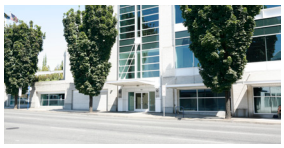
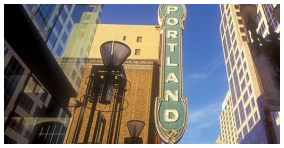
www.oregon**metro.gov**









Sustainability Plan

for Metro internal and business operations

August 2010

Metro | *People places. Open spaces.*

Metro | *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.

Metro representatives

Metro Council President – David Bragdon

Metro Councilors

Rod Park, District 1
Carlotta Collette, District 2
Carl Hosticka, District 3
Kathryn Harrington, District 4
Rex Burkholder, District 5
Robert Liberty, District 6

Auditor – Suzanne Flynn

www.oregon**metro.gov**

Metro
600 NE Grand Ave.
Portland, OR 97232-2736

503-797-1700

Printed on recycled content paper.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In 2003, Metro Council adopted a resolution that directed Metro to develop a sustainable business model for internal government operations, and set an ambitious target for those operations to be sustainable within one generation, by 2025. Five target areas were identified: greenhouse gas emissions, toxics, waste, water, and habitat. These goals were refined during the course of creating a sustainability plan for Metro operations. The planning horizon for these goals is 2025, with the exception of greenhouse gas emissions, for which a target is set for 2050.

- Greenhouse gas emissions: Reduce direct and indirect greenhouse gas emissions (CO_2e) 80 percent below 2008 levels by 2050.
- Toxics: Eliminate the use or emissions of persistent bioaccumulative toxics (PBT's) and other priority toxic and hazardous substances.
- Waste: Recover all waste for recycling or composting, and reduce overall generation of waste.
- Water: Reduce water use 50 percent below 2008 levels.
- Habitat: Metro's parks, trails and developed properties positively contribute to healthy, functioning urban ecosystems and watershed health. Metro's natural areas are healthy, functioning ecosystems.

Since the original goals were adopted in 2003, progress has been made toward greening Metro's operations. However, an analysis of performance in these five goal areas shows that much work has yet to be done. For example:

- Metro's operations generated 56,062 MT CO_2e in 2008, the equivalent of powering 5,000 homes. Largest emission sources are supply chain emissions and electricity consumption.
- More than 90 percent of the products in Metro's chemical inventory have a high hazard rating in one of three categories (environmental toxicity, human toxicity, and physical hazard).
- Recycling recovery ranges widely, from less than 10% recovery at some parks, to more than 70 percent recovery at the Oregon Zoo.
- Metro operations use more than 285 million gallons of water annually, roughly equivalent to the water usage of 9,300 Portland residents.
- Metro's effective impervious area is 96 percent of total impervious area, an area of roughly 110 acres. 2/3 of Metro developed properties do not use habitat-friendly development practices.

For each of Metro's five sustainability goal areas, a set of strategies and actions have been identified. These strategies and actions provide a framework for the work that needs to be done to reach the 2025 goal targets. The strategies and actions are meant to be applicable across Metro's operations, and are not prescriptive to particular facilities or sites.

Greenhouse gas emission reduction strategies focus on reducing emissions from Metro's largest emission sources: supply chain, electricity, and fuels. Program improvements are also needed to establish tracking for the many GHG emission sources, as well as a funding strategy for projects that will reduce emissions from operations.

Toxics reduction strategies include improvements to Metro's chemical inventory, then a systematic replacement of toxic products with less-toxic alternatives where available. Buyers need to be empowered to make better choices when making procurement decisions, and new ways to assess less-toxic alternatives as well as measuring progress developed.

Waste reduction strategies include a new focus on waste prevention, upstream from the "end of life" management of recyclable materials.

Water Conservation strategies focus on a greater understanding of water usage throughout Metro's operations, then systematically implementing water efficient options wherever possible.

Habitat enhancement strategies vary from site to site, so assessment of habitat and stormwater opportunities for each site is a priority, as is creation of new requirements for stormwater and habitat-friendly development practices in construction and maintenance of Metro sites.

Across all goals, several program elements are needed to manage Metro's sustainability efforts over time. These include: accountability for plan implementation, training for Metro employees, building funding and staff capacity to implement, creating policies and procedures necessary, updating goals and targets as needed and tracking progress of sustainability plan implementation and impact on goal areas.

INTRODUCTION

As a regional government committed to promoting sustainable communities, Metro has good reason to reduce the ecological footprint from its own operations and "walk the talk." Like many public agencies, the services that Metro provides to the region come at a cost to natural and community resources.

Metro formalized their commitment to sustainable operations in 1999 when a cross-agency environmental action team was formed. In 2003, a resolution was adopted by Metro Council that called for development of a sustainable business model for internal operations of the agency. This resolution included five environmental goals to be met by 2025 regarding greenhouse gas emissions, toxics, waste, water and habitat[1].

Since then, Metro has achieved some significant results in making its operations more sustainable. These include:

- The Oregon Convention Center is certified as a LEED Existing Building at the silver level, and also certified by Salmon Safe for its sustainable landscape and stormwater management practices.
- The Oregon Zoo pioneered on-site composting of animal waste, helping it to achieve a 72 percent recycling rate.
- The Metro Regional Center purchases 100 percent renewable power, contributing to the development of new renewable energy sources.
- The Metro Central Transfer Station adopted an Environmental Management System that provides accountability for implementation of sustainable operations.

While many projects were completed that support these five environmental goals, Metro lacks a clear vision or plan for achieving agency goals. This plan was amplified by recommendations made by the Metro Auditor in a 2009 report. The report concluded that Metro should: 1) set clear policies and goals for sustainability; 2) reduce organizational barriers to sustainability by clarifying responsibilities and roles internally for implementation and creating a funding structure to support sustainable operations; 3) create tools needed to implement a sustainable business model including a data management system and formalize greenhouse gas emission protocols; and 4) measure progress towards meeting the objectives and disseminate the results of efforts.[2] This plan addresses all four of these recommendations.

This sustainability plan is intended to guide Metro's sustainable operations efforts to the next level by guiding practices and projects to achieve Metro's long-term sustainability goals. The plan identifies environmental impacts of Metro's operations, sets a baseline from which progress can be

[1] Metro Council resolution 03-3338, "Establish a sustainable business model for Metro departments and facilities and to undertake related duties," 2003.

[2] "Sustainability Management: focus efforts and evaluate progress", 2009. Suzanne Flynn, Metro Auditor. http://www.oregonmetro.gov/index.cfm/go/by.web/id=32285/level=4.

measured over time, and creates a framework of the specific strategies and actions that need to be completed to meet the goals.

The scope of this plan is limited to Metro's internal operations. Metro oversees five very different types of operations: public event venues, the zoo, solid waste facilities, parks and natural areas and one office facility. Because of the diverse portfolio of operations, the sustainability plan was developed to be applicable to all operations, regardless of type. While implementation of the plan will vary from one facility to the next, the plan identifies the actions common to all.

It is important to note that this plan focuses on environmental impacts, not the full "triple bottom line" of sustainability. When updating the sustainability goals in the future, Metro should develop meaningful goals for integration of the social equity and economic prosperity aspects of sustainability. During implementation of this plan, Metro's actions will benefit not only the environment, but also the community and the economy. These multiple benefits are the hallmark of any sustainability effort, and are well suited to supporting Metro's sustainability value and reaching Metro's sustainability goals.

Metro sustainability value

We are leaders in demonstrating resource use and protection in a manner that enables people to meet current needs without compromising the needs of future generations, and while balancing the needs of the economy, environment and society.

Adopted by Metro Senior Leadership Team July 2010

PART 1: SUSTAINABILITY GOALS AND INDICATORS

Goal refinement and indicators

Metro's adopted sustainability goals were refined for the purposes of creating this plan to aid the development of specific and targeted strategies and actions. The table below summarizes the goals as refined, as well as the indicators selected for setting a baseline of performance and monitoring progress over time.

Goal as adopted in 2003	Refined goal	Indicators	Goal year
Zero net increase in carbon emissions	Reduce direct and indirect greenhouse gas emissions (CO_2e) 80 percent below 2008 levels by 2050.	▪ Greenhouse gas emission sources for Scopes I, II and II	2050 [3]
Zero discharge of persistent, bioaccumulative, toxic chemicals	Eliminate the use or emissions of persistent bioaccumulative toxics (PBT's) and other priority toxic and hazardous substances.	▪ Percentage of chemical products used at Metro facilities that have ingredients with a "3" rating in MSDS inventory for health, environmental or physical hazard	2025
Zero waste disposed or incinerated	Recover all waste for recycling or composting, and reduce overall generation of waste.	▪ Waste generated by weight (garbage plus recycling) ▪ Percent recovered for recycling or compost (recycling rate)	2025
Fifty percent reduction in water usage	Reduce water use by 50 percent below 2008 levels.	▪ Gallons of water consumed from water utilities and on-site sources	2025
Zero net loss of biodiversity and productive, healthy habitat for forests and riparian areas	Metro's parks, trails and developed properties positively contribute to healthy, functioning urban ecosystems and watershed health. Metro's natural areas are healthy, functioning ecosystems. [4]	▪ Percentage effective impervious area (EIA) ▪ Number of habitat-friendly practices used on developed properties ▪ For natural areas, number of acres and restoration activity type by acre	2025

[3] While the time horizon for this plan and goals is 2025, long-term goals for reducing greenhouse gas emissions are typically set at 2050 in accordance with the most current climate science.

[4] Numerical targets for effective impervious area and use of habitat-friendly development practices will be determined by site-specific habitat and stormwater assessments.

Indicators of progress toward sustainability goals

The 15-year time horizon for this plan is both ambitious and aspirational. To track progress toward these goals, interim targets have been identified for each goal area. They consist of both numerical targets as well as goals for improving processes. Since each facility has different opportunities for improvement, these targets provide a framework for measuring progress Metro-wide, not absolute benchmarks for each facility. These interim targets should be recalibrated after facility audits and work plans are completed and opportunities have been identified.

GHGs: Reduce greenhouse gas emissions 80 percent below 2008 levels by 2050.

	SCOPES 1, 2 and 3 EMISSIONS (excluding Supply Chain) **Reduction targets (quantitative)**	SCOPE 3 SUPPLY CHAIN EMISSIONS **Process targets (qualitative)**
3 Years (2013)	• Arrest GHG emissions	• Develop a process to quantify Scope 3 emissions reductions and establish quantitative targets.
5 Years (2015)	• 15 percent reduction	• Advance efforts to reduce Scope 3 emissions based on current best practices and available tools and data.
10 Years (2020)	• 25 percent reduction	
15 Years (2025)	• 40 percent reduction	
40 Years (2050)	• 80 percent reduction	

Toxics: Eliminate the use or emissions of PBT's and other priority toxic and hazardous substances by 2025.

	Reduction targets (quantitative)	**Process targets (qualitative)**
3 Years (2013)	• 20 percent reduction in chemical products in use at Metro with a "3" rating in one or more hazard categories (health, environment or physical hazard)[5]	• Complete inventory with current ingredient information obtained for all chemical products in use, including quantity used. Include products used by contractors on Metro property. • Develop process to quantify use of less-toxic preferable products and establish interim targets.
5 Years (2015)	• 45percentreduction in the percentage of chemical products used at Metro facilities that have ingredients with a "3" rating in *at least one* category. • Products with a "3" rating in *all 3* hazard categories are no longer in use	• Advance efforts to reduce toxic emissions from durable goods and indirect emissions, and establish quantitative interim targets for reducing these emissions. Increase procurement of less-toxic preferable products.
10 Years (2020)	• No chemical products used at Metro facilities have ingredients with a "3" rating, including those used by contractors.	
15 Years (2025)	• All chemical products used at Metro facilities are designated preferable products, or earn a "1" rating in all 3 hazard categories.	

[5] Product hazard evaluation criteria were established to rate the potential health, environmental and physical hazard risks of chemical products in the inventory. See toxics baseline section and appendix for methodology.

Waste: Recover all waste for recycling or composting, and reduce overall generation of waste by 2025.

	Reduction targets (quantitative)	Process targets (qualitative)
3 Years (2013)	• Metro facilities recover 50 percent of waste for recycling or compost (average).	• Establish monthly waste and recycling reporting for all Metro locations.
5 Years (2015)	• Metro facilities recover 75 percent of waste for recycling or compost. • Increase recycling at parks to 25 percent recovery. • Reduce waste generated 10 percent from baseline.	• Develop long-term waste generation targets.
10 Years (2020)	• Metro facilities recover 90 percent of waste for recycling or compost.	• Advance efforts to reduce overall waste generation.
15 Years (2025)	• Metro facilities divert 100 percent of waste for recycling, compost or other sustainable waste treatment method (i.e. anaerobic digestion).	

Water: Use 50 percent less water from 2008 levels by 2025.

	Reduction targets (quantitative)	Process targets (qualitative)
3 Years (2013)	• 15 percent decrease in water consumption	• Establish water tracking and reporting system. Include all submeters.
5 Years (2015)	• 30 percent decrease	
10 Years (2020)	• 40 percent decrease	
15 Years (2025)	• 50 percent decrease	

Habitat: Metro's parks, trails and developed properties positively contribute to healthy, functioning urban ecosystems and watershed health. Metro's natural areas are healthy, functioning ecosystems.

	Reduction targets (quantitative)	Process targets (qualitative)
3 Years (2013)	• Arrest and begin to reduce effective total impervious area (EIA) on developed properties.	• Identify habitat and stormwater improvement opportunities on Metro developed properties through site assessments. Set numerical targets for effective impervious area (EIA) and increasing use of habitat-friendly development practices. • Establish quantitative interim targets for Metro's natural area properties.
5 Years (2015)	• Advance efforts to reduce EIA and increase use of habitat-friendly development practices on Metro's developed properties, quantitative targets to be developed based on site assessments.	
10 Years (2020)		
15 Years (2025)		

PART 2: SUSTAINABILITY IMPACTS AND BASELINE ANALYSIS

Impacts assessment

While Metro had a clearly articulated direction for action in the areas of greenhouse gas emissions, toxics, waste, water and habitat, the sustainability plan project team wanted to affirm that action in these areas would address the major impacts of Metro's operations. It completed an impacts assessment to provide a high-level qualitative summary of the unintended negative consequences of Metro's operations, and to identify gaps between those impacts and the adopted goals.

During a workshop in January 2010, representatives from all of Metro's functional areas identified impacts in terms of inputs (resources required for Metro's operations) and outputs (waste and other byproducts produced as a result of those operations). Outputs were categorized into three categories: environmental, economic and social.

Major impacts

- **Inputs**: The primary inputs of natural resources for Metro's operations include fossil fuels, water and material goods. Fossil fuels are used to provide building energy and to power vehicles from Metro's fleet as well as from visitors to Metro locations. Water is a key resource for many facilities, from the Zoo's exhibits, to irrigation at parks. Material goods include office supplies, food service items, promotional materials and building construction materials.
- **Outputs**: Major outputs can be grouped into three primary categories: greenhouse gas emissions, solid waste and water waste and runoff. All three of these outputs were investigated further in the quantitative baseline analysis.

Impacts not addressed by goals

While most of Metro's environmental impacts fit within one or more of the five sustainability goals, several key gaps were identified where a major impact was not addressed by the goals.

- Social aspects of sustainability efforts include negative impacts from traffic congestion, noise, equity regarding access to nature and social impacts from the procurement of goods and services.
- Economic aspects of sustainability efforts include lack of preference for using locally-made products, locally-grown food, or locally-based contractors.
- Environmental impacts of air toxics and stormwater run off are not specifically addressed by the goals. This includes toxic air pollutants such as diesel particulate emissions, sulfur dioxide and other byproducts from internal combustion engines. Additionally, water usage is addressed by the goals, but storm water runoff is not.

As a result of this assessment, this plan addresses diesel particulate air pollution in the toxics section, and stormwater runoff in the habitat section. Future updates to this plan should address the social and economic impacts of Metro's operations.

Baseline assessment: Introduction

Why create a baseline?

As the adage goes, what gets measured gets done. In order to measure progress toward meeting Metro's sustainability goals, a starting point is needed from which progress can be measured. For the purposes of creating this baseline, data was collected and analyzed to generate a baseline of performance in the five goal areas across all of Metro's facilities and locations.

2008: A snapshot in time

The furthest year back with the most complete data available was 2008. It is important to note that since the goals were adopted in 2003 but little measurement took place between then and 2008, this baseline will not account for operational improvements that resulted in environmental benefits during that time.

Methodology

Data on the following indicators was collected for each goal area:

- **Greenhouse gas emissions:** A comprehensive analysis of more than 75distinct data sets was completed for the GHG emissions inventory, including: building electricity and natural gas, fuel, fleet, supply chain purchases, St. Johns landfill, commute patterns, refrigerants, long-haul transport of waste and others. Emissions are reported in metric tons of carbon-dioxide equivalent (MT CO_2e).
- **Toxics**: An inventory chemical products and corresponding material safety data sheets (MSDS) was completed, entered into a database hosted by OHSU's Chemical Risk Information System, and analyzed for health, environmental and physical hazards. Toxics use is reported in number of high-hazard chemicals in Metro's inventory.
- **Waste**: Waste and recycling collection data was obtained from haulers. Waste is reported in tons of overall waste generated, as well as the percentage of that waste diverted for recycling or composting. Waste composition information is also presented.
- **Water**: Water usage data was collected from water providing utilities, as well as from well water records. Water use is reported in CCF, or hundred cubic feet (equivalent to 748 gallons).
- **Habitat**: Several metrics were selected for measuring habitat health and enhancement of Metro's developed and natural properties. Effective impervious area (EIA) is used to measure the amount of stormwater runoff leaving a site; EIA is total impervious surface area minus any areas that that slow, reduce, infiltrate or cleanse stormwater runoff onsite. The number of habitat-friendly or low impact practices used on Metro properties (such as ecoroofs or rain gardens) number of acres, and number of acres where pre-restoration, restoration and long term maintenance activities are taking place round out the habitat metrics. These metrics were analyzed for as many locations for which data was available. Metro's operations were grouped into similar functional areas for the purpose of presenting the baseline data (see Table 1).

Table 1: Functional areas within Metro operations.

Metro operations functional areas	
Oregon Zoo	Includes more than 25 facilities and exhibits on the Zoo campus.
MERC venues	Portland Center for the Performing Arts (Keller Auditorium, Schnitzer Hall, Hatfield Hall) Expo Center and Oregon Convention Center.
Parks and natural areas	Oxbow and Blue Lake regional parks, Boreland Field Station/Native Plant Center, Glendoveer Golf Course, Pioneer Cemeteries, Cooper Mountain Nature Park, Mt. Talbert, Howell Mason, Smith and Bybee Wetlands, Chinook Landing, Sauvie Island and Gleason boat ramps and bond-acquired natural areas.
Solid waste facilities	Metro Central and South transfer stations, Central and South household hazardous waste facilities, MetroPaint and the closed St. Johns Landfill.
Metro Regional Center	Metro's sole office building.

More information available

A high-level summary of the baseline findings is provided in this plan for context and to provide a sense of scale for the actions proposed. For further reading, four detailed reports are available upon request:

- Sustainability Baseline Analysis (2010): baselines for waste, water and habitat, as well as a summary of Metro's toxics baseline. Completed by Brightworks.
- Greenhouse Gas Emissions Inventory Report (2010): complete analysis of greenhouse gas emissions from Metro operations. Completed by Metro.
- Status Report: Metro Chemical Inventory Hazard Evaluation and Management Tool Project (2010). Completed by OHSU Chemical Risk Information Service.
- Waste Composition Studies (2009): Analysis of the garbage from six Metro locations generated during October2008.Reports cover PCPA theaters, Expo Center, Blue Lake Park, Oxbow Park, Metro Regional Center and the Oregon Zoo. Completed by Sky Valley and Associates and City of Portland.

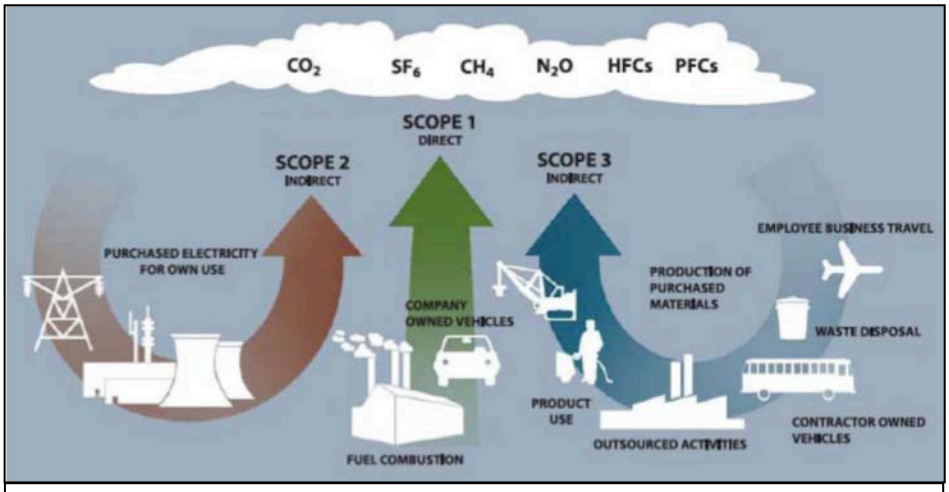
Baseline assessment: greenhouse gas emissions inventory

Greenhouse gas emissions inventory methodology

The inventory establishes a snapshot of greenhouse gas emission sources from Metro's internal operations in order to target investment and business practice decisions that have the greatest effect in meeting the greenhouse gas (GHG) emissions reduction goal and interim targets.

All three emission scopes are addressed in Metro's GHG inventory (see figure 2) which includes direct and indirect emissions from the agency's operations. Metro used Good Company's G3C calculator to complete this analysis. The calculator is based on widely-accepted GHG reporting protocols.[6] All emissions are reported in **metric tons of carbon-dioxide equivalent (MT CO_2e).**

Figure 2: Greenhouse gas emissions inventory scopes



In many GHG inventory protocols, emissions sources and activities are defined as either producing **direct** or **indirect** GHG emissions. Direct emissions are emissions from sources owned or controlled by a particular organization. Indirect emissions are emissions that result from the activities of an organization, but occur at sources owned or controlled by a separate entity. To distinguish direct from indirect emissions sources, three "scopes" are defined for traditional GHG accounting and reporting.

Scope 1: All direct GHG emissions occur from equipment and facilities owned and/or operated by Metro (excluding direct CO_2 emissions from biogenic sources, which are reported separately – See St. Johns Landfill section).

Scope 2: Indirect GHG emissions from the generation of purchased electricity, heat or steam consumed by Metro owned facilities.

Scope 3: All other indirect emission sources that result from Metro activities but occur from sources owned or controlled by another company or entity, including: business travel, embodied emission in material goods purchased, and services contracted, by Metro; emissions from landfilled solid waste; and emissions associated with Metro employee commute patterns.

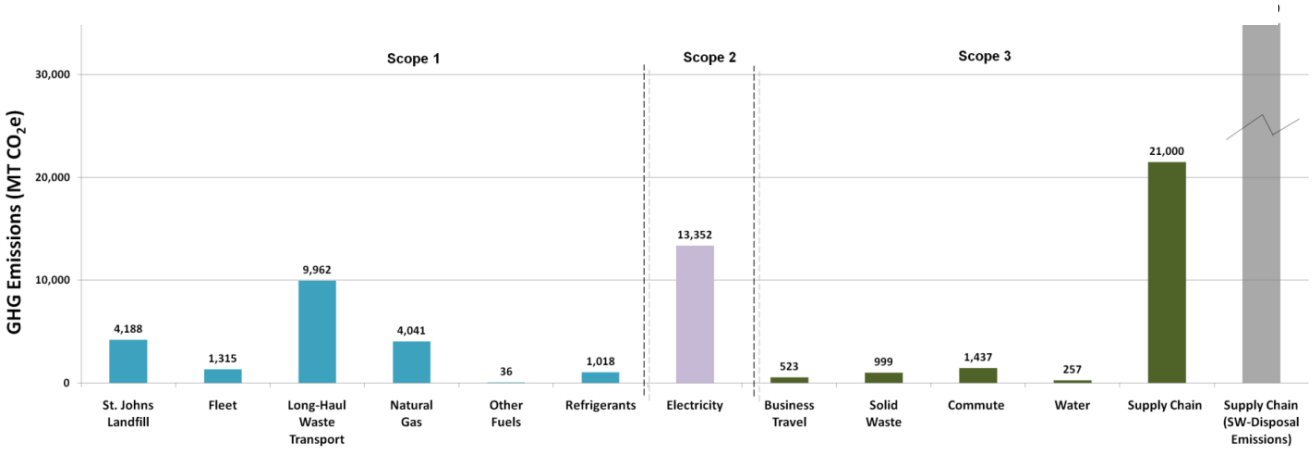
Source: World Resources Institute, The Greenhouse Gas Protocol, p. 25.

[6] The Local Government Operations (LGO) Protocol was developed as a collaboration of The Climate Registry (TCR) the California Air Resources Board (CARB) the California Climate Action Registry (CCAR, now the Climate Action Reserve) and ICLEI Local Governments for Sustainability. The LGO Protocol follows the same format as The Climate Registry's General Reporting Protocol (GRP).

GHG inventory results summary

Metro's total emissions equal 58,062 MT CO_2e (2008). Metro's emissions from vehicle fuel and building energy consumption account for 36,555 metric tons carbon dioxide equivalent (MT CO_2e) shown in Figure 3 as Scope 1 and Scope 2 emissions. Estimated Scope 3 emissions total 33,235 MT CO_2e, which accounts for the emissions from mission-critical operations and activities related to Metro operation, but outside of its direct control. See GHG inventory report for details of this analysis.

Figure 3: GHG emissions from Metro operations (2008)



Scopes I and II yield 33,912 MT CO_2e. For sense of scale, this is equivalent[7] to:

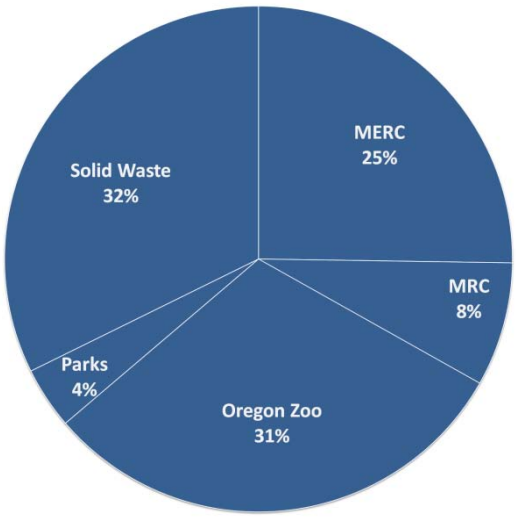
- Annual emissions from 6,484 passenger vehicles
- Annual emissions from the energy consumed by2,886 homes (US average)

Scope III emissions yield 24,215 MT CO_2e. For sense of scale, this is equivalent to:

- Annual emissions from 4,630 passenger vehicles
- Annual emissions from the energy consumed by 2,061 homes (US average)

Figure 4 provides a breakdown of the total GHG emissions for calendar year 2008 by functional area. MERC, the Oregon Zoo and Solid Waste functional areas each account for roughly one-third of Metro's total 2008 emissions; and the Metro Regional Center (MRC) and Parks account for eight and four percent, respectively.

Figure 4: Agency-wide greenhouse gas emissions (2008) by functional area

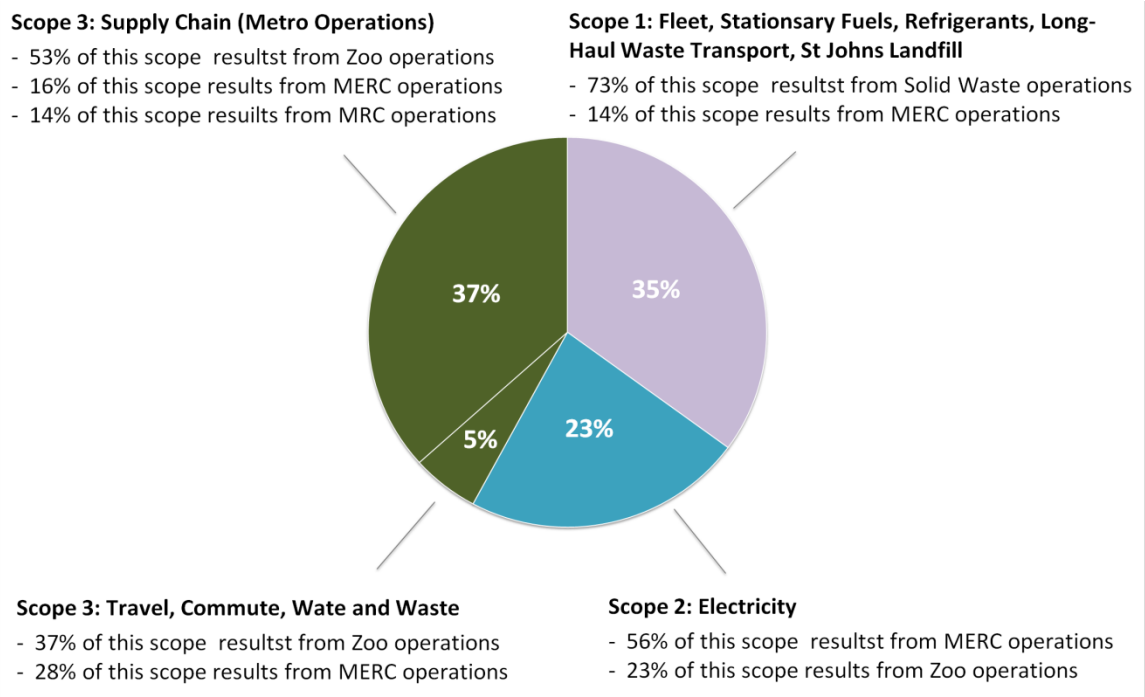


[7] Source: http://www.epa.gov/RDEE/energy-resources/calculator.html

Figure 5 includes a breakdown of GHG emissions for calendar year 2008 by emissions scope and distinguishes supply chain emissions within the total share of Scope 3 emissions. Roughly 73 percent of the total Scope 1 emissions (owned vehicle fuel use, natural gas consumption for building heat and refrigerants) come from Solid Waste operations, with MERC accounting for the next largest source at 14 percent. Scope 2 emissions (electricity) account for the second largest emissions source at 23 percent of Metro's total GHG emissions and 57 percent of all Scope 2 emissions result from MERC operations.

The Scope 3 emissions, Metro's largest emissions source, in Figure 4 are separated out into two general categories; (1) the purchase of potable water, solid waste disposal, employee commute and business travel and (2) supply chain emissions from purchased materials and services. Supply chain emissions make up the largest portion of Scope 3 emissions, the majority of which come from Zoo operations. The remaining Scope 3 emissions comprise five percent of Metro's total emissions, and similar to the supply chain emissions, the two largest sources result from operations at the Zoo and MERC functional areas.

Figure 5: Agency-wide greenhouse gas emissions (2008) by emissions scope



The results above demonstrate a substantial opportunity to reduce the GHG emissions and climate impact from Metro operations. Scope 1 (direct emissions) arise from sources over which Metro has direct control and which reflect the greatest opportunity for reductions. Scope 2 (indirect emissions) electricity emissions are substantial, primarily due to Metro visitor venues. These Scope 2 emissions also provide a significant opportunity for reductions despite being categorized as indirect, through changes in the amount of electricity Metro operations consume. Scope 3 (indirect emissions) are those which are shared with entities providing the product or service and present similar control challenges as Scope 2 emissions, although slightly more complicated strategies are

required to address Scope 3 emissions (for more detail see the Greenhouse gas emissions goal interpretation section in appendix).

Data quality and availability

The inventory attempts to estimate emissions from all of Metro's facilities but due to data limitations, a number of Metro's facilities are not included in the inventory. It is also important to note that complete data sets were not available for each facility that is included in the inventory. The **Metro GHG Emissions Baseline Inventory 2008** report includes a more detailed analysis of the existing data gaps and inventory methodology.

In addition to not including some facilities in the inventory, this analysis does not capture the transportation related impacts of visitors to Metro owned facilities and venues due to data and resource limitations. While Metro does not have direct control over how visitors choose to travel to Metro owned properties, Metro does play a significant role in regional transportation planning and has the capacity to promote alternative transportation modes at the majority of Metro's facilities, especially the visitor venues. It is recommended that future GHG analyses attempt to include these "visitor" impacts.

Case study: Green building and energy audits at PCPA theaters

Sustainability and energy efficiency are important issues in the world of performing arts. The number of performers and touring shows demanding environmentally sensitive policies from venues increases every year. There is also a national trend by public assembly venues to reduce, reuse and recycle as best as possible. To get ahead of this sustainable operations trend, PCPA completed a LEED-Existing Buildings study of two of their theater facilities: Antoinette Hatfield Hall (built in 1987) and Keller Auditorium (opened in 1917 and updated in 1968).The purpose was to determine whether it would be possible to achieve LEED Existing Building certification for either location.

Thorough studies at both of the venues created benchmarks for PCPA practices in energy efficiency, water consumption, cleaning practices, recycling and toxics use. In addition, a detailed energy audit was performed in partnership with the Energy Trust of Oregon. That study identified the state of the buildings' heating and cooling systems, energy use trends and opportunities for increased energy efficiency.

These studies have allowed PCPA to establish a baseline from which it can advance efforts to gain LEED EB certification. They also help PCPA to lay out a path for future efforts. Coupled with the energy audits, the focus on sustainability will allow PCPA to lower operational costs while offering clients and patrons a more environmentally conscious venue for live theater in Portland.

Baseline analysis: Toxics inventory

Toxics baseline methodology

An inventory of chemical products and corresponding material safety data sheets (MSDS) was completed to establish a baseline for toxics in use at Metro operations. This chemical product inventory was entered into an electronic database hosted by the Center for Research on Occupational and Environmental Toxicology at Oregon Health Sciences University called the Chemical Risk Information System. Metro sought toxicity analysis of the chemicals in the inventory and contracted with OHSU to develop the **Metro Chemical Inventory Hazard Evaluation and Management Tool**. This web-based system was designed to help ensure compliance with the OSHA Hazard Communication Standard and to provide health, environmental and physical hazards analysis of the chemical products in use at Metro.

Using this tool, Metro evaluated the potential health, environmental and physical hazard risks of chemical products in the inventory using product hazard evaluation criteria. Each product ingredient in the inventory was assigned a 1, 2 or 3 rating for health, environmental and physical hazards (a rating of 1 indicates low hazard, and a rating of 3 indicates high hazard). An overall rating in these three areas was then given to the product. A description of the methodology for assigning the rankings in each category for a product is included in the appendix.

Using this scale, a baseline was established of the number of chemical products used at Metro facilities that have ingredients with a 3 designation (worst) for health, environmental, or physical hazard.

Metro Chemical Inventory Hazard Evaluation and Management Tool

What products are in the inventory at your Metro facility? Check the database.

http://www.ohsu.edu/croet-cris/metro/metro.cfm

Contact the Sustainability Program for login and password.

Toxics baseline summary

There are currently 3,638 products in the Metro chemical product inventory. Of these, 58 percent have a 3 rating in one of the categories, 37 percent have a number 3 rating in at least two categories and 10 percent have a 3 rating in each of the three hazard categories. Overall, 10 percent of the products in the inventory have the worst hazard rating across all three hazard categories.

Metro's chemical inventory contains more high-hazard rankings for human health toxicity than the other two hazard categories (environmental toxicity and physical hazard). More high-hazard chemicals are found in the Zoo's chemical inventory than most other Metro locations, which is likely due to the unique nature of their operations (i.e. creation of outdoor exhibits) (see figure 6).

Figure 6: Location of products in Metro inventory with high hazard rating in all categories (health, environmental and physical) (2008)

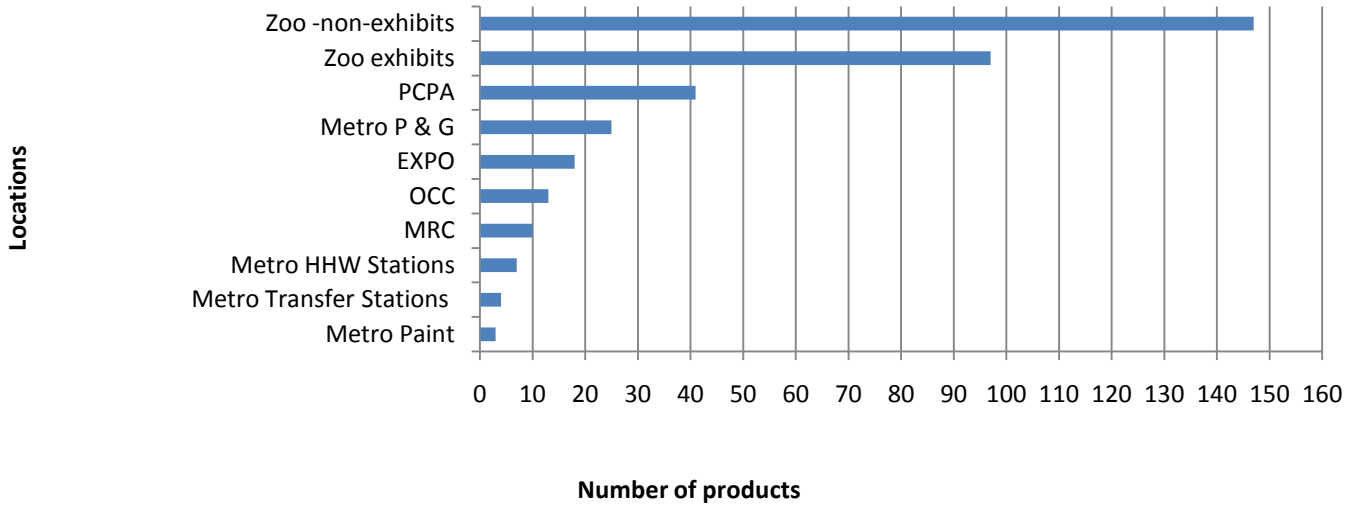
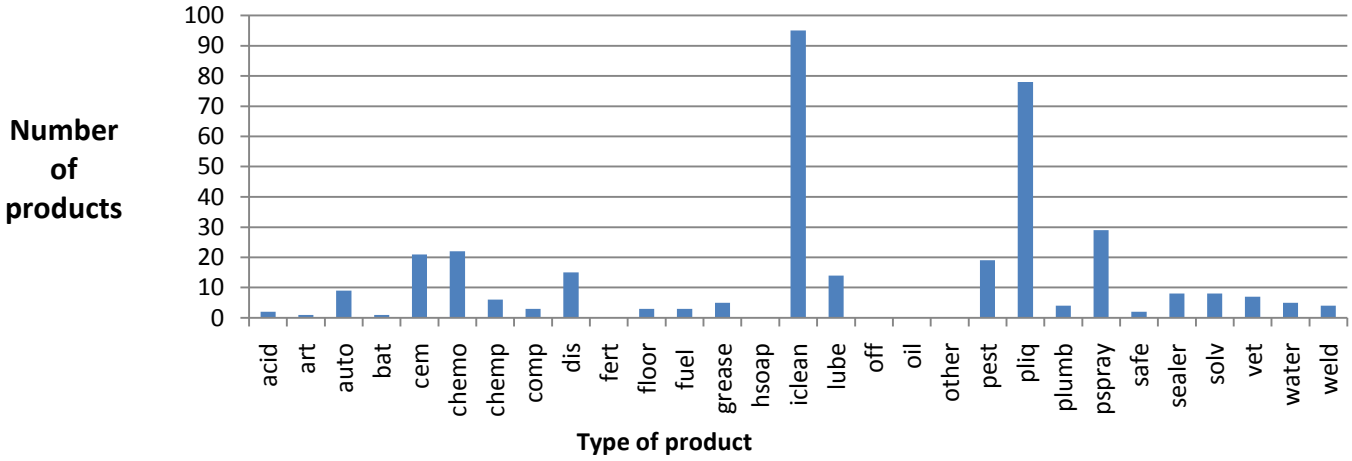


Figure 7: Product Types in Metro inventory with a high hazard rating in all categories (health, environmental, and physical) (2008)



Cleaning products and paints are the product categories with the most products in the inventory with a 3 ranking. For a list of all use type categories, see appendix.

In addition to showing number and distribution of products in the inventory with a 3 rating, Metro identified specific health hazards of the inventory.

- **Carcinogens**: Metro's chemical inventory contains 51 confirmed or probable carcinogens.
- **Developmental toxins**: Eleven developmental toxins are present in the inventory.
- **Persistent Bioaccumulative Toxics (PBT's):** 61 percent of the chemicals in the inventory are persistent, 17 percent are bioaccumulative and 39 percent are toxic. (A PBT chemical is persistent, bioaccumulative and toxic.)

Data quality and availability

- Product data is old or incomplete. Data is based on MSDSs (Material Safety Data Sheets) and 15 percent of the products in the inventory do not have sufficient data on the MSDS to allow a health, environmental, or physical rating. Many of the MSDSs are older; 58 percent pre-date the year 2000. Lastly, herbicides and pesticides used by Metro contractors are not included in this inventory.
- The database does not include the percentage of the ingredients in the product, nor does it address the amount of that product used in Metro's operations. Less than half of the ingredients listed on the MSDSs currently in the database include information on ingredient percentage, and no information was obtained on the quantities of products used during the product study.
- Database does not include durable goods that may contain toxics. These include fluorescent lamps (mercury) computers (brominated flame retardants) and furniture (formaldehyde).

Case study: Sustainable development of Graham Oaks Nature Park

Metro's newest park, Graham Oaks Nature Park in Wilsonville, includes many elements of sustainable site design.

The pervious pavement in the parking lot manages stormwater and removes pollutants. The solar panels on the restroom feed into the City of Wilsonville's electric grid and the stonework at the plazas and overlooks is Columbia River Gorge basalt stone.

The structures and hardscapes at the park include: a parking lot with pervious pavement and stormwater swales planted with native trees, shrubs, grasses and wildflowers to improve water quality; a pedestrian bridge that crosses Arrowhead Creek reused from another Wilsonville park site; low impact, environmentally appropriate and locally produced materials, such as the restroom (a pre-fab kit from Roseburg) and the ecoroof on the picnic shelter (from Baker City); a restroom painted with recycled MetroPaint; and a picnic shelter topped with an ecoroof to be planted in late summer 2010.

The plants used to restore the site's oak woodland habitat are native plants, trees and shrubs grown at Metro's Native Plant Center, where the wildflowers seeds were also sowed. The native ornamental plantings along walkways were also grown at Metro's Native Plant Center. Interpretative messaging and signage educates visitors on the historical, cultural, natural and sustainable practices of Graham Oaks and help tell the story of the site. Benches are detailed with hand forged metal oak trees, and local artist Mauricio Saldana has sculpted a 6,000 pound acorn as one percent of total project cost is used for the arts.

Baseline analysis: Waste generation and recycling

Waste baseline methodology

To create a baseline of waste generation and recycling, data from waste haulers that service Metro locations was used. This data includes the estimated weight of solid waste picked up from each location, as well as the percentage of that waste that is diverted for recovery (recycling or compost). In addition, waste composition was determined through waste sorts conducted at six Metro locations.

Waste baseline summary

Metro facilities and operations generated about 2,600 tons of waste in 2009. Of this, about half is diverted for recycling and compost, resulting in about 1,200 tons of garbage disposed in landfills annually. Waste generation and recycling varies significantly by facility and functional area. The Oregon Zoo, Oregon Convention Center, Expo and MetroPaint combined generate 94 percent of Metro's total identified annual waste generation (Figure 8). MERC facilities contribute 25 percent of Metro's waste each year (Expo accounts for 12 percent and Oregon Convention Center accounts 13 percent of the total waste). The Oregon Zoo is the largest generator of waste (about 53 percent of the total waste generated) but it also has the highest recycling rate of Metro's locations.

MetroPaint is also a significant waste contributor (381 tons per year). MetroPaint does not currently track recycling from its operations, mainly because the market for recycling used steel and plastic paint cans has disappeared.

Figure 8: Percentage of total weight of waste generated by facility (2009). PCPA is undercounted due to lack of data.

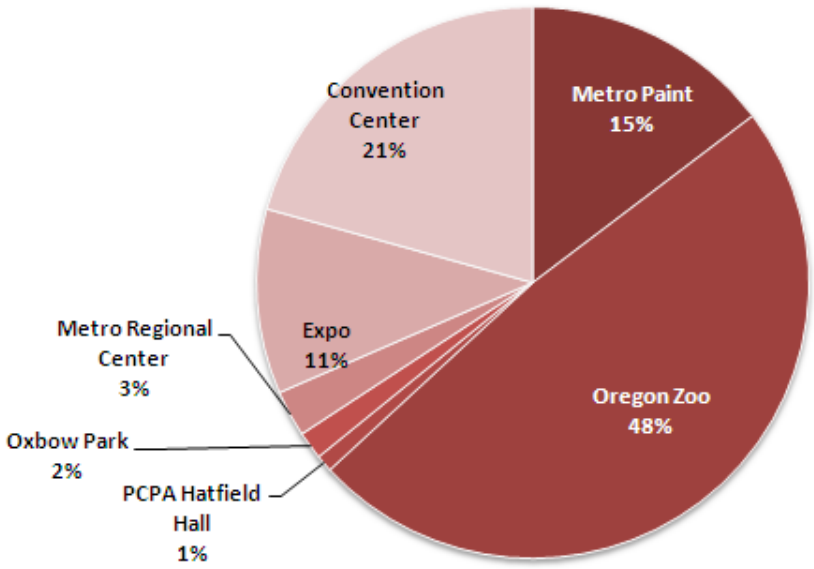


Table 1: Waste recovered for recycling and composting at Metro facilities.

	2006	2007	2008	2009
Zoo	67%	69%	69%	72%
Metro Paint	NDA	NDA	29%	0%
Oxbow Park	NDA	19%	NDA	8%
Oregon Convention Center	31%	56%	48%	56%
Expo	5%	10%	13%	17%
PCPA Antoinette Hatfield Hall/Admin	NDA	38%	NDA	39%
Metro Regional Center	NDA	58%	62%	64%

NDA - No data available.

Recycling rates vary widely across Metro's facilities (see Table 1). The top recyclers in 2009 were the Oregon Zoo (72 percent) Metro Regional Center (64 percent) and the Oregon Convention Center (56 percent). Each of Metro's functional areas (see page 12) has a different waste profile (Table 2). Waste composition was determined through waste audits conducted by Sky Valley and Associates in collaboration with the City of Portland Recycle at Work program. This analysis showed that as of 2008, there were still significant opportunities for diverting materials from Metro's own waste stream to recycling or composting.

Table 2: Waste composition by facility (2008 sample).

Waste Characterization by Facility (2008)	Zoo	OCC	Hatfield	Expo	Regional Center	Blue Lake	Oxbow	Average
Food & food soiled paper	21%	30%	41%	30%	30%	32%	39%	32%
Garbage	9%	13%	16%	18%	12%	9%	8%	12%
Miscellaneous	1%	3%	4%	4%	30%	14%	10%	9%
Food wrapped in plastic	6%	8%	12%	11%	4%	8%	12%	9%
Recyclable paper	0%	17%	0%	10%	7%	7%	5%	7%
Animal waste	41%	0%	0%	0%	0%	0%	0%	6%
Yard waste	1%	14%	1%	2%	1%	9%	5%	5%
Other plastic	2%	2%	7%	2%	7%	4%	4%	4%
Plastic Containers	2%	4%	3%	4%	3%	4%	4%	4%
Metal	1%	2%	2%	4%	2%	5%	5%	3%
Glass containers	0%	2%	1%	3%	1%	6%	6%	3%
Scrap paper	4%	0%	13%	0%	0%	0%	0%	2%
OTHER*	10%	7%	1%	2%	13%	2%	3%	5%

** OTHER includes wood, textiles, carpet, small electronics, and batteries.*

Note: the MRC Miscellaneous category includes 116 pounds of diapers from the Metro Kids daycare, as well as 106 pounds of strobe lights (likely the result of an illegal dump onto Metro property).

Data quality and availability

- Metro facilities outside of Portland lack waste data. Waste and recycling data is inconsistently reported, or not reported at all, for Metro's locations outside of the city of Portland (hauler franchise areas).
- Available recycling data does not include materials recycled outside of the waste hauling contracts, such as electronics or furniture.
- Waste composition data is limited. Waste sort data should be repeated with some regularity to determine opportunities for improving waste prevention, reduction and recycling.

Baseline assessment: Water consumption

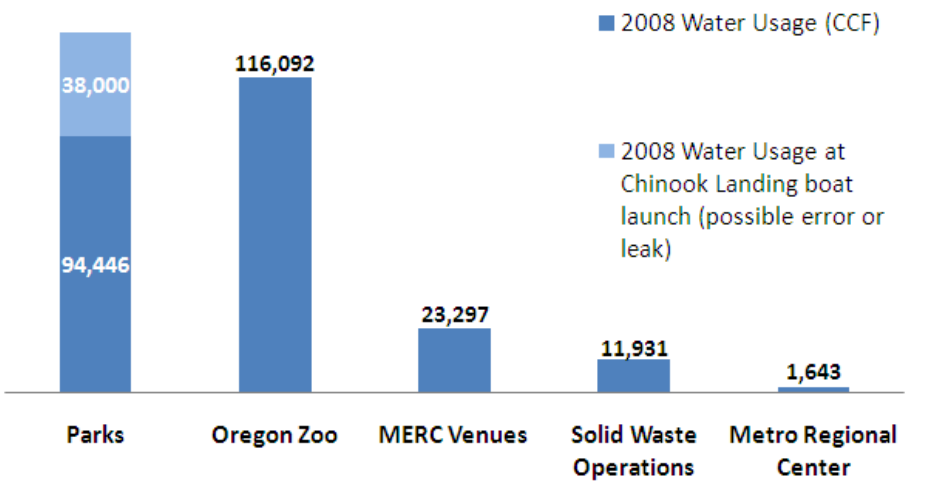
Water baseline methodology

Water usage data was collected from water providing utilities, as well as from well water usage records. Water use is reported in CCF, or hundred cubic feet (equivalent to 748 gallons).

Water baseline summary

Metro's properties collectively consume 285 million gallons per year. This analysis indicates where Metro's primary water uses are, and provides insight into Metro's greatest opportunities for reducing water usage.

Figure 9: CCF of water used by functional area, 2008



The Oregon Zoo is Metro's largest water user, and represents about 40 percent of Metro's total annual water usage. Estimates for water usage at the Oregon Zoo indicate that further study is required; data on two-thirds of the zoo's water use remains unknown.

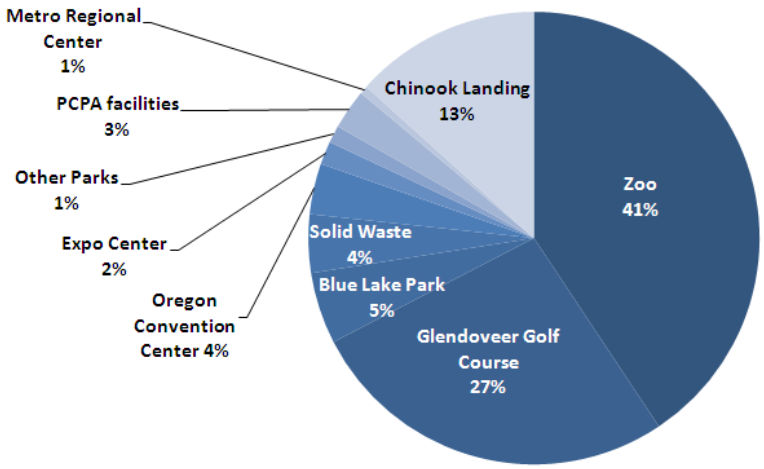
Glendoveer Golf Course is the top water user of Metro's park facilities, and is Metro's second largest water user overall, judging from estimates of water usage from two onsite wells used to irrigate the golf course.

Both of these areas present significant opportunities for reducing water usage through improving water efficiency at the Zoo and at the Glendoveer Golf Course (Figure 10).

Data quality and availability

- **Reading records from water submeters are rarely kept.** While water usage data is available at the meter level from the water utilities, detailed information about where water is used within the facility or location is raraly available. This is especially true for the Zoo.

Figure 10: Relative water usage by facility (2008)



- Chinook Landing boat launch water records are suspiciously high. Records from the City of Fairview showedvery high water usage in 2008 that indicate a faulty water meter or possibly an unnoticed leak. This anomaly is being investigated by the Parks and Environmental Services department.

- Water usage data not available for the Native Plant Center. This facility draws small amounts of water directly from the Tualatin River to irrigate native plant seedlings at this Metro operation in Tualatin.

Case study: Reducing water use at the Zoo

Since exhibits are estimated to account for about 20 percent of the Oregon Zoo's water usage, Zoo staff is looking for way to make that use more efficient.[8] In an effort to keep the pool in the Zoo's Humboldt penguin exhibit clean, approximately 3 gallons of water are skimmed off the pool every minute. In addition, the entire 25,000 gallon pool is dumped into the sanitary sewer every week. Over the course of the year, this effort to maintain a clean environment for the penguins results in the use of millions of gallons of water. As the fourth largest water user in the City of Portland, finding ways to reduce the Zoo's water usage was integrated into the proposed projects to complete under the voter-approved Zoo bond measure.

The first of the projects to address water usage at the Zoo will provide a new filtration system for the penguin exhibit. This upgrade will allow the Zoo to cleanse and re-circulate much of the water in the penguin exhibit, bringing the water usage for this exhibit down to approximately 200,000 gallons per year, reducing annual water usage at the penguin exhibit by about 80 percent.

[8] Estimated water usage at the Zoo, from Oregon Zoo Stormwater Master Plan, 2009.

Baseline analysis: Habitat and stormwater

Habitat baseline methodology

Habitat health and function are impact areas identified within Metro's sustainability goals and are central to its mission. For this baseline, developed properties were distinguished from natural areas with respect to the appropriate metrics. An analysis of stormwater treatment is included in this baseline analysis because it is closely related to habitat health and function. For example, sustainable site design reduces stormwater's impact on water quality and the health of rivers, streams and riparian areas by detaining, treating and/or infiltrating stormwater on-site. This supports native plants, recharges aquifers and prevents erosion and habitat destruction. A list of habitat-friendly practices developed by Metro includes best practices such as rain gardens, swales, stormwater planters, rainwater harvesting, porous pavement, native landscaping, green streets, sustainable site design and green roofs.

What are habitat-friendly development practices?

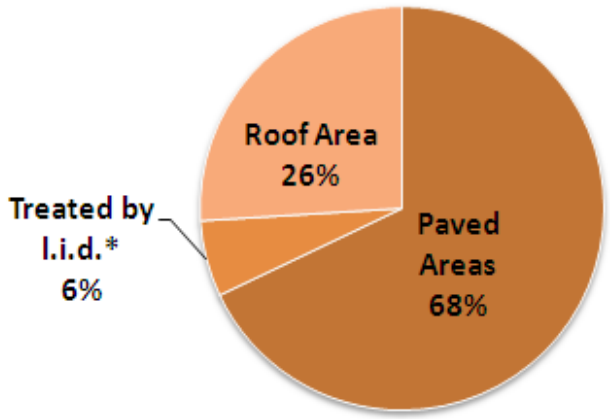
Some examples of habitat-friendly development practices (or low-impact development – l.i.d.), as defined by Metro's Nature in Neighborhoods program, are:

- Pervious pavement and porous concrete
- Ecoroofs
- Rain gardens
- Tree planting
- Use of native plants
- Bioswales and flow-through planters

See appendix for full list.

For each developed property, data was collected to determine the amount of impervious area on-site (hardscapes that include roofs, parking lots and sidewalks) (Figure 11). Data was also collected to identify the square footage of impervious areas treated by habitat-friendly development practices (also known as low-impact development, or LID) and to determine the number of habitat-friendly, or LID practices in use. The data was used to calculate Metro's overall effective impervious area (EIA) which is a measure of impervious areas not treated by LIDs and instead drain directly to a sewer or receiving waterway. The higher the amount of EIA, the more significant the property's negative impact on water quality and wildlife habitat. For natural areas, the available data used in this baseline analysis includes the total number of classified acres and the number of acres undergoing a variety of restoration activities. This data provides a snapshot of

Figure 11: Impervious Surface Type Summary (2008)



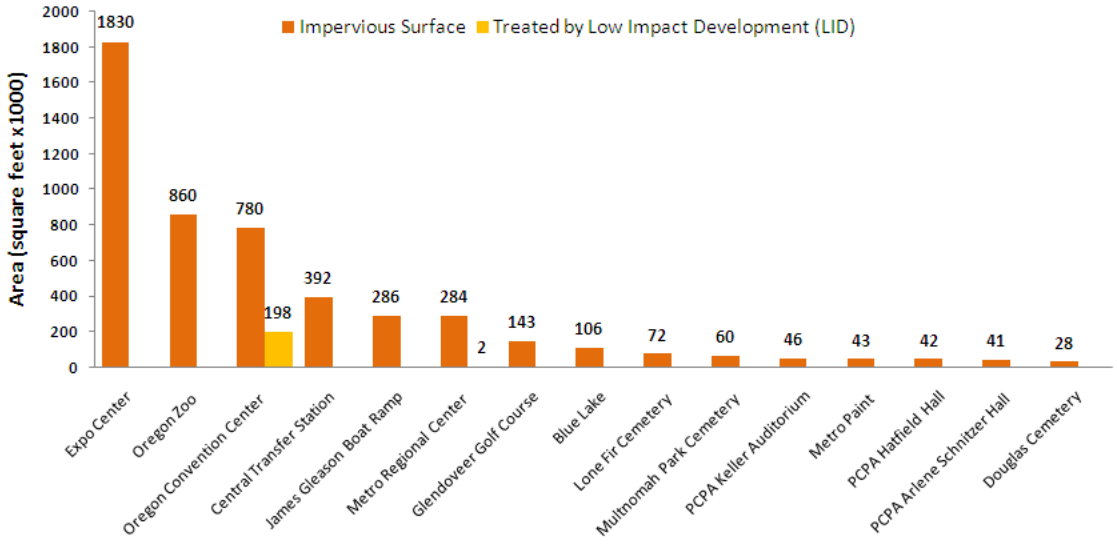
Metro's habitat management and restoration activities which in turn provides an indication of the general health and function of those ecosystems. For example, habitat on acres classified as "Refinement and Long-term maintenance" are subjected to restoration activities related to the long-term shaping and maintenance of the site as it moves towards its desired future condition (a healthy, functioning ecosystem) and to the ongoing care of natural areas required to ensure the preservation of the habitat and water quality protection functions.

Habitat baseline summary

Metro's total effective impervious area (EIA) represents 96 percent of its total impervious area. This means the vast majority of hardscapes drain directly to sewers and streams instead of being treated on-site. The total EIA across all Metro properties is **equivalent to 110 acres**. This contributes negatively to habitat quality and water quality issues and creates stormwater management challenges throughout the region.

Some Metro properties were not be included in the effective impervious area analysis because all stormwater is captured, infiltrated or treated on site via habitat-friendly practices or retention ponds. These properties includeMetro South Transfer Station, Cooper Mountain Nature Park, Mt. Talbert Nature Park, Smith and Bybee Wetland and Chinook Landing boat launch on the Columbia River. Nearly all of Metro's urban developed properties have an EIA of 100 percentThe notable exception is the Oregon Convention Center, which has an EIA of 75 percent due to the rain garden. Metro Regional Center has an EIA of 99 percent due to a small 2,500-foot ecoroof (Figure 12).

Figure 12: Impervious surfaces and area treated by low-impact development at Metro properties with stormwater runoff impacts



Overall, two thirds of Metro developed properties have no habitat-friendly practices in place. The number of habitat-friendly practices used on-site is a good indication of a property's commitment to using innovative, multi-beneficial design solutions during construction, retrofit and remodel projects.Thus, determining where these practices are used and how many are utilized is useful for determining where illustrative examples, lessons learned and the most effective implementation opportunities might be. The largest number of habitat-friendly practices used at any one Metro property is at Cooper Mountain Nature Park, where five practices are in place.

Data quality and availability

- Habitat indicators need further development. The habitat metrics included for this plan are intended to serve as a general trend indicator or "snapshot" of Metro's progress towards and contribution to the region's ecological health. There are a number of indicators that will either be collected during site assessments (such as percentage of native landscaping) and/or developed over time (such as development of site conservation plans) that will provide a more robust picture of habitat health and enhancement on Metro properties.

Case study: Rain garden at Oregon Convention Center

The landscape of the Oregon Convention Center expansion is designed to educate the community and its visitors about water quality. In addition to the native plants, minimized lawn area and efficient irrigation technology, a rain garden was integrated into the facility's design. It serves to filter and cool the extensive stormwater that runs off the large roof and site surface area. The rain garden provides an aesthetic, urban demonstration project for the handling of storm water. This signature feature is a solution to the need for disconnected downspouts from the city's combined sewer system, collecting and cleansing storm water before its release into the Willamette River.

The 318-foot long channel simulates a mountain stream with basalt columns and wetland plants. Terraced cobbled sedimentation basins slow the water, allowing sediments to filter out and increasing time for infiltration. The rain garden collects and treats water from 5.5 acres of roof area. Runoff from the loading dock area is also collected then passed through an oil-water separator before the water flows into another 205-foot vegetated swale. This filtered water enters the rain garden at the lowest detention basin.

The Oregon Convention Center saves $15,600 on its stormwater bill annually because of the stormwater that would otherwise need to be treated by the municipal stormwater system.

PART 3: STRATEGIES AND ACTIONS

For each of Metro's five sustainability goal areas, a set of strategies and actions have been identified. These strategies and actions provide a framework for the work that needs to be done to reach the 2025 goal targets. The strategies and actions are meant to be applicable across Metro's operations, and are not prescriptive to particular facilities or sites.

Methodology

Action planning teams were formed for each of the five goals. Teams included representation from each of Metro's major functional areas, and an outside participant or reviewer for each team. Each of these teams confirmed the strategies that Metro needs to employ in order to meet the goal, and identified actions that should be completed to implement each strategy. Each team developed the strategies and associated actions within the frameworks of several guiding principles appropriate for the goal area and in tune with the baseline findings of largest impact areas.

Strategies
The means for accomplishing goals

Actions
The specific tasks or steps that are taken to implement a strategy

The actions were then prioritized by team members according to two criteria: **feasibility** and **effectiveness** at meeting the goal. Based on this assessment, the team ranked each action as high priority (both highly feasible and highly effective) medium priority (either highly feasible or effective) or low priority (low feasibility, low effectiveness).In addition, the team flagged a subset of these as actions that are essential to the foundation of this plan and should be completed (or initiated, in some cases) in the first three years after the plan is adopted.

Action types

In addition to priority, the actions are categorized by the type of action. There are seven action types in this Sustainability Plan:

1. **Assessment**: Actions to conduct more detailed analysis that is needed to inform future work, such as an energy audit at a facility.
2. **Tracking**: Actions to initiate or improve tracking of various sustainability data that are needed to report progress over time on selected indicators.
3. **Programmatic**: Actions related to development of new programs or expanding existing programs.
4. **Procurement**: Actions directly related to the procurement of goods or services.
5. **Operational/Policy**: Actions that call for a change in internal operations, policy, or procedures.
6. **Funding**: Actions related to funding internal sustainability projects.
7. **Education**: Actions to educate Metro employees, and in some cases, Metro's customers.

Strategies and actions: Greenhouse gas emission reduction

Metro owns and operates a diverse portfolio of facilities that will require specialized strategies to mitigate the climate impacts of Metro's operations. While Metro's greenhouse gas emissions account for a small share of the total regional emissions -- roughly one-tenth of a percent of the total 31 MMT CO_2e associated with the Metro region -- this reduction target provides an opportunity for Metro, as a public agency, to lead by example in taking an aggressive emissions reduction strategy.

In order to successfully meet the operations reduction goal, Metro will need to examine all areas of operation to identify emission-reduction opportunities.

Installation of solar array at Metro's Cooper Mountain Nature Park, 2009.

Guiding principles for greenhouse gas emission reduction

- **Reduce energy demand first.** Metro should work to increase energy efficiency of its facilities to the fullest extent feasible as a top priority for reducing GHG emissions. Purchase and/or on-site generation of renewable energy should be a second priority. Procurement of carbon offsets should not be considered until these avenues have been fully pursued, and then only if the offsets meet certain criteria.
- **Address emissions from all three scopes.** Metro should be comprehensive and address all of Metro's greenhouse gas emission sources: energy, transport, and materials. In other words, address all Scope I, II and III emissions.
- **Use most current climate science to guide actions.** The findings from the IPCC (Intergovernmental Panel on Climate Change) outline what is needed in terms of the scale of emission reductions needed to avoid catastrophic climate change (change beyond the point that we can't adapt).

Greenhouse gas reduction strategies and actions

Greenhouse gas emissions			
Strategy	**Actions**	**Action type**	**Priority**
Strategy 1: Reduce GHG emissions from building operations, maintenance, and siting through energy efficiency and resource conservation.	1.1 Audit buildings for energy efficiency opportunities and develop recommendations for an energy efficiency plan specific to each site. Audit type should be appropriate to the building type (i.e. ASHRAE Level 2 audit for buildings over 10,000 square feet.)	Assessment	High 
	1.2 Implement energy efficiency plans and develop supporting policies for each site audited. Examples of implementation steps could include: • Lighting retrofits and upgrades • Establish energy efficiency guidelines/requirements for existing buildings and new construction. • Building retro-commissioning (to test effectiveness of building systems) where appropriate • Building weatherization (insulation, sealing, etc.) • Equipment upgrades (boilers, HVAC, hot water heaters, refrigerators, etc.)	Operations	High 
	1.3 Identify and evaluate options for reducing GHG emissions from the St. Johns landfill, particularly the flaring of methane and resulting carbon dioxide emissions. Include options for methane management after Metro's contract with Ash Grove Cement expires in 2012.	Operations	High
	1.4 Increase on-site generation of renewable energy at Metro locations. Assess locations for opportunities in partnership with Energy Trust. Implement according to greatest opportunities (i.e. solar, small wind turbines).	Procurement Operations	High
	1.5 Increase purchase of renewable power directly from electrical utilities (Portland General Electric and Pacific Power.)	Procurement Operations	Medium
Strategy 2: Reduce consumption of carbon-intensive fuels, including emissions related to business travel, fleet vehicles, and other fuel-consuming equipment.	2.1 Implement green fleet program to reduce fuel usage by Metro's fleet. Program elements should include: • Decrease overall number of fleet vehicles; • Use of Fleet management software which tracks fleet usage; • Use of car-sharing to supplement fleet needs where possible; and • Fleet purchasing policy with procurement hierarchy, increased use of alternative fuel vehicles and purchase of electric vehicles and charging stations.	Operations Policy	Medium

	2.2 Reduce emissions from the consumption of carbon-intensive fuel related to business operations by adopting sustainable fuel use standards. Standards should include: • Provisions for back-up generators, heavy equipment, off-road vehicles and other equipment; • Idle reduction policy for fleet and contractors; • Diesel emission standards for off-road equipment based on EPA's Tier system, and retrofit or replace equipment to meet those standards; and • Fuel efficiency standards for fleet vehicles and increased use of alternative fuels where available.	Policy	Medium
	2.3 Identify and evaluate options for reducing GHG emissions from the long-haul trucking of solid waste to the Columbia Ridge Landfill in Gilliam County, OR. Strategies could include alternative fuels or transportation methods, reducing the amount of waste requiring disposal and potential for alternative waste treatment options that would not require as much transport."	Operations	Medium
	2.4 Create climate-friendly business travel guidelines for Metro employees, including best practices hierarchy of business travel choices. Include workday travel to and from meetings. Include eco-driving awareness and tips for fleet drivers.	Education	Low
	2.5 Establish public electric vehicle charging stations at Metro locations.	Operations	Low
Strategy 3: Reduce GHG emissions related to the supply chain and service providers Metro purchases through contracts and procurement.	3.1 Include GHG reduction / energy efficiency criteria in all vendor and facility service and equipment contracts. • Include GHG-reduction preferences/criteria into procurement specifications of bids and RFP's, or add to boiler plate language for contracts. • Include requirement to purchase Energy Star certified equipment wherever available.).	Procurement	High
	3.2 Develop and adopt sustainable food procurement standards that reduce GHG emissions from food production, transport and service. To include: • Increases purchase of certified organic food; • Increased purchase of local food; and • Sustainable food service ware options including durable dishware and prohibiting disposal of compostable service ware in a landfill.	Procurement	Medium

Strategy 4: Improve internal business practices to support ongoing monitoring and tracking of GHG emissions sources.	4.1 Establish process for ongoing tracking of all GHG-related data sources in Metro's internal operations for tracking of GHG emissions. To include: • Identify data sets needed for ongoing GHG tracking and reporting, including all data gaps identified in the GHG inventory completed in 2010.Integrate tracking into normal business practices. • Coordinate ongoing tracking needs with all business operations departments, including but not limited to: Accounting, Procurement, Operations/Facility Managers, Contractors, Fleet management, Information Services. • Use utility tracking software for electricity, natural gas and water, waste. • Establish ongoing working relationship with all utility providers, via account representative if available including: establish regular reporting of utility use data, regular updates of utility-specific GHG emission factors.	Tracking	High 
	4.2 Identify tools necessary for Metro operations to quantify the GHG reduction potential of facility improvements or upgrades. *(Related to Metro's GHG Tools and Procedures Manual, in development by Research Center.)*	Assessment	High
	4.3 Conduct annual employee commute survey for all Metro employees (including non-benefits eligible employees) that records travel modes and miles traveled (goes beyond the TriMet Passport program required survey).	Assessment	Medium
Strategy 5: Create a funding strategy and appropriate staffing for greenhouse gas reduction efforts.	5.1 Develop and implement funding mechanism for projects that reduce GHG emissions, including new and existing capital. Explore ways to generate funding, such as: • Set aside avoided costs / savings from energy efficiency investments to pay for future projects; • Use energy incentive program payments (i.e. ETO rebates) to "pay it forward" for future projects. • Develop return on investment (ROI) criteria for energy-efficiency projects and integrate into project proposals. Build relationships with outside funders like Energy Trust of Oregon and other energy incentive programs.	Funding	High 
	5.2 Require selection of energy efficient options for all projects (new and existing capital). Establish opportunity review as a pre-planning requirement. Include requirement to purchase Energy Star certified equipment wherever available.	Funding	High

	5.3 Hire an energy manager to develop and implement a comprehensive energy efficiency program for all Metro/MERC facilities. Scope of work could include: • Build relationships with utility providers; • Set up ongoing tracking of energy use data; • Fundraising; or • Project planning assistance. Could be implemented as part of the capital projects division like MERC uses. Funding for position could emulate City of Portland and Multnomah County positions.	Program	Medium
Strategy 6: Support and encourage employee opportunities to reduce GHG emissions through behavior changes related to their Metro work day, as well as opportunities for visitors to reduce their emissions.	6.1 Provide basic education to Metro employees on climate change, greenhouse gas emissions and what they can do to help reduce GHG emissions at work (i.e. workplace energy conservation).	Education	Medium
	6.2 Reduce emissions from Metro employees commuting to and from Metro work sites. To include: • Expand commute option programs to all locations, and extend to non benefits-eligible employees (i.e. compressed work week, transit pass, bike/walk incentives). • Strengthen telecommuting policy to reduce employee commute emissions.(i.e. MERC use of Citrix to improve employees ability to work from home) • Identify a Transportation Coordinator at each Metro work site.	Program	Medium
	6.3 Provide options for attendees of public meetings hosted at the Metro Regional Center to reduce their greenhouse gas emissions associated with travel to and from the meeting (i.e. use web-based meeting tools, public transit options, install AV equipment to enable virtual/remote meetings).	Operations	Low
	6.4 Increase parking fees at Metro locations as a way to discourage staff and visitor travel by car.	Policy	Low
	6.5 Develop methods to reduce emissions impacts related to transportation of patrons and customers visiting Metro venues. (i.e. Offer incentives such as a discounted entry fee for taking public transit to the event.)	Operations	Low

Strategies and actions: Toxics reduction

As a government agency with a focus on reducing toxic materials from the region's solid waste stream, toxics reduction is a key concept for not only community programs, but to internal operations. The wide variety of consumable products in use at Metro's locations poses a unique challenge.

Many products and materials used in government operations contain toxic substances of concern. Exposures to toxic chemicals are linked to a wide array of human health consequences.

Improving Metro's inventory of products (both consumable and durable goods) is necessary for success. These strategies and actions outline a process for systematically identifying and replacing hazardous products used in Metro operations with less-toxic alternatives, and starting with the most toxic products first.

Household hazardous waste collected from Metro region residents.

Guiding principles for toxics reduction

- **Precautionary principle.** Action should be taken to prevent harm even in the absence of scientifically rigorous proof of harm. In the context of Metro's operations this means that actions should be taken to change, halt or phase-out practices and products that are associated with significant concerns about toxic impacts, often long before these concerns are addressed by regulatory restrictions.
- **Consider hazard, not just risk.** Hazard is the inherent property of a chemical, whereas risk is a calculation of the potential for harm based on concentration, routes of exposure, and other factors. In contrast to a risk assessment approach, which involves complex and often incomplete or inaccurate calculations, a hazard-based approach selects products of concern based on their intrinsic ability to cause harm to health or the environment. This approach is consistent with the precautionary principle.
- **Take a life cycle approach.** Products can have impacts on human health and the environment across their lifecycle, including manufacture, use, storage and disposal. Metro should consider the impacts of hazardous materials not only during storage, and use and disposal at Metro facilities, but also those that result from the manufacture of products.

Toxics reduction strategies and actions

Toxics reduction			
Strategy	**Actions**	**Action type**	**Priority**
Strategy 1: Complete and bring up-to-date Metro's comprehensive chemical product and materials inventory, including consumable and durable products, as well as other toxics.	1.1 Establish process for ongoing tracking and inventory of chemicals and products that contain toxics in use at Metro. To include: • Schedule of regular inventory and database update of chemicals in-use, to repeat at least every three years. Include both Metro and MERC material safety data sheets (MSDS) as well as for products used at Metro facilities by contractors; divide MSDS database into In-use and Old MSDS's (to be archived); create standardized procedure and forms for adding products into the database. • Identify people responsible for keeping MSDS inventory up to date and train them on how to maintain and add to the inventory. • Link to new Safety Policy and Hazard Communication Program (Risk Management).	Tracking Program	High 
	1.2 Conduct high-level assessment of durable products commonly used at Metro that contain toxics; use list to inform future purchases of less-toxic alternatives (i.e. fluorescent lamps)	Assessment	Medium
Strategy 2: Take action to reduce and/or eliminate the most toxic products and materials first.	2.1 Identify the most toxic products in Metro's inventory and target them for replacement with less-toxic alternatives. To include: • Replacement of products that score a 3 (most toxic) in MSDS chemical inventory if substitutions are available; • Prioritize replacement of heavy metals and other PBT's, including those attributable to durable goods; • Prioritize product categories with high quantities of toxic ingredients in inventory (i.e. cleaning products and paints).	Operations Procurement	High 
	2.2 Reduce use of herbicides and pesticides in all Metro operations. Create and implement an IPM (Integrated Pest Management) policy to reduce use of herbicides and pesticides on all Metro properties. Policy should address the unique needs of different property types, including developed property landscapes and natural area restoration needs. Program should phase out high risk pesticides as indicated by Salmon Safe. Begin tracking and reporting of all herbicides and pesticides used by Metro staff and contractors.	Policy Tracking	High 

	2.3 Adopt diesel particulate matter (PM) reduction strategies for internal operations and on Metro property. Include idle reduction policy and require use of diesel PM control technology for all diesel-burning equipment.	Operations Policy	Medium
Strategy 3: Identify and implement methods for procurement of less-toxic goods and materials through purchasing policies and procedures.	3.1 Reduce purchase of toxic products by requiring or requesting least-toxic options from contractors and suppliers in bids and RFP's. Integrate least-toxic criteria into boilerplate procurement language and other procurement practices. Create an "X-List" of ingredients or materials that Metro will no longer purchase due to their toxicity.	Procurement	High 
	3.2 Increase purchase of sustainable products by adopting least-toxic product standards. Formally adopt third-party certified eco-labels where available (i.e. Green Seal standard for cleaning products) and develop product-specific policies where such eco-labels are not available (i.e. low-mercury lighting).Standards should include performance criteria. Where standards are not available, point buyers to compiled lists of least-toxic products (i.e. City of San Francisco's toxics reduction procurement guide[9].)	Procurement Policy	High
	3.3 Develop methods to allow price premium for procurement of less-toxic goods and services where the less-toxic option costs more than conventional options.	Procurement	Low
Strategy 4: Educate, train, and provide tools for product users and buyers about how to choose less-toxic options based on standards and criteria.	4.1 Provide education and tools to buyers on how to purchase least-toxic products. Focus first on biggest purchasers of "toxics", and then broaden to include department procurement coordinators (DPC's) and P-Card users. Use a "train the trainer" approach by enlisting green teams, safety committees and some supervisors to educate Metro employees on selecting least-toxic products. Track trainings completed annually.	Education	High
Strategy 5: Develop toxics reduction program assessment metrics to measure progress over time.	5.1 Integrate contracts and procurement records into the chemical inventory.	Tracking	Low
	5.2 Track the quantity of less-toxic products Metro uses (i.e. third-party certified cleaning products) as well as the amount of toxics reduced over time as less-toxic alternatives are phased-in.	Tracking	Low

[9] SF Approved List of Green Products & Services, City of San Francisco. www.sfenvironment.org/sfapproved.

	5.3 Develop methods for monitoring P-Card purchases that allow more detail of what is purchased. Managers should review receipts and encourage buyers to purchase less-toxic products. Model after MERC P-Card review process.	Tracking Procurement	Medium
	5.4 Develop a method for measuring the life cycle impacts of Metro chemical and toxics purchases.	Tracking Procurement	Low
Strategy 6: Develop a cross-organization least-toxic alternatives assessment team and process.	6.1 Develop a cross-organization least-toxic alternatives assessment team and process. Identify team composition, specific charge, scope, authority and resources.	Operations Procurement	Medium

Strategies and actions: Waste reduction

Metro has had a commitment to recycling in government operations since 1991, when an Executive Order established a comprehensive waste program and recycling program for Metro departments and facilities (Executive Order No. 47.) Since then, Metro's recycling programs at its facilities have served as a model for similar facilities across the nation. The Oregon Zoo and the Oregon Convention Center are notable examples.

Metro provides reusable dishware for public meetings.

However, there are still opportunities for diverting recoverable material from the waste stream (such as organic waste) and for waste prevention upstream. The greatest challenge is due to the nature of operating public facilities and having to deal with the waste that is brought in by customers.

While waste disposal is a problem, the impacts of producing the goods that eventually become waste are many times larger than the environmental impacts of the waste itself. When it comes to waste reduction, the more sustainable practice is not just to keep stuff out of the landfill, but to use less stuff in the first place. By adopting waste prevention practices for waste streams that Metro controls (i.e. purchased goods) Metro will be most likely to meet waste reduction targets.

Guiding principles for waste reduction

- **Meet business recycling requirements.** Since Metro requires commercial facilities in the region to meet basic recycling program criteria, all Metro facilities should model this behavior and follow the best practices for recycling prescribed in that program.
- **Prevent waste before it starts.** Integrate techniques of waste prevention into Metro operations, focusing efforts on preventing waste upstream where it is generated. For example, durable, reusable, and refillable products all prevent waste.
- **Take a life cycle approach.** Consider the waste impacts of the full life cycle of products when making purchasing decisions, which includes the waste generated before or after a product is used by Metro.

Waste reduction strategies and actions

Waste reduction			
Strategy	**Actions**	**Action type**	**Priority**
Strategy 1: Utilize procurement process to prevent generation of waste.	1.1 Create procurement policies and procedures that support waste prevention and reduction. Examples include: Producer take-back as a procurement tool. i.e. require suppliers/vendors to take back packaging; Request that products be packaged in recyclable packaging, or no packaging at all; Establish a preference for durable, reusable, repairable products in procurement procedures. Provide training for buyers on how to use procurement tools to reduce and prevent waste from materials and services.	Procurement	High 
	1.2 Reduce food service ware and organics waste by adopting sustainable catering standards for public meetings hosted by Metro (both internal and public).For client-based catering and banquet services at visitor venues, continue to develop and offer options that reduce waste.	Operations Policy	Low
	1.3 Utilize life-cycle analysis as a procurement selection tool.	Procurement	Low
Strategy 2: Expand materials reuse opportunities.	2.1 Create centralized surplus and material reuse process for supplies, furniture and equipment. Update existing Metro surplus property disposition policy that prioritizes internal reuse first, then donation, then sale (MERC has a similar policy).	Operations Policy	Medium
	2.2 Promote and improve access to Metro's reuse bulletin board on the Intramet.[10]	Operations	Low
Strategy 3: Improve and expand recycling programs at Metro facilities and properties.	3.1 Meet business recycling requirements at all Metro facilities.[11] Follow best practices such as pairing waste bins with recycling bins and using two-sort systems in public areas of all Metro locations.	Operations	High 
	3.2 Increase organics collection at all Metro facilities where services are available.	Operations	High
	3.3 Integrate principles of Resource Management[12] into next waste and recycling contract for Metro facilities, to engage the hauler more in helping Metro to meet waste prevention	Procurement	Medium

[10] http://imet.metro-region.org/index.cfm/go/by.web/id/3688&type_id=3
[11] Metro Business Recycling Requirements, adopted in 2008. http://www.recycleatwork.com/whatsrequired.
[12] EPA website, *What is Resource Management?* http://www.epa.gov/wastes/partnerships/wastewise/wrr/rm.htm

	and recycling goals, and to clarify tracking and reporting requirements. Include preference for increased local processing of recovered materials.		
	3.4 Add recycling collection for other materials found in the waste stream not currently recycled (i.e., rigid plastics, other hard-to-recycle materials) where recycling markets are available.	Operations	Medium
	3.5 Identify a "recycling liaison" at each Metro park (PES) location to coordinate recycling improvement efforts.	Program	Low
Strategy 4: Educate employees on waste prevention and recycling and provide incentives for improvement.	4.1 Train Metro employees on waste prevention techniques and how to recycle where they work. Post recycling instructions on Intramet.	Education	Medium
	4.2 Establish gain-sharing agreements for increasing diversion rate or reducing waste at Metro facilities as a way to provide incentive to employees (Example: OCC gain-sharing agreement).	Program	Medium
Strategy 5: Educate visitors, exhibitors and show promoters about waste prevention and recycling options.	5.1 Create clear and recognizable signage on recycling in public areas at all Metro locations. Use coordinated messages/words/colors for recycling program consistent across all Metro locations (build on messages that work for OCC and Zoo or other public facilities such as Portland airport) and tailor to each site's recycling program offered. Signs at public locations should be in multiple languages and tailored to the visitors' needs at that site.	Operations	Medium
	5.2 Develop and offer waste prevention incentives for show promoters at MERC venues where possible.	Customers	Low
Strategy 6: Identify tools needed to reduce dependency on materials (such as paper) to prevent waste.	6.1 Implement a paper reduction strategy for Metro operations that fosters a transition to a paperless Metro workplace. To include: training for Metro employees on how to use paperless office tools, such as SharePoint and Wikis; options to reduce paper needed for retention of public records.	Operations Policy	High
	6.2 Upgrade AV equipment and meeting rooms to enable paperless and virtual public meetings.	Operations Policy	Medium
	6.4 Prevent paper towel waste in Metro restrooms, especially those with high traffic through use of high-efficiency hand dryers. Unique site needs should be considered (i.e. noise for restrooms near a quiet theater).	Operations	Medium

Strategy 7: Improve tracking and reporting on waste generation and recycling from haulers, as well as internal tracking materials use by department.	7.1 Track waste generation and recycling data for all Metro locations. Create an electronic reporting system to track waste generation and recycling from all Metro locations. Identify staff time needed to input data into a waste/recycling tracking system. Tracking should include all materials recovered for recycling, compost, reuse or refurbishment.	Tracking	High 
	7.2 Track paper use by department or facility; set a goal for reducing paper consumption and track progress.	Tracking	Medium
	7.3 Make it easy for staff to find reports on tracking waste generation so that they can see their impact in the big picture.	Education	Low

Strategies and actions: Water conservation

While the Metro region currently has a plentiful supply of fresh water, water conservation is necessary to ensure a sustainable public water supply and healthy habitat for fish and other wildlife that depends on high water quality and quantity. The influx of new residents predicted to come to the Metro area over the coming decades, combined with advancing changes in climate, will make water conservation more important than ever.

Fortunately, Metro's largest water user, the Oregon Zoo, has plans to upgrade many of its exhibits through a bond program, which will greatly increase the water efficiency of Zoo exhibits. However, much work is yet to be done to improve water efficiency and reduce water usage overall at Metro's other facilities and parks.

Guiding principles for water conservation

- **Prevent water use; eliminate where possible.** Like waste prevention, taking a preventive approach to water use is a good place to start. Examples include eliminating irrigation in areas that do not really need it.
- **Use less water by making use more efficient.** Older facilities like Metro's generally have opportunities for improving water efficiency when making replacements or repairs to building systems. Always specify water-efficient products.
- **Reuse or harvest water when efficiencies have been completed.** Water reuse is a lower priority, due to the fact that water is least available in the form of rainwater when it is most needed for irrigation.

Water conservation strategies and actions

Water conservation			
Strategy	**Actions**	**Action type**	**Priority**
Strategy 1: Assess and prioritize water conservation opportunities on all Metro properties.	1.1 Audit water usage at all Metro locations that have not had a recent water audit to and develop recommendations for water conservation strategies specific to each site. Irrigation systems should be included in audits.	Assessment	High 
Strategy 2: Reduce water usage through improvements to water use prevention and water efficiency, stating with biggest water users.	2.1 Ensure implementation of water conservation projects identified in the Zoo Master Plan (to be completed in 2011).	Operations	High 
	2.2 Integrate sustainable operations and water conservation requirements into operations contract for Glendoveer Golf Course.	Operations	High 
	2.3 Reduce irrigation and watering needs at Metro properties. Determine how much irrigation is necessary, then create an efficient irrigation schedule and eliminate irrigation in areas where not needed. Upgrade irrigation systems to include "smart" sensors to detect soil moisture or weather to reduce watering. Reduce or eliminate hand watering at Metro properties.	Operations	High
	2.4 Retrofit existing buildings' water fixtures and equipment to high-efficiency where highest opportunity areas are found in water audits. Actions could include retrofitting commercial kitchen equipment, bathroom fixtures, truck wash sprayers, etc.	Operations	High
	2.5 Create requirement that all water fixture and equipment purchases be water efficient. Water efficiency to be defined by current best practices. Create standards for new construction and renovations that references a standard for water-efficient fixtures.	Policy Procurement	 High
	2.6 Implement water efficiency best management practices (BMP's) at public wash stations (truck wash at solid waste transfer stations, boat sewage pump station at Chinook Landing boat ramp).Install equipment upgrades to reduce water use. Develop disincentives to overuse of water such as time limits or charge for use.	Operations	Medium
Strategy 3: Reuse water at Metro	3.1 Reduce well water usage at Blue Lake Park by investigating the possibility to redirect water from flushing	Operations Policy	Medium

facilities where feasible and opportunity is significant.	Portland's Columbia Wellfield away from the Columbia River and to Blue Lake for reuse.		
	3.2 Investigate opportunities for gray water reuse and implement where highest opportunities exist (i.e. cleaning Zoo exhibits).	Operations	Low
	3.3 Reduce and reuse water from building environmental systems when those systems are improved or replaced (i.e. air conditioning condensate, cooling tower water, eliminate "single-pass" cooling in HVAC systems).	Operations	Low
Strategy 4: Establish an ongoing tracking and reporting system for all water usage at Metro properties.	4.1 Create ongoing tracking system for all water uses at Metro locations. Include on-site water sources such as wells. Utilize submeters to track detailed water usage; create a regular reading and recording schedule.	Tracking	High 
	4.2 Connect water billing with maintenance staff to close the loop with information and educate water users about consumption.	Tracking Education	Medium
Strategy 5: Educate and train Metro employees, facility managers and public visitors on water conservation.	5.1 Create water conservation training for employees responsible for most water use, including parks operations, animal keepers, transfer station operations and building maintenance.	Education	High
	5.2 Educate truck wash users at waste transfer stations on water conservation. Install signage.	Education	Low
	5.3 Integrate rainwater harvesting where possible as a demonstration in new construction at Metro parks.	Education	Low
Strategy 6: Create a funding strategy for water conservation projects.	6.1 Create funding mechanisms for water conservation projects, including new and existing capital. Evaluate water-related projects in advance of Renewal and Replacement schedule and leverage R&R funds to implement. Establish return on investment (ROI) standards for water conservation projects that would enable them to be prioritized and selected for funding.	Funding	High

Strategies and actions: Habitat enhancement

Metro recognizes that protecting and improving fish and wildlife habitat and ecosystem health are critical elements of an effective, sustainable business model and internal operations plan. This portion of the plan provides guidance and recommendations for integrating habitat-friendly principles, approaches and practices into the development, management and maintenance of Metro's spectrum of built and natural properties. As these habitat strategies and actions are implemented over time, Metro's properties will contribute to restoration and enhancement of vital ecosystem services, water quality improvements, protection and improvement of wildlife habitat and enhancement of human health and well-being.

13Landscape plants that produce berries provide an important food source for birds.

Metro's Habitat sustainability strategies address two key areas: increasing habitat quality and ecological function on Metro-owned and operated properties (healthy habitat) and minimizing the negative development footprint on these properties via use of habitat-friendly and low impact development practices (walking the talk).

Guiding principles for habitat enhancement on developed properties

- **Model use of habitat-friendly development practices.** Lead in implementing and modeling innovative, sustainable, habitat-friendly planning, design, building, operations and maintenance practices across a spectrum of natural and built properties.
- **Prioritize design and development practices that provide multiple benefits.** Implement solutions that serve multiple functions and provide multiple benefits. For example, when completing a project such as a roof replacement, installing an ecoroof will extend the life of the roof, provide pollinator and wildlife habitat, reduce stormwater runoff and help regulate building temperature.
- **Balance development, human needs and the health of natural systems.** Protecting, restoring, and managing habitat and ecosystem function at all scales is a priority. This means Metro's operation, maintenance, and development activities should always seek to improve ecosystem functions and avoid impacts to wildlife habitat. If impacts do occur, they should be minimized to the greatest extent possible.

Habitat enhancement strategies and actions

Habitat enhancement			
Strategy	**Actions**	**Action type**	**Priority**
Strategy 1: Assess and prioritize habitat and stormwater improvement opportunities on all Metro properties.	1.1 Conduct habitat and stormwater site assessments at all Metro properties, especially developed properties. Use assessments to develop habitat and stormwater improvement site plans. Stormwater improvement plans should complement Metro's Total Maximum Daily Load (TMDL) plan and connect to other stormwater program efforts (i.e. City of Portland's Grey to Green Program).	Assessment	High 
Strategy 2: Take action to improve habitat value, ecological function and reduce stormwater runoff from all Metro properties.	2.1 Implement habitat improvement site plans for Metro properties, including developed sites.	Operations	High
	2.2 Implement stormwater improvement site plans for all properties, using low-impact development (LID) strategies that reduce runoff and then treat stormwater on-site.	Operations	High
	2.3 Reduce use of herbicides and pesticides in all Metro operations. Create and implement an IPM (Integrated Pest Management) policy to reduce use of herbicides and pesticides on all Metro properties. Policy should address the unique needs of different property types, including developed property landscapes and natural area restoration needs. Program should phase out high risk pesticides as indicated by Salmon Safe. Begin tracking and of all herbicides and pesticides used by Metro staff and contractors.	Policy	Medium [13]
Strategy 3: Create requirements for using habitat-friendly development practices in construction projects for new and/or existing buildings and properties	3.1 Create habitat and stormwater requirements for all projects (new and existing capital).Establish opportunity review as a pre-planning requirement. Require use of habitat project checklist and multi-disciplinary teams to evaluate habitat impact and opportunities.	Program Policy Funding	High
	3.2 Develop and implement funding mechanism for projects that reduce GHG emissions, including new and existing capital. Include funding for maintenance of habitat-friendly development projects and monitoring habitat improvements over time.	Funding	Medium

[13] The creation of an IPM policy is ranked as a high-priority action for toxics reduction, but didn't rank as high as a habitat protection action. However, since there are multiple benefits to reducing pesticides, the action appears in both sections.

Strategy 4: Educate Metro employees on habitat-friendly development practices, especially property and project managers.	4.1 Create a list of habitat-friendly development practices and sustainable stormwater BMP's (best management practices) for property managers, and train them on how to use it.	Education	High
	4.2 Implement green building and nature-friendly projects in high traffic and/or highly visible areas to serve as demonstration projects for visitors and employees (i.e. MRC plazas). Projects should showcase innovative features, provide active and/or passive learning opportunities and highlight partnerships.	Education	Medium
	4.3 Identify a "habitat site steward" at each site.	Program	Low
Strategy 5: Track habitat and stormwater improvements on Metro properties.	5.1 Establish effective reporting and monitoring system for improvements to habitat and stormwater at Metro locations. Include reductions in impervious surface area, number of low impact developments installed and natural area metric updates as developed by Natural Areas Program.	Tracking	High 

Strategies and actions: Sustainability management

To successfully implement this plan, several program elements are needed to manage the effort over time. Sustainability management generally refers to the process required to implement an organizational sustainability effort over time. Typical elements of a sustainability management system include:

- Plan: Identify and prioritize projects
- Implement: Implement projects and support systems needed
- Monitor: Check progress of the projects
- Review: Evaluate project effectiveness and overall initiative to inform future efforts[14]

The following strategies and actions cut across all five of Metro's sustainability goals and are necessary to implement this plan.

These actions are all high priority.

Sustainability management strategies and actions

Sustainability management			
Strategy	**Actions**	**Action type**	**Priority**
Strategy 1: Integrate accountability into implementation of sustainability plan.	1.1 Create and adopt an implementation process for the Sustainability Plan. Include method to identify, prioritize and develop plans for projects in the Sustainability Plan. Identify roles and responsibilities of those tasked with implementation of the sustainability plan. Create site-specific work plans for implementation. Update annually.	Program	High 
	1.2 Integrate sustainability goals and desired outcomes into PACe and other performance measures for Metro employees, starting with managers. Not intended to measure performance on absolute numbers, but qualitative effort.	Program	High
	1.3 Conduct annual program evaluation with program stakeholders to evaluate what works well and what needs to be improved. Include check in on barriers and opportunities.	Program	High 
Strategy 2: Create a comprehensive	2.1 Provide basic sustainability training to all Metro employees. See Clackamas County training course "Going Beyond Green: Advancing Sustainability at Clackamas County" for example. Encourage peer-to-peer learning on	Education	High 

[14] The Step-by-Step Guide to Sustainability Planning: How to Create and Implement Sustainability Plans in any Business or Organization. Hitchcock, Willard, 2008.

sustainability training program for Metro employees.	Sustainability through discussion such as "Sustainable Systems at Work" course from the Northwest Earth Institute.		
	2.2 Coordinate provision of subject-specific trainings identified throughout sustainability plan. Partner with Metro Learning Center.	Education	High
Strategy 3: Build funding and staff capacity to implement sustainability plan.	3.1 Create comprehensive funding strategy for sustainability projects. To include: • Sustainability requirements for new capital assets; • Establish opportunity review as a pre-planning requirement and leverage replacement funding to implement; • Develop new fund for sustainability projects that require additional funding beyond existing budgets.	Operations Policy	High 
	3.2 Identify and address staff capacity needed to coordinate site-specific sustainability activities. Build capacity where needs have been identified.	Program	High 
Strategy 4: Create policies and procedures to support sustainability plan and goals.	4.1 Develop and adopt a sustainable procurement policy as directed in Metro Code, "Sustainable Procurement Program".	Procurement Policy	High 
	4.2 Adopt a Metro-wide green building policy to set standards based on the LEED standard for new construction and operations of existing buildings. Include sustainable site management standards for Metro's developed parks and green spaces (i.e. Salmon Safe certification).	Policy	High 
Strategy 5: Update sustainability goals and interim targets on a regular basis.	5.1 Update sustainability goals, including interim targets. Recalibrate goals in 2015 after audits and site plans have been completed.	Program	High
	5.2 Create new sustainability goals to address sustainability gaps of social equity and economic aspects of Metro's operations.	Program	High
Strategy 6: Track progress of sustainability plan implementation and impact on goal areas.	6.1 Develop an ongoing tracking and monitoring system for all five goal areas. System to be electronic or web-based and include data from all Metro locations. Identify and train "knowledge workers" who will input data to the system.	Tracking Program	High 
	6.2 Report annually on performance and progress in five goal areas, and on sustainability projects completed each year.	Tracking Program	High

PART 4: IMPLEMENTATION PROCESS

Creating an implementation process for this Sustainability Plan is critical to the success of the plan. This section provides additional detail on the Sustainability Management action 1.1.

Roles and responsibilities

Since Metro has decentralized operations management, clarification of roles and responsibilities of those involved with implementing this plan is an important first step. The following groups all have a role to play, and their responsibilities need to be clearly identified.

Direct role	Indirect role
Metro-wide Sustainability Committee	Directors
Green Teams at Convention Center, Metro Regional Center, Zoo and Solid Waste	COO, Deputy COO and General Manager of Venues
Operations and property managers	Metro Council
Project managers	Metro Learning Center
Sustainability Program	Finance and Regulatory Services
Sustainable Procurement Program (Procurement Services)	Metro Employees
Data collectors	Employee unions
	Human Resources

Development of site-specific work plans

Since this plan is intended to be broadly applicable across Metro's diverse operational portfolio, site-specific work plans need to be developed for how this Sustainability Plan will be implemented at each location. These work plans are intended to be tailored to a location's unique needs, services, opportunities and barriers. Work plans should be updated on an annual basis, in concert with the budget process.

Prioritizing projects for funding proposals

In a constrained fiscal environment, Metro will have to make decisions annually about which projects to fund. The following prioritization criteria to be used for project selection.

Prioritization criteria for project selection
Strong impacts on Metro's sustainability goals
Provides a strong foundation for future sustainable operations work.
Leverages dollars elsewhere (outside Metro) or dollars already allocated (such as CIP)
Presents a strong return on investment (financial payback)
Reduce maintenance costs over time
Strong public visibility and/or public education opportunity.
Supports region's economy (i.e. creates local jobs, support local businesses)

Acknowledgements

This plan is the product of a collaborative planning process that involved many Metro employees. Thanks to all who contributed their time, ideas, skills to create this sustainability plan.

Sustainability plan project team

Tom Bugas	Jim Caldwell	Penny Erickson	Corie Harlan	Scott Paskill
Doug Strickler	Rich Thompson	Brittin Witzenburg	Jim Quinn	Katy Weil

Sustainability plan steering committee

Teri Dresler	Matt Korot	Mike Brown	Paul Ehinger	Karen Totaro
Chris Bailey	Lori Kramer	Stephanie Soden	Jim Desmond	Kathryn Sofich

Goal action planning teams

GHG's Team: Nuin-Tara Key (Facilitator) Richard Thompson, Tom Bugas, Brittin Witzenburg, Doug Strickler, Mark Perkins, Ellen Leitner, Rob Smoot and Michele Crim (City of Portland).

Toxics Team: Jim Quinn (Facilitator) Lisa Heigh, Ivan Ratcliff, Mike Amodeo, Seth Miller, Ryan Thorpe, Clyde Keebaugh, Jim Benson and Andrew Judkins.

Waste Team: Will Elder (Facilitator) Michael Weatherman, Abby Stevens, Jim Caldwell, Scott Paskill and Rosalynn Greene (Clackamas County).

Water Team: Kathryn Sofich (Facilitator) Lee Campbell, Lydia Neill, Penny Erickson, Thomas Thornton and Rich Barrows (City of Portland Water Bureau)

Habitat Team: Corie Harlan (Facilitator) Gail Shaloum, Rod Wojtanik, Katy Weil, Hillary Wilton, Matt Uchtman, Linda Richardson and Henry Stevens (Portland Bureau of Environmental Services).

Greenhouse gas emission inventory

Nuin-Tara Key, Metro Climate Project Specialist, Project Manager

Metro Chemicals Inventory Hazard Evaluation and Management Tool

Lisa Heigh, Metro Toxics Reduction Planner, Project Manager

Greg Higgins, Ph.D. Director, Chemical Risk Information Service, Center for Research on Occupational and Environmental Toxicology at OHSU

Consulting team:

Brightworks: Assistance with sustainability impacts assessment and baseline analysis for water, waste and habitat.

Good Company: Facilitated the use of its proprietary calculation tool technical assistance related to calculator use, support and guidance in data gathering and development of estimation methods. Good Company also completed the EIO-LCA analysis for all Metro functional groups.

Project manager:

Molly Chidsey, Metro Sustainability Coordinator

APPENDICES

Appendix A	Metro operations Included in Sustainability Plan
Appendix B	Summary of impacts: Inputs and outputs, major and minor impacts
Appendix C	Greenhouse gas emissions from Metro's supply chain
Appendix D	Toxics baseline: Product health, environmental and physical hazard ratings
Appendix E	Toxics inventory product categories
Appendix F	Habitat-friendly development practices, Metro Nature in Neighborhoods Program
Appendix G	Essential actions for years 1-3 (2011-2014)
Appendix H	Glossary of terms

Appendix A

Metro operations Included in Sustainability Plan

Parks and Environmental Services

- Metro Regional Center (including operation of Metro departments based there)
- Solid Waste Operations
    - Metro Central Transfer Station
    - Metro South Transfer Station
    - Metro Central and South Household Hazardous Waste Facilities
    - St. Johns Landfill
    - MetroPaint
- Regional parks (including Blue Lake, Oxbow and Smith and Bybee Lakes)
- Glendoveer Golf Course
- Pioneer Cemeteries

Visitor Venues

- Oregon Zoo
- Oregon Convention Center
- Portland Center for the Performing Arts
    - Keller Auditorium
    - Arlene Schnitzer Concert Hall
    - Antoinette Hatfield Hall
- Expo Center

Sustainability Center

- Parks Planning
- Land Conservation
- Boreland Field Station and Native Plant Center

Appendix B

Summary of impacts: Inputs and outputs, major and minor impacts

Parks & Natural Areas	INPUTS	Energy	Materials	Contractors	Stakeholders	Community
	MAJOR	Visitor transit, maintenance vehicles	Herbicides, garbage bags, promotional materials, gloves/gear, building materials	Herbicide application	Visitors, neighbors	Lack of mass transit, unequal access to sites
	MINOR	Residential rentals	Soil amendment materials, paint, gravel, asphalt	Timber management	Renters	Vandalism
	OUTPUTS	Products/Services		Waste		
	MAJOR	Land conversion		Food waste, visitor waste, invasive plants, oil/water pollution from marine facilities		
	MINOR	Agricultural leases, fertilizer runoff		Stormwater runoff, building construction debris, remnant restoration materials		

MERC Venues	INPUTS	Energy	Materials	Contractors	Stakeholders	Community
	MAJOR	Building energy use, event energy use, visitor transportation, parking	Food service supplies, cleaning materials, office supplies, building supplies	Food service, janitorial	Staff, general public, presenters, promoters, ticket buyers	Transit
	MINOR	Energy use from equipment, fleet, machinery	Equipment, fleet, machinery, air filters	Security, herbicide and landscape management	Public agencies	Moving events city to city
	OUTPUTS	Products/Services		Waste		
	MAJOR	Nature of events (promote unsustainable lifestyles) facility land usage (largely developed)		Food waste, materials brought to venues by presenters, paper towels, wastewater, solid waste, greenhouse gases, stormwater runoff		
	MINOR	Greenhouse gases		Air filters		

Solid Waste Facilities	INPUTS	Energy	Materials	Contractors	Stakeholders	Community
	MAJOR	Electricity, HVAC	Uniforms/personal protection equipment (PPE) packaging (i.e. drums) paint cans/ingredients, absorbents	Waste transport	Customers, regional private solid waste facilities	Neighborhoods around facilities
	MINOR	Space heating, lighting	Lubricants, solvents, cleaners, office paper and products, computers, vehicles (rolling stock) light bulbs, herbicides. landfill equipment	Transfer station operator, hazardous waste disposal, landscaping	Manufacturers (product stewardship) paint users	Air pollution from vehicles, traffic, dust from transfer sites, noise
	OUTPUTS	Products/Services		Waste		
	MAJOR	Greenhouse gas release (methane flaring) waste transfer, large facility footprint		Hazardous waste from public disposal, solid waste from public, air pollution, stormwater		
	MINOR	Paint use by customers		Empty paint cans, used PPE, cleanup water, truck water discharge		

Oregon Zoo	INPUTS	Energy	Materials	Contractors	Stakeholders	Community
	MAJOR	Exhibits, buildings, lighting, general equipment	Food, water, janitorial supplies, building materials	Construction, food concessions	Guests, staff	Neighborhood congestion from traffic
	MINOR	Pumps, vehicles, train	Paper products		Contractors	Parking issues
	OUTPUTS	Products/Services		Waste		
	MAJOR	Visitor transportation, greenhouse gases, congestion on Highway 26, neighborhood congestion from overflow parking		Animal [carnivore] waste, food waste, landscape debris, trash, wastewater, sewage, stormwater, packaging, methane from animals		
	MINOR	Additional waste production, car accidents		Recycling		

Appendix C

Greenhouse gas emissions from Metro's supply chain: Future development of targets and metrics for measuring improvements

By including all Scope 1, 2 and 3 emission sources in the agency baseline Metro integrated a holistic and more accurate approach to accounting for the total emissions associated with Metro's mission-critical business activities. The use of additional high-quality public-domain tools to estimate Scope 3 emissions puts Metro at the forefront of GHG accounting by moving beyond the mandatory reporting, or bare-minimum, boundaries that define the typical GHG inventory. However, this new approach also presents a number of challenges regarding the ongoing tracking and monitoring of Scope 3 reductions. In order to address these challenges without compromising the accuracy or approach of the inventory process, the GHG reduction goal and interim targets are organized under a different framework than the other four sustainability plan goal areas.

In order to clearly understand the current monitoring and tracking limitations associated with Scope 3 emissions, specifically regarding the embodied emissions in purchased goods and services (hereinafter referred to as Supply Chain) it is important to first understand Economic Input-Output-Life-Cycle Assessment (EIO-LCA) and second to understand the limitations of the available EIO-LCA tools and datasets. Current EIO-LCA tools provide GHG emissions data per dollar of product purchased for all sectors of the U.S. economy. The models are based on averages of the U.S. economy as a whole and do not differentiate between types of purchases such as virgin paper vs. 100 percent post consumer recycled content. Therefore, the models do not provide accounting options for product substitution emissions reduction strategies, which is most likely where the majority of Metro's Supply Chain GHG reductions would come from.

The current EIO-LCA models do however capture two Supply Chain GHG reduction strategies; first, emissions reductions associated with shifting procurement from a high emissions intensive category to a less emissions intensive category are captured. For example, shifting food procurement from meat to fruits and vegetables will lead to a demonstrable GHG reduction in Scope 3 emissions. However, there are very few options where Metro can shift procurement of goods in this way given the nature of Metro's responsibilities. The second type of emissions that are captured with the current EIO-LCA models are changes in national emissions intensities associated with the production of goods and services that may result from climate change legislature (e.g. cap and trade legislature). However, Metro has no direct control over these potential emissions reductions and cannot rely solely on this strategy for reducing GHG emissions from its mission-critical business activities.

Given the current limitations with quantifying Supply Chain emissions the following goal and interim targets that address "sub-goal" separately have been developed. Metro's overarching, long-term greenhouse gas emissions reduction goal in-line with existing Metro resolutions, current climate science findings and state and regional GHG reduction efforts. What distinguishes the GHG reduction goal from the other Sustainability Plan areas are the two separate scope goals; a quantitative reduction goal for Scopes 1 and 2 and a second qualitative reduction goal for scope 3.

Based on the current climate science it is evident that we cannot mitigate our current climate impacts without an aggressive greenhouse gas emissions-reduction strategy. Therefore, the current goal, which only calls for arresting operations emissions, is not meaningful enough and could be confusing when compared with the statewide climate goals recognized in Metro Resolution 08-3981.15. The current goal is also at odds with Metro Resolution 09-4080, which recognizes the 350 parts per million (ppm) goal to be in accordance with Metro's agency mission.[16] Reaching the 350 ppm goal requires a reduction in total gross emissions, not just arresting current emission levels. Metro's operations emissions reductions goal should specifically be aligned with State-wide and internal resolution goals.

The other issue to take into consideration regarding the current greenhouse gas emissions goal is that the current goal language implies that Metro will measure both sources and sinks of emissions ("net" emissions). However, established tools and methodologies for calculating sequestered emissions are not currently available and in some cases are cautioned for finer scales than the national or international level, due to complex double counting issues. In addition, there is the potential that framing the agency's GHG reduction goal with a net emissions lens will lead to less aggressive reduction approach; therefore the revised goal and baseline inventory only consider gross emissions. It should be noted however, this goal language does not preclude further analysis or consideration of the climate benefits of Metro's open and natural spaces and habitat restoration programs, but focuses the emissions reduction strategy on gross emissions only. Consistent with this approach, Metro's guiding GHG reduction strategy will place first priority on efficiency projects that reduce energy demand and greenhouse gas emissions, then renewable energy purchase and on-site generation, and last, the purchasing of carbon offsets.

The emissions reduction goal includes both direct and indirect emissions and therefore directs Metro to take responsibility for those emissions that we have indirect, but tangible responsibility over – specifically those emissions resulting from the materials and services Metro consumes and contracts. Metro is using recent Environmental Protection Agency (EPA) research to inform this facet of our baseline analysis and will continue to improve our methodology as new tools and protocols become available. Metro recognizes that there are not currently tools or protocols available that can provide precise and universally accepted estimates of all indirect emissions (Scope 3) however Metro as a public agency has an opportunity to lead by example and take responsibility for the emissions resulting from all aspects of internal operations.

[15] The State of Oregon's 2007 greenhouse gas reductions targets call for arresting the growth of greenhouse gas emissions by 2010, reducing emissions to at least 10 percent below 1990 levels by 2020, and reducing emissions to at least 75 percent below 1990 levels by 2050.

[16] The current level of carbon dioxide in our atmosphere stands at 389 parts per million and rising however, 350 represents the carbon concentration level climate scientists have determined as the minimum GHG reduction goal needed to reach climate stabilization at a roughly 2^{o} Celsius increase.

Appendix D

Toxics baseline: Product health, environmental and physical hazard ratings

The individual chemical constituent ratings are based on well accepted, peer-reviewed data from the reference sources noted below. These ratings describe the relative hazard level of the constituents on a scale from 1 to 3, with 1 representing lower hazard, 2 representing intermediate hazard and 3 representing a higher hazard level. Health ratings are based on criteria including the constituent's acute toxicity, irritant properties and potential to cause cancer or produce developmental or reproductive toxicity. Environmental ratings are based on the constituent's toxicity to aquatic organisms and other indicator species, persistence and tendency to accumulate in the environment and potential to damage the ozone layer. Physical hazard ratings consider the constituent's flammability risk level and potential for reactivity. The procedures used to develop ratings from these data are described in the Scoring Criteria Tables developed for this program at http://www.ohsu.edu/cris/documents/criteria.pdf.

Since queries made to these data sources use the Chemical Abstract Service (CAS) number, only those constituents that have CAS numbers displayed on the MSDS are assigned a rating. The following ratings and entries can appear in the search results for each individual constituent.

Rating definition	
1	Lower rating for health, environmental or physical hazard
2	Intermediate rating for health, environmental or physical hazard
3	Higher rating for health, environmental or physical hazard
No CAS#s	No Chemical Abstracts Service number is available for the constituent in question, so it cannot be accessed in the various database sources to generate a rating
ND No Data	Indicates that the specific CAS# in question is not included in the database(s) searched and the constituent cannot be rated
NR Not Rated	Indicates that the CAS# in question is included in the database(s) searched, but does not bring up any data upon which to base a rating

The ratings are based primarily on data from the European Union list of harmonized chemical classifications (referred to as the Annex I list). This list, which uses a series of risk phrases to classify relative hazard levels, was accessed on December 2008 and can be found at: http://www.ohsu.edu/cris/documents/annex.pdf.

Appendix E

Toxics inventory product categories

ACID	Acids
ART	Art supplies
AUTO	Automotive, auto-specific chemicals, cleaners, waxes, body fillers, etc.
BAT	Batteries
CEM	Cements, adhesives, glues and resins
CHEMO	Chemicals, other
CHEMP	Chemicals, photographic
COMP	Compressed gases
DIS	Disinfectants
FERT	Fertilizers and landscaping products
FLOOR	Floor cleaning products and finishes
FUEL	Fuels
GREASE	Grease
HSOAP	Hand soaps and lotions
ICLEAN	Industrial cleaners and soaps
LUBE	Lubricants
OFF	Office supplies
OIL	Oils
OTHER	Other, "inert" materials including grinding wheels, saw blades, etc.
PEST	Pesticides and herbicides
PLIQ	Paints and coatings, liquid
PLUMB	Plumbing supplies
PSPRAY	Paints and coatings, spray
SAFE	Safety supplies
SEALER	Sealers, caulking, silicone sealers
SOLV	Solvents
VET	Veterinary products
WATER	Water testing chemicals
WELD	Welding supplies and metals

http://www.ohsu.edu/cris/documents/search.pdf

Appendix F

Habitat-friendly development practices, Metro Nature in Neighborhoods Program

http://www.metro-region.org/index.cfm/go/by.web/id=13745

Part (a): Design and construction practices to minimize hydrologic impacts
1. Amend disturbed soils to original or higher level of porosity to regain infiltration and stormwater storage capacity.
2. Use pervious paving materials for residential driveways, parking lots, walkways, and within centers of cul-de-sacs.
3. Incorporate stormwater management in road right-of-ways.
4. Landscape with rain gardens to provide on-lot detention, filtering of rainwater, and groundwater recharge.
5. Use green roofs for runoff reduction, energy savings, improved air quality, and enhanced aesthetics.
6. Disconnect downspouts from roofs and direct the flow to vegetated infiltration/filtration areas such as rain gardens.
7. Retain rooftop runoff in a rain barrel for later on-lot use in lawn and garden watering.
8. Use multi-functional open drainage systems in lieu of more conventional curb-and-gutter systems.
9. Use bioretention cells as rain gardens in landscaped parking lot islands to reduce runoff volume and filter pollutants.
10. Apply a treatment train approach to provide multiple opportunities for storm water treatment and reduce the possibility of system failure.
11. Reduce sidewalk width and grade them such that they drain to the front yard of a residential lot or retention area.
12. Reduce impervious impacts of residential driveways by narrowing widths and moving access to the rear of the site.
13. Use shared driveways.
14. Reduce width of residential streets, depending on traffic and parking needs.
15. Reduce street length, primarily in residential areas, by encouraging clustering and using curvilinear designs.
16. Reduce cul-de-sac radii and use pervious vegetated islands in center to minimize impervious effects, and allow them to be utilized for truck maneuvering/loading to reduce need for wide loading areas on site.
17. Eliminate redundant non-ADA sidewalks within a site (i.e., sidewalk to all entryways and/or to truck loading areas may be unnecessary for industrial developments).
18. Minimize car spaces and stall dimensions, reduce parking ratios, and use shared parking facilities and structured parking.
19. Minimize the number of stream crossings and place crossing perpendicular to stream channel if possible.
20. Allow narrow street right-of-ways through stream corridors whenever possible to reduce adverse impacts of transportation corridors.
Part (b): Design and construction practices to minimize impacts on wildlife corridors and fish passage
1. Carefully integrate fencing into the landscape to guide animals toward animal crossings under, over, or around transportation corridors.
2. Use bridge crossings rather than culverts wherever possible.
3. If culverts are utilized, install slab, arch or box type culverts, preferably using bottomless designs that more closely mimic stream bottom habitat.
4. Design stream crossings for fish passage with shelves and other design features to facilitate terrestrial wildlife passage.
5. Extend vegetative cover through the wildlife crossing in the migratory route, along with sheltering areas.
Part (c): Miscellaneous other habitat-friendly design and construction practices
1. Use native plants throughout the development (not just in HCA).
2. Locate landscaping (required by other sections of the code) adjacent to HCA.
3. Reduce light-spill off into HCAs from development.
4. Preserve and maintain existing trees and tree canopy coverage, and plant trees, where appropriate, to maximize future tree canopy coverage.

Appendix G

Essential actions for years 1-3 (2011-2014)

Resources needed

$	Low cost
$$	Moderate cost
$$$	Significant cost

GREENHOUSE GAS REDUCTION

1.1	Audit buildings for energy efficiency opportunities and develop recommendations for an energy efficiency plan specific to each site. Audit type should be appropriate to the building type (i.e. ASHRAE[17] Level 2 audit for buildings over 10,000 square feet.)	**$**
1.2	Implement energy efficiency plans and develop supporting policies for each site audited.	**$$$**
4.1	Establish process for ongoing tracking of all GHG-related data sources in Metro's internal operations for tracking of GHG emissions.	**$**

TOXICS REDUCTION

1.1	Establish process for ongoing tracking and inventory of chemicals and products that contain toxics in use at Metro.	**$**
2.1	Identify the most toxic products in Metro's inventory and target them for replacement with less-toxic alternatives.	**$**
2.2	Reduce use of herbicides and pesticides in all Metro operations. Create and implement an IPM (Integrated Pest Management) policy to reduce use of herbicides and pesticides on all Metro properties.	**$**
3.1	Reduce purchase of toxic products by requiring or requesting least-toxic options from contractors and suppliers in bids and RFP's.	**$$**

WASTE REDUCTION

1.1	Create procurement policies and procedures that support waste prevention and reduction.	**$**
3.1	Meet Business Recycling Requirements at all Metro facilities.[18]	**$**
7.1	Track waste generation and recycling data for all Metro locations with an electronic reporting system to track waste generation and recycling from all Metro locations.	**$**

[18] Metro Business Recycling Requirements, adopted in 2008. http://www.recycleatwork.com/whatsrequired.

WATER CONSERVATION

1.1	Audit water usage at all Metro locations that have not had a recent water audit to and develop recommendations for water conservation strategies specific to each site.	**$**
2.1	Ensure implementation of water conservation projects identified in the Zoo Master Plan (to be completed in 2011).	**$$$**
2.4	Create requirement that all water fixture and equipment purchases be water efficient.	**$$**
4.1	Create ongoing tracking system for all water uses at Metro locations. Include on-site water sources such as wells. Utilize submeters to track detailed water usage; create a regular reading and recording schedule.	**$**

HABITAT ENHANCEMENT

1.1	Conduct habitat and stormwater site assessments at all Metro properties, especially developed properties. Use assessments to develop habitat and stormwater improvement site plans.	**$**
5.1	Establish effective reporting and monitoring system for improvements to habitat and stormwater at Metro locations.	**$**

SUSTAINABILITY MANAGEMENT

1.1	Create and adopt an implementation process for the Sustainability Plan.	**–**
1.3	Conduct annual program evaluation with program stakeholders to evaluate what works well and what needs to be improved.	**–**
2.1	Provide basic sustainability training to all Metro employees.	**$**
3.1	Create comprehensive funding strategy for sustainability projects.	**–**
3.2	Identify and address staff capacity needed to coordinate site-specific sustainability activities. Build capacity where needs have been identified.	**$$**
4.1	Develop and adopt a sustainable procurement policy as directed in Metro Code, “Sustainable Procurement Program”.	**$**
4.2	Adopt a Metro-wide green building policy to set standards based on the LEED standard for new construction and operations of existing buildings. Include sustainable site management standards for Metro’s developed parks and green spaces.	**–**
6.1	Develop an ongoing tracking and monitoring system for all five goal areas.	**$$**

Appendix H

Glossary of terms

ASHRAE: American Society of Heating, refrigerating and Air-Conditioning Engineers. ASHRAE writes voluntary consensus-based standards including energy auditing standards for commercial building systems.

Ecosystem services: Essential goods and services of direct or indirect benefit to humans that are produced by ecosystem processes involving the interaction of living elements, such as vegetation and soil organisms and non-living elements, such as bedrock, water and air. (Sustainable Sites, 2009)

EPA Tier system: EPA's federal Clean Air Nonroad Diesel Rule is part of a national program to reduce emissions from nonroad diesel engines, with the goal to decrease pollution from diesel engines by more than 90 percent. http://www.epa.gov/nonroad-diesel.

Greenhouse gas: Six gasses recognized as contributors to global climate change, including carbon dioxide (CO_2) methane (CH_4) nitrous oxide (N_2O) sulfur hexafluoride (SF_6) perfluorocarbons (PFC's) and hydrofluorocarbons (HCFC's).

Habitat-friendly development: Also known as low impact development, is an ecologically friendly approach to building and site development and stormwater management where a developed site mimics natural systems and their functions in order to remain a functioning part of an ecosystem.

PBT: Persistent, Bioaccumulative and Toxic Chemical

Precautionary principle: When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

Salmon Safe: An independent 501(c)3 nonprofit based in Portland Oregon with a mission to transform land management practices so Pacific salmon can thrive in West Coast watersheds.

Sustainability: "Sustainability" means using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community objectives. Definition adopted by Metro Council 2008.

Contact information

Molly Chidsey
Sustainability Coordinator
Metro
503-797-1690
molly.chidsey@oregonmetro.gov