



Cast Iron Main Replacement

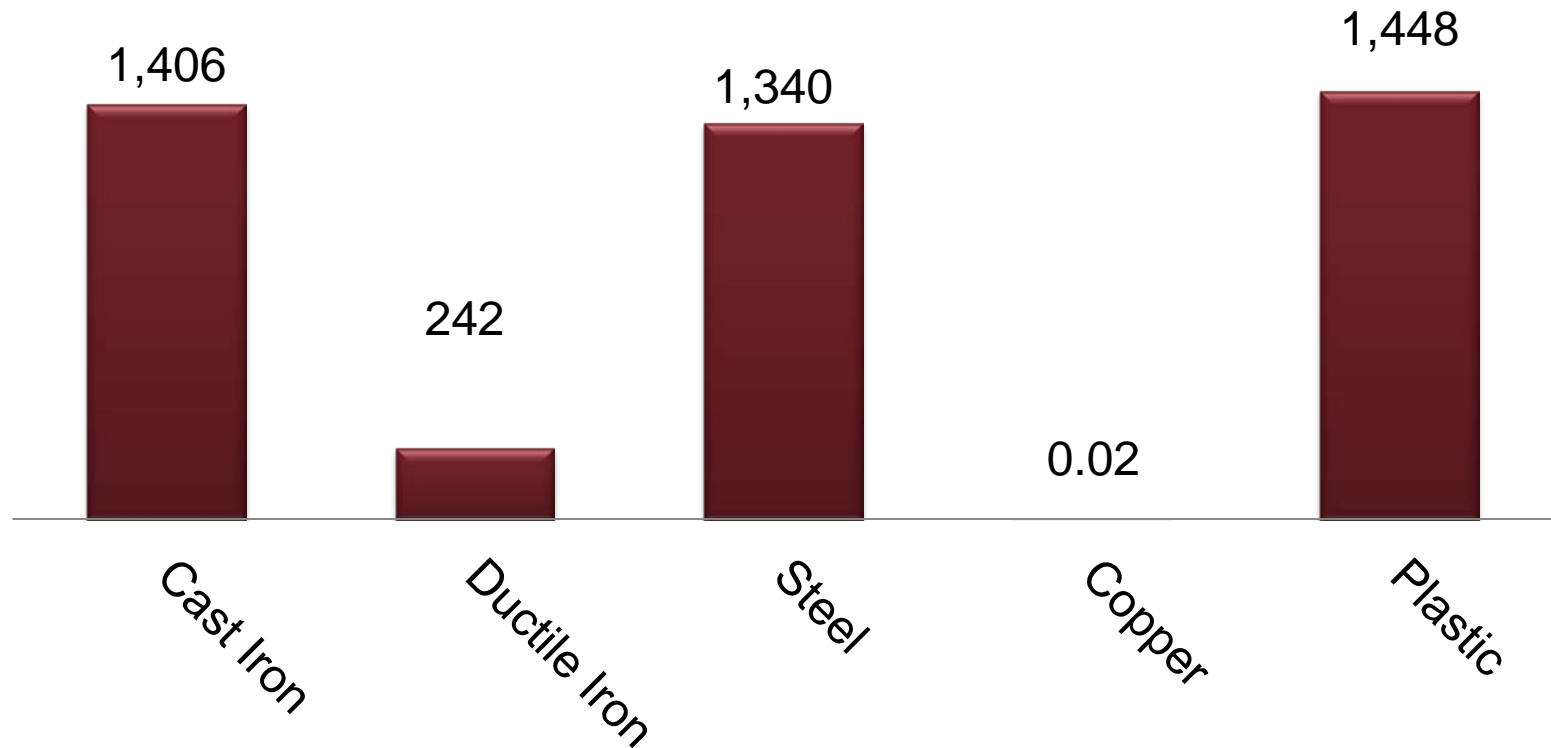
Implementation, Progress & Learnings

August 6 , 2014

The Peoples Gas Light and Coke Company

- 165 years serving Chicago (1849)
- 1,300 employees (approx.)
- 850,000 customers (approx.)
- 4,200 miles of gas main (approx.)
- 525,000 service pipes (approx.)
- 900,000 meters (710,000 inside) (approx.)

Miles of Distribution Mains



Infrastructure Upgrades

- Replace cast iron and ductile iron main & associated services
- Upgrade system from low pressure to medium pressure
- Upgrades to high pressure infrastructure
- Retire medium pressure to low pressure regulator stations
- Relocate meters outside
- Continued focus on safety and reliability

Main Replacement

- Old System (Typical)
 - Large diameter: 6 to 24 inches
 - Low pressure: ¼ pound of pressure
 - Typical in the middle of the street
- Upgraded System (Typical)
 - Small Diameter 2 to 4 inches
 - Medium pressure: 22 pounds of pressure
 - 1 Mile of retirement = 1.5 miles of installed main
 - Double decked

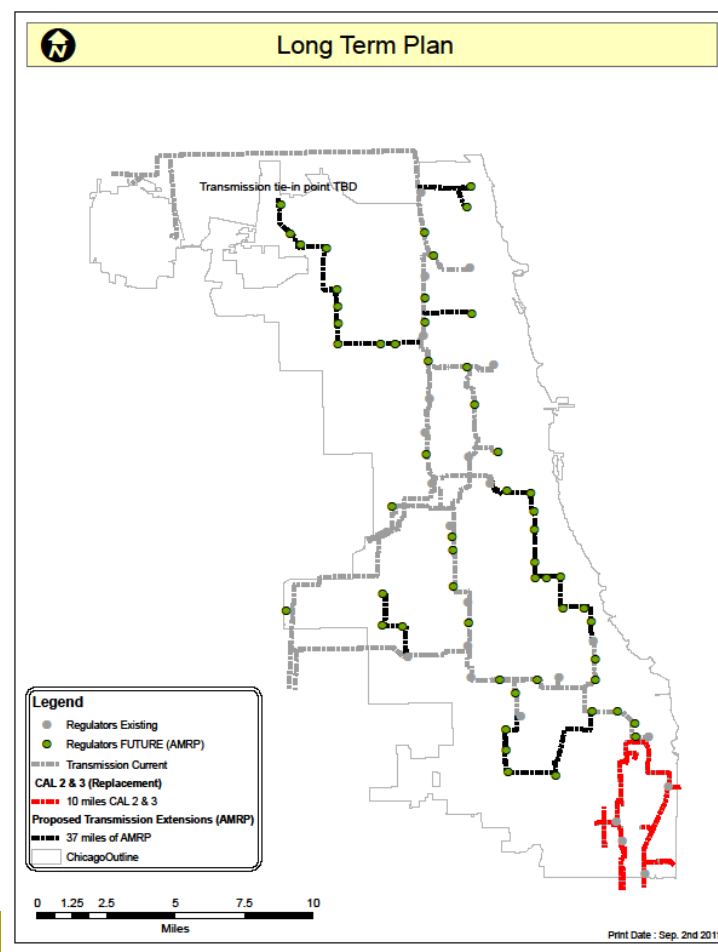
Main Replacement – Implementation



Main Replacement - Planning

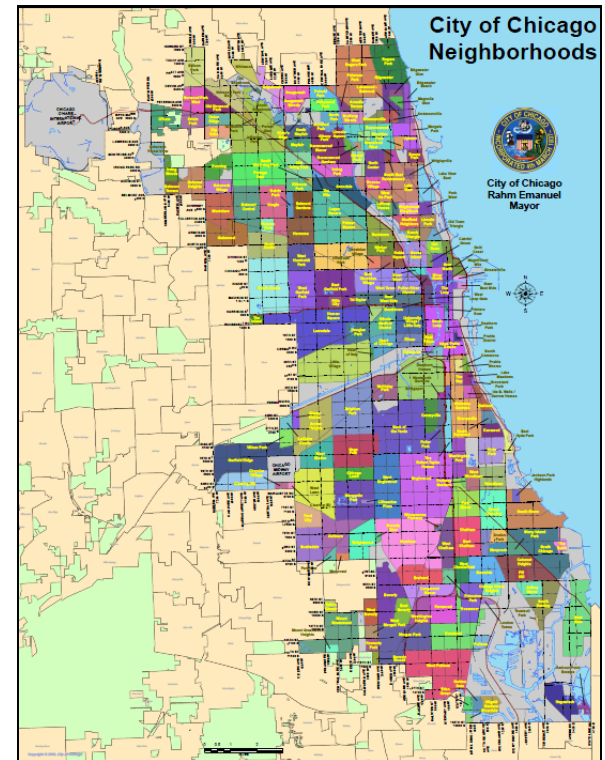
- Major components
 - Build out of the High Pressure (H.P.) System
 - Long range planning
 - Sequencing dependencies
 - Identify and prioritize replacement areas
 - Neighborhood approach
 - Ranking methodology
 - Capture synergies created through Public Improvement projects
 - Limit impact on streets & residents
 - Cost sharing opportunities

Main Replacement – HP Infrastructure



Main Replacement Prioritization

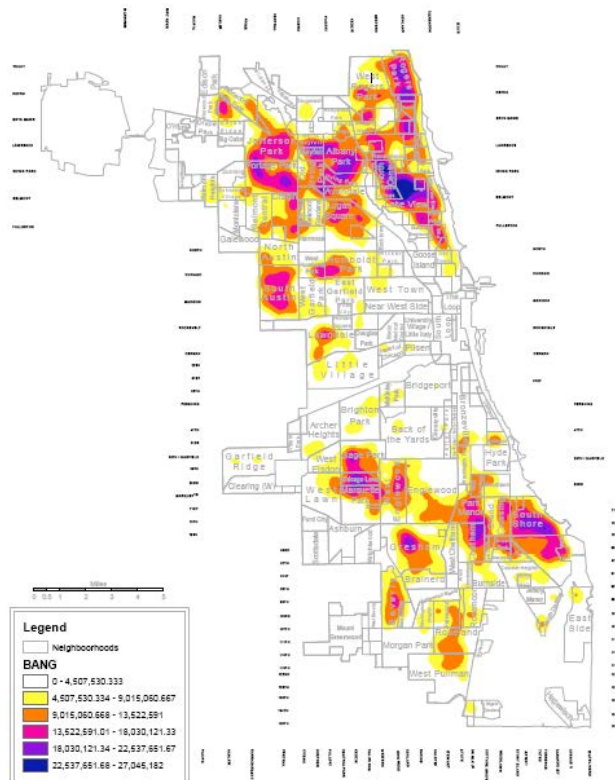
- A zonal approach to executing the AMRP was determined to be the most cost efficient method
- The neighborhood-based approach was selected because it is thought that the geographic size (228 zones) would better facilitate design and construction flexibility as well as provide a familiar communication platform for customers and city agencies



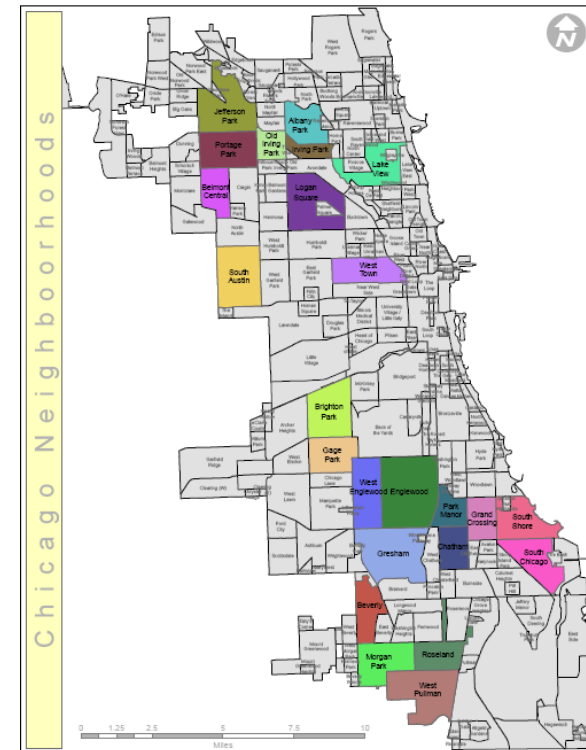
Ranking Methodology

- A neighborhood is assessed based on five operational considerations
 - Amount of medium pressure DI main
 - Amount of 8” or small diameter MPCl main
 - Number of un-repaired leaks
 - Amount of CI main older than 1920
 - Number of inside meters

Main Replacement Prioritization



25 years of leak history



2013 – 2017 Neighborhood ranking

Main Replacement – Public Improvements

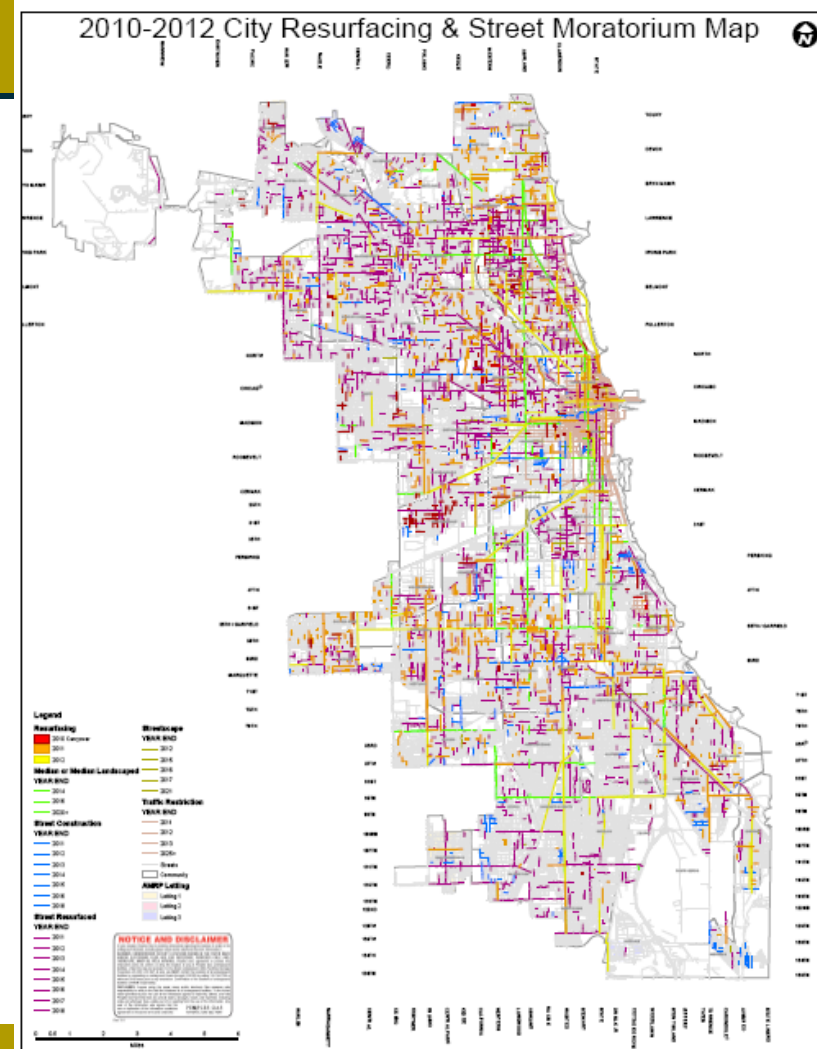
- Coordinating with the City and other utilities
 - Replacement not always based on our priority
 - City infrastructure improvement
 - Water
 - 88 miles/year
 - Sewer
 - 25 miles/year
 - Streets
 - 100 miles/year
 - Com Ed
 - 400 miles of cable
 - 23,000 manholes in the next five years

Main Replacement – Challenges



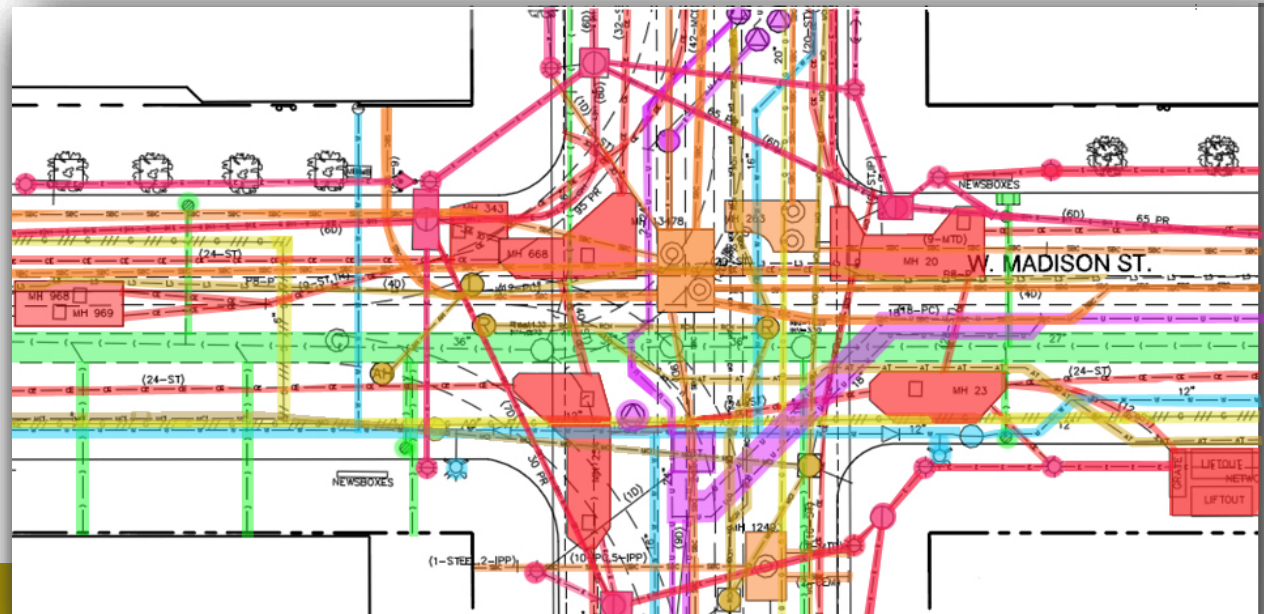
Main Replacement – Challenges

- Street Moratoriums
- Working in some of the most challenging areas of the City
- Revising CDOT standards
- Communication & expectations



Main Replacement – Challenges

- Multiple Telecoms
- CDOT
- AT&T
- Thermal Chicago
- Department of Water Management
- People's Gas
- ComEd



Main Replacement – Challenges

- Damage Prevention
 - Preventing Cross Bores
 - Gas main installation contractors trained on Cross Bore procedures
 - Inspectors trained on Cross Bore procedures
 - Expose all known utilities
 - 100% Camera of all mains and services
 - Video sewer lines
 - Video Service line bore holes

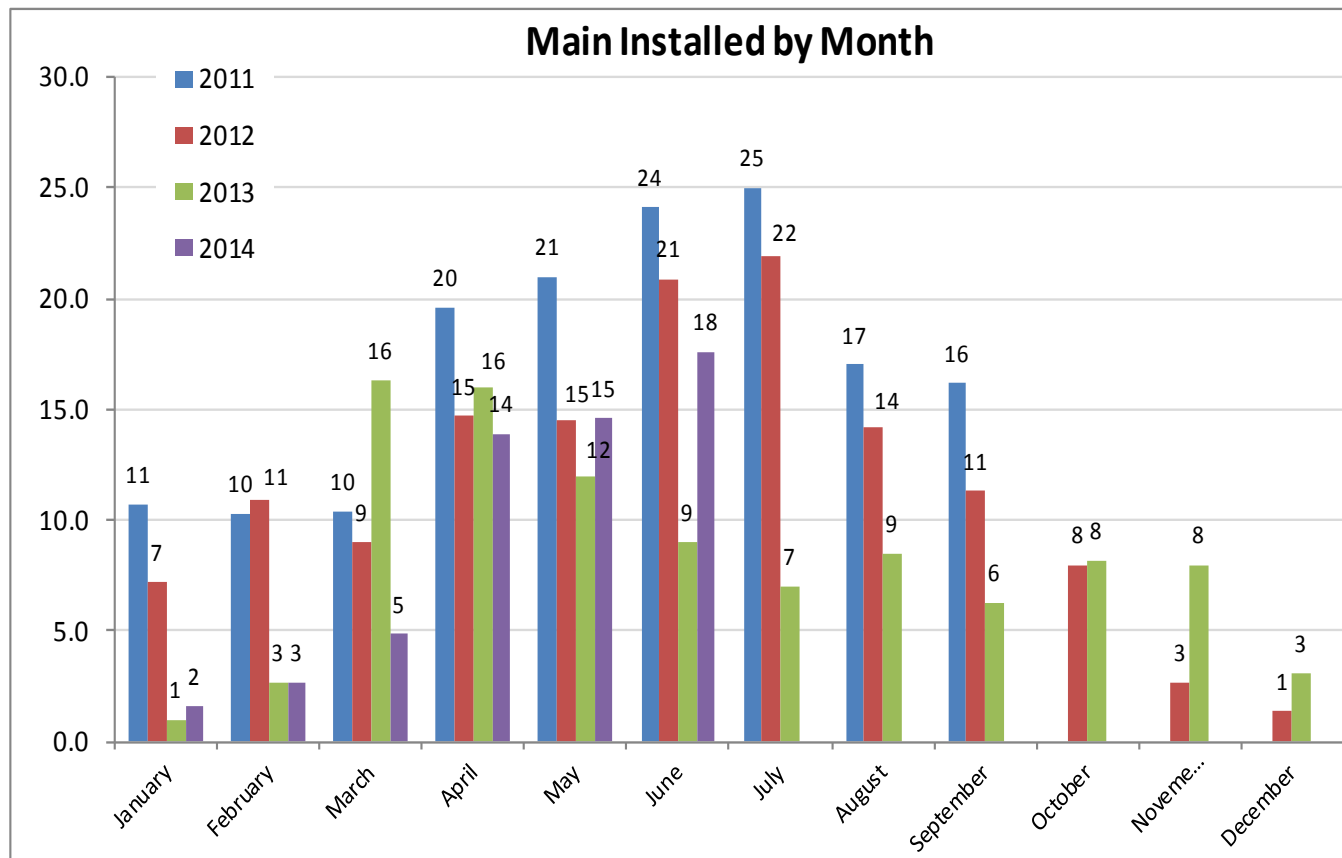
Main Replacement – Challenges

- Installing pipe is just part of the project
 - Construction Schedules
 - Permits/Easements
 - CDOT
 - IDOT
 - Railroads
 - Wards
 - Restoration
 - Roads
 - Intersections
 - Expectations

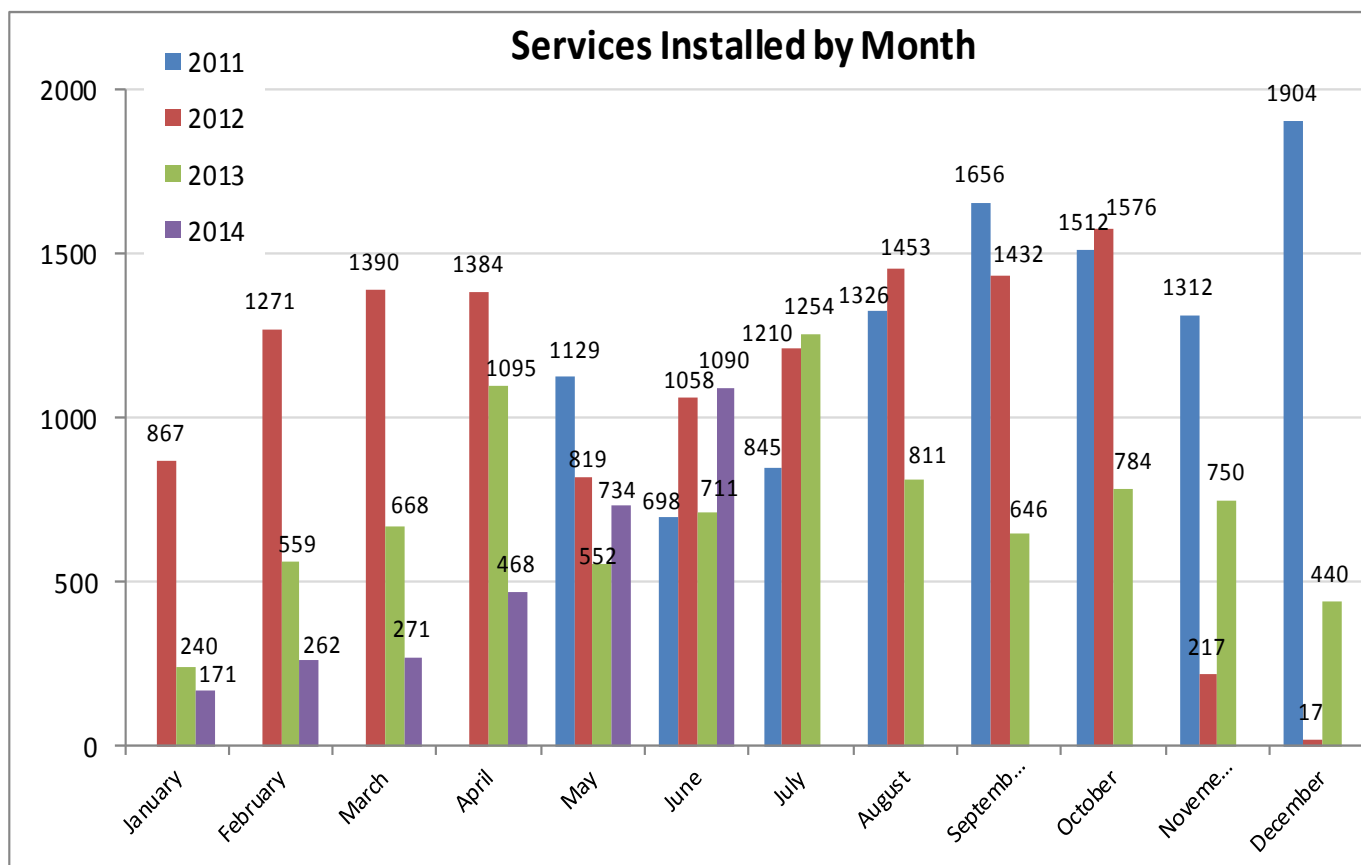
Main Replacement – Progress



Progress to Date



Progress to Date

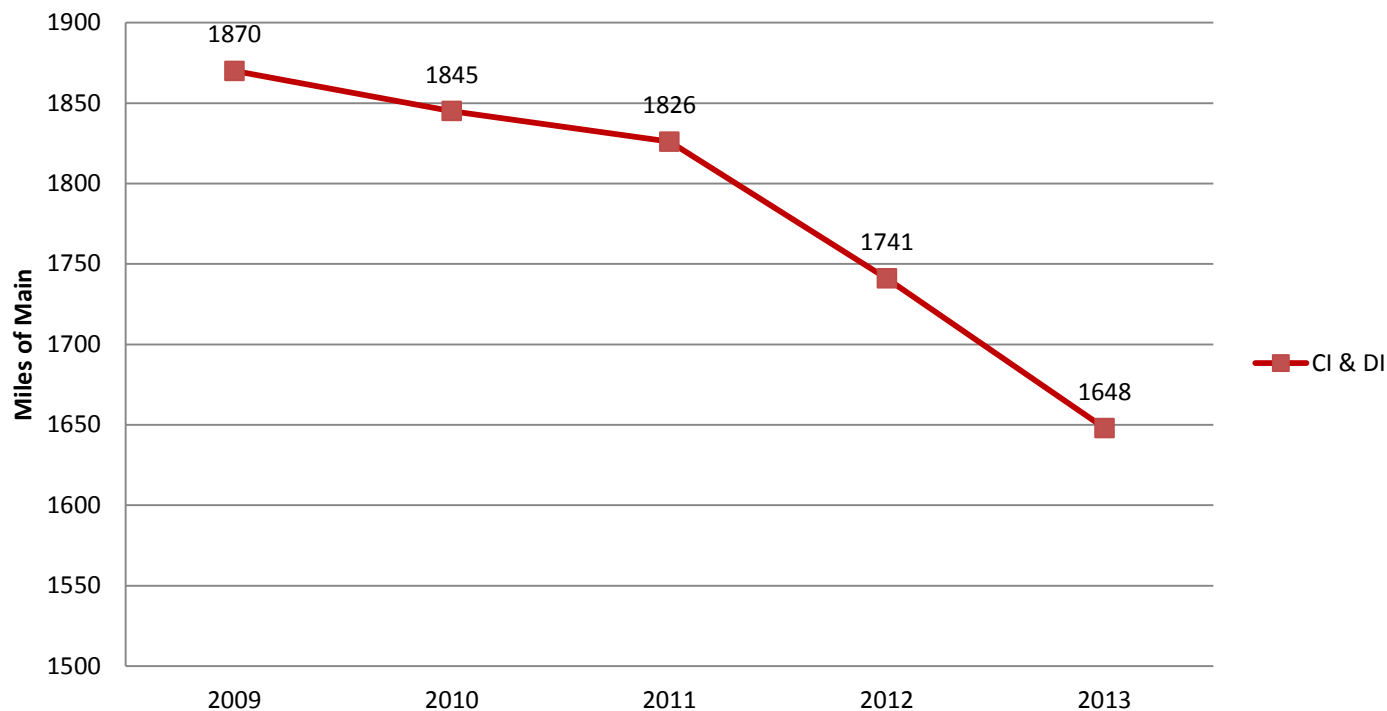


Progress to Date

Work Group	Total Installed - Program to Date July 4, 2014				
	Main Installed (miles)		Main Retired (miles)	Services Installed (each)	Restoration (blocks)
	Transmission	Distribution			
2011 Projects	0.0	190.5	137.7	16,469	1,573
2012 Projects	4.2	176.5	108.4	14,463	421
2013 Projects	2.2	28.9	0.3	1,995	56
2014 Projects	0.0	42.6	0.0	1,834	0
2015 Projects	0.0	3.7	0.0	115	0
TOTAL	6.4	442.2	246.4	34,876	2,050
	448.6				

Progress to Date (2009 thru 2013 PHMSA Report)

PGL Reduction of Cast Iron & Ductile Iron Main 2009 - 2013



Main Replacement – Learnings



Main Replacement – Learnings

Communication

- Proactive - Internal/External

Construction Costs

- Restoration
- Coordination impact

Stressed Systems & Processes

- Process Improvement Initiatives
- Construction Value Stream evaluation

Resource Constraints

- Impact on construction progress

Schedule Impacts

- Impact on external support agencies
- Impact on third party construction
- Impact on neighborhood

Construction

- Pool of Contractors
- Re-evaluate project size

Main Replacement – Technology

Adopted

- Smart forms
- Bore hole camera
- GIS-Main installed but not As-built layer
- GIS-Main retired but not As-built layer

Evaluation

- GPS technology
- Bar code scanning-Material/Fittings
- 3D Imaging
- Live gas main insertion

Future Opportunities

- Improved underground mapping
- Timely as-builts
- Graphical construction status software
- Project planning platforms
- Internal lining of CI/DI mains

QUESTIONS?