



Harbour Island Force Main Replacement Design – Build Project

Community Task Force Meeting
July 11, 2018



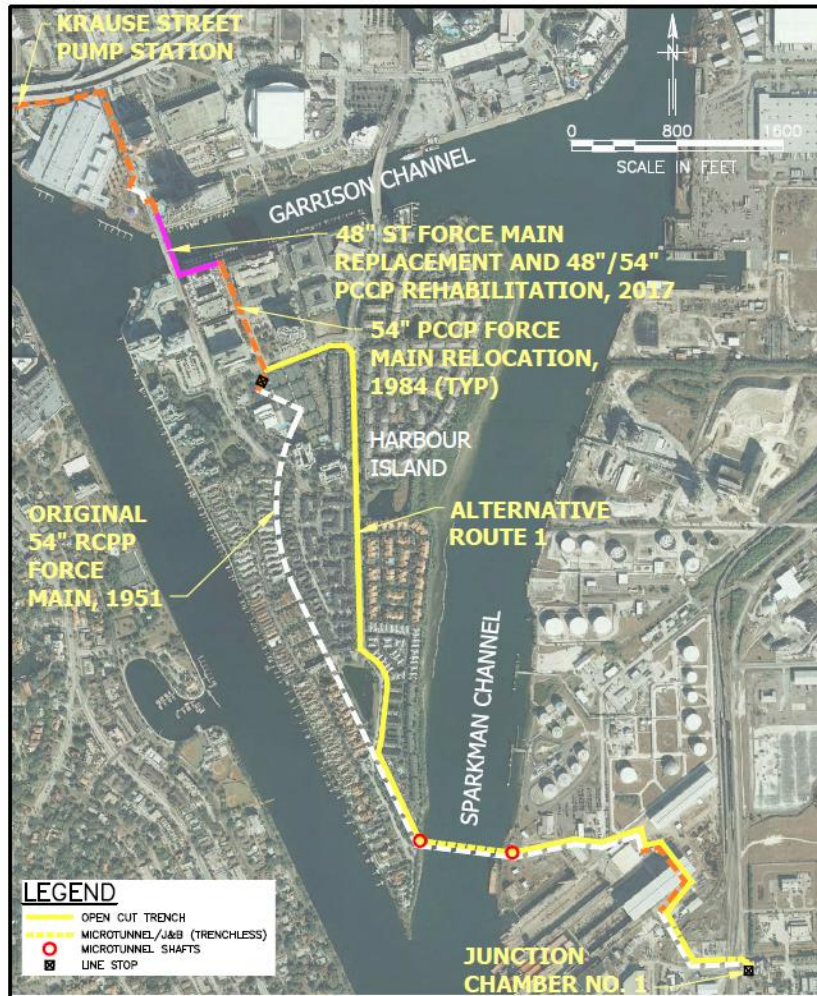
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Agenda

- Present Each Route Alternative
 - Constructability
 - Requirements
 - Conclusions
- Gain Input on Each Route Alternative
- Next Steps
- Questions

Alternative Route 1 - Overview



- Length of Open-Cut Pipe = **7,700 LF**
- Length of Microtunnel = **700 LF**
- Length of Jack & Bore (1) = **50 LF** - CSX
- Length Jack & Bore (2) = **170 LF** - CSX & Maritime Blvd.
- Total Length = **8,600 LF**

FIGURE 1
ALTERNATIVE ROUTE 1
PRELIMINARY DRAFT

HARBOUR ISLAND FORCE MAIN
ASSESSMENT AND REPLACEMENT
ALIGNMENT STUDY
JUNE 2018

Route Alternative 1- Constructability

PROS

- This is the shortest alternative route. This is a more direct route from the existing Harbour Island Force Main on Knights Run Avenue to Junction Chamber No. 1 at the HFCAWTP. The route generally follows the existing pipeline, except where it uses existing right-of-way in lieu of a very narrow easement through residences.
- Alignment runs mostly along paved roadways on Harbour Island where the pipe will be easier to access for maintenance.
- Minimal impact to heavy industrial traffic along Maritime Blvd.

CONS

- Alignment runs mostly along paved roadways that are owned and maintained by the Harbour Island community, not the City of Tampa. This will require additional utility easements that will impact the project schedule.
- Route will require significant maintenance of traffic planning on Harbour Island.
- A short section of the proposed alignment on the east side of the Sparkman Channel in Tampa Shipp LLC property may run through contaminated soils according to the Port Authority.
- The microtunnel shaft located on the south end of Harbour Island will be difficult to construct due to limited access and challenging geotechnical conditions.
- Microtunnel shafts and microtunneling are an expensive trenchless option.
- It is anticipated that there will be significant disruptions to residents on Harbour Island during construction (i.e., noise, traffic issues, mail delivery, garbage pick-up, etc.).

Route Alternative 1 – Requirements

PERMITTING

- City of Tampa Right-of-Way Use permit
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- Port Tampa Bay minor work permit
- CSX Transportation, Inc.

PROPERTY REQUIREMENTS

- Harbour Island Community Services Association, Inc.
- Pointe at Harbour Island Neighborhood Association
- Harbourside at Harbour Island Home Owners Association, Inc.
- Sovereign Submerged Land Easement
- Port Tampa Bay

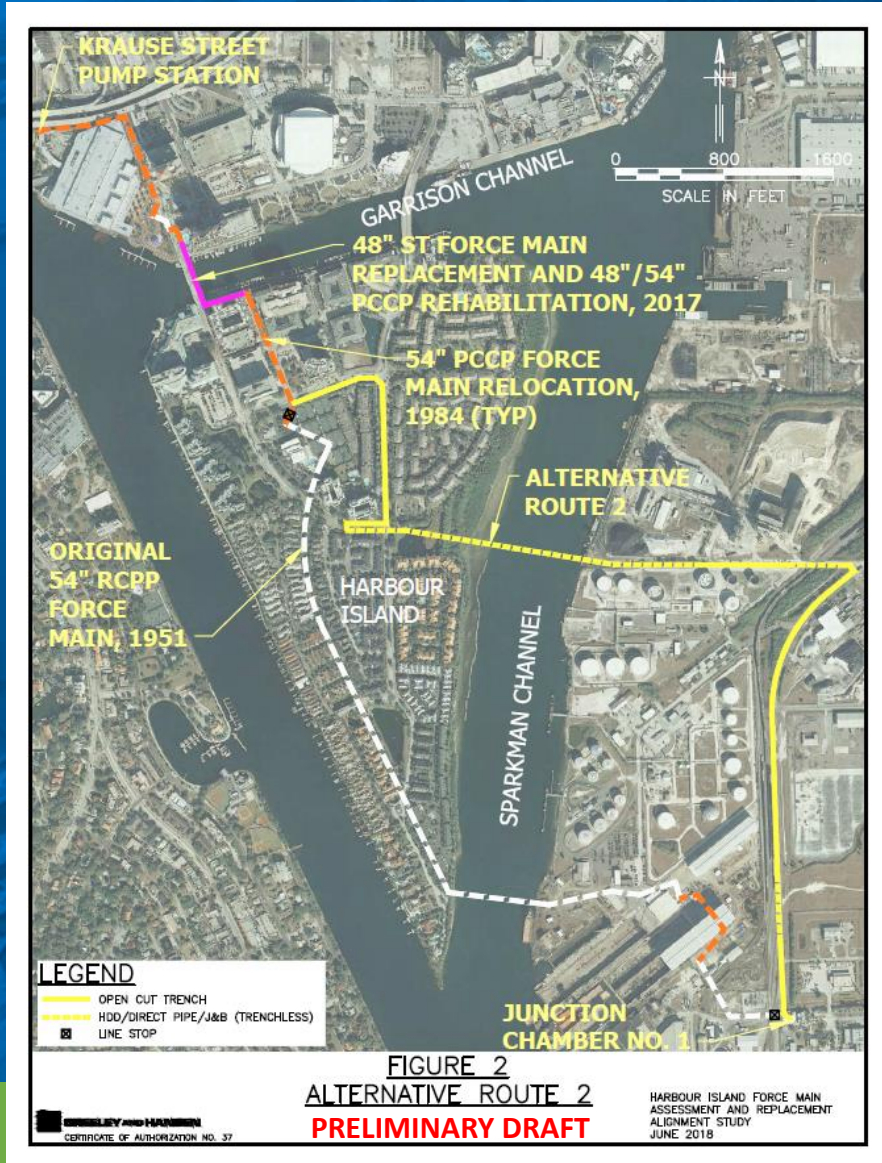
Route Alternative 1 - Conclusions

POTENTIAL FATAL FLAWS

- The 65-foot deep shafts that must extend to 57 feet below sea level may be almost impossible to construct.
- Structures near the shafts may be compromised.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 2 - Overview



- Direct Pipe Option Crossing Sparkman Channel:
 - Length Open-Cut Pipe = **6,400 LF**
 - Length Direct Pipe = **2,600 LF**
- HDD Option Crossing Sparkman Channel:
 - Length Open-Cut Pipe = **6,700 LF**
 - Length HDD = **2,200 LF**
- Length of Jack & Bore (1) = **400 LF – CSX**
- Length of Jack & Bore (2) = **100 LF – CSX**
- Total Length = **9,500 LF (Direct Pipe Option)**
- Total Length = **9,400 LF (HDD Option)**

Route Alternative 2 - Constructability

PROS

- Alignment runs a shorter distance along paved roadways on Harbour Island in comparison to Alternative Route 1, which will simplify maintenance of traffic. Roads have four lanes and a median, which allows traffic on one side of the median during construction.
- Direct Pipe trenchless method can be used to cross Sparkman Channel which is very accurate with less risk than HDD and does not require 24/7 continuous operation until completed.
- HDD only requires a 2,000 ft min. radius, which is less overall length, less cost than Direct Pipe.

CONS

- A portion of the alignment runs along paved roadways that are owned and maintained by the Harbour Island community, not the City of Tampa. This will require additional utility easements that may impact the project schedule.
- There will be less disruptions during construction (i.e., noise, traffic issues, mail delivery, garbage pick-up, etc.) compared to Alternative Routes 1 and 4 but will still impact the island as noted to a lesser degree.
- The chicane (double back) required on S. Harbour Island Blvd is not preferable, but required to maintain traffic in Beneficial Drive.
- HDD trenchless method crossing Sparkman Channel is risky because the size and distance are close to the maximum ever performed and HDD requires 24/7 continuous operation until completed.
- Direct Pipe requires a 5,000 ft min. radius, which is more overall length, higher cost than HDD.
- Finding an open lane to install the new 54" Force Main along Maritime Blvd will be challenging.

Route Alternative 2 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- Port Tampa Bay minor work permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Harbour Island Community Services Association, Inc.
- Argos Cement, LLC
- Sovereign Submerged Land Easement
- Port Tampa Bay

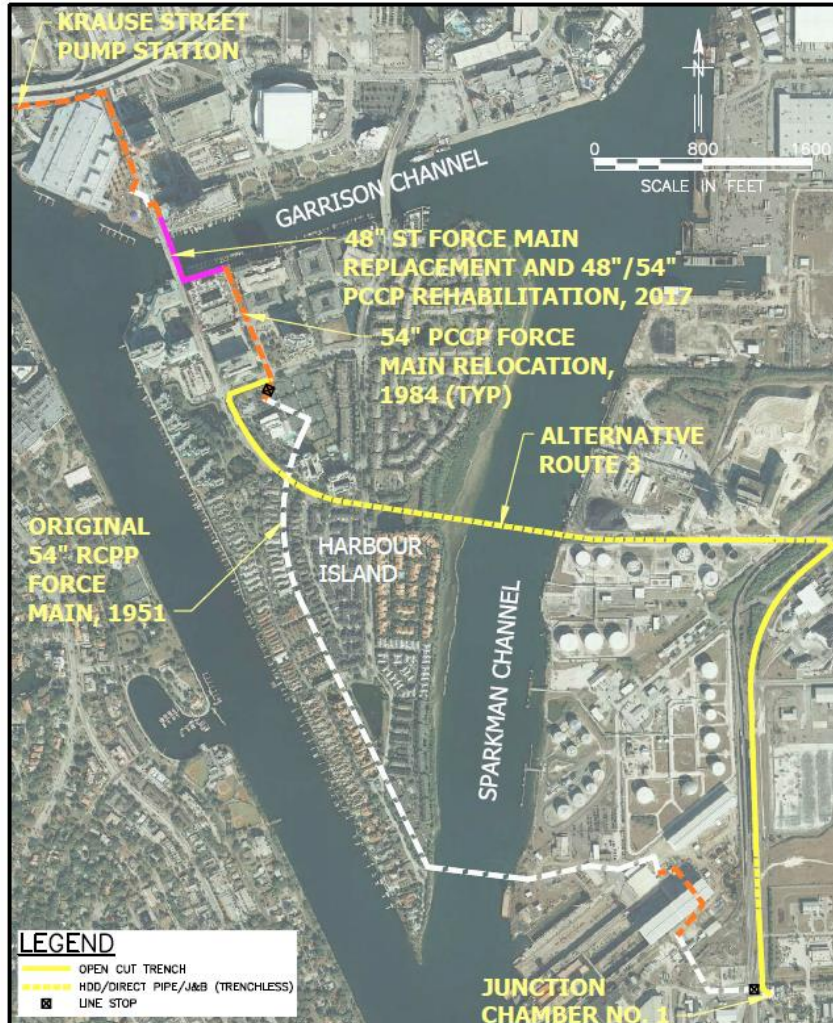
Route Alternative 2 - Conclusions

POTENTIAL FATAL FLAWS

- Requires Harbour Island community association approval.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 3 - Overview



- Direct Pipe Option Crossing Sparkman Channel
 - Length Open-Cut Pipe = **5,550 LF**
 - Length Direct Pipe = **2,600 LF**
- HDD Option Crossing Sparkman Channel:
 - Length of Open-Cut Pipe = **5,950 LF**
 - Length of HDD = **2,200 LF**
- Length of Jack & Bore (1) = **400 LF – CSX**
- Length of Jack & Bore (2) = **100 LF – CSX**
- Length of Jack & Bore (3) = **50 LF** - Existing Force Main (J&B may or may not be required. To be verified by SUE)
- Total Length = **8,700 LF (Direct Pipe & HDD Options)**

FIGURE 3
ALTERNATIVE ROUTE 3
PRELIMINARY DRAFT

HARBOUR ISLAND FORCE MAIN
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ALIGNMENT STUDY
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Route Alternative 3 - Constructability

PROS

- This is the second shortest alternative route. Alignment runs even shorter distance along paved roadways on Harbour Island than Alternative Route 2, which will simplify maintenance of traffic.
- Direct Pipe trenchless method can be used to cross Sparkman Channel which is very accurate with less risk than HDD and does not require 24/7 continuous operation until completed.
- HDD only requires a 2,000 ft min radius, which is less overall length, less cost than Direct Pipe.
- Most likely the quickest route to construct.

CONS

- A portion of the alignment runs along paved roadways that are owned and maintained by the Harbour Island community, not the City of Tampa. This will require additional utility easements that may impact the project schedule.
- There will be less disruptions during construction (i.e., noise, traffic issues, mail delivery, garbage pick-up, etc.) compared to Alternative Routes 1 and 4 but will still impact the island as noted to a lesser degree.
- The proposed new 54" Force Main will have to cross the existing 54" Force Main on S. Harbour Island Blvd., which may require a trenchless method of crossing due to depth of bury if there is not enough clearance to cross over top of the existing force main.
- HDD trenchless method crossing Sparkman Channel is risky because the size and distance are close to the maximum ever performed and HDD requires 24/7 continuous operation until completed.
- Direct Pipe requires a 5,000 ft min. radius, which is more length, higher cost than HDD.
- Finding an open lane to install the new 54" Force Main along Maritime Blvd will be challenging.

Route Alternative 3 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Harbour Island Community Services Association, Inc.
- Argos Cement, LLC
- South Neighborhood Association, Inc.
- Sovereign Submerged Land Easement
- Port Tampa Bay

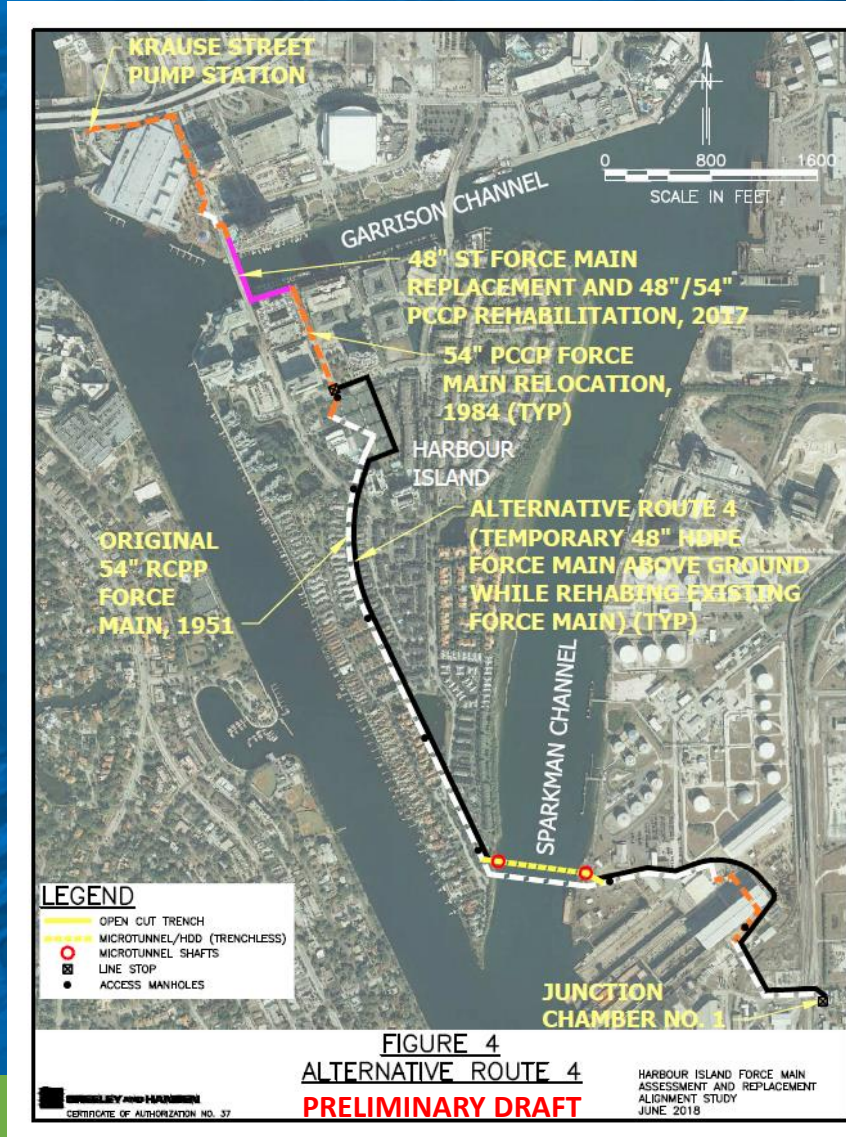
Route Alternative 3 - Conclusions

POTENTIAL FATAL FLAWS

- Requires Harbour Island community association approval.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 4 - Overview



- Length of Open-Cut Pipe = **100 LF** (at tie-in locations)
- Length of Temporary HDPE = **7,050 LF**
- Length of Microtunnel = **700 LF** - Sparkman Channel
- Length of Jack & Bore (1) = **40 LF** - CSX (Bypass Piping)
- Length of Jack & Bore (2) = **170 LF** - CSX & Maritime Blvd. (Temporary HDPE Piping)
- Total Length = **7,050 LF** (Temporary HDPE Pipe)

Route Alternative 4 - Constructability

PROS

- Rehabilitating the existing 54" Force Main can be performed within the existing 20 ft wide utility easement, which includes ingress/egress rights for maintenance.
- Temporary 48" HDPE force main can be laid on top of finished grade within the City's existing 20 ft easement to bypass existing flows during construction.
- Minimal impact to traffic along Maritime Blvd.

CONS

- The type of rehabilitation work can be very expensive.
- Accessing the 20 ft wide easement is limited.
- Temporary 48" HDPE force main will need to be placed just below grade and steel plated at roadway crossings.
- Restoration of the easement following construction will be challenging.
- There will likely be a significant number of complaints during construction due to noise during rehabilitation and the obstruction caused by the temporary 48" HDPE force main laid on finished grade.
- A short section of the proposed alignment on the east side of the Sparkman Channel in Tampa Shipp LLC property may run through contaminated soils according to the Port Authority.
- The microtunnel shaft located on the south end of Harbour Island will be challenging to construct due to limited access and challenging geotechnical conditions. This will require additional utility easements that will impact the project schedule.
- Microtunnel shafts and microtunneling are an expensive trenchless option.
- Will require at least seven (7) access manholes.
- Doesn't solve the current issues with limited ability to access and maintain pipe in existing easement.

Route Alternative 4 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Harbour Island Community Services Association, Inc.
- SNH Well Properties
- Harbour Court Condominium Association, Inc.
- Harbourside at Harbour Island Home Owners Association, Inc.
- South Neighborhood Association, Inc.
- Sovereign Submerged Land Easement
- Gulf Sulfur Services LTD LLP
- Port Tampa Bay

Route Alternative 4 - Conclusions

POTENTIAL FATAL FLAWS

- The internal condition of the existing 54" Force Main is unknown, and may require extensive structural rehabilitation and/or replacement.
- The channel crossing will be very challenging to construct due to limited access and geotechnical conditions.
- Structures near the shafts may be compromised.

ADDITIONAL INVESTIGATION RECOMMENDED

RETAIN THIS ALTERNATIVE ROUTE FOR FURTHER EVALUATION

Alternative Route 5 - Overview

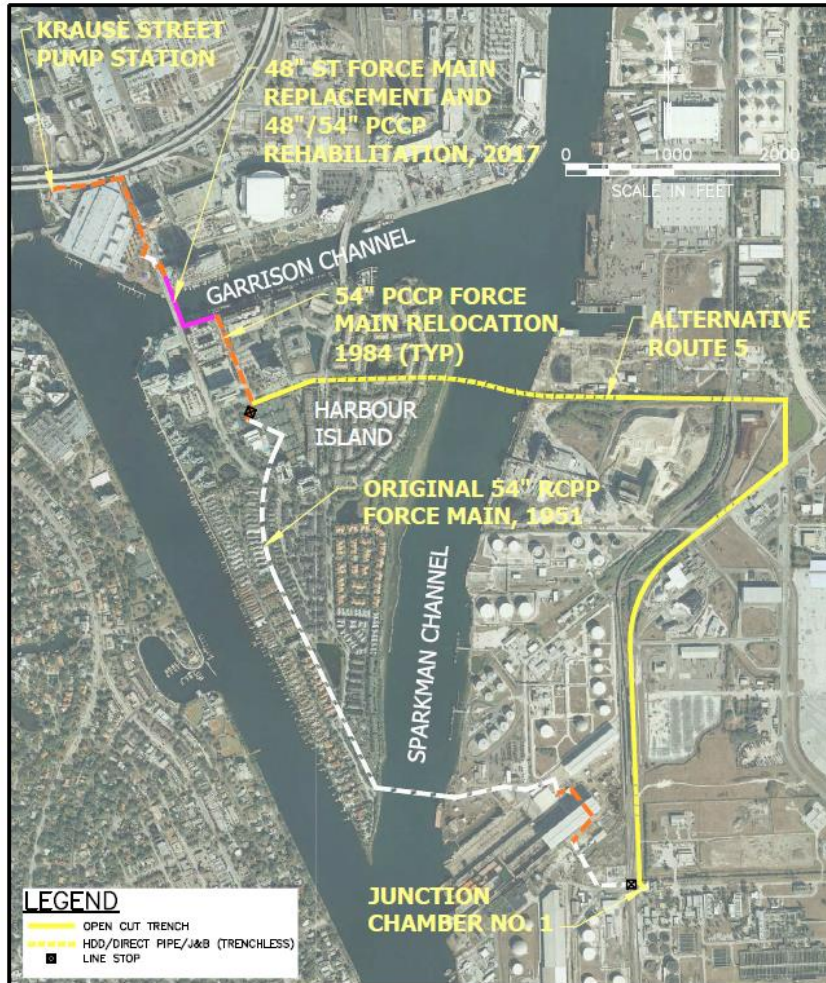


FIGURE 5
ALTERNATIVE ROUTE 5

PRELIMINARY DRAFT

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- Length of Open-Cut Pipe = **7,160 LF**
- Length of Direct Pipe = **2,900 LF** - Sparkman Channel
- Length of Jack & Bore (1) = **240 LF** – CSX
- Length of Jack & Bore (2) = **100 LF** – CSX
- Total Length = **10,400 LF**

Route Alternative 5 - Constructability

PROS

- This route has very little open-cut force main construction on Harbour Island, which is on Knights Run Avenue, which is owned and maintained by the City of Tampa.
- In comparison to other alternative routes on Harbour Island, this route has the least amount of disruption to the residences of Harbour Island.
- Newly constructed 48" SST and 48"/54" Fibrwrap force main will remain in service.

Cons

- Alignment of Direct Pipe runs directly through Island Place Condo Association, which will require an easement.
- Alignment on east side of Sparkman Channel runs through a CSX owned strip of property, which will require an easement.
- There is an existing TECO subaqueous electric crossing under Sparkman Channel that will need to be avoided by the Direct Pipe operation.
- The clearance between condo buildings along the proposed alignment is very tight.

Route Alternative 5 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit
- Port Tampa Bay minor work permit

PROPERTY REQUIREMENTS

- Harbour Island Community Services Association, Inc.
- Island Walk Condominium Association, Inc.
- Island Place Condominium Association, Inc.
- A and G Investments, Inc.
- Robert A Glover/Trustee ET AL
- Sovereign Submerged Land Easement
- Port Tampa Bay

Route Alternative 5 - Conclusions

POTENTIAL FATAL FLAWS

- Installing Direct Pipe trenchless method through a very tight alignment between existing condo buildings may be too risky.
- Precludes future maintenance and/or replacement.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 6



FIGURE 6
ALTERNATIVE ROUTE 6
PRELIMINARY DRAFT

HARBOUR ISLAND FORCE MAIN
ASSESSMENT AND REPLACEMENT
ALIGNMENT STUDY
JUNE 2018

- Length of Open-Cut Pipe = **7,160 LF**
- Length of Subaqueous Open-Cut = **2,200 LF** - Garrison Channel
- Length of Microtunnel = **1,400 LF** - Sparkman Channel
- Length of Jack & Bore (1) = **240 LF** - CSX
- Length of Jack & Bore (2) = **100 LF** - CSX
- Total Length = **11,100 LF**

Route Alternative 6 - Constructability

PROS

- The majority of the construction is located off of Harbour Island.
- Newly constructed 48" SST and 48"/54" Fiberglass force main will remain in service.
- May be able to use the existing line stop installed in 2017, located on Channelside Way.

CONS

- Alignment runs along the north side of Harbour Island in Garrison Channel, next to boat docks / slips, which will be very difficult to permit and construct.
- May not be feasible to open-cut construct the portion of the force main in Garrison Channel located under the Beneficial Drive Bridge.
- The microtunnel shaft located on the Harbour Island side of the Sparkman Channel crossing will be challenging to construct in the water.
- Microtunnel shafts and microtunneling are an expensive trenchless option.
- Subaqueous force main is difficult to access and repair if there is ever a problem.
- Alignment on east side of Sparkman Channel runs through a CSX owned strip of property, which will require an easement.
- There is an existing TECO subaqueous electric crossing under Sparkman Channel that will need to be avoided by the microtunneling operation.
- Finding an open lane to install the new 54" Force Main along Maritime Blvd will be challenging.
- There are two existing lift stations on Harbour Island that connect to the existing 54" Force Main. This will require the City to design and install a new 12" force main to handle these flows.

Route Alternative 6 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit
- Port Tampa Bay Major work permit

PROPERTY REQUIREMENTS

- Post Apartment Homes L P
- Garrison Harbourside, LLC
- A and G Investments, Inc.
- Robert A Glover/Trustee ET AL
- Sovereign Submerged Land Easement
- Port Tampa Bay

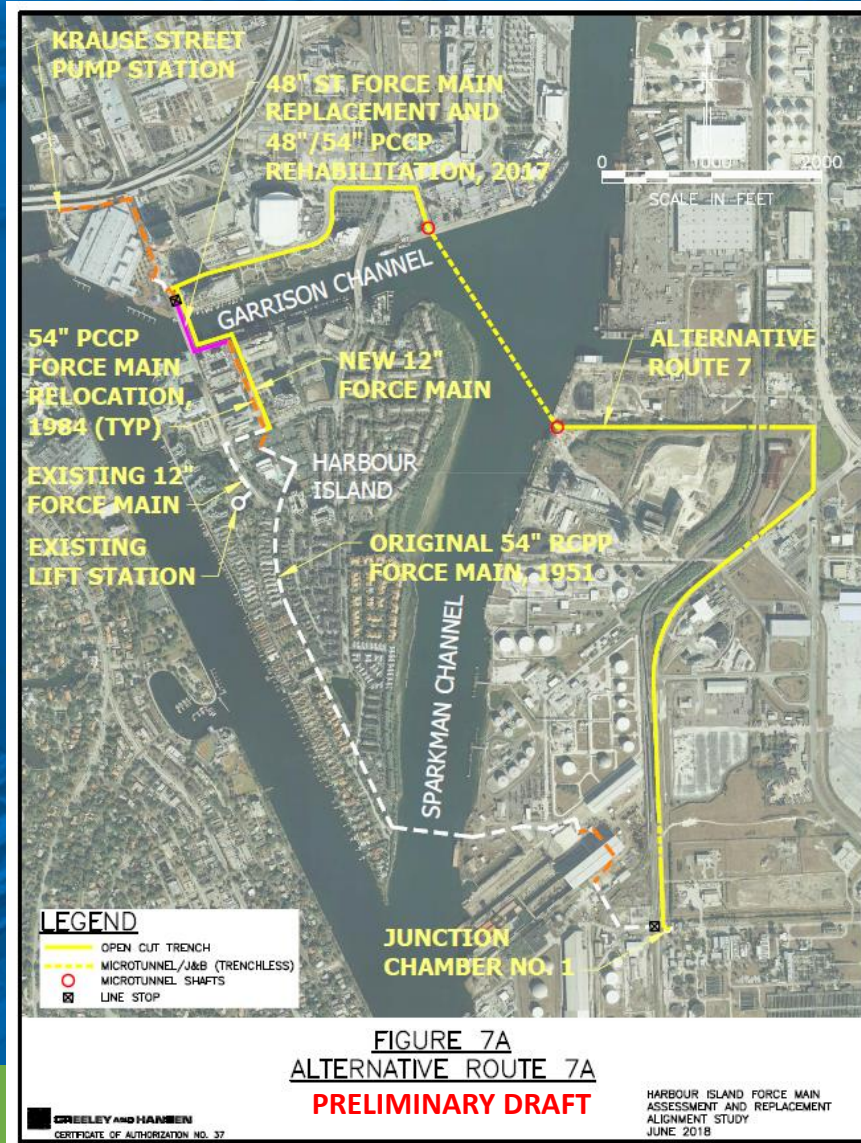
Route Alternative 6 - Conclusions

POTENTIAL FATAL FLAWS

- Open-cut trench excavation under the Beneficial Bridge.
- Constructing the microtunnel shaft located on the Harbour Island side of the Sparkman Channel crossing will be challenging if not impractical to construct and permit.
- Subaqueous force main installation makes future access for repair and maintenance extremely difficult.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 7(a)



- Length of Open-Cut Pipe = **10,260 LF**
- Length of Microtunnel = **2,200 LF** - Garrison & Sparkman Channels
- Length of Jack & Bore (1) = **240 LF** - CSX
- Length of Jack & Bore (2) = **100 LF** - CSX
- Length of Jack & Bore (3) = **100 LF** - CSX
- Total Length = **12,800 LF**

Route Alternative 7(a) - Constructability

PROS

- Alignment does not involve Harbour Island except for access via the Franklin Street and Beneficial Drive bridges during construction.
- There will be significantly less disruptions to the Harbour Island residents during construction (i.e., noise, MOT, mail delivery, garbage pick-up, etc.).
- May be able to use the existing line stop location on the north side of the Harbour Island Bridge installed in 2017.

CONS

- Microtunnel shafts and a microtunnel of this distance are an expensive trenchless option.
- Proposed force main and microtunneling shaft along Old Water Street near the Amalie Arena and next to the Channelside Bay Plaza will require special coordination and cooperation with the “Water Street Project.”
- Alignment on east side of Sparkman Channel runs through a CSX owned strip of property, which may have to be shared with TECO.
- There will be an existing TECO subaqueous electric crossing under Sparkman Channel at this location.
- Finding an open lane to install the new 54” Force Main along Maritime Blvd will be challenging.
- There are two existing lift stations on Harbour Island that connect to the existing 54” Force Main. This will require the City to design and install a new 12” force main to handle these flows.

Route Alternative 7(a) - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- CSX Transportation Inc.
- Argos Cement LLC
- A and G Investments, Inc.
- Robert A Glover/Trustee ET AL
- Sovereign Submerged Land Easement
- Port Tampa Bay

Route Alternative 7(a) - Conclusions

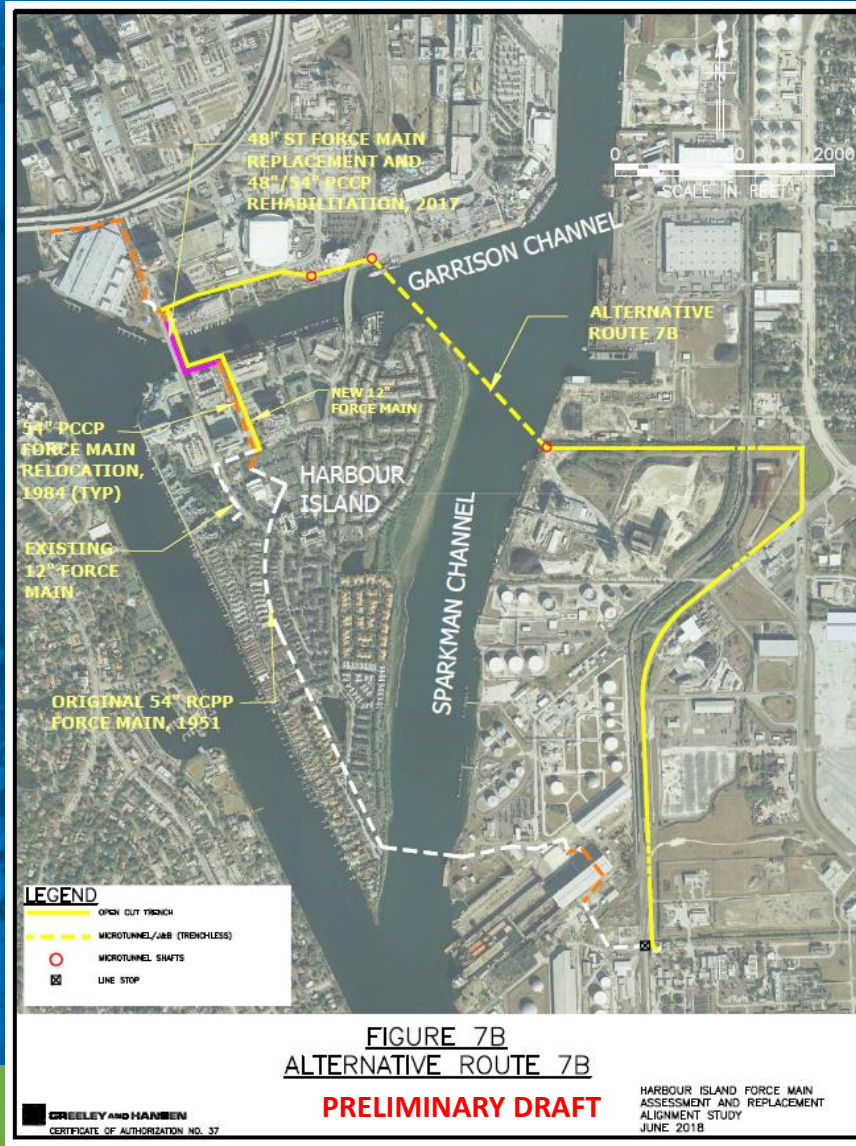
POTENTIAL FATAL FLAWS

- There are many unknowns associated with the route through downtown for a 54" diameter force main; including existing utilities, easy access to the Selmon Expressway, interruptions to major hotels, downtown trolley, Convention Center, Amalie Arena, Channelside Bay Plaza and Port Tampa Cruise Terminal.
- The duration of the design and construction would need to be considered.

ADDITIONAL INVESTIGATION RECOMMENDED

RETAIN THIS ALTERNATIVE FOR FURTHER EVALUATION

Alternative Route 7(b)



- Length of Open-Cut Pipe = **8,554 LF**
- Length of Microtunnel = **2,340 LF** - Garrison & Sparkman Channels
- Length of Microtunnel = **572 FL** – North Approach at Beneficial Bridge
- Length of Jack & Bore (1) = **240 LF** - CSX
- Length of Jack & Bore (2) = **100 LF** - CSX
- Length of Jack & Bore (3) = **100 LF** - CSX
- Total Length = **11,906 LF**

Route Alternative 7(b) - Constructability

PROS

- Alignment does not involve Harbour Island except for access via the Franklin Street bridge during construction.
- There will be significantly less disruptions to the Harbour Island residents during construction (i.e., noise, MOT, mail delivery, garbage pick-up, etc.).
- May be able to use the existing line stop location on the north side of the Harbour Island Bridge installed in 2017.
- Using the Cotanchobee Fort Brooke Park for optional shaft location to avoid Channelside area is a time saving option.

CONS

- Microtunnel shafts and a microtunnel of this distance are an expensive trenchless option.
- Proposed force main alignment along Old Water Street near the Amalie Arena runs between the proposed JW Marriott and the existing Marriott Waterside, which will require special coordination with the “Water Street Project”.
- Alignment on east side of Sparkman Channel runs through a CSX owned strip of property, which is adjacent to property owned by Argos Cement LLC.
- There will be an existing TECO subaqueous electric crossing under Sparkman Channel at this location.
- Finding an open lane to install the new 54” Force Main along Maritime Blvd will be challenging.
- There are two existing lift stations on Harbour Island that connect to the existing 54” Force Main. This will require the City to design and install a new 12” force main to handle these flows.

Route Alternative 7(b) - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Hillsborough County
- CSX Transportation Inc.
- Argos Cement LLC
- A and G Investments, Inc.
- Robert A Glover/Trustee ET AL
- Sovereign Submerged Land Easement
- Port Tampa Bay

Route Alternative 7(b) - Conclusions

POTENTIAL FATAL FLAWS

- There are many unknowns associated with the route through downtown for a 54" diameter force main; including existing utilities, access to the Selmon Expressway, interruptions to major hotels, visitors to Cotanchobee Fort Brooke Park, Convention Center, and Amalie Arena,
- The duration of the design and construction would need to be considered.

ADDITIONAL INVESTIGATION RECOMMENDED

RETAIN THIS ALTERNATIVE FOR FURTHER EVALUATION

Alternative Route 8



- Length of Open-Cut Pipe = **12,880 LF**
- Length of Microtunnel = **900 LF** - Sparkman Channel
- Length of Jack & Bore (1) = **110 LF** - CSX
- Length of Jack & Bore (2) = **100 LF** - CSX
- Length of Jack & Bore (3) = **100 LF** - CSX
- Total Length = **14,200 LF**

Route Alternative 8 - Constructability

PROS

- Alignment does not involve Harbour Island except for access via the Franklin Street and Beneficial Drive bridges during construction.
- There will be significantly less disruptions to the Harbour Island residents during construction (i.e., noise, traffic issues, mail delivery, garbage pick-up, etc.).
- May be able to use the existing line stop location on the north side of the Harbour Island Bridge installed in 2017.

CONS

- This is the second to the longest alternative route being considered.
- Proposed force main and microtunneling shaft along Old Water Street near the Amalie Arena and next to the Channelside Bay Plaza will require special coordination and cooperation with the “Water Street Project.”
- Proposed force main in Channelside Drive in front of the Channelside Bay Plaza, The Florida Aquarium and Port Tampa Bay Cruise Terminals will be extremely difficult to design and construct.
- There will be significant interruptions to the Trolley running between Channelside and Ybor City.
- The microtunnel shaft located between “The Florida Aquarium” and “Port Tampa Bay Cruise Terminal 3” will be challenging to construct due to limited access.
- Microtunnel shafts and microtunneling are an expensive trenchless option.
- There are two existing lift stations on Harbour Island that connect to the existing 54” Force Main. This will require the City to design and install a new 12” force main to handle these flows.

Route Alternative 8 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Sovereign Submerged Land Easement
- Port Tampa Bay

Route Alternative 8 - Conclusions

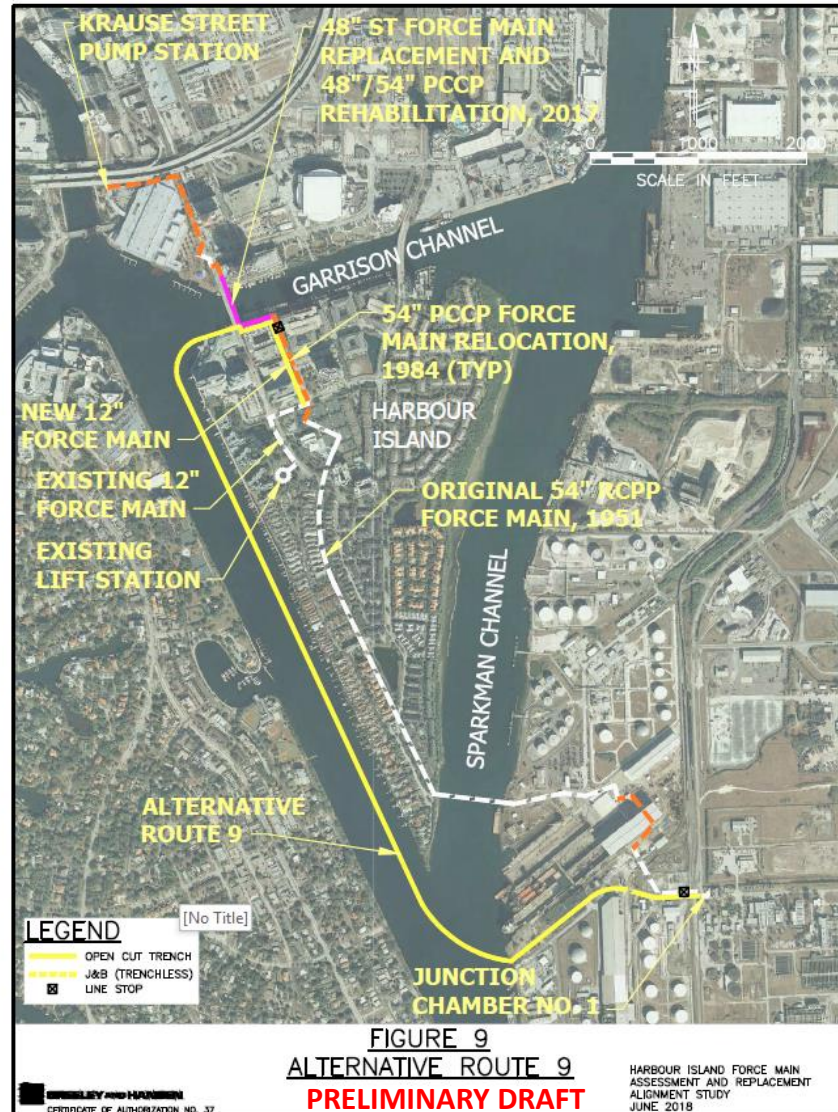
POTENTIAL FATAL FLAWS

- There are many unknowns associated with the longer route through downtown for a 54" diameter force main; including existing utilities, Selmon Expressway, interruptions to major hotels, downtown trolley, Convention Center, Amalie Arena, The Florida Aquarium, Channelside Bay Plaza and Port Tampa Cruise Terminal.
- The duration of the design and construction would need to be considered.

ADDITIONAL INVESTIGATION RECOMMENDED

RETAIN THIS ALTERNATIVE ROUTE FOR FURTHER EVALUATION

Alternative Route 9



- Length of Subaqueous Open-Cut = **7,300 LF** - Garrison, Seddon & Sparkman Channels
- Length of Open-Cut Pipe = **1,790 LF**
- Length of Jack & Bore (1) = **40 LF** - CSX
- Length of Jack & Bore (2) = **170 LF** - CSX & Maritime Blvd.
- Total Length = **9,300 LF**

Route Alternative 9 - Constructability

PROS

- The majority of the subaqueous construction is located off of Harbour Island in the Seddon Channel portion of the Hillsborough River.
- Newly constructed 48" SST force main will remain in service.
- Minimal impact to traffic along Maritime Blvd.
- May be able to use the existing line stop installed in 2017, located on Channelside Way.

CONS

- The majority of the route runs along the west side of Harbour Island in Seddon Channel/Hillsborough River, next to boat docks / slips, which will be very difficult to permit and construct.
- Intermediate high points are difficult to control and air release valves are generally not an option for subaqueous pipe installations.
- 54" Ductile Iron ball and socket pipe is very expensive.
- May be not feasible to open-cut construct the portion of the force main across Sparkman Channel.
- Subaqueous force main is difficult to access and repair if there is ever a problem.
- There are two existing lift stations on Harbour Island that connect to the existing 54" Force Main. This will require the City to design and install a new 12" force main to handle these flows.
- Dredging operations are very expensive and take a lot of time.

Route Alternative 9 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Sovereign Submerged Land Easement
- Port Tampa Bay

Route Alternative 9 - Conclusions

POTENTIAL FATAL FLAWS

- The open-cut trench across Sparkman Channel will not likely be permitted by the U.S. Army Corps of Engineers or Port Tampa Bay due to ship traffic.
- Subaqueous force main installation makes future access for repair and maintenance extremely difficult.
- This is the worst alternative route to access and repair.
- The duration of the construction would need to be considered.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 10



- Length of Open-Cut Pipe = **5,262 LF**
- Length of Subaqueous Open-Cut = **5,370 LF** - Garrison and Sparkman Channels
- Length of Jack & Bore (1) = **240 LF** - CSX
- Length of Jack & Bore (2) = **100 LF** - CSX
- Total Length = **10,972 LF**

Route Alternative 10 - Constructability

PROS

- The majority of the construction is located off of Harbour Island.
- Newly constructed 48" SST and 48"/54" Fiberglass force main will remain in service.
- May be able to use the existing line stop installed in 2017, located on Channelside Way.

CONS

- Alignment runs along the north side of Harbour Island in Garrison Channel, next to boat docks / slips, which will be very difficult to permit and construct.
- May not be feasible to open-cut construct the portion of the force main in Garrison Channel located under the Beneficial Drive Bridge or within Sparkman Channel.
- Subaqueous force main is difficult to access and repair if there is ever a problem.
- Alignment on east side of Sparkman Channel runs through a CSX owned strip of property, which will require an easement.
- There is an existing TECO subaqueous electric crossing under Sparkman Channel that will need to be avoided during dredging operations.
- Finding an open lane to install the new 54" Force Main along Maritime Blvd will be challenging.
- There are two existing lift stations on Harbour Island that connect to the existing 54" Force Main. This will require the City to design and install a new 12" force main to handle these flows.

Route Alternative 10 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit
- Port Tampa Bay Major work permit

PROPERTY REQUIREMENTS

- Post Apartment Homes L P
- Garrison Harbourside, LLC
- Island Place Condominium Association Inc.
- Harbour Island Community Services Association Inc.
- Argos Cement LLC
- Sovereign Submerged Land Easement
- Port Tampa Bay

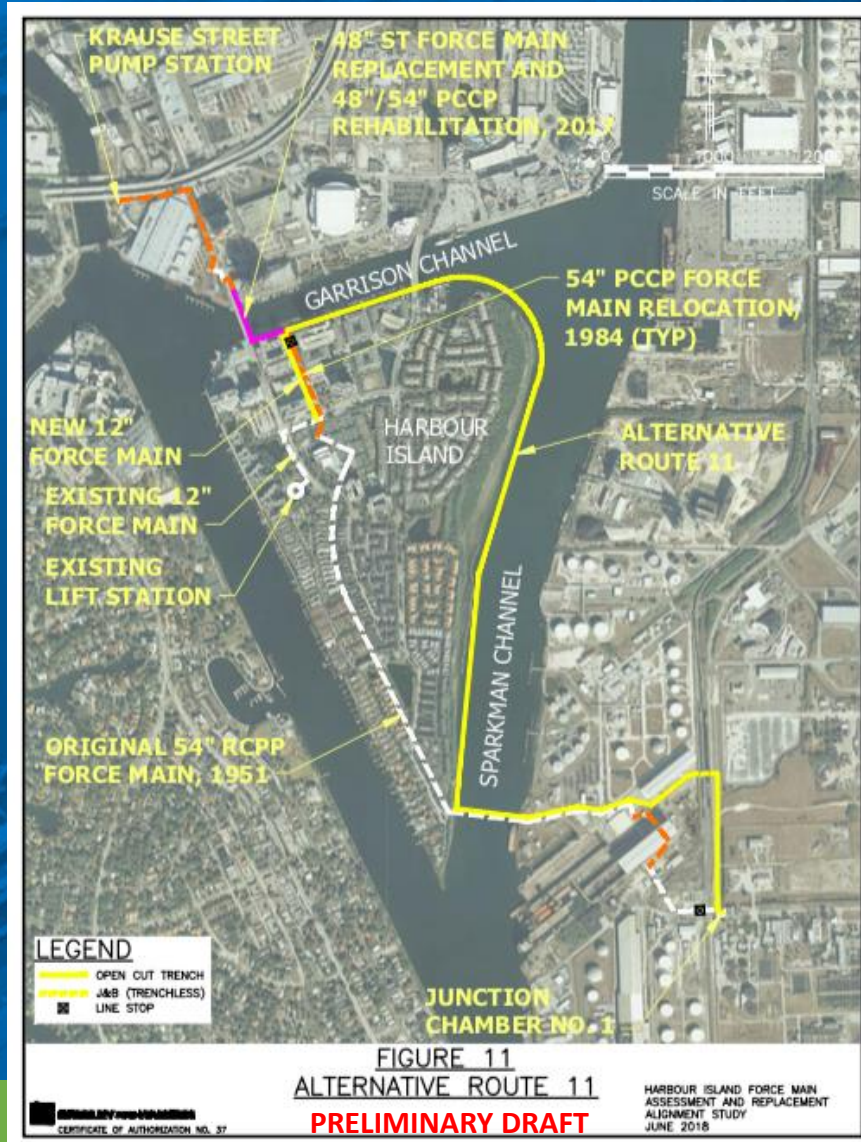
Route Alternative 10 - Conclusions

POTENTIAL FATAL FLAWS

- Subaqueous open-cut trench excavation under the Beneficial Bridge and within Sparkman Channel will be challenging if not impractical to construct and permit.
- The open-cut trench across Sparkman Channel will not likely be permitted by the U.S. Army Corps of Engineers or Port Tampa Bay due to ship traffic.
- Subaqueous force main installation makes future access for repair and maintenance extremely difficult.
- The duration of the construction would need to be considered.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 11



- Length of Open-Cut Pipe = **3,127 LF**
- Length of Subaqueous Open-Cut = **7,700 LF** - Garrison and Sparkman Channels
- Length of Jack & Bore (1) = **240 LF** - CSX
- Total Length = **11,067 LF**

Route Alternative 11 - Constructability

PROS

- The majority of the construction is located off of Harbour Island.
- Newly constructed 48" SST and 48"/54" Fiberglass force main will remain in service.
- May be able to use the existing line stop installed in 2017, located on Channelside Way.

CONS

- Alignment runs along the north side of Harbour Island in Garrison Channel, next to boat docks / slips, which will be very difficult to permit and construct.
- May not be feasible to open-cut construct the portion of the force main in Garrison Channel located under the Beneficial Drive Bridge or within Sparkman Channel.
- Subaqueous force main is difficult to access and repair if there is ever a problem.
- There is an existing TECO subaqueous electric crossing under Sparkman Channel that will need to be avoided during dredging operations.
- Finding an open lane to install the new 54" Force Main along Maritime Blvd will be challenging.
- There are two existing lift stations on Harbour Island that connect to the existing 54" Force Main. This will require the City to design and install a new 12" force main to handle these flows.

Route Alternative 11 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit
- Port Tampa Bay Major work permit

PROPERTY REQUIREMENTS

- Post Apartment Homes L P
- Garrison Harbourside, LLC
- Island Place Services Association Inc.
- Harbour Island Community Services Association Inc.
- Harbour Homes at Harbour Island Neighborhood Association Inc.
- Keys at Harbour Island HOA Inc.
- Harbourside at Harbour Island HOA Inc.
- Sovereign Submerged Land Easement
- Port Tampa Bay

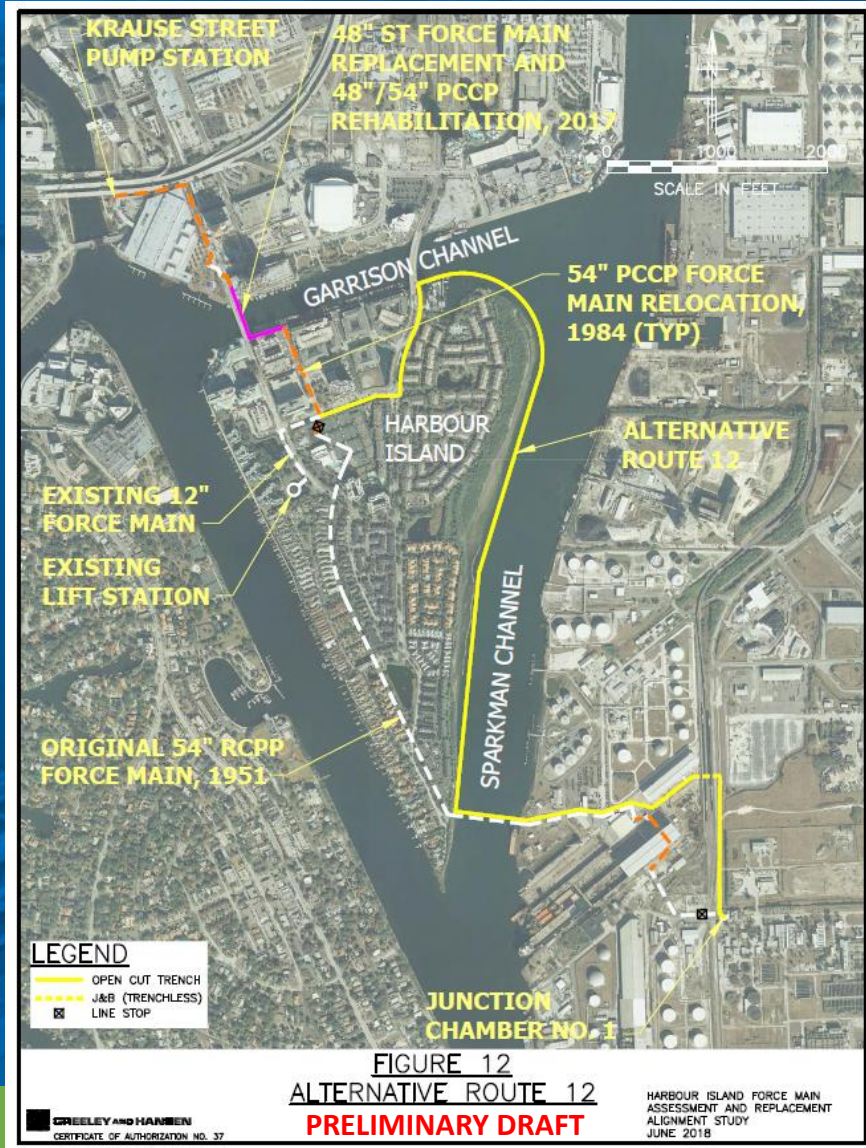
Route Alternative 11 - Conclusions

POTENTIAL FATAL FLAWS

- Subaqueous open-cut trench excavation under the Beneficial Bridge and within Sparkman Channel will be challenging if not impractical to construct and permit.
- The open-cut trench across Sparkman Channel will not likely be permitted by the U.S. Army Corps of Engineers or Port Tampa Bay due to ship traffic.
- Subaqueous force main installation makes future access for repair and maintenance extremely difficult.
- The duration of the construction would need to be considered.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 12



- Length of Open-Cut Pipe = **4,870 LF**
- Length of Subaqueous Open-Cut = **6,480 LF** - Garrison and Sparkman Channels
- Length of Jack & Bore (1) = **240 LF** - CSX
- Total Length = **11,590 LF**

Route Alternative 12 - Constructability

PROS

- Alignment runs a shorter distance along paved roadways on Harbour Island in comparison to other alternative routes, which will simplify maintenance of traffic. Roads have four lanes and a median, which allows traffic on one side of the median during construction.
- Newly constructed 48" SST and 48"/54" Fibrwrap force main will remain in service.

CONS

- May not be feasible to open-cut construct the portion of the force main in Garrison Channel located under the Beneficial Drive Bridge or within Sparkman Channel.
- Subaqueous force main is difficult to access and repair if there is ever a problem.
- There is an existing TECO subaqueous electric crossing under Sparkman Channel that will need to be avoided during dredging operations.
- Finding an open lane to install the new 54" Force Main along Maritime Blvd will be challenging.

Route Alternative 12 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit
- Port Tampa Bay Major work permit

PROPERTY REQUIREMENTS

- Post Apartment Homes L P
- Garrison Harbourside, LLC
- Island Place Services Association Inc.
- Harbour Island Community Services Association Inc.
- Harbour Homes at Harbour Island Neighborhood Association Inc.
- Keys at Harbour Island HOA Inc.
- Harbourside at Harbour Island HOA Inc.
- Sovereign Submerged Land Easement
- Port Tampa Bay

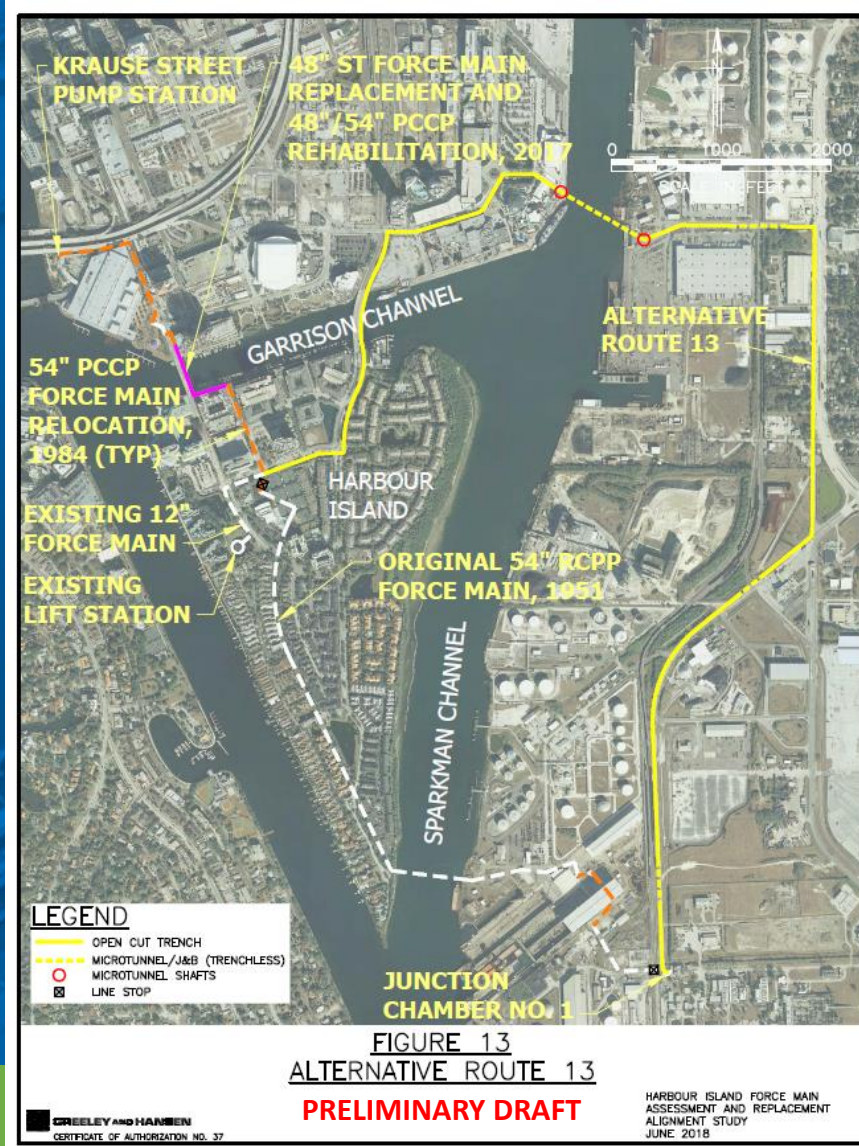
Route Alternative 12 - Conclusions

POTENTIAL FATAL FLAWS

- Subaqueous open-cut trench excavation next to the Beneficial Bridge and within Sparkman Channel will be challenging if not impractical to construct and permit.
- The open-cut trench across Sparkman Channel will not likely be permitted by the U.S. Army Corps of Engineers or Port Tampa Bay due to ship traffic.
- Subaqueous force main installation makes future access for repair and maintenance extremely difficult.
- The duration of the construction would need to be considered.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Alternative Route 13



- Length of Open-Cut Pipe = **12,985 LF**
- Length of Aerial Crossing = **515 LF** – Garrison Channel (Beneficial Drive Bridge)
- Length of Microtunnel = **900 LF** - Sparkman Channel
- Length of Jack & Bore (1) = **110 LF** - CSX
- Length of Jack & Bore (2) = **100 LF** - CSX
- Length of Jack & Bore (3) = **100 LF** - CSX
- Total Length = **14,710 LF**

Route Alternative 13 - Constructability

PROS

- This route avoids the impact to Old Water Street that will be required under Alternative Route 8, which will require special coordination with the Convention Center, Amalie Arena and major hotels.

CONS

- This is the longest alternative route considered.
- Proposed force main along Beneficial and Channelside Drives will require special coordination and cooperation with “Water Street Project.”
- Proposed force main in Channelside Drive in front of the Channelside Bay Plaza, The Florida Aquarium and Port Tampa Bay Cruise Terminals will be extremely difficult to design and construct.
- There will be significant interruptions to the Trolley running between Channelside and Ybor City.
- The microtunnel shaft located between “The Florida Aquarium” and “Port Tampa Bay Cruise Terminal 3” will be challenging to construct due to limited access.
- Microtunnel shafts and microtunneling are an expensive trenchless option.

Route Alternative 13 - Requirements

PERMITTING

- City of Tampa Right-of-Way Use
- Florida Department of Environmental Protection (FDEP) Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System
- FDEP Individual or Standard General Environmental Resource Permit (ERP)
- U.S. Army Corps of Engineers Individual or Nationwide 12 Permit
- CSX Utility Crossing Permit

PROPERTY REQUIREMENTS

- Sovereign Submerged Land
- Port Tampa Bay

Route Alternative 13 - Conclusions

POTENTIAL FATAL FLAWS

- There are many unknowns associated with the route running back across Garrison Channel from Harbour Island: existing utilities, Selmon Expressway, interruptions to downtown trolley, Convention Center, Amalie Arena, The Florida Aquarium, Channelside Bay Plaza and Port Tampa Cruise Terminal.
- The duration of the design and construction would need to be considered.

ELIMINATE THIS ALTERNATIVE ROUTE FROM FURTHER EVALUATION

Summary

Route Alternative 1

Conclusion: Eliminate

Route Alternative 2

Conclusion: Eliminate

Route Alternative 3

Conclusion: Eliminate

Route Alternative 4

Conclusion: Retain for further evaluation

Route Alternative 5

Conclusion: Eliminate

Route Alternative 6

Conclusion: Eliminate

Route Alternative 7(a)

Conclusion: Retain for further evaluation

Route Alternative 7(b)

Conclusion: Retain for further evaluation

Route Alternative 8

Conclusion: Retain for further evaluation

Route Alternative 9

Conclusion: Eliminate

Route Alternative 10

Conclusion: Eliminate

Route Alternative 11

Conclusion: Eliminate

Route Alternative 12

Conclusion: Eliminate

Route Alternative 13

Conclusion: Eliminate

Next Steps

- ✓ Harbour Island Community Task Force Meeting - TBD
 - Present and Discuss Findings from Existing Force Main Evaluation
- ✓ Public Meeting #2 – TBD
 - Present Final Route Alternatives
 - Gather Public Input
- ✓ Harbour Island Community Task Force Meeting - TBD
 - Present and Discuss Final Route Selection
- ✓ Public Meeting #3 - TBD
 - Present Final Route Selection

Q & A

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