



## Technical Memorandum #6 – Draft

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**TO:** Corvallis TSP Project Management Team and Stakeholders

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**SUBJECT: Corvallis Transportation System Plan Update**  
**Task 3.3 Transportation Data and Potential Evaluation Criteria**

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Communities want their transportation systems to deliver a variety of benefits to all system users. In addition to traditional goals of improved mobility and safety, progressive communities expect their transportation investments to support environmental, economic, and social goals. The question is: how do we know which policies and investments are likely to produce the benefits we seek? In a complex multi-modal transportation system analysis like the one we are conducting to develop the Corvallis Transportation System Plan (TSP) and Transit Development Plan (TDP), this understanding is gained by comparing the overall forecasted transportation system of various alternative policy and investment scenarios to a set of criteria designed to evaluate how likely the scenarios are to achieve the community's stated goals and objectives. The relationship between goals, objectives, and potential measures was previously described in Technical Memorandum #4/5.

**Note:** There is a difference between measures that are used when developing a TSP, where the need is to make an initial decision about how best to manage and invest in a comprehensive transportation system over a forecasted planning period, and the measures that are used after a TSP is completed, where the need is to gauge how well a community is doing in implementing recommendations and the degree to which those investments actually affect travel behavior and system performance. To avoid confusion as the Corvallis TSP process moves forward, we will consistently refer to the measures that we use during the TSP development process to assess the likely effectiveness of the TSP in achieving community goals and objectives as "evaluation criteria." Measures that are developed nearer the end of the TSP development process that will be used to monitor and assess the TSP's effectiveness as it is implemented will be consistently referred to as "performance measures." It is the evaluation criteria that are the subject of this memorandum.



The Corvallis TSP and TDP will be guided by Corvallis’ overall vision, goals and objectives for long-range growth and community development. A set of evaluation criteria will be selected as indicators for each TSP goal area as a means to determine how likely various alternative policies and investment packages are to achieve the objectives under each goal. The evaluation criteria will initially be used during the planning process to benchmark how the current transportation system performs. Later, they will be used to inform the selection and prioritization of alternative investments and policies packages for the TSP and TDP by helping to determine how likely the alternative packages are to support the goal areas and achieve the stated objectives. Nearer to the end of the TSP development process, the project team will also recommend a set of performance measures, some of which may be derived from the evaluation criteria, that the City can use over time to monitor transportation system performance and progress toward achieving the TSP and TDP goals and objectives as each plan’s recommendations are implemented.

## Recommended Evaluation Criteria

The project team compiled a pool of potential evaluation criteria from multiple sources to provide a comprehensive picture of the options for performance measurement. The team then assessed the feasibility of their application by considering the availability of needed data and analytical tools. The full list of evaluation criteria considered is provided in the appendix.

The evaluation criteria shown are either qualitative or quantitative. Qualitative criteria can be assessed as getting better or worse or ranking (high, medium, low, etc.), but generally do not have numbers associated with them. In contrast, quantitative criteria are associated with changes that can be described numerically. For example, a qualitative criterion could say that a project would result in an increase, whereas a quantitative criterion would say that a project would result in an increase of X units.

With too many evaluation criteria, it becomes difficult to communicate effectively and see differences among the alternatives. With that in mind, a smaller group of criteria that the Project Team believes best represent each goal was selected to evaluate solutions during the TSP process. While this smaller group of evaluation criteria may not reflect every objective or interest related to the goals, it will not preclude consideration of broader solution types or projects deemed to be effective at addressing specific issues. The evaluation criteria do not necessarily lead to the “right” answer – they are simply a tool to aid decision makers in their understanding of the relative value and expected consequences of various policy and investment choices and the degree to which the various choices are in alignment with community goals. These recommended evaluation criteria are shown below in Tables 1 to 4.



**Table 1: Recommended Evaluation Criteria for Goal 1**

Goal Area	Objectives	Evaluation Criteria
<b>Goal 1: Provide an efficient transportation system that supports economic vitality by facilitating the local and regional movement of people and goods.</b>		
<b>Provide an efficient transportation system</b>	a. Reduce miles of travel and travel time through improved connectivity where barriers exist	<u>Vehicle-Miles Traveled (VMT)</u> Estimated total distance (miles) travelled by vehicles in the Corvallis roadway network. To be estimated using the regional travel demand model. (Also included under Goal 4.)
	b. Maintain acceptable roadway and intersection operations where feasible considering environmental, land use, and topographical factors	<u>Intersection performance compared to applicable agency mobility standards/targets</u>
	c. Improve north/south and east/west street connectivity	Delay (Level-of-Service) or congestion (Volume-to-Capacity Ratio) will be calculated at study intersections during the weekday PM peak hour. Minimum expectations for mobility are reflected by standards/targets adopted by the agency with roadway jurisdiction. (Mobility standards and targets will likely be adapted to reflect expected system performance after constrained funding decisions are made when the TSP is adopted.)
	d. Work with OSU to develop cooperative parking strategies for University area neighborhoods	
	e. Identify transportation system and service improvements that support the City’s long-term land use vision	<u>Peak hour travel time on freight routes</u> Estimated travel time from selected origins and destinations on key freight routes during the weekday PM peak hour. To be estimated using the regional travel demand model.
<b>Supports economic vitality by facilitating the local and regional movement of people and goods</b>	f. Improve pedestrian amenities in business/employment districts	
	g. Provide access to local businesses and business districts by all modes of transportation	<u>Percent of population and employment (employment centers with greater than 100 employees) in close proximity to high quality pedestrian or bicycle facilities</u> Measured in a histogram of Population or Employment within: 1/8-mile to high quality sidewalks (local streets or collectors or arterials with buffered sidewalks), 1/4-mile to high quality biking facilities (bike lanes, protected bike lanes or bicycle boulevards).
	h. Provide efficient freight movement on regional travel routes	
	i. Increase the accessibility of major employment centers	<u>Percent of total jobs within 1/4-mile walking distance of transit stops served by at least 30 transit vehicles per day</u> The percentage of jobs that are within 1/4-mile walking distance from transit stops served by higher frequency service. Estimated based on spatial analysis of job locations, transit stops, and the pedestrian network. (Also included under Goal 3.)
	j. Maintain and support the Corvallis airport as a municipal facility	<u>Percent of total households within 1/4-mile walking distance of transit stops served by at least 30 transit vehicles per day</u> The percentage of households that are within 1/4-mile walking distance from transit stops served by higher frequency service. Estimated based on spatial analysis of household locations, transit stops, and the pedestrian network. (Also included under Goal 3.)



**Table 2: Recommended Evaluation Criteria for Goal 2**

Goal Area	Objectives	Evaluation Criteria
<b>Goal 2: Provide a transportation system that enhances the health and safety of residents.</b>		
<b>Enhances health</b>	a. Support vibrant public spaces, and encourage a culture of walking, cycling, and social interaction	<p><u>Miles of walking facilities on collectors and arterials by type</u>                      This is a direct measure of progress towards expanding the pedestrian network in the city to support active lifestyles. Pedestrian facility types will include lane miles of: sidewalks on both sides, sidewalk on one side, no sidewalk, and multi-use paths. (Also included under Goal 4.) <i>This type of criterion is a good example of an ongoing implementation performance measure.</i></p> <p><u>Miles of biking facilities on collectors and arterials by type</u>                      This is a direct measure of progress towards expanding the bicycle network in the city to support active lifestyles. Bicycle facility types will include: bike lanes, shared lane markings, popular bike streets, multi-use paths, and no facility. (Also included under Goal 4.)</p> <p><u>Number of projects or programs (high, medium, or low by alternative analysis package) that address recognized safety issues</u>                      While most projects have a safety component, this criterion would identify the overall number of projects per analysis that address a safety issue that is “recognized” through analysis of historical crash records, identification of conditions presenting a crash risk, or committee and public input regarding conditions perceived to be unsafe. This may not work well as a differentiator in the TSP’s development as these kinds of projects will be a high priority for every analysis package. However, it can show that TSP recommendations are in alignment with the goals and objectives and may also work well as a post-implementation performance measure.</p>
	b. Expand the sidewalk, on-street bikeway, and multi-use path network in the city	
<b>Enhances safety</b>	c. Improve safety at locations with known issues	
	d. Minimize conflict points along high volume and/or high speed corridors	
	e. Reduce traffic-related fatalities and serious injury collisions	
	f. Reduce the amount of collisions involving pedestrians and cyclists	
	g. Improve personal security on public facilities and services (e.g., street lighting, surveillance/patrols around transit)	
	h. Preserve the function and prioritize investments on routes and transportation facilities critical for emergency response and evacuation	
	i. Apply a comprehensive approach to improving transportation safety that involves the five E’s (engineering, education, enforcement, emergency medical services, and evaluation)	



**Table 2: Recommended Evaluation Criteria for Goal 2**

Goal Area	Objectives	Evaluation Criteria
	j. Work with the school district and educational institutions to identify and implement circulation and access patterns to and around schools that are safe for pedestrians and bicyclists, as well as people in cars and arriving by bus	<p><u>Number of projects and programs (high, medium, or low by alternative analysis package) that improve safety for vulnerable travelers (e.g., school children, elderly, disabled)</u></p> <p>Projects: Number of low-stress bicycle and pedestrian facilities and roadway crossings within 1,000 feet of activity generators of significance to vulnerable users (e.g., schools, senior centers, community centers). This may not work well as a differentiator in the TSP’s development. However, it can show that TSP recommendations are in alignment with the goals and objectives.</p> <p>Programs: Establishment of ongoing non-infrastructure encouragement, education, or safety programs targeted at vulnerable users. (Also included under Goal 4.)</p>

**Table 3: Recommended Evaluation Criteria for Goal 3**

Goal Area	Objectives	Evaluation Criteria
<p><b>Goal 3: Provide a diversified and accessible transportation system that ensures mobility for all members of the community and provides viable alternatives to automobile travel.</b></p>		
<p><b>Diversified transportation system (viable alternatives to auto)</b></p>	a. Increase transit ridership by improving the quality of available transit service as measured by coverage, hours of service and frequency	<p><u>Span and frequency of transit service by route classification</u></p> <p>Span (hours and days of service) and frequency (time between bus arrivals) for each route in the Corvallis Transit System. Routes are evaluated according to their service type classification (e.g. Commute, Regular, Local, Owl).</p>
	b. Develop bicycle and pedestrian facilities that encourage non-vehicular travel and provide safe passage for pedestrians and bicyclists	<p><u>Percent of major collectors and higher roadway mileage with transit service providing 30 or more transit vehicles per day</u></p>
	c. Allow for alternative transportation facility designs in constrained areas to minimize impacts to natural resources	<p>Percentage of roadways (by mile) that have higher frequency transit service coverage. Defined for roadways based on functional classification (major collectors or higher). Does not include local or neighborhood streets.</p>
	d. Encourage comprehensive on-site Transportation Options programs - including incentives and disincentives – by major employers & educational institutions	<p><u>Bicycle Level of Traffic Stress</u></p> <p>Number of lane miles with low, moderate, high, and extreme stress using ODOT’s Bicycle Level of Traffic Stress methodology as a basis.</p>
	e. Ensure Corvallis’ Land Development Code requires new development to support multimodal connectivity and accessibility	



**Table 3: Recommended Evaluation Criteria for Goal 3**

Goal Area	Objectives	Evaluation Criteria
	f. Work with neighboring jurisdictions to identify and provide opportunities to commute to and from Corvallis by means other than single-occupant vehicles	<u>Pedestrian Level of Service on collector and arterial segments</u> Number of lane miles with excellent, good, fair, and poor ratings using ODOT’s qualitative pedestrian level of service methodology as a basis.
<b>Accessible transportation system (mobility for all)</b>	g. Make it easy for people of all ages and abilities to get where they need to go, comfortably and safely, by all modes of travel	<u>Pedestrian Level of Service on collector and arterial intersections</u> Number of intersections with excellent, good, fair, and poor ratings using ODOT’s qualitative pedestrian level of service methodology as a basis.  <u>Percent of total households within 1/4-mile walking distance of transit stops served by at least 30 transit vehicles per day</u> The percentage of households that are within 1/4-mile walking distance from transit stops served by higher frequency service. Estimated based on spatial analysis of household locations, transit stops, and the pedestrian network. (Also included under Goal 1.)
	h. Provide inexpensive transportation options in the city	<u>Percent of total jobs within 1/4-mile walking distance of transit stops served by at least 30 transit vehicles per day</u> The percentage of jobs that are within 1/4-mile walking distance from transit stops served by higher frequency service. Estimated based on spatial analysis of job locations, transit stops, and the pedestrian network. (Also included under Goal 1.)

**Table 4: Recommended Evaluation Criteria for Goal 4**

Goal Area	Objectives	Evaluation Criteria
<b>Goal 4: Provide a sustainable transportation system through responsible stewardship of financial and environmental resources.</b>		
<b>Stewardship of financial resources</b>	a. Preserve and protect the function of locally and regionally significant transportation corridors	<u>Number of projects or programs (high, medium, or low by alternative analysis package) that focus on travel demand management or existing transportation system management</u>
	b. Establish priorities and define the incremental steps needed for investment of ODOT and Federal revenues to address safety and major capacity problems on the State transportation system	Projects or programs that focus on reducing demand for travel by single-occupancy motor vehicles during peak periods and/or improving the efficiency of existing transportation facilities. This may not work well as a differentiator in the TSP’s development. However, it can show that TSP recommendations are in alignment with the



**Table 4: Recommended Evaluation Criteria for Goal 4**

Goal Area	Objectives	Evaluation Criteria
	c. Develop transportation standards that preserve and protect the integrity of neighborhoods	goals and objectives and may also work well as a post-implementation performance measure.
	d. Preserve and maintain the existing transportation system assets to extend their useful life	<u>Miles of walking facilities on collectors and arterials by type</u> Pedestrian facility types will include lane miles of: sidewalks on both sides, sidewalk on one side, no sidewalk, and multi-use paths. (Also included under Goal 2.)
	e. Improve travel reliability and/or efficiency of existing major travel routes in the city before adding capacity	<u>Miles of biking facilities on collectors and arterials by type</u> Bicycle facility types will include: bike lanes, shared lane markings, popular bike streets, multi-use paths, and no facility. (Also included under Goal 2.)
	f. Increase the number of walking, bicycling, and transit trips in the city	
	g. Reduce the number of vehicle-miles traveled	
	h. Pursue grants/ programs or collaboration with other agencies to efficiently fund transportation improvements and supporting programs	<u>Number of projects and programs that improve safety for vulnerable travelers (e.g., school children, elderly, disabled)</u> Projects: Number of low-stress bicycle and pedestrian facilities and roadway crossings within 1,000 feet of activity generators of significance to vulnerable users (e.g., schools, senior centers, community centers). Programs: Establishment of ongoing non-infrastructure encouragement, education, or safety programs targeted at vulnerable users. (Also included under Goal 2.)
<b>Stewardship of environmental resources</b>	i. Develop street standards to reflect the pedestrian realm of the neighborhood	
	j. Evaluate and implement, where cost-effective, environmentally friendly materials and design approaches (water reduction, protect waterways, solar infrastructure, impervious materials)	<u>Encourages increased travel by transit</u> Qualitative measure (high, medium, or low by package) estimating the degree to which transit service is made more: convenient, competitive to automobile travel, or available for additional travel needs.
	k. Support technology applications that improve travel mobility and safety with less financial and environmental impact than traditional infrastructure projects	<u>Vehicle-Miles Traveled (VMT)</u> Estimated total distance (miles) travelled by vehicles in the Corvallis roadway network. To be estimated using the regional travel demand model. (Also included under Goal 1.)



## APPENDIX

The initial list of evaluation criteria considered prior to selecting the core group of criteria for use in the TSP process is provided herein.

**Table 1: Evaluation Criteria Considered for Goal 1**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
<b>Goal 1: Provide an efficient transportation system that supports economic vitality by facilitating the local and regional movement of people and goods.</b>			
<b>Provide an efficient transportation system</b>	a. Reduce miles of travel and travel time through improved connectivity where barriers exist	Auto travel times Vehicle-miles of travel (VMT)	Peak hour travel time on arterials and collectors VMT comparison of alternatives
	b. Maintain acceptable roadway and intersection operations where feasible considering environmental, land use, and topographical factors	Intersection congestion (v/c or LOS)	Intersection performance compared to applicable agency mobility standards/targets
	c. Improve north/south and east/west street connectivity	Network connectivity	VMT comparison of alternatives
	d. Work with OSU to develop cooperative parking strategies for University area neighborhoods	Neighborhood parking strategy	[Qualitative]
	e. Identify transportation system and service improvements that support the City's long-term land use vision	Support for Corvallis land use vision	[Qualitative]
<b>Supports economic vitality by facilitating the local and regional movement of people and goods</b>	f. Improve pedestrian amenities in business districts	Pedestrian scale amenities and essentials	Number of art installations, benches, lighting, planters, and bus shelters in the business district Percent of arterials and collector sidewalks with clear pathways and ADA compliant intersections
	g. Provide access to local businesses and business districts by all modes of transportation	Walking travel times to local businesses and business districts	Percent of households within an 20-minute walk from businesses and business districts
		Biking travel times to local businesses and business districts	Percent of households within an 20-minute bike ride from businesses and business districts
		Transit accessibility to local businesses and business districts	Percent of total jobs within 1/4 mile walking distance of transit stops served by at least 30 transit vehicles per day





**Table 1: Evaluation Criteria Considered for Goal 1**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
	h. Provide efficient freight movement on regional travel routes	Travel times on freight routes	Peak hour travel time on freight routes
	i. Increase the accessibility of major employment centers	Travel times on select arterials accessing major employment centers	Peak hour travel time on select arterials for accessing major employment centers
	j. Maintain and support the Corvallis airport as a municipal facility	Business activity	Number of freight and business related flights

**Table 2: Evaluation Criteria Considered for Goal 2**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
<b>Goal 2: Provide a transportation system that enhances the health and safety of residents.</b>			
<b>Enhances health</b>	a. Support vibrant public spaces, and encourage a culture of walking, cycling, and social interaction	Encouragement of a culture of walking, biking, and social interaction	Miles of walking and biking facilities
		Access to parks and public spaces	Percent of total households within 20-minutes walking time of park or public space
	b. Expand the sidewalk, on-street bikeway, and multi-use path network in the city	Sidewalk, on-street bikeway, and multi-use path network	Miles of walking and biking facilities by type
<b>Enhances safety</b>	c. Improve safety at locations with known issues	Safety improvements at locations with known safety issues	Number of projects or programs that address documented safety issues
	d. Minimize conflict points along high volume and/or high speed corridors	Conflict points along identified high volume/high speed corridors	Number of conflict points eliminated along identified corridors
	e. Reduce traffic-related fatalities and serious injury collisions	Crashes resulting in fatalities	Number of crashes involving fatalities
		Crashes resulting in serious injuries	Number of crashes involving serious injuries
	f. Reduce the amount of collisions involving pedestrians and cyclists	Crashes involving pedestrians	Number of reported crashes involving pedestrians
Crashes involving bicyclists		Number of reported crashes involving bicyclists	



**Table 2: Evaluation Criteria Considered for Goal 2**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
	g. Improve personal security on public facilities and services (e.g., street lighting, surveillance/patrols around transit)	Street lighting at transit stops	Number of transit stops with lighting
		Lighting along key walking and biking routes	Percent of key walking and biking routes with lighting
	h. Preserve the function and prioritize investments on routes and transportation facilities critical for emergency response and evacuation	Number of geometric deficiencies along identified emergency response or evacuation routes.	Number of projects that address documented geometric deficiencies along identified emergency response routes.
	i. Apply a comprehensive approach to improving transportation safety that involves the five E's (engineering, education, enforcement, emergency medical services, and evaluation)	Comprehensive transportation safety improvement	[Qualitative]
	j. Work with the school district and educational institutions to identify and implement circulation and access patterns to and around schools that are safe for pedestrians and bicyclists, as well as people in cars and arriving by bus	Educational institution support for transportation safety	[Qualitative]

**Table 3: Evaluation Criteria Considered for Goal 3**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
<b>Goal 3: Provide a diversified and accessible transportation system that ensures mobility for all members of the community and provides viable alternatives to automobile travel.</b>			
<b>Diversified transportation system (viable alternatives to auto)</b>	a. Increase transit ridership by improving the quality of available transit service as measured by coverage, hours of service and frequency	Transit level of service	Span and frequency of service by route classification
	b. Develop bicycle and pedestrian facilities that encourage non-vehicular travel and provide safe passage for pedestrians and bicyclists	Barriers to connectivity	Number of system gaps filled
	c. Allow for alternative transportation facility designs in constrained areas to minimize impacts to natural resources	Design impacts to natural resources	[Qualitative]



**Table 3: Evaluation Criteria Considered for Goal 3**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
	d. Encourage comprehensive on-site Transportation Options programs - including incentives and disincentives – by major employers & educational institutions	Employer/Institutional transportation programs	[Qualitative]
	e. Ensure Corvallis’ Land Development Code requires new development to support multimodal connectivity and accessibility	Development support of connectivity and accessibility	[Qualitative]
	f. Work with neighboring jurisdictions to identify and provide opportunities to commute to and from Corvallis by means other than single-occupant vehicles	Opportunities for non-SOV travel between neighboring jurisdictions	[Qualitative]
<b>Accessible transportation system (mobility for all)</b>	g. Make it easy for people of all ages and abilities to get where they need to go, comfortably and safely, by all modes of travel	Connectivity of the pedestrian network	Percent of roadways with pedestrian facilities Intersection density Arterial pedestrian crossing index
		Connectivity of the bicycle network	Percent of major collector and higher roadways with protected bicycle facilities
			Miles of multi-use paths (also included under pedestrian connectivity)
		Transit connectivity	Percent of major collectors and higher roadway mileage with transit service providing 30 or more transit vehicles per day
		Transit availability	Percent of total jobs and households within 1/4 mile walking distance of transit stops served by at least 30 transit vehicles per day
	h. Provide inexpensive transportation options in the city	Transit Fares	[Qualitative]



**Table 4: Evaluation Criteria Considered for Goal 4**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
<b>Goal 4: Provide a sustainable transportation system through responsible stewardship of financial and environmental resources.</b>			
<b>Stewardship of financial resources</b>	a. Preserve and protect the function of locally and regionally significant transportation corridors	Protecting existing transportation corridor function	[Qualitative]
	b. Establish priorities and define the incremental steps needed for investment of ODOT and Federal revenues to address safety and major capacity problems on the State transportation system	Implementation and coordination on State facilities	[Qualitative]
	c. Develop transportation standards that preserve and protect the integrity of neighborhoods	Protecting neighborhood integrity	[Qualitative]
	d. Preserve and maintain the existing transportation system assets to extend their useful life	Preserving existing transportation infrastructure	Percent of resources spent on preservation
	e. Improve travel reliability and/or efficiency of existing major travel routes in the city before adding capacity	Non-capacity-adding Improvements to travel time and/or reliability	Number of projects or programs that focus on travel demand management or existing transportation system management
	f. Increase the number of walking, bicycling, and transit trips in the city	Walking mode split	Percentage of residents that commute by walking
		Bicycle mode split	Percentage of residents that commute by bicycling
		Transit mode split	Percentage of residents that commute by transit
	g. Reduce the number of vehicle-miles traveled	Vehicle-miles traveled per capita	Vehicle-miles traveled per capita
h. Pursue grants/ programs or collaboration with other agencies to efficiently fund transportation improvements and supporting programs	Funding potential	[Qualitative]	
<b>Stewardship of environmental resources</b>	i. Develop street standards to reflect the pedestrian realm of the neighborhood	Protecting neighborhood walkability	[Qualitative]



**Table 4: Evaluation Criteria Considered for Goal 4**

Goal Area	Objectives	What are we measuring?	Evaluation Criteria
	j. Evaluate and implement, where cost-effective, environmentally friendly materials and design approaches (water reduction, protect waterways, solar infrastructure, impervious materials)	Environmental consideration	[Qualitative]
	k. Support technology applications that improve travel mobility and safety with less financial and environmental impact than traditional infrastructure projects	Projects that support technology applications	Number of projects that support technology applications