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# Response to Public Comment Concept to Reconfigure the US 50 Connection

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**TO:** KYTC and ODOT

**FROM:** HNTB Corporation

**DATE:** August 29, 2023

**RE:** Brent Spence Bridge Corridor Project | ODOT PID 89068 | KYTC Project Item No. 6-17

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## Introduction

The Bi-State Management Team (BSMT), which is comprised of the Kentucky Transportation Cabinet (KYTC) and the Ohio Department of Transportation (ODOT) met with representatives and proponents of Bridge Forward on five occasions in 2023 as part of the community outreach program for the Brent Spence Bridge Corridor. These meetings also included participation by the City of Cincinnati, Hamilton County, and the Federal Highway Administration (FHWA). During those meetings, overall project goals and constraints were shared and discussed, including the goal of minimizing the project footprint while still meeting the overall transportation goals. Refer to Attachment 1 for the list of design-build contract objectives that the BSMT shared with Bridge Forward. After the third meeting in March 2023, Bridge Forward prepared and presented an alternative concept for connecting US 50 to I-75, I-71, the collector-distributor (C-D) system, and the local road system. In April 2023, Bridge Forward prepared a revised version of the same concept and presented it to the Cincinnati City Council on May 3, 2023. Bridge Forward has continued to update and prepare concept revisions over the past few months. In 2023, proponents of Bridge Forward hired an engineering firm to refine the Bridge Forward concepts and submitted the latest version on June 26, 2023. Below is the BSMT's initial high-level review and comments on the latest version; the June 26, 2023 submittal. See attachment 2 for a layout of both the latest Bridge Forward concept and Refined Alternative I (Concept I-W).

## US 50 Connection (Bridge Forward June 26 Concept)

The Bridge Forward Concepts approach the design of the I-75 ramps to and from downtown Cincinnati (referred to hereafter as the “interchange”) differently from Refined Alternative I (Concept I-W) in terms of the overpass and underpass relationships. The Bridge Forward approach is to stack the movements with US 50 moved to the lowest level of the interchange. The stated goal of Bridge Forward is to develop a concept similar to the trenched approach of Fort Washington Way.

The majority of the differences between the Bridge Forward concept and Refined Alternative I (Concept I-W) occur between 7<sup>th</sup> St and the Ohio River therefore this response focuses on that area. This

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response includes a very high-level conceptual review of the Bridge Forward concept by the BSMT focused in five areas:

- 1) Alignment and profile
- 2) Access
- 3) Footprint
- 4) Costs
- 5) Traffic

## Alignment and Profile

The Bridge Forward Concept approaches the interchange design differently from Concept I-W by stacking the interchange and moving US 50 to the lowest level of the interchange. This arrangement presents some geometric issues as described below and shown in cross sections in Attachment 3:

- 1) The proposed northbound and southbound local streets at 7<sup>th</sup> and 8<sup>th</sup> Streets are 50 feet (west side) and 30 feet (east side) above the existing ground. This places them at the same level as the top of the adjoining buildings.
- 2) The 7<sup>th</sup> Street crossing over I-75 is 40 feet higher than the existing crossing and results in a 9.5% grade coming up from Gest Street and a 6.5% grade coming up from Central Avenue.
- 3) Both the northbound and southbound local streets are 30 feet to 40 feet higher than the existing ground and Gest and Central Avenue which results in higher grades on the east/west connecting roadways and a potential physical and visual barrier between downtown and the Queensgate neighborhood. This elevation difference is not reflected on the renderings presented by Bridge Forward.
- 4) US 50 as currently proposed in the June 26, 2023 Bridge Forward concept requires a tunnel under mainline I-75. Depending on the final tunnel length, life safety access and an ancillary structure may be necessary, impacting costs, footprint, constructability, and grades and elevations in the area of the tunnel.
- 5) Both the northbound and southbound local streets are at over 9% grade from 3<sup>rd</sup> to 5<sup>th</sup> Street.
- 6) The Bridge Forward concept crosses directly over a major Duke Energy gas valve which; due to the high impacts and costs associated with relocation; has been identified as a utility to be avoided.
- 7) The Bridge Forward concept impacts +/- 4 additional acres south of 2<sup>nd</sup> Street near the Bengals practice facility and game day parking, which are not included in the current project impacts or the construction cost comparison.

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In the Bridge Forward Concept, none of the locations listed above meet the project design criteria set during the performance-based design process and could result in operational and safety issues. Correcting the geometry at these locations would require creating more distance between the constraint points and/or less elevation change by revising the levels of the various roadway elements. In both cases, that would require a larger footprint and would impact the additional contiguous developable acreage made available in the Bridge Forward Concept.

## Access

In reviewing access to the interstate and C-D system, the Bridge Forward Concept was compared to the access provided in Concept I-W. Most of the major differences were revised with the June 26, 2023 submittal:

- 1) The 3<sup>rd</sup> Street ramp to northbound I-75 and the C-D roadway system is moved to directly across from the Clay Wade Bailey Bridge.
- 2) The eastbound US 50 to 2<sup>nd</sup> Street access is moved from the current location to utilizing the local road system from 6<sup>th</sup> Street to 2<sup>nd</sup> Street. This would require driving through 4 or 5 additional traffic signals before reaching 2<sup>nd</sup> Street from EB US 50 or southbound I-75,
- 3) Accessing the 5<sup>th</sup> Street and Central Avenue from SB I-75 in the Bridge Forward concept requires exiting at 7<sup>th</sup> St and utilizing the SB arterial road and passing through 3 signals. In the I-W concept the same intersection is accessed through 7<sup>th</sup> Street and Central Avenue and passes through only one signalized intersection.
- 4) The southbound I-75 off ramp to 3<sup>rd</sup> Street requires passing through an additional signal.

These revisions all require further analysis of the operational impacts to the local road system and could require more lanes on the local roads, and/or degraded operations on the local road system. Additional impacts would occur at each of the intersections to account for truck traffic and specifically truck turning traffic. This would impact pedestrian crossings and the amount of contiguous developable land being made available. A high level Highway Capacity Software analysis was performed as part of this review and is included in the Traffic section of this response.

## Footprint

The stated goal of Bridge Forward has been to reduce the Brent Spence Bridge Corridor Project footprint by 30 acres, allowing for redevelopment opportunities along the west side of the Cincinnati Central Business District. The BSMT and local government agencies have a similar goal of minimizing project footprint and maximizing contiguous developable land.

The Bridge Forward Concept appears to identify approximately 23.7 acres of potentially available land (although the text provided by Bridge Forward states 30 acres). Concept I-W creates approximately

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12.9 acres of additional land. However, the most desirable development sites in both plans is the contiguous area west of Central Avenue between 3<sup>rd</sup> Street and 6<sup>th</sup> Street. Areas identified north of 6<sup>th</sup> Street and west of Central Avenue have some constraints and potentially are not as developable. Attachment 4 provides a plan view of the potentially contiguous developable area. The color coding differentiates the contiguous developable land south of 6<sup>th</sup> Street and east of I-75 from the area north of 6<sup>th</sup> Street.

As shown in Bridge Forward's Concept, about 5.82 acres of land is shown in various areas north of 6<sup>th</sup> Street and east of I-75. In this same area Concept I-W shows 2.24 acres available. For a consistent comparison the area at Gest and 9<sup>th</sup> Street in the Concept is not included in either concept. The intersection layout in the Concept would have operational issues as shown and correcting those could result in much less; if any; acreage available.

In looking at truly contiguous developable land the focus of this review is in the area bound by I-75 to the west, Central Avenue to the east and between 6<sup>th</sup> Street and 3<sup>rd</sup> Street. Based on feedback from the City of Cincinnati in the fall of 2022, the BSMT revised Concept I-W to make approximately 9.5 acres of land available west of Central Avenue between 3<sup>rd</sup> Street and 6<sup>th</sup> Street. The Bridge Forward Concept creates another 5.5 acres for a total of approximately 15.7 acres. See Attachment 4 for a layout of this area.

The additional developable land shown in the Bridge Forward Concept is a best-case scenario. Cross sections were developed based on the Bridge Forward Concept with the appropriate lane and shoulder widths (See Attachment 3). Based on the cross sections developed by the BSMT for the Bridge Forward Concept, it appears that the amount of developable land available between 6<sup>th</sup> and 3<sup>rd</sup> Streets is closer to 15.0 acres. Also, the cross sections show the new arterial/local road 30 to 40 feet higher than Central Avenue and the surrounding land both east and west of the I-75 corridor. This would result in either a visual and/or physical barrier between downtown Cincinnati and the Queensgate neighborhood. This is also not reflected in the renderings provided by Bridge Forward and presented at numerous events.

## Costs

A high-level construction cost comparison between the Bridge Forward Concept and Concept I-W was prepared by developing overall lane miles on local streets, US 50, C-D roads, and I-75 for each of the concepts. Costs were then applied to determine an overall cost comparison. See the tables in Attachment 5 for more detail. For consistency the costs applied to the lane miles are those utilized to develop the overall conceptual level costs for the BSB Corridor Project. Where the new arterial road was on significant fill or on structure some additional costs were added to the base lane mile costs to account for the additional materials and construction constraints.

The overall lane miles between the two concepts is almost identical. The differences are in the lane mile splits of local roads and C-D roads. The concept of stacking the freeway system as proposed in the Bridge Forward concept results in more construction complexity and increased construction costs over the more traditional approach in Concept I-W. This results in the June 26, 2023 Bridge Forward concepts lane mile based construction cost being over \$100,000,000 more than Concept I-W. Not considered in the

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high-level cost comparison was constructability and maintenance of traffic. Stacking a freeway system as Bridge Forward proposes will result in a more complex construction and maintenance of traffic process (as compared to Concept I-W). Based on previous projects these complexities could further increase construction costs by 20% to 40%, resulting in a cost increase on the order of \$120,000,000-\$140,000,000. A detailed analysis would be required to provide an accurate estimate.

Operation and maintenance costs were also compared. Due to the stacking of the roadways the yearly operations and maintenance costs for the Bridge Forward Concept are higher than those for Concept I-W. The operation and maintenance costs for the Bridge Forward Concept (based on the tunnel alone) are estimated at approximately \$1 million per year, while the operation and maintenance costs for Concept I-W are estimated at \$160,000 per year. The additional local streets included in the Bridge Forward concept; with a significant amount on structure; significantly adds to the City's inventory and increases maintenance costs.

## Traffic

A high-level analysis of the traffic operations was performed as well. This analysis was done by manually rerouting the Certified Traffic for Concept I-W and analyzing each intersection using HCS software. HCS is an intersection focused software and does not analyze the entire system. To perform a proper, detailed analysis the traffic data would be rerouted using OKI's travel-demand model and analyzed using software that evaluates the whole traffic system.

The high-level analysis showed significant queues on the local street network which could result in gridlock. A more detailed system wide analysis would be performed during the innovation period.

## Conclusion and Next Steps

Based on a conceptual and high-level review of Bridge Forward's June 2023 Concept it presents numerous technical challenges as well as significant cost implications that will require considerable evaluation prior to considering implementation of the concept. As currently laid out the concept:

- Potentially provides 5 acres of contiguous developable land but results in construction costs at least \$100,000,000 more than Concept I-W and much higher yearly maintenance costs going forward. This number could increase significantly when the concept is studied for constructability and maintenance of traffic during the innovation process.
- Increases the local maintenance (City of Cincinnati) responsibility significantly.
- Requires traffic to pass through additional signals to access existing downtown area.
- Results in a profile change of about 40 feet at 7<sup>th</sup> Street resulting in both a significantly higher crossing that impacts the surrounding buildings and land use and results in grades on 7<sup>th</sup> Street between Gest and I-75 of over 9%.

- Proposes the new arterial frontage roads at an elevation about 30 to 40 feet higher than the surrounding land and Central Avenue resulting in a physical and/or a visual barrier between downtown Cincinnati and Queensgate.
- Creates traffic congestion and operational issues on the local road system resulting in queues extended through multiple intersections and potentially creating gridlock during the peak periods.
- Creates potential safety issues due to the added conflict points and additional pedestrian crossing lengths.

The Progressive Design Build process begins with an innovation process. During the innovative process of the Progressive Design Build contract, the design-build team will work with the BSMT to develop and analyze innovative concepts that meet the contract objectives provided in Attachment 1. Local governments will be engaged during this process. The BSMT will share Bridge Forward's Concept with the design-build team at the beginning of this process. At the end of the innovation period the design build team will bring forward any concepts or design revisions that meet established project goals and objectives or reduce project cost and schedule.



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## Attachment 1: Progressive Design-Build Contract Objectives

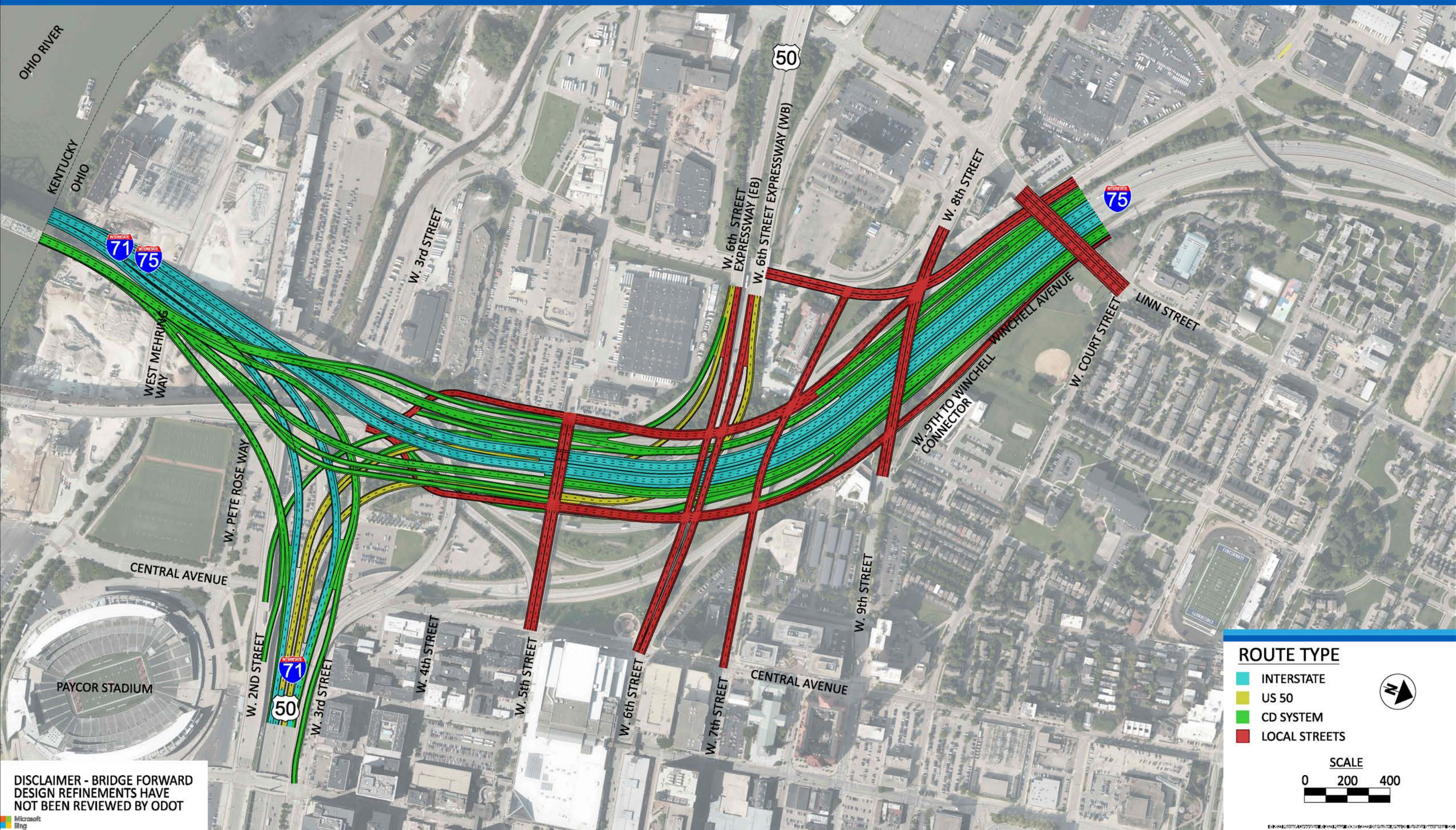
- Maximize the project scope within the programmed funding amounts through innovation, design optimization and effective risk mitigation;
- Build the project with a context sensitive design that fits within the community;
- Maximize the public investment in the project by minimizing the footprint;
- Minimize the footprint of the interstate system to maximize potential developable space;
- Improve neighborhood connectivity across the interstate;
- Minimize traffic disruption during construction, with minimal detours or diversion of traffic to local streets;
- Provide opportunities for workforce development and DBE utilization;
- Provide strong aesthetic value along the project corridor;
- Achieve effective project delivery;
- Minimize physical intrusion and impact;
- Create best environmental outcomes;
- Design for sustained quality of life;
- Improve the local road aesthetics when crossing the interstate; and
- Open the new companion bridge to traffic by July 15, 2029.



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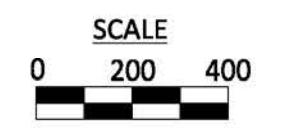
Attachment 2:  
Bridge Forward Concept and Refined Alternative I (Concept I-W) Layouts





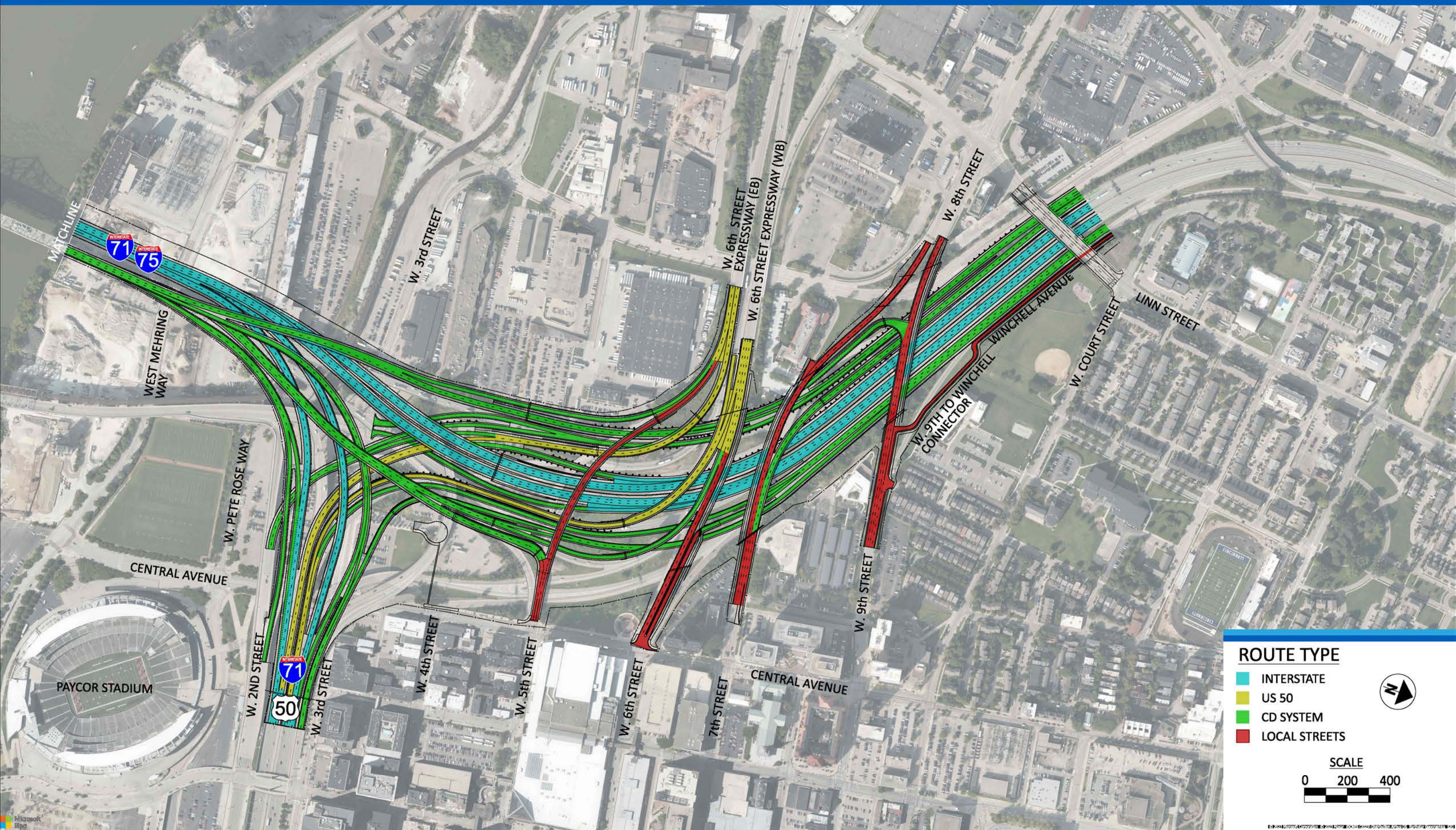
**ROUTE TYPE**

- INTERSTATE
- US 50
- CD SYSTEM
- LOCAL STREETS



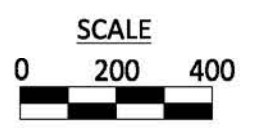
**DISCLAIMER - BRIDGE FORWARD  
 DESIGN REFINEMENTS HAVE  
 NOT BEEN REVIEWED BY ODOT**

Microsoft  
 Bing



**ROUTE TYPE**

- INTERSTATE
- US 50
- CD SYSTEM
- LOCAL STREETS





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Attachment 3:  
Bridge Forward Concept Cross Sections

8TH STREET

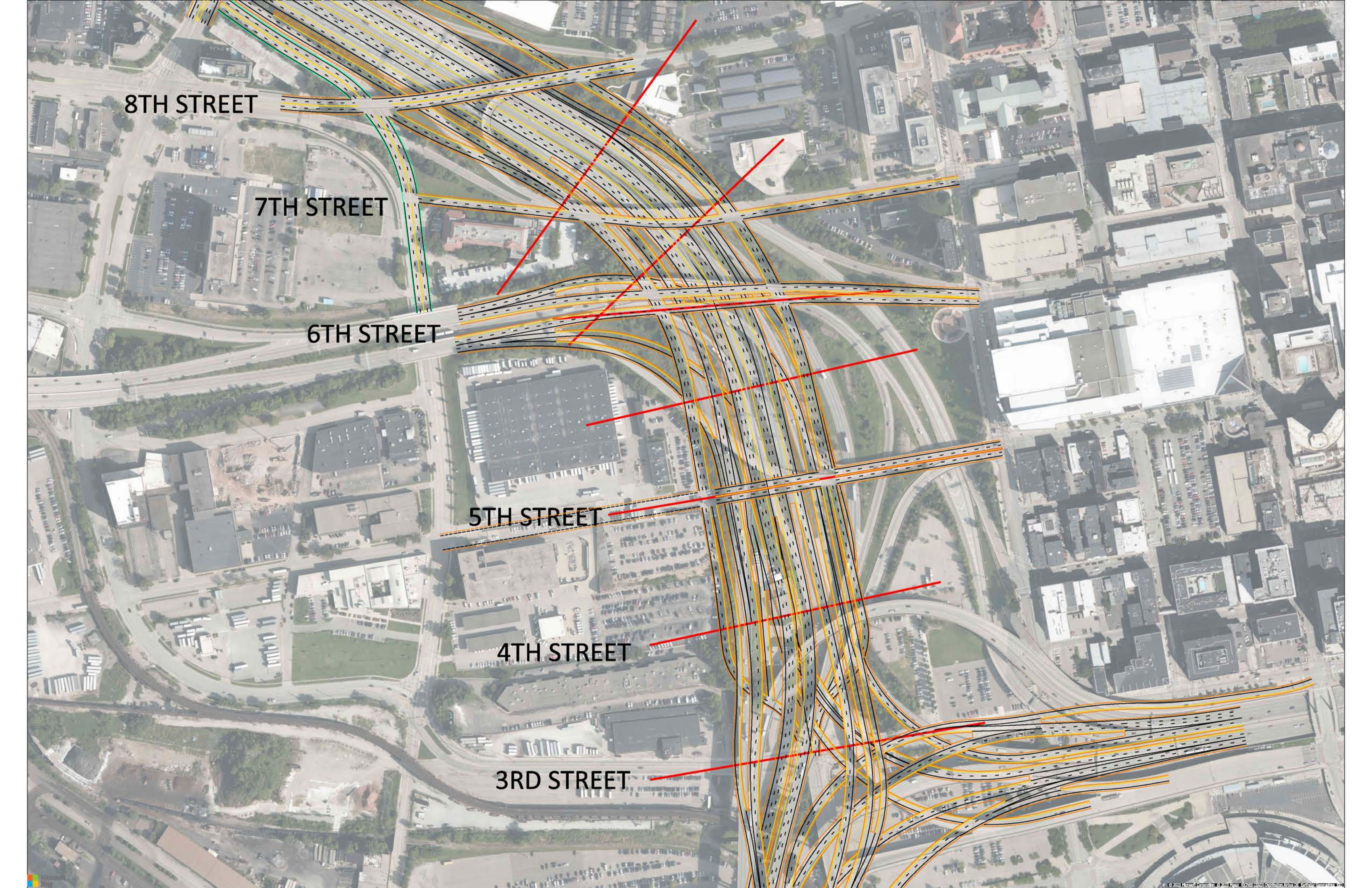
7TH STREET

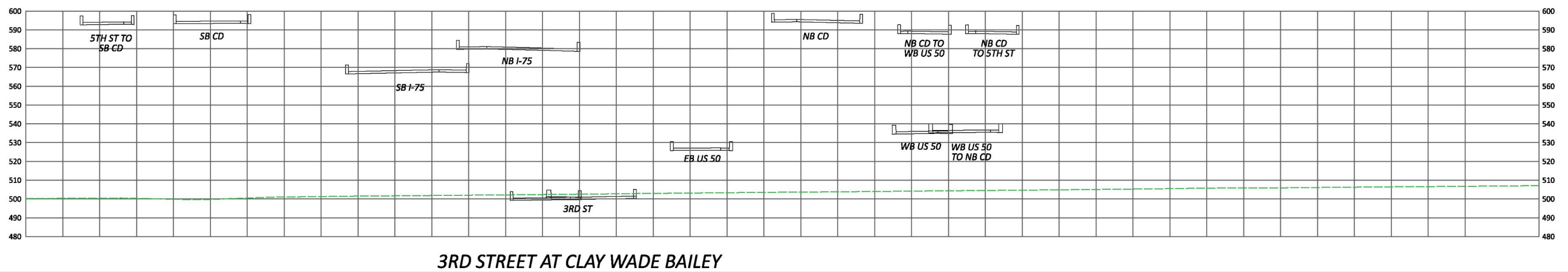
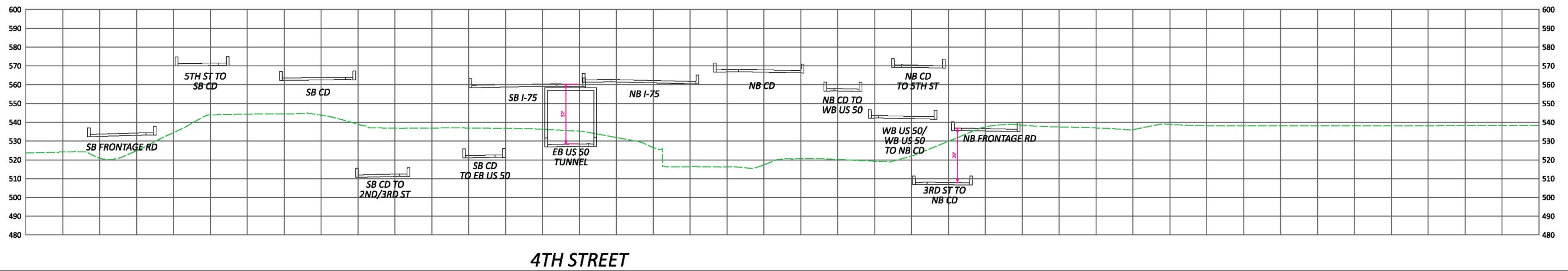
6TH STREET

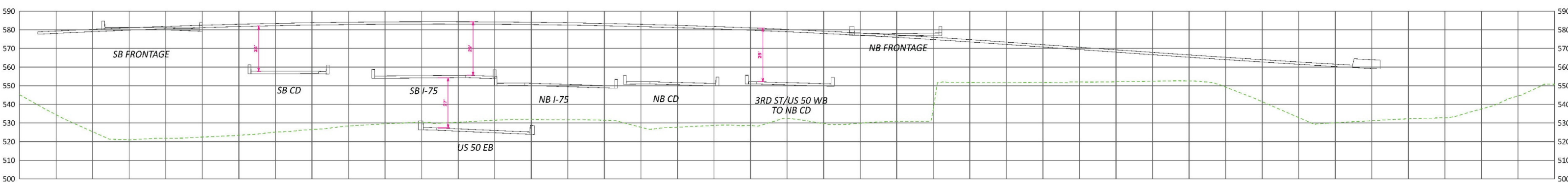
5TH STREET

4TH STREET

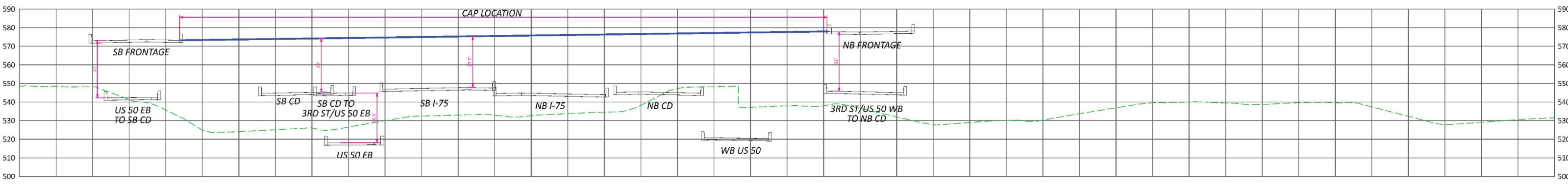
3RD STREET



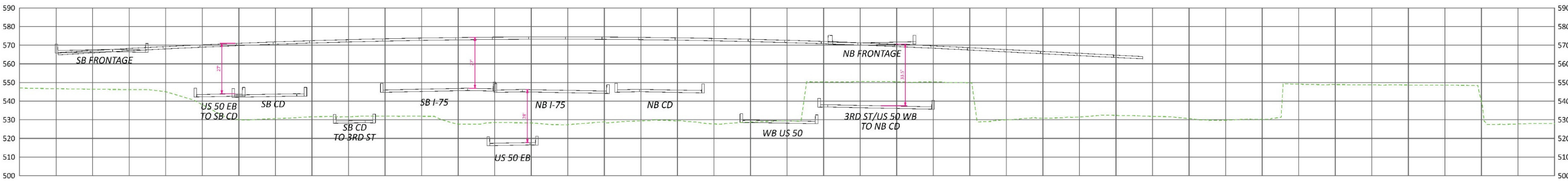




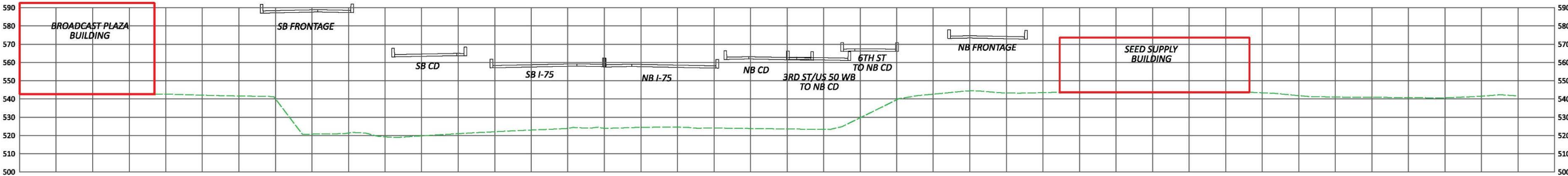
6TH STREET CROSSING



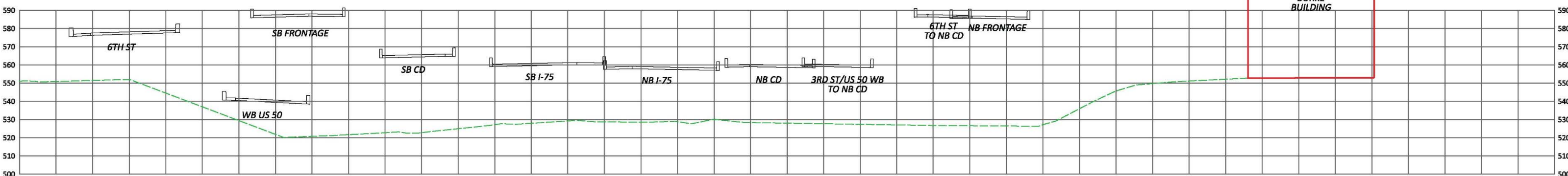
MID-POINT 5TH/6TH STREETS



5TH STREET CROSSING



MID-POINT 7TH/8TH STREET



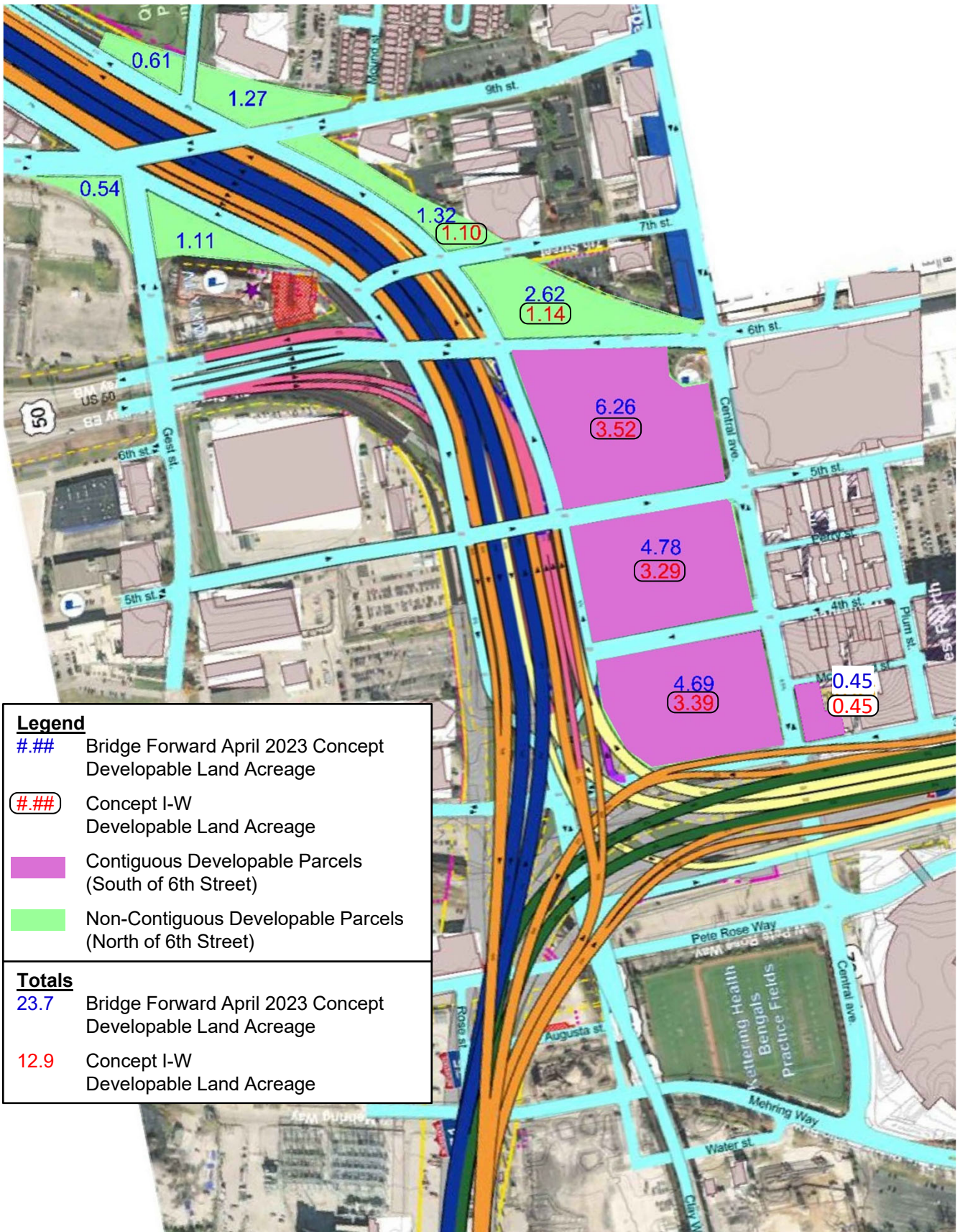
MID-POINT 6TH/7TH STREET



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Attachment 4:  
Contiguous Developable Land





Source: Bridge Forward April 2023 Concept, as presented to the City of Cincinnati on May 3, 2023.



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Attachment 5:  
Construction Costs

**Bridge Forward Lane Miles Total - June Update**

	Roadway	Cost	Structures	Cost	Tunnel	Cost	Total Miles	Total Cost
Local	3.29	\$ 4,400,000	1.37	\$ 27,600,000	-	-	4.67	\$ 32,000,000
CD	1.49	\$ 4,800,000	2.94	\$ 75,550,000	-	-	4.43	\$ 80,350,000
Interstate	1.43	\$ 5,000,000	2.87	\$ 89,000,000	-	-	4.3	\$ 94,000,000
US 50	1.13	\$ 2,400,000	1.13	\$ 22,000,000	0.38	\$ 90,500,000	2.64	\$ 114,900,000
<b>Total</b>	7.34		8.31		0.38		16.04	\$ 321,250,000

**Concept I-W Lane Miles Total**

	Roadway	Cost	Structures	Cost	Tunnel	Cost	Total Miles	Total Cost
Local	0.92	\$ 450,000	1.02	\$ 12,000,000	-	-	1.94	\$ 12,450,000
CD	2.02	\$ 4,800,000	2.77	\$ 61,000,000	-	-	4.79	\$ 65,800,000
Interstate	1.65	\$ 3,500,000	2.90	\$ 90,000,000	-	-	4.55	\$ 93,500,000
US 50	1.95	\$ 4,500,000	2.03	\$ 45,000,000	-	-	3.99	\$ 49,500,000
<b>Total</b>	6.54		8.73				15.27	\$ 221,250,000.00