Central Bayside System Improvement Project

Improving Our Sewer System and Benefiting the Community

The Central Bayside System Improvement Project (CBSIP) is a part of the Sewer System Improvement Program (SSIP), and is a critical element of the City’s efforts to upgrade the aging and seismically vulnerable combined sewer system on the Bayside.

As part of the Bayside Collection System, the Channel Force Main transports 64% of the City’s entire wastewater flows from homes and businesses from the Channel Pump Station (located near AT&T Park) to the Southeast Treatment Plant (located near Islais Creek) for treatment, reuse and disposal. This important piece of infrastructure is vulnerable to seismic damage and has suffered several failures since the 1989 Loma Prieta earthquake.

To address this sewer system need, the design team is initiating design on a potential tunnel to provide seismically reliable gravity conveyance of wastewater flows from the Channel Pump Station to the Southeast Treatment Plant. The potential tunnel would be nearly 20 times bigger than the Channel Force Main and would provide additional storage to reduce the frequency of sewage discharges during rains. A new pump station will also be needed to lift flow from the deep tunnel up to the Southeast Treatment Plant.

Project Timeline:

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<th>Construction</th>
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The Project Seeks To:

- Improve overall system reliability by improving resilience to seismic events
- Improve water quality along the shores of the Bay by reducing combined sewer discharges
- Increase operational flexibility to help meet goals related to adaptation to climate change and sea level rise

Proposed Features:

- **Channel Tunnel** - Convey flows from a shaft near the Channel Pump Station to the Central Bayside Pump Station
- **Central Bayside Pump Station** - Pump flows from the Channel Tunnel to the Southeast Treatment Plant
- **Three Connection Components**
  - Northern Connection tunnel to convey flows from the Channel Pump Station to a shaft at the northern end of the Channel Tunnel
  - Two Southern Connection force mains to convey flows from the Central Bayside Pump Station to the Southeast Treatment Plant
  - Intertie Connection at the Channel Tunnel to convey wet weather flows from the Islais Creek Transport/Storage Box to the Channel Tunnel
How a Tunnel is Constructed

There would be at least two vertical shafts. Shafts allow equipment and crews to enter and exit tunnels during construction. They may be used by crews to operate and maintain the system in the long term.

The shaft where the tunnel boring equipment would enter is known as the driving shaft, and the exit point is known as the receiving shaft. The driving shaft would be the deepest and widest of the shafts and would be located near the Southeast Plant.

All of the soil and rock excavated for the tunnel would be taken from this driving shaft. The receiving shaft would be located near the Channel Pump Station and would be wide enough to permit the boring machinery to be lifted out after the tunnel has been excavated. It may be necessary to dig smaller ventilation shafts along the course of the tunnel.

A Pipe or a Tunnel?

The existing Channel Force Main was built by digging a trench along various streets and laying a 5.5-foot wide pipe in it. The proposed tunnel would be built by using a machine to dig underground with minimal surface impact. The tunnel shafts would be more than 150 feet deep and would allow workers and machinery to access and work on the tunnel far below street level.

Benefits of a Tunnel

- **Less disruption to vehicle and pedestrian traffic.** There is no trench to obstruct the street and sidewalk.
- **Less noise along the alignment of the tunnel.** Construction noise is reduced because it’s deep underground.
- **Less construction vibration.** The excavation work is far underground and expected to be undetectable at the ground surface. It will be considerably less disruptive than work in a trench at street level.
- **Less seismic risk.** During seismic activities soft soils move more than harder, soils or rock. These movements have the potential to damage or break infrastructure. At the depth of the tunnel the ground conditions are harder and the majority of the tunnel is in rock. This reduces the likelihood and/or magnitude of damage to the tunnel compared to a shallow pipe.
- **Less subsidence risk.** Deeper construction reduces risk of ground subsidence for the following two reasons. Firstly, tunneling in rock poses less risk of causing settlements that affect buildings on the surface. Secondly, tunneling deeper provides more distance between the construction and the ground surface so ground movements are less likely to travel to the surface and affect structures there.