New Look
The Regional Transportation Plan

2035 Regional Transportation Plan Update

Background Paper:

Key Environmental Issues and Metro's Mitigation-Related Activities in the Portland Metropolitan Region

Prepared by:

METRO
PEOPLE PLACES • OPEN SPACES

February 14, 2007

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People places • open spaces

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

Your Metro representatives

Metro Council President – David Bragdon
Metro Councilors – Rod Park, District 1; Brian Newman, District 2; Carl Hosticka, deputy council president, District 3; Kathryn Harrington, District 4; Rex Burkholder, District 5; Robert Liberty, District 6.
Auditor – Suzanne Flynn

Metro's web site: www.metro-region.org
Project web site: www.metro-region.org/rtp (Click on "2035 RTP update")

List of RTP Background Research Papers

- **Environmental Justice** in Metro's Transportation Planning Process
- A Profile of **Security** in the Portland Metropolitan Region
- A Profile of the **Regional Trends and Travel Characteristics** in the Portland Metropolitan Region
- A Profile of the **Regional Bicycle System** in the Portland Metropolitan Region
- A Profile of the **Regional Transit System** in the Portland Metropolitan Region
- A Profile of the **Regional Pedestrian System** in the Portland Metropolitan Region
- A Profile of **Regional Travel Options and Parking Management Systems** in the Portland Metropolitan Region
- A Profile of the **Regional Freight Transportation System** in the Portland-Vancouver Metropolitan Region
- **Preliminary Financial Analysis** for the 2035 Regional Transportation Plan Update
- A Profile of **Safety** in the Portland Metropolitan Region
- A Profile of the **Regional Roadway System** in the Portland Metropolitan Region
- A Profile of **Key Environmental Issues and Metro's Mitigation-Related Activities** in the Portland Metropolitan Region

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2035 Regional Transportation Plan Update

Key Environmental Issues and Metro's Mitigation-Related Activities in the Portland Metro Region

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I. Introduction

This paper is one of a series of papers that provide background research and analysis to guide Regional Transportation Plan (RTP) update policy discussions. The papers describe trends and research affecting the regional transportation system, current regional transportation planning policies and regulatory requirements, a profile of the existing transportation system and policy implications to be addressed in the RTP to respond to identified policy gaps and key findings of the background research. Collectively, the background papers will inform future policy discussions by Metro Policy Advisory Committee (MPAC), Joint Policy Advisory Committee on Transportation (JPACT) and the Metro Council and lead to an updated RTP.

This paper provides a profile of environmental issues in the Portland metropolitan region. It summarizes key environmental trends, describes existing environmental planning and mitigation activities and compiles inventories for cultural and natural resources in the region. This research will be used to identify future environmental mitigation activities for RTP projects to support regional goals for protecting the environment.

II. Background

The environment is deeply connected to the identity of the Portland region. When asked what they enjoy most about the quality of life in the region, citizens have consistently chosen environmental quality, access to nature and scenery as things of value and want to protect. The Portland region is situated at the northern end of the Willamette valley ecoregion, a fertile river valley surrounded by dramatic natural features - the Coast range to the west, the Cascades to the east, and the Columbia River to the north (including the Columbia River Gorge National Scenic area). Inside of the region, natural landscape is created by broad river valleys with wetlands, narrow river canyons with riparian vegetation, buttes and forests, mountains and meadows, foothills and farms.

The protection of natural and cultural resources has long been a key responsibility of Metro. The preamble of the 1992 Metro Charter proclaims that "Metro's most important service is to preserve and enhance the quality of life and the environment for ourselves and future generations." This ethic of sustainability is central to several Metro plans and programs, including the Greenspaces Master Plan, the Fish and Wildlife Habitat Protection Program Vision Statement, and the region's overarching long-range plan, the 2040 Growth Concept. Environmental health is one of the 2040 Fundamentals adopted by the region in 1997:

1. *Healthy Economy*
2. *Vibrant Communities*
3. ***Environment Health***
4. *Transportation Choices*
5. *Equity*
6. *Fiscal Stewardship*

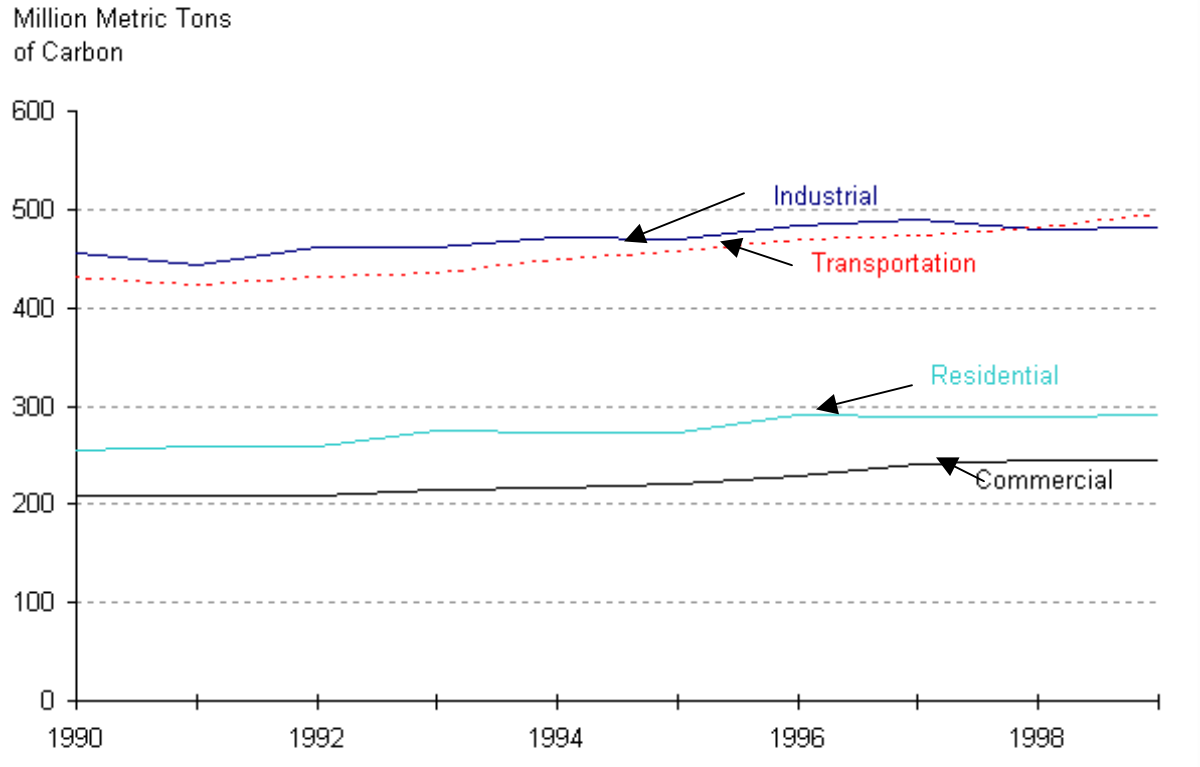
III. Environmental trends/issues

Climate Change and Global Warming

Climate change poses a serious and growing threat to Oregon's economy, natural resources, forests, rivers, agricultural lands, and coastline. Emissions are created as a by-product of fuel combustion and from evaporation of the fuel itself. The combustion of fossil fuels produces a cocktail of greenhouse

gases (GHG's) that trap heat in the atmosphere and cause global warming. The United States is the largest energy user in the world and the largest emitter of greenhouse gases[1]. Transportation activities are one of the largest sources of greenhouse gas emissions. Figure 1 shows greenhouse gas emissions by sector:

FIGURE 1 - U.S. Carbon Dioxide Emissions from Energy Use by Sector (annual data)



Source: Bureau of Transportation Statistics [2]

[1] Energy Information Administration, Department of Energy. <http://www.eia.doe.gov/environment.html>
[2] Bureau of Transportation Statistics. http://www.bts.gov/publications/transportation_indicators/august_2001/Environment/html/US_Carbon_Dioxide_Emissions.html

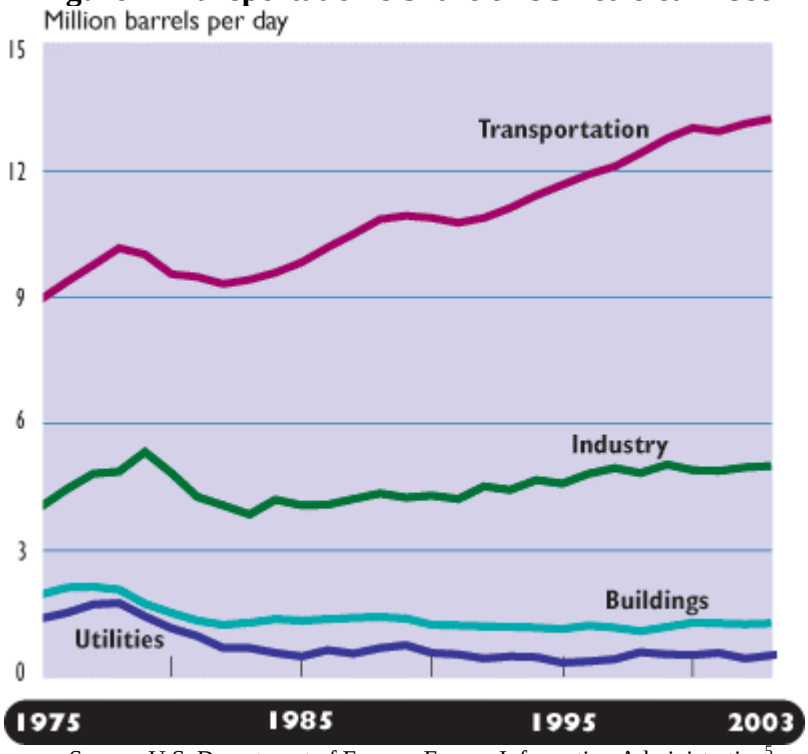
It is estimated that transportation accounts for 38 percent of carbon dioxide emissions in Oregon and this is predicted to increase by 33 percent by 2025 because of increased driving[3].

Little peer-reviewed research has explored the potential impacts of climate change on the transportation system. Many challenges to the transportation system may arise. Warmer temperatures could affect the service life of transportation infrastructure like roads, bridges, runways, shipping terminals and railways. A premature deterioration in infrastructure would increase costs. The predicted severe weather may affect the frequency of landslides and slope failures and increased flooding. This could damage roads and rail infrastructure and may impact the distribution of goods and services. Climate change might also affect transportation systems operations in the areas of safety, mobility and economic competitiveness.

Oil Dependence and Increasing Uncertainty of Supply and Price

The U.S economy's reliance on foreign oil is mainly due to transportation. Figure 2 displays how transportation's share of US petroleum use has been increasing; the transportation sector consumes 66% of oil supplied to US economy, up from 55% in 1975.[4]

Figure 2 Transportation's Share of US Petroleum Use

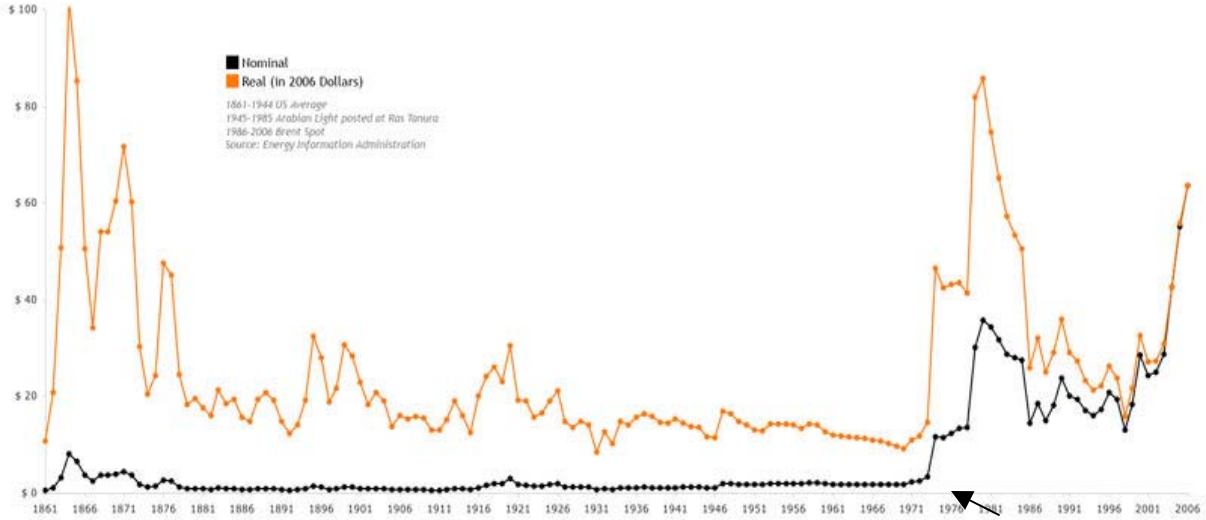


Source: U.S. Department of Energy, Energy Information Administration[5]

[3] *Oregon Transportation Plan*. Oregon Department of Transportation. September 2006. p. I-20.
[4] Bureau of Transportation Statistics, Pocket Guide to Transportation, 2005. http://www.bts.gov/publications/the_changing_face_of_transportation/chapter_05.html, accessed 1/4/07.
[5] U.S. Department of Energy, Energy Information Administration. *Annual Energy Review 2002*. Tables 5.12a-d. October 2003.

This dependence on oil is an issue for long range transportation planning, considering the uncertainty surrounding oil's supply and price. Uncertainty is defined as a measure of the decreasing confidence that supply and price of oil will not be much different next year compared to today's figures[6]. Figure 3 displays the fluctuations in oil prices over the last 150 years.

FIGURE 3. Crude-Oil Price History from 1861 to 2006



Source: Michael Strock[7]

Although the exact timing of the peaking of oil supply is unpredictable, certain changes can be anticipated and strategies developed to ease the effects. The uncertainty of oil prices should be considered as transportation investments are being developed as part of the RTP update. The RTP should continue to emphasize land use and transportation planning to reduce mean travel distances and enable greater use of public transit, walking and bicycling as viable transportation options and modes that are less susceptible to oil price fluctuations than private automobiles.

Air quality / Air toxics

Air quality affects public health, plant and animal life and visibility. Federal and state regulations require that the Portland Metropolitan region assess the air quality consequences of proposed transportation projects and program investments. This work ensures that air quality standards are met as the transportation system is improved. Particulate matter, a main component of air pollution, is small enough to be deeply inhaled and can contribute to various respiratory and cardiovascular ailments. The U.S. Environmental Protection Agency (EPA) set national air quality standards for six common pollutants, referred to as criteria pollutants. These National Ambient Air Quality Standards (NAAQS) consist of:

- $PM_{10}/PM_{2.5}$ (Particulate Matter)
- Carbon Monoxide (CO)

[6] Lerch, Daniel. "White Paper: Future Oil Supply Uncertainty and Metro." April 2006. < http://www.metro-region.org/article.cfm?ArticleID=18951>

[7] Strock, Michael. "Oil Prices: 1861 – 2006." Based on Crude oil price history from 1861-2006. Data: [http://www.eia.doe.gov/pub/international/iealf/BPCrudeOilPrices.xls]. < http://en.wikipedia.org/wiki/Image:Oil_Prices_1861_2006.jpg>

- Nitrogen Dioxide (NO_2)
- Ozone (O_3)
- Sulfur Dioxide (SO_2)
- Lead (Pb)[8]

The EPA designates urban areas into non-attainment, or maintenance areas. Non-attainment means that a geographic area has not consistently met the NAAQS set by the EPA. Maintenance areas are those geographic areas that had a history of non-attainment, but are now consistently meeting the NAAQS. Maintenance areas have been re-designated by the EPA from "non-attainment" to "attainment with a maintenance plan." Table 1 shows the non-attainment and maintenance areas for the State of Oregon.

TABLE 1 – Non-Attainment and Maintenance Areas for the State of Oregon

Non-Attainment Areas	Pollutant(s)
Eugene-Springfield UGB	PM_{10}
Oakridge UGB	PM_{10}
Salem-Keizer Area Transportation Study	Carbon Monoxide and Ozone
Maintenance Areas	**Pollutant(s)**
Portland Air Quality Maintenance Area	Carbon Monoxide and Ozone
Eugene Springfield Air Quality Maintenance Area	Carbon Monoxide
Grants Pass Central Business District	Carbon Monoxide
Grants Pass UGB	PM_{10}
Klamath Falls UGB	Carbon Monoxide and PM_{10}
La Grande	PM_{10}
Lakeview	PM_{10}
Medford UGB	Carbon Monoxide
Medford-Ashland	Ozone and PM_{10}

Source: Oregon Department of Environmental Quality[9]

Oregon's State Implementation Plan (SIP) is an air quality maintenance plan developed to document and ensure continued compliance with the NAAQS for carbon monoxide (CO) in the Portland, Oregon Maintenance Area. The plan is written to comply with the federal Clean Air Act and the policies of the U.S. Environmental Protection Agency (EPA). The Portland region currently meets carbon monoxide standards, although many years ago there were times when carbon monoxide levels were occasionally higher than allowed. The region met standards in 1996 and has done so since then. A maintenance plan was required in 1996 and included emission budgets[10] and the Metro jurisdictional boundary was established as the geographic extent of concern. The region must demonstrate conformance with the

[8] U.S. Environmental Protection Agency. "National Ambient Air Quality Standards (NAAQS)." <http://www.epa.gov/air/criteria.html>

[9] Oregon Department of Environmental Quality. Non-Attainment and Maintenance Areas for the State of Oregon. <http://www.deq.state.or.us/aq/planning/index.htm>

[10] Emission budgets are the maximum pollutant levels allowable for future years.

carbon monoxide maintenance plan at least every three years. This 3-year requirement may create a complication with the new 4-year cycle for RTP updates. Oregon DEQ is currently exploring how to match up the two cycles. For all other air pollutants of national concern, such as ground level ozone and particulates, the Portland Metropolitan region is in attainment with national air quality standards and there are no maintenance plans or conformity demonstrations required.

Air Toxics, also called hazardous air pollutants (HAPs) or toxic air pollutants, are those pollutants known or suspected to cause serious health effects including cancer, birth defects, lung damage and nerve damage. Air toxics can also be damaging to the environment. They include metal processing fumes, smoke, particles, and vapors from fuels, coatings and other sources.

Air Toxics come from natural sources (i.e. forest fires and volcanoes) and from human sources, and can either be stationary or mobile. Stationary or fixed sources can be large in scale, such as metal processing or wood processing plants or small, such as personal wood stoves and fireplaces. Mobile sources are major contributors to air toxics emissions consisting of cars and trucks, construction equipment and lawnmowers. The Oregon Department of Environmental Quality (DEQ) has identified twelve chemicals of most concern in Oregon:

- Acetaldehyde
- Acrolein
- Arsenic and Compounds
- Benzene
- 1,3 – Butadiene
- Chromium and Compounds
- Diesel Particulate Matter (PM)
- Formaldehyde
- Naphthalene
- Polcyclic Organic Matter (POM)
- 1,1,2,2 – Tetrachloroethane
- Tetrachloroethylene (Perc)[11]

Portland Air Toxics Assessment

DEQ has recently completed an air quality modeling study called the Portland Air Toxics Assessment (PATA). This study used local meteorology, topography and emission information about population, neighborhood, car, truck, industrial and smaller sources to predict the level of the 12 air toxics. Levels of ten of these pollutants are estimated to be above benchmark concentrations recommended by the Air Toxics Science Advisory Committee (ATSAC)[12] and recently adopted by the Environmental Quality Commission (EQC)[13]. Benchmarks are not standards, but rather planning goals. This comprehensive assessment by DEQ is a key step in a community planning process to reduce air toxics in the Portland

[11] For more specific information on each air toxic see, "Fact Sheet: Air Toxics of Concern in Oregon." < http://www.deq.state.or.us/aq/factsheets/06-NWR-015pata.pdf>

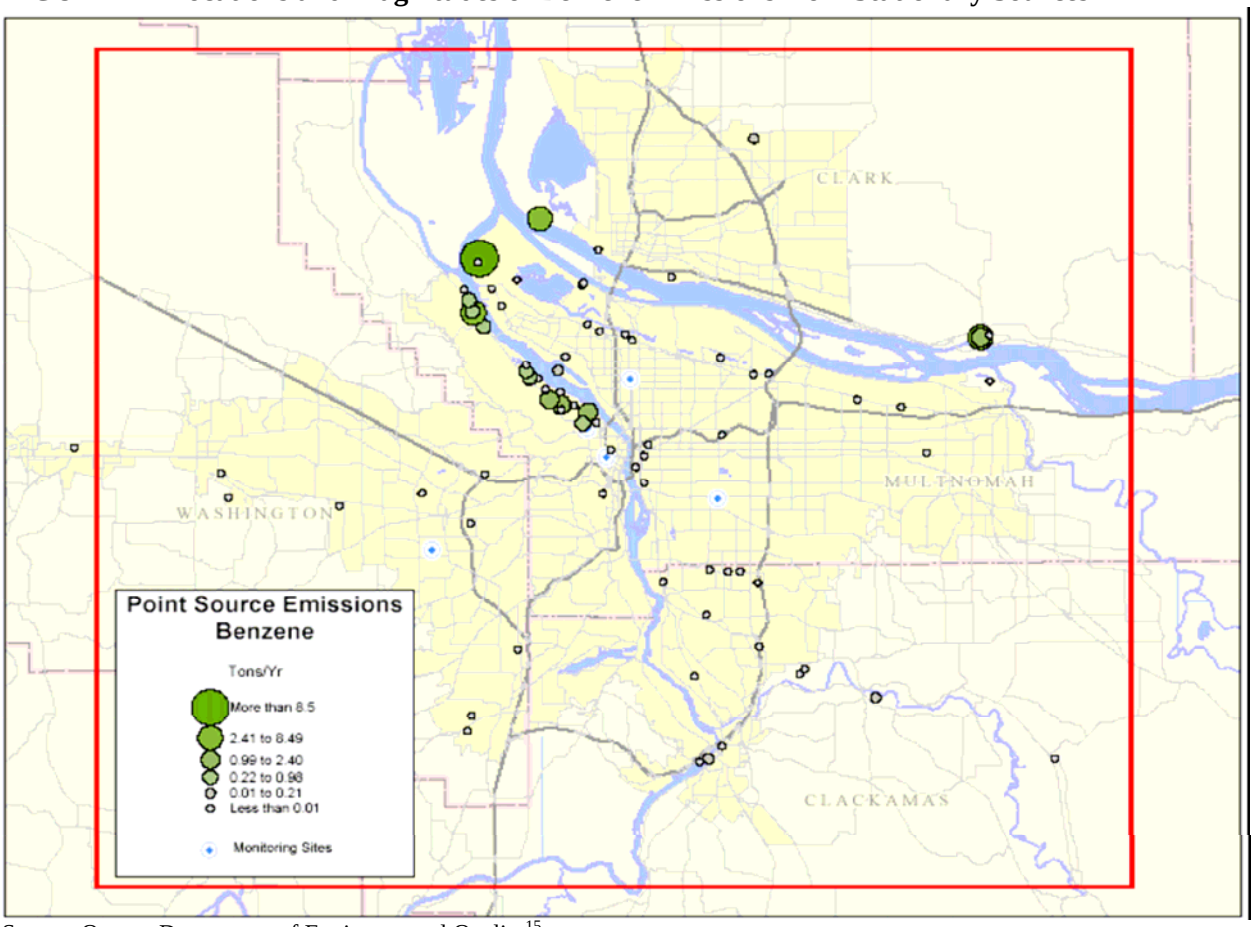
[12] The Air Toxics Science Advisory Committee (ATSAC) is a technical advisory group formed by DEQ's Air Quality Division. For more information: <http://www.deq.state.or.us/aq/toxics/atsac.htm>

[13] The Environmental Quality Commission (EQC) is a five-member citizen panel appointed by the governor for four-year terms to serve as DEQ's policy and rulemaking board. For more information: <http://www.deq.state.or.us/about/eqc/eqc.htm>

area. Regulatory monitoring of these chemicals is not currently required, yet the toxics pose threats to human health and the environment.

Transportation contributes directly to the emissions of several air toxics. Diesel Particulate Matter is a leading air toxic of concern, as emissions include tiny particles that are toxic, tend to stay low in the air column because they are heavy, and can be breathed deeply into the lungs where they can cause a range of health problems from increasing asthma to increasing the risk of cancer. Because diesel engines are widely used in marine vessels, heavy-duty trucks and construction equipment, diesel emission levels in parts of the Portland Metro region exceed healthy levels. Acrolein can be produced from motor vehicle exhaust. Long-term exposure can cause general respiratory congestion and eye, nose and throat irritation. Benzene can also be found in motor vehicle emissions. Recent DEQ research findings have documented that areas of the Portland Metropolitan region exceed federal standards (Figure 4)[14]. Long-term inhalation causes blood disorders, anemia, damage to the immune system and genetic disorders. Also, as a known carcinogen, it has been linked to increased incidence of leukemia.

FIGURE 4 – Locations and Magnitudes of Benzene Emissions from Stationary Sources



Source: Oregon Department of Environmental Quality[15]

[14] ICF Consulting. *Air Dispersion Modeling Component of the Portland Air Toxics Assessment.* Feb. 2004. p. 14, 19.

[15] ICF Consulting. *Air Dispersion Modeling Component of the Portland Air Toxics Assessment.* Feb. 2004. p. 14.

Noise Pollution

Noise is among the most pervasive pollutants today. Noise negatively affects human health include hearing loss, stress, high blood pressure, sleep loss, distraction and lost productivity, and a general reduction in the quality of life. Ambient noise problems are not just limited to airports, but are associated with road and rail transport, industrial noise, and neighborhood and recreational noise. In the past, the Environmental Protection Agency (EPA) coordinated all federal noise control activities through its Office of Noise Abatement and Control. However, In 1981, the Administration concluded that noise issues were best handled at the State or local government level. As a result, the EPA phased out the office's funding in 1982 as part of a shift in federal noise control policy to transfer the primary responsibility of regulating noise to state and local governments. Oregon state regulations have standards for:

- New and used motor vehicles
- Industry and commerce
- Motor sports vehicles and facilities
- Airports[16]

However, in 1991, DEQ Noise Control Program was terminated and enforcement was delegated to local jurisdictions. Several Oregon cities and counties have enacted local noise ordinances. Standards vary from city to city and county to county. Some jurisdictions use the state standards; others have enacted separate standards.

Haze and Visibility

Good visibility is essential to enjoying the natural and scenic areas in the Portland Metropolitan region. Haze is air pollution composed of tiny particles absorbing and scattering light affecting visibility. Sources include automobiles, trucks, power plants, industrial and manufacturing processes and natural sources like wildfires and windblown dust. The Clean Air Act contains a goal of improving and protecting visibility in national parks and scenic areas. In 1999 U.S. EPA adopted the Regional Haze Rule to reduce human-caused air pollution from various sources over broad geographic areas. The rule requires states to develop long-term strategies and to demonstrate that these strategies will make reasonable progress in improving visibility on the haziest days and ensuring no degradation on the clearest days[17]. In December 2003, Oregon DEQ adopted the first regional haze plan for Oregon. DEQ is currently working on the 2007 Oregon Regional Haze Plan and a draft is expected in spring 2007.

The Columbia Gorge Air Quality Project was formed to identify sources both locally and regionally affecting the Gorge and to develop an air quality strategy to address these issues. The project is a partnership between ODEQ, the Southwest Clean Air Agency (SWCAA), the Washington Department of Ecology (WDOE), and grant funding from U.S. EPA. The study aims to:

- Provide an assessment of the causes of visibility impairment in the Columbia River Gorge National Scenic Area
- Identify emission source regions, emission source categories and individual emission sources significantly contributing to visibility impairment in the Gorge

[16] Oregon Department of Environmental Quality. "Finding Solutions to Noise Problems." <http://www.deq.state.or.us/aq/noise/index.htm>

[17] Oregon Department of Environmental Quality. "Fact Sheet: The Regional Haze Rule." <http://www.deq.state.or.us/aq/factsheets/06-AQ-009_regionalhaze.pdf>

- Provide an initial assessment of air quality benefits to the Gorge from upcoming state and federal air quality programs[18]

Wildlife habitat loss

As roadways and other types of transportation infrastructure cut across the landscape, they form barriers to natural wildlife movement, disrupting wildlife migration patterns and population dynamics. The impacts to wildlife and wildlife habitat are disproportionate to the area of land of the infrastructure. While roads cover approximately one percent of the United States, it is estimated that they directly affect 15 to 20 percent of the landscape.[19] Roads not only cause loss of habitat in the spaces they occupy, but can also lead to degradation of adjacent habitats. The impervious surface of roadways leads to increased flow of stormwater run-off, which interrupts the hydrologic cycle, alters stream structure, and degrades stream water quality.

The loss of urban wildlife has significant social and ecological costs, and broad implications for the quality of life of all residents in the region. Preservation of natural areas in the urban environment ensures places of refuge for both humans and wildlife. The degradation of urban wildlife habitat translates to the degradation of parks, greenspaces, and other urban assets that have a high recreational and social value. Furthermore, the loss of habitat in urban areas affects natural systems well beyond urban boundaries.

Wildlife-vehicle collisions are a direct impact of transportation infrastructure cutting across wildlife habitat corridors. See Figure X in section VI for a map of wildlife hotspot incident locations in the Portland region. These conflicts have three distinct types of costs: injury and loss of life to people involved in collisions, injury and loss of life to wildlife involved in collisions, and monetary costs associated with property damage and accident clean-up. These conflicts can be minimized through both engineered solutions, such as wildlife-crossing devices/structures, as well as a more holistic approach of calling out specific wildlife corridor acquisition/restoration needs as part of transportation project development.

Water Quality

As the Portland metro region expands, the pressure of increased development threatens natural areas, clean rivers, streams, and valuable fish and wildlife habitat. Water quality issues are not confined to water bodies, as some of the most damaging human impacts to water quality and aquatic habitat occur inland. Stormwater falling on impervious surfaces, like paved roads and parking lots, picks up chemicals and other pollutants. The polluted runoff is deposited in sediment, groundwater and open bodies of water. Similarly, surface water runoff tends be of a volume and velocity that easily overwhelms streams and can lead to undercutting and erosion of stream banks, depositing excessive sediment, and altering in-stream fish and wildlife habitat. This degrades the health of the aquatic ecosystem, affecting water quality and riparian areas.

[18] Oregon Department of Environmental Quality. *Redesigned Technical Study Plan Columbia River Gorge National Scenic Area Air Quality Study: Executive Summary*. July 2003. <http://www.deq.state.or.us/aq/gorgeair/docs/03Jul25studyplan.pdf>

[19] Forman, R.T.T and Deblinger, R.D. The Ecological Road-Effect Zone for Transportation Planning and Massachusetts Highway Example. *Proceedings of the International Conference on Wildlife Ecology and Transportation.* (Florida Department of Transportation Publication FL-ER-69-98) 1998.

Transportation is a source of non-point water pollution. Transportation projects need to consider transportation-related pollution and water quality standards to develop prevention and mitigation strategies to ensure improvements in water quality. Water quality standards are benchmarks established to assess whether the quality of Oregon's rivers and lakes is adequate for fish and other aquatic life, recreation, drinking, agriculture, industry and other uses. Water quality standards are also regulatory tools used by the State Department of Environmental Quality (DEQ) and the federal Environmental Protection Agency (EPA) to prevent pollution of our waters. States are required to adopt water quality standards by the federal Clean Water Act. Designated management areas (local jurisdictions or agencies) can lose their stormwater permits if area water bodies do not meet DEQ goals.

Transportation-related pollution can negatively impact riparian areas with polluted runoff from impervious surfaces and deposition from air pollutants and toxics. Riparian area refers to land and vegetation near water bodies such as streams, rivers, wetlands and lakes. The best available science indicates that healthy riparian areas generally include trees and shrubs that provide shade and stabilize banks around water bodies. Studies indicate that trees and plants, wetlands, and floodplains all contribute to healthy riparian habitat. Loss of riparian vegetation can degrade the health of a watershed by causing bank instability, fluctuating water temperatures, absence of large woody debris, lack of nearshore terrestrial habitat, and absence of food sources like insects from trees. Contaminated sediments pose a risk to human and animal health as the toxins can bind to sediments at concentrations far above natural conditions and accumulate in the tissues of living organisms and move up the food web through bioaccumulation.

Superfund, Hazardous Waste Sites and Historical Sites

DEQ maintains the Environmental Cleanup Site Information (ECSI) database. The database tracks sites with known or potential contamination from hazardous substances and to document sites where no further action is required. The ECSI is summary and not comprehensive in nature and some of the information may be unconfirmed, outdated or incomplete[20]. The ECSI does store information on sites that are listed on U.S. EPA's National Priority List (NPL) and sites are dubbed "Superfund" sites as the nation's worst hazardous waste sites. The NPL is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation and eventual clean up. Identification of hazardous waste sites will be incorporated during project planning and development activities in Phase III of the RTP.

Protection of historic and archeological resources must also be considered as part of the transportation decision-making process. The National Park Service administers the National Register of Historic Places including districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The Oregon State Historic Preservation Office maintains a database of various historic and archaeological sites across the state. Many local governments also maintain and map historic districts within their jurisdiction. Identification of historic and archaeological sites will be incorporated during project planning and development activities in Phase III of the RTP.

[20] For more information on the ECSI: < http://www.deq.state.or.us/lq/ecsi/ecsi.htm>

IV. Policy and Regulatory Framework

Federal

National Environmental Policy Act (NEPA)

Passed in 1969, NEPA is the United States' basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. The law applies to federal agencies and any federally funded programs or projects. NEPA is best known for its provision requiring an environmental impact statement (EIS) to be written for "all major federal actions which may have a significant impact on the environment." If a major federal action will not have a significant impact on the environment, the agency must prepare a shorter document called an Environmental Assessment (EA).

Recent Federal Guidance has mandated greater integration of transportation planning and NEPA Processes. Federal guidance has encouraged consideration of the environment earlier in the transportation planning process, such as during development of the 20-year regional transportation plan.[21]This allows future NEPA processes to use and build on the decisions made and information developed during the regional transportation plan development.[22] Specifically, for system planning decisions to hold up in subsequent EIS/EA processes, NEPA requires:

- Documentation of alternatives considered and rejected
- Documentation of public and stakeholder involvement
- Consultation with resource agencies

Clean Air Act, 1990 Amendments

The primary framework for regulating and protecting air quality on the federal, state, and local level is the Clean Air Act (CAA). The CAA was adopted in 1963, but amendments in 1970, 1977 and 1990 provided the structure that continues today. The 1970 amendments made the U.S. EPA responsible for setting the NAAQS for pollutants considered harmful to people and the environment. The standards are established at levels meant to protect the health of the most sensitive population groups, including the elderly, children and individuals with respiratory diseases. Air quality planning focuses on meeting the NAAQS and deadlines set by EPA and Oregon DEQ for meeting those standards. States were required to develop State Implementation Plans (SIPs). The SIP process requires each state to submit a detailed plan for the implementation, maintenance, and enforcement of the national ambient air standards for each criteria pollutant. The 1970 amendments also addressed individual air pollution sources.

The basic structure of the CAA did not change as a result of the 1977 amendments. The amendments strengthened regulations of stationary pollution sources distinguishing between new and existing sources. Additionally, the amendments established designations for air quality regions being either in "attainment" or "non-attainment" status for each criteria pollutant. The 1990 amendments left the basic structure of the CAA intact, but added additional controls on key pollutants and created a program for marketable allowance trading. In particular, the 1990 amendments emphasized the regulation of hazardous air pollutants and air toxics. The U.S. Department of Transportation has also established regulations that make failure to conform to NAAQS standards result in the loss of federal transportation funding.

Air Quality Conformity Requirements

[21] However, the intent is not to require NEPA-level studies during regional transportation plan development.
[22] FHWA/FTA, Linking the Transportation Planning and National Environmental Policy Act (NEPA) Processes. http://www.environment.fhwa.dot.gov/strmlng/pdfs/Planning_NEPAGuidance.pdf , accessed 1/03/07.

With the passage of the 1990 CAA and the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA), the requirements of transportation and air quality modeling changed to address air quality concerns. Federal regulations and procedures require Metropolitan Planning Organizations (MPOs) to analyze the impact of regional transportation plans (RTP) and transportation improvement programs (TIP) on their region's air quality and perform a conformity analysis to ensure that the plans do not degrade the region's air quality and projects are consistent with plans to achieve and maintain Federal air quality standards. Specific requirements are set by U.S. EPA and US DOT guidance documents, and local regulations and procedures set up by MPOs and air pollution control districts.

Clean Water Act

The Clean Water Act is the cornerstone of surface water quality protection in the United States. The Clean Water Act is actually a 1977 amendment to the Federal Water Pollution Control Act of 1972. The Act employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."[23] In 1987, the Act was reauthorized and again focused on toxic substances, authorized citizen suit provisions, and funded sewage treatment plants under the Construction Grants Program. The Act requires a permit process designed to protect wetland and aquatic habitats by requiring disclosure of expected impacts of a roadway project. The permit may be required if construction of the roadway will affect a wetland of waterway. During the Regional Transportation Plan update Metro should identify those projects that may impact wetlands or waterways and would need to include environmental mitigation strategies during project planning and development activities.

Endangered Species Act (ESA)

The Endangered Species Act provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered in the U.S. or elsewhere. The Act passed in 1973 and built upon its predecessors, the Endangered Species Preservation Act in 1966 and the Endangered Species Conservation Act in 1969. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The Act outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species. Transportation projects that impact "proposed, threatened or endangered species and/or designated critical habitats" may be required to comply with the ESA permit process, i.e. the application for Section 10 of the ESA requires habitat conservation plans.[24] During the Regional transportation Plan update, Metro should identify those projects that may impact endangered species and would need to include environmental strategies during project planning and development activities. As the federally designated MPO for the Portland region, Metro helps distribute some federal transportation funds to transportation agencies in the region. Therefore, Metro needs to ensure that distribution of these funds addresses and complies with the Endangered Species Act.

Magnuson-Stevens Act

On October 11, 1996, Congress passed the Sustainable Fisheries Act which amended the habitat provisions of the Magnuson Act. The re-named Magnuson-Stevens Ac calls for direct action to stop or

[23] Federal Water Pollution Control Act (Clean Air Act), Summary from Federal Wildlife Laws Handbook. http://ipl.unm.edu/cwl/fedbook/fwpca.html, accessed 1/25/07.

[24] Construction Industry Compliance Assistance Center. Endangered Species Act, http://www.cicacenter.org/espermits.html, accessed 1/25/07.

reverse the continued loss of fish habitats. Toward this end, Congress mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. The Act requires cooperation among the National Marine Fisheries Service (NMFS), the Fishery Management Councils, and Federal agencies to protect, conserve, and enhance "essential fish habitat". Congress defined essential fish habitat for federally managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."[25]. Metro shall make efforts to minimize impacts to essential fish habitat during the RTP process. Section V of this profile describes Metro's current efforts for preserving fish habitat through implementation of green streets

Intermodal Surface Transportation Efficiency Act (ISTEA)
Congress enacted the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. ISTEA gave Metropolitan Planning Organizations (MPOs) increased funding, expanded authority to select projects and mandates for new planning initiatives in their regions. The legislation also focused on improving transportation not as end in itself but as the means to achieve important national goals including economic progress, cleaner air, energy conservation and social equity. ISTEA promoted a transportation system in which all modes and facilities were integrated to allow a "seamless" movement of both goods and people and required a Congestion Management System to address congestion.

MPOs were also required to broaden public participation in the planning process and see that investment decisions contributed to meeting the air quality standards of the federal Clean Air Act Amendments.

Transportation Equity Act for the 21st Century (TEA-21)
Congress passed the Transportation Equity Act for the 21st Century (TEA-21) in 1998. It reduced the 15 planning factors from ISTEA to seven and continued the majority of its predecessor's programs. TEA-21 recognized that transportation investments impact the economy, environment, and community quality of life.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)
In 2005, Congress built on both ISTEA and TEA-21 with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU addresses the many challenges facing our transportation system today, such as improving safety, managing traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment.

Specific changes that SAFETEA-LU made to requirements for environmental planning include:

- expanding the environmental planning factor to include consistency of the RTP with planned growth and development plans;
- requiring transportation plans to include a discussion of potential environmental mitigation activities and areas to carry out these activities
- requiring consultation with resource agencies, such as those responsible for land-use management, natural resource resources, environmental protection, conservation and historic preservation, which shall involve as appropriate, comparisons of resource maps and inventories.
- Requiring participation plans that identify a process for stakeholder involvement
- Requiring visualization of proposed transportation strategies where practicable

[25]NOAA Fisheries, National Marine Fisheries Service, Habitat Conservation division. http://www.fakr.noaa.gov/habitat/cie/CIEfiles/CIEEFHruleexcerpts.pdf

- Developing and utilizing a Congestion Management Process (formerly Congestion Management Systems in the development of plans and TIPs.
- Giving priority in distributing CMAQ funds to diesel retrofits, and to expand the eligibility of projects to include non-road vehicles and engines that are used in highway construction projects.

State

Statewide Planning Goals

The Land Conservation and Development Commission (LCDC) and the Oregon planning program was created in 1973 by Senate Bill 100. The law created LCDC and directed it to adopt statewide planning goals which addressed a range of topics specified by the legislature. After conducting hearings around the state, LCDC adopted 19 state planning goals. The goals reflect a compromise between development and conservation objectives. The intention was to encourage development and redevelopment in existing urban areas while protecting farm and forest lands and natural resources.

Together, the RTP and city and county TSPs that implement the RTP will constitute the land use decisions about need, mode, and function and general location of planned transportation facilities and improvements shown in the RTP. Decisions for the alignment of a project (in a local TSP or the RTP) must be consistent with applicable statewide planning goals. Statewide Planning Goals that include site specific requirements that can affect decisions about the general location of planned transportation facilities include: Goal 5 Open Spaces, Scenic, Historic and Natural Resources, Goal 7 Natural Hazards and Disasters, Goal 9 Economic Development, Goal 10 Housing and Goal 15 Willamette River Greenway. Generally, compliance with these goals is achieved by demonstrating compliance with an acknowledged comprehensive plan.

The statewide planning goal that focused most specifically on impacts to protecting the environment is Goal 5 Open Spaces, Scenic, Historic and Natural Resources. The goal requires that local jurisdictions "adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations."[26] It requires jurisdiction's to inventory its natural resources, determine significant sites and develop programs to achieve the goal. Section V of this profile provides a description of Metro's response to Goal 5.

Executive Order (EO) on Sustainability

Governors Kitzhaber and Kulongoski both issued EO's on sustainability that support increasing sustainability state decision-making. The legislature codified much of Governor Kitzhaber's EO into statue in 2001 known as the Sustainability Act. Under the EO, ODOT has developed a Sustainability Plan, renewing the agency's vision of an environmentally sustainable transportation system.

Oregon Transportation Plan (OTP)

Amended in September 2006 by the Oregon Transportation Commission, the OTP's Sustainability Goal includes a policy and several strategies that address the environment:

[26]Oregon Dept of Land Conservation and Development. http://www.lcd.state.or.us/LCD/docs/goals/goal5.pdf, accessed 1/24/07.

GOAL 4 – SUSTAINABILITY
To provide a transportation system that meets present needs without compromising the ability of future generations to meet their needs from the joint perspective of environmental, economic and community objectives. This system is consistent with, yet recognizes differences in, local and regional land use and economic development plans. It is efficient and offers choices among transportation modes. It distributes benefits and burdens fairly and is operated, maintained and improved to be sensitive to both the natural and built environments.

POLICY 4.1 - Environmentally Responsible Transportation System
It is the policy of the State of Oregon to provide a transportation system that is environmentally responsible and encourages conservation and protection of natural resources.

- **STRATEGY 4.1.1 -** Practice stewardship of air, water, land, wildlife and botanical resources. Take into account the natural environments in the planning, design, construction, operation and maintenance of the transportation system. Create transportation systems compatible with native habitats and species and help restore ecological processes, considering such plans as the Oregon Conservation Strategy and the Oregon Plan for Salmon and Watersheds. Where adverse impacts cannot reasonably be avoided, minimize or mitigate their effects on the environment. Work with state and federal agencies and other stakeholders to integrate environmental solutions and goals into planning for infrastructure development and provide for an ecosystem-based mitigation process.
- **STRATEGY 4.1.2 -** Encourage the development and use of technologies that reduce greenhouse gases.
- **STRATEGY 4.1.3 -** Evaluate the impact of geological hazards and natural disasters including earthquakes, floods, landslides and rockfalls, on the efficiency and sustainability of the location and design of new or improved transportation facilities as appropriate.
- **STRATEGY 4.1.4 -** Work collaboratively to streamline permit procedures and gain efficiencies to transportation system improvements while meeting or exceeding environmental benefits or regulations.
- **STRATEGY 4.1.5 -** In the construction and maintenance of transportation infrastructure and facilities, reduce the consumption of non-renewable construction materials, promote their efficient use and reuse, and reduce other environmental impacts such as stormwater impacts where appropriate.
- **STRATEGY 4.1.6 -** To determine the most cost-effective investments, consider using life-cycle costs in transportation maintenance, purchase of equipment, selection of materials, and design and engineering of infrastructure where appropriate.
- **STRATEGY 4.1.7 -** To accomplish environmental stewardship and increase efficiencies**,** use environmental management systems.

Oregon Transportation Planning Rule (TPR)
In 1991, the Land Conservation and Development Commission adopted the Oregon Transportation Planning Rule (TPR). The TPR implements State Land Use Planning Goal 12, Transportation[27], which was adopted by the Oregon Legislature in 1974. The TPR requires most cities and counties and the state's Metropolitan Planning Organizations, such as Metro, to adopt transportation system plans that consider all modes of transportation, energy conservation and avoid principal reliance on any one mode to meet transportation needs. By state law, local plans in MPO areas must be consistent with the regional transportation system plan (TSP). In the Portland metropolitan region, the Regional Transportation Plan serves as the regional TSP. Likewise, the regional TSP must be consistent with the OTP. Recent updates to the TPR do not affect the requirements for environmental planning.

Regional

Metro Charter
In 1979, the voters in this region created Metro, the only directly elected regional government in the nation. In 1991, Metro adopted Regional Urban Growth Goals and Objectives (RUGGOs) in response to state planning requirements. In 1992, the voters of the Portland metropolitan area approved a home-rule charter for Metro. The charter identifies specific responsibilities of Metro and gives the agency broad powers to regulate land-use planning throughout the three-county region and to address what the charter identifies as "issues of regional concern." Among these responsibilities, the charter directs Metro to provide transportation and land-use planning services. The charter also directed Metro to develop the 1997 Regional Framework Plan that integrates land-use, transportation and other regional planning mandates.

Regional Framework Plan
Updated in 1995 and acknowledged by the Land Conservation Development Commission in 1996, the RUGGOs establish a process for coordinating planning in the metropolitan region in an effort to preserve regional livability. The 1995 RUGGOs, including the 2040 Growth Concept, were incorporated into the 1997 Regional Framework Plan to provide the policy framework for guiding Metro's regional planning program, including development of functional plans and management of the region's urban growth boundary. The Regional Framework Plan is a comprehensive set of policies that integrate land-use, transportation, water, parks and open spaces and other important regional issues consistent with the 2040 Growth Concept. The Framework Plan is the regional policy basis for Metro's planning to accommodate future population and employment growth and achieve the 2040 Growth Concept.

2040 Growth Concept
The 2040 Growth Concept text and map identify the desired outcome for the compact urban form to be achieved in 2040. It envisions more efficient land use and a diverse and balanced transportation system closely coordinate with land use plans. Protecting habitats for wildlife and people is a key component of the plan. The 2040 Growth Concept has been acknowledged to comply with statewide land use goals by the Land Conservation and Development Commission (LCDC). It is the foundation of Metro's 1997 Regional Framework Plan.

[27] Goal 12 states, "To provide and encourage a safe, convenient, and economic transportation system."

2004 Regional Transportation Plan

The RTP implements the goals and policies in 1995 RUGGOs and the 1997 Regional Framework Plan, including the 2040 Growth Concept. The region's plans for environmental mitigation are directed by current RTP policies and objectives as shown below:

Policy 7.0. The Natural Environment
Protect the region's natural environment.

a. Objective: Place a priority on protecting the natural environment in all aspects of the transportation planning process.

b. Objective: Reduce the environmental impacts associated with transportation system planning, project development, construction and maintenance activities.

c. Objective: Reduce negative impacts on parks, public open space, natural areas, wetlands and rural reserves arising from noise, visual impacts and physical segmentation.

d. Objective: New transportation and related utility projects shall seek to avoid fragmentation and degradation of components of the Regional System (regionally significant parks, natural areas, open spaces, trails and greenways). If avoidance is infeasible, impacts shall be minimized and mitigated.

Policy 8.0. Water Quality
Protect the region's water quality.

a. Objective: Meet applicable state and federal water quality standards in the planning process.

b. Objective: Support the implementation of Green Streets practices through pilot projects and regional funding incentives.

c. Objective: Support local jurisdiction efforts to reduce impervious surface coverage in the development review and street design process.

d. Objective: Continue to coordinate updates to the Green Streets guidelines with state and federal regulatory agencies to ensure ongoing compliance with fish protection regulations.

e. Objective: Implement a coordinated strategy to remove or retrofit culverts on the regional transportation system that block or restrict fish passage.

Policy 9.0. Clean Air
Protect and enhance air quality so that as growth occurs, human health and visibility of the Cascades and the Coast Range from within the region is maintained.

a. Objective: Encourage use of all modes of travel (e.g., transit, telecommuting, zero-emissions vehicles, carpooling, vanpooling, bicycles and walking) that contribute to clean air.

b. Objective: Include strategies for planning and managing air quality in the regional airshed in the State Implementation Plan for the Portland-Vancouver air quality maintenance areas as required by the federal Clean Air Act Amendments.

c. Objective: Develop new regional strategies to comply with federal Clean Air Act Amendments requirements and provide capacity for future growth.

d. Objective: Work with the state to pursue close collaboration of the Oregon and Clark County Air Quality Management Areas.

e. Objective: Provide regional support for implementation of the voluntary parking provisions of the Portland region's Ozone Maintenance Plan.

f. Objective: Ensure timely implementation and adequate funding for Transportation Control Measures as identified in the State Implementation Plan.

V. Metro's current Environmental planning/mitigation activities

New Look Regional Planning Process: Integrating Transportation and Land Use planning with Environmental goals

Metro currently links its RTP with the 2040 Growth Concept, the long-range growth management strategy for the Portland metropolitan region. The RTP identifies policies, projects and strategies that promote consistency with growth and development patterns. The RTP and 2040 Growth Concept rely on compact urban form as the first step to protect the environment. In 2005, Metro initiated a "New Look" – which will reevaluate implementation of the 2040 Growth Concept and will result in updated RTP policy, project and implementation strategies to better link land use, transportation, environmental and economic goals. The New Look work program is separated into three broad categories: Investing in our Communities, Shape of the Region and the Regional Transportation Plan. The Shape of the Region work focuses on balancing regional agricultural land needs with the protection of natural resources, creating great communities in outlying areas, and respecting the concerns of neighboring cities just outside the Metro urban growth boundary.

Livable Streets Program

Metro encourages environmental mitigation through its Livable Streets program. Metro created the program in 1996 to encourage local jurisdictions to design streets that better support the 2040 Growth Concept. Through the program Metro has created a series of handbooks. The first handbook, *Creating Livable Streets*, was published in 1997 to provide street design guidelines that support 2040's land use and transportation goals. Metro's *Green Streets: Innovative Solutions for Stormwater and Stream Crossings* and *Trees for Green Streets* handbooks, published in 2002, serve as companion publications to *Creating Livable Streets*. The handbooks take a watershed-based approach to transportation planning by providing methodologies and design solutions to minimize the negative impacts of stormwater runoff caused by the impervious surfaces of streets.

Current RTP policies require consideration of the design guidelines during project development activities and for local plans to be updated to allow for consideration of these design treatments.
Metro's transportation Priorities Process encourages implementation of green streets through the provision of bonus points for project designs that include street trees and other design elements to reduce stormwater runoff.

Environmental mitigation consultation with relevant resource agencies

Ongoing consultation occurs through Metro's Transportation Policy Alternatives Committee (TPAC) and Joint Policy Advisory Committee on Transportation (JPACT), which includes representatives from the Oregon Department of Environmental Quality (DEQ); the Metro Technical Advisory Committee (MTAC) and Metro Policy Advisory Committee (MPAC) include representatives from the Oregon Department of Land Conservation and Development (DLCD). To date, consultation with resource agencies has occurred as part of Metro region major project development activities, such as EIS and EA's, on a project by project basis through CETAS (Collaborative Environmental and Transportation Agreement for Streamlining) collaboration.

CETAS formed in 2000 in response to TEA-21's requirement to streamline the environmental review process for major transportation projects. The goal of the group is to identify and implement "collaborative opportunities to help each participating agency realize its mission through sound

environmental stewardship, while providing for a safe and efficient transportation system."[28] Member agencies include:

- Federal Highway Administration (FHWA);
- National Marine Fisheries Service (NMFS);
- Oregon Department of Land Conservation and Development (DLCD);
- Oregon Department of Environmental Quality (DEQ);
- Oregon Department of Fish and Wildlife (ODFW);
- Oregon Department of State Lands (DSL);
- Oregon Parks and Recreation Department, State Historic Preservation Office (SHPO);
- Oregon Department of Transportation (ODOT);
- US Army Corps of Engineers (USACE);
- US Environmental Protection Agency (EPA); and
- US Fish and Wildlife Service (USFWS).

Metro will address SAFETEA-LU's requirement for expanded consultation with relevant resource agencies through seeking input from the members of CETAS

Regional Fish and Wildlife Protection Program
Access to nature and protecting habitat for fish and wildlife are two of the pillars of the region's vision for managing growth, the 2040 Growth Concept. In the late 90s, in support of 2040, and as a response to State Land Use Goal 5 (Natural Resources), Metro embarked on a process to reach agreement on a regional fish and wildlife habitat protection program. Metro conducted an inventory based on the best science and data available and mapped regionally significant fish and wildlife habitat with input from local partners, technical review committees, and the public. Metro conducted fieldwork to validate and adjust the inventory. Identified habitat was ranked in importance based on its capacity to provide benefits to fish and wildlife.

Two types of habitat are included in the inventory:
- Riparian habitat – land and vegetation near streams, rivers, wetlands and lakes
- Upland habitat – natural areas that provide wildlife with food and shelter and corridors to move from one habitat area to another

Highly ranked riparian habitat areas within the current urban growth boundary were identified as "habitat conservation areas" to be protected by appropriate development standards contained in the proposed model ordinance or through other equivalent approaches by local jurisdictions. As new areas are added to the urban growth boundary, highly valued upland habitat areas will also be identified as habitat conservation areas. Habitat conservation areas are designated based habitat value, with protection level adjusted depending on the area's economic importance to the region. Figure 6 in section VI. displays these fish and wildlife habitat conservation areas.

Nature in Neighborhoods Initiative
Metro conducted an analysis of the economic, social, environmental, and energy tradeoffs of allowing, limiting or prohibiting development in habitat areas for several regulatory and non-regulatory program

[28] http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/cetas.shtml, accessed 12/20/06.

options. The Council's preferred concept, "Nature in Neighborhoods." is a ten-year initiative intended to protect nature in neighborhoods and integrate communities' needs for a strong economy consistent with Statewide planning goals. Metro's fish and wildlife habitat protection program is one component of the Nature in Neighborhoods initiative.

Adopted in 2005, Nature in Neighborhoods is defined by a regional ordinance (Title 13) establishing guidelines for how property in streamside, wetland, and flood areas is developed to conserve and protect fish and wildlife habitat, but does not prohibit development. The ordinance builds upon regional standards for water quality[29] and erosion control as well as local provisions for habitat under city and county comprehensive plans. The Nature in Neighborhoods ordinance provides performance standards and a Model Code to address tree canopy retention, use of habitat-friendly development practices, and mitigation.

Wildlife Crossings

Metro has begun development of a Wildlife Crossings handbook (to be included within the Livable Streets series) that seeks to minimize the impacts of roadway projects on wildlife populations. Wildlife-vehicle collisions are a direct impact of transportation infrastructure cutting across wildlife habitat corridors. These conflicts have three distinct types of costs: injury and loss of life to people involved in collisions, injury and loss of life to wildlife involved in collisions, and monetary costs associated with property damage and accident clean-up. These conflicts can be minimized through both engineered solutions, such as wildlife-crossing devices/structures, as well as a more holistic approach of calling out specific wildlife corridor acquisition/restoration needs as part of transportation project development.

In transportation projects, the current approach is to consider wildlife passage on a site-by-site basis. Because wildlife travels across many sites or parcels and existing wildlife corridors are limited (or sometimes absent), site-level analysis is too small to provide effective wildlife solutions. A larger-scale approach with integration into the surrounding landscape will greatly increase project effectiveness. Local jurisdictions, watershed groups, and departments of transportation may have valuable wildlife corridor location information to help site-level project planning.

In 2002, Metro created an inventory that ranked the culverts in the region to identify those needing repair or replacement to accommodate endangered or threatened fish species. (A map of Wildlife incident hotspots areas along with problematic culverts can be found in Section VI of this profile.) The culvert program was initiated after Pacific salmon and steelhead were added to the ESA listing in the State of Oregon as threatened or endangered species. Metro uses the inventory as a screen when jurisdictions apply for regional flexible funds to retrofit culverts. Metro is currently working with the Oregon Department of Fish and Wildlife to establish a statewide database of problematic culverts with data collected from local agencies.

Regional Environmental Information Network

As part of the Nature in Neighborhoods Initiative, Metro recently created the Regional Environmental Information Network (REIN). www.rein.org is an interactive, searchable Internet mapping tool that serves as a centralized repository and comprehensive resource for ecological project information in the greater

[29] Metro's Title 3 describes specific performance standards and practices for floodplain and water quality protection. It also requires that Metro adopt a Water Quality and Flood Management Model Ordinance and map for use by local jurisdictions to comply with Title 3.

Portland/Vancouver metropolitan region. By compiling information about numerous and varied environmental projects into a single, cohesive location, the REIN tool will help Metro track watershed health for the biennial State of the Watershed report. It will also help Metro track citizen efforts over time, and increase local collaboration and success in environmental projects through information sharing. The primary environmental action categories include: monitoring, research and inventory, habitat restoration and management (including mitigation), conservation, and environmental education and training.

The Metropolitan Greenspaces Master Plan
The Metropolitan Greenspaces Master Plan, adopted in 1992 by the Metro Council, describes a vision for a unique regional system of parks, natural areas, greenways, and trails for wildlife and people. The plan, being implemented by local park providers, schools, businesses, and citizen groups, identifies 57 urban natural areas and 34 trail and greenway corridors that define the green infrastructure for the Portland metropolitan region. The plan articulates eight overriding goals for the regional greenspaces system summarized below:

- Create a cooperative regional system of natural areas, open space, trails and greenways
- Protect and manage significant natural areas
- Preserve the diversity of plant and animal life in the urban environment
- Establish a system of trails, greenways and wildlife corridors that are interconnected.
- Restore green and open spaces in neighborhoods
- Coordinate management and operations at natural area sites in the regional Greenspaces system.
- Encourage environmental Awareness
- Educate citizens about the regional system of greenspaces

This plan will be used with the RTP to identify linkages between transportation improvements.

Regional Open Spaces Acquisition Program
Voters approved metro's $135 million open spaces, parks and streams bond measure in 1995. The bond measure's primary goal was for Metro to purchase natural areas, trails and greenways to be held for future use as parks, trails and fish and wildlife habitat. The Metropolitan Greenspaces Master Plan provided the direction for the Open Spaces Acquisition Program through its goals and policies regarding a regional system of parks, natural areas, open spaces, and trails and greenways for wildlife and people. The approved bond measure identified 14 regional target areas, five regional trail projects, and 90 local community parks projects. The measure consisted of three major elements including:

- Regional park target areas - approximately $76 million earmarked to purchase about 6,000 acres located in 14 specific areas throughout the region.
- Regional trails and greenways - $16 million designated for five specific projects that linked new or existing publicly owned parks and natural areas.
- Local government open spaces and parks projects - about $25 million designated for the purchase and improvement of lands for local parks, open spaces, and trails.

Metro's acquisition program implemented the bond measure over the last 12 years, while following specific conditions that were deemed extremely important by stakeholders:

- It is a "willing seller" program restricting Metro from using its power of eminent domain to acquire land.
- Metro would pay no more than fair market value for property.
- All appraisals were to be made by independent certified appraisers.

As of Feb. 5, 2006, Metro has acquired more than 8,000 acres of land for regional natural areas and regional trails and greenways, in over 250 separate property transactions. These properties protect nearly 75 miles of stream and river frontage. (These numbers include Metro's local share purchases.)

In November 2006, voters of the metropolitan region approved a Natural Areas Bond Measure (26-80), modeled after the successful 1995 measure. The measure directs Metro to purchase natural areas, parks and streams, in an effort to preserve natural areas and protect rivers and streams at the regional, local and neighborhood level. Metro will acquire property in 14 regional natural areas and six regional trails and greenway corridors. In addition, a "local share" portion of the bond monies is funding more than 100 local park projects, located in nearly every city, county and park district in the region.

VI. Implications and Conclusions

Key finding	RTP Implication
1. Integrate NEPA in Transportation planning activities	• Assess potential environmental impacts of transportation from a systems level perspective during Phase 3 of the RTP update. • The Phase 3 analysis will also conduct a GIS analysis of proposed transportation investments that intersect with resource inventories (including Goal 5) to identify those projects that may need to include environmental mitigation strategies during project planning and development activities. • Consider identifying projects likely to require and EA and develop a recommendation that does not preclude evaluation of all alternatives during the NEPA process • Identify RTP projects and programs that have air quality impacts. • Develop environmental mitigation strategies to be addressed during implementation of the RTP • Consult with CETAS on RTP systems analysis and environmental mitigation strategies.
2. Climate Change /Global warming / Oil dependency and supply uncertainty	• Continue to emphasize current strategies for multi-modal transportation investments and compact urban form and look for innovative and adaptive strategies to react to these issues.
3. Stormwater Infiltration	• Expand implementation of green streets projects to link stormwater management with the Endangered Species Act.
4. Air Toxics	• Look for opportunities to implement adaptive strategies that respond to this emerging issue
5. Noise	• Integrate noise into policy framework. • Update Livable Streets handbooks to integrate design treatments to specifically address noise
6. Haze	• Respond to emerging statewide and federal regulations

Conclusion

The environment is very important to the people of the Portland region. There are several issues that will affect the quality of the environment in the coming years, such as climate change, oil uncertainty, air and water quality and wildlife habitat loss. The scope and depth of this profile only skims the surface in identifying environmental issues in the Portland Metropolitan region. It highlights key environmental focus areas that will need to be addressed in the project planning and development phase of the RTP update. The region has initiated efforts to preserve the environment, such as integrated land use/transportation planning, the Livable Streets program, and the Fish and Wildlife Habitat Protection Program. The region should continue to make these efforts, expand them where feasible, and continue to look of adaptive strategies to react to emerging environmental issues.

Appendix. Natural and Cultural Resource Inventories
(Potential areas to carry out mitigation activities) – overlay these with projects later)

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Figure 5: Urban and Natural Resource areas in the Metro Region

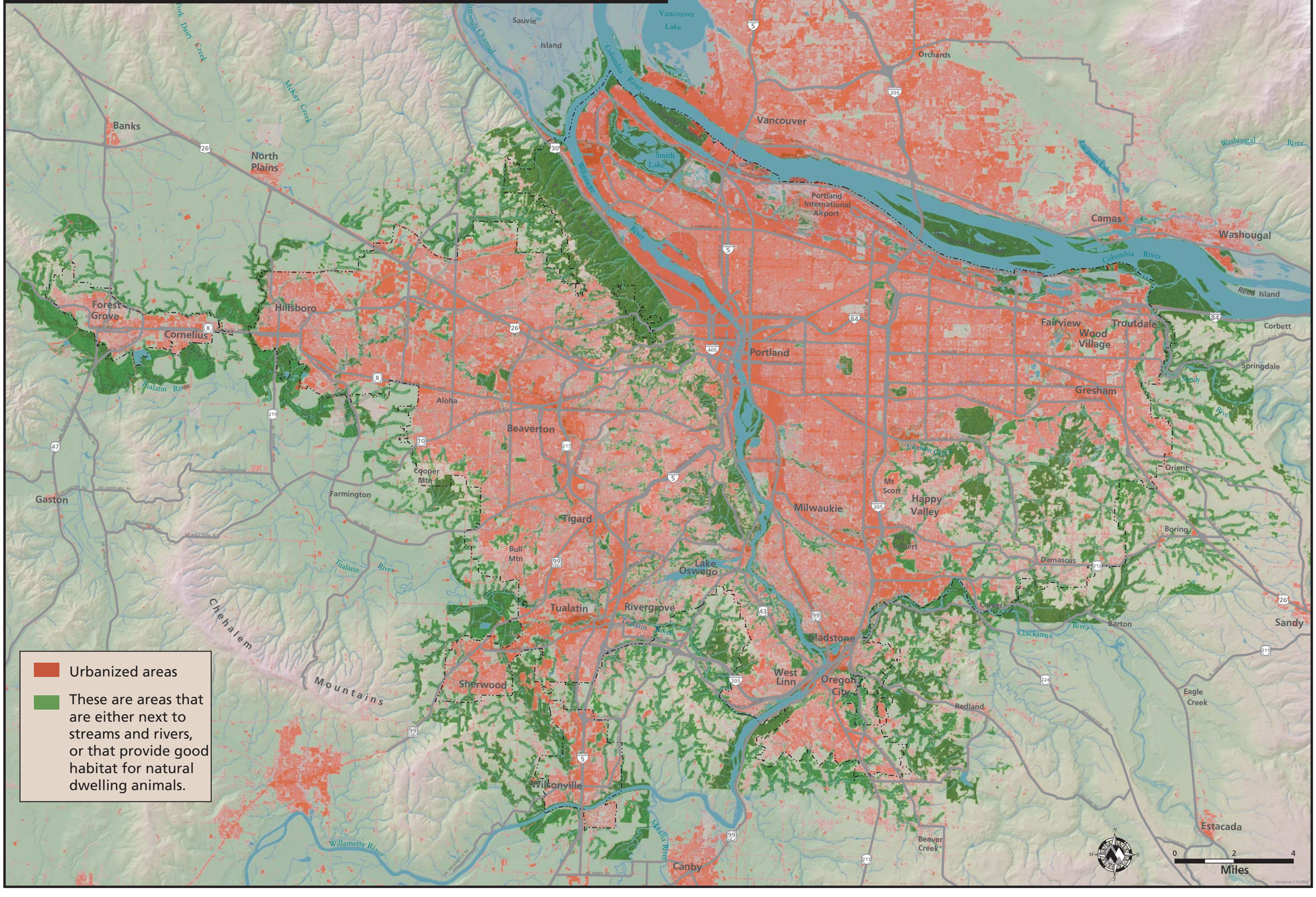
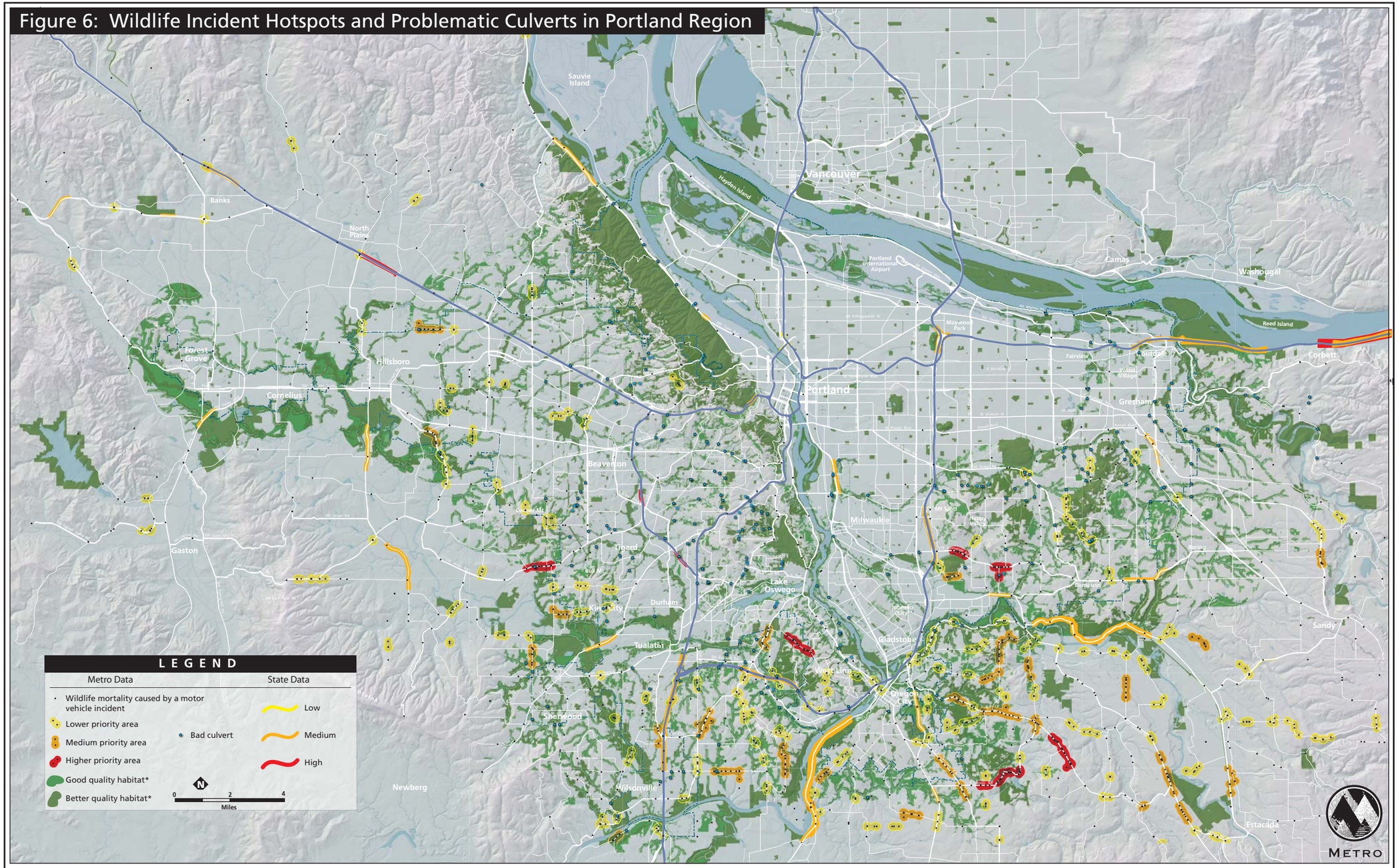


Figure 6: Wildlife Incident Hotspots and Problematic Culverts in Portland Region



The purpose of this map is to identify key areas in the growing region where wildlife mortalities are caused by motor vehicles. This information can then be used by transportation planners to highlight key areas where better wildlife crossings should be built. Key habiat areas are shown on the map in relation to the mortality incidents to provide the environmental context of the wildlife element.

Metro compiled wildlife mortality data for the three-county Portland region from several sources, including:

- City, county and state road maintenance department roadkill pick-up records
- ODOT's Crash Analysis and Reporting Unit
- County animal control agencies
- Animal care and rehabilitation centers.

The study, which was completed in August of 2002, reported more than 2,000 deer and elk deaths between 1992 and 2001 due to collisions with vehicles. The analysis began with a wider scope but was restricted to elk and deer due to limitations of available data—many agencies do not consistently report other wildlife mortalities. Of the reporting agencies, Clackamas County was the most thorough suggesting a regionwide spatial-bias in the above map.

Once the locations were geocoded the spatial analysis of the distribution of wildlife incidents was implemented. Spatialecology.com provides numerous tools for the analysis of wildlife ecology. Hawth's Analysis Tools were used to estimate the kernal density of the wildlife based on the mortality locations. The 95% kernal density volume contours were used to delineate the approximate crossing range and pinpoint the higher priority areas.

State data were supplied by ODOT.

What are Wildlife Crossings?
Wildlife crossings are overpasses and underpasses designed to allow animals to safely cross roadways. Underpasses can be viaducts or culverts. They have a few distinguishing characteristics, including the following:

- Grade separation
- Vegetation to attract animals and provide habitat
- Fencing and other measures guide animal traffic through crossings
- Strategic location to enhance connectivity of wildlife movement corridors
- Adjacent land use and zoning that is conducive to long-term habitat protection

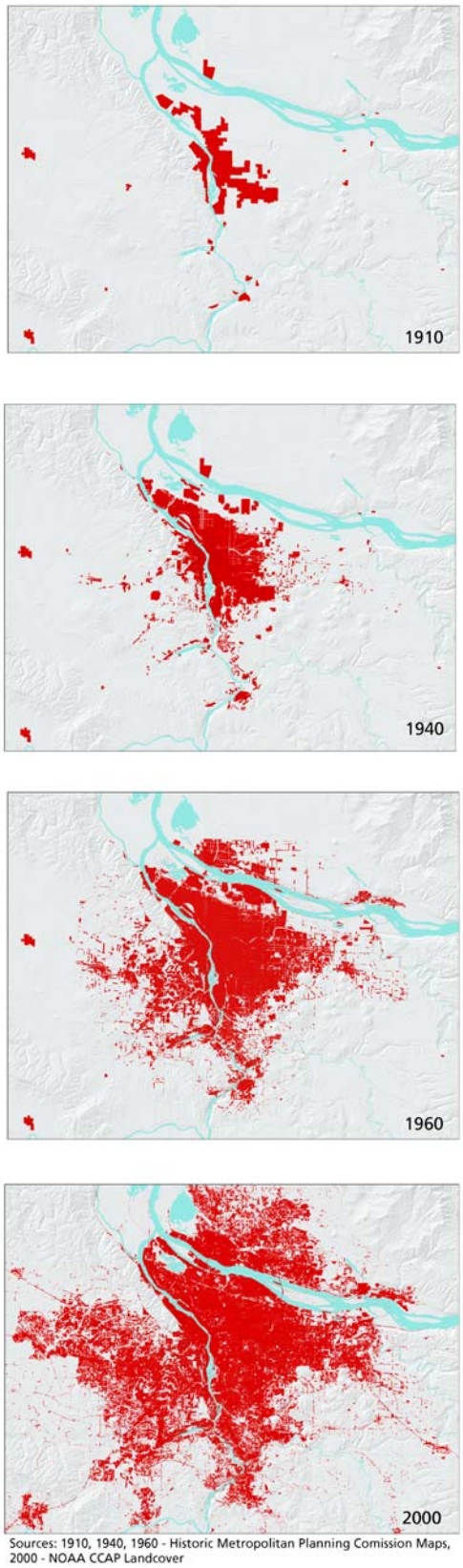
Although animal-vehicle conflicts are already a safety concern for both humans and animals in this region, the problem is likely to increase as the region's populations grows. The metropolitan region is projected to add over 500,000 people in the next 20 years, reaching a population of 2.3 million (Metro, 1994). As the region grows, more and more land will be developed for urban uses.7 It is inevitable that, as people pave over habitat to make room for their own uses, there will be more and more collisions—both figurative and literal—between humans and animals. Planning for ways to alleviate the conflict between vehicles and animals can greatly improve the safety for both animals and humans.

* Habitat designations were built using the Goal 5 ESEE resource classes. Good quality habitat includes Class III riparian and Class C upland areas. Better quality habitat includes Class I and II riparian and Class A and B upland areas.

Figure 7 Change in Portland Region Urban Footprint 1910-1940-1960-

The Urban footprint (impervious surface) of the Portland region increased greatly during the 20th century as the population expanded and travel patterns evolved. The region is expected to grow by over 1 million people in the next 25 years – an unprecedented rate of growth.

How will this growth affect the region's urban footprint? To achieve the compact urban form envisioned by the 2040 Growth Concept, the region will need to work together and continue to refine its pioneering approach to land use and transportation planning.



Sources: 1910, 1940, 1960 - Historic Metropolitan Planning Comission Maps, 2000 - NOAA CCAP Landcover

Figure 8: Wetlands, Floodplains and Watersheds in the Portland Region

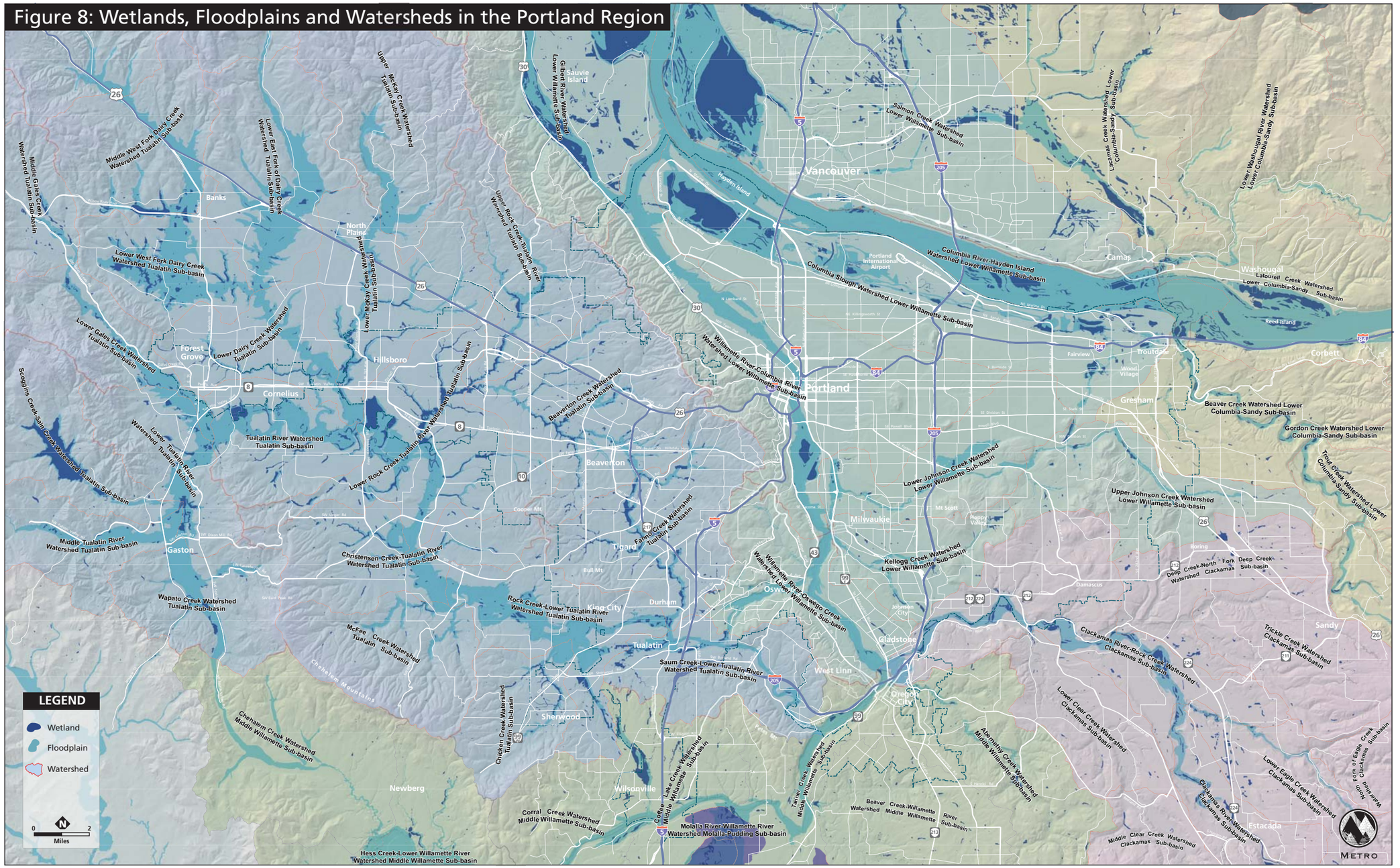
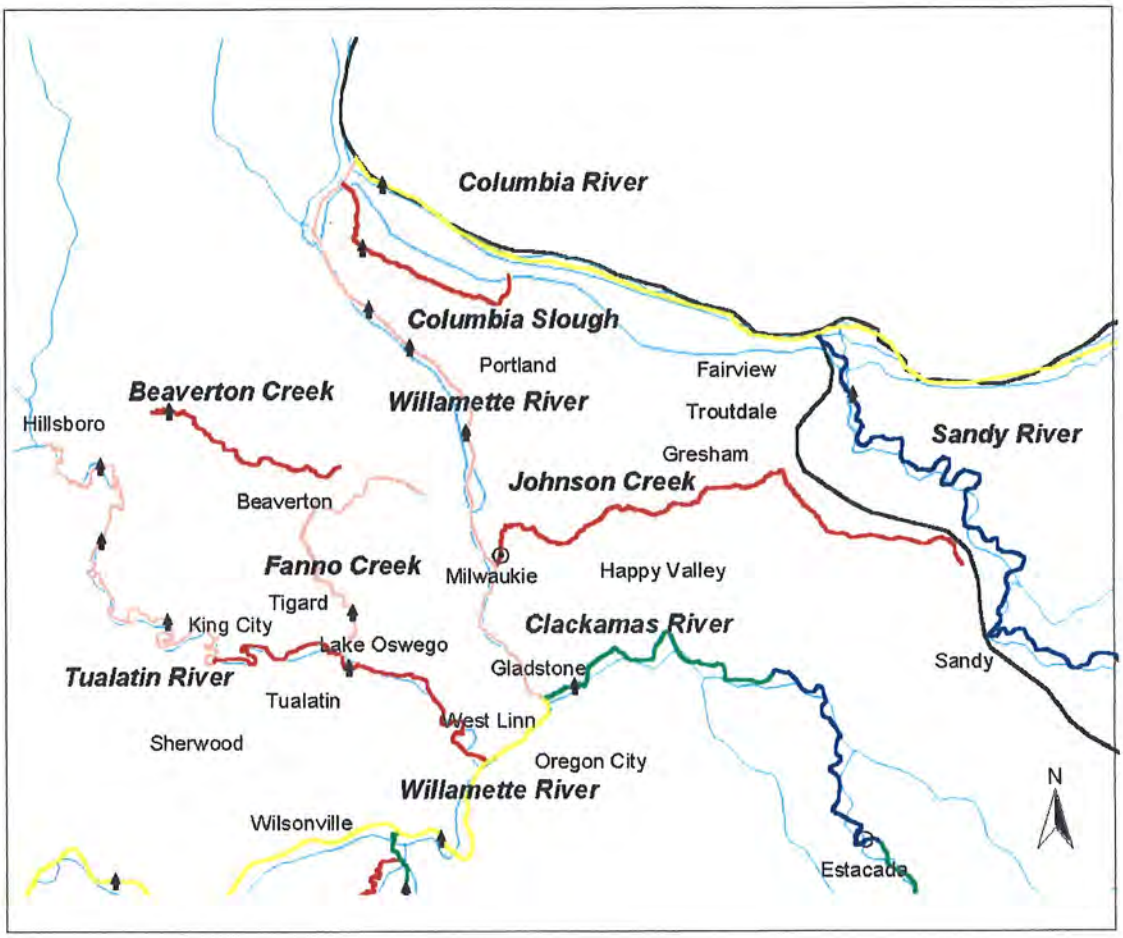


Figure 9 Metro OWQI Information (1991 – 2000)

Oregon Water Quality Index (OWQI) for Metro Streams



Trend Analysis Results
- Increasing Water Quality
- Decreasing Water Quality
- No Trend
- Insufficient Data

Minimum Seasonal Averages
- Excellent (90 - 100)
- Good (85 - 89)
- Fair (80 - 84)
- Poor (60 - 79)
- Very Poor (0 - 59)

Metro-area Streams

Urban Areas

Oregon Department of Environmental Quality
Laboratory Division May 2002

Table 1. ESA species in the Portland Region[30]

Common name	Scientific name
(Oregon Spotted Frog - extirpated)	*Rana pretiosa*
(California Condor - extirpated)	*(Gymnogyps californianus)*
(Columbian White-tailed Deer)	*(Odocoileus virginiana leucurus)*
Aleutian Canada Goose (wintering)	*Branta canadensis leucopareia*
(Northern Spotted Owl - extirpated from Metro region)	*(Strix occidentalis caurina)*
(Grizzly Bear)	*(Ursus arctos)*
Bald Eagle[a]	*Haliaeetus leucocephalus*
Oregon Slender Salamander	*Batrachoseps wrighti*
Tailed Frog	*Ascaphus truei*
Northern Red-legged Frog	*Rana aurora aurora*
Northwestern Pond Turtle	*Clemmys marmorata marmorata*
Harlequin Duck	*Histrionicus histrionicus*
Northern Goshawk	*Accipiter gentilis*
(Mountain Quail - extirpated)	*Oreortyx pictus*
Band-tailed Pigeon	*Columba fasciata*
Lewis's Woodpecker (extirpated as breeding species)	*Melanerpes lewis*
Acorn Woodpecker	*Melanerpes formicivorus*
(Yellow-billed Cuckoo; extirpated)	*Coccyzus americanus*
Olive-sided Flycatcher	*Contopus cooperi (= borealis)*
Streaked Horned Lark	*Eremophila alpestris strigata*
Purple Martin	*Progne subis*
Yellow-breasted Chat	*Icteria virens*
Oregon Vesper Sparrow	*Pooecetes gramineus affinis*
Tricolored Blackbird	*Agelaius tricolor*
Yuma Myotis	*Myotis yumanensis*
Long-legged Myotis	*Myotis volans*
Fringed Myotis	*Myotis thysanodes*
Long-eared Myotis	*Myotis evotis*
Silver-haired Bat	*Lasionycteris noctivagans*
Pacific Western Big-eared Bat	*Corynorhinus townsendii townsendii*
Camas Pocket Gopher	*Thomomys bulbivorus*
White-footed Vole	*Arborimus (= Phemacomys) albipes*
Red Tree Vole	*Arborimus (= Phenacomys) longicaudus*

[30] These species (as of 2001) are classified under the ESA as either Endangered, Listed Endangered, Threatened, Listed Threatened, Proposed Endangered, Proposed Threatened, Candidate, or a Species of Concern. This list includes all known native vertebrate species (and nonnative vertebrate species with established breeding populations) that currently exist within the Metro region for at least a portion of the year. Vagrant species (those that do not typically occur every year) are not included on this list. The species list is based on the opinion of more than two dozen local wildlife experts.

Table 2. Sites on the National Historic Registry List in the Portland Metropolitan Region[31]

Name	City
Abraham, Simon Duplex	Portland
Adam & Johanna Feldman House	Portland
Albers Brothers Milling Company	Portland
Alphabet Historic District	Portland
Ambassador Apartment	Portland
American Apartment Building	Portland
American Can	Portland
Augustus Fanno Farmhouse	Beaverton
Beaverton Downtown Historic District	Beaverton
Benjamin Cornelius, Jr. House	Forest Grove
Captain John C. Ainsworth House	Oregon City
Charles C. Babcock House	Oregon City
Charles F. Adams House	Portland
Clark Historic District	Forest Grove
Dr. Forbes Barclay House	Oregon City
Frederick Ambruster Cottage	Portland
H. Russell Ablee House	Portland
Harry A. Crosley House	Forest Grove
Lawrence D. Bailey House	Milwaukie
Maud & Belle Ainsworth House	Portland
Silas, Jacob N. Beeks House	Forest Grove
Stephen & Parthena M. Blank House	Forest Grove

[31] For more information on each site visit http://www.nationalregisterofhistoricplaces.com/or/state.html#pickem and click on either Clackamas, Multnomah or Washington County.