Consolidated Edison Company of New York, Inc.

Report on 2020 Capital Expenditures and

2021 - 2025 Electric Capital Forecast

Case 19-E-0065 – Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service.

New York, New York

February 28, 2021

Table of Contents

Summary T&D Capital Plan
2020 Capital Budget and Actual Spend

Thousands ($000)

	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
Electric T&D				
System and Transmission	$73,191	$50,999	$22,192	44%
Substations	$332,626	$311,844	$20,782	7%
Distribution	$879,152	$919,060	($39,908)	(4%)
Sub-total Electric T&D	**$1,284,969**	**$1,281,902**	**$3,067**	**0%**
Electric Interference	$163,935	$145,791	$18,144	12%
Total Electric T&D	**$1,448,904**	**$1,427,694**	**$21,210**	**1%**
Electric Production	**$23,466**	**$10,675**	**$12,792**	**120%**
Shared Services				
Facilities	$68,805	$125,727	($56,923)	(45%)
IT Initiatives	$279,601	$261,594	$18,007	7%
General Equipment	$107,593	$60,761	$46,832	77%
Other	$994	$957	$37	4%
Total Shared Services*	**$456,992**	**$449,039**	**$7,953**	**2%**
Sub-total Capital	**$1,929,363**	**$1,887,407**	**$41,955**	**2%**
Storm Hardening	**$4,719**	**$2,000**	**$2,719**	**136%**
Total Capital Expenditures	**$1,934,082**	**$1,889,407**	**$44,675**	**2%**
AMI	**$264,790**	**$331,721**	**($66,931)**	**(20%)**
CES - Electric	**$30,140**	**$48,399**	**($18,259)**	**(38%)**

*Note: *83% of Shared Services is allocated to Electric*

System and Transmission Capital Summary
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget
Total Environmental Programs	**$631**	**$586**	**$45**
Total Information Technology	**$499**	**$265**	**$234**
Total Replacement	**$16,288**	**$10,976**	**$5,312**
Total System Expansion	**$261**	**$0**	**$261**
Total Risk Reduction	**$54,689**	**$37,806**	**$16,883**
Total Safety and Security	**$823**	**$1,366**	**($543)**
Total System & Transmission Operations	**$73,191**	**$50,999**	**$22,192**
Interference	**$21**	**$30,000**	**($29,979)**
Total System & Transmission Operations with Interference	**$73,212**	**$80,999**	**($7,787)**

System and Transmission Operations
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
Environmental				
Environmental Enhancements Programs	$631	$586	$45	8%
Total - Environmental	**$631**	**$586**	**$45**	8%
Information Technology				
Distribution Orders Enhancements	$306	$265	$41	15%
EMS Reliability AECC and ECC	$166	$0	$166	100%
Wireless Solution Project	$27	$0	$27	100%
Total Information Technology	**$499**	**$265**	**$234**	**88%**
Replacement				
Transmission Feeder Failures	$13,217	$10,000	$3,217	32%
Transmission Failures - Other	$3,071	$976	$2,095	215%
Total Replacement	**$16,288**	**$10,976**	**$5,312**	**48%**
System Expansion				
Rainey to Corona - New 138KV Feeder	$261	$0	$261	100%
Total - System Expansion	**$261**	**$0**	**$261**	**100%**
Risk Reduction				
Pipe Enhancement Program	$27,625	$25,000	$2,625	11%
Joint Replacement Program	$12,820	$6,986	$5,834	84%
LP Reservoir Replacement	$0	$100	($100)	(100%)
Emergent Transmission Reliability	$10,028	$0	$10,028	100%
Dynamic Feeder Rating Program	$488	$1,500	($1,012)	(67%)
Overhead Transmission Structures Program	$1,287	$1,951	($664)	(34%)
Underground Transmission Structures Modernization	$1,936	$1,976	($40)	(2%)
Transmission Operations - Risk Reduction Projects	$414	$0	$414	100%
System Operation Enhancements	$91	$293	($202)	(69%)
Total Risk Reduction	**$54,689**	**$37,806**	**$16,883**	**45%**
Safety and Security				
Overhead Tower Rapid Rail Program	$504	$976	($472)	(48%)
Computer Room Renovation	$1	$0	$1	100%
ECC And AECC Facility Enhancements	$318	$390	($72)	(18%)
Total Safety and Security	**$823**	**$1,366**	**($543)**	**(40%)**
Total System and Transmission Operations	**$73,191**	**$50,999**	**$22,192**	**44%**
Interference	**$21**	**$30,000**	**($29,979)**	**(100%)**
Total System and Transmission Operations with Interference	**$73,212**	**$80,999**	**($7,787)**	**(10%)**

Substation Capital Summary
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget
Total Environmental Programs	$69,750	$71,100	($1,350)
Total Information Technology	$0	$0	$0
Total Replacement	$50,523	$42,152	$8,371
Total System Expansion	$38,654	$46,281	($7,627)
Total Risk Reduction	$163,624	$140,916	$22,708
Total Safety and Security	$10,074	$11,394	($1,320)
Total Substations Operations	$332,626	$311,844	$20,782
Storm Hardening	$4,584	$2,000	$2,584
Total Substations Operations with Storm Hardening	$337,210	$313,844	$23,367

Substations Operations
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
Environmental				
Substation EH&S Risk Mitigation Program	$69,750	$71,100	($1,350)	(2%)
EH&S Water Vulnerability	$0	$0	$0	100%
Total Environmental	**$69,750**	**$71,100**	**($1,350)**	(2%)
Information Technology				
Substation Technology Improvements Program	$0	$0	$0	100%
Total Information Technology	**$0**	**$0**	**$0**	**100%**
Risk Reduction				
138KV Disturbance Monitoring Program	$8	$0	$8	100%
Category Alarm Program Various	$879	$1,071	($192)	(18%)
DC System Upgrade Program	$2,399	$3,869	($1,470)	(38%)
Disconnect Switch Capital Upgrade Program	$2,483	$1,339	$1,144	85%
Jamaica Install Additional Breakers In Bus Section 2E And 3W	$8	$0	$8	100%
Circuit Switcher Replacement Program	$1,731	$893	$838	94%
Other Capital Equipment Upgrades	$1,300	$1,339	($39)	(3%)
Pothead Pressure Alarms	$0	$150	($150)	(100%)
Pumping Plant	$2,177	$2,563	($386)	(15%)
Ramapo Install New Surge Arrestors	$194	$924	($730)	(79%)
Reinforced Ground Grid Program	$1,038	$1,020	$18	2%
Substation Enclosure Upgrade Program (Includes Relay House Enclosures)	$839	$826	$13	2%
Relay Protection Communication Upgrades	$1,132	$2,500	($1,368)	(55%)
Retrofitted Overdutied 13KV and 27KV Circuit Breaker Programs	$10,340	$12,030	($1,690)	(14%)
Structural and Infrastructure Upgrades	$1,571	$3,228	($1,657)	(51%)
RTU Upgrade Program	$127	$1,377	($1,250)	(91%)
Transmission Station Metering & Scada Upgrades	$1,147	$1,317	($170)	(13%)
Condition Based Monitoring	$11,421	$12,000	($579)	(5%)
Fire Suppression System Upgrades	$900	$5,500	($4,600)	(84%)
High Voltage Test Set Program	$862	$850	$12	1%
Relay Modifications Program	$27,664	$20,000	$7,664	38%
Roof Replacement Program	$305	$1,037	($732)	(71%)
Buchanan - Addition Of New Breakers For Nuclear Switchyard	$5	$0	$5	100%
Gas Insulated Switchgear Program	$5,374	$0	$5,374	100%
High Voltage Circuit Breaker Capital Upgrade Program	$9,151	$7,770	$1,381	18%
SSO Loss Contingency Area Stat Rapid Recovery/Transm Resiliency TSFS	$5,963	$0	$5,963	100%
Substation Transformer Replacement Program	$53,888	$40,800	$13,088	32%
U Type Bushing Replacement Program	$3,801	$2,736	$1,065	39%
Mobile Control Center	$398	$0	$398	100%
Area Reliability Charges to Completed Projects	$15,333	$14,450	$883	6%
Auxiliary Station Equipment Program	$1,203	$638	$565	88%
Astoria East Stations Feeder 34051 and 34052 Reactor Relocation Project	$39	$0	$39	100%
Cap & Insulator Replacement Program	$0	$690	($690)	(100%)
Replace Disconnect Switches Fresh Kills	$19	$0	$19	100%
Capacitor Bank Tripping	$0	$0	$0	100%
Misc.	($74)	$0	($74)	100%
Total Risk Reduction	**$163,624**	**$140,916**	**$22,708**	**16%**
System Expansion				
Cricket Valley Contractor Oversight	$250	$0	$250	100%
Parkchester 2 Replace Limiting 13Kv Bus Sections No. 2	$110	$0	$110	100%
Astoria Feeder 34124L Cable Bypass	$64	$0	$64	100%
Replace 33KV Feeders Associated With TR21W - Fresh Kills	$0	$6	($6)	(100%)
Establish New Area Substation	($11)	$0	($11)	100%
E. 179Th Street Switchgear And Bus Replacement	$6,529	$12,053	($5,524)	(46%)
New 138KV FDR Vernon-Glendale & Newtown & INST 5th TSF @ Glendale * *(See Note Below)*	($49)	$0	($49)	100%
Greenwood-Install Surge Arrestor, BKR 3N, And Reconfigure Station	$1	$0	$1	100%
Hudson Ave, DSS	$31,760	$34,222	($2,462)	(7%)
Total System Expansion	**$38,654**	**$46,281**	**($7,627)**	**(16%)**
Replacement				
Failed Substation Transformer Program	$43,165	$30,000	$13,165	44%
Failed Substation Equipment Other Than Transformers	$7,358	$12,152	($4,794)	(39%)
Total Replacement	**$50,523**	**$42,152**	**$8,371**	**20%**
Safety and Security				
Critical Infrastructure Protection (NERC) Security Upgrades	$269	$975	($706)	(72%)
Substations Security Enhancement Program	$9,319	$9,750	($431)	(4%)
Cable Termination Platform Program	$486	$669	($182)	(27%)
Total Safety and Security	**$10,074**	**$11,394**	**($1,320)**	**(12%)**
Total Substations Operations	**$332,626**	**$311,844**	**$20,782**	**7%**
Storm Hardening	**$4,584**	**$2,000**	**$2,584**	**129%**
Total Substation Operations with Storm Hardening	**$337,210**	**$313,844**	**$23,367**	**7%**

Electric Distribution Capital Summary
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget
Total New Business	$155,221	$205,200	($49,979)
Total Replacement	$438,443	$403,161	$35,282
Total System Expansion	$31,901	$45,573	($13,671)
Total Risk Reduction	$122,900	$134,422	($11,523)
Oil Minders Environmental	$1,488	$1,700	($212)
Information Technology	$671	$0	$671
Equipment Purchases	$128,527	$129,004	($476)
Total Electric Distribution	$879,152	$919,060	($39,908)
Storm Hardening	$135	$0	$135
Total Electric Distribution with Storm Hardening	$879,287	$919,060	($39,773)
Interference	$163,914	$115,791	$48,123
Total Electric Distribution with Storm Hardening & Interference	$1,043,201	$1,034,851	$8,350

Electric Distribution
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
New Business				
New Business Capital	$129,527	$165,194	($35,667)	(22%)
EV Charging	$0	$10,000	($10,000)	(100%)
Meter Installation	$25,694	$30,006	($4,312)	(14%)
Total New Business	**$155,221**	**$205,200**	**($49,979)**	**(24%)**
Replacement				
Primary Cable Replacement (OA's)	$95,823	$88,213	$7,610	9%
Overhead	$90,737	$39,775	$50,961	128%
Temporary Services (incl. conduit)	$52,687	$69,001	($16,314)	(24%)
Street Lights (incl. conduit)	$21,733	$27,236	($5,503)	(20%)
Transformer Installation	$48,545	$34,367	$14,178	41%
Secondary Open Mains	$123,823	$134,569	($10,746)	(8%)
Targeted Primary DBC Replacement	$5,096	$10,000	($4,904)	(49%)
Total Replacement	**$438,443**	**$403,161**	**$35,282**	**9%**
System Expansion				
179th St Area Substation Reconstruction	$1,139	$488	$651	133%
BQDM Non Traditional	$609	$0	$609	100%
Cable Crossing (XW Riverdale & BQ Flushing)	$890	$5,015	($4,124)	(82%)
Network Transformer Relief	$10,363	$10,411	($48)	(0%)
NonNetwork FDR Relief (Open Wire)	$3,939	$3,782	$157	4%
Overhead Transformer Relief	$3,087	$2,299	$788	34%
Other System Expansion	$33	$0	$33	100%
Penn Network New feeders for Hudson Yards	$91	$0	$91	100%
Primary Feeder Relief	$6,195	$4,449	$1,746	39%
Secondary Main Relief	$3,392	$2,529	$863	34%
Woodrow Load Area	$33	$0	$33	100%
Load Transfer W42nd St to Astor	$1,498	$1,500	($2)	(0%)
Nevins St. Battery Storage	$362	$4,999	($4,637)	(93%)
QBB 13kV Riser Replacement	$2	$1,600	($1,598)	(100%)
Yorkville Crossings and Feeder Relief	$267	$8,500	($8,233)	(97%)
Total System Expansion	**$31,901**	**$45,573**	**($13,671)**	**(30%)**
Risk Reduction				
ATS Installation USS Reliability XW	$278	$0	$278	100%
Modernization and Other	$16,099	$19,163	($3,063)	(16%)
Osmose (C Truss)	$1,149	$1,332	($184)	(14%)
Other Reliability	$48	$0	$48	100%
Overhead Reliability	$40,795	$29,476	$11,319	38%
Pressure, Temperature and Oil Sensors	$986	$1,294	($307)	(24%)
Primary Feeder Reliability	$15,792	$7,502	$8,290	110%
Remote Monitoring System 3rd Generation	$2,309	$2,527	($218)	(9%)
Shunt reactors	$634	$1,291	($657)	(51%)
Transformer Vault Modernization	$21,551	$11,550	$10,001	87%
Underground Secondary Reliability Program	$19,690	$42,538	($22,848)	(54%)
Vented Service Box Covers	$239	$1,001	($761)	(76%)
Critical Facility Program	$1,556	$3,500	($1,944)	(56%)
Hellgate Dock Refurbishment	$0	$850	($850)	(100%)
OH Resiliency	$590	$2,099	($1,509)	(72%)
Smart Sensors For Structures	$513	$6,300	($5,786)	(92%)
UG Network Resiliency	$0	$4,000	($4,000)	(100%)
28th Street- Flush	$170	$0	$170	100%
OH & UG Training Yards - Victory Blvd	$111	$0	$111	100%
Security Fencing for Unit Substations on SI	$388	$0	$388	100%
Total Risk Reduction	**$122,900**	**$134,422**	**($11,523)**	**(9%)**
Oil Minders	**$1,488**	**$1,700**	**($212)**	**(12%)**
Information Technology				
ARCOS Enhancement	$524	$0	$524	100%
Energy Services Dept Cost Accommodation Initiative	$10	$0	$10	100%
DECC Alarm Manager & Analytics System	($89)	$0	($89)	100%
EO MOBILITY PROJECT	$10	$0	$10	100%
Electric Distribution Control Center Upgrades	$0	$0	$0	100%
IGIN Radio Replacement	$212	$0	$212	100%
ProField Encore Enhancements	$0	$0	$0	100%
Rapid Restore System Rewrite	($0)	$0	($0)	100%
R&D Electric	($69)	$0	($69)	100%
Non-Network SCADA Consolidation	$5	$0	$5	100%
PQ SYSTEM UPGRADE	$44	$0	$44	100%
NEW NTX INTELLEGENT DATA CONCENTRATORS FOR U/S/S	$24	$0	$24	100%
Total Information Technology	**$671**	**$0**	**$671**	**100%**
Meter Purchases	**$6,979**	**$10,001**	**($3,022)**	**(30%)**
Sarnoff Equipment Purchase	**$13**	**$5,001**	**($4,988)**	**(100%)**
Transformer Purchases	**$121,536**	**$114,002**	**$7,534**	**7%**
Total Electric Distribution	**$879,152**	**$919,060**	**($39,908)**	**(4%)**
Storm Hardening	**$135**	**$0**	**$135**	**100%**
Total Electric Distribution with Storm Hardening	**$879,287**	**$919,060**	**($39,773)**	**(5%)**
Interference	**$163,914**	**$115,791**	**$48,123**	**42%**
Total Electric Distribution with Storm Hardening and Interference	**$1,043,201**	**$1,034,851**	**$8,350**	**1%**

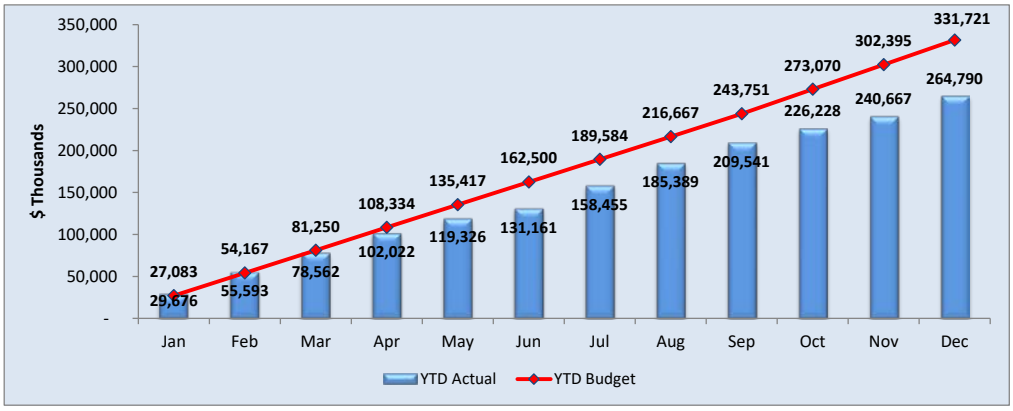
Customer Energy Solutions
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
AMI	**$264,790**	**$331,721**	**($66,931)**	**(20%)**
CES - Electric				
REV-DSPP	$24,535	$37,299	($12,764)	(34%)
REV - Demonstration Project	$5,548	$4,800	$748	16%
Storage - Fox Hills	$57	$6,300	($6,243)	(99%)
Total CES - Electric	**$30,140**	**$48,399**	**($18,259)**	**(38%)**

Consolidated Edison Company of New York, Inc.
AMI Project Update

Thousands ($000)



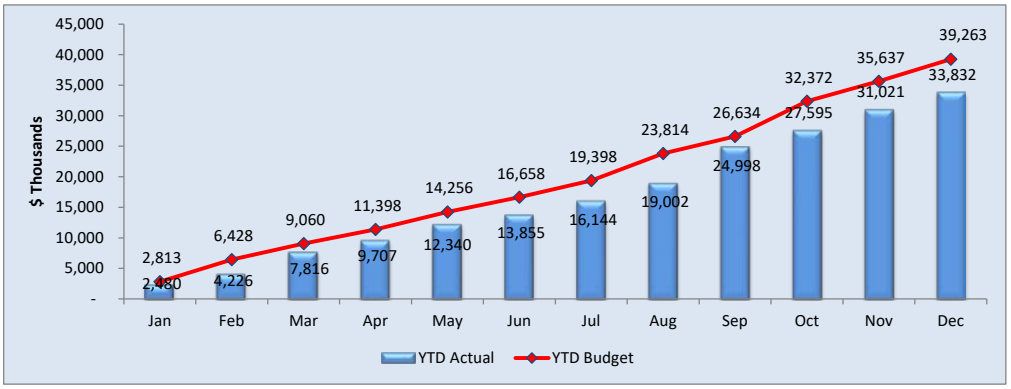
Description	DEC 2020 YTD Actual			2020 Year-End		
	Actual	Budget	Variation	Forecast	Budget	Variation
AMI-Capital	$264,790	$331,721	($66,931)	$270,000	$331,721	($61,721)

Variance Explanation:

Due to lower than expected equipment installation costs which were impacted by COVID-19 and the release of the project contingency back to the Company.

AMI Recent/Upcoming Milestones:

- Implement CVO in Westchester (completed)
- Complete Optimization in Westchester, Fulton Network, and Brooklyn Sheepshead Bay (Completed)
- Following the completion of Optimization in Westchester in 2020, maintain an estimated bill rate of less than 1.5% of Staten Island and Westchester (Completed)
- Complete 90% of mass meter AMI meter installations in Brooklyn (Completed)
- Enable restoration validation for mass pinging of smart meters (Completed)



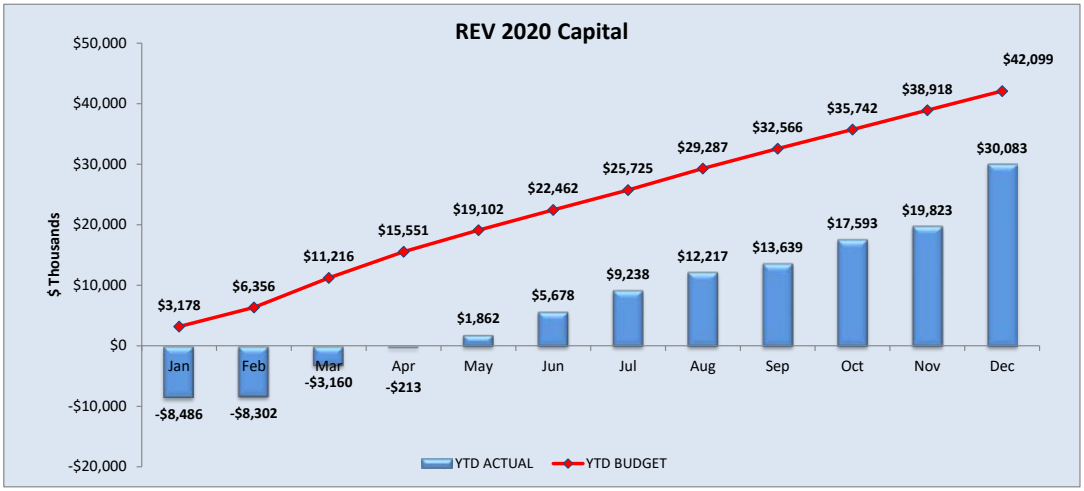
Description	DEC 2020 YTD Actual			2020 Year-End		
	Actual	Budget	Variation	Forecast	Budget	Variation
AMI-O&M	$33,832	$39,263	($5,432)	$36,280	$39,263	($2,983)

Variance Explanation:

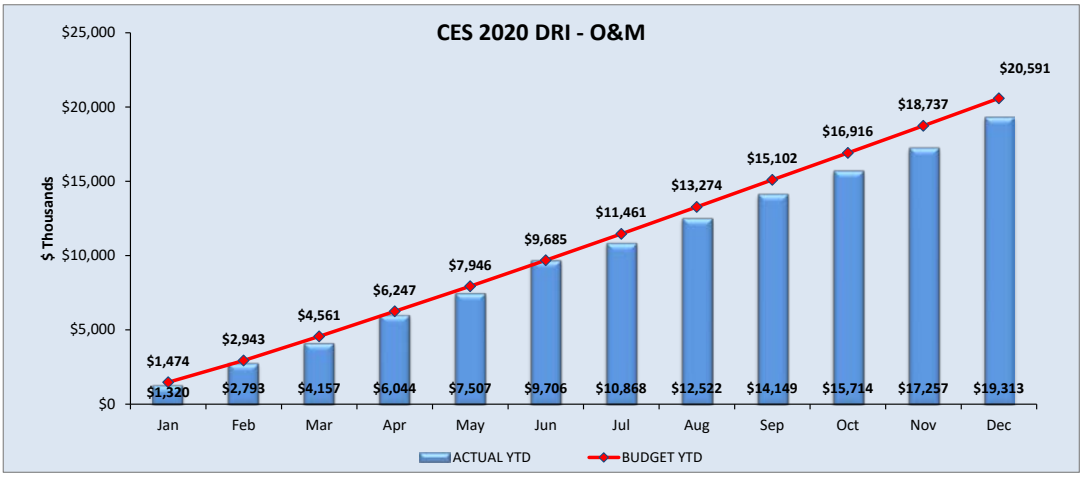
AMI Training: Underrun driven by delays due to COVID-19
AMI Expense: Underrun due to lower than expected IT costs
Rate Pilot: Underrun due to savings in vendor and CSR expenses
Customer AMI External Outreach: Underrun is due to a reclassification of expenses associated with billing adjustment work during installation to capital and the transfer out of O&M to capital accounts and a reduction in mailing expenses

Consolidated Edison Company of New York, Inc
Capital - Distribution Resource Integration

Thousands ($000)



CES - Electric Capital Programs & Projects	Dec 2020 YTD			2020 Year-End		
	Actuals	Budget	Variance	Target	Budget	Variance
REV - Demonstration Projects - Solar	$148	$4,800	($4,652)	$147	$4,800	($4,653)
REV - Demonstration Projects - Storage on Demand	$5,228	$0	$5,228	$50	$0	$0
REV - Demonstration Projects - EV Make Ready	$173	$0	$173	$223	$0	$223
REV - Demonstration Project Total	**$5,549**	**$4,800**	**$749**	**$420**	**$4,800**	**($4,430)**
DERMS	$1,386	$2,800	($1,414)	$1,979	$2,800	($821)
GIS	($9,320)	$0	($9,320)	($9,265)	$0	($9,265)
DMAP	$1,033	$1,667	($634)	$1,303	$1,667	($364)
DMTS	$3,018	$3,333	($315)	$3,103	$3,333	($230)
DRMS	$6,046	$1,300	$4,746	$6,197	$1,300	$4,897
Modernizing Protective Relays	$18,424	$12,600	$5,824	$17,196	$12,600	$4,596
VVO	$3,243	$14,300	($11,057)	$3,367	$14,300	($10,933)
Other Distributed System Platform Projects	$708	$1,299	($591)	$335	$1,299	($965)
REV - DSPP Total	**$24,537**	**$37,299**	**($12,762)**	**$24,215**	**$37,299**	**($13,084)**
Storage Program - Fox Hills	$57	$6,300	($6,243)	$258	$6,300	($6,042)
Storage Program Total	**$57**	**$6,300**	**($6,243)**	**$258**	**$6,300**	**($6,042)**



CES - DRI O&M Programs	Dec 2020 YTD			2020 Year-End		
	Actuals	Budget	Variance	Target	Budget	Variance
Utility of the Future	$2,135	$2,622	($487)	$2,071	$2,622	($552)
Distribution Planning	$843	$908	($64)	$863	$908	($45)
Demonstration Projects	$1,578	$1,492	$86	$1,562	$1,492	$69
Office of VP DRI	$1,086	$1,409	($323)	$1,342	$1,409	($67)
Energy Efficiency & Demand Management	$13,670	$14,159	($489)	$13,884	$14,159	($275)
Grand Total CES	**$19,313**	**$20,591**	**(1,278)**	**$19,722**	**$20,591**	**(869)**

CSS O&M Programs

Thousands ($000)

Description	Dec 2020 YTD			2020 Year-End			Explanations
	Actuals	Budget	Variance	Target	Budget	Variance	
CSS O&M	$2,726	$5,186	($2,460)	$2,808	$5,186	($2,378)	The underrun is due to the refinement of organizational change activities recasting the start to April. This had not been finalized at the time that the Hyperion budget was entered.
CSS Total	**$2,726**	**$5,186**	**($2,460)**	**$2,808**	**$5,186**	**($2,378)**	
Grand Total CSS	**$2,726**	**$5,186**	**($2,460)**	**$2,808**	**$5,186**	**($2,378)**	

New CSS Capital Programs

Thousands ($000)

Description	Dec 2020 YTD			2020 Year-End			Explanations
	Actuals	Budget	Variance	Target	Budget	Variance	
New CSS Capital	$51,950	$76,316	($24,366)	$52,316	$76,316	($24,000)	The cost estimates used to calculate the budget were straight-lined based on the business plan knowing that they would have to be recalibrated annually. For this year, the updates are reflecting the impact of the MSP, VSP, hardware, software and contract negotiations as they are understood by the team.
New CSS Total	**$51,950**	**$76,316**	**($24,366)**	**$52,316**	**$76,316**	**($24,000)**	
Grand Total New CSS	**$51,950**	**$76,316**	**($24,366)**	**$52,316**	**$76,316**	**($24,000)**	

AMI and CSS Deferrals

Thousands ($000)

Description	Dec 2020 YTD			Explanations
	EOY Variance to Budget	Deferred Amount	Carrying Charges	
New CSS Deferred Amounts				
CSS Capital	($24,366)		$0	2020 capital underspend of ($24M) has been budgeted in the '21-'25 Plan leaving ($.4M) to be planned
CSS O&M	($2,460)	($2,090)		
AMI Deferred Amounts				
AMI Capital	($66,931)		$4,289	2020 capital underspend of ($51.721M) has been budgeted in the '21-'25 Plan leaving ($15.2M) to be planned.
AMI O&M	($5,432)	$0		

Electric Production Summary
2020 Capital Budget and Actual Spend

Thousands ($000)

Description	Actual	Budget/Rate Plan	Variation Between Actual and Budget
Total Environmental	($56)	$0	($56)
Total Equipment Purchases	$118	$0	$118
Total Replacement	$6,164	$0	$6,164
Total Risk Reduction	$17,360	$10,425	$6,936
Total Safety and Security	($121)	$250	($371)
Total Electric Production	$23,466	$10,675	$12,792

Electric Production
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
Environmental				
EP Environmental - East River	($56)	$0	($56)	0%
Total Environmental	**($56)**	**$0**	**($56)**	**0%**
Equipment Purchases				
EP Equipment Purchases - East River	$118	$0	$118	0%
Total Equipment Purchases	**$118**	**$0**	**$118**	**0%**
Replacement				
EP Replacement - East River	$2,764	$0	$2,764	0%
EP Replacement - 74th Street Complex	$3,401	$0	$3,401	0%
Total - Replacement	**$6,164**	**$0**	**$6,164**	**0%**
Risk Reduction				
EP Risk Reduction - East River	$1,412	$0	$1,412	0%
EP Risk Reduction - 74th Street Complex	$71	$0	$71	0%
EP Mechanical - East River Unit 70	$2,276	$1,900	$376	20%
EP Mechanical - East River Unit 60	$212	$500	($288)	(58%)
EP Electrical and Controls - East River Unit 70	$4,782	$5,000	($218)	(4%)
EP Electrical and Controls - Hudson Avenue	$231	$250	($19)	(8%)
EP Civil and Structural - Hudson Avenue	$0	$400	($400)	(100%)
EP Civil and Structural - East River Unit 70	$8,233	$2,275	$5,958	262%
EP Electrical and Controls - 74th Street	$145	$100	$45	45%
Total Risk Reduction	**$17,360**	**$10,425**	**$6,936**	**67%**
Safety/Security				
EP Safety/Security - East River	($150)	$0	($150)	0%
EP Safety/Security - 74th Street Complex	$29	$0	$29	0%
EP Safety and Security - East River Unit 70	$0	$250	($250)	0%
Total Safety/Security	**($121)**	**$250**	**($371)**	**0%**
Total Electric Production	**$23,466**	**$10,675**	**$12,792**	**120%**

Shared Services
2020 Capital Budget and Actual Spend

Thousands ($000)

Description	Actual	Budget/Rate Plan	Variation Between Actual and Budget
Total Facility Projects	**$68,805**	**$125,727**	**($56,923)**
Total Strategic IT Projects	**$279,601**	**$261,594**	**$18,007**
Total Other	**$994**	**$957**	**$37**
Total General Equipment	**$107,593**	**$60,761**	**$46,832**
Total CECONY Shared Services Capital	**$456,992**	**$449,039**	**$7,953**

Shared Services and Common
2020 Capital Budget and Actual Spend

Thousands ($000)

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
Facility				
4 Irving Place - Re-Stacking (Local Law 26)	$503	$350	$153	44%
Data Center Expansion - Server Farm	$5,968	$2,421	$3,548	147%
Facilities Buildings and Yards - (Energy Efficiency Program)	$6,309	$10,000	($3,691)	(37%)
Facilities Buildings and Yards - (Roof Replacement Program)	$5,067	$5,060	$7	0%
Facilities Buildings and Yards All Other (Safety Environmental Regulatory)	$14,720	$6,035	$8,685	144%
Facilities Critical Infrastructure Short Term Priority_Programs	$14,656	$18,000	($3,344)	(19%)
Facilities Security Upgrade Program- Tier 1	$1,447	$3,000	($1,553)	(52%)
Facilities Service Center Renovations	$2,940	$8,870	($5,930)	(67%)
McKeon Door Demolition	$8,639	$14,470	($5,830)	(40%)
Sherman Creek Service Center	$36	$56,521	($56,486)	(100%)
Third Avenue New Transportation Building	$0	$1,000	($1,000)	(100%)
Total Facility	**$60,286**	**$125,727**	**($65,442)**	**(52%)**
Other Facility				
Astoria Southwest Storm Water System Corrective Action Plan	$51	$0	$51	100%
Brinkerhoff Demolition	$2,952	$0	$2,952	100%
CET 4IP-23rd Floor Reconfiguration	$464	$0	$464	100%
CNG Fuel Station Upgrades	($1)	$0	($1)	100%
Electric Vehicle Charging Infrastructure	$92	$0	$92	100%
Facilities Asset Management Upgrade	$12	$0	$12	100%
Facilities Flood Mitigation Program	$20	$0	$20	100%
Farrington Flush Facility Upgrade	$176	$0	$176	100%
Fleet Management Solution	$1,288	$0	$1,288	100%
Fuel Station Upgrades	$42	$0	$42	100%
Post COVID Facilities Upgrades	$1,985	$0	$1,985	100%
Van Nest Cable Office Renovation	$8	$0	$8	100%
Window Replacement Program - 4 Irving Place	$125	$0	$125	100%
Worth Street Site Master Plan	$1,304	$0	$1,304	100%
Total Other Facility	**$8,519**	**$0**	**$8,519**	**100%**
Corporate Security Non IT				
Corporate Security - Cyber forensic equipment	$108	$99	$9	9%
Corporate Security NVR and DVR replacements	$886	$858	$28	3%
Total Corporate Security Non IT	**$994**	**$957**	**$37**	**4%**
Strategic IT				
Allegro Replacement	$319	$2,266	($1,947)	(86%)
AutoCAD (Engineering Equipment Upgrade Program)	$252	$635	($383)	(60%)
Back Office Automation - Agent Tools	$0	$2,719	($2,719)	(100%)
BI Enhancements	$0	$453	($453)	(100%)
Budget System Enhancements	$4,278	$2,951	$1,341	46%
Business System Sustainability Program	$1,188	$1,154	$34	3%
CCTN Program	$10,654	$8,692	$1,962	23%
CE Bill Redesign	$886	$906	($20)	(2%)
Communications Infrastructure (Grid Mod)	$11,136	$13,596	($2,460)	(18%)
Construction - Fraud Risk Mitigation Program	$180	$181	($1)	(1%)
Construction Field Smart Forms 2018 -2021 (IT-KONY)	$856	$227	$630	278%
Contingency Analysis Program (CAP)	$9	$227	($218)	(96%)
Corporate Security - Company Wide Camera Rollout Program	$970	$953	$17	2%
CPMS Customer Knowledge Self-Self Service	$1,982	$5,439	($3,456)	(64%)
Customer Experience Center Disaster Recovery	$1,279	$1,360	($81)	(6%)
Customer Operations Data Analytics	$3,425	$4,532	($1,107)	(24%)
Customer Operations Journey Mapping	$654	$2,719	($2,065)	(76%)
Cyber Asset Management	$0	$300	($300)	(100%)
Cyber Security	$1,003	$1,000	$3	0%
Cyber Security Infrastructure	$4,200	$1,813	$2,386	132%
Cybersecurity	$8,183	$5,325	$2,858	54%
Data Center Improvements (Server Farm Infrastructure)	$1,844	$1,860	($16)	(1%)
Desktop Infrastructure	$661	$638	$23	4%
Digital Customer Experience (DCX)	$12,621	$12,563	$59	0%
Distribution Electric Control Center Cybersecurity	$883	$1,000	($116)	(12%)
Distribution Ops Training Simulator	$0	$227	($227)	(100%)
District Operator Task Managing System	$346	$390	($44)	(11%)
2021 Electronic Feeder Sign On	$289	$318	$30	10%
Emerging IT Project Initiative for Enhanced Distribution System Analysis	$0	$746	($746)	(100%)
EMS Replacement ECC and AECC	$4,320	$4,245	$75	2%
Enterprise Application	$62	$254	($192)	(76%)
Enterprise Project Management Software Project	$5,044	$3,898	$1,146	29%
FIG Forensic Data Analytics Platform (Phase 1)	$1,660	$1,900	($241)	(13%)
Financial Close and Consolidation - FCCS Application	$880	$907	($26)	(3%)
Fiserv Payment Processing (ACH)	$1,312	$1,300	$13	1%
GIS Implementation	$43,392	$30,000	$13,392	45%
Grid Mod Data Analytics Use Cases	$1,737	$1,813	($76)	(4%)

Shared Services and Common continued

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
Implementation of TCIS Phase 0 Recommendations	$1,437	$530	$907	171%
Innovative Pricing Pilot	$1,264	$1,500	($236)	(16%)
Install Telecom Facilities	$0	$302	($302)	(100%)
Integrated Supply	$2,457	$3,625	($1,168)	(32%)
IronNet	$705	$721	($16)	(2%)
Metrix IDR upgrade	$507	$310	$197	64%
Mobility	$9,988	$9,969	$19	0%
New Customer Service System	$51,950	$76,316	($24,366)	(32%)
New Technology	$533	$519	$14	3%
NYISO Transmission Owner Data Reporting System Next Generation	$980	$420	$560	133%
Off System Billing	$1,645	$907	$738	81%
OMS IT System Hardening	$12,042	$9,062	$2,979	33%
Operations Network for EMS	$279	$266	$13	5%
Oracle HCM Cloud Implementation	$137	$10,000	($9,863)	(99%)
Outage Management System (OMS) Upgrade	$3,990	$2,265	$1,725	76%
Rate Case Enhancements	$851	$4,254	($3,403)	(80%)
Scada Net	$467	$482	($15)	(3%)
Self Service Payment Kiosks	$1,032	$150	$882	588%
Substation Technology Improvements Program (Maximo Upgrades)	$3,706	$3,900	($195)	(5%)
Virtual Assistants	$4,487	$1,813	$2,674	147%
WMS - Phase 2	$284	$3,840	($3,556)	(93%)
WMS Enhancement	$0	$3,000	($3,000)	(100%)
WMS Sustainability Project	$1,370	$2,718	($1,348)	(50%)
Work and Asset Management Mobility Solution	$4,148	$5,218	($1,071)	(21%)
Account Reconciliation Tool	($0)	$0	($0)	100%
AMI - Load Shedding Project	$1,297	$0	$1,297	100%
AMR Saturation - Other Areas	$1	$0	$1	100%
AMR Strategic or Hard to Read	$1	$0	$1	100%
Application Performance Management (APM)	$581	$0	$581	100%
ARCOS SaaS Products (Workbench)	$1,950	$0	$1,950	100%
Bid Check Estimating Software Development Project	$4	$0	$4	100%
Bill Impact Enhancements	($1)	$0	($1)	100%
Billing System Enhancements to support Value of D	$12	$0	$12	100%
CEMS Windows Server Upgrade	$218	$0	$218	100%
Compass Replacement	$2	$0	$2	100%
Connected Vehicles - Enterprise Communication and Location Services	$3,436	$0	$3,436	100%
Conor Mobile Response Implementation	$188	$0	$188	100%
Construction Supply Chain IR Contractor Oversight System Enhancements	($0)	$0	($0)	100%
Corporate Accounting Request Application	$130	$0	$130	100%
Customer Interaction Center	$86	$0	$86	100%
Customer Service System Sustainability	($14)	$0	($14)	100%
Data Analysis and Reporting Tool	($0)	$0	($0)	100%
Datasplice Upgrade to Version 6	$367	$0	$367	100%
E5	$22,858	$0	$22,858	100%
EDAP-CVO	$490	$0	$490	100%
EHS Mobile Information Management System	$0	$0	$0	100%
Electronic Distribution Feeder Sign On	$35	$0	$0	100%
Electronic Stop Tag Application	$294	$0	$294	100%
Emergency Operation Center Incident Information Management System	$0	$0	$0	100%
Engage Platform Phase IV	$1,575	$0	$1,575	100%
Enterprise BI and Data Visualization Environment	$104	$0	$104	100%
Enterprise PI Historian Platform	$9,493	$0	$9,493	100%
Enterprise Security Platform	$6	$0	$6	100%
HR PeopleSoft Upgrade 2020	($50)	$0	($50)	100%
IBM Filenet Upgrade(NYCDOT Environment)	$377	$0	$377	100%
Information Technology Service Management (ITSM) Tool	$1,141	$0	$1,141	100%
Law Scanning and Coding project	$0	$0	$0	100%
Meter DATA Management System Upgrade	($5)	$0	($5)	100%
Misc. Project_Customer Ops	$0	$0	$0	100%
Misc. Project_EHS	$0	$0	$0	100%
Misc. Project_IT	$0	$0	$0	100%
Oracle BI for EBS Cloud Migration	$645	$0	$645	100%
Outage Scheduling System (OSS) - Phase 3	$590	$0	$590	100%
PeopleTools 858 Upgrade - Human Resources	$1,471	$0	$1,471	100%
PowerPlant Application Upgrade 2	$65	$0	$65	100%
ProField Encore (AMI Implementation)	$192	$0	$192	100%
Project Explorer - Metaphase Replacement 2	$33	$0	$33	100%
Third Party Risk Management	$885	$0	$885	100%
TNVS WEB	$378	$0	$378	100%
Total Strategic IT Projects	**$279,601**	**$261,594**	**$18,046**	**7%**

Shared Services and Common continued

Project/Program Description	Actual	Budget / Rate Plan	Variation Between Actual and Budget	Variation %
General Equipment				
XM1 Tier 1 - Office Furniture	$824	$830	($6)	(1%)
XM2 - Vehicles	$66,668	$37,250	$29,418	79%
XM3 Tier 1 - Stores Equipment	$277	$578	($301)	(52%)
XM 4 - Shop Equipment - Rollup	$333	$360	($27)	(7%)
XM5 and 15 Tier 1 - Laboratory Equipment (Testing and Chemical)	$7,388	$2,580	$4,808	186%
XM6 Tier 1 - Tools and Work Equipment	$5,066	$3,440	$1,626	47%
XM7 Tier 1 - Miscellaneous and Safety Equipment	$750	$1,034	($284)	(27%)
XM10 Tier 1_2 Computer Equipment Critical Infrastructure	$23,887	$12,335	$11,552	94%
XM8 Telecommunications Equipment Priority 1	$2,400	$2,354	$46	2%
Total General Equipment	**$107,593**	**$60,761**	**$46,832**	**77%**
Total CECONY Shared Services and Other Common Capital	**$455,999**	**$448,082**	**$7,955**	**2%**
All other projects	**$994**	**$957**	**$37**	**4%**
Total CECONY Shared Services Capital	**$456,992**	**$449,039**	**$7,953**	**1%**

2020 Capital Actual vs. Budget Variation Explanations

Thousands ($000)

	Actual	Budget	Variation (%)	Explanations
S&TO				
Transmission Feeder Failures	$13,217	$10,000	32%	Feeder Failures on 38M14, 38B02 and 38B05 (3 Failures versus a Budget of 2).
Pipe Enhancement Program	$27,625	$25,000	11%	2,762 TF conventional and 744 TF CFW completed versus the KPI footage goal (2,500TF) and M51,M52 dielectric fluid management goal (>2000TF).
Joint Replacement Program	$12,820	$6,986	84%	Additional 6 joints were completed on Feeder 38B02 in the Fall of 2020.
Interference	$21	$30,000	(100%)	Delays in project start due to municipal contractor selection delays
Substation Operations				
Substation Transformer Replacement Program	$53,888	$40,800	32%	Timing of milestone related transformer payments as well as carry-over from prior period installations
Failed Substation Transformer Program	$43,165	$30,000	44%	Timing of milestone related transformer payments as well as carry-over from prior period failures. Includes Dunwoodie, Farragut, Fresh Kills, Willowbrook, 110th #6 and #8
Failed Substation Equipment Other Than Transformers	$7,358	$12,152	(39%)	Less than anticipated failures
Relay Modification Program	$27,664	$20,000	38%	Acceleration of the Phase Balance relay upgrades and associated outages and 87N relay restorations and purchasing relays for early 2021 outages
Fire Suppression System Upgrades	$900	$5,500	(84%)	Transfers of capital work into retirement due to a revised ruling reduced the capital spend as well as delays in engineering packages issued for construction
E. 179th Street Switchgear and Bus Replacement	$6,529	$12,053	(46%)	Work that was planned in 2020 was shifted into 2021 due to system conditions
High Voltage Circuit Breaker Capital Upgrade Program	$9,151	$7,770	18%	Partly impacted by the installation of a significant crane foundation pad at Sprainbrook for the installation of breaker RNS6
Retrofit Overdutied 13kV and 27KV Circuit Breaker Programs	$10,340	$12,030	(14%)	Impacted by numerous COVID-19 related cancellations along with additional cancellations later in the year due to system conditions and resource constraints
Electric Distribution				
Meter Installation	$25,694	$30,006	(14%)	Due to work stoppage in March and April as a result of the Pandemic.
New Business Capital	$129,527	$165,194	(22%)	Underrun almost entirely in Retail, which was impacted by COVID-19 as well as CESIR DG credits
Overhead	$90,737	$39,775	128%	Overruns in all 3 OH areas: BW, BQ and SI as a result of TS Isaias, which struck on August 4th, a $24M impact. No COVID Impact
Temporary Services (incl. conduit)	$52,687	$69,001	(24%)	Target impacted by COVID 19, only publicly accessible shunts and 220v bridges worked, or anything that supported sheltering in place
Street Lights (incl. conduit)	$21,733	$27,236	(20%)	Reduced receipts due to mild winter and spring, which continued through the summer. No COVID impact
Transformer Installation	$48,545	$34,367	41%	Target increased through the optimization process, primarily in Manhattan and BQ. No COVID impact
Targeted Primary DBC Replacement	$5,096	$10,000	(49%)	Target reduced to due to COVID-19 workstream prioritization
Cable Crossing (XW Riverdale & BQ Flushing)	$890	$5,015	(82%)	Target reduced through COVID optimization process due to project delays in the Bronx
Nevins St. Battery Storage	$362	$4,999	(93%)	Delayed start to the project
Yorkville Crossings and Feeder Relief	$267	$8,500	(97%)	Target reduced through COVID optimization process due to project delays in Manhattan
Modernization and Other	$16,099	$19,163	(16%)	Unit S/S switchgear replacement was impacted due to COVID-19 restraints for social distancing
Overhead Reliability	$40,795	$29,476	38%	Target increased by optimization process for additional work on 33kV feeders in SI, and acceleration of work in Westchester. This work not impacted by COVID
Primary Feeder Reliability	$15,792	$7,502	110%	Target increased through optimization process due to additional work in the BQ Flatbush Network
Transformer Vault Modernization	$21,551	$11,550	87%	Target increased through optimization process due additional work in Manhattan. No COVID impact
Underground Secondary Reliability Program	$19,690	$42,538	(54%)	Target reduced due to impact of COVID-19 prioritization plan as well as availability of UG splicing and cable crews in BQ and Manhattan
Smart Sensors For Structures	$513	$6,300	(92%)	Target initially reduced due to COVID-19 prioritization plan
Sarnoff Equipment Purchase	$13	$5,001	(100%)	Accounting decision that the annual payment of $5M will be handled as a reduction of an existing liability as opposed to an expense for E&P. Transferred the $5M payment which was made in June to E&P to the Balance Sheet
Meter Purchases	$6,979	$10,001	(30%)	Less than anticipated purchase of New Business AMI Meters
Interference	$163,914	$115,791	42%	Overrun is driven by additional municipal resources on Catch Basin work

2020 Capital Actual vs. Budget Variation Explanations

Thousands ($000)

	Actual	Budget	Variation (%)	Explanations
	Actual	Budget	Variation (%)	Explanations
Customer Energy Solutions - Electric				
REV - DSPP	*$24,535*	*$37,299*	*-34%*	Administrative action to transfer expenses to consolidate them within IT contributed ($9.4M) to the underrun. Without this transfer program has a (9 %) variation. Projects also impacted by COVID-19
Storage - Fox Hills	*$57*	*$6,300*	*-99%*	Negligible spend due to re-design of the interconnection and spill containment system to meet compliance requirements followed by impact of COVID-19 NY Pause, site COVID-19 quarantines, and adverse weather conditions toward year end
Customer Energy Solutions - AMI				
AMI	*$264,790*	*$331,721*	*-20%*	Due to lower than expected equipment installation costs which were impacted by COVID-19 and the release of the project contingency back to the company
Shared Services and Common Facilities and Field Services				
Data Center Expansion - Server Farm	$5,968	$2,421	147%	Project delayed as part of FFS 2019 Capital Deferral Plan. COVID further extended completion of project and there were additional change orders during Commissioning
Facilities Buildings and Yards - (Energy Efficiency Program)	$6,309	$10,000	(37%)	COVID restrictions and impacts delayed manufacturing and onsite work
Facilities Buildings & Yards - (Safety Environmental Regulatory)	$14,720	$6,035	144%	Higher than budgeted spend due to emergent safety and regulatory projects
Facilities Critical Infrastructure Short Term Priority_Programs	$14,656	$18,000	(19%)	Lower than budgeted spend due to COVID related project delays.
Facilities Service Center Renovations	$2,940	$8,870	(67%)	Lower than budgeted spend due to COVID related project delays
McKeon Door Demolition	$8,639	$14,470	(40%)	Delayed restart due to COVID restrictions and permitting delays. Project on track for substantial completion early 2021.
Sherman Creek Service Center	$36	$56,521	(100%)	In July, NYC successfully appealed to reinstate the District Rezoning. Litigation finally resolved in NYS Court of Appeals in November 2020. Project re-start commenced December 2020
XM2 - Vehicles	$66,668	$37,250	79%	Higher than budgeted spend due to purchase of additional generators and additional storm response related bucket truck purchases
Strategic IT Projects				
CCTN Program	$10,654	$8,692	23%	Redesign underground conduit to avoid protected streets in Queens, NY and accelerated CCTN underground conduit construction
Communications Infrastructure (Grid Mod)	$11,136	$13,596	(18%)	The under run was due to unavailability of field support due to COVID
CPMS Customer Knowledge Self-Self Service	$1,982	$5,439	(64%)	Underrun due to a higher budget than anticipated for the project for 2020. Excess funds have been redistributed to other projects by the ITB Board
Cybersecurity	$8,183	$5,325	54%	Increase for additional firewalls and to continue PAM project to Phase III (additional licenses and services)
GIS Implementation	$43,392	$30,000	45%	Overrun due to transfer of funds from 2018
New Customer Service System	$51,950	$76,316	(32%)	The cost estimates used to calculate the budget were straight-lined based on the business plan knowing that they would have to be recalibrated annually. In 2020, the updates reflect the impact of the MSP,VSP,hardware, software, and contract negotiations
OMS IT System Hardening	$12,042	$9,062	33%	The incremental funds was used to purchase Oracle Exadata & Nutanix VMs, for the OMS (Outage Management System) hardware upgrade
Oracle HCM Cloud Implementation	$137	$10,000	(99%)	Under run due to revised work plan and revised estimated expenses. (project start delayed from Q1 to Q4 and reduced traveling expenses)
Work and Asset Management Mobility Solution	$4,148	$5,218	(21%)	Project was put on hold for 6 months due to vendor product issues Released $1.3M as dollars that would not be spent in 2020
General Equipment				
XM10 Tier 1_2 Computer Equipment Critical Infrastructure	$23,887	$12,335	94%	Additional funds to cover laptops and enhancements for remote access for both union and management and new data center backup technology

Budget/Rate Plan vs. Actual Capital Spending Explanations (New Programs/Projects)

Thousands ($000)

	Actual	Budget	Explanation
S&TO			
LP Reservoir Replacement	$0	$100	Delayed project
EMS Reliability AECC and ECC	$166	$0	Carryover project
Rainey to Corona - New 138KV Feeder	$261	$0	Carryover project
Transmission Operations - Risk Reduction Projects	$414	$0	New project - see White Paper attached
Substation Operations			
Pothead Pressure Alarms	$0	$150	The planned Corona project changed during mid-year due to user input. As a result, this project has taken additional time to work out the solution and did not start in 2020. Target is now 2021.
Cap & Insulator Replacement Program	$0	$690	Project and associated procurement deferred to outer year to allow for higher priority work
Replace 33KV Feeders Associated With TR 21W - Fresh Kills	$0	$6	The 33 kv feeder upgrades for Transformer 21W is not needed any more. It was a load relief project but not needed based on loads now expected at stations.
Emergent Transmission Reliability Program	$10,028	$0	Feeder M52 section replacement completed for $9M, DF-2 tank installation is in progress and Greenburgh ROW Roadwork carryover now completed.
SSO Loss Contingency Area Stat Rapid Recovery/Transm Resiliency TSFS	$5,963	$0	Carryover project - Purchase of mobile resiliency transformers and transition joints.
Gas Insulated Switchgear Program	$5,374	$0	Carryover project-primarily ABB Switchgear purchased in December, 2020 for 2021 project at 49th St.
Mobile Control Center	$398	$0	Carryover project
Cricket Valley Contractor Oversight	$250	$0	Carryover project
Parkchester 2 Replace Limiting 13Kv Bus Sections No. 2	$110	$0	Carryover project
Electric Distribution			
OH & UG Training Yards - Victory Blvd	$111	$0	New program - see White Paper attached
Security Fencing for Unit Substations on SI	$388	$0	New program - see White Paper attached
28th Street Flush Concrete	$170	$0	New program - see White Paper attached
ATS Installation USS Reliability XW	$278	$0	Carryover project
BQDM Non Traditional	$609	$0	Carryover project - Additional work required for BQDM Battery Project. Security, lighting, fencing
Penn Network New Feeders for Hudson Yards	$91	$0	Carryover project
EV Charging	$0	$10,000	Delayed due to new EV charging order
Hellgate Dock Refurbishment	$0	$850	Project delayed due to pandemic
UG Network Resiliency	$0	$4,000	Target was reduced due to delays in receiving new switches for Flatbush Network.
ARCOS Enhancement	$524	$0	Carryover from 2019, on our Call-Out software
IGIN Radio Replacement	$212	$0	Carryover from 2019, to improve SCADA communications.
Electric Production			
EP Equipment Purchases - East River	$118	$0	Miscellaneous charges related to previous year project.
EP Replacement - East River	$2,764	$0	Carryover project: primarily 70 Superheater Reheater Replacement.
EP Replacement - 74th Street Complex	$3,401	$0	Carryover project: primarily Hudson Ave GT 3,4,5 Exhaust Duct Replacement.
EP Risk Reduction - East River	$1,412	$0	Carryover projects such as ER 6/7 City Water Header Upgrade, Tank Farm Oil Piping Retire, and ER Unit 60/70 Demin Water Header Upgrade.
EP Civil and Structural - Hudson Avenue	$0	$400	Funding shifted to higher priority projects
EP Safety and Security - East River Unit 70	$0	$250	Engineering work on project was delayed due to COVID-19 issues
Shared Services			
Facilities and Field Services			
Third Avenue New Transportation Building	$0	$1,000	Engineering study deferred to 2021
Brinkerhoff Demolition	$2,952	$0	Carryover project - Additional spend due to permitting as well as COVID related delays.
CET 4IP-23rd Floor Reconfiguration	$464	$0	Carryover project from prior year
Farrington Flush Facility Upgrade	$176	$0	Carryover project from prior year
Fleet Management Solution	$1,288	$0	Carryover - Additional programming enhancements were required to complete the project.
Post COVID Facilities Upgrades	$1,985	$0	Emergent project that addresses Covid requirements (those from 2020) in our facilities, yard, control centers, etc. See white paper attached.
Window Replacement Program - 4 Irving Place	$125	$0	Carryover project from prior year
Worth Street Site Master Plan	$1,304	$0	Costs related to temporary facilities for relocated personnel and Site master plan study to optimize use of owned service center hub in Yonkers, Westchester commenced November 2020. See white paper attached.
Other projects	$164	$0	Various small carryover projects.from the prior year
Strategic IT Projects (New Projects)			
AMI - Load Shedding Project	$1,297	$0	New project - see White Paper attached.
Application Performance Management (APM)	$581	$0	New project - see White Paper attached.
ARCOS SaaS Products (Workbench)	$1,950	$0	New project - see White Paper attached.
CEMS Windows Server Upgrade	$218	$0	New project - see White Paper attached.
Connected Vehicles - Enterprise Communication and Location Services	$3,436	$0	New project - see White Paper attached.
Conor Mobile Response Implementation	$188	$0	New project - see White Paper attached.
Datasplice Upgrade to Version 6	$367	$0	New project - see White Paper attached.
E5	$22,858	$0	ITB approved This project is to upgrade to Microsoft 365 E5 licenses from existing license Microsoft licenses. These tools are to be procured, evaluated, and implemented during 2020 and 2021 as part of this project.
EDAP-CVO	$490	$0	New project - see White Paper attached.
Electronic Stop Tag Application	$294	$0	New project - see White Paper attached.
Engage Platform Phase IV	$1,575	$0	New project - see White Paper attached.
Enterprise PI Historian Platform	$9,493	$0	ITB approved The Enterprise Agreement will allow us to deploy and/or upgrade PI technology in an unlimited manner, with no counting of data streams/tags, PI Interfaces, PI Client licenses, etc. Con Edison will benefit from the pro-active support and services provided by OSISoft to ensure that we maximize our use of the PI technology to accelerate company-wide process efficiencies and operational intelligence. OSISoft will work with Con Edison to construct an Enterprise Roadmap for PI implementation.
Gas Piping Inspection Enhancements	$380	$0	New project - see White Paper attached.
IBM Filenet Upgrade(NYCDOT Environment)	$377	$0	New project - see White Paper attached.
Information Technology Service Management (ITSM) Tool	$1,141	$0	Unbudgeted - see White Paper attached.
Oracle BI for EBS Cloud Migration	$645	$0	New project - see White Paper attached.
Outage Scheduling System (OSS) - Phase 3	$590	$0	New project - see White Paper attached.
PeopleTools 858 Upgrade - Human Resources	$1,471	$0	New project - see White Paper attached.
ProField Encore (AMI Implementation)	$192	$0	New project - see White Paper attached.
Third Party Risk Management	$885	$0	New project - see White Paper attached.
TNVS WEB	$378	$0	New project - see White Paper attached.

Budget/Rate Plan vs. Actual Capital Spending Explanations (New Programs/Projects)

Thousands ($000)

	Actual	Budget	Explanation
Strategic IT Projects (cancelled/deferred/delayed)			
Back Office Automation - Agent Tools	$0	$2,719	Deferred project
BI Enhancements	$0	$453	Cancelled project
Cyber Asset Management	$0	$300	Cancelled project
Distribution Ops Training Simulator	$0	$227	Cancelled project
Emerging IT Project Initiative for Enhanced Distribution System Analysis	$0	$746	Cancelled project
Install Telecom Facilities	$0	$302	Cancelled project
WMS Enhancement	$0	$3,000	Cancelled project
Strategic IT Projects (carryover)			
Corporate Accounting Request Application	$294	$0	Carryover projects
Enterprise BI and Data Visualization Environment	$104	$0	Carryover projects
23 projects	$12	$0	Carryover projects

2020 WHITE PAPERS

S&TO WHITE PAPERS

Central Operations / STO
2021-2025

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☒ Strategic	
Project/Program Title: Feeder 38R51 and 38R52 Replacement Project	
Project/Program Manager: Mark Davis	**Project/Program Number (Level 1):** 23289097
Status: ☐ Planning ☒ Design ☐ Engineering ☐ Construction ☐ Ongoing ☐ Other: _____	
Estimated Start Date:	**Estimated Date In Service:**
A. Total Funding Request ($000) **Capital: 238,000** **O&M:** **Retirement:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months)**

Work Description:
This project will replace Staten Island 138kV feeders 38R51 and 38R52. Feeders 38R51 and 38R52 originate from Fresh Kills Substation and are the only two supplies for Wainwright Substation. The existing circuits are directed buried, medium pressure fluid filled (MPFF) cables and will be replaced with cross-linked polyethylene (XLPE) cables in new duct banks. Feeders 38R51 and 38R52 have been prioritized for replacement due to environmental, maintenance and reliability performance. Engineering activities for this project will begin in 2021 and construction is estimated to be completed by the end of 2023.

Justification Summary:
The design, physical configuration, routing, maintenance requirements and overall performance of feeders 38R51 and 38R52 present the Company with operational challenges and risks. The feeders are without conduits or protection plates (having only a thin, easily-removed concrete layer over the direct-buried cables), route through protected wetlands and have a submarine crossing at the Fresh Kills Creek. Feeders 38R51 and 38R52 are the only two supplies to the Wainwright Substation. Pressurization of the dielectric fluid needed to maintain the insulation strength of the feeders is provided via dielectric fluid reservoirs at various points along the path of the feeders. This type of cable (having a lead sheath as the only pressure boundary to contain the dielectric fluid) and pressurization system requires frequent outages and a great deal of labor hours to repair and maintain. All of these factors increase the probability that a failure or defect will have an environmental impact or affect the reliability of the transmission system on Staten Island. Due to the obsolete design, topological configuration and maintenance requirements, feeders 38R51 and 38R52 need to be replaced.

Conduits and steel plating play an important role in protecting underground transmission feeders from dielectric fluid leaks, insulation failures or other damage inadvertently caused by excavation activities. Current design standards would require new feeder installations to utilize some type of conduit and, possibly, steel protection plates. Feeders 38R51 and 38R52 are direct buried cables without steel protection plates and are protected solely by an approximately three-inch thick layer of non-reinforced concrete. This configuration carries the risk that subsurface construction activities along the feeder route may damage the circuits, causing a dielectric fluid leak or outage. Given that the circuits follow the same route and are physically close together (only separated by two to three feet in many areas), there is a risk that both feeders could be damaged by such activities at the same time. In 2007, while excavating, a third party contractor damaged feeder 38R52, resulting in an electrical failure. The feeder was out of service for more than two weeks before repairs were completed. During the length of this outage, Wainwright Substation was in service via one supply feeder (38R51). Any further outage associated with the station would have required load shedding and deployment of mobile generation.

Dielectric fluid leaks on MPFF cable systems pose reliability risk unlike that for high pressure fluid filled (HPFF) cable systems. Unlike HPFF circuits, MPFF circuits must be de-energized to safely facilitate leak repairs. This requirement means that any time either 38R51 or 38R52 is leaking dielectric fluid, an outage must be taken to make repairs. In addition to leak repairs disrupting scheduled outages, they also leave Wainwright Substation in a position where a further contingency will result in loss of customers. Since 2007, feeders 38R51 and 38R52 have had 10 leaks that required circuit de-energization to make repairs. Some of these leaks have been on buried joints and many have been in manholes. As the circuits continue to age, more leaks and associated outages are likely to occur.

A manhole, as a leak location for 38R51 or 38R52, poses another unique reliability risk. Per OSHA regulations, a structure housing an MPFF circuit found to be leaking (considered a D fault condition) cannot be re-entered until such circuit is de-energized. Feeders 38R51 and 38R52 share the same route and have common manholes. This configuration allows the possibility that both circuits could have a leak in the same manhole at the same time. De-energizing both circuits at the same time to facilitate repairs would require temporary transfer of load to stations adjacent to Wainwright and massive deployment of mobile generation.

The routing of feeders 38R51 and 38R52 brings the risk of dielectric fluid leaks to environmentally sensitive areas (wetlands and the Fresh Kills Creek) where repair access may be very difficult. In 2017, 38R52 developed a leak in the Fresh Kills Creek section of the feeder. This event resulted in the loss of over 1,600 gallons of dielectric fluid to the waterway and required multiple, extended outages to make permanent repairs. One of the outages needed to make temporary repairs occurred during a high load period and required the deployment of mobile generation for contingency planning. The cause of the leak was a crack in the lead sheath of the cable due to settlement and movement over time. As feeders 38R51 and 38R52 continue to age and settle further, more leaks of this nature will likely occur.

Due to their design, feeders 38R51 and 38R52 require a great deal of maintenance hours relative to other 138kV circuits. The fluid pressurization reservoirs must be read and adjusted on a routine basis. If one of the feeders is leaking, the frequency of these adjustments increases and continues until the leak is located and repaired. These feeders have historically required between 300-400 labor hours per year to maintain. An analysis of the entire 138kV feeder population in terms of labor hours shows that these feeders are above the average by several standard deviations. XLPE cable systems already in use tend to be significantly less maintenance intensive than MPFF circuits.

Maintaining and repairing feeders 38R51 and 38R52 requires a specialized workforce and non-standard spare inventory. Given that these are the only MPFF circuits owned by Con Edison, new employees do not get many opportunities to splice or perform other repairs on feeders 38R51 and 38R52. Maintaining qualifications and expertise on these circuits is a challenge for the Company. Spare inventory must be carefully managed as the originally equipment manufacturer (OEM) no longer makes the cable used to construct 38R51 and 38R52. Although other manufacturers are willing to make this type of cable, they do so at a financial premium and contingent on long lead times. The replacement of both circuits with a standard, commonly used design would alleviate the personnel and spare inventory burdens associated with MPFF cable.

The replacement of 38R51 and 38R52 with XLPE cable in duct bank would eliminate the environmental and significantly reduce the reliability risks associated with feeders 38R51 and 38R52. The use of an XLPE cable system would eliminate 300-400 hours of maintenance, reduce unplanned outages, improve environmental performance and help to standardize labor expertise and spare inventory.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

2. Supplemental Information

Alternatives

- Two additional alternatives were looked at for replacement of this project:
    - T-Tapping feeders 38R56 and 38R57 and establishing connections to Wainwright Substation. This option would utilize two of the three supplies to Woodrow Substation by adding wye joints and 2.75 miles of new XLPE ties to Wainwright Substation. This option was rejected for its increased reliability risk. Under this configuration, one feeder outage would affect two area stations and contingency planning.
    - A hybrid XLPE/overhead option. This option would utilize overhead transmission for a portion of the feeder route. This option was rejected

because it would introduce the risks associated with overhead transmission such as lightning and storms.
Risk of No Action Not replacing or deferring the replacement of feeders 38R51 and 38R52 will increase the risk of dielectric fluid leaks and reliability concerns for Wainwright Substation as the feeders continue to age. By not replacing feeders 38R51 and 38R52, the Company will continue to spend a disproportionate number of hours maintaining the existing circuits. Maintenance and leak response hours will likely increase as feeder leaks become more frequent. Because these feeders are the only two supplies to Wainwright substation, there is a high impact if one or both of these feeders are out of service. Loss of this substation impacts 91MW of load and almost 25k customers. There are several risks which could impact this scenario which include cable which continues to have leaks, the risk of another contractor dig-in, and the risk of a double D-fault in one structure. In the event that there is an outage, repair could be delayed if there is a need to special order cable and obtain skilled employees able to complete this work.
Non-Financial Benefits Improved reliability and environmental performance are benefits of replacing these circuits. Replacement of the circuits with XLPE reduces dielectric fluid inventory and, the risk of a leak into an environmentally sensitive area. Without having to perform maintenance specific to these feeders (the "Read and Adjust" work orders,) labor hours will made available for other work on the transmission system. Replacement with XLPE also allows Con Edison to move to more standard equipment which reduces the need for special ordering or special inventory.
Summary of Financial Benefits and Costs (attach backup) In company labor alone, Con Edison is spending 30 times more on each of 38R51 and 38R52 than other 138kV circuits. Typical spend for Con Edison labor can range from $50K to over $500K, averaging about $350K per year. Including contractor costs for leaks and emergencies, Con Edison has had several years where over a million dollars in expense have been spent on these circuits. Projecting the maintenance trend forward, it is not unreasonable that the company is projected to spend well over million a year on these circuits. Replacing these circuits with XLPE would eliminate this maintenance need due to the more updated technology.
Project Risks and Mitigation Plan
Technical Evaluation / Analysis
Project Relationships (if applicable)

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital	**N/A**	**N/A**	**N/A**	**N/A**		**N/A**
O&M						
Retirement						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**23,000**	**92,800**	**122,000**		
O&M*					
Retirement					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	1,400	9,600			
M&S	4,103	13,616			
Contract Services	7,937	36,304			
Other	3,389	6,539			
Overheads	6,171	26,741			
Subtotal	**23,000**	**92,800**			
Contingency**					
Total	**23,000**	**92,800**	**122,000**		

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

**Please refer to the Corporate Contingency Guidelines

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Total Contingency: Total contingency expense according to the Corporate Contingency Guidelines

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

ED WHITE PAPERS

Manhattan Electric Operations / Environmental Operations
Budget Year 2021

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: W28th Street Flush Pit Rebuild	
Project/Program Manager: Sally Morales	**Project/Program Number (Level 2): 24943714**
Status: ☒ Planning ☐ Design ☐ Engineering ☐ Construction ☐ Ongoing ☐ Other: _____	
Estimated Start Date: Nov 2020	**Estimated Date In Service: Sept 2021**

Total Funding Request $2,501,000

Capital: $2,161,000
Retirement: $340,000

Work Description:
Replace the flush pit concrete slab and provide additional corrosion protection for the existing surrounding concrete elements such as grade beams and walls.

The detailed scope:

- **Remove Approx. 61 cu yards. of concrete slab and upgrade pit with a new corrosion protection system for the flush facility**
- **Install Approx. 71 cu yards of concrete slab and upgrade pit with a new corrosion protection system for flush facility**

Justification Summary:
<u>Background</u>
The 28th St Flush Facility serves as a main drop off point for treatment of Manhattan flush wastewater. It associated concrete slab has severely deteriorated and needs to be replaced expeditiously because of the high need of its function/service. The facility is also a backup facility for other company Environmental Operations if their local facilities are non-operational.

Facility Engineering has inspected/evaluated the damaged flush pit concrete slab and determined that system must be completely rebuilt as it has lost 100% of its structural integrity; all rebar is exposed/corroded and 7 inches of the existing 10 inch slab is gone, leaving mainly broken up pieces of concrete resting on soil fill. The concrete slab cannot be temporarily repaired in order make the flush system operational. Note that damage to the surface is a result of decades of scraping off concrete layers by backhoe equipment during removal of deposited solids after the liquid waste had

drained into the adjacent basin for treatment. Once rebar reinforcement became an operational obstacle, it would be systematically removed, further weakening the concrete slab, and accelerating its deterioration. Note that the slab is supported by piles/pile caps/grade beams whose condition was investigated.

This project will replace the flush pit concrete slab and provide additional corrosion protection for the existing surrounding concrete elements such as grade beams and walls.

2. Supplemental Information

Alternatives

Alternative 1 – Repair the concrete slab. This alternative is not recommended as it has lost 100% of its structural integrity; all rebar is exposed/corroded and 7 inches of the existing 10 inch slab is gone, leaving mainly broken up pieces of concrete resting on soil fill.

Alternative 2 – Replace the concrete slab and do not provide additional corrosion protection. This alternative is not recommended since concrete chemistry had changed due to the on-going exposure to the harsh environment. Without additional corrosion protection, the grade beams and walls will deteriorate at an accelerated rate, greater than the concrete slab.

Risk of No Action

- **Severe loss of structural integrity**
- **Increase cost of completing Environmental Operations activities**
- **Public & Employee Safety**
- **Increases the department's response time to both scheduled and emergency work**
- **Increases the miles company forces must travel with the large Flush vehicles to the other Environmental Operations facilities.**

Benefits

- **Enhances public & employee safety**
- **Reduced cost of completing Environmental Operations activities**
- **100 % structural integrity**
- **Reduces the department's response time to both scheduled and emergency work**
- **Reduces the miles company forces must travel with the large Flush vehicles to the other Environmental Operations facilities.**

Project Risks

- **Pandemic – Crew Availability**
- **Soil Contamination- (Oil Spill)**
- **ACM Abatement**
- **Supply/Material constraints-(Steel Grating)**
- **Confined Space**
- **Rock/Bedrock**
- **Permitting Issues (Time Delay)**

Note - CEHSP 11.03 Checklist will define and address EH&S items associated for this project.

Technical Evaluation / Analysis

A structural analysis was performed to determine/define the condition of the flush pit concrete floor slab, grade beams and pile caps, and their ability to support anticipated truck loads. The analysis (i.e. petrographic analysis & compression testing) confirmed that the concrete grade beams and pile caps were adequate for the truck loads. The investigative analysis further assessed the "quality" of the existing concrete and whether it had been infested with chlorides from past salting activities. Since it was determined that concrete chemistry had changed due to the on-going exposure to the harsh environment, the design will also provide corrosion protection for the existing concrete elements such as grade beams and walls.

3. Funding Detail

YTD Spend

	Actual 2020	Actual 2021
Capital	**$170,241**	
O&M		
Retirement		

Capital Request by Elements of Expense:

EOE	2021
Capital	
Labor	**$345,680**
Construction Services	**$1,440,775**
Overheads	**$141,152**
Other	**$233,393**
Subtotal	**$2,161,000**
Retirement	
Labor	**$50,033**
Construction Services	**$286,054**
Other	**$3,913**
Subtotal	**$340,000**

Total Request: $2,501,000

[redacted]

Business Unit / Division
2020 & 2021

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Security Fencing for Unit Substations on SI	
Project/Program Manager: James Tuosto	**Project/Program Number (Level 1): 24906423**
Status: ☒ Initiation ☐ Planning ☐ Execution ☒ On-going ☐ ☐ Other: _____	
Estimated Start Date: 12/01/2020	**Estimated Date In Service: 06/30/2021**
A. Total Funding Request ($000) **Capital: $1,087,234.00** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

Replace the existing security fences around Port Richmond, Westerleigh, Canterbury, Silver Lake, New Brighton, Arlington, Dongan Hills and Clifton Unit Substations. It will include a smaller width chain link; 1.25" openings, which makes it more difficult to climb. In addition, we will be using 4" posts versus various smaller sizes as well as three horizontal supports versus only two in the original construction. The fence will be 10' high and be buried 3 feet deep and will have 3 single strands of barbed wire on top of the fence. The new design will be taller above ground and be dug deeper to support the added height. This design is similar in concept to the one adopted by the NYC MTA.

- *Silver lake- 9 Austin Place*
- *Clifton- 30 Greenfield Ave*
- *Arlington- 280 South Ave*
- *Port Richmond- 15 Church Street*
- *Dongan Hills- 161 Mason Ave*
- *New Brighton- 626 Richmond Terrace*
- *Canterbury- 461 Canterbury Ave [Inside College of SI]*
- *Westerleigh- 366 Jewitt Ave*

Justification Summary:

As part of the Operational Self- Assessment for Unit Substation Security the existing security fences around Port Richmond, Westerleigh, Canterbury, Silver Lake, New Brighton, Arlington, Dongan Hills and Clifton Unit Substations will be removed and replaced. The new fence being installed will be constructed based on a new standard developed as part of the OSA project. It will include a smaller width chain link; 1.25" openings, which makes it more difficult to climb. In addition, we will be using 4" posts versus various smaller sizes as well as three horizontal supports versus only two in the original construction. The fence will be 10' high and be buried 3

feet deep and will have 3 single strands of barbed wire on top of the fence. The new design will be taller above ground and be dug deeper to support the added height. This design is similar in concept to the one adopted by the NYC MTA.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Explain how this project/program will help achieve goals in 5-year and long-range plans.
Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.

- Brings Staten Island within Substation Security compliance specification
- Mitigates the risk of penalty for non-compliance and physically reduces risk of intrusion to our facilities, protects the public/company employees and prevents non-company personnel from tampering with our station equipment

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection
There are no other reasonable alternatives. Building cement walls around the facilities would be too costly and be intrusive in residential neighborhoods. The fencing used is also the spec approved material.

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

Mitigates the risk of penalty for non-compliance and physically reduces risk of intrusion to our facilities, protects the public/company employees and prevents non-company personnel from tampering with our station equipment. Internal penalty for non-compliance. External risks include intrusion/trespassing, damage to company facilities/equipment, outages associated with damage to company facilities/equipment. Possible injury to company employees as well as member of the public.

Non-Financial Benefits

- *Increased safety, reliability, efficiency*
- *Ensuring regulatory compliance*

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

No financial benefit but additional security compliance. This will protect the public and company employees and prevent non-company personnel from tampering with the station equipment

3. Total cost

	Vendor	Price
Silver lake- 9 Austin Place	Globe Fence	$ 65,671
Clifton- 30 Greenfield Ave	Globe Fence	$ 99,579
Arlington- 280 South Ave	Globe Fence	$ 131,358
Port Richmond- 15 Church Street	Globe Fence	$ 108,040
Dongan Hills- 161 Mason Ave	Yaboo	$ 34,198
New Brighton- 626 Richmond Terrace	Yaboo	$ 54,269
Canterbury- 461 Canterbury Ave [Inside College of SI]	Yaboo	$ 25,646
Westerleigh- 366 Jewitt Ave	Yaboo	$ 130,463
TOTAL		**$ 649,224**
ConEd Labor	47%	$ 305,990
Material & Labor		**$ 955,213**
Overheads	14%	$ 132,021
Grand Total		**$ 1,087,234**

4. Basis for estimate

- *Vendor quotes for removal of old fence and installation of new fence.*
- *Historical data for similar project to install security fence at Naughton Unit Substation*
    - *Used percentage for ConEd Labor and Overheads*

5. Conclusion

Yes, As part of the Operational Self- Assessment for Unit Substation Security the existing security fences around Port Richmond, Westerleigh, Canterbury, Silver Lake, New Brighton, Arlington, Dongan Hills and Clifton Unit Substations will be removed and replaced for added security of Unit Substations.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1 Mitigation plan

Weather- The remaining work cannot be completed with excessive amounts of snow on the ground. We have been delayed multiple times due to snow storms. This is a delay but not a risk to completion. As the weather improves the work will be completed

Risk 2 Mitigation plan Vendor Availability- The vendor has not shown themselves to be unreliable but the completion of the work is dependent on their availability. We have minimized this risk by maintaining communication and keeping dates on the schedule
Technical Evaluation / Analysis *Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.* *N/A*
Project Relationships (if applicable) *Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).* There are no projects tied to this project

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						**$ 387,778**
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**$699,456**				
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	**$305,990**				
M&S					
Contract Services	**$268,456**				
Other					
Overheads	**$125,011**				
Total	**$699,457**				

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
2020 & 2021

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: OH & UG Training Yards – 4400 Victory Blvd Staten Island	
Project/Program Manager: James Tuosto	**Project/Program Number (Level 1): 24929493**
Status: ☐ Initiation ☒ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 12/01/2020	**Estimated Date In Service: 06/30/2021**
A. Total Funding Request ($000) **Capital: 406,250** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

The proposed Underground Training yard will be constructed in a vacant area on the 4400 Victory Blvd property adjacent to the main Victory Blvd yard approximately 50' x 50'. . Specific topics to be highlighted include:

- *Work area protection*
- *Insulate and Isolate procedures*
- *Tool use and Safety*
- *Rescue and retrieval*
- *Manhole Entry (ELE-1010)*
- *Primary and secondary splicing*
- *Cable Pulling*
- *URD Switching*

The facility will consist of:

- *1 – above ground M-14 manhole on a field poured concrete slab*
- *2 – Service boxes*
- *2 – M-11 Manholes*
- *1 – Pad Mount transformer*
- *1 – Silo and VS Transformer*
- *Various Conduit connecting the structures*
- *Various Cable types and sizes*

The Overhead Training yard is a approx. 300' x 400' area designated for the use of Overhead construction training. This training consists of:

- *Pole climbing*
- *Construction functions like change overs, transformer & equipment installs, grounds & switching….etc.*
- *Pole top & bucket rescue*
- *Setting Poles*
- *"Overhead BEST" Class*

Equipment & services utilized:

- *10x 45' poles*
- *Pole hardware (cross arms, secondary racks, insulators …etc) per pole*
- *3 phase transformer*
- *Regulator*
- *Recloser switch*
- *S&C scadamate switch*
- *2x reels of 4/0 wire*
- *65" outdoor rated tv*
- *4x 8' outdoor picnic tables*
- *Gravel and landscaping services*
- *6' x 6' shed to house tools and material*
- *~300 labor hours to install*

Justification Summary:

Underground Training area will allow for de-energized hands on practice in a controlled environment for those who may not be qualified to practice in the field with live conductors. The Underground Training Effectiveness committee will utilize the facility to host the Underground Best class, to enhance the knowledge of our management workforce, and promote safety and operational excellence.

Overhead Training area designated for the use of Overhead construction training. This allows for de-energized practice in a controlled environment for those who may not be qualified to practice in the field with live conductors. The area is also being utilized to conduct hands on management training via the "Overhead BEST" class and will be incorporated into a formal onboarding for new supervisors.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

This will program will improved quality of supervisors and management leading to better efficiency and planning. It will also help to achieve Inclusion & Engagement goals for the department.

2. Supplemental Information

Alternatives

Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

By providing better training to first line supervisor and management this will lead to better quality decisions when directing field crews.

Risk of No Action
By not doing this program there could be a potential to have personnel in leadership positions who do not understand the details of Overhead work which could lead to poor quality decisions, resulting in inefficient work or possibly a safety issue.

Non-Financial Benefits
Examples:

- *Increased safety, reliability, efficiency, through better planning*
- *Stronger relationships between Union & Management*

Summary of Financial Benefits and Costs (attach backup)
1. Cost-benefit analysis (if required)
To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits
This will program will improved quality of supervisors and management leading to better efficiency and planning. It will also help to achieve Inclusion & Engagement goals for the department.

3. Total cost
Underground Training Yard - $206,250.00
Overhead Training Yard - $200,000.00
Total Cost - $406,250.00

4. Basis for estimate
Unit Costs and units required for the training yards

5. Conclusion
Yes, although no direct financial benefits, there are great benefits in training our management team to produce better quality supervisors. In addition this helps to build relationships between Union & Management to achieve Inclusion & Engagement initiatives..

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
Risk 2	Mitigation plan

Technical Evaluation / Analysis
Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer

Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.
Project Relationships (if applicable) *Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).*

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						**$111,097.17**
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**$295,152.83**				
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

CES WHITE PAPERS

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☐ Project ☒ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☒ Regulatory Mandated ☐ Operationally Required ☐ Strategic	
Project/Program Title: CES Emergent Regulatory Asset Capital Fund ("The Fund")	
Project/Program Manager: Richard Lieb	**Project/Program Number (Level 1): 24810857**
Status: ☐ Initiation ☐ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 01/01/2021	**Estimated Date In Service: Program**
A. Total Funding Request ($000) **Capital: $5M** **O&M: $0**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M: N/A** **Capital: N/A**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: 0** **Capital:0**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

This is a capital program that will fund unanticipated capital needs of projects in the Rate Case Agreement or under a separate PSC Order with regulatory asset funding that may not have initially identified any capital components.
The program will be budgeted with $5M each year. Funds will be released to projects residing outside the fund which will be appropriated and authorized with their own accounting hierarchy.

If those projects in turn are in a position to release funds in subsequent months, those releases will be met by a request from the program to maintain the dollars within the program for future reallocation to regulatory asset projects. The program can request additional capital during the year through the EGC. The program can release dollars to the EGC to reallocate capital dollars outside the program's purpose and not end the year with a balance if there are no anticipated regulatory asset project needs in the remaining months of the year. Projects receiving funding will be reported to Corporate FP&A and Regulatory Accounting to ensure recovery in accordance with existing agreements.

Justification Summary:

Increasingly situations arise where projects with Regulatory Asset funding have work that is ruled capital. This work would receive priority in the Capital Optimization process as regulatory mandated work. Depending on available funds at Governance and Order/Rate Case agreements, these projects may secure funds that would otherwise have gone to operationally required work or strategic projects. If releases are not available for reallocation, the work on regulatory asset programs can be delayed or limited by the lack of capital funding or timing of releases to meet funding needs.

A financial tool was needed to provide a reserve for unanticipated capital funding needs for regulatory mandated projects.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.

The program supports the following 5 Year and LRP Goals:
Programs/Projects to address REV and CLCPA goals

This program addresses:

- Financial/Strategic Risk (Business Model)
- Regulatory Compliance (NY Regulation)
- Operational Risk (Project/Program Management)

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection:

The alternative to this program is to continue to halt/delay those project components of REV or PSC Order projects that have a capital component until adequate releases can cover the project and prioritize these above other capital funding requests. This was rejected as it impedes the execution of regulatory programs that would otherwise proceed. These projects have regulatory asset funding and upon ruling may require capital funding for executing some work that supports a larger body of work.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/program. Quantify the risks, if applicable.

Risk 1:
Regulatory Compliance : capital funding needed to support execution of work in compliance with Rate Case and/or Regulatory Orders.

Risk 2

Operational: Project/Program Management – ensure the seamless execution of programs without impediments caused by "color of money" issues for regulatory asset funded projects.

Risk 3

Finance/Strategic: Business Model – supports execution of projects/programs designed to support REV and/or CLCPA goals. Need is to respond with agility to changing energy market/climate change driven needs while maintaining sound fiscal policy.

Non-Financial Benefits

Examples:

- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*

- Many of the regulatory mandated projects address Clean Energy priorities in the LRP**.**
- Ensure regulatory compliance.
- Increased stakeholder satisfaction by showing administrative agility to respond to market/climate change needs.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

N/A : The program does not hold specific projects but is a reserve for regulatory asset projects requiring capital funding where it had not been planned.

2. Major financial benefits

N/A Program provides liquidity to facilitate the realization of benefits for the projects that it supports.

3. Total cost

N/A

4. Basis for estimate

N/A

5. Conclusion
The program should be enacted to ensure timely execution of regulatory mandated projects.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1 N/A Mitigation plan

Risk 2 Mitigation plan

Technical Evaluation / Analysis
N/A

Project Relationships (if applicable)
Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).

The program is designed to provide unplanned capital funding to support projects authorized through the Rate Case or PSC Order with regulatory asset funding that have some charges ruled capital. As such it provides the complementary funding for REV/NW/NP and other programs managed/executed by Customer Energy Solutions.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**$5M**	**$5M**	**$5M**	**$5M**	**$5M**
O&M*					

Capital Request by Elements of Expense:

EOE	2021	2022	2023	2024	2025
Labor					
M&S					
Contract Services					
Other	**$5M**	**$5M**	**$5M**	**$5M**	**$5M**
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

SHARED SERVICES WHITE PAPERS

X	Capital
X	O&M

2019 – Shared Services / Information Technology

Project/Program Title	Oracle EBS Cloud Migration
Project Manager	Vincent Bonelli
Hyperion Project Number	PR.23287866
Status of Project	Planning
Estimated Start Date	1/1/2020
Estimated Completion Date	9/1/2024
Work Plan Category	Strategic

Work Description:

The goal is to implement Oracle EBS Cloud and Oracle BI Cloud (SaaS) solutions and retire the existing local ERP and BI solutions. For Oracle EBS, all business requirements will be reviewed and validated. Any gaps in functionality will be evaluated and solutions determined. Adoption of Cloud applications requires standardized processes, so it is expected that most gaps should be resolved by configurations.

The Oracle EBS System has 477 Con Edison specific modifications to the base system, which need to be evaluated and tested. These modifications change the way the system works to conform to Con Edison's business practices.

115 Functional Extensions
113 Inbound Interfaces
81 Outbound Interfaces
141 Custom Reports
27 Custom Workflows.

Testing will include all finance and supply chain functions as well as all interfaces to other Con Edison systems and external systems such as banks and vendors.

The information currently stored in the on-premises EBS system will be converted to Oracle's cloud solution.

For Oracle BI, all business reports and data models will need to be reviewed to determine the required rework. Most of the information will continue to come from Oracle EBS which will also be on Oracle's Cloud. In addition, the Oracle BI on-premise solution will need to upgrade to maintain vendor support. This will be done in 2020.

Oracle BI has:

785 Extracts, Transforms and Loads (information pulls from nine separate applications)
350+ Custom Reports and 2000+ Ad hoc reports

45 Dashboards

Each customization will need to be reviewed and tested.

In addition, Consolidated Edison Inc. entered an Oracle Strategic Partnership (OSP which aligns with Con Edison's strategic business cost optimization, enhances operational efficiency, and improves customer experience through technology innovation. It supports Con Edison ability to:

- Innovate on new technologies that benefit Oracle's industry leadership and enable Con Edison to improve business processes and customer service
- Deliver and adopt software and services that are "best in class" with respect to scope, functionality, performance and quality
- Collaborate, utilizing Con Edison's knowledge of the industry to assist Oracle in improving their solutions and Oracle will provide Con Edison input to key solution design decisions
- Prioritize work that focuses on the highest value for both companies

The OSP allows the Company to use Oracle on-premise and cloud solutions at a specified O&M maintenance costs for these services.

On-premise software is available under the Perpetual Unlimited License Agreement (PULA) within the OSP. The PULA lets Con Edison have unlimited use of Oracle software used by utility companies. This includes products such as Oracle EBS, Oracle BI, Hyperion, PeopleSoft Financials as well as Payroll and Recruitment. It also includes technology software such as database and backup software.

Cloud solutions cover utility specific products, such as OPower for Behavior Energy Efficiency and AMI enablement. Also included are general business cloud products such as Primavera.

Justification Summary:

Oracle's strategic direction is to migrate all on-premises solutions to their cloud platform. Oracle is devoting most of their development resources to the cloud, with limited spend local software. This means that on-premises software will have a time lag in bug fixes and eventually will not be enhanced.

If Con Edison does not perform this migration, supply chain and finance operations will be susceptible to delays in enhancements and bug fixes. It will also require periodic and costly upgrades to the local software.

Supplemental Information:

- Alternatives:
  Con Edison could maintain the current local solution or delay the migration to the cloud. These alternatives would require Con Edison to maintain a technical support staff as well as maintain on-premises infrastructure such as storage, networking, and servers.

- Risk of No Action:
  Con Edison's investment in the Oracle EBS would depreciate as Oracle devotes more time and resources to their cloud solutions relative to their on-premise solutions. Although the on-process Oracle EBS would continue to work, it will not improve as quickly as the cloud solution. This reduce the operability of the Oracle EBS system.

- Non-financial Benefits:
  Oracle's current cloud user interface has a modern look and feel. During the next few years, the cloud product will continue to evolve and improve. The timing of the project will provide Con Edison with a mature yet modern solution. One example is the standardization of work flow approvals in the cloud. The on-premise Oracle EBS has different method of implementing workflows which increase the system complexity and cost. The cloud version has a simpler and more efficient workflow process. This would help to speed ordering, receipting of goods, and payments

- Summary of Financial Benefits (if applicable) and Costs:
  Eliminate the need to upgrade the on-premises application which should happen every 2 to 3 years. This would also eliminate the need to upgrade the servers every 5 or 6 years.

- Technical Evaluation/Analysis:
  The technical evaluation will be done during the phase zero section of the project in 2020.

- Project Relationships (if applicable):

- Basis for Estimate:
  The cost estimate was based on the initial Oracle EBS and BI installation with adjustments needed to account for reduced hardware and software licenses.

  The O&M costs were estimated from historical costs and then projected forward. These were augmented with the planned increases due to future uses of the Oracle software products. These costs were then included in the negotiated Oracle Strategic Partnership (OSP).

Total Funding Level ($000):

Capital

Historical Spend

Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018

Historical Elements of Expense

(Historical EOE breakout will only be completed for Steam projects/programs of $500 thousand or more and, for all other organizations, projects/programs of $1million or more.)

EOE	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
Labor						
M&S						
A/P						
Other						
Total						

Request ($000):

Request 2019	Request 2020	Request 2021	Request 2022	Request 2023
$0	**$7,600**	**$0**	**$5,580**	**$50,082**

Request by Elements of Expense

EOE	2019	2020	2021	2022	2023
Labor		$7,600		$2,300	$29,285
M&S					
A/P				$2,900	$20,797
Other					
Overheads					
Total	**$0**	**$7,600**	**$0**	**$5,580**	**$50,082**

O&M

Historical Spend

Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
				$3,625	

Historical Elements of Expense

(Historical EOE breakout will only be completed for Steam projects/programs of $500 thousand or more and, for all other organizations, projects/programs of $1million or more.)

EOE	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
Labor						
M&S						
A/P					**$3,625**	
Other						
Total					**$3,625**	

Request ($000):

Request 2019	Request 2020	Request 2021	Request 2022	Request 2023
	$16,725	**$18,125**	**$21,425**	**$21,618**

Request by Elements of Expense

EOE	2019	2020	2021	2022	2023
Labor					
M&S					
A/P		$16,725	$18,125	$21,425	$21,618
Other					
Overheads					
Total		**$16,725**	**$18,125**	**$21,425**	**$21,618**

X	Capital
X	O&M

2019 – IT / Shared Services

Project/Program Title	IT Service Management (ITSM)
Project Manager	Anibal Rosa
Hyperion Project Number	
Status of Project	Planning
Estimated Start Date	10/1/2017
Estimated Completion Date	12/31/2022
Work Plan Category	Strategic

Work Description:

This white paper proposes the implementation of an industry standard ITSM SaaS (Software as a Service) application suite. Con Edison is advancing its technological capabilities in alignment with the changes in user demand for services. There will be a greater use of cloud technology, automated provisioning and monitoring tools to support the primary technical requirements of the changing environment (example AMI), and the changing demands of the user community for a more services oriented, financially transparent IT operating environment.

Understanding these changing needs, IT has undertaken a Transformation program to create a service center environment. The effort is focused on the transformation of its people, processes and technologies. Key technical drivers for the evolving environment are:

- Security
- Agility
- Customer Service Delivery
- Performance – Technical
- Scalability
- Innovation
- Reliability (Availability & Recovery)
- Live Monitoring of Services

To enable Technology Operations to run its operations as a business, there is a need to implement:

- A standardized IT Service Management environment, including at a minimum, the following processes:
    - Incident Management
    - Request Management
    - Change Management
    - Knowledge Management
    - Problem Management
    - Continuous Improvement
    - Asset/Configuration Management
- Documented and Tracked Service Level Objectives
- Greater automation and self service
- Financial Transparency, allowing IT Management to better understand the costs and performance drivers for these key IT processes

- An IT Operating Model with a clear delineation of the drivers for supplying services, monitoring demand and a formalized 'run the business' component.
- A standardized service catalog so that IT services are delivered consistently, efficiently and at a transparent cost to the user

Currently, Con Edison is utilizing HP's Service Manager Product for its current ITSM environment. It is an older product, on premise and internally support. In this document, IT is providing an estimated cost analysis for an industry leading SaaS ITSM tool.

It is estimated that these activities will take between 12-18 months to complete:

- Evaluate tools against industry standard criteria
- Identify the ITSM tool
- Define and implement internal standard IT practices to be supported by the tool
- Define initial configuration and design requirements
- Identify operating model and service center changes that will be aligned with the tool
- Align the tools requirements with the other automation initiatives underway
- Develop an integrated implementation plan
- Configure the tools
- Implement the new IT processes
- Conduct testing and training on the new tool
- Phase in the implementation

Justification Summary:

This initiative supports several of the corporate strategic drivers:

- Standardize services and processes: The focus on running IT as a Business, automated tools to support core IT functions, and the migration to Cloud requires Con Edison to ensure that services are provided transparently and consistently, within specified time and cost parameters. An integrated ITSM tool, integrating service requests, reported incidents, application and infrastructure events and requested changes in integral to providing this level of service. The Configuration Management Database allows for greater control of IT assets and a more comprehensive understanding of the impact of changes and events in an integrated environment
- Reduce and manage risk: Technology Operations can take a proactive approach to managing the environment and focus on value add activities, as opposed to a reactive 'firefighting' approach
- Enhance User-IT Relationship: The ITSM tool enables IT to run its functions in a more business oriented manner, fostering greater transparency with users, and enabling a more collaborative relationship.
- Strengthen and Develop Employees: This proposal will enable resources to become conversant in industry standard tools and processes for managing the IT environment. Training in the environment will be included in the proposal.

Supplemental Information:

- Alternatives:
  - Continue to use the existing hosted HP Service Manager tool, and leverage additional modules that would enhance the current ITSM environment. This alternative is not recommended because it would require Con Edison to continue maintaining the tool internally.

- Risk of No Action:
  - As the automation capabilities and migrations to the cloud continue to grow, there will be a wider gap between the operational capabilities of IT, the demands of the customer base and IT's ability to manage these efforts.

- Non-financial Benefits:
  - Better collaboration between IT and the Business
  - Enhancing the skills and work practices of the IT staff
  - Clear and consistent reporting of performance across standard IT functions
  - Greater control and reallocation of IT assets

- Summary of Financial Benefits (if applicable) and Costs:
  - Cost avoidance resulting from elimination of duplicate and inefficient processes
  - Ability to provide ITSM services at a lower price point, due to more efficient use of automated governance, provisioning and service management tools.

- Technical Evaluation/Analysis:
  - Will be performed to provide relative strengths and weaknesses of leading ITSM tools

- Project Relationships (if applicable):
  - Capital project and portfolio investment management tools may potentially be leveraged for part of the solution and/or may require interfacing.

- Basis for Estimate:
  - Information provided by industry consultants and internal resource estimates

Total Funding Level ($000):

Capital

Historical Spend

Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
			$101		$536

Historical Elements of Expense

(Historical EOE breakout will only be completed for Steam projects/programs of $500 thousand or more and, for all other organizations, projects/programs of $1million or more.)

EOE	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
Labor				$101		$536
M&S						
A/P						
Other						
Total				$101		$536

Request ($000):

Request 2019	Request 2020	Request 2021	Request 2022	Request 2023
$1,447	$1,087			

Request by Elements of Expense

EOE	2019	2020	2021	2022	2023
Labor	$1,118	$748			
M&S					
A/P					
Other	$328	$339			
Overheads					
Total	$1,447	$1,087			

O&M

Historical Spend

Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018

Historical Elements of Expense

(Historical EOE breakout will only be completed for Steam projects/programs of $500 thousand or more and, for all other organizations, projects/programs of $1million or more.)

EOE	Actual 2014	Actual 2015	Actual 2016	Actual 2017	Historic Year (O&M only)	Forecast 2018
Labor						
M&S						
A/P						
Other						
Total						

Request ($000):

Request 2019	Request 2020	Request 2021	Request 2022	Request 2023
524	**510**	**472**	**494**	

Request by Elements of Expense

EOE	2019	2020	2021	2022	2023
Labor	244	216	164	170	
M&S	280	294	309	324	
A/P					
Other					
Overheads					
Total	**524**	**510**	**472**	**494**	

✓	Capital
	O&M

2020 Capital - Information Resources

Project Name	2020 AMI Shedding
Project Manager	Sandip Talati
Hyperion Project Number	24511467
Organization's Project Number	
Status of Project	Manage
Estimated Start Date	4/1/2020
Estimated End Date	06/30/2021
Work Plan Category	Strategically Required

Work Description:	Load shedding application will provide Coned the ability to reduce electric load during emergencies and network contingencies using the AMI infrastructure. This process will allow for granular control where in the impact on critical infrastructure and LSE customers will be minimized during a load shedding process.

Justification Summary:	Leverage current load shedding process that does not allow control at a meter level therein impacting both critical infrastructure and LSE customers.

Supplemental Information:	
• Alternatives:	
	Manually disconnect individual meters using HES front end application.

• Risk of No Action:	
	It could potentially impact safety and customer experience. We will have to continue using our current process of load shedding wherein we don't have the fine-grained control required to minimize impact on critical infrastructure and LSE customers during a network contingency.
• Non-financial Benefits:	
• Financial Benefits (if applicable) and Costs:	
	N/A
• Technical Evaluation/Analysis:	
• Project Relationships (if applicable):	
	N/A
• Basis for Estimate:	
	Historical projects of similar scope

Total Funding Level ($000):

Historical Spend					
Actuals 2014	**Actuals 2015**	**Actuals 2016**	**Actuals 2017**	**Historic Year** (O&M only)	**Forecast 2020**
					$2,000,000

Historical Elements of Expense

(Historical EOE breakout will only be completed for Steam projects/programs of $500 thousand or more and, for all other organizations, projects/programs of $1 million or more.)

EOE	Actuals 2014	Actuals 2015	Actuals 2016	Actuals 2017	Historic Year (O&M only)	Forecast 2020
Labor						
M&S						
A/P						
Other						
Overheads						
Total	$0.0					2,000,000

Request ($000):

Request 2020	Request 2021	Request 2022	Request 2023
$2,000,000	$0.0	$0.0	$0.0

Request by Elements of Expense:

EOE	Request 2020	Request 2021	Request 2022	Request 2023
Labor				
M&S				
A/P				
Other	2,000,000			
Overheads				
Total	$2,000,000	$0.0	$0.0	$0.0

Shared Services / Information Technology
2020

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Application Performance Management (APM)	
Project/Program Manager: Shihab Hasnat	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☒ Execution ☒ On-going ☐ Other: _____	
Estimated Start Date: March 2020	**Estimated Date In Service: Oct 2020**
A. Total Funding Request ($000) **Capital: 860** **O&M: 686**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:

Application Performance Management (APM) incudes implementation of AppDynamics monitoring application as an enterprise Application performance Monitoring and Management solution. The primary objective of this Project is to implement this tool in order to establish end-to-end Applications monitoring to improve Application stability and gather crucial Application insights. The APM solution will cover real/synthetic user Monitoring, response times, Application layer performance, advanced diagnostics from web-related Server to Application-related Server to database Server.

The project timeline is from January 2020 through October 2020. The high level scope of services under this project are as follows:

- Install and configure AppDynamics Performance Management module (agents) into the Application Environment.
- Provide AppDynamics tools administration and support.
- Setup end user experience monitoring (100 million-page hits package is considered) using AppDynamics' Browser Real User Monitoring.
- Customize the foregoing to set up monitoring alarms/alerts and create out of box reports and dashboards.

Details of Project Activities and Deliverables

Stages	Activities	Deliverables
Plan	• Gather Application data • Study and Plan for Environment • Assess Infrastructure readiness • Categorize critical applications	Validated Application inventory details

Design	• Ensure sanity of collected data • Architect the overall solution • Perform high level and low level design	• High level design documents • Low level design document
Implement	• Validate Infrastructure readiness • Implement AppDynamics with industry best practices • Install agents • Perform sanity check and communication verification • Define health rule definitions • Create dashboard creation and generate reports	• Solution implementation customization completed • UAT
Application Onboarding	• Configure thresholds • Create alerts • Perform user acceptance testing • Provide trainings • Go Live • Handover to AMS Services Tower team for ongoing support	• Rollout to production • Fully configured AppDynamics solution

Justification Summary:

- Monitor and manage end-to-end performance of complex distributed applications while creating a centralized solution.
- Proactive approach to managing the application environment and focus on value-add activities, as opposed to a reactive 'firefighting' approach
- Enhancing the business customer experiences for critical applications
- Enable proactive monitoring to stay ahead of issues including a 24x7 application monitoring, root cause analysis, automated alerts for incidents/events/ etc. creating increased visibility into day to day operations of the applications.
- Identifying opportunities for automation for recurring patterns.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

2. Supplemental Information

Alternatives

Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative description and reason for rejection

- Continue using existing monitoring tools or manual monitoring tools if available, however, there is no centralized process, no uniformity across the board, may be inconsistent in proactive monitoring. AppDynamics allows for centralized monitoring from a central dashboard, able to monitor transactions at application level enabling increased visibility into

application processes, server health, performance tune up etc. Ability to have monitoring across multiple application all from within a centralized dashboard enabling standardization, optimization and opportunities for automation across the board.

Risk of No Action

Give the consequences, including enterprise risks that might arise by not doing the project/program. Quantify the risks, if applicable.

Existing applications may have local monitoring tools and/or manual scripted monitoring or no monitoring in place. This presents limited or lack of visibility to day to day operations, prevents handling issues in advance, prevents performing application tune up etc. Overall, may lead to issues that may cause impacting customer experience, financials etc.

Non-Financial Benefits

- Centralized dashboard presents supervision on multiple applications across the board
- Creating greater control and management of IT applications
- Clear and consistent reporting of application performance
- Increased visibility into application process transactions allowing for application performance tune up
- Enhanced reporting and alerts.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

2. Major financial benefits

- Proactive actions to avoid any final impact due to application issues.
- Reduction and/or elimination of manual labor efforts in reacting to recurring application issues
- Cost avoidance resulting from elimination of duplicate and inefficient processes
- Continued performance tuning of applications will result in long term financial benefits.

3. Total cost

The total project cost is $1,546,000

4. Basis for estimate

- Information provided by Managed Service Provider based on industry standards

5. Conclusion

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1

This project has already been implemented, currently there are no outstanding risks.

Technical Evaluation / Analysis

Project Relationships (if applicable) Not applicable.

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
Capital	535				
O&M*	72		686	686	686

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor	64				
M&S					
Contract Services	471				
Other					
Overheads					
Total	535				

**Total does not include contingency of $30K*

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M	570	686	686	686	686
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☒ Regulatory Mandated ☐ Operationally Required ☐ Strategic	
Project/Program Title: CEMS Windows Server Upgrade	
Project/Program Manager: David Cabrera Salgado	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 6/1/2020	**Estimated Date In Service:9/1/2020**
A. Total Funding Request ($000) **Capital: 253,000** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:
Give a brief description (no less than a paragraph) of the work to be completed and its locations. Include the following:

- *Objectives of the work*
- *Describe units per year and unit costs, if applicable and for identified work.*
- *Justify the Work Plan Categorization and specify whether the work is part of a PCS order/audit.*
- *High-level schedule.*

Project is to upgrade continuous emissions monitoring system (CEMS) Cirrus DAHS software to version 7.8 in order to run on MS Server 2016 to comply with Company cyber security policies.

The DAHS performs data collection, archiving and backup functions as well as control of the CEMS including automated daily calibrations in conjunction with the programmable logic controller (PLC). The existing CEMS for emissions monitoring of Steam Generation Plant stacks, Cirrus DAHS version 7.6, is running on a Windows Server 2008 platform. The CirrusDAHS is designed to meet compliance with applicable 40 CFR Part 60/75 requirements and NYDEC as appropriate based on the current configurations, along with the most current permit limits. Windows Server 2008 is no longer supported by Microsoft and servers must be replaced with an updated operating system to have continued support. This project will replace the existing Cirrus DAHS system with an updated version that meets company and regulatory requirements. The existing Cirrus DAHS systems are:

• East River 10
• East River 20
• East River 60
• East River 70

• South Steam Station
• 59th Street Station - Units 114-118,
• East 60th Street Station - Units 1 through 6 Package Boilers
• 74th Street Station - Units 120- 122,
• 74th Street Station Package Boilers – Units 123 -128
• Ravenswood A-House – Boiler 1&3 (Common Stack) + Boiler 2&4 (Common Stack)

This project will require new hardware, including workstations and servers associated with the Cirrus DAHS system, and configuration of these systems with an updated Operating System and Software.

The vendor provided a quote with a 14 week lead time from award of contract to completion for providing the hardware, software, and services. The vendor is responsible for providing and configuring the hardware and software required. After completion, the vendor will have a support contract to maintain the IT systems. The support contract will be funded by Steam Operations' O&M Budget.

Justification Summary:
Provide justification of why the project/program should be done. ***Give a detailed description of the situation background and work to be completed.*** *If it is a primary driver for doing the work, include a discussion of the ERM addressed by the project or program. Be sure to include financial and non-financial benefits.*

The **Cirrus***DAHS* is designed to meet compliance with applicable 40 CFR Part 60/75 requirements and NYDEC as appropriate based on the current configurations, along with the most current permit limits. This system must be maintained to meet regulatory requirements for stack emissions.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Explain how this project/program will help achieve goals in 5-year and long-range plans.
Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.

There is no relationship to 5-year and long range plans. Incorporating this project will mitigate cybersecurity risks associated with maintaining unsupported Windows Server 2008 equipment and maintain compliance for regulatory requirements.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

An alternative is to upgrade to a Predictive Emissions Monitoring System. Such an upgrade will have higher costs and is not a recommended solution for regulatory requirements.

Alternative 2 description and reason for rejection

Another alternative is a full replacement with a new CEMS system, but this is also a high cost option beyond current requirements and is not recommended.

Alternative 3 description and reason for rejection

Risk of No Action

Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

No action could lead to security vulnerabilities due to outdated operating systems.

Risk 2

Risk 3

Non-Financial Benefits

Examples:

- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*

This project will ensure that existing CEMS systems can continue to meet regulatory requirements.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost
State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate
Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion
Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
Regulatory Compliance	Failure to maintain the system could lead to non-compliance with regulatory emissions monitoring. By implementing this project the emissions monitoring system can be maintained functionally.

Risk 2	Mitigation plan
Cybersecurity	The current OS is not supported by Microsoft and maintaining an outdated system presents cybersecurity vulnerabilities. Upgrading to Windows Server 2016 mitigates the cybersecurity risks.

Technical Evaluation / Analysis
Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

This project is to deliver new **Cirrus*DAHS*** version 7.8 to replace existing version 7.6 systems. The following items are included:

All software and hardware required to install the **Cirrus*DAHS*** version7.8, as specified in the pricing section.

- Software
  - o **Cirrus*DAHS*** version 7.8
  - o SCADA – Honeywell Experion R510
  - o Microsoft Server 2016 Operating System for DAHS Servers
  - o Microsoft SQL Server 2017 Database for Servers
  - o Microsoft Windows 10 Operating System for Client Stations
  - o Kepware OPC Communication Drivers

• Hardware
  - o New Dell T330 Server for each system
  - o New Dell Optiplex SFF 7050 for client workstations
  - o New Dell 19" monitor for all machines

• Engineering Services
  - o Migration from Cirrus DAHS version 7.6 to current version 7.8
  - o Update the OPC Driver and configuration to Kepware where applicable
  - o Migrate Experion points and updated screens.
  - o ConEd Custom features (included) ♣ Target NOx Calculations
  - o NYC Opacity Popup/Audible Alarming
  - o NYC Opacity Agent, Report, & E-Mail
  - o Custom Daily Opacity Plot
  - o Flat File Output
  - o PLC Status Screen
  - o Linearity Results Screen
  - o Gas bottle entry management
  - o Emission Summary Screen

Project Relationships (if applicable)
Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						**253,000**
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital					
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					

Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

x	Capital
X	O&M

2020 – Business System Delivery Electric Operations

Project/Program Title	ARCOS Mobile Workbench
Project Manager	Gabe Cano
Hyperion Project Number	
Organization's Project Number	24823421/0001
Status of Project	Planning
Estimated Start Date	12/2020
Estimated Completion Date	6/2024
Work Plan Category	

Work Description:

The ARCOS Mobile Workbench is a work and work order management application which integrates with existing outage management systems (OMS). A key component of this application is the ability to assign damage assessment crews and have them report back damage information directly into the OMS. The ability for a damage assessor to report back damage directly into the OMS is a critical part of storm analysis and restoration efforts for both CECONY and ORU.

The purpose of this project is to establish he ARCOS Mobile Workbench as the damage assessment application for both CECONY and ORU. The costs include the development, initial training, implementation, and maintenance of the application throughout the lifetime of the proposed contract with ARCOS.

We currently have four package suites which include ARCOS Callout, Crew Manager, Resource Assist, & sMART, having installed this as a single solution suite it has provided us with real-time information for storm role owners, leadership, and managers, whom facilitate better decision-making for the staffing resources. As we move forward with these applications, we see additional enhancements can be added to these products, this enhances our internal customer experience and provides further engagement and usage of the ARCOS software suite based on their operational needs.

We requested the SMS enhancement to crew manager/mobile application, SMS feature increases the effectiveness of delivering communications conducted via ARCOS as it allows the user to read and respond to callouts, instead of responding solely via a the phone system.

Justification Summary:

Currently both Con Edison and Orange and Rockland County utilize the ARCOS ESDA (Electric System Damage Assessment) application to perform damage assessment. The application is

currently in a maintenance only mode and is being retired and will no longer be supported by the 4th quarter of 2021. The application being in maintenance mode means that ARCOS will not support any changes or enhancements requested to the application. The vendor will only provide technical maintenance for bugs, hardware failures, or software failures which occur. Once the application loses its vendor support, any bugs or failures related to the software will not be supported.

Damage Assessment is a critical part of the storm analysis and restoration process. Its processes are continuously changing, and its functionality is critical during major storms. Due to these needs, it is necessary to find an alternative solution to the current ESDA product. The ARCOS Mobile Workbench provides the application solution that we are looking for.

Supplemental Information:

- Alternatives:
  - The easiest alternative for both CECONY and ORU to pursue would be the Oracle Outage Management Application (OMA). The company currently holds a license for the Oracle Network Management System (NMS) for which this application is contained within. For the Oracle alternative to work however, it needs to utilize a fully functional GIS. Currently CECONY is in the process of establishing a GIS platform, but that platform will not be in a state that can be used by OMA until the first quarter of 2023
  - Most alternative Damage Assessment applications do not provide the same level of functionality or support as the ARCOS product. Any applications which could be a viable solution to ARCOS require a fully functional GIS for implementation.

- Risk of No Action:
  - If no action is taken, by the 4th quarter of 2021 we will lose support to our current Damage Assessment application. The application is a critical component to our storm analysis and restoration efforts. If the one of the vendor supported hardware or software components fails, the Company can be left with a product which will either not function at all or will work with limited functionality.

- Non-financial Benefits:
  - Product Enhancements/Customizations: The Con Edison business teams have compiled a list of enhancements, customizations, and other changes that they would like to see included in the product. The current ESDA product no longer allows changes of any kind. As part of the initial delivery agreement for the product, all of the proposed changes will be included at no additional cost in the Mobile Workbench application. ARCOS has also provided guidance that any future changes or enhancements to the product would be considered for development
  - Cloud Hosted: The Mobile Workbench is hosted on cloud servers. This will allow server and storage to be scalable, especially during events with expected high usage. An additional benefit of the application being hosted on the cloud includes the elimination of servers supported by Con Edison. A cloud hosted solution also allows for an enhanced customer experience in which ARCOS engineers can easily develop, test, and deploy new upgrades and fixes for us.
  - Combined CECONY and ORU deployment: ARCOS has committed to releasing this product for both CECONY and ORU at no additional costs outside of what was originally quoted for just the CECONY release.

- Summary of Financial Benefits (if applicable) and Costs:
  - Cost Breakdown: ** Invoicing might differ
    - ARCOS Mobile Workbench + SaaS Product 2020-(Includes implementation fee and storm services) $1,249,006
    - ARCOS Mobile Workbench + SaaS Product 2021 Pymt 1- $738,524
    - ARCOS Mobile Workbench + SaaS Product 2021 Pymt 2 $738,524
    - ARCOS Mobile Workbench + SaaS Product 2021 Pymt 3 $738,524
    - Estimated Labor, testing, PM work etc.. $1,000,000
  - Financial Savings:
    - Moving to a cloud-based infrastructure will provide many indirect financial benefits as described in the section above, but we do not expect there to be any immediate financial savings. We are planning on retiring nine on premises servers which currently host the application. Due to their ages, those servers will be fully depreciated by the time they are retired from service so will not provide any cost benefits.
- Technical Evaluation/Analysis:
  - ARCOS has provided us with a full architectural and security analysis of their application. As a current customer, ARCOS is fully aware of our security and technical standards and have assured us that their product falls within all of the necessary guidelines prescribed by Con Edison and Orange and Rockland.

- Project Relationships (if applicable):
  - CECONY STAR (System Trouble Analysis and Response) – This is Con Edison's OMS system supported by Oracle. The integration of the damage assessment application and STAR is a critical part of storm analysis and restoration efforts.
  - ORU NMS (Network Management System) - This is Orange and Rockland's OMS system supported by Oracle. The integration of the damage assessment application and NMS is a critical part of storm analysis and restoration efforts

- Basis for Estimate:
  - The costs have been provided by ARCOS as part of the contract agreement that they have sent to us.

Total Funding Level ($000): $4,464.6

Request ($000):

Request 2020	**Request 2021**	**Request 2022**	**Request 2023**	**Request 2024**	**Total Capital**
$1.800	$2.308.5				$4.108.5
Request 2020 O&M	**Request 2021 O&M**	**Request 2022 O&M**	**Request 2023 O&M**	**Request 2024 O&M**	**Total O&M**
56.1	$300.0				$356.1

2020 / 2021 – DataSplice Upgrade (to version 6) and Functional Improvements

Project/Program Title	**DataSplice Business Solutions Development and Implementation**
Project Manager	**William Fyke**
Project Number	
Status of Project	**Not Started**
Estimated Start Date	**June 2020**
Estimated Completion Date	**December 2021**
Work Plan Category	

Work Description:

Background

DataSplice, is the primary Mobile Asset Management application for Central Operations and has been in use since 2007. The system is used to capture details of maintenance and operations for asset management decisions and compliance documentation. It interfaces directly with Maximo. DataSplice is also key to driving precision maintenance of assets, best practices of field forces, and daily operational status reporting. Departments currently using DataSplice are SSO, Steam, Transmission Ops (Overhead and Underground) and Construction Services. All of the functions of DataSplice can be performed on mobile devices or desktop computers. DataSplice is the primary interface to Maximo for most users and is the key input source of asset maintenance documentation in the Maximo database. The DataSplice user interface is simplified, in comparison to Maximo, thereby promoting consistent and complete work documentation by field forces. This friendly interface is especially important in driving regulatory, environmental, and internal compliance requirements. DataSplice integrates seamlessly with all versions of Maximo, including Maximo 7.6, which will be implemented in 2020. DataSplice's various configurability functions make it easy to fit varied business processes across the enterprise. Note that the company, DataSplice, LLC, was acquired by Prometheus Group in 2019. It is possible that the name of the product (DataSplice) may change.

Work Description

This project is for the upgrade of DataSplice and the support of the Maximo upgrade. It also includes ongoing development and implementation of new functions in DataSplice, to meet various business needs of Central Operations and to promote work management, operations, and compliance excellence. Historically, we have developed new functionality in DataSplice to meet emergent business needs, or to replace legacy methods and applications. This work will be in the same vain. There is no new software purchase or licensing requirement, only development / configuration in existing software.

Specific Scope:
Line 1 - Upgrades
Upgrade to DataSplice 6 for Maximo (PG Mobile) - Estimate of Man Hours; 1128
Upgrade Con Edison's Test, Dev, and Production instances from version 5 to version 6. The upgraded version of PG Mobile for Maximo will be capable of meeting the functionality required

by the defined use cases as described in this document. For documentation purposes version 6 will be referred to as PG Mobile for Maximo.

- Discovery, Definition, and Design – 88 hours
- Project Resource Coordination/Management 1- 108 hours
- Software Installation, Configuration, & Implementation – 320 hours
- Test Plan and System Testing – 160 hours
- Training – 168 hours
- Mobile Device Deployment – 108 hours
- Deployment/Go-Live Support – 96 hours24
- Post-Production Sustainment and Support – 80 hours
- Prometheus Group Travel Expenses (See Below)

Support Con Ed Upgrade from Maximo 7.5 to 7.6 - 100 hours
Complete tasks related to DataSplice interface with Maximo. Support SIT and UAT during Maximo upgrade project.

<u>Line 2</u> – Functional Improvements

Task 1; Substation Asset and PM Interface – Estimate of Man Hours; 256
* Asset Creation – Develop and implement a DataSplice form / interface that allows area supervisors, planners, etc. to initiate a request for adding an asset or PM record to the system. The form will contain all required fields necessary to create a Maximo Asset and PM record. The ultimate goal is for asset change requestors to create the asset record, in an unapproved status, reducing the amount of work for Maximo admins and reducing the steps required to "on-board" new assets.
* Asset Approval – Authorized Maximo Admins will verify the data submitted from the asset creation form and change the status to Approved. An interface with Maximo will push the details to the Maximo Asset module.
* Move Asset to Production - Record the status change and required signoff information when the asset is placed into production.
* Change Asset Details – Enable an update to existing assets that have incomplete or incorrect information. Apply the asset template form.
* Integrate with PM Module to ensure proper asset maintenance.

Task 2; Create New Functionality in Smart Rounds- Estimate of Man Hours; 256
Increase the number of criteria, from the Maximo Asset, PM and work order records, that can be used to apply points in a round to specific assets, or to apply a round to a specific asset and work order. This would include asset specifications and various asset record fields.

Task 3; DataSplice Rounds Against Inventory Items – Estimate of Man Hours; 80
* Enable functionality for rounds to be performed against inventory items in the same manner as they are currently against Maximo assets and Locations. This should work for regular rounds, and smart rounds.

Task 4; Develop and Implement Oil Leak Management Tool – 160
*Enable and drive detailed, accurate documentation of new leaks in Central Operations
*Support management of leak tracking and status for the life of the leak
*Capture key data to report to regulatory angencies
*Correlate Leaks with EMIS system

Task 5; TLM GIS Improvements - Data Collection Functionality - 230 hours

Currently DataSplice is integrated with Transmission Operation's GIS Application. We would like the below functionality to be able to collect data via Prometheus Group in an off-line environment and update the GIS Database.

1. Capture location of Vegetation Data with specific attribute information. (See examples below)
    i. Danger Trees (Type, Size, Reason, etc.)
    ii. On ROW Trees
    iii. Side Trimming
    iv. Moving
    v. Pruning

2. Capture location of assets with specific attribute information. (Examples Below)
    i. Transmission Tower (Location ID, Tower No., etc.)
    ii. Transmission Manholes

Task 6; Transmission Ops- Remote Monitoring Data - 96 hours
In the current state E-mails are sent from applications/modems associated with Transformers and Remote Freeze Pit Monitoring Units. An application (Think Automation) is utilized to extract information from the e-mails and depict on an application developed on .Net Environment. Geographical information of the unit locations is also associated with the GIS Applications.

Scope of work is to evaluate the existing condition and further develop the .Net App or build in a different environment to perform required functionality.

Task 7; Transmission Ops- Show field complete work orders in a different symbology on the map - 40 hours
Currently only the work orders displayed on the screen can be searched. Search should return results available on all on the data set.

Task 8; Con Ed IT Support for Above Items - 400 hours
Support work by Con Edison IT personnel, and sub-contractors of IT, for the above tasks.
Prometheus Group will include a security architecture document of the "as configured" architecture.

Task 10; Develop and Implement "Smart" Blank Report Format - 196 hours
This would apply the criteria of the selected work order, to a "Smart" inspection, in the blank report, so it displays in the same manner as it would when Begin Inspection is clicked. The blank report will display the points for the assets selected by the smart inspection criteria.

Task 11; Develop and Implement "Smart" Pick Lists – 40 hours
This new functionality is to auto-generate pick lists, in a DataSplice inspection, based on the Maximo smart Location nomenclature. For example, if we want all the breakers, in a particular station, to be available in a picklist for a point in an inspection, it would use the [Location]*BKR* code to pull the correct assets into the pick list.

<u>Line 3</u> Project Management Hours 240
***** Provide project management services and utilize the project.datasplice.com system to house project deliverables and documentation. Use the project system to outline action items and statuses for weekly

meetings. Provide Consolidated Edison designated approver the ability to sign off on completed deliverables.

Line 4 Vendor On-site Work, Travel and Expenses, $17,200.00
***** During the course of this project it is anticipated that on-site working sessions, with the vendor will be needed. This should not exceed 8 days.

Units per Year: N/A

Mandatory: No

High-level schedule:

- Make Changes to accommodate Maximo Upgrade 2nd Quarter 2020
- Maximo Upgarde Go-Live August 2020
- DataSplice Upgrade Go-Live 3rd quarter 2020
- Smart Forms Implementation 3rd quarter 2020
- Implement Failure/Problem Coding 3rd quarter 2020
- Implement New Functionality in Smart Rounds 4th quarter 2020
- Implement Oil Leak Management Tool 4th quarter 2020
- Implement Asset/PM Interface 1st Quarter 2021
- Implement Inventory Rounds Capability 2nd Quarter 2021

Justification Summary: DataSplice has been a key work management application for Central Operations since 2007 and is the primary interface between hundreds of employees and the asset information databases. DataSplice inspections (Job Plans) guide field personnel in the performance of job scopes and alert them to circumstances that are threats to reliability, safety, and system performance. The new functionality, in this project, will drive more complete compliance regarding environmental regulations and waste management. It will also increase the accuracy of the asset database and the PM basis for Central Operations equipment. Additionally, it will enable better inventory management, much more thorough understanding of equipment failure statistics, and better leaveraging of asset information to apply inspections exactly to equipment. All of these new functions will further increase the likelihood of compliance with internal and external regulations.

Supplemental Information:

- Alternatives:
  - Risk of No Action: Increased likelihood lost documentation for PM events. Poor inventory accountability. Inaccuracies in asset and PM information. Non-compliance with regulations for oil leak managment.
  - Non-financial Benefits: Continued excellence in entrerprise asset management information that empowers key asset decision makers. Peace of mind relative to oil leak management. Safety and work efficiency due to availability of detailed asset information and history. Reduced work load for maintenance personnel (eliminate scan and upload of PM datasheets). System reliability. Compliance with external regulators such as NERC, FDNY, DEC, PSC, and DOB.

- Summary of Financial Benefits (if applicable) and Costs: Decreased likelihood of fines for non-compliance. Reduced likelihood of equipment failures.
- Technical Evaluation/Analysis: See proposed solution.

- Project Relationships (if applicable): DataSplice works directly with Maximo. Maximo will be upgraded from version 7.5 to 7.6 in 2020. This project will not impact the Maximo upgrade and all functions will work in Maximo 7.6 with little accommodation required by he vendor or IT.

- Basis for Estimate: Vendor hour estimates. Previous function DataSplice developmet experience. Vendor charges $191.25 / hour for professional services. Estimate includes travel expenses for vendor

Request ($000):

Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
$51	$630	$0	$0	$0

Request by Elements of Expense:

EOE	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
Labor	$3900	$22,000			
M&S	$0	$0			
A/P	$45,000	$598,000			
Other	$0	$0			
Overheads	$2100	$10,000			
Total	$51,000	$630,000	$0	$0	$0

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Construction - IBM Filenet Upgrade(NYCDOT Environment)	
Project/Program Manager: Yolande Cole	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date:	**Estimated Date In Service:**
A. Total Funding Request ($000) **Capital: 400,000** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☒ 5-Year Gross Cost Avoidance ($000)** **O&M: 500,000** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $ 410,000 (IBM Software Maint)** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:
Give a brief description (no less than a paragraph) of the work to be completed and its locations. Include the following:

- *Objectives of the work*
- *Describe units per year and unit costs, if applicable and for identified work.*
- *Justify the Work Plan Categorization and specify whether the work is part of a PCS order/audit.*
- *High-level schedule.*

Construction is the clearing house for the company Notice of Violations (NOV), Corrective Action Reports (CAR) and Permits. This document management system (Summons) interfaces to the Department of Transportation on a daily basis for the processing and documenting of violations. The system is currently used by 1000 plus employees and contractors. The environment needs to be upgraded based the end of support for the current IBM FileNet software.

Justification Summary:
Provide justification of why the project/program should be done. ***Give a detailed description of the situation background and work to be completed.*** *If it is a primary driver for doing the work, include a discussion of the ERM addressed by the project or program. Be sure to include financial and non-financial benefits.*

In order to remain in compliance for support and cyber security the core IBM FileNet software needs to be upgraded.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Explain how this project/program will help achieve goals in 5-year and long-range plans.
This relates to ERM risk cybersecurity, lawsuits for injuries and safety with field conditions.

Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.
The system provides transparency to field conditions that need mitigation, and correction.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

Do not upgrade keep the current system and pay for extended support. The extend support would cost more than the upgrade of the environment.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

Non-Compliance with for support from IBM. Potential

Risk 2

Cyber Security risk because of outdated software.

Risk 3

Non-Financial Benefits
Examples:
- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost

State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate

Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion

Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
Risk 2	Mitigation plan

Technical Evaluation / Analysis

Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

Project Relationships (if applicable) *Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).*

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital					
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services	**400k**				
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Utility Shared Services / Transportation Operations
2020

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Connected Vehicles - Enterprise Vehicle Communication and Location Services	
Project/Program Manager:	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: September 2020	**Estimated Date In Service: Q1, 2021**
A. Total Funding Request ($000) **Capital: $3,205,000** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☒ 5-Year Gross Cost Avoidance ($000)** **O&M: $380,000** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $776,000** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

Transportation Operations is responsible for managing the Company's fleet of near 4,400 vehicles through all phases of their fleet life - procurement, routine maintenance, repairs and ultimately retirement. In the past decade the automotive industry has produced many advances relating to "connected" vehicles. Known in the industry as "Telematics", a fleet manager can now access pertinent data detailing vehicle location, fuel usage, odometer/hour meter readings and onboard diagnostics all in real time from a communication device installed on each vehicle. With this tool creating a fleet of connected vehicles a fleet manager can make sound decisions, backed by the most accurate information in regards to vehicle repair, maintenance, utilization and location to improve the day-to-day operations of the fleet.

As a whole the fleet is currently fragmented. Transportation installs a device to report vehicle fuel usage and mileage. The Operations pay for devices to support in-vehicle Internet and GPS. Additionally, EH&S oversees the use of DriveCam vehicle event recorders. In light of this some vehicles are operating with as many as three aftermarket devices installed on them. In addition to the Company paying separate ongoing service fees for the various systems this has become a vehicle service challenge - with multiple vendor systems installed on the Company's vehicles and issues identifying the responsible party for any faults.

The scope of this project is to create a fleet of connected vehicles and consolidate all the existing efforts by transitioning to one device that provides a cost effective telematics, including GPS. Additionally the Surface Pro devices provided to crews will have embedded SIM cards creating an improved communication solution independent of the vehicle. The selected telematics solution will have alerts for important events which can be sent via email or SMS, and a standard application

programming interface ("API") for enabling integration with other Con Edison applications. Transportation would purchase, install and maintain the device hardware as well as the recurring service fees to standardize across the Company. The comprehensive telematics solution provides a web-based platform where the data can be accessed by different roles/groups within each organization. Transportation will gain the benefit of having telematics data to efficiently maintain and right size the fleet while also being able to troubleshoot any hardware issues for the user groups. The Operations will no longer need to dedicate their own resources to coordinating installations of equipment on vehicles or to maintain the system and will now be able to have Transportation fix any hardware issues that arise. Lastly with every vehicle equipped with the same technology that is managed by Transportation, the Company will be able to report the location of every vehicle in real time.

The devices would be installed on all new incoming vehicles and retrofitted onto the existing fleet (from newest to oldest) over a six month time period from 2020 through 2021.

Justification Summary:

The Company currently uses multiple in-vehicle devices to serve different purposes.

1. GasBoy Plus Data Pass – records vehicle fuel usage and mileage
2. Utility Associates Rocket with Avail GPS – provides employees with in-vehicle internet access and GPS location services
3. Video Event Recorder – used for driver coaching and safe practice reinforcement

The devices listed were introduced to the fleet at different times for different reasons. No single device currently in use can support the functionality of the others in a single platform. Each device is separately mounted and hardwired in the vehicles electrical system, making it a challenge to install and maintain the systems should problems arise. The Company currently pays redundant cellular usage fees to support the Rocket with Avail GPS and DriveCam on the same vehicles rather than use a single cellular subscription. Furthermore since each operational group handles the implementation on their own, there is no transparency – each system is segmented to only be viewed by that organization. Transportation has limited access to the Operations data and regardless, the current GPS tracking has limited functions, such as historical reporting. Avail GPS can currently only pull reports on vehicle location within the last 24 hours and does not record any Telematics information such as odometer readings, fuel usage or vehicle diagnostics. The GPS and Telematics data is critical for Transportation to right size the fleet, optimize preventative maintenance schedules for vehicles and report on vehicle location at all times.

EH&S has advised that use of DriveCam may not need to be continued after the current contract expires in 2021 with the telematics data being able to fill the data need for fleet safety initiatives.

The current Company practice for managing fleet size, reporting on utilization and determining maintenance schedules is based on fuel usage tracked via the GasBoy Plus Data Pass. The Data Pass is installed to report vehicle fuel usage and mileage for each transaction at every in-house fueling station. An algorithm in the Vehicle Management System analyzes each vehicles fuel usage compared to vehicles of similar specification. The service intervals for every vehicle are based on the recorded fuel usage. With more information available through Telematics, Transportation could refine the vehicle maintenance schedules by incorporating not only fuel usage data but also real time odometer readings, total engine hours, and idle hours. Readily available GPS data and fuel usage history would give

Transportation the tools to quickly identify underutilized fleet vehicles. Having all possible information on the fleet's whereabouts in Transportation's control will allow the Company to report on vehicle location at all times, especially in an emergency situation. In addition to the core vehicle functionality of Telematics, Internet and GPS being centralized on a single device, the opportunity exists to consolidate auxiliary items such as video event recording through the communication hub.

Consolidating all the existing efforts by transitioning to one device that provides a cost effective, all-in-one solution for Transportation and the Operations while also provisioning for EH&S integration will allow for greater benefit to the Company as a whole. The Operations will still have their functional needs of in-vehicle internet and GPS tracking satisfied. Transportation will be able to utilize the GPS and Telematics data to better support the fleet in all aspects to effectively maintain and right size the fleet as well as locate the fleet in times of emergency. Redundant cellular charges will be eliminated, and every vehicle will be equipped with the same system no matter which user group is in question, effectively unifying the fleet.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

This project provides situation awareness of every vehicle in the company's fleet on a real-time basis. The solution will enable proactive vehicle management and for understanding and subsequent education related to driver performance.

The technology platform will reduce the risk associated with the current obsolete solution.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection
Take no action – The company could continue to operate on multiple platforms with a higher per unit O&M cost each year and less functionality. Additionally the current Avail system is on an obsolete and unsupported technology (Win Server/SQL 2008) which has an estimated upgrade cost of $400,000.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

The current Avail system is on an obsolete and unsupported technology (Win Server/SQL 2008) which has an estimated upgrade cost of $400,000. If the project were not conducted or an upgrade not funded the system may fail without the ability to repair in a timely and cost effective fashion.

Risk 2

The current Avail system is on an obsolete and unsupported technology (Win Server/SQL 2008) which has an estimated upgrade cost of $400,000. If the project were not conducted or an upgrade not funded the system may be exposed to evolving cyber risks which are not protected by the existing vendor for this particular technology version.

Risk 3

Non-Financial Benefits

A consolidated device will centralize information pertaining to the entire fleet to improve Transportation fleet management abilities while still allowing the Operations to customize data reports for their organizational needs.

The consolidated system will allow Transportation to optimize vehicle maintenance/repair, fleet utilization and report on the fleets real time location at any moment, which is valuable during storms or other types of emergencies.

The telematics will allow for analysis and coaching of driver performance leading to safety and vehicle performance benefits.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

For the 2,747 vehicles currently using the Avail system the O&M platform cost will reduce from $310 per year per vehicle to a platform cost of $179 per vehicle per year. A saving of $131 per vehicle per year or a total of $360,000 per year.

This saving will cover the cost of expanding the connected vehicle scope to the remaining 1,600 vehicles in the company fleet, at a cost of $179 per vehicle per year or a total of $286,400. Allowing for the company operate a fully connected fleet with an O&M reduction of $75,600 per year.

3. Total cost

The total capital cost will be $3.2 million spread across 2020 and 2021. The majority of the work will be targeted in 2020, with all of the required hardware also purchased in 2020. Vehicles which are not available for solution deployment in 2020 will be deployed in 2021.

While the project is a technology solution at its base, the monitoring technology is Software as a Service and as such the vehicle will gain the benefits of the technology as soon as the hardware has been deployed to the vehicle. Therefore project benefit will not need to wait until completion of solution deployment to the whole fleet.

4. Basis for estimate

Estimates are based on prices from current contracts for the existing systems and estimates for the proposed solution.

5. Conclusion

The project should be done. It retires an unsupported system, generates a saving on the population of vehicles using the current system and allows for full connected fleet intelligence as the company seeks to modernize the operation of its business.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
Vehicles may not be available for installation.	Vendor will be asked to provide location flexible resources and incentivized on completion.
Risk 2	Mitigation plan

Technical Evaluation / Analysis

Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

Project Relationships (if applicable)

This project relates to the deployment of laptop devices with embedded SIM cards and data plans, removing their need for specific WiFi hubs within vehicles.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**

Capital						**2,705,00**
O&M					**852,000**	

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**500,000**	**0**	**0**	**0**	**0**
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	**150,000**				
M&S					
Contract Services	**190,000**				
Other	**50,000**				
Overheads	**110,000**				
Total	**500,000**	**0**	**0**	**0**	**0**

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings		**75,600**	**75,600**	**75,600**	**75,600**
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M		**776,000**	**776,000**	**776,000**	**776,000**
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☐ Strategic	
Project/Program Title: EDAP CVO	
Project/Program Manager: Tom Langlois	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☒ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 6/15/2020	**Estimated Date In Service: 1/31/2021**
A. Total Funding Request ($000) **Capital: $927,800** **O&M: $301,350**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:$345,000** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:
Give a brief description (no less than a paragraph) of the work to be completed and its locations. Include the following:

- *Objectives of the work*
- *Describe units per year and unit costs, if applicable and for identified work.*
- *Justify the Work Plan Categorization and specify whether the work is part of a PCS order/audit.*
- *High-level schedule.*

Con Edison would like to replace existing manual Tableau based CVO data analysis and benefits analysis with a new self-service application on the C3 platform. This project will involve two new software integrations, one to STAR and one to PI, that will expand the platform's capability to deliver value to electric and customer energy solutions. The new functionality added to the platform will deliver great value.

Justification Summary:
Provide justification of why the project/program should be done. ***Give a detailed description of the situation background and work to be completed.*** *If it is a primary driver for doing the work, include a discussion of the ERM addressed by the project or program. Be sure to include financial and non-financial benefits.*

Having this system enables us to more aggressively pursue CVO which there are significant environmental savings in CO2 emission reductions and fuel savings. With the implementation of AMI and its impact of CVO, the Company estimates a $346M NPV cost savings for the 20-year BCA analysis, of which $292M is due to fuel savings and $54M is CO2 reductions.

The core integrations being delivered will enable future capabilities to the platform as well. The C3 vendor will perform creation of the application and update of their platform to enable this, the Con Edison ACE IT team will lead the integration work and the AMI business team will help develop and test this new enhanced functionality.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Explain how this project/program will help achieve goals in 5-year and long-range plans.
Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.

The application will help leverage AMI voltage data for area station and 4KV station load to help visualize and provide visibility into the customer voltages to help operators optimize each station's operating voltage schedule. The tool will implement immediate benefit for the CVO program. Project will help address risk mitigation by providing accurate voltage of customers that will help guide what the correct station voltage should be set to avoid high and or low customer voltage.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

In house custom build software using Tableau or an IT in house build software. Using Tableau is not a long-term solution and has to be managed locally and restricted by the Tableau requirements. In addition, there is no IT resources available to support this project due to other pending work scheduled.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

Corporate Risk – Strong
CVO is the third largest customer and company benefit listed in the AMI Business Plan. Without this tool we are risking not meeting the criteria in the AMI Business Plan. Currently we are using a Tableau software that pulls voltage information for the AMI meters. It is very time consuming and publishing

the workbook does not work at the moment. By not doing this project, we are limited and relying on a short term solution that has the risk of failing and not allowing us to extract the AMI data for the customers.

Risk 2

Department Risk -Strong
Currently we are using a Tableau software that pulls voltage information for the AMI meters. It is very time consuming and publishing the workbook does not work at the moment. By not doing this project, we are limited and relying on a short term solution that has the risk of failing and not allowing us to extract the AMI data for the customers. If we do not have the visibility into the meters then we have the risk of leaving customers in a CVO % and causing undesirable low /high voltage customer voltage. Each region manages their area's station voltage. Without the visibility of customer voltage, the region will not know how to properly optimize the station for the region.

Risk 3

Non-Financial Benefits
Examples:

- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*

This project aims to improve customer experience across its new platform. The new application will improve internal and external customer experience. Internal customers will have ability to review customer voltages and make operational decisions to improve the system and allowing Con Edison to reach its CVO goals. The platform will increase our reliability by having an insight into potential trouble area pockets and allowing the company to proactive address any pockets of concerns. Additionally this tool will help reach out efficiency goals with the implementation of CVO which also ensures we meet our regulatory compliance.

Summary of Financial Benefits and Costs (attach backup)
1. Cost-benefit analysis (if required)
To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost
State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate
Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion
Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1 Mitigation plan

Potential risk of overrun into 2021. This might occur if Con Edison does not provide the data the vendor needs by a certain requested date. This can be avoided by having a full time staff assigned to the project to ensure all the data is delivered by the requested timeline.

Risk 2 Mitigation plan

Technical Evaluation / Analysis
Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

Project Relationships (if applicable)
Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						

O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	Request 2022	Request 2023	Request 2024	Request 2025
Capital					
O&M*					

Capital Request by Elements of Expense:

EOE	2021	2022	2023	2024	2025
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Engage Platform Phase IV	
Project/Program Manager: Joachim Gomes	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 11/01/2018	**Estimated Date In Service: 12/31/2020**
A. Total Funding Request ($000) **Capital: 1,231,000** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**
Work Description: **The scope of work involves the development of new applications to support the project planning process, implementation of mobile data collection solutions, and incorporation of automation and machine learning into the work management process. The software development will create new functionality which will reside in the Engage platform and on a separate scheduling optimization server. Additional servers will be purchased and installed to support the increased use of mobile devices using the platform.**	
Justification Summary: **The Engage platform is being utilized to address deficiencies in asset and work management processes that at this time cannot be fulfilled by enterprise systems such as Maximo. The majority of functionality being created is to support management of Central Engineering work, implementation of mobile solutions, and automation of work planning, scheduling, and assignment. The benefits of this new functionality will lower costs and these savings are part of the BCO initiative. This will enable the system to meet the business needs, extend the useable life of the platform, and provide new functionality that has been requested.**	
Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy **This project addresses near term objectives related to the lack of automation and mobile tools for Central Operations. Another project titled "Transition Engage to Maximo" is proposed to align with IT goals of using enterprise solutions and leveraging automation and technology to lower business costs. This work is necessary to achieve savings now until such time that functionality in other enterprise systems is created or configured to replace functionality in Engage. This project will help us streamline processes and implement automation that can then be leveraged by the long-term enterprise solution.**	

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection
An alternative would be to do nothing. The reason for rejecting this alternative is because current enterprise solutions are either not configured or cannot provide all the functionality required by the business. Implementing this project will result in immediate costs savings for the business users while enabling the organization to make a successful gradual transition to enterprise solutions when they are capable of satisfying business requirements.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1
This project is currently in-flight. Risk of no action is that portions of functionality already in use would be unsupported as they were developed using an agile approach and not fully complete. In addition, we would be unable to complete the automated scheduling model which is new technology that can have a significant impact on the cost of maintenance. This would be a missed opportunity and would result in stranded costs as the work could not easily be restarted at a later date.

Risk 2

Risk 3

Non-Financial Benefits
Examples:
- Improved reliability due to better asset and work management software tools.
- Improved employee development through the auto-assign features of the automation.
- Better coordination of work between Central Engineering and its customers.
- Promotion of technology through mobile computing and automation.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

A cost-benefit analysis has not been performed.

2. Major financial benefits

- Automation of scheduling and work assignment will result in the reduction of approximately 5 FTE in Substation Operations.
- Implementation of mobile computing including electronic job briefings should provide an increase in productivity of 2-5% once fully implemented in Substation Operations
- Implementation of a work management system for Central Engineering will result in at least a 10% productivity improvement within the next 5 years based on industry studies of the impacts of the use of work management systems on organizations.

3. Total cost

The total cost to complete this project in 2020 is $1,231,000.

4. Basis for estimate

The estimated cost is based on current purchase orders and vendor quotes. There is a high degree of confidence in the cost estimate.

5. Conclusion

The project should be done. It will enable business continuity and process improvements while the organization investigates alternative enterprise solutions where feasible. This project provides financial benefits that are greater than the cost of the project.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1

The schedule automation doesn't work as intended.

Mitigation plan

Additional work may be required to modify the scheduling tool to function properly. The code is written in Python and training for in-house personnel is planned to enable us to modify the optimization code.

Risk 2 Mitigation plan

Technical Evaluation / Analysis

None

Project Relationships (if applicable)
None

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital			**$4,000**	**$562,000**		**$1,231,000**
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital					
O&M*					

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Electric, Gas, and Steam / Across all divisions
2020-2021

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☒ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Enterprise PI Historian Platform	
Project/Program Manager: Nariman Nasseri	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 2020	**Estimated Date In Service:** 2021
A. Total Funding Request ($12,290,000) **Capital**: $8,295,000 **O&M:** $3,995,000	**B.** **☒ 5-Year Gross Cost Savings ($000)** $1,200,000 **☒ 5-Year Gross Cost Avoidance ($000)** **O&M:** $600,000 **Capital: new purchase:** $4,000,000
C. 5-Year Ongoing Maintenance Expense ($3,995,000) **O&M:** $3,995,000 **Capital:**	**D. Investment Payback Period:** 5 **(Years/months) (If applicable)**

Work Description:

Con Edison has been utilizing OSISoft's PI System for more than 20 years for the real-time monitoring and visualization of critical operations in Electric, Gas and Steam. The list below highlights the extensive use of PI by the various groups within Con Edison that utilize OSISoft's PI System to monitor various systems and make critical time sensitive decisions each and every day.

- Electric Transmission (ECC and AECC)
- Electric Distribution (HQ & 5 boroughs)
- Gas System Planning & Operations
- Gas Engineering Transmission
- Steam Plants (East River, West 59th Street, East 60th Street, 74th Street)
- Steam Business Unit @ HQ
- Engineering Operations
- Substation Engineering
- Substation Operations/Maintenance
- Transmission Planning
- Central Operations – Asset Management
- Westchester Electric Operations
- O&R Electric and Gas Operations

We currently purchased PI software (PI Servers, additional PI tags, PI Interfaces & PI Clients) and PI Services (new PI Server installations, PI System upgrades and training) on a project-by-project basis, and have spent ~ $10M over just the past 7 years on new PI software, PI Services and for 24/7/365 PI Tech Support. As an alternative to continuing to purchase PI software on a project-by-project basis,

which is very inefficient, time consuming and not very cost effective, OSISoft offers an Enterprise Agreement (EA) for the entire company.

The Enterprise Agreement will allow us to deploy and/or upgrade PI technology in an unlimited manner, with no counting of data streams/tags, PI Interfaces, PI Client licenses, etc. Con Edison will benefit from the pro-active support and services provided by OSISoft to ensure that we maximize our use of the PI technology to accelerate company-wide process efficiencies and operational intelligence. OSISoft will work with Con Edison to construct an Enterprise Roadmap for PI implementation.

Below section lists the anticipated implementations of the various Con Edison groups for year 1 and 2.

Justification Summary:

One-time EA Fee – provides unlimited use of the PI software (i.e. – unlimited PI Servers for Production /Testing/Development, unlimited use of High Availability PI, unlimited # of tags, unlimited PI interfaces /connectors, & unlimited PI Clients (PI Vision, ProcessBook, DataLink, Manual Logger) throughout Con Edison.

Enterprise SRP (ESRP) - proactive PI Enterprise Services and Support provided to only Enterprise Customers, by the PI Experts at OSISoft. This includes new PI installs, existing PI System upgrades, training, workshops, PI Visualization Suite, and High Availability. High Availability (HA) add-on will provide dynamic failover and redundant reliability that ensures continuous collection, storage, and availability of our data for sites that currently do not have HA PI systems.

Anticipated Implementations:

Electric Control Center:

- Convert 2 of 3 PI servers to High Availability (HA) PI (mirrored PI Servers – Primary/Secondary with auto failover)
- Increase tag count on all 3 PI Servers to unlimited license (999,999 tags)
- Implement PI Visualization Suite (unlimited PI Vision, PI ProcessBook and PI DataLink (MS Excel add-in) user licenses)
- Implement new PI Vision Web Server
- Add Mobile Control Center PI Servers
- Implement PI AF, PI Analytics and PI Notifications
- PI AF Workshop
- PI Vision Workshop/Training

Electric Distribution:

- Convert new OMS PI server to High Availability (HA) PI (mirrored PI Servers – Primary/Secondary with auto failover)
- Increase PI tag count on OMS PI Server to unlimited (999,999 tags)
- Increase PI tag license from 1.5M tags to unlimited (999,999 tags)
- Implement additional PI Interfaces and PI Connectors (i.e. – PI DNP3, PI Modbus Ethernet, PI OPC DA)
- Implement PI Visualization Suite (unlimited PI Vision, PI ProcessBook and PI DataLink (MS Excel add-in) user licenses)

Distribution Control Center:

- Convert existing 2 PI servers to High Availability (HA) PI (mirrored PI Servers – Primary/Secondary with auto failover)
- Increase PI tag license from 1M tags to unlimited (999,999 tags)

Steam Plants:

- Convert all Steam Plant PI servers to High Availability PI (mirrored PI Servers – Primary/Secondary with auto failover)
- Increase tag count to unlimited (999,999 tags)
- Implement PSA on all the Steam PI Servers - PI Server Access (PSA) toolkit for sending PI data to Maximo to facilitate Condition-based Maintenance (CBM) Program at the Steam Plants
- Implement PI Visualization Suite (unlimited PI Vision, PI ProcessBook and PI DataLink (MS Excel add-in) user licenses)
- Implement PI AF, PI Analytics and PI Notifications
- PI AF Workshop
- PI Vision Workshop/Training

Steam BU:

- Increase tag count on 2 PI Servers from 10k tags to unlimited (999,999 tags)
- Convert both PI servers to High Availability (HA) PI (mirrored PI Servers – Primary/Secondary with auto failover)
- PI Visualization Suite (provides unlimited use of PI Vision, PI ProcessBook, PI DataLink and PI Manual Logger)
- PI AF Workshop
- PI Vision Workshop/Training

Gas Control Center:

- Increase tag count on 2 PI Servers to unlimited (999,999 tags)
- Implement PSA on all the PI Servers - PI Server Access (PSA) toolkit for sending PI data to Maximo to facilitate Condition-based Maintenance (CBM) Program
- PI Visualization Suite (provides unlimited use of PI Vision, PI ProcessBook, PI DataLink and PI Manual Logger)
- Implement new PI Vision Web Server
- Implement PI AF, PI Analytics and PI Notifications
- PI AF Workshop
- PI Vision Workshop/Training

Gas Engineering:

- Implement new PI Server with unlimited tags (999,999 tags)
- Implement new PI Vision Web Server
- PI Visualization Suite (provides unlimited use of PI Vision, PI ProcessBook, PI DataLink and PI Manual Logger)
- PI AF Workshop
- PI Vision Workshop/Training

LNG:

- Implement new PI Server with unlimited tags (999,999 tags)
- Implement new PI Vision Web Server
- PI Visualization Suite (provides unlimited use of PI Vision, PI ProcessBook, PI DataLink and PI Manual Logger)
- PI AF Workshop

- PI Vision Workshop/Training

Central Operations:

- Implement new PI Server with unlimited tags (999,999 tags)
- Convert existing Pump House PI Server and Ancillary PI server to unlimited tags (999,999 tags)
- Convert PI servers to High Availability (HA) PI (mirrored PI Servers – Primary/Secondary with auto failover)
- Implement new PI Vision Web Server
- PI Visualization Suite (provides unlimited use of PI Vision, PI ProcessBook, PI DataLink and PI Manual Logger)
- Implement PI AF, PI Analytics and PI Notifications
- PI AF Workshop
- PI Vision Workshop/Training

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

2. Supplemental Information

Alternatives

Alternative 1 description and reason for rejection
Do Nothing and continue to purchase PI software licenses and PI Services on a project-by-project basis.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action

Risk 1
Continuing to purchase PI software licenses and PI Services on a project-by-project basis is very inefficient, time consuming and not very cost effective, and will cost Con Edison millions of additional expense dollars in the coming years.

Annual maintenance (PI SRP) will increase based on the following:

- Purchasing additional PI tags to expand existing PI Systems (Electric, Gas & Steam)
- Purchasing new PI Systems (for future PI system expansions for other groups)
- Purchasing additional PI Client licenses for new PI users across the Company

In addition, the annual PI Support/Maintenance (SRP) rate will likely increase from 15% to 18% in 2021 which means that the annual PI SRP will increase from the current $1M/year to $1.2M/year (**20% increase in annual Expense**) without the purchase of any additional PI software licenses listed above.

Non-Financial Benefits

- PI EA will allow Con Edison to use additional modules such as PI Analytics and PI Notifications and PI Visualization Suite.
- PI EA includes additional services such as on-site/off-site training and workshops. All Con Edison PI users can be trained according to the OSISoft recommendation on an appropriate learning path that will fit our business needs.
- Dedicated team of advisors will provide strategic advisory services on PI System and enterprise deployment, as well as long-range architectural and strategic planning.
- Eliminating direct access to the SCADA system by connecting all users to the PI System. This allows users to run large queries without crashing the SCADA system
- PI data standardization:
  - Standardizing performance calculations in the PI Server and performance dashboard in PI Vision to replace existing spreadsheets separately kept by different engineers with different calculations to yield the same results. The dashboard would allow engineers to quickly spot check performance and drill down for more information
  - Ability to proactively perform condition-based and predictive maintenance using PI built-in analytic tools and integrating them with existing Con Edison work management products

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

Over the last 20 years, SRP maintenance contract has drastically increased from $600K to $1M. Operations anticipates purchasing additional PI tags and software licenses. Hence, expected expenditure would be $3M-$4M in Capital which would increase O&M to $.5M annually. This would then increase SRP to $1.5M -$1.8M

2. Major financial benefits

OSISoft is proposing an Enterprise Agreement with a one-time fee of $6M (Capital) and an annual ESRP of $1M/year, which will be fixed for the next 5 years, unlike the current SRP which will increase to $1.2M in 2021 and will continue to increase each and every year thereafter with every new PI software purchase.

ROI is 5 years, as with a projected PI software spend of just $2.75M - $3M on various projects over the next 5 years, which is very likely, and an annual SRP rate of 18%, the total additional cost (new PI software licenses + additional SRP for the new PI software) would exceed the one-time EA fee of $6M being proposed by OSISoft.

3. Total cost

Total of capital $8.295M and $4.55M O&M cost for the next 5 years.

4. Basis for estimate

Estimate is based on current customers count across Electric, Gas, and Steam and the anticipated spend on tags license in the coming years.

5. Conclusion

We should proceed with PI EA purchase as doing so will reduce cost across the company and maximize value offered by OSISoft PI System and support.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
None	

Technical Evaluation / Analysis

- Annual evaluation of Con Edison PI system - PI experts will collaborate with the Con Edison IT Team and the various Electric, Gas & Steam business stakeholders to ensure that VALUE, alignment of business needs and industry practices with PI system optimization, continues to be realized throughout the year.
- OSISoft Cyber Security Experts would work with Con Edison Cyber Security Experts & the various stakeholders to ensure PI is being deployed in a consistent and secure manner, following Con Edison Cybersecurity rules and guidelines and implementing Industry Best Practices.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000): $12,295,000

Total Request by Year:

	Request 2020	**Request 2021**	**Request 2022**	**Request 2023**	**Request 2024**
Capital	$7,895,000	$400,000			
O&M*	$497,500	$497,500	$1,000,000	$1,000,000	$1,000,000

Capital Request by Elements of Expense:

EOE	**2020**	**2021**	**2022**	**2023**	**2024**
Labor	$400,000	$400,000			
M&S	$7,495,000				
Contract Services					
Other					
Overheads					
Total	$7,895,000	$400,000			

Total Gross Cost Savings / Avoidance by Year:

	2020	**2021**	**2022**	**2023**	**2024**
O&M Savings	$497,500	$702,500			
O&M Avoidance					

Capital Savings			$200,000	$200,000	$200,000
Capital Avoidance		$4,000,000			

Total Ongoing Maintenance Expense by Year:

	2020	**2021**	**2022**	**2023**	**2024**
O&M	$497500	$497500	$1,000,000	$1,000,000	$1,000,000
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☒ Strategic	
Project/Program Title: Conor Mobile Response Implementation	
Project/Program Manager: Lionel Ing	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☒ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 12/1/20	**Estimated Date In Service: 12/1/21**
A. Total Funding Request ($000) **Capital: $2,867,200** **O&M: 100,000**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:
Give a brief description (no less than a paragraph) of the work to be completed and its locations. Include the following:

- Con Edison and O&R seek to deliver an enhanced mobile experience for field and management employees allowing access to Conor from a mobile device. Conor is currently housed in SharePoint 2016 on-premise. We will leverage the SharePoint Online and Microsoft 365 platform, which currently hosts other CECONY collaboration sites to move Conor from its on-premise location to the cloud. We plan to leverage Con Edison's existing authentication model, enabling employees to access pertinent information from their personal devices using their Con Edison network credentials. All links to on-premise applications like HR Payroll, Oracle, and TLC Training Portal, will be removed from the mobile experience and not available on a mobile or external device, ensuring employees do not encounter broken links. Employees will continue to use CEVO or their company laptops to log into on-premise applications.

Justification Summary:
Provide justification of why the project/program should be done. ***Give a detailed description of the situation background and work to be completed.*** *If it is a primary driver for doing the work, include a discussion of the ERM addressed by the project or program. Be sure to include financial and non-financial benefits.*

- Even before the pandemic restrictions, Con Edison and O&R field employees were not able to directly access information, tools and news available on Conor. Instead, they rely on supervisors to provide information via briefings and printed hand-outs. The landscape of how we work has changed dramatically in recent months. With most employees working remotely for the forseeable future, the challenge to keep them informed is more difficult. There is a pressing need to ensure that our employees receive vital company information.

- Our existing approach to remote access via CEVO presents a sub-optimal employee experience because not all employees have a company device, CEVO oftentimes is not a reliable way to access Conor information, and shared kiosk workstations and toughbooks are touchpoints that present a health concern for field employees as we navigate through COVID response and re-entry.

- Following the principles of the Agile methodology, in 2018, the minimum viable product (MVP) of Conor was implemented for use on company desktops. By design, the MVP contained the foundation necessary to create a mobile responsive experience for Conor.

- In 2018, Con Edison and O&R completed the intranet redesign effort for an in-network desktop experience. Conor is built on SharePoint and provides employees with a familiar and seamless experience for accessing vital information. Mobile accessibility was not in scope for this effort, but the foundation exists to continue to build upon this redesign and empower employees to effortlessly access the information they need to get their work done.

- As a part of the MVP Conor project, the team conducted discovery workshops with employees representing a cross-section of business units, organizational tenure, level, digital aptitude, and leadership. The team created four personas, which brought to life the motivations, behaviors, interactions, needs, and goals of typical intranet users. The personas were used from design to rollout, matching features to personas to make decisions about visual layout, information architecture, backlog priorities, and security and permissions. The personas included a management employee accessing Conor from a desktop, a field employee, a new employee and a content author.

- During the aforementioned discovery workshops, several pain points specific to field employees were identified: broken kiosks, long lines to use kiosks before or after their shift, not wanting other employees to see PII or pay information via a shared computer, reliance on a shift manager to print off time-sensitive communications and distribute to a team at the start of each shift.

- With new remote work arrangements, pain points for management employees include: the increased expectation to remain connected off-hours, access to information pertinent to family support, access to news articles outside of working hours, access to information such as the holiday schedule to plan their lives accordingly.

- Both field and management employees expressed frustration at access and performance issues when using CEVO/CERA as well as accessing the intranet on a company issued device.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Explain how this project/program will help achieve goals in 5-year and long-range plans.
Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.

We would like to provide a friction-free communications channel for all employees (field and management). Our new normal is distributed, remote work. We need to focus on ease of access to pertinent information, and retention of talent in the long term.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

- **The employee intranet will continue to function in its current form with existing challenges on how our employees receive timely communications and information. New stresses on this current method will continue to arise as we move forward into the realm of long-term remote work. Employees must continue to remotely access Conor via CEVO or a company desktop.**

Risk of No Action

Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

- **The employee intranet will continue to function in its current form with existing challenges. Employees must continue to remotely access Conor via CEVO or a company device with existing challenges.**

Risk 2

- **Employee retention, attraction, and development of talent if not addressed.**

Risk 3

- **Health and safety of field workers where there are not enough company devices for all – shared kiosks and toughbooks.**
- **Health and safety of field workers in ensuring pertinent information reaches them in a timely manner.**
- **Confidential information remains secure in Conor space, accessible through your personal device after multi-factor authenitication. Mitigates risk of shared computer logins, printed materials not being destroyed properly.**

Risk 4

- **Poor channels for communication and obsolete infrastructure becoming obstacles to achieving operational or strategic objectives. Misalignment of communicating to employees.**

Non-Financial Benefits

Examples:

- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*

- **Increased safety of workforce (field and management) in ensuring access to time-sensitive communications**
- **Increased efficiency of workforce (field and management) in ensuring employees are empowered with the tools they need to access and exchange information in a timely manner**
- **Increased reliability of workforce (field and management) in ensuring we are providing a clear and easy platform for rapid communications and information**
- **Improved workflows and communication amongst all departments in accessing information housed on Conor.**
- **Improved access to vital information as it pertains to the employee and employee's family (benefits/holiday schedule)**
- **Ensuring compliance by providing employees with multiple channels to access information**

- **Opportunities to align with IT future plans to migrate to Office 365 points if we are going this route – Integration of applications currently existing in our suite with our existing license for an optimized employee experience.**
- **This helps talent retention and communications overall (stream, teams, planner, yammer, power bi, one drive)**
- **By leveraging Con Edison's O365 setup, upgrades and patches maintenance is performed by Microsoft.**

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost

State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate

Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion

Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1: Availability of employee stakeholders to engage in workshops and discovery processes

Mitigation plan: Flexibility in meeting with employee stakeholders

Technical Evaluation / Analysis

Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

We will leverage the ADFS (single sign-on) setup used by employees to access O365. This provides a accepted and secure authentication process for future Conor Mobile users.

We will modify cascading style sheets to format and reconfigure page presentation to fit mobile device screens.

Conor was written in AngularJS per guideline from Microsoft for on-premise SharePoint 2016 environments. Along with moving Conor to O365, we will convert code created in AngularJS to Angular. This is in line with Microsoft's support philosophy for O365 SharePoint applications.

Project Relationships (if applicable)
Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	**Request 2021**	**Request 2022**	**Request 2023**	**Request 2024**
Capital	**$207,200**	**$2,660,000**			
O&M*		**$100,000**			

Capital Request by Elements of Expense:

EOE	**2020**	**2021**	**2022**	**2023**	**2024**
Labor	**X**	**X**			
M&S	**X**	**X**			
Contract Services	**$185,000**	**$2,375,000**			
Other	**X**	**X**			
Overheads	**22,200**	**285,000**			
Total	**$207,200**	**$2,660,000**			

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Corporate Shared Services / IT Engineering and Operations
2020 - 2021

1. Project / Program Summary

Type: ☐ **Project** ☒ **Program**	**Category:** ☒ **Capital** ☐ **O&M**
Work Plan Category: ☐ **Regulatory Mandated** ☐ **Operationally Required** ☒ **Strategic**	
Project/Program Title: Microsoft 365 E5	
Project/Program Manager: Mikhail Falkovich	**Project/Program Number (Level 1):**
Status: ☐ **Initiation** ☐ **Planning** ☐ **Execution** ☒ **On-going** ☐ **Other:** _____	
Estimated Start Date: 05/01/2020	**Estimated Date in Service:** 12/31/2021
A. Total Funding Request ($000) **Capital: $23,606** **O&M: $16,210**	**B.** ☒ **5-Year Gross Cost Savings ($000):** ☐ **5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $16,210** **Capital:**	**D. Investment Payback Period:** N/A **(Years/months) (If applicable)**

Work Description:

Con Edison continues to reduce risk from cyberattacks through defense in depth and defense in breadth strategies. Investments in security and compliance technologies are required to strengthen these layers of defense, ensure adequate and applicable support by vendors, and to continue/acquire services for risk mitigation and threat detection.

This strategy calls for an upgrade to Microsoft 365 E5 licenses, which is comprised of security and compliance tools. These tools are to be procured, evaluated, and implemented during 2020 and 2021. Microsoft's M365 E5 tools will improve our overall cybersecurity and compliance posture by providing advanced threat protection and intelligence as well as advanced compliance and security management capabilities. It will also provide a cloud application security tool for advanced visibility and control in cloud-based applications and information protection solutions.

The M365 E5 program is divided into two major projects: Advanced Threat Protection (ATP) and Microsoft Information Protection (MIP). The program will be executed over the course of three phases from May 2020 through December 2021 using both internal labor and professional services. High-level milestones for the three phases of the program are outlined below:

<u>Phase 1 (May 2020 – June 2020):</u>
Phase 1 of the program consists of a Microsoft-funded security assessment and implementation effort. Implementation efforts will focus on Azure Active Directory Identity Protection, Microsoft Information Protection, and Cloud App Security capabilities that show prove most valuable as per the results of the security assessment. This phase of the program will consist of a combination of internal labor and vendor-provided services.

Phase 2 (June 2020 – December 2020):
Phase 2 of the program will be executed by both internal resources and professional services. Implementation of the following capabilities will be accomplished in Phase 2:

- Cloud Application Security (CAS)
- ATP/Endpoint Protection, to include Windows Defender and Credential Guard
- Privileged Identity Management (PIM)
- Risk-Based Conditional Access
- Data Loss Prevention for Exchange Online, SharePoint Online, OneDrive, and Teams
- MIP Sensitivity Labels (manual classification)

Phase 3 (January 2021 – December 2021):
Phase 3 of the program will include the implementation of ATP Email Protections, the automatic classification of supported documents using MIP Sensitivity Labels, data discovery and classification, and endpoint data loss prevention. This phase will also include the evaluation of additional components and features of the security and compliance suite, including, but not limited to, ATP Attack Simulator, Sentinel, ATP Threat Intelligence/Advanced Hunting, Insider Threat, and Data Governance (CCPA/GDPR).

Justification Summary:

The risk of cybersecurity threats to the Company is increasing, and cybersecurity requirements for IT systems associated with business operations are continuing to grow. Federal legislation and regulatory standards are expected to continue and present risks for fines associated with failing to comply with standards. The risk to the confidentiality, integrity, availability, and reliability of the Company's systems increases greatly without the latest security and compliance technology and accompanying formal cyber and administrative policies to protect data and computing assets. M365 E5 security and compliance suite will enhance the Company's ability to mitigate threats and cybersecurity risks from criminal organizations, nation states, and insider threats by enabling additional protection, detection, and response capabilities.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

Cybersecurity is ranked as the second enterprise risk. This program will help address this corporate risk by enhancing the Company's ability to protect its data and assets from cyber threats and mitigate the risk of attacks. Furthermore, this program will help the Company continue to provide reliable service, significantly strengthen Company processes, and improve IT systems and processes while driving down corporate risk.

2. Supplemental Information

Alternatives

Alternative 1 description and reason for rejection
An alternative to the Microsoft Office 365 E5 program would be to identify and procure individual components of the security and compliance suite from various vendors. The option would be less efficient and would likely be more costly to the Company. In addition, procuring various solutions individually from different vendors would not afford the same visibility and interaction among the security and compliance tools that is present in the M365 E5 suite.

Risk of No Action

Risk 1
The risk of cybersecurity threats is increasing, and the cyber landscape is rapidly changing and evolving. Failure to take action to address the changing landscape will limit the Company's ability to address and mitigate escalating cybersecurity risks and threats.

Non-Financial Benefits

This program will allow for improved visibility, protection, defense, and response capabilities to identify and protect against cyber threats. The additional security and compliance capabilities that are part of the M365 E5 suite will allow us to detect and respond to threats to our on-premise and cloud environments more quickly and efficiently than we currently can with our existing cyber defense tools.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)
The cost of a cyberattack can vary greatly based on impact. In a worst-case scenario, such a breach can impede the Company's ability to deliver energy to the public safely and reliably. A cybersecurity-based intrusion has the potential to result in the loss of customer and employee information and impact power grids within NYC; either of these scenarios may result in material impact to the Company. The financial benefit associated with this program is the reduction of this risk and the associated material impact.

2. Major financial benefits
As per the above cost-benefit analysis, the major financial benefit of this program is the reduction to the risk potential of a cyberattack and the associated material impact to the Company. There is the potential that we will see additional financial benefits and cost savings from the replacement of existing security tools whose capabilities will be replaced by E5 functionality.

3. Total cost
The total funding request for this project is $39.816 million, which includes the costs of licenses, professional services, and implementation labor and overheads. Of this total, approximately $37.855 million is attributed to licensing costs, while the remaining costs are for labor and professional services. Approximately $23.606 million of the total request is capital and the remaining approximate $16.210 million is O&M.

4. Basis for estimate
Historic purchases and program/project implementations are used as the basis for estimates associated with professional services (i.e., vendor labor) and internal labor.

5. Conclusion
The potential risks associated with not implementing the M365 E5 security and compliance capabilities justifies this program. The risk of not acting or selecting an alternative to the program includes increased cybersecurity risk and lessened ability to protect our customer and employee information and assets, detect cyberthreats to our data and systems, and respond appropriately. The loss of this enhanced visibility and defense capabilities leaves an increased risk of material impact to the Company from potential cyberthreats and attacks.

Project Risks and Mitigation Plan	
Risk 1 The possibility of resources assuming contingency assignments outside of IT presents a risk to the project schedule.	**Mitigation Plan:** Mitigation plan is to identify alternate resources who will be retained by IT to assume responsibility for the work of those who are called to contingency assignments.

Technical Evaluation / Analysis

IT Operations & Engineering performs planning and analysis on all technologies introduced and policies established. Cybersecurity policies and procedures are implemented in conjunction with IT strategy and vision planning process. Interaction with IT advisors, vendors, and Company stakeholders ensure the selection of optimal solutions.

Project Relationships (if applicable)

N/A

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital						22,918
O&M						1,351

Total Request ($000): $39,766

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024	Request 2025
Capital	22,918	688				
O&M*						

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024	2025
Labor	446	337				
M&S	23,841					
Contract Services	200	250				
Other	(1,774)	(53)				
Overheads	205	155				
Total	22,918	688				

Total Gross Cost Savings / Avoidance by Year:

	2020	2021	2022	2023	2024	2025
O&M Savings						
O&M Avoidance						
Capital Savings						
Capital Avoidance						

Total Ongoing Maintenance Expense by Year:

	2020	2021	2022	2023	2024	2025
O&M	1,351	4,052	4,052	4,052	2,702	
Capital						

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: PeopleTools 8.58 Upgrade – Human Resources	
Project/Program Manager: Vinesh Chatterjee	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: August 2020	**Estimated Date In Service: January 2021**
A. Total Funding Request ($000) **Capital: 3,243** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:
Currently the company uses Oracle PeopleSoft HCM as the HR Payroll system and PeopleSoft CRM for HR Help desk. Con Edison is responsible to upgrade the on-premise HR systems and maintain the hardware to house the production systems and all the test environments. The support provided by Oracle includes security patches, tax update, upgrades to the underlying technology called PeopleTools and PeopleSoft application upgrades. To remain eligible to receive security patches and tax updates PeopleTools must be upgraded.

In 2018 the company signed a Strategic Partnership with Oracle which included the HCM Cloud application which resulted in HR and IT is re-evaluating the planned HR Payroll PeopleTools upgrade project.

The scope of this project includes the required technology upgrade of PeopleTools. The upgrade of PeopleSoft application and the implementation of mobile technology has been deferred to a pending a future HCM Cloud project and the scope and planned work to implement new functionality has been put on hold. The PeopleTools technology upgrade is required to maintain support with Oracle to continue to receive security updates and tax updates until 2023.

Justification Summary:

The HR/Payroll system operates on the PeopleSoft HCM and CRM platforms, which manage critical HR and CRM processes across CECONY, O&R and CET. The PeopleSoft applications are built upon a toolset called PeopleTools which is the underlying framework for the application. Both the applications and PeopleTools require separate and distinct Oracle support (i.e., upgrades, bug fixes, security patches, etc.) and each system cannot operate without the other.

To remain eligible to receive security patches and tax updates PeopleTools must be upgraded.

Regulatory Mandated/ Reduce and Manage Risks

Each quarter, Oracle releases security patches, application patches, and tax updates for HR Payroll. Like many other vendor product applications, Oracle's patches and updates are critical to the proper operation and security of the application/toolsets. Without the PeopleTools upgrade, we will not receive the automate tax updates, thus risk becoming non-compliant with the IRS codes.

Operationally Required

A deferral of this project would have immediate consequences on the HR Payroll System. The existing support and maintenance for the current version of PeopleTools expires in January 2022 and the HCM Cloud platform will not be implemented in time to stay compliant with security patches. Without the upgrade there will be a gap in applying security patches leaving the system vulnerable for a cyber-attack and increases the risk of employee and retiree personally identifiable information (PII) theft.

Enhance External Relationships:

The project improves relations with the union by ensuring payroll/time keeping is not put at risk. HR Payroll receives information from various work management systems and through direct input of time into the system. We have experienced complaints from employees and the unions when information is not able to seamlessly flow from the interfaces from these systems. The upgrade is required to ensure the system is functioning optimally so that there is no interruption in payroll processing.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
The long-range plan is to replace HR Payroll system with Oracle HCM Cloud. The PeopleTools 8.58 upgrade is required to maintain the existing HR Payroll system with the most current security and tax law updates until the new system has been moved to production in 2022.

2. Supplemental Information

Alternatives

Alternative 1 description and reason for rejection
Not upgrading the HR Payroll system will result in continuing to use the application without the appropriate security and tax law updates. The system could continue to function however there is a high risk of inaccurate payroll and potential data breach.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
If Con Edison does not upgrade the PeopleSoft systems, significant risk to the system will result. Oracle will no longer support the current version of PeopleTools. No action would result in performance degradation as the hardware will be outdated and exceed the supported end of life date. It is recommended that Con Edison remain in compliance of all required tax updates, system bug fixes and security patches.

Risk 1
The payroll system will not be updated with tax law changes resulting in inaccurate payroll processing.

Risk 2
Security patches will not be applied to the system leaving the system vulnerable to cyber-attacks and employee and retiree PII at risk for theft.

Risk 3

Non-Financial Benefits
System upgrades are required to maintain system support (e.g., mandatory tax updates, system bug fixes and security patches) through Oracle.

Summary of Financial Benefits and Costs (attach backup)
1. Cost-benefit analysis (if required)
To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits
Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost
State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate
Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion
Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
Risk 2	Mitigation plan

Technical Evaluation / Analysis
Infrastructure Support:

Although the upgrade will leverage current system architecture, the existing servers require updating as their support expires in 2022. Additional database licenses are also required and are included in the Oracle Strategic Partnership.

System Compatibility:

Upgrading to the latest version of PeopleTools allows Con Edison to leverage current HR/Payroll system architecture and can be maintained by our current technical and functional PeopleSoft HR Payroll support team with help of some additional resources or staff augmentation on technical and business support teams during the upgrade.

Customization/Development:

It is expected that the PeopleTools upgrade may require retrofits to existing customizations.

Project Relationships (if applicable)

- Work Management Systems
  - Maximo
  - Logica
  - JTS
  - GOPs
  - MWM
  - WMS (O&R)
- Oracle eBS (Financials)
  - General Ledger
  - Cost Accounting
  - Employee Data
  - Accounts Payable
- Benefits Vendors (i.e. CIGNA, MetLife)
- Payroll Vendors (i.e. ADP, BNY Mellon)
- Workforce Vendors (i.e. Equifax, ProWatch)
- Recruitment (i.e. Medgate, Sterling)
  - OHAS/Sick time processing

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2022	Request 2024
Capital	**2,746**	**497**			
O&M*					

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor	**262**	**68**			
M&S					
Contract Services	**1,887**	**310**			
Other	**478**	**89**			
Overheads	**119**	**30**			
Total	**2,746**	**497**			

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

System & Transmission Operations
2020/2021

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Outage Scheduling System (OSS) Phase 3	
Project/Program Manager: Irina Northup	**Project/Program Number (Level 1): 24638474**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 09/15/2020	**Estimated Date In Service: 12/31/2021**
A. Total Funding Request ($000) **Capital: 1,900,000** **O&M:**	**B.** **☒ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M: 2,708,000** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:
The Outage Scheduling System (OSS) is used to submit, review, and approve outage requests on the electric system. This effort will enhance OSS with features critical for: securing critical transmission information, safeguarding the electric system reliability, supporting the electric equipment outage-dependent capital budgets of various Company organizations, facilitating compliance requirements and providing needed flexibility, transparency and expected improved user experience.

The major proposed enhancements are as follows:

- Interface with the NYISO's Outage Scheduling System to facilitate outage coordination and ensure transmission information security;
- Interface with Primavera P6, Engineering's Project Management scheduling tool to support the planning and implementation of construction projects and achieve targeted capital budgets;
- Upgraded interface with Maximo to enable automated transmittal of equipment status changes to OSS;
- Timeline structure associated with each outage request to facilitate compliance with outage notifications;
- Additional major enhancements aimed at the automation and integration within OSS currently manual flows and processes, and upgrading the user experience.

We are requesting that the start date of this project be advanced to September 2020 to enable an earlier implementation of the project and thus of a) modifications that will result in an earlier achievement of BCO objectives; and b) elimination of the current exposure to the extreme risk of having transmission information delivered via insecure means.

Justification Summary:

The main driver of the Phase 3 enhancements is a more secure and efficient OSS that enhances electric system reliability through reduced potential for operating errors, better outage planning, coordination and delivery, and facilitates secure compliance notification requirements. These goals are achieved via the following:

a) Facilitates outage coordination: the interface with the NYISO scheduling system ensures a secure and seamless exchange of critical outage information between the NYISO, the neighboring Transmission Owners and Con Edison;
b) The Primavera interface facilitates better outage planning and execution by enabling Company organizations to establish and achieve more accurate targets for capital expenditures and better coordination between the capital and the O&M compliance work;
c) The automation of the Maximo–OSS interface enables the correct selection and validation of the current equipment impacted by the outage and thus contributes to minimizing operating errors;
d) Ensures compliance with evolving requirements for NYISO, NERC, PSC, Transit and Railroad and High Tension customer notifications.

Additionally, this project will streamline, automate and integrate multiple manual tasks and flows thus assuring increased efficiency in outage scheduling.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

.

2. Supplemental Information

Alternatives

Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

Take no new actions and maintain the status quo. This exposes us to non compliance with regulatory notification requirements; inadvertent or malicious release of transmission information; operating errors due to listing incorrect equipment impacted in outages.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action

Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

Notifications of transmission outages could be intercepted by unauthorized entities. Users will be unable to keep OSS current with changes in outage notification requirements by external entities as well as changes in internal procedures whose stipulations are captured in OSS, and thus continue to be prone to failing regulatory compliance mandates for outage notifications. Missed outage notifications also result in missed outages otherwise necessary for maintaining or enhancing electric system reliability..

Risk 2
Outdated equipment and other inconsistencies in impacted equipment listed for outages lead to scheduling errors, which, in turn, could lead to operating errors.

Risk 3
Enhanced outage planning, coordination and execution needed to consistently achieve outage related capital budget targets by various Company organizations cannot be accomplished and thus capital budgets would not meet their targets.

Non-Financial Benefits

Please refer to the Risks listed above

- *Increased safety, reliability, efficiency, or customer satisfaction*
  Increases safety by minimizing the chance for operating errors; Increases electric system reliability by better outage coordination and minimization of missed outage opportunities.

- *Stronger relationships with community or with regulators*
  Ensures that secure, accurate and prompt outage communications take place with the NYISO, neighboring Transmission Owners, Railroads, PSC and other external entities.

- *Ensuring regulatory compliance*
  Ensures the security of transmission information. Ensures that reliability, safety and compliance with NYISO, NERC and PSC requirements are not only maintained, but enhanced.

Summary of Financial Benefits and Costs (attach backup)
1. Cost-benefit analysis (if required)
2. Major financial benefits
Cost Savings of **667k/yr**:

- P6 interface to save 10 manhrs/wk @ $77/hr → $40k/yr
- NYISO approvals populate OSS to save 10manhrs/wk & automation of manual flow to save 3 manhrs/wk, all @$70/hr → $47k/yr
- Better outage coordination and timely approvals to save 20+ occurrences of expedited crane/scaffolding charges, vendor delay charges, all @$3000-5000/occurrence → $80k/yr
- Better outage coordination reduces last minute postponements & cancellations which trigger substantial customer congestion charges → $500k/yr

3. Total cost
$1,900,000

4. Basis for estimate
Based on required enhancements

5. Conclusion
Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.
Yes. This project ensures the security of the transmission information delivered to various outside entities; ensures compliance with evolving outage notification requirements which are regulatory mandates; enhances external relationships with the NYSO, neighboring Transmission Owners, PSC, Railroads, HT customers and other participants in outage coordination; strengthens the reliability of the electric system by ensuring needed equipment outages occur as scheduled, and that chances of operating errors are minimized via accurate and timely equipment updates; augments outage planning, coordination and execution needed to consistently achieve outage related capital budget targets by various Company organizations.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1 Mitigation plan

Complexity of the frequently changing specifications which needs frequent updates done to legacy systems.
Mitigated by having proper communication with respective group/agency

Risk 2 Mitigation plan

Technical Evaluation / Analysis

Project Relationships (if applicable)
These enhancements are performed in various systems due to both the PSC spec and LL 152 dependency.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
Capital	700,000	1,200,000			
O&M*					

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor	120,000	210,000			
M&S					
Contract Services	504,000	864,000			
Other					
Overheads	76,000	200,000			
Total	700,000	1,200,000			

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings	40,000	667,000	667,000	667,000	667,000
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

CECONY Operations / Customer Energy Solutions
2020-2021

1. Project / Program Summary

Type: ☒ **Project** ☐ **Program**	**Category:** ☒ **Capital** ☐ **O&M**
Work Plan Category: ☐ **Regulatory Mandated** ☒ **Operationally Required** ☐ **Strategic**	
Project/Program Title: ProField Encore (AMI Implementation)	
Project/Program Manager: Glennys Marmolejos	**Project/Program Number (Level 1):** 24563972
Status: ☐ **Initiation** ☒ **Planning** ☐ **Execution** ☐ **On-going** ☐ ☐ **Other:** _____	
Estimated Start Date: May 2020	**Estimated Date In Service:** December 2021
A. Total Funding Request ($000) **Capital:** $416,394.20 **O&M**:	**B.** ☒ **5-Year Gross Cost Savings ($000)** ☐ **5-Year Gross Cost Avoidance ($000)** **O&M:** $624,000 **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** $66,693/yr starting on 2024 **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)** 4 -years

Work Description:

In 2017, ProField Encore (PFE) application was chosen by Con Edison of New York as the technology to support the AMI implementation Project for field employees to digitally process meter work. This technology is utilized to capture the set, removal, and exchange of electric meters executed by Electric Operations and is under review for use by Gas Operations. All jobs processed in PFE are fed directly in the Customer Service System (CSS) for billing which now takes two days in comparison to the legacy paper process which took up to 30 days. The introduction of ProField Encore has helped provide improved customer satisfaction, reduced human error for record processing through automation and quality assurance checks, and provided a fully electronic means for storing company metering records. Introduction of the application has also reduced the labor costs associated with manually processing meter work onto the Company's billing system.

To date, progressive enhancements have been made to the PFE application to further improve business processes and increase the overall transaction success rate of the application by addressing human performance, reporting, data quality and the increasing the ability to handle the diverse variety of metering conditions. These enhancements improved organization's use of the tool to process meter work; currently the majority of PFE user groups are performing over 90% of their meter jobs in the PFE application. However, despite the

success of the automation, there are still manual processes supporting these efforts that present an opportunity for labor and cost reduction. In order to recognize these cost reductions and improve human performance, further enhancements are required to automate the manual processes and improve the field-user experience. Nine additional enhancements are proposed for PFE in 2020 to achieve automated reporting, automated QA review and improve the field user experience in order to reduce the labor costs associated with meter processing.

The nine proposed enhancements will allow us to expand automation for review of employee data entry and develop artificial intelligence into our current processes. Below is a list of these enhancements:

No.	Enhancement	Justification	Number of Instances per Year	Price
1	Move "Contextual Reference" content from expandable "Tool Tip" to Static Header in Wireframes	Saves business from having to invoke the tool tip, and moves the information that is in the tool tip to a header section on the Work Order pages. HPI tool to provide context of what meter and address and part supplied the technicians are working on.	Every Work Order	$ 12,765.00
2	Need RIC & COMMENTS from CSS to come into profield	Provides context as to the irregular condition that is being reported. Currently the technicians do not see CIS Comments for the RIC, and they lack context as to the condition they are on location to correct.	All RIC Work Orders	$ 28,860.00
3	Enhancement Request to Pick-up Process - Phase 2	Marries multiple WO's back to original requests that are made where a pickup is needed to complete the service work order. Saves manual processing of multiple Work Orders in Supervisor Review as there would be redundancies in work.	Every Work Order	$ 131,054.00
4	Image Scraping API	Creates a tool that enables the application to perform the Supervisor Review. This is needed to allevaite the burden on the AOC via a tool that can perform this function without human interaction.	Every Work Order	$ 74,626.00
5	Barcode Reader API	Creates a tool that can capture the Meter Number, by reading the face of the device that the camera is pointed at. Eliminates the need for external barcode scanners that will need to be ordered to consolidate down to single machines in electric ops.	Every Work Order	**Every 2 years**
6	Create pathway for direct connection to reporting database	Creates a connection endpoint for ConEdison to hook in the EDAP platform for reporting purposes. This endpoint is needed so we can synchronize PFE data in EDAP in real-time. Currently, there is a file shipped once a day, however that file does not provide the ability to report the goings on in the applicaiton for the purposes that AMI Team needs. An example would be ability to report the success and failure of Work Orders that have been dispatched in the applicaiton from WMS to PFE and from PFE to PFE HH.	Every Work Order	$ 89,100.00
7	RFBK does not go to CIS for RIC Work Order when the meter is replaced (Sequencing)	RFBK Comments are currently not updating the RIC's in CIS when meter is replaced. There is a sequencing issue that needs to be explored to make sure the RIC Comments are sent back to CSS so the RIC can be closed out. These comments are needed to update customer service system as to the happenings of the Work Orders for closure of the inquiry. Requires manual reviewto close out the RIC.		$ 15,392.00

8	Not Capture MAC Address add as an enrichment in the 935 via MAMS	MAMS needs to get the MAC Address from the MMF file instead of from PF E. This will reduce user populating the field and potentially getting the value incorrect. This would be sent from MAMS to CIS via 741 message payload which provides better more accurate information to CSS. This makes lives easier as there is less information to be captured for MAC Addresses. Increases the speed of the job and supervisory review as there are less fields to capture and validate.	Image Scraper needs to be implemented after this feature is implemented.	$	30,784.00
9	Route Work Orders in Supervisor Review via Business Rules	Needed to separate Supervisor Review work that needs to be performed by MAG, CCG, and AOC. This allows for tracking of updating CSS for instances where Work Orders must be manually updated. Makes it so the AOC will only need to look at a subset of the work that is completed. Makes sure Work ORders that require MAG updates to CSS are properly routed to MAG so they can perform the work.	Every Work Order that's unmarried	$	27,513.20
				$	**410,094.20**
	Additional Costs from Vendor				
	Requirement Gathering (2 resources 1 week)			$	4,200.00
	On Site Support (1 resource 1 week)			$	2,100.00
				$	**6,300.00**
	Total Cost			**$**	**416,394.20**

Justification Summary:

AMI Operations Systems Support (AOSS) is seeking funding to institute specific measures to improve the functionality of PFE application and reduce the labor for manual correction of data entry. For example, investing in an API image scraper that would utilize artificial intelligence to perform quality assurance checks on meter work. Additionally, these enhancements will reduce installation tasks and improve information for the Electric Operations installer. By improving information available to the Electric Operations installer and reducing the amount of data captured on site, QA failures and additional investigations per failure will be reduced. Currently, extensive time and effort is taken to identify, analyze and process errors such as switched meter conditions, missing transformer data and inaccurate data capture, all which have a direct impact on account billing and customer satisfaction. Moreover, by transitioning report generation to IT applications instead of having them manually generated reduces overall labor costs associated with meter installation. These initiatives are projected to save Con Edison one full time employee(FTE) while allowing employees to engage with higher value-add activities.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

The AMI platform, in all its parts, is transformational and foundational to the future of Con Edison and the way we work. ProField Encore is a critical portion of the AMI platform, a work management system that will allow for automation and accountability of meter installation in the field, similar to that of LOGICA and Gas Central System. The Company

has invested significant capital in building the AMI system, as this will be the future of how the Company works moving forward.

ProField Encore(PFE) as it relates to ERM

PFE as it relates to CES-AMI ERM most aligns in the following identified categories:

a. Relationship with Stakeholders – Company personnel seek to provide a positive +1 Customer Experience. With enhancements to PFE, meter installations are smoother and provide more accurate details for the installer on meter information and the installation process. This system provides comprehensive meter lifecycle data for the installers, in turn, providing a better relationship with our customers as we better understand their concerns and needs.

b. Personally Identifiable Information and Cybersecurity – PFE stores customer address, phone # and meter lifecycle data as it relates to installation/retirement of an asset. This information is securely kept on the PFE system, and the tablets that our field crew carry must be logged into with Con Edison sign in credentials only. Through multiple field and system audits, PFE has been vetted to ensure the security of PII, as well as strong cybersecurity protection.

The Company and the AMI Team have strategies in place to mitigate these risks to the extent possible as described in the ERM strategy for CES.

PFE as it relates to Long Range Plan

During the early years of the Company's long-range plan, we will install over 4.5 million smart meters through the AMI Project. Those meters will serve as the backbone of future digital advances for our energy systems. Information from smart meters will help customers reduce energy use and save money, while also enabling us to operate the grid more efficiently, more easily integrate energy produced within the distribution system, and cut operating costs.

Our investments in information technology will improve our customer's experience, making it easier to report outages, analyze energy use, receive bill alerts, and interact with us via live chat and smart phones. As the long-range plan is executed, the Company seeks to reduce and limit the impact of energy costs on our customers, and are actively working to limit increases to customer bills. To that end, we are taking an aggressive approach to identify technologies, process improvements, and capital investments that reduce our overall operations and maintenance costs. PFE supports the long range plan as it relates to extending the legacy of the AMI Project, providing +1 customer experience through enhanced customer meter data and providing workflow process improvements to field installation work, amongst others.

2. Supplemental Information

Alternatives

There are two alternatives: a) do nothing and continue to rely on manual QA efforts and reporting as the use of the tool expands, or b) expand the capacity of

PFE application to remove manual QA, reporting, and data entry.

Risk of No Action

If no action is taken, Con Edison will continually rely on the efforts of six FTEs to provide QA, correct data, and provide and build reports.

Non-Financial Benefits

Increased customer satisfaction do to increased bill accuracy and timely billing.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

Not required.

2. Major financial benefits

The Statement of Work has a total cost of $416,394.20. However, by implementing these enhancements we will reduce the need to rely on one FTE. Payback would be less than three years.

3. Total cost

The Statement of Work has a total cost of $416,394.20 for development includes design, development, and production/implementation.

4. Basis for estimate

The estimates are based on the identification of high-level requirements, and a projection of effort involved. Payback period was determined based on one FTE working at an hourly rate of $75.

5. Conclusion

This project should be done because it will:

- Reduce the exception handling costs associated with manual meter processing on CSS
- Reduce labor costs associated with Quality Assurance through technology and artificial intelligence
- Reduce in field data capture requirements by employees
- Reduce meter-to-bill time for meter installations
- Allow us to transition business reporting to automation and same-day generation
- Cost savings of one full-time employee per year at $75/hour

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1 : Vendor Risk

Description: Due to COVID-19 and impacts to the economy,vendor, Alclara (SGS), whom supports ProField Encore application has furlough some of it's employees. This change has not impacted support to ProField Encore yet, but can result in a morderate risk impact to this project in the future.

Risk 1 factor: Controllability

Mitigation plan: Mitigate by working with Vendor to have the necessary support available for this application.

Technical Evaluation / Analysis
For each system being modified to support the solution, an analysis was performed to determine the most efficient and cost-effective design alternative (i.e., adding new field or expanding current fields).

Project Relationships (if applicable)
AMI Project

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital						$191,208
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
Capital	$191,208	$225,187			
O&M*					

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor	$191,208	$225,187			
M&S					

Contract Services					
Other					
Overheads					
Total	$191,208	$225,187			

Total Gross Cost Savings / Avoidance by Year:

	2020	**2021**	**2022**	**2023**	**2024**
O&M Savings			$156,000	$156,000	$156,000
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2020	**2021**	**2022**	**2023**	**2024**
O&M					$66,693
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Substation Operations
2021

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Stop Tag Project	
Project/Program Manager: Sebastian Vero	**Project/Program Number (Level 1):**
Status: ☐ Initiation ☐ Planning ☒ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 1/01/2020	**Estimated Date In Service: 12/31/2020**
A. Total Funding Request ($000) **Capital: $485** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

The current method of recording and tracking Stop Tags associated with Operating Orders is to hand write them on stop tag stock. The operating orders are sent down from the District Operator (Operating Authority), electronically via Rapid Restore and the Substation Operator then fills out the required information by hand on both the main body of the Stop Tag and on the detachable stub. The main bodies of the stop tags are then placed on operating controls of equipment to control their operation and the detachable stubs are maintained in the control room by the Substation Operator. These stop tags provide a control of equipment status that is used for protection of working crews from hazardous energy.

At the completion of work, Operating Orders are again sent down to the Substation Operator electronically via Rapid Restore. The Substation Operator then proceeds to restore equipment and remove stop tags. The tags are then compared manually to the stubs retained in the control room to ensure all are accounted for. Unfortunately this manual process has failed on occasion leading to operating errors and equipment damage, with the potential for employee injury.

Substation Operations wishes to develop an electronic Stop Tag application to print out the information required for Stop Tags directly from the Rapid Restore system so that all information is accurate and electronically associated with the orders. The stop tag serial numbers are electronically tracked and a PIN number is generated to ensure that all stop tags are accounted for upon removal. Dedicated printers will be provided to print out labels so that they can be applied directly to existing stop tag stock, which is hardened to exist securely while placed on substation equipment.

Justification Summary:
The new computerized application will allow Substation Operators to print out multiple stop tags all at once saving substantial time over filling them out by hand. The information will come directly from the

electronic operating order so it will be accurate, and a specific PIN number will be printed on the main body of the tag (only). Upon removing the tags, the Substation Operator will be required to input the PIN number into Rapid Restore in order to return the operating order to the District Operator. This electronically controlled step will prevent the operator from inadvertently leaving a stop tag on the equipment being operated and then accounting for it upon return of the order.

Significant improvements in operating excellence that could be realized by developing this new Stop Tag application are:

- Automatic printing of Stop Tag labels will save time and prevent transcription errors.
- Tracking of all Stop Tag information will be done electronically and will be retrievable during incident review eliminating the need to archive paper tags.
- Specific electronically generated PIN numbers will eliminate the possibility of erroneously accounting for the removal of a stop tag because return of the order will be blocked without the PIN which is printed only on the main body of the tag, not on the stub.
- Electronic Interface to Rapid Restore and FMS/TOMS will ensure accurate tag info is available at equipment held off for work.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

The program is designed to support District Operators and Substation Operators with enhanced situational awareness of the state of the electric system.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection
Continue using a manual stop tag process and develop a new manual system for ensuring accurate reconciliation. This approach is not recommended as it does not make efficient use of existing technology which has proven effective at improving operating performance in other aspects of the process.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

This manual process has failed on occasion leading to operating errors and equipment damage, with the potential for employee injury.

Risk 2

Risk 3

Non-Financial Benefits

Examples:

- Improved reliability due to better asset and work management software tools.
- Improved proficiency in the configuration and use of Maximo.

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost

State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate

Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion

Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1	Mitigation plan
Risk 2	Mitigation plan

Technical Evaluation / Analysis

Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

Project Relationships (if applicable)

Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Forecast 2020
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	Request 2021	Request 2022	Request 2023	Request 2024
Capital	281				
O&M*		200	200	200	200

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor	281				
M&S					
Contract Services					
Other					
Overheads					

Total	**281**				

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2020	**2021**	**2022**	**2023**	**2024**
O&M		**200**	**200**	**200**	**200**
Capital	**281**				

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: TNVS	
Project/Program Manager: Matt Koenig	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 7/1/2020	**Estimated Date In Service: 12/1/2020**
A. Total Funding Request ($000) **Capital: $475** **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: $50 per year** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

TNVS Web Version

Overview: Migration of TNVS Desktop Client Application to a web-based solution. This will allow reach to multiple device platforms with reduced long-term deployment and maintenance costs. This updates the TNVS Server to the latest AVS/OpenViz codebase and contains a full UX update.

a. TNVS Web Version Development (Professional Services)

b. TNVS Standard Support Package including bi-annual map updates to commence on acceptance of Development

TNVS Security Updates

Overview: PI Security and API updates need to be incorporated. Addition of TNVS Active Directory (AD) Security Group for user administration and update of TNVS AD data access credentials.

Area Substation Maps

Adding approximately 65 additional area substation maps expands the coverage and user base for TNVS. The area station maps could be accessed via menu or double click from the top-level mimic map or individually based on user privileges. The primary effort in this project is drawing and validating the new area station CAD maps.

Event Viewer Filter/Search Project
Overview: The current event viewer is a key part of the TNVS workflow. Several improvements will be added to make it even more useful and easy to use. Search, sorting, checkbox filtering, date ranges and more.

Substation View Updates
Overview: Additional feeder annotation and FFI's should be added so components on each individual map can be clearly Identified.

TNVS Historic Performance Updates
Overview: PI historic data requests need to be reworked using latest API to improve historic request performance and improved security. Addition of Server Information Notifications.

This project should take 6 months to complete, beginning in July and ending in December.

Justification Summary:

The current version of TNVS exists on a hardware server that has become obsolete and must be replaced. This project seeks to upgrade the application to a VM server environment along with all appropriate updates in operating system, software, data and browser capabilities. In addition, the application will be enhanced to create a greater scope of observability and number of users.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

The program is designed to support operators and engineers in the field with enhanced situational awareness of the state of the transmission system. By implementing in a browser-based environment, the application provides a significant improvement in resiliency.

Future expansion of this application will provide additional resiliency in the form of increased awareness during emergencies and impacting events such as loss of the ECC mimic board, or other equipment outages due to natural events or other causes.

The new application mitigates security risks through implementation of the new platform and environment.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection
Establish Stand-Alone Hardware Server to replace obsolete server without updating or expanding software. Reject Reason: No alternative for expanding accessibility and expanded functionality.

Alternative 2 description and reason for rejection

Alternative 3 description and reason for rejection

Risk of No Action
Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1: Old Server is already obsolete and will be discontinued in a year. Functionality will be lost. All previous development work will be lost. Customers (including execs) will lose the observational capability provided by the tool.

Risk

Risk 3

Non-Financial Benefits
Examples:

- **This application is already used by 120 operators, engineers and executives. They rely on the easy availability of information in graphical format from remote locations. There is no substitute resource.**
- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*
-

Summary of Financial Benefits and Costs (attach backup)
1. Cost-benefit analysis (if required)
To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

2. Major financial benefits
Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization) that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

3. Total cost
State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate
Explain the method used to create the estimate. Include all key assumptions.

5. Conclusion
Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1. Developers get Corona Virus – delay work Mitigation plan: Hope not too severe!

Risk 2 Mitigation plan

Technical Evaluation / Analysis
Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

Project Relationships (if applicable)
This project depends on output from PI Server.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						
O&M						

Total Request ($000):

Total Request by Year:

	Request 2020	**Request 2021**	**Request 2022**	**Request 2023**	**Request 2024**
Capital	50,000				
O&M*					

Capital Request by Elements of Expense:

EOE	2020	2021	2022	2023	2024
Labor					
M&S					
Contract Services	450,000				
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2020	2021	2022	2023	2024
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2020	2021	2022	2023	2024
O&M		50,000	50,000	50.000	50.000
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Shared Services / Supply Chain
2020-2022

1. Project / Program Summary

Type: ☒ Project ☒ Program (New program for Con Edison)	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☐ Operationally Required ☒ Strategic	
Project/Program Title: Third Party Risk Management Software Project	
Project/Program Manager: Kara Kennedy	**Project/Program Number (Level 1):**
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ Other: _____	
Estimated Start Date: October 2020	**Estimated Date In Service:** January 2022
A. Total Funding Request ($6,352,724*) **Capital: 4,373,000** **O&M: 1,012,362** **Retirement: TBD** **(*2020-2022: does not include O&M staffing model)**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense **O&M: 4,881,810** **Capital: 0**	**D. Investment Payback Period: (Years/months)**

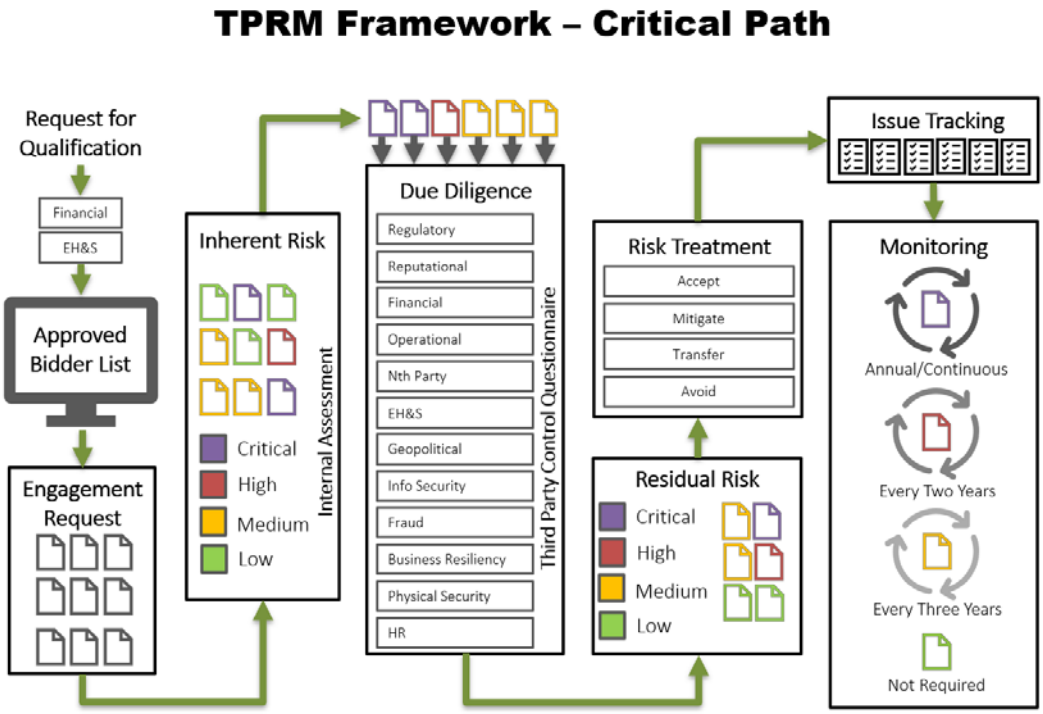
Work Description:

Supply Chain will partner with a consulting firm to assist with the design, build, and deployment of a Third Party Risk Management (TPRM) program to drive efficiencies as well as identify, monitor, and manage the risk(s) of doing business with third parties. This proposal is to leverage its existing Oracle and RSA Archer (RSA) platforms for CECONY and O&R (collectively the Company) to implement consistent and standardized processes of onboarding, assessing, monitoring, and managing the identified risk of its third parties.

This implementation will involve the design of four (4) TPRM Archer modules and build into the existing Issues Management solution leveraged by Compliance. Additionally, the solution will be integrated with Oracle's Supplier Qualification Module (SQM), RSA's Vendor Portal for secure data sharing with third parties, a strong third party risk monitoring tool, as well as several internal tools that will provide data inputs of cyber security scorecards, performance assessment activities, fraud alerts, and linkages to payment and contract management systems. (The integrations with internal tools include the Contractor Oversight System (COS), BitSight, Discovery SAS, Oracle's payment and contract management solutions, and Tableau.)

The scope of this program will address the implementation of the solution for Supply Chain's portfolio, for which a consulting service will be selected to complete a proof of concept via initial assessments of Supply Chain's in-scope third parties. These completed assessments will inform the full design and data inputs of the program and technical solution across twelve (12) risk domains. Business areas throughout the Company are being identified and included

during the first phase to ensure the solution is scalable to the enterprise during subsequent phases. The below diagram reflects the critical path of the TPRM framework.



Justification Summary:
In 2018, an internal fraud review identified third party risk as a heightened risk to the organization. In 2019, Ernst & Young was engaged to perform a phase zero high-level maturity assessment of the Company's TPRM program, including related roles, processes, and controls designed to address third party risks. It was determined that the Company's maturity rating was a 2.0 out of a 5.0 scale, which sits below both industry peers and Fortune 500 companies. The company continues to experience third party incidents (e.g. data breaches of key partners, fraudulent activity resulting in large settlements), expanding regulations that hold companies more accountable for their third parties (e.g. GDPR, CCPA, and pending legislation in New York State), a volatile geopolitical landscape, and a pandemic (COVID-19) directly impacting Supply Chain).

In 2020, the Company hired a former Governance, Risk, and Compliance technology manager from a top eight consulting firm to develop the business case and project manage the TPRM program. The development of the same is aligned with the strategic priority to have a direct line of sight into organizational agility, efficiency and effectiveness, and TPRM initiatives that were approved by the TPRM Steering Committee as part of the project Charter review in Q1 2020.

The major elements of work for this project include:

(1) TPRM Oversight Committee and a single function within Supply Chain to oversee implementation and operation of program;

(2) improve risk coverage by incorporating all 12 risk domains and applying TPRM processes consistently across all third parties;

(3) adopt a risk-based methodology to assess and monitor third parties;

(4) document a formal TPRM policy and procedure;

(5) improve training and awareness to drive change and facilitate adoption of program enhancements;

(6) develop a single, dynamic due diligence (control-based) questionnaire that incorporates all applicable risk domains;

(7) define a risk treatment process to track identified issues to closure;

(8) assess third party risk at an engagement and third party level respectively to better identify and manage new potential risks;

(9) Implement technology that supports the end-to-end TPRM Framework and workflows, which includes:

a. onboarding of third parties, procurement process/lifecycle, risk domain subject matter experts (e.g. EH&S, Law, Information Security), and business requestors throughout the enterprise
b. centralizing third party profile data to capture comprehensive risk profiles
c. embedded and traceable workflows (internally and externally with third parties)
d. real-time risk metrics and end user work queues for workflow management
e. ease of QA reviews with embedded audit trails (internally and externally)
f. document repository

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy

This program will help the Company achieve its third party risk management goals by having a direct line of sight into the risks of doing business with new or existing third parties as well as any risk treatment plans (e.g. open risk acceptances, remediation plans). The centralized information will also support the identification and mitigation of the following corporate and Supply Chain department risks:

1. Organization: Utility Shared Services - Third Party Management
2. Organization: Department: Utility Shared Services - Supply Chain Disruption
3. Organization: Department: Utility Shared Services - Emergency Preparedness & Response
4. Corporate Con Edison: Operations- Cyber Security
5. Corporate Con Edison: Compliance - Fraud

2. Supplemental Information

Alternatives

Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection

An alternative to this project would be the development of standardized processes and instructions that could be followed by employees so that one method is used to manually record and track onboarding and templates can be developed and leveraged to consistently risk rate third parties in the existing non-electronic, decentralized, and duplicative manner currently used. This would not provide efficient or timely sharing of information, and continue the current practices disparate electronic inherent risk, due diligence assessments, and action tracking from the respective third-party risk profiles.

Alternative 2 description and reason for rejection
Another alternative could be to build a home-grown solution that supports the TPRM framework instead of purchasing a system solution from a vendor. Building a system is not an efficient solution in comparison with a fully functional vendor-provided system that remains dynamic and current with the latest technology and industry frameworks as competition drives system improvements and will be supported by a maintenance contract.

Alternative 3 description and reason for rejection
Another alternative is to select a TPRM solution by an alternative vendor. From the Gartner report that rates existing platforms, RSA Archer is the preferred option due to its dynamic abilities to integrate and its ease of configuration to support this evolving landscape. Additionally, it is already being used by other areas of the company.

Risk of No Action

Risk 1
By not proceeding with this project, the Company will not fully address internal audit findings, will continue to fall behind industry TPRM program maturity, and not be able to support the increasing Corporate Risks of Cyber and Fraud or the Organizational Risks of Third Party Risk Management, Supply Chain Disruption, or Emergency Preparedness & Response. The expanding risk landscape and an inability to identify and mitigate risks in real-time operational impacts, financial loss, regulatory exposure, public embarrassment could result in reputational damage to the Company.

Risk 2
By not proceeding with this project, the Company would continue to utilize current processes to manage third parties. Current processes are not standardized, are manual in nature, decentralized, duplicative and do not support efficient information sharing across the Company thereby increasing exposure to risks that cannot be identified or managed in a timely fashion. Thus, making it increasingly difficult for Supply Chain to address its departmental risk of Supply Chain Disruption and Third Party Risk Management.

Risk 3
By not proceeding with this project, this could lead to low employee morale and retention due to a lack of centralized technology that supports Supply Chain's ability to make faster and smarter decisions regarding third party selections from a risk evaluation perspective and its ability to support effectively managing risks as they arise.

Non-Financial Benefits

Centralized technology will significantly enhance information sharing across functional areas (e.g. Supply Chain, Law, Audit, Information Security), improve workflows and communication with third parties, and position the Company to address the evolving landscape of third party risk management to ensure regulatory compliance.

Additionally, a proactive third party risk management program, will increase employees' third party risk awareness and consciousness, which will help the Company to detect, prevent, and manage third party risks, make faster and smarter decisions about doing business with external parties, and will ultimately help instill the Company's long established, positive reputation in the market and the confidence of our customers.

Summary of Financial Benefits and Costs (attach backup)

1. Improved vendor onboarding and qualification process, supporting the delivery of on-time and on-budget procurements
2. Improved governance, supporting the overall reduction in financial, reputational, operational, and regulatory risk to the Company
3. Improved processes, supporting the reduction of manual labor and replication of processes (e.g. manual data entry/collection and administrative tasks supporting the program)

The estimate outlined below was prepared by the TPRM Project Manager. The estimate includes various components as follows:

- Software Implementation and steady state support including the supporting activities of installation, configuration, data migration, integrations, and deployment (based on preliminary third party consulting quotes and input from IT PMO).

The capital spend summary by the Company is highlighted in the attached spreadsheet. The figures are inclusive of capital costs for the aforementioned items.

Project Risks and Mitigation Plan

Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1

Cost and synchronizing with funding cycles to implement technology to automate continuous monitoring of third parties and reporting as well as operational timelines with software and infrastructure support.

Mitigation plan: Timely completion of the capital optimization process for 2020 or 2021 evaluation as well as alignment with IT PMO on resourcing.

Risk 2

Concurrence by Key Stakeholder Organizations on adoption of risk-based methodology to assess and monitor third parties and project participation.

Mitigation plan: Involvement and engagement of senior leadership, an influential TPRM Steering Committee and Program Team to support communications and engagement across the organization.

Risk 3

Impact to project by changes in human resources (including, but not limited to Contingency, Crisis Management, role changes, etc.)

Mitigation plan: By procuring consulting firm services to support the aforementioned activities of this program development, the staffing will augment and support the project management and development functions should the Company experience an event or change that impacts its human resources. Additionally, it will ensure continuity should resources leave the company or department and/or are replaced.

Technical Evaluation/Analysis

The following technical evaluations were performed in designing the TPRM program's technical solution:

1. Infrastructure support evaluation with IT PMO;
2. System compatibility research, supported by RSA Archer, Gartner, and the Project Manager's background as a certified RSA Archer Professional;
3. Selected tool is easily configurable vs other technical coding language (e.g. C++) for easier and faster development and deployment

Project Relationships (if applicable)

Aligned with the following strategic initiatives:

1. Oracle agreement fulfillment (implementing the previously purchased Supplier Qualification Module cloud solution);
2. Archer expansion for an integrated risk management platform (currently leveraged by Compliance Management and Enterprise Risk Management);
3. Privacy project (sponsored by Cyber and Law to address expanding regulations);
4. Discovery SAS project (sponsored by FIG to address fraud monitoring)

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						288,000
O&M						

Total Capital Request ($4,373,000):

Total Request by Year:

	Request 2020	**Request 2021**	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	$288,000	$4,055,000	$30,000.00			
O&M*		$1,012,362	$967,362	$967,362	$967,362	$967,362
Retirement^						

Capital Request by Elements of Expense:

EOE	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Labor	$288,000	$3,622,000	$30,000			
M&S		$393,000				
Contract Services						
Other**		$40,000				
Overheads						
Total	$288,000	$4,055,000	$30,000.00			

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024
O&M Savings				
O&M Avoidance				
Capital Savings				
Capital Avoidance				

Total Ongoing Maintenance Expense by Year:

	2022	2023	2024	2025	2026
O&M	$967,362	$967,362	$1,090,362	$967,362	$967,362
Capital					

Note: the above maintenance reflects the subscription of a Data as a Service risk-intelligence tool and the maintenance cost of the RSA Archer modules and Vendor Portal solution. The Vendor Portal will renew for O&M in 2024.

*If whitepaper is supporting a capital project/program this refers to implementation O&M
**Estimated cost for a server upgrade from medium to large scale (determine if this is under the correct categorization)
^ Potential retirement of Vendor Qualification System (homegrown solution), VRA (homegrown SharePoint), and Contractor Oversight System for scorecards and issues tracking.

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Utility Shared Services / Facilities & Field Service
2020

1. Project / Program Summary

Type: ☐ Project ☒ Program	**Category: ☒ Capital ☒ O&M**
Work Plan Category: ☒ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Post COVID Workplace: Facilities Upgrades	
Project/Program Manager: Katrina Benites	**Project/Program Number (Level 1):** 24539462 - Facilities Pandemic Hardening
Status: ☒ Initiation ☐ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: March 2020	**Estimated Date In Service: December 2021**
A. Total Funding Request ($000) **Capital: $ 4,100** **O&M: $ 4,250 (To be funded outside of FFS)**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M: 4,250** **Capital:**	**D. Investment Payback Period: (Years/months) (If applicable)**

Work Description:

Give a brief description (no less than a paragraph) of the work to be completed and its locations. Include the following:

- *Objectives of the work*
- *Describe units per year and unit costs, if applicable and for identified work.*
- *Justify the Work Plan Categorization and specify whether the work is part of a PCS order/audit.*
- *High-level schedule.*

The current COVID-19 experience, anticipated requirements for mitigating infectious disease spread in the future, necessitate significant changes to Con Edison's predominantly open office space design. Gathering, collaboration, and openness have been a common theme in workplaces across industries. According to *IFMA's 2018 New Space and Project Management Benchmark*, seventy percent of office workers work in open offices. With bench style desks, collaborative spaces, shared pantries and optimized layouts, Con Edison's office spaces align with industry norms. The COVID-19 experience, and the guidelines issued from CDC and others, require significant changes in the Company's approach to its various workspaces (offices, conference rooms, control rooms, et. al.)Whereas many of Con Edison's workspaces have been redesigned over the past decade to eliminate closed offices, promote collaboration and optimize space, new social distancing guidelines with: 1) minimum six foot spacing, 2) avoidance of large gatherings, 3) remote work and virtual conferencing, 4) enhanced cleaning/sanitizing and upgraded HVAC systems will require the Company to adapt and modify. Based on governmental guidance, benchmarking and furniture vendors, 6 feet is the current distance to achieve "safety".

The objective of the re-entry strategies discussed herein, which is derived from current CDC and industry guidance, aims to identify a combination of administrative and engineering controls and changes for implementation for Stage 1 and Stage 2 , that are intended to address multiple concerns with the post COVID workplace. Stage 3 is yet to be determined but will be described here as potential future concepts to consider. Effective implementation is key to mitigating communicable illness transmission potential and facilitating positive worker perceptions and productivity. Cost estimates are identified below for the installation of furniture barriers, signage, cleaning stations, and other measures that can be undertaken in Stage 1 and Stage 2 of re-entry. Estimates for any HVAC, plumbing and elevator upgrades, touchless fixtures, and other more extensive modifications that may be needed will be addressed in separate white papers once design and engineering packages have been developed.

This is a 2 year program which addresses Stage 1 & Stage 2 of re-entry. Although Stage 3 will be assessed at a further date, concepts are noted below.

Justification Summary:
Provide justification of why the project/program should be done. ***Give a detailed description of the situation background and work to be completed.*** *If it is a primary driver for doing the work, include a discussion of the ERM addressed by the project or program. Be sure to include financial and non-financial benefits.*

Planning for Con Edison's post-COVID workplace is challenging as at this point there is a lack of certainty about the virus itself and the CDC and other governmental and industry government guidance and directives are all still evolving. To address this uncertainty, Con Edison's strategy is a phased approach; one that is sufficiently nimble to allow for adjustments to respond to emerging issues and directives. According to Steelcase's report, *Navigating What's Next*, the challenge in the "new" workplace will be to create an environment where workers feel safe and where they can continue to build communities and foster business relationships. Mitigating the spread of disease and worker wellbeing will be at the forefront of the design solutions.

Throughout the planning process, Con Edison has engaged major furniture manufacturers and consultants, and benchmarked with industry partners to canvass strategies for re-occupation post-COVID. Facilities management, occupancy planning/space management, and workplace strategy were among the common themes. One of Lear Corporation's recommendations in their *Safe Work Playbook for Facilities* is to avoid face-to-face desk layouts and adherence to strict cleaning protocols. Complimentary to that, Steelcase and Knoll, recommended screens and barriers between employees and desks. JLL and Cushman & Wakefield provided examples of "readiness essentials" like reducing touch points and increased cleaning. Ernst Young (EY), Bloomberg and many others contemplate checkerboard occupancy of workstations and removal of chairs in conference rooms, training and collaborative areas to maintain minimum 6' distances. In addition to physical changes in the office, all the benchmarking suggests that re-occupation should be a phased-in approach as practices evolve and develop.

The strategy for reoccupation of Con Edison's offices will require a three-staged approach, Stage 1, Stage 2, and Stage 3. This white paper addresses primarily the strategies for stage 1 and Stage 2. Guidance provided in this white paper will apply to all Company workspaces. Each stage will build on the previous stage as more information becomes available; therefore,

adjustments throughout this process may be required. In all three stages, the goal is to create a safe workplace using cost effective flexible and adaptable solutions.

Stage 1

Stage 1 solutions aim to focus on a variety of administrative controls and low or no cost solutions, like staffing strategies and prioritizing physical distancing. As behavioral changes are key to controlling spread of the virus, signage and messaging will be a big component of this stage's strategy. It will be important in this stage to work with existing workspace conditions while preparing for the next stage. Planning and design work needed to implement mid and longer-term changes like workstation redesigns, upgrade of HVAC, plumbing and other building systems, installation of touchless fixtures, automatic doors and elevators, to name a few, will also proceed in this first stage.

As part of the planning process, a pandemic re-entry survey was provided to organizations to gain insight as to what portion of the remote workforce will be returning to Company facilities in the first stage of re-entry. This will assist in prioritizing locations and assessing furniture changes and any modifications that may be needed, as employees come back to the workplace. Staffing strategies should always be considered as the first solution, including continuing to work remotely and staggered shifts, wherever possible. This will allow buildings to operate at lower staffing levels and provide the ultimate social distancing. There are minimal costs to working remotely. Staggered work shifts, where remote work is not practicable, will also help to alleviate employee congestion and density while addressing social distancing concerns. Communication and coordination amongst all teams will be important. On boarding re-entry training will be required of each employee prior to returning to the office so they all understand the ground rules of our new work environment.

The points of entry, exit, stairwells and elevators can also present challenges for employees coming back to the workplace. With occupancy limits in elevators, getting to one's desk or work area and exiting the building may take longer than usual. Staggered shifts, breaks, and alternate workdays, where feasible, will help to reduce employee congestion at entry and exit points.

There are over 8000 workstations and desk layouts throughout the CECONY and O&R that present social distancing challenges as the majority (approximately 6500) currently do not meet the CDC's 6' distance guideline. Repositioning desks and/or adopting checkerboard seating at fixed workstations to increase distance or avoid face-to-face positions (Figure 1) Facilities will work closely with each organization to coordinate workspace changes and ensure space needs are met safely.

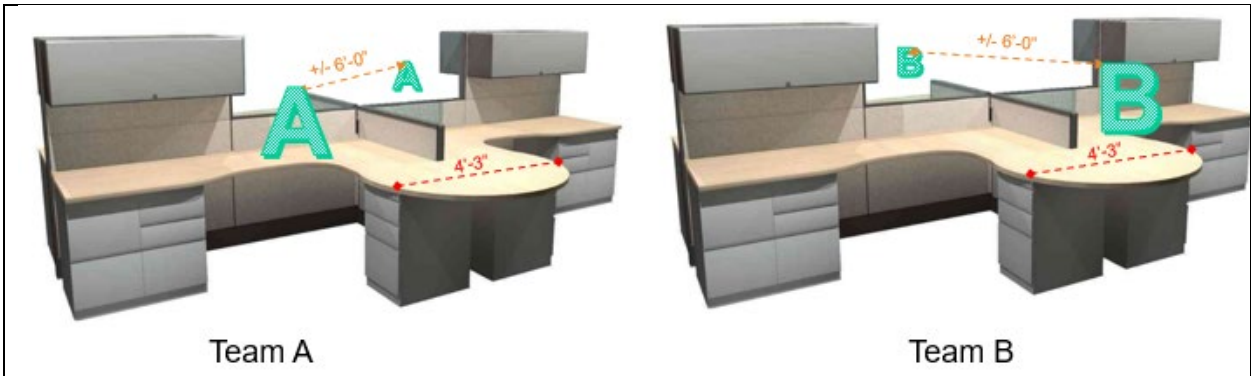


Figure 1. Teams alternate days in the office.

For meeting and training spaces, Con Edison will continue to leverage virtual meetings and conference call technology, to the extent practicable. In addition, existing gathering areas like conference rooms, collaborative/community spaces, and café areas that once were used to encourage teambuilding and gathering will be modified to decrease density. This can easily be achieved in the Stage 1 by removing seats and rearranging furniture to meet social distancing guidelines (Figure 2). Signage and messaging in these areas will include new occupancy signs and "seat intentionally left open" signs to help people navigate the new guidelines. This approach shall be considered, and future construction of conference areas will have to be significantly larger to fit the same number of people we had in the past.

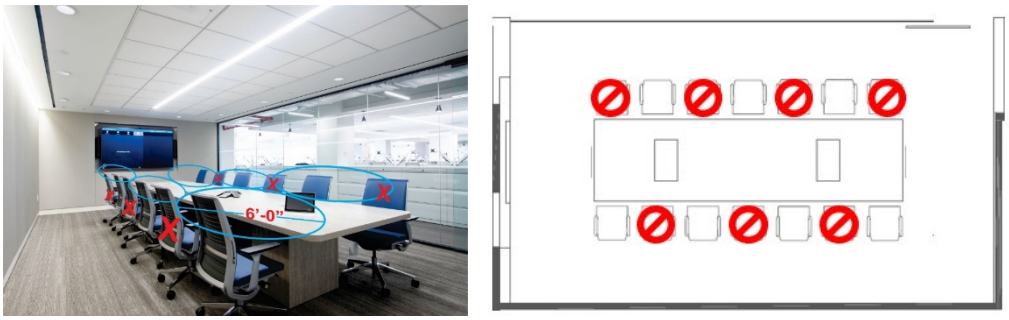


Figure 2. Conference room with seats removed.

Locker rooms, hallways, staircases and restrooms also present a significant challenge because of space constraints. These types of areas also have many touch points. Frequent cleaning of high-contact surfaces is paramount to reducing disease spread throughout the Company's buildings but especially in such confined spaces. Establishment of one-way circulation paths with directional signage and removing unnecessary doors or propping open doors (where not restricted by the building or fire code) to these facilities will also aid in reducing touch points. Where possible, restroom occupancy will be limited by posting signs and restricting access to some toilet stalls and sinks where allowed by the building code. For locker rooms, social distancing recommendations include limiting occupancy and staggering work start/end times and workday schedules, where possible.

Lunch and breakroom areas are challenging as well. In the near term, the cafeterias service areas will be remained closed. According to Compass, a leading food service provider, food

service and catering will need to be a well-coordinated logistical exercise, with a focus on pre-packaged meals. Any food prep areas should be made more visible, so they are easily observed by customers. Entry to any food areas will require mandatory hand sanitizing. Pantries and high touch appliances will require more frequent housekeeping and cleaning products should be readily available.

Keeping the work area clean is critical to a healthy workspace. Beyond cleaning more frequently, locations of self-service sanitizing stations will also be installed throughout the floor in areas that are easily accessible to areas that have frequent touch points like pantries, main corridors and existing centralized trash locations will be essential. The stations will include hand sanitizer dispensers and disinfecting wipes dispenser to encourage cleaning of frequently touched appliances and other touch points. Such stations also need to be located near the cubicle areas so people can pre-clean and post clean their workstations. Since conference rooms are used by multiple users, cleaning wipes will also be provided to wipe down surfaces before and after use. The approximate annual cost per office worker is $140 based on costs at the second quarter of 2020.

Stage 1 stage solutions will mostly impact O&M costs. As per the ruling set by Property records, increased cleaning protocols, signage deployment, modifications to existing doors and chair removal to name a few items were ruled O&M. Incremental cost will need to be funded to address this scope of work.

Stage 2

Stage 2 will build on top of the Stage 1 solutions and may change as guidelines evolve. Administrative controls instituted in Stage 1 will continue. Engineering controls, including installation of shields and barriers, automatic/touchless systems and minor modifications to ventilation and climate controls will be implemented in this stage. Although O&M costs from the previous stage will continue to be incurred, many of the new solutions in Stage 2 are ruled capital. Since there are many facets in this stage, the program will be designed to accommodate various changes along the way.

Shields and Barriers

Mounted shields and free-standing barriers will be incorporated into the approximately 15%-20% workspaces and desk setups in Stage 2, as required by social distancing guidelines, to address the risk of prolonged face-to-face contact. The focus will start with critical areas such as control centers. CDC states that respiratory droplets in the form of coughs, sneezes and talks are what spread the virus; therefore, barriers and shields can help mitigate the spread of disease for areas where close contact is otherwise unavoidable, similar in function to a sneeze guard used in grocery stores and pharmacies where proximity is a concern (Figure 3, 4, 5). Some of the criteria for installing shields and barriers will consider face-to-face orientation, the distance of separation, and the feasibility of installation. The selected material should be anti-microbial, easily cleanable, durable and mostly translucent or clear to maximize visual perception. Specifically, barriers and shields will be used:

- Where direct face-to face-contact is a concern and is less than 6 ft apart (Figure 7).

- Benching where left to right physical distance doesn't meet social distancing guidelines of 6 ft apart. (Figure 7).
- Where existing panel heights fall below 54 inches and the 6 ft guideline is not obtainable (Figure 6). Although there is no specific guidance on dimensions for shields, the recommended height of 54" be used because most desks table-tops are 30" high and adding shields that are 24" high provide coverage for the majority of people from the waist up. 24" is also a common dimension for screen heights. Sit/Stand desks will be fitted with a 3-sided screen that will rise with the desk to provide coverage at any height (Figure 5). For the Vari-desk type desk, custom light weight screens will be mounted to the unit.
- Where the person is facing a primary traffic path and social distancing is not possible (Figure 8).

Figure 3. Glass screens installed on existing workstations.

Figure 4. Glass screens with barriers between desks.

Figure 5. Shields for the Sit/Stand desks.

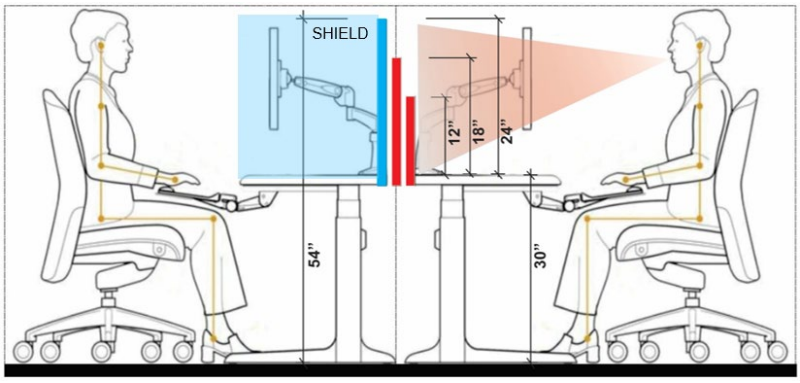


Figure 6. Recommended Shield Height of 54".

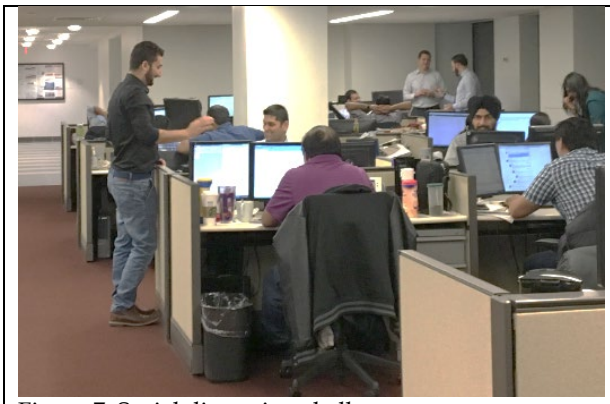


Figure 7. Social distancing challenges.

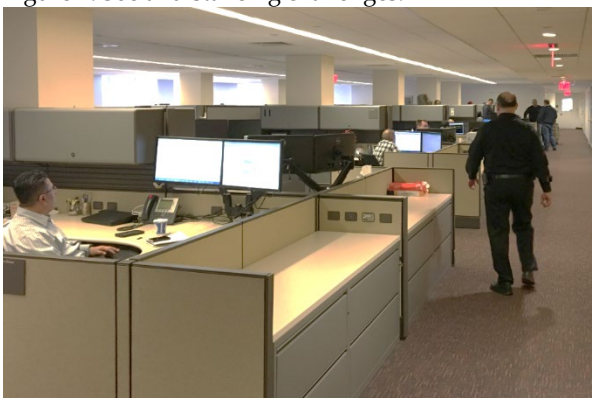


Figure 8. Primary paths where social distancing is a concern.

Clear physical barriers may need to be installed in collaborative areas and conference rooms to help bring them back to normal occupancy (Figure 9). Other communal spaces like pantries and hubs will require renovation to discourage overcrowding and manage social distancing (Figure 10).

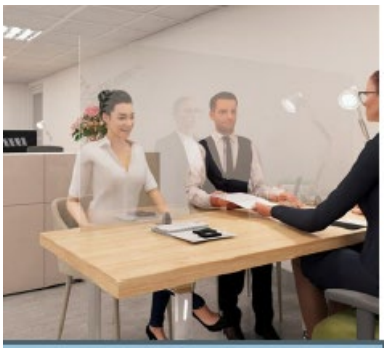


Figure 9. Clear shields installed in conference rooms and collaborative spaces.

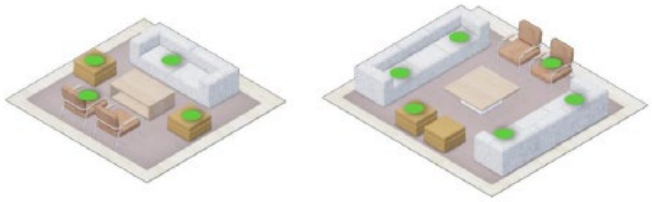


Figure 10. Collaborative spaces rearranged for social distancing.

Automatic and Touchless Systems

Gensler, a leading architectural design firm, recommends learning from healthcare facilities by upgrading fixtures including faucets, paper towel dispensers, soap dispensers and flushometers to be touchless and automatic. Although our current restroom standards include some automatic fixtures, approximately 45% of manual fixture throughout the company need to be upgraded to touchless technology based on a recent survey.

Further evaluation of such systems is needed before committing to such upgrades to ensure any selected equipment durable and have appropriate manual overrides.

Stage 3 – TBD

As more information and science-based evidence emerges, the Stage 3 solution for the workplace will likely require a reinvention. The future workplace will need to be designed with even greater flexibility and agility. New concepts in workstations, materials, collaboration and conferencing will need to be developed. As suggested by EY, the new workplace may be designated for activities that cannot be performed remotely like large conferences, special meetings, or training classes. Working from home may be the new office for the individual. A robust reservation system for desk and conference room spaces will be needed for when physical presence in the office is required. Collaborative spaces, waiting and gathering areas will require likely more physical space.

Conceptualizing the right future solution is difficult at this time, given the dynamic and evolving nature of guidelines and recommendations for mitigating COVID-19 infections; therefore, additional projects are expected to emerge and evolve as more information becomes available.

HVAC Upgrades

HVAC and in-door air management upgrades to be evaluated will include recommendations from ASHRAE and OSHA Position Documents. Chief among the recommended ventilation-related strategies are dilution, air flow pattern, reducing recirculation while increasing fresh air intake, increasing humidity and increasing filtration quality. Other strategies include ultra-violet germicidal irradiation (UVGI).

The overall cost associated with upgrades of such systems is unknown at this time and will be the subject of a subsequent white paper once designs are selected and engineering packages developed. The impact of increasing intake air and increasing humidity is expected to result in increased energy consumption and related costs.

Other Considerations
Automatic doors and touchless elevators can also be considered in this stage where possible.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy
Explain how this project/program will help achieve goals in 5-year and long-range plans.
Explain how this project/program addresses risk mitigation activity. List specific departmental and/or corporate risk being impacted.

Stage 3 implications of COVID 19 pandemic is an emerging issue and trend which may include changing employee expectations for workplace safety and convenience, shifts in supply chain models and available suppliers, regulatory pressures, effects of a potential economic recession, and other implications for the company's operational or strategic plans which may impact its business objectives.

This program addresses risk in Stage 1 & Stage 2 of re-entry by responding to the mitigation strategy detailed in the Pandemic Corporate Risk which is to identify potential impacts to the workforce to maintain critical business functions. The major risk sources include the following:

Internal – Failure to perform critical business functions; Depletion of workforce
External – Workforce depletion in other services that impact company employees from performing critical functions, e.g. public transportation disruptions.

The program provides mitigating strategies such administrative and engineering controls like social distancing, alternating shifts, touchless technology and shielding to help prevent the spread of virus which, if not addressed, may deplete the workforce.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.). ***At least one is required.***

Alternative 1 description and reason for rejection
One alternative would be to redesign all offices; however, this would not be cost effective since existing administrative and engineering controls can be used in conjunction with existing conditions to support re-entry. New office standards have not yet been developed.

Alternative 2 description and reason for rejection
Continue to work without pandemic enhancements. This would jeopardize the safety and health of our workforce. It would also lead to regulatory issues along with work retainment and attraction issues.

Alternative 3 description and reason for rejection

Risk of No Action

Give the consequences, including enterprise risks that might arise by not doing the project/ program. Quantify the risks, if applicable.

Risk 1

If these solutions such as physical barriers and other cleaning protocols are not implemented, the risk spreading disease will likely increase which may lead to workforce depletion and most importantly, employees will not feel confident in their work environment.

Risk 2

Risk 3

Non-Financial Benefits

Examples:

- *Increased safety, reliability, efficiency, or customer satisfaction*
- *Improved workflows and communication among departments*
- *Stronger relationships with community or with regulators*
- *Ensuring regulatory compliance*

Includes the following:

- Provides new normal of safe and healthy work environment
- Retain a workforce
- Stronger relationships with community and regulators
- Regulatory compliance – certainly these will become NYC and NYS regulatory issues

Summary of Financial Benefits and Costs (attach backup)

1. Cost-benefit analysis (if required)

To perform financial analysis on the project or program: Refer to Corporate Instruction 291-1 "Cost-Benefit Analysis (CBA) Guidelines" to determine cost avoidance or cost savings potential. Also, refer to "Estimating Cost Contingency" Guidelines and "Estimating Escalation Cost" Guidelines, both of which are available on the Project Management Society page on the Con Edison intranet site under the Project Manager's Toolkit menu. Attach data (e.g. estimates and quotes from vendors, model outputs) as needed.

Not required since program does not seek approval based on cost savings.

2. Major financial benefits

Explain major benefits (e.g., revenue increase, cost avoidance) and demonstrate these benefits using financial metrics (e.g., net present value, internal rate of return, breakeven point, payback period) as calculated according to the CBA guidelines. If project/program results in cost savings identify the owning cost center (Organization)

that will realize the savings and whether the savings are labor or non-labor. If non-labor include the expected FTE reduction and the baseline FTEs utilized for the assessment.

Not required since program does not seek approval based on cost savings.

3. Total cost

State the total project/program implementation cost (which should match the detailed funding breakdown below), along with any on-going financial costs associated with the project/program. For software projects, segregate costs by each phase of development: feasibility, design, development, and production/implementation.

4. Basis for estimate

Explain the method used to create the estimate. Include all key assumptions.

Estimates are based on the Stage 1 & Stage 2 of re-entry which accounts for approximately 15%-20% of the workstations.

Post COVID Workplace: Facilities Upgrades - Funding Request (5 Years)

Escalation (Per Year)	0%					
YEAR	1	2	3	4	5	5 Year
Item Description (CAPITAL)	Y2020	Y2021	Y2022	Y2023	Y2024	Total
Workstations,Shields, Barriers, Reconfigs	$1,500,000	$1,000,000	$0	$0	$0	$2,500,000
Touchless Fixture Upgrades	$550,000	$350,000	$0	$0	$0	$900,000
Signage (Permanent)	$150,000	$150,000	$0	$0	$0	$300,000
Pinch Points (Entry/exit, Lobby)	$300,000	$100,000	$0	$0	$0	$400,000
	$2,500,000	**$1,600,000**	**$0**	**$0**	**$0**	**$4,100,000**

Escalation (Per Year)	0%						
YEAR	0	1	2	3	4	5	5 Year
Item Description (O&M)	Y2020	Y2021	Y2022	Y2023	Y2024	Y2025	Total
Increased Cleaning Services (Incremental)	-	-	-	-	-	-	-
Sanitizing Stations Supply Refills	-	-	-	-	-	-	-
Signage (Temporary)	-	-	-	-	-	-	-
Energy Costs (New HVAC CDC guidelines)	-	-	-	-	-	-	-
Scope of work relatd to COVID maintenance (See above descriptions)	-	$450,000	$950,000	$950,000	$950,000	$950,000	$4,250,000
	$0	**$450,000**	**$950,000**	**$950,000**	**$950,000**	**$950,000**	**$4,250,000**

Note: Incremental costs outlined for years 2021 to 2025 are covered outside of FFS per 9/25/2020 Corporate Budget meeting. Costs will be split 30% Manhattan Faciltites and 70% Regional Facilities.

Estimates:

FAC-PostCvoidUpgrades-CAP-FINAL.pdf

FAC-PostCvoidUpgrades-Ret-Final.pdf

FAC-PostCvoidUpgrades-Ret-Final.pdf

20-1082-SS-N-00.pdf

Assumptions:

1. Estimates are based on 15%-20% of spaces for Stage 1 & Stage 2 of re-entry.
2. 12,000 CECONY Employees.
3. 80% of the workstations are Herman Miller.
4. Sanitizing stations included wipes and hand sanitizer. Assumed each person uses 4 squirts from a pump sanitizer and 5.5 disinfecting wipes daily. Costs are based on 2nd QTR 2020 prices.
    a. 4 Irving Place was used as a case study for 280 people.
    b. 10 Sanitizing stations & 12 disinfecting wipe stations
    c. Locations
        i. Wipes in restrooms, pantries, and conference rooms.
        ii. Hand Sanitizers near entrances, stairways, pantries, and restrooms.
    d. Assumed cost per person is $140pp annually based on 1st quarter 2020 online rates.
5. Estimates do not include HVAC, elevator, automatic door upgrades.
6. O&M Costs noted on this document is incremental to the existing budget.
7. HVAC costs are not included in the estimates.

5. Conclusion
Should the project be done at all? Does it make sense to spend additional dollars to continue the project? Justify.

Yes. Due to the uncertainty of the virus it is imperative that we follow the current guidelines set by the CDC and other agencies to safeguard the workforce from spreading the disease.

Project Risks and Mitigation Plan
Evaluate and describe any risks that might extend the project timeline, prevent completion, or lead to cost overruns. Explain plan to minimize these risks.

Risk 1
Material for shielding may become scarce as companies nationwide prepare for re-entry.

Mitigation Plan
Sourcing high demand materials typically contributes to long lead times. Purchasing materials in advance will allow product to be available for production when the need arises.

Risk 2
Organizations may need to re-enter the offices sooner than expected and employees need to be accommodated quickly.

Mitigation Plan
Provide administrative guidelines to ensure social distancing is met. Where social distancing cannot be met, temporary reusable shields can be stored while final shields are being fabricated.

Technical Evaluation / Analysis
Describe any specific studies or analysis related to the project such as: trend analysis, internal/external studies, social studies, and related KPI's (e.g. System Average Interruption Frequency Index (SAIFI) or Customer Average Interruption Duration Index (CAIDI)). Load forecasts, failure trends, etc., may also be presented in this section. However, these analyses are not available for all projects or programs.

The analysis associated with the

Project Relationships (if applicable)

Explain whether this project/program will impact other projects/programs. Some projects must be done together due to outages, or one project may depend on another (e.g. Mohansic/Buchanan projects or movement of distribution work due to Substation service date change).

As guidelines evolve, subsequent white papers will be submitted to capture the scope of work currently undefined but noted in this document.

3. Funding Detail

Historical Spend

	Actual 2016	**Actual 2017**	**Actual 2018**	**Actual 2019**	**Historic Year** (O&M only)	**Forecast 2020**
Capital						**$2,500,000**
O&M						**$1,947,500**

Total Request ($000):

Total Request by Year:

	Request 2021	**Request 2022**	**Request 2023**	**Request 2024**	**Request 2025**
Capital	**$ 1,600,000**				
O&M*	**430,000`**	**$1,300,000**	**$1,300,000**	**$1,300,000**	**$1,300,000**

Capital Request by Elements of Expense:

EOE	**2021**	**2022**	**2023**	**2024**	**2025**
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	**2022**	**2023**	**2024**	**2025**
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

4. Definitions

Total Funding Request: All funding requested for program or project over program/project lifecycle or for on-going programs the five-year requested amount, including all capital, O&M, retirement.

Cost Savings: Reductions in costs that are currently being incurred (e.g., reduced annual maintenance cost relative to today)

Cost Avoidance: Reductions in anticipated future costs that don't occur today (e.g., anticipated short-term fixes/maintenance if capital isn't deployed)

Project Status:

- Initiation – New project, not authorized yet
- Planning – Project authorized, not started yet
- Executing – Project in-flight
- On-going – Annual program

Business Unit / Division
Budget Year

1. Project / Program Summary

Type: ☒ Project ☐ Program	**Category: ☒ Capital ☐ O&M**
Work Plan Category: ☐ Regulatory Mandated ☒ Operationally Required ☐ Strategic	
Project/Program Title: Worth Street Service Center, Yonkers – Site Master Plan	
Project/Program Manager: Alastair Lamb	**Project/Program Number (Level 1):** 21506897
Status: ☐ Initiation ☒ Planning ☐ Execution ☐ On-going ☐ ☐ Other: _____	
Estimated Start Date: 11/2020	**Estimated Date In Service: 11/2025**
A. Total Funding Request ($000) **Capital:** 59,000,000 **O&M:**	**B.** **☐ 5-Year Gross Cost Savings ($000)** **☐ 5-Year Gross Cost Avoidance ($000)** **O&M:** **Capital:**
C. 5-Year Ongoing Maintenance Expense ($000) **O&M:** **Capital:**	**D. Investment Payback Period:** **(Years/months) (If applicable)**

Work Description:

A comprehensive site analysis is currently being conducted to study all aspects of the Company-owned service center site at 267 Saw Mill River Road, Yonkers, (commonly known as the "Worth Street" Service Center). The purpose of the site analysis is to document existing site conditions including zoning, topography, site drainage and geotechnics in order to inform a site master plan study to be issued by mid-2021. The study will present a minimum of two alternative site master plans to help determine the optimal layout for the planned development of the Worth Street Service Center site. In addition to the cost to provide temporary office and bathroom accommodation for employees displaced from the 1920's service center building, the preliminary estimated cost of $59M for the site master plan anticipates the relocation and construction of a new service center building ($25M) and, if warranted, re-location of the fuel station to improve site circulation ($4M), improved site ingress and egress ($4M), site security improvements including perimeter fencing ($6M), site drainage improvements (($5.2M) and other improvements to improve vehicular and pedestrian safety ($8.8M). However, the decision to proceed (or not) with the engineering and construction of each project currently contained within the site master plan will be taken based on updated cost estimates for each element and subject to the further review and approval of leadership.

Justification Summary:

Initially, the capital project plan for Worth Street anticipated the gut renovation of the existing service center (Building 1), to provide office, muster space, locker room, storage, etc. for various and to accommodate Gas Operations expansion. Other separate site improvements were also planned, including the replacement of the underground fuel storage tank to the fueling station, possible site access improvements and new perimeter security fencing. However, in 2019 following receipt of bids for the service center renovation and due to a concern for potential cost increases once the true

condition of the building structure was fully exposed, the service center renovation was suspended. Specific concerns included the potential significant cost to repair severely frost/water damaged exterior brickwork; replace life-expired roof covering; the mitigation of widespread mold to bathrooms and occupied offices and the known presence of asbestos throughout the premises. The bid costs to renovate Building One (not including possible additional costs that may be incurred as the structure was fully exposed as the work progressed) were comparable to the estimated cost to build a new facility. As such, it was agreed to evaluate alternative new-build options for a modern service center, ideally located outside the Saw Mill River flood zone, that was not constrained by the limiting layout and condition of the original 1920's building. Further, it was agreed that a more holistic review of the Worth Street Service Center site was appropriate to better integrate the previously planned but separate projects into a cohesive site master plan. Recent dealings with City of Yonkers have demonstrated the benefit of a coordinated approach in order to obtain necessary permits and approvals and also to ensure compliance with Department of Environmental Conservation development controls.

Please note that due to health and safety concerns, in 2020 all employees currently operating out of Worth Street were relocated into temporary office, muster and bathroom accommodation installed immediately to the south of Building One. The associated costs to install and operate the temporary accommodation is included in the preliminary estimated project cost.

Relationship to 5-Year and Long-Range Plans and Enterprise Risk Management Strategy:

Worth Street Service Center, Yonkers is an owned, industrial zoned, property comprising approx. eight acres which is ideally located to support the Company's current and future operations both in Westchester and the Bronx. The site master plan is aligned with the Company's overall real estate strategy to optimize owned property assets and will incorporate feedback from the (Leveraging Innovation and Flexibility Team (LIFT Team). The team was formed in July 2020, to help redefine how we will work; the team engaged in benchmarking, across industries, soliciting feedback through various initiatives such as employee surveys, focus groups, expanded staff meetings and other forums. The efforts of the LIFT team provided information and recommendations to explore regarding future workplace needs. For budget planning purposes, the current development schedule anticipates completing a two-stage site evaluation (Stage 1 – Site Analysis and Stage 2 – Site Master Plan Options & Recommendations) in 2021, with engineering and permitting in 2022/early 2023 followed by phased site construction extending into late 2025. This timing of future site development at Worth Street will also be aligned with the ongoing evaluation of other owned and leased office and service center locations.

Subject to further engineering analysis, it is anticipated that the cost to operate and maintain the new service center building, will be lower than the cost to operate and maintain the existing 1920's building, even after significant renovations and improvements.

2. Supplemental Information

Alternatives
Briefly describe reasonable alternatives and reason for rejection (e.g., costs, timing, etc.).

Alternative 1 – Do Nothing

This option was not considered. The existing service center building has been vacated and employees are now operating out of temporary office accommodation. Further, the underground storage tank for the fuel station needs to be replaced to remain in compliance and there have been ongoing security concerns due to breaches through the existing perimeter fence.

Alternative 2 – Gut Renovation of Existing Service Center with other separately planned projects

As stated above, the gut renovation of the service center was considered but rejected due to the poor condition of the building structure, the limitations of the building's age & footprint and the potential for significant cost increases once the building structure was exposed. Further, proceeding with independent separate projects may introduce additional permit and approval 'risk' and result in a sub-optimal site development plan overall.

Risk of No Action

Risk 1 – Service Center will not be able to support the Company's operational needs

The service center may be able to continue to operate from temporary office and bathroom accommodations but eventually the City of Yonkers will require these facilities to be removed if no permanent solution is submitted for permit. Further, the yard area is currently congested with Facilities Operations being required to shuffle competing vehicle parking needs from existing and, potentially, new customers.

Risk 2 – Temporary Office and Engineering Costs revert to O&M

The costs incurred to install the temporary offices and bathrooms are currently being capitalized. If the new-build service center project does not proceed these costs (along with the engineering costs) will revert to O&M for Facilities & Field Services which is unfunded.

Non-Financial Benefits

The primary justification for the proposed site master plan is to provide a safe working environment for our employees reporting out of Worth Street. Improvements will include providing modern, flexible office and muster space and other measures to improve safe access/egress to the site.

Summary of Financial Benefits and Costs (attach backup)

For budgeting purposes only, the preliminary estimated costs and five year budget forecast for the various projects currently included in the site master plan are provided in the table below. All costs are preliminary pending the outcome of the site master plan study.

Worth Street Site Master Plan - Budget Overview

	FFS Actual/Budget ($000)	
2018	3	
2019	1,672	
2020	1,304	
2021	514	FFS 5YR Total Request - $55.8M
2022	3,002	
2023	20,003	
2024	25,003	
2025	7,291	
TOTAL	**$ 58,792**	

Breakdown by Project	**ROM Estimate * ($000)**	**Comments**
Temporary Accommodation	1,823	*Temp. office accommodation set up; IT infrastructure*
Feasibility Study	1,000	
Engineering	3,000	
New Service Center Building	25,000	*2/3 story new-build service center (25,000SF) - subject to program review during feasibility study*
Fuel Station	4,000	*Appropriated $3.6M; included for escalation.*
Security Fencing	6,000	*Based on comparable work at Farrington - $5.5M*
Traffic Improvements	4,000	*Based on comparable Van Nest Improvements (2014) - $3.5M*
Re-Paving	8,500	*Assumed 8 acres ($30/SF based on W28th Street scope); reduced by $2M to align with Total above*
SW Drainage Improvements	5,200	*Assumed 8 acres ($15/SF)*
Lighting	269	
TOTAL	**$ 58,792**	

* *ROM (Rough Order of Magnitude) Estimate for miscellaneous projects bundled into Site Master Plan*

For the reasons stated above, it is anticipated that at a minimum the new-build service center will be required. The other site improvements could be phased as needed to align with the Company's strategic needs and any funding constraints.

Project Risks and Mitigation Plan

The project risks and associated mitigation plan will evolve as the alternative site development plans are developed and refined. However, potential risks may include:

Risk 1	Costs Underestimated	Update cost estimates during site master plan study
Risk 2	Site Conditions	Existing site conditions prohibit relocation of service center.
Risk 3	Permits & Approvals	Closely manage site approvals and permit applications

Technical Evaluation / Analysis

A comprehensive site analysis will be conducted to study all aspects such as zoning, topography, site drainage and geotechnics, of the existing yard. A final analysis report will be produced to help determine the most appropriate solution for the yard usage and redevelopment in term of location of the new building, if warranted, location of the new fuel station, ingress and egress, site security, fencing, vehicular circulations and parking layout, etc.

Project Relationships (if applicable)

Not Applicable

3. Funding Detail

Historical Spend

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Historic Year (O&M only)	Actual 2020
Capital			3	1,672		1,304
O&M						

Total Request ($000):

Total Request by Year:

	Request 2021	Request 2022	Request 2023	Request 2024	Request 2025
Capital	514	3,002	20,003	25,003	7,291
O&M*					

Capital Request by Elements of Expense:

EOE	2021	2022	2023	2024	2025
Labor					
M&S					
Contract Services					
Other					
Overheads					
Total					

Total Gross Cost Savings / Avoidance by Year:

	2021	2022	2023	2024	2025
O&M Savings					
O&M Avoidance					
Capital Savings					
Capital Avoidance					

Total Ongoing Maintenance Expense by Year:

	2021	2022	2023	2024	2025
O&M					
Capital					

*If whitepaper is supporting a capital project/program this refers to implementation O&M

Five Year
2021 - 2025 Capital Forecast

Summary T&D, Electric Production and Shared Services Capital Plan

Thousands ($000)

	2021	2022	2023	2024	2025	5 Year Total
Electric T&D						
System and Transmission	$97,306	$154,093	$205,700	$305,500	$304,200	$1,066,799
Substations	$398,747	$344,727	$352,030	$323,079	$330,284	$1,748,867
Distribution	$952,652	$951,728	$1,021,624	$1,079,254	$1,079,934	$5,085,192
Sub-total Electric T&D	**$1,448,704**	**$1,450,548**	**$1,579,354**	**$1,707,833**	**$1,714,418**	**$7,900,858**
Electric Interference	$157,000	$168,000	$225,000	$236,000	$242,000	$1,028,000
Total Electric T&D	**$1,605,704**	**$1,618,548**	**$1,804,354**	**$1,943,833**	**$1,956,418**	**$8,928,858**
Electric Production	$22,000	$14,999	$30,389	$25,750	$19,950	$113,088
Shared Services	$469,670	$448,992	$488,062	$463,656	$436,810	$2,307,190
Total Capital Expenditures	**$2,097,374**	**$2,082,539**	**$2,322,805**	**$2,433,239**	**$2,413,178**	**$11,349,136**
AMI	**$281,677**	**$31,578**	**$0**	**$0**	**$0**	**$313,255**
CES Electric	**$66,476**	**$68,901**	**$80,001**	**$84,002**	**$84,001**	**$383,381**

Note: 83% of Shared Services is allocated to Electric

S&TO Summary Capital Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Environmental Programs	$600	$600	$600	$600	$600	$3,000
Information Technology	$572	$903	$982	$1,000	$1,000	$4,457
Replacement	$11,000	$11,000	$11,000	$11,000	$11,000	$55,000
Risk Reduction	$81,406	$140,190	$191,718	$291,500	$290,200	$995,014
Safety and Security	$3,728	$1,400	$1,400	$1,400	$1,400	$9,328
Total S&TO	**$97,306**	**$154,093**	**$205,700**	**$305,500**	**$304,200**	**$1,066,799**
Interference	**$63,000**	**$60,000**	**$60,000**	**$40,000**	**$33,000**	**$256,000**
Total S&TO with Interference	**$160,306**	**$214,093**	**$265,700**	**$345,500**	**$337,200**	**$1,322,799**

S&TO Capital Projects Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Environmental						
Environmental Enhancements Program	$600	$600	$600	$600	$600	$3,000
Total Environmental	**$600**	**$600**	**$600**	**$600**	**$600**	**$3,000**
Information Technology						
Distribution Orders Enhancements	$272	$272	$300	$300	$300	$1,444
EMS Reliability AECC and ECC	$300	$300	$300	$300	$300	$1,500
Operation Management System at Energy Control Center	$0	$331	$382	$400	$400	$1,513
Total Information Technology	**$572**	**$903**	**$982**	**$1,000**	**$1,000**	**$4,457**
Replacement						
Transmission Feeder Failures	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000
Transmission Failures - Other	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000
Total Replacement	**$11,000**	**$11,000**	**$11,000**	**$11,000**	**$11,000**	**$55,000**
Risk Reduction						
Pipe Enhancement Program	$25,000	$26,162	$25,018	$25,000	$25,000	$126,180
Joint Replacement Program	$15,000	$7,500	$6,500	$6,500	$6,500	$42,000
Dynamic Feeder Rating System Program	$1,500	$1,500	$1,000	$1,500	$1,500	$7,000
Overhead Transmission Structures Program	$2,000	$1,828	$2,000	$2,000	$2,000	$9,828
Modernization Program CECONY Electric Transmission Feeder Structure	$2,000	$2,000	$2,000	$2,000	$3,000	$11,000
Feeder 38R51 and 38R52 Replacement Project	$23,006	$93,000	$122,000	$0	$0	$238,006
Queensboro Bridge Risk Mitigation Project	$0	$0	$20,000	$80,000	$80,000	$180,000
Partial Replacement of Feeders M51 and M52	$0	$0	$10,000	$168,000	$168,000	$346,000
Feeder Replacement Program	$3,500	$2,500	$2,500	$3,500	$3,500	$15,500
Overhead Transmission Reliability	$2,300	$0	$0	$2,300	$0	$4,600
Amtrak PSA - OAK	$5,000	$5,000	$0	$0	$0	$10,000
Mobile Program Transmission Feeder Leak Detection	$300	$300	$300	$300	$300	$1,500
Transmission Resiliency System	$1,500	$0	$0	$0	$0	$1,500
System Operation Enhancement	$300	$400	$400	$400	$400	$1,900
Total Risk Reduction	**$81,406**	**$140,190**	**$191,718**	**$291,500**	**$290,200**	**$995,014**
Safety and Security						
Overhead Tower Rapid Rail Program	$3,328	$1,000	$1,000	$1,000	$1,000	$7,328
ECC and AECC Facility Security	$400	$400	$400	$400	$400	$2,000
Total Safety and Security	**$3,728**	**$1,400**	**$1,400**	**$1,400**	**$1,400**	**$9,328**
Total S&TO	**$97,306**	**$154,093**	**$205,700**	**$305,500**	**$304,200**	**$1,066,799**
Interference	**$63,000**	**$60,000**	**$60,000**	**$40,000**	**$33,000**	**$256,000**
Total S&TO with Interference	**$160,306**	**$214,093**	**$265,700**	**$345,500**	**$337,200**	**$1,322,799**

Substation Summary Capital Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Environmental Programs	$76,000	$5,000	$13,000	$13,000	$13,000	$120,000
Information Technology	$1,543	$1,655	$0	$0	$0	$3,198
Replacement	$39,000	$38,900	$45,000	$45,000	$45,000	$212,900
System Expansion	$86,440	$102,660	$34,052	$1,100	$1,100	$225,352
Risk Reduction	$184,214	$184,487	$247,928	$251,929	$259,134	$1,127,692
Safety and Security	$11,550	$12,025	$12,050	$12,050	$12,050	$59,725
Total Substations Operations	**$398,747**	**$344,727**	**$352,030**	**$323,079**	**$330,284**	**$1,748,867**

Substations Operations Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Environmental						
Substation EH&S Risk Mitigation Program	$76,000	$5,000	$13,000	$13,000	$13,000	$120,000
Total Environmental	**$76,000**	**$5,000**	**$13,000**	**$13,000**	**$13,000**	**$120,000**
Information Technology						
Substation Technology Improvements Program	$1,543	$1,655	$0	$0	$0	$3,198
Total Information Technology	**$1,543**	**$1,655**	**$0**	**$0**	**$0**	**$3,198**
Risk Reduction						
Disconnect Switch Capital Upgrade Program	$2,375	$1,900	$2,800	$2,800	$2,800	$12,675
Retrofit Overdutied 13kV and 27kV Circuit Breaker Programs	$12,500	$12,500	$12,500	$12,500	$12,500	$62,500
Structural and Infrastructure Upgrades	$5,932	$7,600	$8,150	$8,150	$8,150	$37,982
Other Capital Equipment Upgrades	$3,000	$2,001	$3,485	$3,485	$3,485	$15,456
High Voltage Circuit Breaker Capital Upgrade Program	$9,500	$11,000	$15,700	$14,500	$14,500	$65,200
Reinforced Ground Grid Program	$2,000	$1,350	$1,230	$1,230	$1,230	$7,040
138Kv Disturbance Monitoring Program	$2,099	$2,250	$4,500	$4,500	$4,500	$17,849
U Type Bushing Replacement Program	$1,736	$2,736	$4,720	$4,720	$4,720	$18,632
RTU Upgrade Program	$2,512	$2,285	$2,510	$2,510	$2,510	$12,327
Ramapo - Install New Surge Arrestors	$500	$1,000	$0	$0	$0	$1,500
SSO Loss Contingency Area Stat Rapid Recov/Transm Resiliency Tsfs	$9,405	$0	$4,000	$0	$0	$13,405
Transmission Station Metering & SCADA Upgrades	$1,566	$2,566	$3,066	$3,066	$3,066	$13,330
Farragut - Feeder 32077 Breaker and V Disconnect Switch Addition	$0	$0	$500	$3,280	$0	$3,780
Relay Protection Communication Upgrades	$3,500	$3,500	$3,500	$4,000	$3,000	$17,500
Pothead Pressure Alarms	$150	$150	$150	$150	$150	$750
Auxiliary Station Equipment Program	$750	$750	$1,000	$1,000	$1,000	$4,500
Cap and Pin Insulator Replacement Program	$750	$750	$1,000	$1,000	$1,000	$4,500
Elmsford - Add 138kV Disconnect Switches on TR5, 38W24 and 38W14	$1,100	$0	$0	$0	$0	$1,100
Mobile Control Center	$0	$1,000	$0	$0	$0	$1,000
Substation Enclosure Upgrade Program	$1,300	$1,300	$1,900	$1,900	$1,900	$8,300
Gas Insulated Substation Replacement Program	$8,000	$13,000	$13,000	$20,000	$31,500	$85,500
Light and Power System Upgrades	$0	$0	$1,000	$1,000	$1,000	$3,000
Area Substation Phased Replacement Program	$3,000	$11,000	$15,000	$15,000	$15,000	$59,000
Stabilization of Pothead Stand Supports/Settlement	$0	$0	$2,500	$2,500	$2,500	$7,500
Relay Modifications Program	$20,000	$20,000	$20,000	$20,000	$20,000	$100,000
Condition Based Monitoring	$12,100	$0	$0	$0	$0	$12,100
Substation Transformer Replacement Program	$40,000	$40,000	$76,640	$76,640	$76,640	$309,920
Roof Replacement Program	$1,627	$1,627	$2,127	$2,127	$2,127	$9,635
DC System Upgrade Program	$5,092	$5,318	$5,100	$5,100	$5,100	$25,710
High Voltage Test Set Program	$1,775	$3,400	$6,500	$6,500	$6,500	$24,675
Area Substation Reliability	$12,000	$10,800	$10,800	$10,800	$10,800	$55,200
Fire Suppression System Upgrades	$5,500	$8,000	$10,000	$10,015	$10,000	$43,515
Category Alarm Program Various	$1,565	$1,750	$3,250	$2,156	$2,156	$10,877
Pumping Plant Improvement Program	$4,180	$5,154	$3,900	$3,900	$3,900	$21,034
Circuit Switcher Replacement Program	$1,300	$1,400	$1,400	$1,400	$1,400	$6,900
East River Automation - Upgrade The 69KV Yard	$2,000	$6,000	$0	$0	$0	$8,000
Substation Indian Point Retirement Program	$400	$400	$0	$0	$0	$800
Protection, Automation and Control Program	$5,000	$2,000	$6,000	$6,000	$6,000	$25,000
Total Risk Reduction	**$184,214**	**$184,487**	**$247,928**	**$251,929**	**$259,134**	**$1,127,692**
System Expansion						
Emergent Load Relief Program	$0	$0	$1,100	$1,100	$1,100	$3,300
Hudson Avenue DSS	$79,953	$72,910	$32,952	$0	$0	$185,815
E. 179th Street Switchgear and Bus Replacement	$6,487	$29,750	$0	$0	$0	$36,237
Replace 33kV Feeders Associated With TR 21W - Fresh Kills	$0	$0	$0	$0	$0	$0
Total System Expansion	**$86,440**	**$102,660**	**$34,052**	**$1,100**	**$1,100**	**$225,352**
Replacement						
Failed Substation Transformer Program	$30,000	$30,000	$35,000	$35,000	$35,000	$165,000
Failed Substation Equipment Other than Transformers	$6,500	$6,500	$10,000	$10,000	$10,000	$43,000
Hellgate Dock Refurbishment (SSO Portion)	$2,500	$2,400	$0	$0	$0	$4,900
Total Replacement	**$39,000**	**$38,900**	**$45,000**	**$45,000**	**$45,000**	**$212,900**
Safety and Security						
Critical Infrastructure Protection (NERC) Security Upgrades	$500	$975	$1,000	$1,000	$1,000	$4,475
Substations Security Enhancement Program	$10,000	$10,000	$10,000	$10,000	$10,000	$50,000
Cable Termination Platform Program	$1,050	$1,050	$1,050	$1,050	$1,050	$5,250
Total Safety and Security	**$11,550**	**$12,025**	**$12,050**	**$12,050**	**$12,050**	**$59,725**
Total Substations Operations	**$398,747**	**$344,727**	**$352,030**	**$323,079**	**$330,284**	**$1,750,867**

Electric Distribution Capital Forecast Summary continued

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
New Business	$204,657	$219,235	$222,933	$241,437	$249,942	$1,138,203
Total Replacement	$407,595	$399,154	$413,029	$439,379	$440,361	$2,099,518
Total System Expansion	$66,747	$57,654	$63,724	$52,364	$44,681	$285,170
Total Risk Reduction	$156,952	$153,987	$184,239	$194,772	$193,652	$883,602
Environmental (Oil Minders)	$1,700	$1,700	$1,700	$1,700	$1,700	$8,500
Equipment Purchases	$115,001	$119,997	$135,999	$149,602	$149,599	$670,199
Total Electric Distribution	**$952,652**	**$951,728**	**$1,021,624**	**$1,079,254**	**$1,079,934**	**$5,085,192**
Interference	**$94,000**	**$108,000**	**$165,000**	**$196,000**	**$209,000**	**$772,000**
Total Electric Distribution with Interference	**$1,046,652**	**$1,059,728**	**$1,186,624**	**$1,275,254**	**$1,288,934**	**$5,857,192**

Electric Distribution Capital Projects Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
New Business						
New Business Capital	$159,001	$164,299	$168,001	$178,000	$178,000	$847,301
Meter Installation	$30,006	$30,006	$30,006	$30,006	$30,006	$150,030
EV Charing (Grid Innovation)	$15,650	$24,931	$24,926	$33,430	$41,935	$140,872
Total New Business	**$204,657**	**$219,235**	**$222,933**	**$241,437**	**$249,942**	**$1,138,203**
Replacement						
Primary Cable Replacement (OA's)	$89,500	$89,500	$93,000	$95,983	$95,962	$463,945
Overhead	$40,625	$38,825	$39,825	$46,706	$46,826	$212,807
Service Replacements	$70,000	$66,000	$66,500	$70,297	$70,000	$342,797
Street Lights (incl. conduit)	$27,235	$27,235	$27,235	$27,235	$27,235	$136,175
Transformer Installation	$37,990	$35,890	$37,890	$37,890	$37,890	$187,550
Secondary Open Mains	$129,244	$130,704	$134,579	$147,268	$148,448	$690,244
Targeted Primary DBC Replacement	$13,000	$11,000	$14,000	$14,000	$14,000	$66,000
Total Replacement	**$407,595**	**$399,154**	**$413,029**	**$439,379**	**$440,361**	**$2,099,518**
System Expansion						
Load Transfer W42nd St to Astor	$6,000	$6,100	$2,000	$2,000	$0	$16,100
Nevins St. Battery Storage	$5,000	$0	$0	$0	$0	$5,000
Cable Crossing (XW Riverdale & BQ Flushing)	$4,656	$1,014	$1,014	$1,014	$1,014	$8,712
Yorkville Crossing and Feeder Relief	$4,980	$10,138	$10,139	$8,638	$0	$33,895
Primary Feeder Relief	$3,879	$4,444	$10,444	$10,444	$10,444	$39,655
Network Transformer relief	$9,086	$10,112	$10,782	$10,871	$10,977	$51,828
NonNetwork Fdr Relief (Open Wire)	$5,783	$3,783	$7,283	$7,283	$7,282	$31,414
Overhead Transformer Relief	$2,299	$2,299	$2,299	$2,299	$2,299	$11,495
Secondary Main Relief	$5,065	$7,064	$7,064	$7,064	$7,064	$33,322
West Bronx to Central Bronx Load Transfer	$20,000	$12,700	$12,700	$0	$0	$45,400
Queensboro Bridge Riser Replacement	$0	$0	$0	$750	$1,600	$2,350
Load Transfer Newtown to N. Queens	$0	$0	$0	$2,000	$4,000	$6,000
Total System Expansion	**$66,747**	**$57,654**	**$63,724**	**$52,364**	**$44,681**	**$285,170**
Risk Reduction						
Hellgate Dock Refurbishment	$850	$0	$0	$0	$0	$850
179th Street Area Substation Reconstruction	$488	$488	$488	$488	$488	$2,440
Osmose (C Truss)	$1,333	$1,333	$2,333	$2,333	$2,333	$9,664
Vented Service Box Covers	$1,000	$1,000	$1,000	$999	$1,000	$4,999
Monitoring Device and Application Program	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000
Underground Secondary Reliability Program	$33,875	$41,828	$54,300	$54,000	$53,000	$237,003
Nonnetwork Reliability (Overhead Reliability)	$37,000	$30,708	$27,000	$37,119	$36,999	$168,826
Transformer Vault Modernization	$17,110	$17,506	$17,435	$17,350	$17,350	$86,751
Remote Monitoring System	$2,016	$1,822	$3,222	$3,222	$3,222	$13,504
Pressure Temperature and Oil Sensors	$2,000	$2,000	$2,000	$2,000	$2,000	$10,000
Shunt Reactors	$2,500	$2,500	$5,000	$5,000	$5,000	$20,000
Primary Feeder Reliability	$13,793	$10,327	$11,761	$15,561	$15,561	$67,003
Critical Facility Program	$9,000	$9,000	$9,000	$9,000	$9,000	$45,000
Modernization and Other	$13,589	$13,075	$15,500	$15,500	$15,499	$73,163
OH Resiliency (Risk Reduction)	$2,100	$2,100	$2,100	$2,100	$2,100	$10,500
UG Network Resiliency (Risk Reduction)	$4,000	$4,000	$15,000	$15,000	$15,000	$53,000
Smart sensors for structures (Risk Reduction)	$6,299	$6,301	$10,100	$10,100	$10,100	$42,900
Wainwright/Willowbrook	$5,000	$5,000	$3,000	$0	$0	$13,000
Total Risk Reduction	**$156,952**	**$153,987**	**$184,239**	**$194,772**	**$193,652**	**$883,602**
Environmental (Oil Minders)	**$1,700**	**$1,700**	**$1,700**	**$1,700**	**$1,700**	**$8,500**
Equipment Purchases	**$115,001**	**$119,997**	**$135,999**	**$149,602**	**$149,599**	**$670,199**
Total Electric Distribution	**$952,652**	**$951,728**	**$1,021,624**	**$1,079,254**	**$1,079,934**	**$5,085,192**
Electric Interference	**$94,000**	**$108,000**	**$165,000**	**$196,000**	**$209,000**	**$772,000**
Total Electric Distribution with Interference	**$1,046,652**	**$1,059,728**	**$1,186,624**	**$1,275,254**	**$1,288,934**	**$5,857,192**

Customer Energy Solutions - Electric Forecast continued

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
21658580 - L1_REV - Demonstration Proj	$3,153	$0	$0	$0	$0	$3,153
21151526 - LV 1 - REV - DSPP	$37,300	$37,300	$37,300	$37,300	$37,300	$186,500
23322939 - L1_Storage	$21,024	$26,601	$37,701	$41,702	$41,700	$168,728
24810857-L1_CES Emergent Regulatory Asset Capital Fund	$5,000	$5,000	$5,000	$5,000	$5,000	$25,000
Total CES Electric	**$66,476**	**$68,901**	**$80,001**	**$84,002**	**$84,001**	**$383,381**
AMI	**$281,677**	**$31,578**	**$0**	**$0**	**$0**	**$313,255**

Electric Production Capital Forecast Summary

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Environmental	$16,550	$6,766	$17,184	$4,000	$100	$44,600
Replacement	$800	$2,379	$6,400	$18,500	$16,300	$44,379
Risk Reduction	$4,650	$5,854	$6,805	$3,250	$3,550	$24,109
Total Electric Production	**$22,000**	**$14,999**	**$30,389**	**$25,750**	**$19,950**	**$113,088**

Electric Production Capital Projects Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Environmental						
Environmental - EP - East River	$16,550	$6,766	$16,684	$3,500	$0	$43,500
Environmental - EP - 74th Street	$0	$0	$500	$500	$100	$1,100
Total Environmental	**$16,550**	**$6,766**	**$17,184**	**$4,000**	**$100**	**$44,600**
Replacement						
Balance of Plant Replacement Projects - EP - ER	$0	$399	$0	$1,000	$2,000	$3,399
Instrument & Control Replacement Projects - EP-ER	$800	$1,540	$1,850	$0	$0	$4,190
Major Equipment Replacement Projects - EP - ER	$0	$0	$350	$15,000	$6,000	$21,350
Power Distribution Replacement Projects - EP - ER	$0	$440	$4,200	$2,500	$8,300	$15,440
Total Replacement	**$800**	**$2,379**	**$6,400**	**$18,500**	**$16,300**	**$44,379**
Risk Reduction						
Balance of Plant Risk Reduction Projects - EP - ER	$0	$500	$0	$0	$0	$500
Civil & Structural Projects - EP - 59th Street	$0	$500	$0	$0	$0	$500
Civil & Structural Projects - EP - 74th Street	$800	$0	$0	$0	$0	$800
Civil & Structural Projects - EP - East River	$2,700	$2,275	$1,555	$0	$0	$6,530
Instrument & Control Risk Reduction Projects-EP-ER	$950	$459	$2,250	$0	$300	$3,959
Instrument & Control Risk Reduction Projects-EP-59	$0	$120	$0	$0	$0	$120
Major Equipment Risk Reduction Projects - EP - ER	$0	$2,000	$3,000	$3,250	$3,250	$11,500
Mechanical Facilities - EP - ER	$200	$0	$0	$0	$0	$200
Total Risk Reduction	**$4,650**	**$5,854**	**$6,805**	**$3,250**	**$3,550**	**$24,109**
Total Electric Production	**$22,000**	**$14,999**	**$30,389**	**$25,750**	**$19,950**	**$113,088**

Shared Services Capital Forecast Summary

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	Total
Total - Strategic IT Projects	$314,738	$300,243	$317,792	$272,764	$273,401	$1,478,938
Total - Facility Projects	$99,973	$100,304	$101,099	$112,614	$83,931	$497,921
Total - General Equipment	$54,959	$48,445	$69,171	$78,278	$79,478	$330,331
Other	$0	$0	$0	$0	$0	$0
Total CECONY Shared Services	**$469,670**	**$448,992**	**$488,062**	**$463,656**	**$436,810**	**$2,307,190**

Shared Services and Common Forecast

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
Facilities Projects						
Astoria Southwest Storm Water System Corrective Action Plan	$901	$1,998	$11,598	$12,080	$0	$26,577
Brinkerhoff New Facility	$0	$1,004	$4,496	$12,000	$12,000	$29,499
Electric Vehicle Charging Infrastructure	$0	$149	$2,000	$2,501	$3,000	$7,651
Facilities Buildings and Yards - (Energy Efficiency Program)	$2,006	$3,007	$14,999	$14,996	$3,002	$38,010
Facilities Buildings and Yards - (Roof Replacement Program)	$3,009	$3,007	$9,018	$4,007	$6,010	$25,051
Facilities Buildings and Yards All Other (Safety Environmental Regulatory)	$3,009	$3,509	$5,010	$10,018	$13,008	$34,554
Facilities Critical Infrastructure Short Term Priority_Programs	$13,376	$6,027	$17,000	$16,997	$20,604	$74,005
Facilities Security Upgrade Program- Tier 1	$2,495	$2,494	$3,002	$3,002	$3,001	$13,994
Facilities Service Center Renovations	$3,009	$3,007	$8,003	$8,002	$11,005	$33,027
McKeon Door Demolition	$558	$0	$0	$0	$0	$558
Post COVID Facilities Upgrades	$1,622	$0	$0	$0	$0	$1,622
Sherman Creek Service Center	$63,500	$66,100	$3,969	$0	$0	$133,569
Third Avenue New Transportation Building	$974	$0	$1,002	$4,007	$5,008	$10,991
Van Nest Cable Office Renovation	$5,001	$6,998	$1,000	$0	$0	$12,999
Worth Street Site Master Plan	$514	$3,002	$20,003	$25,003	$7,291	$55,814
Total - Facility Projects	**$99,973**	**$100,304**	**$101,099**	**$112,614**	**$83,931**	**$497,920**
Strategic IT Projects						
74th St and 59th St Station High Fidelity Simulators	$1,616	$0	$0	$0	$0	$1,616
Advanced Employee Safety Tools	$0	$829	$7,643	$7,643	$7,643	$23,756
Allegro Replacement	$2,040	$0	$0	$0	$0	$2,040
AMI - Load Shedding Project	$350	$0	$0	$0	$0	$350
Analytics Center of Excellence	$0	$0	$7,164	$7,499	$7,499	$22,162
ARCOS SaaS Products (Workbench)	$1,700	$0	$0	$0	$0	$1,700
AutoCAD (Engineering Equipment Upgrade Program)	$706	$0	$0	$0	$0	$706
Back Office Automation - Agent Tools	$1,510	$166	$0	$0	$0	$1,676
BI Enhancements	$0	$413	$0	$500	$500	$1,413
Budget System Enhancements	$2,828	$827	$0	$3,500	$3,500	$10,655
Business System Sustainability Program	$3,600	$4,054	$4,216	$4,273	$4,273	$20,416
CCTN Program	$6,877	$4,937	$7,590	$16,550	$16,550	$52,504
CDG Net Crediting and Payment Processing	$944	$0	$0	$0	$0	$944
CE Bill Redesign	$200	$0	$0	$0	$0	$200
Collaboration Tools	$0	$195	$225	$0	$0	$420
Communications Infrastructure (Grid Mod)	$12,752	$16,031	$15,285	$16,284	$16,284	$76,636
Conduct Maximo Upgrade Phase 0 and Project SSO	$350	$1,655	$1,910	$1,910	$1,910	$7,735
Construction - Fraud Risk Mitigation Program	$151	$165	$191	$191	$191	$889
Construction - Survey Mapping Repository	$257	$430	$0	$0	$0	$687
Construction Field Smart Forms 2018 -2021 (IT-KONY)	$553	$207	$239	$239	$239	$1,477
Construction Migration (Contractor Payment System Work Tracking)	$1,397	$0	$0	$0	$0	$1,397
Contingency Analysis Program (CAP)	$145	$207	$239	$239	$239	$1,068
Corporate Security - Company Wide Camera Rollout Program	$850	$834	$955	$955	$955	$4,550
Corporate Security - Cyber forensic equipment	$99	$99	$100	$100	$100	$498
Corporate Security NVR and DVR replacements	$837	$822	$901	$901	$901	$4,361
CPMS Customer Knowledge Self-Self Service	$2,265	$4,965	$0	$0	$0	$7,230
Customer Operations Data Analytics	$3,775	$5,000	$5,000	$2,000	$2,000	$17,775
Customer Operations Journey Mapping	$736	$600	$500	$500	$500	$2,836
Cyber Security	$900	$1,000	$1,000	$1,000	$1,000	$4,900
Cyber Security Infrastructure	$1,700	$1,654	$3,821	$3,821	$3,821	$14,816
Cybersecurity	$4,994	$4,559	$5,804	$7,380	$7,380	$30,117
Data Center Improvements (Server Farm Infrastructure)	$2,169	$1,698	$1,960	$3,052	$3,052	$11,931
Datasplice Upgrade to Version 6	$203	$0	$0	$0	$0	$203
DECC Alarm Manager	$0	$206	$238	$238	$238	$919
Desktop Infrastructure	$482	$582	$673	$0	$0	$1,737
Dielectric System Orders	$420	$0	$0	$0	$0	$420
Digital Customer Experience (DCX)	$9,815	$14,207	$14,601	$13,000	$13,000	$64,623
Distribution Electric Control Center Cybersecurity	$851	$912	$956	$956	$956	$4,630
Distribution Ops Training Simulator	$116	$125	$143	$143	$143	$670
District Operator Task Managing System	$604	$400	$400	$400	$400	$2,204
E5	$688	$0	$0	$0	$0	$688
Electric Distribution SCADA Enhancement	$0	$828	$0	$0	$0	$828
2021 Electronic Feeder Sign On	$242	$0	$0	$0	$0	$242
Electronic Distribution Feeder Sign On	$0	$291	$334	$334	$334	$1,292
Emerging IT Project Initiative for Enhanced Distribution System Analysis	$5,000	$3,247	$11,330	$14,329	$14,329	$48,234
EMS Replacement ECC and AECC	$0	$0	$0	$0	$4,500	$4,500
Enterprise Application	$278	$304	$352	$0	$0	$934
Enterprise Project Management Software Project	$4,530	$2,301	$1,655	$0	$0	$8,486
FERC XBRL for filing FERC Forms	$700	$0	$0	$0	$0	$700
Gas Central	$25,018	$0	$0	$0	$0	$25,018
Gas Incident Management Sustainability	$350	$0	$0	$0	$0	$350
GIS Implementation	$29,999	$36,300	$62,500	$63,500	$63,500	$255,799
Green Energy Program	$2,100	$0	$0	$0	$0	$2,100
Grid Mod Data Analytics Use Cases	$1,512	$1,656	$1,912	$2,912	$2,912	$10,904
Implementation of TCIS Phase 0 Recommendations	$350	$0	$0	$1,739	$1,739	$3,828
Integrated Supply	$1,260	$0	$0	$0	$0	$1,260
Learning and Inclusion Digital Learning Transformation	$0	$1,434	$3,772	$238	$0	$5,444
Mass Market Rate Reform (MMRR)	$1,000	$3,000	$5,000	$1,000	$0	$10,000
Metrix IDR upgrade	$0	$0	$0	$410	$410	$821
Mobile SME on Demand – Body Camera	$0	$826	$1,000	$1,000	$174	$3,000
Mobility	$8,305	$6,973	$9,498	$18,000	$18,000	$60,775
MV 90 Upgrade Replacement project	$0	$827	$0	$0	$0	$827
23322950 - L1_EM Applications Integration to New CIS	$0	$2,300	$4,585	$1,240	$1,240	$9,365
23322977 - L1_Analytics Integration to C3 Platform	$0	$1,639	$2,866	$0	$0	$4,505
23322926-L1_Grid visualization platform ADMS (CES - IT)	$0	$807	$1,844	$0	$0	$2,651

Shared Services and Common Forecast continued

Thousands ($000)

Project/Program Description	2021	2022	2023	2024	2025	5 Year Total
24156674-L1_New Customer Service System Enhancements	$0	$0	$0	$48,000	$48,000	$96,000
New Customer Service System	$105,590	$126,541	$59,406	$0	$0	$291,537
New Technology	$680	$473	$546	$629	$629	$2,957
nMarket upgrade to accommodate REV	$0	$929	$0	$0	$0	$929
NYISO Transmission Owner Data Reporting System Next Generation	$374	$313	$0	$835	$835	$2,356
Off System Billing	$700	$1,000	$0	$0	$0	$1,700
OMS IT System Hardening	$5,792	$4,023	$0	$0	$0	$9,814
Operation Management System Enhancements	$0	$331	$382	$400	$400	$1,513
Operations Network for EMS	$255	$248	$287	$300	$300	$1,390
Oracle BI for EBS Cloud Migration	$3,430	$4,614	$47,841	$6,190	$6,190	$68,265
Oracle HCM Cloud Implementation	$19,848	$18,034	$13,175	$4,103	$4,103	$59,263
Outage Management System - Phase Four	$2,250	$1,448	$1,672	$1,672	$1,672	$8,712
Outage Scheduling System (OSS) - Phase 3	$840	$0	$0	$0	$0	$840
Plant Information System	$0	$207	$0	$0	$0	$207
PowerPlan Application Upgrade 2021	$2,150	$0	$0	$0	$0	$2,150
ProField Encore (AMI Implementation)	$225	$0	$0	$0	$0	$225
Rate Case Enhancements	$1,073	$1,262	$1,263	$1,263	$1,263	$6,124
Scada Net	$638	$440	$508	$532	$532	$2,650
SCADA Upgrade	$0	$3,500	$0	$0	$0	$3,500
Self Service Payment Kiosks	$0	$0	$0	$1,500	$0	$1,500
Soft Tissue Injury Prevention Project	$0	$900	$300	$300	$0	$1,500
Substation Technology Improvements Program (Maximo Upgrades)	$1,543	$1,655	$0	$0	$0	$3,198
Third Party Risk Management	$2,200	$0	$0	$0	$0	$2,200
TNVS WEB	$35	$0	$0	$0	$0	$35
Virtual Assistants	$1,510	$1,412	$955	$2,000	$2,000	$7,877
WMS Sustainability Project	$2,700	$2,219	$2,867	$3,867	$3,867	$15,521
Work and Asset Management Mobility Solution	$5,225	$0	$0	$0	$0	$5,225
Total - Strategic IT Projects	**$314,738**	**$300,243**	**$317,792**	**$272,764**	**$273,401**	**$1,478,938**
General Equipment						
XM1 Tier 1 - Office Furniture	$602	$602	$700	$700	$700	$3,304
XM2 - Vehicles	$34,400	$30,000	$47,650	$46,650	$47,850	$206,550
XM3 Tier 1 - Stores Equipment	$376	$376	$437	$437	$437	$2,063
XM 4 - Shop Equipment - Rollup	$360	$360	$360	$360	$360	$1,800
XM5 and 15 Tier 1 - Laboratory Equipment (Testing and Chemical)	$2,580	$2,580	$3,000	$3,000	$3,000	$14,161
XM6 Tier 1 - Tools and Work Equipment	$3,440	$3,440	$4,000	$4,000	$4,000	$18,880
XM7 Tier 1 - Miscellaneous and Safety Equipment	$774	$774	$900	$900	$900	$4,247
XM8 Telecommunications Equipment Priority 1	$2,426	$2,054	$2,053	$4,588	$4,588	$15,709
XM10 Tier 1_2 Computer Equipment Critical Infrastructure	$10,000	$8,259	$10,071	$17,643	$17,643	$63,616
Total - General Equipment	**$54,959**	**$48,445**	**$69,171**	**$78,278**	**$79,478**	**$330,329**
Total CECONY Shared Services	**$469,670**	**$448,991**	**$488,062**	**$463,655**	**$436,809**	**$2,307,187**