



2008 Metro Facilities Master Plan

August 2008



Executive Summary

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Introduction

Metro owns and maintains two solid waste transfer station facility complexes in the Portland Metropolitan region: Metro South Station (MSS) and Metro Central Station (MCS).

Metro South Station is on an approximately 12-acre site in Oregon City, in Clackamas County. The station opened in 1983 as the Clackamas Transfer and Recycling Center. The region's growth and additional services at MSS have generated a substantial increase in traffic and the corresponding site management issues that develop through vehicle volume changes. Metro South has functioned well as a transfer station and material recovery facility after several expansions and equipment additions throughout its 25 years of operation.

MSS has reached its maximum site use capacity as a result of its increase in vehicle traffic. The traffic increase is based on a growing number of public self-haul customers. This increase in public self-haul facility use is an unprecedented trend in the solid waste industry. It's the result of a regional increase in home ownership, the corresponding home improvements by owners, and the limitations by collection companies on disposal weight and container size.

The 2008 Metro Self Haul Study indicates a steady increase in the public demand for this service. The agency's research indicates that self haul is 11% of the waste stream volume and 54% of the loads at its facilities.

This issue of site capacity has created safety and traffic flow concerns at what has become

a congested facility. URS has made specific recommendations for site and facility modifications, which should improve traffic flow and some capacity issues on the site.

These recommendations, however, provide only a temporary facility solution. The best solution for Metro is an additional regional transfer station. This facility could be designed and built to serve only commercial customers, while Metro maintains the current facility for public use only. A new facility could also serve both commercial and public use.

Metro Central Station is on a 10.4-acre site in an industrial area of Northwest Portland within Multnomah County. Metro Central began operations in 1991, and has functioned well as a transfer and material recovery facility. URS research and interviews with MCS personnel have identified issues of concern about stormwater management, facility water use, traffic flow related to one of the scalehouses, general maintenance, and material recovery. URS has made recommendations to Metro about these issues to help the MCS site optimize its functions for a number of years.

Facilities Master Plan Update Objectives

URS developed this Plan Update based on five objectives that Metro has identified to consider the current conditions and future opportunities for its South and Central transfer stations. These objectives are to:

- Improve the sustainability of the waste transfer operations
- Improve customer service
- Provide flexibility in materials handling and recovery
- Increase operational efficiency and employee safety
- Improve hazardous waste facilities capacity

Plan Preparation Methodology

URS prepared this 2008 Facilities Master Plan Update through a comprehensive approach that included a sequence of research tasks to:

- Examine the historical context of the facilities and Metro’s current and future roles in the solid waste system
- Examine the current capital and operating conditions at the facilities
- Conduct a facilities needs assessment based on interviews with stakeholders
- Assure Plan conformance with the 2008 Regional Solid Waste Management Plan Update
- Review traffic safety issues at the facilities
- Recommend specific actions for each facility

Recommendations

URS made the following recommendations based on the facilities needs assessments determined through interviews with Metro Headquarters, MSS, and MCS operations personnel. The recommendations are in two categories:

- Overall operations and non-facility recommendations that Metro should consider
- Specific facility design options that include cost estimates.

Metro South Station Recommendations

Recommendation 1: Decide on Future of MSS Site

Metro should make a decision to begin the process to identify and acquire a future site to accommodate either a commercial only transfer station or a full transfer facility complex that includes services for the general public and commercial haulers. This process should start as soon as possible because it will require a minimum of five years for Metro or a private operator to site, design, permit and open a facility.

Recommendation 2: Upgrade Lighting in Bay 1

URS recommends upgrading the lighting conditions in Bay 1 by either including a new lighting network or replacing the roof deck with translucent panels to provide natural light during daylight operating hours.

Lighting System Upgrade Cost Estimate: \$317,890

Translucent Roof Installation Cost Estimate: \$295,350

Recommendation 3: Replace Site Signage

URS recommends that Metro install an overhead road sign indicating lane use for public and commercial traffic. This system should be an electronic reader board that allows Metro to provide current information for its users as the site operations change throughout the day.

Please see Figure 3 in Appendix A.
Site Signage Replacement Cost Estimate:
\$297,250

Recommendation 4: Central Office Location at MSS

MSS lacks a central office location with easy access. The existing office is in a difficult, almost hidden location, on the second floor on the west side of the tipping pit between Bay 1 and Bay 2. Staff facilities are dispersed in various locations with bathrooms below the office between Bay 1 and Bay 2, and in the northwest corner of the Bay 3 building. There is also a break room with bathrooms in the maintenance facility on the east side of the property.

There is an existing operations room, overlooking the load-out pit, which Metro does not use. Metro could expand this room to accommodate the office without compromising the electronic equipment. This change can be done easily and economically without disrupting the facility and would place the office in a central location for easy access.

Please see Figure 5 in Appendix A.
Central Office Location Cost Estimate:
\$147,030

Recommendation 5: Post HHW Hours of Operation

Metro should post the appropriate notice at the scalehouse to advise customers that the HHW facility is closed on Sundays with a suggestion to use this service during off-peak days and hours for better service. It should also use a system of traffic cones to indicate how the reach the facility when users enter the site.

Recommendation 6: Bay 3 Building Expansion at MSS

The Bay 3 Building is operating at capacity under the existing conditions. The building is used primarily for the recovery of construction and demolition recyclables with a floor sort and sort line process. The accumulation of incoming material often overwhelms the recovery capacity of the sorters. The result is that the material has to be discarded to provide floor space for incoming waste. This expansion will provide an increase in the tipping floor size.

The construction of the proposed building expansion can be done while Bay 3 is in operation. Traffic can be restricted to enter/exit Bay 3 from the west side only. There will be a short period of impact, limited to 25 feet from the east wall, during the demolition/relocation of the existing east wall. The expanded 12,500 square foot building would house the relocated existing sort line and would be dedicated to the recovery function.

An expansion of Bay 3 would also require a reconfiguration of the ramp area to add space for container storage. This change would improve the overall use of the container storage area within the transfer station site.

Please see Figures 2 and 4 in Appendix A.
Bay 3 Expansion Cost Estimate:
\$1,686,210

Recommendation 7: Container Parking Area Relocation at MSS

Metro, to expand the Bay 3 building, should relocate the existing transfer trailer parking location to provide space for the expansion. The remaining area on site that is not developed is the 'hill' on the south-east

portion of the site. The relocation requires widening the road that provides access to the pre-compactors. Metro can develop a parking location for the transfer trailers southward towards the ‘hill.’

Please see Figure 2 in Appendix A.

Container Parking Relocation

Cost Estimate: \$968,310

Recommendation 8: Upgrade Building Facades

Metro should replace a portion of the south wall panels that face Washington Street with translucent panels. These panels will improve the appearance of the façade and add light for the Bay 1 tipping floor.

Please see Figure 6 in Appendix A.

Translucent Wall Panel Installation Cost Estimate: \$29,000

Recommendation 9: MSS Truck Entrance Improvements and Landscaping

Metro, in its continuing effort to be a good neighbor, should improve the MSS entrance/exit east of Bay 1 with new landscape materials. This should include new plants on both sides of the exit road to narrow the visual opening into the transfer station for vehicle traffic and the Home Depot store customers.

The Washington Street side of the facility also requires additional landscape materials to provide a better visual buffer from the public right of way.

Please see Figure 3 in Appendix A.

Truck Entrance Improvements

Cost Estimate: \$67,430

Metro Central Station Recommendations

Recommendation 10: Wheel Wash

The waste collections vehicles that use MCS must back-in a considerable distance to deposit their loads of MSW, which are then stacked against the north push wall. The leachate from the MSW mixes with waste residue into a thick, viscous material that is picked up by the trucks’ tires as they leave the unloading area. This situation contributes to exceeding the maximum allowable levels of suspended solids in the surface drainage system. Metro should install wheel washes in each bay to mitigate this situation.

Wheel Wash Cost Estimate: \$91,600 (Per Bay)

Please see Figure 6 in Appendix B.

Recommendation 11: Truck Wash

The truck wash, because of its location and unfortunate overuse by some operators, has an issue with careless water use as well as organics entering the oil-water separator.

URS recommends a complete re-construction of the truck wash floor area. The recommendation is to demolish and remove the existing floor as well as the drainage system and the existing oil-water separator.

Metro should install a new concrete floor with a trench drain that would have screen filters prior to the new oil-water separator. The three screen filters are placed prior to the oil-water separator with easy access for removal and cleaning.

In addition, URS recommends that Metro install a metered water timer that allocates a quantity of water per use period. Once the

water quantity is consumed the system will not reactivate within a preset period (15 minutes). Metro should also consider installing a closed circuit camera to monitor the wash area and reduce damage to the wash system.

Please see Figure 7 in Appendix B.

Truck Wash Cost Estimate: \$109,960

Recommendation 12: Ventilation

The URS due diligence during site visits to MCS included an observation that some roof ventilation fans were operating in varying degrees of rotation and others were clearly not operating at all. This implies that the drive belts from the motor might be slipping or that the motors are not performing. The fans require a maintenance check to verify if the fan belts are operating properly and the motors are operating under designed loads. URS could not verify when the last maintenance was performed on the fans.

Recommendation 13: Scalehouse A Improvements

Metro should renovate and refurbish the interior of this scalehouse. The current furniture layout does not provide a comfortable internal circulation.

Recommendation 14: MCS Waste Process Line

URS recommends that Metro design and install a new process sort line for construction and demolition waste at MCS. This new line will allow the MCS operator to recover greater levels of the top commodities: wood, metal, plastic and cardboard.

Please see Figure 4 in Appendix B.

**Waste Process Line Cost Estimate:
\$864,000**

Recommendation 15: HHW Facility Expansion

There is a difference of opinion between management and staff about the necessary space requirements for staff at this facility. The collection of HHW does not require offices. It is a simple operation of removing the material from vehicles and placing it in the designated carts. URS observed that the existing storage space available for hazardous materials is sufficient.

This facility has an unused existing loading ramp that is a hindrance to operations. URS recommends an expansion for the HHW facility to improve access, provide more area for non-hazardous material management, and create more space for operations.

**HHW Facility Expansion Cost Estimate:
\$863,000**

Recommendation 16: Capture and Reuse Stormwater

URS recommends redirecting the roof drainage system to capture, store and reuse the stormwater to wash trucks. Capturing the average storm event on 83% of the facility's roof area should provide approximately 42,000 gallons of water for the truck wash.

The 2001 Facility Master Plan included a description of this recommendation on page 3-23 and a drawing in Figure MCS-12.

Please see Figure 2 in Appendix B for tank location.

1-1. Facilities Master Plan Update Objectives

This Plan Update is based on five objectives that Metro has identified to consider the current conditions and future opportunities for its South and Central transfer stations. These objectives are to:

- Improve the sustainability of the waste transfer operations
- Improve customer service
- Provide flexibility in materials handling and recovery
- Increase operational efficiency and employee safety
- Improve hazardous waste facilities capacity

1-2. Plan Preparation Methodology

URS prepared this 2008 Facilities Master Plan Update through a comprehensive approach that included a sequence of research tasks to:

- Examine the historical context of the facilities and Metro’s current and future roles in the solid waste system
- Examine the current capital and operating conditions at the facilities
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1-3. The History of Metro

The initial consideration of Metro began in 1977 as a ballot measure referred to the voters by the Oregon State Legislature. Then known as the Metropolitan Service District (MSD), voters approved combining the MSD with a separate, earlier form of regional government known as CRAG, the Columbia Region Association of Governments.

Metro began official operations in January 1979 with the responsibilities to manage the urban growth boundary process, solid waste planning, and the Washington Park Zoo. Its first large role in the region’s solid waste system was a 1980 assignment to manage the St. Johns Landfill in North Portland.

1983 was an important year for Metro’s increasing management of the region’s solid waste. The agency opened the Clackamas Transfer and Recycling Center in Oregon City. Now known as the Metro South Transfer Station, this facility is one of two Metro-owned regional stations. The second station, Metro Central Transfer Station in Northwest Portland, opened in 1991.

The opening of Metro Central coincided with the closure of the St. Johns Landfill. A 1989 decision by the Metro Council to select a new, out-of-region disposal site and sign a long-term agreement with Waste Management, Inc., also mandated a transfer station to replace the landfill. The new disposal site, known as the Columbia Ridge Landfill, began receiving Metro regional waste in 1990. This waste was shipped to the site in Arlington, Oregon, by long-haul transfer trailers through a separate transportation contract.

This combination of transfer, transport and distant landfill disposal site are the fundamental components of Metro’s management system in 2008. Many regional solid waste issues and solutions have evolved over the two decades since the initial Metro Council decisions about managing waste. The most comprehensive recognition of those changes may be Metro’s iterative update of its Regional Solid Waste Management Plan.

Today, of course, the Metro region is much different than it was in 1979. Its growth and the corresponding development of Metro’s roles and responsibilities reflect a more complex set of regional issues. Metro is a directly elected government with a president and six councilors. The president is a region-wide role; the councilors represent specific districts. This government serves 1.3 million citizens in Clackamas, Multnomah and Washington Counties and the 25 cities within the region.

The extent of Metro’s mission today may be best understood by the results of a February 2006 survey of its citizens to identify the region’s leading values and beliefs. This research, conducted by a private firm, identified the issues and planning priorities during the decade between 2006 and 2016.

The issues in order of importance are:

- Education
- Traffic congestion and transportation
- Economy and jobs
- Population and growth
- Environmental quality
- Housing
- Healthcare
- Taxes

Education was identified as the only top tier issue. Environmental Quality, fifth on the list, was considered a third-tier issue.

The top ten planning priorities from the survey, which include three top-tier environmental issues, are:

- Protecting area rivers and streams
- Protecting air quality
- Preserving farm and forestland
- Protecting existing neighborhoods
- Building new roads and highways
- Nurturing citizen commitment to community and civic involvement
- Building light rail extensions
- Revitalizing town centers
- Opening up farm and forestland to new and expanding businesses

1-4. Metro’s Role in the Solid Waste System

Metro’s role in the regional solid waste system, which is guided by the Council and managed by its Solid Waste and Recycling Department, is described in the 2008 Regional Solid Waste Management Plan Update (RSWMP) as:

“Metro is responsible for solid waste planning and disposal in the region. As part of these responsibilities, Metro develops and administers the RSWMP. Metro is accountable for state-mandated waste reduction goals in the tri-county region, and works with its local government and private sector partners to accomplish these goals. Metro provides funding assistance to local governments for waste reduction programs, and operates household hazardous waste prevention and collection programs in the region.”

Metro oversees the operation of two Metro-owned regional transfer stations and administers contracts for the transport and disposal of that waste. Metro also oversees a system of franchises and licenses to regulate privately owned and operated solid waste facilities that accept waste from the region. Finally, Metro plays a role in the closure and monitoring of several landfills located in the region.”

The Solid Waste and Recycling Department’s responsibilities have grown and changed through activities that parallel regional growth and a solid waste system that has matured through almost three decades of management. These changes reflect greater efforts for material recovery that match an increasing demand to meet regional goals for sustainability.

The 2008 Facilities Master Plan Update reviews the operations of the Metro South Transfer Station and the Metro Central Transfer Station in the context of the regional solid waste system. The last plan update, completed by URS in 2001, has been followed by a series of important studies by Metro. This research includes the:

- 2001-2002 Strategic Plan: this plan identified nine goals and a direct link to Metro’s mission for regional sustainability.
- 2004 Regional Transfer Capacity Analysis: this research estimated that by 2015 the region’s facilities will receive approximately 1.56 million tons per year.
- 2006 Metro Transfer System Ownership Study: this Phase 1 study considered the best way to deliver safe, environmentally sound and cost-effective disposal services to the region.
- 2006 Waste Reduction Plan: this plan produced a regional recovery rate forecast of 64% by 2009.
- 2007 Metro Solid Waste Transportation Study: this white paper investigated the alternative transportation modes available for the next selection process for long-haul disposal.
- 2008 Regional Solid Waste Management Plan Update: this update will guide Metro’s ten-year effort to manage the region’s waste.

1-5. The Regional Solid Waste Management Plan

Metro completed the previous update of the RSWMP in 1996. Over the ensuing decade, 1995 to 2005, the regional population grew approximately 18%, but the corresponding waste generation rate increased over 50%. The Metro region is growing and so is the amount of waste its citizens generate.

This substantial change in just one decade indicates how important the 2008 RSWMP Update is to region’s management strategy. The RSWMP describes the plan’s purpose as:

“The Regional Solid Waste Management Plan (RSWMP, or the Plan) is a document that:

- *Serves as a regional framework for the coordination of solid waste practices.*
- *Provides the region with a program of solid waste system improvements.*
- *Establishes regional solid waste goals and objectives, including an overall waste reduction goal and a plan to monitor progress towards the goals.*

- *Satisfies state law requiring the development of a waste reduction plan for the metropolitan area (ORS 459)."*

The 1996 RSWMP Update described a balanced regional approach with an important emphasis on waste prevention and reduction. It established a series of goals for 2005 that included mandates to:

- Increase the region's recycling rate to 56%.
- Exceed the state's mandated recovery goal of 50%.
- Recycle an additional 200,000 tons of waste annually.
- Eliminate the need for a new, publicly-owned transfer station.

These goals combined a greater focus on waste reduction as a method to create additional transfer capacity for regional growth. This approach supported the continued planning and development of private waste facilities to receive and process materials.

The 2008 RSWMP Update demonstrates how the region's approach to managing waste continues to mature and reflect how Metro's constituents view the future. Today, the focus is on how waste reduction is related to resource conservation through regional sustainability policies. The 2005 recovery goal was 62%; the 2009 recovery goal is 64%. The region reached 59% in 2004, 58.6% in 2005, and 49.5% in 2006.

The new plan combines a historical perspective of how the region reached its current goal with what the future mandates for sustainability and success:

"Historically, the waste reduction rate has been the Plan's primary measure of resource conservation progress. Emphasis on this measure continues in the near term and this Plan identifies policies and programs needed to achieve a 64% waste reduction goal. The Plan also anticipates that other measures of performance in resource conservation will be established in the years ahead and that the RSWMP will be amended to include those measures."

How Metro meets the 64% recovery goal for 2009, which is a five percent increase in two years, is a challenge described in the Plan:

"The Plan is designed to reach the 64% waste reduction goal through targeted efforts in the single-family residential ("curbside"), multi-family residential, business, building industry and commercial organics sectors. Regional work groups, SWAC and Metro Council have worked to develop implementation strategies for each of these sectors. In particular, regional discussions have focused on strategies for the business and building industry sectors."

The title of Chapter V of the 2008 RSWMP Update is Sustainable Operations. As Metro was preparing the plan, it convened a group of solid waste system stakeholders in 2005 to develop sustainability goals. This process to identify and incorporate reasonable practices to meet these goals was based on the following definition of sustainability developed by the state of Oregon:

“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 [ORS 184.421 (4)].”

The nine goals include:

- Reduce greenhouse gas and diesel particulate air emissions
- Reduce stormwater run-off
- Reduce natural resource use
- Reduce use and discharge of toxic materials
- Implement sustainability standards for facility construction and operation
- Adopt best practices for customer and employee health and safety
- Provide training and education on implementing sustainable practices
- Support a quality work life
- Employ sustainability values in seeking vendors and contractors

These goals have also guided the URS approach to the 2008 Facilities Master Plan Update.

1-6. Metro Facilities

The Metro region has seven transfer stations that process and prepare waste loads for landfill disposal. Three of these stations are regional facilities that may receive unrestricted volumes of wet and dry waste. These stations are:

- Metro South Transfer Station (MSS) in Oregon City

- Metro Central Transfer Station (MCS) in Northwest Portland
- Forest Grove Transfer Station in Washington County

Metro owns the South and Central transfer stations. Metro South was built by the agency and opened in 1983. Metro Central is a former industrial facility that opened in 1991. Each facility is operated by Allied Waste Industries, Inc., through a private contract. The Forest Grove station is owned and operated by Waste Management, Inc.

These stations serve public and private customers throughout the region. They receive, process, and prepare waste for delivery to regional landfills for disposal. They also recover materials that are diverted from the disposal sites and sold as commodities. The Metro South and Central stations send their waste by transfer trailers to the Columbia Ridge Landfill near Arlington, Oregon, 150 miles east of Portland. The Forest Grove station’s waste is delivered to the Riverbend Landfill near McMinnville, Oregon, 40 miles southwest of Portland.

The 2008 Facilities Master Plan Update is an analysis of current conditions and future considerations for the Metro South and Central Transfer Stations.

1-7. Additional Regional Facilities

The Metro region is served by a combination of processing, material recovery and disposal facilities. Transfer stations and landfills are the larger regional solid waste system facilities. The 2008 Plan Update analyzes the Metro transfer stations within the context of how the region uses all the available facilities.

The region's four other transfer stations are private operations, considered by Metro as local service facilities, and are part of a regional development pattern that has evolved since the prior facilities master plan update in 2001. These stations are franchised by Metro to accept an annual volume cap of wet waste but unrestricted volumes of dry waste. They operate collection services as well and include:

- Pride Recycling in Sherwood (Pride Disposal)
- Troutdale Transfer Station (Waste Management, Inc.)
- Willamette Resources in Wilsonville (Allied Waste Industries, Inc.)
- (Planned) Columbia Environmental in Northeast Portland (local consortium)

The Metro 2004 Regional Transfer Capacity Analysis considered six transfer stations (Columbia Environmental was a future facility) with significant roles in the solid waste system. The analysis described this complete system overview:

“Metro estimates that the total of wet and dry solid waste generated within the Metro district and ultimately disposed is approximately 1.2 million tons per year. The solid waste system in the region that collects this waste is composed of many interdependent parts – collection, recycling and processing, transfer, transport and disposal, as well as many waste reduction activities. The subject of this report – what capacity do solid waste facilities have to transfer the putrescible or “wet” part of the waste stream to landfills - is best understood as part of the overall system.”

The six transfer stations in the 2004 analysis processed seventy eight percent of the wet and dry waste in the region. The three regional stations (Metro South, Metro Central and Forest Grove) received fifty seven percent of the waste. The three local, private stations received twenty one percent. The remaining twenty two percent, much of it dry waste, was delivered to material recovery facilities and limited purpose landfills.

The 2008 RSWMP Update describes the role that waste disposal serves for the region in the context of transfer operations:

“The region’s system of transfer stations was developed to meet the need to consolidate smaller loads from collection routes into significantly larger loads that could be economically hauled the relatively long distances to general purpose landfills serving the region.

Eight landfills serving the region have entered into Designated Facility Agreements (DFA) with Metro and are considered a part of the region’s solid waste system. Riverbend Landfill has not entered into a DFA, and therefore, customers from the region need a non-system license to use the facility. It is also the nearest landfill authorized to accept municipal solid waste containing putrescible matter (about 40 miles from the center of the region). The shortest “long hauls” are about 30 miles from transfer facilities near the southern boundary of the region; other waste is hauled in excess of 150 miles to a disposal site.

The Hillsboro and Lakeside Landfills are located immediately outside the Metro boundary. These are limited purpose landfills that are permitted by DEQ to only take dry waste and some special wastes.”

The eight landfills have a total available capacity of approximately 590 million tons and include these locations:

- Columbia Ridge, Arlington, Oregon (Waste Management, Inc.)
- Roosevelt Regional, Gilliam County, Oregon (Allied Waste Industries, Inc.)
- Finley Buttes, Goldendale, Washington (Waste Connections, Inc.)
- Hillsboro, Hillsboro, Oregon (Waste Management, Inc.)
- Lakeside Reclamation, Hillsboro, Oregon (Grabhorn)
- Coffin Butte, Morrow County, Oregon (Allied Waste Industries, Inc.)
- Wasco, Wasco County, Oregon (Waste Connections, Inc.)
- Weyerhaeuser, Longview, Washington (Weyerhaeuser)
- Riverbend, McMinnville, Oregon (Waste Management, Inc.)

2-1. Facility Overview

Location and Access

The Metro South Station (MSS), which opened in 1983 as the Clackamas Transfer and Recycling Center, is on an 11.47-acre site in Oregon City (Clackamas County). The address is 2001 Washington Street, Oregon City, Oregon.

The site is bound on the north by a Southern Pacific Railroad line, on the south by Washington Street, on the east by State Highway 213, and on the west by property owned by Oregon City.

Access to MSS is through a Washington Street entrance that is 1,000 feet west of Highway 213. Most vehicles approach this site from I-205 (Exit 10, Oregon City/Molalla) or Highway 213. One of the most common routes to the transfer station for local public and private collection vehicles is from Oregon City via Washington Street.

The station operates seven days per week. It is open from 7:00 am to 7:00 pm from March 1 through September 30 and 7:00 am to 6:00 pm from October 1 through the end of February. The station opens Monday through Saturday at 3:00 am for commercial and industrial accounts with automation tags. It opens on Sunday at 7:00 am for all customers. MSS is closed on December 25 and January 1.

The MSS site functions as a comprehensive service facility with three sections:

- The western 1.47 acres include a stormwater retention area constructed by

Metro for the mitigation of wetland removal.

- The central 4 acres contains the household hazardous waste (HHW) building, a transfer building with load out pit and pre-compactors for commercial transfer and public drop-off, scalehouses, and truck wash.
- The eastern six 6 acres include the dry waste unloading and recovery facility, contractor’s maintenance building and area, paved area for staging loaded and empty transfer trailers, and roadways for access to the pre-compactors.

Figure 1 in Appendix A illustrates the current site layout and recent improvements.

Adjacent Land Uses

The MSS site is within important industrial and transportation corridors in Clackamas County. There are no private residential properties within several hundred yards of the facility. It has rail and interstate traffic on the north, a large Home Depot store on the south across Washington Street, Highway 213 to the east, and on the western edge there are light industrial facilities along Washington Street. The End of the Oregon Trail Museum, a regional attraction, is also west of the transfer station.

Zoning and Permitting

The MSS site is in an M-2 Heavy Industrial land use zone and is designated I. Industrial in the Oregon City Comprehensive Plan. This land use designation allows the transfer station to operate through a Conditional Use Permit (CUP), which is subject to periodic review by the Oregon City Planning Commission.

The station also has a group of permits issued by the Oregon Department of Environmental Quality (ODEQ) for its operations. These include permits for solid waste disposal and stormwater. These permits, which are also subject to periodic review and renewal, assure compliance with the provisions of the Oregon Revised Statutes (ORS) Chapter 459 for a solid waste facility operation.

MSS also has an industrial waste discharge permit from the Tri-County Sewer District.

Environmental Issues

Flood Plain

The MSS site in Oregon City is vulnerable to flood events. The site is one-half mile east of the confluence of the Willamette and Clackamas Rivers, and one-half mile west from Abernethy Creek.

The Federal Emergency Management Agency (FEMA) has established the one percent (1%) chance flood and the 100-year flood elevation at 45.0 feet National Geodetic Vertical Datum (NGVD). Portions of the MSS site are below elevation 45.0 feet. Some of the station facilities in these low-elevation areas include the original transfer tunnel (now used for storage and HHW activities), the HHW facility, the compactors and some service utilities.

The Metro region experienced a major flood event, which was over two feet higher than the 100-year flood elevation, in February 1996. This flood demonstrated the vulnerability of the MSS site. High floodwater from the Willamette and Clackamas Rivers inundated much of Oregon City. The flow of Abernethy Creek into the Willamette River was constrained by a highway-crossing culvert

that caused additional flooding during the event.

This flood had a major impact on MSS. The Washington Street access road was under water. The water crested at elevation 47.2 feet NGVD. Some of the station facilities below elevation 47.2 feet were under water. Metro closed the station for a brief time while it constructed a temporary sandbag wall along the west entrance road.

Metro built a permanent flood protection wall along the west entrance road in 1997. This wall protects the transfer station facilities to elevation 42.0 feet NGVD and delays flood waters from entering lower levels of the site.

Geology

The ground surface site elevation before construction of the transfer station in the early 1980's was at elevation +22.0 ft. to +27.0 ft. NGVD. Metro, during the design of the facility, made a decision to raise the site grade to meet the Corps of Engineers designation of the 100-year flood level of elevation +45.0 ft. NGVD. This decision required the site construction to include engineered structural fills up to 23.0 ft. in thickness.

The original site soils consisted of man-made fills (sand, gravel, concrete debris) and soft, slightly organic clayey sandy silts, underlain by a distinctive layer of sand, gravel, and cobbles with occasional boulders. The site investigation observed hard clays below the gravel layer at depths of 20.0 ft. to 25.0 ft.

The investigation also observed groundwater at elevations from 16.0 ft. to 21.0 ft. NGVD.

These elevations, however, changed during the wet winter season, and included observations at elevations above 22.0 ft. NGVD. The original site, which was wetlands, required construction to include engineered structural fills to a depth of 23 ft. The investigation also identified the sand-gravel-cobble layer as a probable aquifer that acts as a groundwater discharge area for the site.

The soft silty soils, large structural fills, and the underlain gravel aquifer or groundwater discharge areas these present important site factors:

- All high load areas, such as the station building columns, are supported on pilings driven to the hard clays.
- Areas of the site at elevation +20.0 to +25.0 ft. NGVD (HHW and compactor areas) are subjected to groundwater discharge that requires proper management.

Metro Code Title 3 – Planning

The Metro Code, which includes ten titles, designates Title 3 to planning. Chapter 3.07, the Urban Growth Management Functional Plan, has a separate Title 3 for Water Quality and Flood Management. The Metro Council approved amendments to this chapter in April 2007.

The earlier amendments to this chapter imposed additional criteria for the future development of the Metro South Station site. These amendments, which reflected policy decisions, based on the February 1996 flood, protected water quality and flood plain designations throughout the region.

The effect of these code changes at Metro South was to include significant portions of the site that were historically above the FEMA established 100 year flood level in a Flood Management Area. This required excavation to balance fill and cut volumes for all development below 47.2 feet mean sea level, the elevation of the February 1996 floods, rather than the current 45-foot elevation.

Utilities

On-site utilities at MSS include electrical, water supply, storm and sanitary sewer. Modifications to the transfer station since its opening in 1983 have changed the utilities throughout the operating life of MSS.

Power is supplied to the site from Portland General Electric (PGE) power lines along Washington Street. A review of the existing service indicates that a maximum of 900 amps is available through the 750-kVA transformer for the main building, 75-kVA for Bay 3, 150-kVA for the maintenance building, and 112-kVA for the HHW building, with on-site voltages of 480V, 220V and 110V.

Based on the size of the service transformers, proximity of the PGE system and the ability to locate conduits and additional transformers on site, there are no apparent obstacles for future development.

Major power requirements include lighting for all structures, the two compactors in the transfer operation, special equipment for the household hazardous waste service, and scalehouse operations. The existing power system service can meet any new development at MSS.

Water Supply

MSS is served by a 10-inch water main loop, which runs along the north side of the site within a 15-foot easement. Connections to this main line continue to provide water for facility washdown, truck wash facilities, hydrants and sprinkler system, and restrooms for Metro and station operators. The estimated maximum demand is 10,000 gallons of water per day, with the truck wash consuming over 85% of this supply. The existing water supply system should support future development.

Storm Sewers

Metro manages storm water with two methods at MSS. The west end water is collected and drained through manholes and lines directly into the retention pond/wetlands. The stormwater from other areas is collected in a sump near the HHW facility and pumped to lines draining to the retention pond/wetlands.

Most surface/subsurface water at the east end is collected and drained by gravity to a storm sump in the roadway in the lower compactor area. Then the water is pumped to a drainage ditch along the south edge of the site. The water drains by gravity through a compost filter, and then a pipeline, into the water retention ponds in the west-end wetlands.

Any portion of the MSS site that may be considered for development is already part of the storm water management system because of the existing pavement. The system receives the maximum amount of surface drainage and any development should not add any substantial flows to it.

Sanitary Sewer

The MSS sanitary sewer uses a 4-inch force main system which pumps the wastes to a regional treatment plant 1.5 miles from the site. All buildings feed directly to the sanitary sewer.

Sanitary sewer wastes from the scalehouse washrooms, public unloading building and maintenance building are drained by gravity to the sanitary sewer. The wastes are pumped to a manhole south of the bridge over the compactor area. From this manhole, the wastes are drained by gravity to the sanitary sewer.

The wash waters from the truck wash are drained by gravity through an oil/water separator and then by gravity to the sanitary sewer.

2-2. History of Transfer Station Development

Original Operations

The Clackamas Transfer and Recycling Center began operations in 1983. The original station design was based on an average 400 to 500 tons per day (TPD) waste process and transfer operations. The peak design capacity was 700 TPD with approximate vehicle counts of 80 commercial and 200 public vehicles per day.

The transfer building, a 30,000 square foot structure (150 foot x 200 foot), was designed with a 40 foot wide x 12 foot deep surge pit for the full length of the building. The station served commercial and general public vehicles based on these circulation, unloading and transfer operations:

- Metro weighed commercial packer trucks, drop box vehicles, and long vehicle/trailer units on the inbound scale. Each vehicle then entered the transfer building through the east wall on the south side of the surge pit, reversed, and unloaded the wastes into the surge pit. These vehicles left the site after going through the truck wash (optional) and over the exit scale.
- Metro charged each general public vehicle a flat fee. Each vehicle then entered the transfer building through the east wall on the north side of the surge pit, reversed, and then unloaded the wastes into the surge pit. Metro also placed drop boxes along the north side of the building for the public to unload their source-separated recyclables.
- Wastes placed in the surge pit were moved by track-mounted loaders and top-loaded into transfer trailers through openings at the west end of the surge pit. These vehicles then transported the waste to the St. Johns landfill in North Portland.

The surge pit concept in the transfer building provided a definite separation between the unloading operations of commercial and public vehicles for safety and efficient

operations. It also allowed the surge capacity to accommodate the peak arrival rates of commercial vehicles and the random arrival of transfer trailers. This surge pit also allowed the station to accommodate the continued increase in traffic and waste volumes during the first decade of operations.

This surge pit operations, however, combined with the limited unloading space for commercial and public vehicles, minimized the facility's full use. These constraints offered a very limited ability to recover material from the waste streams delivered to the transfer station.

Major Modifications and Additions from 1983 To 2001

The MSS has changed significantly since it began operation in 1983. These changes include the steady growth of traffic and waste volumes throughout its first two decades as reflected in Figure 2-1 on the next page.

Metro South was the first regional waste transfer facility. Its growth was a function of important policy decisions about the management of the region's waste. The first decision with an impact on MSS was the closure of the St. Johns Landfill in 1990. This change, which included the opening of Metro Central Transfer Station in Northwest Portland, meant that most of the waste generated in the Metro region had to be processed and transported to a distant disposal site, the Columbia Ridge Landfill in Gilliam County, Oregon.

Figure 2-1, MSS Waste Volumes

	Waste Volumes (TPD)	Traffic Volumes (VPD ¹)
Original Station Design Criteria	500 (avg.)	80 commercial
	700 (peak)	200 public
2000 Volumes	1,285 (avg.)	300+ commercial
	2,000 (peak)	600+ public
2007 Volumes	800 (avg.)	679
	1,473 (peak)	1,113 (combined)

⁽¹⁾ VPD = Vehicles Per Day

The growth in demand at MSS during its first two decades required Metro to make major modifications at the station. Figure 1 in Appendix A illustrates the present layout with the modifications.

1983-1996

- Metro installed a 3-bay truck wash and associated wash water collection and treatment facilities in the mid-1980’s.
- In 1989, Metro installed a compactor at the west end of the transfer building. This installation replaced the top load operation. The compacted waste was loaded into transfer trailers and delivered to the St. Johns landfill.
- Metro selected Waste Management and its Columbia Ridge Landfill as the new provider and disposal site for the region’s waste. The landfill is 150 miles east of Portland.
- Metro also selected a transportation company to deliver the waste to the landfill.
- Metro modified the station in 1990 to prepare for the shipment of waste to the

new landfill by installing two compactors at the east end of the transfer building. One compactor was new; the other was an existing compactor relocated within the building. This modification included a new control room and extensive changes to the east end of the transfer building.

These facility modifications did not require any changes to the existing traffic patterns and unloading operations for commercial vehicles and public vehicles. They did, however, mandate the following changes for the transfer trailer traffic circulation and loading operations:

- Metro installed the compactor at the east end of the transfer building at an elevation approximately 29 feet below the building slab. The compactors are top loaded by a track-mounted dozer like the original trailer top load operation. They compact the waste and push it into the transfer trailers.
- This installation required extensive revisions at MSS to provide an access

ramp for the transfer trailers to travel from the main site level down 29 feet to the compactor level. The transfer trailers travel down the ramp, turn, and then reverse up to the compactors for loading.

- The transportation contractor uses the site's east side to store empty and full transfer trailers.
- As part of their contract with the transportation contractor, Metro agreed to provide a trailer staging area at the east end of the site. It was designed to allow for the storage of over 70 trailers with sufficient space for the trailers and tractors to travel to and from the compactor area.
- This staging area is approximately 5 acres and paved for efficient traffic circulation and storm water drainage. It was built during the compactor installation sequence at the east end of the transfer building.
- Metro installed a second scalehouse and scale to manage greater traffic volumes.

Metro also made significant improvements at MSS that provided additional management services for the regional waste stream that included:

- The construction of a 4,000 sq. ft. household hazardous waste (HHW) facility. This facility is where the transfer trailers originally circulated down to the west end of the transfer building for top loading the waste.
- The addition of a latex paint recycling system in the former transfer trailer loading tunnel.

1996-2001

The improvements to MSS between 1983 and 1996 were essential to how the facility functioned based on the regional changes for managing solid waste. These changes, however, did not address every operations issue.

The largest issue for MSS was revealed through its flood vulnerability. This facilities update discussed the effect of the February 1996 flood on the station site in Section 2.1 - Environmental Issues. This event caused major damage to the HHW and latex processing facilities.

Metro based the criteria for changes at MSS on how the station could function more efficiently through better traffic management and maintain its commitment to material recovery. This approach differed from the early operation of primarily transferring waste to the local landfill. The closure of St. Johns Landfill and the opening of Columbia Ridge Landfill 150 miles east of Portland eliminated the local disposal option and its associated low costs.

These improvements emphasized greater recycling and material recovery, reduced traffic congestion and better site circulation, and reduced energy consumption. The changes to MSS between 1996 and 2001 include:

- A wider entrance roadway and different traffic pattern to accommodate two inbound lanes that begin at the site entrance. This alternative, one lane each for commercial and public vehicles, separated these two types of vehicles

sooner to provide safer and more efficient traffic circulation.

- A new scalehouse and new scale. This change, which meant the site had two entrances and two exit scales, increased scalehouse capacity and separated commercial and public vehicles.
- The construction of a flood protection wall along the west side of the main entrance road. The 228-foot wall, built to elevation 42.0 feet from the site’s north end to Washington Street, provides additional time before any flood waters enter the site.
- A new 5,000 square foot latex processing building in the site’s northeast corner.
- A new truck wash with an oil-water separator system, at a site conducive to future development.
- Construction of a 4,000 sq. ft. addition to the main transfer building at the southeast side to improve operations.
- Construction of a new 28,000 sq. ft. public unloading building. This change reduced traffic congestion and increased capacity at the main transfer building for commercial vehicles. It also increased material recovery opportunities throughout the operation.
- Installation of a new transfer trailer scale (east end) and automated weighing system.

2001-2007

- The new latex building opened in 1999. Metro moved the operation to a North Portland site on Swan Island in 2005. The building is now a maintenance shop for the operations contractor.
- Metro added 4,000 sq. ft. to the main transfer building in 2004.

- The Lift Station was removed and connected to the gravity sewer added to the street.

2-3. Existing Facility Description

Commercial Transfer Building

Structure

The structure is a steel-framed building with concrete driving surfaces, concrete and metal wall panels, and a metal roof deck. The original building, constructed in 1983, is approximately 150 feet x 200 feet (30,000 square feet). Metro added 4,000 square feet in 1991 and an additional 4,000 square feet to the main transfer building in 2004.

Transfer Building Operation

The transfer building operation manages commercial vehicles delivering an average of 800 TPD (2007) of MSW. The commercial waste is delivered on the south tipping area (Bay 1) and the public self-haul on the north tipping area of Bay 2. The waste, a combination of residential, commercial, and industrial materials, is compacted and loaded into transfer trailers for delivery to the Columbia Ridge Landfill in Arlington, Oregon.

The pit is 40-foot wide, 12-foot deep, and equals the building’s 200-foot length. The commercial vehicles are weighed on the inbound scales, proceed to the southeast side of the building and enter it through doorways on the south side of the pit. Then they reverse and unload their wastes into the pit. The vehicles leave the building and proceed to an exit scale. The drivers may also leave the site without an exit scale stop if the vehicle’s tare weight is in the Metro data base.

The public self-haul vehicles enter the building on the north side of the pit and unload on the floor, not into the pit, because the pit is barricaded with a six foot wall. The wall was installed to improve safety as people unload their vehicles. A loader pushes the waste to an opening on the east side of the wall and into the pit.

This operation changed when the public unloading building opened in 2001. The transfer building, now without the flow of public vehicles, gained additional space to improve the process of material recovery. This change allows the commercial vehicles to unload onto the tipping floor rather than directly into the pit to improve the potential recovery of recyclables. The limited tipping floor space, however, does not provide sufficient area to conduct an effective, efficient floor sort.

Metro and its operations contractor made a decision to dedicate the new transfer building to manage commercial loads for the recovery of recyclables. The commercial vehicles enter the building from the southwest door, drop their loads, and exit the building on through the northwest door. Public commercial haulers (contractors) enter and exit the building through the east side. A combined labor operation of five floor sorters and six line pickers recover recyclables.

The north face of the transfer building includes a group of drop boxes to store materials recovered from the sort operation. The DEQ solid waste disposal permit requires Metro to collect materials in these categories:

- Ferrous scrap metal

- Container glass
- Non-ferrous scrap metal (including aluminum)
- Tin cans
- Motor oil
- High-grade office papers
- Old newspaper (ONP)
- Mixed papers
- Corrugated containers (OCC) and kraft papers
- Used tires

The MSS transfer station equipment includes:

- Track-mounted loaders. These operate in the surge pit and are owned or leased by the MSS operator.
- Compactors. These compactors receive loose waste (8-12 lbs. per cubic foot), compact it into a dense bale (30+ lbs. per cubic foot), and move it to a transfer trailer. There are two compactors at Metro South. Metro replaced the compactors in 2000 with the new equipment supplied by Shredding Systems, Inc., in Wilsonville, Oregon.

Public Unloading Facility

The 28,000 square foot building began operation in 2001. It is a transfer building with two load out bays for top loading of transfer trailers. The building was originally designed for use by public self haul vehicles. Currently it is used to process dry waste from commercial vehicles as well as public commercial dry loads.

Public vehicles weighing in at the scalehouse are directed to either Bay 2 if they have non-recyclables or Bay 3 for their recoverable loads. The facility staff directs the public

customers to specific areas in the building to unload their vehicles based on materials types.

Bins are provided along the north wall of Bay 3 for the following recyclables:

- Newsprint
- Glass
- Aluminum
- Steel (tin) cans
- Mixed ferrous
- Mixed non-ferrous
- White goods
- Corrugated cardboard
- Tires
- Used motor oil
- Oil filters
- Car batteries
- Anti-freeze
- Yard debris/wood
- Plastic bottles/milk jugs
- Scrap paper
- Phone books
- Magazines

Household Hazardous Waste Building and Operations

Structure

Metro opened the Household Hazardous Waste (HHW) building in 1993. It is a 4,000 square foot structure with steel rigid frames, concrete wall panels, and an insulated metal roof. It has extensive ventilation systems and explosion-proof electrical equipment to meet the required fire and building codes regulations.

The HHW building remains in good condition as it nears the mid point of its second decade of service. The primary long-term concern for this structure is that it was built 10 feet below the 100-Year Flood level of elevation 45.0 feet.

Operations

The HHW facility is open Monday through Saturday from 9 a.m. to 4 p.m. The general public has access for use and delivers its HHW to a covered, drive-through receiving area. This operation also serves regional businesses that generate small quantities of hazardous wastes. These generators, which are categorized by DEQ as conditionally-exempt (CEG), use the HHW service through an appointment process. This allows the Metro staff to serve the public and prepare for these special deliveries during off-peak sequences.

Metro personnel, who are trained to manage these materials, manage both customer groups with the same process. They unload the waste, properly identify and classify it, and move the materials to specific areas in the building for further testing, processing and storage.

Much of the material that the public delivers to the Metro South HHW facility is latex paint. Metro, in response to this service demand, opened a latex paint recovery and recycling program operations building at MSS in 1999. The program became so successful that Metro moved the operation to a larger site in Northeast Portland in 2005.

The Metro Paint store is on Swan Island in North Portland at 4825 N. Basin Avenue. It operates from 8 a.m. to 4 p.m. Monday through Friday and 7 a.m. to 4 p.m. on Saturday. The store, which does not accept

old paint, offers a basic, multi-color palette with the opportunity to create many color variations off the base products.

Summary

The HHW operation, which serves the general public and small business community, is a very successful regional service.

Scale and Scalehouses

MSS has five scales and three scalehouses. Metro installed the fourth scale and third scalehouse in 1998. The newest scalehouse, which is approximately 600 square feet (12 feet x 50 feet), includes restrooms and records storage space.

Metro installed the fourth scale to provide more flexibility in weighing the inbound and outbound vehicles. Under normal operating conditions, two scales are available for inbound traffic and two scales are available for outbound traffic. Under peak conditions it is possible to use three scales for inbound or outbound traffic.

This four-scale system allows Metro to weigh more than 100 vehicles per hour either entering or exiting the site. The fifth scale, which was installed in 2001, is for weighing the long-haul transfer trailers in the lower ramp area near the compactors.

The scalehouses are in good structural condition and through normal maintenance should provide service for at least an additional ten years.

Metro installed a tagging system at the scalehouses in 1997. This Radio Frequency

(RF) system provides MSS and its customers with a smoother operation through:

- The ability to weigh vehicles without attending Metro personnel.
- Better staff utilization and the capacity to weigh more vehicles.

Truck Wash

Metro installed a three-sided metal building in 2000 that replaced an existing truck wash. It serves three vehicles simultaneously and is a manual wash operated by drivers to clean their vehicles.

Traffic Studies

1997 Study

Metro completed a traffic study in 1997 as part of its application for a Conditional Use Permit with Oregon City. This application was based on the improvements described in Section 2.2 of this report. The study considered traffic issues associated with the entrance roadway and new scale and included the following findings:

- The proposed two-lane entry configuration to MSS will increase the available vehicle storage for the entry scales from 20 vehicles to 29 vehicles on Saturday and from 16 to 23 vehicles on weekdays, when the proportion of commercial traffic yields a greater average vehicle length.
- Examination of April/May 1997 vehicle queue data indicated that under current conditions, the proposed two-lane entry configuration will eliminate vehicle queuing onto Washington Street during weekdays and Sunday, and reduce it substantially on Saturdays.

- Under existing conditions, both transfer station access intersections function safely at acceptable service levels during the Saturday peak hour and the Monday noon and p.m. peak hours.

2001 Study

Metro also completed a traffic study for the 2001 Master Facilities Plan Update. This study included consideration of a proposed Home Depot Store across Washington Street from the station. The Oregon City Planning Department was concerned about commercial vehicle and transfer trailer traffic related to the station's east gate.

The study emphasis was to determine the safety of vehicles using the east gate when the Home Depot began operation. It recommended that the east driveway could continue to operate with full access turning movements and safe operations after the Home Depot site is complete.

2-4. Facility Needs Assessment and Recommendations

URS conducted a series of site visits to the Metro South Transfer Station during the needs assessment process. These visits, and a corresponding series of interviews with representatives of Metro and Allied Waste, provided this needs assessment and the basis for the recommendations in the next section. (A summary of comments is included in Appendix D.)

Issues identified in the interviews about Metro South activities included:

- Long term site capacity – no more room to grow in current location
- The need for better signage

- Queuing capacity/traffic
- Recyclables recovery
- Self-hauling
- Sustainability
- Coordination with Allied Waste
- Organic waste
- Lighting improvements needed
- Good neighbor responsibilities

URS reviewed the facility needs and made recommendations for improvements at MSS considering the following:

- Regional facility needs
- Operations and safety
- Material recovery and recycling
- Sustainable design
- Good neighbor strategy

The needs assessment and improvements that the URS team recommends for MSS are also based on the major objectives of the Solid Waste Facilities Master Plan Update. These objectives are to:

- Improve the Sustainability of the Waste Transfer Operation
- Improve Customer Service
- Provide Flexibility in Materials Handling and Recovery
- Increase Operational Efficiency and Employee Safety
- Improve Hazardous Waste Facility Capacity

The recommendations that follow were based on the facilities needs assessments determined through interviews with Metro and MSS operator personnel. The recommendations are in two categories:

- Overall operations and non-facility recommendations that Metro should consider.
- Specific facility design options that include design and cost estimates.

The recommendations do not include a consideration by URS of the future of the facility or apply any cost benefit analysis. The purpose of these recommendations is to improve the existing operation of MSS.

Regional Facility Demands

The URS team assessed the future needs for MSS with consideration for how the region's growth has affected the current capacity and operation of the facility. MSS was the first regional transfer station. The station opened in 1983 and has served its customers well for twenty-five years.

The Clackamas Transfer and Recycling Center, now known as the Metro South Station, was designed and built when the region's solid waste was delivered to the St. Johns Landfill in North Portland. Within a decade of its opening, the Portland site closed and waste was shipped by transfer trailer to the Columbia Ridge Landfill, 150 miles east of Portland in Gilliam County, for disposal.

This change in regional disposal policy created different demands on how to manage waste. The initial role of MSS, as only a transfer station with limited recycling service, grew to include strategies to recover a larger volume of the waste stream.

The Metro region will continue to grow. The pace of population change, regardless of its intensity, will generate more waste and a

demand for facilities to manage it. This is the context within which to consider the following options for MSS.

Long-term Commitment to the MSS Site

MSS site is an important location for Metro. Part of its value to the region combines the site's location, history, functions and customer familiarity with an emphasis on the self-haul public. These same variables have created a situation that, under the station's current configuration, it has reached its maximum vehicle capacity. This is an essential consideration in the future of MSS. The facility has additional volume capacity; the site doesn't have additional vehicle capacity.

The long-term use of this site as a solid waste facility requires a decision by Metro on one of the following options:

- Increase the public tipping fees to reduce public self-haul
- Expand the facility, if possible, into the remaining space available and operate it until it reaches complete capacity
- Retain the facility for only public self haul use and develop a new facility (separate location) for commercial traffic only
- Retain the facility for only commercial use with a large material recovery capability and relocate the public to separate site
- Develop a completely new facility for both commercial and public use

The Current Use of MSS

Future development and land use considerations in Clackamas County are colliding with the current use of MSS as a transfer station operation. Regional growth continues to place greater demand on the

current use of Metro South as a public access facility.

Historic research for Metro South indicates how the demand use for this facility has changed as the region grows. The contrast is in the steady increase in public vehicles at MSS and very stable flow of commercial vehicles over time. This difference is due to the number of private, regional material recovery facilities that have opened since the last facilities plan update in 2001.

These private facilities, which do not receive public vehicles, provide alternatives for commercial vehicles in the material recovery process. Their impact on the regional movement of solid waste is apparent in the changing flow forecasts for facilities. A 2001 estimate for the total waste volume at MSS in 2010 was 319,800 tons. The January 2008 estimate (Metro Transportation RFP) at MSS in 2010 is 277,106 tons.

The transfer processing capacity at MSS is over 400,000 tons per year. This exceeds both the 2001 and 2007 total waste volume forecasts for Metro South. This capacity, however, doesn't solve the traffic volume issues. Metro data from a 2006 survey indicates that 54% of the total traffic volume, which is public vehicles, represents only 11% of the waste volume. This growing contrast in vehicles versus volumes creates an inefficient transfer operation.

New Facility Site Selection

An important consideration in Metro's long-term regional role in managing solid waste is the decision to replace MSS. A new site and facility will be a challenging process and require a substantial lead time to find an

appropriate property with the proper land use designation, size and transportation access.

The time necessary to complete the siting process may be a minimum of five years. The variables that will define the schedule and complexity for a new facility include site size and levels of service. Metro may consider a site for only commercial vehicles, only public vehicles, or a combination of both services and the HHW operation.

A site that serves only commercial vehicles may require 6 acres. If the site serves commercial and public vehicles its size may mandate 12 to 15 acres. The addition of an HHW facility and container storage will require 20 acres. The corresponding search sequence will be more difficult as the parcel size and site operations grow. Fewer site functions may ease the mitigation requirements.

More information about the Facility site selection process is included in Appendix C.

Recommendation 1: Decide on Future of MSS Site

Because MSS is operating at its maximum vehicle capacity with a queue that flows onto Washington Street during peak use periods, Metro needs to decide whether or not to improve the facility and at what cost. This decision, which is how to operate MSS as long as possible, should consider that any capital investment for improvements will not generate any significant additional revenue for Metro.

Metro should implement the recommendations that improve the operations and safety at MSS. The long-term decision for Metro about the facility should consider the following options to:

- Improve and expand the facility and operate it until it reaches a vehicle saturation level that may occur in seven or eight years.
- Maintain the operation for public self-haul customers and relocate commercial users to a new facility (maintaining the existing operation for commercial use only and relocating the public self-haul may place the new public self-haul facility outside the waste centroid).
- Close the facility and find a new location to provide full service for both public and commercial customers in transfer, material recovery and HHW.

Operations & Safety

Operations and safety are very important considerations at MSS. The development of services at MSS has created significant circulation and communication concerns. What began as a reasonably simple operation in 1983 has evolved over twenty-five years into a complicated set of activities sometimes with conflicting service mandates. The conflicts are now more functions of space and service times than volume capacity. The growing demand for public use by self-haul customers has created a vehicle capacity issue related to peak time use. The issue of how to balance the use of MSS for commercial and public client service continues to challenge Metro.

Lighting

There is insufficient light in Bay 1 and the load out pit. The system is old, has not been improved, and there are no other lighting sources for natural light such as windows, skylights or openings.

This is an important consideration for improving operations in Bay 1 and the pit. The two options for an upgrade include either a new lighting network and/or a replacement of the roof deck with translucent panels for a natural light source.

Recommendation 2: Upgrade Lighting in Bay 1

Metro should upgrade the lighting conditions in Bay 1 by installing a new lighting network and/or replacing the roof deck metal panel with translucent fiberglass panels to provide natural light. Installing translucent panels in the south wall would providing light and also improve the exterior appearance of the Washington Street building façade.

Lighting System Upgrade Cost Estimate

Remove existing lights	\$ 97,440
Install new lights	121,800
Subtotal	\$219,240
General conditions (10%)	21,920
Contingency (25%)	54,810
Engineering (10%)	21,920
Total	\$317,890

Translucent Roof Installation Cost Estimate

Remove / install panels labor	\$ 97,440
Material (translucent panels)	\$106,250
Subtotal	\$203,690
General conditions (10%)	20,370
Contingency (25%)	50,920
Engineering (10%)	20,370
Total	\$295,350

Site Signage

MSS is a very busy and sometimes confusing site. The lack of clear, visible signage to guide customers creates situations that confuse them and exacerbate an already challenging safety environment.

The transfer station operators and Metro scalehouse staff have expressed concern over the traffic congestion and lack of proper signage to guide the self-haul traffic around the site at Metro South. This traffic management issue is, in part, a function of the HHW facility located at the station entrance, because it does not operate on the same hours as the transfer station. The public customers who drive through the closed HHW facility find themselves confronted with a queue of vehicles to the transfer facility.

Metro has identified the need for an entrance sign placed at a proper distance from the entrance curb that will provide guidance to the traffic when it enters the site. Although the entry distance is short, it is at that critical turning point into the facility that the vehicles are traveling at the slowest speed. This sign should be controlled electronically from the

scalehouse as the on site operation changes to accommodate demand. These changes can be indicated quickly on an electronic reader board to direct the public and commercial vehicles to the proper lanes

Recommendation 3: Replace Site Signage

URS recommends that Metro install a new, comprehensive site signage system that includes every operation on the transfer station property. The sign should be installed 14 feet above and across the incoming lanes, approximately 130 feet from the entrance. This sign should include an electronic reader board to help manage the traffic flow. This board would identify commercial and public lane access throughout the day at MSS and guide the public and commercial users to the proper lanes for the materials they are delivering to the transfer station. This sign should be controlled electronically from the scalehouse because on-site operations change at times. The goal of this system is to improve customer service by eliminating confusion and delays.

Please see Figure 3 in Appendix A.

Site Signage Replacement Cost Estimate

Demolition	\$ 10,000
Foundations	20,000
concrete/pavement repair	10,000
New bridge sign with specified signage	125,000
Power/control supply	40,000
Subtotal	\$205,000
General conditions (10%)	20,500
Contingency (25%)	51,250
Engineering (10%)	20,500
Total	297,250

Staff Facilities

The existing staff facilities are in several locations and in different buildings. These include the original facility on the west side of Bay 1, the new facility at the northwest corner of Bay 3, and a large break/locker room at the original paint recycling building that is now a maintenance shop. The facilities, although not in a central location for direct access, are adequate for site personnel.

The MSS office, however, is on the second floor west of Bay 1, and is difficult to find and even more of a challenge to reach. What MSS needs is a central, easily accessible office location.

Recommendation 4: Central Office Location

The original operations room, which is not in use and is above the pre-compactors and overlooks the pit, can be expanded to provide a large, central office location.

Please see Figure 5 in Appendix A.

Central Office Location Cost Estimate

Structural foundation	8,500
Floor w/ insulation	9,500
Exterior wall	10,000
Roof (structural and metal)	15,900
Gutters and flashing	900
Interior walls	9,100
Interior doors	7,200
Tile floor	11,500
Suspended ceiling	3,900
Paint	2,700
Mechanical	5,300
Sprinkler	3,400
HVAC	13,500
Sub total	101,400
General conditions (10%)	10,140
Contingency (25%)	25,350
Engineering (10%)	10,140
Total	147,030

HHW Service

The MSS HHW service is very popular with the public. Its service peak is often during the weekend when many customers combine their MSW and household hazardous waste delivery for one trip. The current HHW operations provide service Monday through Saturday.

This operation meets the needs of private citizens, as well as businesses in the Metro region that generate small quantities of hazardous materials. An important variable for the business customer is that they can call the MSS HHW operation to schedule an appointment for their material delivery. This system allows Metro to manage a significant

part of the HHW service throughout the off-peak periods of activity at the facility.

Recommendation 5: Post HHW Operating Hours

Metro customers need to know that the HHW facility is closed on Sunday. This can be done with a notice at the scalehouse and a verbal communication from the scale attendant to encourage customers to use the service during off-peak hours.

Container Movement

The site movement of waste containers that deliver MSW to the Columbia Ridge Landfill is a separate function at MSS. The hauler takes possession of the waste once it is transferred from the pre-compactor into the trailer. There have been issues with the hauling company not providing sufficient trailers to accept the waste and slowing the throughput of the transfer facility. This can be resolved through contract mandates with a new transportation provider when Metro changes this service in 2010.

Material Recovery & Recycling

Metro continues to emphasize a greater importance on material recovery and recycling throughout the region. It has been negotiating with private facilities to improve their respective recovery rates through a focus on the dry waste streams of construction and demolition debris. Regional policy, in turn, includes mandates on Metro facilities to improve material recovery and recycling to match concerns about how public and private operations compare.

The regional focus on additional material recovery includes the implementation of a dry

waste recovery program by Metro in 2009. The Enhanced Dry Waste Recovery Program (EDWRP) goals include diverting highly recoverable, unprocessed mixed dry waste from landfills, increasing recovery of this stream by 30,000 tons per year, and supporting the source-separated market for these materials.

URS has reviewed the following options to improve MSS:

Expand Bay 3

MSS (and its operator) have a materials recovery goal of 15% under the current facility operations contract. This goal is an important part of the regional focus on meeting the 64% recovery target by 2009. This station, due to its site constraints and facility configuration, should expand these bays to make more material recovery possible.

Historically, the low recovery rates at MSS were due to the lack of tipping floor space in the main transfer building. The new building housing Bay 3 now offers more space to unload wastes on the tipping floor for hand sorting recyclables as additional support to a sort line at the southwest corner of the building.

Sorting materials on the tip floor is an acceptable and efficient method for the recovery of recyclables. Under the right spatial conditions, a five-person floor team may recover twice the material that the five-person team does on the sort line. The problem in this specific situation is that the tipping floor is not large enough to accommodate all the incoming waste. As a result, when the waste volume overwhelms the floor capacity it has to be transferred out to make room for the

incoming waste before any recovery process by the team. A larger building will provide better customer service and the management of material recovery and processing at MSS.

Recommendation 6: Bay 3 Building Expansion at MSS

Today, Bay 3 is used primarily for the recovery of construction and demolition recyclables. The Bay 3 tipping floor, however, is not large enough to accept and hold the incoming waste for the floor sort recovery of recyclables. This lack of floor capacity means that the recyclables must be loaded out to make room for incoming waste. The result of this inefficiency is a very low recovery rate.

URS recommends expanding the building eastward into the existing transfer trailer parking area. This will add 12,500 square feet to the building.

The construction of the proposed building expansion can be done while Bay 3 continues to operate. Traffic can be restricted to enter/exit Bay 3 from the west side only. There will be a short space of impact, limited to 25 feet from the east wall, during the demolition/relocation of the existing east wall. The expanded 12,500 square foot building would include relocating the existing recovery sort line to the building’s southeast corner.

An expansion of Bay 3 would also require the relocation of the transfer trailer parking area.

Please see Figures 2 and 4 in Appendix A.

Bay 3 Expansion Cost Estimate

Foundation excavation	\$6,700
Backfill	5,300
Foundations	89,600
Concrete floor	125,000
Pre-manufactured metal building	500,000
Mechanical	50,000
Electrical	100,000
Sprinklers	42,500
Steel push walls	243,800
Subtotal	\$1,162,900
General conditions (10%)	116,290
Contingency (25%)	290,730
Engineering (10%)	116,290
Total	\$1,686,210

Sort Line Relocation

The sort line operation is important to the MSS role in regional material recovery. The problem with its current location is that it blocks a load out bay in this building. The line location, and its low efficiency rating with an eight-person crew on a six-hour shift, really mandates a change of position within the operation. The sort line should be relocated to the southeast corner of the proposed expansion of Bay 3.

See Recommendation 6.

Container Relocation

An expansion of Bay 3 is based on the relocation of the MSW long-haul containers parking area to the lower ramp area. The URS team site analysis identified a substantial container parking storage area on the ramp below Bay 3 by widening the ramp/road leading to the pre-compactors to the

southeast and stabilizing the cut into the hill with a six foot retaining wall. This will create an area to accommodate 15 transfer trailers. This change provides space for five more containers, which is a fifty percent increase for onsite availability and storage.

Recommendation 7: Container Parking Area Relocation at MSS

The existing transfer trailer parking should be relocated to provide space for the Bay 3 expansion. The remaining undeveloped area at MSS is the ‘hill’ on the southeast portion of the site. The road to the pre-compactors can be widened 40 feet to the south by cutting into the hill. Contouring the cut to provide a fall line perpendicular to the parking spaces, and building a retaining wall to contain the hill, will create space for fifteen trailers.

Please see Figure 2 in Appendix A.

**Container Parking Relocation
Cost Estimate**

Foundation excavation and disposal off-site	80,100
Structural backfill	24,300
Concrete foundation	217,400
Concrete retaining wall	246,500
Concrete road/parking area	95,700
Wheel stops	3,800
Sub total	\$667,800
General Conditions (10%)	66,780
Contingency (25%)	166,950
Engineering (10%)	66,780
Total	\$968,310

Sustainable Design

Metro recognizes the importance of sustainability to the agency and region. The Metro Council, through its direction to the Solid Waste and Recycling Department, has mandated a regional approach to improved sustainability practices at all facilities, public and private.

Lighting Improvements

Sustainable design for Metro facilities is an important component of The 2008 Regional Solid Waste Management Plan Update. Energy efficiency is part of that sustainability strategy and MSS offers good opportunities to implement basic improvements through lighting alternatives.

The issue for Bay 1 and the pit operation is a choice between a florescent system upgrade and a greater commitment to the use of natural light. Replacing the metal roof panels with translucent fiberglass panels and providing sensor switches on the lights will not only increase the visibility and safety in Bay 1 but also reduce the power demand. The Bay 3 building represents much better lighting conditions for operations, safety and sustainability.

Please see Recommendation 2.

Landscape Design

The MSS landscape design and its maintenance should improve to reflect the growing importance of water management and use. A change in the selection of plant materials, with a decision to use drought-resistant options, will reduce the watering requirements at MSS. This recommendation, with a decision to store stormwater on site for dry season use, will reduce Metro’s water costs and improve its green profile.

Please see Recommendation 9.

Noise and Odor Mitigation

The MSS has no apparent site issues with either noise or odor impacts. The transfer station has no immediate, contiguous neighbors. Its isolation as an industrial site in an evolving land use area offers a buffer on some mitigation issues and exposure on other long range considerations. This situation may change over time as Oregon City considers the development of the neighborhood that includes MSS.

Good Neighbor Strategy

The MSS continues to operate as part of older industrial land use zone in Oregon City. This area, however, also continues to change as regional growth creates more demand for land development and residential services. MSS, as never before, faces extensive pressure to represent its operation as a good neighbor within this changing context.

Landscape Design

The MSS site context has changed since the facility opened in 1983. At that time, its immediate neighbor was the former Rossman Landfill. Today, MSS operates in an evolving land use situation and the station’s new neighbors include a Home Depot store just across Washington Street.

These changes mandate an important emphasis on how MSS can be a good neighbor within this community. This includes a substantial improvement to the landscape design, which serves as a visual screen to the site and its operations. The landscape upgrade should include new Metro monument signs.

A tall landscape hedge on both sides of the Washington Street exit ramp would narrow the visual opening into the facility with specific exposure into Bay1.

Please see Recommendation 9.

Building Facades

An important good neighbor feature, which will complement a landscape design change, is attention to the building facades at MSS. These structures, designed and built as appropriate industrial facilities, require a reconsideration of how their street edge facades impact the community. Like the current site landscape, the building buffer edges are worn and unfriendly.

Recommendation 8: Upgrade Building Facades

The south wall of Bay 1 facing Washington Street needs an upgrade. URS recommends removing the upper 12 feet of the metal panels and replacing them with fiberglass translucent panels. This will improve the exterior appearance of the building and provide daylight into Bay 1.

Please see Figure 6 in Appendix A.

Translucent Wall Panel Installation Cost Estimate

Remove existing panels	\$ 8,000
Install translucent panels	12,000
Subtotal	\$ 20,000
General Conditions (10%)	2,000
Contingency (25%)	5,000
Engineering (10%)	2,000
Total	\$ 29,000

Traffic Management

The traffic management at MSS requires improvements that relate to site operations, safety and Metro’s ability to be a good neighbor. The site’s traffic patterns, internal and external, are linked by the station’s capacity to move vehicles in a strategy that eliminates the queue on Washington Street at peak demand times.

This queue is the most visible external impact created by MSS. The growth of Metro services at the transfer station, including HHW and CEG services, and a long-term demographic change in this part of the region, combine to overload the site’s vehicle capacity. The off-site queue affects the neighborhood traffic patterns.

Site Entrance/Exit Driveway

The Metro South site has a large, gated entrance/exit location east of Bay 1 in the transfer building. The primary purposes for this access point are to provide:

- An entrance and exit for the transfer trailers/tractors.
- An exit for some commercial vehicles if their tare weights are in the scalehouse database.

This is a 40-foot long, rolling gate that also provides easy viewing from Washington Street into the site.

Metro, in its continuing effort to be a good neighbor at MSS, should improve this

entrance/exit with a creative landscape design to minimize the visual corridor into the facility.

Recommendation 9: MSS Truck Entrance Improvements and Landscaping

Metro, in its continuing effort to be a good neighbor, should improve the MSS entrance/exit north of Bay 1 with new landscape materials. Planting a tall hedge on both sides of the driveway all the way to within 8 feet of the sidewalk (visual safety) will narrow the visual opening into the facility and into Bay 1 from Washington Street.

Several spots along the south boundary of Washington Street need infill vegetation to provide a visual buffer.

Please see Figure 3 in Appendix A.

Truck Entrance Improvements Cost Estimate

30 Trees @ \$1550	\$46,500
Subtotal	46,500
General Conditions (10%)	4,650
Contingency (25%)	11,630
Engineering (10%)	4,650
Total	\$67,430

3-1. Facility Overview

Location and Access

The Metro Central Station (MCS) is on a 10.4-acre site in Northwest Portland within Multnomah County. The address is 6161 NW 61st Avenue, Portland, Oregon 97210.

The primary site access is from NW 61st Avenue. Vehicles reach MCS by traveling north on NW Front Avenue to NW 61st Avenue. They turn left onto 61st and proceed to the Station entrance approximately 500 feet west from the Front Avenue and NW 61st Avenue intersection.

Figure 3-1 in Appendix B illustrates the present site layout.

Adjacent Land Uses

The MCS property is in a heavy industrial zone and part of a designated corridor within the city of Portland's Industrial Sanctuary strategy. The adjacent land use pattern reflects the history of the transfer station site, which was an American Steel operation. The contiguous properties include two (north and west) that are designated by the federal Environmental Protection Agency (EPA) as Superfund sites. The south property is a petroleum storage and transfer facility and on the east is a company that produces industrial gases.

Zoning and Permitting

MCS is a 10.4-acre site, above the 100-year flood plain, in a Heavy Industrial Use zone. The Station operates under a Solid Waste Disposal Permit issued by DEQ based on regulations in ORS Chapter 459.

Environmental Issues

The MCS site remains free of any significant environmental concerns or issues. This is an important consideration for its operation due to the history of properties contiguous to the transfer station.

Utilities

The on-site utilities that serve MCS include natural gas, electrical, water supply, storm sewer and sanitary sewer. The station, which began operations in 1991, has a history of consistent utility service with no significant changes to the existing systems.

Electrical

Portland General Electric (PGE) delivers power to MCS through its lines on NW 61st Avenue. This service remains sufficient to provide power to any new operations at the transfer station site.

Water Supply

Water is supplied from The City of Portland supplies water to MCS through its line along NW 61st Avenue. The station requires water for general facility washdown, truck wash, fire hydrants and sprinkler system, and staff restroom facilities. The daily water use is between 5,000 and 8,000 gallons. The city's water service is capable of supporting any future developments.

Storm Sewers

The MCS stormwater is collected and routed by gravity to the east side of the site into an existing system which drains to the Willamette River. The site has 26 storm inlets that drain to the takeaway gravity line. The Station operator pumps this system every 30 days.

Sanitary Sewer

The MCS sanitary waste drains to the City of Portland sanitary pipeline system on NW 61st Avenue. The city and MCS operator test the flows at that location regularly. Historically, these tests have indicated some violations (from the truck wash) in water quality. These violations are due to vehicle grease and oil leaks, as well as high pH caused by decaying organic matter in the oil-water separator.

3-2. History of Transfer Station Development

Original Operations

Waste Receiving

Metro, through a competitive proposal process in 1989, selected a private contractor to design, construct and operate a transfer station to replace the St. Johns Landfill in North Portland. Metro Central Transfer Station began operations in 1991 through a seven-year contract.

The materials recovery operations at Metro Central began in late 1991 after an extended start-up and testing period. The design criteria required MCS to receive and transfer over 2,000 tons of MSW per day (TPD), and to process mixed wastes to recover recyclables at an initial rate of 20%.

The Metro Central Transfer Station serves commercial and general public vehicles through the following circulation, unloading, transfer and recycling operations sequence:

- Metro weighs the general public vehicles on the first scale (Scalehouse A) as they enter the site. The vehicles proceed to the public unloading area in the east portion

of the transfer building and unload their wastes onto the tipping floor. Drop boxes are available along the edge of the building for source-separated recyclables. The public vehicles must return to the same scale for weighing and payment before leaving the site.

- Metro weighs commercial packer trucks and drop box vehicles at Scalehouse A or the second scale (Scalehouse B) as they enter the site. The vehicles proceed to the north side of the building to unload the wastes onto the tipping floor. The vehicles, after unloading, return to Scalehouse A if a tare weight is required or leave the site at its southwest corner after going through the truck wash (optional).

Metro Central uses different inbound scales to separate the public and commercial vehicles for efficiency and safety. It uses a third scale to weigh outbound commercial vehicles.

Transfer Operations

The transfer area and operations include the following:

- The original facility construction included the installation of three compactors near the south end of the building.
- The MSW is loaded into an in-floor conveyor system that delivers waste to the top of the compactors.
- The compacted waste is transferred into trailers for delivery to the out-of-region landfill in Arlington, Oregon.

Each compactor has the capacity for compacting and transferring 75 to 100 tons per hour (TPH).

Waste Recovery Operations

The Metro Central Transfer Station, which opened eight years after MSS, is a significantly different operation from the Oregon City facility. MCS had complete processing systems installed to remove recyclables from the waste stream. When the station began the materials recovery operations in late 1991 it included the following equipment:

- A processing line for mixed solid wastes (MSW) called the MSW No. 1 line. This line, in general, consisted of the following:
 - A stationary grapple hook to place the mixed wastes from the tipping floor onto the system feed conveyor.
 - Two disc screens (one small and one large) to remove residue (2-inch and smaller) and separate the waste into more efficient process-based streams.
 - Two rotary air separators to separate the light paper fractions from the heavier waste fractions.
 - One magnetic separator for removal of ferrous metals.
 - One air knife for additional separation and removal of light papers and heavier wastes.
 - A series of conveyors to move the wastes between the various pieces of equipment.
 - An area where sorters could manually sort recyclables off the waste stream.
 - A conveyor to move the residue from the MSW line over to the tipping floor where it could be loaded into a compactor.
 - A series of conveyors to transfer the papers from the MSW line over to an area for baling.
- A second processing line for mixed solid wastes called the MSW No. 2 line. This MSW No. 2 line had the same equipment as the MSW No. 1 line.
- A third processing line called the commercial line for the processing of clean commercial paper loads. This line consisted of the following:
 - A conveyor to receive and elevate the papers up to a manual sorting line.
 - A manual sorting conveyor line where sorters could remove residue and/or recyclables from the waste stream.
 - A conveyor to transfer the papers over to an area for baling.
 - A baler feed system and baler which consisted of the following:
 - A single conveyor which starts in-floor to receive the recovered papers, and then conveys them up to the baler feed hopper.
 - A single ram baler which produced marketable bales of papers.
- A processing line for wood and yard wastes which consisted of the following:
 - A stationary grapple to place the wood and yard wastes from the tipping floor onto the system feed conveyor.
 - One slow speed and one high-speed shredder to reduce the wastes down to the proper size for marketable use.
 - A water screen to remove the heavy materials from the waste stream.
 - A magnetic separator for removal of ferrous materials.
 - A sequencing loading system to place the overs or chips into the top of a transfer trailer for removal to markets.
 - A series of conveyors to move the wood and yard wastes between the various pieces of processing equipment

These three waste processing lines, the baler line, and the wood and yard wastes line provided the MCS with the theoretical capability to remove large quantities of recyclables from the waste stream. The initial recovery rate estimates were 20 to 25%. The application of this technology, however, never allowed MCS to meet those material recovery rate estimates for reasons that included:

- Very successful curbside collection programs for source-separated recyclables and a corresponding waste composition of mixed solid wastes with recyclables.
- Other private processing facilities in the region reduced the amount of clean commercial loads delivered to MCS.
- The mixed waste processing lines (MSW No. 1 and No. 2) were difficult to maintain and costly to operate.
- The markets and prices for recyclable materials, which are commodities, are variables that fluctuate and during that period did not justify the recovery costs.

Major Modifications: 1991 to 2001

The Metro Central general transfer station operations remained relatively unchanged during the first seven years of its service. The materials recovery operations, however, had significant changes during that time including:

- The removal of the MSW No.1 and MSW No. 2 commercial processing lines.
- The installation of a Fiber Based Fuel (FBF) line which converted mixed waste paper into pellets for sale to local pulp companies for use as fuel in their power boilers. This FBF line, which was owned by BFI, operated for approximately two years.

Since those changes, the materials recovery operations at MCS has included the manual sorting of recyclables from the waste stream on the tipping floor and the continued operation of the wood and yard wastes line. This combined approach of floor sorting and wood waste processing has delivered a reasonably steady, historical recovery rate of 7% to 8% at the MCS. MCS also continues to operate its baler system which prepares primarily old corrugated cardboard (OCC), newspaper (ONP), plastics and carpet for shipment to markets.

Metro opened its second permanent HHW facility (the first one is at MSS) at MCS on the station site's northeast corner in 1993. This facility, which is similar in layout and operations to the service at Metro South, is also the location for the agency's Round Up program.

Metro completed a master plan for MCS in 1999. That plan made several recommendations for changes at MCS to improve operations. The 1999 plan proposed ten improvements. Metro chose to complete two changes including:

- An expansion of the public unloading area.
- An addition of a spare parts room in the maintenance area.

Modifications Since 2001

Since 2001, Metro Central has incorporated the following modifications:

- The wood recovery system was redesigned and installed to eliminate some conveyors and simplify the system.

- The conveyor loading system for Compactor SSI No. 1 was revised. The existing conveyor was removed, and a new direct in-floor elevating conveyor system was installed. Included in this conveyor revision was the removal of some existing columns to improve loader access to the new in-floor conveyor.
- The existing metal roof deck was removed and replaced with a new translucent fiberglass roof deck system. The result was a significant improvement in the overall environment within the building., Some new roof ventilators were also installed with this roof deck replacement.
- Some improvements in outdoor storage capacity have been made at the HHW facility.
- Metro is evaluating removal of the existing chimney adjacent to the transfer building in 2009 or 2010 due to seismic safety.

3-3. Existing Facility Description

Transfer/Materials Recovery Building

History of Structure

The building was constructed prior to 1924 and then expanded several times over fifty years. It was a steel fabrication plant until the 1970's. The building is a steel-framed structure with metal siding and roof deck. The steel columns supported large bridge cranes that were essential for the steel fabrication operations. The bridge cranes are not part of the facility's operation today. The conversion of this building to a transfer station included the following changes:

- A 1990 addition to the west side of the building to process wood and yard waste.

- The installation of cast-in-place walls to provide push walls.
- Floor slab improvements throughout the building to support heavy equipment traffic.

Today, this renovated building provides 168,000 sq. ft. of enclosed space to manage all the transfer material recovery operations, including the wood and yard waste processes. The building is large enough to accommodate the vehicle and waste volumes coming to the station.

Transfer/Materials Recovery Operations

The Original Operations description provides a thorough explanation of the current operations. During an average day at MCS, approximately 1300 tons of waste is unloaded, moved by loaders to the compactors, compacted, and then transferred into trailers for delivery to the Columbia Ridge Landfill near Arlington, Oregon. The operation includes residential, commercial, industrial and general public waste.

MCS is open every day from 8:00 a.m. to 7:00 p.m. for public haul vehicles between March 1 and September 30 and 8:00 a.m. to 6 p.m. from October 1 through the end of February. The station is available to commercial vehicles every day from 2:00 a.m. to closing. The commercial vehicles use a radio frequency tagging system for facility access.

The standard operations sequence begins when wastes are unloaded onto the tipping floor and then moved by loaders to the in-floor conveyors for loading into the compactors. Sorters are located on the tipping floor to remove any recyclables from the waste stream before the wastes are pushed

onto the conveyors. The floor space is sufficient to allow vehicles to maneuver, to store waste, and to perform manual sorting before the waste is moved to the in-floor compactor feed conveyor.

The transfer operations equipment includes:

- Front-end loaders: These loaders, which are owned or leased by the operator, move the wastes around the tipping floor.
- Three in-floor and elevating conveyors and one transfer conveyor (SSI No. 1) supply waste to the compactors. These are 72-inch wide, fully supported, chain driven rubber belt conveyors and one idler conveyor for the transfer conveyor.
- Compactors: The compactors receive the loose wastes (8-12 lbs. per cubic foot), hydraulically compact them into a dense bale (30+ lbs. per cubic foot), and transfer the compacted bale into a transfer trailer. MCS has three compactors: SSI No. 1, (eastern), SSI No. 2 (middle), and SSI No. 3 (western). SSI No. 1 and SSI No. 3 were installed in 2000. SSI No. 2 is the original compactor installed in 1991.

The MCS operator uses the SSI No. 1 and SSI No. 3 compactors for load-out of residential wastes. SSI No. 2 is used for miscellaneous wastes and as a back-up unit. This approach allows the operator to respond to equipment service/failure and fluctuating waste flows that affect standard operations.

Household Hazardous Waste Building

Metro built the household hazardous waste (HHW) building in 1993. It is a 4,000 sq. ft. structure with steel framing, concrete wall panels, and an insulated metal roof. Similar to the Metro South HHW facility, it has an extensive ventilation system, and explosion-

proof type equipment. The operations within the building are exactly as described for the Metro South HHW facility.

Scale and Scalehouses

Metro Central Station has three scalehouses on the site to receive and weigh the waste vehicles that use the facility. Each scalehouse is operated by Metro personnel and contains washroom facilities and minimal space for storage. These are designated as follows:

- **Scalehouse A** is at the entrance to the site. This scalehouse has two scales, and is used primarily to process public vehicles entering and leaving the site. Commercial vehicles can also use this scalehouse to enter and exit the site.
- **Scalehouse B** is at the northeast corner of the transfer building for receiving commercial vehicles. There is one scale at this location.
- **Scalehouse C** is near the northwest corner of the transfer building and weighs outgoing commercial vehicles without tare weights. There is one scale at this location.

MCS has a radio frequency (RF) tagging system for its commercial vehicle customers. This system serves Metro and the commercial collection companies through its ability to:

- Weigh vehicles through the scales without Metro personnel.
- Improve staff efficiency and weigh more vehicles.
- Provide commercial service from 2 a.m. to closing.

MCS has a fourth scale south of the contractor's office at the southwest corner of the site. This scale weighs loaded transfer trailers before they exit the site.

Truck Wash

The truck wash facility is on the west wall of the transfer building south of the wood and yard wastes process area. It is a reasonably large area that can accommodate three trucks simultaneously.

Materials Recovery

This MCS operation continues through three locations within the transfer building that support the recovery of recyclable materials from the waste stream. These include:

- Sorters on the tipping floor to hand sort the recyclables from the wastes unloaded on the floor. The sorters remove mixed papers (MP), old corrugated containers (OCC), old newspapers (ONP), wood, ferrous metals, and plastics. They place these materials in drop boxes or small containers that are collected for off-site processing.
- The self-service available to the general public for their source-separated recyclables. These customers use drop boxes in the public unloading area.

MCS operates through the oversight of a solid waste disposal permit issued by the Oregon Department of Environmental Quality (DEQ). The agency requires Metro to collect materials for recovery in these categories:

- Ferrous scrap metal
- Container glass
- Non-ferrous scrap metal (including aluminum)
- Tin cans
- Motor oil
- High grade office paper
- Old Newspaper (ONP)
- Mixed papers

- Corrugated Containers (OCC) and kraft paper
- Used tires

The wood and yard waste process area has the capacity to receive 100 tons per day (TPD) of material. The process breaks the material into smaller size fragments, removes ferrous metals and residue, and loads the finished products into trailers for delivery to market. These products include compost and boiler fuel for regional pulp mills.

These combined activities at MCS generate an overall recovery rate of 7% to 8% for the complete transfer station operation.

Metro and Station Operator Personnel Facilities

The MCS site has two small office buildings. The Metro office is a 1,230 sq. ft. structure near the southeast corner of the transfer building with offices, washrooms, and small break room. The station operator office is a 3,700 sq. ft. structure near the southwest corner of the transfer building with a reception area, offices, break room, locker rooms, and washrooms.

Traffic Management

The primary access to MCS is from NW 61st Avenue via NW Front Avenue. This intersection is the main route for all vehicles using the transfer station site.

The public and commercial vehicles enter the site near its southeast corner. Public vehicles also leave the station site from the entry location. The commercial vehicles, however, may leave from this location or from an exit near the southwest corner of the site because

they are equipped with radio frequency sensors.

Present Station Capacity

MCS has three compactors. However, only two are used on a regular basis for daily transfer operations. The third compactor is a backup system component. If all three compactors were to operate at the rate of 75-100 tons of solid waste per hour, the station is capable of processing over 500,000 tons per year.

The Long Range Metro Landfill Tonnage Forecast (revised in December 2007) indicates that MCS will reach an incoming MSW volume of 405,894 tons in 2018. This long range forecast, which is part of an estimate for the region's generating rate for a twenty-year period from 2006 to 2027, suggests that Metro Central Station has at least ten years of operating capacity before it reaches the maximum service level for MSW. This maximum service level could be extended through improved material recovery rates.

3-4. Facility Needs Assessment and Recommendations

The URS team conducted a series of site visits to the Metro Central Transfer Station during the needs assessment process. These visits and a corresponding series of interviews with representatives of Metro and Allied Waste provided the basis for the team's facility needs assessment and recommendations. (A summary of comments is included in Appendix D.)

Issues identified in the interviews about Metro Central included:

- Material flow

- Ventilation/dust
- Load verification
- HHW hours
- Scalehouse remodel
- Recyclables recovery
- Self-hauling
- Sustainability
- Organic waste
- Wash rack water usage
- Good neighbor responsibilities

The needs assessment and improvements that the URS team recommends for MCS are also based on the major objectives of the Solid Waste Facilities Master Plan Update. These objectives are to:

- Improve the Sustainability of the Waste Transfer Operation
- Improve Customer Service
- Provide Flexibility in Materials Handling and Recovery
- Increase Operational Efficiency and Employee Safety

Our recommendations were based on the facilities needs assessments determined through interviews with Metro and MCS operations personnel. The recommendations are in two categories:

- Overall operations and non-facility recommendations which Metro should consider.
- Specific facility design options that include cost estimates.

Regional Facility Demands

The URS team assessed the future needs for MCS with consideration for how the region's growth has affected the current capacity and operation of the facility. MCS opened in 1991 as the second regional transfer station within the Metro solid waste system.

The selection of MCS as a transfer station site in Northwest Portland was an essential part of the regional transition from local disposal to an out-of-region landfill site. Metro closed the local MSW disposal option, the St. Johns Landfill in North Portland, in 1990. Metro Central opened as a replacement location for the delivery, processing and transfer of waste to the Columbia Ridge Landfill, 150 miles east of Portland in Gilliam County, for disposal. This change in regional disposal policy created different demands on how to manage waste.

The MCS operation combines a transfer system with an extensive array of services to recover material and deliver it to the commodities market.

Development Constraints

The MCS site is 10.4 acres. The transfer and materials recovery building is almost 4 acres. The six other structures on site and the roadways offer limited space for expansion of existing facilities. Any additions to the existing structures must minimize the impact on efficient traffic patterns.

The Metro Central Station is a vital part of Metro's solid waste management system. Therefore, any proposed modifications to the Station must allow daily transfer operation to continue with minimal interruption.

Development alternatives should be limited to improvements within the existing structures that improve operations and personnel facilities.

Operations & Safety

Operations and safety are very important considerations at MCS. What began as a reasonably simple operation in 1991 has evolved over 16 years into a complicated set of activities with sometimes conflicting service mandates. The following recommendations would help improve operations and safety.

HHW Service Hours

The MCS HHW service is popular with the public. Its service peak is often during the weekend when many customers combine their MSW and household hazardous waste delivery for one trip. The current HHW operations provide service Monday through Saturday.

Container Movement

The site movement of waste containers that deliver MSW to the Columbia Ridge Landfill is a separate function at MCS. The long-haul contractor is responsible for these movements, which means they do not report to the facility operator. This lack of coordination, at certain times, creates problems for the availability and timing of containers slowing the throughput at MCS.

Floor Maintenance

The transfer station floor at MCS is a maintenance issue in the commercial delivery bay. The building is very deep and requires the commercial MSW trucks to back into the load drop area. The incoming wet waste arrives in peak periods. To manage this large volume of waste for processing, it is stored

temporarily against the north push wall the length of the bay. The liquid released by the wet waste mixes with waste particles and is ground into a ‘wet pulp’ by the traffic.

The problem created by this situation is that collection vehicles exiting the bay track this ‘wet pulp’ on their tires into the north area and subsequently into the storm water drainage system. Floor sweeping and pushing the waste to absorb this ‘wet pulp’ have improved but not eliminated this problem. The solution for this problem is to install a wheel wash system at the exits in each bay.

Recommendation 10: Wheel Wash

URS recommends that Metro install a drive-through wheel wash at the exit of both Bay 2 and Bay 3 for trucks leaving the bays. This will reduce the trucks tracking the waste into the yard and reduce the suspended solids in the stormwater runoff. The design is a passive system where trucks drive over a tubular screen through a water bath. The water level in the trough is maintained by a float valve and the settled solids below the tubular screen are removed periodically with an excavator/loader.

Wheel Wash Cost Estimate (Each Bay)

Demolition	\$ 16,270
Concrete Work	23,200
Steel	19,200
Float valve, water pipe, filter	4,500
Subtotal	\$ 63,170
General Conditions (10%)	6,320
Contingency (25%)	15,790
Engineering (10%)	6,320
Total	\$ 91,600

Truck Wash Design

The MCS truck wash is an issue. It’s in a good location, but requires a new water distribution system to prevent the current abuse of water consumption by drivers. Attempts to provide water-conservation nozzles result in hoses being cut by the drivers to eliminate the nozzle. Water is left running while the driver sweeps out the compaction chamber or other parts of the truck. In addition, particles of the solid waste swept out of the trucks end up in the oil-water separator, which is not designed for organic removal.

Recommendation 11: Truck Wash

To prevent nozzle loss and reduce water consumption, URS recommends that Metro install new nozzle technology and closed circuit cameras. The nozzles should include a regulated flow device that meters the quantity of water and then shuts down for a pre-determined period (such as 15 minutes) before reactivation. This will force the drivers to be frugal with the water and their time.

URS recommends removing the existing catch basin and oil-water separator and installing a completely new system. This will require the demolition of the existing floor and installation of a new floor properly sloped into a trench drain. The east end of the trench drain will have three screen filters to remove the solids. The screens are located for easy removal and cleaning. The trench drain sectional grill is designed for ease of removal for cleaning out operations. A new oil-water separator will also be installed.

Truck Wash Cost Estimate

Demolition & removal of existing oil/water separator	\$ 8,540
New slab, 10”	46,020
Trench drain with screens, catch basin	8,280
Oil/water separator and installation	11,200
Water supply, meters, timers	1,800
Subtotal	\$ 75,840
General Conditions (10%)	7,580
Contingency (25%)	18,960
Engineering (10%)	7,580
Total	\$109,960

Site Drainage

The site has a well-designed drainage system that works efficiently. The area of concern is the quality of the runoff with suspended solids. One source of this contamination is the vehicles exiting Bays 2 and 3 with the ‘wet pulp’ attached to their tires. This problem requires the installation of wheel washes in both bays that accept wet waste.

The other primary source of contamination is the oil and grease from vehicles leaving the truck wash.

See **Recommendation 11**.

Dust Suppression

Dust is a problem at MCS. The entire transfer building seems to have a substantial layer of dust throughout its structural surfaces. The sources include the commercial truck bay area, conveyor drops, and compressed air to clean the facility and equipment.

Metro is considering a portable misting system. It has installed new ceiling exhaust fans, but when URS inspected the facility on several occasions the fans were not operating. The simple solution would be install timers to automatically turn on the fans during peak operating hours.

Recommendation 12: Ventilation

URS recommends that Metro establish a maintenance schedule for the ceiling exhaust fans because they appear to be operating at various rotating speeds. This will guarantee that the fans operate at their design capacity.

Scalehouse Remodel

The furniture layout within Scalehouse “A” blocks the circulation between the scale room and the meeting room. The shelf on the south wall needs to be removed and the desk replaced with a narrow computer desk to keep a clear passageway between the scale room and the meeting room. Files should be removed from the break room and the room restored to its original function. A fresh coat of paint would improve the working environment.

Recommendation 13: Scalehouse A Improvements

Metro should remodel and refurbish the interior of the scalehouse. The break room should be cleaned and the files stored in a file room at the office.

Materials Recovery and Recycling

Metro continues to emphasize a greater importance on material recovery and recycling throughout the region. It has been negotiating with private facilities to improve their respective recovery rates through a focus on the dry waste streams of construction and demolition debris.

Regional policy, in turn, includes mandates on Metro facilities to improve material recovery and recycling to comply with the regulations.

URS has made the following recommendations to improve MCS’ material recovery rates.

Dry Waste Recovery

Metro has a policy directive that requires private regional facilities to improve or implement a dry waste recovery program. This policy will apply to Metro facilities as well. MCS has improved its ability to meet future recovery goals through its development of a wood waste processing system for high grade loads.

Waste Processing Line

The transfer station operator and Metro staff have identified that significant amounts of recyclables are moved directly to the compactors for compaction and transfer. This direct movement of materials without recovery means that MCS is not maximizing its recycling capability.

The operator uses on-floor sorting to remove some of these recyclables prior to compaction. Installing an appropriate sort line designed specifically for processing moderate- to high-grade commercial loads will increase the recycling rate. In addition, removing workers from the tipping floor to perform the sort in a safe and controlled environment improves the overall safety of the operation. The processing line should be installed in Bay 2 because that is where the operator currently directs the moderate- to high-grade loads for on-floor sorting.

Recommendation 14: MCS Waste Process Line

The URS team recommends that Metro design and construct a new process sort line at MCS. This new line will allow the MCS operator to recover greater levels of the top commodities: wood, metal, plastic and cardboard.

Please see Figure 4 in Appendix B.

Waste Process Line Cost Estimate

Area preparation	\$ 5,000
Foundations	15,000
Concrete repair	5,000
Conveyor supports/sorting platform and access	100,000
Conveyor (48-inch) and chute work	350,000
Residue screen and support	40,000
Receiving hopper	15,000
Miscellaneous steel (bunker, railings)	40,000
Power supply	25,000
Subtotal	\$595,000
General Conditions (10%)	60,000
Contingency (25%)	149,000
Engineering (8%)	60,000
Total	\$864,000

HHW Facility

Most of the HHW waste at MCS is collected at roundup functions throughout the metropolitan area. It is the roundup waste that provides the challenge for the sort and disposal process that incorporates the full staff for its process.

URS observed that the existing storage space available for hazardous materials is sufficient.

The receiving area, however, appeared overwhelmed with a mix of materials, paperwork, computers and desks. In addition there is a trailer located adjacent to the facility that serves as an office and break room for the staff. URS recommends that the space be redesigned to provide better organization.

Recommendation 15: HHW Facility Expansion

The HHW facility at Metro Central has experienced an increase in its total operations during the recent decade mainly from collection events. To meet this demand, URS recommends that Metro expand the facility to prepare it for future service to the regional customers.

This facility has an unused existing loading ramp that is a hindrance to operations and expansion. The proposed expansion for this HHW facility will improve access, provide more area for non-hazardous material management, and create more space for hazard-based operations.

Please see Figure 3 in Appendix B.

HHW Facility Expansion Cost Estimate

Demolition	\$ 25,000
Roadway relocation	50,000
Site concrete (curbs, etc.)	75,000
Revisions to existing facilities	50,000
Utility revisions	25,000
New access ramp with foundations	40,000
Canopy over ramp	20,000
New building additions (1,400 sq. ft.)	280,000
Miscellaneous	20,000
Subtotal	\$585,000
General Conditions (10%)	59,000
Contingency (25%)	146,000
Engineering (10%)	73,000
Total	\$863,000

Sustainable Design

The URS research for this facilities master plan update indicates that Metro continues to recognize the importance of sustainability to the agency and region. The Metro Council, through its direction to the Solid Waste and Recycling Department, has mandated a regional approach to improved sustainability practices and all facilities, public and private.

Truck Wash

An important part of the URS recommendation to redesign the truck wash station at MCS is the management of water. The history of this service, unfortunately, includes the loss of hose nozzles and the continuous flow of water left running by careless drivers.

See Recommendation 11.

Stormwater Management and Reuse

The reuse of stormwater is an important and sustainable recommendation for MCS. The historic, average water use at MCS is approximately 6,700 gallons per day. Much of this flow, perhaps 80%, is used in the truck wash facility located on the west side of the building. A decision to collect this water from the roof system at the transfer station is environmentally sound. It would allow Metro to use it for the truck wash and substantially reduce the monthly water and stormwater charges from the city of Portland.

This project would reduce metered water consumption and the corresponding sewer charge, and may be eligible for stormwater credits through the City of Portland. This system design should include an approach to reduce the impact of suspended solids and how stormwater dilutes the site discharge.

Recommendation 16: Capture and Reuse Stormwater

URS recommends redirecting the roof drainage system to capture, store and reuse the stormwater to wash trucks. Capturing the average storm event on 83% of the facility's roof area should provide approximately 42,000 gallons of water for the truck wash.

Metro should install a storage system based on the site requirements in the chimney area adjacent to the wash. This water should be available only for the truck wash. The tank will be continuously replenished during the region's wet season which should suffice during that period. The truck wash will operate on city water during the dry season.

The 2001 Facility Master Plan included a description of this recommendation on page 3-23 and a drawing in Figure MCS-12.

Please see Figure 2 in Appendix B for tank location.

Appendices

Appendix A: Metro South Drawings

Appendix B: Metro Central Drawings

Appendix C: Facility Siting Process

***Appendix D: Metro South and Metro Central
Interview Survey***

Appendix E: Long Range Tonnage Forecast