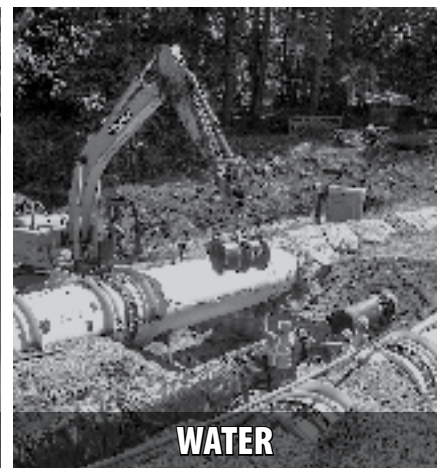
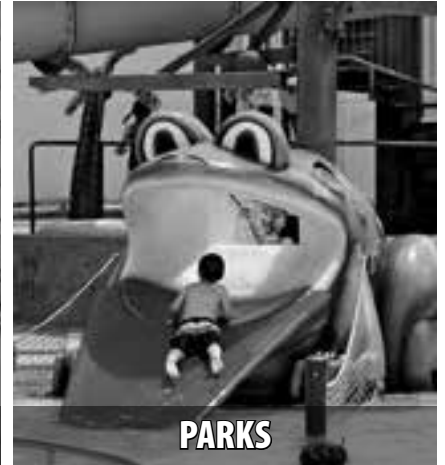


CITY OF PORTLAND 2013 CITYWIDE ASSETS REPORT

Status and Best Practices



City Asset Managers Group

Sponsored by the Planning and Development Directors

Bureau of Environmental Services
Bureau of Planning and Sustainability
Bureau of Transportation

Office of Management and Finance
Portland Parks and Recreation
Portland Water Bureau

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1. Executive Summary

The City of Portland's physical infrastructure assets include roads, pipes, treatment facilities, parks, buildings and more. What does it take to be steward of these community assets? What will we turn over to future generations? This report compiles data and best practices useful to City bureaus and decision-makers in answering these questions. Understanding the value and condition of assets and current asset management (AM) practices will help City decision makers allocate scarce financial resources to deliver public services.

This report provides integrated information about the City of Portland's physical assets. It provides a summary of the number of assets, replacement value, condition, and unmet funding needs. Information in the report assists the City's efforts to ensure infrastructure is in adequate condition and that operation, maintenance, rehabilitation, and development programs are as efficient and effective as possible.

Purpose of Report

This report serves to:

- Provide City of Portland staff, policy makers and general public with information needed to make more informed decisions that extend the life of the City's physical assets and deliver agreed service levels.
- Account for the community's investments and track assets over time — past, present and future.
- Relate challenges, progress and future opportunities.
- Share best practices with peer communities and infrastructure professionals.

This report collects and assembles key data, observations and best practices into a single report. This report leverages asset management expertise, contacts and trainings, through the cross-bureau City Asset Managers Group (CAMG), and enables more effective information exchange and the sharing of best practices within and outside of the City. This report dovetails with bureau-specific reports, City audits and policy reports, and is shared with City Council through the annual budget process.

To develop this report, the City's infrastructure bureaus collect and analyze data on all City-owned buildings and infrastructure. The bureaus strive to follow internationally recognized asset management principles, and use best practices to develop a coordinated approach to citywide asset management. This approach includes determining key measures, such as the value and condition of infrastructure assets, identifying confidence levels for the information presented and acknowledging when information is not available.

Relation to City Policy and Budget

Policy Development

From a policy perspective, there are three key factors to effectively manage the City's infrastructure systems: service levels, funding and risk. Service levels and risk management are described as key best practices, in Section 5 of this report. Annual funding gaps, by asset group, are described in Section 4 of this report.

At current funding levels, some of Portland's infrastructure will continue to deteriorate and bureaus may have to decrease their service levels. Two bureaus, Parks and Recreation (PP&R) and the Bureau of Transportation, lack reliable and stable funding sources to adequately invest in maintaining their assets, which means levels of service will decline and risks will increase by default. Water and BES face political pressures to limit rate increases which will impact their long-term ability to maintain their assets.

Conservatively, infrastructure bureaus estimate a combined annual funding gap of \$287 million per year to maintain existing facilities, address regulatory requirements, and meet service levels. This gap will likely grow for each of the next ten years. Some new assets often add to ongoing operations and maintenance needs, potentially adding to the funding gap. Some new assets may also replace existing asset functions and add new functionality.

City infrastructure policies are shaped by the recently-adopted Portland Plan and by the Comprehensive Plan Update (CPU), currently under development. The CPU Working Draft Part 1 proposes six integrated goals: equity, prosperity, education, human

health, environmental health and resilience. Staff and the public are discussing draft policies to guide priorities for the investment in and management of infrastructure assets.

City Budget Process

The information contained in this report is intended to help decision-makers make more informed decisions in the annual budget process. This annual report, as with previous versions, is submitted to the Portland City Council as part of the annual budget work sessions (for more information, visit www.portlandoregon.gov/cbo). Service level data is also coordinated with the City Budget Office's budget mapping exercise.

Recent experience shows that this report informs decision-makers with data and business practices relevant to allocating limited resources. Using expertise of the cross-bureau City Asset Managers Group, bureau directors are assisted in responding to questions from City Commissioners and citizen budget members.

Continuous Improvement

Four City bureaus (Environmental Services, Water, Transportation and Parks) have identified these work tasks:

1. Refine service levels, as needed. Each bureau will guide and determine any changes to its service levels.
2. Improve data collection for high-risk assets, and apply mitigation strategies based on asset risk classification. Identify opportunities for bureaus to collaborate on risk assessments and mitigation strategies.
3. Add a report card to future Citywide Assets Reports.
4. Develop bureau and asset-specific templates and application processes, for business case.
5. Apply reliability-centered approach to bureau maintenance.
6. Complete long-term investment profiles, develop tools and methodologies, and develop investment profiles for high-risk assets.
7. Continue bureau consultations in bureau budget advisory committees. Discuss lessons from Citywide Systems Plan and pilots from any bureaus, on community consultation or information.

2. Key Findings

This report cites data and processes for the year ending June 30, 2013. This section includes information regarding the value and condition of city assets, the quality of that data, and an update on improvements to bureau business practices for managing their assets.

Status and Conditions

Highlights from the 2013 data are:

1. The **current replacement value** of the City's physical infrastructure is estimated at \$31 billion. Current replacement value is an estimate of what it would cost to construct these assets today. It represents substantial investments by several generations of Portlanders. Current replacement value excludes the value of land.
2. At current funding levels, some of Portland's infrastructure will continue to deteriorate and bureaus may have to decrease their service levels. Two bureaus, Parks & Recreation and the Bureau of Transportation, lack a reliable resource base to adequately fund investments in maintaining assets. By default, levels of service will decline and the risk of failure will increase. Water and BES face political pressures to limit rate increases which will impact their long-term ability to maintain their assets.
3. Conservatively, infrastructure bureaus estimate a **combined annual funding gap of \$287 million per year** to maintain existing facilities, address regulatory requirements, and/or meet service levels. This gap will likely grow for each of the next ten years.
4. New assets often add to ongoing operations and maintenance needs, potentially adding to the funding gap. Some new assets may also replace existing asset functions and add new functionality.
5. The consistent finding of the City's annual citywide asset reports (since 2002) is that a substantial annual funding gap persists.

Asset Management

In 2013, bureaus continued to advance selected business practices. These include:

Transportation created Streets of Citywide Significance (SCS) to prioritize maintenance of transportation infrastructure, with a focus on safety.

Environmental Services reported on its updated performance measures. These measures incorporate levels of service and expand use of AM to refine prioritization of sewer rehab work.

Water is working to complete Asset Management Plans (AMPs) for all major asset groups and continue efforts on risk management (especially for high failure consequence pipes) and business cases.

Parks completed asset inventories, established a dedicated Asset Management program manager and broadened AM participation across all departments, and initiated a Comprehensive Asset Risk Profiles project to assess general risk exposure for all assets and to prioritize investments.

These bureaus continued to share their best practices.

Trends, Challenges and Opportunities

The Planning and Development Directors (the CAMG's sponsor) see three general policy trends:

- Assets age and wear out, even with best of maintenance.
- Bureaus are making the best of limited resources, but have a large funding gap.
- The funding gap results in increased risk of failures, reduction in levels of service and perpetuation of long-standing inequities.

There are several challenges to advancing citywide asset management best practices. These include:

- Limited resources to reduce the annual funding gap.
- Prioritizing limited resources. As bureaus seek out long-term, cost-effective approaches to service delivery, the community also wants to reduce historic inequities by ensuring all Portlanders receive at least basic minimum services.
- Challenge of coordinating and communicating across multiple bureaus.
- A steep learning curve, for City staff and decision makers, to understand and apply asset management practices.
- Pending retirements of City staff with hands-on knowledge of how to operate and maintain infrastructure assets (so-called succession planning issue).

Opportunities include:

- Cross-functional teams — the Water Bureau has used cross-functional management plans and ranks risks of asset failure. Parks is engaging in cross-functional work teams to assess and quantify the risk of certain assets and to determine priorities for investments. Other City bureaus (BES, PBOT, Parks) have also attended trainings on fundamentals of asset management, and committed to cross-training their departments.
- More shared understanding of infrastructure asset management by decision-makers, managers and line staff.
- Community interest in best value for public services, setting realistic service levels and reducing risk of assets failing. Reducing inequitable access to services is another strong community interest. Process tools, such as Triple Bottom Line and risk assessments, can be calibrated to account for social impacts.
- Extensive contacts with peer communities (especially for utilities) and consultants.

For more details on citywide best practices, see Section 5 of this report.

3. Asset Management Context

Goals

The goal of strategic asset management (AM) is to develop a sustainable asset base that provides appropriate levels of service and responds to social, economic, and environmental needs. Asset management addresses the design and specifications, maintenance, repair, rehabilitation, replacement, acquisition and disposal of assets.

Asset management is a set of industry standard best practices that provides a risk mitigation approach to decision making. It is commonly defined as meeting agreed upon public, customer and environmental service levels, while minimizing life cycle costs at an acceptable level of risk.

Asset management activities are driven by asset deterioration, regulations, and community needs (based on service levels). They will differ for each asset type based on maintenance management techniques, scheduling and priorities of activities, failure modes, treatment options, renewal strategies, equipment and practices, and renewal techniques. However, a whole-of-city approach ensures that the most innovative and cost-effective techniques are employed as each bureau's practices improve. Using this cross-bureau effort will continually improve performance-based information that is available to the public, bureaus, and city leaders as they make choices in the types and levels of service desired.

Asset management informs asset acquisition, maintenance and operations, renewal and adaptation, and asset disposal. It focuses on reliability and the lowest total life-cycle cost to provide desired levels of service.

Applying AM principles and practices will:

- Support the efficient delivery of services with assets that are cost-effective, well maintained, accessible, energy efficient and safe.
- Improve the ability to make sound business and planning decisions at all levels.
- Promote effective use of resources.
- Improve bureau support and accountability.
- Improve and coordinate City AM planning across bureaus.

Common elements for managing assets include:

- Information systems, such as GIS, CADD and Computerized Maintenance Management Systems (CMMS), that provide data on asset inventories and their condition.
- Good documentation of life-cycle costs, and optimum renewal strategies that ensure the lowest life-cycle cost.
- A needs assessment to evaluate current practices, asset risks, and opportunities.
- Links between service outcomes, bureau programs, AM plans, and performance measures.
- Community engagement to better define desired and affordable levels of service.
- Clear assignment of roles and responsibilities to guide AM efforts.

Drivers

In FY 2001–02, City Council set strategic priorities as part of the Managing for Results exercise. The Council identified the City’s deteriorating physical infrastructure as an immediate strategic priority. It remains a top Council strategic priority.

Other policy drivers (federal, state and local) underscore the importance of the condition of municipal infrastructure in supporting a community’s economic health, active neighborhoods, and environmental stewardship, including:

- State and federal regulations.
- Public Facilities Plan, a long-range, citywide plan which requires a major projects list for use in annual capital budgets.
- Portland Comprehensive Plan.
- The Portland Plan.
- Climate Action Plan.
- Municipal bonded debt covenants.
- City of Portland Budget Manual, which requires bureaus to analyze operations and maintenance costs and savings in new projects.
- U.S. Governmental Accounting Standards Board statements (GASB 34, 42, 48, 49 and 51).
- City of Portland Comprehensive Financial Management Policies.
- Other Council Priorities.

Regulatory Compliance

Regulatory compliance requirements can have major impacts on the management of infrastructure systems and on the resources available for repair and expansion projects. Currently a number of federal, state, and local regulations require additional compliance measures by the City. These mandates vary in compliance requirements, timeline, and level of funding through current City revenues.

Regulatory mandates affect all of the City’s infrastructure systems, including sewer and stormwater, transportation, water, parks and civic facility investments. The following represent some of the major regulations on capital systems:

- Clean Water Act, such as the Long Term Enhancement Rule (LT2) and CSO Amended Stipulation and Final Order.
- Environmental Protection Act, including Superfund cleanup requirements.
- Safe Drinking Water Act, including Underground Injection Control requirements.
- Endangered Species Act, such as Habitat Conservation Planning.
- Americans with Disabilities Act.
- Uniform Building Code, including minimum seismic standards.
- Green Building and Energy Efficiency Policies.

Many of these regulations do not have dedicated funds set aside for compliance measures. Compliance often requires significant capital investment, which may require diverting financial resources from capital repair and rehabilitation projects. In addition to existing mandates, future regulations may further impact management of the City’s infrastructure systems.

Bureau funding gaps presented in this report include varying degrees of regulatory compliance. Certain requirements, such as ADA accessibility and building code improvements may occur as part of capital repair or rehabilitation projects.

4. Citywide Asset Status and Condition

This section discusses key citywide data, bureau profiles and bureau methodologies. Several appendices support this status and condition analysis, and define terms. The City Asset Managers Group continues to seek opportunities to more closely align methods across bureaus.

A. Key Data

The annual citywide assets reports cite three key measures of the health of infrastructure systems. The measures are: current replacement value, current condition, and annual funding gap. These are fully loaded costs, including overhead. Confidence levels are assigned to communicate the relative quality of the data. In some cases, data is not available or is pending more detailed data collection and analysis.

- **Current replacement value (CRV)** — This is the total cost to replace the entire asset to meet current accepted standards and codes. CRV represents past investments of Portlanders in the City’s transportation, water, sewer, stormwater, parks and civic facilities. At critical points in Portland’s history, the community has supported major investments — to deliver drinking water from Bull Run (using headworks treatment, conduits and storage reservoirs), to treat sewage water (using sewer pipes and two sewer treatment plants), to improve access for people and goods (by paving streets and accommodating pedestrians and bikes), to provide safe places to play (with landscape plantings, recreation buildings and features), and to provide civic facilities and technology services (including police and fire facilities).

The City’s physical infrastructure has a current replacement value of \$31.2 billion. By bureau, the infrastructure value is: PBOT (\$8.1 billion); BES (\$13.2 billion); Water (\$7.6 billion); Parks (\$1.0 billion); and Management and Finance (\$1.3 billion).

- **Current condition** — This is the physical condition of the asset, used to assess its rate of deterioration and remaining useful life. Bureaus set priorities for inspecting the condition of assets, and potential high-risk assets may get priority. Methods range from actual field condition assessment, to staff estimates (based on repair history), to deterioration or failure rate curves. Some assets (like buried pressure water pipes) are typically assessed by age and type of pipe, break history and spot excavations. Other assets can be inspected directly, but may

be dispersed (as with parks buildings, recreation features, trails, benches and other furnishings).

- **Annual funding gap** — This is the difference between the funding needed to address infrastructure needs of a group of assets at a defined condition or level of service, and the funding that is currently available. It is the amount of money needed to eliminate the backlog and/or maintain the asset to achieve its optimal useful life. There are three types of funding gap:
 - **Repair, Rehabilitation, Replacement (R/R/R):** Additional funding necessary to repair, rehabilitate and replace existing assets to bring them up to current service levels, or replace assets considered obsolete.
 - **Mandate:** Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under Repair, Rehabilitation, Replacement or Capacity.
 - **Capacity:** Additional funding necessary to address existing inequities and deficiencies in levels of service for current customers and citizens.

Appendix 3 includes charts and data sheets for each bureau’s total funding gap, their funding gap by type (with capacity split out) and compared to their annual budgets (capital and operating). The bureau observations below, describe each bureau’s approach to asset management, recent experiences and improvement priorities.

Unfunded federal mandates and external funding of capital projects add to the number and type of physical assets. Although primarily built with leveraged funds, these assets become a long-term City obligation to maintain and operate. Typically, there is little or no set-aside funding for ongoing operating or maintenance of these assets prior to their construction.

For 2013, the key citywide measures did not significantly change from the prior year. In 2012, the annual report added a separate chart for capacity improvements (Appendix 3.b) and eliminated the future (10-year) asset condition table, since data confidence levels were very low for many asset groups.

Sustainable Funding Levels

This year, the combined annual funding gap for Transportation, Environmental Services, Water, Parks and Civic assets is \$287 million, including street pavement. The ongoing funding gap is the result of under-investing in capital maintenance. This is not a sustainable business practice. With this trend, we can expect lower levels of service and more frequent system failures.

Past Responses

In 1996, City Council increased the General Fund capital set-aside from a base of \$3 million. The Council's intent was to add \$1 million to it each year until a \$10 million set-aside pool was formed. That fund rose to \$7 million in FY 2002–03, and then declined after a series of annual budget cuts. The General Fund capital set-aside funded a variety of maintenance, replacement, and improvement projects. Major funded projects included ongoing replacements of fire apparatus, ongoing street lighting improvements, renovation of the Hillside Community Center, major maintenance of the 800 MHz system, purchase of a bomb robot, funding of debt service for the Gateway Child Receiving Center and Streetcar #7, and funding of several Parks maintenance projects and acquisitions. In FY 2008–09, City Council redirected the capital set-aside to fund the Public Safety Systems Revitalization Project.

The Auditor's 2002 report *Managing for Results* identified the deteriorating physical infrastructure as a priority. That report recommended that City Council consider a Major Maintenance Fund to increase the investment in capital maintenance. City Council did not act on that recommendation.

In January 2007, the Directors' group reviewed key findings of this report, and asked staff to prepare ideas to 1) start closing the annual funding gap, and 2) more fully maintain existing infrastructure. The City Council must balance many competing demands. This effort would take a number of years. The concept was to build a funding gap finance plan with a planning horizon of 10 to 15 years.

In 2007, the City Asset Managers Group worked with OMF Financial Planning to improve the General Fund Capital Set-Aside allocation process. The revised process used a new set of criteria based on the risk management process (see Appendix 5 of the City of Portland Asset Status and Conditions Report, December 2007). The risk rating process allows ranking of projects based on how effectively they reduce the risk of the high and extreme risk assets. Use of the citywide risk management process is on hold, pending more feedback and direction.

City Council adopted revised Financial Policies effective July 1, 2008. A new provision stated that at least 25 percent of General Fund discretionary revenue that exceeds the budgeted beginning balance (adjusted) will be allocated to infrastructure maintenance or replacement in the fall budget monitoring process (BMP). The percentage calculation will be based on any discretionary funds in excess of the budgeted beginning balance, adjusted for the difference in encumbrances carried over from the prior year. Infrastructure maintenance projects to be considered for funding will be projects requested but not funded in the prior year's budget and projects that are underway but still require funding.

There have been mixed results since this provision was enacted. There was no surplus in beginning balance (FY 2009-10 or FY 2012-13) resulting in no additional General Fund capital allocations. In FY 2010–11, City Council allocated \$2.4 million in Capital Set-aside funding for infrastructure maintenance or repair. In FY 2013-14, City Council allocated \$4.5 million Capital Set-aside.

B. Transportation

Profile

The Portland Bureau of Transportation (PBOT) manages transportation assets with a replacement value of over \$8 billion. Improved streets, the sidewalk system, bridges, traffic signals (signal hardware), and streetlights make up 92 percent of the dollar value (\$7.4 billion). In addition to these key assets, the City of Portland owns other assets that ensure the safety and movement of people and goods: streetcars; an aerial tram; various support facilities; traffic calming devices; signs; parking meters; parking garages; pavement markings; bikeways; guardrails; retaining walls; the Harbor Wall; stairways; and traffic signal computer controllers. These assets are worth \$680 million.

Asset Management Approach

Transportation utilizes asset management as a way to effectively and efficiently allocate resources, measure performance, and track infrastructure needs. PBOT's Asset Management Advisory Committee (which includes engineers and operations staff as well as maintenance, finance, and information technology managers) sets the priorities for asset management within the bureau and helps implement those priorities into business practices.

Asset Management Achievements

Condition Monitoring — Transportation currently conducts condition monitoring on pavement, bridges, structures, street lights and traffic signal infrastructure. PBOT is working with engineers and technology staff to expand condition monitoring to guardrail and traffic signs. Condition monitoring will allow PBOT to plan for appropriate preventive maintenance, rehabilitation or replacement needs and budget accordingly.

Risk Assessment — PBOT has established a risk assessment for failure of assets. Criteria for assessing consequences and likelihood of failure have been created and are being applied to transportation assets. A risk registry, identifying failure modes and assigning risk of failure will be created. Risk of failure is used to prioritize pavement preservation across the city.

Asset Levels of Service — Levels of service for each infrastructure asset class have been established to track and monitor performance and outcomes achieved. Performance measurement is a way of monitoring progress toward a result or goal. It is also a process of

gathering information to make well-informed decisions. An Infrastructure Asset Report Card summarizes achievement of the levels of service.

Asset Management Priorities

Streets of Citywide Significance (SCS) was created as a way to prioritize how Maintenance Operations crews do the work to maintain the infrastructure. SCS are travel corridors PBOT prioritizes for expenditures due to their high traffic volume across all modes (freight, transit, motor vehicles, pedestrians and bicycles). Safety is a key element that factors into the SCS designation. The prioritization is necessary because the scope of resources needed to maintain transportation infrastructure greatly exceeds resources available.

Asset Value and Condition

Maintaining and operating the transportation infrastructure are key activities of PBOT. Emerging needs include:

Street Lighting — Street lights are important for the safety of our neighborhoods and for those who use the transportation system. Many of the city's 55,477 street lighting luminaries were replaced in the early 1980s when mercury vapor lights were converted to high pressure sodium lamps. PBOT is currently working with City Council to implement a program for conversion to LED lighting.

Signals — Traffic signals are made up of several components (i.e. hardware, software, mast arms, controllers, cabinets and signals). Approximately 52 percent of the traffic signals are in poor or very poor condition. Traffic signals in poor condition are more prone to increased trouble calls, causing safety and congestion problems. Traffic signals in optimal condition provide efficient movement of people and goods and when synchronized reduced greenhouse gases.

Pavement — Approximately 48 percent of the collector and arterial system is in poor or very poor condition, 19 percent is fair and 33 percent is in good or better condition. PBOT's goal is that 80 percent of the arterial and collector system is in fair or better condition and no more than 2 percent are in very poor condition.

Bridges — Of the 157 bridges the city owns, 30 percent are either structurally deficient or functionally obsolete; 26 of these are in poor or very poor condition including 22 that are weight restricted. Weight restrictions on bridges impact the ability to move freight and goods, which ultimately has an impact to our economy. Additionally, freight has to find alternate routes, extending travel time requiring the use of more fuel and impacting the environment.

Sidewalk Network — ADA required the City’s public facilities be designed and constructed so that they are accessible to all people, including those with disabilities. Ten percent of the sidewalk system in Portland has corners with ramps that meet current ADA-accessible standards. In total, 46 percent of corners have accessible corner ramps, which met both current and past ADA standards.

Annual Funding Gap

The funding gap is defined as the amount of additional funding and resources needed to bring or restore an existing asset class to a fair or better condition and to maintain it at that condition. This includes preventive maintenance, rehabilitation and replacement needs.

Transportation’s maintenance liability continues to increase as the infrastructure ages.

PBOT’s primary source of discretionary funds is not keeping pace with inflation, meaning the purchasing power has decreased. This means PBOT has had to make reductions to the budget, resulting in the ability to do less preventive and routine maintenance. This will have a severe impact on the future condition and continued decline of Transportation’s infrastructure.

PBOT’s annual \$153.4 million funding gap breaks out as follows:

Streets — The funding gap is estimated at \$47.6 million for collector and arterial streets; another \$44 million for local streets. Ratings of collector and arterial streets have been completed. Calculations of need are based upon assigned treatment rules, which are based upon pavement condition, road type and road usage.

A road in good repair provides a smooth ride, limits the wear and tear on vehicles and improves safety. The key to keeping pavements in good condition is to prevent water from getting under the surface of the pavement. With proper maintenance, streets last longer and maintenance costs less. Proper pavement preservation techniques mean that the right treatment to fix the road

is applied at the right time.

When a road deteriorates to the point where it requires major rehabilitation or reconstruction, the costs are very high. In contrast, it is less expensive to perform preventative maintenance on pavement that is still in good condition. Preventing major deterioration and keeping roads at the preventative maintenance level or better is the best way to invest limited funds. Like other transportation agencies across the nation, PBOT’s policy is to prioritize these early-stage repairs.

Sidewalk system — \$15.7 million is needed annually to repair, restore or replace curbs to bring them to a fair or better condition and \$7.1 million is needed annually to build ADA accessible corners, where there are currently none, and maintain the corners in a fair or better condition. While the sidewalks are owned by the City, it is the adjacent property owner’s responsibility to repair, restore or replace sidewalks. This means that the stated unmet need for sidewalks is not the sole responsibility of Transportation to address.

Bridges — The total cost to replace city-owned bridges in poor condition, and address bridge deficiencies is \$12.9 million annually.

Signal Hardware — A total increase of \$17.5 million per year is needed in capital funding.

Street Lights — \$5.8 million per year is needed to improve the lights to a fair or better condition. This need may change with the conversion of street lights to LED lighting. PBOT is currently working with City Council to implement a program for conversion to LED lighting.

Other — Unmet need for pavement markings, street signs, streetcar, traffic signal controllers, other equipment, and retaining walls and stairways totals \$2.8 million.

Calculation Methodologies

Replacement Value

By using the average unit cost at a network level, the Portland Bureau of Transportation (PBOT) uses a simple approach in calculating the replacement value for its assets. For an asset, the replacement value includes the costs of removal and installation. Overhead is included in the replacement value. This is consistent with how PBOT capitalizes overhead at year-end on infrastructures for two accounts, improvements (closed projects) and work-in-progress (open projects). Transportation uses the overhead methodology based on labor for most of

the assets, except for bridges and other structures that were based on the total costs overhead methodology, since additional work is needed. Efforts continue to improve the information on the inventory count and replacement values on some of the transportation assets. Please note that actual replacement costs would vary by location.

Current Condition

Condition methodology is reported as a percentage of the total number of assets. The methodology for determining asset condition varies by asset group, see below.

Asset Group	Method of Asset Condition Assessment
Pavement	<ul style="list-style-type: none"> ▪ Visual inspection of pavement using the Metropolitan Transportation Commission rating methodology.
Sidewalk System	<ul style="list-style-type: none"> ▪ Sidewalks: Visual inspection; Guidelines in the Operating Policy and Sidewalk Repair Program. ▪ Curbs: Functional purpose, that is, if they protect the street edge and direct runoff and if they present a traffic hazard.
Bicycle Network	<ul style="list-style-type: none"> ▪ To be determined.
Structures	<ul style="list-style-type: none"> ▪ Bridges: Inspection rating system based on Oregon Department of Transportation and National Bridge Inspection. ▪ Retaining Walls, Harbor Wall: Visual inspection. ▪ Stairways: Visual inspection. ▪ Guardrails: Visual inspection.
Traffic Signals	<ul style="list-style-type: none"> ▪ Hardware & Controllers: Age. ▪ ITS and Other Equipment: To be determined.
Streetcar	<ul style="list-style-type: none"> ▪ All Components: Age; Visual inspection.
Aerial Tram	<ul style="list-style-type: none"> ▪ Age; Visual inspection; Structural inspection for stations and towers (every 2 years), cables (annually).
Traffic Calming Devices	<ul style="list-style-type: none"> ▪ Visual inspection.
Street Lights	<ul style="list-style-type: none"> ▪ Field inspections; Age of the components; Type of luminaire; Type of system (underground vs. above ground).
Pavement Markings	<ul style="list-style-type: none"> ▪ Painted Markings: Currently no condition assessment. ▪ Durable Markings: Type of material; regular maintenance; visual inspection.
Parking Meters	<ul style="list-style-type: none"> ▪ Single and Double Meters: Age; Visual inspection. ▪ SmartMeters: Notifications of maintenance issues from software system connected to meters.

Annual Funding Gap

Total unmet need is defined as the amount of additional funding and resources needed to bring a given asset class to an acceptable condition and to maintain it at that condition. Reported unmet need does not include sidewalks or unpaved streets. Adjacent property owners are financially responsible for repairing sidewalks; therefore, the City does not have an unmet sidewalk repair need. Figures do not include unpaved streets as the City is not financially responsible for upgrading and maintaining unpaved streets.

PBOT is in the process of updating the Transportation System plan (TSP). In order to place a value on what it would take to address existing inequities and deficiencies in levels of service, an update of the TSP would be needed.

C. Environmental Services

Profile

The Bureau of Environmental Services (BES) provides sewer and stormwater collection and treatment services to approximately 600,000 people, numerous commercial and industrial facilities, and six wholesale customers. The existing system consists of 1,000 miles of separated sanitary sewers, 885 miles of combined sewer that carry both stormwater and sanitary waste, 454 miles of stormwater pipes, 1,900 water quality facilities (green streets, vegetated swales, ponds, constructed wetlands), 97 pump stations, and two wastewater treatment plants. These assets are valued at approximately \$13.2 billion.

Asset Management Approach

Asset Management has been part of the business practices at BES for over 20 years beginning with the implementation of the Hansen Maintenance Management Database and condition assessment scoring in 1990. BES' updated Systems Plans incorporate asset management principles to prioritize projects to address the highest risks. The bureau's performance measures include levels of service (LOS).

Asset Management Practices

BES applies AM practices of asset inventory, condition assessment, and computerized maintenance management systems for its system components: treatment, pump stations, and collection systems. The Systems Plan for the sanitary and combined collection system incorporates system inventory, condition, GIS data, and failure records in an AM context to develop a risk register consisting of likelihood of failure times

consequence of failure. This work has been incorporated into the annual planning process for the CIP. The plan identifies the appropriate sewer maintenance routines (and repairs) to enable individual infrastructure components to reach an optimal useful service life at an overall least cost. A similar multi-year effort focused on the stormwater system is underway.

The companion Capacity, Management, Operation & Maintenance (CMOM) project identifies the appropriate sewer maintenance routines and repairs to enable the individual infrastructure components to reach an optimal useful service life at an overall least cost.

Asset Value and Condition

The overall replacement value of BES assets increased to \$13.2 billion in 2013. This reflects an adjustment for ENR (9291 to 9826). There has been no significant change to overall asset condition.

Annual Funding Gap

The financial plan includes an ambitious pipe rehabilitation program focused on pipes with the highest risk, primarily in the combined system. The financial plan also includes many, but not all, of the recommended capacity related projects from the Systems Plan. The funding gap is based on the following:

- **R/R/R** — The difference between the replacement value of assets in very poor condition and the amount of funding in the financial plan for rehabilitation of those assets. The gap assumes all wastewater pipe rehab projects in the proposed financial plan proceed as programmed.
- The extent of stormwater system needs is unknown. The estimated gap makes very broad assumptions about rehab and capacity needs from the Stephens Creek pilot.
- **Capacity — Combined** — Projects recommended in the Systems Plan with positive benefit/cost ratios (primarily those that address conveyance of the 2-year storm in combination with deteriorated pipes) that are not included in the financial plan. Note that the gap does not include projects required to meet stated LOS for conveying the 25-year storm.
- The value of the stormwater system reflects only the piped system and other constructed facilities (such as sumps, green streets, water quality facilities). It does not include natural systems – either the value of them or the funding gap to address watershed health/habitat or anticipated regulatory changes related to the MS4 permit.

Asset Management Improvement Priorities

BES reported on updated performance measures which incorporate levels of service and expanded use of asset management to refine prioritization of sewer rehab work. Also BES made further progress on documenting the amount of risk reduced by completed projects.

D. Water

Profile

The Portland Water Bureau (PWB) delivers potable drinking water for consumption and fire protection. The City is the largest supplier of domestic water in Oregon, serving more than 800,000 people and providing about 100 million gallons of water per day, or about 36 billion gallons per year. About 60 percent of the water is delivered to customers within Portland city limits. The remaining 40 percent is sold to customers in 19 surrounding cities and special water districts. Water is supplied from the Bull Run watershed and the Columbia South Shore wellfield through more than 2,000 miles of pipes. The water system is valued at \$7.6 billion.

Asset Management Approach

The Water Bureau has an Asset Management Group (AMG), located within the Engineering Department, which coordinates asset management activities within the organization. An Asset Management Steering Committee makes policy decisions related to asset management and approves major work items.

Uses of Asset Management

The approach to Asset Management in the Bureau has been to focus on key asset management concepts. To achieve progress in Asset Management, the Water Bureau has taken the following actions:

- Incorporated key service levels into the Water Bureau's Strategic Plan. Those service levels have been tracked since FY 08-09. In FY 2012-13, the Bureau met 20 of its 27 service levels.
- Asset Risk Management. There is a risk service level. The bureau identifies key assets, assessing the potential risk of asset failure, and then is committed to either better understanding the risks or taking steps to mitigate those risks. There are currently 10 extreme risk assets and 44 high risk assets. All extreme risks and 83 percent of high risks are being addressed.
- Management of high risk assets. Developed overall strategy for high consequence pipes. Identified primary failure modes. Since 2012, completed condition assessment on all crossings under Interstate 84 and conducted an in-pipe assessment of a crossing under Interstate 205 that had points of interest.

- Performing dozens of business cases and using the results to support project planning, design, construction and operation decisions.
- Creating Asset Management Plans (AMPs) that define maintenance, repair and replacement strategies for the assets. The bureau completed 13 AMPs in 2012, with eight more in development and due for completion in 2014. All recommended strategies are prioritized and considered for implementation.

Asset Management Practice

As noted above, the bureau has continued with its tracking of service levels, identification and mitigation of risks, condition assessments, business case development and creation of Asset Management Plans.

Asset Value and Condition

The overall replacement value of the Portland Water Bureau's assets increased from \$7.1 billion in 2012 to \$7.6 billion in 2013 due primarily to actual replacement costs being higher than previous estimated replacement costs.

Since 2007, the overall condition of the water system has improved (although condition ratings based on seismic vulnerability would impact this conclusion if included). Twenty three percent of assets are in fair condition, and eight percent are in poor to very poor condition.

Annual Funding Gap

A funding gap exists in the need to replace assets in poor condition and to maintain the overall condition of other groups of assets. Baseline unmet needs amount to \$155 million over 10 years. The following list reflects the Water Bureau's anticipated system needs beyond the current level of funding.

Distribution:

- Replacement of hydrants: Replacement of all screw-type (obsolete) hydrants not being met by current funding levels.
- Replacement of services: Replacing all plastic and galvanized services, and aging copper services, not expected to be replaced under the current funding levels.

- Replacement of valves: Replacement of all large valves in poor condition.
- Facility valves: Install drainage valves at active tanks and pump stations.
- Replacement of high consequence pipe segments in poor condition: Replacement of all poor condition pipe segment crossings of bridges, major arterials, freeways and railroad lines; and funding a pipe condition assessment program.
- Replacement of pump mains: Replacing the sections of two major pump mains that are currently in poor condition but not funded for replacement.
- Pipe relocations and replacements in response to bike boulevards, green improvements, or inadequate cover on road reconstruction.
- Expanded predictive/preventive maintenance program for site valves and pipes, tanks and fountains.
- Tank cathodic protection and seismic upgrading.

Transmission — Conduits:

- There is a need to further assess condition and to replace/upgrade sections of the oldest conduits east of Portland. There is also a need for a Willamette River pipe crossing that meets current design standards.

Supply:

- A significant portion of the Bull Run watershed road system is in need of maintenance.

Asset Management Improvement Priorities

The Water Bureau continues to expand its efforts to implement Asset Management. An updated Asset Management work plan for the organization was created in 2013. A stakeholder group reached consensus on the focus of the next steps of the organization in Asset Management identifying eleven work tasks. The decision was made to complete eight more Asset Management Plans (AMPs), to develop and implement a strategy for high consequence pipes, and to continue to improve the approach to business cases, risk of asset failure, and the reliability centered maintenance program.

Calculation Methodologies

Replacement Value

In most cases, the replacement value is based on the current costs to install assets and includes all overhead costs. Replacement costs were last estimated in December 2012 and are inflated to reflect current replacement values.

Current Condition

Condition can be based on age, visual inspection, deterioration or failure curves. The Water Bureau matches one of these methods to each asset type.

The Water Bureau uses available information to assess physical condition of its assets. The least specific is a rating based on asset age relative to useful life. The most specific form of rating is based on an actual field condition assessment of individual assets. Intermediate forms of estimating condition involve ratings based on the judgment of Bureau personnel most knowledgeable about a particular asset or group of assets or partial inspection data, extrapolated to an entire asset class. For pipes, the Water Bureau uses Weibull curves of the failure rate by age of the asset class. Deterioration curves are used for pump, tank, and several other assets.

All reported condition information values are based on the percentage of value of assets. All notable asset groups are included.

E. Parks

Profile

Bureau Highlights

Portland Parks and Recreation (PP&R) continues to refine and implement its asset management practices.

- **Technology** — PP&R upgraded the MS2000 work order system to the current version of MicroMain. This transition will help PP&R more accurately track and maintain assets over their useful lives. PP&R is also refining terminology and definitions to ensure more accurate and consistent reporting.
- **Assessments** — PP&R continues to conduct inspections and assessments of the asset system, with regular inspections of all buildings, pools, and play equipment. The bureau continues to add new assets to its inspection and condition assessment program.
- **Strategic Plan** — PP&R's 2012–15 Strategic Plan includes Asset Management as one of six key strategic themes. Five initiatives are aimed at adapting best practices to the widely diverse portfolio of public parks, recreation and natural area assets.
- **Bureau Structure** — Two existing positions, previously partially involved in asset management, have been wholly dedicated to the Asset Management program. The program manager reports directly to the Senior Manager for Planning, Development and Asset Management.

Asset Management Approach

- All PP&R assets, both built and natural, that are owned and managed by PP&R are accounted for in six asset class groups: Amenities, Buildings/Pools, Recreation Features, Utilities, Circulation, and Green Infrastructure. All major assets are identified in PP&R's Geographic Information System (GIS). Work continues to add all assets to the GIS and CADD systems, as well as keep up with changes on the ground.
- Asset Management practices and principles are used to coordinate asset data, develop accurate asset inventories and produce up-to-date reports. Accurate AM data coupled with statistically valid information on customer needs and desires allows PP&R to make informed decisions about the assets needed to provide specific services.

- PP&R's AM program continues to help implement Parks 2020 Vision by ensuring the provision of high-quality facilities, providing for long-range capital needs and developing best management practices. It allows Parks to fulfill a major part of its mission of developing and maintaining excellent facilities and places for public recreation.
- Initial work focused on the more heavily used facilities and on the basic elements that provide good visitor experiences. Current efforts expand inventory and condition assessments to parks and natural areas circulation systems and infrastructure.

Uses of Asset Management

AM information is utilized in preparing PP&R's capital plans and budgets, developing consistent maintenance and operations regimes, fulfilling City and federal reporting requirements, informing system planning, and supporting financial forecasting. Applying asset management principles and practices helps prioritize capital projects and allocate scarce resources.

As asset management continues to be integrated into PP&R management practices, PP&R is better able to determine acquisition and capital improvement needs, provide appropriate levels of maintenance, and determine which assets to acquire and which to dispose of in order to develop a stable asset portfolio that meets service needs.

Asset Management Practices

- Current efforts focus on improving the inventory, attribution and condition of circulation systems and utilities infrastructure. Buildings and playgrounds have been inventoried and are assessed regularly. A new green infrastructure, natural area condition methodology has been developed, and PP&R intends to continue updating the condition using the new methodology. Marine facilities, docks and ramps have been assessed and are included in a longer-term rotation. PP&R has developed an inspection and condition assessment work plan, currently extending through 2015, intended to bring new assets into the condition assessment rotation.
- For many assets, PP&R has completed the initial inventory and condition assessments and is in the process of inspecting 20 percent of all assets each year. By 2015, all remaining assets will be included in this annual rotating schedule, with most assets being inspected at least once every five years and more often in high risk cases.

- PP&R is pursuing a lean approach to developing and implementing asset management. A small staff team is developing and implementing best practices system-wide, working in collaboration with parks, recreation facilities, and natural areas maintenance staff.
- Coordination between Asset Management, Planning, and Services departments. The focus is on business process improvements that increase knowledge of asset conditions while increasing efficiency. Leverage tools include GIS, CADD and CMMS.

Asset Value and Condition

The overall replacement value of PP&R's assets increased from \$984 million in 2012 to \$1.03 billion in 2013 due to inflation and the addition of new assets. Overall condition improved slightly from 2012 to 2013. Moreover, more asset classes are included in the report than in prior years, mostly stemming from the Asset Risk Profiles project. This project delivered an overview of the risk exposure of most asset classes in Parks. Thus the percentage of TBD dropped from 44 percent to 32 percent of assets. Improvement in condition is primarily attributable to newly included asset classes in better overall condition than the whole base. However, when scaled by replacement value, the condition of high value assets — such as community centers and pools — fell slightly.

Annual Funding Gap

PP&R has an expected total capital annual funding need of \$84.4 million for each of the next 10 years. This includes \$47.8 million for expanding the system to provide standard levels of service for all residents, in addition to \$36.6 million in funding needed to maintain existing assets. The funding need calculations are based on the 1- to- 10-year list of all identified potential PP&R projects. The economic recovery has delivered a significant increase in System Development Charges flowing to Parks. The forecast for SDC funds, plus grants and donations has been increased to \$8 million annually. These funds are dedicated to addressing new growth and therefore the Capacity component of the Annual Funding Gap grew less than expected. Additionally, City Council has been able to provide about \$1 million annually to address some of the most urgent needs for repair, rehab and replacement and mandated work. This totals an average of \$9 million annually available for capital, leaving a funding gap of \$84.4 million annually to expand and maintain current assets.

Parks system capacity, meaning addressing growth, represents over half of the Annual Funding Gap. Realization of these projects would mean more and improved parks, community centers, aquatics facilities, trails, and natural areas. Some areas of the City are underserved, notably neighborhoods east of I-205. However, there are neighborhoods that are not within one-half mile of a park or natural area throughout the city (one of PP&R's key Level of Service targets).

Maintaining existing assets in good condition requires regular repair and replacement, which depends on sufficient regular funding, which has not kept up with need. The recommended standard for reinvestment needed to maintain building assets in good condition is from 2 percent to 4 percent of the asset's current replacement value (CRV). With an average of below 2 percent of CRV in funds to reinvest in past years, PP&R has consistent shortfalls and a widening gap. In 2013, PP&R invested 1.8 percent of CRV (based on calculation of major building and pool reinvestment only).

Asset Management Improvement Priorities

The 2012–15 Strategic Plan includes asset management as one of six strategic themes. Five initiatives outline the bureau's priorities over the next three years, as follows below:

- Establish levels of service by asset classes.
- Assess condition of assets to determine remaining useful life.
- Develop asset risk profiles.
- Prepare asset management plans.
- Develop funding strategies for capital improvements.

Calculation Methodologies

Replacement Value

PP&R calculates the replacement value for its assets by estimating the installed cost to replace the asset in kind, without increasing its size or changing its functionality, but bringing it up to current code. As PP&R expands and improves its asset management program, more specific valuations are being gathered for all assets. Where specific information is not available, general estimates of the value of all assets are provided, albeit with varying levels of confidence.

Method of Asset Replacement Value Calculation	
Asset Group	Method
Amenities	Per each for assets such as benches, tables, drinking fountains, etc.
Buildings and Pools	Square foot costs per type of facility.
Recreation Features	Square foot costs or per each.
Built Infrastructure	Lineal feet.
Green Infrastructure	Per acre or square foot.

Current Condition

Condition is primarily determined by visual inspections and tests unless the asset is hidden from view. In those cases, previous experience or manufacturer’s recommended replacement dates are used to estimate condition and remaining life. Additional testing may be required in some cases.

Method of Asset Condition Assessment		
Asset Group	Method	Status
Amenities	Visual inspection	Furnishings in developed parks are complete; furnishings in natural areas are in process.
Buildings and Pools	Visual inspection and/or remaining life	Major and minor building assessments complete.
Recreation Features	Visual inspection	Assessments for most recreation features have been completed. Ongoing assessments are in place for certain assets, but need to be developed for many others.
Built Infrastructure	Visual inspection and remaining life	Roads and parking lots have been inventoried and assessed; many regional trails have been assessed; paths and walks in developed parks need to be assessed; utilities have been inventoried but few have been assessed.
Green Infrastructure	Visual inspection	Natural Area green infrastructure were inventoried and assessed in 2010.

PP&R is updating its annual asset inspection program to determine the condition of all assets and aims to inspect 20 percent of all critical assets each year. All assets will be inspected at least once every five years and more often in the cases of pools and play equipment or other items that require more oversight and maintenance. PP&R is working to add asset classes to the Asset Management Program each year.

Annual Funding Gap

PP&R has identified capital needs for the next 20 years on its Capital Improvement Project (CIP) list. The PP&R funding gap represents the difference between the anticipated annual revenue PP&R receives for CIP projects and the cost it would take to complete all the projects within the first 10 years of the 20 year CIP list, annualized over ten years.

PP&R tracks four categories of projects on its CIP list. Preserve (repair, rehabilitate, and replace) and Efficiency (projects that improve the cost effectiveness of maintaining and operating assets) are combined into the R/R/R category for the citywide report. Safety (projects needed to bring existing assets up to current codes and meet mandates such as ADA) is reported as Mandate. Growth (projects that expand the system and are needed to meet level of service targets for all customers) is reported as Capacity. Examples of Capacity projects include developing new parks, new community centers, and new trails, or building new features in parks, like new spray play features or skate parks in neighborhoods where current levels of service are below PP&R standards.

F. Civic

Profile

Asset Management Approach

The Civic Asset's AM program includes two asset groups: Facilities and Technology. The Facilities group includes facilities managed by the Office of Management and Finance (Police facilities, office buildings, other buildings, Union Station, and spectator facilities) and facilities other organizations manage (Fire facilities and Portland Center for the Performing Arts). The Technology group includes the technology assets that OMF owns and manages through its Bureau of Technology Services and the Enterprise Business System owned and managed by Enterprise Business Solution division.

OMF takes the lead for the Civic Assets group. In FY 2009 management of the City's parking garage assets was transferred to PBOT.

Asset Management serves as the basis for documenting the physical and financial status of these assets, coordinating asset data, developing accurate asset inventories and producing up-to-date reports and maintenance plans. Accurate AM data allows OMF and other organizations to make informed decisions about assets. The annual and one-time funding gaps are the main indicators of financial status of these assets.

Uses of Asset Management

OMF uses AM information to prepare its capital planning and budgets; develop consistent maintenance, operations, and replacement programs; fulfill City and other reporting requirements, and support financial forecasting. Applying asset management principles and practices helps to prioritize projects and allocate scarce resources.

Annual Update

A key component of the OMF Asset Management program for Facilities is the preparation of five-year maintenance plans. These plans are developed with input from internal and external customers, as well as staff who maintain the infrastructure, and are influenced by City Council's established goals, objectives, and policies. A final step is balancing needs with resources. OMF works closely with its customers to understand their businesses and how their facilities support and serve their work objectives.

A key component of the OMF Asset Management program for Technology Services is the preparation of five-year maintenance and replacement plans. These plans are produced by BTS staff responsible for AM and are reviewed and refined by a management review group. Priority is given to items that support public safety, improve reliability and availability of critical data systems and improve efficiency and reduce costs through the consolidation of infrastructure.

Over the last several years the City has invested in the replacement of large Civic assets. These investments include the replacement of the IBIS financial system with the SAP enterprise business solution, the replacement of the Police property warehouse, and the replacement of the Auditor's archives center. Additionally, a combination of General Fund resources approved by the Council and General Obligation (GO) bonds approved by voters in November 2010 fully funds the Public Safety Systems Revitalization Project that replaced Computer Aided Dispatch in April 2011 and will replace the Portland Police Data System and the 800 MHz radio system.

However, other Civic Assets continue to have large annual and one-time funding gaps for major maintenance.

Fire Facilities —Voters approved a GO bond measure in November of 1998 to rehabilitate, relocate, and construct new City fire stations. The program addresses deferred maintenance in addition to addressing seismic requirements and program changes within the Fire Bureau. The program was completed in FY 2012-13.

Fire has no ongoing budget authority for major maintenance projects for these new facilities. Fire does have regular operations and maintenance budgets for these facilities. Over the 10-year period of FY 2013-14 to FY 2023-24, overall condition will not decrease. However, without identifying major maintenance funding up for the future when the large needs come due in 20-30 years, no money will be available. The City will find itself in the same position as in 1998 when there was too much deferred maintenance to fund and the buildings had not been modified for the changing needs of the bureau. Funding for major maintenance of Fire facilities should be set aside each budget year, as is done for Police facilities and office buildings.

A GO bond measure approved by voters in November 2010 provides for funding of the replacement of a fire station in inner SE on the Willamette River.

OMF has high confidence in this assessment. It is based on very recent completed projects to rehabilitate and construct new, or projects in progress for which we have gained considerable experience.

Facilities Services — Through its rental rates Facilities Services collects major maintenance money for office buildings (Portland Building, City Hall, and 1900 Building), Police facilities, maintenance facilities, the Portland Communications Center, and the new Archives and Records Center. Major maintenance money is also carved out from net income of Union Station to fund major maintenance projects at that facility.

While the industry standard, and OMF’s goal, for facility maintenance is to reinvest three percent of a building’s current replacement value each year, OMF is currently only able to reinvest about 1.2 percent. This level of reinvestment has declined in recent years. Reasons for the decrease are rapidly escalating costs to replace buildings (over regular inflation), the increase in the number of new facilities, and only increasing the major maintenance component of rental rates at the level of regular inflation.

This 1.2 percent reinvestment level does not allow OMF to cover needs in the five-year horizon, and projects are having to be pushed to the out years. However, this is not severe enough that over the 10-year period of FY 2013-14 to FY 2023-24 overall conditions are not expected to decrease from the very broad categories of good, fair, and poor. Contributing to this is the relative low age of these facilities and the recent renovation of some facilities. However, when large major maintenance needs come due in 20 to 30 years, asset conditions will decline.

Since the likelihood of rental rate increases is low, funding for major maintenance should be increased by directing savings from efficiencies identified to major maintenance until the 3 percent goal is achieved.

The City has recently addressed one of its poorest rated facilities by replacing it. The City’s archives center moved from an old building in Chimney Park to a newly constructed building on the PSU campus.

For all facilities, except spectator facilities and Union Station, the funding gap is the annual difference between what is collected in rental rates, or set aside from net income, for major maintenance and the

industry standard of 3 percent of replacement value. For spectator facilities and Union Station, the gap is the one-time difference between actual fund reserves for capital maintenance and costs to upgrade Memorial Coliseum and Union Station to address deferred maintenance.

Recently Union Station has received grants to assist in maintaining the asset. These monies have been used mainly for the roof, which is the most pressing need. Grants are this facility’s best resource for addressing maintenance needs.

The Portland Building provides office space for approximately 1,300 City employees, as well as retail space and office space for other agencies. Since its completion, the building’s exterior envelope has presented numerous and chronic problems with water infiltration. In addition, an assessment conducted in 2013, it was determined that the building structure would perform poorly in a wide range of seismic events.

Some envelope issues have been identified and resolved during previous repairs, but ongoing repairs are not sustainable or practical, and will not work to address some of the structural issues. The Portland Building is also considered a historic building and on the National Register of Historic Places, which means additional requirements for addressing the building’s issues. The cost to resolve the building’s structural and envelope deficiencies is estimated at \$95 million. Currently other alternatives are being researched. OMF will be asking Council for direction once more information on alternatives is available.

OMF has confidence in this assessment. It is based on a complete inventory of buildings. The conditions are assessed based on visual inspection by qualified personnel on a regular schedule.

Spectator Facilities — This program includes Veterans Memorial Coliseum, the Rose Quarter parking garages, and Jeld-Wen Field. This program is managed by OMF and operated by contractors.

Portland 5 Center for the Arts (formerly Portland Center for the Performing Arts) — This complex includes the Keller Auditorium, Arlene Schnitzer Concert Hall, and the Antoinette Hatfield Hall. The City owns these assets and through an intergovernmental agreement Metro/MERC manages, operates and maintains them. The replacement values of these three assets are included, but the City has limited information on their status. OMF has made progress working with Metro/MERC to provide more City oversight to these

assets and will continue to make progress. Next steps include identifying long term capital needs of the facilities.

Technology Services — Establishing replacement values, current conditions, and funding gaps for technology infrastructure requires a different approach than for facilities infrastructure. Unlike buildings, technology infrastructure can quickly become unusable. This is primarily due to the short lives/quick obsolescence and the critical need to stay current with technologies that may not be supported by vendors in the future and render the technology unusable. Below is a discussion of the unique nature of BTS infrastructure replacement values, conditions and funding gaps.

OMF has high confidence in these assessments, except in the FY 2023-23 assessment where confidence is moderate.

OMF has established a multi-bureau committee to address the replacement of major Public Safety technology systems including the 800 MHz radio system, BOEC CAD, and Portland Police Data System. This work, called the Public Safety Systems Revitalization Project (PSSRP), will address funding, governance, coordination, timing, and other issues related to the replacement of these major systems. The replacement values of these systems vary depending on the approach planned and so should only be considered orders of magnitude.

As part of prior budget processes the Council authorized a mix of debt and cash financing for the PSSRP. This and GO bonds approved by voters in November 2010 fully fund the program.

800 MHz Radio System — Core System — The 800 MHz system will be replaced prior to FY 2023-24 because its condition deteriorates to less than poor by then. The system has to be replaced prior to FY 2023-24 because prior to then Motorola, the system's vendor, will not provide support to it, as technology is becoming obsolete. The underlying component chips are old, it is an analog system, and Motorola is focusing on digital systems.

800 MHz Radio System — Devices — Just as the core system has to be replaced prior to FY 2023-24 because the condition falls below poor, the system's devices which use the system have to be replaced. The one-time funding gap is the cost of replacement less money that has been collected for replacement so far.

CAD and PPDS — A replacement for the CAD system was completed in April 2011. The PPDS system will be replaced prior to FY 2023-24. The replacement of this system is in the planning stage.

Communications — Integrated Regional Networking Enterprise (IRNE): Assets in this group include the City's telephone switch, sonnet gear, and software. The replacement value listed does not include the fiber provided to the City as part of franchise agreements and partnerships.

Production Services — Assets in Production Services include storage area networks (SAN), data networks, email system, and core servers. This infrastructure has a life of five to eight years.

Strategic Technologies — Corporate Applications — Corporate applications include GIS, TRACS, CAD, PPDS, and CIS. CAD and PPDS are discussed above as part of the PSSRP.

BTS has virtually no annual resource for major maintenance and replacement of its assets. It must use one-time fund balance resources for critical projects. A citywide technology assessment is in progress, and it is anticipated that this will identify savings in the City's approach to technology that could be redirected to funding major maintenance and replacements.

EBS Services: This asset grouping includes the City's new enterprise business system implemented to replace IBIS and numerous other information systems. It is operated and managed by a new division within OMF. Plans call for the asset to be continually improved and expanded in functionality.

Asset Management Improvement Priorities

OMF has identified the following asset management improvement priorities:

- Improving data (particularly condition and tracking of maintenance activities).
- Improving data integration.
- Completing system-wide asset management plans.
- Evaluating service delivery.
- Improving coordination of AM activities.
- Improving staff AM knowledge.

Calculation Methodologies

Methods for civic assets fit into two categories: Facilities and Technology.

Facilities

Replacement Value

Replacement values are based on the size of facilities, the type of facility, and costs per square foot to construct that type of facility. To this are added percentage mark ups for indirect costs, including overheads.

Condition

Condition assessment is based on an inventory of buildings. Conditions are assessed based on visual inspection by qualified personnel on a regular schedule and are expressed as a percentage of assets in each rating category. Condition ratings for the Portland Center for the Performing Arts have not been determined at this time.

Annual Funding Gap

For all facilities, except spectator facilities and Union Station, the funding gap is the annual difference between what is collected in rental rates, or set aside from net income, for major maintenance and the industry standard of 3 percent of replacement value. Current funding at 1.2 percent of replacement value ensures relative condition (percentage in good, fair, and poor condition) remains relatively constant over the next ten years.

Due to the level of deferred maintenance at Veteran's Memorial Coliseum, the spectator facilities funding gap is the one-time difference between actual fund reserves for capital maintenance and the costs to upgrade Veteran's Memorial Coliseum. OMF is conducting a comprehensive review of the facility to identify all of the facility's capital needs. Union Station has a similar one-time funding gap based on unfunded deferred maintenance. Unmet needs for the Portland 5 Center for the Arts are not included in the total.

Technology

Establishing replacement values, current conditions, and funding gaps for technology infrastructure requires a different approach than for facilities infrastructure. Unlike buildings, technology infrastructure can quickly become unusable. This is primarily due to the short lives/quick obsolescence and the critical need to stay current with technologies that may not be supported by vendors in the future and render the technology unusable.

Replacement Value

The replacement value assessment is based on recently completed projects and the experience of other governments, but we have not had an opportunity to analyze their experiences to assess the degree of similarity. These values include indirect costs for engineering and other professional services, but do not include indirect costs for City overheads.

Condition

Condition ratings for Technology assets are based on current age and expected useful life. Condition is expressed as a percentage of assets. Systems considered to be obsolete are included in the poor condition rating.

Annual Funding Gap

The funding gap includes annual funding necessary to meet industry standards for major maintenance; and annual needs to ensure replacement and upgrades of technology on accepted schedules.

5. Asset Management Practices and Process

Asset management is an industry standard that provides a risk mitigation approach to decision making. It is commonly defined as meeting agreed upon customer and environmental service levels, while minimizing life cycle costs at an acceptable level of risk.

At present, bureaus apply elements of AM best practices customized to meet each bureau's unique needs. The City Asset Managers (CAM) group continues to prepare the annual Citywide Asset Report, and works to identify key measures, define terms, and collect and display each year's data.

A. History and Progress

For over 20 years, individual City bureaus have initiated components of Asset Management. Five of Portland's infrastructure bureaus — Transportation (PBOT), Water (PWB), Environmental Services (BES), Parks and Recreation (PP&R), and Management and Finance (OMF) — apply AM principles to some of their practices. Separately, the Office of Housing Policy and Portland Development Commission (PDC) track affordable housing units. Unlike the five infrastructure bureaus, the City does not own most affordable housing units in the city.

Ten years ago, the AM focus began to broaden to a citywide focus. At that point, infrastructure bureaus began to prepare an annual citywide report on assets. These reports are presented annually to the Planning and Development Directors' group, which represents infrastructure, development permitting, financial and planning bureaus. The Directors' group oversees policies and resource allocation, coordinates long-range planning, and manages certain cross-bureau planning and development initiatives. After reviewing findings of the annual report, the Directors' group provides recommendations to City Council. Each AM report is presented to the City Council at the start of annual budget work sessions.

Although the City's infrastructure bureaus started with, and continue to use, different AM strategies, bureaus collaborate actively with the long-term goal of improving AM practices citywide. As such, bureaus use common definitions and terminology but apply techniques consistent with their bureau's structure and the unique needs of their assets.

The following timeline identifies major milestones in the development of citywide asset management within the city.

2002

The Auditor, City Commissioners and bureau directors completed a strategic exercise, Managing for Results. They identified seven priority issues and flagged five of them for "immediate action." One of the priority issues was aging physical infrastructure.

2003–2004

Asset managers from the City's infrastructure bureaus formed a City Capital Maintenance Committee to collaborate on AM issues and prepare an annual report on the City's physical assets. Their reports to City Council in 2003 and 2004 focused on the current and projected condition of infrastructure, not on the strategies needed to manage assets over their whole life. Efforts to describe assets and needs varied from bureau to bureau as did confidence in the information. This made it difficult for City Council to make decisions using that information.

A special feature of the 2003 report was to identify potential funding sources to bridge Portland's maintenance funding gap. It used a matrix format, based on a January 2001 analysis of potential transportation revenue options (prepared by PBOT).

2005

The committee became the City Asset Managers Group (CAM group), adopting a more holistic approach to AM and looking for ways to collaborate on common AM issues. While Transportation had an existing program of AM, other bureaus were just beginning to adopt AM principles and techniques. By joining forces, the CAM group identified common long-term AM needs and helped frame AM throughout the City using a consistent approach.

In the FY 2005–06 budget process, City Commissioners asked for better data on the funding gap in capital maintenance. There were questions about the quality and completeness of the data, and doubts about bureaus' stated funding needs. To address Council's

concerns and to reflect the current state of City asset management, the 2005 report added three features: common definitions for basic asset management terms, data confidence levels, and bureau observations on their asset management activities.

2006

The 2006 report added affordable housing as an asset category. For purposes of this report, affordable housing was defined as multi-family rental housing units with direct City investment (leveraged financing) and a regulatory agreement with the Portland Development Commission.

2007

The 2007 report included a pilot of risk analysis and a framework for the inclusion of green infrastructure. BES reported on some green infrastructure.

2008

To assess current capacity and interest in improving AM best practices, Transportation, Water, Environmental Services, and Parks completed a survey, prepared by the Bureau of Planning. Generally, the survey found that the participating infrastructure bureaus have initiated elements of AM best practices, with each bureau taking a different approach. The survey identified five priority AM best practices areas for further exploration: data collection and management, service levels, asset management plans, risk management, and business case. The 2008 report introduced these AM best practices and reported on bureaus' current and potential capacities to adopt them.

2009

In 2008, the CAM group retained an outside consultant to assess the use of asset management best practices to optimize City investments in infrastructure. The assessment included research on high-performing peer communities in North America and established recommendations for a sequence of AM best practices. These recommended best practices were used as a basis for development of a citywide asset management work plan for 2010–2014, included in the 2009 report.

2010

The CAM group updated its work plan (see below) and edited definitions for annual funding need. Both actions respond to recommendations of the Planning and Development Directors in the 2010 City Assets Report.

2011

In 2011, the CAM group featured service level examples, from four City bureaus:

- **Transportation** showed service levels for thirteen transportation asset classes (from PBOT's Infrastructure Asset Report Card — 2010). The focus was on the maintenance of existing transportation infrastructure. Its purpose was to develop and implement levels of service for each asset class to track and monitor performance and outcomes achieved.
- **Environmental Services** showed service levels in seven action areas. It tied customer and technical service levels, based on customer core values and strategic outcomes.
- **Water** showed the status of eleven service level indicators, from Portland Water Bureau Strategic Plan 2008–2011. The Water Bureau has created key service levels (27) and programmatic service levels (40+).
- **Parks** showed how performance measures track progress toward outcomes in its three year Strategic Plan. Each performance measure is linked to a target.

2012

This 2012 report separates out policy recommendations, distinguishes between data and business practices, and displays annual funding gap in more ways.

2013

The current report provides new data, using last year's structure. No changes were made to the shared work plan.

B. Citywide Asset Management Work Plan

In 2009, the City Asset Managers Group (CAM) developed a Citywide Asset Management Work Plan to guide asset management improvements between 2010 and 2014. The work plan was informed by the internal survey (completed in 2008–2009) and a review of peer communities (completed in 2009). This work laid a foundation for identifying the steps necessary to move the City towards more comprehensive asset management practices.

Four City bureaus participate in the work plan: Environmental Services, Water, Transportation and Parks and Recreation. The CAM group realized that some tasks will take longer than the initial five years, and affirmed the importance of making continuous improvements. For the 2012 report, the CAM group will outline milestones for the tasks through the year 2019 (a second five-year interval).

This work plan lays out general approaches and timelines for cross-bureau work to apply seven advanced asset management best practices:

- Service levels.
- Risk management.
- Report cards.
- Business case.
- Reliability-centered maintenance.
- Long-term investment profiles.
- Community information and consultation.

The CAM group anticipates that the work of individual bureaus will progress on varying timelines based on the status of current practices, resources, and relative priorities. As many of these best practices

are interdependent, the CAM group recognizes that achieving the goals outlined in the work plan will require continuous and iterative improvements.

Each bureau director is tasked to implement the bureau's core mission, goals and values, along with the City Charter, state and federal mandates, and community priorities. AM offers a framework and tools to examine and address infrastructure needs to help meet this charge. As asset management improves across the bureaus, so will the ability of City Council, bureau managers, and citizens to make informed decisions about asset-related services.

However, advances in AM practices are not accomplished overnight. Each bureau encounters a unique set of challenges and barriers to implementing AM best practices. Bureaus are constrained by budget and resources, limitations in data and data management systems, and other commitments and priorities.

To meet these challenges, the work plan relies on the CAM group to continue to share information and mentor each other to build AM capacity and expertise citywide. The work plan assumes a phased implementation of AM improvements, with flexibility to meet the needs and capacities of each bureau. The CAM group will report to the Planning and Development Directors.

The CAM group plans to apply these best practices to all assets in the future. However, due to limited resources and breadth of this work plan, many tasks focus initially on highest risk assets. The CAM group will report on progress in each of these tasks annually through the Citywide Assets Report and through updates to the Planning and Development Directors.

A summary chart follows a profile of each work plan task. Service levels (task #1) and risk mitigation (task #2) interact directly with funding levels.

Task #1: Service Levels

Definition Service levels establish measurable goals against which actual achievement can be compared. Service levels set expectations for what service to provide, in what quantities, and how often. Service levels are most useful in a long term perspective (sustainable). There are internal and external service level targets. Service levels may address reliability, quality, quantity, and safety. AM planning allows bureaus to set service levels and cost of service. Both can be evaluated with customers and regulators to set the optimum service level they are prepared to support.

Goal To develop meaningful and measurable service levels based on system needs that match the expectations of customers to guide funding and investment decisions.

Desired Outcomes The four participating CAM group bureaus will have established tangible service levels or performance measures, with targets consistent with industry peers. Each bureau will use service levels to bridge its organizational strategies to its tactical assets. Progress in service level work is reported in the annual city asset reports.

Approach For CAM group bureaus without refined service levels, research and information-sharing will help identify what service level changes they need. Bureau service levels will be developed or refined, in combination with appropriate community consultation. Any established service levels will be adopted as a component of the Citywide Systems Plan. Further refinement of service levels will occur over time, as needed.

Interrelationships Defining service levels for assets sets a foundation for all of the remaining work plan tasks.

2013 Status Currently, bureaus have capacity to measure and track a limited number of actual levels of service.

Environmental Services BES has developed a draft Level of Service document, and will test and adjust service levels as needed. Benchmarks and performance measures are in progress. BES has 44 service levels (a mix of system and maintenance). There is no formal process to adopt the service levels.

Water PWB has created two tiers of service levels: 27 key service levels and more than 40 programmatic service levels. The bureau also has workload measures in each budget program that supports specific service levels. In FY 2011–12, the bureau met 19 of its 27 service levels.

Transportation PBOT has developed service levels for infrastructure maintenance.

Parks and Recreation Parks 2020 Vision establishes broad levels of service for parks, trails, and recreation programs. Established performance measures report on progress toward Strategic Plan outcomes and service level targets. These provide additional management level of service targets. Linkages between broad levels of service to operational levels of service are in process.

Task #2: Risk Management

Definition Risk management provides a structure to assess and act on risk of assets failing to provide defined levels of service. It navigates degrees of uncertainty by identifying possible events, understanding their likely consequences and determining an appropriate response. Effective risk management relates asset failure to decisions to acquire, maintain and renew assets.

Goal To identify assets most critical to achieving sustained performance of agreed service levels. In more advanced stages, bureaus will use risk data to prioritize resources and collaborate with other bureaus to identify collateral risks to other public assets.

Desired Outcomes The four participating CAM group bureaus have identified high-risk assets and have begun to prioritize monitoring and data collection within available resources.

Approach The CAM group has discussed risk management methodologies. The CAM group will look for opportunities to collaborate, such for interdependent assets. As appropriate, bureaus will identify high risk assets, improve data collection for these assets and apply mitigation strategies based on asset risk classification.

Interrelationships Data collected will inform Task #3: Report Card, Task #5: Reliability Centered Maintenance, and Task #6: Long Term Investment Profiles. Data will also inform the Citywide Systems Plan (part of the Comprehensive Plan Update).

2013 Status Bureaus collect a variety of data on their assets, though the extent of and confidence in this data varies by bureau. Bureaus are making progress in identifying high risk assets, at least on some of their asset groups. Bureaus continue to encounter limited capacity to predict likely failure modes for assets and have not estimated the likelihood and consequences of asset failure.

Environmental Services The combined and sanitary sewer elements of the BES Systems Plan estimates the likelihood and consequence of failure and identifies projects with positive benefit/cost ratios for near term investment. The stormwater system plan is in progress. Building on watershed work, BES is in the process of identifying high risk assets of the stormwater system.

Water One of the Water Bureau's service levels is for risk. PWB has identified high risk assets through a process, Consequence Likelihood Evaluation Methodology. CLEM identifies assets/failure modes that may pose substantial risk to the bureau and a process to evaluate the risk and guidelines for action. In 2012, PWB created 15 asset management plans for the majority of asset groups which include a risk analysis of all assets. Those high risk assets at the asset class level will be evaluated through the CLEM process as well.

Transportation PBOT has an established risk approach for key infrastructure, including pavement and traffic signals. The risk assessment allows for improved prioritization of resources and management of risks.

Parks and Recreation PP&R completed a comprehensive review of risks to service delivery of all assets. The Asset Risk Profiles report provided a list of assets at high risk of failure to deliver levels of service. This report informed new capital projects to repair, rehabilitate or replace high risk assets. High risk assets are regularly inspected. Each year, the bureau will add new assets to the inspection program.

Task #3: Report Card

Definition Report cards are a clear and uniform metric (e.g., a letter grade) to indicate the health of the City’s infrastructure and bureau’s business practices. The metric could combine various measures, including the condition of assets; the degree to which customer requirements (i.e., service levels) are being met; the quality of the information and practices in place for maintaining the assets over their lifecycle; and the degree to which funding is available for lifecycle management of the assets.

Goal To develop a “report card” product that displays the current and projected status of assets, identify trends and issues, and track the City’s path to sustainability.

Desired Outcomes A citywide infrastructure report card will appear along with the annual Citywide Assets Report. The report card will serve to educate the public, inform City decisions (operations, budget, etc.) and track progress over time. For content, the report card could address asset condition, achievement of levels of service, AM business practices, and/or levels of unmet need.

Approach The four participating CAM Group bureaus will develop a template, recognizing the diversity of bureau approaches to AM and most relevant data for that year. The report card will be highly graphic, and may take the form of a dashboard of selected data. The CAM group will test and refine several formats. The template could include status of assets, levels of service, business practices, and unmet need. Bureaus can provide additional information for their own reporting needs. Once complete, the report card should be included in the annual Citywide Assets Report. Over time, the group will make continuous improvements to the report card and the quality of data presented.

Interrelationships Reporting on service levels would require the completion of Task 1: Service Levels. It is anticipated that the report card will become a component of the Citywide Assets Report. The report card could also be used as a component of Task 7: Community Consultation.

2013 Status All CAM group bureaus currently provide information on assets and AM practices in the annual Citywide Assets Report. In addition, the Water Bureau, PBOT and PP&R have developed some form of an infrastructure report card.

Environmental Services As discussed in Task #1, above, BES has drafted a Level of Service and organization performance report, and will test and modify the service levels over time. BES suggests a concise report card that spotlights hot button topics, with selected data.

Water PWB issued two report cards — a Service Level Progress Report and a budget report.

Transportation PBOT has created a transportation maintenance report card. The report card is an annual tracking process for the condition of 12 transportation asset classes. Each asset class compares actual and target conditions levels.

Parks and Recreation PP&R needs to complete service levels (Task #1) before it can fully participate in an infrastructure report card. PP&R suggests that the CAM group use the report card to track selected measures over time, and consider a dashboard format displaying a composite of measures in order inform decision-making. PP&R’s 2013 Performance Report displays historical outcome measures (condition, perception and intervention) for four key result areas. Some measures also project targets into the future.

Task #4: Business Case Template

Definition A business case is an economic analysis tool used to evaluate alternative investment decisions in a systematic and logical manner. At the project level, a business case compares project alternatives — such as “do-nothing” or status quo — and uses the costs and benefits to help the bureau make decisions on the best use of financial resources. Business cases are also used at the program level to determine the best level/type of maintenance and operational strategies.

Goal To develop a framework or template to justify infrastructure improvements based on lifecycle costs, benefits, and impacts to the triple bottom line (economic, social and environmental factors).

Desired Outcomes The four participating CAM group bureaus will have developed a methodology and template for business case and piloted application of the template within their bureau, as appropriate.

Approach The CAM group will share information and research to build a foundational understanding of business case among bureaus. Bureaus will evaluate the applicability for their assets and practices and develop templates and application processes, as needed. Application of business case templates will be completed as appropriate for each bureau.

Interrelationships Application of business cases could impact project priorities in the annual budget process.

2013 Status Most bureaus evaluate multiple alternatives for significant asset investment decisions. Most bureaus consider life cycle costs to maintain and operate, and triple bottom line impacts (economic, social, and environmental).

Environmental Services BES has applied business case analysis to the collection system (sanitary and combined). All BES CIP projects must have a business case analysis. Formats vary by project. BES expects to create a business case template and application process within two years. BES has modified its project request form for capital projects (CIP) to better reflect business case criteria. The CIP project evaluation criteria have also been modified. One of the next steps will be to use the revised criteria to re-evaluate CIP projects in the 10-year plan.

Water PWB has created a Business Case Development Guidebook. Business cases, mainly cost-benefit analysis, are used in all project validation reports (CIP Planning). Many business cases are done separately and are used to identify projects for the PWB CIP and for maintenance activities. The PWB has developed a template and application process. Asset management plans include identifying potential business cases and/or project validation reports by asset group for the higher risk assets.

Transportation PBOT finds this a useful analytical tool, and has applied it to certain projects and proposals. Business case development is a long-term priority.

Parks and Recreation PP&R uses established criteria for capital investment decision-making. In the future, the bureau will develop business case analysis for specific project alternatives.

Task #5: Reliability-Centered Maintenance

Definition Reliability-centered maintenance is an approach to identify the optimal or safe minimum level of maintenance for assets. RCM includes identifying failure modes and maintenance tasks to address those failures before they occur, including preventative and predictive maintenance. An RCM investment strategy can form the basis for calculating a long-term investment profile for an asset type.

Goal To develop cost-effective maintenance programs for assets to address the main causes of failure and ensure assets continue to perform important functions.

Desired Outcomes The four participating CAM group bureaus will have identified appropriate maintenance strategies and schedules for high risk assets, based on RCM principles. Bureaus have begun to align maintenance practices as appropriate.

Approach Application of the reliability-centered approach will occur on a bureau determined basis.

Interrelationships RCM program should be based on performance measures and risk assessments. These steps should be completed for targeted assets before a full RCM program is developed. RCM should inform a bureau's long-term investment strategy.

2013 Status No collective progress reported.

Environmental Services BES documented RCM in response to CMOM (Capacity, Management, Operations, and Maintenance) regulations of the federal Clean Water Act. CMOM products were submitted by DEQ in 2013. RCM is already utilized for the treatment system.

Water PWB is working on reliability-centered maintenance (RCM) for some asset groups. There is an RCM key service level goal in place for the bureau. Many recurring work orders for preventive maintenance activities are in place.

Transportation PBOT uses Streets of Citywide Significance (SCS) to prioritize the right treatment on the right asset at the right time. Knowing there are not enough funds to maintain all infrastructure, SCS prioritizes where the greatest risk of asset failure exists.

Parks and Recreation PP&R's approach is asset-specific, focused on optimal operations and maintenance for each asset group.

Task #6: Long-Term Investment Profile

Definition Long-term investment profiles are projections of major maintenance, repair, and replacement needs by asset group based on set service levels over a long-term forecast. By developing long-term investment profiles, bureaus will be better equipped to define funding gaps and identify future needs to maintain a sustainable system.

Goal To project revenue needs for major maintenance, repair and replacement, by asset group, over a long-term forecast.

Desired Outcomes The four participating CAM group bureaus will have collected necessary data, developed tools and methodologies to project investment needs. As possible, bureaus will have identified long-term investment profiles for high risk assets.

Approach The CAM group will share information and research regarding long-term investment profiles. Bureaus will develop tools and methodologies to prepare investment profiles for their assets, as appropriate. Investment profiles will help bureaus determine the optimal mix of operations, maintenance and capital acquisition to achieve lowest long-term system costs.

Interrelationships Development of long-term investment profiles is dependent on setting service levels (Task 1: Service Levels) and on identifying maintenance needs (Task 5: Reliability Centered Maintenance). Work on long-term investment profiles may also inform the 20-year capital project list under development for the Citywide Systems Plan.

2013 Status No collective progress reported.

Environmental Services BES' work plan does not currently include development of 50-year investment profiles. BES has created remaining life models for pipes. This is complete for collection systems; it is in progress for the treatment plant.

Water PWB has projected the long-term replacement needs of some of its asset classes.

Transportation PBOT is in the process of implementing software to conduct trade-off scenarios and budget forecasting for bridges and pavement.

Parks and Recreation PP&R is creating long-term investment profiles by asset group and will then create a PP&R composite profile. PP&R has completed 75-year investment profiles for community and arts centers and pools.

Task #7: Community Information and Consultation

Definition Community information and consultation is a key component of a successful AM program. It is necessary to identify appropriate service levels, based on community needs, costs, and ability to pay. In addition, outreach and information can help broaden the base of support for revenues needed to adequately maintain the City's infrastructure systems.

Goal To inform the public about the state of the City's assets and to improve the public's understanding of the City's asset management program and needs. To involve the public at key decision points, including establishing service levels.

Desired Outcomes The four participating CAM group bureaus will have had informed community conversations regarding the costs of providing desired levels of service.

Approach All four bureaus will continue to consult with the public to help identify investment priorities. The CAM group anticipates that improvements in reporting and information to the public will improve as the tasks of this work plan are completed. However, the CAM group believes that it is particularly critical to have informed community conversations regarding desired levels of service, the cost of providing such service, and resulting investment priorities.

Interrelationships In particular, development of tangible performance measures (Task 1); a report card (Task 3); and long-term investment profiles (Task #6) can help the City better describe asset needs to the community.

2013 Status No collective progress reported.

Environmental Services BES is scoping public involvement options to discuss asset management of its systems. BES expects to start public engagement by 2014. Also, BES intends to develop a customer service report based on customer service feedback.

Water The PWB convenes a budget committee on an annual basis to help identify investment priorities. It has no current plans to discuss service levels with the general public.

Transportation PBOT will continue to use its budget advisory committee, which includes citizen members.

Parks and Recreation PP&R will continue to use its Parks Board and other venues for public engagement and input. The bureau conducts regular outreach to the community and periodic community surveys to identify priorities and establish service levels.


Progress on Previous Recommendations

In previous years, the Directors' group endorsed the following major recommendations for citywide AM practices. Progress on these recommendations is also noted below.

Recommendation	Progress Update	Status
1. Improve asset management practices.		
a. Continue with Whole-of-City Approach.	CAM group continues to implement	Ongoing
b. Review service levels and pursue community consultation.	As part of Portland Plan and Comprehensive Plan update, bureaus are encouraged to set or amend service levels. Each bureau determines its scope, pace and community consultation.	Varies by bureau
2. Report on asset status and condition.		
a. Continue annual reports and improvements.	This remains a CAM group priority.	Ongoing
b. Include and distinguish between repair/rehabilitation/replacement, mandate, and capacity-related needs in the annual funding gap.	Starting in 2009, the annual report distinguishes between funding gaps for these various types of needs.	Ongoing
3. Prioritize infrastructure spending.		
a. Prepare strategies related to service levels, funding allocations, and management practices to align revenues with service levels.	This activity is detailed in the work plan, see Task #1 Service Levels, Task #6 Long Term Investment Profile, and Task #7 Community Consultation.	Future
b. Track local and regional discussions related to infrastructure financing.	Metro has evaluated infrastructure needs to accommodate projected growth of the region. PDC and the Water Bureau served on the project advisory committee. BPS collected and assembled data from City bureaus, for use in the Metro analysis. The City of Portland adopted Portland Plan and is updating the City's Comprehensive Plan. Both plans will guide long-term growth and development in Portland. The CAM group is tracking and involved with this process.	Ongoing
c. Develop a funding strategy to shrink the unmet budget needs for infrastructure maintenance.	Bureaus are individually addressing infrastructure maintenance in the context of available budgets.	Varies by bureau
4. Integrate with related planning efforts.		
a. Integrate Asset Management into other planning efforts, including community visioning, strategic planning, and long term capital planning.	Asset management will be a key component of the Citywide Systems Plan (part of the Comprehensive Plan).	Ongoing
b. Track local and regional discussions related to infrastructure.	City staff is tracking local and Metro discussions.	Ongoing
5. Prepare a plan to guide continued improvement in citywide asset management best practices.		
a. Complete an evaluation of current citywide asset management practices.	The CAM group completed an internal survey of AM practices in 2008–2009.	Complete
b. Identify key gaps based on research into best practices and each bureau's unique needs.	The CAM group, with the support of an outside consultant, completed research on best practices within peer communities.	Complete
c. Prioritize improvements necessary to achieve best practices in asset management.	The work plan identifies and prioritizes AM best practices improvements.	Complete
d. Establish implementation steps and schedule.	The work plan identifies key implementation steps and timelines for each best practice.	Complete
e. Report on progress annually.	The 2010 report included the first annual progress report.	Ongoing
6. Build capacity to implement asset management best practices within capital bureaus and citywide.		
a. Enable bureaus to make continuous improvements to asset management practices based on their respective needs.	The work plan is based on cross-bureau collaboration but allows flexibility for bureaus to proceed on their own schedule.	Ongoing
7. Use asset management as a tool to improve decision making.		
a. Define and revise service levels to align service provision with system requirements, community needs, and sustainable funding levels.	This activity is detailed in the work plan; see Task #1 Service Levels.	Future
b. Determine appropriate asset management strategies to reduce maintenance liabilities.	This activity is detailed in the work plan, see Task #5 Reliability Centered Maintenance and Task #2 Data Collection for High Risk Assets.	Future
c. Set infrastructure investment priorities.	This is related to Task #4 Business Case and Task #6 Long Term Investment Profile.	Future
d. Identify sustainable funding levels.	This activity is detailed in work plan; see Task #6 Long Term Investment Profile.	Future

Citywide Asset Managers Group

Work Plan Tasks by Year — updated for 2011 City Assets Report

Year/Best Practice	Service Levels (SLs)	Risk Management	Infrastructure Report Card	Business Case	Reliability-Centered Maintenance	Long Term Investment Profile	Community Consultation or Information	
Timeline 	2010	Scoping.	Discuss methodology and information needed.	Identify reporting needs (could include status of assets, service levels, business practices, and unmet need). Examples from Water and Parks (2011).	Research and share information. Evaluate appropriateness for each bureau. Each bureau experiments with business cases.	Apply reliability-centered approach on a bureau-determined basis.	Research and share information on long-term investment profiles.	Each bureau consults with public members on its budget advisory committee.
	2011	Developing bureau service levels.	Identify high risk assets, by asset group.					
	2012		Start to collect condition data on high risk assets.					
	2013	Adopt some SLs in Citywide Systems Plan (CSP).	Improve data collection for high risk assets, and apply mitigation strategies based on asset risk classification.	Relate to Comprehensive Plan Update process.				Monitor Citywide Systems Plan.
	2014	Refine service levels, as needed.						Continue public consultation in budget advisory committees. Discuss lessons from Citywide Systems Plan and pilots from any bureaus.
	2015			Include a report card in 2015 Citywide Assets Report.	Develop bureau and asset-specific templates and application processes.		Develop tools and methodologies.	
	2016		Refine risk assessment methods. Identify opportunities to collaborate, including assessment and mitigation strategies for cross-bureau asset risk.	Refine report card format.				
	2017				Share business case examples, and identify key questions in analysis.		Develop investment profiles for high-risk assets.	
	2018							
	2019							

Appendices

1. Current Replacement Values of City Assets

- a. Current Replacement Value, by Asset Type
- b. Current Replacement Value Data Sheet

2. Current Condition of Capital Assets

- a. Summary of All Bureaus
- b. Transportation
- c. Environmental Services
- d. Water
- e. Parks
- f. Civic
- g. Current Condition Data Sheet

3. Annual Funding Gap

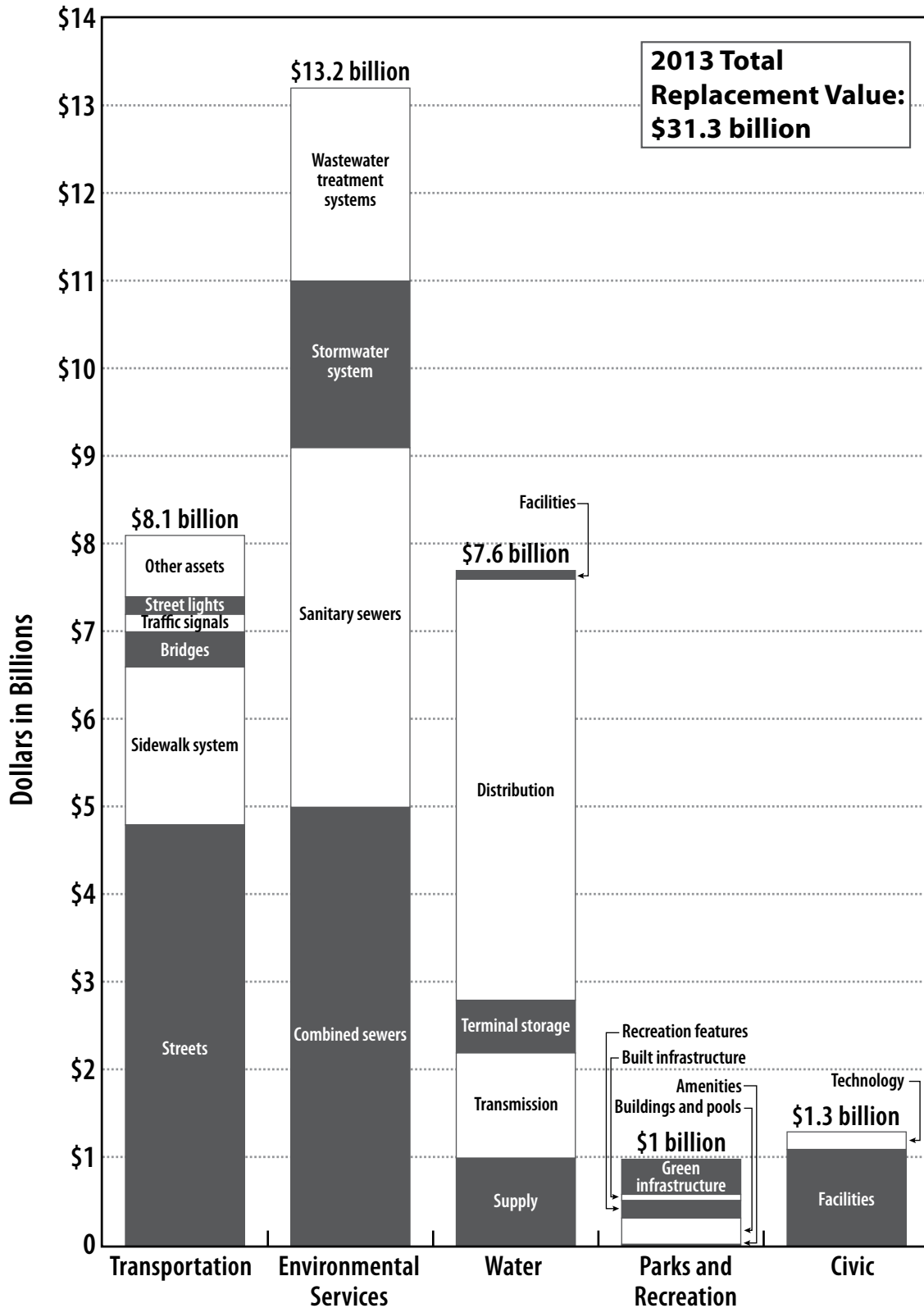
- a. Annual Funding Gap by Asset Type
- b. Annual Funding Gap by Type of Gap
- c. Annual Funding Gap (Mandates, Repair, Rehabilitate, Replace) by Bureau
- d. Capacity Related Annual Funding Gap by Bureau
- e. Annual Funding Gap Compared to Bureau Program Budgets
- f. Annual Funding Gap Data Sheet

4. Data Confidence Level Summary

5. Definitions

Appendix 1a: Current Replacement Value by Asset Type

in billions, December 2013



Appendix 1b: Current Replacement Value

Data Sheet, December 2013

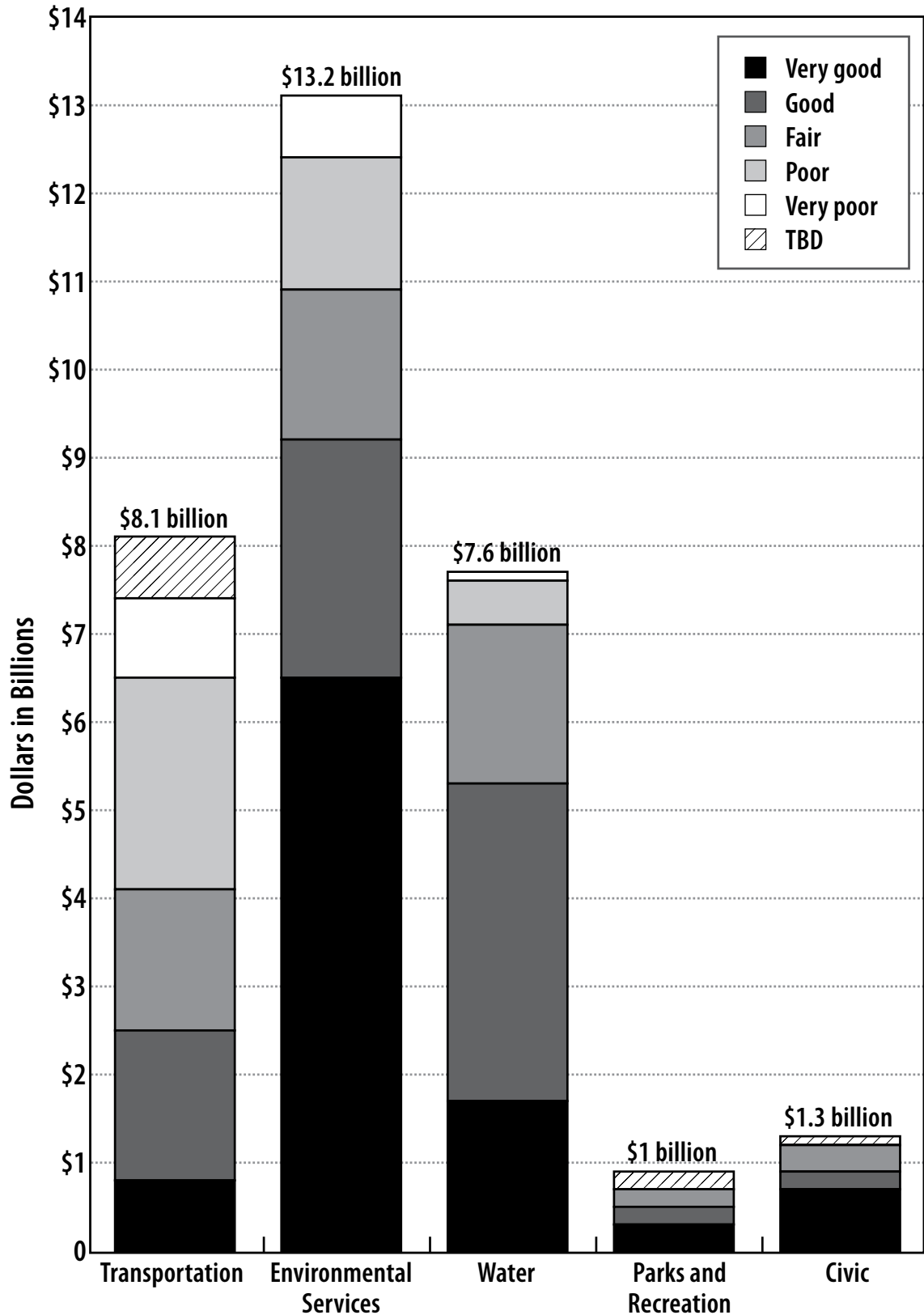
Capital Asset Class	Description	Value (in millions)	Confidence Level	Notes
Transportation				
arterial & collector streets	1,865 lane miles	\$2,496.4	3 - Moderate	
local streets	2,962 lane miles	\$2,346.6	3 - Moderate	
sidewalks	8,869,556 sq yds	\$1,037.7	4 - High	
curbs	3,263 centerline miles	\$603.0	3 - Moderate	
corners	37,886 corners	\$128.1	4 - High	
structures (bridges only)	157 bridges	\$382.2	5 - Optimal	
traffic signals (hardware only)	923 traffic signals	\$248.9	3 - Moderate	
street lights	55,477 street lights	\$196.1	2 - Low	
support facilities	various buildings	\$6.9	None to Low	
other transportation assets		\$673.5	Low to Optimal	
Total Transportation		\$8,119.4		
Environmental Services				
combined sewers	885 mi. of pipe & access structures	\$5,018.8	4 - High	All dollars updated for ENR (construction cost index) from 9291 to 9826. No significant new assets accounted for in value.
sanitary sewers (owned and/or maintained)	1,000 mi. of pipe & access structures	\$4,104.4	4 - High	
stormwater system	454 mi. of pipe; 1,900 water quality facilities	\$1,946.7	3 - Moderate	
wastewater treatment systems	2 treatment plants & 97 pump stations	\$2,168.0	3 - Moderate	
Total Environmental Services		\$13,237.91		
Water				
supply	158 miles of roads, 1609 culverts, 12 bridges, 1 195-ft high concrete dam, 1 145-ft high earth dam, 27 active production wells, 1 groundwater pump station, treatment facility, tank, and 11 miles of groundwater collection main	\$967.0	3 - Moderate	
transmission	75 miles of large diameter conduits, with various supports, 9 conduit trestles and 4 conduit bridges, 9 river crossings, 59 miles of large diameter transmission mains	\$1,207.0	3 - Moderate	
terminal storage	228 million gallons finished water storage (as of December 2013), interconnecting piping, post-storage treatment facilities, and microhydro facility	\$554.0	3 - Moderate	
distribution	2,100 miles of distribution pipes, 186,000 service lines, 52,000 valves, 178,000 meters, 14,200 hydrants, 257 active pressure regulating station, 39 pump stations, 54 active storage tanks	\$4,785.0	4 - High	
facilities (buildings and support facilities)	buildings, SCADA, vehicles, construction equipment, lab equipment, computers, and infrastructure components in inventory	\$130.0	4 - High	
Total Water		\$7,643.0		

Table continued on next page.

Capital Asset Class	Description	Value (in millions)	Confidence level	Notes
Parks and Recreation				
amenities	decorative elements and furnishings	\$21.4	3 - Moderate	Base costs from prior year escalated by construction cost index, plus newly capitalized assets.
buildings and pools	community and arts centers, pools, restrooms, maintenance facilities	\$280.6	4 - High	
recreation features	sports fields, courts, playgrounds, water play areas, community gardens, skate parks, etc.	\$236.6	3 - Moderate	
built infrastructure	roads, major trails, utilities	\$68.0	2 - Low	
green infrastructure	urban forest, turf, shrub beds, botanic gardens	\$419.2	2 - Low	
Total Parks		\$1,025.8		
Civic				
<i>Facilities (buildings, structures)</i>				
Police facilities	Four precincts, Justice Center, property warehouse, equestrian division, and vehicle storage lot	\$108.8	4 - High	
Office buildings	Portland Building, 1900 Building, City Hall	\$172.3	4 - High	
Other buildings	Archives and Records Center, Kerby Garage, and Portland Communications Center	\$69.3	4 - High	
PDC facilities	Train station and related buildings, Centennial Mills	\$48.7	3 - Moderate	
Spectator facilities	Memorial Coliseum, Rose Quarter parking garages, and PGE Park	\$529.6	3 - Moderate	
Portland Center for the Performing Arts	Portland Center for the Performing Arts	\$111.2	3 - Moderate	
Fire facilities	30 stations, administration building and support facility	\$96.8	4 - High	
<i>Technology</i>				
Communications-BTS	Data networks, WiFi network, 800 MHz radio system	\$70.8	3 - Moderate	
Production Services-BTS	Storage area network, core servers, and email system	\$2.8	3 - Moderate	
Strategic technology-BTS	Large corporate applications owned and managed by BTS such as GIS	\$6.2	3 - Moderate	
Electronic equipment and software — other bureaus	Video systems, electronic equipment, Office Suite software, bureaus' PC's and laptops	\$8.2	3 - Moderate	
Strategic technology — other bureaus	Large corporate applications such as TRACS, CAD, PPDS, CIS and EBS	\$93.8	3 - Moderate	
Total Civic		\$1,318.5		
Total Capital Assets		\$31,344.6		

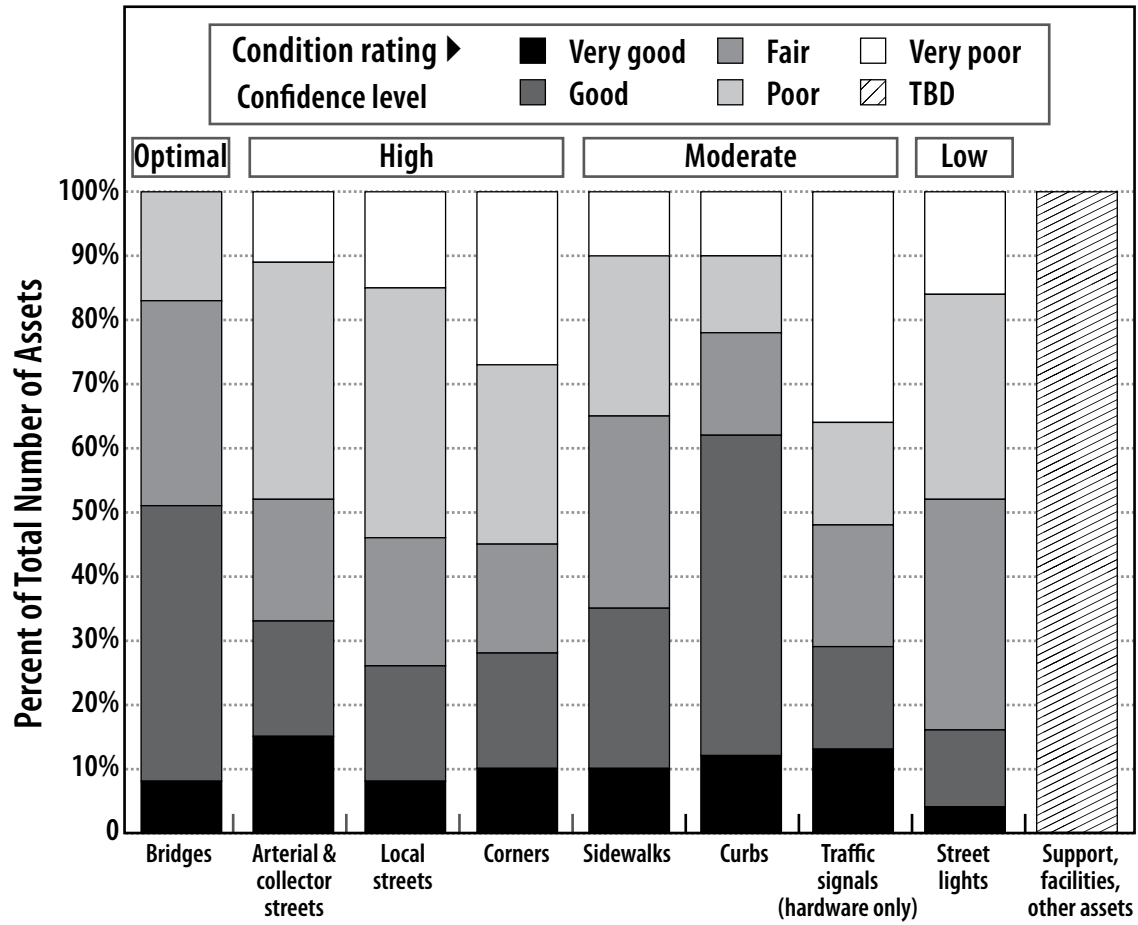
Appendix 2a: Current Condition of Capital Assets

Summary of all Bureaus, December 2013



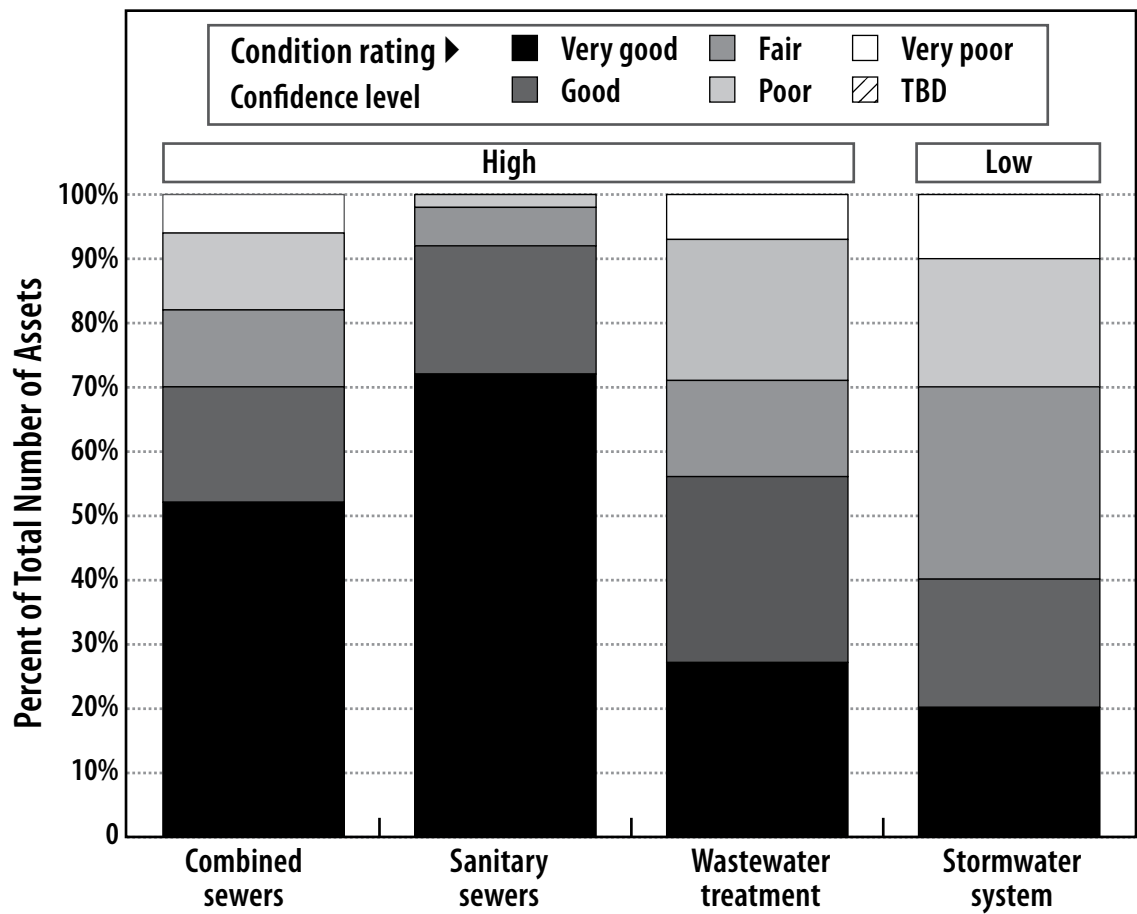
Appendix 2b: Current Condition of Capital Assets

Office of Transportation, December 2013



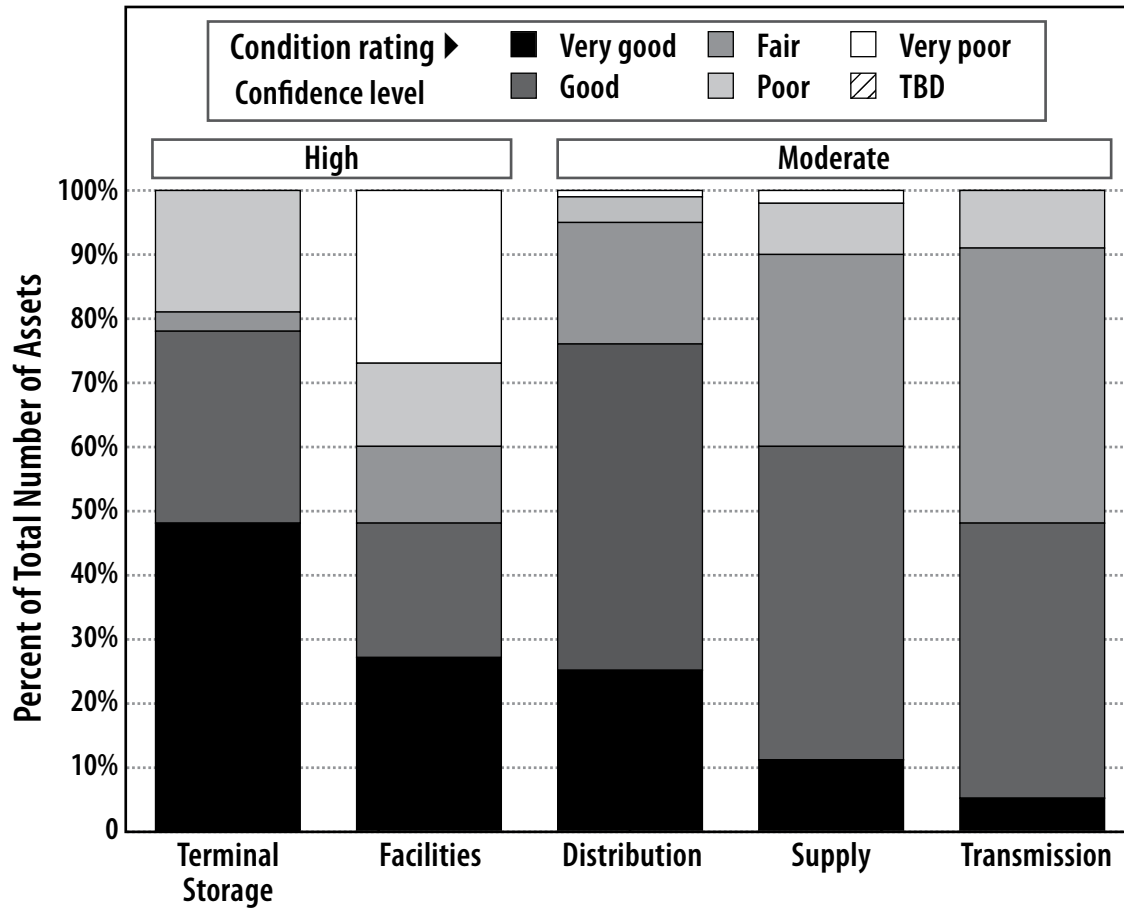
Appendix 2c: Current Condition of Capital Assets

Environmental Services, December 2013



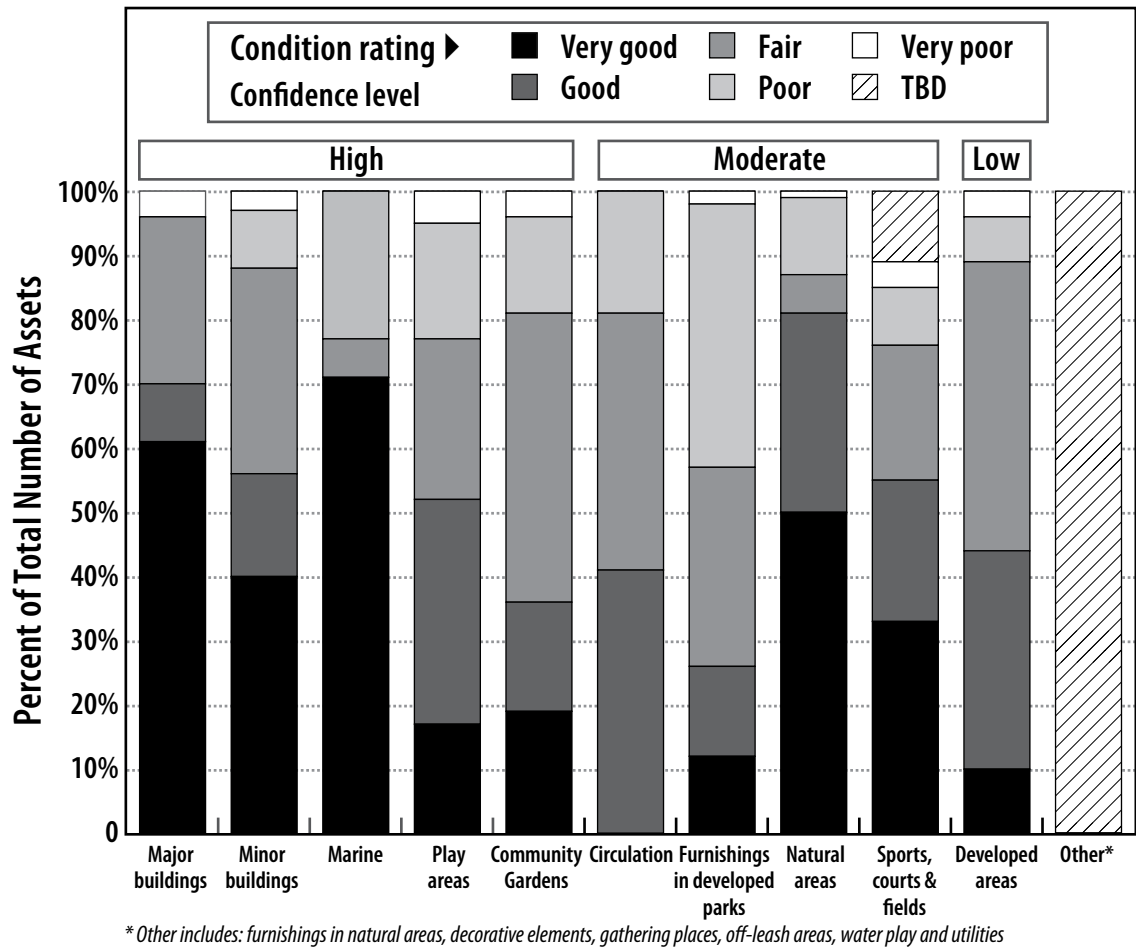
Appendix 2d: Current Condition of Capital Assets

Water Bureau, December 2013



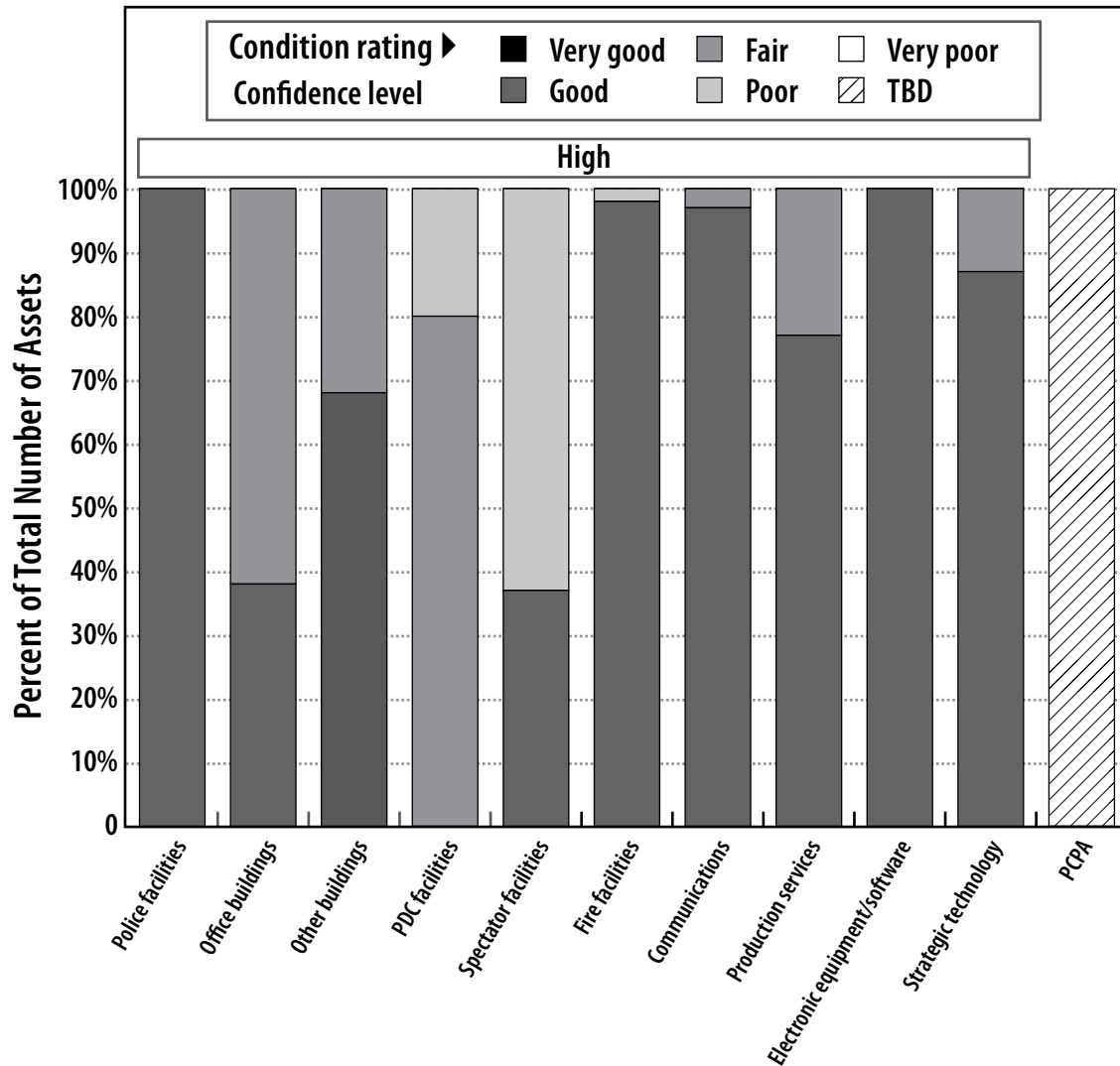
Appendix 2e: Current Condition of Capital Assets

Parks Bureau, December 2013



Appendix 2f: Current Condition of Capital Assets

Civic (OMF, Police, Fire), December 2013



Appendix 2g: Current Condition Data Sheet

December 2013

Bureau and capital asset type	Current Condition (in %)						Confidence level	Notes	
	Very Good	Good	Fair	Poor	Very Poor	TBD			
Transportation									
arterial & collector streets	15	18	19	37	11		4 - High		
local streets	8	18	20	39	15		4 - High		
sidewalks	10	25	30	25	10		3 - Moderate		
curbs	12	50	16	12	10		3 - Moderate		
corners	10	18	17	28	27		4 - High		
structures (bridges only)	8	43	32	17	0		5 - Optimal		
traffic signals (hardware only)	13	16	19	16	36		3 - Moderate		
street lights	4	12	36	32	15		2 - Low	<– Weighted average of Option B & C lights	
support facilities (for PBOT & BES)	condition ranges from poor to very good							None to Moderate	
other transportation assets	condition range from poor to very good or tbd							Low to Optimal	
Environmental Services									
combined sewers	52	18	12	12	6		4 - High	Gap assumes requested rate increases continue to be funded. Based on regular ongoing assessments (except stormwater).	
sanitary sewers	72	20	6	2	0		4 - High		
wastewater treatment systems	27	29	15	22	7		4 - High		
stormwater system	20	20	30	20	10		2 - Low		
Water									
supply	11	49	30	8	2		3 - Moderate		
transmission	5	43	43	9	0		3 - Moderate		
terminal storage	48	30	3	19	0		4 - High		
distribution	25	51	19	4	1		3 - Moderate	Condition rating does not account for seismic vulnerability. For example, old cast iron pipes rated in fair condition in terms of physical deterioration are considered deficient (very poor) in likely seismic response.	
facilities (buildings and support facilities)	27	21	12	13	27		4 - High		

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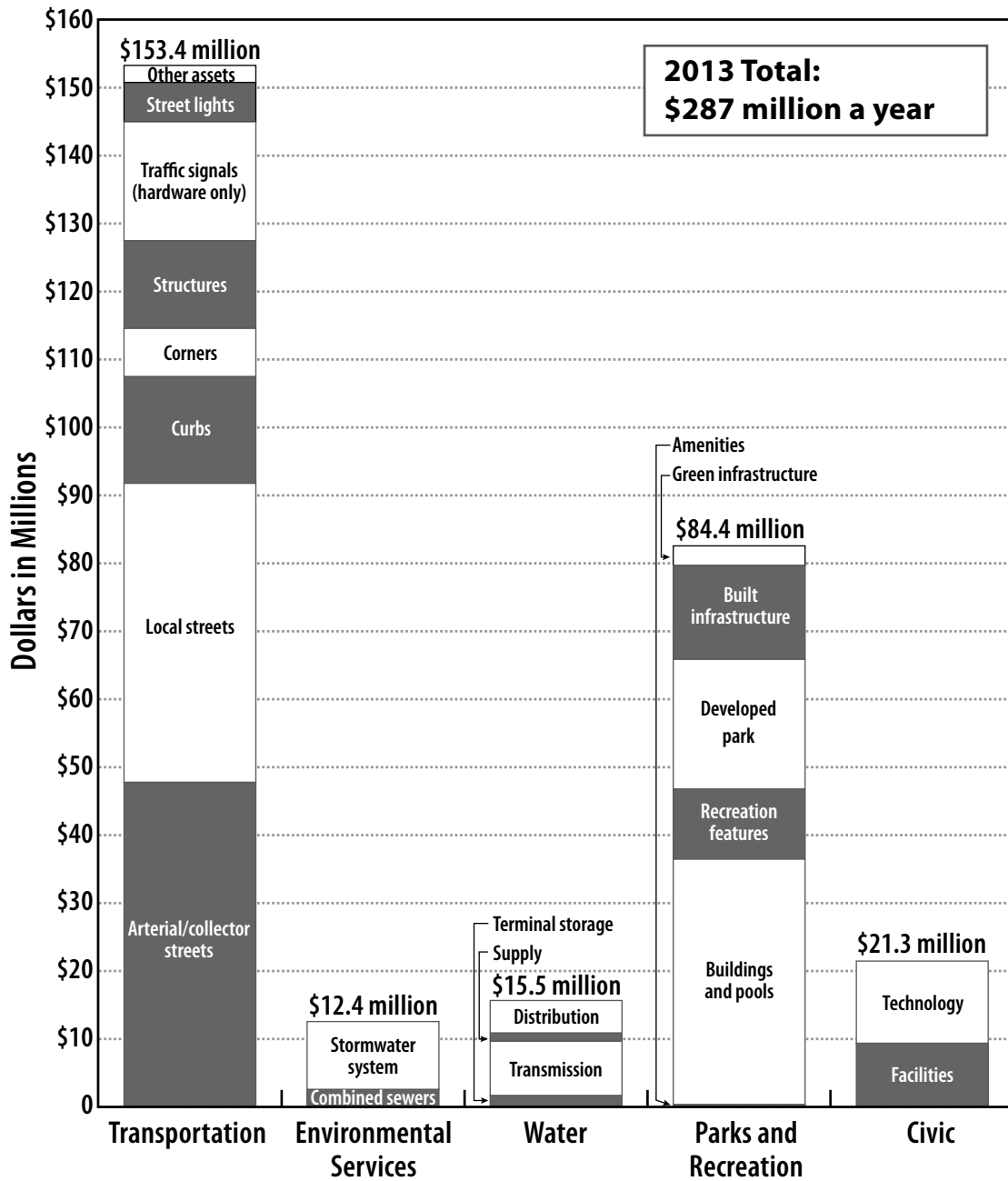
Bureau and capital asset type	Current Condition (in %)						Confidence level	Notes
	Very Good	Good	Fair	Poor	Very Poor	TBD		
Parks and Recreation								
<i>amenities</i>								
furnishings in developed parks	12	14	31	41	2	0	3 - Med	Asset Risk Profiles 2013
furnishings in natural areas	0	0	0	0	0	100	1 - TBD	
decorative elements	28	31	19	21	1	0	3 - Med	Asset Risk Profiles 2013
<i>buildings and pools</i>								
major buildings	61	9	26	0	4	0	4 - High	Inspections on rotating 5-year schedule
minor buildings	40	16	32	9	3	0	4 - High	
<i>recreation features</i>								
gathering places	0	0	0	0	0	100	1 - TBD	Inspection methodology in development
marine	71	0	6	23	0	0	4 - High	Asset Risk Profiles 2013
off-leash areas	0	0	0	0	0	100	1-TBD	Inspection methodology in development
play areas	17	35	25	18	5	0	4 - High	Asset Risk Profiles 2013
sports courts and fields	33	22	21	9	4	11	3 - Med	Asset Risk Profiles 2013
water play	0	0	0	0	0	100	1 - TBD	Wading pools closed per regulations. Splash pads and interactive fountains TBD.
community gardens	19	17	45	15	4	0	4 - High	Asset Risk Profiles 2013
<i>built infrastructure</i>								
circulation	0	41	40	19	0	0	3 - Moderate	Includes paved vehicular circulation (2009 assessment). "Very Good"/"Very Poor" categories not used. Other circulation (pathways, etc.) TBD
utilities	0	0	0	0	0	100	1 - TBD	
<i>green infrastructure</i>								
natural areas	50	31	6	12	1	0	3 - Med	Based on new methodology from Natural Areas Restoration Plan (October 2010)
developed areas	10	34	45	7	4	0	2 - Low	To be re-inspected

Table continued on next page.

Bureau and capital asset type	Current Condition (in %)						Confidence level	Notes
	Very Good	Good	Fair	Poor	Very Poor	TBD		
Civic								
<i>facilities (buildings, structures)</i>								
police facilities	0	100	0	0	0	0	4 - High	
office buildings	0	38	62	0	0	0	4 - High	
other buildings	0	68	32	0	0	0	4 - High	
PDC facilities	0	0	80	20	0	0	4 - High	
spectator facilities	0	37	0	63	0	0	4 - High	
Portland Center for Performing Arts	tbd	tbd	tbd	tbd	tbd	0	TBD	Working with Metro/MERC on oversight.
fire facilities	0	98	0	2	0	0	4 - High	
<i>technology</i>								
communications-BTS	0	97	3	0	0	0	4 - High	
production services-BTS	0	77	23	0	0	0	4 - High	
strategic technology-BTS	0	84	16	0	0	0	4 - High	
electronic equipment and software — other bureaus	0	100	0	0	0	0	4 - High	
strategic technology — other bureaus	0	88	12	0	0	0	4 - High	

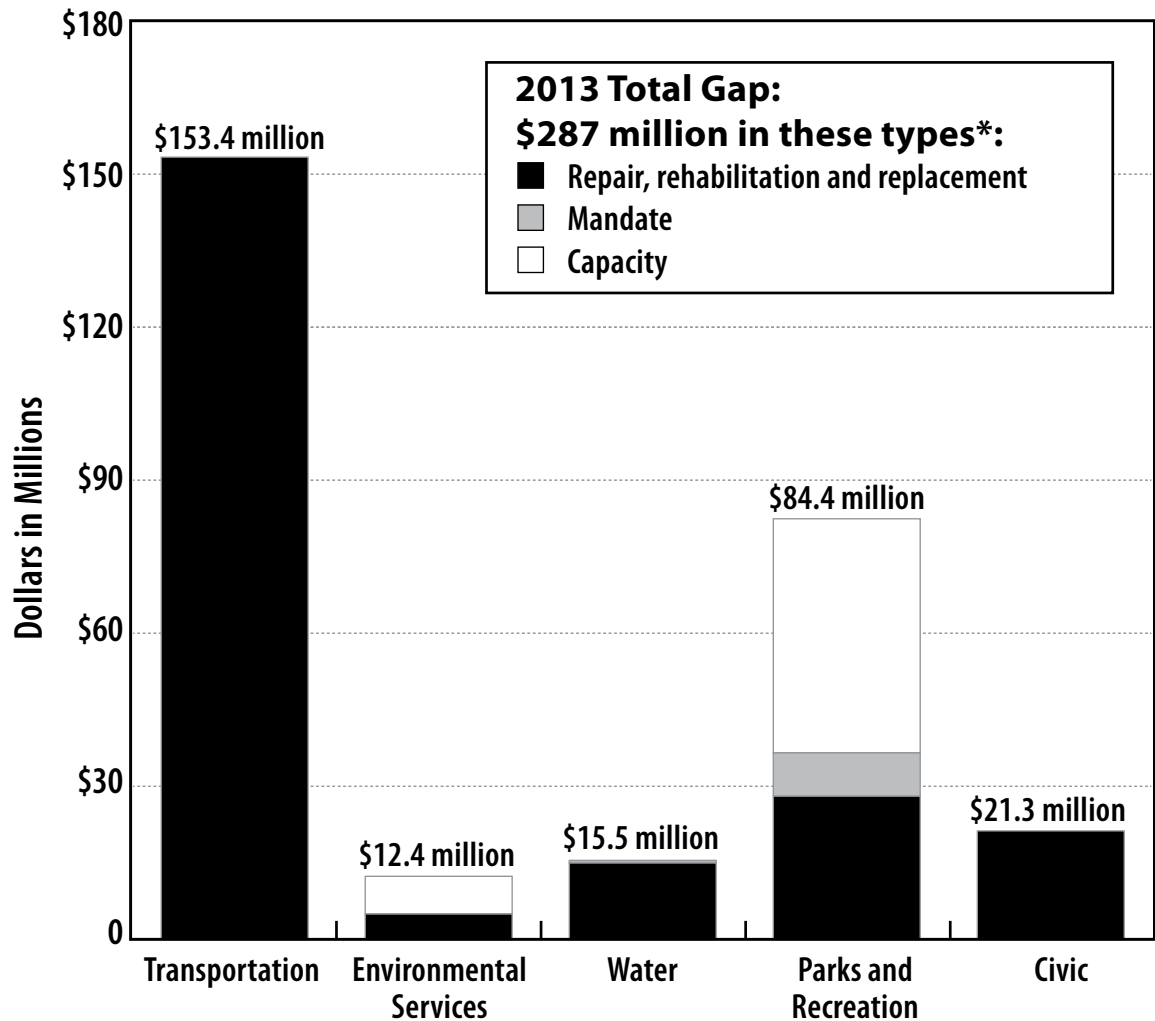
Appendix 3a: Annual Funding Gap, by Asset Group

in millions per year, December 2013



Appendix 3b: Annual Funding Gap, by Type of Gap

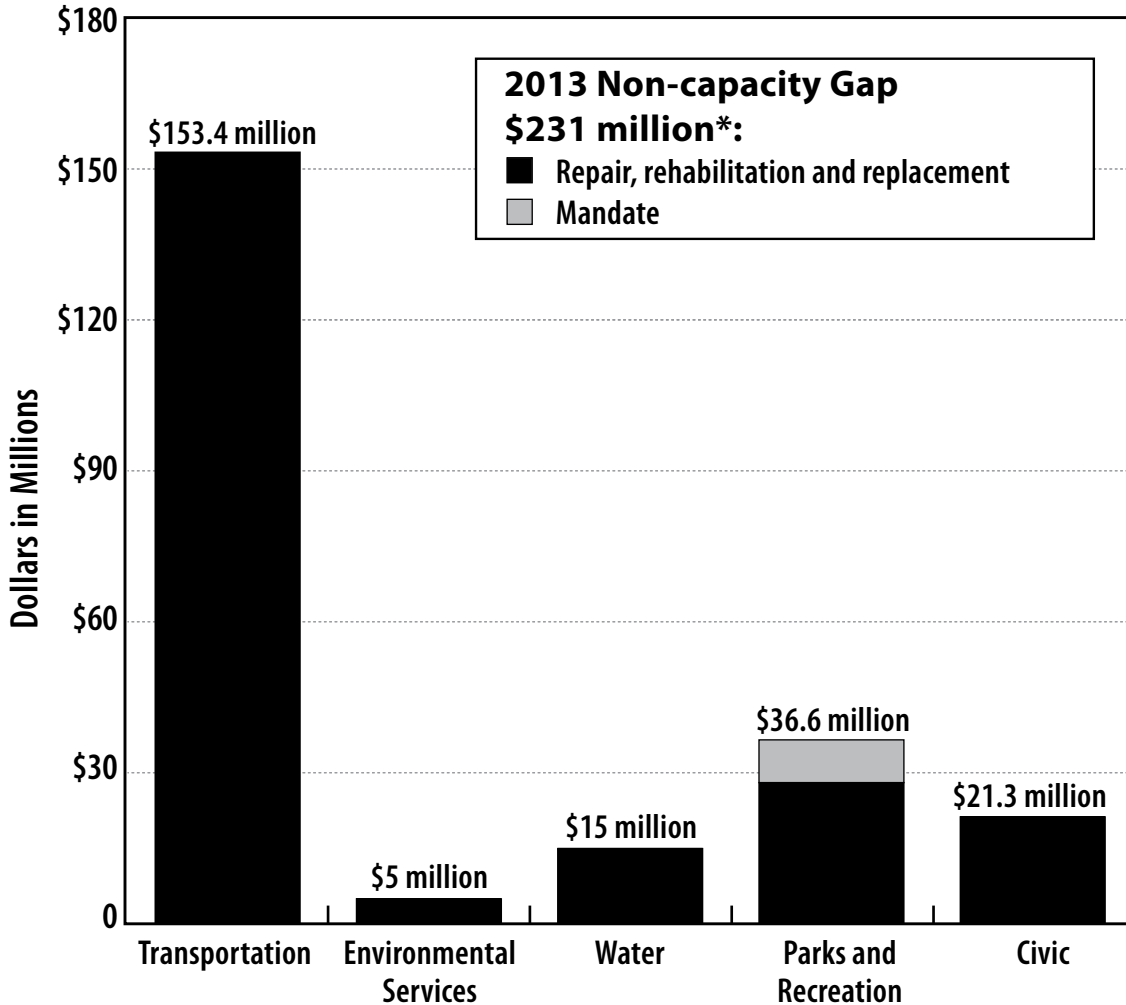
in millions per year, December 2013



* The three types of Funding Gap are defined in Appendix 5 of this report.

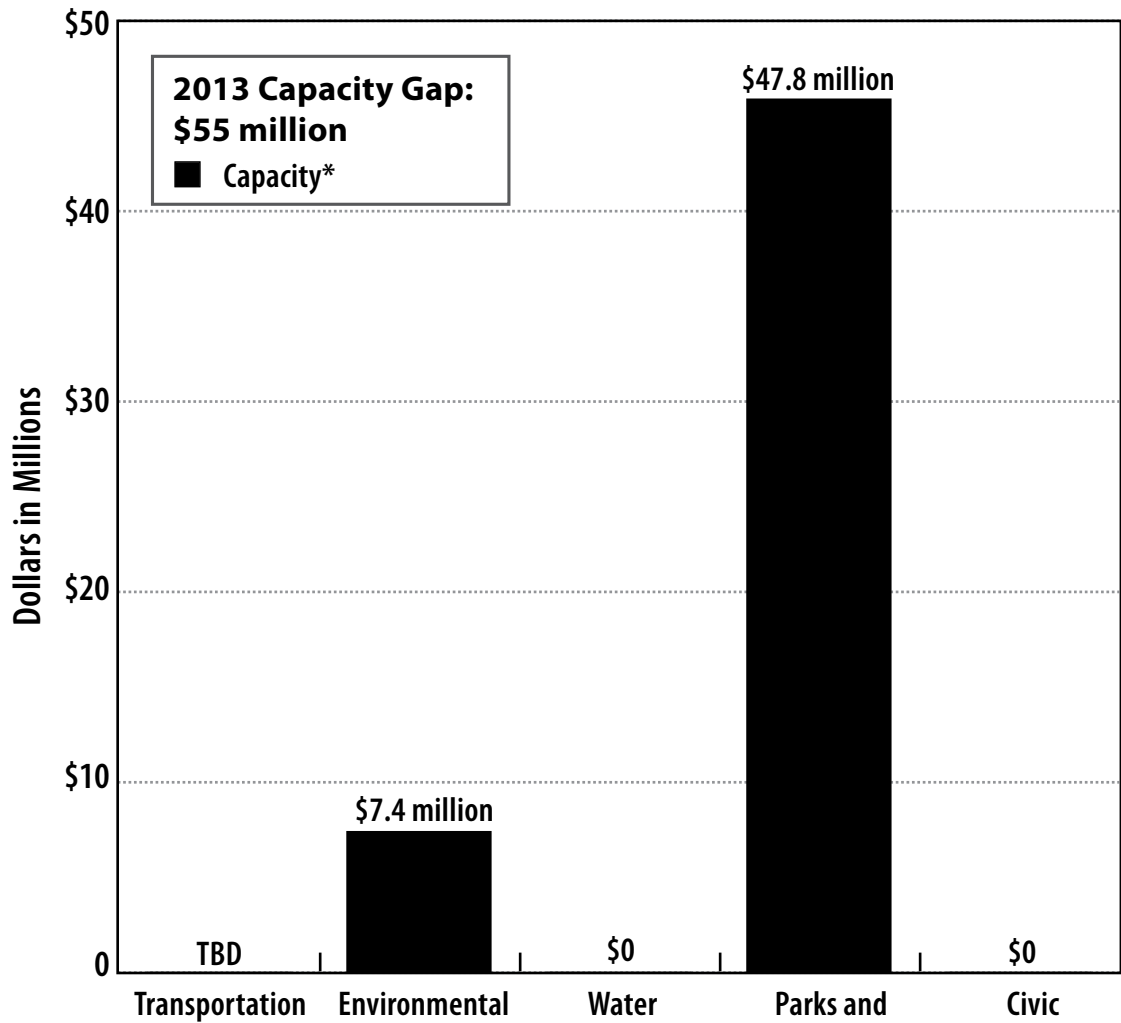
Appendix 3c: Annual Funding Gap (Mandates, Repair, Rehabilitate, Replace), by Bureau

in millions per year, December 2013



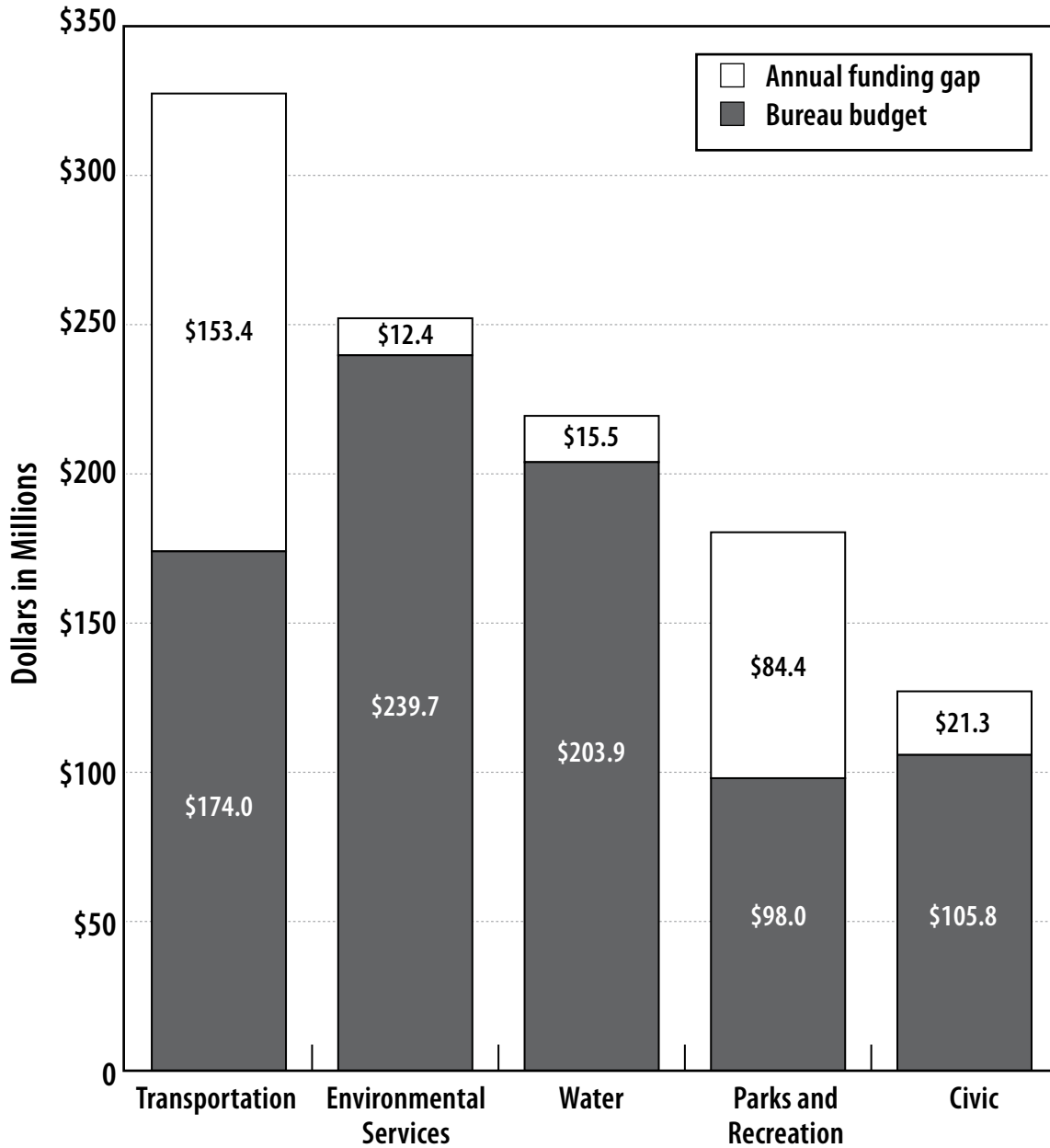
** The three types of Funding Gap are defined in Appendix 5 of this report.*

Appendix 3d: Capacity Related Annual Funding Gap, by Bureau in millions per year, December 2013



Appendix 3e: Annual Funding Gap Compared to Bureau Program Budgets

in millions per year, December 2013



Appendix 3f: Annual Funding Gap Data Sheet

in millions per year, December 2013

Bureau and capital asset type	Value* (in millions)				Confidence level	Notes
	R/R/R	Mandate	Capacity	Total		
Transportation						
arterial & collector streets	\$47.6			\$47.6	4 - High	
local streets	\$44.0			\$44.0	4 - High	
sidewalks	n/a	n/a	n/a	n/a	n/a	<— adjacent property owners are financially responsible for repairing sidewalks
curbs	\$15.7			\$15.7	3 - Moderate	
corners	\$7.1			\$7.1	4 - High	
structures (bridges only)	\$12.9			\$12.9	5 - Optimal	
traffic signals (hardware only)	\$17.5			\$17.5	3 - Moderate	
street lights	\$5.8			\$5.8	2 - Low	
support facilities (for PDOT & BES)	tbd	tbd	tbd	tbd	1-TBD	
other transportation assets	\$2.8			\$2.8	Low to Moderate	
Total Transportation	\$153.4	\$0.0	\$0.0	\$153.4		
Environmental Services						
combined sewers	\$0.0	\$0.0	\$2.4	\$2.4	3 - Moderate	Gap assumes requested rate increases continue to be funded.
sanitary sewers	\$0.0	\$0.0	\$0.0	\$0.0	3 - Moderate	
stormwater system	\$5.0	\$0.0	\$5.0	\$10.0	2 - Low	
wastewater treatment systems	\$0.0	\$0.0	\$0.0	\$0.0	3 - Moderate	
Total Environmental Services	\$5.0	\$0.0	\$7.4	\$12.4		
Water						
supply	\$1.5	\$0.0	\$0.0	\$1.5	3 - Moderate	
transmission	\$8.0	\$0.0	\$0.0	\$8.0	3 - Moderate	
terminal storage	\$1.2	\$0.0	\$0.0	\$1.2	3 - Moderate	
distribution	\$4.3	\$0.5	\$0.0	\$4.8	3 - Moderate	
Facilities (buildings, structures)	\$0.0	\$0.0	\$0.0	\$0.0	3 - Moderate	
Total Water	\$15.0	\$0.5	\$0.0	\$15.5		
Parks and Recreation						
amenities	\$0.2	\$0.1	\$0.0	\$0.3	3 - Moderate	Funding Gap changes influenced by newly assessed high risk assets at end of useful life and ADA deficiencies. Economic recovery brings increased SDC revenues, reducing Capacity investment gap.
buildings and pools	\$11.0	\$3.0	\$23.0	\$37.0	3 - Moderate	
recreation features	\$4.8	\$2.2	\$3.5	\$10.5	3 - Moderate	
developed park	\$4.1	\$1.7	\$13.9	\$19.7	3 - Moderate	
built infrastructure	\$5.5	\$1.5	\$7.0	\$14.0	3 - Moderate	
green infrastructure	\$2.5	\$0.0	\$0.4	\$2.9	3 - Moderate	
Subtotal	\$28.1	\$8.5	\$47.8			
<i>Subtotal Current Assets</i>	\$36.6					
Total Parks				\$84.4		

Table continued on next page.

Bureau and capital asset type	Value* (in millions)				Confidence level	Notes
	R/R/R	Mandate	Capacity	Total		
Civic						
<i>Facilities (buildings, structures)</i>						
Police facilities	\$2.8	\$0.0	\$0.0	\$2.8	4 - High	Spectator Facilities and Union Station fund gaps are of a one-time nature: \$45M for Union Station renovation and \$35M for Spectator facilities reserves funding. OMF is beginning to work with Metro/MERC on the status of PCPA facilities.
Office buildings	\$2.2	\$0.0	\$0.0	\$2.2	4 - High	
Other buildings	\$1.3	\$0.0	\$0.0	\$1.3	4 - High	
PDC facilities	NA	NA	NA	NA	4 - High	
Spectator facilities	NA	NA	NA	NA	4 - High	
Portland Center for the Performing Arts	tbd	tbd	tbd	tbd	tbd	
Fire facilities	\$2.9	\$0.0	\$0.0	\$2.9	4 - High	
<i>Technology</i>						
Communications-BTS	\$5.4	\$0.0	\$0.0	\$5.4	4 - High	
Production Services-BTS	\$0.4	\$0.0	\$0.0	\$0.4	4 - High	
Strategic technology-BTS	\$0.7	\$0.0	\$0.0	\$0.7	4 - High	
Electronic equipment and software — other bureaus	\$0.7	\$0.0	\$0.0	\$0.7	4 - High	
Strategic technology — other bureaus	\$4.9	\$0.0	\$0.0	\$4.9	4 - High	
Total for Civic Assets	\$21.3	\$0.0	\$0.0	\$21.3		
Total Capital Assets	\$222.8	\$9.0	\$55.2	\$287.0		

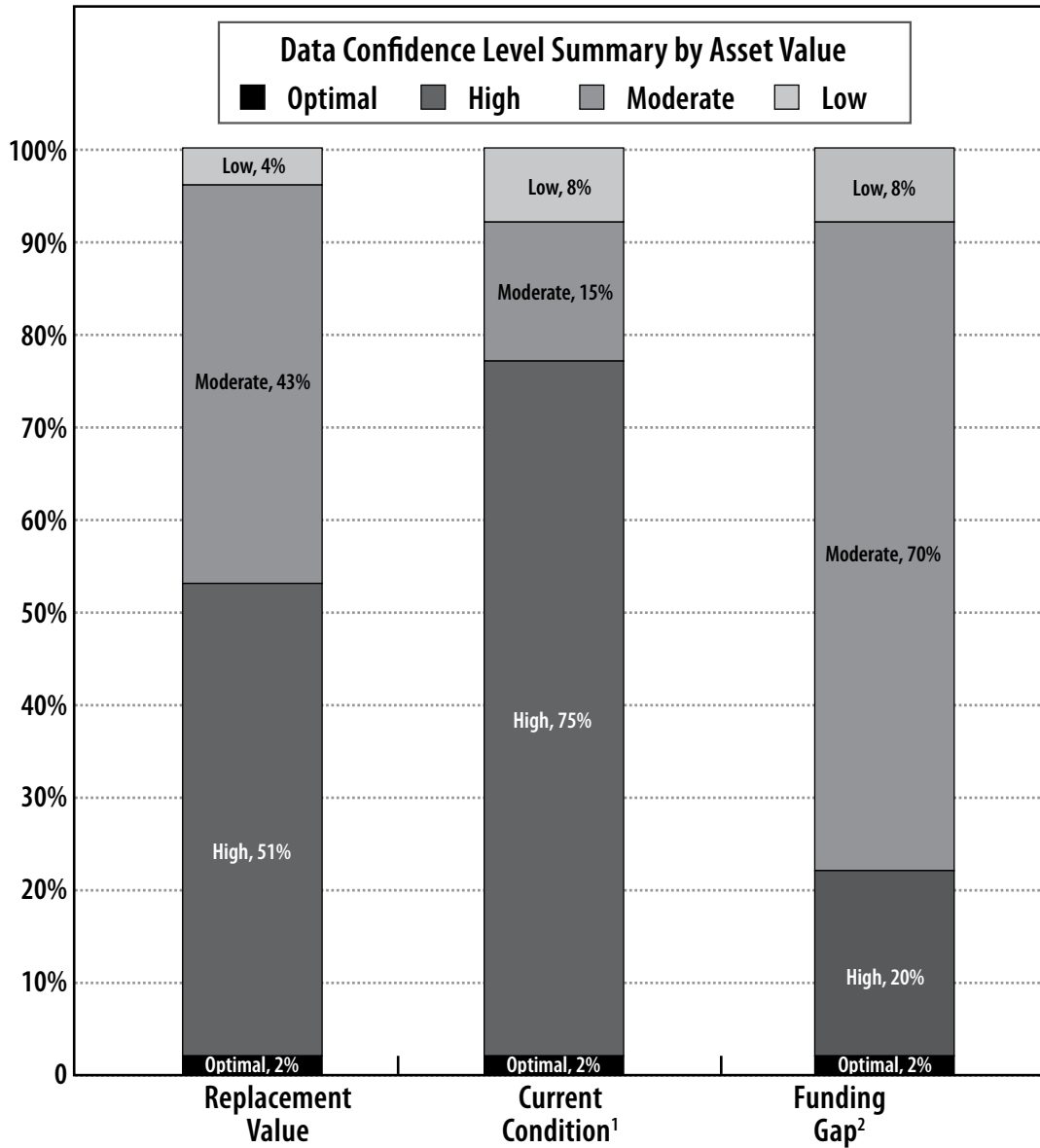
R/R/R (Repair, Rehabilitation, Replacement): Additional funding necessary to repair, rehabilitate and replace existing assets to bring them up to established service levels, or replace assets considered functionally obsolete (not meeting those service levels).

Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under R/R/R or Capacity.

Capacity: Additional funding necessary to address existing inequities and deficiencies in levels of service for current customers and citizens.

Appendix 4: Data Confidence Level Summary

Citywide, December 2013



¹ Current Condition is to be determined for parks furnishings in natural areas, parks gathering places, off-leash areas, water play and Portland Center for the Performing Arts.

² Annual Funding Gap is to be determined for transportation support facilities and the Portland Center for the Performing Arts.

Appendix 5: Definitions

The following definitions and confidence levels draw on several AM sources, including GHD Consultants (used by the Water Bureau and PBOT), trained bureau staff, and literature searches.

Asset A physical component of infrastructure or a facility which has value and has an expected useful life of more than one year, that would be replaced if destroyed, and is not surplus to needs.

Asset Management The continuous cycle of asset inventory, condition, and performance assessment that has as its goal the cost-effective provision of a desired level of service for physical assets. Investment decisions consider planning, design, construction, maintenance, operation, rehabilitation, and replacing assets on a sustainable basis that considers social, economic, and environmental impacts.

Backlog The sum of deferred activities, such as maintenance, operations, and rehabilitation, needed to achieve the lowest life-cycle cost for an asset. Backlog results from lack of money, materials, or staff to perform the needed work. (See Funding Gap.)

Capital Expansion Projects or facilities that create new assets, increase the capacity of existing assets beyond their original design capacity or service potential, or increase the size and service capability of a current service area, including service to newly annexed, undeveloped, or under-served areas. Generally increases the total maintenance requirements because it is increasing the total asset base.

Civic A collection of City-owned assets, including facilities (office, police, fire, parking garages, spectator facilities, Portland Center for the Performing Arts) and technology services (800 MHz radio system, telecommunications, IT operations, strategic technology). Bureau maintenance facilities are assets of the operating bureau.

Condition Assessment The method used to quantify the deterioration rate and remaining useful life of an asset. Methods of condition assessment vary by asset classification and range from use of industry estimates for deterioration rates up to documented physical inspection regimens on established cycles that ensure optimum economic life of an asset.

Condition Measure/Rating A means of classification using information from periodic inspections or measurements to indicate the ability of an asset to deliver a particular level of service.

Confidence Levels (in data/information) The expression of accuracy and reliability in the areas of information (source and reliability), process (ad hoc or repeatable) and documentation (documented or not documented).

Confidence Levels in Data and Information

Confidence level	Label	Inventory completeness	Condition assessment method and frequency	Process and documentation
No confidence	1-TBD	No inventory	No assessment method (to be determined)	No process (to be determined)
Low confidence	2-Low	Partially complete inventory	Estimates used to assess condition	Process not well documented
Moderate confidence	3-Moderate	Inventory complete	Subjective process to estimate condition estimated followed on a regular schedule	Some documentation in place
High confidence	4-High	Inventory complete	Condition surveys conducted on a regular schedule by well-trained personnel	Well documented process followed
Optimal confidence	5-Optimal	Inventory complete	Condition surveyed on a regular schedule	Objective process followed; Accuracy of data verified and well documented

Consequence of Failure	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. There may be a range of possible outcomes associated with an event. There may be economic, social and/or environmental consequences of asset failure.
Critical Infrastructure	Infrastructure assets that are essential for the functioning of society and the economy, including energy generation, transmission and distribution; telecommunications; water supply and wastewater; transportation systems; public health; and security and emergency response services.
Current Replacement Value (CRV)	The CRV is the total cost to replace the entire asset to meet current accepted standards and codes. For this report, the CRV excludes land value. The CRV does not match financial book value or market value.
Failure Mode	The reason why an asset failed to provide the function for which it was installed.
Funding Gap	<p>The difference between the funding needed to address infrastructure needs of an asset at a defined condition or level of service and the funding that is currently available. The funding gap varies with the funding level and affects the level of service. The funding gap is the amount of money needed to eliminate the backlog and/or maintain the asset to achieve its useful life. Given a certain funding level, the resulting level of service can be forecast; if a certain level of service is desired, the funds needed to achieve it can be estimated. There are three types of funding gap:</p> <ul style="list-style-type: none"> ▪ Repair, Rehabilitation, Replacement: Additional funding necessary to repair or rehabilitate existing assets to bring them up to current service levels, or replace assets considered obsolete. ▪ Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under Repair, Rehabilitation, Replacement or Capacity. ▪ Capacity: Additional funding necessary to address existing inequities and deficiencies in levels of service for current customers and citizens.
Green Infrastructure	<p>Infrastructure that uses natural processes, systems, or features to provide traditional infrastructure services. There are two types of green infrastructure:</p> <ul style="list-style-type: none"> ▪ Natural networks of streams, rivers, and open spaces that naturally manage stormwater, provide habitat, improve air and water quality, reduce flooding risk, and provide areas for human recreation and respite; and ▪ Engineered facilities, such as green street treatments or eco-roofs, which use natural processes in an infrastructure setting.
High-risk Infrastructure	Infrastructure assets that have a high risk of failure, based on the likelihood and consequence of that failure.
Infrastructure	Consists of assets in three general networks that serve whole communities — transportation modalities (roads, rail, etc.), utilities and parks. These are necessary municipal or public services, provided by the government or by private companies and defined as long-lived capital assets that normally are stationary in nature and can be preserved for a significant number of years. Examples are streets, bridges, drainage systems, water and sewer lines, pump stations and treatment plants, community centers and pools, and police and fire stations. Beyond transportation and utility networks, Portland includes parks, buildings, green infrastructure, communications, and information technology as necessary infrastructure investments that serve the community.
Inventory	A list of assets and their principal components.

Level of Service	A defined standard against which the quality and quantity of service can be measured. A level of service can include reliability, responsiveness, environmental acceptability, customer values and cost.
Life-Cycle Cost	The sum of all costs throughout the life of an asset, including planning, design, acquisition, construction, operation, maintenance, rehabilitation/renewal and disposal costs.
Likelihood of Failure	The probability or possibility of an event that will cause the asset to fail.
Maintenance	<p>Activities that keep an asset operating as designed or prevent it from deteriorating prematurely, excluding rehabilitation or renewal which may extend asset life. Maintenance can be planned or unplanned. Planned maintenance is:</p> <ul style="list-style-type: none"> ▪ Preventive maintenance conducted at regular scheduled intervals based on average statistical/anticipated lifetime. ▪ Condition-based maintenance based on objective evidence of need from tests, measurements and observations. ▪ Deferred — the shortfall created by postponing prudent but nonessential repairs to save money or materials. Generally, a policy of continuing deferred maintenance results in higher costs when repairs are eventually made, or failure that occurs sooner than if normal maintenance had been performed. <p>Unplanned maintenance is:</p> <ul style="list-style-type: none"> ▪ Reactive or Emergency-corrective actions taken upon failure or obvious threat of failure, usually at a higher cost than planned or preventive maintenance.
Operations	The ongoing activities that allow the use of an asset for its intended function.
Performance Indicator	A qualitative or quantitative measure used to compare actual performance against a defined standard. Indicators are commonly used to measure cost, performance, or customer satisfaction.
Performance Monitoring	The periodic assessments of actual performance compared to specific objectives, targets, or standards.
Rehabilitation/Renewal	Maintenance performed on an asset to restore it to its original level of service or capacity and achieve its useful life, which may result in an extension of the asset's service life.
Retirement/Removal	Decommissioning or removal of an asset through disposal, abandonment, demolition, or sale that may involve retiring deteriorated assets and recovering salvage value.
Risk	The chance of something happening that will have an impact upon objectives. Risk is measured in terms of likelihood and consequences.
Risk Analysis	A systematic use of available information to determine how often specified events may occur and the magnitude of their consequences.
Risk Management Strategy	The systematic application of management policies, procedures and practices to the tasks of establishing the context, identifying, analyzing, evaluating, treating, monitoring and communicating risk.
Triple Bottom Line	A method to categorize the benefits and impacts an organization can expect from investing in its assets. The benefits are categorized into Social, Economic, and Environmental benefits to ensure a comprehensive evaluation in the decision-making process (measure, manage and report).
Useful Life	the period of time over which an asset is expected to deliver efficient service with normal or appropriate maintenance (defined as accepted industry standard or documented local experience).
