OREGON TRANSPORTATION PLAN
Transportation Trends and Challenges

Population

Over 3.42 million people called Oregon home in 2000. The state's population has increased by 29.5 percent or almost 800,000 people in the past two decades. But population growth has been uneven across the state. The fastest growing counties are located primarily in Central Oregon, the Portland metropolitan area and northern Willamette Valley, and Southwestern Oregon. Deschutes, Washington and Jefferson Counties experienced growth of over 60 percent. But six counties in Central and Eastern Oregon lost population, and Coos County on the Southwestern coast experienced the largest loss. [1]

While parts of Central and Southern Oregon have had rapid population growth between 1980 and 2000, the majority of Oregon's population continues to live in the Portland metropolitan area and Willamette Valley. About 71 percent of Oregonians live in the Willamette Valley while the Portland metropolitan area alone represents 42 percent of the state's population. Statewide, population density varies significantly, ranging from 1518 persons per square mile in Multnomah County to less than 1 person per square mile in Lake, Harney and Wheeler Counties. In the year 2000, the statewide average was 35.6 persons per square mile.[2]

Population increases in some parts of the state brought an increase in the number of federally-designated metropolitan planning organizations (MPOs), that develop regional transportation plans and evaluate and approve projects within their area. The Bend and Corvallis areas passed the 50,000 population mark, joining Medford as MPOs. The Salem and Eugene metropolitan areas with over 200,000 people became transportation management areas (TMAs) along with the Portland metropolitan area. In 2000 about 58 percent of the state's population lived in a metropolitan area.[3]

The Oregon Office of Economic Analysis predicts the state will grow by almost 1.19 million people from the year 2000 to 2025, largely because of in-migration. The fastest growth is expected to be in Deschutes, Jefferson, Washington, and Morrow Counties, but the greatest number of people will become residents of Washington, Clackamas, Marion, Multnomah, Deschutes and Lane Counties. All Oregon counties are forecast to grow although some will add only small numbers of people.[4]

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[1] U.S. Census Bureau, 1980 and 2000 Census.
[2] Ibid.
[3] Ibid.
[4] Oregon Office of Economic Analysis, *Long Term Population Forecast for Oregon and Its Counties 2000-2040.*

By 2025 the state's 4.61 million residents will live at an increased average density of 48 persons per square mile, 12.4 more than in the year 2000. The disparity in density between the northern Willamette Valley and Eastern Oregon will increase. Counties in the Portland and Salem metropolitan areas will have densities ranging from 118 to almost 1800 persons per square mile. Some Eastern Oregon counties will continue to have an average density of 1 or 2 persons per square mile.[5]

The state's population is also getting older. Those age 65 and over have increased from 11.5 percent in 1980 to 12.8 percent of the population in 2000, and the percentage of those under age 15 has declined from 22.3 percent in 1980 to 20.5 percent in 2000. Although 20 percent or more of the population of Curry, Josephine and Wheeler Counties is now age 65 or over, the counties with the largest number of seniors live in the metropolitan areas. These same metropolitan counties have the largest number of persons under age 15, but Morrow County at 26 percent has the highest percentage of children.[6] Minorities now are over 13 percent of the population; Latinos make up the largest part of this group.[7]

Employment and Income

The Oregon Employment Department predicts that employment will grow about 13.7 percent from 2002 to 2012, slightly higher than the population forecasts of about 13 percent growth. Oregon's major industrial sector is high technology, followed by forestry and wood products, agriculture and food processing, and metals and transportation equipment. While the greatest growth is expected to be in service industries, the Employment Department forecasts that employment will also grow in trade industries; finance, insurance and real estate; transportation and public utilities; construction; manufacturing and government.[8]

However, as the population ages and increasing numbers of people retire, the percentage of those in the work force is expected to drop.[9] The proportion of the population in the labor force to provide services and products for the senior population may drop.

Oregon's statewide income per person was almost $21,000 in 2000. However, only five counties had per capita incomes above the state average (Clackamas, Washington, Multnomah, Benton and Deschutes). Many counties, primarily in Eastern and Southwestern Oregon, were significantly below the statewide average income, with some having high poverty rates.

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[5] Ibid.
[6] U.S. Census, 1980 and 2000 Census.
[7] Portland State University, et al, *Oregon Outlook 2003*.
[8] Worksource Oregon, Oregon Labor Trends, October 2003.
[9] Oregon Office of Economic Analysis, *Oregon's Population and Employment Forecasts*, 1997.

Freight Movements

The economy relies on efficient, safe and secure freight movements. Nationally in 2000, purchases of transportation-related goods and services accounted for 11 percent of the Gross Domestic Product. **"**The movement of bulk goods, such as grain, coal, and ores, still comprises a large share of the tonnage moved on the U.S. freight network. However, lighter and more valuable goods, such as computers and office equipment, now make up an increasing proportion of what is moved." [10]

According to the Federal Highway Administration, in Oregon trucks hauled 76 percent of the tonnage worth 82 percent of the total freight value in 1998, the latest year comparative figures are available. About 18 percent of the tonnage worth 9 percent of the total value went by rail. Freight moving via water represented 5.5 percent of the tonnage and only 1.5 percent of the value. Air freight, in contrast, was less than 1 percent of the tonnage, but 7.5 percent of the value.

Table 1

Oregon	Tons (millions)			Value (billions $)		
	1998	2010	2020	1998	2010	2020
By Mode						
Air	<1	<1	1	15	42	85
Highway	220	323	420	165	330	555
Other	2	3	4	<1	<1	<1
Rail	53	81	109	18	34	55
Water	16	20	24	3	5	8
Grand Total	291	428	557	201	411	704
By Destination/Market						
Domestic	258	372	477	180	362	613
International	33	55	81	22	49	90
Grand Total	291	428	557	201	411	704

Table from FHWA, "Freight Transportation Profile - Oregon," 2003.

The percentages of tonnage for trucks, rail and water freight are not expected to change significantly by 2020. Air freight's high-valued goods will still represent less than 1 percent of the tonnage, but will be 12 percent of the total freight value. Lumber/wood products and secondary traffic to and from distribution centers are and will remain the top commodities by tonnage and value. Large volumes of farm products will also be shipped.

[10] Federal Highway Administration, "Freight Transportation Today," www.ops.fhwa.dot.gov/freight/publications.

Trends and Challenges

The emerging importance in Oregon's economy of high technology reflects a national shift toward a service and non-resource based economy. The implications for transportation include:

- Customers' demanding more flexible, reliable, on-time service,
- Greater growth in smaller shipments, and
- Growth in demand for traditional, high-volume transportation services that account for a smaller portion of the industry's revenues and volume.[11] Shipments of below 1000 pounds accounted for 18 percent of the value of all shipments in 1977, but accounted for 32 percent in 1997.[12]

Globalization, deregulation and changing logistics are major trends. Globalization is occurring rapidly worldwide. "By 2005, parts for well over half of the products built in the United States will originate in other countries."[13] Products and components often can travel long distances; some Intel computer chips, for example, travel around the world three times before reaching the final destination.[14]

"The value of international imports and exports grew at an annual rate of 9.3 percent during the 1990s, from $891 billion to $2.152 trillion, nearly double the 5.5 percent rate of GDP during the same period. This growth has increased the significance of international trade to the U.S. economy—equaling 24.1 percent of GDP in 2000, compared to 13.4 percent in 1990."[15] International trade by volume is expected to increase by more than 3 percent annually through 2020, and trucks will transport most of this in the United States.[16]

Deregulation has facilitated restructuring and mergers of freight carriers, greater efficiencies in the use of labor and equipment, and price reductions for many shippers. It has led to fewer choices for some shippers and communities as carriers have concentrated on larger markets.

Businesses are also in the midst of "an evolutionary shift" from "manufacture-to-supply" to "manufacture-to-order" logistics. This trend relies on "accurate information and timely transportation to match supply and demand"[17] that uses "information technology to optimize production and transportation, enabling customers to keep inventories at low

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[11] Federal Highway Administration, "Freight Transportation in a Changing Business Environment," 2003, www.ops.fhwa.dot.gov/freight/publications.
[12] U.S. Census Bureau, *1997 Economic Census—Transportation : 1997 Commodity Flow Survey,* in ASSHTO, *Transportation: Invest in American: The Bottom Line,* 2003.
[13] Marvin J. Cetron and Owen Davies, "Trends Shaping the Future: Technological, Workplace, Management and Institutional Trends," *The Futurist*, March-April 2003.
[14] Susie Lahsene, "New Economy, New Vision for Transportation: Prominent Role for Intermodal Freight," *TR News*, September-October 2001, p. 9.
[15] ASSHTO, *Transportation: Invest in American: The Bottom Line,* 2003, p. 10.
[16] Ibid., p. 11.
[17] FHWA, op.cit.

levels and improving supply chain management. Today, 28 percent of United States production is already based on just-in-time practices. As more firms move toward such practices, an efficient transportation system becomes even more critical to a healthy economy."[18]

Internet use and sales have increased rapidly throughout the world. Net users number around 500 million worldwide. Total business-to-business sales was expected to reach $3.95 trillion in 2003. Internet sales will increase deliveries of goods to businesses and individual consumers. These deliveries are expected to grow more efficient with the use of global positioning satellite (GPS)-based truck tracking, vehicles using alternative-fuels and other technologies.

The expected doubling of the U.S.'s international trade by 2020 will strain highways, ports, and gateways.[19] Infrastructure at some seaports has been deteriorating and is less efficient. In some locations, loads serving the truck and rail terminals are in poor condition, and larger containers and very large ships have challenged the infrastructure.[20]

Congestion is growing on highways and rail lines. "Congestion, with its resulting delays, is especially problematic for freight transportation. Continued deterioration of the reliability of the highway system threatens the productivity gains of businesses and their employees. A recent study indicated that, on average, carriers value an hour of transport time savings at $168. However, avoiding an hour of non-scheduled delay was valued at $371. In other words, system reliability is over twice as valuable as system speed.[21]

Other challenges include improving system operations and increasing the safety and security of freight movements.

Movements of People

Most Oregonians drive alone or share a ride to make a trip. But more Oregonians than the national average use non-motorized transportation and more use transit in the Portland, Salem and Eugene metropolitan areas. In 2000, to commute to work, 73 percent of Oregonians drove alone, 12 percent carpooled, 3 percent walked, and 6 percent worked at home. Transit use reflected the availability of transit facilities; almost 7 percent of commuters in the Portland metro area used public transit, but less than 1 percent of those outside the Willamette Valley commuted by transit. While workers in Deschutes County averaged a commute time of 19 minutes, those in the Portland metro area averaged almost 25 minutes.[22]

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[18] Ibid., p. 9.
[19] Ibid., pp. 12-13.
[20] Ibid., p. 11.
[21] Ibid., p. 9, from ICF Consulting and HLB Decision-Economic, *Economic Effects of Transportation: The Freight Story,* 2002.
[22] U.S. Census Bureau, 2000 Census.

Congestion on Oregon's main roadways has increased considerably since the early 1980s because vehicle travel has grown rapidly while roadway capacity has changed little. From 1982 to 1999, freeway traffic demand grew about six times faster than freeway lane-miles.[23] Traffic congestion is growing more rapidly on urban freeways than on other arterials, and congestion in the Portland metropolitan area is increasing more than in other parts on the state. On average, each urban freeway carried about 60 percent more traffic in 1999 than in 1982. On the most congested freeways, primarily in the Portland area, the increase in demand has caused the duration of peak congestion to increase. About 41 percent of the 2002 Oregon Population Survey respondents in the Portland area said traffic congestion is a serious problem.

Statewide, the number of vehicle miles each person travels (VMT per capita) is moderating as employment growth is moderating and automobile ownership is approaching saturation, but vehicle miles traveled will still grow substantially over the next 20 years because of population growth.

Intracity Transportation

Nationally, three major trends characterize metropolitan America:

- Resurgence of investment in downtown areas as people move back to cities, and immigrants choose cities as destinations.
- Continuing growth and the emerging maturity of suburbs, many becoming cities in their own right. Growth issues include the need to create urban centers and the growing problem of traffic congestion along overtaxed suburban arterials.
- Renewed interest in transit use and transit investment. Virtually every major city in America is planning some form of urban rail or rapid bus system, and some states are joining together to build high speed rail systems linking metropolitan regions.[24]

Similar trends are occurring in parts of Oregon. Downtown Portland and adjacent areas are seeing a resurgence of housing and other investment. Several of Portland's suburban cities have become employment centers. Comparatively, Oregon is urbanizing at a denser rate than most other places in the nation. The difference may be attributed to Oregon's comprehensive land use program. Between 1982 and 1997 the U.S. population grew by 17 percent, but the amount of urbanized land grew by 47 percent.[25] Between 1992 and 1997, Oregon urbanized 0.56 acre per new resident whereas Georgia urbanized at a rate of 1.62 acres and Florida at a rate of 1.25 acres for each new resident.[26]

Growing problems of traffic congestion along overtaxed suburban arterials also characterize many of Oregon's suburban communities and urban fringe areas.
A number of strategies are being used in Oregon and nationally to encourage in-fill development and to create compact development. Included are the concepts of clustering,

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[23] Brian Gregor, *Congestion Overview(draft),* January 2002, p. 2.
[24] Hank Dittmar in foreword to *Transit-Oriented Development: Moving From Rhetoric To Reality* by Dena Belzer and Gerald Autler, June 2002.
[25] Arthur Nelson, Georgia Institute of Technology, for the Lincoln Institute of Land Policy.
[26] Ibid.

smart growth, New Urbanism, and transit-oriented development to help move toward higher densities and fewer automobile trips. Residents of higher density urban areas make about 25 percent fewer automobile trips, and more than twice as many pedestrian and transit trips as the national average.

The development of the Portland Transit Mall in 1978 renewed interest in transit use and transit investment. In 1986 the first 15 miles of Portland's light rail system became operational. The light rail (MAX) system is now 38.5 miles long with an additional 5.8 mile segment to open September 2004. Passengers made about 80,000 trips per day on the MAX lines in 2002. Portland is also home to a 2.4 mile-long streetcar line that connects the city's most dense residential neighborhoods with downtown; plans are underway for its extension. A rapid bus system is scheduled to become operational between downtown Eugene and Springfield in 2005. Passengers made 104 million rides on fixed-route bus systems in Oregon in 2002.

National public health studies have linked compact growth with health, saying urban sprawl is making Americans sick and overweight. Although Oregon has a high rate of obesity, one health journal cited Portland for its promotion of active, healthy living, through smart growth, a strong mass transit system, walking and bicycling.[27]

Since 1992, the elderly and disabled population in Oregon has gone from just under 600,000 people to almost 905,000. Services provided for this population have increased significantly, but the number of special transportation rides given per person has declined slightly. The aging of the population means that demand for services will continue to increase.

Intercity Passenger Travel

Intercity passenger travel is also changing. Nationally, Americans took over 2.6 billion long-distance, intercity trips in 2001. Over 89 percent of these were in personal vehicles, but that percentage only accounted for 56 percent of the long-distance miles. Air travel, which only represented 16 percent of the long-distance miles in 1985, supplied 7 percent of the trips and 41 percent of the long-distance miles in 2001.[28] Buses served about 2 percent of the long-distance trips while trains served just 0.8 percent.

Although long-distance train ridership has declined nationally, ridership on passenger rail services in intercity corridors of under 500 miles has increased more than 26 percent over the past five years.[29] In addition to the *Coast Starlight* train that goes from southern California to Seattle, two daily Amtrak trains from Eugene to Portland supported by Thruway motorcoaches served 122,000 passengers in 2003. Three motorcoach routes connect over 12,000 people from the Coast and Central and Eastern Oregon to Amtrak

[27] Randy Gragg, "Walking the Portland Way," *The Oregonian,* September 1, 2003.
[28] U.S. Department of Transportation, *2001 National Household Travel Survey.*
[29] AASHTO, *Intercity Passenger Rail Transportation: Standing Committee on Rail Transportation,* 2002, p. 6.

stations annually. Amtrak discontinued the *Pioneer*, Oregon's east/west rail line, in 1997 because of low ridership.[30]

The 1992 Oregon Transportation Plan envisioned market-driven commercial air service to Astoria, Bend/Redmond, Coos Bay/North Bend, Eugene, Klamath Falls, Medford, Newport, Pendleton, Roseburg, and Portland. Since 1992, commercial airlines no longer serve Astoria and Newport and have not served Roseburg. In 2002 boardings at Portland International Airport reached almost 6 million annually while there were about 735,000 boardings at the six other commercial airports. All the airports except North Bend and Klamath Falls saw fewer boardings in 2002 than in 2001.[31]

With consolidation, major air carriers are serving fewer airports and/or making fewer connections. Regional carriers using smaller aircraft are now serving mid-sized communities. Because of increased security arrangements at large airports, some corporations have shifted to the point-to-point service offered at general aviation airports.

- **Trends and Challenges**

In the Northeast Corridor of the United States, train speeds are reaching 150 miles per hour, and train travel is replacing short-distance air travel in some places. California and Florida are exploring the possibilities of high speed rail to relieve congestion at airports and on freeways. California's proposed 700-mile rail system would serve major cities from Sacramento to San Diego at speeds exceeding 200 mph.[32]

The long-term rail vision of the Northwest Corridor from Eugene to Vancouver, B.C. includes increased speeds up to 110 miles per hour, reduced travel times and increased train frequencies. Travelers would be able to choose one of eight round trips for the two-hour Portland to Eugene trip.[33]

Like freight transportation, transportation serving passengers is moving toward greater intermodal cooperation. In the Northeast Corridor, during bad weather one airline transfers passengers from short-distance flights to Amtrak. Rail lines to airports link train and air services. Bus services linked to train stations have increased passenger rail frequencies in California. In Oregon, a light rail line links the airport to the Portland metro area. Thru-way buses connect 27 Oregon communities with Amtrak services in the Willamette Valley. Increased intermodalism--ease of connection from one mode to another--creates opportunities for easier trip planning, linked schedules, and common tickets for trips using more than one mode.

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[30] ODOT Rail Division, unpublished information.
[31] Federal Aviation Administration, Enplanement and All Cargo Reports 1993 & 2002.
[32] Albert C. Witzig, "Keeping California Mobile with High-Speed Rail: Megaproject Arrives at Critical Stage," *TRB News*, September-October 2002, pp. 12-16.
[33] Ibid., p. 133.

The Environment

Air Quality and Global Warming

The air that Oregonians breathe meets federal air quality standards almost 100 percent of the time, and major pollutants associated with transportation activities--carbon monoxide, ozone, and particulate matter--are generally declining. Vehicles generally use engines that burn fuels more efficiently and have fewer emissions; state and local governments have paved dusty unpaved roads to reduce ambient particulate matter (PM_{10}). However, $PM_{2.5}$—particulate matter that is 2.5 microns or less in size—is increasing because of the emissions of increased driving.

Scientists generally agree that increasing concentrations of greenhouse gases, including carbon dioxide, are causing the average temperature of the earth to rise. The United States is the largest energy user in the world and the largest emitter of carbon dioxide, currently accounting for almost 25 percent of the world total. Transportation activities in the United States have been estimated to be the largest single source of greenhouse gas emissions in the world. [34] The Oregon Office of Energy predicts that carbon dioxide emissions in the state will increase by 32 percent from 1990 to 2015. These emissions are increasing mainly because driving is increasing.

Some states are taking the lead in addressing global warming issues. In October 2003 the governors of California, Washington, and Oregon announced a joint strategy to take steps to reduce global warming through actions including purchasing fuel-efficient vehicles and developing renewable sources of energy.

Energy

Transportation is the first or second largest energy consumer in the United States, and its use of energy more than tripled from 1949 to 2000. Motor vehicles account for about two-thirds of the petroleum consumed. While consumption has risen, domestic supply has declined. U.S. production of crude oil and natural gas plant liquids peaked in 1970 at 11.2 million barrels per day. By 2000 production had fallen to 8.1 million barrels per day, and the U.S. imported more petroleum than it produced.[35]

The average fuel economy of light vehicles is also lower than it was at its peak in 1987 (22.1 mpg), but major automobile makers and others are exploring alternatives to gasoline and diesel fueled vehicles and expect to produce fuel-cell vehicles in the near future. Competition to fuel cells may come from advanced conventional vehicles with gasoline and diesel options, hybrid and compressed natural gas vehicles and hydrogen-powered internal combustion engines. Some believe that large-scale hydrogen fuel, produced from biomass or from nuclear, solar, water or wind power, could be the

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[34] Elizabeth Deakin, "Sustainable Transportation: U.S. Dilemmas and European Experiences," *Transportation Research Record 1792: Sustainability and Environmental Concerns in Transportation 2002*, p. 2.
[35] U.S. Department of Energy, *Annual Energy Review 2000*, August 2001.

solution to many transportation energy problems including greenhouse gas emissions and energy security. Others see increased use of compressed natural gas, biodiesel and ethanol in the future.[36] Cost will be a major factor.

Hybrid vehicles are already selling well. Their gas engine runs the car when necessary but also charges the battery to run the electric motor. National package delivery companies and others are exploring the use of hybrid electric vehicles as well as those powered by hydrogen fuel cells, compressed natural gas and all-electricity.[37]

Water Quality

Transportation is a source of non-point water pollution: paved roads and parking lots, for example, are impervious surfaces that allow water run-off to flow quickly, picking up chemicals and pollutants and depositing them into open bodies of water. Transportation-related pollution prevention practices appear to be improving since water quality in streams has improved during the past decade.

Transportation also affects salmon passage. To meet the problems of threatened or endangered fish runs, ODOT and others have developed programs to improve fish passage by retrofitting or replacing culverts. ODOT opened over 300 miles of fish habitat from 1997 to mid-2003 through fish passage improvements. Fish have reappeared in places upstream of rehabilitated bridges or culverts where fish have not appeared for 10-50 years. ODOT has completed a best management practices guide for maintenance activities to minimize impacts on habitat, including salmon-bearing streams.

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Interest in sustainable development—including the natural environment, economic betterment and social equity—has been growing throughout the world. Strategies for reducing greenhouse gas emissions and moving toward sustainable transportation include improved efficiency of vehicles, development of new fuels, improvements to highway operations, demand management, greater use of telecommunications, pricing incentives, and land use/transportation integration. Governor Kulongoski has directed an advisory group on global warming to develop an Oregon climate change strategy and state agencies to develop plans for sustainable practices.

Safety

Nationwide, during the past decade, the highway fatality rate per 100 million vehicle miles traveled has been reduced from 2.1 fatalities to 1.5.[38] In Oregon, since 1992 the rate

[36] Jonathan Rubin, "Driving to New Sources of Transportation Energy," *TRB News*, May-June 2003, pp. 16-20.
[37] John D. Schulz, "Delivering the Future," *Traffic World*, June 23, 2003, pp. 21-23.
[38] USDOT, NHTSA, *Traffic Safety Facts,* p. 15.

of fatalities per 100 million vehicle miles traveled has declined from 1.76 to 1.26 in 2002, less than the national average. Since the population and travel are increasing, the number of fatalities did not decline in line with the decline in fatality rate. Oregon had 518 fatalities in 1992, but 436 in 2002. The 48,282 vehicle crashes in 2002 were slightly fewer than in 1992.

The number of Oregonians killed involving speed, alcohol and other drugs, work zones, and commercial motor carriers has declined significantly since 1992. The trend in number of rail crossing incidents is declining. Fatalities involving pedestrian-motor vehicle crashes have gone down in the past ten years, and injuries from bicycle-motor vehicle crashes are lower.

However, the number of motorcyclists killed in crashes has increased significantly in recent years. Young drivers aged 16 to 24 represented 21 percent of driver fatalities in 2002, higher than any other age group.[39] For the same year, 90 percent of vehicle occupants in Oregon used seat belts or child restraints, much higher than the national average.

- **Trends and Challenges**

In 2003 traffic fatalities increased compared to recent years. Some safety experts believe that the perception that fewer law enforcement officers are present leads some motorists to drive more aggressively.

The number of older drivers is expected to increase significantly. Between 1983 and 1995, older Americans had the largest increase in travel of any age groups, and even drivers aged 85 or older continue to prefer driving their own vehicles. But older drivers present a higher crash risk than other drivers because of vision problems and other health problems. Driving will continue as the preferred way of traveling unless alternatives, such as demand/response transit, are made more readily available.[40]

Major changes are occurring in vehicle technology that may improve safety and travel. Futurists predict that "advances in automobile technology such as road-condition sensors, continuously variable transmissions, automated traffic management systems, night-vision systems, and smart seats that tailor airbag inflation to the passenger's weight will all be in common use by 2010."[41] More devices for drowsy driver detection, mayday (crash detection, vehicle location in a crash), and crash detection analysis are being developed. Nationally-sponsored tests were conducted of automated highways in San Diego; development of these could be pursued if liability and other issues could be resolved.

[39] ODOT Transportation Data Section, crash data, 2003.
[40] AASHTO, *Bottom Line*, p. 46.
[41] "Trends Shaping the Future," p. 33.

Security

Since September 11, 2001, those in transportation worldwide have focused major attention on transportation system security. Security at airports and marine ports has been strengthened. Airlines are screening passengers more carefully. More sophisticated screening and tracking devices are being used for cargo. For highways, "system redundancy has proved to be a key planning factor. Current military and engineering judgement indicates that the complete protection of key facilities from destruction is not feasible or cost-effective." States are encouraged to "deter, detect, defend and design." The overall practical objective of the counter-terrorism measures is not to provide full protection but to reduce exposure to terrorist activities. A key component is improving evacuation and emergency response capabilities of the urban roadway system. [42] Transit facilities need protection similar to those of the highway system.

- **Trends and Challenges**

Challenges to improving security include improving emergency response, maintaining reliable communications among transportation agencies, law enforcement, rescue and medical services and the public, and developing cost-effective security measures for freight transportation facilities and infrastructure.

Intelligent Transportation System (ITS) technology offers possibilities for increasing detection of terrorist activities, emergency response, coordination of transportation operations and traveler information. Radio frequency identification (RFID) technology is being developed to track goods and containers through the supply chain. The new technology has the potential to improve operations as well as security.

Funding Transportation

Oregon raises transportation revenue from user licenses and fees, fuel taxes, property taxes, state and local general funds, lottery proceeds and other sources. About 66 percent of the revenue distributed at the state level comes from statewide user-related sources and 22 percent from federal funding. State highway bonds and the state lottery provide the other 12 percent.

The 2003 Legislature approved a $2.5 billion investment in state and local road-related infrastructure over the next ten years. The legislation raises revenue by increasing registration and title fees, heavy vehicle fees and other fees and by setting up a bonding program. The Legislature also approved an increase in funding for transportation for the elderly and disabled from additional fees, $2 million in bonds for rail shortline assistance and $8 million in bonds for industrial rail spurs repaid from lottery funds. Development of the south Metro commuter rail line also received lottery-backed bonding.

[42] Ibid., p. 48.

The Oregon Legislature has not increased the state motor vehicle fuel user tax since 1991. Over time, the buying power of revenue from Oregon's motor vehicle fuel tax has been declining because of fuel-efficient vehicles, hybrid vehicles, the use of alternate fuels and inflation. If the international oil supply should drop, then prices may be expected to increase and tax yields decrease further. Proposals to maintain highway funding include tolling, congestion pricing and new forms of revenue, specifically VMT taxes. However, administrative, technological, cost and privacy issues need to be resolved.

In addition to increasing revenue, policymakers are exploring reducing demand for highway use and encouraging public-private partnerships for transportation projects. To promote less driving, the 2003 Legislature supported a pilot project for tax incentives for mileage-based auto insurance. Other legislation encourages entrepreneurial and innovative approaches to transportation projects through public-private partnerships.

At the national level, Congressional support for Amtrak has not been certain, but transportation officials are exploring public sector participation in funding railroad improvements in order to handle increased freight traffic and relieve congestion on the highways during the next 20 years.

At the national and state levels, providing adequate funding for transportation maintenance, operations and infrastructure improvements will likely continue to be a major issue.

The trends and challenges introduced in this paper are explored in more detail in the Oregon Transportation Update background papers that follow.