

NEW YORK CITY UNDERGROUND INFRASTRUCTURE WORKING GROUP

Prepared by:

Department of Transportation

Department of Environmental Protection

Department of Design and Construction

Department of Buildings

Fire Department

Economic Development Corporation

Mayor's Office of Long-Term Planning and Sustainability



June, 2014

INTRODUCTION & SUMMARY

Below New York City streets is a vital web of infrastructure — pipes, tunnels, tubes and wires carrying water, sewage, gas, electricity, steam, and digital information. Some of these systems are owned and operated by the City of New York; others are operated by private utility companies, pursuant to franchise agreements with the City, and subject to local, state, and federal regulation. Together, they make possible countless daily tasks fundamental to modern life: taking a hot shower, checking e-mail, adjusting a thermostat, running credit cards, keeping industrial freezers cool, and linking large computer networks to global financial systems.

The complexity of these crucial systems, their proximity to each other, and the number of public and private actors involved in their maintenance, repair, and upgrade, means that close collaboration is essential. It could also be improved. City agencies and private utilities need to work together to respond to defective or potentially hazardous conditions, upgrade aging systems, and build the new infrastructure needed to keep New York a world-class city.

In response to the de Blasio administration's commitment to strengthening infrastructure in the City of New York and to improving operational coordination between City and utility actors, the City convened a working group of City agencies responsible for underground infrastructure and emergency response. This group helped develop a series of recommendations that can inform plans for ongoing coordination and operational improvements.

These recommendations include:

1 IMPROVING EMERGENCY RESPONSE to defective under-street conditions by incorporating private utility notification into street defect response procedures, instructing FDNY to respond to gas calls, and sending a clear and coordinated message that people who smell gas should call 911.

2 IMPROVING THE WAY STREET WORK IS CONDUCTED by piloting coordinated investment in critical infrastructure by the City and private utilities this summer, with the eventual goal of institutionalizing a process that expedites the upgrade of aging critical infrastructure; improve coordination among all under-street actors; expanding the use of joint bidding; and re-evaluating street opening stipulations and regulations.

3 IMPROVING THE PACE OF INVESTMENT in critical public and private underground infrastructure.

TIME FRAMES



TODAY

THIS
SUMMER



LONG-TERM

BACKGROUND

The de Blasio administration is committed to improving New York City’s infrastructure, and making the critical investments needed to improve quality of life, protect health and safety, and maintain New York City’s competitive edge.

Based on these commitments, the City convened a working group of City agencies responsible for the infrastructure systems under the streets of New York. This group is working to improve response times to potentially hazardous conditions under the streets, enhance coordination between City agencies and private utilities, and identify ways to increase or better target investment in aging infrastructure systems.

Across the city, aging gas lines co-exist beneath the streets with City-managed water and sewer pipes, private-utility-managed electricity cables, steam lines, franchise-operated telecommunications lines, and the roots of trees managed by the City’s Department of Parks and Recreation.

Underground work beneath the streets requires authorization from the NYC Department of Transportation. The number of these permits give a sense of the scope of work conducted beneath the streets each year. Private utilities involved in underground infrastructure account for approximately half of the street opening permits DOT issues.

Approximately 40% of all DOT street opening permits are issued to Con Edison or National Grid for work related to their utility networks. In FY2013, Con Edison’s more than 47,000 permits, 27% were related to gas infrastructure, 27% were related to

NYC DOT STREET OPENING PERMITS (FY 2013)		
Private Utility	#	%
Con Edison	47,374	31%
National Grid	13,967	9%
Verizon	5,321	3%
Empire City Subway (Verizon Subsidiary)	2,658	2%
Time Warner	986	1%
Cablevision	854	1%
LIPA	64	0%
Other Permits (including NYC DEP)	81,111	53%
TOTAL	152,335	100%

electricity infrastructure, and 1% were related to steam, with the remainder devoted to ancillary work, including restoration of street beds, the installation of poles, and the construction or alteration of manholes. National Grid’s work was entirely related to their natural gas infrastructure in Staten Island, Brooklyn, and Southern Queens.

Another 7% of under-street work was conducted by private cable and telecommunications utilities, including Verizon (3%), Empire City Subway, a subsidiary of Verizon that constructs conduit and manhole infrastructure in Manhattan and the Bronx and leases to other telecom companies (2%), Time Warner (1%) and Cablevision (1%).

The remaining 53% of street permits are issued to a range of contractors for major private and public construction projects. These include contractors performing work on behalf of the NYC Department of Environmental Protection for the maintenance and upgrade of the city’s 15,000 miles of water and sewer infrastructure. Other permits include private water and sewer hookups, sidewalk reconstruction in connection with real estate development, and landscaping activities.

WATER AND SEWER

The City's Department of Environmental Protection (DEP) operates a network of water mains, pipes and sewers that transport New Yorkers' clean drinking water and wastewater. Drinking water is distributed throughout the city under the streets through more than 7,000 miles of mains and pipes. Much of this water infrastructure is aging and leak-prone: 4,400 miles of water pipe, approximately two thirds of the system, is made of cast iron and laid before 1970, susceptible to corrosion and leaks compared to contemporary materials.

Deeper underground, DEP maintains 7,500 miles of sewers that connect the city's drains and storm water catch basins to wastewater treatment plants. Every day the City treats 1.3 billion gallons of wastewater and returns the treated water to the city's waterways.

These sewers include 1,820 miles of storm sewer (that transport storm water back into receiving waters), 3,330 miles of combined sewer (that transport wastewater and rain water to wastewater treatment stations) and 2,200 miles of sanitary sewer (that transports wastewater only). Approximately 5,000 miles of sewer was built before 1970. While many of these older brick and clay sewers have stood the test of time and require no immediate repair, some segments are prone to cracking and blockage.

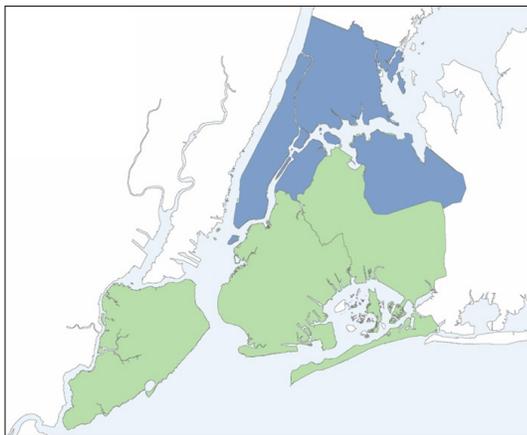
ELECTRICITY

Con Edison operates an underground electricity distribution system for Manhattan and the denser areas of the Bronx, Queens, and Brooklyn. This underground distribution system accounts for 86% of the load and 82% of the 3 million customers in Con Edison's citywide electric system (including all 8.3 million New Yorkers and approximately 250,000 businesses). The remainder of the City is serviced by an above-ground overhead radial and loop system. In the Rockaways, the above-ground electricity system is operated by Long Island Power Authority (LIPA). Con Edison's underground electrical lines connect 24 generating facilities and 16 import lines (that originate outside New York) to 24 transmission substations and more than 50 area substations.

NATURAL GAS

New York City's private gas utilities, Con Edison and National Grid, manage more than 6,300 miles of gas mains and service lines connecting more than 2 million customers. Natural gas fuels approximately 65% of heating and cooking capability in buildings across the city, as well as 98% of electricity production by in-city power plants.

Con Edison manages 2,234 miles of gas mains servicing more than 830,000 customers in the Bronx, Manhattan, and Northern Queens while National Grid manages 4,128 miles of gas mains that service 1.2 million customers in Staten Island, Brooklyn, and Southern Queens. Each utility also manages the "service lines" connecting the mains to individual buildings.



■ Con Edison (833,000 customers)
■ National Grid (1.2 million customers)

Source: Office of Long Term Planning and Sustainability

This gas infrastructure is aging and increasingly fragile. Approximately 60% percent of Con Edison's mains and 48% of National Grid's mains (as well as 22% of Con Edison and 5% of National Grid service lines) are made of unprotected steel or cast iron. These older materials are more leak-prone and susceptible to corrosion than newer forms of pipes.

STEAM

Con Edison also operates a network of 105 miles of under-street steam pipes. These pipes connect steam generation facilities to more than 1,700 buildings in Manhattan, including ten hospitals and many other large institutions, providing them with energy for heat and hot water.

TELECOMMUNICATIONS

Telecommunications companies rely on a network of more than 50,000 miles of cabling beneath the streets of New York. This cabling provides New York residents, businesses, and civic institutions telephone, Internet, and cable television.

Under the streets, most cabling is run through conduits, underground pipes shared by multiple individual telecom operators. Cabling is typically one of three types: (1) Lead-encased copper cable, older telephone cabling susceptible to leaks and water damage, (2) Coaxial cable, used for cable TV and Internet services (and more resistant to water than copper cable) and (3) Fiber cables, fully water resistant and able to carry high volumes of all types of telecommunications services.

THE UNDERGROUND INFRASTRUCTURE WORKING GROUP

The City has convened a working group of agencies involved in under-street infrastructure, including the Department of Transportation (DOT), the Department of Environmental Protection (DEP), the Department of Design and Construction (DDC), the Department of Buildings, (DOB), the Fire Department (FDNY), the Economic Development Corporation (EDC) and the Mayor's Office of Long-Term Planning and Sustainability (OLTPS) (the "Working Group"). Follow-up meetings were held with private gas utilities, Con Edison and National Grid.

This group worked to develop short-term, medium term, and long-term steps to improve:

- » *Emergency response to defective under-street conditions;*
- » *Under-street infrastructure prioritization and street opening procedures; and,*
- » *The pace and schedule for upgrading and replacing the most vulnerable portions of New York City's aging utility infrastructure.*

IMPROVE EMERGENCY RESPONSE

The first focus of the Working Group was to better integrate municipal and private utility reactions to potentially hazardous situations under the streets and to improve response times.

SEND A CLEAR PUBLIC MESSAGE: *People Who Smell Gas Should Call 911*

The City will begin a coordinated message encouraging people to call 911 if they smell gas. Based on the current level of gas calls to utilities, 311, and 911, FDNY has indicated it will be able to handle the full universe of gas-smell calls, even if such calls increase considerably due to high-profile public messaging.



This change has already been made.

FASTER RESPONSE TIMES: *FDNY to Respond to Gas Leaks*

FDNY will respond to all calls to 911 reporting a smell of gas. Calls to 311 regarding gas smells will be immediately routed to 911. The average FDNY response time for non-fire emergencies (which includes suspected gas leaks), from 911 call to arrival on the scene, is less than eight minutes. The average Con Edison response time to reports of gas smells is between 20 and 25 minutes.

FDNY officers will respond following their standard operating procedures, which includes notifying Con Edison/National Grid, disconnecting leaky appliances, venting, and evacuating buildings.



FDNY has implemented this change in coordination with Con Edison and National Grid.

COORDINATED RESPONSE:

Incorporate Private Utility Notification into Street Defect Response Procedures

NYC DOT is charged with responding to defective conditions on the streets. Currently, DOT notifies Con Edison or National Grid only if there is a smell of gas or other indication of a gas leak. However, DOT does not know whether the defective street lies above particularly risk-prone infrastructure. To give Con Edison and National Grid a full opportunity to respond to potentially hazardous conditions, NYC DOT will incorporate a notification of Con Edison or National Grid into standard procedures upon issuing Corrective Action Requests to DEP for defective street conditions like depressions, cave-ins, or failed street cuts.

From now on, when DOT issues any Corrective Action Requests (CARs) to DEP for cave-ins, depressions, or failed street cuts, the agency will also send a



March 14, 2014: Construction project in Times Square Manhattan. (Credit: iStock)

IMPROVING THE WAY STREET WORK IS CONDUCTED

The Working Group also recommends improved coordination among public and private parties performing work under the streets, the establishment of clearer priorities for dealing with aging and critical infrastructure, and the exploration of new tools to improve prioritization across the public and private sectors. As a first step in this effort, the City will initiate a new pilot program in ten locations across the City to coordinate, for the first time, DEP water and sewer investment and private utility investment in leak-prone cast iron and bare metal gas lines.

IMPROVE STREET OPENING COORDINATION:

Protecting or Replacing Higher-risk Utility Lines

In 2011, the City created processes to coordinate under-street work and codified them in an MOU between DOT and utility companies. These processes included DOT public data sharing on capital project calendars in order to facilitate coordination. This effort was designed to improve coordination of street work to reduce the number of street openings necessary to repair and upgrade critical infrastructure. This work was publicly released in the form of the 2011 Street Works Manual.

The City will expand this effort to increase data sharing opportunities, assess the successes and limitations of the current program, and further improve coordination of street openings. Entities with maintenance responsibilities under the streets should strive to engage in integrated risk analysis to determine how a failure of one under-

street system could impact another (*i.e. should water main repair adjacent to aging gas infrastructure be prioritized to prevent one from affecting the other*).

As a first step in this coordination effort, DEP is preparing an integrated investment pilot program in 10 locations citywide, five with Con Edison, and five with National Grid. At these pilot sites, for the first time, the City will collaborate with the utilities in replacing water and gas infrastructure with the highest repair frequency and a similar set of leak-prone gas mains, particularly cast iron and bare metal gas mains. These pilot projects will target locations in all five boroughs and will begin before the end of the summer.

If these pilots prove successful, they could provide a model for large-scale, coordinated infrastructure investment with DEP, DDC, DOT, and private utilities and allow for an acceleration of upgrade targets for critical infrastructure across the City.

Large-scale, systematic data sharing has been limited by concerns about data privacy and security. One potential way forward is to explore the identification of a neutral third-party holder of the information, such as an academic institution. This third party would conduct aggregate mapping of City and private utility underground infrastructure projects, including utility line project data from Con Edison and National Grid. Such data sharing would allow better short-term and long-term coordination. The utilities, DDC, DEP, and DOT are meeting to explore proposals that would allow shared access to project plans by City and utility staff.



Pilot program will begin this summer. Policy development and regular policy coordination meetings have begun.

REDUCE THE COST: *Improve Street-Opening Procedures to Reduce the Cost of Infrastructure Improvements*

The replacement cost of gas lines in New York City is the highest in the country, costing between \$2.2 million and \$8 million per mile of main. Some of these costs are due to street opening permitting requirements, which are intended to mitigate impacts on emergency vehicle response times, the flow of goods and services during construction, and quality of life for the public.

These requirements include stipulations placed on the permit by DOT, including time of day restrictions and lane and traffic closure requirements, as well as other City requirements, including those associated with tree root protection and preservation. These street-opening costs affect the maintenance, upgrade, and expansion costs of the wide array of under-street infrastructure. In addition to increased costs, private utilities claim that these restrictions limit the pace of infrastructure upgrades. The Working Group recommends continuing to work to reduce these costs by reviewing the permit stipulations that affect the pace and costs of maintenance and replacement, and making recommendations.

In addition, the Working Group recommends continuing to pursue “joint bidding” legislation in Albany. This legislation would allow City construction proposals to include related under-street utility work as part of single, more efficient bidding process. Bidders would be required to provide, within a single bid, separate prices for the municipal work and the private utility work, with the contract awarded to the lowest responsible bidder for the combined work. The State has already provided limited statutory authorization for joint bidding for certain projects in lower Manhattan. The City should continue to work with state legislators to expand this authority to cover infrastructure projects in other parts of the City. An expansion of this procedure would improve the pace and lower the cost of upgrading aging infrastructure.



Ongoing. The Working Group will work in coordination with private utilities (including Con Edison, National Grid, Verizon, Empire City Subway, Time Warner, and Cablevision) to identify further cost saving measures to spur investment and upgrades. In addition, they will work with the State legislature to expand joint bidding authority for priority infrastructure contracts.

TARGET UTILITY INFRASTRUCTURE MODERNIZATION AND INVESTMENT

The Working Group also recommends additional prioritization of investment in the improvement of aging public and private infrastructure and track our progress.

PRIORITIZE AND TRACK INFRASTRUCTURE INVESTMENT: *Targeted City Investment in Water and Sewer Utility Infrastructure*

Beyond private-utility gas investments, the City has begun exploring whether the current pace of its own capital investments into under-street water mains, sewage pipes, and other basic infrastructure is appropriately prioritized. Under the recently-proposed Water and Sewer Authority rate plan, the Department of Environmental Protection will be able to invest an additional \$100 million per year to accelerate its upgrade cast-iron water mains and brick sewers which exhibit high repair frequencies, setting a pace to replace the highest risk water and sewer infrastructure in 10 years.

The pilot projects and data sharing with private utilities described above would allow DEP to prioritize upgrades along streets where there are leak-prone cast iron or bare metal gas mains, allowing simultaneous upgrade with private utility priority projects, and ensuring that DEP infrastructure adjacent to fragile gas infrastructure is adequately maintained.

The City will work with private utilities to develop a tracking tool to monitor our progress in reducing the extent of vulnerable and aging underground infrastructure as our programs move ahead.



This summer. These additional investments are incorporated into the current Water and Sewer Authority rate plan and the pilot programs will begin this summer.

ENCOURAGE PRIVATE UPGRADES:

Encourage a More Rapid Pace of Gas Line Upgrade and Maintenance by Private Gas Utilities.

The replacement schedule for leak-prone gas mains is negotiated through rate-setting cases before the New York State Public Service Commission (PSC). The PSC is responsible for the regulation of rates and safety conditions of local distribution companies and retail gas service. Federal regulation of pipelines is managed by the US Department of Transportation Office of Pipeline Safety (OPS). In New York State, OPS has certified the PSC to inspect gas pipelines and to enforce pipeline safety regulations.

Using a “rate case” process, the PSC establishes conditions for proposed rate increases by the private utility. Con Edison’s current gas rate plan, adopted February 2014, heeded the City’s call for an accelerated replacement schedule for cast iron and unprotected steel mains. This rate plan has a term of calendar years 2014 through 2016. At the request of the City and the State, Con Edison will remove 195 miles of leak-prone main during 2014-2016, including 60 miles in 2014, 65 miles in 2015, and 70 miles in 2016. These commitments include a minimum of 30 miles of cast iron/wrought iron and 20 miles of bare/unprotected steel mains removed from service each year. Failure to comply with the plan will result in a downward rate adjustment for Con Edison.

National Grid is currently operating under a gas rate plan for 2013 and 2014. If National Grid decides to seek a change in its rates or terms of service in 2015, this rate plan could be up for review by the PSC as soon as January 2015.

The City is also a participant in several “generic” proceedings, coordinated by the PSC, which address statewide issues not associated with a particular private utility. The City will continue to work with Con Edison and National Grid to improve their ability to upgrade infrastructure, and it will advocate during future rate cases before the PSC for appropriate and ambitious upgrade targets. In addition, the City is currently actively participating with Con Edison and Public Service staff in a methane leak reduction study. The study results and recommendations will be submitted to the PSC for further regulatory action in September of this year.



In connection with rate cases before the PSC. The City will advocate for expanded investment in safer natural gas infrastructure during future rate case deliberations before the PSC.

PLAN IMPLEMENTATION

The Working Group will continue to meet internally, and with private stakeholders that perform underground work, to move forward on the recommendations included here and develop new recommendations to improve the quality of infrastructure under the streets of New York. We expect to provide you with an update after each of those meetings. Staff from our office will handle coordination of these updates.



© Photo: Con Edison