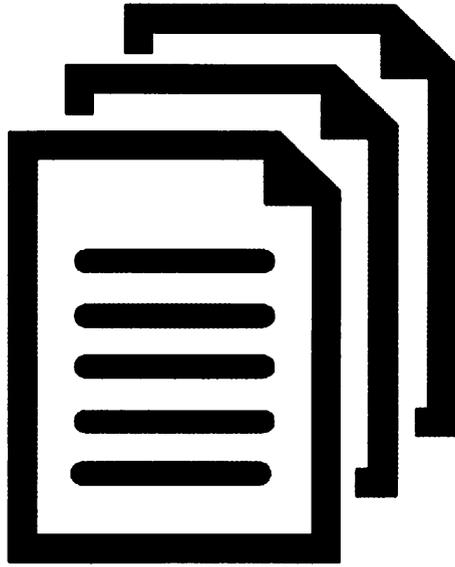


**Worksession: Electric Department 10 Year  
Capital Plan and  
an overview of Ordinance 2016-38**





September 1, 2016

To: Mark Gorman, Municipal Administrator  
Via: Jay Sweeney, Chief Finance & Administrative Officer  
From: Bryan Bertacchi, Electric Utility Director

**Subject: Electric Department - 10 Year Capital Plan and Associated Funds Transfer**

**Executive Summary:**

The Electric Department respectfully requests Assembly approval of a revised and consolidated ten year capital plan. This ten year plan includes expending a total of \$22M in capital over the ten year period while maintaining an emergency reserve of \$2.5M and a liquidity reserve of \$1.0M. These reserve requirements are based on industry best practice as recommended by the CBS Chief Finance and Administrative Officer. The currently available Electric Department total working capital of \$15,881,204 will be increased by a \$1.5M/year due to the bond covenants. This request includes a revision to all Electric Department existing capital projects (“re-appropriation”) as well as newly identified projects to provide a complete consolidation. This recommendation comes after an eight month long process within the Electric Department which included detailed reviews coupled with 3<sup>rd</sup> party engineering studies. These projects are lengthy and interrelated, thus approval of the complete revision is requested.

**Background:**

The electrical infrastructure of the Electric Department required a thorough review to ensure that efficient and reliable operation will be sustained at the lowest reasonable cost. After review, it was identified that the available working capital was not sufficient to support the total number of capital projects identified. However, after an intensive and long process, staff is able to recommend a series of projects which can be completed within the existing capital constraints and that have the highest probability of ensuring reliability at low cost to our citizens and customers.

**Highlights:**

1. N-1 Project (\$3.9M): This term is used in our industry to describe redundancy and emergency backup. As we have often described, 80% of our citizens and customers are served from the Marine Street Substation. A back-up for this substation is imperative and necessary as the existing equipment is now over 35 years old. A new substation north of town would be ideal (Kramer Ave area) however the cost was identified as being too high (>\$13M of the available capital would be consumed). Alternatively, we are proposing to install a 2<sup>nd</sup> bay at the existing Marine Street Substation at a cost of approximately \$3.9M. This second bay would still utilize a portion of the older equipment, but the overall cost is substantially lower. This modification would also increase the amount of power that can be delivered from the Jarvis Substation to Marine Street customers in the

- event of an emergency. While not ideal, this provides the greatest increase in emergency backup at the lowest cost.
2. Green Lake Power Plant Overhaul (\$4.8M): The Green Lake Power Plant is a very valuable asset for the community and has not been overhauled since the early 1990's. A major pre-inspection is scheduled for 2018 which will help to further define and identify the costs of a major overhaul. Similar plants have had overhauls in the cost range of \$8M when a full rewind of the generators was required. We are currently recommending a reserve of 4.8M for this item. Numerous small inspections during the last twelve months have clearly demonstrated specific needs to return this overhaul to the list of required capital items.
  3. Jarvis Fuel System Repairs/Storage (\$1.5M) & Thimbleberry Bypass (\$3.8M): These two items are directly related. In August 2015 the fuel release demonstrated a need for extensive repairs and redesign to the Jarvis Street fuel storage system. Presently, the system was designed for over seven days of fuel storage. This period was defined by the time needed to repair the worst case scenario on the electrical transmission line....the Thimbleberry portion of the transmission line. The existing Thimbleberry portion of our 69kv backbone transmission line is installed in difficult and dangerous terrain and is subject to outages from fallen trees and extensive degradation of transmission poles. Presently, a repair during winter months has demonstrated to be dangerous and time-consuming (on the order of seven days), thus setting the amount of fuel storage required. This plan, proposes to permit and install a bypass to the existing transmission line from the Whale park area to the Blue Lake Switchyard. This line would be planned on the inside of the roadway to minimize the impacts to the viewshed. This line will reduce the cost of annual diesel fuel burned, reduce the redesign costs of the Jarvis fuel system (\$2M saved), likely eliminate the need to replace the very old diesel generation units at the Jarvis facility (\$10M saved) , and eliminate the costly and dangerous maintenance required on the existing transmission line.
  4. Feeder Improvements (\$1.6M): A host of miscellaneous feeder improvements are planned and required. Extensive aging and environment requires sufficient engineering, planning, inventory and lead time.
  5. Blue Lake 3<sup>rd</sup> Turbine (\$2.48M): A significant host of items are needed to close out this project and are required for compliance with the FERC permit including but not limited to: the dam overlook project, the campground, safety ladders on the dam, rock removal, etc.
  6. SCADA System (\$230,000): A significant amount of work has already been performed to remove the Electric Department control system from the interface with commercial carriers thus making the system significantly more secure. Additionally, the Green Lake power house and many of the system field breakers have only very limited control capability making outages more frequent and longer with extensive personnel overtime. These changes will improve safety and reliability and will bring old systems up to date significantly extending the life of the equipment (which lowers overall costs).
  7. Capital for Fuel Conversions (\$1.2M): With the assistance of Siemens Engineering, a number of facilities have been identified for conversion to dual fuel (Electric Interruptible boilers). These projects have a three year return on the invested capital and will subsequently improve revenue for the department and reduce the need for rate increases to all citizens.
  8. Harbor Meters (\$75,000): The revised electric rates will include an increase to the monthly rate for harbor meters which was reviewed and supported by the Harbor

Commission. This increase will generate annual revenue of approximately \$75,000 per year to support the needed replacement of failed harbor meters (currently approximately 75 meters out of service). These capital funds will be used to “kick start” this program to allow replacement of first 30 meters. Additional funding will be requested as the revenue is generated.

9. Jarvis Electric Storage and Shop Building (previously \$1.2M being reduced to \$85,000): Assembly members previously expressed concern at the older approved capital project (over \$1.2M) to add a new warehouse to the Jarvis Street Complex. The approval of this project was suspended by the Electric Department last year and has been revised to adding a number of new replacement cargo containers and an office trailer adjacent to the existing switchgear room.
10. Other Items on the list – Include existing approved capital projects which are being updated to reflect the balance needed for completion. Some additional new items are included for Safety, automatic start of back-up generators at Blue Lake/Green Lake, and a replacement roof for Green Lake.

**Recommendation:**

Approve the Electric Department 10 year Capital Plan.

# ELECTRIC DEPARTMENT 10 YEAR CAPITAL PLAN

B. Bertacchi - 8/25/2016

Rev 2

	Required	Desired Status	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	TOTAL	
63010	Green Lake FERC Compliance: Inspect and Upgrades	141,291	OPEN	105,000	36,291							141,291	
90562	Green Lake Power Plant Improvements	334,697	OPEN	50,000	50,000	50,000	50,000	50,000	50,000	34,697		334,697	
90594	Blue Lake Third Turbine and Dam Upgrade	2,477,001	OPEN	500,000	560,000	340,000	760,000	250,000	67,001			2,477,001	
90610	Blue Lake FERC License Mitigation	423,734	OPEN	220,000	93,790	109,944						423,734	
90614	Takatz Lake Hydroelectric (open pending Grant Aug FY17)	(0)	OPEN									0	
90646	Jarvis Street Diesel Capacity Increase	(21,361)	CLOSE	(21,361)								(21,361)	
90717	Jarvis Street Improvements	27,781	OPEN	27,781								27,781	
90794	Jarvis Bulk Tank Improvements	0	OPEN									0	
90804	Blue Lake Powerhouse Conversion	150,000	OPEN								150,000	150,000	
- New -	Blue Lake Howell Bungler Valve	0	NEW									0	
- New -	Green Lake Power Plant 35yr Overhaul	4,900,000	NEW		0	4,900,000	0	0				4,900,000	
- New -	Green Lake Power Plant pre overhaul inspection	380,000	NEW		380,000							380,000	
- New -	Jarvis Fuel System Repairs and Storage Tanks	1,500,000	NEW		200,000	700,000	500,000	100,000				1,500,000	
- New -	Blue Lake Auto start Back-up Diesel	70,000	NEW		70,000							70,000	
- New -	Green Lake Auto start Back-up Diesel	20,000	NEW			20,000						20,000	
- New -	Green Lake Re-roof	225,000	NEW					225,000				225,000	
80003	Feeder Improvements	1,600,000	OPEN	200,000	200,000	200,000	200,000	200,000	200,000	200,000	100,000	100,000	1,600,000
90261	Island Improvements	225,000	OPEN	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	225,000
90512	SMC Road Upgrades Express Feeder	0	CLOSE									0	
90627	Marine Street Substation Voltage Regulator	0	CLOSE									0	
90645	HPR - Kramer - Cascade Creek Line Riser	0	CLOSE									0	
90648	Transmission & 1220 Upgrade	0	CLOSE									0	
90672	Medevejje Hatchery Transformer Replacement	45,000	OPEN	45,000								45,000	
90718	Marine Street Substation Replacements	160,000	OPEN	20,000	20,000	20,000	20,000	20,000	20,000	20,000	10,000	10,000	160,000
90765	Jarvis St. Control Building Roof Replacement	0	CLOSE									0	
- New -	Marine St N-1 Design to New HPR North Sub	3,900,000	NEW	1,400,000	1,500,000	0						2,900,000	
- New -	69 kV Thimbleberry Trans Line Bypass	3,800,000	NEW		20,000	20,000	60,000	300,000	1,000,000	1,400,000	1,000,000	3,800,000	
80040	Automated Meter Reading	32,085	OPEN	32,085								32,085	
90410	SCADA System Enhancements	230,000	OPEN	110,000	120,000							230,000	
90611	Microwave or Fiber Optic	0	CLOSE									0	
90628	Demand Side Load Management- (close 6/30/15)	14,437	OPEN	14,437								14,437	
90777	Meter Replacement Upgrading Meters	95,000	OPEN	45,000	50,000							95,000	
90791	Dual Fuel Interruptible Power	0	CLOSE									0	
90719	Jarvis Warehouse Paving	0	CLOSE									0	
90776	Jarvis Electric Storage & Shop Building	85,000	OPEN	85,000								85,000	
- New -*	Capital for Fuel Conversions (Interruptibles)	1,200,000	NEW	600,000	600,000							1,200,000	
- New -*	Asset Management	12,800	NEW	12,800								12,800	
- New -*	Safety - Arc Flash, Training, Equipment and implementation support	50,000	NEW	20,000	10,000	10,000	10,000					50,000	
- New -*	Harbor Meters	75,000	NEW	75,000								75,000	
	<b>TOTAL</b>	<b>22,152,464</b>		<b>3,565,742</b>	<b>3,865,081</b>	<b>6,444,944</b>	<b>1,645,000</b>	<b>945,000</b>	<b>1,587,001</b>	<b>1,679,697</b>	<b>1,135,000</b>	<b>285,000</b>	<b>21,152,464</b>

Existing Total Working Capital as of 8/2016	15,881,204											
Working Capital Growth per year	1,500,000			1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	
Liquidity to Maintain	(1,000,000)											
Emergency Reserve to Maintain	(2,500,000)											
Calculated Avail Cap per year	12,381,204			8,815,462	6,450,381	1,505,437	1,360,437	1,915,437	1,828,437	1,648,740	2,013,740	3,228,740

# ELECTRIC DEPARTMENT 10 YEAR CAPITAL PLAN

B. Bertacchi - 8/25/2016

Rev 2

	Required	Desired Status	FY17	Current Balance	Funding needed for FY2017	Closed Projects Re-appropriate Funds	Reappropriate	Balance
63010	Green Lake FERC Compliance: Inspect and Upgrades	141,291	OPEN	105,000	\$ 137,993.58			
90562	Green Lake Power Plant Improvements	334,697	OPEN	50,000	\$ 197,319.89			
90594	Blue Lake Third Turbine and Dam Upgrade	2,477,001	OPEN	500,000	\$ 5,531,526.28		\$ 971,213.76	\$ 4,060,312.52
90610	Blue Lake FERC License Mitigation	423,734	OPEN	220,000	\$ 423,733.62			
90614	Takatz Lake Hydroelectric (open pending Grant Aug FY17)	(0)	OPEN		\$ 488,555.66			
90646	Jarvis Street Diesel Capacity Increase	(21,361)	CLOSE	(21,361)	\$ 244,393.41	\$ 244,393.41		
90717	Jarvis Street Improvements	27,781	OPEN	27,781	\$ 27,780.97			
90794	Jarvis Bulk Tank Improvements	0	OPEN		\$ 381.05			
90804	Blue Lake Powerhouse Conversion	150,000	OPEN		\$ 150,000.00			
- New -	Blue Lake Howell Bungler Valve	0	NEW					
- New -	Green Lake Power Plant 35yr Overhaul	4,900,000	NEW					
- New -	Green Lake Power Plant pre overhaul inspection	380,000	NEW					
- New -	Jarvis Fuel System Repairs and Storage Tanks	1,500,000	NEW					
- New -	Blue Lake Auto start Back-up Diesel	70,000	NEW					
- New -	Green Lake Auto start Back-up Diesel	20,000	NEW					
- New -	Green Lake Re-roof	225,000	NEW					
80003	Feeder Improvements	1,600,000	OPEN	200,000	\$ 118,328.00	\$ 81,672.00		
90261	Island Improvements	225,000	OPEN	25,000	\$ 65,087.91			
90512	SMC Road Upgrades Express Feeder	0	CLOSE		\$ 9,574.57		\$ 9,574.57	
90627	Marine Street Substation Voltage Regulator	0	CLOSE		\$ 9,150.00		\$ 9,150.00	
90645	HPR - Kramer - Cascade Creek Line Riser	0	CLOSE		\$ 21,985.05		\$ 21,985.05	
90648	Transmission & 1220 Upgrade	0	CLOSE		\$ 4,519.98		\$ 4,519.98	
90672	Medevejic Hatchery Transformer Replacement	45,000	OPEN	45,000	\$ 153,954.20			
90718	Marine Street Substation Replacements	160,000	OPEN	20,000	\$ 89,521.54			
90765	Jarvis St. Control Building Roof Replacement	0	CLOSE		\$ 12,223.05		\$ 12,223.05	
- New -	Marine St N-1 Design to New HPR North Sub	3,900,000	NEW	1,400,000		\$ 1,400,000.00		
- New -	69 kV Thimbleberry Trans Line Bypass	3,800,000	NEW					
80040	Automated Meter Reading	32,085	OPEN	32,085	\$ 55,215.94			
90410	SCADA System Enhancements	230,000	OPEN	110,000	\$ 44,298.77	\$ 65,701.23		
90611	Microwave or Fiber Optic	0	CLOSE		\$ 37,618.48		\$ 37,618.48	
90628	Demand Side Load Management- (close 6/30/15)	14,437	OPEN	14,437	\$ 24,437.93			
90777	Meter Replacement Upgrading Meters	95,000	OPEN	45,000	\$ 181,514.75			
90791	Dual Fuel Interruptible Power	0	CLOSE		\$ 78,979.09		\$ 78,979.09	
90719	Jarvis Warehouse Paving	0	CLOSE		\$ 30,899.79		\$ 30,899.79	
90776	Jarvis Electric Storage & Shop Building	85,000	OPEN	85,000	\$ 919,616.05		\$ 834,616.05	\$ -
- New -*	Capital for Fuel Conversions (Interruptibles)	1,200,000	NEW	600,000		\$ 600,000.00		
- New -*	Asset Management	12,800	NEW	12,800		\$ 12,800.00		
- New -*	Safety - Arc Flash, Training, Equipment and implementation support	50,000	NEW	20,000		\$ 20,000.00		
- New -*	Harbor Meters	75,000	NEW	75,000		\$ 75,000.00		
	<b>TOTAL</b>	<b>22,152,464</b>		<b>3,565,742</b>	<b>\$ 1,372,580.80</b>	<b>\$ 2,255,173.23</b>	<b>\$ 449,343.42</b>	

Closed Accts      \$ 449,343.42  
                           \$ 1,805,829.81  
                           \$ 834,616.05    Jarvis Electric Storage & Shop Building #90776  
                           \$ 971,213.76    Blue Lake Third Turbine and Dam Upgrade #90594  
 Balance                    \$ -