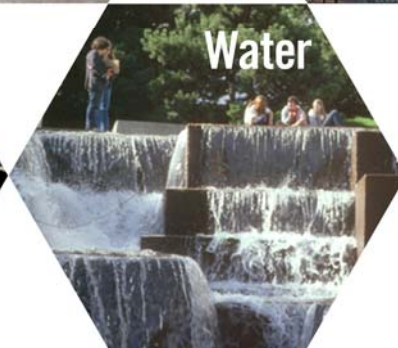# City of Portland
Citywide Assets Report

December **2009**

Citywide Asset Management Work Plan, 2010-2014

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City of Portland
Citywide Assets Report—December 2009

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Executive Summary

This is the seventh year of reporting on the status and condition of the City's physical infrastructure. These asset reports give a snapshot of five infrastructure systems, to enable effective resource allocation to deliver community services.

The City's infrastructure bureaus[1] collect and analyze data for this report. The Bureaus strive to use internationally recognized asset management (AM) principles and practices to enable informed decisions that best meet customer needs. The City Asset Managers Group (the CAM group) is developing a coordinated citywide AM program for all City assets, using a common approach, while allowing each bureau to strategically employ AM for their particular assets.

This report includes a 5-year work plan that details a cross-bureau approach for AM improvement. It also includes current replacement value, current and projected physical condition, and annual funding gaps for infrastructure assets. Each bureau identifies their confidence in the information presented. In some cases, information is not yet available. Bureaus are working to align methods to calculate key measures.

Key Findings

1. The current replacement value of the City's physical infrastructure is estimated at $23.1 billion. Current replacement value is a measure of physical assets used to deliver public services.
2. The infrastructure Bureaus have estimated a combined annual need for $183 million more than current funding to develop needed capacity, maintain existing facilities, address regulatory requirements, and/or meet service levels. This gap does not include any unmet street pavement need is expected to persist and probably grow for each of the next ten years.
3. At current funding levels, some of Portland's infrastructure will continue to deteriorate.
4. New assets often add to ongoing operations and maintenance needs, potentially adding to the funding gap. Some new assets may replace existing asset functions and add new functionality.

Directors' Recommendations

The Planning and Development Directors support ongoing citywide asset management and request City Council support for the following initiatives.

- Update the definition for bureaus' annual funding gaps to include and differentiate between unmet repair, rehabilitation, and replacement needs; current capacity deficiencies and regulatory mandates.
- Establish a five-year work plan for the CAM group to advance asset management practice. The CAM group will report to the Planning & Development Directors on its progress each year.

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[1] Participating bureaus include the Bureau of Environmental Services (BES), the Office of Management & Finance (OMF) for City-owned buildings, Portland Parks and Recreation, Portland Bureau of Transportation (PBOT) and the Water Bureau. The Bureau of Planning and Sustainability organizes the group's meetings and reporting. OMF budget and finance staff attends to ensure overall coordination with City Council priorities and budgeting.

1. Introduction

This seventh report on the status and condition of the City's physical infrastructure takes a holistic approach to ensure that the City's assets are adequate to provide desired levels of service. This report seeks to provide coordinated, integrated, fact-based information about the City of Portland's physical assets that will enhance a 'whole-of-city' approach to asset management (AM). It provides an accounting of the number of assets, replacement value, condition, and unmet funding needs. Information in the report will assist the City's efforts to ensure infrastructure is in good condition and that operation, maintenance, rehabilitation, and development programs are as efficient and effective as possible.

This year's report introduces a five year work plan (Section 5 and Appendix 1) for improvements in citywide asset management. This work plan is based on an internal assessment of bureau's current and potential capacities to adopt best practices as well as research on the practices of peer communities.

To reflect the current state of City asset management, this report includes:
1. citywide asset management practice (see Section 3);
2. citywide asset status and conditions (see Section 6);
    - current replacement values of city assets (see Appendix 2);
    - assessment of the current condition of each asset group, based on a five tiered rating system and associated confidence levels (see Appendix 3);
    - annual estimated funding gap (see Appendix 4);
    - calculation methodologies (see Appendix 5);
3. unmet funding needs (see Section 7);
4. related planning efforts (see Section 8);
5. bureau observations on their AM activities (see Section 9); and
6. common definitions for basic AM terms (see Appendix 6).[2]

2. Asset Management Goals and Drivers

Goals

The goal of strategic asset management 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 maintenance, repair, rehabilitation, replacement, acquisition and disposal of assets.

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 practice improves. Using this cross-bureau effort will continually improve performance-based information that is available to citizens, bureaus, and city leaders as they make choices in the types and levels of service desired.

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

Asset Management informs:
- asset acquisition;
- maintenance and operations;
- renewal and adaptation; and
- asset disposal.

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; and
- improve and coordinate City AM planning across bureaus.

Common elements for managing assets include:
- information systems 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; and
- clear assignment of roles and responsibilities to guide AM efforts.

Policy 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;
- Climate Action Plan;
- Municipal bonded debt covenants;
- City CIP budget manual, which requires bureaus to analyze operations and maintenance costs and savings in new projects;
- U.S. Governmental Accounting Standards Board 34, which allows the City to capitalize costs that extend an asset's useful life; and
- 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 impact all of the City's infrastructure systems, including sewer and stormwater, transportation, water, parks and civic facility investments. The following regulations represent some of the major regulations currently impacting 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; and
- 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.

3. Citywide Asset Management Practice

History
For over 20 years, individual City bureaus have initiated components of AM. Seven years ago, the AM focus began to broaden to a whole-of-city, or citywide focus. In June 2002, City Commissioners and bureau directors completed a strategic exercise, *Measuring for Results.* They identified seven priority issues, and flagged five of them for "immediate action". One of the priority issues was aging physical infrastructure.

In 2003, 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.

In 2005, this 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.

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. The 2007 report included a pilot of risk analysis and a framework for the inclusion of green infrastructure. The 2008 report introduced AM best practices and assessed four bureaus' current and potential capacities to adopt these best practices.

The CAM group reports periodically to the Planning & Development Directors' group. The Directors group represents infrastructure, development permitting, financial and planning bureaus. Findings of the annual assets reports are reviewed, and the Directors' group updates recommendations to City Council. 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.

Bureau Practice

Six of Portland's infrastructure bureaus apply asset management (AM) principles to some of their practices. Those bureaus are Transportation (PBOT), Water (PWB), Environmental Services (BES), Parks and Recreation (PP&R), Portland Development Commission (PDC), and Management and Finance (OMF). For this report, BES provides information on both wastewater and stormwater services and OMF reports on civic facilities, including government offices, police and fire facilities, parking garages, technology services, and spectator facilities. In previous reports, PDC has reported on affordable housing, however information is not available for this year's report.

PBOT has applied traditional AM tools in the transportation sector for more than 20 years. In the past ten years, Water and Environmental Services have begun to apply the principles from the *International Infrastructure Management Manual*. Although the City's infrastructure bureaus started with, and continue to use, different AM strategies, the City supports collaboration and between bureaus with the long-term goal of improving AM practice citywide. Currently, bureaus use common definitions and terminology but do not apply consistent techniques.

Current Citywide Practice

Portland has reached a crossroads in asset management practice. The annual *Citywide Asset Report* has been the CAM group's primary focus. At present, bureaus apply elements of AM best practices according to their own needs. The CAM group works by consensus to identify key measures, define terms, and collect and display each year's data. The CAM group also prepares the annual report and briefs the Directors group before presenting it to City Council. The Directors group oversees policies and resource allocation, coordinates long-range planning, and manages certain cross-bureau planning and development initiatives. Each AM report is presented to the City Council at the start of annual budget work sessions.

To further AM practice, the City must now tackle more advanced AM best practices. As such, the CAM group has prepared a multiyear, integrated work plan to build capacity in citywide AM best practices (see Appendix 1).

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 Practice		
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, 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
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 is evaluating infrastructure needs to accommodate projected growth of the region. PDC and the Water Bureau serve on the project advisory committee. The Bureau of Planning collected and assembled data from City bureaus, for use in the Metro analysis. The City of Portland is also developing the Portland Plan, which will guide long term growth and development within the City. 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 Council-mandated budget cuts.	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 Portland 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 practice.	The CAM group completed an internal survey of AM practice in 2008-2009.	Complete
b. Identify key gaps based on research into best practices and bureau's unique	The CAM group, with the support of an outside consultant, completed research on	Complete

needs.	best practices within peer communities.	
c. Prioritize improvements necessary to achieve best practices in asset management.	The work plan identifies and prioritizes AM best practice improvements.	Complete
d. Establish implementation steps and schedule .	The work plan identifies key implementation steps and timelines for each best practice.	Complete

6. Build capacity to implement asset management best practices within capital bureaus and citywide.

a. Enable bureaus to make continuous improvements to asset management practice 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 activity 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 the work plan, see Task #6 Long Term Investment Profile.	Future

4. Assessment and Peer Review

Internal Survey

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 in fall 2008. Bureau responses were forwarded to a consultant to identify and match peer communities with identified best practice gaps.

Generally, the survey found that the participating infrastructure bureaus have initiated elements of AM best practice, with each bureau taking a different approach.

The survey found:
- Most bureaus have asset management programs which cover the majority of their infrastructure assets;
- Bureaus have differing levels of practice for various AM activities, leading to potential opportunities for cross-bureau knowledge sharing;
- Training programs in AM practices are not currently widely available for bureau staff;
- Two bureaus involve the public on issues regarding infrastructure system or service delivery (methods may include setting service levels, defining acceptable levels of risk, using public surveys or feedback to predict future demand, inviting customer feedback and questions, and updating public on project issues, alternatives and progress);

- Collaborative relationships with other communities on AM practice are not uniform;
- Bureaus identified common AM improvement priorities in the following best practice areas: data collection and management, service levels, asset management plans, risk management, and business cases. These best practices are discussed in greater detail below.

The internal survey identified five priority AM best practice areas for further exploration: data collection and management, service levels, asset management plans, risk management, and business case. These were used as the focus of the peer community research. More information on these best practices can be found in the 2008 City Assets Report.

Peer Community Review

In July 2008, the City of Portland Bureau of Planning and Sustainability retained Camp Dresser & McKee Inc. (CDM) to assess the use of asset management best practices to optimize City investments in infrastructure. CDM was assigned to conduct research on high-performing peer communities in North America, and to recommend a sequence of AM best practices for the City of Portland to pursue. BPS accepted CDM's final report as a substantial resource for use by the CAM group in preparing its work plan. Bureaus, individually, may use any of the report's research or recommended actions as well.

This research found no US cities with mature whole of city asset management practices in place, although a handful of cities (including Cincinnati, OH; Charlotte, NC: and Kansas City, MO) have made some progress toward this goal, a few of which have similarities in size and structure to Portland. Several Canadian cities (including Edmonton, Hamilton, and Calgary, Alberta) are also working towards whole of city asset management programs.

Further, CDM believes "one of the greatest opportunities available to the City is utilization of the CAM group to continue strengthening the City's practices and the spirit of cooperation and helpfulness that exists between the Bureaus that make up the CAM group."

CDM recommended eight actions to advance the goal of whole of city asset management in Portland.
1. Develop an infrastructure growth and preservation policy.
2. Develop 50-year minimum lifecycle investment profiles for all major infrastructure systems.
3. Learn about reliability-centered maintenance.
4. Develop asset performance measures based on tangible things customers can understand.
5. Enlist community support for infrastructure investments.
6. Add an infrastructure report card to the City Assets Report.
7. Develop a standard business case template and review process.
8. Target data collection activities to those assets that pose the greatest risk.

The CAM group used actions 2 through 8 as a basis for development of a citywide asset management work plan. Action 1 will be completed as part of the Citywide Systems Plan.

According to CDM, "these eight actions will advance the City's... asset management practice and will position the City to take on its infrastructure growth and preservation challenges. For these actions to be successful, it is imperative that the CAM group continue their asset management coordination and reporting role. Moreover, implementing the actions will be greatly facilitated by the expansion of CAM group's role to include selected implementation responsibilities including Bureau-to-Bureau mentorship in which those Bureaus with more

advanced practices help to bolster the practices of the other Bureaus. In addition to the eight actions, it is recommended that Portland maintain formal contact with several of the communities that provided information for this report. ICMA has offered to facilitate a whole of city asset management forum as part of their performance measurement group and we recommended that Portland help to advance this initiative."

5. Work Plan for Citywide Asset Management

Work Plan Development
The City Asset Managers Group developed a Citywide Asset Management Work Plan to guide asset management improvements between 2010 and 2014. The work plan is informed by the internal survey (completed in 2008-2009) and the 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 practice.

This work plan lays out general approaches and timelines for cross-bureau work to apply best practices. The CAM group anticipates that the work of individual bureaus will progress on varying timelines based on the status of current practice, resources, and relative priorities. CAM group bureaus also recognize that achieving the goals outlined in the work plan will require continuous and iterative improvements. 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.

The CAM group plans to apply these best practices to all assets in the future, including shared assets and green infrastructure. However, due to limited resources and breadth of this work plan, many tasks focus initially on highest risk assets.

Best Practices
This work plan includes key tasks outlining development of the seven asset management best practices listed below. The plan lays out an approach and timeline for each best practice to encourage progress towards advanced asset management. In general, each task relies on bureaus accomplishing some level of practice in prior tasks. However, all of the identified tasks are interdependent and the CAM group anticipates that improvement and progress will be iterative.

Appendix 1: Citywide Asset Management Work Plan is a five-year plan for improvement in the following areas:

1. **Service Levels:** Service levels establish measurable standards against which actual achievement can be compared. These include characteristics such as reliability, quality, quantity, and safety. AM planning allows bureaus to identify service levels and the associated cost of service. Both can be evaluated with customers to identify the optimum service level they are prepared to support.

2. **Risk Management:** Risk management provides a structure for identifying and analyzing risk and determining appropriate responses. It deals with degrees of uncertainty by identifying possible events, understanding their likely consequences and determining an appropriate response. Effective risk management allows bureaus to maximize opportunities and achieve their goals.

3. **Report Card:** Report cards are a clear and uniform metric (e.g., a letter grade) to indicate the health of the City's infrastructure and bureaus' 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, practices in place for maintaining the assets over their lifecycle, and the degree to which funding is available for lifecycle management of the assets.

4. **Business Case Template:** A business case is an analysis tool to evaluate investment decisions. At the project level, a business case compares project alternatives, such as do-nothing, best technology at the best price, or best value for a certain allocation.

5. **Reliability-Centered Maintenance:** 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 the occur, including preventative and predictive maintenance. An RCM investment strategy is an element for calculating the long-term investment profile for an asset.

6. **Long-Term Investment Profile:** 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.

7. **Community Information & Consultation:** 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 and willingness 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.

6. Citywide Asset Status and Condition

A prerequisite for sound AM is relevant, reliable, and timely information about asset resources. This report includes data on three key measures: current replacement value, current and projected physical condition, and annual funding gap. The confidence level in the data is included. In some cases, data is not available or is pending more detailed data collection and analysis. Most of these "not available" responses are for projected condition.

As much as possible, information provided in this report is comparable across bureaus and asset groups, and the confidence levels for the information were assigned using a common scale.

1. Asset management practices ensure maximum use of existing assets, show tradeoffs, and optimize decision-making and investment planning.

2. The City's physical infrastructure has a current replacement value of $23.1 billion. By bureau, the infrastructure value is: PBOT ($8.4 billion); BES ($5.9 billion); Water ($7.0 billion); Civic ($1.0 billion) and Parks ($0.9 billion).

3. A gap exists between the funding required to maintain the City's infrastructure in a sustainable way, and existing funding. For 2009 alone, there is a sustainable level investment gap of $183 million for these assets. This total does not include any unmet needs for street pavement.

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

5. At current funding levels, some of Portland's infrastructure will continue to deteriorate. In 10 years, two asset groups (street lights and Union Station) are projected to remain or shift into mostly poor condition.

Section 8 of this report includes additional bureau specific observations regarding each bureau's asset management approach; uses of AM; AM practice; asset condition, replacement value, and funding gap; and AM improvement priorities. Full asset data, including condition, replacement value, and unmet need, can be found in Appendices 1 through 3.

7. Unmet Funding Needs

- A major finding of the annual asset reports (2002 through 2009) is that a substantial annual funding gap persists. The gap is defined as the difference between the funding needed to address infrastructure needs at a defined condition or level of service and the funding that is currently available. This year, the CAM group modified how the funding gap is defined and calculated. The group has presented funding gaps in three categories:
- Repair, Rehabilitation, Replacement: Additional funding necessary to repair, rehabilitate and replace existing asset to bring them up to current service levels. Also includes replacement of assets considered obsolete.
- Capacity: Additional funding necessary to meet the demands of existing customers, based on current levels of service.
- Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under Repair, Rehabilitation, Replacement or Capacity.

The sum of these three types is listed as the Total Funding Gap. In the Bureau Observations section, Bureaus have described if or how their methodology accounts for these three types of funding gaps.

Sustainable Funding Levels

As the asset managers have refined methods and updated data, the estimates of annual funding gap have gone up, not down. This year, the combined annual funding gap for Transportation (except street pavement), Environmental Services, Water, Parks and Civic assets is $183 million.

Running a constant funding gap or under-investing in capital maintenance 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, with the intent to add $1 million to it each year until the Office of Management and Finance found the amount to be sufficient. That fund rose to $7 million in FY 2002-03, and then declined after a series of annual budget cuts to an amount insufficient to meet ongoing needs. In FY 2008-09, City Council redirected the capital set-aside to fund the Public Safety Systems Revitalization Project (PSSRP).

As noted earlier, *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 start closing the annual funding gap, and more fully maintain existing infrastructure. It is understood that City Council must balance many competing demands, and such an effort will take a number of years. The concept is to build a funding gap finance plan, with a trajectory of 10 to 15 years.

In 2007, the City Asset Managers Group worked with 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.

8. Related Planning Efforts

Basic services, community health and livability, and economic development all depend on a well-functioning infrastructure system. Bureaus can apply asset management practices to make strategic planning decisions and achieve community goals at the bureau, City, regional and state levels.

The Bureau of Planning and Sustainability seeks opportunities to advance AM practices in the Portland Plan, an inclusive, citywide effort to guide how Portland develops over the next 30 years. The Portland Plan will update a number of planning documents, including the 1980 Comprehensive Plan, the 1988 Central City Plan and the 1989 Public Facilities Plan.

A major product of the Portland Plan is a coordinated 20-year infrastructure plan, the Citywide Systems Plan (CSP), which will address transportation, water, stormwater, sewer, parks and publicly owned buildings. The CSP will update the City's 1989 Public Facilities Plan and will include an inventory and general assessment of the condition of the significant public facility systems. It will provide a list of significant public facility projects, estimates of when and where each project will be needed and rough cost estimates.

The CSP will also discuss existing and potential funding mechanisms and their ability to fund the development of each public facility project. The CSP will go beyond the state planning requirements by identifying service levels (as available), updating Comprehensive Plan policies, and describing two funding levels (constrained and priority).

At the regional level, Metro completed the *Regional Infrastructure Analysis* in July 2008 as part of its *Making the Greatest Place* initiative. The analysis evaluated eight types of infrastructure-transportation, water, sewer, parks, civic facilities, transit, energy, and schools. It found that "to accommodate growth over the next 30 years, the Portland region will require infill utilities and upgrades to existing systems in urban areas and new systems to serve urbanizing areas. Demands are projected to be relatively consistent across the region, regardless of location." Region-wide, "traditional funding sources are expected to cover only about half the estimated $27 to 41 billion needed to accommodate growth by 2035." Local jurisdictions cited a number of causes of funding gaps including declining state and federal allocations, diversion of funds to unanticipated or emergency repairs, rising construction costs, and lack of ongoing and stable funding sources.

In general, the analysis found that rate-supported infrastructure systems like water and sewer tend to be more stable than non-rate-based infrastructure because of their ability to raise rates to cover system costs. According to the report, parks, transportation, and civic systems "generally do not have significant and stable sources for maintenance and operations and are subject to local budgetary constraints". Often, parks & recreation systems can fund capital costs through bond levies but usually lack adequate funding for maintenance and operations. For transportation, the current *Regional Transportation Plan* has identified a $7 billion finance gap.

9. Bureau Observations

The Bureau Observations, below, discuss the following five areas for each of the participating infrastructure systems:

- the bureau's asset management approach;
- uses of AM;
- annual updates on AM practice;
- asset condition, replacement value, and funding gap; and
- AM improvement priorities.

These bureau observations build on those included in previous annual reports.

Transportation

The Portland Bureau of Transportation (PBOT) manages transportation assets with a replacement value of $8.4 billion. Improved streets, the sidewalk system, bridges, traffic signals, and streetlights make up 93% of the dollar value ($7.8 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 $555 million.

Asset Management Approach

Asset Management is a strategic approach to managing transportation infrastructure. PBOT 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 the business practices.

Uses of Asset Management

In a climate of declining transportation revenue, asset management has played a key role in identifying where budget reductions should be made. In a recent budget prioritization process, maintaining assets was one of the highest priorities. Asset Management also helps plan for and prioritize preventive maintenance needs, which helps ensure a safe and efficient transportation system.

Annual Update
Asset Management Practice

The goal of data management is to provide high-quality and reliable information that can be used for decision making. PBOT tracks the inventory of all eight asset classes. In an effort to ensure that the right data is being collected and identify any outstanding needs in the data management system, an analysis was conducted to identify needs and gaps in the system. Over the last year, staff has worked to solve the issues that resulted in gaps to the data management system. They have been successful in creating efficiencies and changes to the business process that will ensure accurate capturing of data.

PBOT continues to implement findings from the City Auditor's report on pavement management. The pavement management system will be replaced with more robust software which will provide greater ability to target future investments for pavement assets. A new rating system of the streets has also been completed, which will allow PBOT to accurately report on the pavement needs.

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

- **Street Lighting:** Many of the city's 44,000 street lighting luminaries were replaced in the early 1980's when mercury vapor lights were converted to high pressure sodium lamps. These luminaries are now reaching the end of their useful life and will need to be replaced. Approximately 19% of street lights are in poor or very poor condition and can stop working at any time. These lights, in addition to the ones that are reaching the end of their life will need capital replacement funds to replace them with induction or LED lighting. Street lights are important for the safety of our neighborhoods and for those who use the transportation system. Evaluations are continuing to determine the cost-effectiveness of converting to more efficient street lighting technologies.

- **Signals:** Traffic signals are made up of several components (i.e. hardware, software, mast arms, controller boxes, lights). Approximately 42% of the traffic signals are in poor or very poor condition. Without additional resources, the condition will continue to decline. Traffic signals in poor condition are more prone to increased trouble calls, causing safety and congestion problems. Traffic signals in optimal condition ensure that there is synchronization of traffic flow, which results in congestion reduction. Synchronization can also help improve the environment through a reduction in carbon emissions.

- **Pavement Management:** Changes to pavement management practices are underway which comply with 2006 audit recommendations. New pavement condition rating methods, replacement of 25-year old software and changes to street preservation activities are in progress. During this transition, pavement condition and unmet need will not be reported until 2010. Pavement condition and performance target are expected to change following this transition in management practices and tools.

- **Bridges:** Of the 155 bridges the city owns, 32% are either structurally deficient or functionally obsolete; 30 of these are in poor condition including 27 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. Only 4% of the sidewalk system in Portland has corners with curb ramps that meet current ADA-accessible standards. In total, nearly 40% of corners have accessible corner ramps. PBOT's goal is to construct at least 700 new corners per year. In FY 08-09, the sidewalk inspection program was significantly reduced meaning it will take longer to inspect all of the City's residential and commercial sidewalks. The curb repair program was eliminated in FY 06-07 meaning that no preventive maintenance is conducted on curbs.

As part of the citywide standardization of overhead development, it is important to note that PBOT has changed the way overhead is reported, which resulted in a change in the estimated value of the transportation system. PBOT now 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.

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.

PBOT's annual $120 million funding gap breaks out as follows:

▪ **Streets:** Transportation is changing the way pavement is inspected and the software that identifies current needs and strategies that optimize available resources. Pavement network condition and unmet need will not be reported until 2010 when this transition is complete.

▪ **Sidewalks:** $19.6 million is needed annually to repair, restore or replace curbs to bring them to a fair or better condition and $10.2 million is needed annually to build ADA accessible corners and maintain the corners in a fair or better condition. An additional $50.6 million would be needed annually to maintain the sidewalk system. However, while the sidewalks are owned by the City, it is 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. Combined, these activities require an additional investment of $80.4 million annually over the next 10 years.

▪ **Bridges:** The total cost to replace city-owned bridges in poor condition, and address bridge deficiencies is $14.1 million annually.

▪ **Signals:** A total increase of $18.4 million per year is needed in capital funding.

▪ **Street Lights:** In addition to fully funding the PGE contract, an increase of $4.2 million per year is needed.

▪ **Maintenance Facilities:** Kerby and Albina Yards are antiquated and in need of upgrading to modern standards. In addition, most vehicles are currently parked under the I-5 bridge structures at the Kerby Building, which puts them at risk of damage should the bridge fail. Identifying funding and a location where PBOT can safely park the vehicles needs to be addressed. However, the total need is not defined at this time.

Transportation funding continues to decline as the maintenance liability continues to increase. The primary source of PBOT's discretionary operating revenue, the State Highway Trust Fund, is not indexed to inflation causing the funding gap to grow. The result is a continuing loss of general transportation revenue purchasing power. Additional parking revenues, while increasing, have been dedicated to streetcar operations (33% City share), aerial tram operations (15% City share), and additional transit mall maintenance and transit mall match debt service. While funds are identified to build projects, ongoing operating and maintenance costs become PBOT's long-term obligation.

On July 29, 2009, the Governor signed into law House Bill 2001: Jobs and Transportation Act. This bill increased the State gas tax by 6-cents and other transportation related fees, beginning in 2011. When this bill is fully implemented in FY 11-12, it will yield an estimated $21 million of new revenue per year for Portland's transportation system.

Asset Management Improvement Priorities
PBOT has no dedicated funding available to move AM forward systematically. Despite the lack of funding, PBOT continues to track assets and their conditions to inform decision making. PBOT also plans to implement risk assessment and life cycle costs across assets to better allocate the limited resources for transportation operations and maintenance. PBOT is currently working to build condition monitoring programs for assets that currently don't have a formalized program.

Within the next year, PBOT will address the following improvement priorities for asset management:
- improving asset data collection and data entry
- implementing condition monitoring programs for assets
- setting and refining performance measures
- developing a common definition of unmet need across all assets
- conducting a risk assessment, including identifying failure modes for assets

Environmental Services
The Bureau of Environmental Services (BES) provides sewer and stormwater collection and treatment services to 575,000 people, numerous commercial and industrial facilities, and six wholesale customers. The existing system consists of 1,441 miles of separated storm and sanitary sewers, 891 miles of combined sewer that carry both stormwater and sanitary waste, 725 green street facilities, 96 pump stations, and two wastewater treatment plants. These assets are valued at nearly $6 billion.

Asset Management Approach
Asset Management has been part of the business practices at BES for nearly 20 years beginning with the implementation of the Hansen Maintenance Management Database and condition assessment scoring in 1990. In 2008, BES participated in an international asset management benchmarking project. Early action items that were identified as a result of the benchmarking process have resulted in the development and approval of a work plan to further integrate asset management practices into the organizational culture. This culture change will lead to increased efficiencies and savings by directing dollars to the right activities at the right time and the right cost. Central to the work plan will be the setting of levels of service in collaboration with our rate paying customers.

Uses of Asset Management
BES recently completed an update of the Systems Plan for the combined and sanitary collection systems. This update resulted in the identification of $123 million in rehabilitation work (also see Annual Funding Gap below). A similar effort is now underway for the stormwater collection system. The System Plan incorporates system inventory, condition, GIS data, and failure records into an asset management context including a risk register (likelihood of failure times consequence of failure). Recommended projects are based on life-cycle cost with consideration given to financial, social, and environmental benefits. The goal is cost effective expenditures that result in optimal asset value and customer service.

The companion Capacity, Management, Operation & Maintenance Project is identifying 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.

Annual Update
Asset Management Practice
BES currently applies AM practices of asset inventory, condition assessment, and computerized maintenance management systems for its treatment and pump stations as well as the collections system. The bureau has completed its three-year infrastructure planning effort which has resulted in an upgraded System Plan for the sanitary and combined collection system. The plan 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*. 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. BES has initiated a similar multi-year effort focused on the stormwater system.

The Systems Plan resulted in several new proposed capital projects as part of CIP development for fiscal years 2011 – 2015. The bureau will begin to use *likelihood of failure times consequence of failure* as part of a business case approach in evaluating new CIP projects.

During fiscal year 2009, staff from the bureau participated in an international AM conference; provided training to key staff on AM principles; and drafted a multi-year work plan which it will begin to implement in fiscal year 2010.

Asset Value and Condition
The overall replacement value of BES assets increased from $5.55 billion in 2008 to $5.88 billion in 2009 due to escalation, approximately $125 million in new investment in the system, and the inclusion of approximately 725 green street facilities valued at an average of $20,000 each.

There has been no significant change in the overall condition of the bureau's systems since 2008. In general, the vast majority of the sanitary (97%) and combined sewer (89%) systems are in good or very good condition. These numbers were validated through the System Plan effort. Approximately 40% of the stormwater system and 66% of the wastewater treatment system are in good or very good condition.

Annual Funding Gap
The financial plan generally assumes annual rate increases of 6.5%. The annual funding gap represents the difference between the projected revenue with 6.5% annual rate increases and newly identified needs, averaged over a ten year period. Specific needs represented include:
- $123 million for pipe rehab identified in the systems plan update;
- $40 million for sewer work associated with the proposed Milwaukie light rail line;
- $20 million for capacity enhancements in the Fanno system and an additional $20 million for capacity enhancements in other basins;
- $10 million for infiltration and inflow improvements (I&I) in the Fanno/Tryon system and $10 million for surface water management elsewhere in the system; and
- $60 million for capacity-related projects at Columbia Boulevard Wastewater Treatment Plant (CBWTP).

Asset Management Improvement Priorities
BES continues to participate in the Water Services Association of Australia (WSAA) AM benchmarking project to identify bureau strengths and weaknesses. Findings from this project have helped to shape the bureau's Asset Management Program Work Plan. It is anticipated that the work plan will be approved by bureau leadership early in fiscal year 2010 and that work will begin shortly thereafter.

Other AM activities for fiscal year 2010 will include initiation of the stormwater system plan and application of business risk in the evaluation of proposed CIP projects.

Water

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. By volume, about 60% of the water is delivered to customers within City limits. The remaining 40% is sold to customers in 19 surrounding cites and special water districts. Water is supplied from the Bull Run watershed and the Columbia South Shore wellfield through 2,200 miles of pipes. The water system is valued at $7.1 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, comprised of high level managers, makes policy decisions related to asset management and approves major work items. The AMG is responsible for maintaining inventory and condition information about the water system, and provides guidance and support as key asset management initiatives are implemented.

Uses of Asset Management
The application of asset management concepts has helped the Water Bureau to focus on meeting key service levels, addressing high risk assets and developing business cases to make investment decisions. Among the specific results:
- Incorporating into the Strategic Plan key service levels, including: ranking risk of asset failure, and addressing those risks in relation to the risk level; performing business cases; limiting supply outages at a prescribed rate; providing minimum pressures; and assuring availability of operational hydrants within 500 feet of service connections
- Ranking risks and conducting condition assessments of potential high risk assets (especially pipes)
- Performing business cases and using the results to support project design, construction and operation decisions
- Prioritizing maintenance and construction tasks in relation to asset risk or key service level objectives
- Creating a long term forecast of maintenance, repair and replacement needs of the water system

Annual Update
Asset Management Practice
In 2009, the Water Bureau continued to make progress in asset management, introducing and continued to further apply asset management concepts such as risk, service levels and business cases.

Some of the highlights for the year include:

- Starting to monitor of key services levels. Improvement steps have been identified and service level impacts are a consideration in the Budget process.
- Obtaining results from a forecasting model of asset repair and replacement needs.
- Completing condition assessments for high risk assets, including pipes under I-5 and I-405, pipes over I-84 and railroad lines and the conduits.
- Preparing a business case guidance document. Two Water Bureau groups (Asset Management and Engineering Planning) use the business case framework for decision making.
- Scheduling almost all construction and operations maintenance tasks with the Computerized Maintenance Management System.

Asset Value and Condition
The overall replacement value of the Portland Water Bureau's assets increased from $5.47 billion in 2007 to $7.1 billion in 2008 due to inflation, including more water system assets (including equipment) and to the higher cost associated with pipe and reservoir replacement.

There has been no change in the overall condition of the water system since 2007. In general, the vast majority (about 90%) of supply, transmission, and distribution systems are in fair to very good condition. 80% of terminal storage is in poor to fair condition. Eighty percent of buildings and support facilities are in poor to good 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 $30 million a year. 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 and Corey style hydrants in poor condition.
  - Replacement of valves: Replacement of all large valves in poor condition
  - Replacement of high risk pipe segments in poor condition: Replacement of all poor condition pipe segment crossings of bridges, major arterials, freeways and railroad lines
  - Valve installation: Installation of valves at the base of tanks and at the down slope end of pump mains to address vulnerability to draining during a pipe break
  - Meter replacement: Replacement of meters at a sustainable rate
  - Installation of an Advanced Metering Infrastructure system to facilitate monthly billing, demand management and pressure and leakage management
  - Pipe relocations in response to light rail/streetcar development, bike boulevards and green improvements
  - Expanded predictive/preventative maintenance program for site valves and pipes, tanks and fountains.

- **Transmission – Conduits:** There is a need to replace / upgrade sections of the oldest conduits.

- **Facilities:** There is a need to fund replacement of the Maintenance facility building at the Interstate site.

- **Supply:** There is a significant portion of the Bull Run watershed road system in need of maintenance.

Asset Management Improvement Priorities
The Water Bureau plans to prepare a 5-year work plan for Asset Management in early 2010. Meeting service levels, managing asset risks and making informed investment decisions will continue to be a focus of the asset management program.

Parks

Asset Management Approach
All Portland Parks & Recreation (PP&R) assets, both built and natural, that are owned and managed by PP&R are accounted for in five asset groups: Amenities, Buildings, Recreation Features, Built Infrastructure, and Green Infrastructure. All assets are identified in PP&R's Geographic Information System (GIS).

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 has focused on the more heavily-used facilities and on the basic elements that provide good visitor experiences.

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.

Annual Update
Asset Management Practice
Currently PP&R is completing additional inventories and condition assessments for the smaller buildings, and has finished a draft report on furnishings in the developed parks. Roads and parking lots have been inventoried but not yet assessed. Playgrounds have been inventoried and are assessed regularly. Inventories for other assets are underway or planned in the near future.

PP&R has updated its annual asset inspection program and is in the process of inspecting 20% of all assets each year. By 2012, all assets will be included in this annual rotating schedule, with most assets being inspected at least once every five years and more often in many cases.

PP&R's core team, made up of the Central Services Asset Manager, the Senior Planner for Asset Management and the Principal Management Analyst for Corporate Strategy, guides and coordinates the asset management program, with direction from PP&R's Senior Management Team.

Coordination between asset management, GIS and MS 2000, the work order system, continues to evolve and improve.

AM practices play an increasingly important role in the bureau's capital planning and budget preparation.

Asset Value and Condition
The overall replacement value of PP&R's assets increased from $816 million in 2008 to $874 in 2009, due to inflation, greater accuracy in estimating and the addition of new assets.

There has been little change in the overall condition of the parks and recreation system since 2008, although that may change as more assets are included in the inspection and assessment program. With the exception of natural resources, 85% percent or more of all assets are in estimated to be in fair to very good condition; 77% of natural resources are estimated to be in fair to very good condition.

Annual Funding Gap
PP&R has an expected total annual funding gap of $46.2 million for each of the next 10 years. This is a significant increase from last year because it includes meeting the needs of existing customers by providing standard levels of service for all residents. This is in addition to the funding needed to maintain existing assets.

Meeting the needs of existing customers requires $41.6 million for each of the next 10 years to serve current residents. With an average of only $7 million received in SDC funds, grants and donations to meet that need, that annual gap is $34.6 million.

Maintaining existing assets in good condition depends on regular repair and replacement, which depends on sufficient regular funding, which has not kept up with need. The industry standard for reinvestment needed to maintain assets in good condition is from 2% to 4% of the asset's CRV. With an average of around 2% of CRV in funds to reinvest in past years, PP&R has consistent shortfalls and a widening gap. In 2009, PP&R had 1.9% to reinvest. Additionally, the new assets being added to meet current demand will increase future repair and replacement costs, increasing the shortfall. The annual gap in repair, rehab and replacement is $11 million and the gap in mandated work is $1.6 million. While city council has been able to provide about $1 million annually to address some of the most urgent needs, the annual gap for that work is $11.6 million.

In the current economy, many sources of funds such as PDC and grants are being reduced. Since park facilities are a very affordable and desirable source of recreation, especially in a down economy, they get very heavy use, adding to the need to invest in them and keep them in good condition.

Asset Management Improvement Priorities
PP&R has identified the following asset management practices for improvement. Initial priorities are:
▪ improve the accuracy, completeness and consistency of data (particularly condition)

- refine level of service standards
- ensure that relevant asset management information is provided to other PP&R departments and divisions
- improve AM links to the current work order system
- expand the use of business cases for capital planning and budgeting
- use preliminary risk assessments to determine capital improvement priorities

Additional priorities are:
- complete AM plans (note: Acquisition plans are generally complete)
- complete risk analyses for all asset groups
- determine life cycle costs for all assets
- evaluate service delivery
- improve staff AM knowledge

Civic Assets

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 EBS Services.

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, the Council is funding a large part of the Public Safety Systems Revitalization Project which will replace CAD, PPDS, 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 is over 85% complete and will run through FY 2012.

Fire has no ongoing budget authority for major maintenance projects for these new facilities. Fire does have regular O&M budgets for these facilities. Over the 10-year period of FY 2010 to FY 2020, overall condition will not decrease. However, without saving major maintenance money 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.

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 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 1.8%. 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 1.8% reinvestment level allows OMF to cover immediate needs on the 5-year horizon. This is also enough so that over the 10-year period of FY 2010 to FY 2020 overall conditions aren't 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 very low, funding for major maintenance should be increased by directing savings from efficiencies identified to major maintenance until the 3% goal is achieved.

The City has recently addressed two of its poorest rated facilities by replacing them. The Archives Center will move from an old building in Chimney Park to a newly constructed building on the PSU campus. The Police Property Warehouse moved from an old building at SW 17th and Jefferson to new space in the Guilds Lake commercial development. While this is one way to address a backlog of maintenance issues, it is expensive. But, in both of these cases the physical capacity of the old buildings was limited and restricting operations.

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% of replacement value. For spectator facilities the gap is the one-time difference between actual fund reserves for capital maintenance and a target level of $10 million based on the costs to upgrade Memorial Coliseum and address the long-term capital needs of PGE Park. Union Station's one-time funding gap is $45 million based on unfunded deferred maintenance, in addition to the annual gap. The annual gap of $780,000 assumes the $45 million one-time gap is funded to catch up on deferred maintenance and bring the building up to current standards. In other words, the $780,000 does not stand on its own.

Recently Union Station has received grants to assist in maintaining the asset. These monies have been used mainly for roof which is the most pressing need.

OMF has high 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.

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. We have included the replacement values of these three assets but have no information on their status. OMF is in the process of working with Metro/MERC to provide more City oversight to these assets.

Technology Services: Establishing replacement values, current conditions, projected 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 medium confidence in these assessments, except in the replacement values assessment where we have a medium-low confidence level. 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.

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 the FY 2009 budget process the Council authorized a mix of debt and cash financing for the PSSRP. This still leaves the program $20.5 million short, but should allow CAD and PPDS to be replaced and work to begin on the 800 MHz system replacement.

800 MHz Radio System – Core System
The 800 MHz system is a system that has to be replaced prior to FY 2020 because its condition goes beyond Poor by then. The system has to be replaced prior to FY 2020 because prior to then Motorola, the system's vendor, will not provide support to it. This is because the technology is becoming obsolete. The underlying component chips are old, it is an analog system, and Motorola is focusing on digital systems. We have included in the funding gap the one-time cost to replace it.

800 MHz Radio System-Devices
Just as the core system has to be replaced prior to FY 2020 because the condition goes beyond 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. This replacement money could be used for a grant match.

CAD and PPDS
The CAD system is in the process of being replaced. Migration to the new system is now tentatively set for April 2011.

The PPDS system has to be replaced or rebuilt prior to FY 2020. Doing nothing would cause the system to be unusable prior to FY 2020. The replacement of this system is in the planning stage.

Telecommunications – Integrated Regional Networking Enterprise (IRNE)
The annual major maintenance funding gap for this new system is 5% of replacement value less $124,000 we have in the rates for major maintenance. Five percent of replacement is the industry standard for large technology infrastructure and reflects the shorter life of components compared to buildings. The original IRNE financial plan assumed that efficiencies as achieved would be retained in the rate base to provide replacement and major maintenance funding; however, the budget reduction requirements over the last few years have necessitated those efficiencies being turned into rate relief as opposed to replacement/major maintenance funding. The replacement value listed doesn't include the fiber provided to the City as part of franchise agreements and partnerships.

IT Operations
The assets in IT Operations include storage area networks (SAN), data networks, email system, and core servers. This infrastructure has a life of 5 - 7 years. Our assumption about condition in FY 2020 then is based on the infrastructure needing to be replaced twice in the 10-year period. BTS should be collecting one-seventh to one-fifth the replacement value of the hardware per year. However, the fund is collecting below this level and having to supplement

these collections with money from its reserves to avoid conditions going to poor. The fund has been able to redirect some savings from efficiencies into this replacement fund.

Strategic Technologies - Corporate Applications
Corporate applications include GIS, TRACS, CAD, PPDS, and CIS. CAD and PPDS were discussed above as part of the PSSRP. CIS is relatively new and GIS has money in its rates for on-going improvements. TRACS may be enhanced to address the reduced workforce in BDS.

EBS Services: This is a new asset grouping to reflect the City's new enterprise business system recently implemented to replace IBIS and numerous other information system. 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

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3. **Current Condition of Bureau Assets, by Confidence Level**
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Appendix 1. Citywide Asset Management Work Plan, 2010-2014

Introduction
The City Asset Managers Group (CAM group), composed of representatives from six City bureaus (Transportation, Parks & Recreation, Water, Environmental Services, Management & Finance and Planning & Sustainability), developed this Citywide Asset Management Work Plan to guide asset management improvements between 2010 and 2014. The work plan is informed by an internal survey (completed in 2008) and a review of peer communities (completed in 2009). This work laid a foundation to identify the steps necessary to advance comprehensive asset management practice.

This work plan lays out general approaches and timelines for collaborative work to apply best practices. The CAM group anticipates that the work of individual bureaus will progress on varying timelines based on the status of current practice, resources, and relative priorities. CAM group bureaus also recognize that achieving the goals outlined in the work plan will require continuous and iterative improvements. 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.

The CAM group plans to apply these best practices to all assets in the future, including shared assets and green infrastructure. However, due to limited resources and breadth of this work plan, many tasks focus initially on highest risk assets.

Best Practices
This work plan includes key tasks outlining development of the seven asset management best practices listed below. This work plan lays out an approach and timeline for each best practice to encourage progress towards advanced asset management. In general, each task relies on bureaus accomplishing some level of practice in prior tasks. However, all of the identified tasks are interdependent and the CAM group anticipates that improvement and progress will be iterative.
1. Service Levels
2. Risk Management
3. Report Card
4. Business Case Template
5. Reliability-Centered Maintenance
6. Long-Term Investment Profile
7. Community Consultation & Support

Barriers to Improvement
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 can offer a framework and tools to examine and address infrastructure needs in order to meet this charge. However, advancements in AM practice are not accomplished overnight. Each CAM group bureau encounters a unique set of challenges and barriers to implementing AM best practice. Individually, bureaus are constrained by budget and resources, limited internal coordination and expertise, limited high-quality 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 also allows a phased implementation of AM advancements to give greater flexibility to bureaus with limited resources. As needed, the CAM group will identify any additional resources necessary to complete the work plan and report to the Planning & Development Directors.

Task #1   Service Levels

Definition	Service levels establish measurable standards against which actual achievement can be compared. The include characteristics such as reliability, quality, quantity, and safety. AM planning allows bureaus to set service levels and cost of service. Both can be evaluated with customers 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 5-Year Outcome	By 2015, each CAM group Bureau has established tangible service levels or performance measures, with targets consistent with industry peers. Status of key service levels is reported in annual report.

Approach

2010-2011	For CAM group bureaus without refined service levels, CAM group research and information-sharing will help identify what service level changes are needed.
2011-2012	Bureau-level service levels are developed or refined.
2010-2012	Community consultation
2012	Established service levels are adopted as a component of the Citywide Systems Plan.
2012-2014	Further refinement of service levels, as needed.

Interrelationships	Defining service levels for assets will set a foundation for all of the remaining work plan tasks.
Current Status	Currently, bureaus have limited capacity to measure and track actual levels of service.
Bureau of Environmental Services	BES intends to review level of service and performance measures, set targets, and establish reporting mechanisms.
Portland Water Bureau	The PWB has established key service levels and is monitoring the its performance relative to targets.
Portland Bureau of Transportation	PBOT has established service levels for some assets. Reviewing and establishing revised performance measures is a priority in the Bureau's work plan.
Portland Parks & Recreation	PP&R has established performance measures for some assets but intends to evaluate existing measures and establish new measures as it develops its Service Delivery Strategy.
Civic Facilities (OMF)	Civic Facilities establishes service levels for its properties within service level agreements with tenants.

Task #2   Risk Management

Definition

Risk management provides a structure for identifying and analyzing risk and determining appropriate responses to the possible impacts. It deals with degrees of uncertainty by identifying possible events, understanding their likely consequences and determining an appropriate response. Effective risk management allows bureaus to maximize opportunities and achieve their goals.

Goal

To identify assets with high risk of failure and to associate data collection efforts with risk classification. In more advanced stages, bureaus should use data to prioritize resources and risk management strategies and coordinate with other bureaus to identify collateral risks to other public assets.

Desired 5-Year Outcome

By 2015, CAM group bureaus have identified high-risk assets and have begun to prioritize monitoring and data collection within available resources.

Approach

2010-2011	CAM group discussion of methodology
2010-2012	Develop bureau-specific methodologies for identifying high risk assets. Identify high risk assets based on these methodologies.
2012	CAM group check-in to identify potential opportunities for collaboration and next steps.
2010-2014+	Improve data collection for high risk 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.

Current Status

Bureaus collect a variety of data on their assets, though the extent of and confidence in this data varies by bureau. Most bureaus currently have limited capacity to predict likely failure modes for assets and have not estimated the likelihood and consequences of asset failure.

Bureau of Environmental Services

BES has identified high risk assets and is working towards more advanced and program-specific risk management strategies.

Portland Water Bureau

PWB has created a risk ranking methodology, identified high risk assets and has begun ongoing monitoring activities for these assets.

Portland Bureau of Transportation

PBOT currently collects data on a number of its assets, but has identified risk assessment as a priority for the short term internal work plan. The risk assessment will allow for improved prioritization of resources and management of risks.

Portland Parks & Recreation

PP&R inspects public buildings on a regular basis, and conducts detailed annual inspections on the heavily-used community and arts centers, swimming pools, playgrounds and play equipment. Other high risk assets will be identified and tied to monitoring and data collection.

Civic Facilities (OMF)

Civic Facilities inspects its properties on a regular basis. Investment priorities are based on the outcomes of these inspections, tenant feedback, and regulatory requirements.

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' type product that displays the current and projected status of assets, identify trends and issues, and track city's path to sustainability.
Desired 5-Year Outcome	By 2015, a report card is included in the annual Citywide Assets Report. The report card could provide an overview of the status of the City's assets, achievement of levels of service, AM business practices, and/or levels of unmet need.
Approach	Develop a basic template that meets all bureaus' needs. Bureaus can provide additional information for their own reporting needs

	2010-2012	Identify reporting needs (could include status of assets, LOS, business practices, and unmet need). Develop the report card template
	2012	Include a report card in the annual Citywide Assets Report
	2013+	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.
Current Status	All CAM group bureaus currently provide information on assets and AM practice in the annual Citywide Assets Report.
Bureau of Environmental Services	BES intends to produce a Level of Service and organization performance report.
Portland Water Bureau	PWB updates its status and condition database on an annual basis, but does not present information in a report card format. The Bureau's work plan does not currently include development of a report card for its assets.
Portland Bureau of Transportation	PBOT currently produces an annual Status and Condition Report, but does not present information in a report card format. The Bureau's work plan does not include development of a report card for its assets.
Portland Parks & Recreation	The Bureau's current work plan does not include development of an assets report card beyond the citywide report.
Civic Facilities (OMF)	Civic Facilities currently updates its CIP and Asset Management Report annually, but does not use a report card format.

Task #4   Business Case Template

Definition

A business case is an analysis tool to evaluate investment decisions. At the project level, a business case compares project alternatives, such as do-nothing, best technology at the best price, or best value for a certain allocation.

Goal

To develop a framework or template to justify infrastructure improvements based on lifecycle costs, benefits and impacts to the triple bottom line.

Desired 5-Year Outcome

By 2015, CAM group Bureaus have developed a methodology and template for business case and piloted application of the template within their bureau, as appropriate.

Approach

2010-2012	CAM group research and information-sharing to build a foundational understanding of business case.
2010-2013	Evaluate appropriateness for each bureau; Develop templates and application process.
2010-2014	Application of business case template, as appropriate.

Interrelationships

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

Current 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).

Bureau of Environmental Services

Development and application of business case is currently on BES' work plan. The Bureau intends to use business case processes, including risk and economic analysis, to justify capital and operating expenditures.

Portland Water Bureau

The PWB has developed a business case template for evaluating decisions in terms of quantified costs and benefits. The Bureau is working to expand its use.

Portland Bureau of Transportation

Business case development is included as a long-term priority in PBOT's work plan.

Portland Parks & Recreation

PP&R uses established criteria for capital investment decision-making but will be developing more detailed business case processes in the future.

Civic Facilities (OMF)

Civic Facilities currently evaluates projects based on set criteria to develop budget decision packages. The Bureau does not currently use a formal business case template.

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 the 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 5-Year Outcome

By 2015, CAM group bureaus 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.

Current Status

Bureau of Environmental Services	BES is working towards reliability-centered maintenance for some asset groups.
Portland Water Bureau	The PWB is working towards reliability-centered maintenance for some asset groups.
Portland Bureau of Transportation	PBOT currently applies reliability-centered maintenance principles to some assets. The Bureau anticipates that its ongoing improvements in AM knowledge and activities will result in improved RCM practices in the future.
Portland Parks & Recreation	PP&R includes some reliability-centered maintenance practices in its asset maintenance and operations, but intends to formalize more practices in the future.
Civic Facilities (OMF)	Reliability-centered maintenance practices are not currently on the work plan for civic facilities.

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 major maintenance, repair and replacement needs by asset group over a long-term forecast.

Desired 5-Year Outcome

By 2015, CAM group bureaus have collected necessary data, developed tools and methodologies to project investment needs. As possible, bureaus have identified long term investment profiles for high risk assets.

Approach

2010-2012	CAM group research and information-sharing regarding long-term investment profiles.
2013	Develop tools and methodologies.
2013-2014	Development of investment profiles for high-risk assets.

Interrelationships

Development of long-term investment profiles is dependent on establishment of service levels (Task 1: Service Levels) and on identification of 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.

Current Status

Bureau of Environmental Services
BES' work plan does not currently include development of 50-year investment profiles.

Portland Water Bureau
The PWB has developed its first 50-year investment profile forecast for most assets. Further work is needed.

Portland Bureau of Transportation
Developing 50-year investment profiles is currently not on PBOT's work plan. The Bureau does project 10-year needs.

Portland Parks & Recreation
PP&R has completed 75-year investment profiles for community and arts centers and pools. Profiles for other assets will be completed as needed.

Civic Facilities (OMF)
Developing 50-year investment profiles is currently not on Civic Facilities' work plan. The Bureau does project 5-year needs.

Task #7   Community Information & 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 5-Year Outcome	By 2015, CAM group bureaus have had informed community conversations regarding the costs of providing desired levels of service.
Approach	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.

Current Status

Bureau of Environmental Services	BES intends to develop a customer service report based on customer service feedback. The Bureau also utilizes a budget committee on an annual basis to help identify investment priorities.
Portland Water Bureau	The PWB convenes a budget committee on an annual basis to help identify investment priorities.
Portland Bureau of Transportation	PBOT convenes a budget committee on an annual basis to help identify investment priorities.
Portland Parks & Recreation	PP&R works with its budget advisory committee to inform them about bureau needs and identify investment priorities. The Portland Parks Board and the Parks Foundation both advise and assist PP&R on budget issues. The Bureau conducts regular outreach to the community and periodic community surveys to identify priorities and establish service levels.
Civic Facilities (OMF)	Civic Facilities has ongoing discussions with facility tenants to identify needs.

Work Plan Tasks by Year

Best Practice		2010	2011	2012	2013	2014
1	**Service Levels**	Research and share information to identify what service level changes are needed.	Develop or refine Bureau-level service levels, as needed.	Adopt established service levels in the Citywide Systems Plan.	Refine service levels, as needed.	
2	**Risk Management**	Discuss methodology and information needed.	Develop bureau-specific methodologies for identifying high risk assets. Identify high risk assets based on these methodologies.	CAM group check-in to identify potential opportunities for collaboration and next steps.	Improve data collection for high risk assets and apply mitigation strategies based on asset risk classification.	
3	**Report Card**	Identify reporting needs (could include status of assets, LOS, business practices, and unmet need). Develop the report card template.		Include a report card in the annual Citywide Assets Report	Make continuous improvements to the report card and the quality of data presented.	
4	**Business Case**	Research and share information; Evaluate appropriateness for each bureau.		Develop templates and application process.		Apply business case template, as appropriate.
5	**Reliability Centered Maintenance**	Apply reliability-centered approach on a bureau determined basis.				
6	**Long Term Investment Profile**	Research and share information regarding long-term investment profiles.		Develop tools and methodologies.	Develop investment profiles for high-risk assets	
7	**Community Consultation or Information**	Level of Service	Level of Service	Level of Service; Report Card	Report Card	Report Card; Investment Profiles; Business Case

Appendix 2a: Current Replacement Values of City Assets

December **2009**

City's total Current Replacement Value for 2009 is $23.1 billion

$8.4 billion

SUPPORT & STREET LIGHTS

TRAFFIC SIGNALS

OTHER TRANSPORTATION

BRIDGES

SIDEWALK SYSTEM

STREETS

$5.9 billion

STORMWATER

SANITARY SEWERS

WASTEWATER TREATMENT

COMBINED SEWERS

$7.0 billion

SUPPORT

SUPPLY

TERMINAL STORAGE

TRANSMISSION

DISTRIBUTION

BUILT INFRASTRUCTURE

AMENITIES

$0.9 billion

RECREATION BUILDINGS & POOLS

GREEN INFRASTRUCTURE

$1.0 billion

TECHNOLOGY

FACILITIES

Transportation **Environmental Services** **Water** **Parks** **Civic**

Appendix 2b: Current Replacement Value of Capital Assets
Data Sheet
December **2009**

Capital Asset Class	Description	Value *(in millions)*	Confidence level	Notes
Transportation				
streets (by lane mile, improved)	4,776 lane miles	$5,510.2	2 - Low	Construction costs volatile over past few years. New software Street Saver will break out streets with curbed and no curb in order to improve the estimate of drainage costs for next year.
sidewalk system				
sidewalks	8,769,201 sq yds	$780.4	4 - High	
curbs	3,251 centerline miles	$515.0	4 - High	
corners	37,744 corners	$132.7	4 - High	
structures (bridges only)	155 bridges	$422.1	5 - Optimal	
traffic signals (hardware only)	1,040 traffic signals	$267.1	4 - High	
street lights	54,755 street lights	$185.3	2 - Low	
support facilities	various buildings	$6.8	None to Low	
other transportation assets	parking garages, streetcar, aerial tram, signal controllers and other equipment, traffic calming devices, street signs, pavement markings, parking meters, retaining walls, stairways, guardrails and harbor wall.	$555.4	Low to Optimal	New - In FY2008-09, PBOT took over the management of the City's parking garage system.
Total Transportation		**$8,375.0**		
Environmental Services				
combined sewers	890 mi. of pipe & access	$2,359.0	3 - Moderate	ENR 8293 to 8578 (3.44%) plus approx. $125 million in new investment in various system components plus 725 green street facilities estimated at $20,000 each.
sanitary sewers	990 mi. of pipe & access	$1,081.4	3 - Moderate	
stormwater system	450 mi. of pipe & access & 725 gr.st. fac.	$987.3	2 - Low	
wastewater treatment systems	2 treatment plants & 96 pump stations	$1,457.3	2 - Low	
Total Environmental Services		**$5,885.0**		
Water				
supply	123 miles of roads, 1500 culverts, 11 bridges, 1 200-ft high concrete dam, 1 110-ft high earth dam, ASR wells, 33 well sites with drilled wells, pumps and motors, monitoring wells, 1 groundwater pump station, treatment facility, tank, and collectoon mains to bring water from wells to pump station	$791.0	3 - Moderate	New estimates for dams, bridges and conduit trestles based on actual work. Also collection main costs increased.
transmission	75 miles of large diameter conduits, with various supports, 9 conduit trestles 7 river crossings, 49 miles of large diameter transmission mains	$1,011.0	3 - Moderate	Pipe install costs have been going up significantly, so replacement costs were adjusted to reflect this
terminal storage	220 million gallons finished water storage, interconnecting piping, post-storage treatment facilities, and microhydro facility.	$863.0	3 - Moderate	Costs now based on preliminary estimates for Powell Butte II, which are higher than previous. It is unlikely that we will ever replace all of the storage at Mt. Tabor if we have to cover these reservoirs.
distribution	2100 miles of distribution pipes, 182,000 service lines, 44,000 system valves, 6800 large meters, 178,000 small meters, 14,000 hydrants, 24,000 backflow devices, 39 pump stations, 70 storage tanks	$4,276.0	4 - High	Pipe install costs have been going up significantly, so replacement costs were adjusted to reflect this
facilities (buildings and support facilities)	13 support buildings, SCADA, vehicles, construction equipment, lab equipment, computers, and infrastructure components in inventory	$104.0	4 - High	Does not include upgrades to Maintenance Building (extra square footage and additional parking, etc).
Total Water		**$7,045.0**		

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Appendix 2b: Current Replacement Value of Capital Assets
Data Sheet, continued   December **2009**

Capital Asset Class	Description	Value *(in millions)*	Confidence level	Notes
Parks and Recreation				
amenities		$15.5		
decorative elements	memorials, plaques, decorative fountains	$5.0	2 - Low	
furnishings- developed parks	benches, tables, drinking fountains, etc.	$6.5	4 - High	
furnishings in natural areas	benches, tables, drinking fountains, etc.	$4.0	2 - Low	
buildings and pools		$242.2		
community, arts, pools	primary public buildings	$136.0	4 - High	includes MAC, Pittock, CM2, CC w/ Pools, outdoor pools, Columbia pool, St Johns CC, UPCC
remaining buildings	secondary buildings	$106.2	3 - Moderate	
recreation features		$199.4	3 - Moderate	total of all rec features escalated by 3.3% based on ENR-CCI data
gathering places	amphitheaters, plazas			
marine	docks, boat ramps			
off-leash areas	designated off-leash areas			
play areas	play grounds			
sports	courts and fields			
water play	spray features, splash pads			
built infrastructure		$49.7	2 - Low	incomplete data, escalated by 3.3% based on ENR-CCI data
circulation	trails, walks, roads, parking lots			
utilities	gas, electric, water, sewer, irrigation			
green infrastructure		$367.2		
natural areas (7,263 acres)	natural ecological systems	$155.0	4 - High	escalated by 3.3% based on ENR-CCI data
developed (187 parks, 3,272 acres), undeveloped (228 acres)	managed gardens, grass, trees, shrubs	$212.2	2 - Low	escalated by 3.3% based on ENR-CCI data
Total Parks		**$874.0**		
Civic				
Facilities (buildings, structures)				
Police facilities	Four precincts, Justice Center, property warehouse, equestrian division, and vehicle storage lot	$65.7	4 - High	
Office buildings	Portland Building, 1900 Building, City Hall	$126.8	4 - High	
Other buildings	Records Center, Kerby Garage, and Portland Communications Center	$30.5	4 - High	
Union Station	Train station and related buildings	$28.6	4 - High	
Spectator facilities	Memorial Coliseum, Rose Quarter parking garages, and PGE Park	$389.0	4 - High	
Portland Center for the Performing Arts	Portland Center for the Performing Arts	$81.7	2 - Low	
Fire facilities	30 stations, administration building and support facility	$74.1	4 - High	
Technology				
800 MHz radio system	Towers, communcation devices, and backbone infrastructure	$58.2	2 - Low	
Telecommunications	Telephone system	$14.6	2 - Low	
IT operations	Email system, storage servers, data networks and core servers	$4.3	2 - Low	
Strategic technology	Large corporate appplications such as TRACS, CAD, PPDS, Cayenta, and EBS	$44.9	2 - Low	
EBS	The City's enterprise business system that replaced IBIS and other info systems	$50.0	4 - High	
Total Civic		**$968.4**		
Total Capital Assets		**$23,147.4**		

Appendix 3a: Current Condition of Capital Assets
All Assets

December **2009**
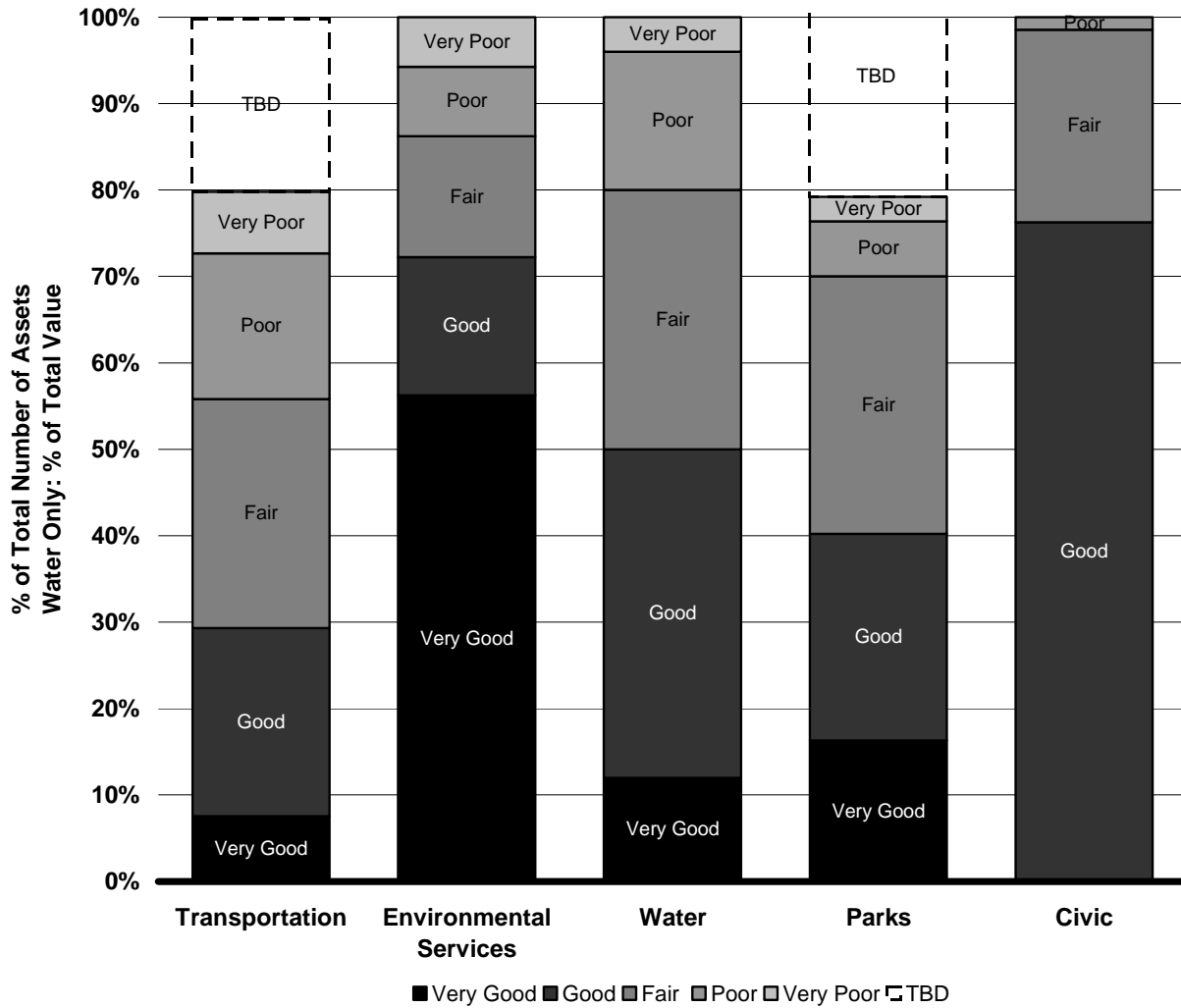
Appendix 3b: Current Condition of Capital Assets
Office of Transportation   December **2009**

Confidence Level →

| 5 - Optimal | 4 - High | 3 - Moderate | 2 - Low | 1 - None |

% of Total Number of Assets

Bridges
- Very Good
- Good
- Fair
- Poor

Traffic Signals
- Very Good
- Good
- Fair
- Poor
- Very Poor

Sidewalk System
- Very Good
- Good
- Fair
- Poor
- Very Poor

Street Lights
- Very Good
- Good
- Fair
- Poor

Streets
- TBD

■Very Good ■Good ■Fair ■Poor □Very Poor ⊏TBD
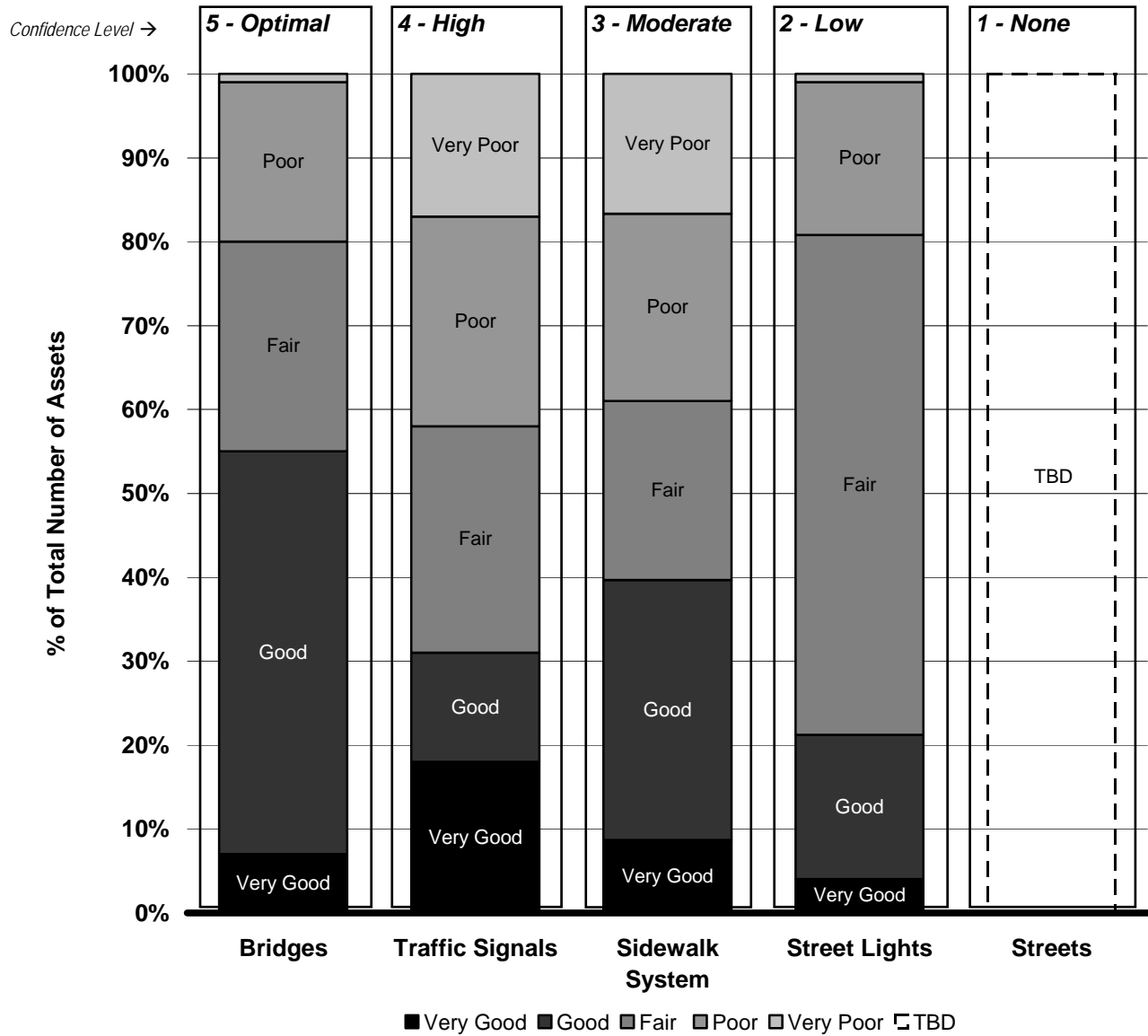
Appendix 3c: Current Condition of Capital Assets
Environmental Services   December **2009**

Confidence Level →

| | 4 - High | 3 - Moderate | 2 - Low |

% of Total Number of Assets

Combined Sewers:
- Very Good
- Good
- Fair
- Very Poor

Sanitary Sewers:
- Very Good
- Good

Wastewater Treatment:
- Very Good
- Good
- Fair
- Poor
- Very Poor

Stormwater System:
- Very Good
- Good
- Fair
- Poor
- Very Poor

■Very Good ■Good ■Fair ■Poor □Very Poor ■TBD
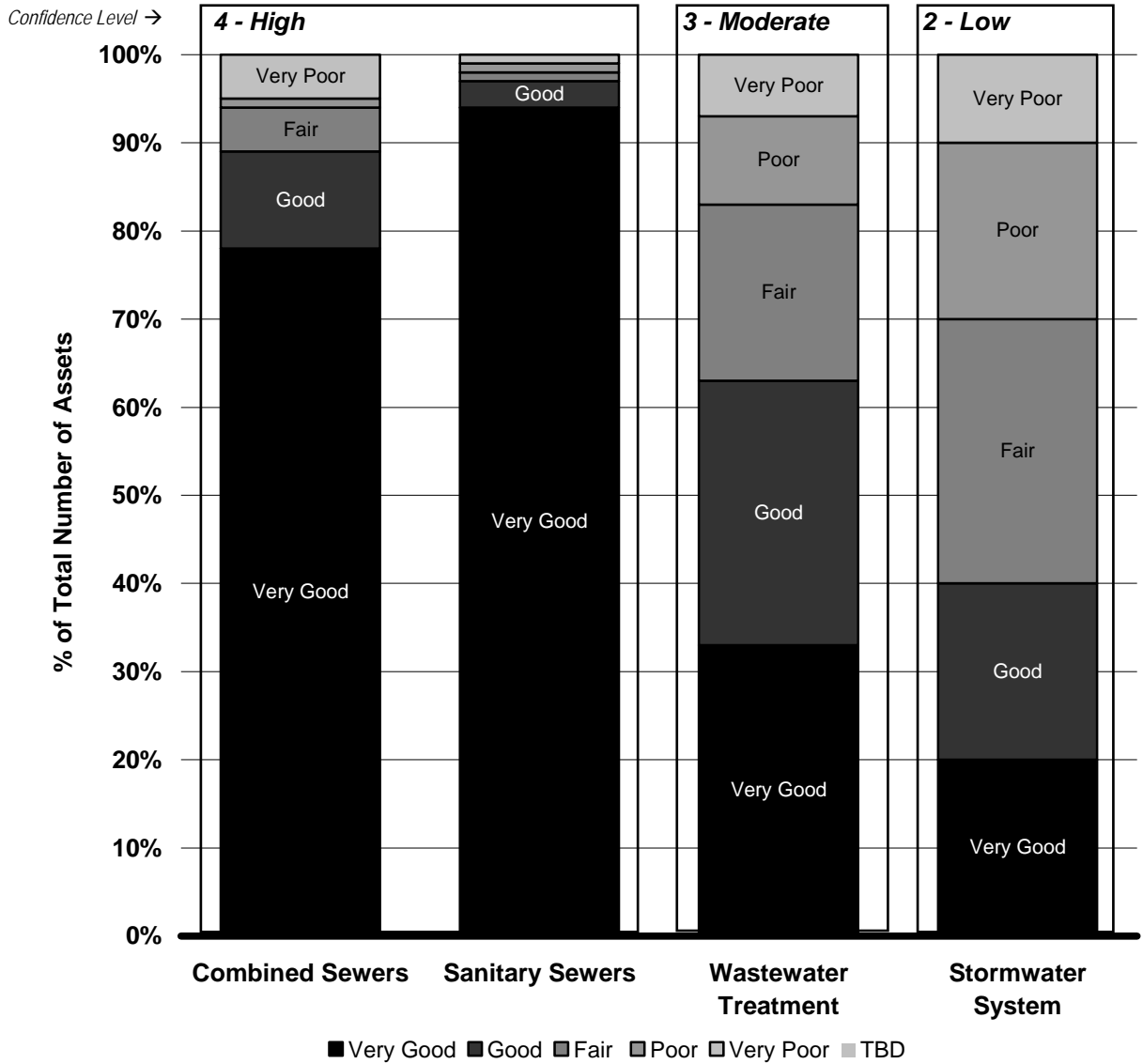
Appendix 3d: Current Condition of Capital Assets
Water Bureau

December **2009**

Confidence Level →

4 - High

3 - Moderate

% of Total Value

Terminal Storage: Very Good, Fair, Poor, Very Poor

Distribution: Very Good, Good, Fair, Poor, Very Poor

Supply: Very Good, Good, Fair, Poor

Transmission: Very Good, Good, Fair, Poor

Facilities: Very Good, Good, Fair, Poor, Very Poor

■Very Good ■Good ■Fair ■Poor □Very Poor ■TBD
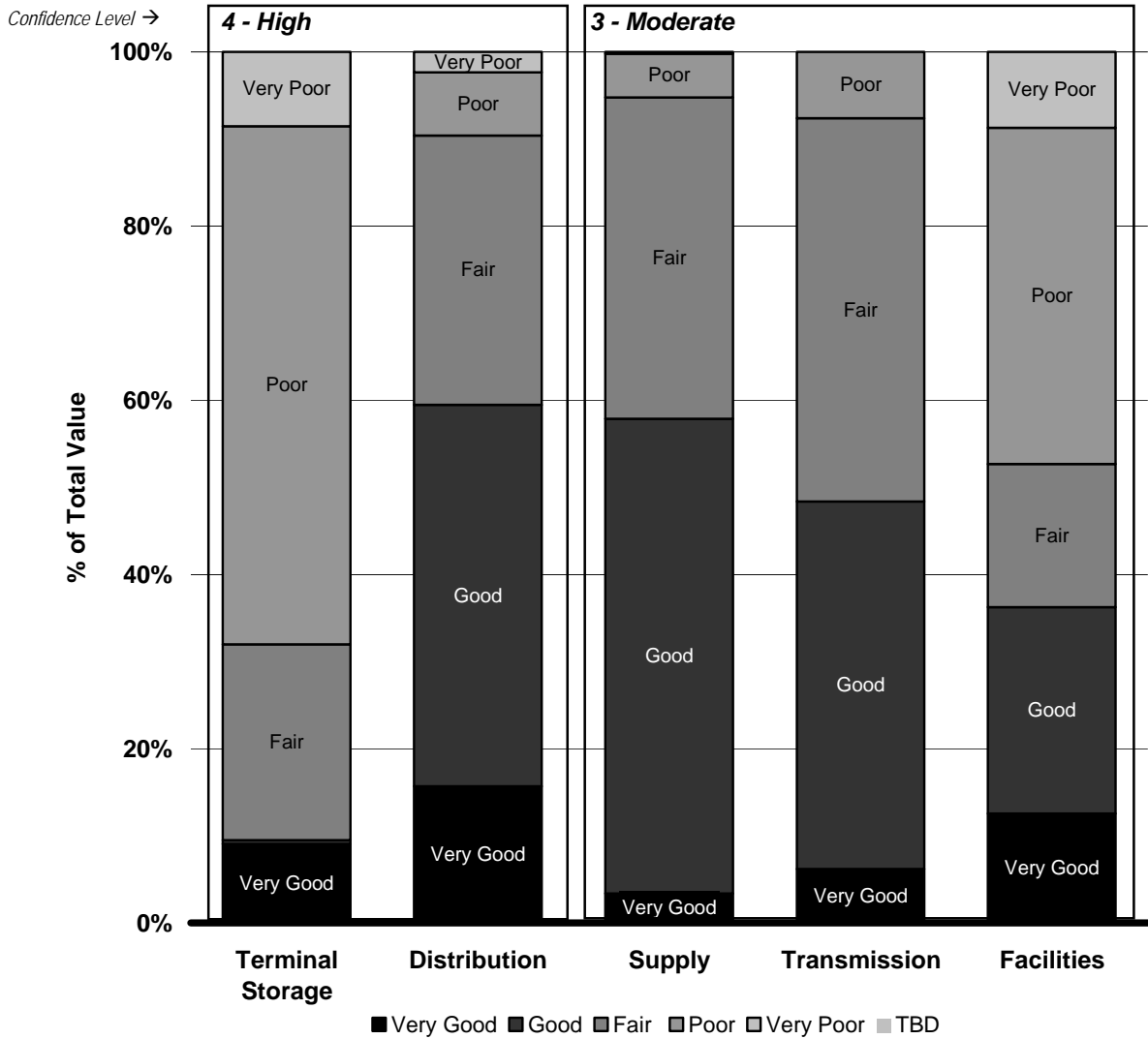
Appendix 3e: Current Condition of Capital Assets
Parks Bureau
December **2009**

Confidence Level → | *4 - High* | *3 - Moderate* | *2 - Low* | *1 - None*

% of Total Number of Assets

| Amenities | Buildings & Pools | Recreation Features | Green Infrastructure | Built Infrastructure |

■Very Good ■Good ■Fair ■Poor □Very Poor ⊏TBD
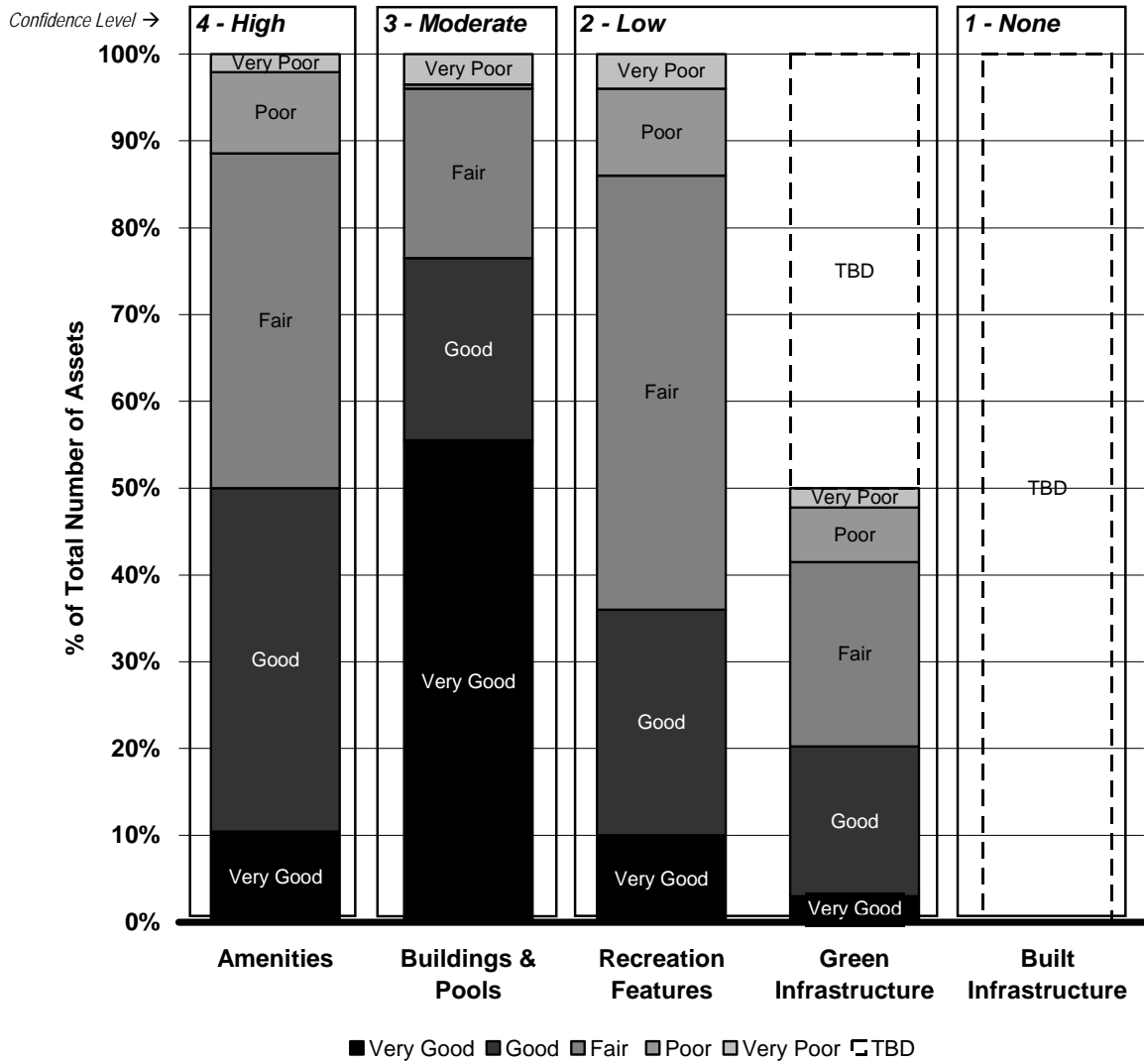
Appendix 3f: Current Condition of Capital Assets
Civic (OMF, Police, Fire)   December **2009**

Confidence Level →   **4 - High**   **3 - Moderate**

% of Total Number of Assets

Category	Condition labels
Police facilities	Good
Office buildings	Good
Other buildings	Fair / Good
Union Station	Fair / Fair
Spectator facilities	Fair / Good
Portland Center for the Performing Arts	TBD
Fire facilities	Good
EBS	Good
800 MHz radio system	Good
Telecommunications	Good
IT operations	Fair / Good
Strategic technology	Fair / Good

Legend: ■ Very Good ■ Good ■ Fair □ Poor □ Very Poor ■ TBD

Appendix 3g: Current Condition of Capital Assets
Confidence Level Summary December **2009**

Replacement Value

Optimal
2%

| High 27% | Moderate 38% | Low 32% |

Current Condition

Optimal
2%

| High 38% | Moderate 22% | Low 7% | TBD 30% |

Funding Gap

Optimal
4%

Low
2%

| High 32% | Moderate 63% | TBD 27% |

Appendix 3h: Current Condition of Capital Assets
Data Sheet
December **2009**

Bureau and capital asset type	Current Condition *(in %)*					Confidence level	Notes
	Very Good	Good	Fair	Poor	Very Poor		
Transportation							
streets (by lane mile, improved)	tbd	tbd	tbd	tbd	tbd	tbd	PBOT is implementing new software
sidewalk system	9	31	21	22	17	Moderate - High	Weighted average of components based on replacement value.
sidewalks	10	25	30	25	10	3 - Moderate	
curbs	12	50	16	12	10	3 - Moderate	
corners	4	18	18	30	30	4 - High	
structures (bridges only)	7	48	25	19	1	5 - Optimal	
traffic signals (hardware only)	18	13	27	25	17	4 - High	
street lights	4	17	59	18	1	2 - Low	Weighted average of Option B & C lights
support facilities (for PDOT & BES)	condition ranges from poor to very good					None - Moderate	
other transportation assets	condition range from poor to very good or tbd					Low to High	
Environmental Services							
combined sewers	78	11	5	1	5	4 - High	Updated data from Systems Plan
sanitary sewers	94	3	1	1	1	4 - High	
wastewater treatment systems	33	30	20	10	7	3 - Moderate	Capacity affects overall condition at CBWTP
stormwater system	20	20	30	20	10	2 - Low	
Water							
supply	3	54	37	5	0	3 - Moderate	Existing disinfection treatment system is assumed to remain in good-fair condition, even with addition of UV treatment.
transmission	6	42	44	8	0	3 - Moderate	Some leak detection just completed. Few leaks found.
terminal storage	9	0	22	59	9	4 - High	Recent upgrades to open reservoir systm are classified as very good shape.
distribution	16	44	31	7	2	4 - High	Continue to conduct condition assessments. Most pipes inspected in good condition.
facilities (buildings and support facilities)	13	24	16	38	9	3 - Moderate	Used square footage costs from other city building construction projects.
Parks and Recreation							
amenities							
furnishings in developed parks	10	38	37	9	2	4 - High	4% not rated, inspected in 2007
furnishings in natural areas	tbd	tbd	tbd	tbd	tbd	tbd	in process
decorative elements	tbd	tbd	tbd	tbd	tbd	tbd	low priority for assessments
buildings and pools							
community centers, arts centers, pools	50	19	25	0	6	4 - High	inspected in 2005 and 2006
all buildings by square footage	61	23	14	1	1	2 - Low	in process of reinspection
recreation features	10	26	50	10	4	2 - Low	overall estimate from 2008 based on old information
gathering places	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
marine	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
off-leash areas	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
play areas	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
sports courts and fields	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
water play	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
built infrastructure							
circulation	tbd	tbd	tbd	tbd	tbd	tbd	inspection and assessment in process
utilities	tbd	tbd	tbd	tbd	tbd	tbd	to be determined
green infrastructure							
natural areas	2	35	40	18	5	2 - Low	information is from 2006
developed areas	10	34	45	7	4	2 - Low	inspection and assessment in process
Civic							
facilities (buildings, structures)							
police facilities	0	100	0	0	0	4 - High	
office buildings	0	100	0	0	0	4 - High	
other buildings	0	94	6	0	0	4 - High	
Union Station	0	0	100	0	0	4 - High	
spectator facilities	0	37	63	0	0	4 - High	
Portland Center for the Performing Arts	tbd	tbd	tbd	tbd	tbd	tbd	Working with Metro/MERC on oversight.
fire facilities	0	94	0	6	0	4 - High	
technology							
800 MHz radio system	0	100	0	0	0	3 - Moderate	
telecommunications	0	100	0	0	0	3 - Moderate	
IT operations	0	64	26	10	0	3 - Moderate	
strategic technology	0	50	50	0	0	3 - Moderate	
EBS	0	100	0	0	0	4 - High	

Appendix 3i: Projected Condition of Capital Assets - 2018
Data Sheet
December **2009**

Bureau and capital asset type	Projected Condition (in %)					Confidence level	Notes
	Very Good	Good	Fair	Poor	Very Poor		
Transportation							
streets (by lane mile, improved)	tbd	tbd	tbd	tbd	tbd	tbd	
sidewalk system							
sidewalks	tbd	tbd	tbd	tbd	tbd	tbd	
curbs	tbd	tbd	tbd	tbd	tbd	tbd	
corners	tbd	tbd	tbd	tbd	tbd	tbd	
structures (bridges only)	3	37	40	19	1	2 - Low	
traffic signals (hardware only)	16	11	27	27	19	2 - Low	
street lights	18	1	4	17	59	2 - Low	
support facilities (for PDOT & BES)	tbd	tbd	tbd	tbd	tbd	tbd	
other transportation assets	tbd	tbd	tbd	tbd	tbd	tbd	
Environmental Services							
combined sewers	74	14	8	3	1	4	
sanitary sewers	75	20	3	1	1	4	
stormwater system	20	20	30	20	10	2	
wastewater treatment systems	40	25	20	10	5	3	
Water							
supply	15	20	45	10	10	4 - High	Assumes LT2 expenditures prevent refurbishment of other existing assets due to funding limitations
transmission	0	45	45	10	0	3 - Moderate	Condition could decline unless additional spending allocated to CP addition. Assumes new river crossing is not built before 2019
terminal storage	80	0	15	5	0	4 - High	assumes open res replaced before 2017, but no improvements to existing PB Res 1.
distribution	15	40	35	10	0	3 - Moderate	Focus will be on eliminating very poor condition mains which will become very good. Funding limitations will likely cause all other mains to age and decline in average condition.
facilities (buildings and support facilities)	35	30	30	5	0	4 - High	Assumes the Interstate Maintenance Building will be replaced, but all other facilities will age and decline in condition over next 10 years
Parks and Recreation							
amenities	tbd	tbd	tbd	tbd	tbd	tbd	
buildings and pools	tbd	tbd	tbd	tbd	tbd	tbd	
recreation features	tbd	tbd	tbd	tbd	tbd	tbd	Information is not available at this time.
built infrastructure	tbd	tbd	tbd	tbd	tbd	tbd	
green infrastructure	tbd	tbd	tbd	tbd	tbd	tbd	
Civic							
Facilities (buildings, structures)							
Police facilities	0	100	0	0	0	4 - High	
Office buildings	0	100	0	0	0	4 - High	
Other buildings	0	94	6	0	0	4 - High	
Union Station	0	0	0	100	0	4 - High	Condition decreases from fair to poor if funding gap is not addressed
Spectator facilities	0	37	63	0	0	4 - High	
Portland Center for the Performing Arts							Working with Metro/Merc on oversight.
Fire facilities	0	94	0	6	0	4 - High	
Technology							
800 MHz radio system	0	100	0	0	0	3 - Moderate	Assumes replacement of the 800 MHz System, a project underway, but not fully funded. Letting the system become obsolete is not an option for the City.
Telecommunications	0	100	0	0	0	3 - Moderate	
IT operations	0	0	71	29	0	3 - Moderate	
Strategic technology	0	100	0	0	0	3 - Moderate	Assumes replacement of the Portland Police Data System, a project underway, but not fully funded. Letting the system become obsolete is not an option for the City.

Appendix 4a : Annual Funding Gap

in millions per year   December **2009**

City's total Annual Funding Gap is $183 million

$75 million

$69.6 million/ year
TOTAL EXCLUDES STREETS & SUPPORT FACILITIES

$70 million — OTHER

$65 million — STREET LIGHTS

$60 million

$55 million — BRIDGES

$50 million

$45 million

$40 million — TRAFFIC SIGNALS

$35 million

$46.2 million/ year
AMENITIES
BUILT INFRASTRUCTURE
GREEN INFRASTRUCTURE
RECREATION

$30 million

$28 million/ year
STORMWATER
SANITARY
WASTEWATER

$31.5 million/ year
TERMINAL STORAGE
TRANSMISSION
FACILITIES
SUPPLY

DEVELOPED PARKS

$25 million

$20 million

$15 million — SIDEWALKS

COMBINED SEWER

DISTRIBUTION

BUILDINGS & POOLS

$10 million

$7.2 million/ year
OTHER
OFFICE BLDGS.
UNION STATION
POLICE FACILITIES
TECHNOLOGY
FIRE

$5 million

Transportation   **Environmental Services**   **Water**   **Parks**   **Civic**

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Appendix 4b: Annual Funding Gap in Relation to Bureau Overall Budgets (in millions per year) December **2009**

Bureau budgets include adopted FY09-10 capital & operating budgets. Civic includes Police, Fire, and Facilities and Technology portions of OMF.

ANNUAL FUNDING GAP

CURRENT BUDGET

$550 million	
$500 million	
$450 million	
$400 million	
$350 million	
$300 million	
$250 million	
$200 million	
$150 million	
$100 million	
$50 million	

Transportation: $69.6 M / $266 M

Environmental Services: $28.0 M / $349 M

Water: $31.5 M / $150 M

Parks: $46.2 M / $100 M

Civic: $7.2 M / $486 M

Appendix 4c: Annual Funding Gap
Data Sheet
December **2009**

Bureau and capital asset type	Value* (in millions)				Confidence level	Note
	R/R/R	Capacity	Mandate	Total		
Transportation						
streets (by lane mile, improved)	tbd	tbd	tbd	tbd	tbd	<-- Pavement condition and performance target is expected to change as PBOT is in the process of replacing current rating method and replacing software.
sidewalk system	$29.8	$0.0	$0.0	$29.8	tbd	
sidewalks	tbd	tbd	tbd	tbd	tbd	
curbs	$19.6	$0.0	$0.0	$19.6	4 - High	
corners	$10.2	$0.0	$0.0	$10.2	4 - High	
structures (bridges only)	$14.1	$0.0	$0.0	$14.1	5 - Optimal	
traffic signals (hardware only)	$18.4	$0.0	$0.0	$18.4	4 - High	
street lights	$4.2	$0.0	$0.0	$4.2	2 - Low	
support facilities (for PDOT & BES)	tbd	tbd	tbd	tbd	1 - None	
other transportation assets	$3.1	$0.0	$0.0	$3.1	Low to Moderate	
Total Transportation	**$69.6**	**$0.0**	**$0.0**	**$69.6**		
Environmental Services						
combined sewers	$12.0	$0.0	$4.0	$16.0	4 - High	Financial plan generally assumes annual rate increases of 6.5%. Gap represents the difference between the projected revenue with 6.5% annual rate increases and the identified need averaged over 10 years.
sanitary sewers	$0.0	$4.0	$0.0	$4.0	4 - High	
stormwater system	$1.0	$1.0	$0.0	$2.0	3 - Moderate	
wastewater treatment systems	$0.0	$6.0	$0.0	$6.0	4 - High	
Total Environmental Services	**$13.0**	**$11.0**	**$4.0**	**$28.0**		
Water						
supply	$9.0	$0.0	$0.0	$9.0	3 - Moderate	
transmission	$2.0	$0.0	$0.0	$2.0	3 - Moderate	
terminal storage	$1.0	$0.0	$0.0	$1.0	3 - Moderate	
distribution	$12.0	$4.5	$0.0	$16.5	3 - Moderate	
facilities (buildings/support facilities)	$3.0	$0.0	$0.0	$3.0	3 - Moderate	
Total Water	**$27.0**	**$4.5**	**$0.0**	**$31.5**		
Parks and Recreation						
amenities	$1.0	$0.3	$0.0	$1.4	3 - Moderate	
buildings and pools	$3.7	$17.0	$1.2	$21.9	Moderate to High	
recreation features	$0.7	$5.3	$0.2	$6.1	Moderate to High	
developed park	$2.9	$15.5	$0.0	$18.4	Moderate to High	
built infrastructure	$1.1	$0.5	$0.2	$1.8	Low to Moderate	Likely low estimate, information is incomplete
green infrastructure	$1.6	$2.9	$0.0	$4.5	3 - Moderate	
Total Parks	**$10.4**	**$34.6**	**$1.3**	**$46.2**		Assumed average capital funding of $0.7 million for R/R/R, $7.0m for capacity, and $0.3m for mandated improvements has been distributed proportionally among asset groups.
Civic						
Facilities (buildings, structures)						
Police facilities	$1.3	$0.0	$0.0	$1.3	4 - High	
Office buildings	$0.8	$0.0	$0.0	$0.8	4 - High	
Other buildings	$0.6	$0.0	$0.0	$0.6	4 - High	
Union Station	$0.8	$0.0	$0.0	$0.8	4 - High	
Spectator facilities	NA	NA	NA	NA	4 - High	In addition to annual (ongoing) funding gap, OMF reports these one-time needs: $45M for Union Station renovation, $7.346M for Spectator facilities reserves funding, and $20.5M for 800 MHz system replacement. OMF is beginning to work with Metro/MERC on the oversight of the PCPA assets.
Portland Center for the Performing Arts						
Fire facilities	$2.2	$0.0	$0.0	$2.2	4 - High	
Technology						
800 MHz radio system	$1.2	$0.0	$0.0	$1.2	3 - Moderate	
Telecommunications	$0.1	$0.0	$0.0	$0.1	3 - Moderate	
IT operations	$0.2	$0.0	$0.0	$0.2	3 - Moderate	
Strategic technology	$0.1	$0.0	$0.0	$0.1	3 - Moderate	
EBS	$0.0	$0.0	$0.0	$0.0	4 - High	
Total for Civic Assets	**$7.2**	**$0.0**	**$0.0**	**$7.2**		
Total Capital Assets	**$127.2**	**$50.1**	**$5.3**	**$182.5**		

R/R/R (Repair, Rehabilitation, Replacement): Additional funding necessary to repair, rehabilitate and replace existing asset to bring them up to current service levels. Also includes replacement of assets considered obsolete.
Capacity: Additional funding necessary to meet the demands of existing customers, based on current levels of service.
Mandate: Additional funding necessary to improve existing assets to meet regulatory requirements, exclusive of improvements that fall under R/R/R or Capacity.

Appendix 5:   Calculation Methodologies

City bureaus vary in methods used to calculate current replacement value, current and projected condition, and annual funding gap. This appendix describes the methods of five infrastructure systems: transportation, environmental services, water, parks and civic facilities. Civic systems include government offices, police and fire facilities, parking garages, technology services, and spectator facilities. In future years, the City Asset Managers Group will discuss opportunities to more closely align methods across bureaus.

Transportation

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). As part of the citywide standardization of overhead development, it is important to note that Transportation has changed the way overhead is reported, which resulted in a change in the estimated value of the transportation system. Transportation now 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. Current condition data does not include ratings for pavement.

Method of Asset Condition Assessment

Asset Group	Method
Pavement	New pavement condition rating methods, replacement of 25-year old software and changes to street preservation activities are in progress
Sidewalk System	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 hazard to traffic Corners: Same guidelines as sidewalks
Bicycle Network	To be determined
Structures	Bridges: Inspection rating system based on Oregon Department of Transportation and National Bridge Inspection Retaining Walls, Harbor Wall: Visual inspection; Minimal settlement Stairways: Visual inspection Guardrails: To be determined
Traffic Signals	Hardware & Controllers: Age ITS and Other Equipment: To be determined
Streetcar	All Components: Age; Visual inspection
Aerial Tram	Age; Visual inspection; Structural inspection for stations and towers (every 2

	years), cables (annually)
Traffic Calming Devices	Visual inspection only
Street Lights	Field inspections; Age of the components; Type of luminaire; Type of system (underground vs. above ground)
Pavement Markings	<u>Painted Markings</u>: No condition assessment since all painted markings are replaced annually due to poor durability characteristics <u>Durable Markings</u>: Type of material; regular maintenance; visual inspection
Parking Meters	<u>Single and Double Meters</u>: Age; Visual inspection <u>SmartMeters</u>: Preventive maintenance schedule; Visual inspection
Source: Portland Bureau of Transportation, Asset Status and Condition Report, 2007.	

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.

Environmental Services

Replacement Value

Overall, BES applied a 3.44% construction inflation factor to last year's replacement value (a change in ENR from 8293 to 8578) plus investment made during FY08 ($108.9 million in combined, $1.4 million in sanitary, $8.3 million in stormwater, and $8.1 million in wastewater). In addition, 725 green street facilities, valued at an average of $20,000 each were added to the stormwater system totals.

Current Condition

BES uses a variety of methods to measure current condition. Methods include visual TV inspection, age, material, and history of failure of adjacent pipes (to indicate remaining useful life).

Condition for combined sewers and sanitary sewers are based on regular ongoing assessments. Analysis of the data has been updated as part of the System Plan. A similar multi-year review of the stormwater system is underway. Condition for wastewater treatment systems are based on estimate of repairs for each process area. Assets at the Columbia Boulevard Wastewater Treatment Plant are experiencing degradation due to the high capacity of flow relative to the capacity of the facilities. A number of upgrades, currently in construction, will result in significant improvement to this situation.

Annual Funding Gap

The financial plan generally assumes annual rate increases of 6.5%. The gap represents the difference between the projected revenue with 6.5% annual rate increases and newly identified needs. Specific needs represented include:

- $123 million for pipe rehab identified in the systems plan update;
- $40 million for sewer work associated with the proposed Milwaukie light rail line;
- $20 million for capacity enhancements in the Fanno system and an additional $20 million for capacity enhancements in other basins;
- $10 million for I&I improvements in the Fanno/Tryon system and $10 million for surface water management elsewhere in the system; and
- $60 million for capacity-related projects at CBWTP.

Water

Replacement Value

In most cases, the replacement value is based on the current costs to install assets and includes all overhead costs (assumed at 1.135 times total personnel costs, or 0.4 times project costs if personnel costs cannot be separated from project costs).

Pump mains and vulnerable mains are assumed to cost more than the average pipe, due to routing, easements and sensitive locations (in terms of stability and environmental issues). The Bureau has developed a cost model to more reliably estimate project costs for small mains. Since the small mains model costs include the costs for hydrants and valves, these costs were estimated for a typical 500 foot section of pipe and removed, then the cost per foot per inch without hydrants and valves was re-figured so that pipe costs were for pipe only.

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 maintenance.

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

Annual Funding Gap

The Water Bureau calculated its annual funding gap in two ways. For some assets, poor physical condition triggers the gap. For other water assets, the gap is measured by the need to mitigate the high risk of asset failure (install valves for pump mains, relocate pipes due to other infrastructure projects), or the desire to make a sound investment decision (meter replacement to limit lost revenue, install advanced metering infrastructure system to provide better customer service and system monitoring).

The reported funding gap includes costs to:
- replace screw-type hydrants, service lines, high risk pipe segments, and large valves in poor condition;
- replace meters at a sustainable rate;
- install valves to address tank vulnerability;
- fund maintenance facility replacement;
- improve maintenance of valves, tanks, fountains, and the Bull Run watershed road system; and
- replace / upgrade sections of the oldest conduits.

Parks

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.
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 is in process. Art work and memorials are inventoried; assessments will be by others in future.
Buildings and Pools	Visual inspection and/or remaining life	Arts, community centers, pools are complete; baseline data on other buildings is complete with new assessments to be done this fall; other buildings will be assessed next year.
Recreation Features	Visual inspection	Courts and playgrounds are complete; other features are inventoried but remain to be inspected.
Built Infrastructure	Visual inspection and remaining life	Roads and parking lots have been inventoried but not 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 vegetation units were inventoried and assessed in 2004.

PP&R is updating its annual asset inspection program to determine the condition of all assets and will inspect 20% of all 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.

Annual Funding Gap

PP&R has identified capital needs for the next 20 years in the categories of Growth (projects needed to meet current service levels for all customers), Preserve (repair, rehabilitate and replace existing assets to meet current service levels), Safety (projects needed to bring assets up to current codes and meet mandates such as ADA) and Efficiency (projects that improve the cost effectiveness of maintaining and operating our assets).

In past years, PP&R calculated the annual funding gap as just the difference between the funding needed to bring existing assets to good condition (also defined as eliminating the maintenance backlog) and available funding. The unmet needs of existing customers for basic levels of service were not included. They will be included in this year's calculations to present a more accurate picture of current gaps in service and the resources needed to fill them.

Civic

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% of replacement value. Current funding at 1% of replacement value ensures relative condition (percentage in good, fair, and poor condition) remains relatively constant over the next ten years.

For spectator facilities the gap is the one-time difference between actual fund reserves for capital maintenance and a target level of $10 million based on the costs to upgrade Memorial Coliseum and address the long-term capital needs of PGE Park. Union Station's one-time funding gap is $45 million based on unfunded deferred maintenance, in addition to the annual gap. The annual gap assumes the $45 million one-time gap is funded to catch up on deferred maintenance and bring the building up to current standards. Unmet need for the Portland Center for the Performing Arts is not included in the total.

Technology
Establishing replacement values, current conditions, projected 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 one-time, annualized costs to replace or rebuild obsolete systems (800 MHz Radio System, CAD and PPDS); annual funding necessary to meet industry standards for major maintenance (telecommunications); and annual needs to ensure replacement and upgrades of technology on accepted schedules (IT Operations).

Appendix 6:   Asset Management Definitions

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).

The following chart addresses this information:

	Inventory completeness	Condition assessment method and frequency	Process and documentation	Resulting confidence level
1	No inventory	No assessment method	No process	No confidence
2	Partially complete inventory	Estimates used to assess condition	Process not well documented	Low confidence
3	Inventory complete	Subjective process to estimate condition	Some documentation in	Moderate confidence

	Inventory completeness	Condition assessment method and frequency	Process and documentation	Resulting confidence level
		estimated followed on a regular schedule	place	
4	Inventory complete	Condition surveys conducted on a regular schedule by well-trained personnel	Well documented process followed	High confidence
5	Inventory complete	Condition surveyed on a regular schedule	Objective process followed; Accuracy of data verified and well documented	Optimal confidence

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.

Current Replacement Value (CRV): The CRV is the total cost to replace the entire asset to meet current accepted standards and codes.

Failure Mode: The reason why an asset failed to provide the function for which it was installed.

Funding Gap: 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.

Green Infrastructure: Infrastructure that uses natural processes, systems, or features to provide traditional infrastructure services. There are two types of green infrastructure:
1) 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
2) Engineered facilities, such as green street treatments or eco-roofs, which use natural processes in an infrastructure setting.

Infrastructure: Consists of assets in two general networks that serve whole communities— transportation modalities (roads, rail, etc.) and utilities. 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, tunnels, drainage systems, water and sewer lines, pump stations and treatment plants, dams, and lighting systems. Beyond transportation and utility networks, Portland includes 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: 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:
- 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.

Unplanned maintenance is:
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).