

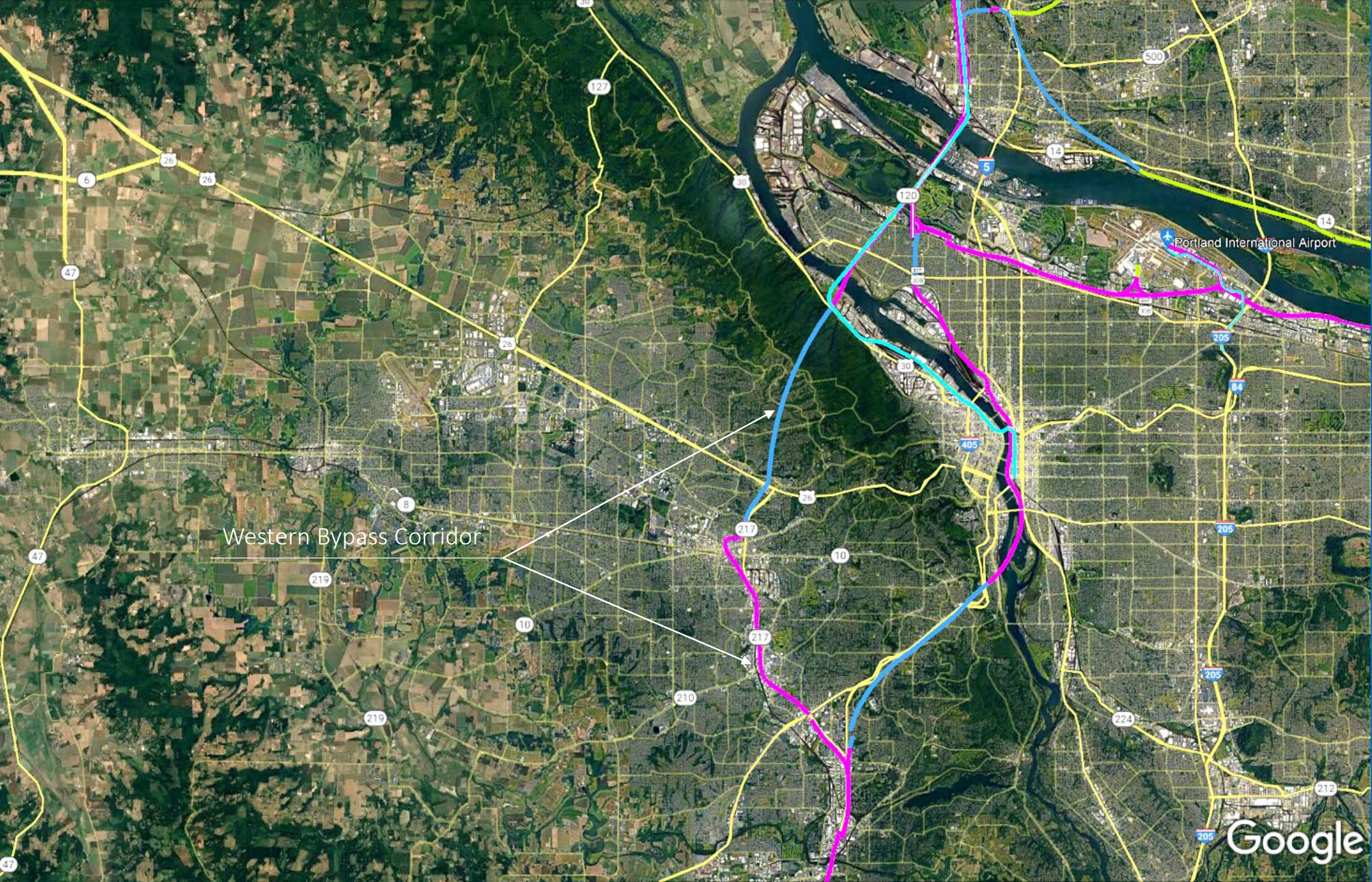
Cascadia High-Speed Rail Corridor

Hwy 217/26 Bypass (Portland Westside)



Hwy 217 and 26 Bypass

- The proposed solution for the Portland Downtown traffic congestion is to build a western bypass through the Forest Park hill.
- This bypass will accommodate two motorways, one north, the other south and a single-track commuter train in the center of the western-bypass corridor.
- This commuter corridor is from Tualatin/Lower Boones Ferry Rd to Vancouver ± 18 miles. Tualatin to Beavertown may be double tracked. Beaverton to the Multi-Modal Bridge may be single tracked.
- This proposed plan will also address the freight rail crossing at the steel bridge. The rail freight interchange between the UP and the BNSF will now use the north crossing at the BNSF Willamette River. The CHSR will use the new Rose Quarter Transit Station.

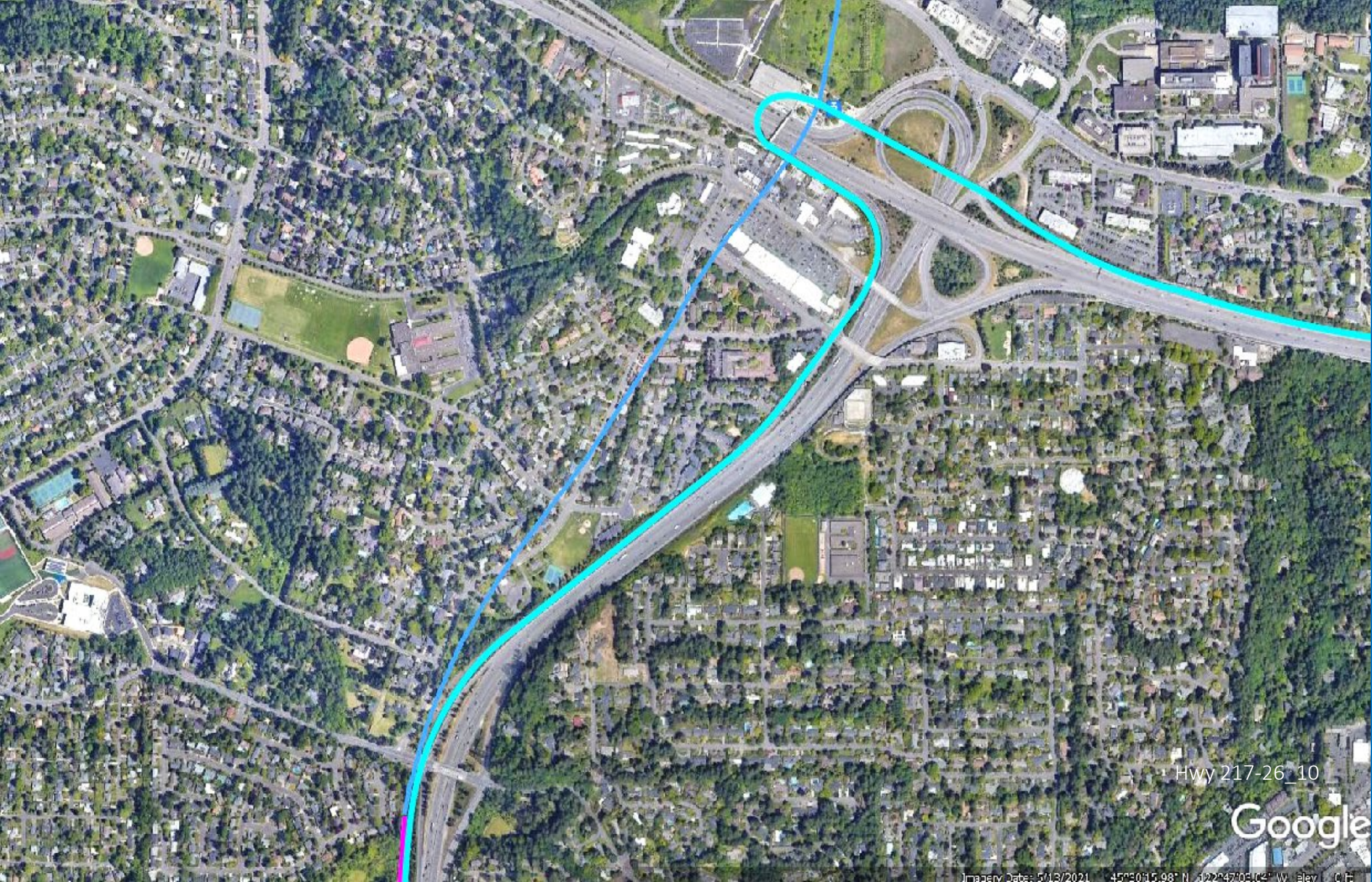


Bird's Eye View of the Western Bypass Corridor

This area does provide the bypassing for traffic on the westside of Portland.

The merging of the Hwy 217 with the Hwy 26 at the Sunset TC creates a massive bottleneck in Portland. The current roadway layout must absorb all the westside traffic between Sunset and Vancouver.

The proposed Forest Park bypass will solve this problem. Restrictions for hazardous materials will be applied.



Bird's Eye View of the Sunset Transit Center

This area does interchange the highway's 217 and 26.

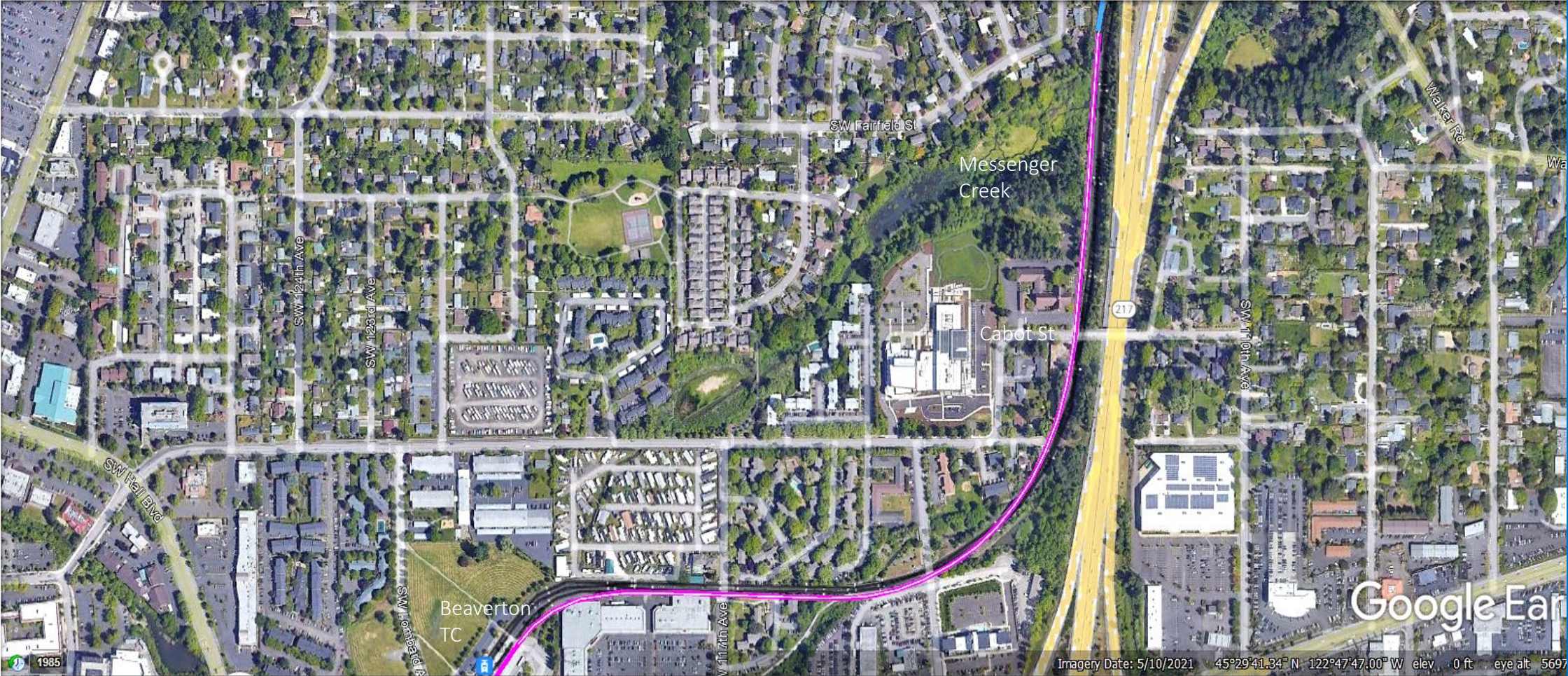
The horseshoe loop is the MAX light-rail, the blue line is the proposed commuter line between Tualatin and Vancouver, WA.

The merging of the Hwy 217 with the Hwy 26 creates a massive bottleneck.

The proposed Forest Park bypass will solve this problem.

Hwy 217-26_10

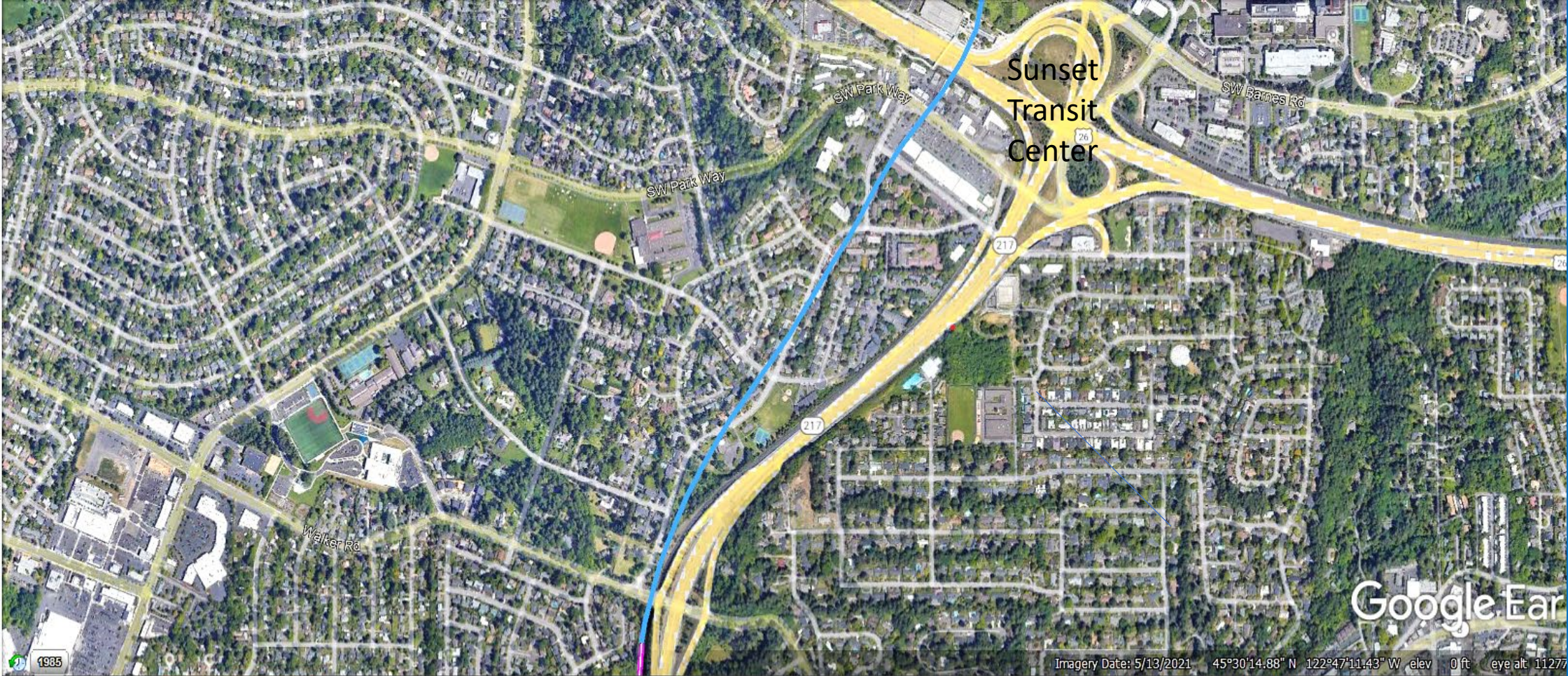




Beaverton Station to Sunset Tunnel Entrance

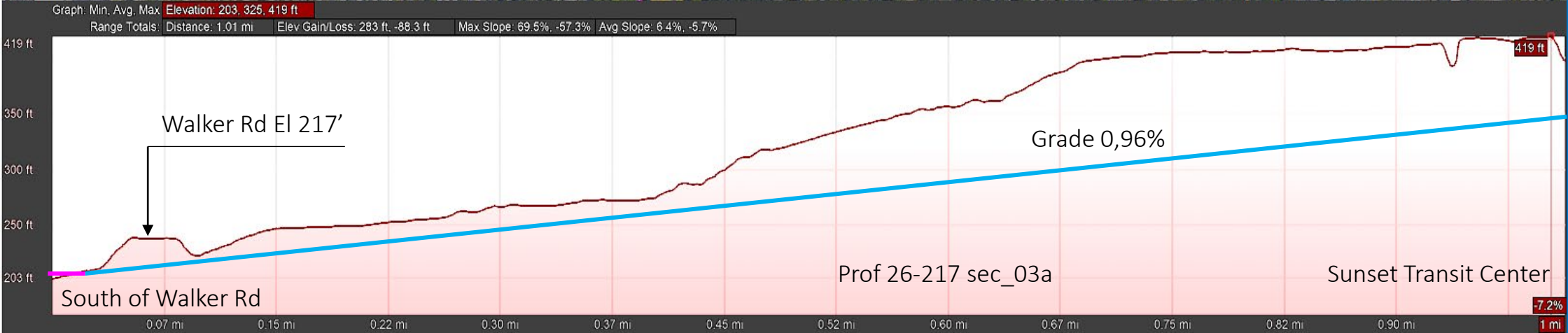
The commuter line is in a short tunnel below the SW Cabot St.

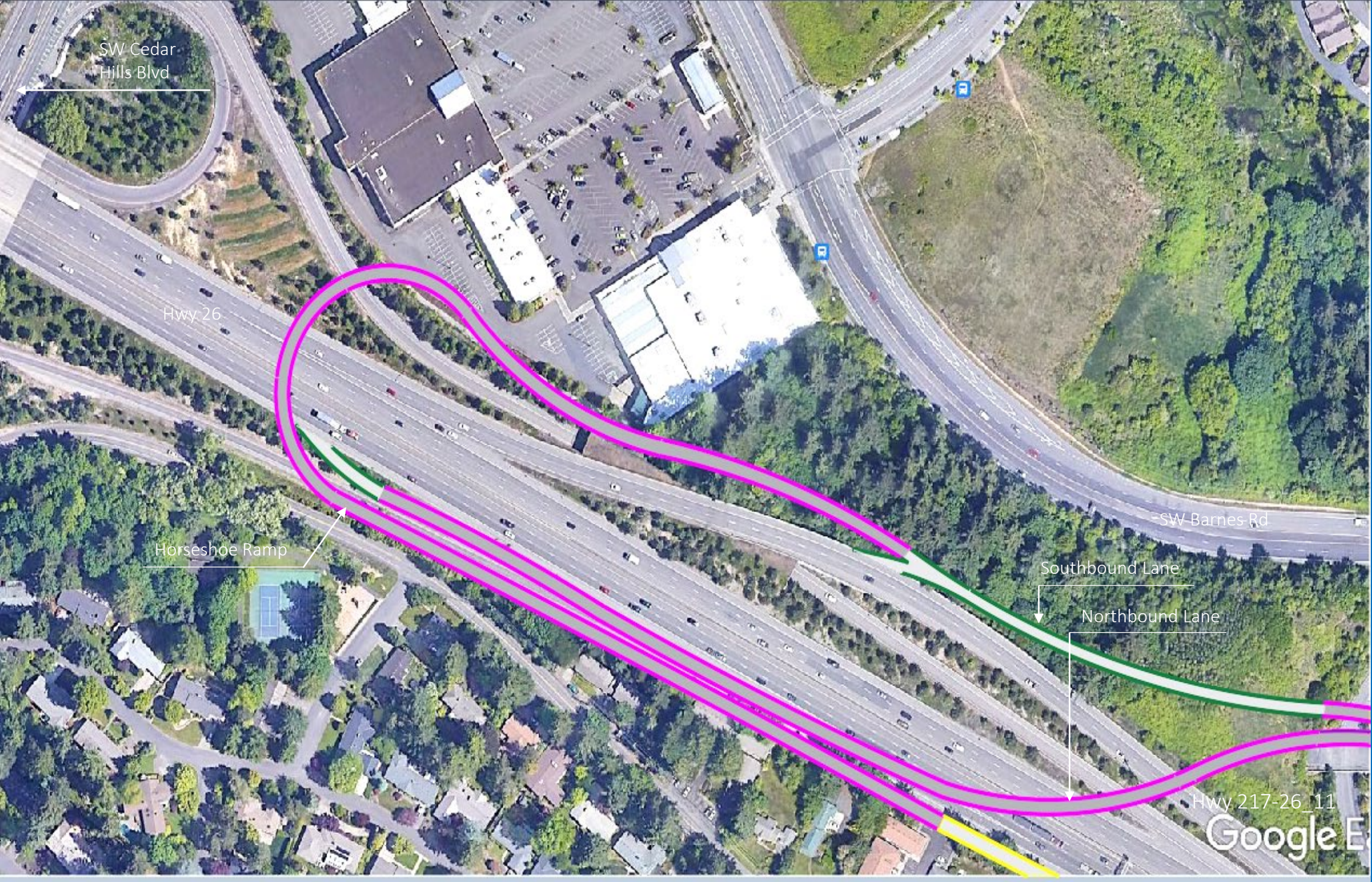




The Tunnel between Beaverton and the Sunset Transit Center.

The commuter train will be in single track between Beaverton and the Vancouver CHSR River Station.





SW Cedar Hills Blvd

Hwy 26

Horseshoe Ramp

Southbound Lane

Northbound Lane

SW Barnes Rd

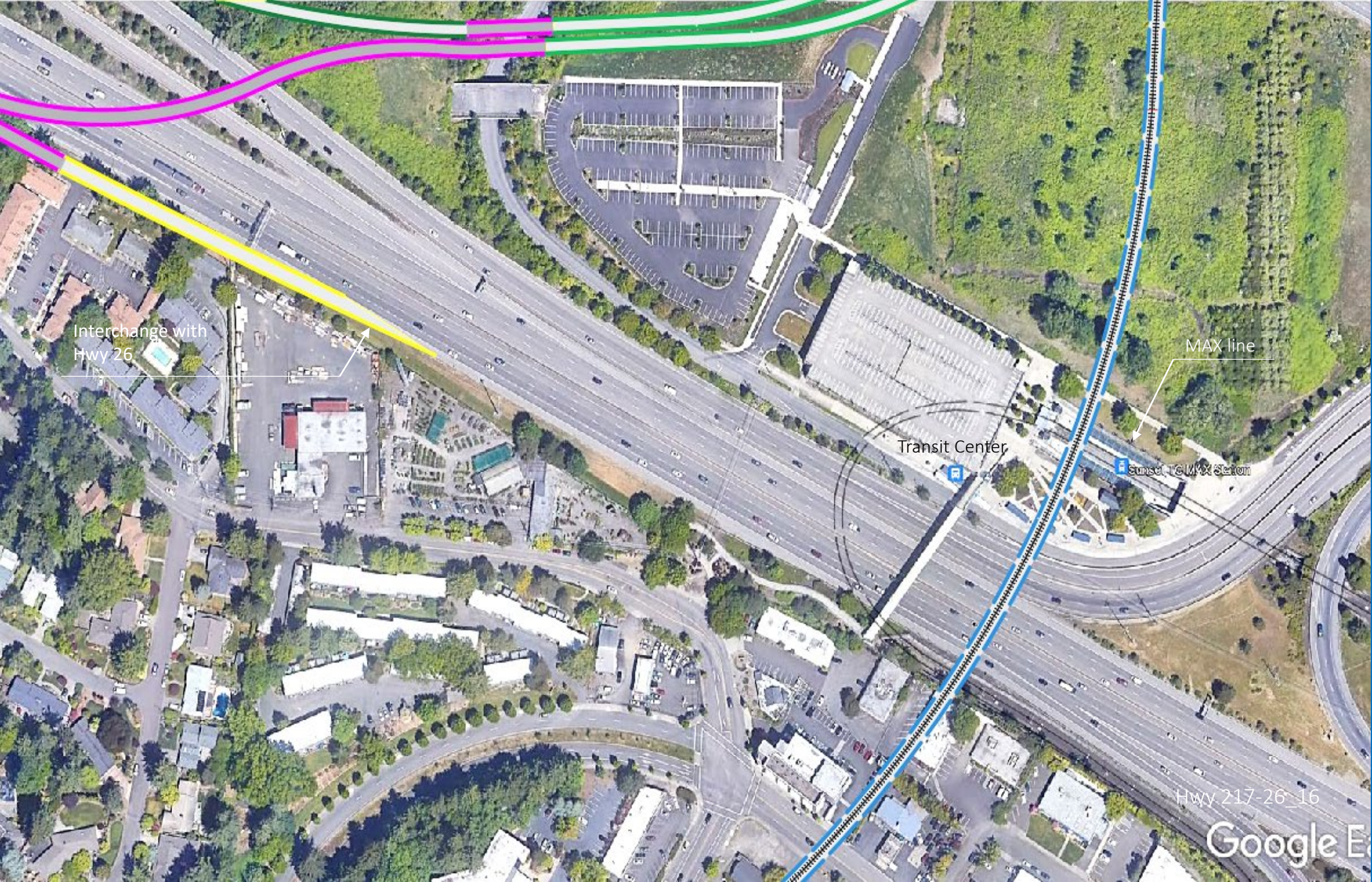
Hwy 217-26_11

Google E

This is the Forest Park Corridor's Bypass Horseshoe Loop

The southbound lane from North Portland will direct intersect with the westbound Hwy 26 and loop around to intersect with Hwy eastbound and Hwy 217.

The northbound lane will flyover the Hwy 26 and then connect to the tunnel to North Portland.



The Commuter Rail and the Motorway Bypass Corridors.

The commuter line is in the tunnel below the MAX line and the Sunset Transit Center.

The red lines are flyovers, the dark green is infill's and the light green is in cuts.

Interchange with Hwy 26

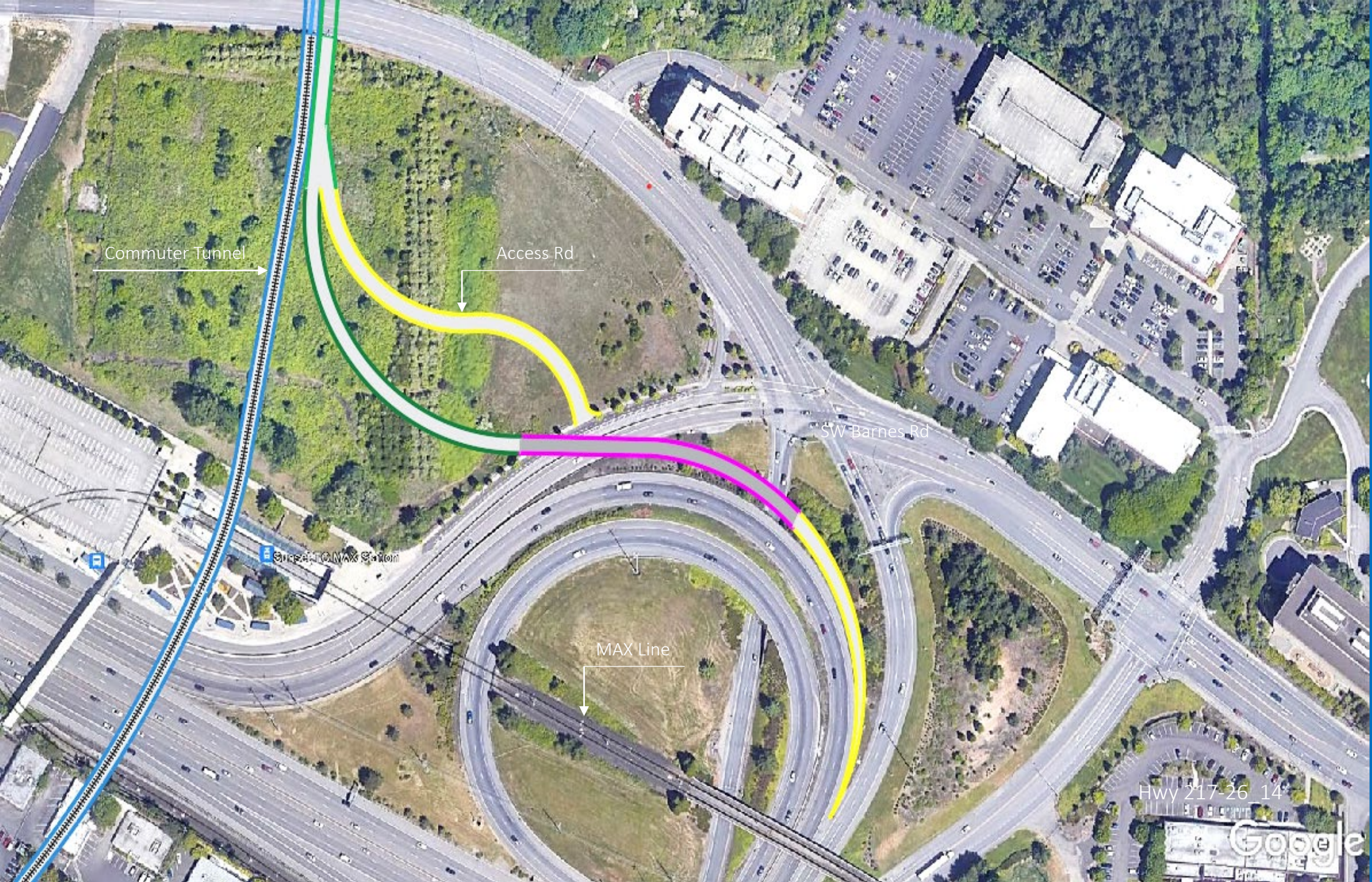
Transit Center

MAX line

Sunset 16 MAX Station

Hwy 217-26_16

Google E



Commuter Tunnel

Access Rd

SW Barnes Rd

MAX Line

Sunset MAX Station

Hwy 217-26 14



The Proposed Sunset Highway Northbound Intersection Connections to the Tunnel

The yellow lines are on ground, the red lines are on flyover, dark green lines are on infill's and light green is in cuts.

The access Rd will allow connection from Hwy 26 westbound via SW Baltic Ave, SW Barnes Rd and Sunset Transit Center.



North of Barnes Rd

The commuter rail tunnel is lower than the approaching bypass roadways.

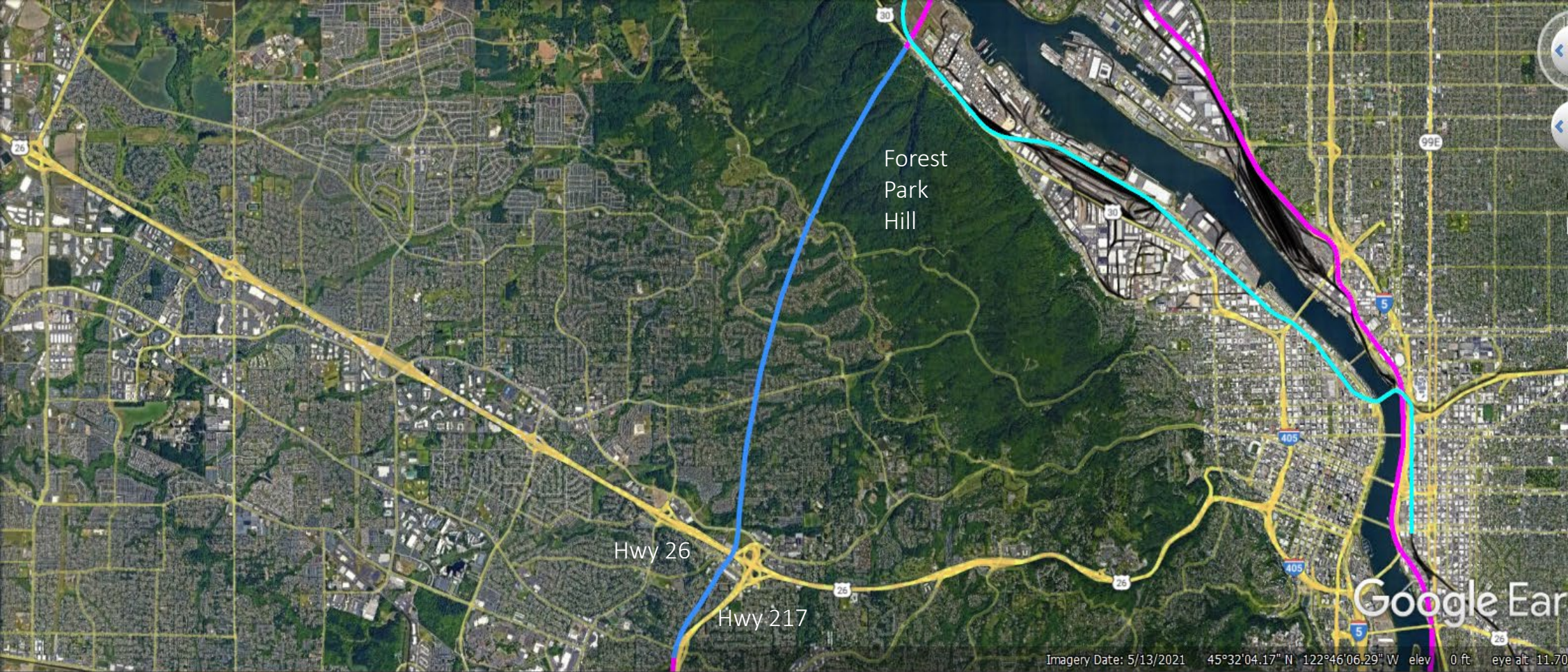
The roadways will merge with the tunnel elevation past the bridge.

The bypass roadways will underpass the SW Barnes Rd. The distance is long enough between the west-end Sunset Transit Center and the SW Barnes Rd to hold a grade of 4.7%.

Barnes Rd

Hwy 217-26_15

Google



Birds Eye View
between Sunset
TC and Hwy 30

The commuter rail
tunnel starts at
northwest
Beaverton and
goes to Sunset TC
and then to the
westside of Hwy
30.

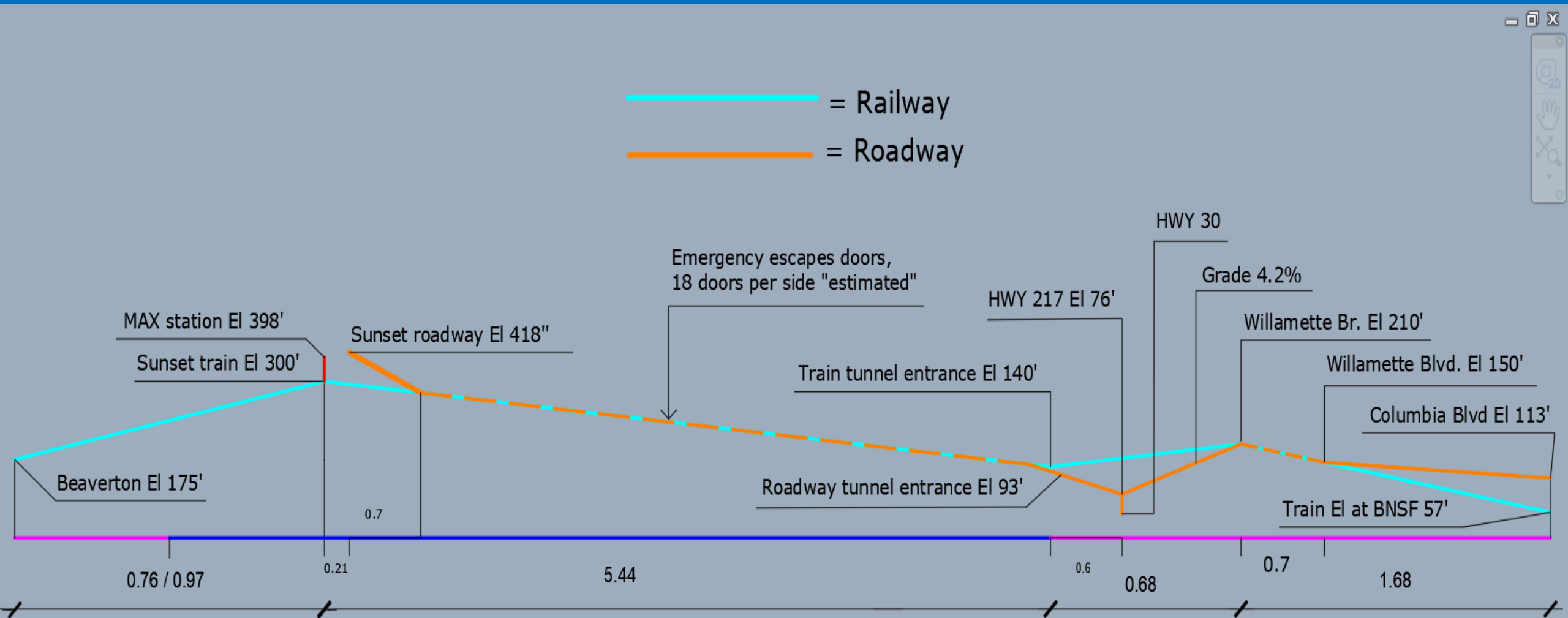
The motorway
tunnel starts
north
of Sunset TC and
ends at the
westside of Hwy
30.

Graph: Min, Avg, Max Elevation: 89, 553, 1125 ft
Range Totals: Distance: 5.37 mi Elev Gain/Loss: 2193 ft, -2306 ft Max Slope: 47.0%, -68.0% Avg Slope: 11.3%, -17.7%

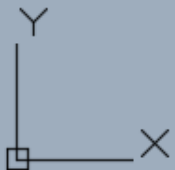
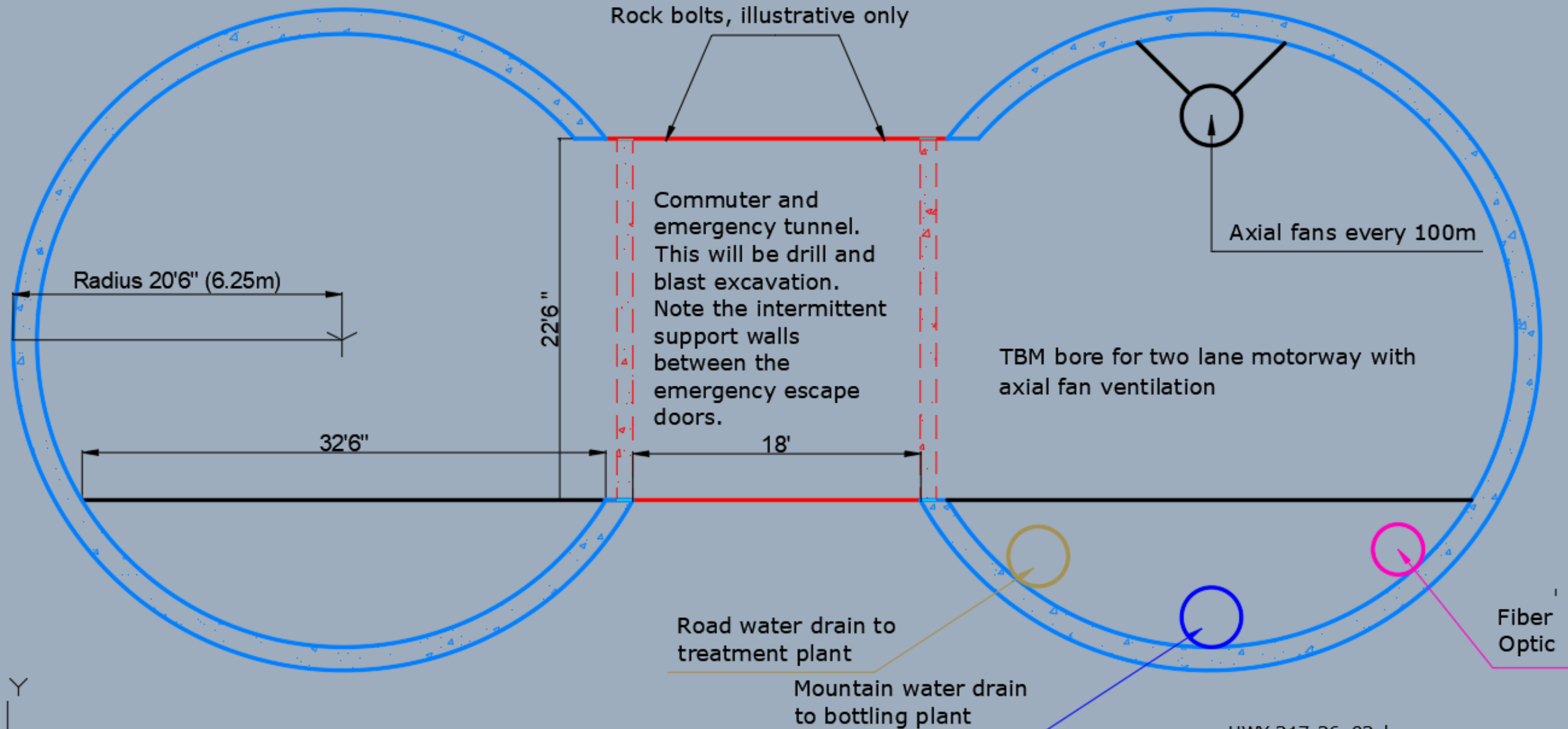


Imagery Date: 5/13/2021 45°32'04.17" N 122°46'06.29" W elev 0 ft eye alt 11.70

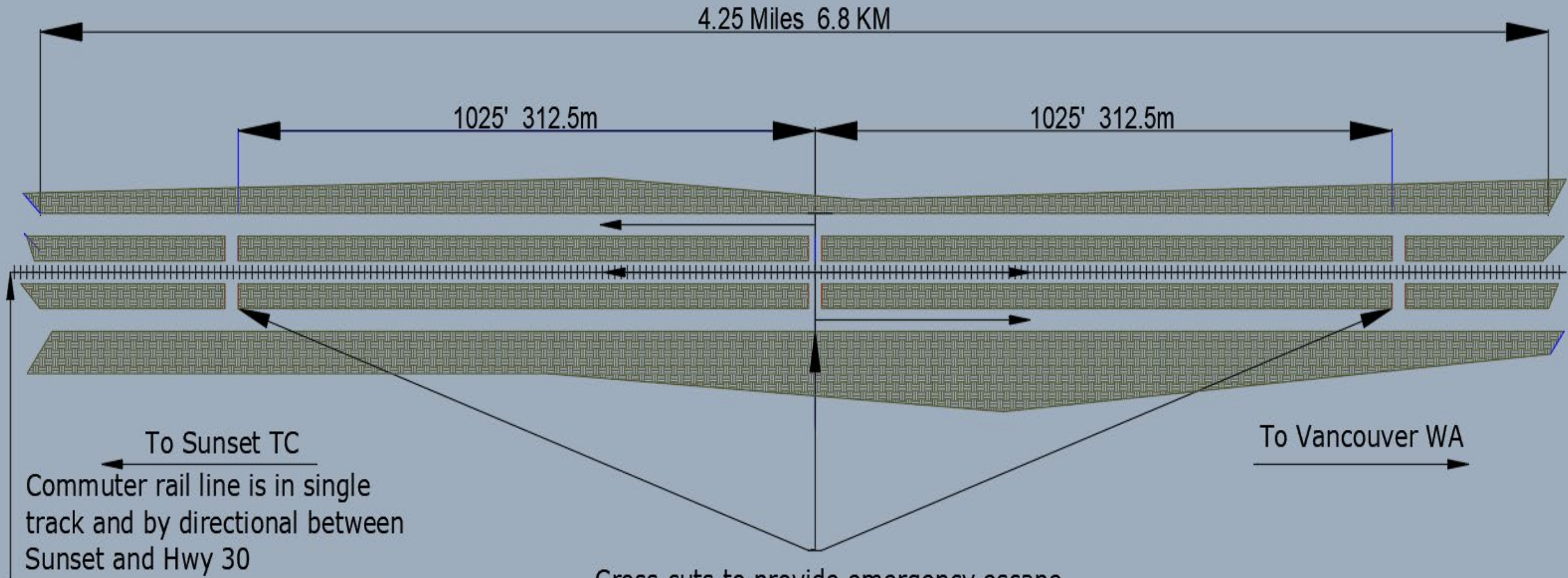
Profile chart between Beaverton and Willamette River



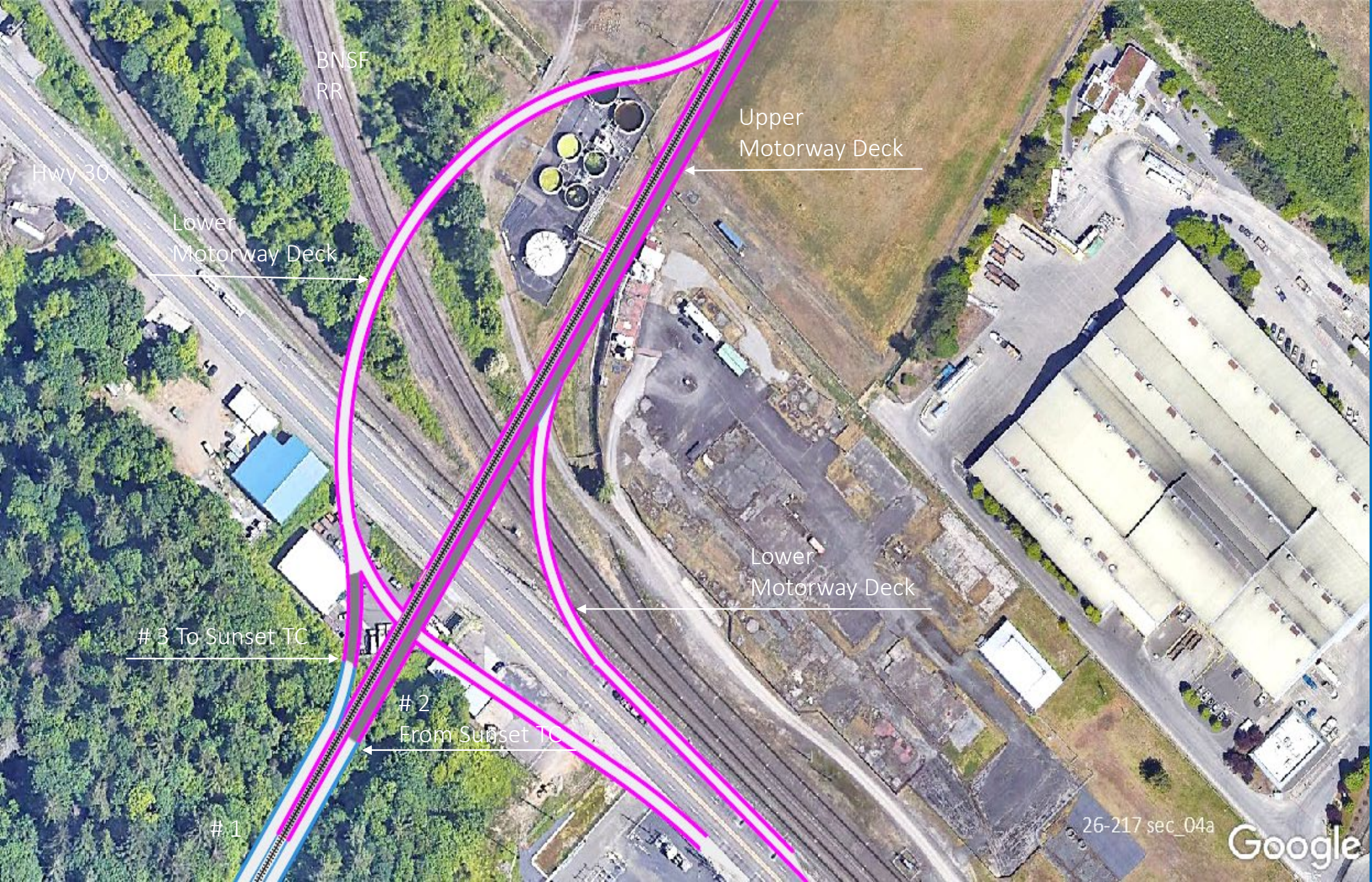
TBM tunnel arrangements



HWY 217-26 extension tunnel - length is estimated two tunnels for automotive and one tunnel for commuter trains



Cross cuts to provide emergency escape
21 cross cuts will be needed
escape to rail line by escape doors normally closed
install sensors, cameras, light signals and one vertical vent shaft



Western Bypass and Hwy 3 Interchange

The Hwy 30 has no connections to or from the Sunset Transit Center.

Hwy 30 northbound onramp connects to the lower deck.

- # 1 Rail tunnel entrance El 140'.
- # 2 From Sunset TC tunnel entrance El 93'.
- # 3 To Sunset tunnel entrance El 81'.

The motorways are over and under in this area.



Western Bypass Corridor

Build the flyover bridge first to connect the tunnels. Transport the tunnel muck with side-dump rail cars and dump the material in the in-fill area.

Use conveyor systems to forward the material for the 1400-foot distance.

The westside wedge is not terraced.

This plan will provide much needed housing ground.



University of Portland
Birdseye View

This view depicts the existing freight rail corridors and the proposed solutions.

There are new tunnel sections for the planned freight railroads. This new routing will reduce freight rail congestion in the existing rail yards.

The yellow shaded areas are for new housing.

New pre-fabricated panel tunnel on top of fixed concrete track base

New UPRR rail tunnel

Existing UPRR corridor

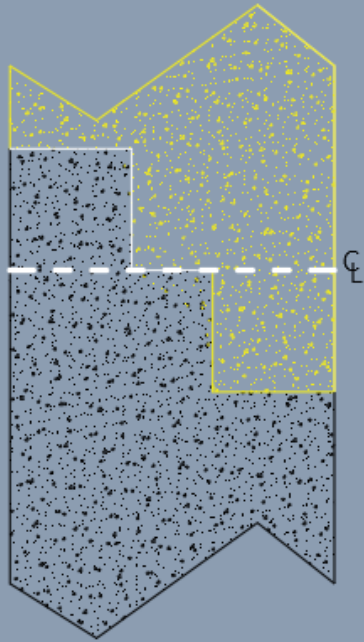
University of Portland

Hwy 217-26_01

CHSR

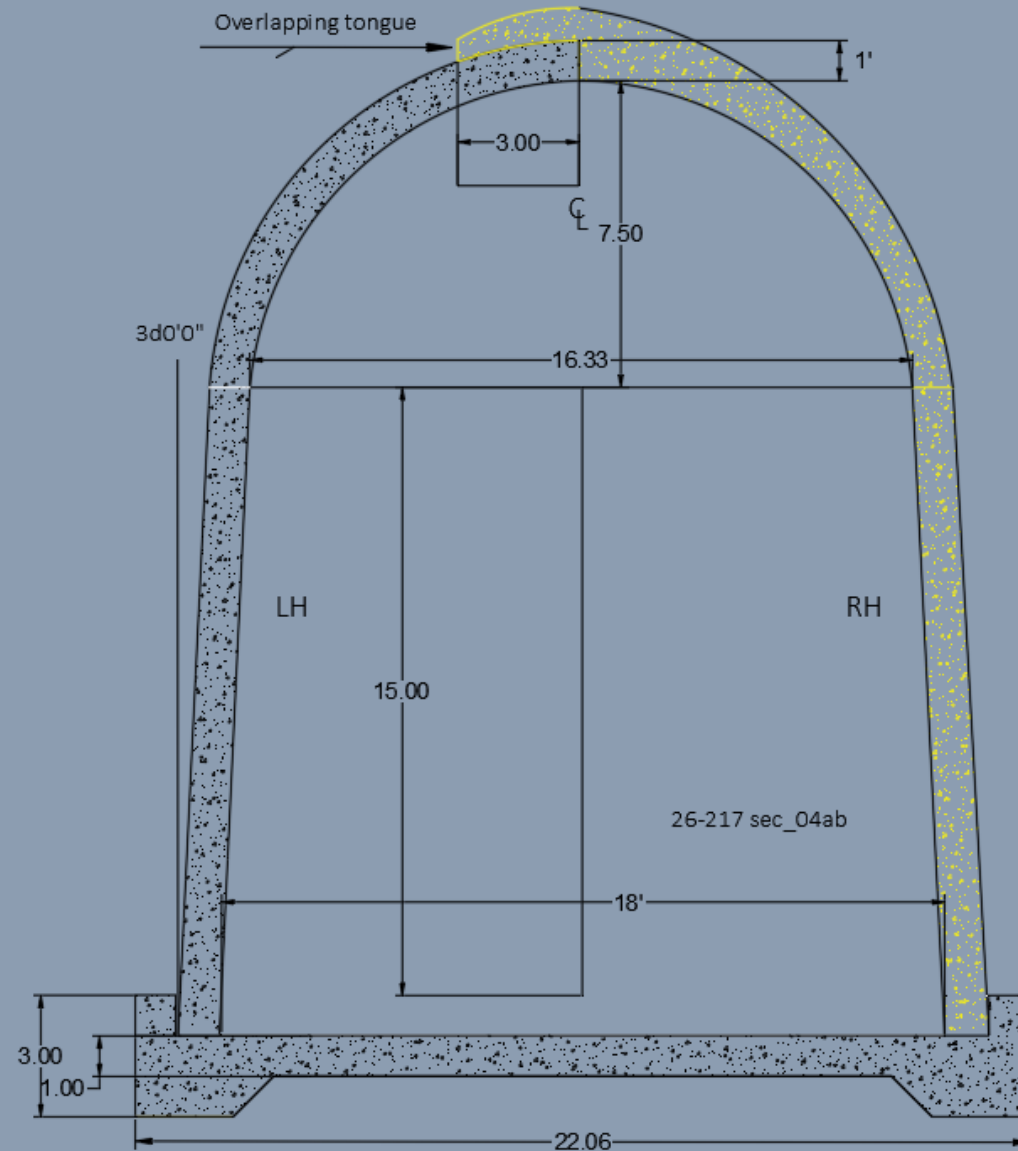
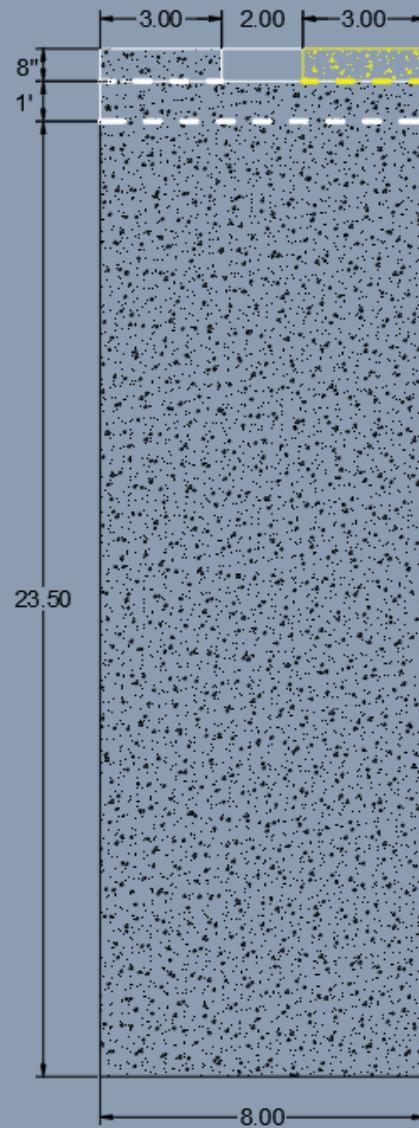
Google E

Pre-fabricated tunnel panels for the in-fill areas



Pre-fabricated panel
8 feet wide, 25 tones.
Panel tongues will overlap one
on another right hand RH and
left hand LH. This will create a
seismic interlocking. The
panels have a 3 degree slope
to provide additional stiffness
during earth quakes.

This is for a single track layout,
the RR may want double track.





Edgewater Flats Terraced

Develop this land
for housing.

For the tunnel
lines see the
drawing above.

Open wedge area
may differ. This
area is needed
for the
re-naturalized
westside slope
bank.

New RR, this will
connect the
UPRR Albina Yard
with the Portland
BNSF Yard via the
Willamette BNSF
lift bridge. The
Portland steel
bridge will be
closed for rail
traffic. The CHSR
will use the new
Rose Quarter TC
station.

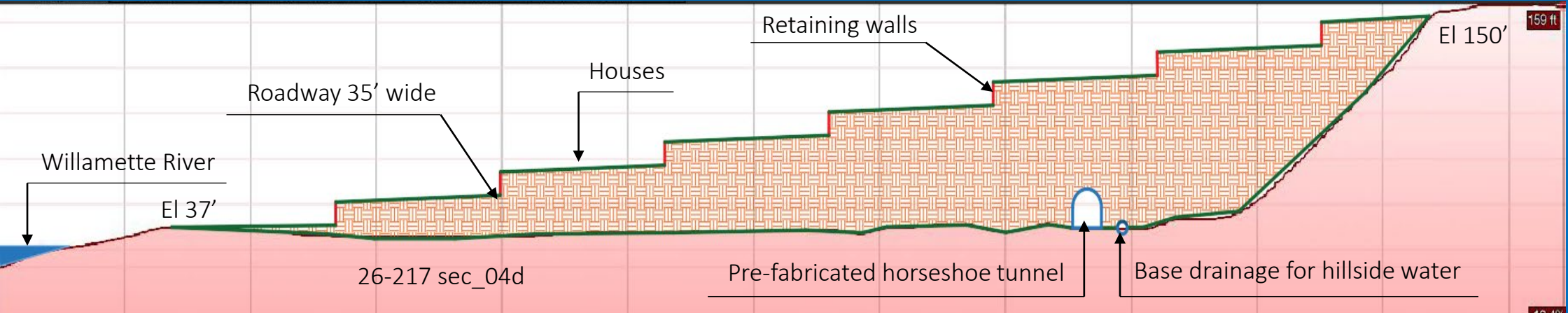


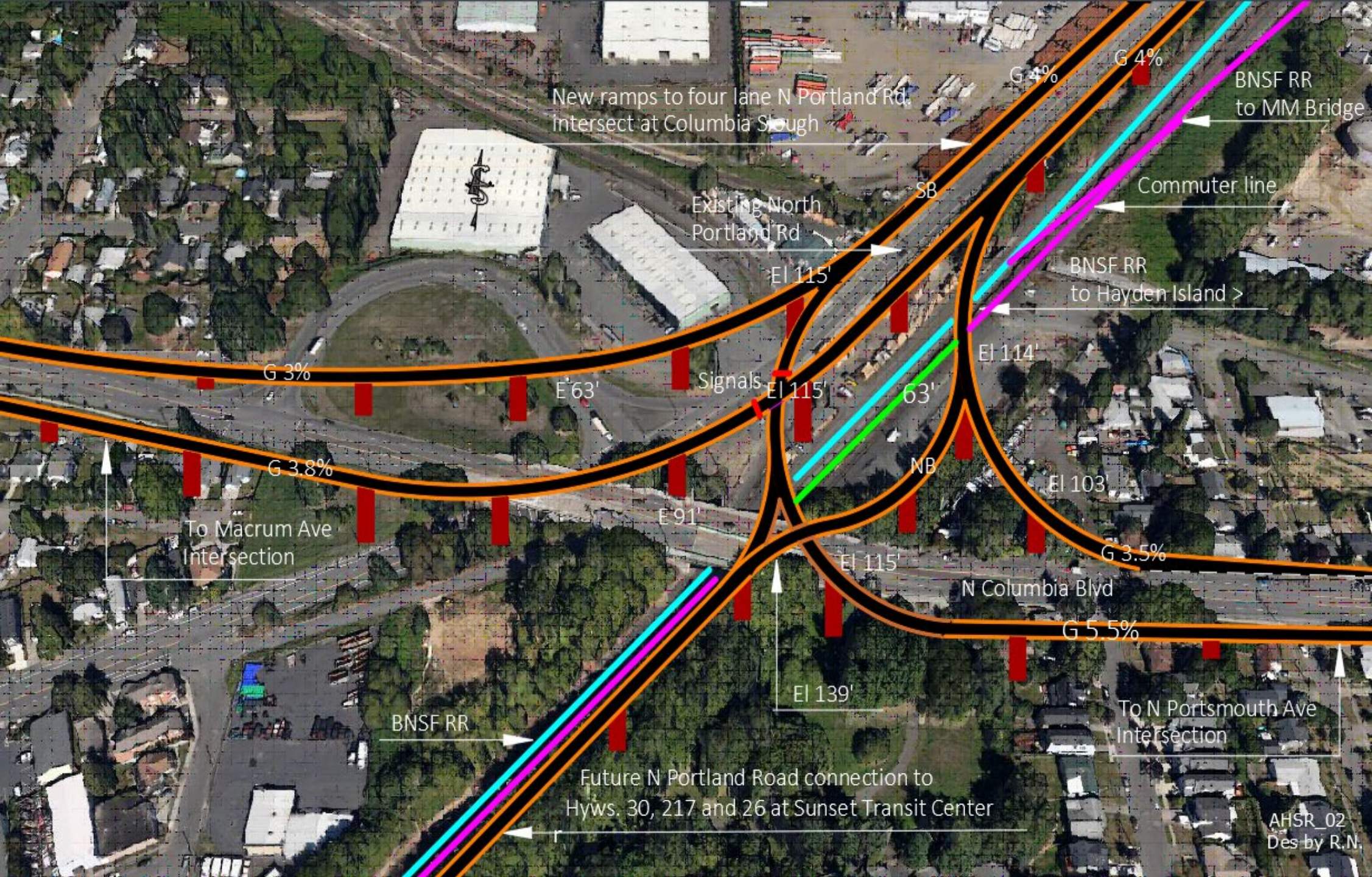
Edgewater Flats West of University of Portland

Area of land is ± 41 acres, in-filled with Forest Park tunnel muck. Install geo-mat on top of the existing ground to lockout surface water intrusion which will hinder water leaching to the Willamette River.

Terrace this area and then build housing. The slope is 3% for lot drainage. The estimated retaining wall height is 15 feet.

The roadways are along the retaining walls.





N Columbia Blvd Crossing for the Hwy 26/217 bypass corridor

We may have a commuter station on the east side of the BNSF rail location.

New roadway interchanges and future commuter rail service between MAX Sunset TC, Battle Ground and Camas. SB = southbound, NB = northbound.

Note; Drawings were made on AutoCAD 2010, bad conversion to version 2022.

Hayden Island Auxiliary Bridge

- This is the proposal to bring MAX to Hayden Island.
- This auxiliary bridge will also accommodate motor traffic to and from the Hayden Island. The interchanges are with Marine Dr. W, N Marine Dr., N Vancouver Way, NE M L K Jr. Blvd. and I-5.
- This bridge will reduce the I-5 bottleneck traffic.
- The automotive traffic has a modern elevated inter-loop layout to eliminate additional traffic signals.

Des. By R.N.

Not to scale.



Hayden Island Auxiliary Bridge

The MAX line will be in the center arch over the Columbia River Slough at the same elevation as the I-5.

The northbound automotive traffic is parallel along the eastside and the southbound automotive traffic is on the westside of the auxiliary bridge.

The N Marine Dr./MLK Jr. Blvd and the northbound W Marine Dr. have traffic signals.

Columbia River Slough

Auxiliary Bridge

W Marine Dr.

Traffic Signal

Traffic Signals
N Marine Dr.
MLK Jr. Blvd

Existing MAX Yellow Line

Hayden Island Auxiliary Br_04
Des. By R.N.





MAX flyover extension

The MAX will flyover the W Marine Dr and the Hayden Island Southbound off Ramp.

The current MAX station will require some elevation raising to reduce the grade %. A direct climb would be 9.5%, to steep for MAX.

Hayden Island Southbound off Ramp

M
A
X

W Marine Dr

Existing I-5 Interchange System

Hayden Island Auxiliary Br_05





Auxiliary Bridge at the southside of the slough

Here we have the automotive merging on/off ramps and the extended MAX line.

The northbound ramp from W Marine Dr will crossover the MAX tracks. There is a traffic signal on the westside of the MAX tracks.

The bridge elevation is 38' at the southside slough bank and till the south edge of the W Marine Dr. The Marine Dr elevation is 14', MAX grade is 5% between the south end of the existing MAX station.

Southbound off ramp from Hayden Island

Northbound on ramp from MLK

W Marine Dr

Northbound ramp From W Marine Dr

N Pier 99 St

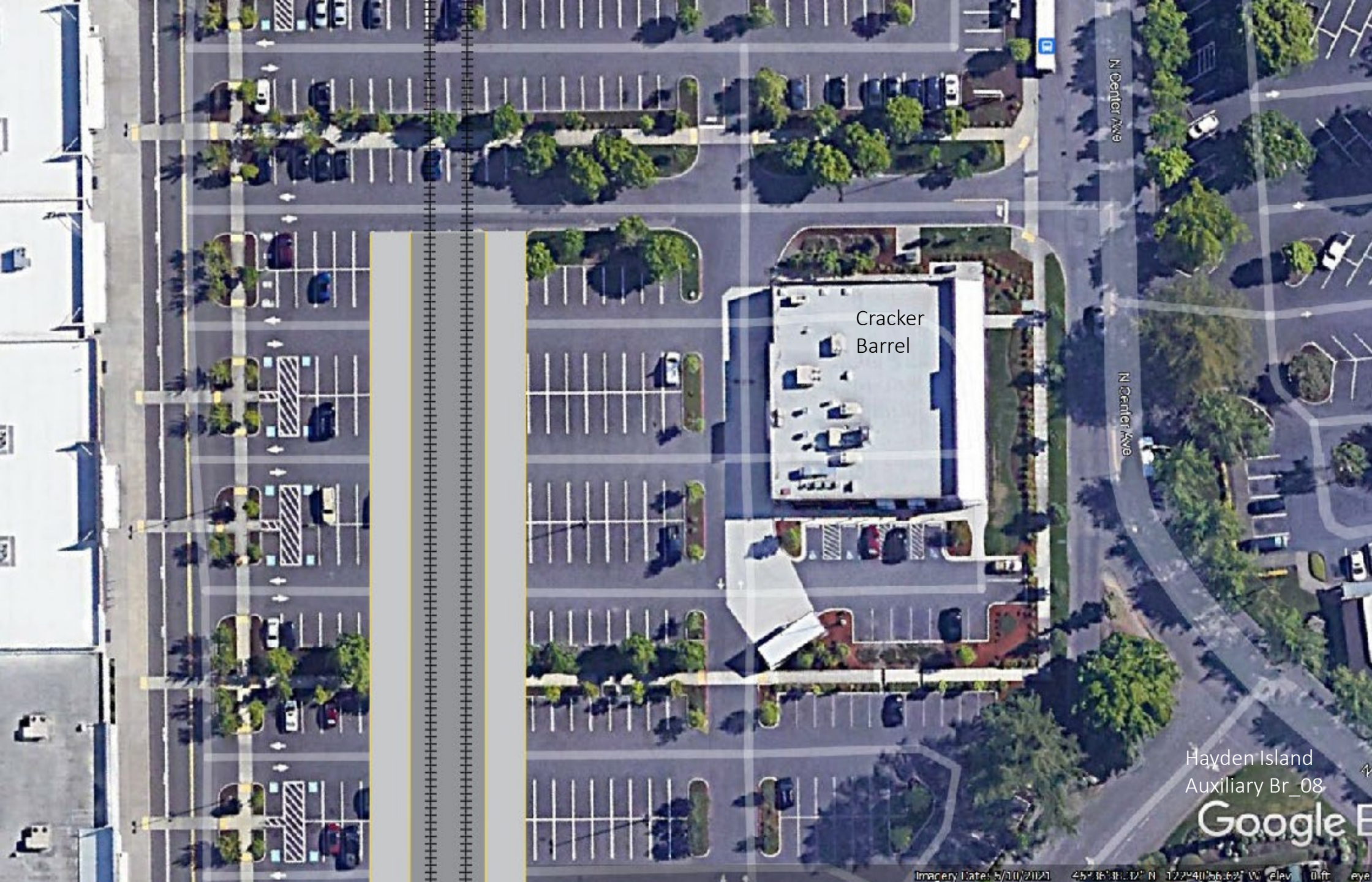
N Pier 99 St

N Pier 99 St

Hayden Island Auxiliary Br_06

M
A
X

Google E



Hayden Island Auxiliary Bridge

The end of the auxiliary is west of the Cracker Barrel Old Country Store.

The Max station is between the Cracker Barrel and the Stanford's Restaurant, end of the line not shown.

Cracker Barrel

N Center Ave

N Center Ave

Hayden Island Auxiliary Br_08

Google E



Columbia River Slough

Single arche bridge
no piers in the slough

Hayden Island
Auxiliary Br_09

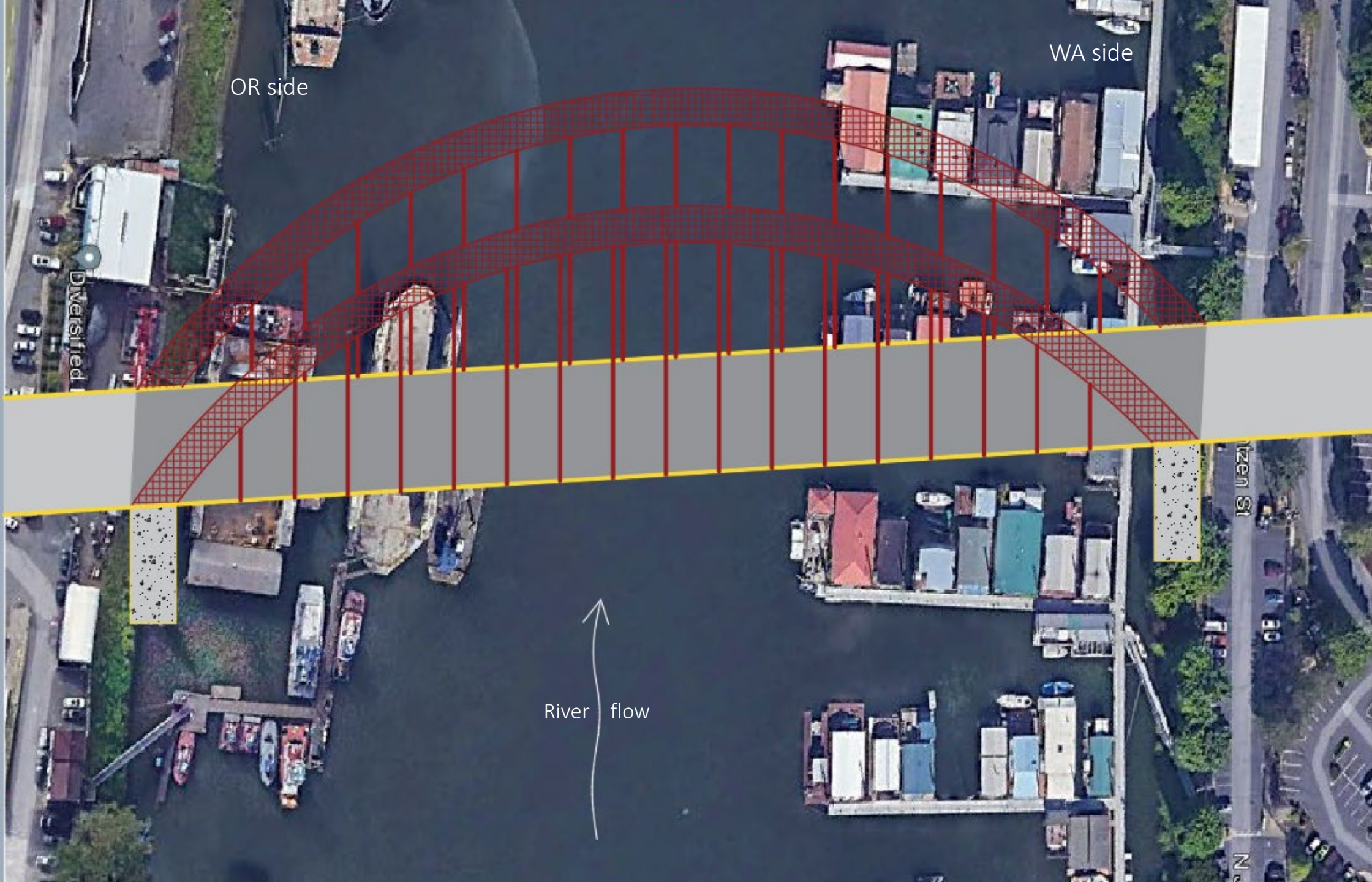
The Columbia River Slough will have an Arch Bridge same as the proposed Multi-Modal Bridge. The Span Width is 830 '.

The construction will be in lighter format than the Multi-Modal bridge

The MAX and roadway details are not shown.

The grey fields have regular bride columns for the bridge.





OR side

WA side

River flow

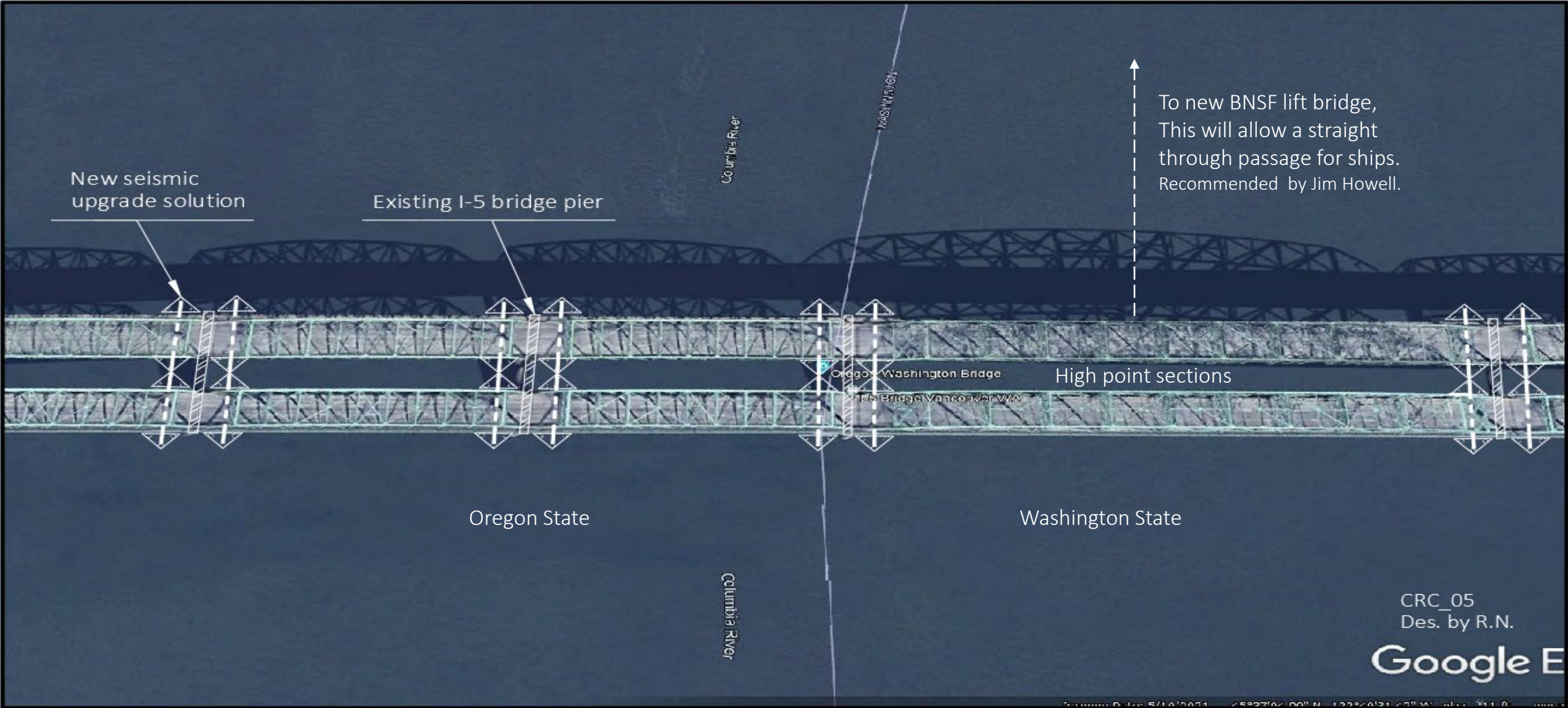
Hayden Island Auxiliary Arch Bridge Proposal

This bridge is ± 20 feet above the Columbia River Slough. It will flyover the house-boats and allow proper height for boat passage.

The MAX tracks and the single motorway lanes are not shown.

COLUMBIA RIVER CROSSING BETWEEN OREGON AND WASHINGTON

Seismic I-5 Bridge Upgrade Solution and Aerial View of Bridge Sections

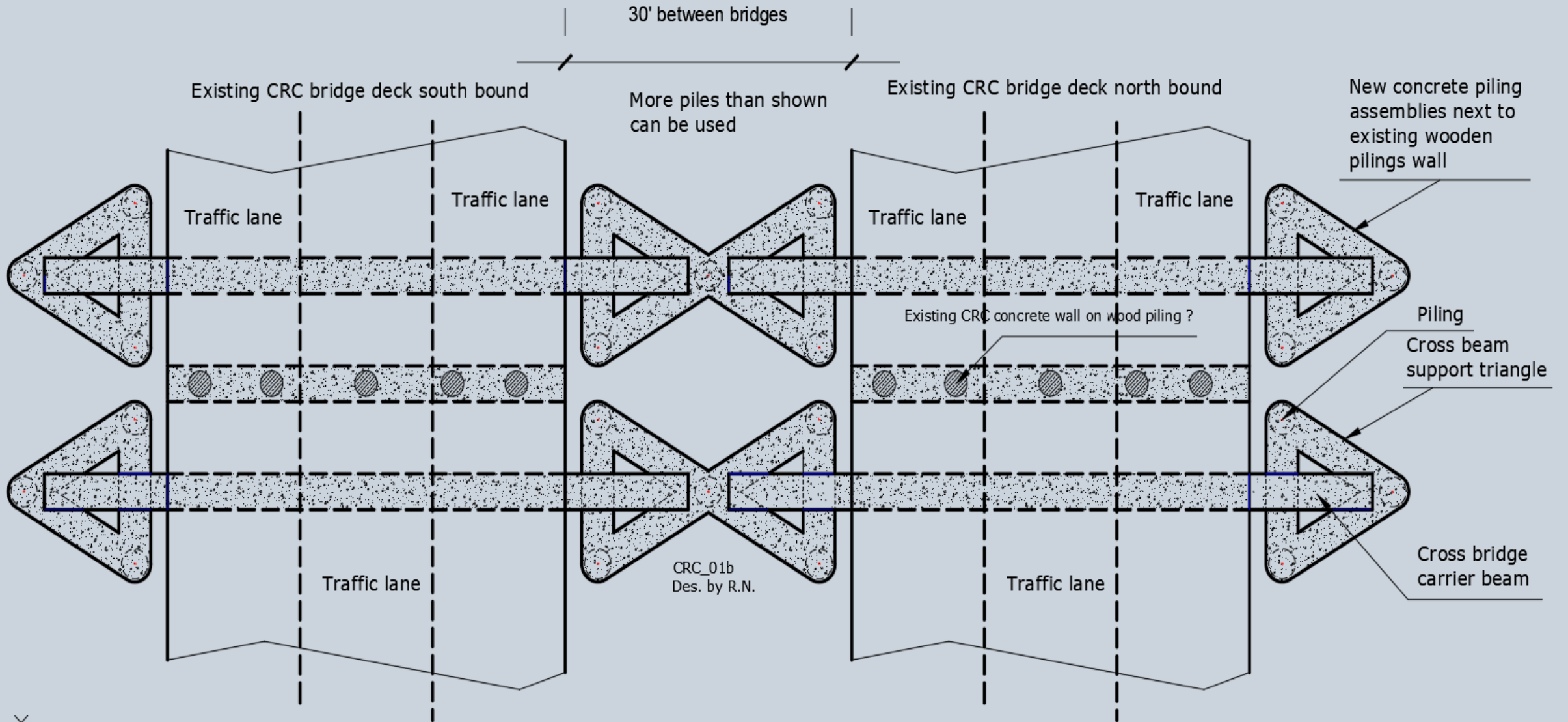


CRC_05
Des. by R.N.

Google E

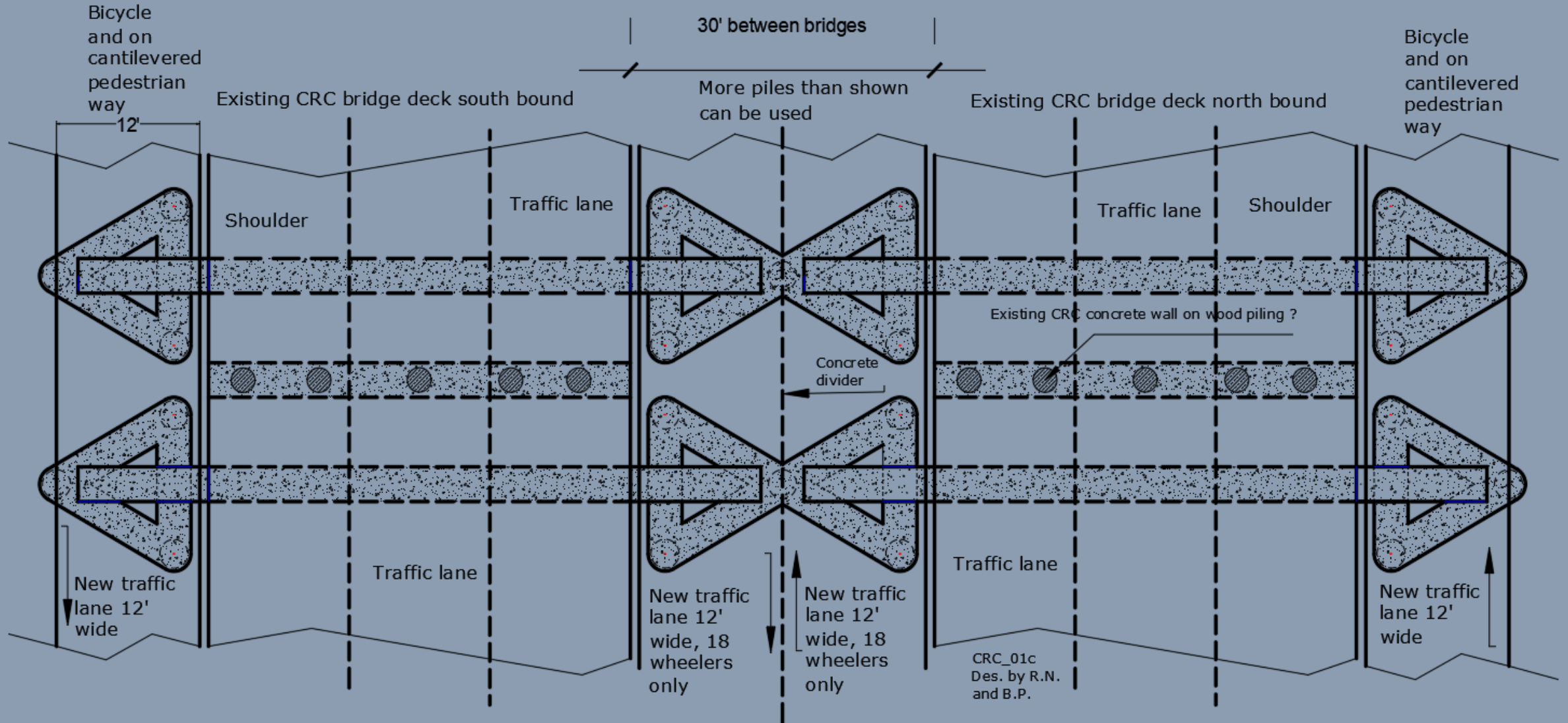
OPTION 1: NEW SEISMIC UPGRADE SOLUTION

Existing Condition



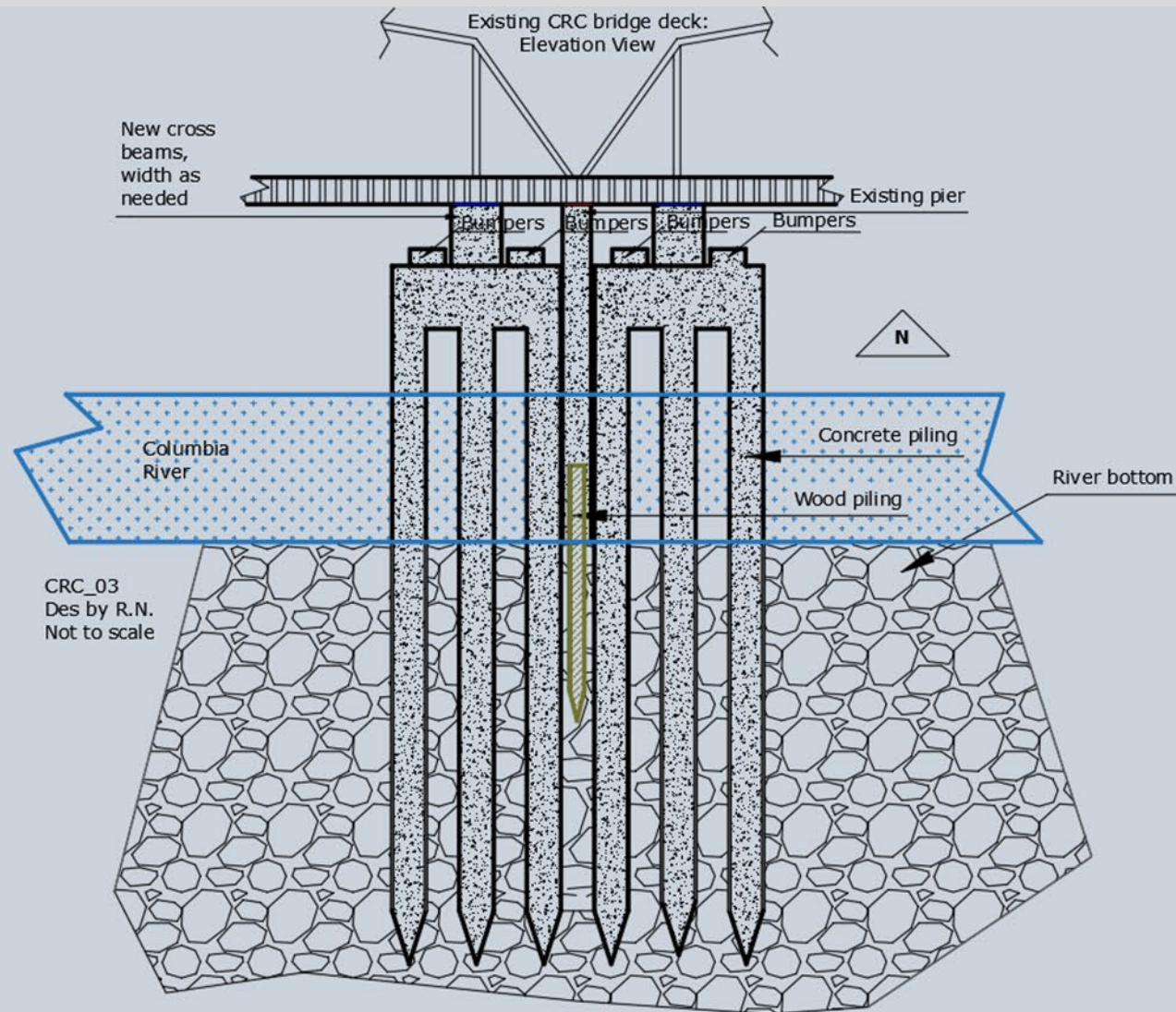
OPTION 2: NEW SEISMIC UPGRADE SOLUTION

Existing Condition



CROSS SECTION VIEW

Center Pile is Wood



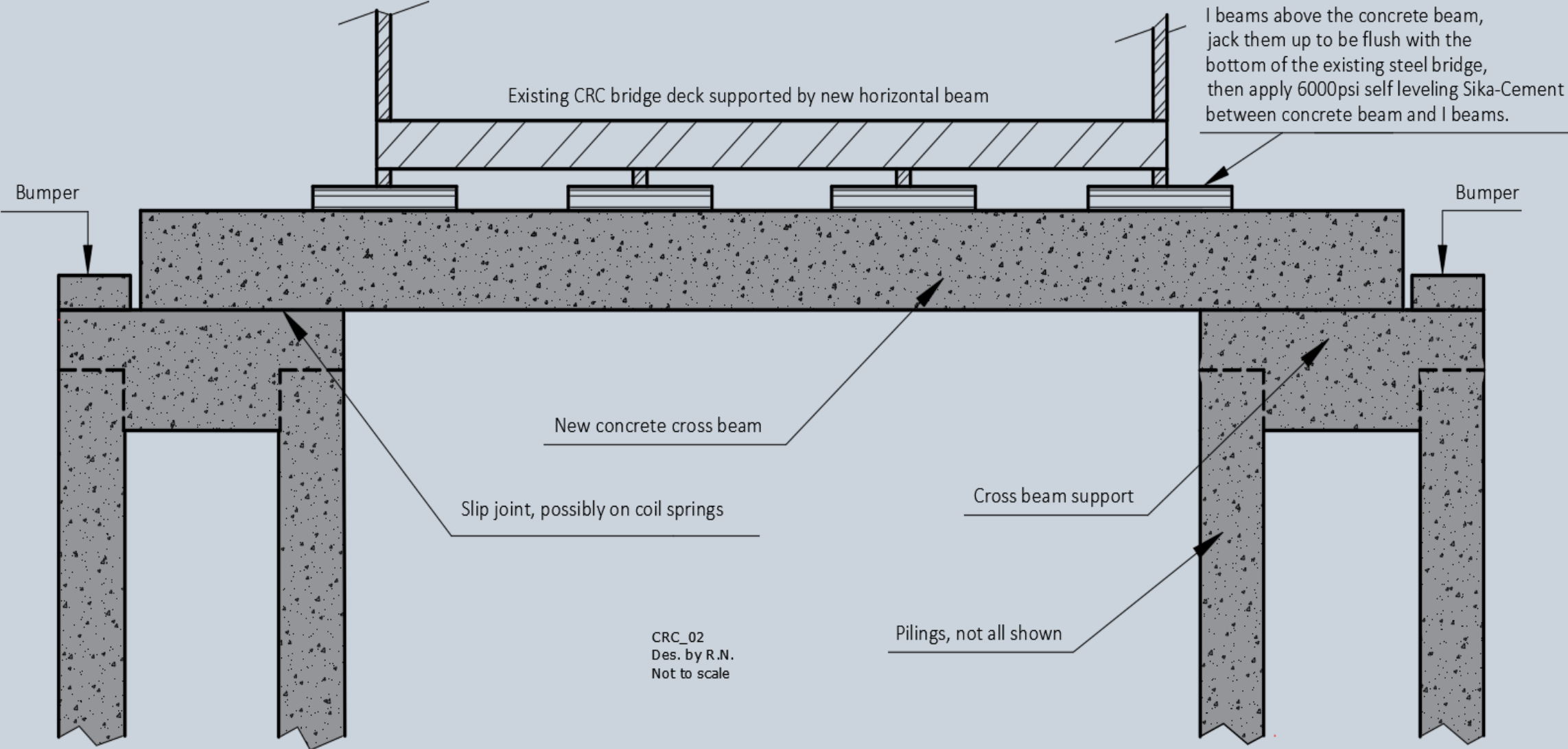


High point section

I-5 bridge undercarriage
with locations for
concrete cross beams

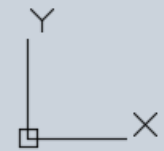
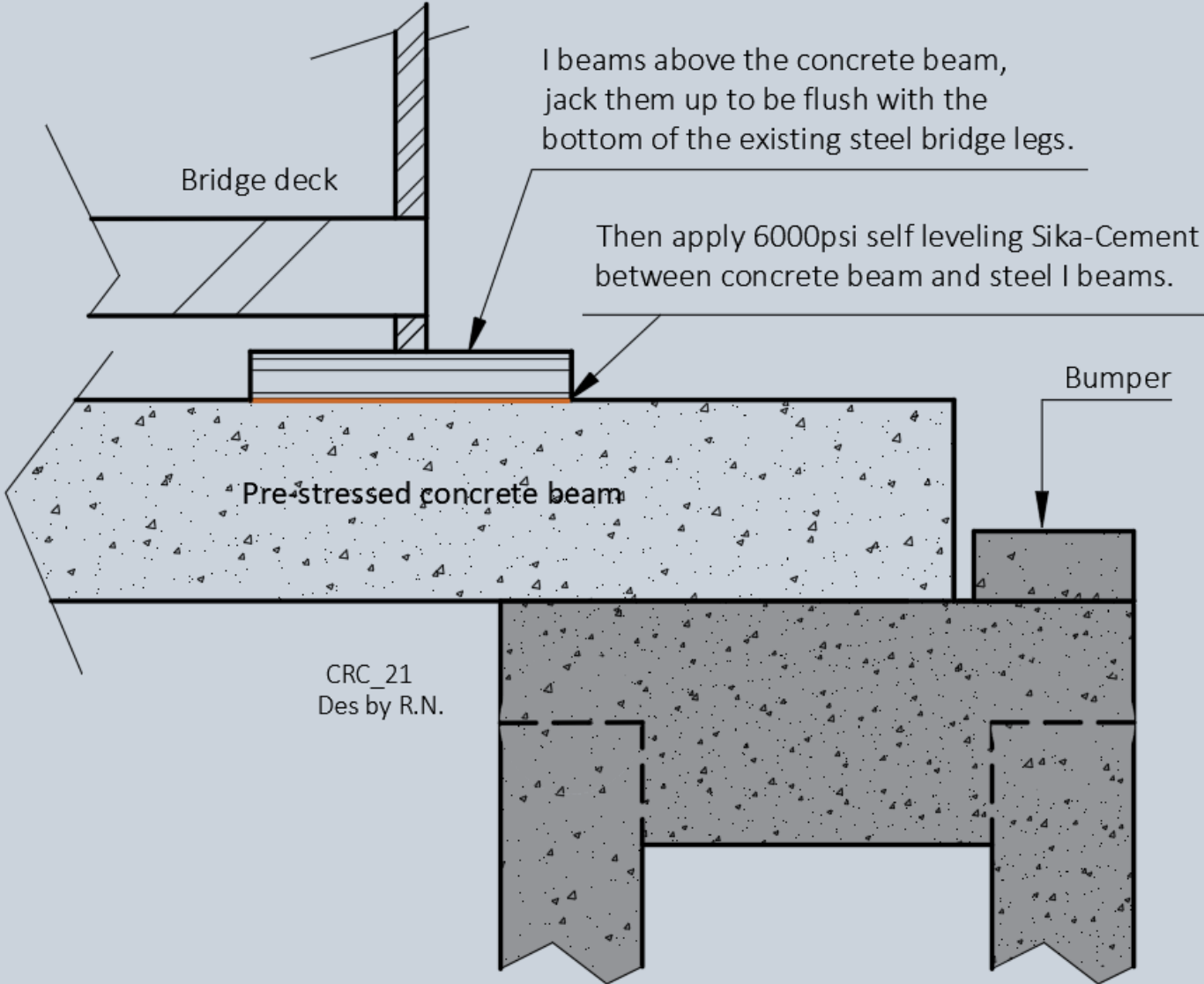
COLUMBIA RIVER CROSSING

Seismic Upgrade Solution in Elevation View



COLUMBIA RIVER BRIDGE BASE

Shoe Above I-Beam Assembly



BRIDGE SHOE DETAIL

Keep I-Beams Flush with Bridge Undercarriage. Apply Sika Cement Shim to Fill Voids.

Steel bridge undercarriage

