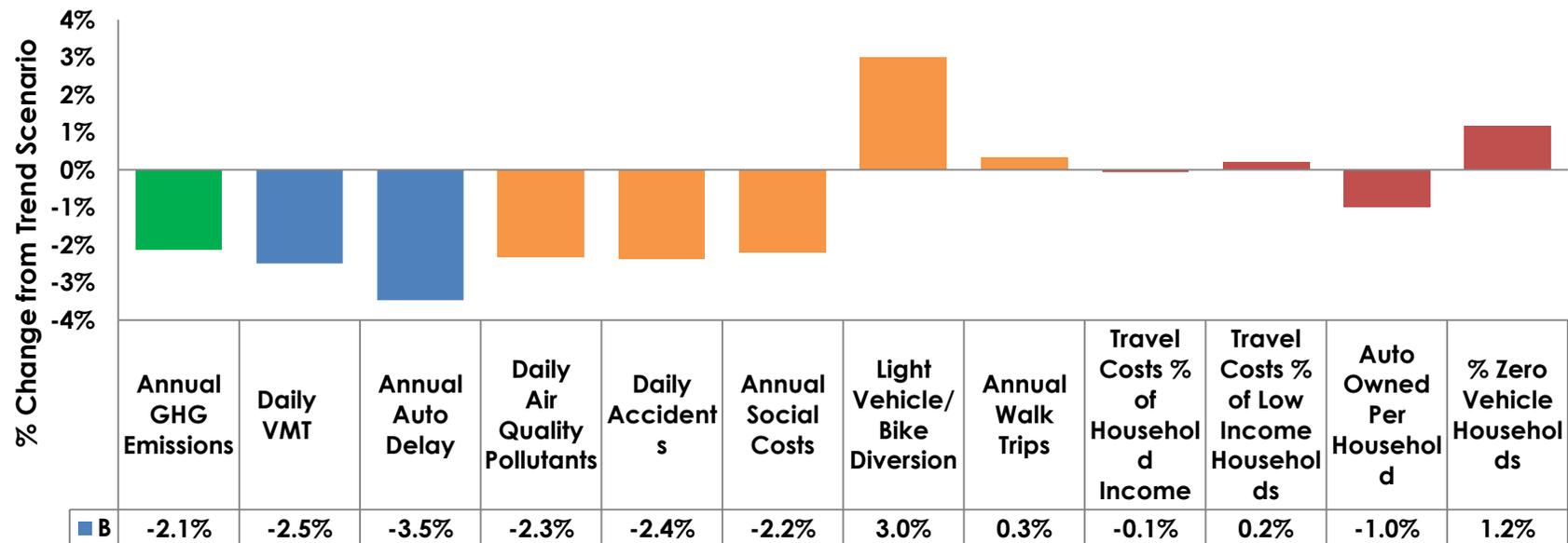
## Policy Bundle- Scenario B

This policy bundle is similar to Scenario A, in that it envisions the adopted plans land use pattern, but is coupled with a less aggressive set of transportation policies. Politically sensitive issues of parking are left unchanged, with only cash-out parking at large employers implemented. Transit frequencies are increased to 15 minutes for the am and pm peak periods and expanded bicycle and pedestrian facilities are added. Car sharing vehicles are also added.

Land Use	Parking	Alternative Modes	Transportation Options
Trend Scenario	<ul style="list-style-type: none"> <li>Cash-out Parking</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>

### Findings

Aggressive transportation policies coupled with adopted plans land use patterns decrease the demand for driving, leading to larger impacts on GHG and health measures, with little difference in VMT and delay. In addition, increased alternative modes coupled with fewer parking policies provides a low cost alternative to driving that leads to negligible increased transportation costs for households on average, including low income households. As transit investments are more expensive to implement than other policy levers, the gains in this scenario are modest when compared against the lower cost Scenario A.



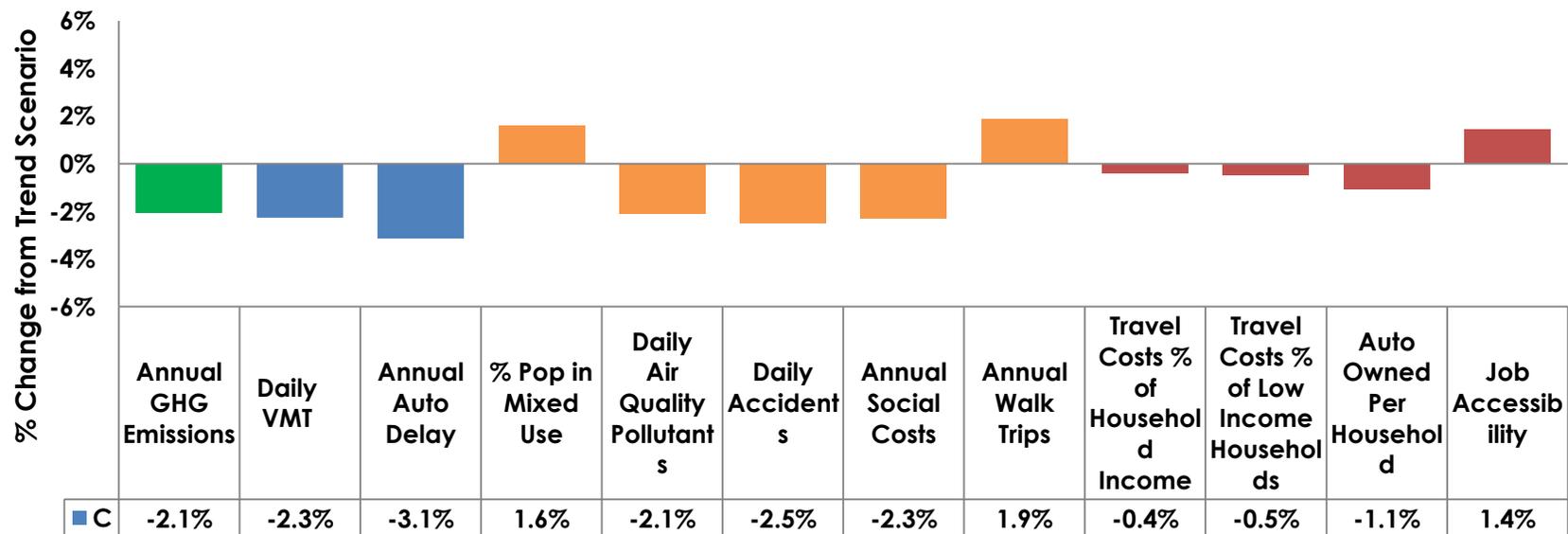
# Policy Bundle- Scenario C

This policy bundle envisions a decentralized, nodal regional growth pattern (population and employment), coupled with a complementary set of transportation policies. Parking districts are expanded, but fees left alone. Transit frequencies are increased to 15 minutes during peak periods with routes expanded to Philomath and Adair Village to accommodate growth, but bike infrastructure and car share programs are not increased. Both home and work-based transportation options marketing programs are expanded.

Land Use	Parking	Alternative Modes	Transportation Options
Decrease developments in central area and direct new developments to outer areas	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Adopted Plans</li> </ul>	<ul style="list-style-type: none"> <li>Expand high frequency transit to Philomath and Adair Village</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> </ul>

## Findings

The increased use of transit frequency and reach results in positive outcomes across each of the evaluation criteria. Transit investments providing expanded service area to nodal development outside of Corvallis brings down household transportation costs across all households. However further household cost benefits from bike investment and car share programs are not included in this scenario. The increased availability of transit through the expanded service area also results in the largest decrease in autos owned per household of the scenarios evaluated. Walk trips and job accessibility also rise corresponding with an increased use of transit and the largest increase in mixed use population of all scenarios. However, the dispersed growth means that many measures (e.g., VMT, delay, emissions) are on par with the current trend land use (Scenarios A and B), not capturing the higher benefits of the Corvallis-focused growth patterns (Scenarios D and E).



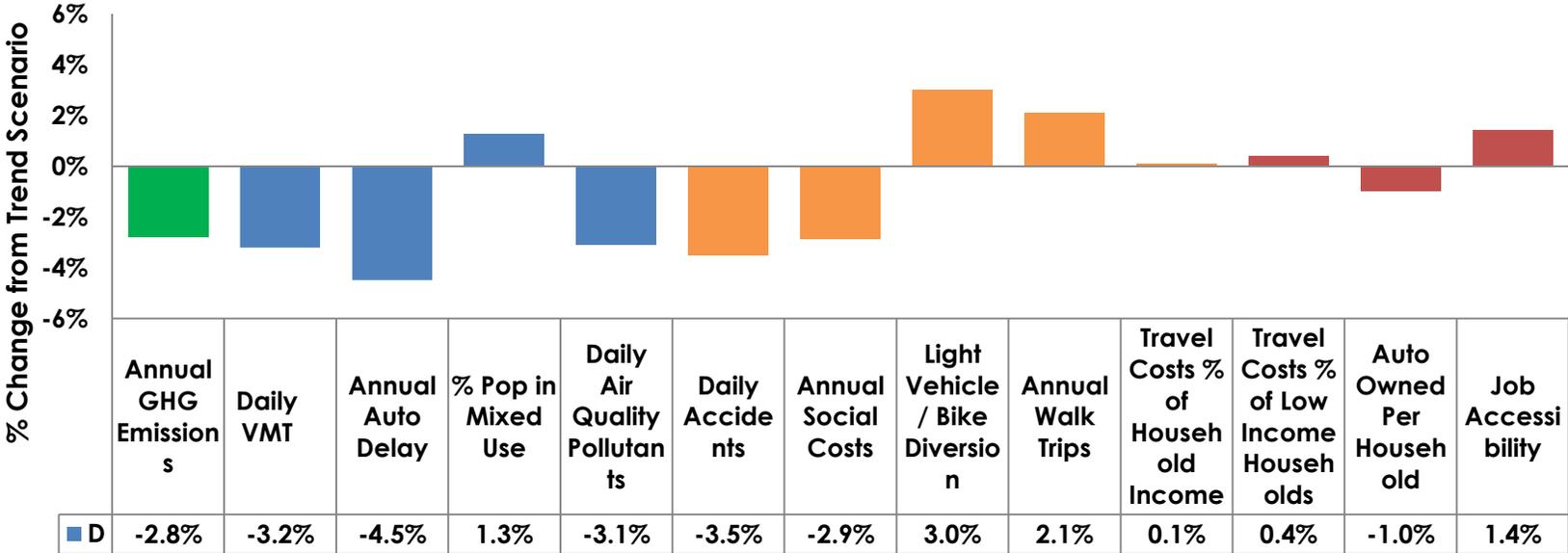
# Policy Bundle- Scenario D

In this policy bundle, household growth is shifted to central Corvallis rather than outlying areas. Parking districts in central Corvallis are expanded and the fees in downtown are increased in response to the increased population densities. Transit frequencies are increased to 15 minutes for the am and pm peak periods and expanded bicycle and pedestrian facilities are added. Car sharing vehicles were also added. These investments are strengthened with increased travel demand management outreach programs.

Land Use	Parking	Alternative Modes	Transportation Options
Increase development in central areas	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>

## Findings

The increased transit frequencies have a similar positive effect as Scenario B (without the expanded transit routes), resulting in similarly positive impacts across each evaluation criteria. Although the combined transit and land use, bike and car share policies benefit lower income households travel costs, this is offset by higher parking fees, resulting in a slight increase in costs for these households. Nonetheless, capitalizing on past multi-modal investments in this area of diverse incomes, this scenario has the largest impact on auto dependence (high zero income households and alternative mode use).



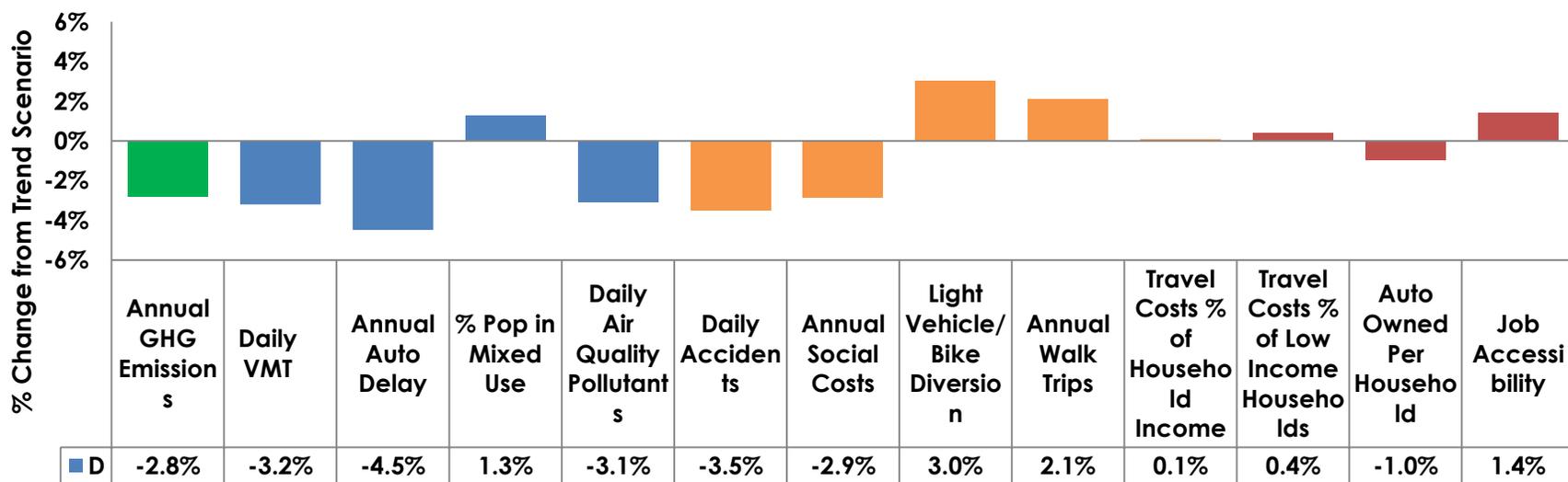
## Policy Bundle- Scenario E

In this policy bundle most new development is concentrated near alternative mode facilities. Approximately 25% of household growth is moved to transit oriented developments (TOD) in South Corvallis. Parking districts in central Corvallis are expanded and fees are increased downtown, with the addition of cash-out parking programs at large employment centers. Transit frequencies are increased to 15 minutes for the am and pm peak periods and expanded bicycle and pedestrian facilities are added. Car sharing vehicles were also added.

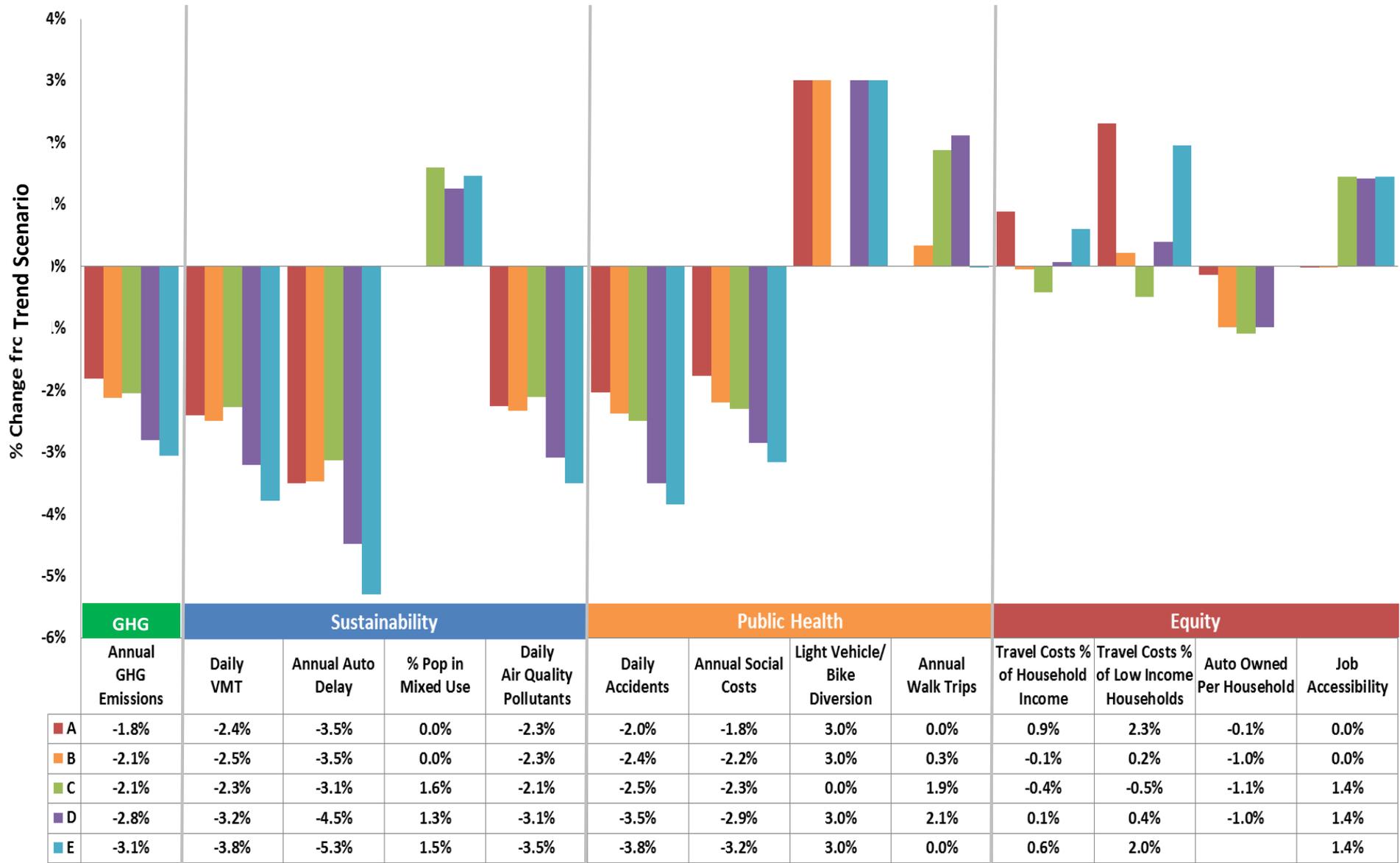
Land Use	Parking	Alternative Modes	Transportation Options
Most new development is concentrated near alternative mode facilities (South Corvallis TOD)	<ul style="list-style-type: none"> <li>Expanded parking districts</li> <li>Increased fees downtown</li> <li>Cash-out parking</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>

## Findings

This policy bundle represents the most ambitious combination, and as a result has the greatest overall impact beyond adopted plan levels on GHG emissions reduction, sustainability, and public health indicators. Directing new development into a dense mixed use district in the South Corvallis area combined with expansion of transit service with increased frequencies would allow individuals to make fewer trips and utilize alternative modes more often. Increased bicycle facilities and transportation options program levels also contribute to reduced VMT and increased alternative mode use. Increased parking management results in one of the larger increases in household travel costs (particularly onerous for low income households).



IMPACTS OF POLICY BUNDLES RELATIVE TO TREND SCENARIO



## Policy Bundle Key Findings

### GHG

Greenhouse gas emissions are reduced by almost 2% in all scenario bundles, reflecting land use changes that concentrate development in central areas in each of the three cities and/or aggressive transportation policies. The transportation only policy scenarios (A and B) have roughly the same impact as the Adair Village-Philomath growth scenario that is coupled with transit investment. A slight boost in benefits is found in the scenarios that concentrate growth in Corvallis, downtown or south Corvallis TOD. The South Corvallis TOD policy option, coupled with supportive transportation policies, provides the greatest GHG reduction (and most other measures) of all the policy bundles evaluated.

### Health

Health measures are positively impacted across each measure by all policy bundle scenarios. Each scenario lowers air pollution, crashes, and social costs beyond adopted plans by reducing trip length and encouraging alternative mode use. As with GHG, the Corvallis growth scenarios typically result in more benefits, and the Adair Village-Philomath growth impacts are on par with the transportation-only policy bundle scenarios. Walking however is more positively affected by scenarios with more concentrated land use patterns.

### Sustainability

Each of the policy bundles performs well on sustainability measures, as VMT and delay are reduced more than the trend scenario. As with other measures, the scenarios that included dense development in the core of the region experienced the greatest benefit.

### Equity

Policy actions that increase parking fees for individuals show negative impact on all scenarios, which is of particular concern for low income households. Scenario B with less parking or Scenarios C and D with offsetting policies (transit, bike, car share in particular) have less negative impact on household costs. Most scenarios are effective at reducing auto ownership, particularly the Adair Village-Philomath growth scenario with its increase in walkable densities and supportive transit. Scenario A with no change to adopted plans land use, transit, or car-sharing, showed negligible impact on auto ownership. All bundled scenarios enable an increase in zero vehicle households, with the central Corvallis growth scenario showing the greatest impact by building on existing quality multi-modal options serving a mix of incomes in the area. Modified land use, leads to improved accessibility, with more compact development of households and jobs in all scenarios.

## Climate Refugees (Increased Population Growth)

This scenario is intended to test the resiliency of the region’s currently adopted plans and policies to the pressures of increased population growth. Climate change and the prolonged drought in the American Southwest may have a profound effect on migration rates, seeing people move northward to areas with available water resources. The Climate Refugee scenario imagines what would happen if the current population growth forecasts are doubled, with an additional 7,500 households moving into the CAMPO region by 2040. Approximately 90% of the additional population growth would be accommodated on available land outside city core areas. A scenario bundle is also examined on the next page to test the resiliency of the policies under investigation to the same pressures of population growth.

TABLE 6 CLIMATE REFUGEE INPUTS

Climate Refugees	Trend Scenario 2040	Scenario Analysis 2040
Double population growth, 90% outside core areas	33,915 households	41,432 households

### Climate Refugees Key Findings

The findings demonstrate mixed results in relation to the evaluation criteria, resulting in negative impacts on some measures and positive impacts on others. Increased population growth would negatively impact GHG, VMT, and delay; yet could also result in an increased population living in mixed use areas which would increase the use of alternative modes of transportation.

### Greenhouse Gas Emissions Reductions

The large increase in population across the region with new development concentrated along the periphery of the downtown core results in increased GHG emissions from an increased amount of travel.

### Public Health

The population increase and associated automobile travel would result in an increase in air quality pollutants, while walking, bicycle, and transit trips would also increase as a result of the new population. The increase in population also result in an increase in the number of individuals living in mixed use.

### Sustainability

Automobile delay could increase substantially resulting from the increase in population competing for limited roadway capacity; yet job accessibility would increase due to the influx of individuals living in mixed use.

### Equity

Household travel costs could increase due to the number of households residing on the periphery of the region, but also the number of zero vehicle households could also increase resulting from the increase in population.

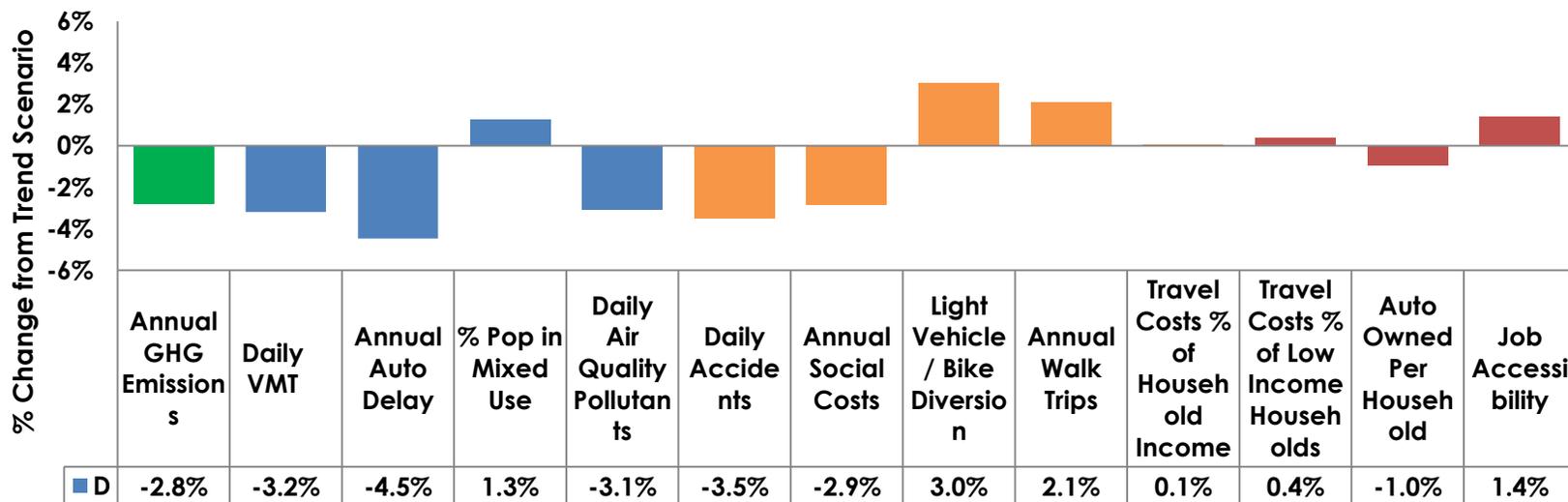
# Climate Refugees Policy Bundle

This policy bundle is built around the “climate refugee” growth scenario under which the region is subjected to much higher population growth from people fleeing drought in the southern states than anticipated under current growth forecasts. Over 90% of the increased growth is channeled into currently undeveloped areas, with already developed areas in the core growing by an additional 10% that would be accommodated by accessory dwelling units intended to retain the existing character of these neighborhoods. Similar to Scenario A, a full complement of aggressive transportation policies are implemented to mitigate the increased demand for travel. Due to the differences in population sizes, this policy bundle should not be comparable to the other scenarios.

Land Use	Parking	Alternative Modes	Transportation Options
Doubles the current population growth forecast	<ul style="list-style-type: none"> <li>Expanded Districts</li> <li>Increased fees downtown</li> <li>Cash-out Parking</li> </ul>	<ul style="list-style-type: none"> <li>Increased transit frequency</li> <li>Expand bicycle facilities</li> </ul>	<ul style="list-style-type: none"> <li>Home/Work-based Marketing</li> <li>Car Sharing</li> </ul>

## Findings

This policy bundle is heavily influenced by the large increase in population, which increases the share of population in mixed use areas with access to transit and walkable, bikeable destinations. Many of the potential negative effects of density are offset through aggressive investments in alternative modes and Transportation Options program, with benefits to public health measures (active mode use, reduced crashes) and equity (reduced auto ownership and associated costs). While automobile delay increases as a result of more individuals utilizing the transportation system, most other per capita measures show significant improvement (e.g, reduced VMT, emissions, crashes, increased alternative mode use).



## Conclusions

The policy options and scenarios constructed for the Scenario Analysis are best case representations of policies and investments that could potentially be implemented in the CAMPO region. The findings show that if each of the scenarios are pursued, beyond the adopted plans, the region will be heading in a more positive direction, with slight negative impacts from parking policy costs. The results range from up to 5% above adopted plans levels when tested in combination, while individual policies result in much smaller changes beyond adopted plans, between 1-2%. This illustrates the importance of combining supportive policies in order to gain the most benefit from investments. Compact mixed use land use strategies even when dispersed (and supported by transit service) not only create walkable, bikeable destinations for obtaining goods and services, but can minimize the equity impacts of transportation policies that raise household transportation costs for low income households. Mixed use development and alternative mode investments are best complemented with supportive parking management and transportation options programs that have the largest impacts on shifting travel to alternative modes. This is especially effective and equitable when building upon the region's success in establishing a multi-modal region in central Corvallis, or extending it to other areas. By acting on combinations of policies included in this analysis the CAMPO region could realize many of the benefits provided by these types of policies.

### Policy Considerations for Region

The analysis demonstrates that scenarios which include mixed use development, enhanced transit, increased parking management, and Transportation Options programs provide the largest benefits to the region. Implementing combinations of these policies provide the greatest positive impact on the evaluation criteria of GHG emission reduction, sustainability, public health, and equity. Looking to the future the region will need to prioritize policy choices and investments in order to achieve regional goals within fiscal constraints. To maximize the benefits of policies on community goal areas, this analysis offers the following considerations:

- Compact mixed use development reduces the distance that individuals travel to access daily needs.
- Transit enhancements have the greatest impact across each community goal area.
- Pairing transit investments with mixed use development results in the largest benefits.
- Transportation and land use investments in the city core provides the most benefit to lower income households.
- Providing alternative modes of transportation in parking fees areas reduces equity impacts.
- Transportation Options programs are most effective when targeted and combined with supportive policies.
- Parking fees have a larger benefit on goal areas when paired with residential parking permit programs.
- Car share, compact mixed use growth, and transit policies showed the largest reductions in auto ownership; parking policies had the least effect.
- A slight increase in benefits across all goal areas is found in the scenarios that concentrate growth within the City of Corvallis.

# Appendix

## Land Use Inputs

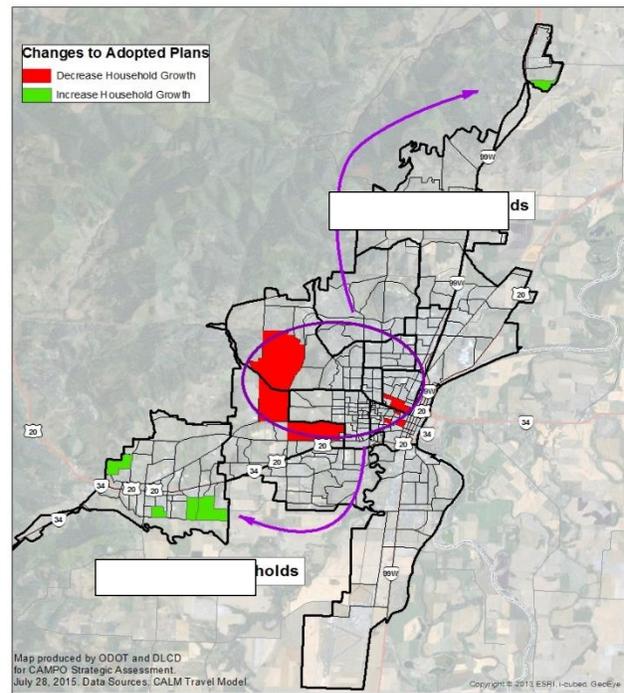
Three regional land use patterns were identified for inclusion in the scenario analysis: decentralized growth, centralized growth, and concentrating growth near alternative mode facilities. Each scenario assumes a share of future regional household growth and redirects it to areas identified through consultation with planning staff from each jurisdiction. Household growth was reassigned based upon the proportion of regional population in the base year. The total household growth over the adopted plans horizon is approximately 7,500 households, each Land Use policy option input reallocates roughly 20% of this household growth control total.

### LAND USE POLICY INPUTS

Policy Option	Adopted Plans 2040	Scenario Analysis 2040
1 Decrease developments in central area and direct new developments to outer areas	363 new households to Philomath 600 new households to Adair Village	914 new households to Philomath 1,333 new households to Adair Village
2 Increase developments in central areas	374 new households in central/downtown Corvallis	1,283 new households in central/downtown Corvallis
3 Most new development is concentrated near alternative mode facilities	2,580 new households in S Corvallis area	3,863 new households in S Corvallis area

### Decrease Developments in Central Areas

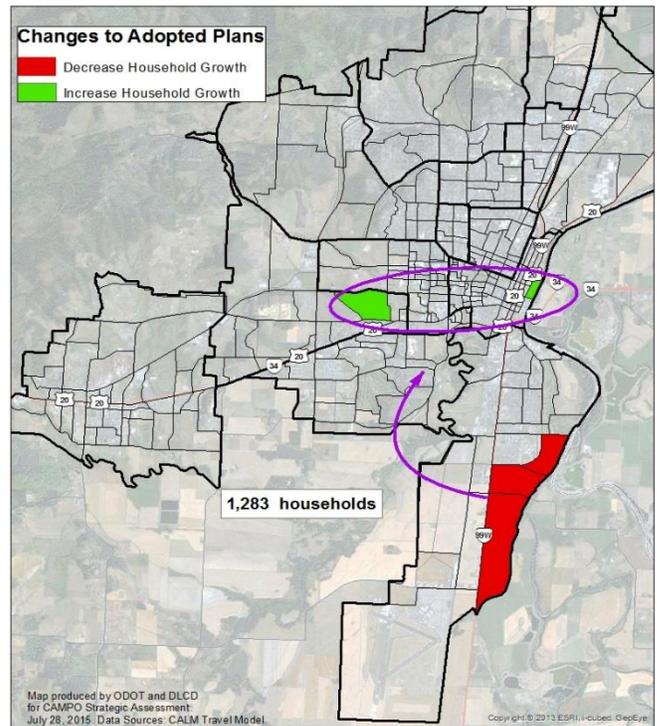
This scenario redistributes 914 additional households to Philomath and 1,333 additional households to Adair Village from the growth areas identified in the City of Corvallis Comprehensive Plan. The project team worked with staff from Philomath and Adair Village to identify areas where this growth could potentially be accommodated, this scenario redistributes approximately 10% of the growth assumed over the planning horizon. Figure A-1 identifies the areas where the growth is redistributed in this scenario.



**Figure A-1: Household Allocation for Land Use Policy Option 1**

### Increase Developments in Central Areas

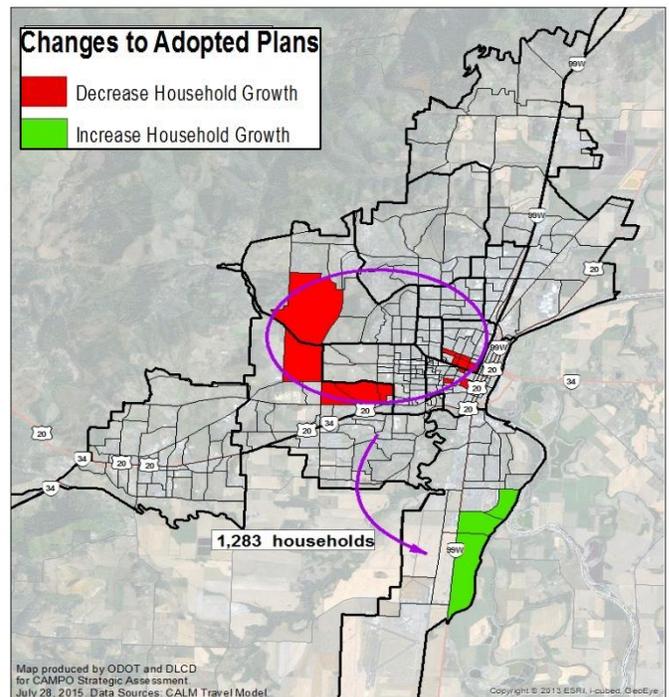
This scenario redistributes 1,283 new households from outer areas in South Corvallis targeted for growth in the City of Corvallis Comprehensive Plan, and redirects the growth to more centralized areas of the city. Figure A-2 identifies the areas of redistributed growth in this scenario.



**Figure A-2: Household Allocation for Land Use Policy Option 2**

### South Corvallis Transit Oriented Design

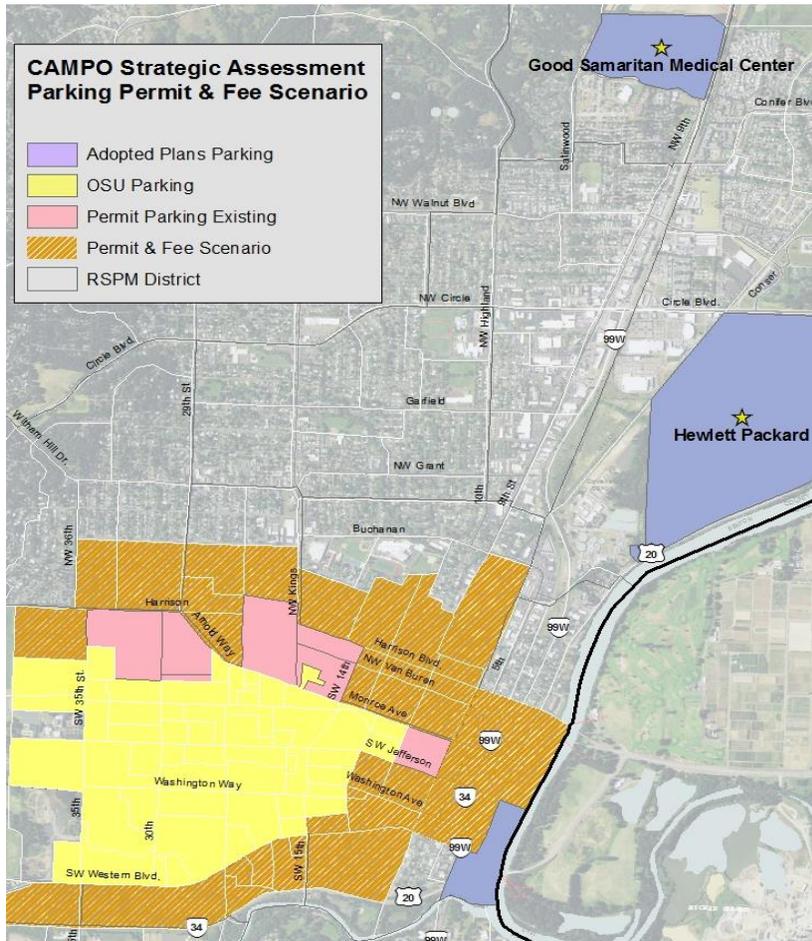
This scenario redistributes 1,283 households to a Transit Oriented Design (TOD) in south Corvallis. As shown in Figure A-3 below, the majority of households were taken from growth areas on the periphery of the Corvallis Urban Growth Boundary. This scenario assumes a higher level of the population living in a mixed-use development than each of the other land use inputs.



**Figure A-3: Household Allocation for Land Use Policy Option 3**

## Parking Management

Two different types of parking policies are tested in the scenario analysis, expanding parking district regulation and increasing parking pricing. Parking regulation controls who, when, and for how long vehicles may park in a parking district. Parking pricing means drivers pay directly for the use of parking facilities both on and off the street.



**Figure A-5: Parking Policy Input Locations**

or assumed to drop to zero with the expansion of the neighborhood parking district system.

### Increase Parking Fees Downtown

Under this scenario, parking fees for the existing paid areas in Corvallis are increased from an average of \$1.20 per day to \$5 per day, matching the existing parking costs at OSU, the coverage area is unchanged.

### Cash-out Parking Programs

Cash-out parking programs are an employer sponsored parking management policy, in which employers who provide subsidized parking for their employees offer a cash allowance as an alternative to using the parking space. The policy's intent is to reduce driving by offering

### Expanded Parking Districts

As shown in Figure A-5, the existing neighborhood parking permit districts near downtown and OSU are expanded to fully surround the OSU campus. The district is a time limited parking restriction, with permits for neighborhood residents. Multiple parking fee evasion levels are evaluated using information from the 2015 City of Corvallis-OSU Parking Utilization study, which assessed parking in the neighborhoods that border the fee areas downtown and at the university. The final analysis assumes a mid-level value where approximately 10% of trips attracted to the area avoid paying parking fees in the base year, which is either retained in the trend scenario,

employees the option of “cashing-out” their subsidized parking space and taking an alternative mode to work. Under current adopted plans less than one percent of work trips are subject to a cash-out parking program, while the scenario analysis tested a rate of 6.7% of work trips participating in a cash-out option.

**PARKING POLICY INPUTS**

Policy Option	Adopted Plans 2040	Scenario Analysis 2040
1 Expanded parking districts	Existing Neighborhood Parking Districts	Expands coverage surrounding University
2 Increase parking fees downtown	\$1.20/\$5 per day	\$5 per day
3 Cash-out parking programs	Less than 1% work trips	6.7% work trips

**Alternative Modes of Transportation**

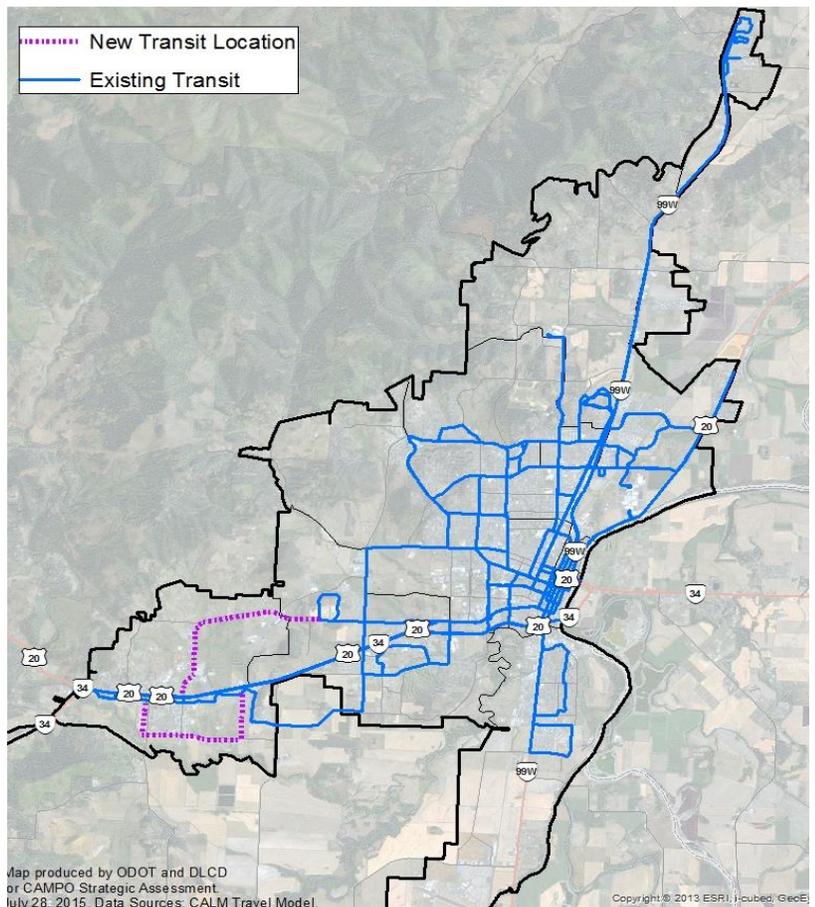
Transit and bicycle policies are explored as alternative modes of transportation. Transit is analyzed in both increasing frequencies of existing routes and by expanding routes into Philomath and Adair Village. An expansion of bicycle facilities is also analyzed.

**Increase Transit Frequencies**

Under this scenario, existing transit service frequencies for the entire system are increased to 15 minute headway in the pm peak periods on weekdays, adopted plan levels include 15 and 30 minute headways in the pm peak periods on weekdays. This roughly doubles the service miles per capita provided in the region, from 6 to 11.94 service miles per capita.

**Expand Transit to Philomath and Adair Village**

This scenario envisions expanded transit routes to Philomath and Adair Village with the higher frequency 15 minute headways in peak periods. This increases transit service levels in the region from roughly 6 service miles per capita under adopted plans to 12 service miles per capita.



**Figure A-6: Existing and Expanded Transit Locations**

## Expand Bicycle Facilities

As a strategic, household-based model, the RSPM evaluates the effect of short trips being diverted from driving to bicycles or other light vehicles. Bike diversion is a number reflecting the percentage of trips under 20 miles roundtrip that are diverted from auto to bike modes. This diversion level was estimated based on anticipated regional investment in cycling facilities and promotional efforts. The expanded facilities scenario assumes the 12% regional average diversion rate of the trend scenario is increased up to 24% diversion within areas surrounding the OSU campus to represent investment in bicycle facilities in the area.

### ALTERNATIVE MODE POLICY INPUTS

Policy Option		Adopted Plans 2040	Scenario Analysis 2040
1	Increase transit frequency	15 & 30 min headways (pm peak)	15 min headways (pm peak)
2	Expand transit to Philomath and Adair Village	11.94 service miles per capita	12.24 service miles per capita
3	Expand bicycle facilities	20% diversion	12-24% diversion (higher surrounding OSU)

## Transportation Options Programs

Transportation options programs and incentives (also referred to as “Transportation Demand Management”) create more choice in transportation systems, encouraging people to bike, walk, take transit, share rides, and telecommute. The two transportation options program areas identified by the CAMPO Policy Board are marketing programs and a car sharing program.

### Home/Work-based Marketing

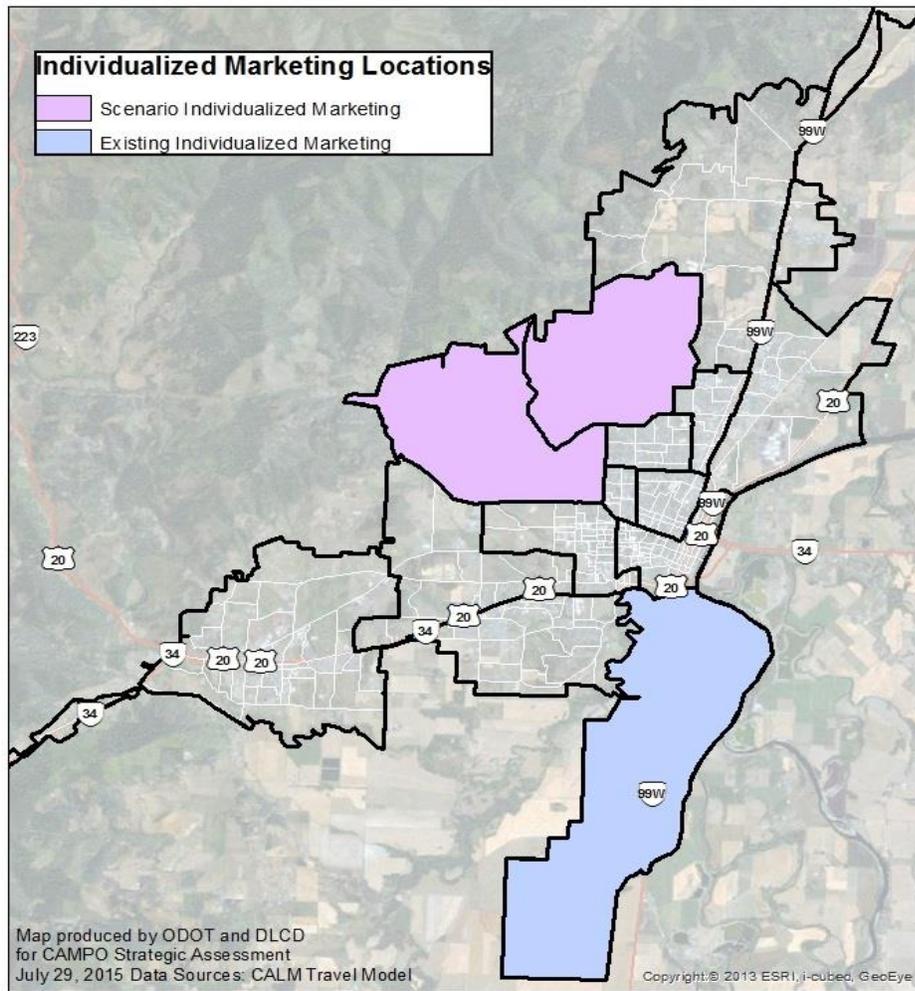
Marketing programs are analyzed based upon the assumptions of what percentage of households participate in the program. Marketing programs can be run as either home-based Individualized Marketing, where specific neighborhoods are targeted, or as work-based, where specific employment sites are targeted. Cascades West Council of Governments currently manages the transportation options marketing programs for the CAMPO area, and identified the areas where the expanded programs should be targeted. The existing programs were expanded beyond adopted plans levels from a 5% home-based/3% work-based participation rate under the current program, to a 5.2%/5.4% participation rate respectively. Figure A-7 shows the areas that are targeted for home based Individualized Marketing programs.

### Expanded Car Sharing

Car sharing programs give households the option of owning fewer or no cars by providing an alternative to car ownership. This scenario increases car sharing vehicles from 50 to 59 in the region. A car share program is currently operated on the OSU campus by Enterprise Rent a Car.

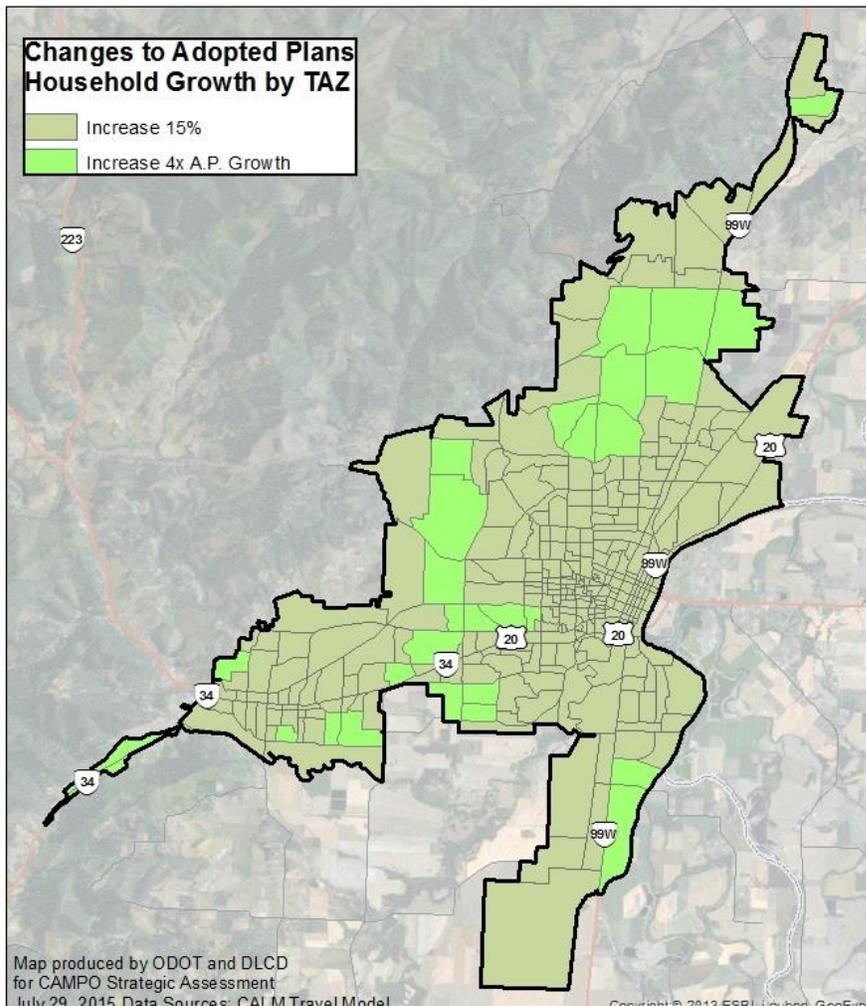
**TABLE 7 TRANSPORTATION OPTIONS INPUTS**

Policy Option	Adopted Plans 2040	Scenario Analysis 2040
1 Home/Work-based marketing programs	5% home based/3% work based	5.2% home based/5.4% work based (home based expands IMP pilot in 3 districts)
2 Expanded car sharing	50 vehicles	59 vehicles



**Figure A-7: Home based Individualized Marketing Input Locations**

## Climate Refugees (Increased Population Growth)



**Figure A-4: Household Allocation for Land Use Policy Option 4**

70% of the additional population growth would be accommodated in available land outside of the city core areas, as growth in developed areas is limited to 10% increase via auxiliary units that retain the neighborhood’s character.

This scenario is intended to test the resiliency of currently adopted plans, as well as the policies under analysis to the pressures of increased population growth. Climate change and prolonged drought and severe weather anticipated for parts of the U.S. may have a profound effect on migration rates as people move to the Pacific Northwest. The Climate Refugee scenario imagines what would happen if the current 2010-2040 population growth forecasts are doubled, with a total of 15,000 additional households moving into the CAMPO region of 55,000 households in 2010. Approximately

Scenario	Adopted Plans 2040	Scenario Analysis 2040
1 Climate Refugees (2x population growth, nearly 70% outside core areas)	33,915 households	41,432 households