





Google earth



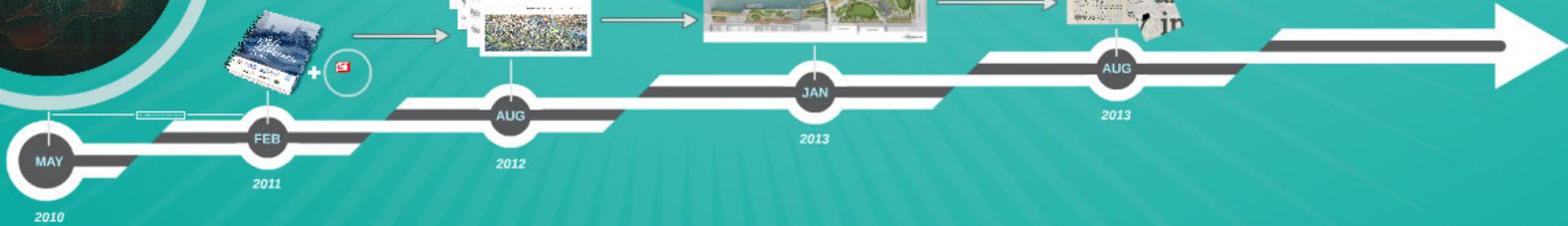
MAY
2010

FEB
2011

AUG
2012

JAN
2013

AUG
2013





Davidson County
\$2.1 million in damages
\$1.1 million in lost business
Downtown Nashville
15%
of downtown Nashville
is underwater
at peak flooding





YouTube



YouTube

Davidson County

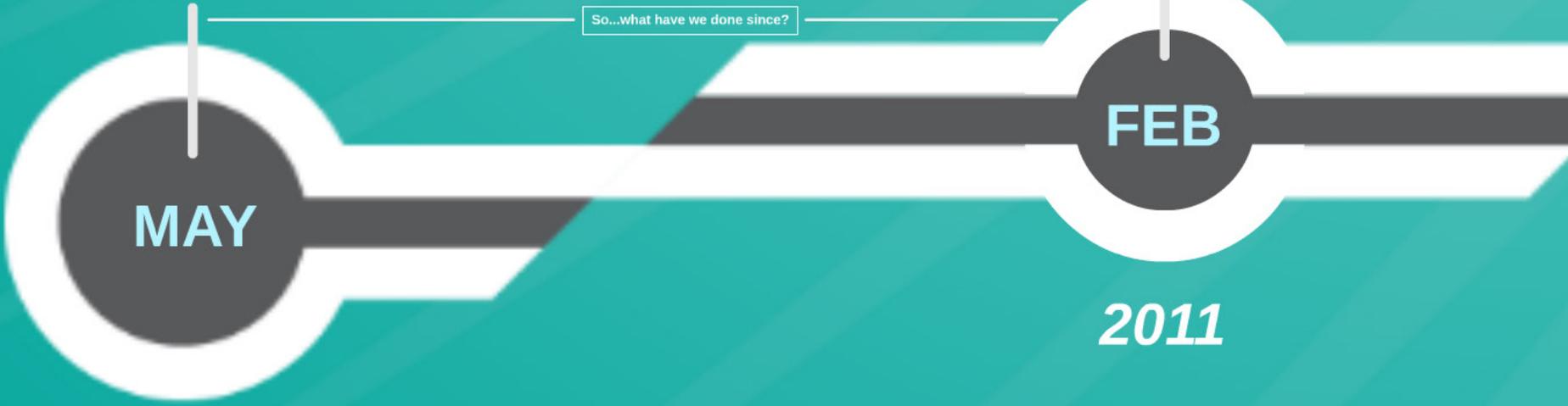
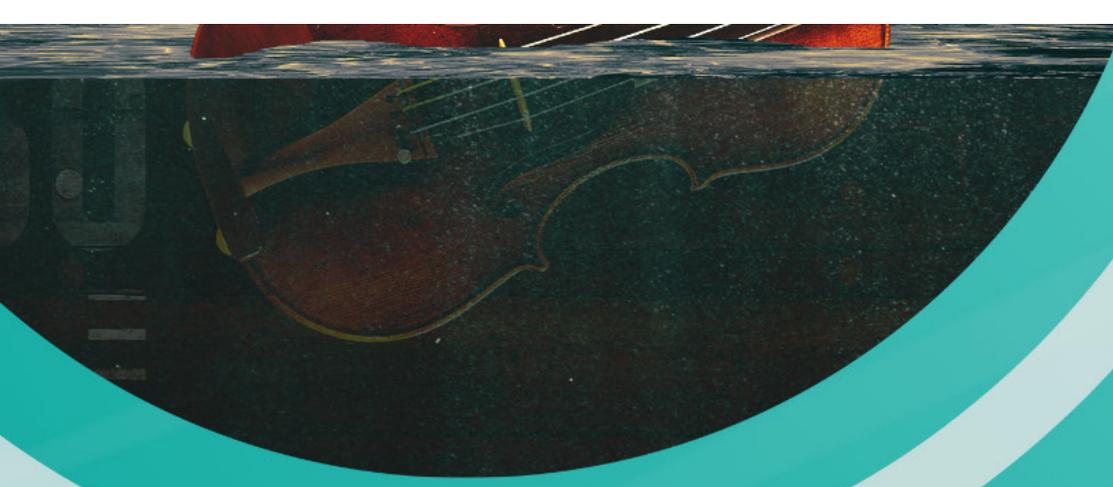
\$2 billion in Damages
\$3.6 billion in lost revenue

Downtown Nashville

\$1.2 billion in building permits since May 2010

15%
Downtown
Population
Growth Rate

So...what have we done since?

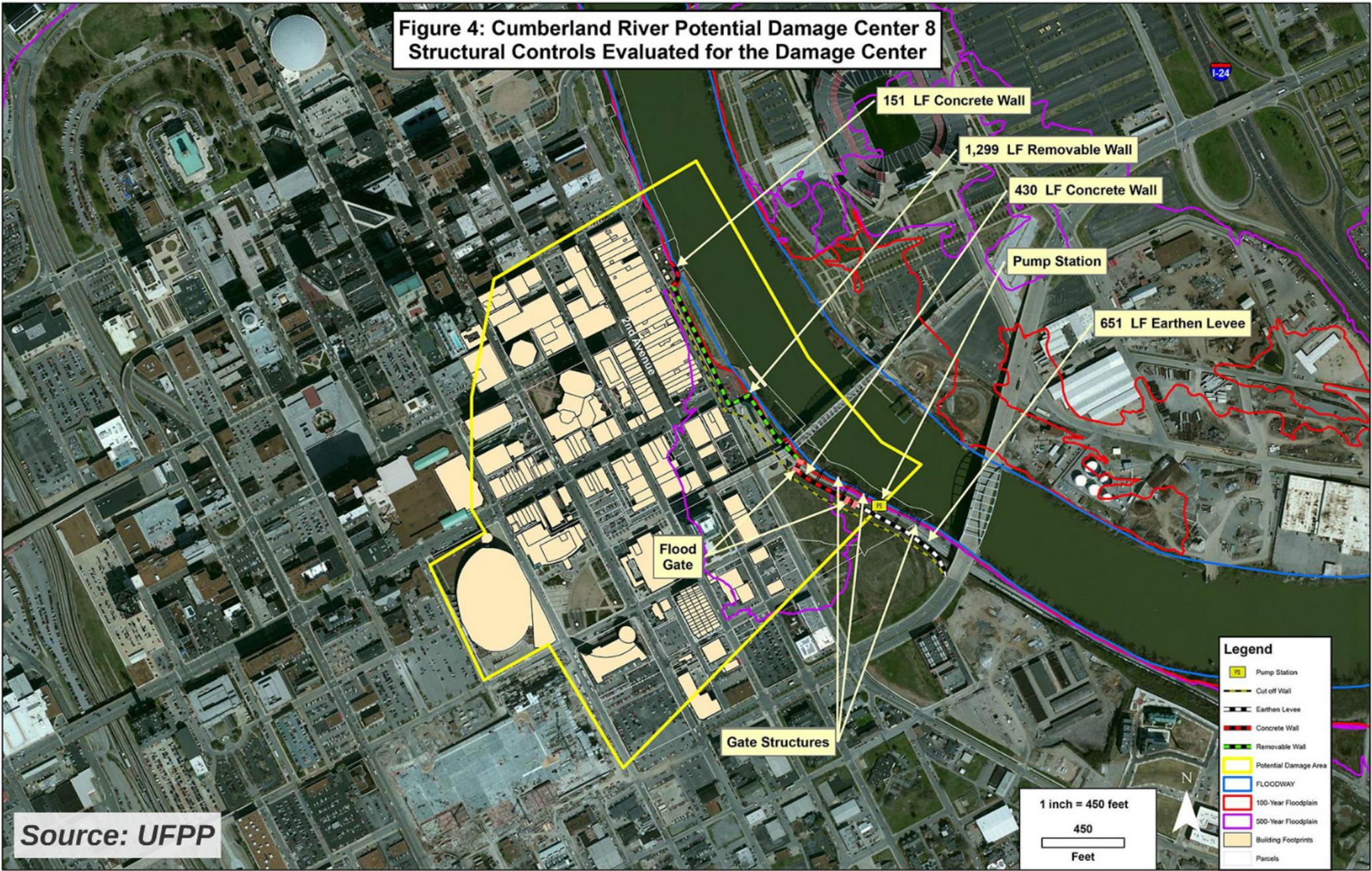


2010

2011



**Figure 4: Cumberland River Potential Damage Center 8
Structural Controls Evaluated for the Damage Center**



Source: UFPP

1 inch = 450 feet
450
Feet

Legend	
	Pump Station
	Cut off Wall
	Earthen Levee
	Concrete Wall
	Removable Wall
	Potential Damage Area
	FLOODWAY
	100-Year Floodplain
	500-Year Floodplain
	Building Footprints
	Parcels



NASHVILLE
FLOOD
MAY 2010



MAY

2010

FEB

2011

AUG

2012

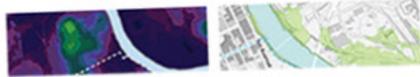
So...what have we done since?



FLOOD MITIGATION PLAN

History

IN MAY 2010, THE NASHVILLE area was hit with a significant amount of rainfall. More than 17 inches of rain was recorded within a 36-hour period. This was more rain than had ever been recorded in the 140 years of record keeping. The result was widespread



Contemporary Planning Efforts

In the aftermath of the 2010 flood, Mayor Karl Dean created a special team to

on the Com
collaborative
level. The t
by an achie
possible the
evaluating a
team has id
Cumberland
tion in the e
likely ident
as well as p
Cumberland
Plan (UFPF)
Early in
ing and per
duction. T
provide tim
encies in S
(Nashville)
ation, this
ation area
this site to
their destin
This system
Center is a

Additional Measures ar

Developing in the flood ge
minimum, he performed in
plain ordinance. As a result
Metro Council passed legi
floodplain regulations to e
more in floodplains and es
to the Stormwater Manag
Development (LID).
Development or redue
flood-prone areas (from th
Street to Millip Street) d
floods could occur. The es
opment to have the floor
and residential develop
the flood elevation. At th
little more than what the
these requirements are al
town below ground exist
below grade space. Dovel
towns. The developer sho
that will allow vehicles
to higher ground. All th
be placed above the floo
alternative of water-poo
design to insure the wa

This UFPF team has also created a very powerful computer model

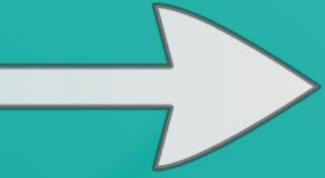
SOUTH OF BROADWAY STRATEGIC MASTER PLAN

Nashville, Tennessee URBAN DESIGN ASSOCIATES

JANUARY 2013



© 2013 URBAN DESIGN ASSOCIATES





AUG

2012



JAN

2013





JAN

2013



AUG

2013



Riverfront vision includes promoter

» RIVERFRONT FROM 1A

"People are drawn to water," Dean told a crowd of city officials. "And we have seen, in other places, that when you make the riverfront a destination in the center of your city, it creates energy and excitement."

Dean called the former thermal transfer location — where an old plant burned to the ground more than a decade ago — the "last great piece of open space in downtown Nashville."

As part of a newly completed West Riverfront

Master Plan, this area, sandwiched between the Shelby Street bridge and Korean Veterans Boulevard Bridge, will be transformed into an "iconic park," Dean said.

For now, the plan is still in a conceptual phase, with formal designs to come.

His vision includes a flood wall and walkable, 26-foot-wide promenade along the entire west bank, stretching from the thermal plant site to Church Street, to mitigate future flooding. The outdoor amphitheater is slated for the park's middle,

with an open park surrounding it. Amenities will include gardens, a dog park and trails.

The city recently opened up this land for a handful of concerts, including its annual Fourth of July celebration and a Bob Dylan show this summer. But the staging and seating lack infrastructure.

New plans call for an actual venue that would hold 6,500 people. It would feature 2,500 removable seats, along with grass seating on an existing hill that would optimize views of the skyline.

A second home

For years, leaders of the financially struggling symphony have wanted a site for summer concerts. News of the outdoor music venue comes just weeks after the symphony avoided foreclosure this summer on its Schermerhorn Symphony Center, thanks largely to philanthropist Martha Ingram's continued support.

"When you look at other orchestras in our budget category, the thing that they have that we don't really have is a summer home, a place where the symphony can actually do some major concerts in the summer," said Alan Valentine, the symphony's CEO and president. "This facility can actually be a very key ingredient in the Nashville Sympho



We MUST prevent this from happening again!



Flow Control Valve

Flow Control Structure

Flow Control Valve

Flood wall

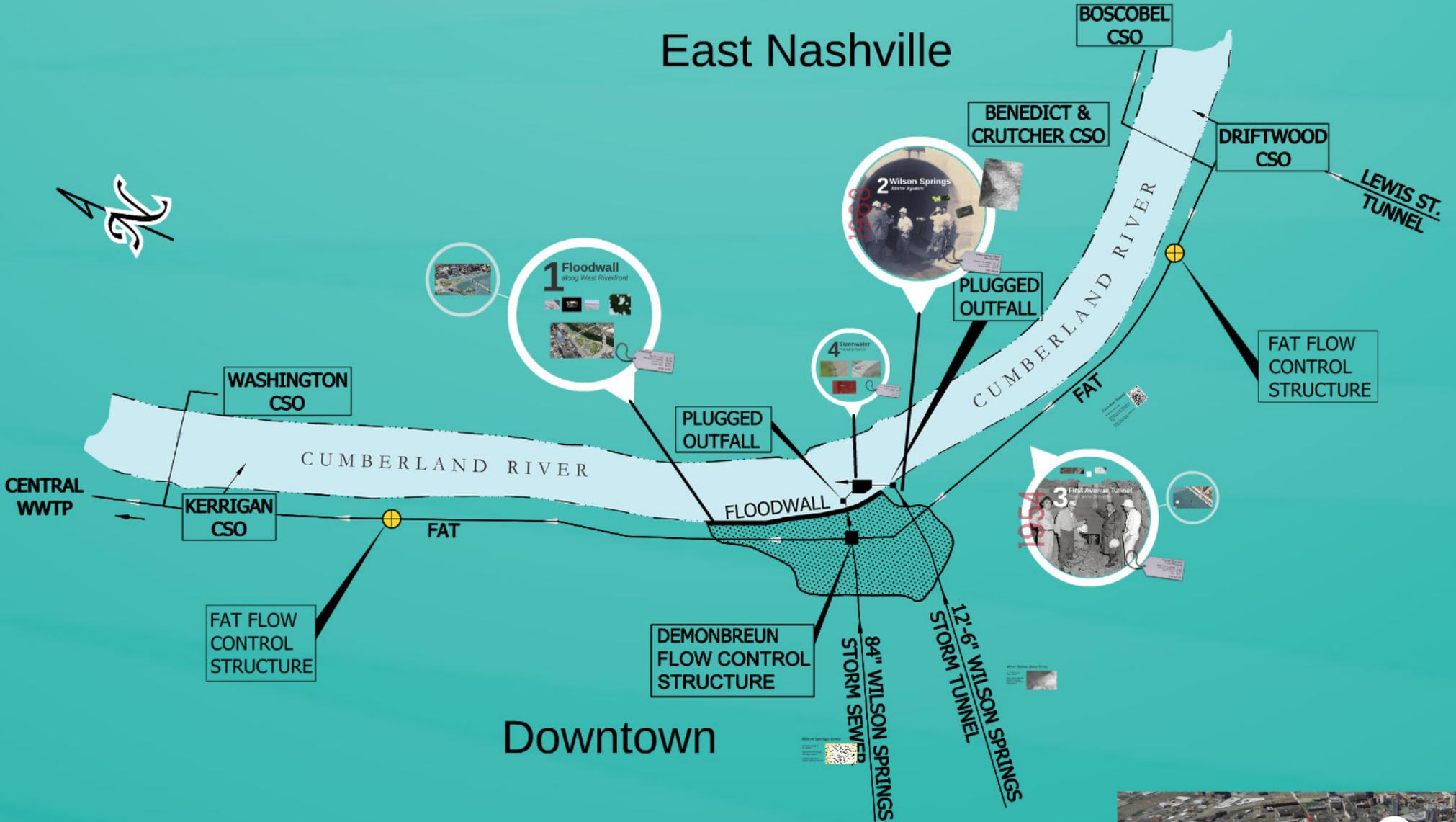
Outfall Closure

Pump Station

Outfall Closure



East Nashville



RIVERFRONT REDEVELOPMENT

West bank to get new look, sound

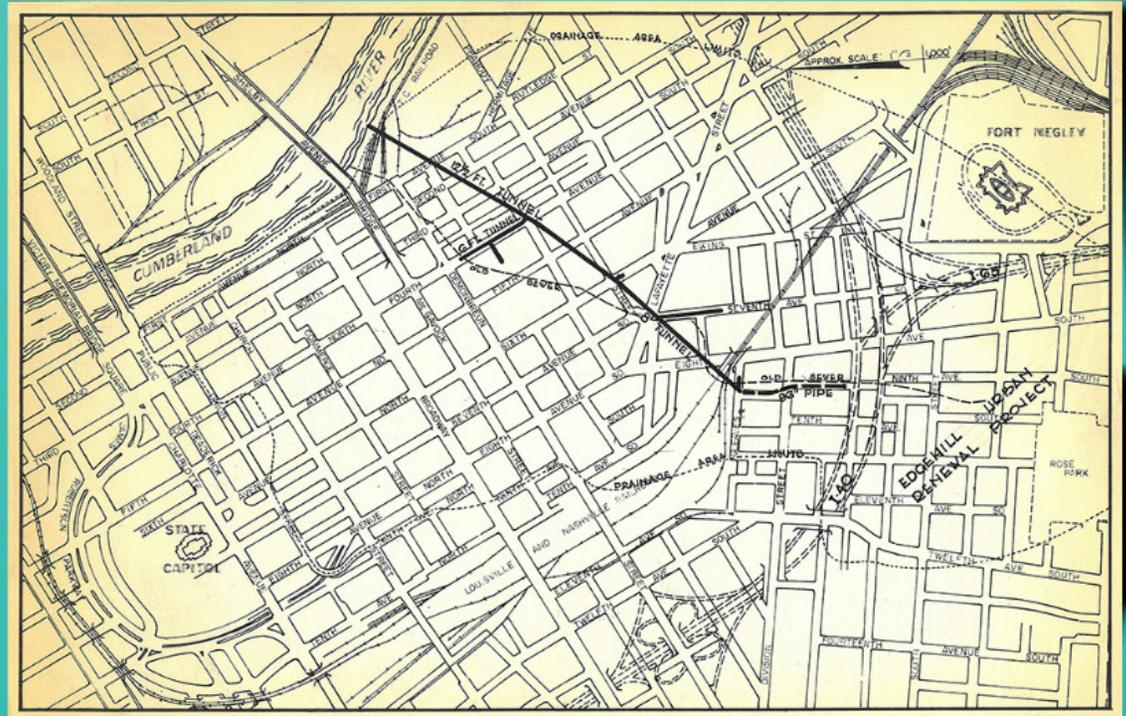


Wilson Springs Sewer

*84" sewer built in
the 1880's*

*Nashville's first large
drainage project*

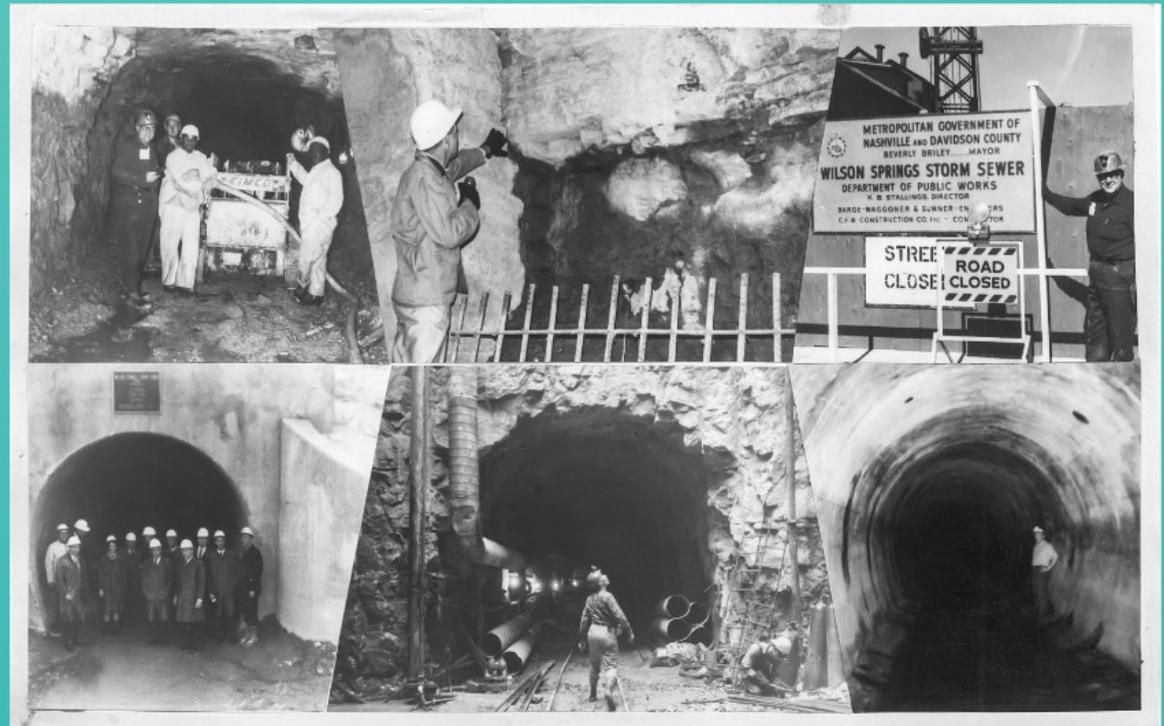
*Constructed over
Wilson Springs Branch*



Wilson Springs Storm Tunnel

***12' - 6" Horseshoe
Storm Sewer***

***Built in 1967 to provide
additional drainage
capacity for the Wilson
Springs Basin***





1 Floodwall

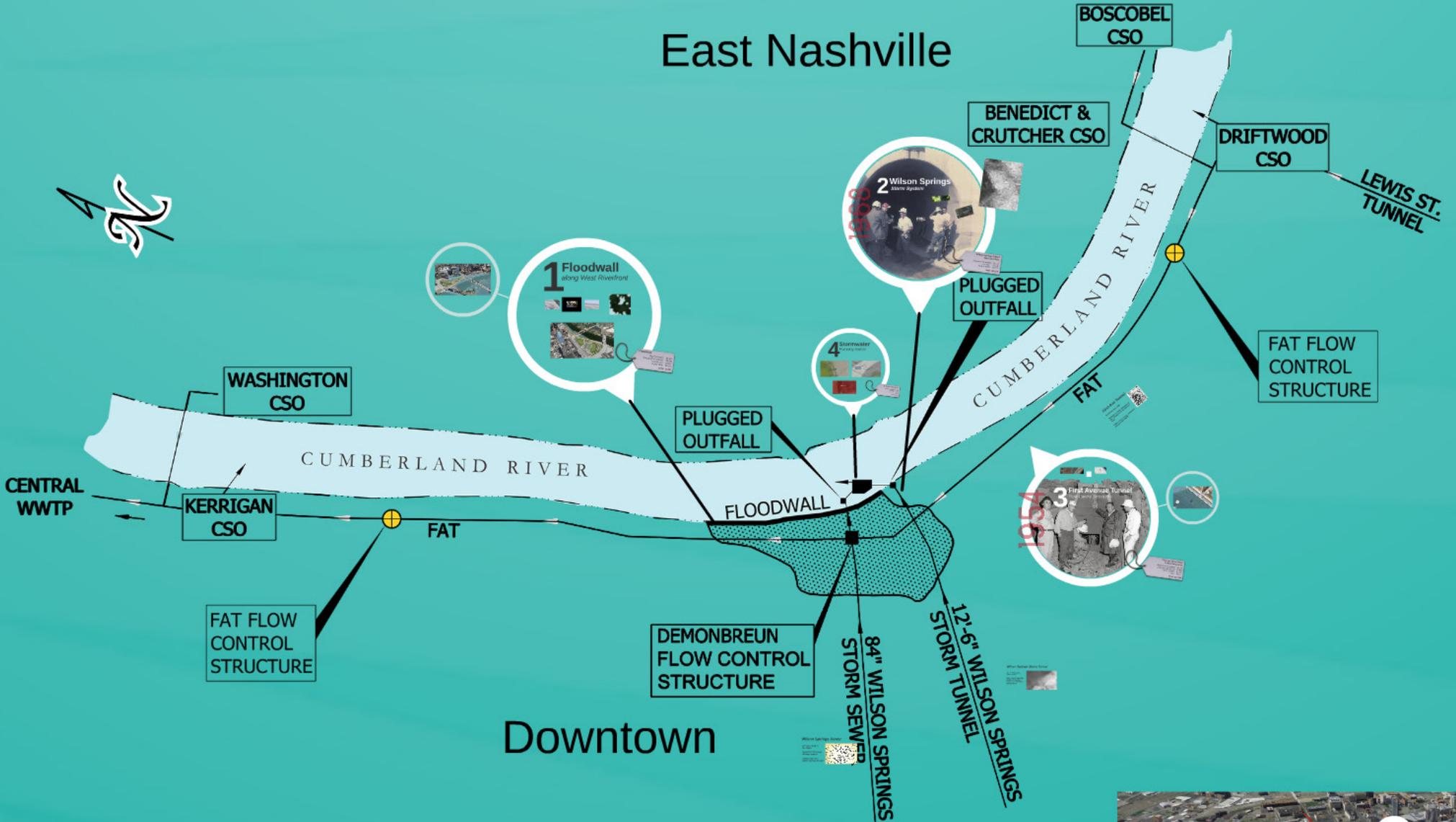
along West Riverfront



Floodwall

Flood Markers:	\$0.9M
Temporary Floodwall:	\$2.5M
Foundation:	\$3.6M
Cutoff Wall:	\$5.9M
Total:	\$13M

East Nashville



RIVERFRONT REDEVELOPMENT

West bank to get new look, sound

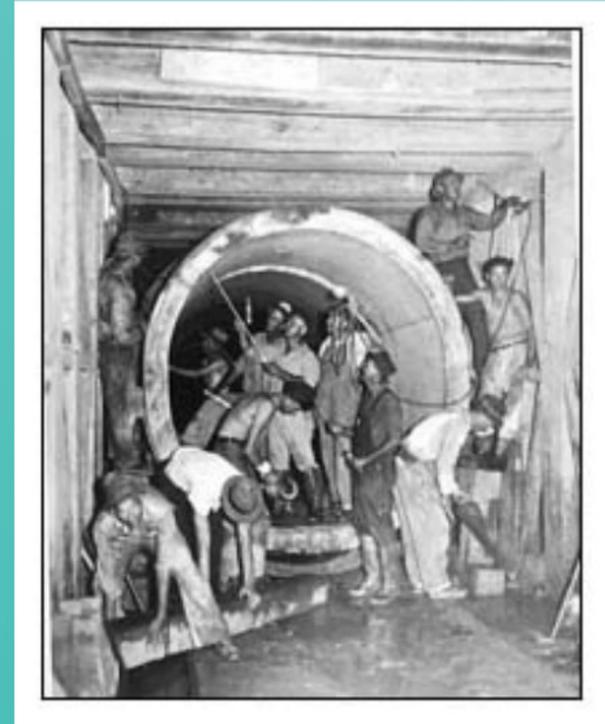


First Ave Tunnel

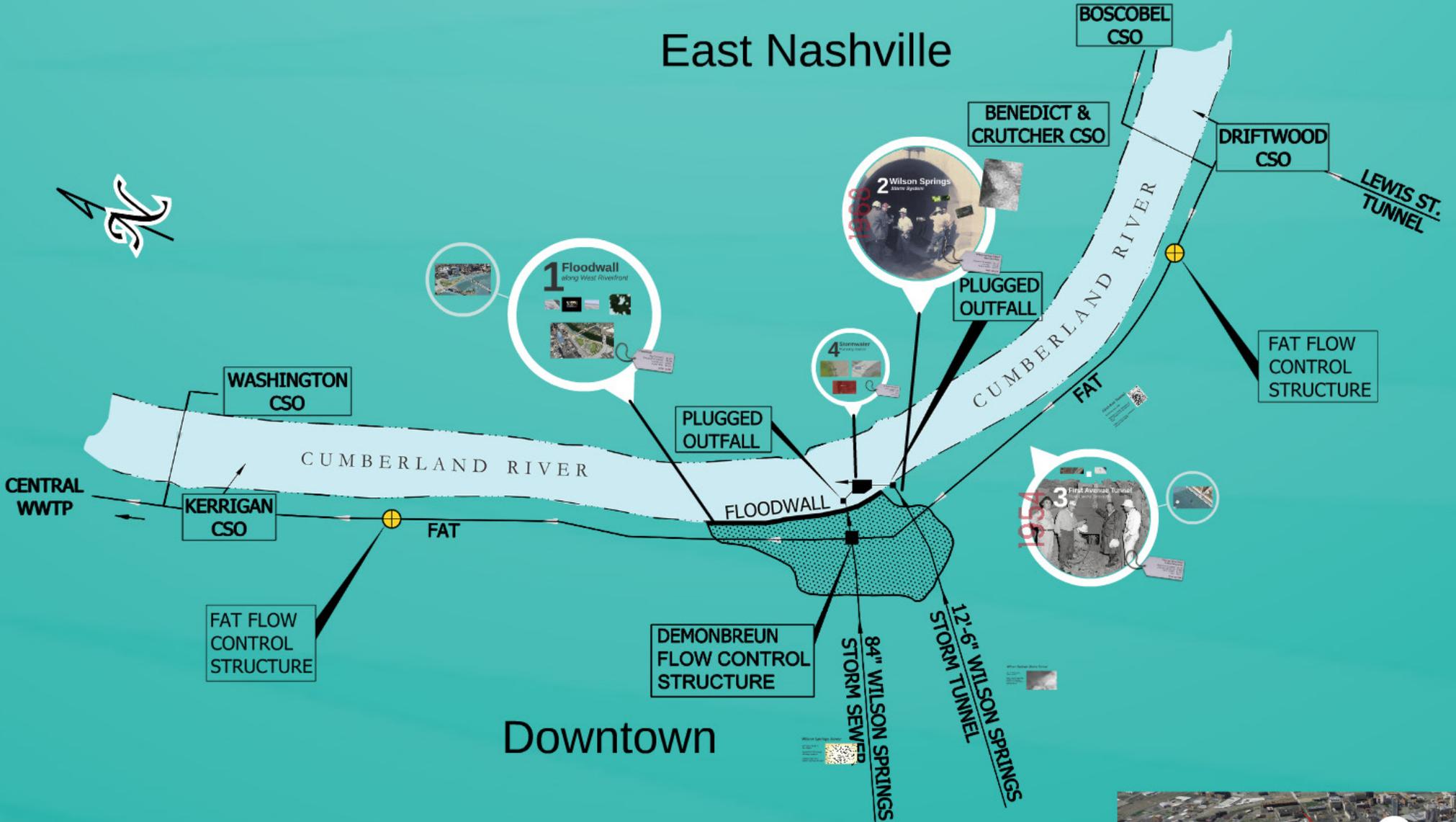
Built in the mid-1950's

Purpose: to cease discharge of raw sewage to the Cumberland River

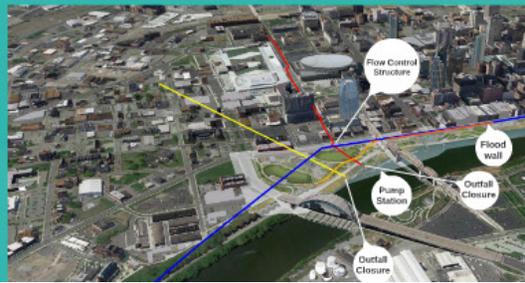
Collects and conveys combined sewage to the WWTP



East Nashville



RIVERFRONT REDEVELOPMENT
West bank to get new look sound





1 Floodwall

along West Riverfront



Floodwall

Flood Markers:	\$0.9M
Temporary Floodwall:	\$2.5M
Foundation:	\$3.6M
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YouTube





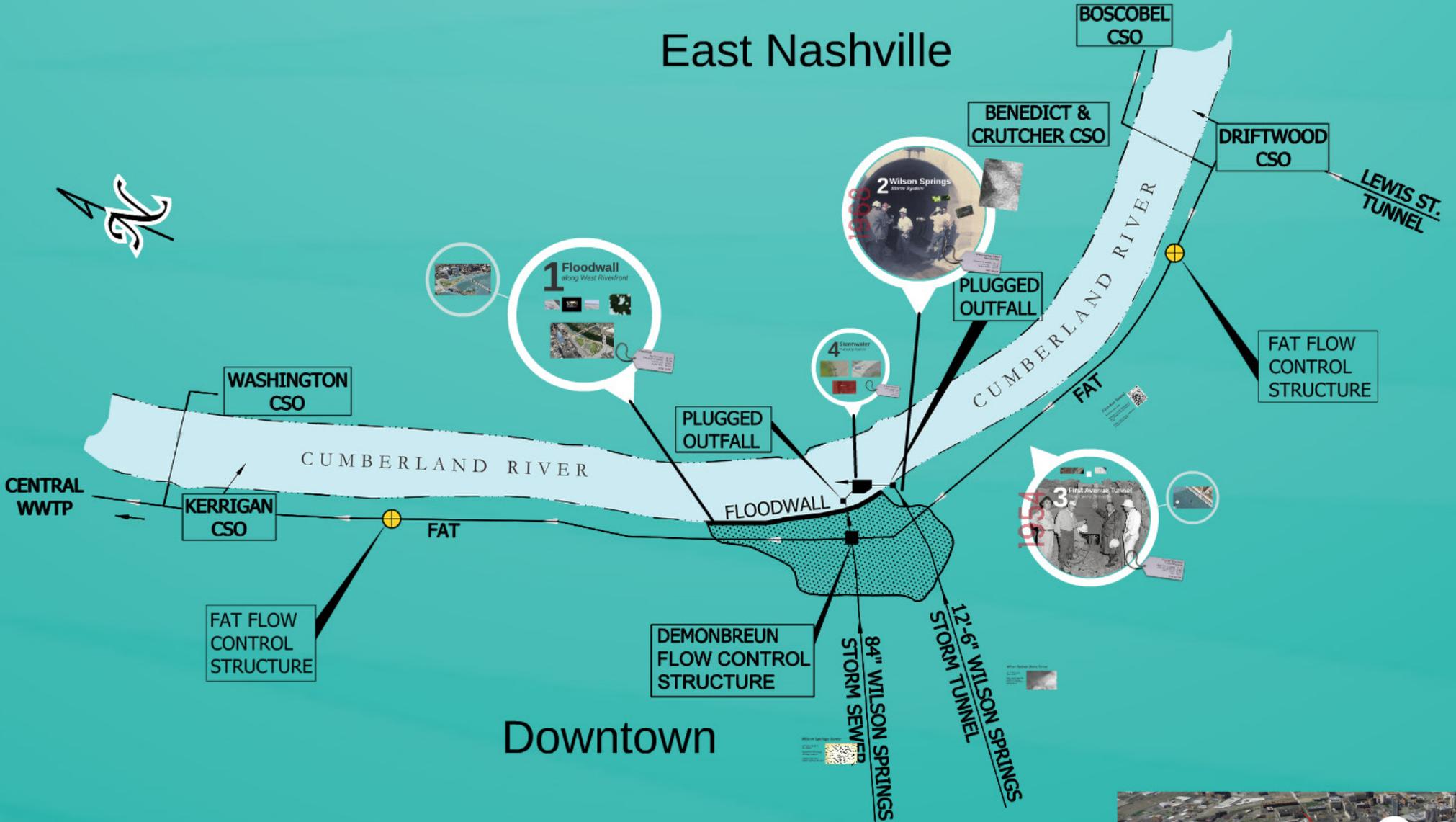


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East Nashville



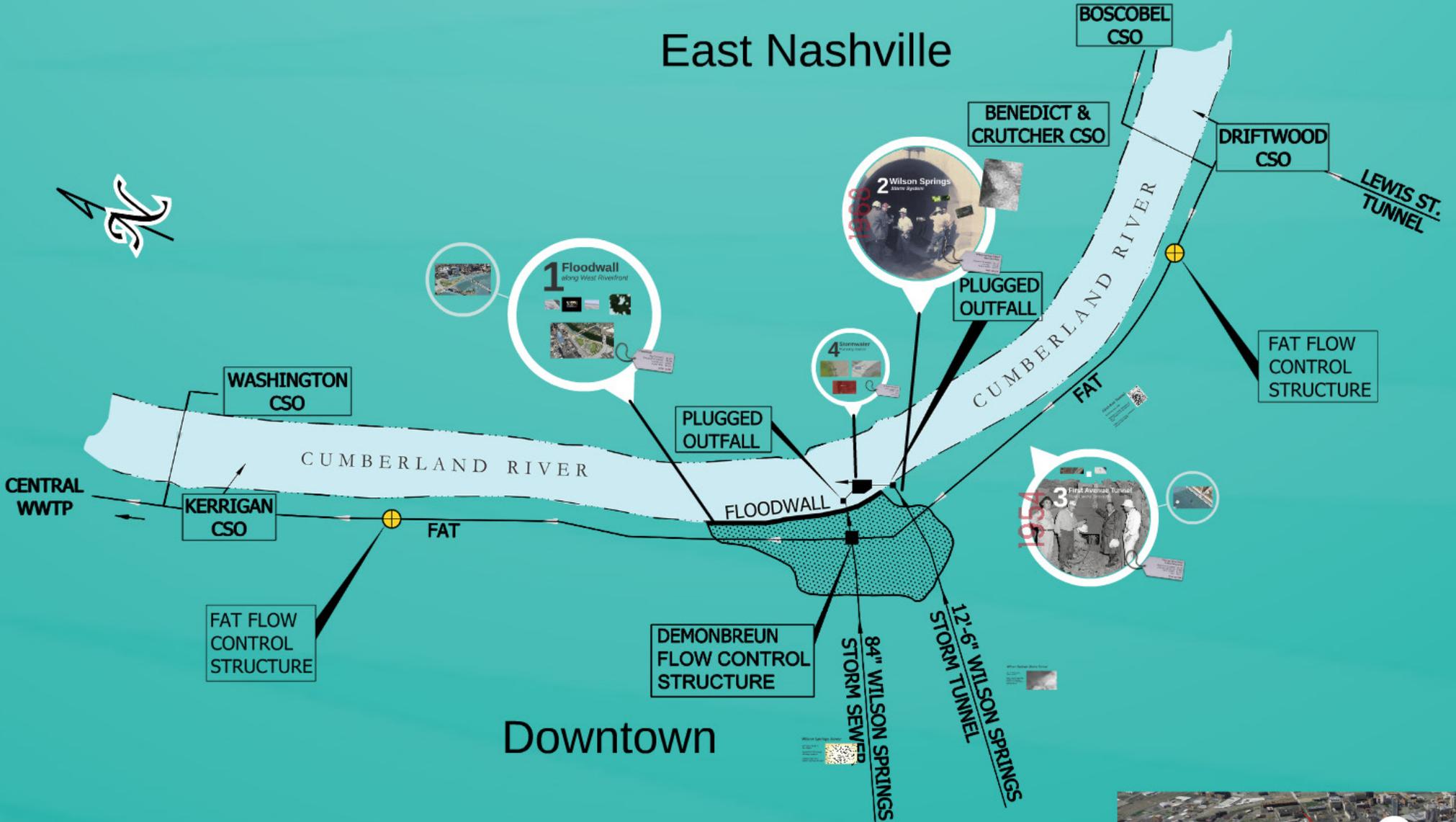
RIVERFRONT REDEVELOPMENT

West bank to get new look, sound

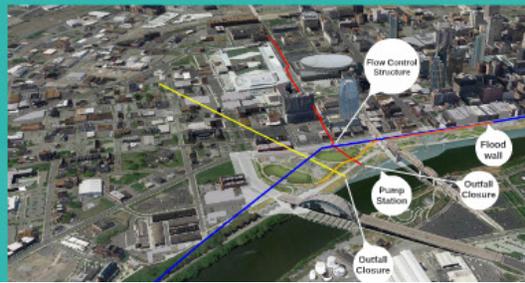




East Nashville



RIVERFRONT REDEVELOPMENT
West bank to get new look, sound



CROUCH

8961

2 Wilson Springs Storm System



Wilson Springs Outfall Gate Structure	
Sitework & Excavation:	\$1.4 M
Concrete:	\$1.0 M
Gates & Valves:	\$2.4 M
Total:	\$4.8M

PLUGGED OUTFALL



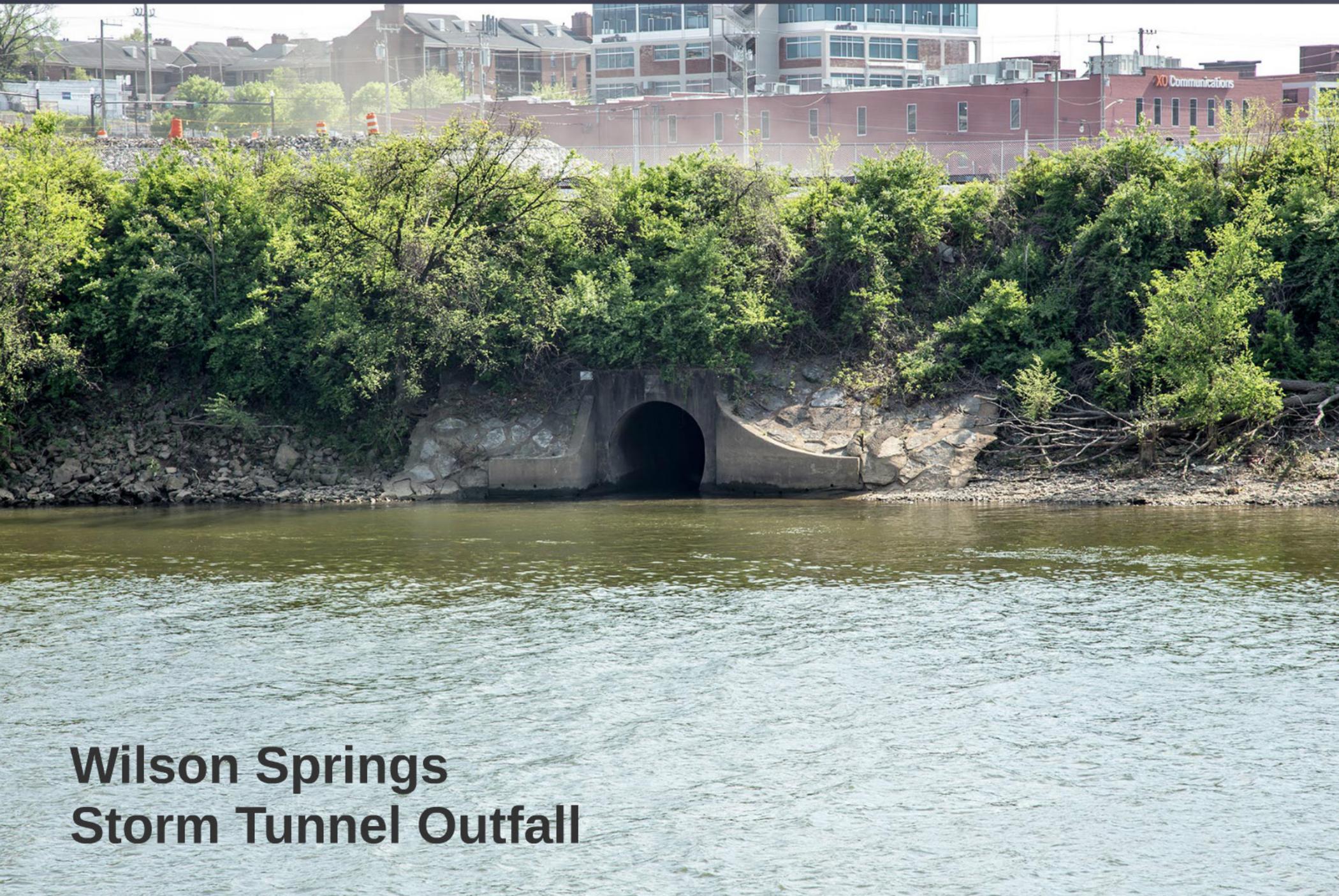
580 Acres

1" of Rain = 16M Gallons

8th Ave
Reservoir

Google earth

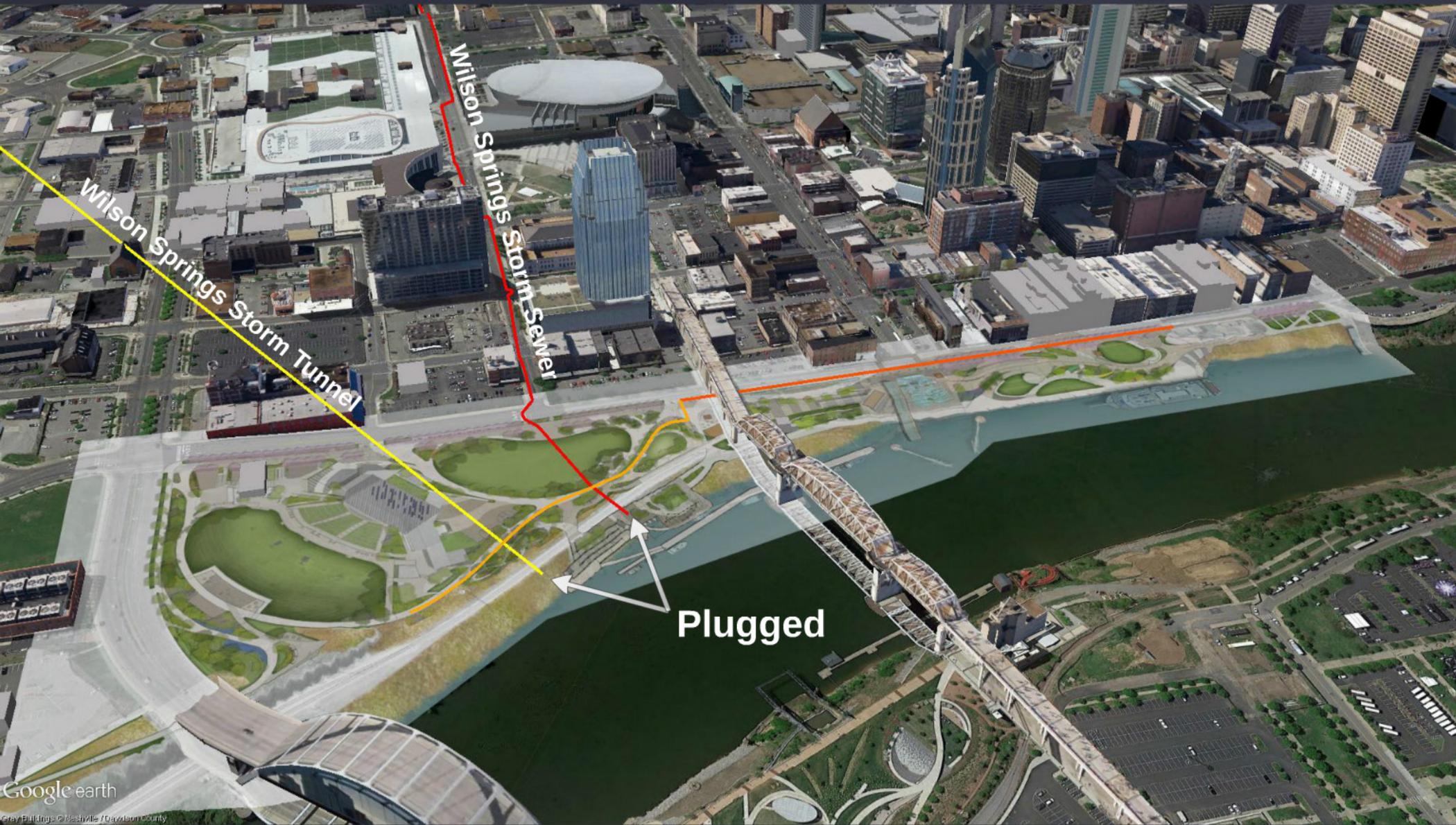
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**Wilson Springs
Storm Tunnel Outfall**



Wilson Springs Storm Sewer Outfall



Wilson Springs Storm Sewer

Wilson Springs Storm Tunnel

Plugged



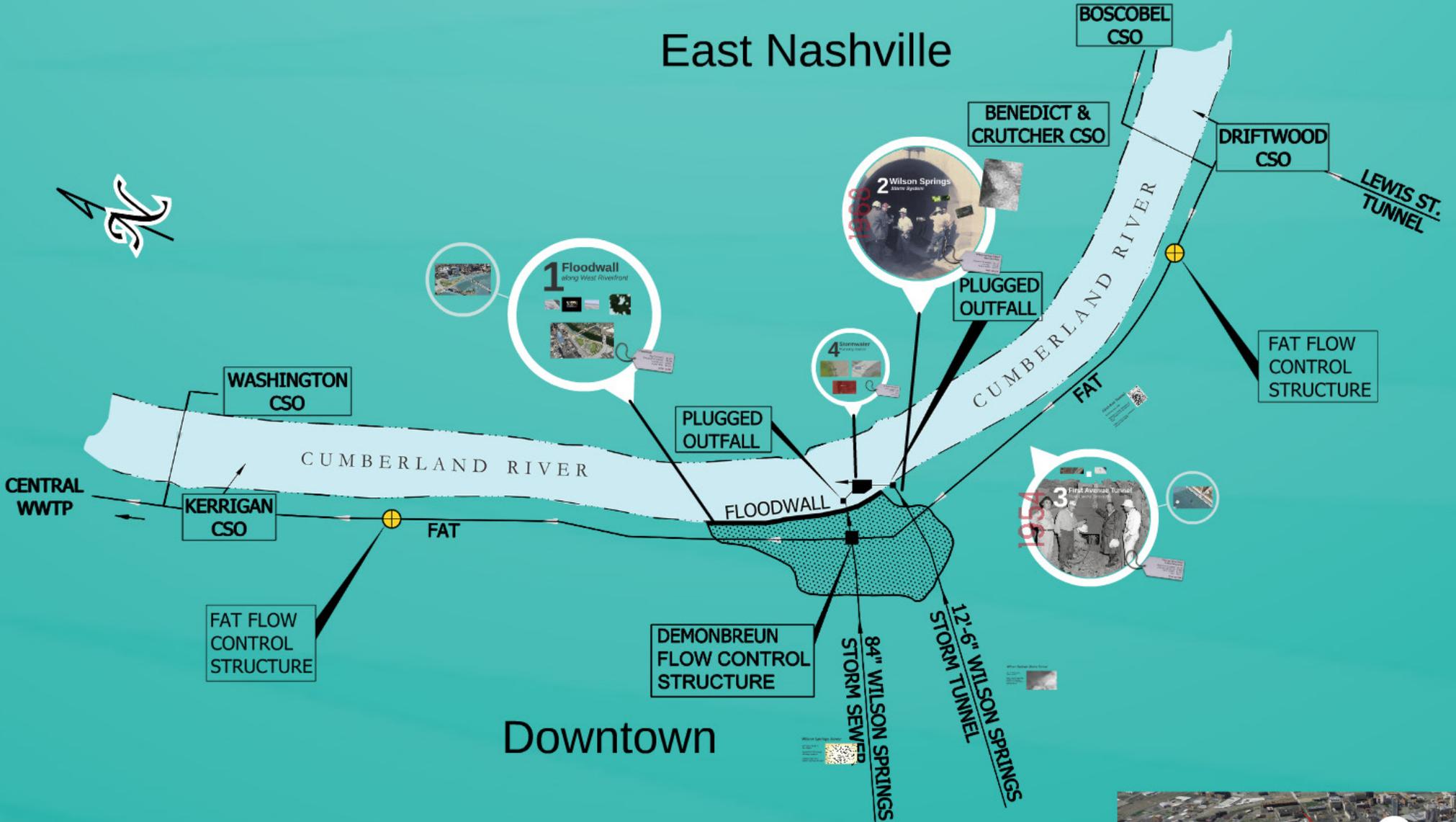
Wilson Springs Outfall Gate Structure

Sitework & Excavation: \$1.4 M
Concrete: \$1.0 M
Gates & Valves: \$2.4 M

Total: \$4.8M

PIUGO

East Nashville



RIVERFRONT REDEVELOPMENT

West bank to get new look, sound





3 First Avenue Tunnel Flow Control Structures



4
LO
100

First Ave Tunnel Flow Control Structures	
Sitework & Excavation:	\$9.2M
Concrete & Structures:	\$4.9M
Valves & Gates:	\$1.8M
Piping:	\$1.8M
Total:	\$17.7M



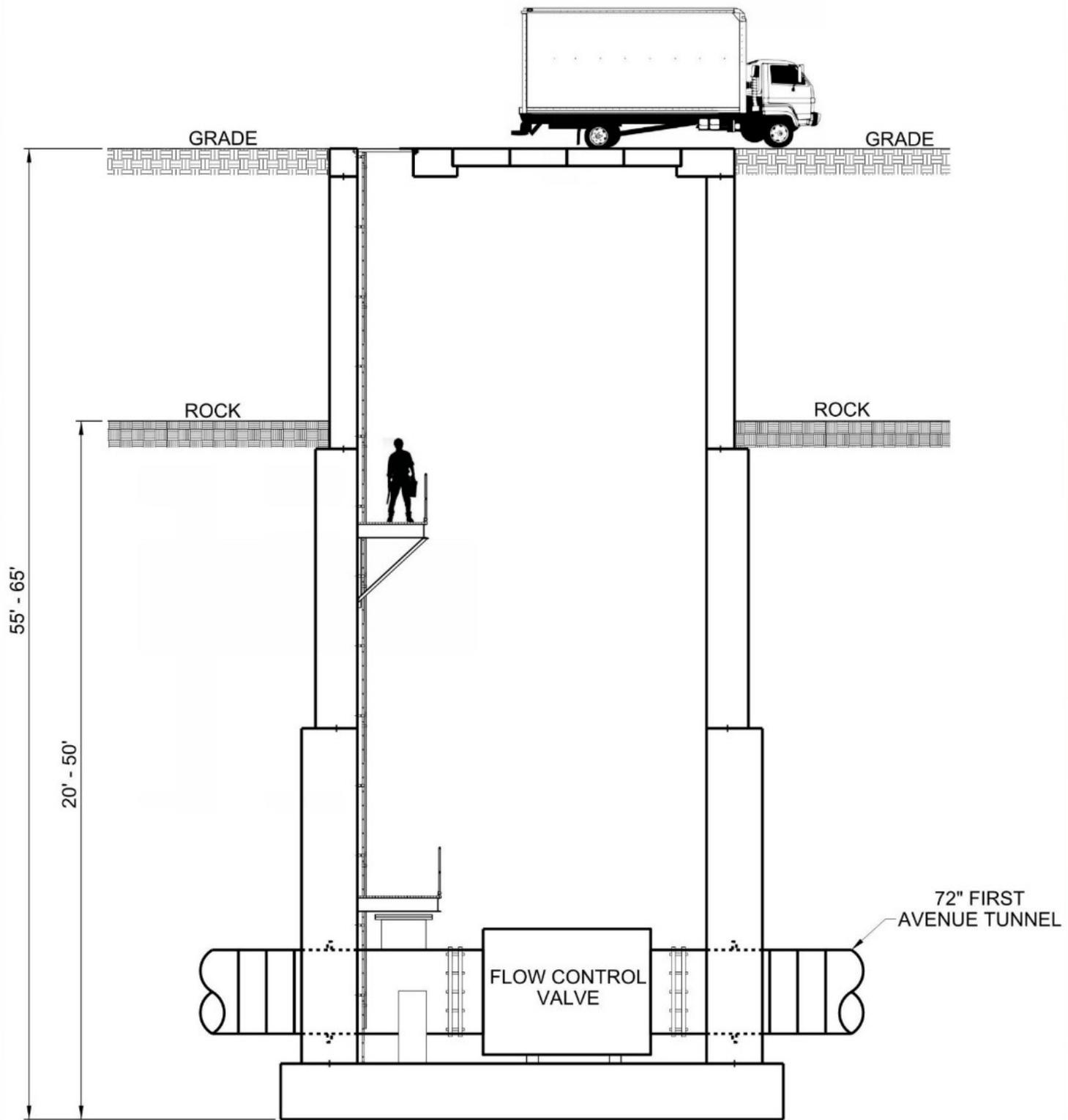
First Ave Tunnel

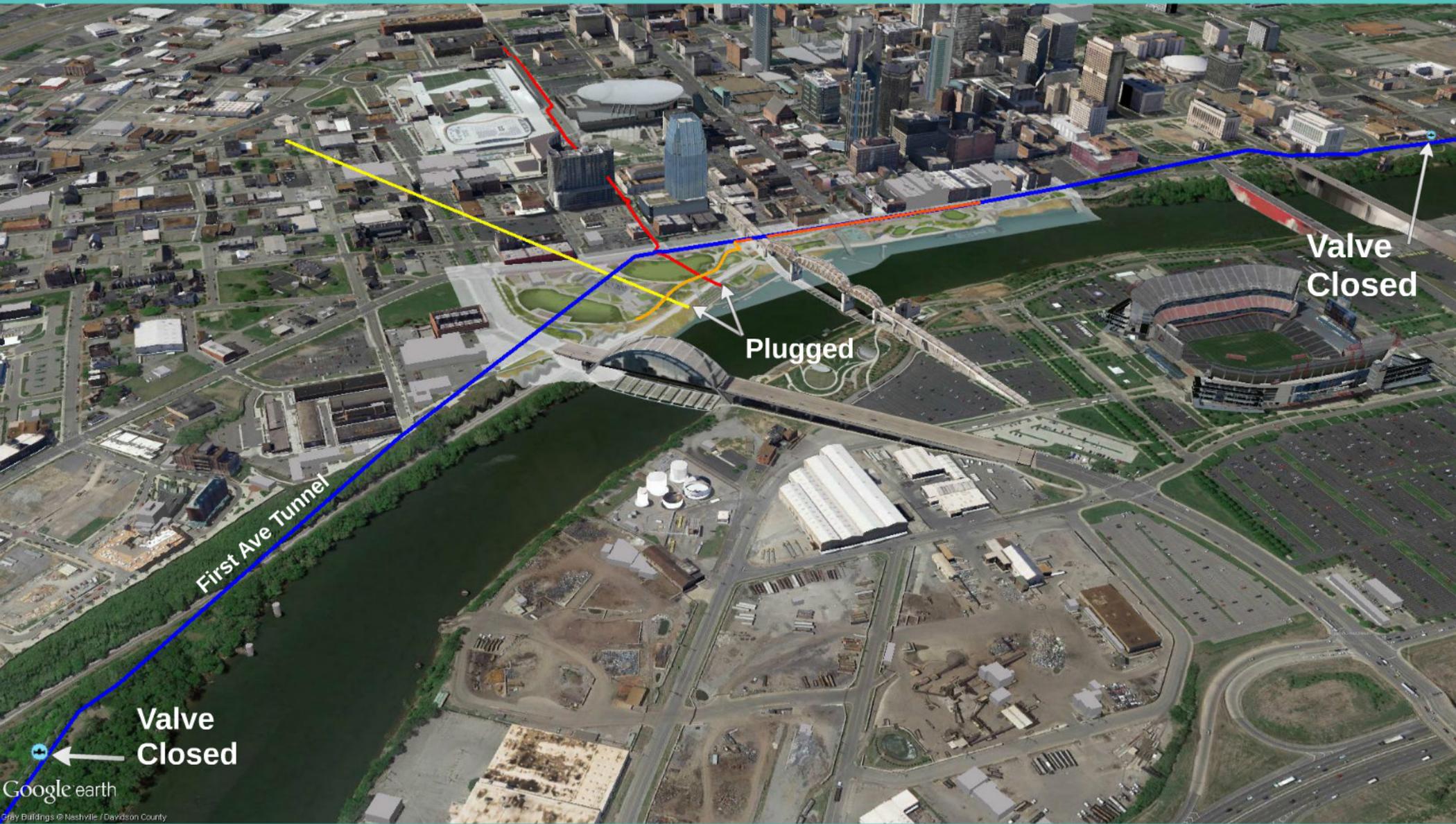
← First Ave Flow Control Structure Location



First Ave Tunnel

First Ave Flow Control Structure Location





First Ave Tunnel

Plugged

Valve Closed

Valve Closed

Google earth

© Gray Buildings © Nashville / Davidson County



First Ave Tunnel Flow Control Structures

Sitework & Excavation: \$9.2M

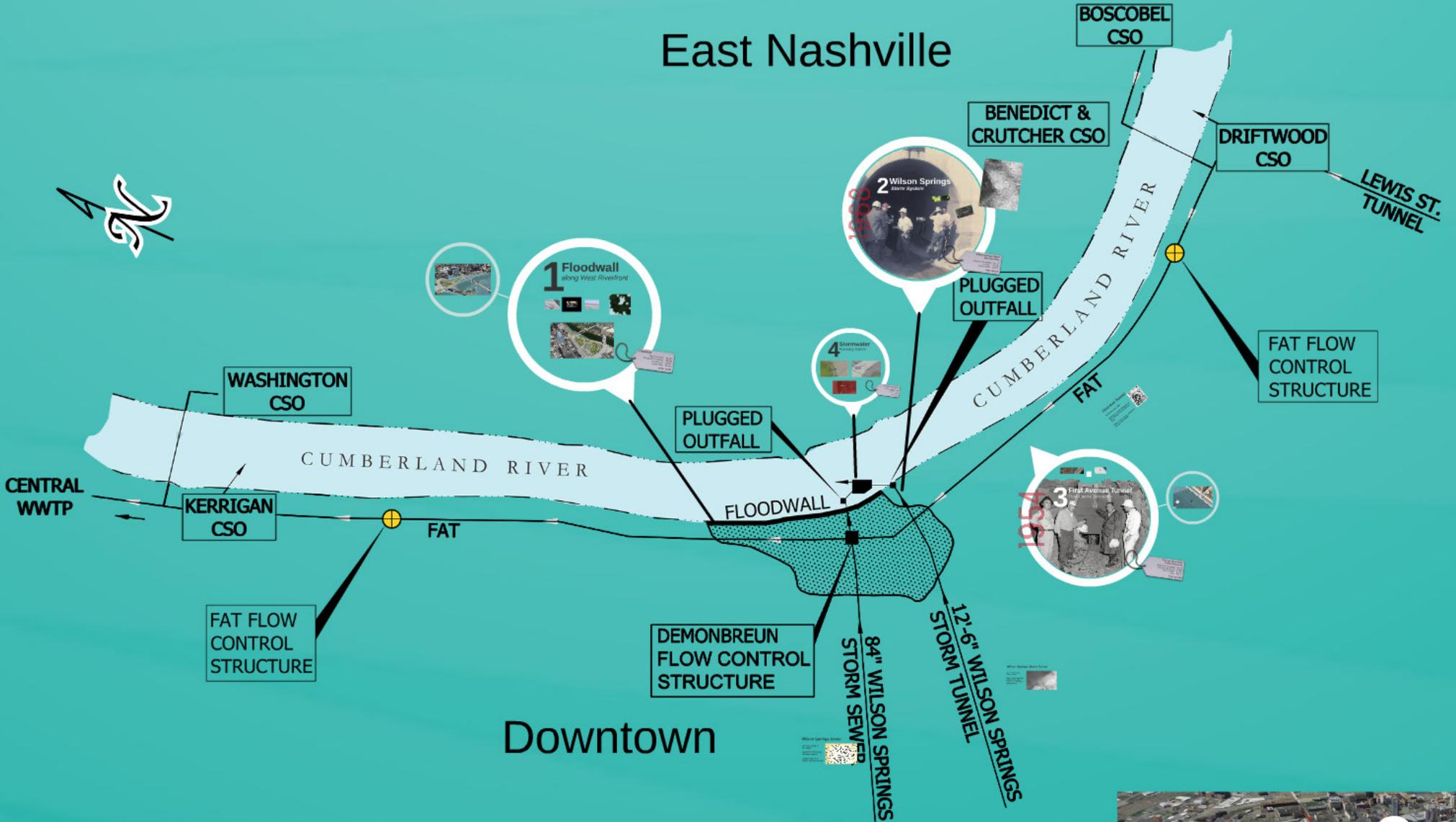
Concrete & Structures: \$4.9M

Valves & Gates: \$1.8M

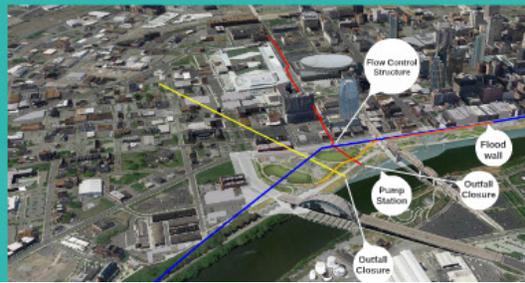
Piping: \$1.8M

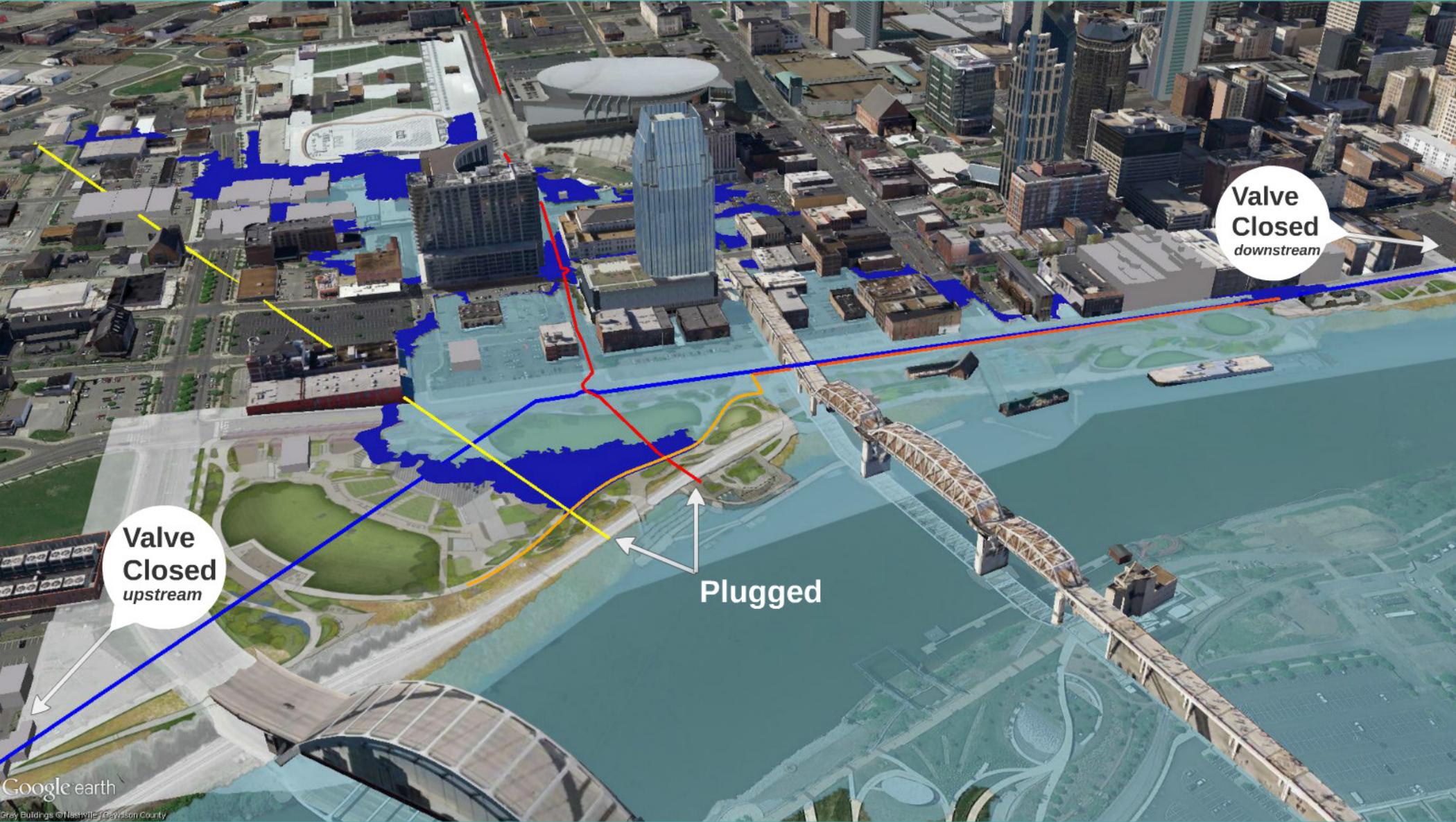
Total: \$17.7M

East Nashville



RIVERFRONT REDEVELOPMENT
West bank to get new look, sound





Valve
Closed
downstream

Valve
Closed
upstream

Plugged

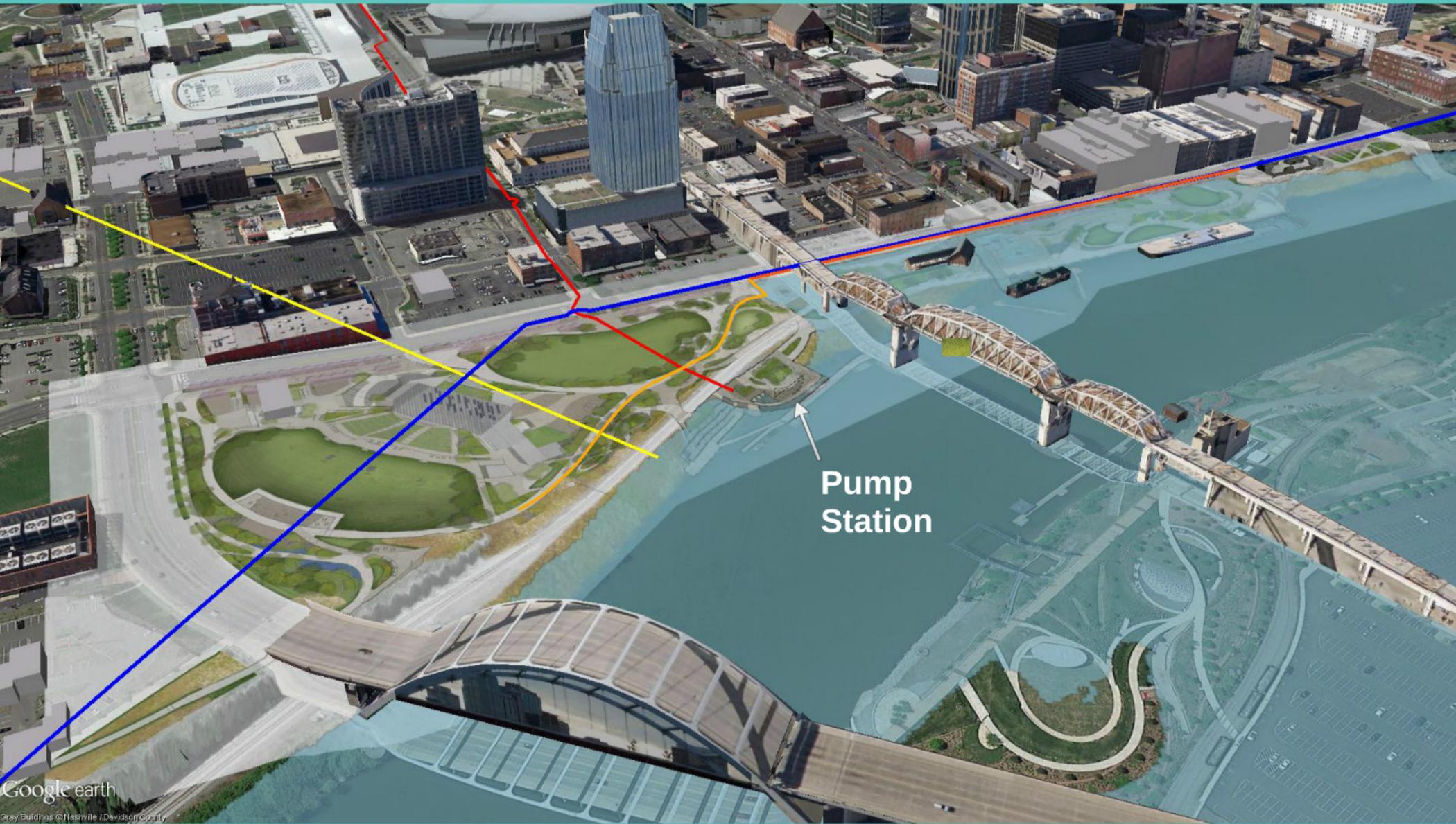
4 Stormwater Pumping Station



Stormwater Pump Station	
Sitework & Excavation:	\$14.2M
Concrete:	\$10.1M
Equipment:	\$27.0M
Electrical:	\$13.6M
Total:	\$64.9M

680 Acres





Pump
Station



7MW standby power
in DES facility



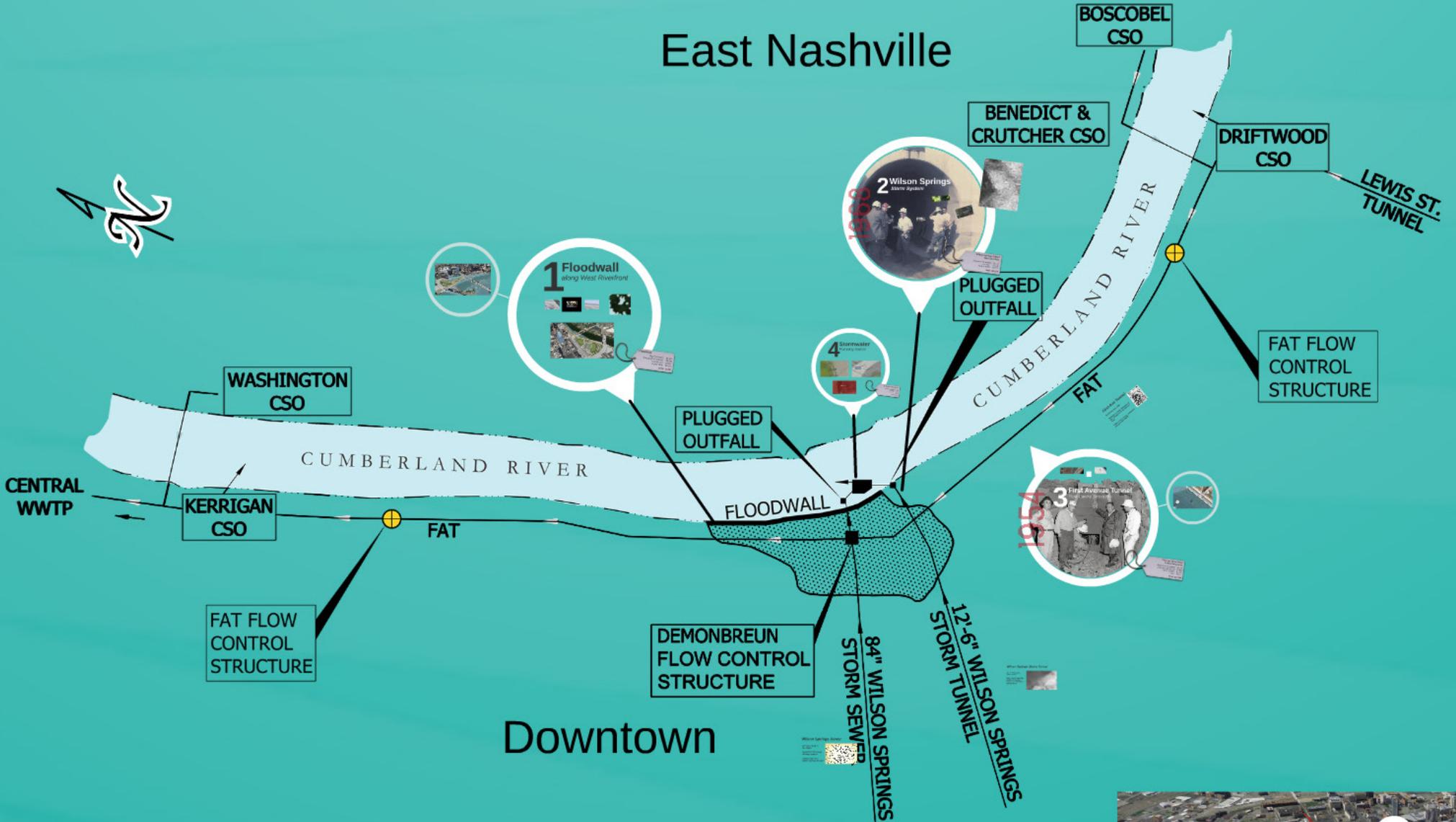


Stormwater Pump Station

Sitework & Excavation:	\$14.2M
Concrete:	\$10.1M
Equipment:	\$27.0M
Electrical:	\$13.6M

Total: \$64.9M

East Nashville



RIVERFRONT REDEVELOPMENT

West bank to get new look, sound





100 year river elevation

 **0.005 ft**
total depth added



MAY
2010



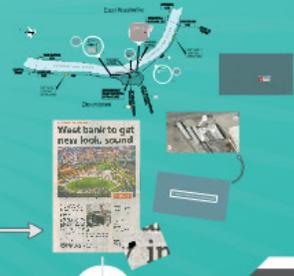
FEB
2011



AUG
2012



JAN
2013



AUG
2013

