

Appendices

Appendix A: New or Expanded Capital Facilities

Seattle City Light

Project Name	Project ID	Project Capacity	Project Location	2022 Budget*
MC-CL- XB6351	Boundary Powerhouse - Unit 51 Generator Rebuild	Rationale: The Unit 51 generator at Boundary is the original installation and its typical 30-year life expectancy has expired. It has accelerated deterioration of its windings caused by thermocycling (frequent startup and shutdowns of the generator, resulting in more pronounced temperature fluctuations). Failure of a generator can cause lost revenue, which during runoff could be many millions of dollars. Additionally, a failure may cause a fire and set off the fire extinguishing system, which would expose the powerhouse and its personnel to safety risks inherent with fire, smoke, and carbon dioxide (CO2) discharge for fire suppression. A rewind also allows for an updated insulation design that will permit the use of water as a fire protection system, providing an improvement in worker safety. Also, if the technology is advanced sufficiently by the time of the rewind, we may add a rotor mounted scanner or other diagnostic equipment. Alternative(s): Defer work indefinitely.	10382 Boundary Rd, Metaline, WA 99153	\$19
MC-CL- XB6353	Boundary Powerhouse - Unit 54 Generator Rebuild	Rationale: The Unit 54 generator at Boundary is the original installation and its typical 30-year life expectancy has expired. It has accelerated deterioration of its windings caused by thermocycling (frequent startup and shutdowns of the generator, resulting in more pronounced temperature fluctuations). Failure of a generator can cause lost revenue, which during runoff could be many millions of dollars. Additionally, a failure may cause a fire and set off the fire extinguishing system, which would expose the powerhouse and its personnel to safety risks inherent with fire, smoke, and carbon dioxide (CO2) discharge for fire suppression. A rewind also allows for an updated insulation design that will permit the use of water as a fire protection system, providing an improvement in worker safety. Also, if the technology is advanced sufficiently by the time of the rewind, we may add a rotor mounted scanner or other diagnostic equipment. Alternative(s): Defer work indefinitely.	10382 Boundary Rd, Metaline, WA 99153	\$6,452

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MC-CL- XB6401	Boundary Facility - Minor Improvements Program	Rationale: Setting up and monitoring separate capital projects entails considerable administrative costs which may unreasonably increase the cost of small projects, even when identified in advance. Covering such projects under the emergent project program allows for accountability and tracking at the subproject level, with minimal overhead costs. A recent example is a FERC requirement for a mobile emergency generator as a redundant source of power to open spill and sluice gates. Project Weighted Rating-40.8, Primary Rationale-Varies Alternative(s): The only alternative for emergent projects is to find some other way to fund emergency needs that arise. Usually, for capital projects, this involves emergency appropriations involving the passage of special City ordinances, among other things. The time required to cut through the red tape of special appropriations could be prohibitively long, given that the needs that arise are either of an emergency nature or cannot be predicted. The only alternative for planned small capital projects is to secure separate budgeting for each one by putting each small project into the same administrative league as multi-million dollar projects.	10382 Boundary Rd, Metaline, WA 99153	\$202
MC-CL- XB6493	Boundary Powerhouse Generator Step-up Transformer Replacement	Rationale: Design to begin in 2010. Closeout in 2017. First transformer delivered in 2012. Alternative(s): An alternative approach would be to repair or replace units as they fail from deferred maintenance. This approach would eventually result in a significant loss of revenue and/or fines from a regulatory agency. Accepting the risk of failure would not be in the best interest of the utility. Having a spare unit onsite would prevent such failures.	10382 Boundary Rd, Metaline, WA 99153	\$7,183
MC-CL- XB6535	Boundary Powerhouse - Unit 52 Generator Rebuild	Rationale: This project is part of the Utility's Generator Rebuild Program, a series of projects to maintain and extend the useful life of the Utility's aging generators. The program rebuilds ten generators, accounting for 70 percent of City Light's generating capability. Alternative(s): No Alternatives Provided.	Boundary Rd, Metaline, WA 99153	\$5,480
MC-CL- XB6565	Landis and Gyr RTU Modernization Boundary, Cedar Falls and Skagit	Rationale: Replace failing gear with new. Alternative(s): No Alternatives Provided.	Boundary, Skagit and Cedar Falls power facilities	\$520
MC-CL- XB6566	Boundary - DC Battery System & Charge Modernization	Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.	Boundary Rd, Metaline, WA 99153	\$78

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MC-CL- XB6987	Boundary - Licensing Mitigation	Rationale: In order to continue to operate the facility, the City must obtain a new FERC license. The decision to apply for a new license has been made and we have embarked on the default FERC licensing process, the Integrated License Process (ILP). While the cost of attaining a new license to operate Boundary Dam is very significant, Boundary provides anywhere from 25% to 40% of SCL's power requirements and produces power at a cost significantly below the market rate. The plant's operations are shaped to deliver power during peak-load hours, an operating regime that allows the City to meet continued service area load growth and provide regional system reliability. For these reasons, the Utility has determined that obtaining a new license is a priority and we are confident that it will continue to be a cost effective source of renewable power for the City. Alternative(s): No Alternatives Provided.	10382 Boundary Rd, Metaline, WA 99153	\$16,927
MC-CL- XC6406	Cedar Falls/South Fork Tolt - Minor Improvements Program	Rationale: Setting up and monitoring separate capital projects entails considerable administrative costs which may unreasonably increase the cost of small projects, even when identified in advance. Covering such projects under the emergent project program allows for accountability and tracking at the subproject level, with minimal overhead costs. A recent example is the replacement of an Oil-filled Transformer. Project Weighted Rating-40.8, Primary Rationale-Varies Alternative(s): The only alternative for emergent projects is to find some other way to fund emergency needs that arise. Usually, for capital projects, this involves emergency appropriations involving the passage of special City ordinances, among other things. The time required to cut through the red tape of special appropriations could be prohibitively long, given that the needs that arise are either of an emergency nature or cannot be predicted. The only alternative for planned small capital projects is to secure separate budgeting for each one by putting each small project into the same administrative league as multi-million dollar projects.	19901 Cedar Falls Rd SE, North Bend, WA 98045	\$746

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MC-CL- XC6450	Cedar Falls Powerhouse - Unit 5/6 Generator Protective Relay	Rationale: The present generator protection is outdated and lacks some basic protection elements to protect it from abnormal frequency and voltages. The existing relay does not meet the North American Electric Reliability Council (NERC) and the Western Electricity Coordinating Council (WECC) regional requirements for maintaining the generator in-service during system disturbances. This deficiency was identified as part of the NERC/WECC compliance program, and has been scheduled for replacement as part of a prioritized program along with other outmoded technology present in SCL's aging infrastructure. Alternative(s): 1. Do the project described. 2. Do Nothing. This is not considered to be a viable approach since the present generator protection scheme does not meet the ANSI/IEEE Standard or the WECC/NERC regional requirements for the protection of generators.	19901 Cedar Falls Rd SE, North Bend, WA 98045	\$1,183
MC-CL- XC6573	Cedar Falls - Bank 6 Replacement	Rationale: This project improves generation reliability by replacing this critical transformer prior to failure. It will also enhance overall operational performance since new transformers are more efficient, have more environmental protections, and require less maintenance. Alternative(s): The only alternative to this project is to run the transformer to failure which would necessitate an emergency project to replace it.	Cedar Falls	\$1,887
MC-CL- XC6625	Cedar Falls Rehabilitation	Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.	Cedar Falls	\$150

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MC-CL- XF8389	Special Work Equipment - Shops	<p>Rationale: This project provides new tools and work equipment to replace outdated equipment. The project updates technical systems to current standards, as our current transformer test equipment relies on out dated computer equipment and programming that is no longer supported. Some equipment does not meet latest safety standards. Other equipment is no longer supported by replacement parts or can no longer be repaired to provide accurate cutting, bending, etc. Some equipment needs to be updated to provide for increased production or size of stock material worked. Other equipment needs updated programming to provide for the latest technology advancements. The project ensures the transformers CL purchases and installs are safe and will last up to and beyond the average life span. It also ensures that we receive what we paid for, as specified, and that it will fit our system without problems such as oil leaks, incorrect voltage, and non-functional safety interlocks, etc. Replacing shop special tools and equipment will allow customer service enhancements by providing newer technology for more accurate fabrication of parts and other shop made items, safer tools to use, and newer equipment with more safeguards built in. Alternative(s): The recommended alternative would be to fully fund the special tool requests. This option would allow for the stated goals to be realized. Alternatives to funding special tools budget for shops are to not fund it or to fund at a lower level. Both of these options would slow production and would impact the opportunity to effectively serve the shops customers. It could also impact safety and injury rates where older equipment is less efficient and less ergonomic, requiring more repetitive motion and more labor with less automation.</p>	System wide	\$292
MC-CL- XF9006	Safety Modifications	<p>Rationale: Project 9006 was established to correct imminent and critical safety hazards not covered by divisional budgets. Investments will lower the risk of WA State compliance penalties and possible costs related to employee or customer injuries. Alternative(s): 1. Complete the projects as they emerge within established budget. Proactive response reduces the risk of employee and customer injuries, and related costs, as well as potential non-compliance penalties. 2. Do not fund project. This may leave significant safety problems unresolved, leading to increased compliance penalties. 3. Defer the project. The impact is similar to alternative 2 above, and also results in a continual growth of open and unfunded safety projects.</p>	Citywide	\$1,701

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MC-CL- XF9101	Equipment Fleet Replacement	<p>Rationale: As mobile equipment ages, it reaches a point where it becomes more economical to replace the equipment than to continue to repair it. In the past, the mobile equipment fleet coordinator used a twenty year replacement plan to maintain City Light's vehicle pool. Due to replacement deferrals starting in the mid 90's and the budget cuts which began in 2000, that replacement plan by necessity was revised. We are now faced with replacing fleet on an as needed basis. That priority is to replace the most often used, specialized, or critical equipment to the Utility, or the most costly to maintain and least reliable vehicles first. To get back to an established plan will require seven plus years of enhanced financing. A seven year recovery plan requires \$10 million annually. That plan has been underfunded for 15 years. The planned annual purchases, per the twenty year plan for the heavy fleet equates to approximately \$8 million per year. That \$10 million replaces the equipment that normally needs to be replaced every year and addresses some of the equipment that has been deferred. The proposed \$10 million will not fully cover inflation and the increasing cost of materials as many purchases now have a steel surcharge added. There are also added emissions requirements for the coming years starting in 2007. This will require about \$10,000 per diesel engine along with design changes to accommodate space for higher heat and larger exhaust pipes. The Memorandum of Understanding between the Fleet Management Department (FMD) and Seattle City Light (SCL) regarding financing and management of the City Light Fleet states on June 22, 1998, the City Council adopted Resolution 29771. In that resolution is reference to Timely Replacement of Vehicles. The recommendation is to replace vehicles in a timely manner, when fully depreciated.</p> <p>Alternative(s): The recommended alternative is to address the backlog of City Light vehicles, heavy and light fleet, on a plan spread over 7 or more years (a \$30 million backlog currently on a \$130 million fleet) A second plan would be to not purchase fleet vehicles. This option would result in paying both higher maintenance costs for worn out vehicles and higher rental costs both for specialized vehicles and daily use vehicles currently at \$2 million annually. It also has safety ramifications when considering malfunctions and inopportune breakdowns. A third plan would be to continue to not address the back log but replace on an as needed basis. This plan requires more rental costs and time loss due to equipment down time. It also does not address the need to be more fuel efficient and environmentally friendly. This plan to replace only as needed would be less</p>	System wide	\$7,715
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		reliable for tracking or budgeting. Address the back log through a seven year or longer plan.		
MC-CL- XF9103	Office Furniture and Equipment Purchase	Rationale: Workplace and process improvements completed under program 9159, plus ongoing organizational change, require the purchase of office furniture and equipment in order to achieve the project objectives. Each year Utility Support Services completes approximately 450 service requests requiring furniture reconfiguration, at least a third of which involve ergonomic corrections. Alternative(s): 1. Fund program 9103. 2. Don't fund program 9103 and purchase all office furnishings and equipment from the O&M budget. 3. Maintain office furniture until it can no longer be sustained in acceptable condition and then replace in total with a future ad hoc program.	System wide	\$8,521
MC-CL- XF9107	North and South Service Center Improvements	Rationale: The purpose of the proposed subprojects, SSC locker room remodeling, NSC building on the main site, and the SSC yard study, is to improve each facility in support of the assigned staff/crews. Results include improved efficiency and reduced maintenance. Planning in the employee parking lot is necessary since an off-ramp will be constructed over a portion of the lot. The SSC yard study subproject includes planning for the revisions needed when the off ramp is built from the Spokane Street Viaduct to 4th Avenue South. The off ramp is to be placed over the employee parking lot. Alternative(s): 1. Continue the improvements as proposed. 2. Defer improvements. 3. Replace the service centers with state-of-the-art facilities. 4. Do no improvements until the service center is unusable and then replace the asset.	Outside City of Seattle	\$5,686
MC-CL- XF9134	Seismic Mitigation	Rationale: Several seismic surveys of City Light facilities have been done in past years. Some of the deficiencies were corrected; usually as part of a major construction program, however many of the deficiencies remain. Our structural engineering unit has an unscheduled plan to review prior surveys and release a prioritized corrective action plan. Plan implementation funding will be considered at the next budget cycle, or earlier, by special appropriation. Alternative(s): 1. Budget for emergent projects is recommended until the above action plan is in place. 2. Take no corrective action. 3. Contract for a comprehensive seismic study. Include cost estimates and a firm schedule requirement in the study results. Initiate a program of projects to make corrections.	Outside City of Seattle	\$1,364

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MC-CL- XF9151	Facilities Regulatory Compliance	Rationale: Before City Light property is sold the area must be evaluated for any contamination. This project allows each property to be thoroughly investigated for contamination. Alternative(s): The alternative is to pass on contaminated properties to new owners and therefore incur long standing environmental liability.	500 Newhalem Creek Rd, Marblemoun t, WA 98267	\$348
MC-CL- XF9152	Environmenta l Safeguarding and Remediation of Facilities	Rationale: Statutory fines for mishandling or releasing hazardous and dangerous materials can reach tens of thousands of dollars per day and civil liability claims for damages stemming from a release or spill can reach into the millions. More important is City Light's position, as a responsible member of the community, to safeguard the environment. Alternative(s): 1. Fund Program 9152. 2. Don't fund Program 9152 and address environmental issues as directed by environmental agencies using O&M funds. 3. Incorporate money in other capital projects to address environmental issues. 4. Shift risk by outsourcing or by purchasing environmental insurance.	Outside City of Seattle	\$72
MC-CL- XF9159	Workplace and Process Improvement	Rationale: This program defines a separate workplace improvement element devoted specifically to integrate people and processes within the built environment as opposed to the long term strategic asset management focus of other facilities programs. Projects proposed under this program are justified based on an asset life cycle that is typically shorter than that used for replacement or improvement of building elements serving multiple and varied work groups and processes. Implement properly authorized process improvement projects within one month of the agreed upon completion date. Alternative(s): 1. Fund Program 9159. 2. Eliminate Program 9159 and expense business function support projects. 3. Force individual business units to budget for their own improvements and institute a charge back system to bill them for materials and outsourced labor.	System wide	\$451
MC-CL- XF9161	Substation Comprehensiv e Improvements	Rationale: 1. Reduce the risk to communications equipment and power network controls in order to sustain City Light's historically high system reliability. 2. Reduce workplace complaints among substation staff so that City Light maintains its harmonious relationship with electrical workers. Alternative(s): 1. Fund Program 9161. 2. Eliminate Program 9161 and make limited scope improvements in reaction to critical situations. 3. Eliminate Program 9161 and fund substation improvements out of other programs. 4. Make no improvements and finance increasing risk through insurance. 5. Eliminate Program 9161 and complete substation improvements as an O&M expense.	System wide	\$1,311

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MC-CL- XF9233	Georgetown Steamplant Access Road	Rationale: The Georgetown Steamplant is a National Historic building of great interest to the public and one of the cultural sites of Gerogetown itself. As an environmental justice community, it is important that the City provide access to residents and visitors to be able to show their rich history. Tours are provided to the public and we plan on operating the building as a museum in the future. Alternative(s): Several alternatives for an access route have been reviewed together with King County, and the current agreement includes the chosen alternative.	Off Wa 99 At King County Airport	\$1,478
MC-CL- XF9235	Denny Substation Tenant Improvements	Rationale: The Seattle Design Commission operating under the guidelines set forth by the Urban Design Merit program unanimously approved the construction of the Denny Substation Project with the condition that the two shell spaces be developed as neighborhood enhancements. As stipulated by the Design Commission, the spaces shall be funded by the Capital Improvement Program, be fully programmed as part of the Denny Substation project and address any mitigation associated with vacating Pontius street. Alternative(s): Altenatives to not moving forward with this project would impact the overall Denny Substation Project - as it would impact the ability to vacate Pontius Street - which is critical to developing the planned Denny Substation for efficient layout of the yard and substation equipment. Options for the community center and the learning center are being explored through best value and benefit to the community and neighborhood, and City Light customers.	Valley Street	\$38
MC-CL- XF9320	Energy Conservation	Rationale: Energy reduction is a Department and City goal. SCL Conservation Unit's energy audits of our facilities will identify a program of projects to accomplish these goals. With documented savings, there will be recovery of some of the costs from BPA. Alternative(s): Do nothing. Continue to consume energy at existing levels.	System wide	\$1,100

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MC-CL-XP6102	Special Work Equipment - Generation Plant	<p>Rationale: Special equipment needs and new tooling frequently arise on an unpredictable basis. Technology obsolescence and evolution, which are not easily predicted, also play a part in replacement. This project provides some financial coverage for meeting these needs on a first-come, first serve basis. Without this authority, funding for special tooling and equipment would not be readily available and could take months to acquire. This category of acquisition often provides rapid payoff in terms of the efficiency of work execution. Alternative(s): The only alternative is to find some other way to fund special equipment needs that arise. For capital projects, this usually involves emergency appropriations involving the passage of special City ordinances. The time required for special appropriations could be prohibitively long when needs can not always be predicted or arise sometimes from an emergency nature.</p>	Outside City of Seattle	\$922
MC-CL-XP6385	Power Production - Network Controls	<p>Rationale: A 2003 Report from Westin Engineering identified limits to our automation, remote control and supervisory control capabilities at Skagit. Among other things, the report found that there are protocol issues within and between the facilities and between the facilities and the System Control Center. Improvements are necessary before supervisory control, such as remote start stop and remote loading can be achieved. The consequence of not coordinating all the individual controls and monitoring projects is that we will not resolve our protocol issues, and that we will continue to limit our ability to remotely control and operate the plants. This leads to reduced efficiencies and higher production costs. Project Weighted Rating-26.8, Primary Rationale-Reliability Alternative(s): Do nothing. This is not advisable as it can lead to higher maintenance costs and to unscheduled outages due to unforeseen catastrophic bearing failures. Do partial replacements. This has been the approach. However, there are incompatible pieces that cannot be replaced or replicated as some components are no longer in production. This results in greater potential of system failures due to outdated electronic components being run past their life or not updatable.</p>	500 Newhalem Creek Rd, Marblemount, WA 98267	\$158

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MC-CL-XP6530	Hydro Project Spill Containment	Rationale: The project will implement upgrades that will either prevent spills, from oils, greases, fuels and other petroleum products, through process improvements and equipment replacement, or provide additional containment capacity for accidental spills. Options for reducing spills include replacing oil filled transformers with dry type transformers, building larger containment basins around oil filled equipment, reconfiguring powerhouse sumps to separate potentially oily water from non-oily water, installing oil/water separators on transformer and generator cooling water systems, and replacing greased valve bushings with greaseless bushings. Because each powerhouse is unique, different solutions will be designed and implemented at each facility. Alternative(s): No Alternatives Provided.	Outside City of Seattle	\$215
MC-CL-XP6600	SMT AutoLab	Rationale: This project supports continued new cyber security and automation projects. The existing equipment lab is too small and the HVAC system doesn't adequately cool existing equipment. Alternative(s): The project will also look at enlarging the existing lab on SMT 35, as well as looking at alternate spaces to create a new lab. Existing IT labs will be considered.	System Wide	\$114

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MC-CL-XP6990	Endangered Species Act Mitigation	<p>Rationale: This project protects and restores fisheries habitat in the Skagit and Tolt basins by implementing the Endangered Species Program for recovery of listed fish species that are potentially affected by City Light projects. The project scope includes land purchase, restoration, assessment, and management. The ESA prohibits harming listed species and their habitat. SCL's facilities impact these species since the dams have changed the downstream hydrology, affecting the rearing and spawning habitat for Chinook, and rearing habitat for bull trout and steelhead. When SCL lowers the flow to reduce generation (load following), thousands of chinook juveniles may be adversely affected. In addition, the Skagit Project separates the bull trout population into four distinct populations. Concerns have also been expressed about interference with access to spawning areas resulting from lower reservoir levels and the potential of entraining bull trout. Since SCL's licenses for the Skagit and Tolt were issued prior to the listing, they provide no protection for third party lawsuits under ESA. We have no "take" permit. SCL licenses can also be reopened by Federal agencies, e.g. the U.S. Fish and Wildlife Service, seeking additional measures to protect and restore the listed species. Alternative(s): 1. Complete the projects envisaged by the City Council and incorporated into the Recovery Plans for each basin and work to obtain legal protection. 2. Complete projects as budgeted, extending the timeframe. 3. Terminate the project at current expenditure levels. This would result in failure to carry out a Council and Executive mandate and increase the Department's liability under the ESA. We would not be able to obtain legal protection.</p>	Outside City of Seattle	\$1,154
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MC-CL- XS6232	Skagit - Sewer System Rehabilitation	<p>Rationale: Sewer pipes in the Town of Diablo are so badly cracked and broken that high flows in the river raise the groundwater level above the sewer pipes. The sewage system attempts to drain high levels of ground water (a phenomenon called "infiltration") from the Skagit River through our sewage plant. The excessive plant flow upsets the delicate balance of bacteria in the sewage treatment plant that process the sewage, "washing out" the plant, causing it to stop functioning properly and releasing raw sewage into the Skagit River. This project will provide a design for a sewer pipe rehabilitation, which will eliminate the "washout" problem caused by groundwater infiltration. During heavy storms, the ground becomes saturated and groundwater enters sewer lines via breaks in the pipes, resulting in pipe flows that exceed the capacity of the treatment plant. When this happens, the sewage overflow is passed directly into the Skagit River without treatment. This sort of situation happens once every three to four years. Such sewage overflows, in addition to being a source of pollution affecting downstream users, causes a violation of our sewage discharge permit. When this situation occurs, we are required to contact appropriate authorities and are at risk of being fined. Alternative(s): 1. Do the project described. Replace all broken and deteriorated pipe lengths. Clean pipes with root penetration but no major breaks. This option provides maximum design life. 2. Do nothing: Sewage overflows, permit violations and sewer systems breakdown will result. 3. Pipe liners: Use an alternative pipe rehabilitation method in which a liner is placed inside the original pipe, leaving the existing pipe in place. Eliminates pipe cracks and leaking joints, but is a non-structural solution. 4. Perform a project that supports only the Reflector Bar infrastructure. The rationale is that Hollywood improvements would not be needed pending the outcome of the housing evaluation.</p>	Milepost 126 State Highway 20	\$161
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MC-CL- XS6373	Ross Dam - AC/DC Distribution System Upgrade	<p>Rationale: The operation of critical components of the dam, such as gates, valves, and lighting, depend on the power distribution system. The electrical system is 50 years old and has been in service beyond its normal life expectancy. Extra space for breakers is not available, cable insulation is starting to strip, and the existing gear is not approved for lockout/tagout requirements. Presently there is a risk of losing power to the dam spillgates. New conduit and conductors will improve reliability of spillgate operations and other dam operations requiring electric power. New electrical equipment, new lighting, and the addition of emergency lighting will allow staff greater operational flexibility, safety, and efficiency. Alternative(s): Doing nothing will result in eventual loss of control of motors and valves used for water spill control and could cause the dam to be overtopped. Maintaining power to operational components on the dam (for instance the spillgate) is needed to ensure the operation of Ross, which provides an average of 100 megawatts.</p>	Milepost 128 State Highway 20	\$776
MC-CL- XS6405	Skagit Facility - Minor Improvements Program	<p>Rationale: Emergent capital projects are, by definition, unpredictable. This project provides some financial coverage for such projects on a first-come, first serve basis. Without this authority, funding for emergency work would not be readily available, and could take months to acquire. Setting up and monitoring separate capital projects entails considerable administrative costs which may unreasonably increase the cost of small projects, even when identified in advance. Covering such projects under the emergent project program allows for accountability and tracking at the subproject level, with minimal overhead costs. A recent example is Emergency Generators for the Wastewater Treatment Plants. Project Weighted Rating-40.8, Primary Rationale-Varies Alternative(s): The only alternative for emergent projects is to find some other way to fund emergency needs that arise. Usually, for capital projects, this involves emergency appropriations involving the passage of special City ordinances, among other things. The time required to cut through the red tape of special appropriations could be prohibitively long, given that the needs that arise are either of an emergency nature or cannot be predicted. The only alternative for planned small capital projects is to secure separate budgeting for each one by putting each small project into the same administrative league as multi-million dollar projects.</p>	500 Newhalem Creek Rd, Marblemoun t, WA 98267	\$2,468

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MC-CL- XS6415	Skagit Powerhouses - Install Protection Relays	Rationale: Generator protective relaying at the Ross, Diablo, and Gorge plants does not meet present IEEE Standards. Protective relaying allows the system to automatically and instantaneously respond to surges and faults that may occur in transmission lines due to lightning strikes, load rejections, and other unexpected events, limiting the potential for damage when these events occur. Protection is currently inadequate for some equipment faults, which could lead to fire or additional equipment damage. Such damage can cause generator outages, lost revenues due to loss of generation, longer time to repair, and in some cases causing personnel injury. Project Weighted Rating-38.1, Primary Rationale-Reliability Alternative(s): No Alternatives Provided.	500 Newhalem Creek Rd, Marblemoun t, WA 98267	\$107
MC-CL- XS6515	Skagit Facility Conservation	Rationale: No Rationale Provided. Alternative(s): 1. Do nothing. 2. Perform work as detailed.	Newhalem Creek Rd, Marblemoun t WA 98267	\$484
MC-CL- XS6520	Skagit Facilities Plan	Rationale: The Skagit FERC Licensing agreement requires SCL to meet Section 106 of the National Historic Preservation Act of 1966, to take into account the effects of SCL's undertakings on historic properties. Additionally, the Skagit Licensing Agreement requires SCL to implement a historic resource mitigation and management plan demonstrating proper management of these resources. The Skagit Facilities Plan is SCL's commitment to meeting this licensing agreement requirement and results in better management of the overall resources and better operations and maintenance of the overall assets. Alternative(s): See the separate Skagit Facilities Plan that addresses alternatives. The alternatives include doing nothing, which does not conform to the FERC licensing requirements, and compromises our facilities as an asset to our power production operations and our civic and cultural stewardship responsibilities. The alternative to increase O&M resources (labor and budgets) is another option. This option improves facilities that are not required to meet program needs (improvements to vacant buildings).	Newhalem Creek Rd, Marblemoun t, WA 98267	\$817
MC-CL- XS6540	Skagit - Boat Facility Improvements	Rationale: Design and construct several new structures to support industrial and recreational boat operations on our Skagit reservoirs. Structures to include a new tour dock, new dry dock, additions to the existing boat houses and a new barge landing in Diablo. Alternative(s): No Alternatives Provided.	Newhalem Creek Rd, Marblemoun t, WA 98267	\$290

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MC-CL- XS6562	Ross - Governors	Rationale: The project will be best coordinated with the Bank 44 and 42 replacement projects in order to take advantage of the same outage. Alternative(s): No Alternatives Provided.	Ross Powerhouse	\$95
MC-CL- XS6564	Ross - Exciters 41-44	Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.	Ross Powerhouse	\$756

**Amounts in thousands of dollars.*

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MC-CL- XS6610	Diablo Dam - Spill Gate Trunnion Upgrades	<p>Rationale: FERC requires the floodgates on the dams be demonstrated regularly. Gates 2, 3, 14 and 15 at Diablo Dam were tested per FERC requirements in July 2013. Gate 2 trunnion had the highest friction of those tested. Along with the high numeric values there was mechanical noise from the trunnion when the gate was operated. Gate 2 was LOTO'd, and in 2014 the trunnion was disassembled, inspected and found to be deteriorated. The trunnion pins were cleaned of corrosion, the bronze bushing was replaced with like-kind new materials, and the unit was reassembled and tested successfully. After repairs to gate 2, Mechanical Engineering studied why gate 2 failed, establishing requirements for testing the other gates, and identifying a repair method. During this program, it was identified that: ? all the other gates (being of similar design) were at risk of failing by this method, ? the other gates tested at the same time were better than gate 2, but none met the standard of a coefficient of friction of 0.3 or less, ? replacement with like-kind materials offered only a renewal of the time. Maintenance inputs would remain the same (annual lubrication of 20 gates at approx. 3 hr/gate for a two-person crew) ? replacement with a permanent sealed bushing was the preferred method of rehabilitation. The project will rehabilitate all Tainter gate arms' trunnion bushings with new synthetic bushings that are permanently sealed and lubricated. Alternative(s): Do nothing and the Trunnions could seize up, causing a failure of the gate in the open position. This is considered a Dam Failure by FERC standards, and would be extremely costly to ratepayers. Replace with like-kind materials was performed for Gate 2. However there is no significant savings in labor to replace with like-kind (bronze), vs permanently lubricated, sealed, synthetic bushings. Materials savings only with this option, and maintenance continues as in the past which amounts to 2 persons @ 3 hrs/ea per gate, so for 20 gates about 120 person-hours for annual maintenance. Over the expected 75 year life, this amounts to a total of 9,000 hours @\$100/hr (total loaded rate) this amounts to \$900,000 in maintenance in 2014 dollars. Replace with new permanently sealed and lubricated synthetic bushings, labor is the same as for like-kind option, but materials are significantly more expensive than replacement with bronze bushings. However SCL can then avoid the maintenance cost of 120 person-hours annually and the \$900k in 2014 dollars for maintenance over the life of the improvement. The increased material cost for the new bushing type is \$2,660 per gate. That amounts to an upcharge of 53,200 for all 20 gates. As noted previously there is no labor difference between replace in kind vs these new bushings. The labor</p>	Milepost 126 Stte Highway 20	\$306
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*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

		savings in maintenance alone pays for the new bushing type.		
MC-CL- XS6986	Skagit - Relicensing	Rationale: Procurement of a new license for the Skagit River Hydroelectric Project from the Federal Energy Regulatory Commission (FERC) is required to continue operations. Alternative(s): No Alternatives Provided.	Newhalem Creek Rd, Marblemoun t, WA 98267	\$41,522
MC-CL- XS6991	Skagit Licensing Mitigation	Rationale: As part of the relicensing of the Skagit River Hydroelectric Project, City Light is required to provide mitigation for 30 years of continued project operation between 1995 and 2024. The license incorporates the Wildlife Settlement Agreement signed in 1991 by the City of Seattle and numerous interveners (Federal and State agencies, tribes, and environmental groups). This stipulates that the City shall make available a total of \$17,000,000 (in 1990\$) to secure and preserve valuable wildlife habitat. The charges to this CIP project will be credited towards the \$17,000,000 total. Alternative(s): 1. Perform work as scheduled in the Settlement Agreements and required by the license. This is the preferred approach to meeting our license obligations. 2. Delay implementation. This increases our liability since the bridge is falling down and poses a safety hazard which will only increase in future years. 3. Do not undertake some mitigation. This would have severe repercussions as the agencies and tribes are carefully monitoring our progress and participating as partners on many projects. They would likely contest our license should we not fulfill our commitments.	500 Newhalem Creek Rd	\$82

**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YD9009	Communications Improvements	<p>Rationale: Project 9009 provides the necessary flexibility to address emergent communication system problems that arise between biennial budget requests. These tend to be smaller projects costing less than \$10K per incident. During any given year there are a variety of requests requiring immediate attention. In addition, this program includes small specific improvement projects that are too small to warrant uniquely assigned project numbers. Each of these small projects has a separate scope of work, schedule, budget, and tracking mechanisms. An example is the project to monitor tower movement on our transmission towers near Oso, WA. Alternative(s): Option 1: Respond to customer requests for emergent and critical work in a timely manner. This approach preserves operational reliability, safety and security. This project provides flexibility to respond to these unknown communications problems or requirements. The alternative to having PE 9009 is to make special requests to the City Council for budget appropriations when emergencies occur. This is time consuming and limits the department's flexibility to react to emergent communications problems. Option 2: Fund the project at a reduced level and incur the risk that emergent trouble cannot be met and worker safety, security and system reliability is compromised.</p>	System Wide	\$700
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YD9102	Special Work Equipment - Other Plant	<p>Rationale: This project is a roll up of requests from individual work units in the Electrical Services Branch and other units in the department except for Generation Division (see CIP 6102) and Power Stations (see CIP 7902). All tools and work equipment over \$5,000 dollars must be capitalized. The purpose of this project is to collect these requests into a project to allow better tracking and review of the expenditures throughout the year. Requests have been reviewed and prioritized during the 2003-04 budget cycle and purchases deferred. The proper funding of tools for high voltage electrical and related work supports the department's goals of safety, productivity and employee morale. Alternative(s): 1. See description. 2. Do nothing. Do not allow units to purchase new tools or equipment valued at over \$5,000. This alternative is not acceptable as the department would be unable to meet the needs and expectations of our customers. 3. Prioritize and review the individual units' requests and adjust CIP to budgeted targets. This would be a new way to budget for this CIP. Individual units may need to defer equipment purchases and in some cases work may be deferred. Risks include the possibility that unplanned equipment failures in deferred equipment will delay work completion. Option 3 has been selected and only the highest priorities for equipment have been funded. This project is being funded at approximately one third the level that historically has been required.</p>	System Wide	\$794
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YD9108	Transmission & Generation Radio Systems	<p>Rationale: This project builds or replaces communications infrastructure consisting of fiber optic rings, digital microwave, telephone networks and two-way radio systems. This project provides City Light with command and control capabilities for the operation of the electrical system. This project ensures the safe, reliable and efficient operation of the system and positions SCL to meet the Federal Energy Regulatory Commission's vital communications systems requirements. Alternative(s): Option 1 Proceed as proposed. Option 2 Do nothing and continue to have systems that are incompatible with each other, require a high degree of maintenance, at greater cost, and in some cases, rely on commercial carriers for service and system protection; and/or face the loss of capability, capacity, coverage, licenses, and electrical system reliability. This alternative maintains the inadequate data exchange between sites, switches, feeders, meters, and communications systems and networks. Option 3 Install digital microwave instead of fiber systems at all substations and facilities. This is not cost effective, very difficult to locate land or space, design the system, acquire the land or space, provide power and get permits for adequate sites. Future upgrades are very difficult and expensive, and increases maintenance costs.</p>	System Wide	\$630
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YD9202	Security Improvements	<p>Rationale: If Seattle City Light's Security Improvements Program is underfunded, its critical facilities face increased risk to sabotage, vandalism, theft, and terrorism that can result in the loss of valuable infrastructure for generation and distribution of power, as well as noncompliance with North American Reliability Council (NERC) 1200 Standards, adopted May 2, 2006, to improve security at critical facilities that house command and control systems. Curtailment of Seattle City Light's electric operations would impact reliability of the power system in the Pacific Northwest, create lost revenues, and jeopardize public safety and emergency response due to loss of lifeline services such as medical services, water and wastewater systems, communications, law enforcement, banking, transportation system, etc. Alternative(s): Option 1, Status Quo: No centralized security system. Operate local security systems in place and use local law enforcement and private security companies to address security on a limited basis. Use private security services and/or request additional assistance from local law enforcement during times when the Federal government has raised the alert level for the nation or region, or for a situation that has occurred requiring additional security services. Option 2, Centralized Security System: Seattle City Light installs security enhancements to delay, detect, and respond to security intrusions at its critical facilities that are connected to a central security monitoring center that will be staffed by trained security guards on a 24/7 basis to monitor and respond to security incidents. Department wide response procedures will be established and coordination with local law enforcement will be established for responding to security incidents.</p>	System Wide	\$2,326
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**Amounts in thousands of dollars.*

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MC-CL- YD9307	Distribution Area Communications Networks	<p>Rationale: The communication systems now employed are in need increased capacity, better security, faster speeds, and increased reliability to meet new regulatory requirements. This will meet our ever increasing data and voice communication needs and take us twenty years or more into the future. Maintenance costs are lower because increased redundancy and reliability as well as better system alarms and the capability to remotely troubleshoot and reprogram the system. Traffic on the network is easily rerouted until major failures can be repaired. The new requirements of security, relaying, Automated Meter Reading, Automated Distribution and other automated systems will be easier to implement at lower cost once this project is completed. The system is easily upgraded to increase capacity or take advantage of new technology as it becomes available. Alternative(s): Option 1 Proceed as proposed. Install/complete fiber optic rings. Option 2 Do nothing. Have an inadequate communications network, with a high expense O&M component.</p>	Citywide	\$2,396
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YD9957	Enterprise Geographic Information System	<p>Rationale: The Enterprise GIS Initiative will support the Seattle City Light 2013-2018 Strategic Plan in these objectives: 1. Improve customer experience and rate predictability. 2. Increase workforce performance and safety practices. 3. Enhance organizational performance. 4. Continue conservation and environmental stewardship. Replacing our multiple, incompatible GIS systems with a single enterprise level GIS will eliminate redundant data entry into GIS and other systems, increase data quality and put information into the hands of the people who need it, when they need it, including engineering, operations, asset management and environmental affairs. An enterprise GIS will improve field worker safety and reduce the occurrence of expensive project changes in the field resulting from inaccurate or incomplete information. It will also streamline software maintenance and support requirements and ease integration to other future utility systems requiring access to GIS data. This new system will provide: 1. A centralized geospatial data store improving data access and interoperability to support other enterprise systems such as Outage Management (OMS), Work and Asset Management (WAMS), Mobile Workforce, System Planning/Analysis, Automated Utility Engineering Design (AUD), Advanced Metering Infrastructure (AMI) and Business Intelligence (BI). 2. Electronic and web based access to distribution, transmission, streetlight, joint use and fiber optics/communications infrastructure information. 3. A flexible, configurable system that can accommodate evolving business information needs. The additional transmission, streetlight, joint use and fiber optics information that the utility needs to maintain as we move to an asset centric maintenance and planning model essentially doubles the size of the GIS dataset. The number of staff supporting GIS needs has seen an overall reduction in the last decade. Alternative(s): This business case and proposal presents 3 options for dealing with the problem: A. Do Nothing B. Replace the current DAMS editor and convert TLM Services C. Install a new unified GIS system A. Do nothing. Do not fund the work. Continue to leave our Radial Distribution System's GIS data at risk, and by extension, baseline OMS functionalities. Apply additional resources to manually maintain systems using current tools. Write and support multiple custom interfaces and procedures to provide base line GIS data required by OMS & WAMS. Do not take advantage of new business processes and functionality of automation between GIS, OMS and WAM. B. Replace the current DAMS editor and convert TLM Services. The current DAMS editor was originally implemented in 1994 as a suite of custom applications</p>	System Wide	\$790
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*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

using Environmental Systems Research Institute (ESRI) Arc/INFO GIS products. DAMS tools are so obsolete that SCL is no longer backward compatible with our City partners in the Common Geographic Data Base (CGDB). To begin addressing these issues, the existing DAMS editor needs to be replaced. This project would incorporate into the DAMS GIS the final piece of connectivity data, between the customer meter and the transformer that is currently stored in the separate Transformer Load Management (TLM) database. This work will position City Light to begin working toward a unified GIS and to better leverage our GIS investment through new and improved integration to other major IT systems. Examples might include: 1. The ability to replace obsolete engineering analysis and planning systems, such as TLM and NLM/Loadflow, with modern GIS based applications. 2. The ability to more robustly model the underground portions of our Radial distribution system. 3. The ability to move closer to a unified GIS, including both our Radial and Network distribution systems in a single GIS data store, at City Light. C. Install a new unified GIS system. This option would install a new unified

MC-CL- YD9967	Outage Management System Phase II Implementati on	Rationale: See attachments Alternative(s): See attachments	Citywide	\$2,203
MC-CL- YD9969	Enterprise Software Solution Replacement Strategy	Rationale: This project is an ongoing commitment to provide a sustainable funding stream to keep enterprise level resources up to date and fully functional. Software systems today are as critical to operate City Lights business as poles and wires. The Utility can no longer afford to delay regular required upgrades and or replacements to the system. Alternative(s): City Light could decide not to upgrade the systems, as prescribed, but that could create a significant risk if the system goes unsupported by the vendor or if something were to happen with the software. Operations and Maintenance costs could rise significantly while attempting to maintain the software on our own.	City Wide	\$11,082

*Amounts in thousands of dollars.

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MC-CL- YN8129	Network Hazeltine Upgrade	<p>Rationale: Using the Network Hazeltine system provides reliable power by remotely monitoring the electrical vaults and electrical equipment within the entire downtown service area. The Power Dispatchers constantly monitor the real time status of the network using the Hazeltine system. This program costs \$304K per year and avoids problems that can easily exceed twice that amount for Seattle City Light and its customers. The utility's cost for one such problem can range from \$200K up to as much as \$3M. Aggregated customer costs can range from \$100K up to \$5M. The benefit cost ratio for any one problem can range from 0.99 ($[\\$200k + \\$100k] / \\$304k$) to be as high as 26.3 ($[\\$3M + \\$5M] / \\$304k$). We usually avoid 4 to 5 smaller problems each year and a larger problem, with combined costs of \$1.53M, every 5 years. The yearly benefit cost is then $[4 * 0.99 + 1.53M / (304k * 5)] = 5.0$. Alternative(s): 1. Do nothing. Do not change existing Hazeltine system. Hazeltine has changed the production of their transmitters, forcing utilities to pay a premium for the transformers that is a fraction of the cost of upgrading to their Next Generation equipment. 2. Upgrade to Hazeltine's Next Generation system, changing station receivers and transmitters on each transformer. Total cost is about \$2.2 million. 3. Develop SCL proprietary network EMS system, capable of monitoring plus a new function of control of NP's, BTS's, and primary switches if they are added. Total cost ranges from \$7 million to \$17 million, depending on communications option selected. This excludes developmental costs. 4. Buy any upgrades from vendors only. Wait for Hazeltine or other vendors, to develop network EMS systems with the desired control and monitoring features. No products or competitors to Hazeltine are available at this time for cost estimates. 5. Add sensors to existing or future Hazeltine system to enhance the monitoring of the network environment. This would enable system operators to detect and respond to abnormal field condition and thereby improve customer reliability. 6. Continue existing program of upgrading the sensors to match the current SCL standard. In 2007 and 2008, review the Hazeltine program and determine if more significant upgrades are feasible. Presently, this is the recommended action and funding level for 2007 and 2008. The 2009 and beyond dollars are expected expenditures for the significant Hazeltine upgrades, if approved.</p>	System Wide	\$539
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*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

MC-CL- YN8130	Network Maintenance Hole and Vault Rebuild	<p>Rationale: The Network Maintenance Hole (MH) & Vault Rebuild project provides reliable electric service by repairing or replacing damaged electrical maintenance holes/vaults and ducts located within the network. This project also reduces unsafe working conditions for our workers and potential hazards to the public. In the 1990s, licensed engineering consultants conducted a series of structural surveys on approximately 1,200 underground maintenance holes and vaults. Based on the survey, 38 MH/vaults have been repaired or replaced at a cost of \$14.1Million. Subsequent additional surveys have been done. Our prioritized list of facilities requiring major repairs or replacements includes replacing 78 MH/vaults and 350 vault roofs. The vaults that we are replacing for the 2007-2008 period have exceeded their expected lifetime. These are among the oldest facilities and include brick structures in Pioneer Square that are approximately 100 years old. Replacing now provides an opportunity to construct a route for bringing main stem feeder service cables through the Pioneer Square area and to a significant portion of the Downtown core area (City Hall, Justice Center, Seattle Municipal Tower) rather than using the Alaskan Way Viaduct structure. By repairing or replacing six manholes/vaults, rebuilding at least 10 vault/manhole roofs and 2,800 feet of old clay tile duct banks. Surveys performed by licensed civil engineering consultants have identified 78 maintenance holes/vaults requiring replacement as well as roofs for an additional 350 underground right-of-way facilities. Alternative(s): Alternative 1 - No Action: Vaults and maintenance holes with failing structures and grates would be left in place until catastrophic failure. Problems associated with deferring repair work include reduced worker and public safety, increased City liability, increased City paving expense, negative impacts on traffic flow through downtown when repairs are not coordinated with SDOT's paving operations, and loss of use of City Light facilities for customer service needs. The no action alternative is never an option as too many facilities are in states of failure that require at least temporary shoring and loss of use, and many require immediate repair. Alternative 2: Perform temporary fixes to the highest risk facilities until permanent repairs are made at some unspecified future date. Without a specific project to repair vaults and maintenance holes, temporary shoring systems installed in failed facilities has the following challenges: a) Electric crews cannot perform electric work in the failed facility with shoring left in place, effectively resulting in loss of use of the facility. b) Placement and removal of temporary shoring reduces productivity of field</p>	System Wide	\$1,852
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**Amounts in thousands of dollars.*

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personnel. c) Wood shoring rots from continuous exposure to moisture has limited life in wet network environments. d) Temporary fixes using steel beams can be applied in facilities with few cables or obstructions from temporary supports. Such repairs require costly custom designs from Civil Engineers and could be applied only where manhole access is not needed for several years. Alternative 3 (Preferred): Make permanent repairs to those facilities in need and continually monitor condition of civil facilities. Work would be prioritized to those facilities in highest need of repair, those associated with new customer load additions and those affected by public right of way projects, such as street paving. Benefits of this approach are improved worker and public safety, reduced City liability, improved tr

**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YN8201	Union Street Substation Networks	<p>Rationale: The Union Street Substation Networks project provides sufficient and reliable electrical capacity for the growing power needs of our customers. It is a programmatic approach for comprehensive management of underground network assets (electrical and in some cases civil) serving customers in the area bounded by Yesler Street, Alaska Way, Pike Street, 6th Avenue, Union Street, the Freeway, University Street, 3rd Avenue and the Waterfront area from Denny to Yesler. The project goal is to increase the capacity of present Union Street Substation network feeder cables to their ultimate service build out limit (an overall increase of 128 MVA) as determined by Union Substations transformer capacity, with allowances for feeder imbalances, feeder diversity and diversity among sub-networks. We will re-conductor and re-route four targeted service feeders by the end of 2008 and perform associated work such as feeder balancing. This includes the work in support of finishing the main stem build out and to address capacity issues in the branch portion of the feeder service cables as needed in response to specific service requests, as well as analyses of branch cable congested areas. Work in 2007 and 2008 as well as successive years is necessary to be able to pick up loads that will likely be transferred from Broad Street sub-networks in 5 years. To meet the projected new loads on the Waterfront and at specific downtown core sites we need to complete re-conductoring and re-routing of four targeted service feeders by the end of 2008 and perform associated work such as feeder balancing that will be transferred from Broad Street, and may be transferred from Massachusetts Street; build and energize a new network substation at least six years before all Downtown network capacity is used so that service cutovers can be done with minimal impact to our customers. This work is essential to meet near term load requirements of the SAM/WaMu and Four Seasons projects. This critical project Alternative(s): Alternatives include: 1. Do nothing. Make no improvements to system reliability or additions to feeder capacity. This would allow customer load to continue growing without commensurate additions to capacity of feeders serving this area, ultimately leading to multiple cable failures and extended customer outages. This would reduce the reliability of the network system from its present level, subjecting it to more lengthy outages. 2. Reduce customer demand for more load with demand side management measures. This alternative was evaluated in the Network Strategic Systems Plan and found to have negligible ability to reduce customer demand in the network area. 3. Increase capacity of network feeders incrementally, as little</p>	1312 Western AV	\$2,015
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*Amounts in thousands of dollars.

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as possible and as close to near-term load requirements as possible. This is no longer feasible as the next increment of feeder capacity additions reach their final capacity targets. 4. Increase capacity of network feeders to the full limit of the substations capability to deliver power. 5. Add measures that improve system reliability to mitigate the severity of any network event. 6. Add measures that improve customer reliability by preventing the chain of events leading to major customer impacts.

MC-CL- YN8202	Massachusetts Street Substation - Networks	<p>Rationale: The rationale for this project is to increase the capacity and reliability of present Massachusetts Street Substation network feeder cables to their ultimate service build out limit (an overall increase of 69 MVA), as determined by Massachusetts Street Substation's transformer capacity, with allowance for feeder imbalances, feeder diversity and diversity among sub-networks. The Alaska Way Viaduct project will require the relocation of all 13kV distribution feeders that are suspended from the viaduct. These include feeders serving Pioneer Square and the downtown core. Additional duct banks and electrical vaults must be built throughout the Pioneer Square area to accommodate the feeder relocations. Doing the engineering for this relocation during 2007 will ensure that timely civil construction can be done in order to avoid many conflicts with other utilities and mitigate some of the traffic impacts that will occur during the Viaduct and Seawall construction. Alternative(s): Alternatives include: 1. Do nothing. Make no improvements to system reliability or additions to feeder capacity. This would allow customer load to continue growing without commensurate additions to capacity of feeders serving this area, ultimately leading to multiple cable failures and extended customer outages. This would reduce the customer reliability of the network systems from its present level, subjecting it to infrequent but lengthier outages. 2. Reduce customer demand for more load with demand side management measures. This alternative was evaluated in the Network Strategic Systems Plan and found to have negligible ability to reduce customer demand in the network area. 3. Increase capacity of network feeders to the full limit of the substations capability to deliver power. 4. Add measures that improve system reliability to mitigate the severity of any network event. 5. Add measures that improve customer reliability by preventing the chain of events leading to major customer impacts.</p>	1555 Utah Ave S	\$3,164
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**Amounts in thousands of dollars.*

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MC-CL- YN8203	Broad Street Substation - Network	<p>Rationale: Customer demand for higher loads continues. Capacity of the cables serving two sub-networks is near overload, requiring immediate attention to avoid cable failure and customer outages. In the next five years, customers are projected to exceed the capacity of cables in another five network subareas. This capital project addresses the means to serve customer demand for higher capacity. Reliability measures identified in the Network Strategic System Plan are incorporated into this capacity driven work. Without this critical project it is very likely that there will be insufficient reliable electrical capacity in the very near future to hook up new customers and to serve present customers such as the Westin building. hernanju (7/29/21010): The project goal increases capacity of present Broad Street Substation network feeder cables to their ultimate service build-out limit (an overall increase of just under 100 MVA) as determined by Broad Street Substation's transformer capacity. This project constructs ten vaults and ten blocks of duct banks, re-conductors and relocates three primary feeders per year, upgrades/optimizes network transformers as needed, reduces secondary bus ties (reduce the size of the secondary grid resulting in greater reliability), and performs ancillary work. Alternative(s): Alternatives include: 1. Do nothing. Make no improvements to system reliability or additions to feeder capacity. This would allow customer load to continue growing without commensurate additions to capacity of feeders serving this area, ultimately leading to multiple cable failures and extended customer outages. This would reduce the customer reliability of the network systems from its present level, subjecting it to infrequent but lengthier outages. 2. Reduce customer demand for more loads with demand side management measures. This alternative was evaluated in the Network Strategic Systems Plan and found to have negligible ability to reduce customer demand in the network area. 3. Increase capacity of network feeders incrementally, as little as possible and as close to near-term load requirements as possible. 4. Increase capacity of network feeders to the full limit of the substations capability to deliver power. 5. Add measures that improve system reliability to mitigate the severity of any network event. 6. Add measures that improve customer reliability by preventing the chain of events leading to major customer impacts.</p>	319 6th AVE N	\$2,331
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**Amounts in thousands of dollars.*

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MC-CL- YN8301	First Hill - Network	<p>Rationale: At present, capacity of the cables serving the First Hill network is exceeded in several areas, requiring operation restrictions to avoid cable failure and customer outages. In the next few years, four or more large customer loads are expected to be added, exceeding the capacity of cables. Based on projected new loads within the First Hill area (Harborview and Swedish Medical Centers), the electrical capacity of the cables serving the sub-network will be exceeded, requiring immediate action to avoid cable failures and long costly customer outages. This project will provide and overall electrical capacity increase of 32.4 MVA for First Hill Substation customers. Alternative(s): Alternatives include: 1. Do nothing. Make no improvements to system reliability or additions to feeder capacity. This would allow customer load to continue growing without the department making commensurate additions to capacity of feeders serving this area. This would ultimately lead to multiple cable failures and extended customer outages. This would also leave the customer reliability of network systems at its present level, subject to infrequent but lengthy outages. 2. Reduce customer demand for more loads with demand side management measures. This alternative was evaluated in the Network Strategic System Plan and found to have a negligible ability to reduce customer demand in the network area. 3. Increase capacity of network feeders incrementally, as little as possible and as close to near-term load requirements as possible. 4. Increase capacity of network feeders to the full limit of the substation's capability to deliver power. 5. Add measures which improve system reliability to mitigate the severity of any network event. 6. Add measures which improve customer reliability by preventing the chain of events leading to major customer impacts.</p>	1100 Madison St	\$3,620
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**Amounts in thousands of dollars.*

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MC-CL- YN8404	Denny Substation - Network	<p>Rationale: This project is a result of a four years of advocacy by customers to make sure that the electrical distribution system has sufficient capacity to meet the projected loads in the rapidly growing area of North Downtown, and that the system has the reliability and voltage stability to support the research activities of the emerging biotech industry there. The principal stakeholders are the Fred Hutchinson Cancer Research Center, the UW School of Medicine, the Seattle Biomedical Research Institute, Rosetta Inpharmatics, ZymoGenetics, Children's Hospital and Medical Center, and the startups at the Accelerator Project. This five to seven year infrastructure project is specifically tailored and designed to the core needs of this business sector in the North Downtown area. The research activities and the laboratory equipment are so sensitive to system reliability and voltage stability that this area requires an extraordinary level of service from the utility. The motto is "World class research requires world class facilities.". The utility through this project is a partner in that effort. Because existing City Light substations cannot accommodate the new network feeders, this project requires the construction of a new North Downtown substation in a three to five year period, proposed as project 7757, North Downtown Substation Development. This network project cannot exist without the new substation. Alternative(s): 1. Enhance the service using non-network feeders from other substations. 2. Have individual customers invest in private reliability improvements. 3. Install network system in core service area, including the biotech industries. 4. Install network system throughout North Downtown area. Option 1 is not feasible because the availability of feeders from adjacent substations is limited and in question over time. Option 2 has been tried recently, but did not meet the reliability needs of this set of customers. Option 3 is the recommended option, as it is effective in meeting the need and cost effective. Option 4 includes all customers in the area, which is not necessary and expensive.</p>	Valley Street	\$10,647
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**Amounts in thousands of dollars.*

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MC-CL- YN8464	University Substation - Network	<p>Rationale: This project increases electrical capacity and reliability for University Substation customers in response to increased customer demand. At present, capacity of the cables serving the University network is exceeded in several areas, requiring operation restrictions to avoid cable failure and customer outages. In the next few years, larger customer loads are expected to be added, exceeding the capacity of cables. Based on projected new loads within the University area (University of Washington, Sound Transit) the electrical capacity of the cables serving the sub network will be exceeded, requiring immediate action to avoid cable failures and long costly customer outages. Alternative(s): 1. Do nothing. Make no improvements to system reliability or additions to feeder capacity. This would allow customer load to continue growing without the department making commensurate additions to capacity of feeders serving this area. This would ultimately lead to multiple cable failures and extended customer outages. This would also leave the customer reliability of the network system at its present level, subject to infrequent but lengthy outages. 2. Reduce customer demand for more loads with demand side management measures. This alternative was evaluated in the Network Strategic System Plan and found to have negligible ability to reduce customer demand in the network area. 3. Increase capacity of network feeders incrementally, as little as possible and as close to near term load requirements as possible. 4. Increase capacity of network feeders to the full limit of the substation's capability to deliver power. 5. Add measures which improve system reliability to mitigate the severity of any network event. 6. Add measures which improve customer reliability by preventing the chain of events leading to major customer impacts.</p>	645 NW 45Th	\$366
MC-CL- YR8322	Dallas Ave. 26 kV Crossing	<p>Rationale: Boeing and the other industrial customers in this area have critical facilities (e.g., Boeing wind tunnels) that depend on reliable power. The additional feeders assure reliable power supply to Boeing's operations and local industrial plants and residences. The Boeing Company has lobbied our management and the City Council to ensure that this line is replaced. Alternative(s): The do nothing alternative would leave Boeing and others with reduced reliability and in violation of previous SCL commitment.</p>	Dallas Ave S	\$206

**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- YR8351	Overhead Equipment Replacements	<p>Rationale: Equipment that is aging, overloaded, or of an outdated design poses a risk to the reliability of the system and could lead to unplanned outages and additional restoration expenses. By replacing the oldest and failing parts of our system, and those parts that are not made anymore, and we have no spare parts. We will replace items such as rotten and damaged cross-arms, transformers, hardware, old lead cable, PCB transformers, etc. By doing so, the system will be more maintainable and customer outages will be fewer and not as long.</p> <p>Alternative(s): The do nothing alternative leaves the existing system in place. As the aging and outdated equipment fail they will cause unplanned outages. This necessitates the immediate, unplanned replacement of these facilities. This causes hardship for the customers that are impacted and increased expense for City Light, especially if overtime is required to get the customers re-energized.</p>	System Wide	\$48,718
MC-CL- YR8353	Underground Equipment Replacements	<p>Rationale: Avoid unplanned outages or interruption of service due to equipment failure. Alternative(s): The do nothing alternative would allow the equipment to deteriorate beyond its useful life and result in increased outages to customers.</p>	System Wide	\$17,045
MC-CL- YR8355	Overhead Customer Driven Capacity Additions	<p>Rationale: This project adds capacity to the distribution system to accommodate increased load from new services. Alternative(s): The do nothing alternative leaves the existing system in place. New loads added to the system will adversely impact system reliability and voltage stability. It may be necessary, if the load increase is significant, to deny new service connections if the feeder capacity is inadequate.</p>	System Wide	\$2,579
MC-CL- YR8356	Overhead System Capacity Additions	<p>Rationale: This project adds capacity to the distribution system to maintain the reliability level for the existing customers on the system and accommodate the increased load from new services. Alternative(s): The do nothing alternative leaves the existing system in place. New loads added to the system will adversely impact system reliability and voltage stability. It may be necessary, if the load increase is significant, to deny new service connections if the feeder capacity is inadequate.</p>	System Wide	\$2,260

**Amounts in thousands of dollars.*

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MC-CL- YR8358	Overhead 26kV Conversion	Rationale: The existing 4kV equipment has lasted beyond its useful life and is no longer supported by manufacturers. In some places, the 4kV system no longer has the capacity to carry the system loads we are now experiencing. The system also demands ever increasing O&M resources. Alternative(s): The do nothing alternative leaves the 4kV system in place. The capacity concerns will remain and grow worse as more loads are added to the system. Obtaining 4kV equipment will become increasingly difficult and O&M will increase as the system continues to age.	System Wide	\$1,053
MC-CL- YR8360	Underground Customer Driven Capacity Additions	Rationale: This project adds capacity to the distribution system to accommodate increased load from new services. Alternative(s): The do nothing alternative leaves the existing system in place. New loads added to the system will adversely impact system reliability and voltage stability. It may be necessary, if the load increase is significant, to deny new service connections if the feeder capacity is inadequate.	System Wide	\$3,079
MC-CL- YR8361	Underground System Capacity Additions	Rationale: This project adds capacity to the distribution system to maintain the reliability level for the existing customers and accommodate the increased load from new services. Alternative(s): The do nothing alternative leaves the existing system in place. New loads added to the system will adversely impact system reliability and voltage stability. It may be necessary, if the load increase is significant, to deny new service connections if the feeder capacity is inadequate.	System Wide	\$2,551
MC-CL- YR8362	Underground 26kV Conversion	Rationale: This project increases capacity to deliver power to City Light customers, rebuilds and maintains the backbone of the system, saves energy by reducing transformer and line losses, improves quality and reliability of service to customers, and releases unit substation properties for better neighborhood uses. Alternative(s): The do nothing alternative leaves the 4kV system in place. The capacity concerns will remain and grow worse as more loads are added to the system. Obtaining 4kV equipment will become increasingly difficult and O&M will increase as the system continues to age. Operations and maintenance costs are not expected to change as a result of this project. The Capitol Hill Underground Ordinance area does not have capacity at 4 kV to serve the load growth in the area, thus requiring City Light to install vaults, ducts and underground at 26 kV.	System Wide	\$1,005

**Amounts in thousands of dollars.*

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MC-CL- YR8425	Distribution Automation	<p>Rationale: The new distribution switching equipment is capable of intelligent controls. The integration of this equipment into the Seattle's distribution system will provide significant benefits and will set the stage for a Smart Distribution System that will become one of the main components of a Smart Grid. S&C Electric offers first generation switching equipment with compatible intelligence built in. Through this CIP, the Smart Distribution infrastructure can be designed, constructed, and operated until fully built out. With SMART GRID in place, operators of the distribution system can optimize the operation of our distribution system, reducing time for outage restoration and preventing some outages in the first place. A smart distribution system can also provide real time data of the system, maximizing the capability of the system, and may allow for deferment of capital expenditure. A fiber cable system that can support this operation has been partially constructed. This fiber ring project can continue and be expanded to provide adequate coverage for Smart Grid and other communication needs of Seattle City Light in the future. Fiber optics communication allows secure communications and meets NERC Cyber Security requirements. As the power system is changed or redesigned through usual needs to serve customers, automated switches can be installed in consonance with the integrated DA plan. Eventually the whole distribution system in Seattle Service Area would have a capability to become a Distribution Automation system. Alternative(s): 1. Business as Usual. Automatic switches will be installed as need arises. Power system switching will be done through manually operated switches. Outage restoration will depend on feeder patrols. 2. Expand pilot projects. Candidates are SODO, which is highly congested with power lines and serves the industrial customers, White Center & Burien areas, which have potential for growth, and south Duwamish commercial area. Include the South Lake Union area when the City decides to proceed with the development. Required? Yes. Distribution Automation needs to be a properly funded project. City Light will have a distribution system ready to deliver automation as part of a SMART GRID initiative.</p>	Citywide	\$2,998
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**Amounts in thousands of dollars.*

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MC-CL- YR8452	Pole Attachments	<p>Rationale: City Light is legally and contractually obligated to make space available on its facilities to government and private entities for communication and other purposes. Customers wishing to utilize space on City Light facilities are required to pay in advance for any necessary work required to provide the necessary space and minimum clearances to the electrical equipment. This ensures that the attachments meet all applicable federal, state and local safety codes. Customers are not allowed to make any attachments until all make ready work, including tree trimming, has been completed and the system made safe for the communication worker. Speed to market in the communications industry is critical for them to maintain their competitive advantage. Customers pay in advance for City Light crews to complete this work on overtime, without interrupting the normal assignments of the crews. All construction charges are deposited into the Light Fund. New wireless facilities and pole attachments generate an additional \$100,000 in rental revenue annually. Currently \$3.3 million in annual rental revenue is being generated and will continue to increase as construction and make ready work is completed. All rental revenue is deposited into the Light Fund. The communications industry and associated technology are growing at an astounding rate. City Light has experienced a 375 percent increase in pole attachment applications since 2007. All trends indicate that this growth will increase by an average of 24 percent annually. This does not take into account major initiatives such as fiber to the home, Advanced Metering Infrastructure (AMI), or vast expansion of existing networks and Distributed Antenna Systems (DAS). Completing the construction for make ready work and wireless facilities will enable City Light to fulfill its legal and contractual obligations to our customers. Customers will be provided a small measure of rate relief through increased revenue streams from these additi</p> <p>Alternative(s): It is possible that some or all of this construction work could be outsourced to electrical utility construction companies. This alternative presents obstacles like logistics, compatible parts, quality control, and required electrical reviewers. These challenges negate any cost savings and sometimes take longer to construct.</p>	System Wide	\$16,057
MC-CL- YR9974	PCB Tracking and Condition Assessment Project	<p>Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.</p>	System Wide	\$300

*Amounts in thousands of dollars.

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MC-CL-YS7121	Replace Breakers BPA Covington and Maple Valley Substations	Rationale: City Light's interconnection agreement with Bonneville Power makes City Light the owner of the breakers in the Maple Valley Yard. City Light is required by this agreement to make upgrades as required. The breakers are currently over capacity due to the addition of another 500 kV line into the area. Alternative(s): If SCL does not replace the breakers, they may be forced to do so through legal means due to a breach of contract.	Kent	\$11
MC-CL-YS7750	Substation Plant Improvements	Rationale: The Power Stations CIP Review Committee evaluates subprojects for this category based on cost benefit ratios and departmental policies. Proposed work includes seismic improvements to old buildings, refurbishment of concrete buildings, upgrades to potable water systems, and construction of storage facilities for materials and tools. Incidental work that Power Stations do to improve station security is also funded in this project. Alternative(s): The water system at the North Substation is old, deteriorating, and becoming unreliable for drinking and for fire protection. Allowing the present systems to deteriorate may endanger employees and further put the safety and reliability of key system resources at risk. Additional seismic improvements are planned at Broad Street substation. Refurbishment of concrete structures is planned at North Substation. Storage facilities for tools and safety protective ground cables are planned for Delridge and East Pine substations. There are several levels of alternatives for improving security at Seattle City Light's fourteen substations. They range from installing more effective perimeter fencing, to adding remote monitoring systems, to catch intruders.	System Wide	\$1,108
MC-CL-YS7751	Substation Capacity Additions	Rationale: We plan to design the feeder get-aways to carry power from substations as needed. Alternative(s): The alternatives to making capacity additions to existing substations are: 1. Accepting limitations on service to customers. 2. Successfully promoting voluntary power demand reductions. 3. Meeting capacity demand increases by new substations and transmission lines.	System Wide	\$2,199

**Amounts in thousands of dollars.*

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MC-CL-YS7752	Substation Equipment Improvements	<p>Rationale: The project includes a regular program of critical electrical equipment replacements at the substations, because this equipment becomes less reliable as it ages. The 2005-2006 plans continue a program to provide supervisory control of breaker functions. This allows remote control and monitoring of substation equipment from the System Control Center, which allows the System Control Center to diagnose the seriousness of an equipment malfunction or switch equipment more quickly. This allows a faster response time to correct system instability or outages. Alternative(s): This project is where the utility funds work on equipment that the maintenance review process identifies as being more cost effective to replace or refurbish than to continue to maintain. A review team prioritizes replacements by their criticality rating. This is a figure provided by the System Control Center that identifies the components of Seattle's distribution infrastructure that are especially important to the system as a whole. For example, an equipment failure at Broad Street Substation may cause more of a problem than one at Canal Substation because it is not as easy to switch loads into the network grid.</p>	System Wide	\$6,117
MC-CL-YS7753	Relaying Improvements	<p>Rationale: Relays are protective devices that guard system components when electrical equipment fails. When a relay senses a problem with a major piece of equipment, it opens the circuit flowing to that component and isolates it from the rest of the electrical system. This protects the rest of the distribution system from potentially cascading effects if one part fails to operate properly. Recent technological advances in relay and protection equipment and software allow remote control and documentation of system events. The work plan includes installing digital fault recorder (DFR) equipment and software at the substations. City Light is changing electro-mechanical relay components to electronic, programmable devices. This will make it easier to detect and manage equipment problems. Alternative(s): Almost every change out of high voltage substation equipment requires that its relay and metering be reset and modified. Not continuing to have a significant relay improvement program would keep us using old technology that is not maintained by its manufacturers.</p>	System Wide	\$5,105
MC-CL-YS7755	Substations Demand Driven Improvements	<p>Rationale: Requests from other agencies typically occur without enough notice to be included in the biennial budgeting process. The Power Stations Division budgets a nominal sum for each year to cover requests and to request spending authority. Alternative(s): The alternative to implementing regional demands is failing to meet City commitments to regional agreements.</p>	System Wide	\$5

*Amounts in thousands of dollars.

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MC-CL- YS7756	Interbay Substation - Development	<p>Rationale: The Broad Street Substation is reaching its capacity to serve the network and the growing South Lake Union neighborhood. The limiting factor is an inability to construct additional underground feeders to carry electrical current in to the area. The existing 26 kV distribution system and substations are becoming overloaded and a new 26-kV substation will feed the areas load growth. The 115 kV ring bus work at Broad Street and Canal Substations will provide the connections to the transmission system. The new substations will provide 10 to 15 new 26 kV getaways, adding to the distribution network and providing a new path for power to the area. Because City Light already owns property for a station in Interbay, it is the nearest opportunity we have to add capacity in the western part of the service area that will off-load demand from the Broad Street Substation for the South Lake Union district. Developers who are interested in projects in the SLU district want to know that City Light will be able to serve their needs reliably. Alternative(s): 1. Not build the new substation. 2. Option one build: Contract out the design and construction 3. Option two build: Have City Light design and integrate the facility into the distribution system, and construct the facility. It requires at least 36 months to site, contract for design, construct, and energize a distribution substation. There are several alternatives such as installing distributed generation facilities to meet load growth. City Light has considered constructing additional transmission corridors from the University Substation and/or Canal Substation. Both alternatives require crossing a body of water, which are expensive options even if environmental challenges do not delay or halt progress. Given the recognized growth in South Lake Union, City Light selected the most cost effective and achievable option - constructing a station at Interbay to serve the growing load in that part of the service territory.</p>	17th Ave West	\$247
MC-CL- YS7776	Substation Transformer Replacements	<p>Rationale: To replace aging substation transformers before they fail in service. Alternative(s): The alternative is to accept the risk of a transformer failure and the consequent added cost and time for emergency replacement.</p>	2136 N 163rd St, Shoreline	\$5,050
MC-CL- YS7779	Substation Breaker Replacements and Reliability Additions	<p>Rationale: To replace aging substation circuit breakers before they fail in service. Alternative(s): The alternative is to accept the risk of a transformer failure and the consequent added cost and time for emergency replacement..</p>	System Wide	\$4,181

*Amounts in thousands of dollars.

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MC-CL-YS7783	Substations Oil Containment	<p>Rationale: The rationale of this project is to get City Light into compliance with the Clean Water Act regulations (Title 40, Code of Federal Regulations, Part 112) which require that oil containment measures be taken that will prevent oil spills into any streams or open bodies of water. During preparation of the Oil Spill Plans required by the regulations, a comparison of existing oil containment facilities was made with the recently revised (August 2002) regulations, which resulted in discovery of instances at 11 of our substations of design problems or capacity problems that should be resolved to fully meet the regulations.</p> <p>Substation Scope of Recommended Oil Containment: (Scott McLean's project estimates) Duwamish Sub - Add oil containment at the bus bays and potential transformers. Major issues are proximity to the Duwamish River, which with porous soils raises the prospect of an oil spill finding its way to groundwater and into the river in a short period of time. Broad Sub - Remedy the insufficient capacity of the oil containment system and lack of impervious sumps. Major issue with the existing system is that spilled oil can overflow the undersized unlined sumps into the combined yard drain sys (i.e. combined drainage and oil containment system) and from there into City drains. There is no oil containment in the E yard. Improve the system or set up a contingency plan. Bothell Sub 1. Provide lining for the currently unlined sumps at transformers and OCBs, and provide for separating the oil containment system from the drainage system. Major issues include unlined sumps; no oil containment for oil tanks at west side next to wetland, combined drainage/oil containment system can spread an oil spill into the yard gravel. 2. Retrofit with impervious sumps at bulk storage tanks with normally closed valve. 3. Pipe 3 CBs at SW yard to MH with OSV. East Pine Sub - Remedy the undersized combined oil containment system, which has the potential of overflowing i</p> <p>Alternative(s): 1. Implement improvements recommended by Oil Spill Plans as soon as possible, to obtain compliance with the applicable federal regulations (Title 40, Code of Federal Regulations, Part 112). 2. Implement recommended improvements over a phased period of time, to obtain compliance with the applicable federal regulations (Title 40, Code of Federal Regulations, Part 112), giving priority to the sites of highest environmental risk. This is the selected alternative. 3. Do nothing.</p>	System Wide	\$548
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*Amounts in thousands of dollars.

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MC-CL-YS8424	Substation Automation	<p>Rationale: Seattle City Light's (SCL) remote monitoring and control of critical substation equipment from our system control center dates from the 1970s, when SCL led the industry's development. The basic configuration in each substation is unchanged since those early days. The configuration consists of a Remote Terminal Unit (RTU), which collects electric system measurements and status; forwards them promptly to the control center; conveys power dispatcher commands back to the substation to operate high voltage switches and circuit breakers for electric system reconfiguration in real time. Industry developments and the toll of decades have made necessary the upgrade of this system. The existing Remote Terminal Unit equipment is 40 years old, wearing out and cannot be replaced in kind because the equipment is no longer manufactured. It has insufficient capacity to address the needs of added substation sensors and controls, cannot offer the computerized capabilities of new technology, cannot support automation of the distribution system feeders radiating from the substations, is too slow to meet the speed requirements of new control applications, is energy inefficient and cannot support modern demands of sophisticated asset management of expensive high-voltage equipment, and it doesn't provide the insight into the operation of the substation that today's staff could be using to improve operation and maintenance practices. Further, an RTU failure will significantly affect the operation of the Automatic Generation Control (AGC) at the EMS. The AGC relies heavily on the RTU for accurate data acquisition of real time power flow on transmission lines to neighboring utilities, comprising the Western Interconnection governed by the Western Electricity Coordinating Council (WECC). The AGC enables the proper allocation of a pool of power generation to the appropriate load required by each utility customer. Loss of AGC due to RTU failure will in turn cause fines from the appropriate Alternative(s): Option I - Replace at Failure: This strategy poses significant business risk that will grow as the equipment ages. Currently, the average age is about 40 years old. This analysis assumes that this equipment will fail at an increasing rate at or before reaching 60 years old. The current technology can no longer be replaced or maintained because it is no longer manufactured. When the RTU fails, it will take one year to replace and require one year of manual operation, which adds approximately \$1Million of additional labor costs above the \$1.3 Million planned cost of replacement. Should SCL lose more than 2 RTUs in one year, it would take longer to replace and require more labor to manually operate the substations. However, replacing this equipment with</p>	System Wide	\$1,275
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*Amounts in thousands of dollars.

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modern technology will set the foundation to support future smart grid applications like AMI (Advanced Metering Infrastructure), OMS(Outage Management System), Asset Management applications, Distribution Automation, and reactive power management, to name a few. It will also allow SCL to meet future NERC compliance requirements for substation equipment and install intrusion control measures for substation security. Option II - Preferred Option: Planned RTU Replacement over 7 Years at a rate of 2 per year. This option will: Remove existing RTU. Install new server systems in every substation. Install supervisory control of feeders (30 feeders for each station) that serve network loads to allow remote control of feeder breakers from the EMS. Install group control of network feeders to enable load restoration in case of a sub-network or total substation outages. Install new annunciators and monitors for productive operator interfaces. Two other options were discussed but not pursued for this analysis. One alternative considered adding a server to each substation over 7 years, but did not propose to connect it. This option didn't return sufficient benefit and resulted in the disadvantage of prolonging the peri

MC-CL- YT7011	Transmission Capacity	Rationale: The capacity of the system is based on winter and summer peaks, weather conditions, and N-1 criteria. Additional capacity shall be added to meet the planning criteria for power delivery of new load demand. Alternative(s): If transmission lines are overloaded, overhead wires could sag beyond National Electric Safety Code clearances causing an unsafe condition, and underground lines could exceed the insulation's temperature rating causing damage to the cable. In order to avoid these situations from overload, which could cause long term outages; shorter term load shedding would be used.	System Wide	\$24
MC-CL- YT7104	Transmission Reliability	Rationale: As structures, insulators and conductors reach their end of life expectancy and need to be replaced to maintain existing systems. To meet the National Electric Reliability Council and Western Electricity Coordinating Council reliability criteria, it is necessary to add additional transmission lines that are not capacity driven. Wood poles will have a shorter replacement life of approximately 40-60 years depending on condition assessment. Alternative(s): Allow the lines to fail before replacing them. This can cause a dangerous safety issue and will reduce the availability of the system at unscheduled and inopportune times. The August 2003 East Coast blackout has shown that inattention to the transmission system has large implications.	System Wide	\$3,064

*Amounts in thousands of dollars.

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MC-CL- YT7105	Transmission Inter-Agency	Rationale: Seattle City Light is required to relocate facilities at the request of other agencies. Drivers for the relocations are road realignments, construction of facilities, regional upgrades, and changes in lighting. Inter-agency projects may or may not be reimbursable depending on real estate drivers. Alternative(s): Do not meet other agencies needs and potentially delay local, state, or regional construction programs. If interagency agreements are not met, there are usually contractual, permit, or franchise rights involved, which could lead to litigation.	System Wide	\$567
MC-CL- YT7125	Denny Substation Transmission Lines	Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.	System Wide	\$1,001

**Amounts in thousands of dollars.*

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MC-CL- YT8461	Transmission Line Inductor Installation	<p>Rationale: Rationale: This project is based upon a Memorandum of Agreement (MOA) between Bonneville Power Administration (BPA), Puget Sound Energy (PSE), and Seattle City Light (SCL), aimed at improving the reliability of the regional electric grid in the Puget Sound Area Northern Intertie (PSANI). Since the early 2000's, BPA has limited energy transfers between the Puget Sound area and Canada due to congestion in the Puget Sound Area. This project will reduce congestion and upgrade the reliability of the transmission system, reducing the risk of region-wide customer power outages in the future. Objectives for this project include: 1. Install series inductors on the Massachusetts to Union to Broad (MA-US-BR) and Denny to Broad (DN-BR) 115kV Underground Transmission Cable Lines in the downtown Seattle Transmission System by 2017. 2. Complete all Transmission System Improvements within the 2013 - 2018 CIP Forecast and Budget. 3. Complete all agreed upon Transmission System Improvements per the MOA by the end of 2017. 4. Complete necessary upgrades to existing substation and transmission equipment or structures to support Seattle City Light's 2013 - 2018 Strategic Plan Initiative for Transmission System Improvements. Project Goals: 1. Enhance customer experience and service reliability for SCL customers. 2. Reinforce transmission interties and interconnections with PSE and BPA. 3. Improve SCL asset strengths and load capacity on existing transmission systems. 4. Reduce the risk of region-wide customer power.</p> <p>Alternative(s): City Light belongs to the Columbia Grid, a regional transmission planning organization. SCL and other Columbia Grid members considered alternatives such as new phase shifting transformers, 500kV transmission lines, and additional underground cables. The goal of the regional analysis was to minimize costs and impacts using a one-utility approach for solving the transmission congestion issues. The selected projects were chosen after two years of transmission system studies and analysis. The 2011 report can be found in City of Seattle Ordinance 123779, as an attachment with a table of the alternatives considered.</p>	System Wide	\$285
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**Amounts in thousands of dollars.*

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MC-CL-ZC9937	New Customer Information System	<p>Rationale: A Customer Information System (CIS) is a key information asset for all utilities. The CIS needs to support the business model and directions of the utilities. Products in the CIS market become less viable over time while others become more viable as they mature and evolve. The current billing system, Consolidated Customer Service System (CCSS), that supports customer billing and call center operations of SCL and SPU was implemented originally in 2000 and was upgraded in 2006. This mission critical system supports SPU and SCL call center utility billing functions. As such, it bills over \$900 million in annual retail revenues for both utilities and issues more than 5 million bills per year. The underlying technologies that support the CCSS system are obsolete and no longer supported by the vendor. Replacing CCSS with a new or revised customer care and billing system enables high priority business capabilities that are not currently supported within the existing or upgraded Banner product. Implementation is expected to take 30 months with the assistance of a systems integrator and/or a team of new and dedicated FTEs who will be responsible for the delivery of all project deliverables.</p> <p>Alternative(s): 1. Do nothing. This alternative will have Seattle maintain its business relationship with the current vendor and plan for future upgrades on a periodic basis, about every four years. 2. Contract for customization of the current version to enhance capabilities and functions. 3. Purchase an upgraded version of the application from the same vendor. 4. Replace the CCSS with a different CIS. This alternative will involve developing a strategic plan, a business plan, and procurement plan. This alternative will require a sizable upfront cost for implementation. The utility plans to conduct a business requirements study in 2012 to identify the benefits and costs associated with each option and assist in making the best choice.</p>	700 5th Avenue	\$3,109
MC-CL-ZC9972	Call Center Improvements - City Light	<p>Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.</p>	University District / Roosevelt / Northgate	\$45
MC-CL-ZL8377	Transportation Streetlights	<p>Rationale: 2010 EMS Streetlighting that SCL owns may need to be relocated for transportation purposes, just as other SCL facilities. Often SCL will pay to move all types of its facilities if a project is deemed a Transportation Project. Utilizing SDOT as the design and construction management consultant allows SCL to avoid being in the critical path of transportation projects. It also allows for leveraging engineering staff. Alternative(s): The do nothing alternative would hamper transportation projects and cause delays to the public.</p>	System Wide	\$6,784

*Amounts in thousands of dollars.

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MC-CL- ZL8378	Streetlights: Arterial, Residential and Floodlights	<p>Rationale: Streetlights and floodlights are provided in public right of way, and on private property, for either public or private benefit. Often these lights are attached on existing City Light wood poles, but they may also be installed on separate metal poles, depending on the application. City Light owns the arterial and non-arterial lighting systems throughout the City of Seattle per Ordinance 119497. In other jurisdictions, franchise agreements may dictate City Light's requirement to support lighting needs. City Light has historically provided the resources to install street lighting. These capital costs are then reimbursed by the requesting party through monthly billing according to Seattle Municipal Code 21.49.060, Schedule T, Option C.</p> <p>Alternative(s): The do nothing alternative would deny new lighting, a service authorized by ordinance. In residential areas, public safety would remain at present levels. Along arterials, the existing aging system would deteriorate beyond usefulness and lag behind improved lighting standards.</p>	System Wide	\$4,334
MC-CL- ZL8441	Streetlight LED Conversion Program	<p>Rationale: 2010 EMS - This project will reduce annually energy consumption by 40% (for those lights replaced), provide Greenhouse Gas Avoidance of 5,446 metric tons of carbon per year, and reduce maintenance cost of the Utility's streetlight system. The savings in energy and maintenance costs will pay for the initial investment within the life of the new system. The overall goal of this project is to improve customer service and reduce cost. With a total system conversion, it is estimated that annual operating costs will be reduced from \$10,180,213.59 per year to \$6,510,231.31 per year. Debt service for system conversion capital cost may be made with these savings. Through 2011, 20,000 cobrahead residential fixtures have been installed. In 2012, residential conversion will take place from the southern border of City Light's service area to Brandon St. The 2013 conversion effort includes residential and minor collector arterials in Zone 2 (250 watt High Pressure Sodium replacements), from Brandon St to Denny Way. Complete conversion of the residential streetlights completion anticipated by the end of 2014. Arterial cobrahead luminaire conversion will continue through 2017. Ornamental LED conversion anticipated through 2021.</p> <p>Alternative(s): No Alternatives Provided.</p>	Citywide	\$2,983
MC-CL- ZL8481	Seattle Waterfront Streetlight Installation	<p>Rationale: No Rationale Provided. Alternative(s): No Alternatives Provided.</p>	1312 Western AVE	\$6,385

*Amounts in thousands of dollars.

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MC-CL- ZS8054	Meter Additions	<p>Rationale: Background: Of the 400,000 meters in City Light's metering system, approximately 80,000 are older than 30 years. City Light's Rates Unit estimates that replacing the meters would result in an increase in revenues of more than \$450,000 annually. City Light has a fiduciary responsibility to continually update the metering system. Due to continuous budget constraints, both in labor and material, targets of 10,000 obsolete meter exchanges were reduced in 2000, 2006 and 2008 to our current level of 5300, thus the backlog of older meters continues to increase. Methodology: New Service Installations: Over the past 9 years, new or upgraded services have averaged 5,500 a year. Material budgeting was based on a 2006 to 2008 average and current labor figures. These project funds support the demands of new construction and upgraded services. Obsolete Meter Exchange: The life cycle of a meter is 30 years based on the electro-mechanical meter. However, current and future electronic technology may reduce this life-span up to 50%. Older meters slow with age, resulting in a loss of revenue to the Department. Obsolete meters can account for up to 3 percent loss in department revenue. The Technical Metering Unit expects to exchange 10,000 obsolete meters annually starting in 2013 through 2016. Alternative(s): 1. Continue to replace obsolete meters at current level of 5,300 annually. City Light could not accurately bill for electrical consumption. Incur loss of City Light revenue due to slow meters. Results in increasing backlog of meters over 30 years old. Increased future utility costs due to replacing obsolete meters at an accelerated pace with higher labor and material costs. 2. Continue to replace obsolete meters at higher level of 10,000 annually. Increase number of customers who receive accurate and timely bills. Reduce loss of utility revenues due to slow meters. Avoid higher cost of meter replacement when meters fail.</p>	System Wide	\$3,830
MC-CL- ZS8350	Overhead Outage Replacements	<p>Rationale: During unplanned outages, work often must be done that requires the complete replacement, rather than repair just one piece of equipment that is normally capitalized. This includes poles and transformers. This project is intended to capture those expenditures. Alternative(s): During an unplanned outage, feeder switching will restore most, if not all of the affected customers. The do nothing alternative possibly leaves the few affected customers without power. The system also remains in its damaged condition which severely limits the flexibility to switch the feeders to allow for other outages, both planned and unplanned. Planned outages are needed to accommodate line moves and other system work.</p>	System Wide	\$1,043

*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

MC-CL-ZS8352	Underground Outage Replacements	Rationale: During unplanned outages, work often must be done that requires the complete replacement rather than repair just one piece of equipment that is normally capitalized. This includes cable and transformers. When there are no customer outages, the goal is to restore the system to its normal configuration within two months, unless customer driven construction mandates an earlier deadline or the magnitude of the scope of the outage makes this impractical. Alternative(s): During an unplanned outage, feeder switching will restore most, if not all, of the affected customers. The do nothing alternative possibly leaves the few affected customers without power. The system also remains in its damaged condition which severely limits the flexibility to switch the feeders to allow for other outages, both planned and unplanned.	System Wide	\$1,350
MC-CL-ZS8363	Network Additions and Services: Broad Street Substation	Rationale: The Broad Street Substation Network Additions and Services project connects approximately five small, four medium, and five large properties costing \$4.6 million and performs capacity additions work associated with service connections. These connections include condominiums, office buildings, medical facilities, hotels, and commercial and apartment buildings. Alternative(s): No Alternatives Provided.	319 6th AV N	\$10,901
MC-CL-ZS8364	Network Additions and Services: First Hill, Massachusetts, Union & University	Rationale: This Network Additions and Services project for the customers in the First Hill, Massachusetts, Union, and University District network areas provides service connections to approximately nine small, five medium, and four large properties costing \$3.5 million. These connections include condominiums, office buildings, medical facilities, hotels, and commercial and apartment buildings. Alternative(s): No Alternatives Provided.	1555 Utah AV S	\$3,903
MC-CL-ZS8365	Large Overhead and Underground Services	Rationale: There is a continuous demand for additional electric power services as new construction and renovation work occurs. Seattle City Light provides service to new customers in a safe, reliable, timely, and cost effective manner as a means to fulfill its commitment to be a customer and community focused organization. Alternative(s): Each service connection may have unique aspects that would require or facilitate design, construction, and financing alternatives. Seattle City Light will fully consider alternatives as a means to fulfill its commitment to be a customer and community-focused organization.	System Wide	\$3,371

**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL-ZS8366	Medium Overhead and Underground Services	<p>Rationale: There is a continuous demand for additional electric power services as new construction and renovation work occurs. Seattle City Light provides service to new customers in a safe, reliable, timely, and cost effective manner as a means to fulfill its commitment to be a customer and community focused organization.</p> <p>Alternative(s): Each service connection may have unique aspects that would require or facilitate design, construction, and financing alternatives. Seattle City Light will fully consider alternatives as a means to fulfill its commitment to be a customer and community-focused organization.</p>	System Wide	\$19,508
MC-CL-ZS8367	Small Overhead and Underground Services	<p>Rationale: There is a continuous demand for additional electric power services as new construction and renovation work occurs. Seattle City Light provides service to new customers in a safe, reliable, timely, and cost effective manner as a means to fulfill its commitment to be a customer and community focused organization.</p> <p>Alternative(s): Each service connection may have unique aspects that would require or facilitate design, construction, and financing alternatives. Seattle City Light will fully consider alternatives as a means to fulfill its commitment to be a customer and community-focused organization.</p>	System Wide	\$6,020
MC-CL-ZS8379	Normal Emergency	<p>Rationale: This project will collect costs related to the annual storm invoked work orders, which results in more accurate accounting for weather related and other emergency outage situations and leads to better planning for similar future events. SCL traditionally has budgeted for these events in the Outage capital project. This did not allow us to easily account for emergencies versus billed work, such as car and pole accidents. Separating these charges will allow us to track costs and feasibly plan for future emergency situations. Alternative(s): To continue to mix emergency and non emergency work in the Outage capital project. This project does not add a body of work but clarifies the accounting for it.</p>	System Wide	\$687
MC-CL-ZS8380	Major Emergency	<p>Rationale: This project will collect costs related to emergency work. This will result in more accurate accounting for weather related and other emergency outage situations. This project does not add a body of work, but clarifies the accounting for it. SCL traditionally has budgeted for these events in the Outage capital projects. This did not allow us to easily account for emergencies versus billed work such as car and pole accidents. Separating these charges will allow us to track costs and feasibly plan for future emergency situations. Alternative(s): To continue to mix emergency and non emergency work in the Outage capital projects.</p>	System Wide	\$2,885

*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

MC-CL-ZS8405	Network Additions and Services - Denny	<p>Rationale: This is a mandated project that provides electrical service connections and related improvements in response to requests for service from customers. The project provides targeted civil and electrical design assistance to customers to connect existing and proposed buildings to the North Downtown network system. The conversion effort is quite large since we are installing a new network in this area. It is imperative to participate in early design discussions with customers building in the area. For existing buildings, the conversions to network service are complicated and require expert assistance. This project provides service connections to biotech industry, condominiums, office buildings, medical facilities, hotels, and commercial and apartment buildings. Alternative(s): 1. Do nothing. 2. Hook up customers as they request. Option 2 is recommended as it is most compatible with our mission of customer service.</p>	Valley Street \$6,057
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL-ZS8426	Advanced Metering Infrastructure	<p>Rationale: City Light is at a point where replacement is unavoidable and needed in the short term due to the age and condition of its meters, meter reading equipment, and software. Approximately 50% of 350,000 residential meters in the field are at least 30 years old, which is outside the estimated lifespan for electro-mechanical meters. As of February 2009, residential electro-mechanical meters are no longer being manufactured. The software and handheld devices currently used by City Light meter readers to manually capture and record reads will no longer be supported after 2012. In addition, City Light currently employs 57 FTEs in Customer Billing and 44 FTE Meter Readers, of which 43%, or 25 FTE and 19 FTE respectively, are eligible to retire by 2014. This presents an opportunity for SCL to make operational changes that move the utility from a manual to an automated system at a time when it is needed. Alternative(s): Option 1 - Recommended solution: Full AMI implementation as entered. This option's up front capital costs result in significant net savings due primarily to reduced labor costs and increased revenue. In addition, it establishes the infrastructure, technology, and capabilities for improved customer service and support for future plans and operations. Option 2 - Status quo: Continue current meter replacement cycle using current commercially available digital meters without communication capabilities. At the current expenditure rate, between 5,000 and 7,000 meters are installed annually (replacement of failed meters, new meter growth, service changes, etc.). This option minimizes current annual capital costs, but does not provide for timely replacement of all electro-mechanical meters. In the event of accelerated failure rates from the aging meter population, capital costs would escalate. Other options previously screened out: A. Replace failed electro-mechanical meters with working electro-mechanical meters. The cost of purchasing electro-mechanical meters is currently lower than digital units but they are no longer being manufactured. SCL would have to acquire used or refurbished replacement meters from other utilities or companies, with the risk that availability will be reduced over time. B. Replace current electro-mechanical meters on an accelerated schedule using commercially available digital meters without communication capabilities. This option carries significant capital costs for meters, although it does not require the communications and IT infrastructure. It provides limited benefits, primarily through increased meter accuracy, but provides severely limited benefits compared to AMI deployment. C. Deploy AMI on a limited basis to Commercial and Industrial customers, plus a limited number of small services with</p>	Citywide	\$410
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL- ZT8307	Alaskan Way Viaduct and Seawall Replacement - Utility Relocations	<p>access problems. Partial implementation would require reduced capital costs but substantially the same investment.</p> <p>Rationale: The Alaskan Way Viaduct replacement includes a complex transmission and network/non-network relocation, design and construction, and is on a fast track. This work is integrated and required by the broader transportation project. The externally generated project and schedule includes significant electrical relocation work in the near term that will extend for over a decade. The utility is required to relocate for transportation relocated projects. The City's overall plan for the Alaskan Way Viaduct project includes utility funded relocations for the viaduct replacement and for rebuilding the Seawall. The series of subprojects that make up the Alaskan Way Viaduct replacement have opportunities for system improvements that will also be funded under this program. For most of the subprojects in the Alaskan Way Viaduct project, utility relocations will lead the construction. Therefore any delay in accomplishing SCL work will result in delays along the overall projects critical path. While the designs & construction schedules for the various subprojects in the Alaskan Way Viaduct program are being sequenced and detail design is underway for the immediate projects, the central waterfront elements of the overall project are beyond this budget cycle and are still in the preliminary design phases. Alternative(s): The Alaskan Way Viaduct program provides the utility with a combination of obligations and opportunities for system improvements over the next 6 years. The Alaskan Way Viaduct program will likely be the City's primary construction focus as its various projects impact traffic and roadway construction, seawall stabilization, and urban design on the waterfront. Seattle City Light facility relocations will be a part of each of these projects. The global nature of the Viaduct Program also provides the opportunity to make system improvements that will provide for increased reliability and capacity for our customers. For example, work in the south end will include system improvements that will increase feeder capacity and reliability for Port customers. Undergrounding of transmission lines near Broad Sub are being done as part of an overall SDOT street improvement with costs shared based on a negotiated MOA with SDOT. The return of Aurora, north of Harrison Street to a city street, and the decommissioning of the Battery Street Tunnel provides an opportunity to extend ducts and vault across Aurora to help provide system capability to the NODO area.</p>	SR 99 / Battery St	\$6,408
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**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

MC-CL-ZT8369	Overhead and Underground Relocations	Rationale: This project provides the means to move City Light system infrastructure, located in the public right-of-way for transportation projects, including street widening and street vacation projects. This means moving distribution lines to make way for construction of buildings, bridges, airport runways, tunnels, and for other utilities. This project moves electrical lines to accommodate or take advantage of transportation-related projects being constructed by other agencies. The project builds new and replaces old line segments, installs and replaces poles, and adds or renovates underground facilities to the distribution system, as necessary, to relocate distribution systems for transportation projects, street vacations, or other projects proposed by outside (non-City Light) agencies. Some projects are paid for by City Light and some are paid for by the requesting agencies. This project provides the means to move the system for transportation projects in the public right of way, including street widening and street vacation projects. Alternative(s): The do nothing alternative leaves the distribution of facilities in their current location, which would interfere with the projects of the other agencies.	System Wide	\$4,080
MC-CL-ZT8435	State Route 520 Bridge Relocations	Rationale: SCL is legally required to relocate its infrastructure to support transportation driven projects. Alternative(s): No Alternatives Provided.	SR 520 / Lake Washington	\$7,478
MC-CL-ZT8471	Sound Transit Lynnwood - City Light	Rationale: See alternatives. This is a legally required relocations project for SCL. Alternative(s): The Sound Transit Lynnwood Link project is a mandatory distribution system relocations project for SCL. Pursuant to SCL's status as a utility operating in the public transportation right-of-way, SCL is required by Washington State law to facilitate construction of new transportation projects by other agencies, such as Sound Transit. Therefore, this is not an optional project for SCL.	City Wide	\$2,794

*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

Seattle Department of Transportation

Project Name	Project ID	Project Capacity	Project Location	2022 Budget*
MC-TR-C004	Sound Transit - East Link	This project will provide design review, permitting, and construction support services for the Sound Transit - East Link project.	Citywide	\$70
MC-TR-C013	RapidRide Roosevelt	This project will increase the person-carrying capacity of Seattle transportation network and of the regional transit network.	VARIOUS	\$21,133
MC-TR-C019	Neighborhood Traffic Control Program	This program will install traffic calming devices on neighborhood streets.	Citywide	\$354
MC-TR-C020	New Traffic Signals	This project will install new traffic signals to improve traffic flow, reduce the frequency and severity of traffic accidents, and support pedestrian activity.	Citywide	\$1,867
MC-TR-C021	Next Generation Intelligent Transportation Systems (ITS)	This project will install new Intelligent Transportation System equipment to improve traffic flow.	Citywide	\$1,005
MC-TR-C029	Transit Corridor Improvements	This program implements projects that improve transit speed, reliability, access, and convenience, consistent with the Transit Master Plan.	Citywide	\$3,271
MC-TR-C030	Northgate Bridge and Cycle Track	This program will design and build pedestrian and bicycle improvements in order to increase safety and improve access to transit modes.	Multiple	\$6,064
MC-TR-C037	23rd Avenue Corridor Improvements	This project will install road improvements and improve the efficiency of Seattle transportation network and of the regional transit network.	23rd AVE S/E John ST/Rainier AVE S	\$3,290
MC-TR-C041	Non-Arterial Street Resurfacing and Restoration	This project is consistent with the priority placed on basic services and asset preservation, and protects the City's capital investment in non-arterial asphalt and concrete streets. City crews budgeted against this work are also those who respond to emergency events.	Citywide	\$1,797
MC-TR-C044	Burke-Gilman Trail Extension	This project will construct three miles of new multi-use trail.	VARIOUS	\$2,029
MC-TR-C047	Freight Spot Improvement Program	This project will improve mobility. Specific projects and the corresponding impacts on capacity are still to be determined.	Citywide	\$1,634
MC-TR-C050	Urban Forestry Capital Establishment	The initial estimate for establishment provided by SDOT Urban Forestry as a component of the Org Based Budget is subject to confirmation near the end of construction to ensure support to complete the 3 year establishment for trees and associated planting installed by the project. This coordination between SDOT Urban Forestry and CP&RS supports the close out capital projects in timely manner.	Citywide	\$9

*Amounts in thousands of dollars.

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MC-TR-C051	Madison BRT - RapidRide G Line	This project will increase the person-carrying capacity of Seattle's transportation network and of the regional transit network.	Madison ST/Alaskan Way/Martin Luther King Junior W	\$15,523
MC-TR-C062	Bike Master Plan - Protected Bike Lanes	This program will install bike lanes and bicycle route signing, and complete links or reconstruct key sections of urban trails in order to increase bicycle safety and access.	Citywide	\$9,188
MC-TR-C064	Vision Zero	This project will upgrade existing signals and signs, and install new ADA ramps, and pedestrian safety improvements.	Citywide	\$6,243
MC-TR-C072	Alaskan Way Main Corridor	The program will construct a new Alaskan Way surface street and public space.	VARIOUS	\$35,780
MC-TR-C087	SR-520 Project	This project will provide for the planning, design and EIS review on the SR 520 bridge replacement.	SR520 WB	\$1,951

**Amounts in thousands of dollars.*

Appendix A: New or Expanded Capital Facilities

Seattle Parks and Recreation

Project Name	Project ID	Project Capacity	Project Location	2022 Budget*
MC-PR-21001	Park Land Acquisition and Leverage Fund	This project will add acreage to Seattle's total park land acreage.	Citywide	\$2,582
MC-PR-21003	Develop 14 New Parks at Land-Banked Sites	This project will add 14 developed parks for active recreation to help meet the City's parks and open space goals.	Citywide	\$3,500
MC-PR-21004	Activating and Connecting to Greenways	This project will increase the number of miles of safe pedestrian routes for all ages.	Citywide	\$232
MC-PR-41029	Parks Upgrade Program	Capacity will depend on the project scopes that will be the subject of additional citizen review consistent with the Parks Department's Public Involvement Policies.	Citywide	\$808
MC-PR-41036	Comfort Station Renovations	ADA access will be improved.	Multiple	\$110
MC-PR-41039	Play Area Renovations	The project improves the safety and usability of the play areas, ensuring that Seattle's children can have a safe and enjoyable place to play.	Multiple	\$825

*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

Seattle Public Utilities

Project Name	Project ID	Project Capacity	Project Location	2022 Budget*
MC-SU-C1111	Water Infrastructure-Water Main Extensions	This project will install approximately 8,000 feet of new watermains per year.	Citywide	\$2,016
MC-SU-C1112	Water Infrastructure-New Hydrants	This project will improve fire protection by increasing the number of fire hydrants in the city.	Citywide	\$50
MC-SU-C1504	Regional Water Conservation	This project will extend SPU's water supply by up to 11 MGD using demand reduction from customer upgrades in water-using facilities and equipment to be more water efficient.	Citywide and Regional	\$1,183
MC-SU-C1505	Seattle Direct Water Conservation	This project will upgrade water-using facilities to be more water efficient and accelerate conservation savings by 3 million gallons per day in conjunction with reservoir covering, other system efficiencies, and upgrades to low income customer facilities.	Citywide and Direct Service	\$681
MC-SU-C2302	South Recycling Center	This project will replace the existing facility to increase the capacity to recycle more solid waste and improve the transfer capability of non-recyclable materials.	8100 2nd AVE S	\$900
MC-SU-C3604	Long Term Control Plan	This project will determine size and location of all future CSO control facilities within the City.	Various	\$100
MC-SU-C3610	Green Stormwater Infrastructure Program	This project increases capacity to convey combined sewer flows by slowing stormwater flows and reducing volumes entering the combined system, this is achieved by slowing, infiltrating or reusing stormwater.	Citywide	\$310
MC-SU-C3611	CSO Facility Retrofit	This project will retrofit, upgrade, and modify existing Combined Sewer Overflow reduction facilities.	Various	\$112
MC-SU-C3703	Pump Station & Force Main Improvements	This program will provide wastewater pump station improvements, upgrades, repairs and rehabilitation.	Various	\$8,993
MC-SU-C3802	Drainage Capacity Program	This program will provide flood control and local drainage and wastewater projects in under-served parts of Seattle to improve system capacity or increase the existing level of service.	Various	\$2,978
MC-SU-C3804	Sanitary Sewer Overflow Capacity	This project will add capacity to the existing sanitary sewer collection system to improve service and accommodate growth.	Various	\$3,799
MC-SU-C3806	South Park Stormwater Program	New Pump Station with capacity of 44 cubic feet per sec, an associated stormwater filtration facility will treat flows up to 11 CFS, with the balance of higher flows bypassing filtration and pumped directly to the river.	698 S Riverside DR	\$19,032

*Amounts in thousands of dollars.

Appendix A: New or Expanded Capital Facilities

MC-SU-C3812	Broadview Long-Term Plan	Program does not increase capacity.	Broadview	\$4,158
MC-SU-C4107	Regional Facility - Other	This program will improve facilities at SPU's regional sites.	Regional	\$2,700

**Amounts in thousands of dollars.*