

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 (33 percent of need) \$50 million
 - Rebuild 60 miles of paved county roads (3 percent of need)\$30 million
 - Improve the level of city street maintenance \$ 42 million per year
- County Road Program Funding\$90 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 per year
- 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 per year

Highways, Roads and Streets Investment Options

Make the System Work Better

Critical Investments in:

- Intelligent Transportation System projects \$2 million per year
- Intelligent Transportation System projects on local roads and streets.... \$8 million per year

Improve Safety

Critical Investments in:

- Replace bridge railings to meet national safety standards \$30 million

Increase Capacity

Critical Investments in:

- Increase State Modernization Program \$50 million per year
- Increase the Financing for Large Projects \$50 million per year
- Improve City / County Arterials \$200 million per year

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 is being done today?

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 is it 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.

What happens if the investment is not made?

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 the investment 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

US 30 Bypass

St. Johns Bridge to I-5

MP 1.3-5.3

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OR 213 / 82nd Ave	Foster to OR 224	MP 5.8-8.3
OR 43 / Macadam	I-5 to Terwilliger	MP 0-5.79

Region 2

OR 99W	Newberg to McMinnville	MP 23.7-38.0
OR 551	I-5 to OR 99E	MP -0.3-5.6
OR 47	Gaston to Carlton	MP 26.5-37.7

Region 4

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 to 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).

County Road Program Financing

What is being done today?

Oregon counties have received revenue derived from activities on national forest lands and O&C lands — primarily timber harvest — since the early 1900s. These payments were intended to compensate local governments for the taxes and economic development opportunities they forgo because of the presence of federal land. The revenue has been allocated to the counties in which those lands were located and has been used to support schools, roads, and other government activities.

Payments to many counties and schools declined by an average of 70 percent from 1986 through 1998 as federal resource policies shifted from an emphasis on timber harvest to a focus on conservation.

Congress passed the Secure Rural Schools and Community Self-Determination Act (Public Law 106-393) in 2000. While the act restored historical payment levels the counties and guaranteed payment levels over a six year period, it was scheduled to expire in 2006.

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

Why is it important?

Oregon counties received about \$225 million under the Secure Rural Schools and Community Self-Determination Act in fiscal year 2004, the last year for which records have been compiled. More than \$90 million were allocated to county road programs, with the balance going to education and general county purposes. This money was about 25 percent of the funding for Oregon's county road programs in FY 2004.

What happens if the investment is not made?

Congress adjourned in December 2006 without re-authorizing the Secure Rural Schools and Community Self-Determination Act for another six years or providing a temporary extension for it.

The expiration of the federal Act will result in substantial funding losses for many counties, with some seeing losses in their federal payments in excess of 90 percent. The impact on the transportation system will be substantial: at least 13 Oregon counties will lose over 40 percent of their total road funding and three counties will lose about 75 percent. Some counties may substantially curtail their road operations, maintenance, and construction activities.

How much does the investment cost?

The federal government will make the final (2006) payments to counties under the Act in early 2007. Efforts to renew the Secure Rural Schools Act will begin when Congress convenes in January 2007 with the introduction of the legislation to extend the Act.

Replacing the federal money that was allocated to county road programs under the Act would require an investment of \$90 million per year.

Gravel Roads: Maintenance and Repairs

What is being done today?

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 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 is it 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.

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

What happens if the investment is not made?

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 the investment cost?

Approximately 20 percent 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 percent of the failed roadways).

Roadside Maintenance and Vegetation Control

What is being done today?

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 is it 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.

What happens if the investment is not made?

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 grow along the right of way. Pavements will also deteriorate more quickly if water is trapped by

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vegetation in the roadbed. Debris along the road can be a safety hazard. Litter is unsightly and can be unhealthy.

How much does the investment 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 is being done today?

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 rather than bridges are used to channel small streams under the road. 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.

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Why is it 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 large culverts as stand-alone projects. 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.

What happens if the investment is not made?

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 led 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 the investment 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.

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Traffic Signs and Signals, Striping, and Lighting

What is being done today?

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 is it 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.

What happens if the investment is not made?

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 the investment cost?

For an additional \$3 million, ODOT could replace the lighting system on the interstate highways in the Portland Metro Area. It is 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 is being done today?

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 is it 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.

What happens if the investment is not made?

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 the investment 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 is being done today?

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 is it 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.

What happens if the investment is not made?

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 the investment cost?

An additional \$3 million per year 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 per year would improve maintenance of existing barriers and guardrails on county roads.

Snow and Ice Removal and Other Storm Repair

What is being done today?

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 is it 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.

What happens if the investment is not made?

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 the investment 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.

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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 is being done today?

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 is it important?

ITS can help improve Oregon's transportation system by:

- Allowing 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.

What happens if the investment is not made?

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 because 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 the investment 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,

Highways, Roads and Streets Make the System Work Better

communications equipment, cameras, and variable message signs that make up an arterial traffic management system. An additional investment of \$8 million per year would allow metropolitan planning organizations and local government implement their ITS plans.

Highways, Roads and Streets

Improve Safety

Bridge Railings

What is being done today?

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 is it 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 on other bridges until those railings can be replaced by the Bridge Railing Program.

What happens if the investment is not made?

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 the investment 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 is being done today?

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 adopted by the Oregon Legislature, to support economic development, and to develop modernization projects.

Why is it 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.

What happens if the investment is not made?

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 the investment cost?

An investment of \$50 million in the State Modernization Program would double the annual program. (See also proposals for Large Modernization Projects and City / County Arterials.)

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Large Modernization Projects

What is being done today?

The Oregon Transportation Commission has adopted a list of “Projects of Statewide Significance” in 2002, which includes 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 is it 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.

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What happens if the investment is not made?

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 the investment 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 is being done today?

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 percent of a total \$355 million need for City and County road modernization.

Why is it 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.

What happens if the investment is not made?

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

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are substantially over design capacity. Moreover, lack of timely investments will increase the cost of projects dependent upon public right of way acquisitions because of rapid escalation in real estate prices.

How much does the investment 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.