

## MEASURES, EVALUATION CRITERIA AND METHODOLOGY FOR IMPLEMENTATION

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**Date:** March 29, 2012 **Project #:** 11732

**To:** Project Management Team

**Cc:** Technical Advisory Committee, Public Advisory Committee

**From:** Susan L. Wright, P.E.; Marc A. Butorac, P.E., P.T.O.E.; Kelly M. Laustsen; and Erin M. Ferguson, P.E.

**Project:** Clackamas County Transportation System Plan Update

**Subject:** Technical Memorandum 6.1 - Measures, Evaluation Criteria and Methodology for Implementation

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This memorandum presents the draft measures and criteria developed to evaluate and assess progress toward Clackamas County's Transportation System Plan goals and objectives. The information is divided into two sections:

- *Key Definitions* establishes a common understanding of the evaluation tools and plan elements.
- *Measures and Evaluation Criteria* presents the draft measures, evaluation criteria and process (methodology) for implementing and applying the definitions.

### Key Definitions

Two sets of key definitions are presented here:

- *Evaluation Tools* establish a common understanding of the tools (i.e., vision, goals, objectives, measures, criteria) that will be used to assess the existing transportation system.
- *Plan Elements* (i.e., policies, programs, projects, pilot projects, studies), which will be the primary content of the County's updated Transportation System Plan.

## EVALUATION TOOLS

The evaluation tools -- The TSP's vision, goals, objectives, measures and evaluation criteria -- provide the foundation for assessing the existing transportation system and potential future planned projects, programs and policies.

**Vision** – An aspirational description of what the future transportation system will look like and how it will influence quality of life in Clackamas County.

**Goals** - The desired outcomes or other more refined expressions of the vision.

**Objectives** – More refined and focused descriptions of goal statements, describing how a goal can be accomplished.

**Measures** - Quantitative or qualitative tools to assess progress towards objectives.

**Evaluation Criteria** - Standards used to estimate how well a project, policy, program or study achieves the objectives.

**Performance Measures** - Specific evaluation criteria used for long-term tracking of achievement of goals. *(Performance measures for monitoring the TSP will be identified later in the project after the preferred plan is developed.)*

## PLAN ELEMENTS

The final, updated Clackamas County TSP will include the following elements, which will be assessed using the evaluation tools defined above.

**Projects** - Capital investments made to improve the existing transportation system and support the movement of people, goods, and services.

**Policies** – Statements adopted in the Clackamas County Comprehensive Plan that are intended to influence and guide County decisions and actions relating to transportation. These policies are set out and implemented by county ordinances such as the Zoning and Development Ordinance (ZDO).

**Programs** - Plans of action aimed at accomplishing an identified county goal(s) and/or objective(s) that commonly include such details on what work is to be done, by whom, when, and the intended outcome of the action.

**Pilot Project** – An activity planned as a test or trial of a transportation project or program.

**Future Studies** - Research and investigation to be completed at by the County after the updated TSP is completed. Such studies will not be done during the TSP update process due to lack of available data, a need for guidance and/or analysis from responsible agencies, and/or the need for a focused public involvement and analysis process beyond the TSP scope of work and budget.

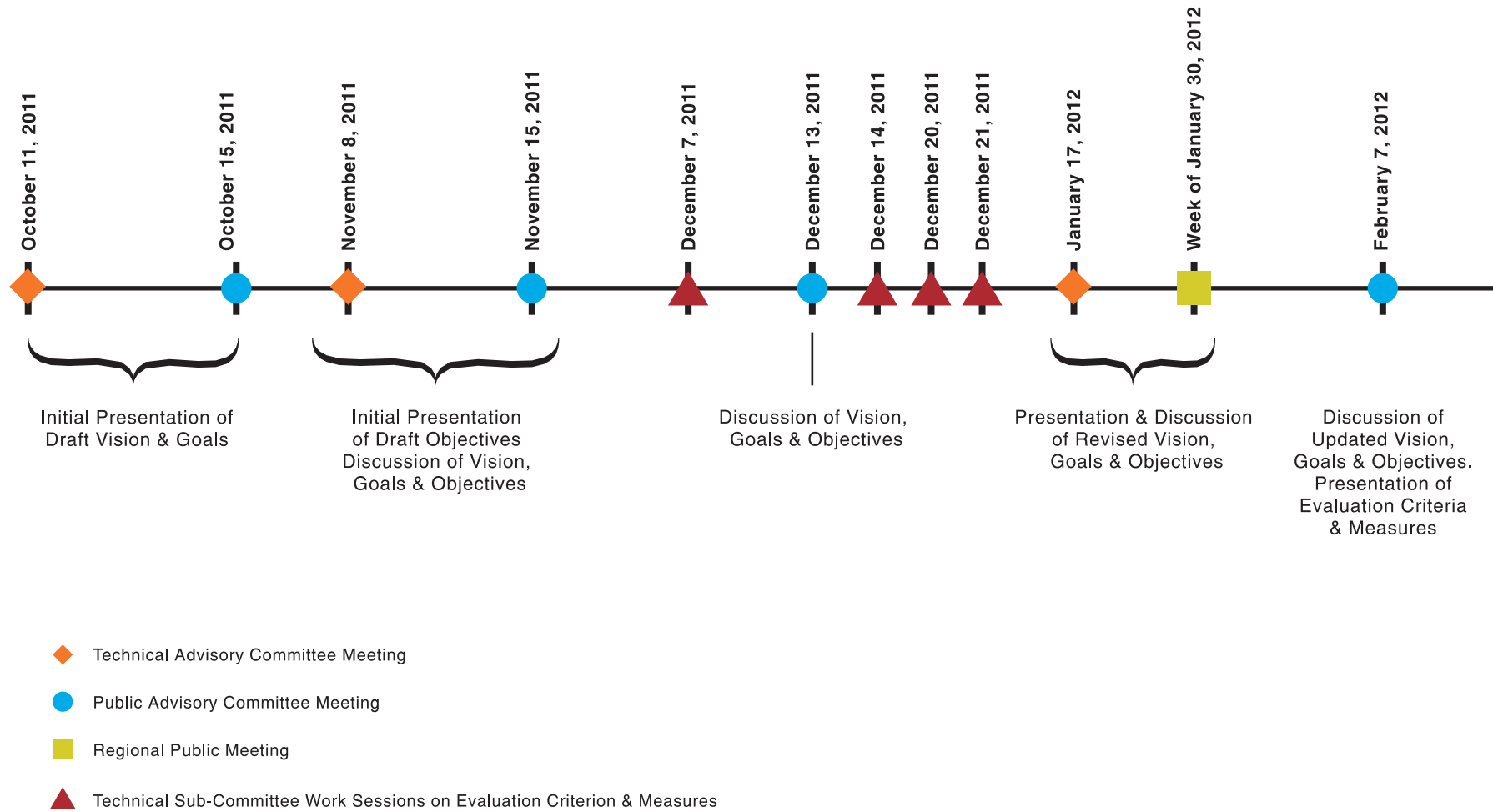
## Measures and Evaluation Criteria

The TSP measures and evaluation criteria are being developed in coordination with development of the plan's goals and objectives. Figure 1 illustrates the development process timeline.

As shown, the initial draft goals and objectives were developed and discussed with the Technical Advisory Committee (TAC) and Public Advisory Committee (PAC) at several meetings during October, November, and December of 2011. During these meetings, the groups worked to develop goals and objectives that are meaningful across the County's diverse communities and geography. Additional meetings in January and early February 2012 will further refine and finalize the goals and objectives; the final set of goals and objectives will be prepared after the February 7 PAC meeting.

Development of initial draft measures and evaluation criteria began in December 2011, and was updated based on input received on the draft goals and objectives at the December 13 PAC meeting. The initial draft measures and evaluation criteria were developed through two sets of work sessions, with two technical sub-committees:

- The first sub-committee focused on two goals:
  - Safety and Health (Goal 4) and
  - Equity (Goals 5).
- The second sub-committee focused on four goals:
  - Sustainability (Goal 1),
  - Local Businesses and Jobs (Goal 2),
  - Livable and Local (Goal 3), and
  - Fiscally Responsible (Goal 6).



The sub-committees included experts in transportation engineering and planning as well as community health, social services, and equity. The sub-committees:

- Considered and discussed measures and evaluation criteria applied by other agencies;
- Reviewed national research related to transportation, health, sustainability and equity,
- Brainstormed measures and evaluation criteria for each of the draft objectives.;
- Identified the general data needed to apply the potential measures, and
- Modified or revised measures, as needed, if there was a known lack of data.

The draft measures and evaluation criteria developed by the sub-committees are intended to be the most appropriate given available data, state of the practice, industry standards, guidance and requirements.

The work of the two sub-committees was combined with input from the TAC and PAC to produce one set of draft measures and evaluation criteria. In this process, the consultant team realized there were a number of objectives stated in a similar manner that overlapped across several of the goals. A common version of each of these objectives was developed to be applied consistently across the goals. At the end of this document are tables that describe the draft objectives and measures from two perspectives.

These tables are:

- Table 1: Summary of draft objectives and measures illustrating which goals each of the objectives and measures help to assess progress towards.
- Table 2: Additional technical details for the Project Management Team's reference and use in implementing and applying the objectives, measures and evaluation criteria.

The following section provides a description of each of the draft measures selected to evaluate the TSP plan elements (including Projects, Plans, and Policies) and determine if they help the County to achieve the plan's goals and objectives.

## Draft Measures

The following describes the draft measures selected to evaluate the TSP plan elements (including Projects, Plans, and Policies). These measures will be used to determine if a proposed plan element helps the County to achieve its goals and objectives for the transportation system. The way in which these measures will be applied will vary based on whether the project, program or policy is primarily urban; primarily rural; or impacts rural and urban areas relatively equally.

The measures have been grouped into themes for easy review and reference.

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**BIKE/PEDESTRIAN**

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
3.2, 3.5, 5.6	<b>Access to Schools</b>	Identify gaps in facilities for walkers and bicycle-riders on local roads that provide access to schools.	Provide comfortable, safe multi-modal options for school-age children, and improve the livability of neighborhoods.
1.1.1, 1.4, 2.1, 2.3, 3.1, 3.5, 4.3, 4.6, 5.1, 5.4, 5.6	<b>Bike and Pedestrian Facilities</b>	Quantify miles of bicycle and pedestrian facilities, such as sidewalks, bicycle lanes, multi-use paths, and sufficiently wide shoulders.	Assess progress towards increasing the miles of facilities for non-motorized travel. Assess the impact of projects, programs and policies on that mileage. The project team will consider setting a target mileage or percentage increase for miles of non-motorized travel.
4.6	<b>Bike and Pedestrian Network on Low Volume Roads</b>	Identify the percentage of bike and pedestrian facilities on low-volume roads (collectors and local roads) compared to all such facilities in the County.	Reduce the exposure of bicyclists and pedestrians to transportation-related air emissions and increase safety.
1.1.1, 1.4, 2.1, 2.3, 3.1, 3.5, 4.3, 4.6, 5.1, 5.4, 5.6	<b>Gaps in Non-Motorized Network</b>	Determine the percent of networks, e.g., bicycle network, with facility gaps.	Determine which projects, programs and policies help fill the gaps.

**FUNDING**

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
1.5, 6.3	<b>Budget Allocations</b>	Near-term financial resources available for transportation-related projects, programs and processes.	Identify stable, diverse, long-term funding for capital projects, transportation operations and maintenance, and the allocation of funds to these major categories.
1.5, 6.3	<b>Funding</b>	Longer-term potential, viable sources of money for future transportation projects.	Develop a list of financially feasible projects with stable, diverse and long-term funding sources
6.4	<b>Public Right-of-Way</b>	Identify land needed to be reserved for public use, such as a roads, trails or utilities.	Ensure sufficient land is available in needed locations for future projects. Help avoid or reduce right-of-way costs.
6.1, 1.7	<b>Transportation Maintenance</b>	Identify the percent of the transportation network that needs maintenance based on the quality of the facilities.	Help determine the level of maintenance needs as compared to needs for expanded or new facilities.

**ENVIRONMENT**

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
1.1.4, 4.7	<b>Alternative Energy Programs</b>	Identify and determine the current effectiveness of existing programs and activities encouraging the use of alternative-fuel and fuel-efficient vehicles.	Identify current activities that are successful and identify improvements to unsuccessful activities.
		Quantify the number of new programs / actions taken to encourage use of alternative-fuel and other fuel-efficient vehicles.	Track the effectiveness of programs/actions designed to encourage use of alternative-fuel and other fuel-efficient vehicles.

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
4.6	<b>Construction Emissions / Best Management Practices</b>	Building or working on transportation facilities can result in releases of substances that are harmful to the environment.	Encourage use of best management practices during construction to reduce emissions that could be harmful to the environment or humans.
1.3	<b>Green Street Design Elements</b>	Landscaped areas sized and shaped to collect rainwater and treat it naturally, e.g., bio-swales, bio-retention ponds; an alternative to conventional street drainage systems.	Improve the health of the watershed by supporting the balance between urban development and natural hydrological processes.
1.3	<b>Sensitive Habitat</b>	Conservation areas, animal habitat, river corridors and wilderness areas	Minimize negative impact from transportation system
4.6	<b>Sensitive Uses Near Major Roadways and Freight Routes</b>	The health of people schools, parks and senior living centers within 1/4 mile of high traffic roadways and freight routes are negatively impacted by transportation-related emissions.	Reduce community members' exposure to transportation-related emissions with particular attention to children and senior citizens.
1.2, 4.5	<b>Transportation Emissions (in tons)</b>	Carbon dioxide, carbon monoxide, volatile organic compounds, nitrogen oxide and other air toxins are produced from transportation-related activities.	Measure the impact of transportation-related emissions on air toxins and work to reduce those emissions.
1.1.4, 4.7	<b>Vehicle Energy Efficiency</b>	Assess the number of programs and activities as well as the infrastructure available to accommodate those vehicles.	Improve air quality, thereby improving the health of the environment and of community residents.



**CAPACITY FOR MOTORIZED VEHICLES**

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
2.2	<b>Level of Service</b>	Level of service for motorized vehicles is a letter grade assigned to intersections based on the average amount of delay during the peak commute periods a motorist experiences at that intersection. The letters assigned are A through F with A representing minimal delay and F representing the highest amount of delay.	Determine the impact a project has on the amount of delay a motorist experiences at an intersection during peak periods.
2.2	<b>Volume-to-Capacity Ratio</b>	Ratio representing the amount of capacity being used at an intersection during the peak period. A ratio of 0.75 means 75% of the intersection's capacity is being used. A ratio greater than 1.00 means the intersection does not have enough capacity to serve all of the motorists that want to travel through it.	Determine the impact a project has on amount of capacity available to serve motorists.
2.2	<b>Average Travel Time</b>	Average length of time it takes to make a certain trip at a certain time of day; indicates general traffic conditions	Determine the impact of projects on travel time.
2.2, 2.6, 6.5	<b>Travel Time Reliability</b>	Consistency in vehicular travel time. For example, does the same trip always take 10 minutes or does it vary widely from one day or one time period to the next. Travel time reliability applies to roadway segments and corridors. It considers delays, impediments to traffic flow beyond what occurs at specific intersections.	Increase travel reliability for all transportation modes.

1.1.3, 1.2, 4.5, 5.3	<b>Vehicle Miles Traveled (total and per capita)</b>	Measure vehicle miles traveled in general and on a per capita basis to account for population growth and assess how driving habits are changing.	Reduce vehicles miles traveled per capita.
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**SAFETY OF THE TRAVELING PUBLIC**

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
4.1	<b>Safety Culture</b>	Activities and programs that support expanding a safety culture through coordination between transportation engineering, law enforcement, medical services, and education.	Increase the prevalence of safety considerations across multiple county departments. Increase the prevalence of safety considerations for county residents in their day to day travel. Encouraging everyone to make safe choices. Reduce the potential of future crashes.
4.2	<b>Emergency Vehicle Response Time</b>	How long it takes for a fire truck, ambulance, sheriff's deputy or other emergency vehicle to get to the site of an emergency. Includes considering alternative routes available particularly within rural areas.	Support systems that decrease response time for emergency vehicles.
3.2	<b>Safe Routes to School Plans</b>	Identify the number of schools with Safe Routes to School plans. Provide support to schools in developing and implementing Safe Routes to School plans.	Facilitate projects, education programs and other activities that enable school-age children to safely walk and bicycle to school.
4.2	<b>Space for Incident Management and Emergency Vehicles</b>	Adequate space is needed to clear vehicles and allow for emergency vehicle to maneuver for incidents such as crashes and disabled vehicles.	Support systems that increase space needed to quickly and efficiently respond to incidents.
4.1	<b>Vehicle, Pedestrian and</b>	Evaluate and analyze the	Identify safety

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
	<b>Bicycle Crashes</b> <ul style="list-style-type: none"> <li>• <b>Inventory</b></li> <li>• <b>Severity</b></li> </ul>	number and location of crashes on County roadways over the last 3-5 years. Quantify crashes based on resulting fatality, injury or only property damage.	improvement locations and assess the potential of projects, programs and policies to reduce crashes.

**SOCIAL/COMMUNITY**

<b>Applicable Objectives</b>	<b>Measure/ Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
3.7	<b>Design Elements</b>	Identify and encourage use of design elements in transportation facilities that improve livability, community cohesiveness and civic amenities.	Improve livability, community cohesiveness and civic amenities.
2.1, 3.6, 5.7	<b>Employment Area Accessibility</b>	Increase options for people to reach their place of employment.	Increase options for employees to get to work and thereby increasing the attractiveness of job sites to employers, employees, customers and business partners.
1.4, 3.8	<b>Land Use and Transportation Integration</b>	Transportation system performance depends on land use factors (e.g., zoning, distance between destinations, etc.) that cannot be addressed just with transportation planning.	Be aware of land use factors that impact the transportation system, including requiring a larger system and/or a more auto-oriented system.
1.4, 3.8	<b>Travel Network Connectivity</b>	The density of frequency of system links within an area, and how direct the links are between various residential and activity centers (shopping, jobs, etc.)	Increase connectivity to reduce travel distances, improve accessibility, provide flexibility to adapt to changing land uses and increase travel options.
3.10, 4.9, 5.4	<b>Access to Transportation for Transportation Disadvantaged Populations</b>	Transportation Disadvantaged Populations are populations who have historically had significant unmet transportation needs or who have experienced disproportionate negative impacts from the	To identify areas with a high proportion of transportation disadvantaged, identify their needs, and determine if proposed

		<p>transportation system. Examples of people that historically have high unmet needs include people who cannot drive (due to age or ability), are experiencing poverty (cannot afford the costs of a car and/or transit), and people with limited mobility. The types of negative impacts they typically experience disproportionately to the rest of the population include increased exposure to air and noise pollution, decreased community connectedness from major transportation investments, increased danger of injuries or death from transportation-related incidents, and living far from areas with amenities due to the high cost of housing.</p>	<p>projects or policies will improve their access to transportation.</p>
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**TRANSIT**

<b>Applicable Objectives</b>	<b>Measure/Evaluation Tool</b>	<b>Description</b>	<b>Purpose</b>
1.1.2, 2.4, 3.3, 4.4, 5.2	<b>Infrastructure</b>	Includes amenities at transit stops such as park n' ride facilities, covered shelters, benches, waiting rooms, public restrooms, sidewalks connecting to the stop, lighting and/or other features to increase sense of personal security.	Support increased amenities to improve the quality of service for transit riders.
1.1.2, 2.4, 3.3, 4.4, 5.2	<b>Service Coverage</b>	Identify populations and destinations reasonably accessible with transit service; areas within 1/2 mile of a transit stop.	Determine the extent to which projects, programs and policies impact access to transit or increase transit options.
1.1.2, 2.4, 3.3, 4.4, 5.2	<b>Service Frequency</b>	How often a transit vehicle stops at a specific location.	Increase transit service frequency to improve quality of service for transit riders.
1.1.2, 2.4, 3.3, 4.4, 5.2	<b>Service Schedule</b>	The number of hours and time of day transit service is	Increase hours or the feasibility of increasing

Applicable Objectives	Measure/Evaluation Tool	Description	Purpose
		provided.	hours to provide additional transit opportunities.
<b>1.1.2, 2.4, 3.3, 4.4, 5.2</b>	<b>Transit Stops with Access to Pedestrian/Bicycle Facilities</b>	Identify stops with sidewalks, multi-use paths, bicycle lanes or wide shoulders that connect to essential destinations.	Improve public access to essential destinations.

## Application of Measures and Evaluation Criteria

The measures and evaluation criteria will be used for three TSP update activities:

1. Evaluating the existing transportation system and identifying areas for improvement;
2. Evaluating previously planned projects to determine whether they should remain on the list of planned improvements; and
3. Evaluating potential new projects, programs, policies and studies to improve the transportation system.

The measures and evaluation criteria will be applied to each of the plan elements described above using a variety of analysis tools (as noted in Table 2) including Metro travel demand model outputs, Geographic Information Systems (GIS) data, transportation operations analysis and qualitative assessments. Each element will be analyzed at one and/or two levels of detail:

- Project-Level–Assess individual projects, policies, programs, and studies, with the results guiding the general prioritization of these plan elements.
- System-Level–Applied to help determine whether the proposed system achieves and/or contributes to achieving the given objective and corresponding goal.

After the TSP update is completed, the County will also be able to use some of the system-level evaluation criteria to track the County’s TSP goals.

**TABLE 1 EVALUATION MEASURES - SIMPLIFIED MATRIX**

TSP Goals

- Goal 1: Sustainable - Provide a transportation system that balances benefits to the environment, economy and community.
- Goal 2: Local Businesses and Jobs - Plan the transportation system to support a prosperous and adaptable economy and further the economic well-being of businesses and residents of the county.
- Goal 3: Livable and Local - Tailor transportation solutions to suit the diversity of local communities.
- Goal 4: Safety and Health - Promote a transportation system that maintains and improves our safety, health and security
- Goal 5: Equity - Provide an equitable transportation system
- Goal 6: Fiscally Responsible - Promote a fiscally responsible approach to protect and improve the existing transportation system and implement a cost-effective system to meet shared future needs.

*X = Indicates an objective and associated measures help to assess progress towards: 1) Achieving the corresponding Clackamas County Transportation System Plan goal; 2) Comply with the state Transportation Planning Rule; and/or 3) Be consistent with Metro's Regional Transportation Plan.*

Objective Number	Objectives	Measures	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	RTP
1.1.1; 2.3; 3.1; 4.3; 5.1	Identify, maintain and improve networks of facilities for motorized and non-motorized travel	Bike and Pedestrian Facility Inventory	X	X	X	X	X		X
		Pedestrian and Bike Facility Gap Inventory							
		Multimodal Level of Service Analysis (MMLOS) for pedestrians and bicyclists at selected intersections							
1.1.2; 2.4; 3.3; 4.4; 5.2	Invest in and encourage public transit and connections to public transit	Transit service coverage	X	X	X	X	X	X	X
		Transit service hours							
		Transit service frequency							
		Transit stops with access to pedestrian facilities							
		Transit stops with access to bicycle facilities							
		Transit infrastructure (e.g., improvements to transit stop and/or							

Objective Number	Objectives	Measures	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	RTP
		Park 'n Ride amenities)							
		Multimodal Level of Service (MMLOS) for transit riders							
1.1.3; 2.5; 3.4; 5.3	Explore and encourage ridesharing, car sharing, transit pass programs, telecommuting and other transportation demand management strategies	Alternative Transportation Programs Participation	X	X	X	X	X		
		Vehicle Miles Traveled Per Capita							
1.1.4; 4.7	Encourage the use of alternative fuel vehicles and more fuel efficient vehicles	Identify Existing Alternative Energy and/or Fuel Efficient Programs/Activities and Number of New Programs/Actions	X			X			
		Alternative Transportation Programs Participation							
1.2; 4.5	Improve air quality by reducing transportation related emissions including reducing greenhouse gases to target levels	Vehicle Miles Traveled	X			X			X
		Transportation Emissions in Tons (CO2, CO, NOx, VOC, PM2.5, other air toxins)							
4.6	Reduce exposure to transportation-related air toxics	Bike and Pedestrian Network on Low Volume Roads				X			
		Sensitive Populations near Major Roadways							
		Construction Emissions							
1.3	Minimize water quality impacts of transportation-related activities	Use of Best Management Practices	X						
		Green Street Design Elements (in Urban Areas?)							
		Sensitive Habitat (acres impacted)							

Objective Number	Objectives	Measures	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	RTP
1.5; 6.3	Stabilize existing sources of transportation revenue and identify stable, diverse, long-term sources of funding	Estimated Transportation Funding	X					X	X
		Assumed Transportation Budget Allocations							
2.1; 3.6; 5.7	Prioritize transportation improvement projects within and providing access to existing and future employment sectors	Employment Area Accessibility		X	X	X	X	X	
2.2	Promote efficient movement of people	Average Travel Time in Identified Corridors	X	X		X		X	X
		Travel Time Reliability							
		Multimodal Level of Service (MMLoS) for Vehicles at Selected Intersections							
		Volume-to-Capacity Ratios at Selected Intersections							
2.6	Improve freight movement	Travel Time Reliability		X				X	X
		Level of Service on Truck Routes at Selected Intersections							
3.5; 4.10; 5.6	Facilitate access to daily needs and services	Essential Destinations			X		X		X
		Transit Services, Bicycle Facilities, Pedestrian Facilities, and Roads between Residential Areas and Essential Needs.							
3.7	Identify and incorporate design elements that increase community livability and cohesiveness, and improve civic amenities	Transportation Facility Design Elements			X				



Objective Number	Objectives	Measures	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	RTP
1.4; 3.8	Promote a resilient transportation system that can adapt to evolving land use and fit the desired future, while meeting present needs.	Travel Network Connectivity Analysis	X		X			X	X
		Land Use and Transportation Integration							
3.9; 4.8	Maintain existing and enhance access to recreational opportunities and public lands	Access to Open Space (URBAN: Population within 1/2-mile access to open space by mode?)		X	X	X		X	
		Access to Open Space (RURAL: People with access to natural areas within 60 minutes by mode?)							
3.2	Improve Safe Routes to School Planning	Number of and Support for Developing Safe Routes to Schools Plans			X				X
		Pedestrian and Bike Facility Gap Inventory							
4.2	Optimize the transportation system's ability to facilitate emergency response services	Emergency Vehicle Response Time				X			
		Space for Incident Management and Emergency Vehicles							
4.1	Reduce crash frequency and severity of crashes for all modes of travel. Increase safety culture through on-going engineering, education, enforcement, encouragement, and evaluation.	Vehicle, Pedestrian and Bicycle Crash Inventory				X		X	X
		Severity of Vehicle, Pedestrian, and Bicycle Crashes							
		Enhance County Safety Culture							
3.10; 4.9; 5.4	Prioritize resources to address transportation needs of transportation disadvantaged populations within the County	Alternative Transportation Programs and Projects that Benefit Transportation-Disadvantaged Populations			X	X	X		X

Objective Number	Objectives	Measures	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	RTP
		Transportation-Disadvantaged Population Served By Other Modes of Travel							
3.11; 5.5	Create project outreach activities and decision-making process that provides meaningful opportunities for all residents to influence decision-making	Public Involvement Opportunities			X		X		X
5.8	Provide opportunities for low-income, minority workers and business owners to access/obtain jobs and contracts created by transportation investments	Minority-Owned Businesses Contracting -- Clackamas County shall comply with federal, state, and local open competitive procurement processes.					X		
1.7; 6.1	Prioritize repairs and maintenance of existing transportation facilities and services	Transportation Maintenance Status	X	X				X	
1.6; 6.2	Support motorized and non-motorized transportation projects that use public resources cost-effectively	A project, program, or policy's relative cost effectiveness of achieving desired outcomes (a qualitative assessment)	X					X	
6.4	Identify and protect right-of-way for future transportation facilities and services	Public Right of Way Inventory / Needs		X				X	X
6.5	Prioritize projects, programs, polices that balance safety, mobility, and provide for multiple modes.	Vehicle Crash Inventory	X		X			X	
		Travel Time Reliability.							
		MMLOS for Pedestrians, Bicyclists, Transit							

TABLE 2 EVALUATION CRITERIA – DETAILED MATRIX

- Tool used for Evaluation: Travel Model
- Tool Used for Evaluation: GIS Analysis
- Tool Used for Evaluation: Qualitative Review

<b>Evaluation Criteria</b>				
<b>Objectives</b>	<b>Measure</b>	<b>Project Level - Helps to determine if a project implements the goal</b>	<b>System Level - Helps to determine whether the proposed system achieves the goal</b>	<b>System Level/Performance Tracking - Performance Measure</b>
<b>Goal 1: Sustainable</b> - Provide a transportation system that balances benefits to the environment, the economy and the community.				
<i>Objective 1.1: Reduce energy consumption associated with transportation:</i>				
<i>1.1.1 Identify, maintain, and improve networks of facilities for motorized and non-motorized travel.</i>	Bike and Pedestrian Facility Inventory	Project increases miles of bicycle and pedestrian, facilities such as sidewalks, bicycle lanes, multiuse paths, and sufficiently wide shoulders (i.e., four feet in width or greater). (Y/N)	Planned system increases miles of bicycle and pedestrian facilities. Does the system increase non-motorized travel options and provide travel choices?	Number of miles of bicycle and pedestrian facilities increased during performance period.
	Pedestrian and Bike Facility Gap Inventory	Project completes an existing gap in the bicycle and/or pedestrian facilities network. (Y/N)	Percent of existing gaps in the bicycle and pedestrian, networks filled by the plan.	Percent of existing gaps in the sidewalk or bikeway system completed.
	Multimodal Level of Service Analysis (MMLOS) for pedestrians and bicyclists at selected intersections	Project improves quality of service experienced by pedestrian or bicyclist as measured by HCM 2010 MMLOS methodology. Y/N	Planned system reflects characteristics found to improve pedestrian and bicycle quality of service as reflected by the HCM 2010 MMLOS methodology.	Prevalence of planned and built projects incorporating characteristics found to improve pedestrian and bicycle quality of service as reflected by the HCM 2010 MMLOS methodology.

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
1.1.2 Invest in and encourage public transit and connections to public transit.	Transit service coverage	Project increases or supports the increase of transit service coverage (Y/N)	Percent of transit supportive area served by transit	Percent of transit supportive area served by transit
	Transit stops with access to pedestrian facilities	Project provides pedestrian improvements within 1/2 mile of a bus stop	Increased number of additional bus stops with walk access	Percent of transit stops with walk access
	Transit stops with access to bicycle facilities	Project provides access to transit stop via bicycle facilities	Increased number of bus stops with bike access	Percent of transit stops with bike access
	Transit service frequency	Increases frequency (i.e., decreases headways)	Transit Frequency LOS by route	Transit Frequency LOS by route
	Transit service hours.	Increases transit service hours	Transit Service Hours LOS	Transit Service Hours LOS
	Transit infrastructure (e.g., improvements to transit stop and/or Park 'n Ride amenities)	Increase or improve existing transit infrastructure	Number of transit stops that have been improved (pullouts, shelters, dedicated lanes, signal priority).	Number of transit stops that have been improved (pullouts, shelters, dedicated lanes, signal priority).
	Multimodal Level of Service (MMLOS) for transit riders	Project or program improves quality of service experienced by transit riders as measured by HCM 2010 MMLOS methodology. Y/N	Planned system reflects characteristics found to improve transit riders quality of service as reflected by the HCM 2010 MMLOS methodology.	Prevalence of planned and built projects incorporating characteristics found to improve transit riders quality of service as reflected by the HCM 2010 MMLOS methodology.
1.1.3 Explore and encourage rideshare, car-sharing, transit pass programs, telecommuting, and other transportation demand management strategies.	Alternative Transportation Programs Participation			Increase participation in car-pooling, vanpooling, rideshare, transportation demand management, transit pass programs, and telecommuting.
	Vehicle Miles Traveled Per Capita		Planned system reduces VMT / capita	VMT/capita

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
1.1.4 Encourage the use of alternative-fuel vehicles and more efficient fuel vehicles.	Identify Existing Alternative Energy and/or Fuel Efficient Programs/Activities and Number of New Programs/Actions			Number of programs / actions taken to encourage use of alternative-fuel vehicles
	Alternative Transportation Programs Participation			
Objective 1.2: Improve air quality by reducing transportation related emissions including reducing greenhouse gas emissions to target levels.	Vehicle Miles Traveled	Project, program, policy helps reduce County-wide VMT. (Y/N)	Planned system reduces VMT county-wide and/or average stops on key corridors.	Planned system reduces VMT county-wide and/or average stops on key corridors. May use measurements that may come out of Climate Smart Communities project or State STI project.
	Transportation Emissions in Tons (CO <sub>2</sub> , CO, NO <sub>x</sub> , VOC, PM <sub>2.5</sub> , other air toxins)	Project, program, policy helps reduce vehicle emissions. (Y/N)	Planned system reduces vehicle emissions either County-wide or along key corridors	Planned system reduces vehicle emissions either County-wide or along key corridors
Objective 1.3: Minimize water quality impacts of transportation-related activities.	Use of Best Management Practices	Use of best management practices including during construction phases	Improve water quality, e.g. by advancing local jurisdictions' efforts to comply with TMDLs (Total Maximum Daily Loads, set by Oregon DEQ), or increasing stormwater runoff treated	
	Sensitive Habitat (acres impacted)	Decreasing/minimizing number of acres of sensitive water habitats impacted by a project, program or policy.	Minimize the number of sensitive water habits negatively impacted by roadway facilities.	
	Green Street Design Elements	Green street treatments in projects, programs or policies.	Increase the prevalence and use of green street treatments in projects.	

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
Objective 1.4: Promote a resilient transportation system that can adapt to evolving land use and fit the desired future, while meeting present needs.	Travel Network Connectivity Analysis	Degree to which project, program, policy increases connectivity of vehicle, pedestrian and bicycle network.	Degree to which project, program, policy increases connectivity of vehicle, pedestrian and bicycle network.	Degree to which project, program, policy increases connectivity of vehicle, pedestrian and bicycle network.
	Land Use and Transportation Integration	Degree to which project, program, policy increases integration of land use and transportation planning	Degree to which project, program, policy increases integration of land use and transportation planning	Degree to which project, program, policy increases integration of land use and transportation planning
Objective 1.5: Stabilize existing sources of transportation revenue and identify stable, diverse, long-term sources of funding. (Same as Objective 6.3)	See Objective 6.3			
Objective 1.6: Support motorized and non-motorized transportation projects that use public resources cost effectively. (Same as Objective 6.2)	See Objective 6.2			
Objective 1.7: Prioritize repairs and maintenance of existing transportation facilities and services. (Same as Objective 6.1)	See Objective 6.1			
<b>Goal 2: Local Businesses and Jobs</b> Plan the transportation system to support a prosperous and adaptable economy and further the economic well-being of businesses and residents of the county				
Objective 2.1: Prioritize transportation improvement projects within and providing access to existing and future employment centers.	Employment Area Accessibility.	Project increases miles of roads, bicycle facilities, pedestrian facilities and transit service route miles within and providing access to urban or rural employment area	Planned system increases miles of bicycle facilities, pedestrian facilities, and transit service routes in urban and rural employment areas. Does the system maximize multimodal travel options and provide travel choices to these areas?	Number of miles of road, bicycle facilities, pedestrian facilities and transit service routes increased during performance period.

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
Objective 2.2: Promote efficient movement of people, materials and goods.	Average Travel Time in Identified Corridors	Project reduces average travel time	Decrease average travel time.	Decrease average travel time.
	Travel Time Reliability	Project improves travel time reliability	Improved travel time reliability (reduced required trip buffer)	Improved travel time reliability (reduced required trip buffer)
	Multimodal Level of Service for Vehicles at Selected Intersections	Peak hour LOS for auto, ped, bike, or transit improved on a corridor or intersection based on HCM 2010 MMLOS	Increase in number of intersections and segments with improved LOS, my mode (MMLOS)	Increase in number of intersections and segments with improved LOS, my mode (MMLOS)
	Volume-to-Capacity Ratios at Selected Intersections	Peak hour volume-to-capacity (V/C) ratios at selected intersections. Calculated using existing and forecasted auto volumes and intersection vehicular capacity.	Increase in number of intersections with v/c ratios less than 1.0.	Increase in number of intersections with v/c ratios less than 1.0.
Objective 2.3: Identify, maintain, and improve networks of facilities for motorized and non-motorized travel.	See Objective 1.1.1			
Objective 2.4: Invest in and encourage public transit and connections to public transit.	See Objective 1.1.2			
Objective 2.5: Explore and encourage carpooling, vanpooling, rideshare, transit pass programs, telecommuting, and other transportation demand management strategies. (Same as Objective 1.1.3)	See Objective 1.1.3			
Objective 2.6: Improve freight movement.	Travel Time Reliability.	Project improves travel time reliability on a freight route	Improved travel time reliability on truck routes (reduced required trip buffer)	Improved travel time reliability on truck routes (reduced required trip buffer)
	Level of Service on Truck Routes at Selected Intersections	Project improves LOS for trucks on truck routes	Planned system improves intersection and corridor LOS on truck routes	Intersection and corridor level of service on truck routes.

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
<b>Goal 3: Livable and Local</b> Tailor transportation solutions to suit the diversity of local communities				
<i>Objective 3.1: Identify, maintain, and improve networks of facilities for motorized and non-motorized travel.</i>	See Objective 1.1.1			
<i>Objective 3.2: Improve Safe Routes to School Planning</i>	Number of and Support for Developing Safe Routes to Schools Plans	Project, policy, program facilitate in Safe Routes to School Plans for schools within the County	Planned activities, programs move towards all schools in the County having a Safe Routes to School Plan	Planned activities, programs move towards all schools in the County having a Safe Routes to School Plan
	Pedestrian and Bike Facility Gap Inventory	Project, policy, program help fill gaps in pedestrian and bicycle facilities on roads providing access to schools	Planned system fills gaps in pedestrian and bicycle networks providing access to schools	Planned system fills gaps in pedestrian and bicycle networks providing access to schools
<i>Objective 3.3: Invest in and encourage public transit and connections to public transit. (Same as objective 1.1.2)</i>	See Objective 1.1.2			
<i>Objective 3.4: Explore and encourage carpooling, vanpooling, rideshare, transit pass programs, telecommuting, and other transportation demand management strategies. (Same as Objective 1.1.3)</i>	See Objective 1.1.3			
<i>Objective 3.5: Facilitate access to daily needs and services</i>	Transit Services, Bicycle Facilities, Pedestrian Facilities and Roads between Residential Areas and Essential Needs and Destinations	Use Opportunity Mapping produce by Housing authority to determine if project increases accessibility to daily needs and services		<i>Improves network connections of people to vital services and Increase the number of essential destinations accessible by walking, biking, or public transit for all residents.</i>



Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
<i>Objective 3.6: Prioritize transportation improvement projects within and providing access to existing and future employment centers (Same as Objective 2.1)</i>	See Objective 2.1			
<i>Objective 3.7: Identify and incorporate design elements that increase community livability and cohesiveness, improve civic amenities.</i>	Transportation Facility Design Elements	Degree to and consistency with which design elements are incorporated into projects, programs, policies.	Degree to and consistency with which design elements are incorporated into projects, programs, policies.	Degree to and consistency with which design elements are incorporated into projects, programs, policies.
<i>Objective 3.8: Promote a resilient transportation system that can adapt to evolving land use and fit the desired future, while meeting present needs. (Same as Objective 1.4)</i>	See Objective 1.4			
<i>Objective 3.9: Maintain existing and enhance access to recreational opportunities and public lands.</i>	Access to Open Space (URBAN: Population within 1/2 mile ; Rural: Population within 60 minutes)	Degree to which to the project provides or maintains access to open space.	Increases the number of people within ½ mile network walking access to open space	Urban: Increases the number of people within ½ mile network walking access to open space Rural: Increases access to public natural area (Gorge, Columbia River, regional trail, Mt. Hood)
<i>Objective 3.10: Prioritize resources to address transportation needs of transportation disadvantaged populations within the County. (Same as Objective 5.4)</i>	See Objective 5.4			
<i>Objective 3.11: Create project outreach activities and decision-making process that provide meaningful opportunities for all residents to influence decision-making. (Same as Objective 5.5)</i>	See Objective 5.5			

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
<b>Goal 4: Safety and Health</b> Promote a transportation system that maintains and improves our safety, health and security				
<i>Objective 4.1: Reduce overall crash frequency and severity for all modes of travel. Increase safety culture through on-going engineering, education, enforcement and evaluation.</i>	Vehicle, Pedestrian and Bicycle Crash Inventory	Projects, policies, programs aimed at reducing vehicle, pedestrian and bicycle crashes	Projects, policies, programs aimed at reducing vehicle, pedestrian and bicycle crashes	Projects, policies, programs aimed at reducing vehicle, pedestrian and bicycle crashes
	Severity of Vehicle, Bicycle and Pedestrian Crashes	Projects, policies, programs aimed at reducing the severity of vehicle, pedestrian and bicycle crashes	Projects, policies, programs aimed at reducing the severity of vehicle, pedestrian and bicycle crashes	Projects, policies, programs aimed at reducing the severity of vehicle, pedestrian and bicycle crashes
	Enhance County Safety Culture	Increasing activities and coordinated efforts to establish and further a transportation safety culture in the County for the purpose of reducing the potential for future crashes.	Planned activities and coordinated efforts draw on resources within and outside of the transportation engineering discipline to further an overarching safety culture.	Planned activities and coordinated efforts draw on resources within and outside of the transportation engineering discipline to further an overarching safety culture.
<i>Objective 4.2: Optimize the transportation system's ability to facilitate emergency response services.</i>	Emergency Vehicle Response Time	Is the project improving, degrading, or not changing the mobility for an emergency vehicle on an emergency transportation route (ETR)?		Is there a change to response time for emergency services?
	Space for Incident Management and Emergency Vehicles	Does a roadway have space for an impaired vehicle to pull to the side? Does an ETR have space allow emergency vehicles to pass other vehicles?		Enhances emergency response access by increasing vehicle capacity or system operations.
<i>Objective 4.3: Identify, maintain, and improve networks of facilities for motorized and non-motorized travel.</i>	See Objective 1.1.1			
<i>Objective 4.4: Invest in and encourage public transit and connections to public transit.</i>	See Objective 1.1.2			
<i>Objective 4.5: Improve air quality by reducing transportation-related emissions.</i>	See Objective 1.2			

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
Objective 4.6: Reduce exposure to transportation-related air emissions.	Bike and Pedestrian Network on Low Volume Roads	Projects, policies, programs that increase pedestrian and bicycle facilities on secondary road network		
	Sensitive Populations near Major Roadways	Projects, policies, programs that decrease the number of sensitive uses close to high traffic roadways, freight routes		
	Construction Emissions	Projects, policies, programs that increase the prevalence of best management practices		
Objective 4.7: Encourage the use of alternative-fuel vehicles and more efficient fuel vehicles.	See Objective 1.1.4			
Objective 4.8: Maintain existing and increase access to recreational opportunities and public lands.	See Objective 3.9			
Objective 4.9: Prioritize resources to address transportation needs of transportation disadvantaged populations within the County.	See Objective 5.4			
Objective 4.10: Facilitate access to daily needs and services.	See Objective 3.5			
<b>Goal 5: Equity</b> Provide an equitable transportation system.				
Objective 5.1: Identify, maintain, and improve networks of facilities for motorized and non-motorized travel.	See Objective 1.1.1			
Objective 5.2: Invest in and encourage public transit and connections to public transit.	See Objective 1.1.2			

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
<i>Objective 5.3: Explore and encourage carpooling, vanpooling, rideshare, transit pass programs, telecommuting, and other transportation demand management strategies.</i>	See Objective 1.1.3			
<i>Objective 5.4: Prioritizing resources to address transportation needs of transportation disadvantaged populations within the County.</i>	Alternative Transportation Programs and Projects that Benefit Transportation-Disadvantaged Populations			Maximize multimodal travel options and provide travel choices for transportation disadvantaged populations.
	Transportation-Disadvantaged Populations Served By Other Modes of Travel and Car-Sharing Programs			Increase the number of people within transportation disadvantaged population with access to multimodal networks and services.
<i>Objective 5.5: Create project outreach activities and decision-making process that provides meaningful opportunities for all residents to influence decision-making</i>	Public Involvement Opportunities			
<i>Objective 5.6: Facilitate access to daily needs and services.</i>	See Objective 3.5			
<i>Objective 5.7: Prioritize transportation improvement projects within and providing access to existing and future employment centers.</i>	See Objective 2.1			

Objectives	Measure	Project Level - Helps to determine if a project implements the goal	System Level - Helps to determine whether the proposed system achieves the goal	System Level/Performance Tracking - Performance Measure
<i>Objective 5.8: Provide opportunities for low-income, minority workers and business owners to access/obtain jobs and contracts created by transportation investments.</i>	Minority-Owned Businesses Contracting	Clackamas County shall comply with federal, state, and local open competitive procurement processes.		
<b>Goal 6: Fiscally Responsible</b> Promote a fiscally responsible approach to protect and improve the existing transportation system and implement a cost-effective system to meet shared future needs.				
<i>Objective 6.1: Prioritize repairs and maintenance of existing transportation facilities and services.</i>	Transportation Maintenance Status	Project, program, or policy helps reduce proportion of network behind on maintenance	Planned programs, policies, projects support maintenance activities.	Planned programs, policies, projects support maintenance activities.
<i>Objective 6.2: Support transportation projects that use public resources cost effectively.</i>	A project, program, or policy's cost effectiveness of achieving desired outcomes	Project cost and complexity is commensurate with benefits (as compared to other projects in plan - used for project prioritization)		
<i>Objective 6.3: Stabilize existing sources of transportation revenue and identify stable, diverse, long-term sources of funding.</i>	Estimated Transportation Funding	Project, program, policy helps increase future funding sources.	Maximize stable, sufficient funding sources.	Maximize stable, sufficient funding sources.
	Assumed Transportation Budget Allocations	Project, program, policy helps secure and/or increase current funding sources	Funding exists for ongoing operations and maintenance.	Funding exists for ongoing operations and maintenance.
<i>Objective 6.4: Identify and protect right-of-way for future transportation facilities and services.</i>	Public Right of Way Inventory / Needs		Plan identifies long-term ROW needs	
<i>Objective 6.5: Prioritize projects, programs, policies that balance safety, mobility, and provide for multiple modes.</i>	Vehicle, Pedestrian and Bicycle Crash Inventory	Reduces likelihood of vehicle, bicycle, and pedestrian crashes	Reduces likelihood of vehicle, bicycle, and pedestrian crashes	Reduces likelihood of vehicle, bicycle, and pedestrian crashes
	Travel Time Reliability	Project improves travel time reliability	Improved travel time reliability (reduced required trip buffer)	
	MMLOS - Pedestrians, Bicyclists, Transit	Improves MMLOS for pedestrians, bicyclists, transit		