



REGIONAL TUNNEL SYSTEM

Information Package for Council President Theresa Kail-Smith
City of Pittsburgh Council District 2

January 2022

ALCOSAN has adopted the Clean Water Plan (CWP) to improve and protect the quality of the region's streams and rivers by controlling combined sewer overflows (CSOs) and eliminating sanitary sewer overflows (SSOs). The CWP is part of the modified Federal Consent Decree to comply with the United States Environmental Protection Agency's CSO Control Policy.

The CWP is made up of four components: preventing excess water from entering the sewer systems; expanding the wastewater treatment plant; taking ownership of multi-municipal sewers; and **constructing a new regional tunnel system**, using the best data in future construction.

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Regional Tunnel System Overview

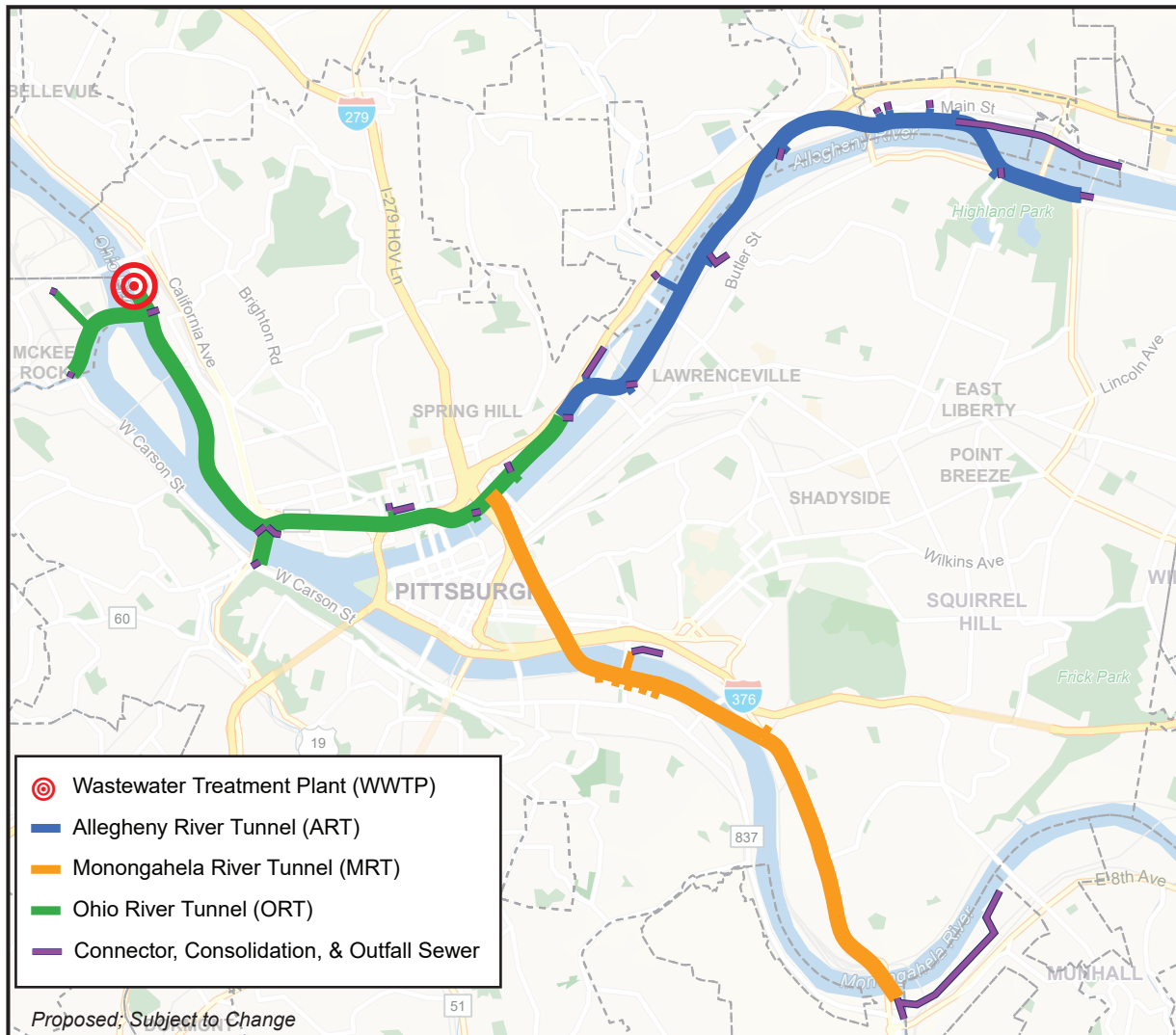
The regional tunnel system is a critical component of the CWP

The new regional tunnel system will consist of three major tunnel projects, including near surface facilities, designed to capture wet weather flows and move them to the WWTP for treatment (see pages 2 and 3 for details).

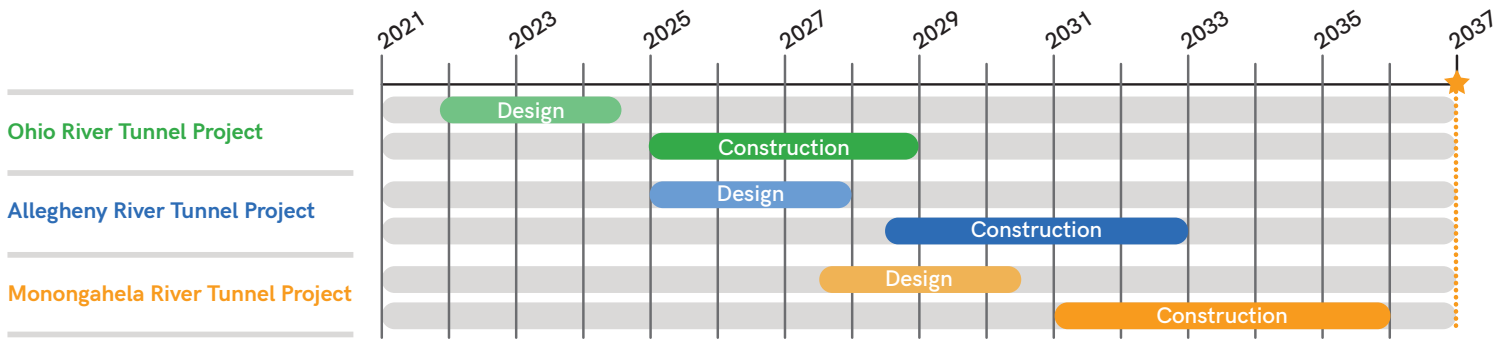
Implementation will start with the Ohio River Tunnel (ORT) project, followed by the Allegheny River Tunnel (ART) project and Monongahela River Tunnel (MRT) project.

The implementation of the proposed regional tunnel system coupled with the WWTP expansion and the other components of the CWP is anticipated to reduce the volume of wet weather overflows from an estimated 9.3 billion gallons to less than 2.7 billion gallons per year by the end of 2036 (or an approximately 70% reduction). This will help ALCOSAN meet the ultimate requirement of the consent decree to improve water quality through the reduction of overflows.

MAP OF REGIONAL TUNNEL SYSTEM



Implementation will span 15 years



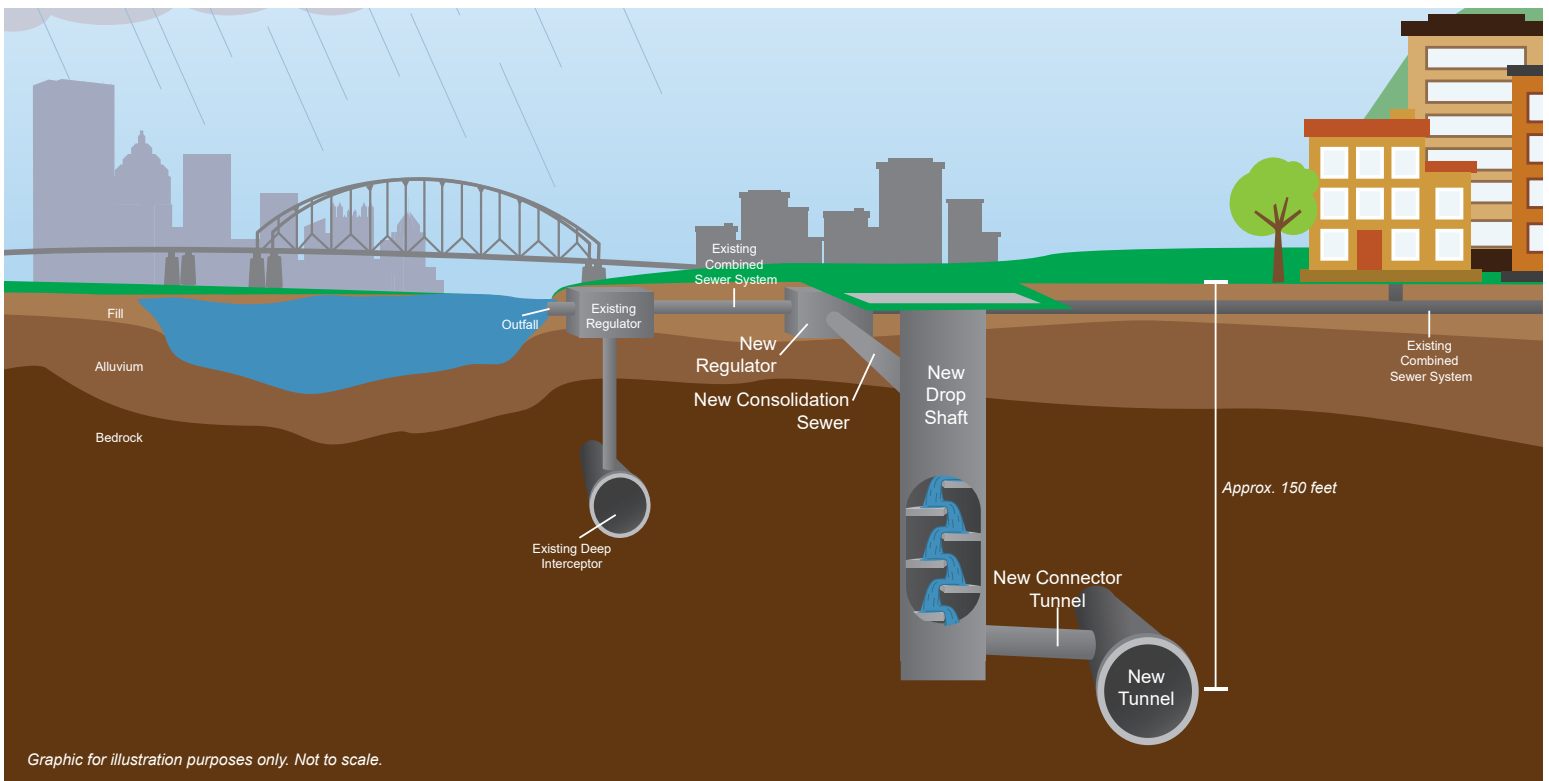
The new system will connect to existing sewer infrastructure

The new tunnel system facilities will...

- Divert sewer overflows during wet weather from the existing municipal and ALCOSAN's system via regulators and consolidation sewers.
- Transfer flow from the consolidation sewers to the deep tunnel through drop shafts and connector tunnels.
- Transfer flow to a new wet weather pump station which will move the flow to the plant for treatment.
- Store excess flow in the main tunnels when the plant capacity is exceeded. Stored combined sewage would be pumped out when the plant has capacity to receive the flow.

The regional tunnel system operating together with the existing infrastructure will reduce CSOs at the existing outfalls along the main rivers and streams and allow for captured flows to be treated, thereby working towards improving water quality for the entire region.

Tunnel System Facilities Diagram



Graphic for illustration purposes only. Not to scale.

Regional tunnel system facilities

The regional system will include tunnel-related facilities and near surface facilities.

The **main tunnels** are planned to be 18 feet in finished diameter (see example in top photo) and will be constructed at a depth of about 150 feet below ground. They will primarily be constructed using large tunnel boring machines that will be lowered from the surface and later retrieved via construction shafts.

Connector tunnels are short tunnels that send flows from the drop shafts to the main tunnels. Connector tunnels will typically be 8 feet in finished diameter and be located at similar depths as the main tunnels.

Construction shafts are large diameter, deep, vertical structures that are used as part of the main tunnel or connector tunnels construction for insertion and removal of the tunnel boring machine. After construction is complete, internal structures are installed to convert the construction shafts to a drop shaft and/or an access shaft.

Drop shafts are deep, vertical structures that transfer the combined sewage from the surface to the level of the connector tunnels and tunnels. Their design includes hydraulic structures to manage flow as it drops and to dissipate the energy generated to prevent damage to the drop shaft and the tunnels. The drop shafts are anticipated to range between around 15 feet and 50 feet in diameter.

Access shafts are used solely for inspection and maintenance. Access shafts do not convey flow from the surface to the tunnel and therefore have limited internal structure facilities compared to a drop shaft. They will have fewer covers but would have a larger access to allow for lowering of equipment and personnel to the tunnel if necessary.

Regulators are underground structures that are built along existing sewers to control where combined sewage is sent. Regulators allow normal dry weather flow to continue to the existing sewer network but during wet weather they divert flow to drop structures and into the tunnel. During very large storms, there may be times when the existing sewer network and the tunnel cannot handle the flow and excess flows would then discharge to the rivers as they do today.

Consolidation sewers are needed to convey some of the combined sewage to the drop shafts. Consolidation sewers avoid building additional drop shafts and long connector tunnels to the main tunnels. Consolidation sewers are part of what is referred to as "near surface facilities" as they are built closer to the ground surface at similar depths as existing sewers and are anticipated to range between 24-inches and 144-inches in diameter at depths between 10 and 50-feet below ground.



The new system provides regional benefits

Environmental and Health

Reducing the volume of overflows into the receiving rivers and streams is a requirement of the Modified Consent Decree and will have significant positive short and long-term benefits of enhanced river and waterfront recreational opportunities, public health and the protection of public water supplies. The CWP will reduce sewer overflows into the rivers and waterways in our region from over 9 billion gallons to less than 3 billion gallons in a typical year. In addition, combined sewer overflows will be eliminated at 15 outfalls located near Sensitive Areas, such as recreation areas. The regional tunnel system will help ALCOSAN meet the ultimate requirement of the consent decree to improve water quality through the reduction of overflows.

Community Benefits

The positive impact of the CWP and regional tunnel system is significant, not only in job creation over the next 15 years, but also in supporting future/continued riverfront development. The regional tunnel system is laying the foundation of sustainable infrastructure for today and decades to come.

Improvement of Public Spaces

During construction of the regional tunnel system, ALCOSAN will temporarily impact certain sites. ALCOSAN will restore these sites. ALCOSAN will work with communities to leave behind an improved site. These “green leave behinds” aim to leave sites impacted by construction better than they were found while considering the affordability, adaptability and regional characteristics of the CWP.

Jobs

The regional tunnel system is anticipated to support a **total of over 21,000 jobs** throughout Allegheny County.

- **Direct jobs = over 14,000**
- **Indirect jobs = over 2,000**
- **Induced jobs = over 5,000**

Riverfront Development

Our region is undergoing extensive economic redevelopment along its waterfronts, which will be boosted by the capital investments in necessary infrastructure.

Economic Output*

The regional tunnel system is estimated to contribute **\$2.6 billion in total economic output**, with \$1.4 billion in total value added to Allegheny County's economy. Tunnel construction alone will generate nearly half of the benefit directly. Indirect benefits will be dispersed primarily among Architectural/Engineering, Wholesale, and Retail (building material and equipment/supply). The regional tunnel system is expected to **generate \$1.5 billion in capital investment** from all three river tunnel segments between 2021 and 2036.

** in 2020 dollars*

The new system represents half of the CWP budget

ALCOSAN's updated CWP is the more affordable alternative to the previous Wet Weather Plan. The original selected plan was \$3.6 billion, which would have resulted in a high financial burden for many ALCOSAN customer municipalities and individual ratepayers. In response to public comments, ALCOSAN negotiated the first stage of the CWP as part of Modified Consent Decree to a more affordable \$2 billion.*

**in 2010 dollars*

The new system aligns with the City's vision for improved water quality

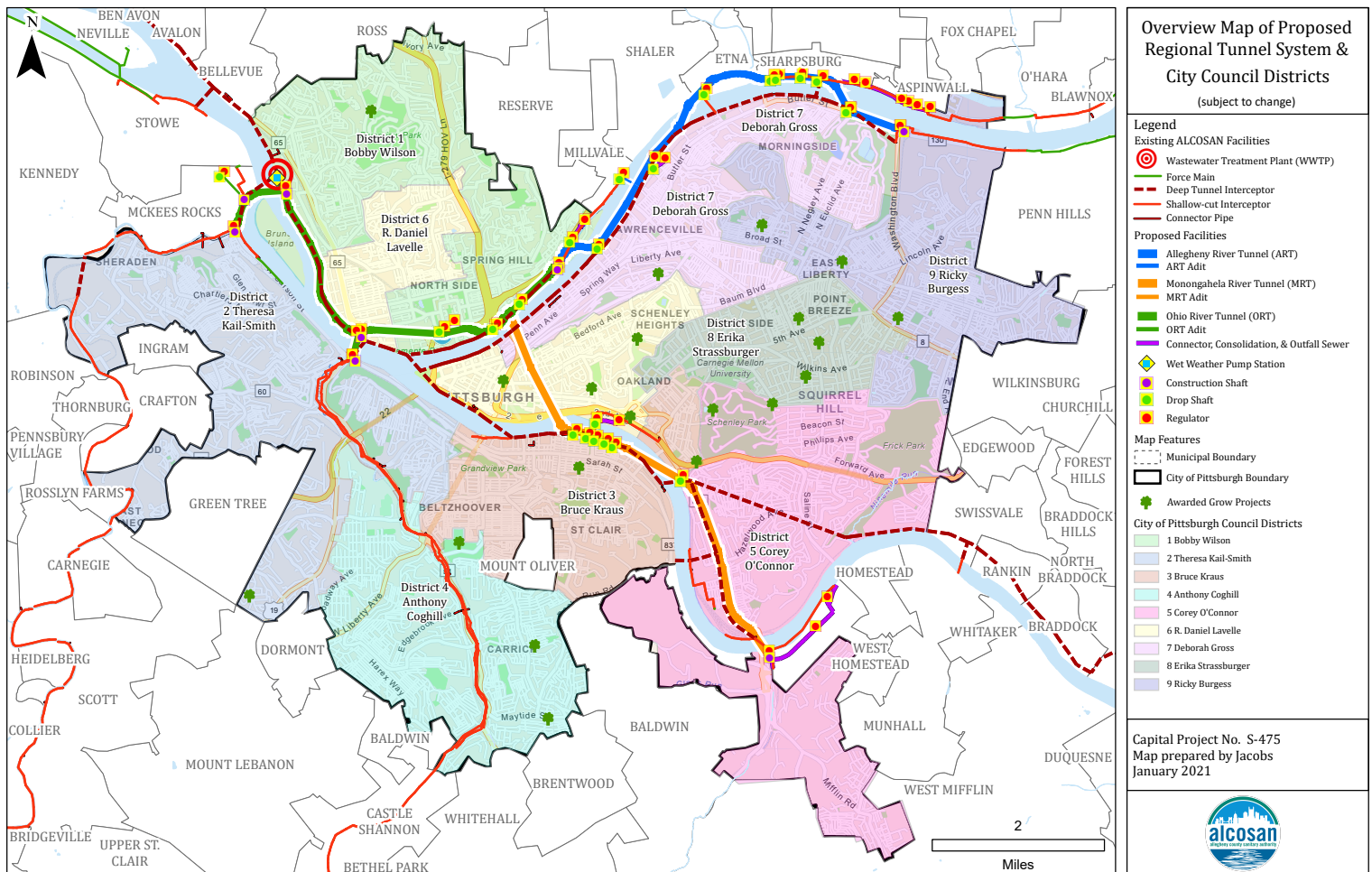
The proposed regional tunnel system location within the City of Pittsburgh and Council Districts is shown in the map below.

Within the City of Pittsburgh, there are multiple organizations working towards the same goal – improving water quality. Ongoing planning efforts include the Department of City Planning - Forging PGH Comprehensive Plan, PWSA Stormwater Strategic Plan and PWSA Wet Weather Plan. ALCOSAN will continue to make itself available to these organizations to coordinate their efforts with the CWP and regional tunnel system implementation and ensure that the best and most cost-effective solution for the region is implemented.

ALCOSAN will also continue implementing its Green Revitalization of Our Waterways (GROW) program, which was created in 2016 by the ALCOSAN Board of Directors to prevent excess water from entering the already overloaded sewer collection system. Since its inception, the GROW program has provided over \$65 million in grant funding towards 136 projects in the ALCOSAN service area that will reduce sewer overflow by an estimated 245 million gallons.

ALCOSAN awarded 22 GROW grants for projects within the City as shown on the map below. The projects included a majority of green stormwater infrastructure projects (16) as well as inflow/infiltration reduction projects (4) and direct stream inflow removal projects (2). Two of these projects were led by the City of Pittsburgh, while the remainder were led by PWSA.

In total, the City and PWSA have been awarded approximately \$25 million in GROW funding towards a total project cost of approximately \$50 million. Alignment with the City's vision will be an ongoing process throughout the design and construction phases of each of the three tunnel projects.





537 Plan Special Study

The Special Study will amend the 537 Sewage Facilities Plan

ALCOSAN's 537 Plan was approved in 1996 and subsequently amended in 2018 to reflect ALCOSAN's expansion of wet weather treatment capacity at its WWTP.

A new Special Study is being drafted to serve as a second amendment to the 537 Plan covering the Regional Conveyance Facilities included in ALCOSAN's Clean Water Plan.

Upon Pennsylvania Department of Environmental Protection approval, this new Special Study will effectively amend the 537 Plan from 1996.

The Regional Conveyance Facilities consist of a 120 million gallon per day wet weather pump station to be constructed at or near ALCOSAN's WWTP and the subject new regional tunnel system.

The Special Study is a key component of the permitting process that will ultimately allow ALCOSAN to proceed with the construction of the regional tunnel system as required by the Modified Consent Decree.

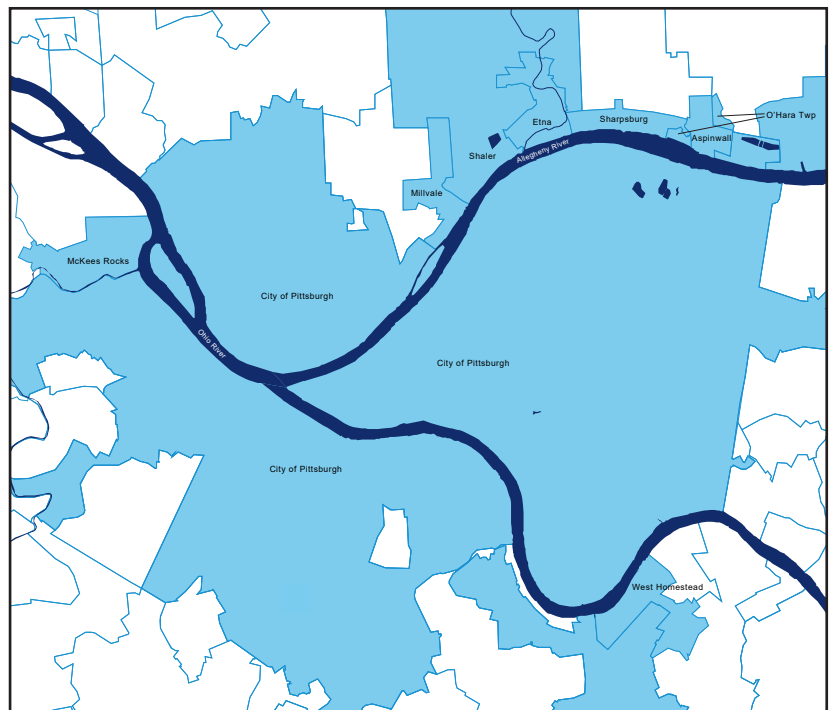
Formal adoption of the Special Study is required

Resolutions formally adopting the Special Study will be required from the nine customer municipalities directly impacted by the planned construction:

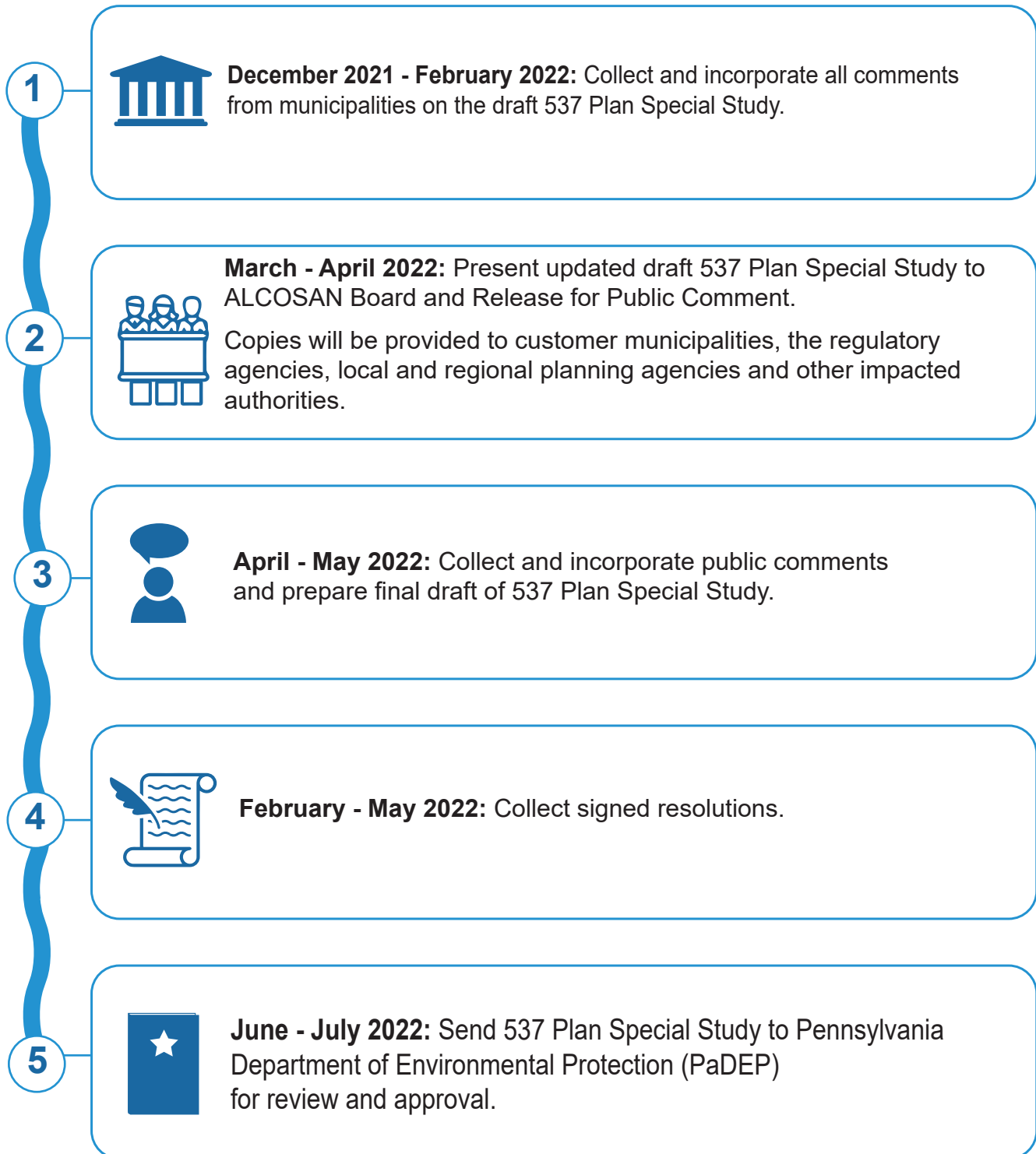
1. Aspinwall Borough
2. City of Pittsburgh
3. Etna Borough
4. McKees Rocks Borough
5. Millvale Borough
6. O'Hara Township
7. Shaler Township
8. Sharpsburg Borough
9. West Homestead Borough

ALCOSAN is also coordinating the development of this Special Study with the Pittsburgh Water and Sewer Authority (PWSA) and Hampton-Shaler Water Authority.

Municipalities required to adopt the Special Study



537 Plan Special Study Tentative Timeline





Call to Action

What do we need from you?

Review & Provide Comments on the Act 537 Plan Special Study

- Share the 537 Plan Special Study with the City of Pittsburgh Planning Commission.
- Review and provide comments on the 537 Plan Special Study.
- Forward all comments (from Planning Commission and City Council) to ALCOSAN within 60 days.
- Pass a City Council Resolution approving the Act 537 Plan Special Study and forward to ALCOSAN.

Prepare for Final Design of the Ohio River Tunnel (ORT) Project

- Opportunities for coordination and collaboration will occur throughout the final design and permitting process as well as during construction.
- ORT is the first project; design is starting in 2022 and construction is expected to begin in 2025.
- Help us to identify the right people, groups, messaging, and methods we should use to reach your constituents.

Questions?

Please contact:

Jeanne K. Clark

Director of Government Affairs, ALCOSAN

412-734-6222 (desk) / 412-735-8197 (cell)

jeanne.clark@alcosan.org



City Council District 2 Details

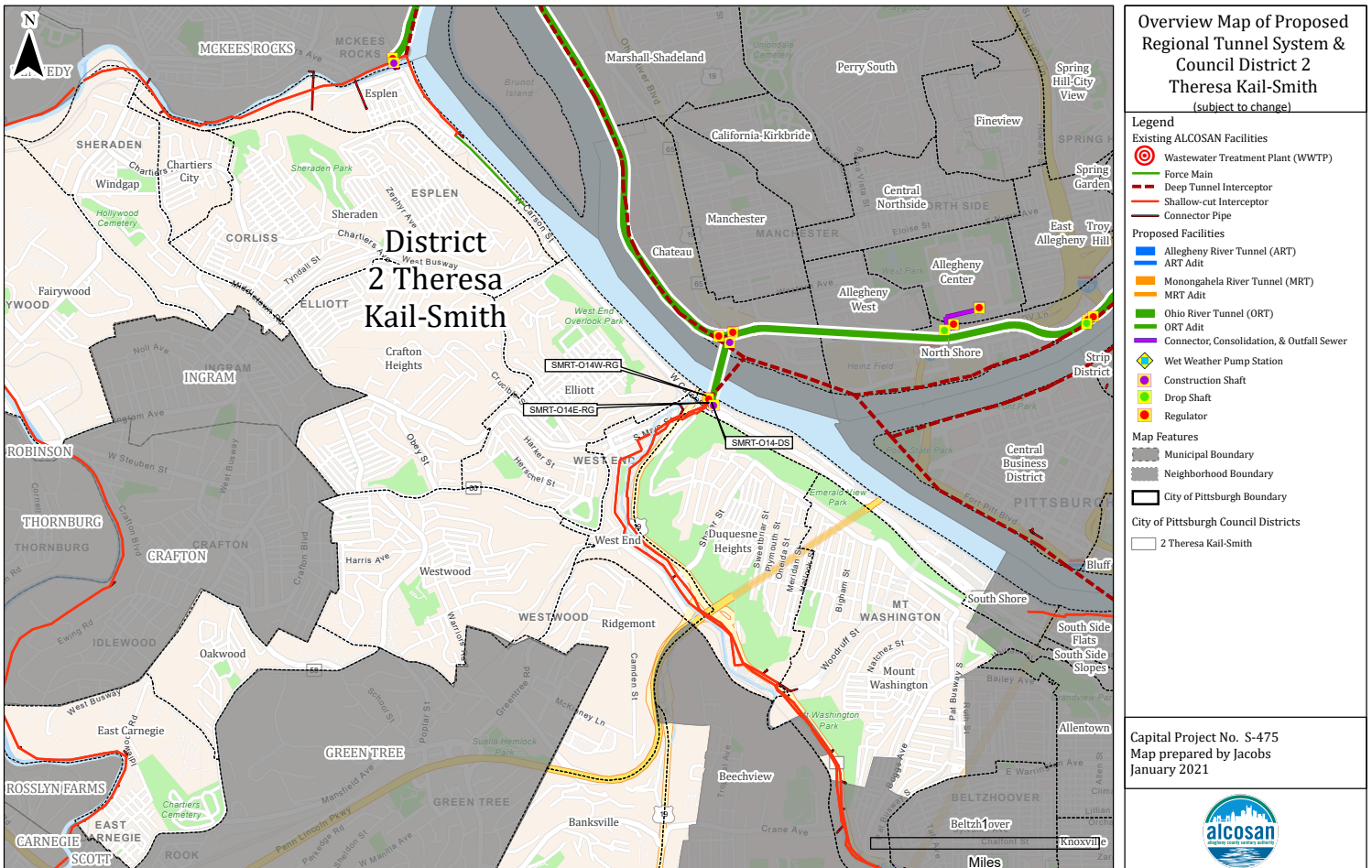
Regional Tunnel System in District 2

District 2 has made great strides in addressing overflows through green infrastructure and other source control projects. However, these projects alone are not sufficient to achieve the targeted overflow reductions and ALCOSAN must move forward with the implementation of the regional tunnel system.

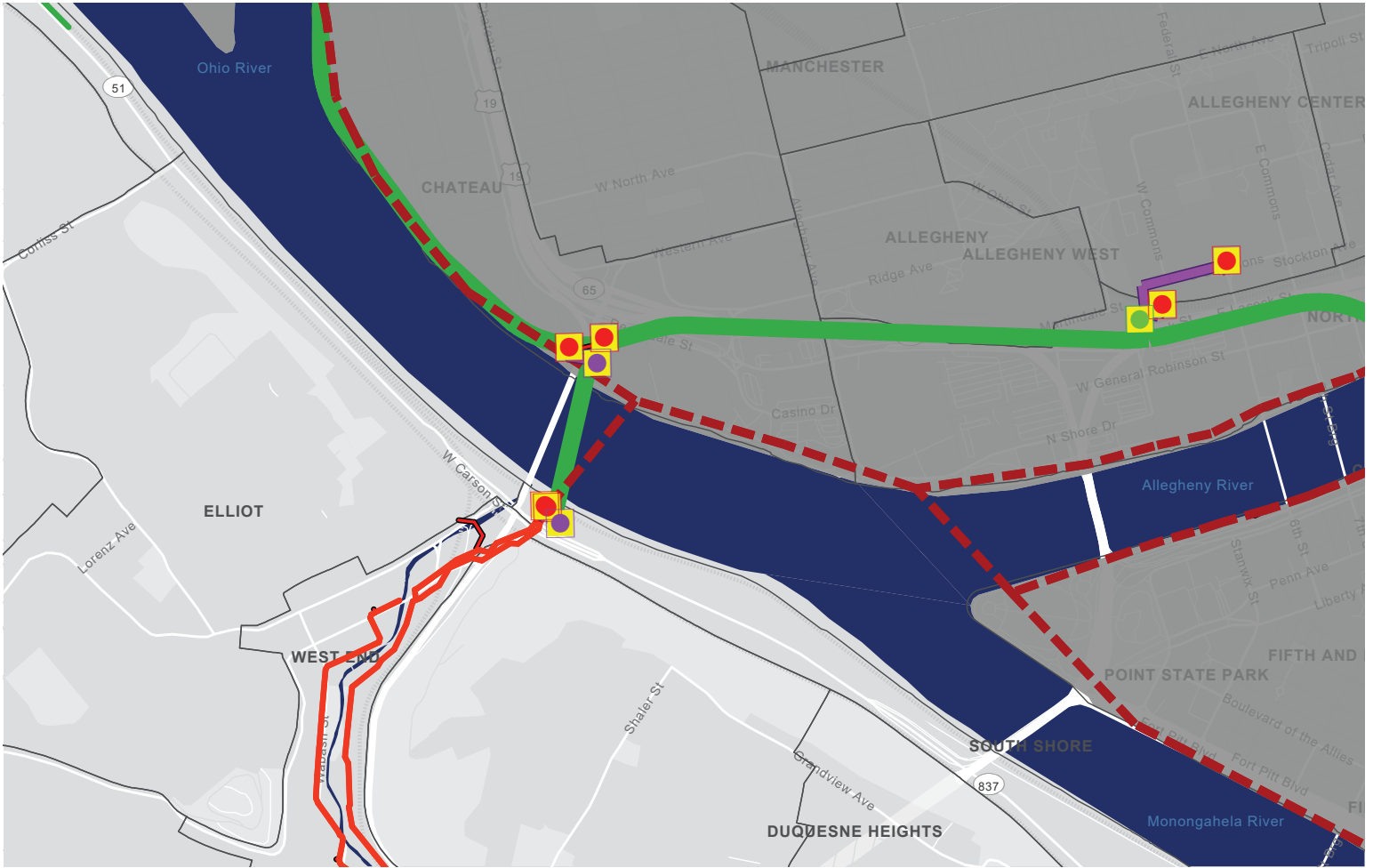
The implementation of the regional tunnel system and other components of the CWP will significantly reduce overflows at O-14, located at the north-western end of the South Shore Neighborhood (see map below).

ALCOSAN is engaged in a Memorandum of Understanding with Riverlife as part of their Closing the Loop project, extending the trail to the West End, safely connecting pedestrians and bikers to the West End Bridge, and creating a park allowing community access to the river. As ALCOSAN is acquiring land in the area for our tunnel project, we are working side-by-side with Riverlife and other stakeholders to make sure that the planned improvements will fit with both ALCOSAN's and the community's needs.

For a more detailed representation of the proposed facilities location and tunnel statistics in District 2, please see page 10.



TUNNEL SYSTEM IN DISTRICT 2













District 2 Tunnel Stats*

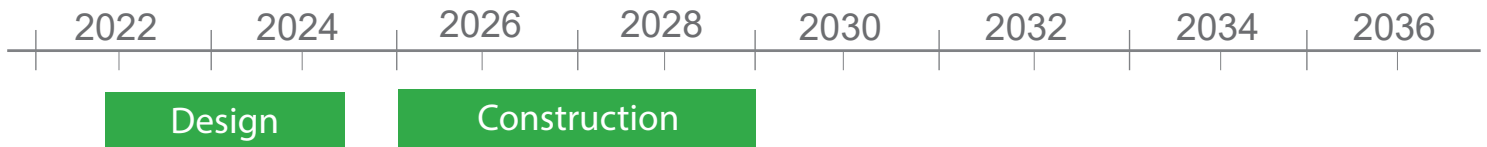
- Total length of tunnel:** 670 feet
- Depth of tunnel below ground:** 150 feet
- Diameter of tunnel:** 14 feet
- # of Shafts:** 1
- Diameter of shafts:** 35 feet
- Depth of shafts:** 150 feet
- # of Regulators:** 2
- Total length of consolidation sewer:** 161 feet
- Total length of connector tunnel (adit):** N/A
- Depth of connector tunnel below ground:** N/A

* Tunnel stats and timeline are subject to changes as design proceeds towards a final design and construction.

Map Key

-  Point of Connection (*Existing*)
-  Regulator
-  Drop Shaft
-  Construction Shaft
-  Ohio River Tunnel (ORT)
-  ORT Connector Tunnel (or Adit)
-  Connector, Consolidation, & Outfall Sewer
-  Shallow-cut Interceptor and river crossings (*Existing*)
-  Deep Tunnel Interceptor (*Existing*)
-  Neighborhood Boundary

ORT Timeline



City of Pittsburgh

RESOLUTION NO. _____

File Number:

Enactment Number:

SPONSOR /S:

Resolution adopting the ALCOSAN ACT 537 SPECIAL STUDY.

WHEREAS, Section 5 of the Act of January 24, 1996, P.L. 1535, No. 537, known as the Pennsylvania Sewage Facilities Act, as amended, and the Rules and Regulations of the Department of Environmental Protection adopted thereunder, Chapter 71 of Title 25 of the Pennsylvania Code, requires the City of Pittsburgh to adopt an Official Sewage Facilities Plan providing for sewage services adequate to prevent contamination of waters and/or environmental health hazards with sewage wastes, and to revise said plan whenever it is necessary to meet the sewage disposal needs of the municipality, and

WHEREAS, the Allegheny County Sanitary Authority (ALCOSAN) has prepared an Act 537 Special Study – Interim Measures Wet Weather Plan (IWWP) as an amendment to ALCOSAN’s Act 537 Sewage Facilities Plan (1996) which provides for sewage facilities in a portion of the City of Pittsburgh; and

WHEREAS, the scope of this Special Study is limited to Act 537 planning requirements that directly relate to the alternative of choice to be implemented by December 31, 2036: Regional Conveyance Facilities including the wet weather pump station to be constructed at ALCOSAN’s Woods Run Wastewater Treatment Plant; and

WHEREAS, adoption will be required by those municipalities through which the tunnel alignment passes and those locations where surface construction is proposed. As such, formal adoption of the Special Study is required from nine municipalities: Aspinwall Borough, City of Pittsburgh, Etna Borough, McKees Rocks Borough, Millvale Borough, O’Hara Township, Shaler Township, Sharpsburg Borough, and West Homestead Borough; and

WHEREAS, the City of Pittsburgh finds that the Act 537 Special Study conforms to applicable zoning, subdivision, other municipal ordinances and plans and to a comprehensive program of pollution control and water quality management; and

WHEREAS, the Act 537 Special Study has been submitted to the City of Pittsburgh Planning Commission for review and comment on _____.

NOW, THEREFORE, BE IT RESOLVED that the Council of the City of Pittsburgh, Allegheny County does hereby adopt and submit to the Department of Environmental Protection for its approval as a revision to the Official Plan of the Borough, the above referenced Act 537 Special Study. The City of Pittsburgh hereby assures the Department of the complete and timely implementation of the said plan as required by law (Section 5, Sewage Facilities Act, as amended).

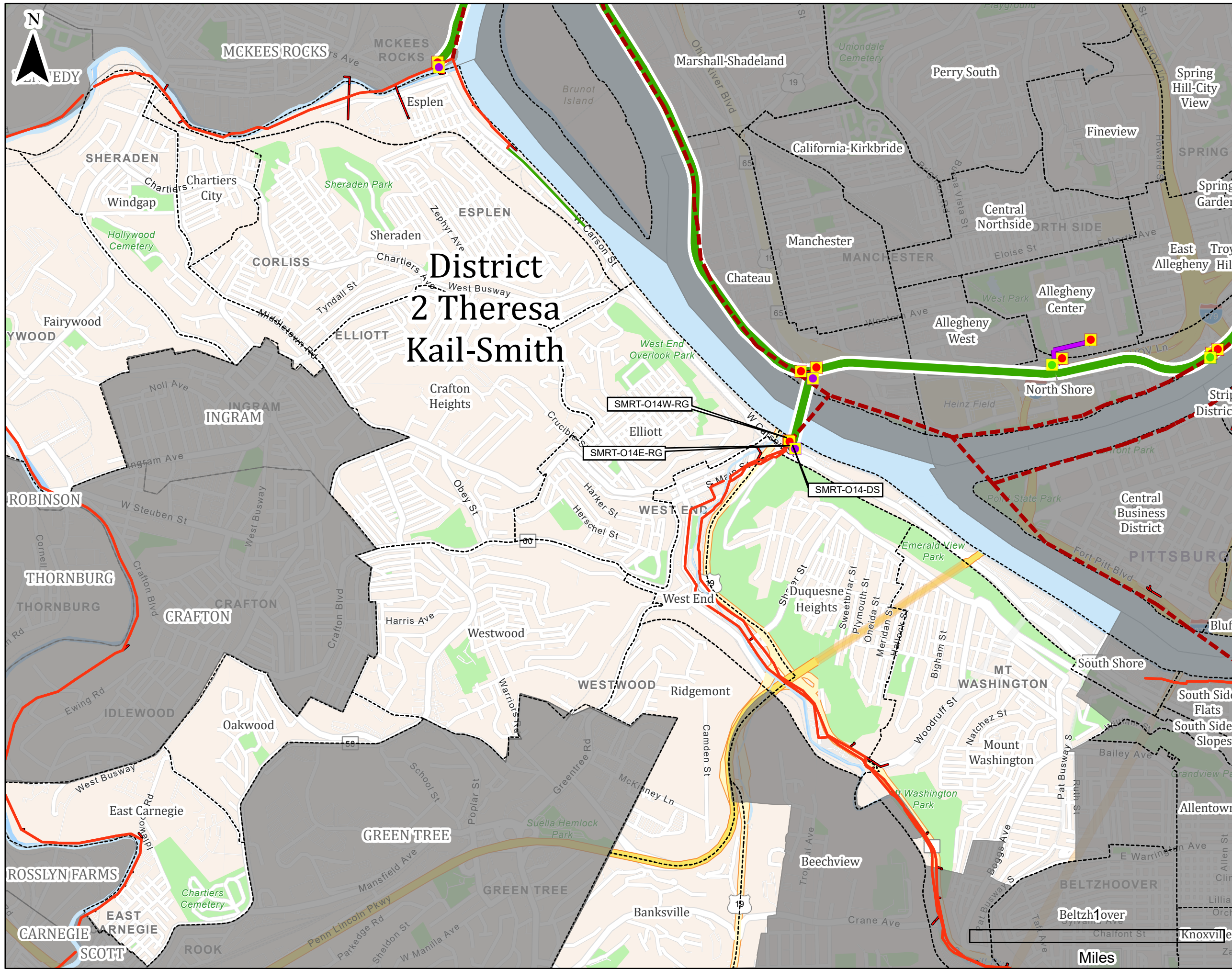
Any resolution or ordinance or part thereof conflicting with the provisions of this Resolution is hereby repealed so far as the same affects this Resolution.

I, certify that this is a true copy of the Pittsburgh City Council Resolution No. _____, passed by Council on _____, approved by the Mayor on _____.

Effective date _____.

ATTEST

Brenda F. Pree
City Clerk



Overview Map of Proposed Regional Tunnel System & Council District 2 Theresa Kail-Smith

(subject to change)

Legend

Existing ALCOSAN Facilities

- Wastewater Treatment Plant (WWTP)
- Force Main
- Deep Tunnel Interceptor
- Shallow-cut Interceptor
- Connector Pipe

Proposed Facilities

- Allegheny River Tunnel (ART)
- ART Adit
- Monongahela River Tunnel (MRT)
- MRT Adit
- Ohio River Tunnel (ORT)
- ORT Adit
- Connector, Consolidation, & Outfall Sewer
- Wet Weather Pump Station
- Construction Shaft
- Drop Shaft
- Regulator

Map Features

- Municipal Boundary
- Neighborhood Boundary
- City of Pittsburgh Boundary

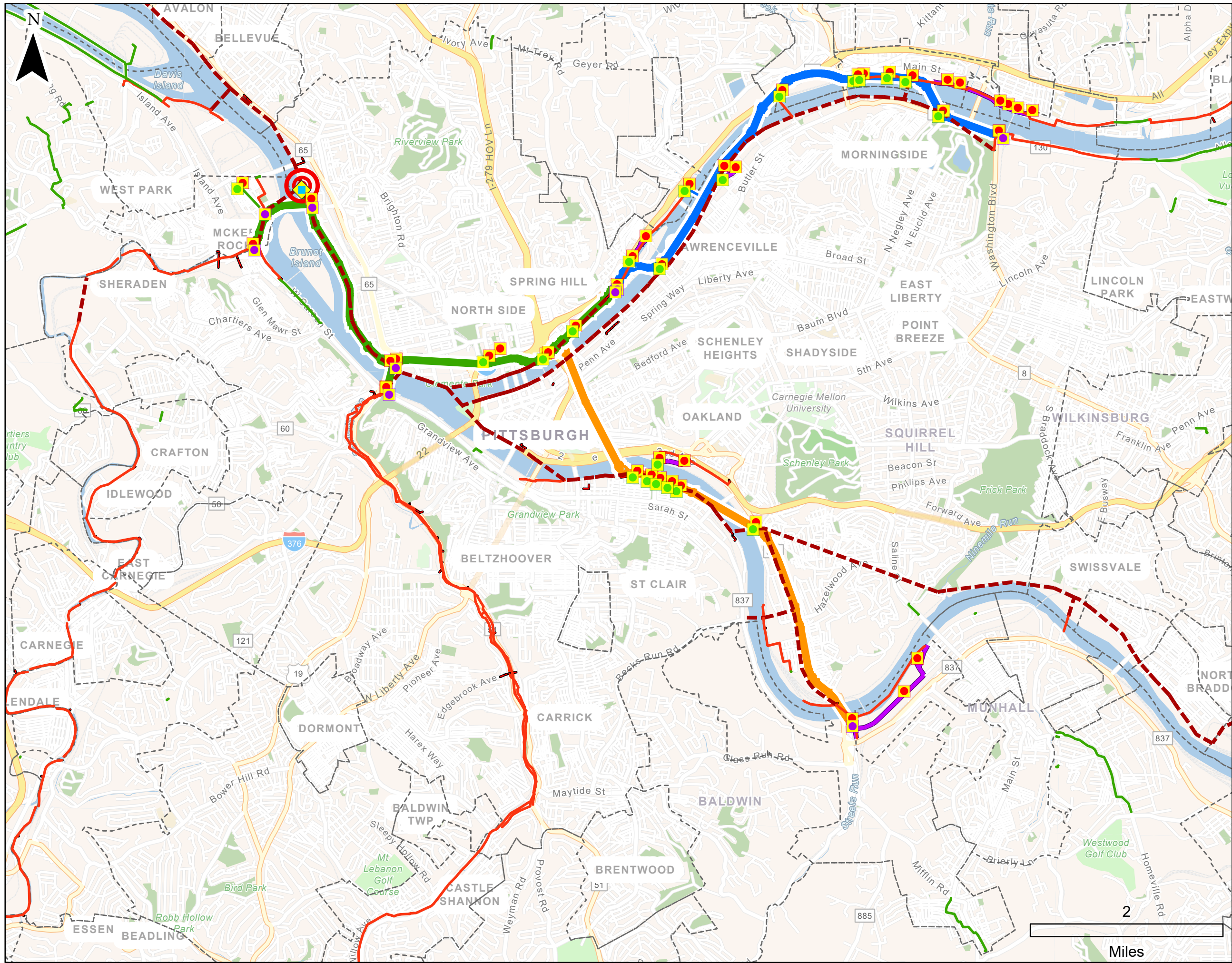
City of Pittsburgh Council Districts

- 2 Theresa Kail-Smith

Capital Project No. S-475
 Map prepared by Jacobs
 January 2021



Miles



Overview Map of Proposed Regional Tunnel System (subject to change)

Legend

Existing ALCOSAN Facilities

- Wastewater Treatment Plant (WWTP)
- Force Main
- Deep Tunnel Interceptor
- Shallow-cut Interceptor
- Connector Pipe

Proposed Facilities

- Allegheny River Tunnel (ART)
- ART Adit
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- Ohio River Tunnel (ORT)
- ORT Adit
- Connector, Consolidation, & Outfall Sewer
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Map Features

- Municipal Boundary

Capital Project No. S-475
 Map prepared by Jacobs
 September 2021



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