# CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. 2017-2019 GAS OPERATIONS CAPITAL PROGRAMS/PROJECT WHITE PAPER UPDATES

| CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. 2017-2019 GAS CAPITAL PROGRAMS | | Year Total Current Budget Total Dollars ($000) | | |
|---|---|---|---|---|
| **Project /Program Description** | **Category Code** | **RY1** | **RY2** | **RY3** |
| ***Distribution System Improvement Programs*** | | | | |
| **Main Replacement Program** | | | | |
| Replace Corroded Steel Mains | Risk Reduction | $ 98,319 | $ 106,685 | $ 121,291 |
| Replace Cast Iron Mains | Risk Reduction | $ 150,106 | $ 164,143 | $ 180,150 |
| Cathodic Protection Steel Mains | Risk Reduction | $ 1,261 | $ 1,284 | $ 1,284 |
| | **Sub-Total** | **$ 249,687** | **$ 272,112** | **$ 302,725** |
| **Distribution Supply Main Program** | | | | |
| Winter Load Relief | Risk Reduction | $ 17,163 | $ 17,513 | $ 17,491 |
| Supply Main Planned Reinforcement (CONFIDENTIAL*) | Risk Reduction | $ 5,558 | $ 6,767 | $ 6,813 |
| Gas System Vulnerability Elimination Program (CONFIDENTIAL*) | Risk Reduction | $ 11,113 | $ 8,566 | $ 14,943 |
| Emerging Supply Mains Reliability | Risk Reduction | $ 4,041 | $ 4,129 | $ 4,123 |
| Rehabilitate Large Diameter Gas Mains | Risk Reduction | $ 4,798 | $ 4,902 | $ 4,895 |
| Replacement of Existing PE and Emergent Water Intrusion | Risk Reduction | $ 3,029 | $ 3,094 | $ 3,089 |
| SM - Yorktown Upgrade | Risk Reduction | $ 1,010 | $ 1,032 | $ 1,031 |
| Rehabilitation of the Gas Supply Main to City Island | Risk Reduction | $ - | $ - | $ 721 |
| Second Supply to Roosevelt Island | Risk Reduction | $ 12,123 | $ - | $ - |
| | **Sub-Total** | **$ 58,835** | **$ 46,003** | **$ 53,106** |
| **Isolation Valve Installation Program** | | | | |
| Isolation Valves | Risk Reduction | **$ 5,051** | **$ 5,161** | **$ 5,153** |
| **Service Replacement** | | | | |
| Services associated with main work | Risk Reduction | $ 45,391 | $ 49,254 | $ 52,074 |
| Services Without Curb Valves | Risk Reduction | $ 1,110 | $ 1,134 | $ 1,132 |
| | **Sub-Total** | **$ 46,501** | **$ 50,388** | **$ 53,206** |
| **Emergency Replacement of Services** | | | | |
| Leaking Services | Risk Reduction | **$ 46,854** | **$ 47,990** | **$ 47,408** |
| **Distribution System Improvement Programs Total** | | **$ 406,928** | **$ 421,655** | **$ 461,597** |
| ***Transmission Programs and Projects*** | | | | |
| **Transmission Risk Reduction and Reliability Projects** | | | | |
| Remotely Operating Valves (ROVs) | Risk Reduction | $ 1,478 | $ 1,977 | $ 3,608 |
| TG – Transmission Pipeline Integrity Main Replacement Program | Risk Reduction | $ 1,516 | $ 3,098 | $ 3,085 |
| Transmission Main Leaks | Risk Reduction | $ 2,018 | $ 2,058 | $ 2,056 |
| TG – St. Ann's Tee to Hunt Point Downgrade | Risk Reduction | $ 10,609 | $ 7,742 | $ - |
| TG – Yorktown Gate Station Refurbishment | Risk Reduction | $ - | $ 9,291 | $ - |
| Newtown Creek Metering Station | Risk Reduction | $ 3,032 | $ - | $ - |
| Cortlandt Gate Station Refurbishment | Risk Reduction | $ 9,093 | $ - | $ - |
| Greenburgh Yard Refurbishment | Risk Reduction | $ 8,082 | $ - | $ - |
| Westchester / Bronx Border to White Plains | Risk Reduction | $ 40,414 | $ 41,292 | $ 41,222 |
| TG - Bronx River Tunnel to Bronx Westchester Border | Risk Reduction | $ 25,261 | $ 25,810 | $ 25,764 |
| Bronx River Tunnel and Easement | Risk Reduction | $ - | $ 15,485 | $ 12,368 |
| Astoria Transmission Main Reinforcement OTG | Risk Reduction | $ 10,103 | $ - | $ - |
| OTG Transmission Main Reinforcement | Risk Reduction | $ 11,821 | $ 12,078 | $ 7,214 |
| Millennium - Lower Westchester Interconnect | System Expansion | $ - | $ - | $ 46,374 |
| Iroquois-3rd Ward of Queens Interconnect | System Expansion | $ - | $ - | $ 15,458 |
| Millennium Pipeline Distribution Regulator Stations (CONFIDENTIAL*) | System Expansion | $ - | $ - | $ 4,895 |
| | **Sub-Total** | **$ 123,426** | **$ 118,830** | **$ 162,044** |
| **Pressure Control** | | | | |
| PC - Water Proof Manholes | Risk Reduction | $ 100 | $ 100 | $ 100 |
| PC - Replace Regulators, Valves & Strainer 2 and Larger | Risk Reduction | $ 500 | $ 500 | $ 500 |
| PC - Unserviceable Equipment | Risk Reduction | $ 500 | $ 500 | $ 500 |
| PC - Regulator Vent System Refurbishment | Risk Reduction | $ 456 | $ 463 | $ 462 |
| PC - Uncoated Piping | Risk Reduction | $ 203 | $ 206 | $ 205 |
| PC - Corroded Gauge Lines | Risk Reduction | $ 101 | $ 103 | $ 103 |
| PC - Pressure Monitoring / Telemetrics | Risk Reduction | $ 500 | $ 500 | $ 500 |
| PC - Gridboss / Automated Adaptive Controls | Risk Reduction | $ 650 | $ 650 | $ 650 |
| | **Sub-Total** | **$ 3,010** | **$ 3,022** | **$ 3,020** |
| **Transmission Programs and Projects Total** | | **$ 126,436** | **$ 121,852** | **$ 165,064** |

| CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. 2017-2019 GAS CAPITAL PROGRAMS | | Year Total Current Budget Total Dollars ($000) | | |
|---|---|---|---|---|
| **Project /Program Description** | **Category Code** | **RY1** | **RY2** | **RY3** |
| ***Security*** | | | | |
| Tier 2 Security Improvement | Safety/Security | $ 1,011 | $ 1,032 | $ 1,031 |
| Various Tunnel Properties - Security Improvements | Safety/Security | $ - | $ - | $ 310 |
| **Security Total** | | **$ 1,011** | **$ 1,032** | **$ 1,340** |
| ***Growth Related Programs and Projects*** | | | | |
| OTG - #4/6 Conversions NYC | New Business | $ 55,244 | $ 29,437 | $ 25,150 |
| OTG - #2 Oil Conversions NYC | New Business | $ 13,422 | $ 13,234 | $ 12,801 |
| OTG - Westchester Area Growth | New Business | $ 10,102 | $ 10,322 | $ 10,306 |
| OTG - Westchester Conversions | New Business | $ 17,590 | $ 18,545 | $ 19,684 |
| New Business - Traditional | New Business | $ 51,904 | $ 53,144 | $ 53,410 |
| OTG – Regulator Stations | New Business | $ 24,244 | $ 21,669 | $ 12,569 |
| New Business - Regulator Stations | New Business | $ 7,072 | $ 7,225 | $ 7,208 |
| **Growth Related Programs and Projects Total** | | **$ 179,577** | **$ 153,577** | **$ 141,128** |
| ***Technical Operations*** | | | | |
| **Liquid Natural Gas (LNG)** | | | | |
| LNG - Purchase and Install Vaporizers 1 and 2 | Rplmt - Replacement | $ 3,250 | $ 1,700 | $ 1,400 |
| LNG - Liquefier Instrumentation | Rplmt - Replacement | $ - | $ - | $ 1,163 |
| LNG - Purchase and Install Balance of Plant Instrumentation | Rplmt - Replacement | $ - | $ 1,360 | $ - |
| LNG - Year Round Liquefier Operation | Rplmt - Replacement | $ 1,746 | $ 440 | $ - |
| LNG - Plant Boil-Off Compressor | Rplmt - Replacement | $ - | $ - | $ 750 |
| LNG - Plant Motor Control Center | Rplmt - Replacement | $ - | $ 1,100 | $ 900 |
| LNG - Plant Regeneration Skid | Rplmt - Replacement | $ - | $ - | $ 1,300 |
| LNG - Rebuild Turbines 601 and 626 | Rplmt - Replacement | $ 450 | $ 216 | $ 223 |
| LNG - Reconditioning of Plant Structures | Rplmt - Replacement | $ 845 | $ - | $ - |
| LNG Plant- Replacement of Dry Chemical Fire Suppression System Zones 5 & 6A | Rplmt - Replacement | $ 695 | $ 1,200 | $ - |
| LNG Plant - Fire Detection and Suppression Compliance Upgrades | Rplmt - Replacement | $ 5,937 | $ 2,563 | $ - |
| | **Sub-Total** | **$ 12,923** | **$ 8,579** | **$ 5,736** |
| **Tunnels** | | | | |
| Various Tunnel Properties - Steel Replacement Program | Rplmt - Replacement | $ - | $ 996 | $ - |
| Ravenswood Tunnel - Electric Upgrade | Rplmt - Replacement | $ 1,323 | $ - | $ - |
| Ravenswood Tunnel - NYF Gas Main Rollers | Rplmt - Replacement | $ 626 | $ 918 | $ 500 |
| Ravenswood Tunnel - Feeder Support | Rplmt - Replacement | $ 627 | $ 918 | $ 500 |
| Bronx River Tunnel - Hoistway | Rplmt - Replacement | $ 96 | $ - | $ - |
| Flushing Tunnel - Hoistway | Rplmt - Replacement | $ 96 | $ - | $ - |
| Ravenswood Tunnel - Hoistway | Rplmt - Replacement | $ - | $ - | $ 100 |
| Hudson Avenue Tunnel - Oil Minder | Rplmt - Replacement | $ - | $ - | $ 35 |
| Ravenswood Tunnel - Oil Minder | Rplmt - Replacement | $ - | $ - | $ 35 |
| Various Tunnel Properties – Sump Pumps | Rplmt - Replacement | $ - | $ 75 | $ - |
| Various Tunnel Properties - Upgrade Cable Radio Systems | Rplmt - Replacement | $ - | $ - | $ 926 |
| Various Tunnel Properties - Asphalt Paving | Rplmt - Replacement | $ - | $ - | $ 81 |
| First Ave. Tunnel - Flash Tank Replacement | Rplmt - Replacement | $ - | $ - | $ 500 |
| Hudson Avenue Tunnel - Floor Meter | Rplmt - Replacement | $ - | $ - | $ 65 |
| | **Sub-Total** | **$ 2,768** | **$ 2,907** | **$ 2,742** |
| **Meters** | | | | |
| Meter Purchases - New Business and Program Replacements | Equipment Purchases | $ 9,577 | $ 9,521 | $ 9,600 |
| Meter Purchases - #4/6 Oil-to-Gas | Equipment Purchases | $ 2,100 | $ 1,800 | $ 1,500 |
| Meter Installations – New Business and Program Replacements | New Business | $ 16,378 | $ 16,481 | $ 16,495 |
| Meter Installations – #4/6 Oil-to-Gas | New Business | $ 852 | $ 743 | $ 590 |
| | **Sub-Total** | **$ 28,907** | **$ 28,545** | **$ 28,185** |
| **Picarro Leak Detection Equipment** | Information Technology | **$ 1,200** | **$ -** | **$ -** |
| **Technical Operations Total** | | **$ 45,799** | **$ 40,031** | **$ 36,663** |
| **Gas Work and Asset Management Total** | | **$ 21,929** | **$ 27,149** | **$ 32,715** |
| **Municipal Infrastructure Total** | | **$ 82,365** | **$ 82,055** | **$ 79,860** |
| **Grand Total** | | **$ 864,045** | **$ 847,351** | **$ 918,367** |

**Note A: Replace Cast Iron Main program adjustments of ($1,633) RY1 and ($1,837) RY2 are not currently included in our Capital Model.**

# CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. 2017-2019 GAS OPERATIONS OPERATIONS AND MAINTENANCE (O&M)

| GAS OPERATIONS - O&M INCREASES BY CATEGORY | Total Dollars ($000) RY1 | RY2 | RY3 |
|---|---|---|---|
| **Service Line Defintion** | **$ 11,000** | **$ 11,000** | **$ 11,000** |
| Capital Related Maintenance | $ 9,840 | $ 10,678 | $ 11,630 |
| Service Transfers | $ 1,096 | $ 1,094 | $ 1,096 |
| Net Negative Salvage | $ 1,089 | $ 1,089 | $ 1,089 |
| **Total Maintenance Associated with Capital** | **$ 12,025** | **$ 12,861** | **$ 13,815** |
| Leak Repairs | $ 53,806 | $ 53,830 | $ 53,830 |
| Emergency Response | $ 16,722 | $ 16,838 | $ 16,784 |
| Follow Ups & Rechecks | $ 1,953 | $ 1,965 | $ 1,972 |
| Emergency Response Ctr | $ 4,503 | $ 4,536 | $ 4,708 |
| Surveillances | $ 4,794 | $ 4,819 | $ 4,841 |
| Non-Leak Tickets | $ 6,321 | $ 6,354 | $ 6,382 |
| **Leak Management Subtotal** | **$ 88,099** | **$ 88,342** | **$ 88,518** |
| Meters, Regulators & Others | $ 1,781 | $ 881 | $ 881 |
| Measurement | $ 1,051 | $ 1,051 | $ 1,051 |
| **Meters & Measurement Subtotal** | **$ 2,832** | **$ 1,932** | **$ 1,932** |
| Main Valve Inspections | $ 1,210 | $ 1,213 | $ 1,215 |
| Fault Repairs | $ 1,243 | $ 1,231 | $ 1,240 |
| Vaulted Areas | $ 306 | $ 307 | $ 307 |
| PA Inspections (bopa) | $ 1,697 | $ 1,701 | $ 1,702 |
| Other highway complaints, drips, etc. | $ 1,921 | $ 1,922 | $ 1,921 |
| High Pressure Inspections | $ 451 | $ 452 | $ 453 |
| **Inspection Programs Subtotal** | **$ 6,829** | **$ 6,825** | **$ 6,838** |
| Corrosion | $ 1,298 | $ 1,830 | $ 2,362 |
| Total Tunnel Ops | $ 7,654 | $ 7,662 | $ 7,662 |
| Leakage Survey | $ 7,652 | $ 7,658 | $ 7,665 |
| Corrosion Faults | $ 1,217 | $ 1,199 | $ 1,180 |
| Pressure Control | $ 4,448 | $ 4,455 | $ 4,462 |
| Engineering | $ 10,308 | $ 10,483 | $ 10,599 |
| SVP & NYF | $ 8,214 | $ 8,020 | $ 8,019 |
| **Technical Operations Subtotal** | **$ 40,792** | **$ 41,308** | **$ 41,949** |
| **Gas Control** | **$ 1,992** | **$ 2,043** | **$ 2,097** |
| **Reconnects** | **$ 637** | **$ 626** | **$ 638** |
| **Poor Pressure/No Gas** | **$ 776** | **$ 778** | **$ 778** |
| **Total Miscellaneous Operations and Leak Management** | **$ 141,957** | **$ 141,854** | **$ 142,750** |
| **Compliance and Quality Assessment Staffing** | **$ 3,193** | **$ 2,975** | **$ 3,012** |
| **LNG Tank Coating** | **$ 1,000** | **$ -** | **$ -** |
| **Environmental Health & Safety** | **$ -** | **$ -** | **$ -** |
| **Grand Total** | **$ 169,175** | **$ 168,690** | **$ 170,576** |

# CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. 2017-2019 GAS OPERATIONS CAPITAL PROGRAMS/PROJECT WHITE PAPER UPDATES

| | |
|---|---|
| X | Capital |
| | O&M |

**2017 – Gas Operations**

| | |
|---|---|
| **Project/Program Title** | Rehabilitate Large Diameter Gas Mains |
| **Project Manager** | John Ciallella |
| **Hyperion Project Number** | 21680785 |
| **Organization's Project Number** | N/A |
| **Status of Project** | Planning |
| **Estimated Start Date** | January 2017 |
| **Estimated Completion Date** | On-going |
| **Work Plan Category** | Operational Risk |

## Work Description:

This is a multi-year project that provides a program for rehabilitating large diameter supply mains. Loss of service along supply mains due to a major leak could lead to customer outages and regulator impact during the winter heating season. There are two rehabilition methods covered in this project:

1. CISBOT: Seal and reinforce cast iron joints internally on highly congested and sensitive streets in lieu of keyhole repairs and/or main replacement.
   Units per Year: 260 joints

2. LINER: Utilize plastic liner on mains to seal leaks and prevent future leaks in lieu of direct bury main replacement.
   Units per Year: 5,200 feet

## Justification Summary:

The first rehabilitation method is the sealing of cast iron joints internally through CISBOT. CISBOT is a joint sealing robot manufactured by ULC that travels within the gas main to seal joints and prevent future leaks. This alternative minimizes the number of excavations to repair leaking joints on large diameter cast iron mains that are located on sensitive or congested streets. This process is designed to launch a tool head through a special fitting into a live cast iron gas main, which travels up to 500 feet inside the pipe then drills and injects anaerobic sealant into each joint it passes, sealing any active leaks and preventing any future joint leaks while being pulled back to the launch site. The robot is then turned around to the other side of the launch fitting and the process is repeated in the second direction to complete up to 1,000 feet of main joint sealing from one insertion point with no release of gas to the environment and without disturbing service to our customers. The sealant used is an anaerobic sealant (cures in the absence of oxygen) made up primarily of acrylics that acts as a packing to stop gas from flowing between the dried-up jute fibers installed when the main was originally installed. This sealant has demonstrated through testing to be able to withstand the repeated ground movement from vehicular traffic, the seasonal pipe movement from thermal expansion and contraction and would last at least 50 years. The wall thickness of the large diameter mains are generally in good condition. Historical leak repairsprove that joints, generally located approximately 12 feet apart, are the most leak-prone areas of large cast iron gas mains.

Therefore, the use of CISBOT to seal the cast iron joints internally will minimize the number of excavations required to eliminate the leaks and extend the useful life of the main.

The second rehabilitation method is cured-in-place pipe liner. The pipe liner is a seamless / joint-less circular woven fabric-hose made of polyester yarns and plastic coating which is bonded to the host pipe using a solvent free two component adhesive that is custom fit depending on the project. This method seals existing leaks and prevents future leaks. It minimizes lengthy excavation and re-construction. Studies have shown that cured-in-place liner has the ability to add 50 years of new life to the host pipe, and can be utilized on both steel and cast iron.

This project addresses enterprise risks for Gas Distribution system events, Water Main Breaks, and Incurring Operating Penalties for Customer Outages.

## **Supplemental Information:**

- Alternatives: One alternative to this program is to continue to resolve leaks with main repairs instead of main rehabilitation. This will include current keyhole methods for sealing cast iron mains, which require an excavation at every leaking joint.
  An additional alternative is the replacement of large diameter cast iron and unprotected steel gas mains. While replacement is the best solution for select large diameter gas mains, the operational difficulty and cost of replacing large diameter gas main makes this alternative unstrategic in many scenarios. Replacement of large diameter steel gas mains involves costly, long-lead fittings and materials, and results in adverse customer impact due to large excavation footprint and lengthy installation time.

- Risk of No Action: If these mains are not rehabilitated, they will continue to deteriorate and develop leaks that will need to be repaired as they arise. Repairing active leaks is mandatory and is a rate case performance indicator. The risk of customer and regulator outages increases should a serious leak develop on a large diameter main during the heating season. CISBOT and liners can prevent these high-consequence leaks from developing.

- Non-financial Benefits: Benefits include increased safety, reliability, efficiency and reducing the leak backlog. This process extends the useful life of the gas main and reduces the effects of lost gas and water infiltration.

- Summary of Financial Benefits (if applicable) and Costs: This program is O&M cost avoidance and does not yield direct financial benefits. The use of CISBOT for reinforcing multiple joints on a segment of cast iron main will minimize numerous keyhole excavations and/or trenching if replacement was the method of repair. One excavation can be made to reinforce up to a 1,000 foot segment of pipe as opposed to making approximately 80 excavations for keyhole repairs to the same segment of pipes. The use of liners minimizes the amount of excavation and/or trenching during main replacement.

- Technical Evaluation/Analysis: This program has a direct impact on the reduction of the leak backlog. This program will help reduce the probability that a crack/break will cause an incident.

- Project Relationships (if applicable): N/A

- Basis for Estimate: Historical Unit Cost

## Total Funding Level ($000):

### Historical Spend

| Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|
| | | | | | |

### 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 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|---|
| Labor | | | | | | |
| M&S | | | | | | |
| A/P | | | | | | |
| Other | | | | | | |
| **Total** | | | | | | |

## Request ($000):

| Request 2017 | Request 2018 | Request 2019 | Request 2020 | Total Request |
|---|---|---|---|---|
| $4,798 | $4,902 | $4,894 | $4,908 | $19,502 |

### Request by Elements of Expense

| EOE | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Labor | | 190 | 190 | 190 | 190 |
| M&S | | 515 | 515 | 257 | 257 |
| A/P | | 2,580 | 2,577 | 2,871 | 2,904 |
| Other | | 271 | 271 | 277 | 279 |
| Overheads | | 1,242 | 1,349 | 1,299 | 1,278 |
| **Total** | | 4,798 | 4,902 | 4,894 | 4,908 |

| | |
|---|---|
| X | Capital |
| | O&M |

**2016 – Gas Capital**

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|---|---|
| **Project/Program Title** | Services Associated With Main Work |
| **Project Manager** | Various |
| **Hyperion Project Number** | 7GD9805, 7GD9808, 7GD9811, 7GD9815, 20953826 |
| **Organization's Project Number** | N/A |
| **Status of Project** | Construction |
| **Estimated Start Date** | Ongoing |
| **Estimated Completion Date** | Ongoing |
| **Work Plan Category** | Regulatory Mandated |

**Work Description:**

The work covered in this program includes the replacement of non-leaking services associated with capital main replacement programs.

- Units per Year: Approximately 1 service replacement every 160 feet of main replacement
- Mandatory: The replacement of non-leaking steel services when completing the replacement of the main is in compliance with Gas Specification G-8100 and G-8005.

**Justification Summary:**

We plan on replacing approximately 2,600 – 2,900 services annually in conjunction with our main replacement programs. These programs replace existing unprotected steel and/or cast iron gas main with new protected steel or plastic. This program funding is associated with the replacement of the existing unprotected pre-1972 steel services that exist on the planned gas main segments. These main replacements represent an accelerated replacement program which supports the elimination of unprotected steel and cast iron gas mains to reduce risk and improve system reliability. In addition, this replacement program is a rate case required program and supports our long range plan to eliminate our leak prone gas main by replacement with plastic and/or protected steel gas main. As part of the accelerated replacement program, the unprotected steel services would not be connected to a new gas main. Instead, the leak prone steel service would be replaced in conjunction with our accelerated efforts.

**Supplemental Information:**

- Alternatives: The only alternative in this scenario would be to not take action, which would involve transferring the existing service to the newly installed gas main.

- Risk of No Action: Transferring an existing unprotected steel service to a new plastic main is not a viable option and not a good business practice. Since these services are installed prior to 1972 and are not cathodically protected, it is a not a good business practice to leave the old steel service, which is at risk for corrosion. Retaining the existing small diameter unprotected steel gas service would result in an increased risk of future leaks on the service line, which would negatively impact the overall safety and reliability of the gas system. Since the service line is generally an average of 40'-50', a leak on the service line may result in a hazardous condition and would require emergency response and increase our risk of a distribution event. In addition, the replacement of the service at the time of the leak would require excavation to make the necessary repairs. This work will help avoid future re-excavations to eliminate leaks and will contribute to improved customer satisfaction.

- Non-financial Benefits: The replacement of the service is in conjunction with the replacement of leak prone pipewhich contributes to a PSC mandated program. . In addition to replacing leak prone gas main, the replacement of these services will result in avoided future leaks.

- Summary of Financial Benefits (if applicable) and Costs: Replacement of non-leaking services while performing capital main improvements will reduce future O&M costs related to investigation of leaks on the bare steel service and resulting excavation to repair/replace the steel service.

- Technical Evaluation/Analysis: Replacement of non-leaking services has an indirect impact on the KPI for workable leak backlogs. Customer satisfaction is a KPI that will be impacted if services are not replaced; service leaks may develop and excavation will be required to repair/replace the service. In addition, the elimination of leak prone pipe has a direct impact on our Sustainability Strategy and the reduction of methane emissions from the gas distribution system.

- Project Relationships (if applicable): This program is directly related to the main replacement programs. There are currently approximately 70,000 unprotected steel gas services in the Con Edison system. As we replace our gas mains, we plan to replace any unprotected steel gas service as part of this effort. We estimate approximately 2,600 – 2,900 services replaced under this program annually.

  In addition, if a leak is discovered on a steel gas service, we would replace such service on the Emergency Replacement of Services Program. We estimate to replace approximately 2,600 services per year in the next 5 years under Emergency Replacement of Services program. This program is also related to Service No Curb Valves. As we continue our accelerated efforts and address emergent service replacements, the existing inventory will be reduced accordingly by over 5,000 unprotected services per year which will reduce the existing inventory of approximately 70,000 services. These programs will improve the safety and reliability of gas to our customers.

- Basis for Estimate: For every 160 feet of main replaced, it is estimated that we will replace one pre-1972 steel gas service under the main replacement program. Since the cost for excavation over the gas main is associated with the gas main work, the overall service unit cost are lower than other service replacement programs. The estimated cost per service is approximately $17,000 per service

**Total Funding Level ($000):**
**Historical Spend**

| Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|
| $22,356 | $20,108 | $18,328 | $23,325 | | $30,610 |

**Historical Elements of Expense**

| EOE | Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|---|
| Labor | $4,785 | $3,274 | $3,043 | $4,220 | N/A | $4,369 |
| M&S | $765 | $584 | $591 | $1,465 | N/A | $1,763 |
| A/P | $6,630 | $4,685 | $8,722 | $10,158 | N/A | $12,758 |
| Other | $1,736 | $3,501 | ($842) | ($71) | N/A | $1,282 |
| Indirect | $8,440 | $8,064 | $6,814 | $7,553 | N/A | $10,438 |
| **Total** | $22,356 | $20,108 | $18,328 | $23,325 | N/A | $30,610 |

**Request ($000):**

| Request 2016 | Request 2017 | Request 2018 | Request 2019 | Request 2020 |
|---|---|---|---|---|
| $30,767 | $45,391 | $49,254 | $52,074 | $52,222 |

**Request by Elements of Expense:**

| EOE | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Labor | $2,569 | $3.871 | $4,123 | $4,372 | $4,176 |
| M&S | $1,472 | $2,072 | $2,216 | $2,361 | $2,361 |
| A/P | $16.787 | $24,332 | $25,846 | $27,547 | $28,239 |
| Other | $1,720 | $2,369 | $2,550 | $3,089 | $3,121 |
| Overheads | $8,219 | $12,747 | $14,520 | $14,705 | $14,325 |
| **Total** | $30,767 | $45,391 | $49,255 | $52,074 | $52,222 |

| | |
|---|---|
| X | Capital |
| | O&M |

**2017 – Gas Operations**

| | |
|---|---|
| **Project/Program Title** | Transmission Main Leaks |
| **Project Manager** | Christian Martinez |
| **Hyperion Project Number** | 2GD0162 |
| **Organization's Project Number** | N/A |
| **Status of Project** | |
| **Estimated Start Date** | Ongoing |
| **Estimated Completion Date** | Ongoing |
| **Work Plan Category** | Strat - System and Component Upgrades |

**Work Description:**

Unrepaired gas leaks may pose a safety risk as the escape of natural gas inherently causes a potentially unsafe condition. Gas leaks can pose an even higher risk when they occur on gas mains which operate at high pressures. As a result, Con Edison treats all leaks on its transmission system as type 1 leaks. Per 16 NYCRR 255.811, once a type 1 leak is discovered, continuous action must be taken to secure the leak condition. This action generally involves a maintenance repair to the existing facility. However due to the high-stakes nature and design of the transmission system, it is sometimes necessary to execute a capital transmission main replacement in order to repair (retire) a leaking transmission pipe or fitting.

This multi-year program will be used for projects that will replace sections of transmission main containing leaks or defects, which cannot be made safe using a maintenance repair technique.

**Justification Summary:**

This program was added as a revision to the 2014 and 2015 capital budgets. During each of these years, one capital transmission main replacement project was completed in order make a permanent repair to a section of transmission main which was discovered to contain a leak or defect.

**Supplemental Information:**

- Alternatives: There are acceptable maintenance alternatives to pipe replacement such as split repair sleeves, grinding, high hats, leak clamps, hot tapping, and welded patch plates. However, each repair method is acceptable for only certain types of damage, in accordance with Con Edison maintenance procedures. Aside from these specific instances, pipe replacement is the only acceptable method.

- Risk of No Action: Risk of fire or explosion arises from workers (Company, contractor or other) who excavate and accidentally make contact with Con Edison's gas transmission main. Other potential causes of this type of incident might be gas transmission main damage that has gone undetected resulting in localized corrosion, or leaking of adjacent water lines that erode the gas pipe. These scenarios could create a leak that might lead to an explosion or fire.

  Public safety and service reliability could be imperiled by an incident of this nature. The cost of restoring damaged customer property, Company property and systems (gas, electric, or steam structures), and non-Company utilities could also be significant. In addition, the Company might have to engage in an extensive effort to restore gas service to customers. This type of event could lead to increased oversight and/or penalties from regulatory agencies, which could mandate relocation of Company facilities or impose restrictions on gas pressures, both of which could adversely impact our operations.

  The aforementioned risk of taking no action is tempered by existing pipeline monitoring programs. Gas Control continually monitors system pressures and flows utilizing the GOSS SCADA system to detect abnormal conditions, which may be an indication of a major leak or damaged facilities. Leak survey also patrols our entire transmission system three times each year.

- Non-financial Benefits: Mitigate risk and maintain safe, reliable service to our customers.

- Summary of Financial Benefits (if applicable) and Costs: Not applicable

- Technical Evaluation/Analysis: Most capital upgrades on transmission leaks require a section of transmission main, valve, regulator to be replaced. The pressures on our transmission system have a maximum allowable operating pressure of 245psig and 350 psig. The cost drivers for these capital upgrades are dependent on main size, which can be between 4"to 36"size mains.

- Project Relationships (if applicable): Not applicable, this project emerges as a capital response to an unforeseen transmission leak in the system.

- Basis for Estimate: The basis for this estimate is based on historical information for this program, which is $2 million per year.

**Total Funding Level ($000):**

**Historical Spend**

| Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|
| | $5,037 | $5,258 | $(352) | | $1,500 |

**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 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|---|
| Labor | | $406 | $395 | | | $135 |
| M&S | | $302 | $160 | | | $112 |
| A/P | | $2,666 | $3,232 | ($283) | | $714 |
| Other | | $268 | $3 | | | $73 |
| Indirect | | $1,395 | $1,468 | ($69) | | $466 |
| **Total** | | $5,037 | $5,258 | ($352) | | $1,500 |

## Request ($000):

| Request 2016 | Request 2017 | Request 2018 | Request 2019 | Request 2020 |
|---|---|---|---|---|
| $2,001 | $2,018 | $2,058 | $2,056 | $2,062 |

**Request by Elements of Expense**

| EOE | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Labor | 499 | 500 | 500 | 500 | 500 |
| M&S | 238 | 238 | 238 | 238 | 238 |
| A/P | 484 | 490 | 504 | 547 | 574 |
| Other | 63 | 63 | 64 | 68 | 70 |
| Overheads | 717 | 727 | 752 | 703 | 680 |
| **Total** | $2,001 | $2,018 | $2,058 | $2,056 | $2,062 |

| | |
|---|---|
| **X** | Capital |
| | O&M |

**2016 – Gas Operations**

| | |
|---|---|
| **Project/Program Title** | Westchester / Bronx Border to White Plains |
| **Project Manager** | John Powers |
| **Hyperion Project Number** | PR.7GD9817 |
| **Organization's Project Number** | |
| **Status of Project** | Ongoing Program |
| **Estimated Start Date** | Ongoing Program |
| **Estimated Completion Date** | Ongoing Program |
| **Work Plan Category** | Strategic- System and Component Upgrades |

**Work Description:**

This work consists of the multi-year project to install approximately 54,000 feet of new 36 inch steel transmission pressure main looping the existing 24 inch steel transmission pressure main from the Westchester/Bronx Line to the Tennessee White Plains gate station outlet. Details include:

- Units per Year: approximately 5,500 feet per year
- Mandatory: This is a crucial main identified by the Transmission Master Plan to satisfy G-8051, the Gas System Design Criteria specification.
- High-level schedule: 5,500 feet per year for ten (10) years.

**Justification Summary:**

This project accomplishes a number of system objectives in the Transmission Master Plan:

- It delivers Canadian gas from the Hunts Point station further into Westchester diversifying the supply.
- It helps reduce dependency on the critical White Plains gate station and the associated Gulf Coast gas supply.
- It helps offset the loss of 134th St.
- It allows the future downgrade of the MAOP of the existing line to operate at less than 20% SMYS. This future downgrade would be on the older brittle pipe that may rupture before it leaks.

The 245-psig system consists of two mains - a 24 inch main operating at 26% of SMYS (1940's vintage) that connects the Hunts Point Yard to the Tennessee White Plains gate station, and a 20 inch main operating at 18% of SMYS (1970's vintage) that loops the 24 inch main from the

Hunts Point yard to the Westchester/Bronx line. There are approximately 125,000 customers supplied by the Hunts Point – White Plains 245 PSIG system. Supplying the system from the south is the Hunts Point regulator station (GR-199), that reduces pressure from the 350-psig system and is supplied from Transco and the Iroquois gate station. Supplying the system from the north is the Tennessee White Plains gate station. Installing the proposed main will create a continuous parallel system from Hunts Point in the Bronx to the White Plains gate station in Westchester.

The 24-inch transmission main is the oldest on our system and is constructed of lower strength steel joined with mechanical couplings, about 2,000 of which are not reinforced. There are 66 drip pots on the 24-inch main and these provide unnecessary potential points of failure. This reinforcement will allow us to systematically downgrade the existing 24-inch main. This 24-inch main also feeds 22 distribution system regulator stations that can be supplied at pressures substantially lower than the current 245-psig MAOP. Looping this section will allow us to downgrade the existing 24-inch main and operate at stress levels less than 20% of SMYS. The Design Criteria calls for all transmission pipes installed prior to 1970 to operate at less than 20% SMYS by 2024. This project will contribute towards this objective. Additionally, operating the system at less than 20% SMYS removes these lines from the Federal DOT definition of transmission lines and related transmission pipeline integrity rules.

**Supplemental Information:**

- Alternatives: Several route alternatives were analyzed – Route 22, Route 100, Bronx River Pkwy, and a fourth hybrid alternative in local streets. These routes were either non cost effective or non-constructible.

- Risk of No Action: At some point in the future, the 24" main may develop leaks as it has in the past. By not installing this main, we expose ourselves to future leaks or a potential rupture on this main, as it is operating at one of the highest SMYS levels in our system.

- Non-financial Benefits: This project will reduce the consequences of various risks and increases the flexibility in which the system as a whole can be operated. In addition, the 24-inch transmission main is the oldest on our system and is constructed of lower strength steel joined with mechanical couplings, about 2,000 of which are not reinforced. There are 66 drip pots on the 24-inch main and these provide unnecessary potential points of failure. This reinforcement will allow us to systematically downgrade this older brittle main.

- Summary of Financial Benefits (if applicable) and Costs: The total capital to complete this project is approximately $250 million. This reinforcement will greatly enhance system capacity and provide supply reliability (contingency mitigation) for firm and interruptible customers in the Bronx and Westchester that are currently served by a system operating under a zero contingency mode at temperatures below 30 degrees F. The project increases system reliability on the loss of single gate station. This project eliminates any customers lost due to the loss of the White Plains Gate station (75,000) or the loss of the Hunts Point regulator (315,000). If a condition occurred where one of these sources was lost on a design day, the gas customers previously mentioned can be adversely affected. Restoring gas

service to these customers would be a time consuming, labor-intensive effort, greatly reducing our ability to respond to other calls, incidents and events. Furthermore, this restoration effort will most likely consume resources from other neighboring utilities, hampering their normal operations. Numerous customers would be without life sustaining; essential amenities such as heat and hot water for an extended period of time, and commercial businesses would suffer economically and may even be forced out of business. Resulting claims to the Company from such an event could be enormous, in addition to sustaining tremendous damage to its reputation. Installing this main mitigates these potential liabilities.

- Technical Evaluation/Analysis: Stoner gas transmission network (gas model) analysis determined the size pipe required to realize the full supply potential.

  Major assumptions relating to this project are:
  - Contractor price for the installation of the facility as well as the cost of material
  - Length of the project may vary (total footage) due to sub-surface interference and the generation of a viable route for the transmission pressure main through the streets or through private property.
  - Any community resistance is overcome to the point that it doesn't impact the project.

- Project Relationships (if applicable): The project is part of the Gas Transmission Master Plan. The Hunts Point Gate Upgrade would enhance the takeaway ability of this main.

- Basis for Estimate: Historical

**Total Funding Level ($000):**

Historical Spend

| Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|
| | $26 | $3,702 | $25,000 | | |

Historical Elements of Expense

| EOE | Actual 2011 | Actual 2012 | Actual 2013 | Actual 2014 | Historic Year (O&M only) | Forecast 2015 |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Labor | | $12 | $150 | $592 | | |
| M&S | | | $379 | 5,786 | | |
| A/P | | | $2,108 | | | |
| Other | | $14 | $1,066 | $6,366 | | |
| Total | | $26 | $3,702 | $25,184 | | |

Request ($000):

| Request 2016 | Request 2017 | Request 2018 | Request 2019 | Request 2020 |
|---|---|---|---|---|
| $23,000 | $40,413 | $41,292 | $41,222 | $41,337 |

Request by Elements of Expense:

| EOE | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| Labor | $919 | $1,600 | $1,600 | $1,600 | $1,600 |
| M&S | $3,493 | $6,076 | $6,076 | $6,076 | $6,076 |
| A/P | $11,659 | $20,000 | $19,979 | $20,297 | $20,573 |
| Other | $1,321 | $2,274 | $2,272 | $2,300 | $2,324 |
| Overheads | $5,608 | $10,463 | $11,365 | $10,949 | $10,764 |
| Total | $23,000 | $40,413 | $41,292 | $41,222 | $41,337 |