

Thames Street & Wellington Avenue Sewer Rehabilitation Project

Initial Informational Meeting

City of Newport
City Hall Council Chambers

December 10, 2009



Agenda

- **Introductions**
- **Why this project? Why now?**
- **Project overview**
 - Locations of the sewers
 - Condition Assessments
 - Potential rehabilitation methods
 - Recommended technologies
 - Project schedule
- **Potential public impacts and mitigation measures**
 - Impacts and Mitigation measures
 - Opportunities for public input
- **Questions and discussion**

Introductions

- **City of Newport – Department of Utilities**
 - Julia Forgue, P.E. – Director of Utilities
 - Jim Lauzon – United Water
- **CH2M HILL Project Team**
 - Peter von Zweck, P.E. – Project Manager
 - Alan Johnson, P.E. – Lead Designer
 - Michael Domenica, P.E. – Principle-in-Charge
 - Becky Weig, P.E. – Public Involvement Coordinator

WHY THIS PROJECT?

WHY NOW?

Primary drivers for the Thames Street and Wellington Avenue rehabilitation projects...

History of Newport's sewers and regulatory actions

Current framework for regulatory requirements

Minimizing the costs for repair and replacements for aging infrastructure

Newport's Critical Sewer Infrastructure

- **The City of Newport owns approximately 97 miles of sanitary sewer pipelines, many of which have been in operation for over 100 years**
 - Originally designed to collect both sanitary and storm water flows
 - The system overflows to receiving waters during wet weather events
 - Overflows violate Clean Water Act



- **Thames Street Interceptor**
 - +/- 100 year-old brick sewer
 - Runs the length of the Thames Street business district
 - Serves the business district and the southern half of the city's population
- **Wellington Avenue Interceptor**
 - Only conduit to Wellington Avenue CSO Facility
 - Poor condition
- **A loss of either of these sewers could cause:**
 - Significant loss of service for the community
 - High-cost emergency repairs
 - Loss of business revenue
 - Environmental degradation

EPA Enforces the Clean Water Act through Consent Decrees

- Thames St. and Wellington Ave. projects will have enforceable deadlines
- The Department of Justice can impose penalties for non-compliance



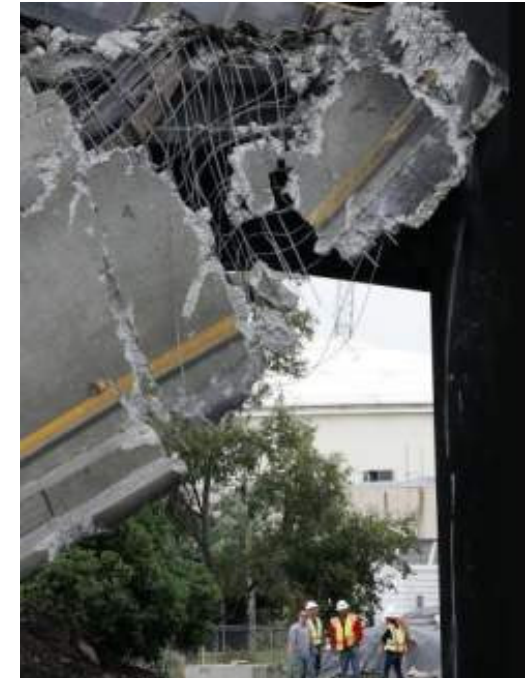
*Ultimate Goal: Protection of Newport Harbor &
Newport's Economy*

ASCE's Report Card for America's Aging Infrastructure



REPORT CARD	
America's Infrastructure	
DATE 2001 2009	
Roads	D+
Bridges	C
Transit	C-
Aviation	D
Schools	D-
Drinking Water	D
Wastewater	D- X
Dams	D
Solid Waste	C+
Hazardous Waste	D+
Navigable Waterways	D+
Energy	D+
America's Infrastructure GPA	D+
Total Investment Needs (estimated five-year need)	\$1.3 Trillion

\$2.2 Trillion



Growing Need to Replace America's Buried Assets

- Sanitary sewers are assets, just like buildings or cars – if they fall into disrepair they may fail to serve their intended purpose
 - The life expectancy of well maintained pipelines can vary between 50 and 100 years
 - A large percentage of our water and sewer pipelines are approaching the end of their useful life
 - The percentage of assets needing replacement will increase rapidly for the next two decades

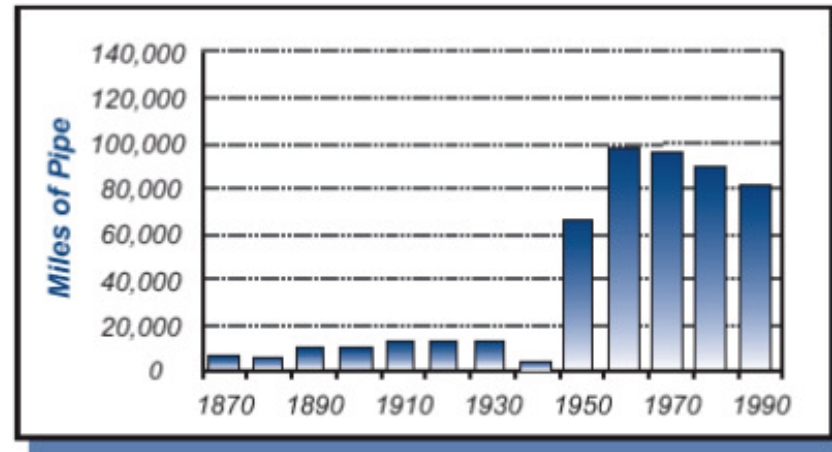


Figure 2-6: Histogram of Miles of Sanitary Sewer Pipe Installed per Decade

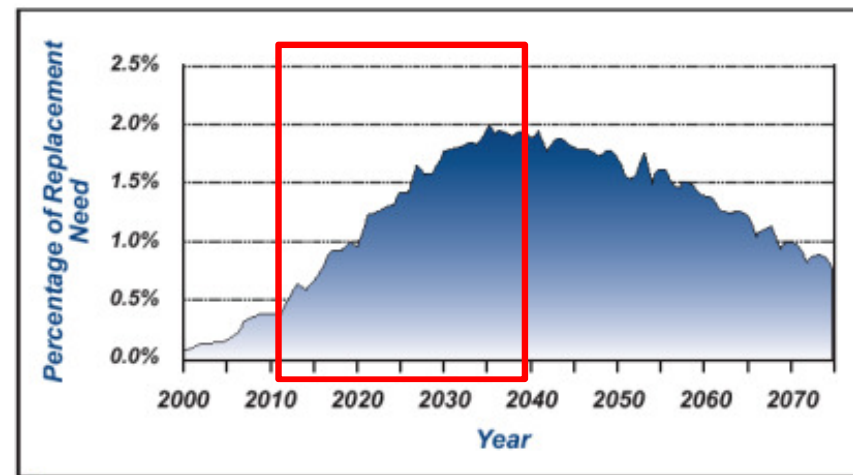


Figure 2-11: Projected Annual Replacement Needs for Transmission Lines and Distribution Mains, 2000-2075

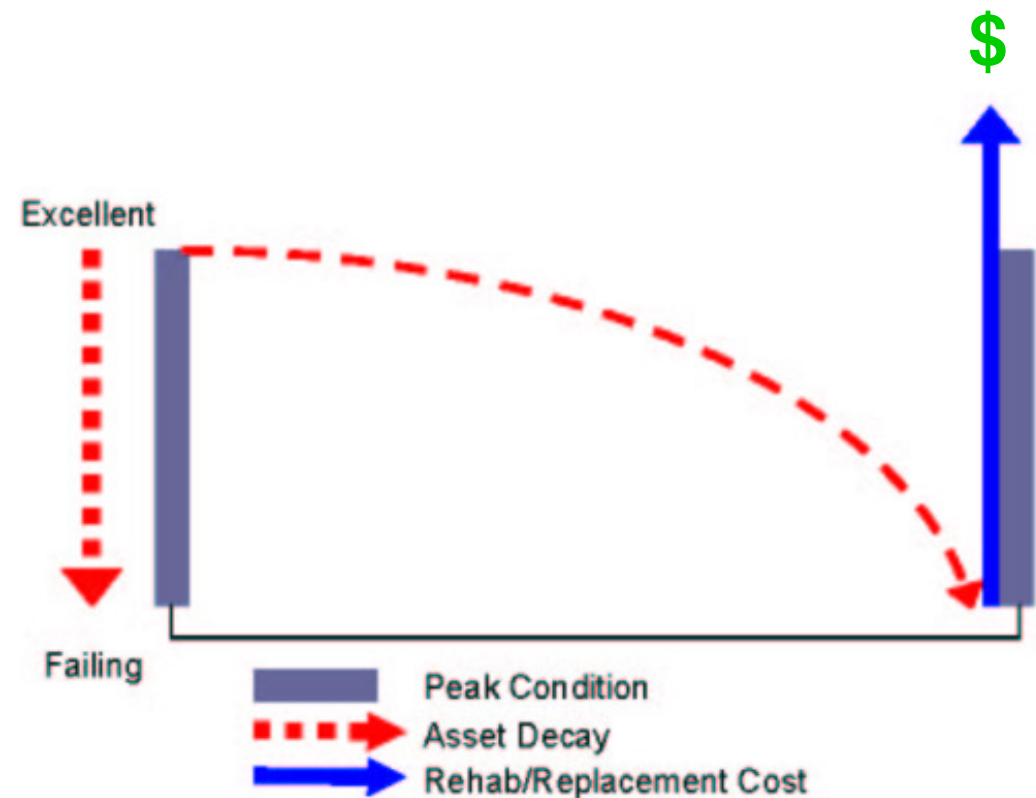
Reactive Management of Sanitary Sewers Leads to Costly Capital Replacements

- Run to failure costs rate payers more in money and headaches:
 - Higher cost capital improvements
 - Adverse public impacts due to breaks and unplanned service disruptions
 - Loss of control over repair schedule
 - Impacts ability to get best possible financing



Run to Failure

Current users are “stuck” with the high capital cost for full replacement of the asset not maintained

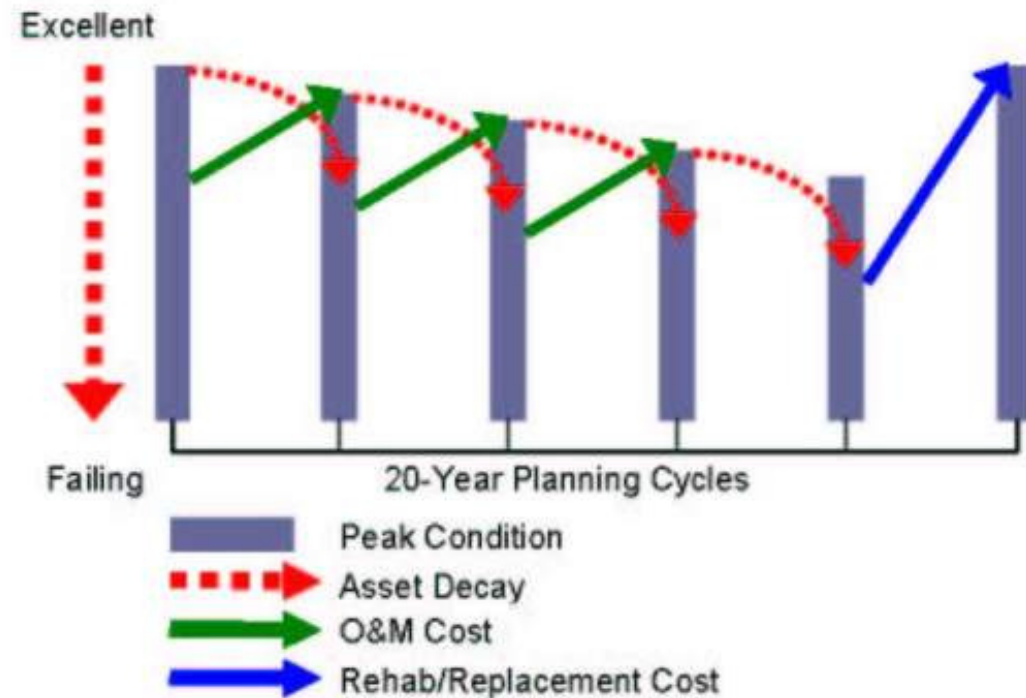


Proactive Management of Sanitary Sewers Provides the Lowest Lifecycle Costs

- **Benefits of proactive management...**
 - Reduced Infiltration & Inflow
 - Lower treatment costs
 - Improved conveyance capacity
 - Reduced overflows and improved water quality
 - Reduced likelihood of catastrophic failure
 - Predictable costs for repairs and replacements

Proactive Management

Renewal and replacement is implemented as its needed with available funding (asset management)

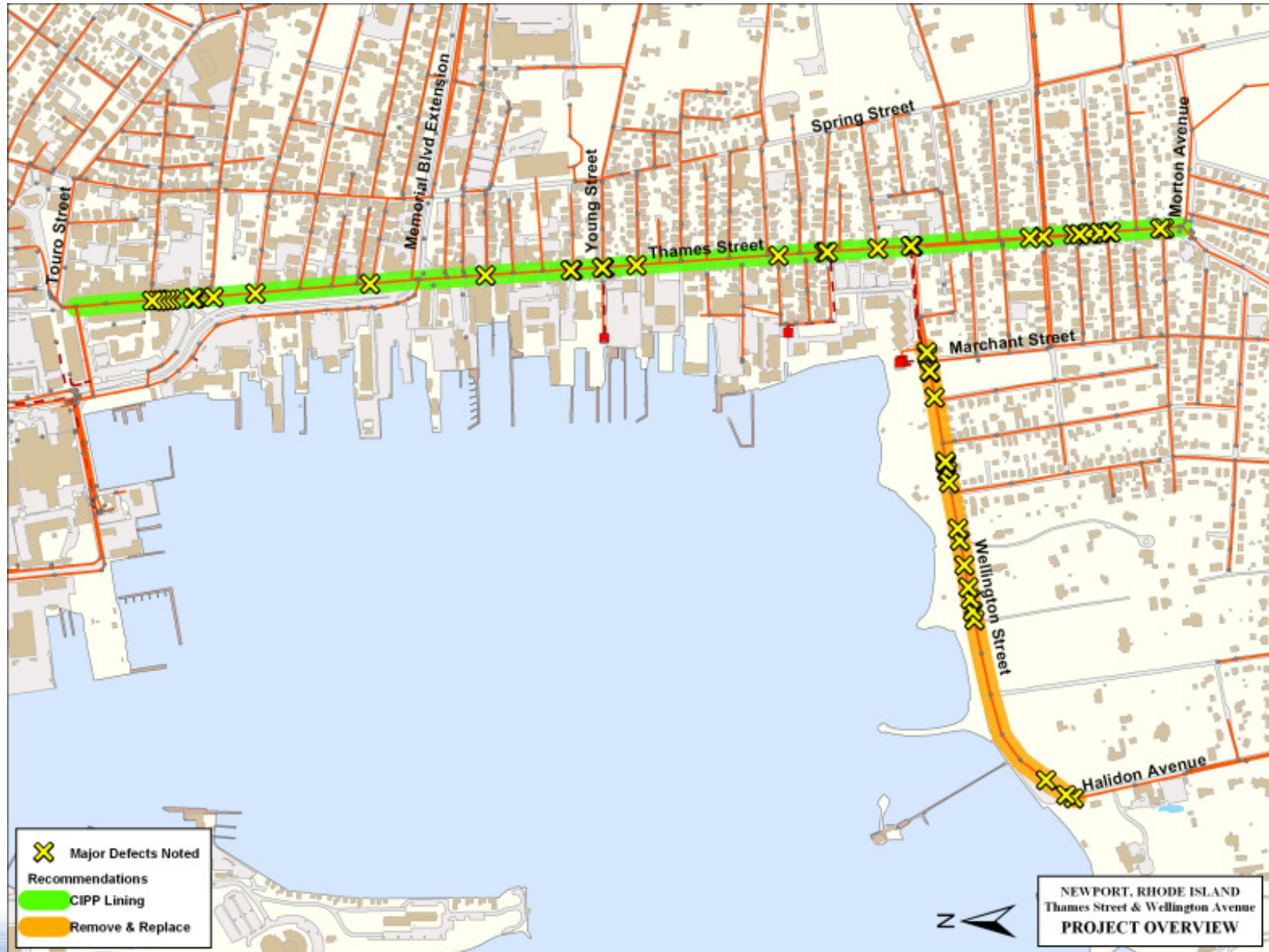


PROJECT OVERVIEW

Components of the Thames Street and Wellington Avenue rehabilitation projects...

- Locations of the sewers
- Condition Assessments
- Potential rehabilitation methods
- Recommended technologies
- Project Schedule

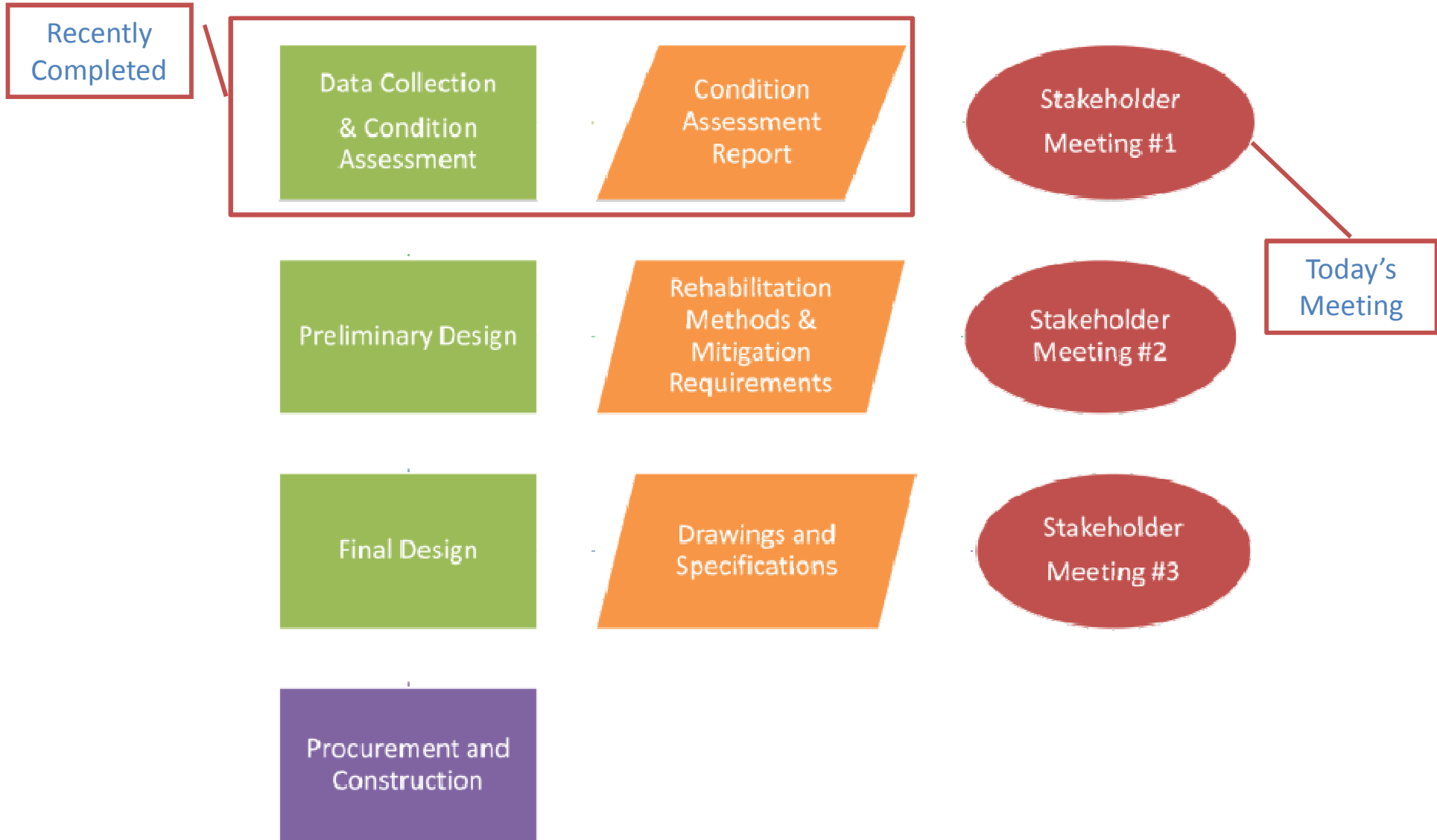
Thames St. & Wellington Ave. Sewer Rehabilitation Project Location



Typical Pipeline Rehabilitation Options

Pipe Replacement	Pipe Rehabilitation	Point Repair	Manhole Repair
Open-Cut Replacement	Cured-in-Place Pipe (CIPP)	Open-Cut Replacement	Open-Cut Replacement
Microtunneling and Pipe Jacking	Sliplining	Structural Sleeves	Sprayed
Horizontal Directional Drilling (HDD)	Grouted lining	Joint Seals	CIPP Bag
Impact Molding	Fold & Form/ Deformed Reformed	CIPP	Grouted Flexible Panels
Guided Boring	Spiral Wound	Joint Grouting	Troweled Liner
Auger Boring	Panel Lining		Insert Liner
Pipe Ramming	Sprayed		
Pipe Bursting	Close Fit		

Overview of the Planning & Design Process



Wellington Ave. Condition

Observed Defects	Failure Risk	Condition
Spalling pipe	Increased surface roughness, loss of capacity, eventual sewer collapse	Structural
Sags, poor vertical alignment	Reduces pipe capacity, traps debris	Structural and Operations & Maintenance
Break-in service taps	Reduces overall structural integrity of pipeline	Structural
Broken pipe, cracks, and holes in pipe	Reduces overall structural integrity of pipeline, risk of pipe failure	Structural
Inflow and Infiltration (I/I)	Allows storm water into sanitary sewer increasing risk of overflows	Operations & Maintenance and Structural
Mineral deposits, grease, accumulated debris	Reduces pipeline capacity	Operations & Maintenance



Sag, poor vertical alignment

Spalling concrete pipe



Spalling concrete pipe



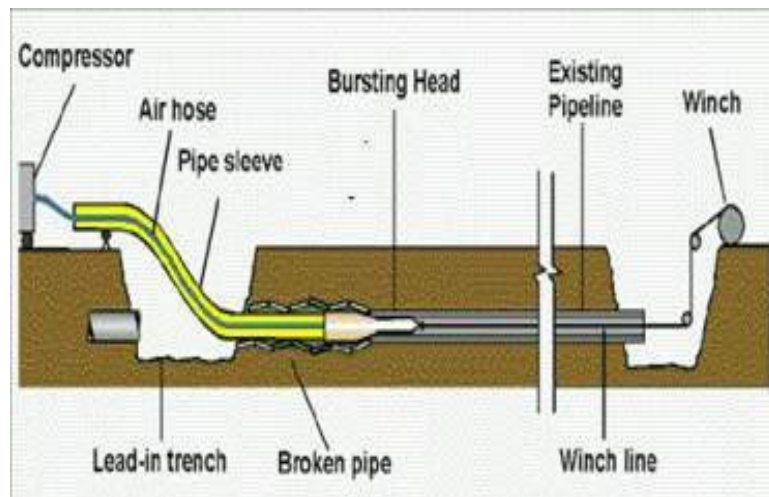
Protruding tap



Wellington Avenue Rehabilitation Options

- Pipe Bursting & Reaming (4" - 42")

Principal Advantages	Principal Disadvantages	Features
<ul style="list-style-type: none"> • Pipeline Upsize available (2X Dia.) • New structural pipeline installation • Cost-effective where lateral connections are minimal • Potential to install from existing manhole structures • Faster than Open-Cut construction • Lower odor control requirements 	<ul style="list-style-type: none"> • Disruptive to adjacent utilities, particularly water lines • Limited availability of experienced contractors in many geographies • Damage to existing service connections • Follows existing pipe, may not correct sags and poor alignment • Difficulty with steel, DIP and CIP • Upheaval of displaced material possible • Entry pits may be required 	<ul style="list-style-type: none"> • Materials: HDPE, Steel, PVC, DIP/Restrained Joint • Specialized pipe bursting equipment is required



Wellington Avenue Rehabilitation Options

- **Open-Cut Replacement (6"-120") – RECOMMENDED REHABILITATION OPTION**

Principal Advantages	Principal Disadvantages	Features
<ul style="list-style-type: none"> • Limited bypassing required (generally) • Many experienced contractors • Pipe size and shape can be changed for increased capacity and improved hydraulics • Most extensive history of successful installations • Grade changes and curved alignments are easily handled • Nearly all pipe materials may be installed • Poor pipe alignment is easily corrected 	<ul style="list-style-type: none"> • Requires robust excavation trenches along entire alignment • Disruption of traffic • Extensive surface restoration required • May require much longer construction time than trenchless methods • Open excavations and trenches pose safety hazard • Open trenches may require special odor control practices • Special cobble stone pavement repairs required 	<ul style="list-style-type: none"> • Materials: HDPE, PVC, GRP, RCP, VCP • Conventional construction practice, no specialized equipment or training required • Local capable contractors may be available



Thames Street Condition

Observed Defects	Failure Risk	Condition
Missing mortar between bricks	Bricks loosen and fall, eventual sewer collapse	Structural
Intruding service taps	Collects debris, reduces pipe capacity	Structural
Interfering utility pipelines	Collects debris, reduces pipe capacity, poses leak risks	Structural
Break-in service taps	Reduces overall structural integrity of pipeline	Structural
Inflow and Infiltration (I/I)	Allows storm water into sanitary sewer increasing risk of overflows	Operations & Maintenance and Structural
Mineral deposits, grease, accumulated debris	Reduces pipeline capacity	Operations & Maintenance
Roots	Reduces pipeline capacity, affects the integrity of connections and mortar joints	Operations & Maintenance



Protruding tap



Intrusion, wall mortar loss



Interfering utility pipe

Interfering utility pipe



Thames Street Rehabilitation Options

- **Open-Cut Replacement (6"-120")**

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Thames St. Trenchless Rehabilitation Options

- Slip Lining (6"-120")

Principal Advantages	Principal Disadvantages	Features
<ul style="list-style-type: none"> • Flow by-pass pumping may not be required • Liner can be pushed with and against flow • Designed for full structural pipe • Extensive history of successful installations • Formed shapes are now available for FRP 	<ul style="list-style-type: none"> • Limitation for grade changes and curved alignments • Requires robust excavation for insertion pits • Removal of structural obstructions and heavy debris is required • Reduction of effective inside pipe diameter and possible reduction of capacity • Expensive annulus grouting is required 	<ul style="list-style-type: none"> • Materials: HDPE, PVC, GRP/FRP • Longest history of trenchless pipeline rehabilitation methods



Thames Street Trenchless Rehabilitation Options

- Cured-in-Place-Pipe (CIPP) (4”–120”) – RECOMMENDED REHABILITATION OPTION

Principal Advantages	Principal Disadvantages	Features
<ul style="list-style-type: none"> • Faster installation than open cut • No excavation • Accommodates bends and minor deformation • Accommodates Egg Shaped pipes • Maximizes capacity • Annulus grouting not required • Internal lateral reopening • Designed for full structural conditions • Lining can be installed in relatively confined locations • Extensive history of successful installations 	<ul style="list-style-type: none"> • Full bypass pumping necessary • High setup costs on small projects • Does not correct lateral defects or sags • Point repairs may be required prior to installation • Relies on existing pipe for installation • Connection treatment required if I/I reduction desirable 	<p><u>Materials:</u></p> <ul style="list-style-type: none"> • Thermosetting resins and felt • Standard and custom sizing available • Pre-inspection and high-pressure cleaning required • For gravity and pressure pipelines • Curing: steam, hot water, UV • Odor control is easily handled



The Cured-In-Place Pipe Process

The CIPP Process

1. A resin-saturated, coated felt tube is inverted (left) or pulled (right) into a damaged pipe



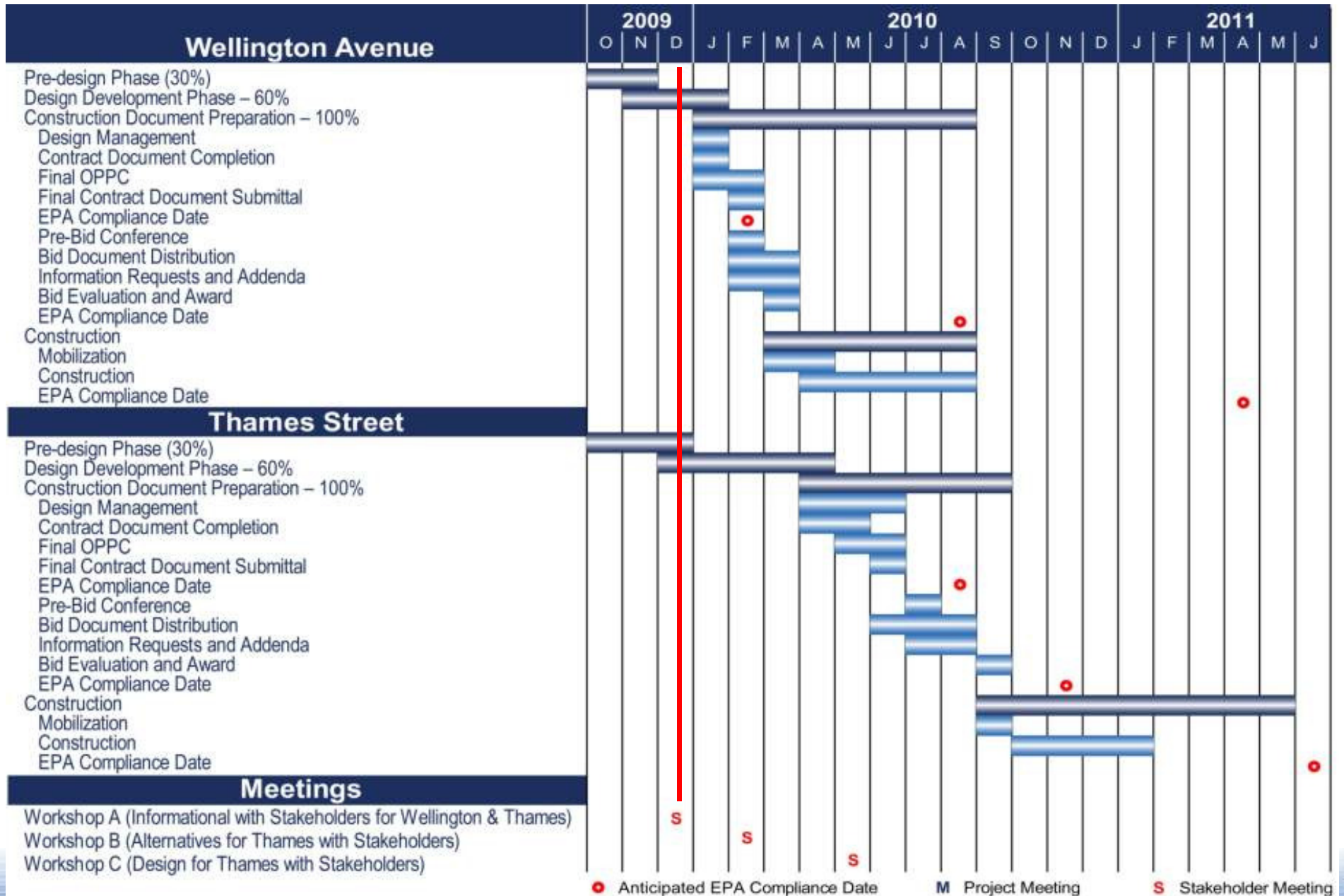
2. Hot water or steam is used to cure the resin and form a tight-fitting, jointless and corrosion-resistant replacement pipe.



3. Restore service laterals internally using robotically controlled cutting devices, inspect the rehabilitated pipe by closed-circuit TV.



Proposed Project Schedule



POTENTIAL PUBLIC IMPACTS AND MITIGATION MEASURES

Thames Street and Wellington Avenue rehabilitation projects...

Potential Impacts and Mitigation Measures

Opportunities for public input

Advance Planning Mitigates Adverse Impacts

Two (separate) construction projects are planned to address the unique requirements of the Wellington Avenue and Thames Street projects.

Wellington

- Small diameter sewers
- Beyond repair
- Wide thoroughfare
- Paved surface
- Residential
- Public park



Issues to Evaluate

- Business operations
- Vehicular traffic
- Pedestrian traffic
- Deliveries
- Parking
- Noise
- Odors
- Street restoration
- Work schedules
- Project costs

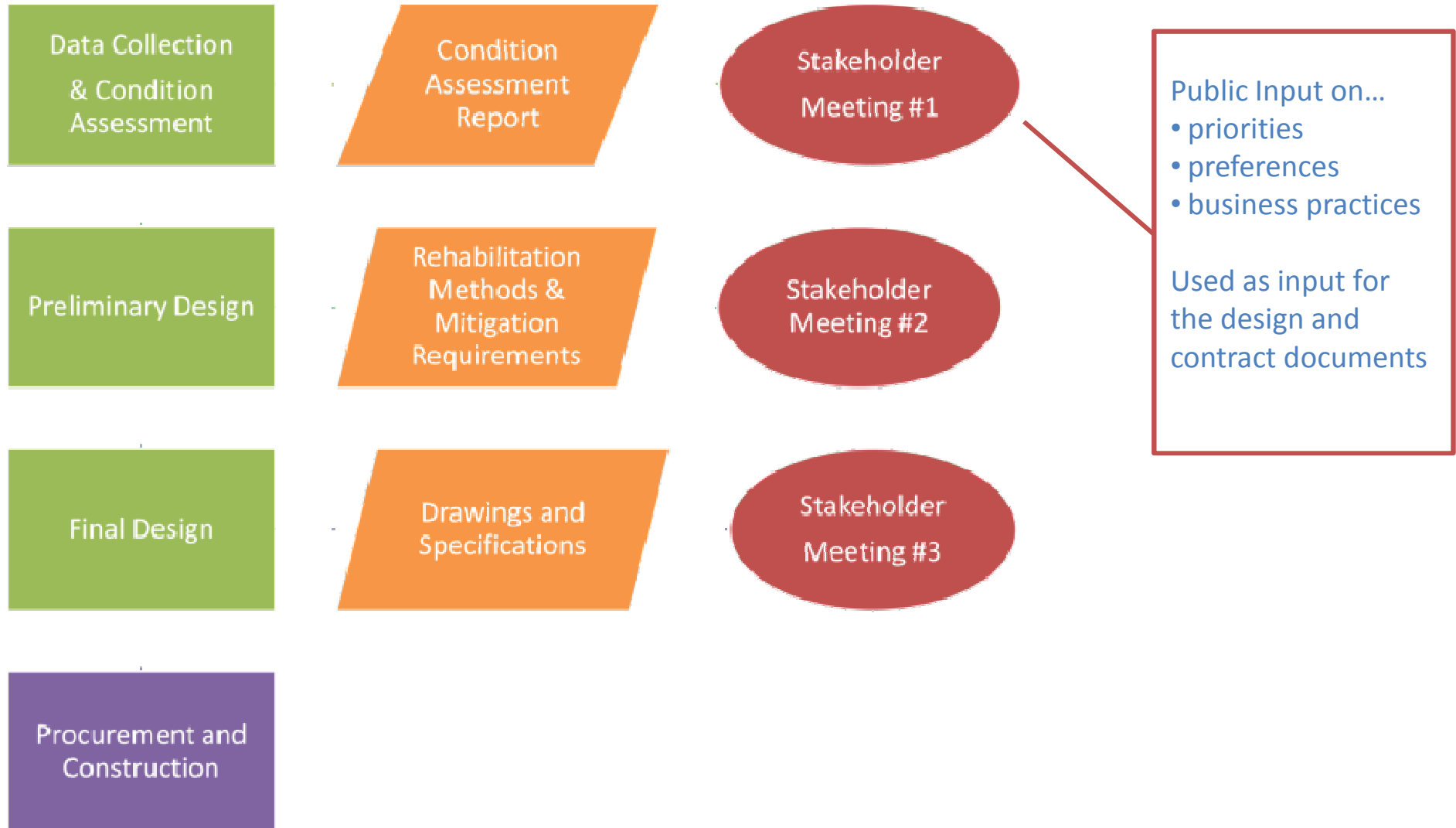
Thames

- Large brick sewer
- Utility penetrations
- Loss of mortar
- Mixed pavement surfaces
- High traffic
- Retail - commercial



Measures incorporated into planning and design documents from the beginning reduce unwanted public impacts and costly after-the-fact repairs.

Collaboration is Incorporated into the Planning & Design Process



Potential Impacts for Wellington Avenue Replacement Project

- Construction period: 3 months
- Carry two-way traffic during construction
- Parking may be limited at times in construction zones
- Keep construction activities along south edge of pavement
- Provide continuous access to adjacent properties
- Open-cut construction will have limited effect on pedestrian traffic
- Access to and parking at sports facility will be maintained

Potential Impacts for Thames Street CIPP Rehabilitation

- Each CIPP lining setup will require 48-hours for insertion and curing
- One lane of traffic will be maintained through construction, one lane will be blocked at times for lining and other repairs
- Parking may be limited at times
- Sidewalk access will be maintained
- Public notification plans to be provided
- It is anticipated that construction will begin at the intersection with Morton St. and work toward Touro St.
- CIPP lining is recommended for Thames Street because:
 - Brick pipeline is in fair to poor condition, CIPP is viable solution
 - Least disruptive alternative
 - Limited excavation for moving utilities
 - Non-excavation manhole renewal is recommended

Advantages & Disadvantages of Potential Construction Alternatives

	Principal Advantages	Principal Disadvantages
Season of Construction		
Fall	<ul style="list-style-type: none"> Typically drier – easier for bypass pumping Generally good weather – less construction disruptions 	<ul style="list-style-type: none"> Shoulder season for businesses
Winter	<ul style="list-style-type: none"> Least busy season for businesses 	<ul style="list-style-type: none"> Disruptive to businesses Cold or snowy weather may make construction last longer Wetter weather may require larger bypass pumping
Time of Construction*		
Day	<ul style="list-style-type: none"> Less staging for lighting Detours may be easier to follow 	<ul style="list-style-type: none"> Disruptive to businesses
Evening	<ul style="list-style-type: none"> Many businesses closed 	<ul style="list-style-type: none"> Disruptive to restaurants
Late Night	<ul style="list-style-type: none"> Least amount of vehicular and foot traffic 	<ul style="list-style-type: none"> Noise may disturb residents right off of Thames Street

* While the timing of the actual work to install the liner can be adjusted, the recommended technology requires that the liner cure for at least 48 hours. This will require that the area over the manholes and directly above the sewer pipe be closed to vehicular traffic.

Potential Thames Street Vehicular Traffic & Pedestrian Traffic Mitigation Measures



Large diameter Installation:
Maintaining pedestrian and vehicular
traffic with bypass pumping cross-
over points



Smaller diameter Installation:
Maintaining vehicular
and pedestrian traffic



Traffic Control Measures

Traffic Control Options

	Principal Advantages	Principal Disadvantages
Vehicular Traffic Routing	<ul style="list-style-type: none"> • Police details to be provided • Signage for traffic routing and detours • Existing traffic patterns will be maintained as much as possible 	<ul style="list-style-type: none"> • Side street closures may be required • Parking will be limited or closed in construction zones • Short term lane closures will be required at times in construction zones
Pedestrian Protection	<ul style="list-style-type: none"> • Sidewalk access will be maintained • Barricades, screening and warning signs for any excavations • Pipelines for bypass pumping will be ramped for crossing safely 	<ul style="list-style-type: none"> • Sidewalks may be narrowed at times during construction • Noise or lighting may be a nuisance • Where necessary, pedestrian detours may be required
Detours	<ul style="list-style-type: none"> • Dead-end streets/courts will have access maintained as much as possible • Signage and pavement marking to be provided for all traffic detours 	<ul style="list-style-type: none"> • Short term detours and lane closures will be required at times in construction zones • Detours may be inconvenient to businesses and residents
Notification	<ul style="list-style-type: none"> • Residents and businesses impacted will be notified prior to commencing planned work 	<ul style="list-style-type: none"> • Notifications may be missed or ignored

Questions & Comments

**Please complete a Comment Form and
Project Issues Survey!**

