

(note to public involvement workshop participants: This material is provided in response to a question in Workshop #1 about City Light’s capital improvement program and in particular the capital expenditures assumed in the rate forecast.)

Seattle City Light

Capital Requirements and Financing

6.1 Introduction

The Department maintains long-range capital improvement and conservation implementation programs to ensure the availability of adequate supplies of power and to provide a high level of service reliability to its various customer groups. The Capital Improvement Program (“CIP”) for the Department forms a part of the City’s Comprehensive Capital Improvement Program, which is mandated by the State’s Growth Management Act. The City’s biennial budget process determines the annual funding levels for both the CIP and the Conservation Implementation Program.

The Department’s current CIP emphasizes projects that address the long-term performance and reliability of its hydroelectric generation plants, substations and distribution systems. It also includes the costs of computing equipment, systems, and software that have a life spanning several years. The capital expenditure program was designed to meet all these requirements while keeping total expenditure levels as low as possible.

The Department’s Conservation Implementation Program provides funding for investments in the commercial and industrial sectors of the service territory to achieve the Department’s long-term energy savings goals. City Light began deferring conservation costs in 1984. Since 1986 they have been amortized over twenty years. Amortized costs include only program-specific expenditures that are related to installation of long-lived conservation measures. Expenditures not related to such programs are expensed as they occur.

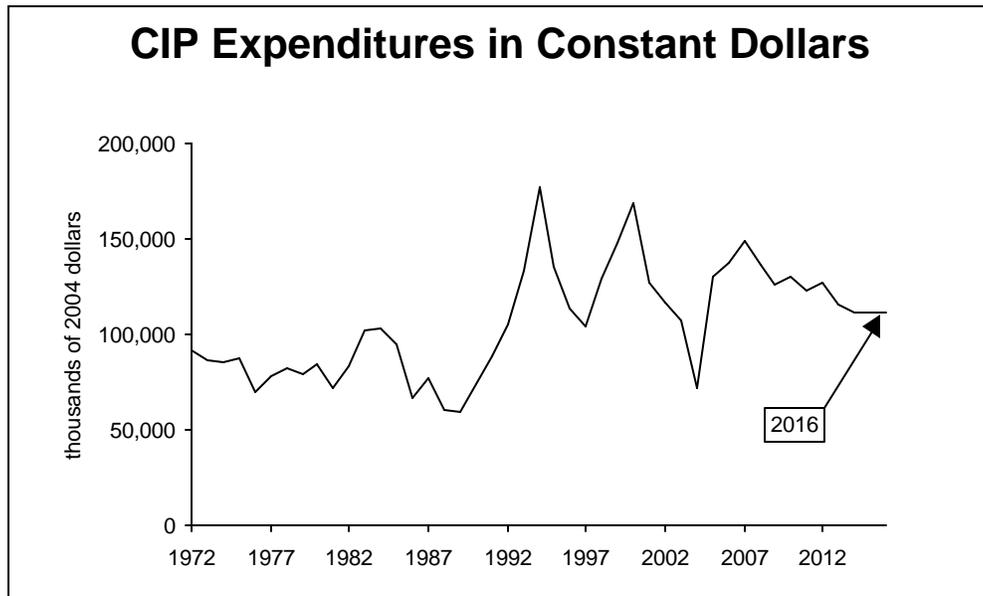
Capital and programmatic conservation expenditures do not have a significant effect on the revenue required from customers in the year in which they occur. They affect borrowing requirements instead and are a major factor in determining the debt issued each year. In turn, debt service payments affects the revenue required from customers in the following years because coverage of first-lien debt is a component of revenue required.¹

Capital requirements cover CIP expenditures, conservation programs, and other deferred costs. Other deferred costs result from the fact that some of the Utility’s expenditures do

¹ Debt is usually issued in the last months of the year, so the first debt service payment is due the following year.

not produce conservation or capital assets for City Light, but still relate to activities that have impacts extending beyond the year these payments are made. One example is the payment to other parties (such as native tribes and the Federal Government) required under the terms of the relicensing of generation plants. These payments are not expensed in the year they are made, but are amortized over several years. They are grouped with CIP and conservation because they have the same impact on revenue requirements as capital expenditures.

As FPM Table 1.03 shows, capital requirements for the 2005-2016 period are projected to range from a low of \$165.5 million in 2005 to a high of \$186.7 million in 2007, with an average about \$173.5 million per year. Expenditures in the Capital Improvement Program alone are projected to average \$145.4 million annually over the 12-year period. The forecast of capital expenditures incorporates about \$92 million, or 5% per year, of projected underexpenditures compared to the levels authorized in the CIP Budget. This assumption is consistent with the average underexpenditure of the CIP Budget in recent years. The long-term trend of CIP expenditures is shown in the graph below.



The CIP forecast is discussed in Sections 6.2 and 6.3. The impact of capital expenditures on depreciation expense is reviewed in Section 6.4. Programmatic conservation expenditures are reviewed in Section 6.5.

6.2 The Forecast of Capital Expenditures

Projects become part of the Capital Improvement Program (CIP) after a lengthy selection process in which costs and benefits are examined. Project costs and benefits incorporate legal and technical considerations as well as environmental impacts. Every two years, capital expenditures for the next budget period are approved by the Mayor and the City

Council as part of the City's biennial budget process. At the same time, expenditures for existing projects are also reviewed.

The RRA forecast classifies CIP expenditures according to functional categories: generation, transmission, distribution, and general plant. Generation plant includes facilities used to produce electricity. Typical assets would be reservoirs, dams, waterways, waterwheels, turbines, generators, and accessory electrical equipment. Transmission plant refers to the poles, towers, and conductors used to carry electricity from generation facilities to substations. Distribution includes substations and other distribution plant equipment. Substations comprise the buildings and equipment that transform electricity from the 115-KV or 230-KV levels, at which it is transported over long distances, to the 4-KV, 13-KV, or 26-KV levels at which it is delivered to the line transformers located at the premises of individual customers. Other distribution assets include the equipment used to deliver electricity from the substations through customers' meters, such as poles, underground conduits, line transformers, and meters. General plant includes all assets not included in the other four categories: buildings, such as the North and South Service Centers, computer equipment, office furniture, and communications and mobile equipment.

The total capital expenditure forecast is the sum of the forecast for each of the functional categories. The projection of expenditures in each functional category is done separately. The RRA forecast includes all projects individually documented in the Department's 2005-2006 CIP Budget and proposed CIP through 2010. Beyond this period the financial forecast makes provision for the expected level of spending on CIP projects required but not yet specifically identified.

6.3 Major Projects in the Capital Expenditure Forecast

Figure 6.1 shows the major components of the Capital Improvement Program over the 2005-2010 period. Total capital expenditures over this period are projected to increase 22% from \$135.9 million in 2005 to a peak of \$165.7 million in 2007, then decline to \$156.4 million in 2010.

Figure 6.1

**Forecast of Capital Improvement Expenditures
(\$000)**

PROJECTS	2005	2006	2007	2008	2009	2010	TOTAL
Generation							
Turbine Runner Replacements	1,403	3,433	218	38	693	0	5,785
Generator Rebuilds	79	5,665	6,109	6,528	7,287	7,179	32,847
Boundary Plant Improvements	5,877	5,755	4,633	1,645	1,610	1,795	21,315
Skaqit Plant Improvements	6,339	8,503	5,672	5,285	6,695	3,081	35,575
Environmental Mitigation	1,074	927	811	979	892	914	5,597
All Others	2,623	1,983	3,865	1,540	2,785	1,494	14,290
TOTAL GENERATION	17,395	26,266	21,308	16,015	19,962	14,463	115,409
Transmission							
	4,505	5,733	5,991	6,132	6,260	6,430	35,051
Substations							
	12,497	11,730	22,995	33,617	18,225	32,953	132,017
Distribution							
26KV Conversion	352	386	2,769	2,838	2,893	2,974	12,212
Regional Transit	8,810	12,305	9,862	2,158	884	910	34,929
Network Additions and Services	19,291	20,302	21,265	21,797	22,218	22,847	127,720
Service Connections	14,008	14,374	12,822	13,145	13,398	13,778	81,525
Capacity Additions	15,744	16,433	17,816	18,260	18,614	19,138	106,005
Relocations	6,598	7,226	9,230	8,949	9,122	9,379	50,504
Monorail	5,552	7,483	7,751	1,150	1,204	1,260	24,400
Alaskan Way Viaduct	1,089	1,456	9,686	9,930	10,120	5,880	38,161
Street and Floodlights	1,736	1,785	1,686	1,728	1,762	1,811	10,508
All Others	13,119	8,015	5,655	5,796	5,909	6,074	44,568
TOTAL DISTRIBUTION	86,299	89,765	98,542	85,751	86,124	84,051	530,532
General Plant							
Mobile Equipment Replacement/Additions	3,161	2,185	5,220	5,347	5,454	5,594	26,961
Communications Improvements	2,033	2,240	2,443	2,503	2,553	2,622	14,394
Information Technology	5,388	8,892	7,417	7,456	7,642	8,165	44,960
All Others	4,644	3,706	1,796	1,848	1,915	2,117	16,026
TOTAL GENERAL PLANT	15,226	17,023	16,876	17,154	17,564	18,498	102,341
TOTAL CIP EXPENDITURES	135,922	150,517	165,712	158,669	148,135	156,395	915,350

Generation

The Department plans to spend \$115.4 million on generation plant improvements over the 2005-2010 period. The following discussion provides a brief summary of the major Generation CIP projects planned.

- **Turbine Runner Replacement**

Completion of the current program to refurbish and replace turbine runners and associated equipment at City Light's hydroelectric generation plants will require \$5.8 million in expenditures through 2009, when the replacement will be complete. These improvements, which peak at \$3.4 million in 2006, are needed because existing equipment is aging and suffering cavitation, leakage, or other deterioration problems. Boundary upgrades were completed in 2004, but work at the Diablo and Gorge plants is planned.

- **Generator Rebuilds**

The Department is beginning a comprehensive program to rebuild 10 aging hydroelectric generators, accounting for 70% of the utility's generating capability at the Boundary, Ross and Diablo powerhouses. Expenditures of \$32.8 million are planned for the 2005-2010 period for this purpose, with major work beginning in 2006. Annual expenditures from 2006 through 2010 range from \$5.7-7.3 million. Projected work at Boundary includes repair of the Unit 55 generator stator and rewinding and refurbishing Unit 56 generators. Work at the Ross powerhouse will include replacement of air circuit breakers for Generators 41, 42 and 44, and rebuilding of Generators 41-44. Generator 31 at the Diablo powerhouse will also be rebuilt. These projects will significantly extend the economic life of the generators.

- **Boundary Plant Improvements**

Capital improvements at the Boundary Plant, beyond those mentioned above, are expected to require expenditures of \$21.3 million over the six-year period, with most of the planned expenditures occurring in the 2005-2007 time frame. Projects include replacement or upgrades of safety and security installations, control, monitoring and electrical systems, rockfall guards and other plant infrastructure.

The Federal Energy Regulatory Commission (FERC) licenses all City Light's hydroelectric plants except Cedar Falls, which was built before the Federal Power Act of 1920. City Light's FERC license for the Boundary project expires in 2011. The projects described in this section, together with the generator and turbine projects noted above, will contribute positively to the relicensing process, which was formally initiated near the end of 2004. The Pre-Application Document for the relicensing is due in April 2006.

- **Skagit Plant Improvements**

In addition to the turbine runner and generator improvements described above, costs for other upgrades to the Skagit plants—Ross, Gorge, Diablo and Newhalem—amount to \$35.6 million over the 2005-2010 period. Projected annual expenditures for these years range from \$3.1 million to \$8.5 million, peaking in 2006. About 60% of the expenditure over the six-year period is for improvements to the Gorge and Diablo plants.

Improvements and replacements are scheduled for powerhouse and switchyard equipment and control systems, for drainage and water supply systems, roads, shop and warehouse facilities, and for security and communications systems. Rehabilitation work at the Gorge plant is expected to average about \$1.4 million per year over the 2005-2010 period, with the peak expenditure occurring in 2006. Annual expenditures for Diablo capital improvements will average about \$2.2 million, peaking in 2009. About 53% of the expenses associated with Ross improvements during the six-year period will occur in 2008 and 2009.

- **Environmental Mitigation**

Environmental mitigation projects required under the terms of the license for the Skagit Project and by City Council resolution to protect endangered species in City Light generation areas are expected to cost \$5.6 million over the 2005-2010 period.

The Skagit Mitigation projects in the CIP fund the remediation actions required to mitigate the environmental impacts of running the Skagit plants, for which FERC relicensing was completed in 1995. The license is valid for 30 years. The Skagit mitigation package includes expenditures for acquisition and management of land for wildlife habitat, an environmental learning center, and other costs associated with mitigating the environmental effects of these plants. The Environmental Learning Center project is nearly complete, with final work scheduled for 2006. However, funds for land management related to wildlife habitat are allocated over the term of the license until 2026. Expenditures for this purpose will average about \$0.2 million per year for the next six years.

The Endangered Species Act (ESA) mitigation program was established by City Council Resolution 30272 in response to the listing of Puget Sound Chinook salmon and bull trout as threatened under the ESA in 1999. Both City Light and Seattle Public Utilities are required to carry out mitigation work in this area. City Light's responsibilities include research, watershed planning in the Skagit and Tolt River basins where the utility owns generation resources, and restoration and protection activities in those watersheds. Annual expenditures for endangered species mitigation are planned to average about \$0.7 million over the 2005-2010 period.

Transmission

Over the next six years, the Department expects to spend about \$35.1 million for expansion, modification and replacement of its overhead and underground transmission plant. The majority (95%) of this amount will be spent for projects that enhance or maintain reliability and satisfy capacity needs; these include new and rebuilt lines, new configurations and relocations, correction of 115 kV violations, replacement of poles, conductors, lights, and tower structures, x-ray assessments, and upgrades to cathodic protection of underground conductors. These projects total to an average of \$5.5 million per year.

Smaller projects include demand-driven transmission improvements such as a request by Burlington Northern Santa Fe Railway to raise three transmission lines and a request by Puget Sound Energy to reconductor the Bothell-Sammamish Line. Another small project, with shared costs in 2005 and 2006, is one carried out in cooperation with BPA and Pend Oreille PUD to install a 230/115-kV auto-transformer in the Boundary switchyard to interconnect to City Light's 115-kV Boundary transmission tap line.

Substations

Substation expansion and improvements are projected to cost \$132.0 million over the 2005-2010 period. Major expenditures are programmed from 2007 through 2009 to construct the new Interbay Substation and in 2006 to acquire land for a future substation

in the South Lake Union area. Significant expenditures for a South Lake Union substation are projected to begin in 2010. Projects in this category also include the replacement and addition of substation equipment to maintain reliability and to increase capacity to provide for load growth; the cost of these projects taken together averages about \$10.0 million per year for the six-year period.

Distribution

The Department plans to spend \$530.5 million over the 2005-2010 period on improvements and additions to the distribution system. A major portion of these expenditures will be required to relocate infrastructure and provide capacity related to a number of large local transportation projects, including the development of a light rail system by Sound Transit, the construction of the Seattle Monorail and the replacement of the Alaskan Way viaduct. The Department expects to be reimbursed for a portion of the costs of these large transportation projects, but together they account for about 18% of the total Distribution CIP during the six-year period. Other projects in this category include improvements to the downtown network distribution system, service connections, relocations and capacity additions, conversion of the 26 kV system, and streetlight/floodlight improvements.

The following discussion provides a brief summary of the major Distribution CIP projects planned for 2005-2010.

- **26-kV Conversion**

The Department began the process required for the conversion of both the overhead and underground distribution systems from 4 KV to 26 KV several years ago. The conversion provides greater capacity and reliability, and allows the system to meet increased capacity demand. Total expenditures over the 2005-2010 period are projected to amount to \$12.2 million, with the majority of the expenditure occurring 2007-2010 at an average rate of about \$1.9 million per year.

- **Regional Transit**

This project relocates City Light transmission and distribution facilities and provides service connections and capacity to the Sound Transit Light Rail project. Project expenditures for the six-year period 2005-2010 are expected to amount to \$34.9 million, peaking in 2006 at \$12.3 million. Almost 90% of the six-year capital costs of this project are projected to occur within the 2005-2007 time frame.

- **Network Additions and Services**

These projects provide for the improvement and expansion of the networks that serve high-density load areas (downtown, University District, First Hill), ensuring system reliability and continuity of service. The planned work includes installation, upgrading and replacement of conduits, maintenance holes, vaults, feeders, primary cables, transformers, network protectors, fire protection systems, and switch gear, as well as

improvements to the network transformer monitoring system. Over the 2005-2010 period, annual expenditures are projected to average \$21.3 million.

- **Service Connections**

There is a continuous need for new and enlarged service connections within the City Light service territory. Customer requests fluctuate with land use development and changing demand. Voluntary underground projects are also included in this set of capital projects. Average annual expenditures for these purposes over the six-year period are expected to amount to \$13.6 million.

- **Capacity Additions**

The expenditures projected in this group of projects are for building or reconducting line segments, replacing poles, adding cables for increased customer loads, installing new feeders, and adding underground facilities to match changing service demands in the City Light service territory. Capital expenditures in this category are expected to average \$17.7 million per year over the 2005-2010 period.

- **Relocations**

The Department frequently has to move electrical lines to accommodate projects being constructed by non-City Light entities. Types of projects that require relocation of electrical lines include transportation projects, street vacations, and large industrial, commercial and residential developments. The capital costs of relocation projects over the 2005-2010 period are expected to average \$8.4 million per year.

- **Monorail**

The Seattle Monorail Project is planning an initial 14-mile route between Ballard and West Seattle that travels through downtown Seattle, with up to 19 stations. Work included in this capital project includes relocation of City Light transmission and distribution facilities, as well as provision of service connections and capacity to the Monorail Project. The work is on a fast track schedule and City Light relocations occur in the project's initial construction phase. Eight-five percent (\$20.8 million) of the Department's capital expenditures for the Monorail Project are expected to occur in the first three years of the six-year CIP.

- **Alaskan Way Viaduct**

The Alaskan Way Viaduct is part of State Route 99, which carries 25% of the north-south traffic through downtown Seattle. It is also a major truck route serving Seattle's industrial area. Viaduct support structures were damaged during the 2001 Nisqually Earthquake. The Washington State Department of Transportation is conducting a plan and study for demolition and replacement of the viaduct. City Light has critical transmission and distribution infrastructure along the project corridor, all of which must

be relocated once or twice during the project. City Light has assumed that some reimbursement for its part of the project will be forthcoming, but no such legislation has been proposed or passed. City Light capital expenditures for this project are expected to peak in 2009 at \$10.1 million, with close to 80% of the costs being incurred in the 2007-2009 period.

- **Streetlights and Floodlights**

Lighting projects in the 2005-2010 capital plan include provision of additional customer-requested streetlights in unincorporated areas served by City Light, provision of additional streetlights in certain commercial and residential neighborhoods to improve public safety, and major maintenance for arterial streetlights in Seattle whose ownership was transferred from the City to City Light at the end of 1999. Slightly over 70% of the proposed lighting project cost is in the arterial streetlights category, and the majority of those expenditures will be for lights and their associated infrastructure in the downtown area. Total capital expenditures for lighting are projected to average about \$1.8 million per year throughout the six-year CIP.

General Plant

Programmed expenditures of \$102.3 million will support general plant improvements over the 2005-2010 period. Replacement and expansion of mobile fleet equipment, which had been deferred over the past several years, will require the expenditure of \$27.0 million, or about 26% of the total General Plant CIP. Improvements in communications systems are budgeted at \$14.4 million, or 14% of the total. Investments in information technology, including a major upgrade to customer billing systems, account for \$45.0 million, or about 44% of the total CIP in this category. The major components of General Plant CIP for the next six years are described below.

- **Mobile Equipment Replacement/Additions**

Averaging expenditures of \$4.5 million per year over the period, the Vehicle Replacement Project is dedicated to replacing and expanding City Light's heavy-duty mobile equipment fleet, as well as gradual replacement of light-duty vehicles previously leased from the City's Fleets and Facilities Department.

- **Communications Improvements**

The major communications projects included in the 2005-2010 CIP will improve fiber optic cable and radio communications infrastructure that support distribution, transmission and generation control systems. The annual expenditure for these projects will average about \$2.4 million.

- **Information Technology**

Planned capital projects in information technology are expected to average \$7.5 million per year over the 2005-2010 period. CIP funding is provided for the Department's

customer billing systems, as well as those dedicated to disaster recovery, information technology infrastructure, non-network area mapping, and work process management.

6.4 The Impact of Capital Expenditures on Depreciation Expense

The expenditures in the Capital Improvement Program are recognized by the Department's income statement over a number of years, depending on the expected lengths of the economic lives of the assets acquired. Depreciation expense therefore reflects the level of capital expenditures in prior years and the expected lives of the components of the utility's plant. While depreciation expense does not affect revenue requirements, which are associated with cash flows, it has considerable impact on the utility's net earnings.

Total depreciation expense in 2004 was \$73.4 million. It is projected to increase from \$75.9 million in 2005 to \$127.2 million in 2016, an increase of nearly 68%. This increase is the result of the growth in capital improvement project expenditures, which are expected to reach a peak of \$165.7 million in 2007. Substation and other distribution projects are the most significant factor impacting the increase in forecasted depreciation; these include the Interbay and South Lake Union substations, regional transportation projects, and improvements to networked distribution areas. The next most significant factor impacting the increase is generator improvements, with forecasted capital expenditures peaking in 2006.