

Highways, Roads and Streets Investment Options

Take Care of the System That We Have

Critical Investments in:

- Pavement Repair and Preservation
 - Rebuild 50 lane miles of high volume state highways \$50 million
 - Rebuild 60 miles of paved county roads..... \$30 million
 - Improve the level of city street maintenance \$ 42 million per year
- Gravel Roads
 - Rebuild 80 miles of gravel county roads \$20 million
- Roadside Maintenance and Vegetation Control
 - Additional weed control along state highways \$2 million per year
 - Additional shoulder and vegetation control on county roads \$7 million per year
- Ditches and Culverts
 - Replace six or seven additional large culverts on the state highway system each year. \$4 million per year
 - Replace county road culverts for fish passage each year..... \$10 million per year
- Traffic Signs and Signals, Striping and Lighting
 - Replace lighting systems on interstate highways in Portland metro area. \$3 million
 - Use more durable striping material and re-stripe lines state highways more often. \$11 million per year
 - Upgrade intervals for paint striping and signing to adequate levels on county roads statewide..... \$4 million per year
- Bridges
 - Strengthen 43 bridges on I-5 that will not be repaired by OTIA III to meet current earthquake standards..... \$25 million
 - Strengthen 18 bridges on routes to the coast to meet current earthquake standards..... \$15 million
 - Additional annual maintenance of county bridges..... \$2 million per year
- Guardrail and Barrier
 - Upgrade guardrail and barrier on state highways \$3 million per year
 - Upgrade guardrail and barrier on county roads \$1 million
- Snow and Ice Removal and Other Storm Repair
 - Purchase the same amount of de-icing material for the winter of 2007 as that ODOT purchased for the winter of 2006. \$1 million per year
 - Purchase of about 20 percent more de-icing materials each year. Add \$1 million per year
 - Do two additional landslide and rockfall mitigation projects along state highways each year..... \$6 million per year
 - Increase use of de-icing materials on county roads \$3 million

Make the System Work Better

Critical Investments in:

- Intelligent Transportation System projects \$2 million

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Improve Safety

Critical Investments in:

- Bridges
 - Replace railing on bridges to meet national safety standards\$30 million

Increase Capacity

Critical Investments in:

- State Modernization Program \$50 million per year
- Large Project Financing \$50 million per year
- City/County Arterials \$200 million per year

Current Status ... Final Review

Available Resources:

- Oregon Transportation Plan Update
- Association of Oregon Counties Survey of County Needs
- League of Oregon Cities Survey of City Needs

Highways, Roads and Streets Investment Options

Background

Oregon's highway, road and street network is one system. The Oregon Department of Transportation, counties and cities are jointly responsible for the system.

The Oregon Department of Transportation develops, builds and maintains the state highway system. The system consists of more than 8,100 miles of highway, connectors and frontage roads. The ODOT spends about \$1 billion annually. The following table shows the major state highway program areas, annualized spending, and relative size based on ODOT's 2005-2005 budget:

- Bridge - \$267M – 26.5%
- Highway Operations - \$23M – 2.3%
- Highway Safety - \$27M – 2.7%
- Local Government Programs - \$107.5M – 10.7%
- Maintenance - \$149.5M – 14.8%
- Modernization - \$227M – 22.6%
- Preservation - \$115.5M – 11.5%
- Special Programs - \$87.5M – 8.7%
- Utility Right-of-Way Permits - \$2.5M – 0.2%

The Legislative Assembly reviews and approves ODOT's highway program budget biennially and has established a number of performance measures for the program.

Oregon's 36 counties develop, build and maintain county roads. There are about 33,300 miles of county roads in Oregon, including about 6,500 miles of local access roads. Collectively, Oregon counties spend about \$410 million per year to maintain and develop county roads. County commissions review and approve county road program budgets annually.

Oregon's cities develop, build and maintain city streets. There are about 10,000 miles of city streets. Collectively, cities spend about \$370 million per year to maintain and develop their street systems. City councils review and approve city street program budgets annually.

The Oregon Transportation Plan (OTP) is the state's long-range multimodal transportation plan. It is an overarching policy document that focuses on state, local and public aspects of Oregon's transportation system. Identifying what should be done to maintain and improve the transportation system ("feasible needs") is a major component of the Plan.

The 2006 update of the Plan estimated the difference between the local, state and federal resources that are available and those that would be required to meet "feasible needs." The annual resources for highways, roads and streets were estimated to be \$1.5 billion (2004 dollars). Feasible needs were estimated to be \$2.3 to \$2.5 billion (2004 dollars), leaving an annual gap of about \$1 billion.

The investment options described on the attached pages are not intended to represent a plan to meet all feasible needs. They propose specific improvements in the highway system provided additional resources can be identified. They assume that state and local funding for the road system remains in place and continues to be invested as it is today.

Highways, Roads and Streets Take Care of the System That We Have

Pavement Repair and Preservation

What we do

Smooth, even pavements provide the public with a good quality ride, enhance safety and protect the public's investment in the roadbed itself. Pothole patching, crack sealing and repaving a road are examples of pavement repair and preservation activities.

ODOT spend about \$115.6 million (preservation program) plus \$45 million (maintenance budget for surface repairs) per year to repair and renew road surfaces of the state's highways. This is about 75 percent of what the OTP Update estimated would be needed to maintain 90 percent of Oregon highway pavements in fair or better condition. Annual spending for pavement repair and preservation is about 16 percent of the state highway program spending based on ODOT's 2005-2007 biennial budget.

Counties spend about \$54 million (Preservation program) plus \$23 million (maintenance budgets for surface repairs) per year to repair and renew road surfaces on county roads. This is approximately half of what is needed to adequately preserve the public's investment in 16,000 miles of paved county roads.

Cities spend about \$123.7 million to maintain their streets. This total includes the cost of street maintenance and operations, signage, striping, traffic signals, pavement overlays, emergency repairs, snow and ice removal, guardrails and similar expenses. This is about one-third of what is needed (about \$331.2 million) to adequately maintain and preserve the public's investment in the 20,200 lane miles of paved streets.

Why it is important.

Roads that do have a cracked, rough surface are not safe. Potholes, ruts, and uneven surfaces present drivers with hazardous situations. Rough roads put extra wear and tear on vehicles and can damage freight.

Good road conditions are safe and save motorist money ... \$275 each year for a motorist according to a 2006 report by The Road Information Program (TRIP); TRIP's 2005 report estimated that roads in substandard condition cost urban motorists even more, \$400 per year.

Impact if under-funded

A smooth road surface is key to keeping a road safe for motorists, to reducing motorists' vehicle repair and maintenance cost, and to reducing the life cycle cost of the pavements owned by public agencies. Road surfaces that become a maze of potholes, cracks and patches are hazardous and become a source of public complaints. Rebuilding a road's surface will eventually cost four, five or more times the cost of maintaining surface properly.

How much does it cost?

The state highway system has about 150 lane miles of high volume roads that have pavements in poor condition. The roads listed below are examples:

Region 1

Hwy 123

Lombard St. (St. Johns-I5) MP 1.3-5.3

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Hwy 068 (OR213)	82nd Ave (Foster - OR224)	MP 5.8-8.3
Hwy 003 (OR43)	Macadam (I5 - Terwilliger)	MP 0-5.79

Region 2

Hwy 091 (OR99W)	Newberg-McMinnville	MP 23.7-38.0
Hwy 051 (OR551)	I5-99E	MP -0.3-5.6
Hwy 029 (OR47)	Gaston-Carlton	MP 26.5-37.7

Region 4

Hwy 004 (US-97)	South end of Redmond	MP 121.7-123.2
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Rebuilding the pavements on high volume roads costs about \$1 million per lane mile. An investment of \$50 million would rebuild 50 lane miles of high volume road; \$150 million would rebuild three times that amount of critically needed pavements.

Counties have over 2,000 miles of pavement in very poor condition. Replacement of these pavements will average \$500,000 per mile. An investment of \$30 million would rebuild 60 miles of county roads; \$90 million would rebuild 180 miles of county roads (less than 10 percent of the failed roadways).

Cities should spend as much to maintain their streets as was spent to build them in the first place. This includes the cost of timely pavement overlays to keep the surface in good condition and ensure motorists have a safe and smooth ride. Cities estimate that they should invest about \$16,400 annually for each lane mile of city street. However, almost 80 percent spend less than half of this amount. Cities estimate that about half of the annual cost is related to street maintenance and operations; the other half is an annualized cost estimate for pavement overlays. An annual investment of \$42 million would enable cities to improve their street maintenance program. The amount fills the gap between resources (\$123.7 million per year) and needs (\$165.4 million per year).

Gravel Roads: Maintenance and Repairs

A level, smooth surface is necessary to provide the public with acceptable ride, enhance safety, support commerce, and protect the public's investment in the roadbed itself. The primary activity is grading the road several times a year. Fresh new gravel must be added on a regular basis to replace the material lost through degradation caused by traffic usage. Counties have over 10,000 miles roads that need grading.

Counties will spend about \$17 million (including fresh aggregate) per year grading gravel roads. Another \$5 million is needed to do the job adequately.

Why it is important.

Roads that do not have a smooth, consistent surface are not safe. Rough roads put extra wear and tear on vehicles and can damage freight. Much of Oregon's agricultural and forest products are hauled to market over the counties' gravel roads.

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Impact if under-funded

A smooth road surface is key to keeping a road safe for motorists and accessible for commerce. Without regular grading, chuckholes and washboarding make the road difficult to travel at any speed without vehicle damage or compromising safety.

How much does it cost?

Approximately 20% of the county roads are in very poor condition (2,000 miles). These are the roads with failed bases. They will have to be rebuilt at an average cost of \$250,000 per mile. An investment of \$20 million would rebuild 80 miles of county roads; \$60 million would rebuild 240 miles of county roads (9% of the failed roadways).

Roadside Maintenance and Vegetation Control

What we do

We maintain the area between the edge of travel lanes and the edge of the public's right-of-way. This involves sweeping dirt and debris from paved shoulders, repairing fences, mowing, controlling weeds, cutting down trees that might fall onto the road or street, removing graffiti and repairing damage caused by vandalism, litter pickup, and maintaining sidewalks and bike paths. In addition, we maintain landscaped areas and street trees and safety rest areas.

ODOT spends about \$19.8 million per year as part of its maintenance program. This is about two percent of annual state highway program spending, based on ODOT's 2005-2007 biennial budget.

Counties spend about \$10 million a year on shoulder maintenance and \$15 million for roadside vegetation.

Cities maintain their rights-of-way between the curb and private property. Property owners are often, but not always, responsible for sidewalk maintenance and maintenance of landscaping in the parking strip. To the extent that cities bear these expenses, the cost has not been broken out. It is a portion of the overall estimate for maintaining and preserving city streets. See Pavement Preservation and Repair.

Why it is important.

Maintaining road shoulders and grass and brush alongside roads improves the safety of highways, roads, and streets. It also prevents vegetation from trapping water on the roadway which causes cracking and damage to road surfaces.

Impact if under-funded

Ruts can develop along the edge of pavement and gravel shoulders when shoulders are not graded regularly, making it difficult for drivers to safely regain control if they leave the paved surface. Grass and brush can obscure signs and limit visibility at intersections and around curves. Roadsides are also breeding grounds for noxious weeds. Grass can catch fire from exhaust systems. In rural areas, wildlife may graze or browse on grass or brush if it is allowed to

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grow along the right of way. Pavements will also deteriorate more quickly if water is trapped by vegetation in the roadbed. Debris along the road can be a safety hazard. Litter is unsightly and can be unhealthy.

How much does it cost?

An additional \$2 million per year would allow ODOT to augment its noxious weed control program. The additional resources would be used to purchase more effective, longer lasting weed control products.

An additional \$7 million a year could be invested for additional maintenance for county road shoulders and roadside vegetation.

Ditches and Culverts

What we do.

Draining water off road surfaces is another key safety function. Water trapped under pavement can cause roads to fall apart quickly and water in hillsides can cause dangerous landslides and block the road. In urban areas, curbs and gutters, catch basins, and storm drains channel water away from the streets' travel lanes. In rural areas, ditches perform the same function and culverts allow water to pass through the roadbed.

Routine maintenance cleans catch basins and ensures that storm drains are clear. Ditches are periodically cleaned and shaped when debris, vegetation or wildlife block the flow of water. Culverts are also cleared and inspected to ensure that they are not leading to erosion within the roadbed itself.

In addition, culverts are used to channel small streams under the road rather than bridges. In many places, these culverts are barriers to the passage of fish where there have historically been fish runs. The legislature required adequate passage for fish at culverts to implement *The Oregon Plan for Salmon and Watersheds*. The *Oregon Plan* generally increases the cost of replacing a worn out culvert because the replacement must be a larger "fish friendly" culvert.

ODOT spends about \$9 million per year for drainage as part of its maintenance program. The OTP Needs analysis identified an additional \$3.6 million in annual spending for fish passage. This is about one percent of annual state highway program spending, based on ODOT's 2005-2007 biennial budget.

Counties spend about \$17 million per year for general drainage activities and another \$1 million for fish passage.

Cities maintain bridges and culverts over streams in the urban areas. The cost of this activity has not been broken out. It is a portion of the overall estimate for maintaining and preserving city streets. See Pavement Preservation and Repair.

Highways, Roads and Streets Take Care of the System That We Have

Why it is important.

Good drainage maintains the integrity of the roadway. Water can undercut the road and nearby property, causing sinkholes, washouts and landslides.

There are an estimated 50,000 culverts beneath state highways, including about 3,300 that are more than six feet in diameter; the number in county roads and city streets has not been estimated. In addition, there are thousands of miles of ditches and storm drains alongside and beneath Oregon's highways, roads and streets.

ODOT has inspected its 3,300 large culverts and has found that about 220 show moderate to sever deterioration. ODOT also anticipates that about one-third of its large culverts will be replaced for fish passage. ODOT and counties replace most failing culverts as part of other highway improvement projects, such as pavement overlay projects. In addition, ODOT set aside about \$2.5 million per year to replace for large culverts as stand-alone project. The amount is sufficient for three or four projects per year. Counties have identified 100 large culverts that must be replaced to allow fish passage over the next five years. The average cost of these county replacements is about \$300,000. \$1 million is planned for large culvert replacements on county roads.

Impact if under-funded

We experience the hazards of inadequate drainage when leaves and debris block drains. Puddles form and cars can stall if there is high water over the roadway. If culverts are not inspected and cleaned, blockages can lead to erosion and washed out roads.

Emergency repairs to re-open a road will always be done, but emergency repairs cost much more than routine maintenance. For example, the failure of a small culvert lead to a landslide at Cape Foulweather, costing \$2.3 million to repair.

The recovery of salmon watersheds will be delayed until funding can be found to replace culverts that block fish migration.

How much does it cost?

An additional \$4.0 million per year could be invested to replace aging large culverts on the state highway system. The level of total investment (\$6.5 million) in combination with replacements that are components of other highway improvements is sufficient to replace large culverts on the state highway system in 15 years. It will protect the road system as well as help meet the standards of *The Oregon Plan for Salmon and Watersheds*.

Counties need an additional \$5 million a year for general drainage activities and \$5 million a year for needed, but unfunded, fish passage problems.

Highways, Roads and Streets

Take Care of the System That We Have

Traffic Signs and Signals, Striping, and Lighting

What we do

These activities improve safety on our roads, streets and highways by guiding drivers to improve traffic flow or to keep vehicles from straying into on-coming traffic. They include marking travel lanes, fixing and replacing signs, repairing traffic signals and ramp meters, replacing light bulbs and straightening or replacing guard rails and other barriers.

ODOT spends about \$27.2 million per year as part of its maintenance program. This is about three percent of annual state highway program spending, based on ODOT's 2005-2007 biennial budget.

Counties spend about \$17 million per year for traffic services.

Cities also install and maintain traffic signals, signs and street lighting. The amounts for this activity are combined into the overall estimate for maintaining and preserving city streets. See Pavement Preservation and Repair.

Why it is important.

These safety improvements are essential for safe travel on our roads. Motorists depend on traffic signs and signals, lane markings and directional signs, and street lights to navigate the roads safely and efficiently. Signals, signs, pavement markings, and lights wear out from the elements, traffic and constant use even though they are made of durable, high quality materials.

Impact if under-funded

More urgent repair calls may occur for malfunctioning traffic signals. Lane striping is not as visible in adverse driving conditions as it could be. Roadside lighting systems do not function reliably and require repairs more frequently. More signs are faded and are not as visible at night as they could be.

How much does it cost?

For an additional \$3 million, ODOT could replace the lighting system on the interstate highways in the Portland Metro Area. They are failing structurally.

For an additional \$11 million a year, ODOT would increase its use of durable striping products, resulting in a better overall striped line. ODOT would also retrace striped lines annually that are now retraced every two years. The additional funding would also result in an increased level of routine preventive maintenance and would reduce the level of malfunctions that require urgent repairs.

Counties need an additional \$4 million per year to provide uniform adequate services statewide.

Highways, Roads and Streets

Take Care of the System That We Have

Bridge

What we do

Bridge maintenance, repair and rehabilitation are activities that extend the useful lives of existing bridges. This includes repair and repainting and installing fencing to prevent vandals from throwing rocks onto traffic below. Moveable bridges, such as the lift spans of the I-5 Columbia River Bridge and the Burnside Bridge, require ongoing operating expense.

The 2003 Oregon Transportation Investment Act (OTIA III) is providing significant funding for the bridge program. The OTIA III program will replace \$1.3 billion of state highway bridges and \$300 million of bridges on county roads and city streets that have become structurally deficient.

ODOT spends about \$266.8 million to repair or replace bridges per year. A substantial portion of these expenditures are related to the OTIA III state bridge program. In addition, ODOT spends about \$8.1 million per year for structure maintenance. This is about 27 percent of annual state highway program spending, based on ODOT's 2005-2007 biennial budget.

Counties spend about \$13 million per year for structure maintenance. These expenditures include the more than \$5 million that Multnomah County spends to maintain the movable span bridges over the Willamette River. Counties seek state and federal assistance for major rehabilitation and repairs of city-owned bridges. About 84 percent of the \$300 million in OTIA III local bridge bond proceeds is being used to replace or repair county bridges.

Cities spend about \$1 million to maintain the structures on their streets. Cities seek state and federal assistance for major rehabilitation and repairs of city-owned bridges. About 16 percent of the \$300 million in OTIA III local bridge bond proceeds is being used to replace or repair city bridges.

Why it is important.

Oregon has about 6,300 state, county, and city bridges. They are the critical link that allows traffic and commerce to take direct, efficient routes. Some are lifelines that connect communities to the rest of the state. Many bridges are historic and serve as icons for regions of the state.

We have known that Oregon is at greater risk of strong earthquakes since the 1993 Scotts Mills and Klamath Falls earthquakes. Many bridges on state highways were not designed to withstand the strong shaking that a large earthquake might cause. These bridges may be at risk of collapse during an earthquake.

ODOT has been strengthening its bridges to withstand earthquakes on a priority basis for many years. The work involves making the connections between components of the bridges stronger.

Impact if under-funded

The OTIA III program, despite its significant size, addresses only a portion of Oregon's bridges. The OTIA III program will ensure that freight can move on north-south and east-west corridors

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across the state without weight, width or height restrictions. In addition, the bridges that are repaired or replaced by OTIA III will meet current earthquake standards.

There are 43 bridges located on I-5 and 18 located on other routes (US-20, US 26 or OR 34) that are not part of the OTIA III bridge program. These bridges are vulnerable to earthquake damage and should be strengthened.

How much does it cost?

ODOT estimates that:

- An additional \$25 million would strengthen 43 bridges on I-5.
- An additional \$15 million would strengthen 18 bridges on US-20, US-26 and OR-34.

Counties need an additional \$2 million per year for structure maintenance.

Guardrail and Barrier

What we do

We install guardrails and barriers along roads where the terrain may not allow drivers who leave the road time or space enough to regain control. They may also be used to protect pedestrians or bicyclists from motor vehicle traffic.

ODOT spends about \$21.7 million per year to upgrade existing guardrails and barriers and install new sections as components of STIP projects. In addition, ODOT spends about \$500,000 per year to maintain guardrails and barriers and to replace sections damaged in crashes as part of its maintenance program. Despite this level of spending, there are hundreds of miles of substandard guardrail and thousands of substandard guardrail and barrier terminals along state highways.

Counties spend \$2 million per year repairing and maintaining guardrail and barriers along county roads.

Cities maintain guardrails and barriers along their streets. The amounts for this activity are combined into the overall estimate for maintaining and preserving city streets. See Pavement Preservation and Repair.

Why it is important.

Guardrails and barriers are essential for safety. They prevent vehicles from leaving the roadway and either crossing into on-coming traffic or striking some fixed object. While newly installed guardrails and barriers meet today's safety standards, safety standards have changed over time and much of the guardrail and barrier along Oregon roads is substandard.

Impact if under-funded

The critical safety function that guardrails and barriers fulfill cannot be realized so long as substandard guardrails and barriers remain in place. Substandard guardrails and barriers, especially at the ends or terminals, can present as great a safety hazard to motorists as leaving the roadway.

Highways, Roads and Streets Take Care of the System That We Have

How much does it cost?

An additional \$3 million could be invested to upgrade guardrails on about 30 miles of the state highway system. Guardrail costs about \$100,000 per mile. The additional investment would also allow the department to replace substandard terminals and improve safety.

An additional \$1 million should be spent just to provide repairs and maintenance to the existing barriers and guardrails on county roads.

Snow and Ice Removal and Other Storm Repair

What we do

We apply anti-icing materials before freezing weather sets in. We plow snow to keep roads open and sand to increase traction. Roads and highway must be repaired during and after major storm events to ensure public safety. This can include everything from rock and tree removal to major slide repairs.

ODOT spends about \$32 million per year for snow and ice removal, clearing rockfalls from the roadway, and extraordinary maintenance. In addition, the Needs Analysis for the OTP Update estimated that ODOT spends about \$6.9 million per year in STIP projects to mitigate landslides and rockfalls. The STIP projects are done on a non-emergency basis. They are intended to stabilize roadways and slopes to reduce the risk to travelers and the likelihood of long term closures. This is about four percent of annual state highway program spending, based on ODOT's 2005-2007 biennial budget.

Counties anticipate spending about \$10 million a year for these activities along their roads and streets.

Cities spend about \$0.6 million for snow and ice removal.

Why it is important.

Roads to all Oregon's communities must be kept open for commerce and safe for motorists. Counties must keep their routes open for school buses, mail delivery and emergency vehicles.

Impact if under-funded

Activities in other areas would be deferred rather than to under-invest in snow and ice removal or to defer immediate repairs for slides and washouts.

How much does it cost?

A \$1 million increase in the state highway snow and ice removal program would allow ODOT to purchase the same amount of de-icing material for the winter of 2007 as it purchased for the winter of 2006. The cost of de-icing material has increased significantly. Twenty percent more material, costing an additional \$1 million, would allow ODOT to apply de-icing material to more roadways or to apply more often. The public could see improved winter service with a lower likelihood of stopping to put chains on their vehicles.

Highways, Roads and Streets Take Care of the System That We Have

The costs of major landslide and rockfall mitigation projects have wide range. The Needs Analysis for the OTP Update estimates that a typical project costs about \$3 million. An investment of \$6 million would fund two additional projects each year.

Counties need approximately \$3 million a year to provide similar increases in service.

Highways, Roads and Streets Make the System Work Better

Intelligent Transportation Systems

What we do

Intelligent Transportation Systems (ITS) makes use of communication and computer technology to enhance the movement of people, goods and services. Examples of ITS in place today include:

- Urban Traffic Management, such as Portland's Advanced Traffic Management System. These projects decrease travel times for commuters and improve safety. For example, when ramp meters were introduced on I-5 in Portland, rush hour travel speeds increased and the number of accidents fell by 43 percent.
- Rural ITS projects focus on traveler information and safety. These include highway cameras, variable message signs, warning signs for high wind or high water, and road weather information.
- Travel Information Services, like ODOT's TripCheck.com and the 511 system provide current information to help travelers avoid adverse road and weather conditions. TripCheck also links to web sites such as the Salem Cherriots and Amtrak to help bus and train riders plan their trips.

ODOT invests about \$3.7 million per year in new ITS projects and spends about \$1.25 million per year to maintain existing ITS equipment.

Why it is important

ITS can help improve Oregon's transportation system by:

- Allowing for better management of transportation supply and demand.
- Promoting the use of alternative modes and connectivity across the different modes.
- Increasing travel efficiency and mobility without increasing the physical size of the transportation facility.
- Enabling travelers to choose travel time, mode and route efficiently based on real-time roadway and public transit status information.
- Reducing the cost of operating and maintaining transportation facilities and services through more efficient use of existing facilities and with the use of automated or remote control of equipment.

National studies indicate that the benefit to cost ratios for ITS projects are in the range of 10 and 20 to 1.

Impact if under-funded

ITS technology will be introduced onto Oregon highways at a slower pace. It may take longer to install enough ITS technology to make an appreciable difference since an individual project, such as a variable message sign, ramp meter, or camera, does not affect the flow of traffic. ITS is most effective when considered from the perspective of the system as a whole.

How much does it cost?

An additional investment of \$2 million per year would enable ODOT to advance the ITS program. The money would pay for the installation, operation and maintenance of the wiring,

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communications equipment, cameras, and variable message signs that make up an arterial traffic management system.

Highways, Roads and Streets

Improve Safety

Bridge Railings

What we do

All bridges have railings to keep traffic on the bridge. The Federal Highway Administration set national standards during the 1990s for the design of bridge railings to improve safety. Many bridges on state highways were built before the standards were set and have railings that do not meet the FHWA standards.

ODOT does not have a specific program to replace substandard bridge railings. Rather, when a bridge is repaired beyond a certain threshold, ODOT upgrades the railing as part of the overall bridge repair project. This approach complies with ODOT's agreements with FHWA.

Why it is important.

If ODOT creates a Bridge Railing Program to dedicate funding to replace deficient bridge railing on the highest priority bridges, then FHWA will allow ODOT to defer upgrades other bridges until those railings can be replaced by the Bridge Railing Program.

Impact if under-funded

Without a Bridge Railing Program, bridge repair projects in both OTIA III State Bridge Program and the Interstate Maintenance Program must replace substandard railing, in addition to the original scope of work for these projects. Replacement work on the deck and rail involves longer lane closures, traffic delays, and/or detours than would be required for the repair work alone.

How much does it cost?

An investment of \$30 million would fund a Bridge Railing Program for 10 years. The program would benefit the OTIA III and Interstate Maintenance programs when bridges are rehabilitated by deferring the requirement to replace bridge rails, reducing traffic delays, impacts to the public and costs.

Highways, Roads and Streets Increase Capacity

State Modernization Program

What we do

Capital improvements to the state highway system are identified and scheduled in the Statewide Transportation Improvement Program (STIP), including projects aimed at safety, major rehabilitation and replacement, and modernization. The State Modernization Program is aimed at expansion of facilities to address current or future congestion, planned growth areas, economic development opportunities, industrial access and freight movement.

The State Modernization Program totals about \$83 million per year during 2010 and 2011 of which \$34 million is dedicated to repay bonds issued for the modernization components of the Oregon Transportation Investment Act programs adopted by the Oregon Legislature, to support economic development, and to develop modernization projects.

Why it is important

While the OTIA programs have accelerated about \$750 million of modernization projects to early construction, the debt payments leave \$49 million per year available for new projects.

The Oregon Transportation Plan estimated that the gap between current resources for modernization and what should be built to be \$222 million per year, far in excess of the available \$49 million STIP Modernization Program.

Impact if under-funded

Area Commissions on Transportation (ACTs) and ODOT Regions are stretching the resources of the State Modernization Program by:

- Dividing projects into multiple phases.
- Designing projects to be ready if federal funds or earmarks become available to build them.
- Purchasing right-of-way early to avoid higher cost after land has been developed.

The public must wait for the benefits of projects when they are divided into small phases. In addition, the public is inconvenienced longer as the construction process is extended. Further, project designs are often overtaken by developments on the ground and a substantial amount of the work must be redone.

How much does it cost?

An investment of \$50 million in the State Modernization Program would double the annual program. See also proposals for Large Modernization Projects, an Arterial Program and City and County modernization.

Highways, Roads and Streets Increase Capacity

Large Modernization Projects

What we do

The Oregon Transportation Commission has adopted a list of “Projects of Statewide Significance” in 2002 comprised of the following major facilities:

- The I-5/Columbia River Crossing (in cooperation with the State of Washington)
- I-205
- The Sunrise Corridor – connecting the Portland region to the new community of Damascus and Central Oregon
- The I-5/99W Connector – connecting the Portland region to the communities of Newberg, Dundee and McMinnville and the Oregon Coast
- The Newberg-Dundee Bypass in Yamhill County
- The I-5/I-405 loop in central Portland
- US 20: Pioneer Mountain to Eddyville
- OR 62 Corridor Solutions in Medford

Since the Commission adopted the list, one project (US 20: Pioneer Mountain to Eddyville) has been fully funded and is under construction.

These projects are large; there are others around the state of similar magnitude. For instance, the total cost of the US 20 project is projected to be about \$158 million. Estimates for other projects listed above range from \$250 million to \$1 billion, based on what is known about them today. Financing such large projects through the annual State Modernization Program is impractical. If the full \$49 million annual program was dedicated to just one of these projects, it would take years, if not decades, to complete the project and would defer action on projects elsewhere in the state.

It may be feasible to complete large projects like those listed above as public-private partnerships, possibly through the adoption of tolls if tolls are acceptable to the public. ODOT and the Oregon Transportation Improvement Group, a consortium lead by Macquarie Infrastructure Group, is now evaluating the financial and technical feasibility of building three projects (the Newberg-Dundee Bypass, the Sunrise Corridor and I-205 South Corridor) as public-private partnerships.

Why it is important

These are critical segments of the state highway system where existing and projected congestion is causing significant impact on livability and economic vitality. Failure to address this congestion threatens to undermine plans for growth and cause severe limitation to freight movement. Considering funding through conventional mechanisms is not practical due to the size of the projects. This proposal would make it feasible to advance the projects on the basis of a public-private partnership.

Highways, Roads and Streets Increase Capacity

Impact if under-funded

The projects would continue to be developed on an incremental basis, resulting in an extended schedule with very little construction in the foreseeable future. A public funding resource would provide significant flexibility to finalize a funding strategy most appropriate to the state and the locality.

How much does it cost?

An investment of \$50 million per year would provide a funding vehicle to advance these projects. The funding would be used to complete the project development process needed to define the project scope and financing, to acquire and protect needed right-of-way, and to provide financing to close the gap between project cost and possible toll revenues.

The Newberg-Dundee Bypass is the project that has completed the greatest level of project development and likely the first to develop a completed funding agreement allowing it to proceed to construction.

City / County Arterials

What we do

This need consists of 1) arterials parallel to the state highway system, 2) arterial freight corridors and industrial access routes, and 3) major bottlenecks. Cities and Counties identify necessary arterial improvements in local Transportation System Plans (TSP) and Regional Transportation Plans (RTP). These improvements are then programmed in local Capital Improvement Plans (CIP) as funding is available.

The statewide need for arterial capacity improvements is estimated to be \$284 million per year, which represents 80% of a total \$355 million need for City and County road modernization.

Why it is important

These system improvements will relieve pressure on congested state highways and support statewide and local economic development by improving access to industrial and employment centers. Arterials and collectors compose the critical first and last "leg" of freight routes. The current freight and general traffic demands cannot be accommodated on the current system, particularly in high growth areas where congestion negatively impacts livability and the competitive advantages for business.

This estimate of statewide need will assist many new urban areas to grow as planned but the estimate does not fully reflect all costs. In the Portland Metropolitan area, additional statewide arterial needs will become evident as soon as transportation plans are completed for the emerging growth areas now designated for significant expansion or density changes.

Impact if Underfunded

Without adequate funding, the current system will experience more and longer periods of congestion, missed deliveries and safety problems associated with longer periods when the roads are substantially over design capacity. Moreover, lack of timely investments will increase the

Highways, Roads and Streets Increase Capacity

cost of projects dependent upon public right of way acquisitions because of rapid escalation in real estate prices.

How much does it cost?

An investment of \$200 million per year could be made in the Local Arterial System. The remainder (about 30 percent of the estimated \$284 million annual need) can be met through development, development fees, and other local and regional funding mechanisms.

Take Care of the System That We Have

Critical Needs in the areas of:

- Continue the Pavement Maintenance Program to maintain hard surfaces (aprons, taxiways and runways) at public-use airports in good condition.....
- Maintain airside airport infrastructure (aprons, taxiways, runways, and navigation lighting) in a safe and operable condition
- Rebuild existing failed airside facilities.....
- Maintain landside airport infrastructure (terminal areas, fire services, etc) in a safe and operable condition.....
- Rebuild existing failed landside facilities
- Mitigate environmental issues (i.e., drainage, noise, wetlands, etc).....
- Maintain and replace equipment (i.e., tractors, mowers, snow plows, etc.) used to maintain facilities
- Keep airports open during natural disasters.....
- Maintain compatible land uses on and surrounding airports
- Protect airports and airport (airspace) overlays from encroachment

Make the System Work Better

Critical Needs in the areas of:

- Upgrade airside facilities to meet current and forecasted demands.....
- Upgrade landside facilities to meet current and forecasted demands
- Improve the availability of surface transportation to and from airports
- Improve all-weather flight access to airports by adding instrument approaches and procedures
- Develop system coordination for large-scale disasters and emergency response.....
- Improve airport signage and markings where deficient on aprons, taxiways, and runways .
- Improve airport services (i.e. fuel, aircraft maintenances, pilot flight planning rooms, etc.)
- Add facilities, such as public restrooms, heliports, agricultural applicator pads, aircraft wash pads, etc.) where most needed
- Install energy efficient (L.E.D.) runway/taxiway lighting systems
- Install perimeter fencing and electric gates for security enhancement
- Install security cameras.....

Improve Safety

Critical Needs in the areas of:

- Install Automated Surface Observation Systems and Automated Weather Observation Systems (ASOS/AWOS) to improve airport weather reporting capabilities
- Improve airport fire protection and suppression.....
- Equip first responders with the tools necessary to address aviation incidents/accidents
- Prioritize and implement specific airport safety improvement projects, such as obstruction removal
- Install perimeter fencing for wildlife management.....
- Improve apron, taxiway, instrument approach lighting capability (ground/flight safety, security, etc.).....

- Preserve and improve runway safety areas, protection zones, and approach clearance
- Educate pilots, airport crews, and others involved on current airport operations and procedures

Increase Capacity

Critical Needs in the areas of:

- Develop efficient and effective air passenger services where market demand is evident to/from Oregon destinations
- Develop efficient and effective air freight services where market demand is evident to/from Oregon destinations
- Coordinate/connect with other transportation modes to move people and freight effectively
- Add instrument approaches to increase system capacity
- Improve the air traffic control system.....
- Increase and improve runway length and weight bearing capacity at high-demand airports
- Develop and improve all weather capability at identified airports with enhancements to runway length, markings/lighting systems, and instrument approaches.....
- Expand airport infrastructure to meet both air and landside demands.....
- Acquire land for airport development and to protect airports from incompatible adjacent land uses.....
- Develop airports or heliports in selected areas to relieve air traffic congestion and for emergency uses
- Strengthen land use and zoning laws to ensure airports remain as a vital transportation link

Current Status ... Gathering Information to Quantify Need

Available Resources:

- Oregon Transportation Plan Update
- 2000 Aviation System Plan
- Aviation System Plan Update (underway)
- Economic Impact Study (underway)
- Aviation Master Plan (underway)

Background

Oregon's statewide system of airports consists of over 400 public- and private-use airports. Of these 101 are public-use airports. Services are provided to airline passengers, general aviation travelers, air cargo, air ambulance and military users and for numerous businesses, agricultural and resource management activities including fire suppression. While most air transportation services are provided by the private sector, the airports facilities are primarily owned and managed by public entities including the state, city and county governments, ports, and federal agencies.

Portland International Airport dominates Oregon's air service, providing about 90 percent of the state's commercial passenger service and 97 percent of the state's enplaned cargo. The Eugene, Klamath Falls, North Bend, Redmond, Medford, and Pendleton airports also have commercial air passenger service. Newport, Corvallis, Salem, and other locations no longer have commercial air service, but did at one time.

The Oregon Transportation Plan is the state's long-range multimodal transportation plan. It is an overarching policy document that focuses on state, local and public aspects of Oregon's transportation system. Identifying what should be done to maintain and improve the transportation system ("feasible needs") is a major component of the Plan.

The 2006 update of the Plan estimated the difference between the local, state and federal resources that are available and those that would be required to meet "feasible needs," based on the *2000 Oregon Aviation Plan*. The annual resources for aviation infrastructure maintenance and improvement were estimated to be \$69 million (2004 dollars). Feasible needs were estimated to be about \$178 million (2004 dollars), leaving an annual gap of about \$109 million.

The Oregon Department of Aviation is conducting several studies to assess the condition of the existing aviation infrastructure, the economic benefit of the aviation industry, and the passenger demands for air service. These include:

- An update of the State Aviation System Plan. The update will inventory existing facilities at each airport, assess its current conditions and future needs, and its role in the state's overall aviation system.
- An Economic Impact Study. The Study will document and quantify the value of the aviation system to Oregon's economy and to the economies of communities where they are located.
- A State Aviation Master Plan. Each airport has an airport master plan and airport layout plan. These plans guide growth and development for the airport. The State Aviation Master Plan will be a comprehensive plan to address all the public-use airports in Oregon. It will identify improvements for individual airports, as part of the larger state system, to meet the needs of tourism, economic development, and transportation services for each community and the state as a whole.

The Oregon Department of Aviation's planning effort is underway. While areas for investment have been identified, the studies have not reached the stage where investment needs have been quantified.

Maritime and Ports

Take Care of the System That We Have

Critical Investments in the areas of:

- Channel Deepening, Dredging and Jetty Maintenance and Replacement(maintain federal commitment)
- Dockside and Marina Dredging \$2 million
- Dock Rehabilitation \$4 million

Improve Safety

Critical Investments in the areas of:

- Intermodal Container Security \$2.4 million

Increase Capacity

Critical Investments in the areas of:

- Columbia River Channel Deepening(maintain federal commitment)
- Improvements to Docks and Facilities..... \$20 million

Current Status ... Final Review

Available Resources:

- Oregon Transportation Plan Update
- Marine Transportation System Study
- Port master plans
- *ConnectOregon* applications

Maritime and Ports

Background

The majority of marine freight in Oregon moves on the Columbia River below Portland and on the Willamette River in Portland. The Columbia-Snake River System is navigable by barge as far east of Portland as Lewiston, Idaho. Much of the freight moved by barge is transloaded to/from ships, primarily in Portland.

Oregon has 23 port districts. Nine port districts move freight through intermodal marine terminals. Deep-draft freight terminals are located in Coos-Bay-North Bend, at Newport and at three ports on the Oregon side of the Columbia River (Astoria, St. Helens, and Portland). Shallow draft terminals are located in The Dalles, Arlington, Boardman (Morrow), and Umatilla.

Ports and marine freight play a significant role in the economy. Ports are also a key link in moving freight between transportation modes and have the equipment and facilities needed to move freight between marine, rail, and truck transportation.

The Oregon Transportation Plan is the state's long-range multimodal transportation plan. It is an overarching policy document that focuses on state, local and public aspects of Oregon's transportation system. Identifying what should be done to maintain and improve the transportation system ("feasible needs") is a major component of the Plan.

The 2006 update of the Plan estimated the difference between the resources that are available today and those that would be required to meet "feasible needs." The annual resources for available to maintain and improve the marine infrastructure were estimated to be \$51.3 million (2004 dollars). Feasible needs were estimated to be \$56.2 million (2004 dollars).

The investment options described on the attached pages are not intended to represent a plan to meet feasible needs. They propose specific improvements in the marine transportation system provided additional resources can be identified. They assume that both public and private funding for the marine transportation system remains in place and continues to be invested as it is today.

Maritime and Ports Take Care of the System That We Have

The majority of marine freight in Oregon moves on the Columbia River downstream from Portland and on the Willamette River in Portland. The Columbia-Snake River System is navigable by barge upstream from Portland as far as Lewiston, Idaho, 465 miles from the Columbia's mouth. Much of the material moved by barge is loaded directly to or from ships, primarily in Portland.

In addition, coastal and Columbia River ports host much of Oregon's seafood industry, a sport fishery and a growing cruise line business.

Channel Dredging and Jetty Maintenance

What is being done today?

The U.S. Army Corps of Engineers maintains the federally authorized channel depths for the Columbia and Snake River systems, the Lower Willamette River, Coos Bay and harbor, and Yaquina Bay and harbor. The draft Oregon Transportation Plan update estimates that channel maintenance cost about \$35 million per year (2004 dollars).

The Corps is also responsible for the maintenance of the jetties that protect coastal harbor entrances and the pile dikes that maintain the Columbia River shipping channel. The Corps spends about \$3.2 million per year (2004 dollars) to monitor and maintain these jetties.

Why is it important?

River currents and marine tides erode channels and deposit silt, sand and gravel. Maintenance dredging is essential to ensure that channels remain at the proper depth and that vessels can pass safely.

What happens if the investment is not made?

Maintenance dredging is a major concern for the ports on the Oregon coast. Without maintenance of the jetties and channels, harbor facilities are not likely to remain viable for freight, commercial and sport fishing, recreational boating, and Coast Guard activities. Channels will fill in and become unusable. Businesses that depend on reliable marine transportation will move elsewhere or close. Significant public and private investments in docks and upland improvements will be reduced in value.

The Marine Transportation Study notes that the Columbia River jetties are overdue for major repair. The jetties could be breached during a large storm and large volumes of sand could be deposited in the Columbia River navigation channel. This would disrupt navigation and commerce. Maintenance and rehabilitation of other coastal jetties has been deferred as well.

How much does the investment cost?

Channel and jetty maintenance is a largely a federal responsibility. The U.S. Army Corps of Engineers does the channel dredging and jetty maintenance work with funds appropriated by Congress. However, Congress has not appropriated sufficient resources

Maritime and Ports Take Care of the System That We Have

budgeted and there is significant deferred maintenance in this area, especially for Oregon's smaller coastal ports.

Investments in channel dredging and jetty maintenance require continuation of federal commitments in this critical area. The Oregon and Northwest congressional delegations, state agencies, local government, and the private sector must work to assure that annual federal appropriations for Corps projects are made.

Dockside and Marina Dredging

What is being done today?

Dredging of the channels that serve moorages outside of the federally authorized channels is a local port responsibility. Ports request assistance from the U.S. Army Corps of Engineers. These requests are granted occasionally. Several ports also do dredging on their own to maintain serviceable channel depth.

Why is it important?

Silt and other materials settle into basins and marinas and alongside docks, restricting channel depths and widths. Businesses that depend on reliable marine transportation may move elsewhere. Significant public and private investments in docks and upland improvements could be reduced in value if dredging is not done when needed.

What happens if the investment is not made?

Some ports continue to function for a time by restricting operations to high tide; others restrict operations to shallow draft or partially loaded vessels. Restricted operations adversely affect business, such as fishing and fish buying. In addition, restricted operations may have safety implications during storms. Eventually, the water in marinas and around docks becomes too shallow for use.

At the Port of Astoria, annual dredging removes about 175,000 cubic yards of silt to maintain access to docks and facilities. This protects businesses that employ 230 people and bring 25,000 visitors to the area. It also protects public and private investments of almost \$30 million.

How much does the investment cost?

An investment of \$2 million would address the ports' dockside and marina dredging requirements, based on information received from coastal ports. This is in addition to requests granted by the federal government and spending by the port districts themselves.

Dock Rehabilitation

What is being done today?

Docks are repaired or rebuilt as funds become available. This is usually in connection with a specific development project or grant opportunity.

Maritime and Ports Take Care of the System That We Have

Why is it important?

Docks and moorages make the link between landside and marine transportation. They are essential for the movement of freight, for Oregon's fisheries, and for recreation.

What happens if the investment is not made?

Docks and moorages, whether built of timber or steel and concrete, deteriorate. Ports make repairs and perform routine maintenance, but cannot halt deterioration due to long-term exposure to the harsh marine environment.

How much does the investment cost?

An additional investment of \$4 million would address ports' dock and moorage rehabilitation needs. Ports' improvement plans identify a number of dock, marina, and moorage replacement or rehabilitation projects.

Maritime and Ports Improve Safety

Intermodal Container Security and Safety

What is being done today?

Oregon ports are adding their ability to handle intermodal containers by both ship and barge. The Maritime Transportation Study anticipates that container traffic at Oregon ports will increase from about 300,000 units in 2000 to 500,000 units in 2010. Examples of projects that support and facilitate this increased volume the Columbia River Channel Deepening Project and Port of Portland's purchase of a post-Panamax container crane

The Transportation Security Administration is providing assistance to ports to improve the ability to screen intermodal containers. The goal of the effort is to provide safer, more reliable and more efficient intermodal freight mobility. While improving the capacity to handle intermodal containers enhances freight mobility, benefits Oregon's economy and mitigates congestion, it must also ensure that national security goals are met.

Why is it important?

Containers are screened at foreign ports of departure. Nevertheless, containers have been used ship illegal immigrants and drugs into the country. There are also concerns that terrorists could use containers to smuggle bombs and bomb making material, including nuclear weapons, and biological weapons into the U.S.

What happens if the investment is not made?

Improving the container screening process at U.S. ports of entry is necessary. However, the screening process could become a bottleneck at Oregon ports if facilities at larger ports, such as Seattle, Tacoma, or Los Angeles / Long Beach, are better equipped.

How much does the investment cost?

An investment of \$2.5 million can leverage federal funds to begin to improve port security.

Maritime and Ports Increase Capacity

Columbia River Channel Deepening

What is being done today?

The Columbia River Channel Deepening project is a major addition to the capacity of the maritime transportation system. The project will deepen the 600-foot wide Columbia River channel from 40 to 43 feet. The U.S. Army Corps of Engineers began work on the project in 2005 after 16 years of planning and development work.

Why is it important?

The world's shipping fleet is changing. Over 80 percent of the vessels in transpacific trade are the larger, more fuel-efficient ships that are constrained by the 40-foot depth in the Columbia River channel. The channel deepening project enables these large vessels to call at Columbia River ports and improves access of Oregon businesses, farmers, ports, and communities to world trade.

What happens if the investment is not made?

If the Columbia River channel is not deepened, the Portland – Vancouver area will lose its competitive edge in the world market and suffer direct economic consequences.

How much does the investment cost?

The project's total cost is estimated to be about \$150.5 million. The states of Oregon and Washington are each providing matching funds of \$27.7 million; the balance, about 65 percent of the cost, is expected to be federally funded.

The U.S. Army Corps of Engineers began dredging operations in 2005 and completed about 25 percent of the project by the end of the year. Another major section of the channel is expected to be deepened in 2006.

However, additional effort is needed to keep the project moving forward. Future federal appropriations must occur in order to complete it. The Oregon and Northwest congressional delegations, state agencies, local government, and the private sector must work to assure that annual federal appropriations for this project are made.

Capacity Improvements to Docks and Facilities

What is being done today?

Improvements to docks and facilities are usually made as part of or the support for economic development projects. These can range from improving moorages, to rehabilitating or expanding the capacity of docks, to purchasing equipment, such as cranes.

Why is it important?

These improvements provide the addition freight handling capacity to support economic development.

Maritime and Ports Increase Capacity

What happens if the investment is not made?

It is difficult to attract development and grow the economy when the necessary transportation infrastructure is not available to support the development.

How much does the investment cost?

An investment of \$20 million would allow ports to add capacity to their dock and facilities. Ports' improvement plans identify a number of projects to expand capacity to support economic development.

Public Transportation

Take Care of the System That We Have

Critical Investments in the areas of:

- Vehicle Replacement:
 - Standard buses for the fixed route bus fleet.....\$24.5 million/year
 - Smaller vehicles that provide services for senior citizens and people with disabilities\$7 million/year
- Maintain Special Transportation Service LevelsAdd \$1.8 million each year

Make The System Work Better

Critical Investments in the areas of:

- Innovative Approaches / Best Practices.....\$5 million
- Signal Priority\$1 million/year

Improve Safety

Critical Investments in the areas of:

- Sidewalks and Bus Stop Improvements.....\$1.5 million/year

Increase Capacity

Critical Investments in the areas of:

- Additional High Capacity Transit..... not estimated
- Additional Special Needs Transportation Service to Meet Demands of Aging Baby Boomers\$7.3 million per year
- Improved Connectivity Between Cities and Towns not estimated

Current Status ... Final Review

Available Resources:

- Oregon Transportation Plan Update
- The Portland Regional Transportation Plan (RTP)
- The TriMet Transit Investment Plan
- The Region 2040 Framework Plan
- 2003 Status and Condition of the Statewide Transit Fleet
- Public Transit Division vehicle inventories
- Tri-County Elderly and Disabled Transportation Plan (May 2006)
- Recommendations on the Future of Long Term Care in Oregon May 2006, Department of Human Services
- Other Districts' Long Range Plans

Public Transportation

Background

There are more than 230 public transportation providers in Oregon, including large metro area transit districts, transportation districts, cities, counties, private non-profit organizations, and for-profit companies, such as privately owned intercity bus and taxi cabs.

Regional transit districts, cities, counties, non-profit organizations, and private for-profit intercity bus operators provide public transportation services in Oregon. The transportation providers operate more than 1,700 vehicles. They provided over 120 million passenger trips in 2002-2003.

- Fixed route services use about 1,000 vehicles each year.
- Paratransit services use about 700 vehicles each year.

Public transportation services vary significantly between Oregon's urban centers, small cities, and rural areas. The large metro area public transportation operators provide the majority of service, light rail, fixed route bus, transportation demand management, such as carpool and vanpool, and demand response to meet special needs. Smaller cities and rural areas are served by community based services whose main focus is to provide mobility options for those who cannot drive, typically through local bus, van and dial-a-ride services.

The Oregon Transportation Plan is the state's long-range multimodal transportation plan. It is an overarching policy document that focuses on state, local and public aspects of Oregon's transportation system. Identifying what should be done to maintain and improve the transportation system ("feasible needs") is a major component of the Plan.

The 2006 update of the Plan estimated the difference between the local, state and federal resources that are available and those that would be required to meet "feasible needs." The annual resources for public transportation were estimated to be \$364 million (2004 dollars). Feasible needs were estimated to be \$812 million (2004 dollars)

The investment options described on the attached pages are not intended to represent a plan to meet all feasible needs. They propose improvements in the public transportation system provided additional resources can be identified. They assume that state and local funding for the public transportation system remains in place and continues to be invested as it is today.

Public Transportation

Take Care of the System That We Have

Vehicle Replacement

What is being done today?

The standard (40') buses used by the fixed route operators should be replaced after 12 years of operation. The national bus testing indicates that a 12-year replacement cycle maintains the lowest life-cycle cost of operation. A 12-year replacement cycle is the "standard" used by the Federal Transit Administration.

The smaller buses, cars and vans used to provide demand response services to the general public in rural areas and to senior citizens and people with disabilities. These vehicles should be replaced after four to seven years of operation, depending on the type of vehicle. They are designed for light-duty use.

Oregon transit providers are replacing equipment when they can obtain federal grant funds. They use their local funds for capital purchases when federal matching grants are not available. Transit providers have strengthened maintenance practices to extend vehicle life and to stretch replacement cycles. They generally accept a 15-year replacement cycle for large buses and a seven-year replacement cycle for smaller buses. However, maintenance cannot substitute for timely replacement in keeping life-cycle operating costs at their lowest level.

Why is it important?

Buses that look good and have the latest features are more likely to attract new riders. Clean and maintained equipment is a prerequisite both to positive customer reception and to reliable operations. As equipment ages, it becomes more costly to maintain and may become noisy and more difficult to keep clean and looking good. Eventually, deferred vehicle replacement reduces the reliability and quality of service to the public. The public will not ride buses that are perceived to be in poor condition.

The deferred vehicle replacement results in higher cost of operation. Oregon statistics show that:

- Older buses break down on the road much more often than newer buses. Eight year old buses required service on the road 32 percent more often than one year old buses.
- By the 15th year of operation, an hour of bus repair is required 38 percent more frequently than in the first year.
- Technology changes over time and it becomes more difficult to find replacement parts after eight years.

What happens if the investment is not made?

The Oregon bus fleet will continue to age. Transit operators will trim resources from service expansion plans or will reduce service to meet the higher cost of maintaining older equipment in good repair. Transit ridership will decline if equipment is unreliable or uncomfortable. Obsolescence will eventually force the retirement of buses and, ultimately, reductions in service.

How much does the investment cost?

Public Transportation

Take Care of the System That We Have

The state's transit community views support for vehicle replacement as being the highest priority for state assistance.

An investment of \$31.5 million per year would halt the aging and deterioration of:

- Large Bus Replacement – About \$24.5 million per year to replace one-fifteenth of the large bus fleet (70 vehicles at \$350,000 each).
- Small vehicle replacement – About \$7 million per year would replace vehicles used in special transportation service on the appropriate replacement cycle (about 100 vehicles per year at an average of \$70,000 each).

A 2003 Oregon Transit Association study indicated that it would be necessary to replace about 249 buses to return Oregon fixed route bus fleet to a 15-year average age (about \$87 million at \$350,000 each). According to the same study, it would be necessary to replace about 167 vehicles (about \$11.7 million at \$70,000) to return the fleet of smaller vehicles used to provide special transportation service.

The Oregon Transportation Plan indicated \$25.7 million in 2004 vehicle replacement spending (the OTP's base year). Federal and state funds earmarked or planned for vehicle replacements in the near term total about \$10 million per year.

The level of investment (\$31.5 million per year) would need to be sustained to meet vehicle replacement cycles. State and federal financial assistance is almost sufficient to maintain the replacement cycle for the small vehicles used for special transportation service.

Maintain Special Transportation Service Levels

What is being done today?

Transportation service tailored to meet the needs of senior citizens and people with disabilities is available statewide. In urban areas, special transportation service supplements fixed route bus service and is required by the federal regulations that implement the Americans with Disabilities Act (ADA). In many rural areas, service for seniors and people with disabilities is provided by the public transportation operators. In a few communities, the only form of public transportation service available is service for seniors and people with disabilities.

Collectively, Oregon's public transportation agencies offered 19.7 million miles of special transportation service during fiscal year 2005. Each mile of service costs about \$3.00, and the average cost per ride is close to \$20.00.

These services are financed by the local public transit agencies, supplemented by federal funds and the state of Oregon's Elderly and Disabled Special Transportation Fund.

Public Transportation

Take Care of the System That We Have

The Special Transportation Fund is a long standing state commitment to support transportation services for seniors and people with disabilities. The commitment began in 1985 with the revenue from a penny of cigarette tax. While the level of assistance from the Special Transportation Fund has grown, it has not kept pace with the rapidly rising demand for special transportation service.

Why is it important?

Important aspects of the design and service standards for special transportation service offered by the fixed route systems are set by federal Americans with Disabilities Act (ADA) regulations. The special transportation service is more costly to operate than fixed route service on a per passenger basis because the special service is tailored to passengers' needs. Further, there is need for special transportation service well beyond the curb-to-curb requirements of the federal law.

What happens if the investment is not made?

The amount of public transportation service available will decline in the face of the increasing cost of providing those services. The large urban transit systems may shift resources from services to the general public to those that meet special needs because of the ADA mandate. In rural areas, public transportation providers may reduce the level of service to balance resources with the increasing cost of providing service.

The revenues for the Special Transportation Fund are relatively stable. Cigarette tax revenue is stable, as the declining percentage of people who smoke is balanced by population growth. Revenue from ID cards is increasing slowly as the number of people who do not have driver licenses increases. However, Special Transportation Fund resources on a per capita basis is declining as population growth is outpacing the growth in the Fund.

How much does the investment cost?

Even a moderate 3.1 percent rate of inflation increases the cost of operating special transportation services by about nine cents per year. If each mile of service costs \$3.00 this year, it will cost \$3.09 next year and \$3.19 the year after that. The cumulative effect is that Oregon's special transportation operators need an additional \$1.8 million each year to merely continue to maintain the level of service.

Public Transportation

Make the System Work Better

Innovative Approaches / Best Practices in Elderly and Disabled Transportation

What we do

Typically, public transportation operators in urban areas offer two types of service – fixed route service (bus and rail) and paratransit service for those who cannot use fixed route service. In rural areas, transportation operators usually offer demand responsive service for the general public, including seniors and people with disabilities.

Urban public transportation operators are experimenting with a variety of service designs and techniques to increase the cost effectiveness of special needs transportation service and to build a bridge between paratransit and fixed route services. Examples include travel training, consumer education, shopper shuttles and paratransit feeder service, suburban shuttles, travel hosts, travel buddies, deviated fixed route services, community-based transportation services such as privately operated accessible vans, rideboards, volunteer exchanges, web-based customer information, and coordinating rides between programs such as MTP brokerages and paratransit. All of these options and more are listed and supported in the Tri-County Elderly and Disabled Transportation Plan (2006) and in the E-Z Access program developed at Lane Transit District.

Rural public transportation operators are also experimenting with service strategies designed to increase access and to serve more people in a cost effective manner. This includes using new technology, consumer education, service and resource coordination, and innovative evening and weekend services.

Why it is important

Complementary paratransit is a civil right. Transit agencies must meet the demand for service. Yet, ADA complementary paratransit rides cost 10 times as much as fixed route rides. Many customers of paratransit services are frail elderly. Given the aging of the population, the resulting increased demand for paratransit will likely result in financial crises that put the state's fixed route transit systems in jeopardy. Yet, for every senior or person with a disability and uses complementary paratransit, there are 10 seniors or people with disabilities who use fixed route services.

The goal of innovation/best practices is to offer a range of services that match individual abilities and support customer independence and convenience, but also promote fixed route and other lower-cost options as the best use of scarce transportation resources. Experimental service, whether newly developed or adapted from another community, require resources and evaluation.

Cost-effective solutions are critical to responding effectively to the demographic crisis that transit agencies, social service agencies and private non-profit providers of care for seniors and people with disabilities are facing.

Curb-to-curb paratransit is a lifeline for elders and people with disabilities throughout the state. The state Department of Human Services and its many county programs for seniors and people with disabilities rely on door-to-door public transit services to them active, able to remain in their

Public Transportation **Make the System Work Better**

homes, thus reducing the state's cost of care. The continued availability of curb-to-curb paratransit is assumed in the state's recommendations on long-term care. Yet, transit agencies are facing the same financial crisis that the state is facing with long term care.

Impact if under-funded:

If growth in complementary ADA paratransit services continues at the rates of the recent past, soon neither today's levels of fixed route bus and rail service nor door-to-door paratransit services will be affordable. Given the aging of the population, the problem will be more acute ten years in the future. Reducing the level of fixed route service to pay for additional paratransit service may result in a downward spiral in service levels as people who could use fixed route service shift to more expensive paratransit service.

Using TriMet as an example, if LIFT ridership grows 3% per year the additional cost to TriMet by 2014 is \$11.0 million a year. If LIFT ridership grows 4.5% per year, the additional cost to TriMet by 2014 is \$15.6 million a year. The \$5 million a year difference could be invested in fixed route accessible service. TriMet is projecting LIFT ridership growth of 4.5% per year. If, however, LIFT ridership growth is 6% instead of 4.5%, the additional cost by 2014 is \$21 million (operating costs only) and \$6 million of fixed route service will have to be cut (6% of service).

If the region could stem the growth of LIFT demand with innovative low cost services for elderly and people with disabilities, the difference could be invested in fixed route accessible service, community based services for elderly and people with disabilities, community shuttles, more frequent fixed route bus service, providing service to areas not served, more and better areas for customers to wait.

How much does it cost?

To begin, an additional \$5 million per year would provide statewide funding for new innovative transportation services for elderly and people with disabilities. This funding amount would need to be in addition to fully funding the current Special Transportation Fund program.

A foundation of innovative services will help stem the growth of expensive curb-to-curb complementary paratransit services. This will help transit agencies get out in front of the coming demographic shift by funding the types of programs that are included in the Tri-County Elderly and Disabled Transportation Plan (2006).

Public Transportation

Make the System Work Better

Signal Priority

What we do

Oregon road authorities (ODOT, cities and counties) use 3M's Opticom signal priority system to control traffic lights. The Opticom system allows managers to set and time signals so that traffic flows smoothly. The Opticom controllers also have the ability to extend the green light phase or to shorten the red light phase on a traffic signal in response to signals received from authorized vehicles, like buses.

In partnership with the City of Portland, TriMet is making use of the City's expanded Opticom system at 290 intersections to help keep buses on time and to stem the erosion of bus schedules and associated bus fleet requirements due to congestion. TriMet has leveraged this resource with other service frequency improvements, new bus stop amenities, customer information and targeted sidewalk and crosswalk improvements to produce dramatic increases in bus transit ridership on "Frequent Service" routes.

Signal priority is also a key strategy in implementing Bus Rapid Transit (BRT) in Eugene and Springfield. In addition to its BRT routes, Lane Transit District intends to use signal priority at key intersections on major arterials throughout its system, beginning with a partnership with the city of Eugene.

Why it is important

Buses operate in traffic. Customer research shows that frequency and reliability are at the top of the list of factors that influence the decision to use transit. When a bus is falling behind schedule, a transit signal priority (TSP) system tips the traffic signal cycles in favor of the bus until it is back on schedule – generally by holding a green cycle a few seconds longer – to allow a bus to clear the intersection. This minor adjustment is transparent to other motorists, but keeps the transit system efficient and riders happy. TSP technology is combined with other strategically executed strategies such as curb extensions, intersection queue jump lanes, and the respacing of bus stops to expedite service reliability and to reduce operating costs.

Impact if under-funded

TriMet has found that TSP technology in combination with other service improvements can improve service reliability, reduce operating costs, and attract riders. These benefits cannot be realized in corridors outside the city of Portland or the BRT corridor without additional resources to make the improvements.

How much does it cost?

The cost to equip each bus with TSP was \$1,645 in 1998. The cost for each intersection was \$12,000 (based on a program that includes 290 installations) and the overall bus dispatch and related systems cost was \$1,000,000. The cost for the full program with the City of Portland (290 intersections and 775 buses) was \$4 million. For TriMet, the system is already in place and

Public Transportation

Make the System Work Better

the focus could be on additional intersection installations outside of the City of Portland. For new applications to other transit districts, some of these same startup costs would apply. The above unit costs would have to be updated for inflation and technology changes. Lane Transit District estimates the cost to be \$100,000 to \$150,000 per intersection.

Public Transportation

Improve Safety

Sidewalks and Bus Stop Improvements

What we do

Ability to walk to a bus stop safely is key to using fixed route bus service – every transit user is a pedestrian. Walking is the most basic, human form of transportation. It is also aerobic exercise that can improve functions such as planning and task coordination, according to the AARP.

Sidewalks are a fundamental part of the urban and suburban road system. They are generally constructed to widely accepted standards and Americans with Disabilities Act (ADA) requirements as new roads are built. The existing road and street infrastructure, however, is often deficient in this respect and improvements are generally not made until an adjacent property redevelops or until there is a major reconstruction of the roadway.

The state and cities are beginning to address the need for pedestrian improvements. For example, TriMet and Metro have prepared a comprehensive mapping of the pedestrian network and have worked with ODOT to examine the safety of intersections along three “case study” corridors.

Why it is important

The pedestrian infrastructure is the greatest barrier to transit use. The lack of sidewalks, unsafe shoulders, widely spaced signalized intersections, the lack of crosswalks and pedestrian signal phases are all significant barriers for getting to or from the bus stop. For a person with disabilities even a short gap in the sidewalk or the lack of an intersection curb ramp can be an all-or-nothing barrier for accessing transit.

Priorities for improvements to the pedestrian infrastructure are often in conflict with objectives such as the most efficient movement of traffic. Wide intersections, the lack of pedestrian refuges, short signal cycles and sidewalks that are compromised by driveways and interchange ramps are some of the challenges.

Our significant investment in transit service is wasted, if it cannot be accessed by the community. Short trips that might be made by walking are also thwarted by unsafe or incomplete sidewalk and crosswalk connections and require reliance on the automobile. These deficiencies often are neglected until there is an accident or fatality involving a pedestrian.

Impact if under-funded

The state and the regions have made significant investments in public transit systems. The bus transit system relies on major travel corridors to provide direct connections among regional centers.

The consequences of deferring needed pedestrian related improvements means the full potential of the transit investment will not be realized and more trips will be auto-dependent. Unsafe conditions, of course, increase the risk of tragic conflicts between pedestrians and traffic. The risk is greatest for transit-dependent populations.

Public Transportation Improve Safety

How much does it cost?

An investment of \$1.5 million per year would begin a sustained program of improvement of pedestrian facilities and crosswalks. This would be in addition to pedestrian improvements that are components of highway, road and street programs.

It should be noted that the cost of pedestrian improvements is highly variable and site specific. The cost of sidewalks will depend on the width, existence of curbs, drainage requirements and topography. Also, while investment in pedestrian facilities supports public transportation and it is included here, road authorities are responsible for sidewalks, crosswalks, etc. adjacent to streets, roads and highways.

Public Transportation

Increase Capacity

Additional High Capacity Transit

What we do

High capacity transit in the Portland region has taken the form of light rail or the MAX. “Bus Rapid Transit,” such as being developed in Lane County and Portland is another form of high capacity transit. Streetcar can sometimes be placed in this category, but its local service focus and slower speeds in mixed traffic tends to leave it out of this grouping. Commuter rail is another form of high capacity transit that uses existing freight rail facilities. It is most adaptable to becoming inter-regional in the services it can provide. Some Portland-area high capacity transit projects awaiting construction are:

- The Gateway to Clackamas Regional Center “Green Line” along I-205
- The downtown Portland Mall light rail extension to Portland State University
- The Washington County Commuter Rail (Wilsonville to Beaverton)

Projects in various stages of planning include:

- Portland-to-Milwaukie Light Rail (South Corridor Phase 2)
- Portland-to-Lake Oswego streetcar extension (using streetcar in a more regional application)
- The transit element of the Columbia River Crossing – a bi-state program
- SE Powell / SE Foster bus rapid transit (based on a Phase 1 corridor study)
- SW Barbur Boulevard / SW Pacific Highway high capacity transit (awaiting study)

Other light rail and commuter rail extensions are also in various stages of consideration in the Portland region. High capacity transit is a fundamental element of the Regional Transportation Plan. TriMet with Metro will undertake a comprehensive study of the high capacity transit network and associated priorities as part of the 2008 Regional Transportation Plan update.

The State participates in the development of high capacity transit both through funding and through the joint use of rights of way. The light rail projects in the Portland region use rights of way along freeways for some portion of their alignments. This is a natural evolution since principle corridors are often defined by the state highway system and high capacity transit seeks to connect principal regional centers – which are generally coincident with the state highways and the freeway system.

The state provided financial assistance for the Banfield light rail project, the initial MAX line, the Westside LRT extension and the Washington County Commuter Rail Project. Lottery bond proceeds provided the state financing for Westside project. The bonds require \$10 million annual debt service payment and will be fully repaid in 2010.

Why it is important

High capacity transit is important for three reasons:

- It provides mobility options for the broad spectrum of society including those who are unable to use the automobile.

Public Transportation

Increase Capacity

- It provides relief to congested roadways and freeway. A single light rail line, such as the Westside Blue Line, is roughly equivalent to 1.5 freeway lanes with existing ridership with potential to carry the equivalent of 3 lanes of person trips – or the full freeway.
- Like a freeway system, a regional light rail or bus rapid transit network provides attractive and effective mobility choices for residents and can have significant synergistic effects on land uses and life styles. A high capacity transit system, however, has the ability to encourage contracted “transit-oriented” development near light rail stations and the bus routes connecting with the high capacity system. Only transit that is competitive for travel times and comfort will be a real travel option for those travelers who otherwise have an automobile available to them. High capacity transit should also connect with the State-wide air, rail and intercity bus networks.

Impact if under-funded

The Portland region has managed through its high capacity transit development program to “grow” transit ridership faster than regional VMT, which no other region in this country has accomplished. Transit can continue to be the most viable option to freeway construction and expansion. It is the key component to developing a balanced transportation system and an urban form that reduces sprawl and the associated infrastructure costs. Added benefits include reduced oil dependency and continued management of the region’s air quality.

Light rail, commuter rail and bus rapid transit are high capacity transit development strategies that accommodate increased service demand.

How much does it cost?

Light rail transit costs vary depending on the characteristics of the alignment – and significant hurdles such as tunnels and bridges. Portland MAX system has been constructed generally for \$60 million / mile. Streetcar can be constructed for close to \$25 million / mile.

Lane Transit District estimates bus rapid transit construction costs to be \$5 - \$6 million per mile, excluding vehicles. The exclusivity of the right of way and the features of the vehicles will be major cost factors for any variation of high capacity transit.

Public Transportation Increase Capacity

Additional Special Needs Transportation Service to Meet Demands of Aging Baby Boomers

What we do

Transportation service tailored to meet the needs of senior citizens and people with disabilities is available statewide. Investments to support and improve existing special transportation service and required complimentary paratransit service are described elsewhere in this report.

Oregon is just a few years away from the beginning of a dramatic demographic shift that has significant implications for costs and services:

- Today, one in ten people are over the age 60. By 2030, one in five people will be over the age of 60.
- Between 2005-2030, the growth of people age 60 and older will be 151%, while the growth of the general population will be just 37%.
- By comparison, between 1990 and 2000, the elderly population grew just a half a percent a year (.5%).

No projections about the number of people with disabilities in future years are currently available from state and regional agencies. However, the incidence of disability increases with age. Today, 16% of the regional population has a disability, but 39% of the age 65+ population has a disability, according to 2000 census data. This will be magnified as the population ages.

Why is it important?

Oregon transit systems, like many throughout the country, are struggling to meet the demand for complementary paratransit services made by today's population.

The demand for complementary paratransit service will grow rapidly as the population ages. There will be more seniors and more people with disabilities who qualify for complementary paratransit service.

The demand for services, like TriMet's LIFT and Lane Transit's *RideSource*, has grown significantly since 1992 when the Americans with Disabilities Act became a civil rights law. Costs have increased by 11 percent per year, tripling over that time. Over the same time, the population over 65 grew by just half a percent per year.

Impact if under-funded

Complementary curb-to-curb paratransit is a civil right. Transit agencies must meet the demand for this type of service. Complementary paratransit rides cost 8 to 10 times as much as fixed route rides. Many customers of paratransit services are frail elderly.

As the population ages, the increased demand for paratransit will likely result in financial crises that put the fixed route transit service in jeopardy. Yet, for every one person who is elderly or has a disability and uses complementary paratransit, there are 10 seniors or people with disabilities

Public Transportation Increase Capacity

who use fixed route. It is critically important to address this issue now so that both the state's fixed route services and paratransit can be maintained and improved.

How much does it cost?

Paratransit service is growing between 4.5 and 7.5 percent per year. An investment of \$7.3 million annually would provide state funding to meet a 7.5 percent growth rate in paratransit service. This investment would fund growth, but not the current gap that is being provided by the general fund of the fixed route providers.

Improved Connectivity Between Cities and Towns

What We Do

Public and special transportation in both rural and urban areas is designed and developed primarily to serve central communities and the outlying areas surrounding those communities. Intercity bus providers, such as Greyhound (a national carrier) and Central Oregon Breeze (a regional carrier), also provide connections so that people can move between communities to access airports, rail and major communities.

Both employment and essential services have become more centralized in recent decades, causing changes in living and travel patterns. Work trips are longer as are those for essential services, such as medical or shopping. For example, people residing in Milton-Freewater must travel to Walla Walla to see a doctor; people working in Bend seek affordable housing in Redmond, Madras and LaPine.

During the same time, the intercity transportation system also changed. Intercity bus carriers no longer provide the frequency or schedule that supports day trips for services and work trips. For example, Greyhound reduced operations in Oregon to only the I-5 and I-84 corridors in 2004. Although regional providers extended their operations to pick up some of the former Greyhound routes, intercity carriers do not stop at small communities or serve rural areas, except along major highways, as such services are not economically or logistically feasible. In addition, intercity carriers are not required to operate vehicles meeting the accessibility requirements of the ADA unless a request for such service is made at least 48 hours prior to the planned trip.

Why it is important

Regional transportation services that complement community-based transportation and intercity service is increasingly needed in many rural communities and communities surrounding urban areas. People, especially seniors, people with low income and people with disabilities need to have accessible, affordable, regularly scheduled regional services to commute to work, obtain health care, and go shopping and the like.

Regional transportation services can "feed" passengers to the intercity carriers and to passenger rail services, enabling travel beyond the region. Lastly, regional public transit services must use

Public Transportation Increase Capacity

equipment that meets the requirements of the ADA, which enables people to be more independent in planning their day-to-day schedule.

Impact if under-funded

Adequate mobility options are especially important to communities to maintain economic vitality. Since seniors prefer to age in place, providing an adequate transportation system to enable healthy living is the preferable option. Lack of transportation options may result in fewer options for people to work and for essential services, which then results in either moving away from the community, or lesser ability to meet one's needs.

How much does it cost?

The cost of intercity bus service is specific to the route and communities involved.

For example, the Lane Transit District provides service connecting the City of Oakridge to Eugene (about 45 miles one-way) with three round trips per day Monday through Friday. This service costs about \$200,000 per year, about half of which is contributed by the community in fares and other funds. Harney County provides service twice a week from Burns to Bend for about \$50,000 per year.

Communities that may need regional connections in addition to local and intercity services include (and are not limited to): Hermiston to Pendleton and Tri Cities, WA; Monroe to Corvallis and to Junction City; Monmouth to Corvallis; Newport to Corvallis; Grants Pass to Roseburg; Lakeview to Klamath Falls; and Madras to Bend.

Rail Freight and Passenger

Take Care of the System That We Have

Critical Investments in the areas of:

- Rail Freight – rehabilitate rail bridges
 - Rail Bridge Inventory Database.....\$0.5 - \$1.0 million
- Rail Freight – rail replacement and modernization program – upgrade rail infrastructure to carry industry standard 286,000 pound cars\$150 million
- Rail Passenger Service – stable funding New Revenue Source

Make the System Work Better

Critical Investments in the areas of:

- Rail Passenger – upgrade track and switches at specific locations.....\$10 million
- Upgrade Signal Systems\$4.6 million

Improve Safety

Critical Investments in the areas of:

- Grade Crossing Improvements\$5 million

Increase Capacity

Critical Investments in the areas of:

- Improve Rail Yard Switching Capacity
 - Site specific improvements \$3 million to \$8 million
- Improve Rail Capacity in the Portland Metro Area
 - Ten major improvements \$170 million (2003)

Current Status ... Final Review

Available Resources:

- Oregon Transportation Plan Update
- 2001 Oregon Rail Plan
- I-5 Rail Capacity Study
- *ConnectOregon* applications

Rail Freight and Passenger

Background

Oregon's rail system is comprised of 22 railroads and 2,413 miles of track. About 47 percent main lines owned by Union Pacific Railroad and BNSF Railway Company (formerly the Burlington Northern & Santa Fe). The balance is publicly or privately-owned short line railroads. In addition, Oregon port districts own and operate rail terminals, yards, and intermodal facilities.

Railroads carried over 63,000 tons of freight in 1999. The major commodities were farm products, lumber and wood products, chemicals and allied products, and various pulp, paper and food products.

Amtrak operates the Coast Starlight and Cascades passenger trains on the Union Pacific north-south tracks from Washington to California. The two daily Cascades trains between Portland and Eugene are sponsored by the State of Oregon. The State of Washington sponsors three daily trains between Portland and Seattle. The Coast Starlight carries passengers between Seattle and Los Angeles each direction once daily. State-sponsored Amtrak Thruway bus services connect 16 communities to train services. About 123,000 passengers started or ended their trips at Oregon train stations in 2004.

The Oregon Department of Transportation's Rail Division ensures compliance with state and federal regulations related to the safety of public road-railroad crossings and the safety of railroads and rail transit operations in Oregon. The Rail Division manages passenger and freight rail service programs, including the development of passenger and freight rail transportation opportunities and railroad improvement projects financed through the Short Line Credit Assistance Program, Industrial Rail Spur Program and the *ConnectOregon* program.

The Oregon Transportation Plan is the state's long-range multimodal transportation plan. It is an overarching policy document that focuses on state, local and public aspects of Oregon's transportation system. Identifying what should be done to maintain and improve the transportation system ("feasible needs") is a major component of the Plan.

The 2006 update of the Plan estimated the difference between the local, state and federal resources that are available and those that would be required to meet "feasible needs." Since much of the rail infrastructure is privately owned, the Plan Update could not estimate the overall gap between the resources available to maintain and improve it and feasible needs. The Plan estimated that there are about \$19 million (2004 dollars) per year in freight rail opportunities and that improvements necessary to support passenger rail service range from \$9 to \$57 million (2004 dollars) per year depending on the desired level of rail passenger service.

The investment options described on the attached pages are not intended to represent a plan to meet all feasible needs. They propose specific improvements in the rail system provided additional resources can be identified. They assume that both public and private funding for rail infrastructure remains in place and continues to be invested as it is today.

Rail Freight and Passenger Take Care of the System That We Have

Railroad Bridge Reconstruction

What we do

Many rail bridges, especially on Oregon's shortline railroads, are timber bridges built during the 1930s, 40s and 50s. These rail bridges, like Oregon's highway bridges, are reaching the end of their useful lives. In addition, most were designed before modern 286,000 pound gross weight freight cars came into common use.

The railroad companies own and maintain their bridges. Most are private companies although some are owned by local governments (cities, counties, ports and special districts). The Oregon Department of Transportation inspects rail bridges.

Why it is important

Bridges form critical links in rail system. Bridges that may fail for any reason are a barrier to freight movements.

Impact if under-funded

Shippers experience lower quality, less efficient service when cars must be partially loaded. Further, shippers may experience no service or long service delays when rail bridges fail. There are seldom detour routes around failed bridges; rail service is halted until the bridge can be repaired or rebuilt.

How much does it cost?

We do not know how many rail bridges have reached the end of their useful lives and are load limited. We cannot estimate the cost. There is no comprehensive, statewide inventory of rail bridges similar to the National Bridge Inventory System that exists for highways, roads and streets. We estimate that it would cost between \$500,000 and \$1 million to build a similar rail bridge inventory database for Oregon.

Rail Replacement and Modernization Program

What we do

Oregon has about 2,400 miles of rail. More than 20 percent (about 500 miles) of this was not built to carry modern 286,000 pound GVW railcars. These rails are located on more lightly used lines that serve coastal and rural Oregon.

The railroad companies own and maintain their track. Most are private companies although some railroads are owned by local governments (cities, counties, ports and special districts). The Oregon Department of Transportation inspects tracks.

Why it is important

Rail that cannot safely carry trains made up of fully-loaded 286,000 GVW freight cars is a barrier to freight movements. These freight cars cause the ties and rail bed under rail not designed to carry them to deteriorate rapidly. This increases maintenance cost and reduces the

Rail Freight and Passenger Take Care of the System That We Have

life of the investment in ties and rail bed. In addition, derailments may result in lost or damaged product or more serious environmental damage.

Impact if under-funded

Shippers experience lower quality, less efficient service when cars must be partially loaded. It also takes more time to move freight by rail when railroads reduce train speeds to travel over lightly built rail and rail bed.

How much does it cost?

We estimate that it would cost about \$150 million to upgrade rail line during the 2007-09 timeframe. Upgrading a mile of existing rail line (rail, ties, and ballast) to carry 286,000 GVW cars costs about \$300,000. There are about 500 miles of track that is not capable of carrying the heavier rail cars.

The Oregon Legislature provided about \$2 million per biennium in 2001-03 and 2003-04. Several *ConnectOregon* applications proposed to upgrade rail lines to carry 286,000 GVW cars.

Rail Passenger Service

What we do

The Oregon Department of Transportation manages and markets two daily roundtrips of the *Cascades* trains in the Willamette Valley and the related intercity bus service. The service is operated by Amtrak under contract; the trains themselves are owned by Amtrak and the state of Washington. These contracts cost \$5.3 million per year.

ODOT participates in the Pacific Northwest High Speed Rail Corridor with the state of Washington and Amtrak.

Why it is important

Passenger trains expand transportation options, reduce the pressure on the state's road infrastructure, attract tourists, and contribute to the state's overall livability. Oregon's transportation modes are being taxed by increasing demands, and passenger trains are a component in helping to manage this situation. Investments in passenger rail yield long-term benefits as the infrastructure improvements last decades. These improvements benefit freight rail business as passenger trains operate on the freight rail system.

Impact if under-funded

Passenger rail and the related bus service will be reduced.

How much does it cost?

It is essential to provide stable, sustainable funding for the existing two daily round trip passenger trains that exist today. Biennial General Fund appropriations lead to question as to whether Oregon will support one or two trains.

Rail Freight and Passenger Make The System Work Better

Track Improvements for Rail Passenger Service

What we do

The Coast Starlight and the *Cascades* trains operate over the Union Pacific's main north-south track. This single track line is heavily used and is congested. The number, length and placement of existing sidings are adequate to meet the needs of Union Pacific's freight business. The existing sidings do not fully meet the needs of passenger service.

Passenger trains between Eugene and Portland take about two and half hours with intermediate stops at Albany, Salem and Oregon City. Passenger trains are sometimes delayed by other rail traffic, making schedules unreliable.

Why it is important

Passengers expect a high quality of service. They expect trains to arrive and leave on time and that the time required for the trip not be too great.

Passenger trains that are delayed for any reason lose their place in the scheduled flow of north-south traffic. They are put on sidings to wait for on-coming traffic to pass. The length and placement of sidings has a significant effect on how long the trains wait. In addition, the sidings have good quality track for freight trains, but provide a rough ride for faster-moving passenger trains.

Impact if under-funded

Amtrak and ODOT will not be able to significantly improve travel time and reliability without an investment in sidings, grade crossings and signal systems. Ridership on passenger trains in the Willamette Valley will not increase, and may in fact decrease due to passengers' frustration with unreliable service.

How much does it cost?

We estimate that building new high speed sidings for passenger trains would cost about \$1 million per mile of siding. A \$10 million investment in high speed sidings would enable Amtrak and ODOT to improve the reliability and travel time for passenger trains. The investment would also be beneficial to freight movement in this congested corridor.

Upgrade Signal Systems

What we do

The Coast Starlight and the *Cascades* trains operate over the Union Pacific's main north-south track. Union Pacific currently uses a signal system called an Automatic Block System to manage the congested segment of its mainline between Albany and Salem.

Union Pacific has proposed upgrading the signal system used between Albany and Salem to a modern and highly efficient system call Centralized Control. Union Pacific uses Centralized Control for its mainline track elsewhere in Oregon.

Rail Freight and Passenger Make The System Work Better

Why it is important

The Centralized Control system will make the movement of passenger trains more fluid. Moving to the new system will also upgrade highway grade crossing systems and improve the safety of higher speed passenger train operations.

Impact if under-funded

Amtrak and ODOT will not be able to significantly improve travel time and reliability without an investment in sidings, grade crossings and signal systems. Ridership on passenger trains in the Willamette Valley will not increase.

How much does it cost?

An investment of at least \$4.6 million would be required to upgrade the signal system on the UP mainline between Albany and Salem.

Rail Freight and Passenger Improve Safety

Grade Crossing Improvements

What we do

There are about 2,500 public highway-railroad crossings in Oregon. Most of these crossings are at grade. State policy as articulated in statute is that Oregon have a uniform and coordinated regulations of crossings and that crossings at grade be eliminated wherever possible.

ODOT regulates grade crossings and determines whether new crossings should be built as grade separated and, if not, what protective devices are required for the at-grade crossings. Annually, ODOT uses about \$200,000 in State Highway Funds plus \$2.1 million of federal hazard elimination program money to improve grade crossings. While the railroads, local government and ODOT build some new grade separated crossings, more often they install new signals and barriers to update existing at-grade crossings.

Why it is important

Grade crossings are an obvious point of conflict between highway and rail traffic. Collisions between cars and trains are always serious. Trains cannot stop quickly due to their heavy weight and can easily cause great damage to a car and its occupants. Trains travel more slowly in areas where there are at grade crossings than they could otherwise to give motorists a margin of safety.

Separating grades eliminates the conflict between highway and rail traffic. Grade separation is expensive. Further, it is not a feasible solution in many situations.

Additional crossings improvements would reduce the number of hazardous situations. They could reduce injuries and fatalities related to crashes. They could also allow both freight and passenger trains to travel faster.

Impact if under-funded

Safety for the public is reduced.

How much does it cost?

It costs about \$400,000 to install signal lights and barriers at a grade crossing. An additional investment of \$5 million could improve about 12 crossings. While grade crossing improvements are included as an investment in the rail infrastructure, these investments are also investments in the highway system and improve highway safety as well.

Rail Freight and Passenger Increase Capacity

Improve Rail Yard Switching Capacity

What we do

Rail yards are used to sort rail cars and to build and distribute trains. The mainline and shortline railroads own rail yards that are located at key points throughout their systems.

Why it is important

Improvements to rail yards increase the capacity of railroads. Rail yards are especially important to Oregon's shortline railroads. Efficient exchanges of rail traffic between the shortlines and the mainline railroads require the shortlines to assemble and break down long strings of cars.

Impact if under-funded

Delayed product and good movement, increased costs and blockage impacts to highway traffic depending on the proximity of the rail yard to public roads.

How much does it cost?

The amount required for a rail yard improvement project is site specific and depends on the condition of each yard. Freight switching yards are significant investments. Two projects that have been funded through the *ConnectOregon* program illustrate the range of investment: the Central Oregon and Pacific Railroad's \$9.6 million project to build a new 11-track yard in Winchester and the Portland and Western Railroad's \$3.7 million project to build a yard in Tigard.

Improve Rail Capacity in the Portland Metro Area

What we do

The Portland/Vancouver region's freight rail network includes five major rail yards, numerous lesser rail yards, and port terminals. The system serves the state's largest collection of industrial customers and provides access to the ports of Portland and Vancouver. Nearly 150 freight trains and 10 passenger trains per day are dispatched through this rail network.

Why it is important

The Portland/Vancouver area is a key transportation hub and rail is an important component of that hub. The capacity of the rail network is significant because:

- Rail is critical to the area's economy.
- Rail passenger service is a key element in the region's transportation system.
- Solutions to rail capacity will require joint public-private cooperation.

Impact if under-funded

The Portland / Vancouver rail network is congested and is close to its capacity. Trains moving across the network experience about 100 hours of delay during each 24-hour workday. For comparison, this is about half of the delay experienced in Chicago's rail network which handles about four times as many freight trains per day as are handled in Portland / Vancouver.

How much does it cost?

Rail Freight and Passenger Increase Capacity

The I-5 Rail Capacity Study (2003) identified ten major improvements to the Portland / Vancouver rail network, totaling \$170 million (2003 dollars). These include investments in rail yards, spurs, connections between mainline tracks, and the rail bridges in the region.