Engineers, Surveyors, Planners, Scientists

Delivering**Solutions.**

5500 New Albany Rd., Columbus, OH 43054

p. 614.775.4500

f. 614.775.4800

info@emht.com

20200412

FRA-270-32.92 SB EASTON WAY (PID 113663)

Feasibility Study

ODOT - District 6

February 18, 2022

Revised: October 3, 2022

emht.com

TABLE OF CONTENTS

1.0 INTRODUCTION 2
2.0 I-270 SB EXIT TO EASTON WAY 3
2.1 EXISTING CONDITIONS 3
2.2 PROJECT HISTORY 3
2.3 ALTERNATIVES CONSIDERED 3
2.3.1 SB ALTERNATIVE 1 – CONVENTIONAL GEOMETRY 4
2.3.2 SB ALTERNATIVE 2 – CONVENTIONAL GEOMETRY WITH 6' SHIFT 4
2.3.3 SB ALTERNATIVE 3 – PBPD WITH NO SHIFT 5
2.3.4 SB ALTERNATIVE 4 – PBPD WITH 6' SHIFT 7
2.3.5 SB RAMP APPROACH TO EASTON WAY 9
2.3.6 EASTON WAY 10
2.4 DRAINAGE AND BMP'S 10
2.5 UTILITIES 11
2.6 TRAFFIC CONTROL 11
2.7 ITS 11
2.8 LIGHTING 11
2.9 MAINTENANCE OF TRAFFIC 11
2.10 ENVIRONMENTAL 12
2.11 RIGHT OF WAY 12
3.0 NB I-270 EXIT RAMP TO EASTON WAY 12
3.1 EXISTING CONDITIONS 12
3.2 ALTERNATIVES CONSIDERED 12
3.2.1 NB ALTERNATIVE 1 – OPTION LANE 13
3.2.2 NB ALTERNATIVE 2 – EXIT ONLY LANES 13
4.0 COST ESTIMATE 14
5.0 CONCLUSION 15

APPENDICES

APPENDIX A: Southbound Design Alternative Exhibits
APPENDIX B: Environmental Red Flag Summary
APPENDIX C: Northbound Design Alternative Exhibits
APPENDIX D: Cost Estimates

1.0 INTRODUCTION

A Safety Study was conducted in April 2020, as part of a ramp-clear initiative, to alleviate the I-270 southbound (SB) ramp to Easton Way from regularly queueing onto the C-D lanes. The Safety Study proposed a Performance Based Project Development (PBPD) design to create a two-lane exit while avoiding major impacts, including right-of-way. The improvements to the SB ramp were approved for Safety Funding in 2020 for construction in FY 2024. The purpose of this Feasibility Study is two-fold:

1) Document the decision making process for the PBPD design of the proposed SB ramp to Easton Way and finalize design details so that the project can proceed to final design; and

2) In addition to the SB ramp improvements, ODOT scoped the IOS to also identify issues with the interchange as a whole, particularly the NB exit ramp, as a foundation for future planning of additional improvements. For the NB ramp improvements, the Feasibility Study evaluates high-level design aspects, provides a visual for the analyzed alternatives, and estimates construction costs.

Alternatives considered for the SB exit ramp will address work limits, construction costs, drainage, constructability, and discuss the elements that led to the approval of a PBPD design for the proposed improvements. A map of the project location and study area is presented below:

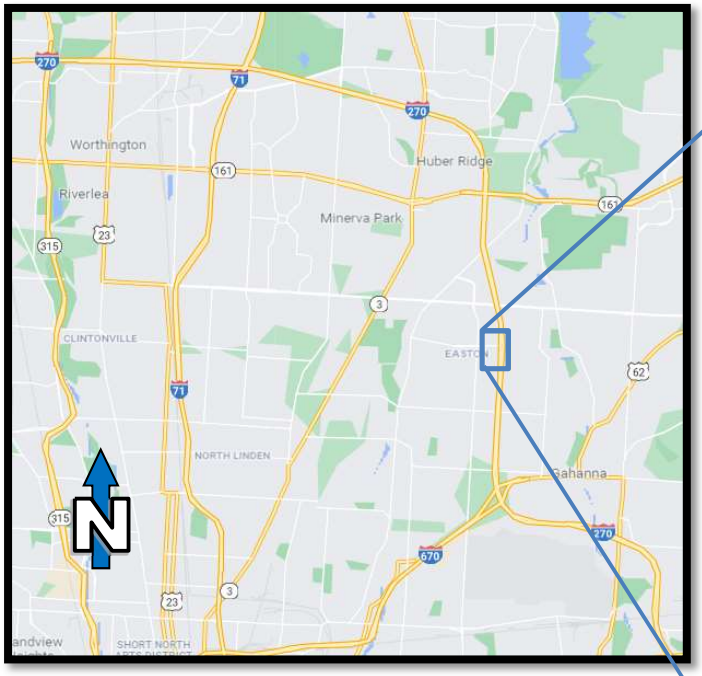


Figure 1 - Location Map

Figure 2 - Work Limits

2.0 I-270 SB EXIT TO EASTON WAY

2.1 EXISTING CONDITIONS

The project study area is defined as the 0.45-mile section of Easton Way from 200 feet east of Stelzer Road to the I-270 NB ramp termini, and along both NB and SB I-270 exit ramps to Easton Way. Easton Way is divided with a median separating two WB lanes leading to a L-L-T-T-TR-R configuration at the intersection with Stelzer Road. The SB ramp is a single lane exit that continues as a free-flow add lane to WB Easton Way, providing only 600' of storage prior to the gore area of the ramp.

2.2 PROJECT HISTORY

The desire to improve the operations at the I-270 SB exit ramp date back to 2015 when a study was initiated by The Georgetown Company to assess traffic improvement options for the entire area surrounding Easton, including the I-270 and Easton Way interchange and the intersection of Stelzer Road and Easton Way. Although it was determined that a much larger fix is likely needed at the interface of I-270 and Easton Way, several smaller projects were developed to provide some near-term operational and safety benefits. Recent efforts include the following:

- Safety improvements in the Morse Road corridor between Stelzer Road and Cherry Bottom Road including the I-270/Morse Road interchange (FRA-CR 17-4.96, PID 106930).
- Capacity addition of a northbound right turn lane on Stelzer Road at Easton Way and an additional lane for the southbound entrance ramp from Easton Way to I-270.
- I-670 Smart Lane improvements including I-270/I-670 interchange improvements that reduce weaving on I-270 between I-670 and Easton Way (PID 104674).

In 2018, in coordination with ODOT D6 and ORES, EMH&T began to explore options to economically create a two-lane SB exit ramp along the C-D lanes and signalize the ramp terminal at Easton Way. The I-270 SB exit ramp is grossly under capacity as a single lane exit, often queueing onto the through lanes of the C-D mainline. The intent of the improvement was to relieve the over-capacity ramp by providing a two-lane exit and additional storage at the signal. The signal will alleviate queueing along Easton Way that occurs due to the existing free-flow ramp movements. The weave on Easton Way often contributes to traffic queues along the ramp. The following discussion is intended to document the alternatives that were considered and dismissed—and why a PBPD design was selected to move forward when Safety funding was sought for design and construction of the project.

2.3 ALTERNATIVES CONSIDERED

As documented in the accompanying IOS, the need for a two-lane exit at this location is clear. The advantage at this particular location is that the C-D lanes have available capacity, making an option-lane design a feasible solution from an operations perspective. Over the course of the last three years, alternatives to create a two-lane exit with an option lane have been evaluated at this location. District 6 and ORES were involved in early coordination meetings to collectively decide on what alternative should be carried forward for the funding request. In addition to the previously considered three alternatives, this study explores one additional option for the PBPD design that offers additional information for the Department to consider. The four alternatives are described below, exhibits of which can be found in **Appendix A**.

2.3.1 SB ALTERNATIVE 1 – CONVENTIONAL GEOMETRY

At the onset of the study, traffic analysis showed that two exit-only lanes were not necessary and that an option lane on the C-D road used to create a two lane exit would operate efficiently. Therefore, a conventional solution was analyzed that met all the requirements of L&D V1, 505-2d, for a 70mph design. Although it was clear that the impacts to the infrastructure of the C-D lanes would be significant, the alternative was explored to establish a baseline so that any non-conventional solutions could be compared to the "ideal" solution, by examining costs and benefits. As you can see in **Appendix A**, significant impacts to the bridges and MSE walls, due to the widening, would be incurred. Right of Way would also be required along the exit ramp due to the geometry of the option lane and widening in the conventional manner. The construction cost estimate for Alternative 1 is estimated to be $9.5M, which did not include right of way that would be required.

2.3.2 SB ALTERNATIVE 2 – CONVENTIONAL GEOMETRY WITH 6' SHIFT

This alternative sought to maintain a *geometrically* conventional solution, but utilize lane shifts and reduce shoulder widths in order to minimize impacts to the bridge over Morse Road, the bridge over the SB entrance ramp from Morse Road, and the MSE walls along the C-D lanes that were impacted with Alternative 1. Alternative 2 meets the 70mph geometry requirements of the L&D manual, by shifting the location of the through lanes on the C-D road and narrowing the existing shoulder widths. As shown in the Figure below, the lane shift starts on the bridge over Morse Road.

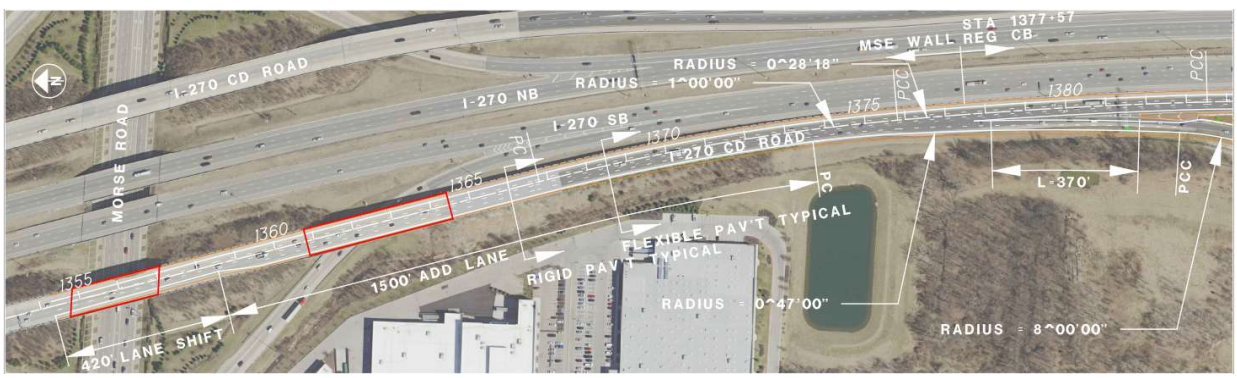


Figure 3 - SB Alternative 2

A 65' wide concrete pavement section exists between the two bridges and for 282' south of the bridge over the Morse Road entrance ramp, representing about 650' of inside/outside shoulder replacement in the rigid pavement section, as shown below. The full depth pavement replacement is needed to correct the cross slopes. However, this work is not necessary on the bridges themselves as the bridge decks were constructed without a shoulder break and will work with the lane shifts. The 6' outside shoulder would require a Design Exception. Throughout the concrete section, existing pavement joints would not be located in the preferred lane line location once traffic is shifted. This is not recommended as any future maintenance of failing joints would require the closure of multiple lanes during repair.

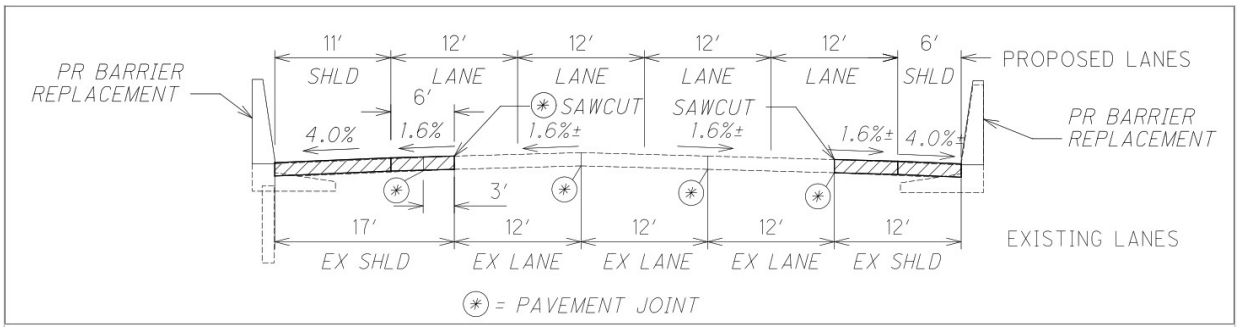


Figure 4 - SB Alternative 2 Rigid Pavement Typical

The typical transitions to superelevated cross slopes as the pavement switches to the 63' wide flexible design seen in the following typical. MSE wall with jersey barrier continue along the inside shoulder until Station 1377+57 where the wall ends and standard barrier continues south. Therefore, full depth pavement and barrier replacement are included along the shoulders within the wall and superelevation section for approximately 1,035'. Variable depth mill and overlay to correct cross slopes with no impact to barrier are proposed for the 1,015' of remaining length to the south.

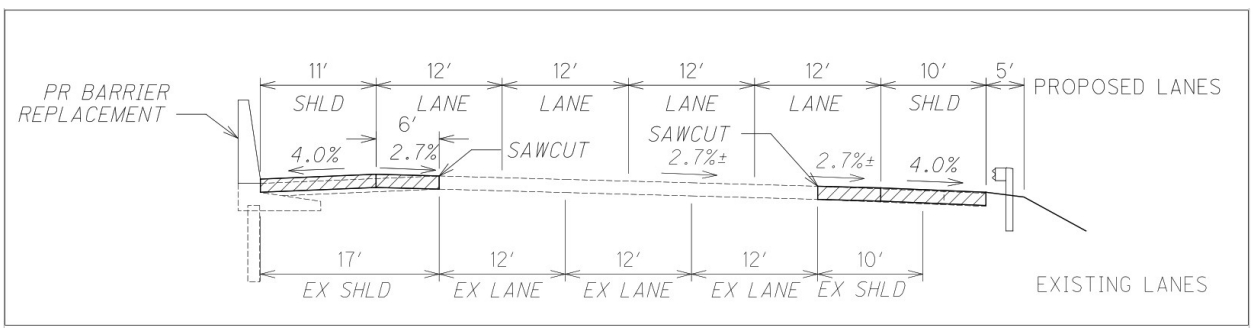


Figure 5 - SB Alternative 2 Flexible Pavement Typical

The alternative avoids the need for right of way if barrier grading is used and is estimated to cost approximately $7.5M.

2.3.3 SB ALTERNATIVE 3 – PBPD WITH NO SHIFT

In March of 2019, after discussing both Alternative 1 and 2 with ODOT, the idea of this PBPD design was explored per the request of ODOT. The goal of this alternative was to maximize the room available to add the exit-only lane and create the option lane, without impact to the MSE walls or bridges along the C-D lanes and avoid the need for right of way. To accomplish a minimally impactful and fundable design, several L&D design requirements are not quite met including: minimum lane development length; 70mph diverging curvature; and gore length for a 70mph design speed. Therefore, Alternative 3 focuses on minimizing impacts to the C-D road concrete pavement, bridges, retaining walls, grading, and right of way—without a shift of the C-D lanes. The exit-only lane is developed just after the concrete pavement/MSE wall that follows the bridge over the SB entrance ramp from Morse Road and widens from the existing edge of traveled way without disturbing the alignment of the through lanes on the C-D Road.

Figure 6 - SB Alternative 3

The C-D road alignment in the area of the exit ramp consists of a compound curve of 1°-0'-0" and 0°-28'-18". The PCC, identified above, is roughly in the middle of where the asphalt pavement starts and the existing gore. The metrics listed are used in creating a two-lane exit using an option lane, for various design speeds:

ODOT Design Standard Metrics (per L&D figures 505-2d and 505-2a)

- Exit Only Lane Development Length
  - 1500' from PC of the diverging curve
- Diverging Curve (Differential)
  - 70mph = 0°-30'
  - 65mph = 0°-35'
  - 60mph = 0°-40'
  - 55mph = 0°-45'
- Gore Length
  - 70mph = 370'
  - 65mph = 340'
  - 60mph = 300'
  - 55mph = 280'

Alternative 3 PBPD Design Metrics Achieved – 55pmh

- Exit Only Lane Development Length
  - 612' of the 1500' standard
- Diverging Curvature (Differential)
  - 0°-45" (from the 0°-28'-18" curve = 1°-13" Diverging Curve)
- Gore Length
  - 285'

As shown above, the diverging curvature meets a 55mph design and the lane is developed for 612' rather than the standard 1500'. However, the design does add an additional 850' of storage for the exit only lane when compared to the existing exit only lane. It should be noted that the 1°-13' curve for this alternative is still acceptable for a 70 mph design speed, the deficiencies are related to the multi-lane exit ramp requirements.

As part of this study, EMH&T needed to assess impacts of the widening to verify no right of way was needed. As the C-D road comes back down to grade, an existing 2:1 slope is present just off the bridge over the Morse Road entrance ramp and ranges in height from 25' to 12' over almost 600' in our project area. For any 2:1 slope that is 16' or higher, a 10' graded bench is required

at the toe of slope. Applying this standard, pushed our grading outside the limits of the existing right of way.

Two options were considered to avoid right of way. The first option considered was maintaining the 10' shoulder standard and placing a retaining wall at the edge of pavement. The cost of this wall was estimated to be approximately $800,000. The second option was a combination of a reduced paved shoulder width in conjunction with adjusting the width of the graded bench at the toe of slope. After coordinating with ODOT, it was determined that an 8' paved shoulder, a 3' graded shoulder with long post guardrail, and an 8' minimum bench was the preferred solution, as shown in the figure on the following page. The 8' paved shoulder reduction is needed for 565', which does require a Design Exception. The shoulder returns to 10' as soon as right of way is no longer a constraint.

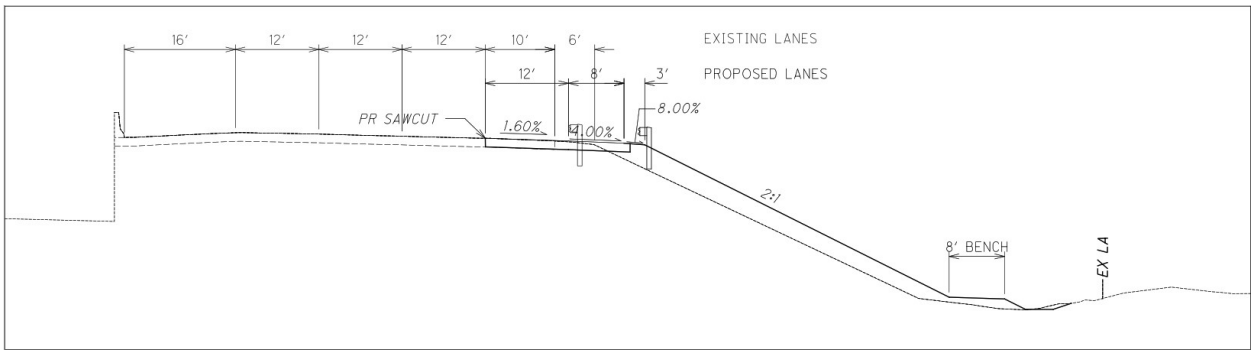


Figure 7- Alternative 3 Typical

The cost of Alternative 3 is estimated to be $5.0M in 2022 dollars.

2.3.4 SB ALTERNATIVE 4 – PBPD WITH 6' SHIFT

In an effort to maximize the PBPD design of Alternative 3, while still limiting impacts, EMH&T explored Alternative 4. Alternative 4 utilizes a 6' lane shift along the C-D road after the bridge over the SB entrance ramp from Morse Road so that the exit lane is developed in the same location as in Alternative 3. As with Alternative 2, the lane shift will locate the pavement joints off the preferred lane line location and any future maintenance will require the closure of multiple lanes during repair. The shift will also have impacts to the existing barrier that separates the mainline of I-270 and the C-D road due to superelevation corrections being needed. However, this shift does allow us to achieve a better design speed for the diverging curvature of the option lane, albeit a shorter lane development length. For Alternative 4 the following design metrics are achieved:

Alternative 4 PBPD Design Metrics Achieved – 60mph

- Exit Only Lane Development Length
  - 210' of the 1500' standard
- Diverging Curvature (Differential)
  - 0°-40" (from the 0°-28'-18" curve = 1°-08" Diverging Curve)
- Gore Length
  - 317'

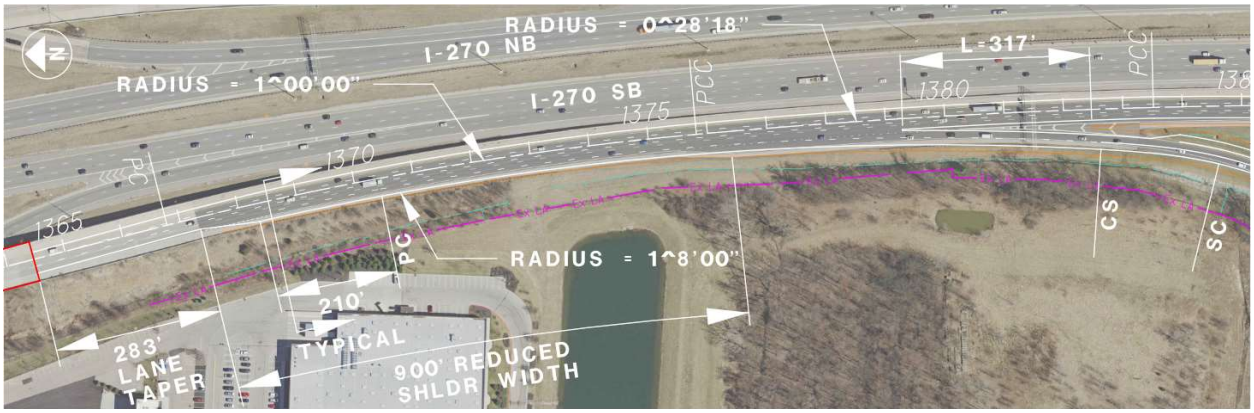


Figure 8 - Alternative 4

As shown above, a 60mph design speed is achieved with the diverging curvature and the lane is developed for only 210' rather than the standard 1500'. Similar to Alternative 3, the design does add an additional 850' of storage for the exit only lane when compared to existing.

With a standard 10' shoulder, the 2:1 slope mentioned above is still impacted. It would take the shoulder width being reduced to 6' in this area for approximately 900' to avoid the slope fill altogether along the west side of the C-D road.

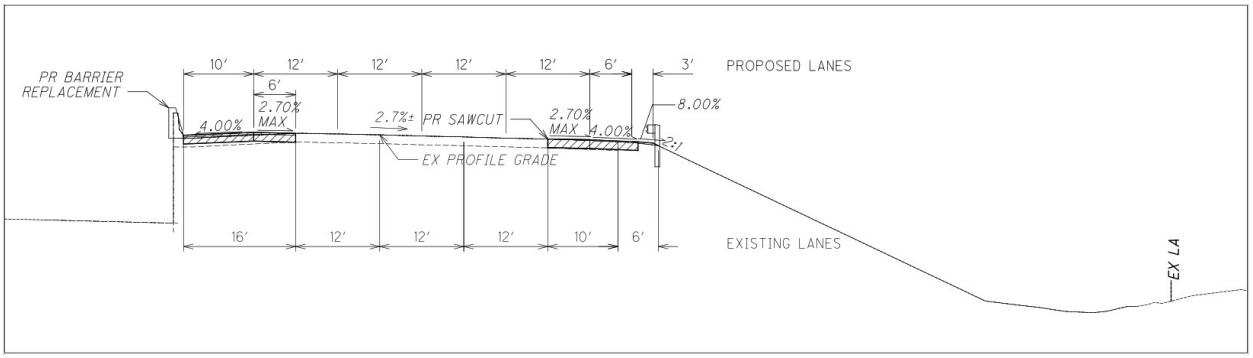


Figure 9 - Alternative 4 Typical

The cost of Alternative 4 is estimated to be $6.6M in 2022 dollars.

2.3.5 SB RAMP APPROACH TO EASTON WAY

The proposed widening of the SB ramp to three lanes at the signal will closely follow the existing profile to ease construction. However, full depth pavement replacement has been accounted for in the estimates to properly revise the superelevation needed for the additional lanes. Widening takes place towards the infield of the ramp so that the existing outside shoulder position can be held and avoid right of way impacts with the required grading.

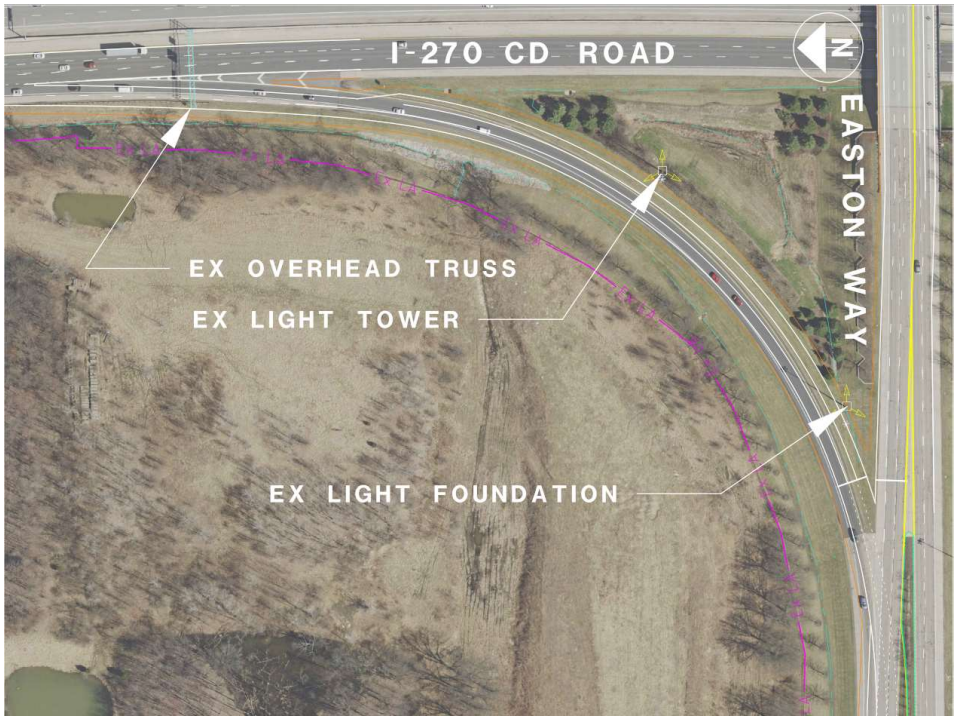


Figure 10 - SB Ramp Approach

While safety grading is preferred, Figure 11 – SB Ramp Typical below shows how there may be some areas that require clearzone or barrier grading in order to avoid right of way impacts.

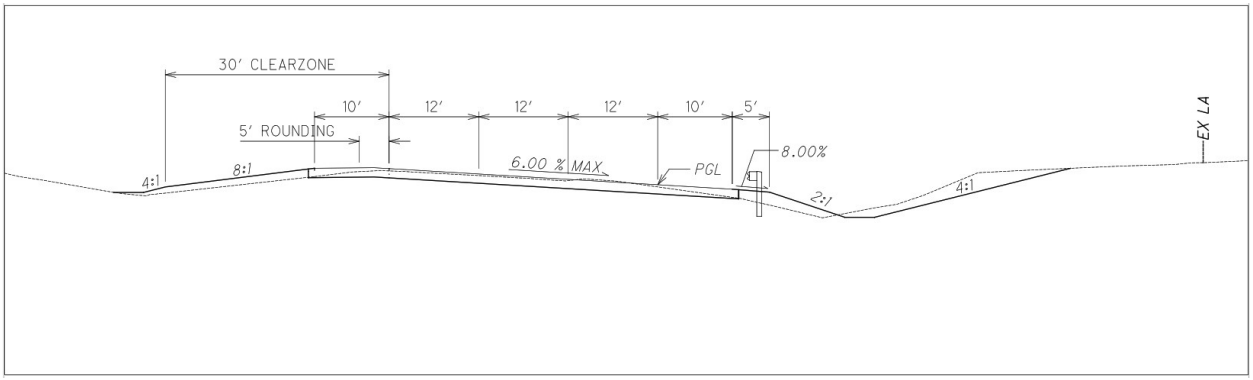


Figure 11- SB Ramp Typical

2.3.6 EASTON WAY

Improvements to Easton Way will include the signal at the SB I-270 exit ramp, an additional 1,530' of WB lane, and the left turn lanes onto Stelzer Road being extended as shown below, as well as converting a SB thru lane on Stelzer to a thru-right to optimize signal performance. The new signal is proposed at the ramp's intersection to not only add storage, but to remove the free-flow movement that currently exists. The intersection of Easton Way and Stelzer Road is over capacity and only 1,100' upstream of the ramp junction, making the existing free-flow movement a problem. The signal will eliminate the weave on Easton Way that currently exists between NB and SB exiting traffic. As shown in the IOS, the proposed design improves storage and prevents SB exiting vehicles from queueing onto the through lanes of the C-D Road, including the option lane.

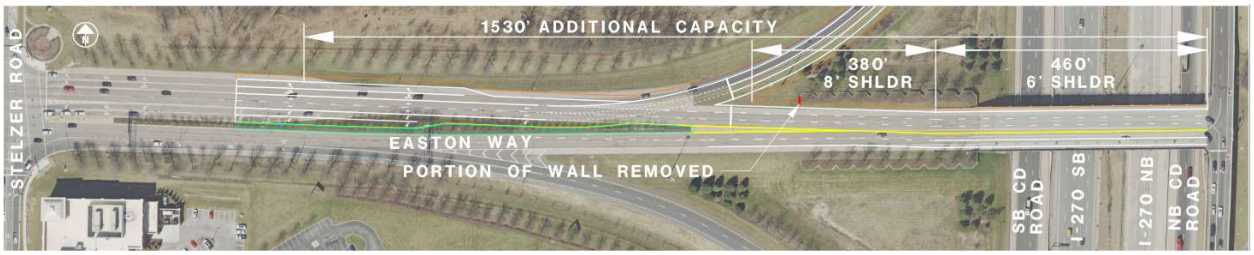


Figure 12 - Easton Way

Developing the third WB lane just after the bridge would have significant impacts to the existing landscaping walls if the lane is added with standard shoulder widths and preferred grading. It would require a full relocation of the landscaping wall and would cost approximately $800,000. Therefore, a PBPD was evaluated for developing the third lane on the Easton Way Bridge over I-270 using 12' lanes and reducing the shoulders 6' on both sides. We are also proposing to use an 8' shoulder for the 380' stretch after the bridge in order to avoid impacts to the landscaping features. In Figure 13 – Easton Way Typical, is a typical section in this area that shows the widening proposed along the adjacent landscaping wall. A small portion of the wall is impacted at the west end due to paving limits and clearzone requirements, the cost of which is included in accompanying estimate.

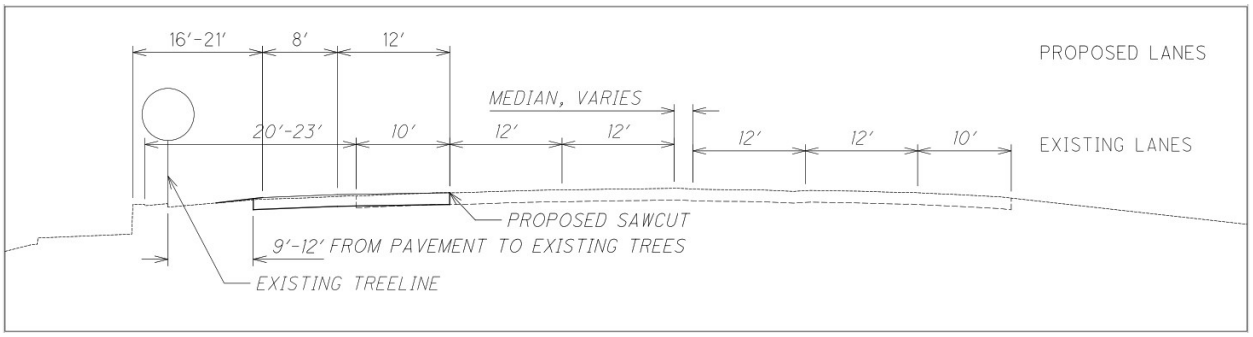


Figure 13 - Easton Way Typical

The cost of Easton Way improvements has been included in each of the previous estimates for the southbound alternatives.

2.4 DRAINAGE AND BMP'S

Existing drainage for the SB exit ramp area consists of open ditches, two median inlets from the C-D Road that outlet into the ditches, and two culverts emptying the outside ditches into the infield between the SB exit ramp and the C-D Road. The ditches will be regraded, and pipes and culverts will need extended as a result of the pavement widening. Underdrains will be added for the

additional pavement and existing underdrain outlets will be extended/reinstalled at the new ditch elevations. BMP treatments for the project will be a combination of vegetated filter strip and vegetated biofilters as a majority of the project will remain open ditches. Although all work on this project will be contained to ODOT LA-R/W, coordination with the City of Columbus will be initiated to confirm the City standards for BMP's will not need applied to impacts on Easton Way.

2.5 UTILITIES

In the SB ramp area record plans indicate existing utilities within the construction limits consist of storm, sanitary, and a private irrigation line. Utility relocations needed include a private irrigation line located along the west side of the SB ramp impacted by the ramp widening. Minor adjustments and extensions will be needed for the existing storm sewers and culverts along the project. There are no anticipated conflicts with the existing sanitary and no other relocations noted at this time.

2.6 TRAFFIC CONTROL

There is an existing truss over the C-D Road at the existing gore with guardrail along the outside shoulder that will need relocated north in order to accommodate a second truss that will include guide signs over the three ramp lanes at the signal.

2.7 ITS

Upon review of record plans and documents, the City of Columbus Traffic Signal System (CTSS) infrastructure installed with Phase E is located on the south side of Easton Way and outside the influence area of the planned widening. A new 24-strand drop cable will be needed from the existing splice enclosure on Easton Way for connection to the proposed traffic signal.

Based on record plan information, ODOT has conduit and fiber optic cable in the median areas of I-270, but appear to be outside the influence area of the planned widening areas. There is a conduit crossing, pull boxes and surveillance loops in the SB and NB lanes of I-270 that will be impacted by the widening of the SB ramp. It is our understanding these surveillance loops are no longer used by ODOT. As a result, the accompanying estimate provides allowances for replacement of the impacted conduit and pull boxes, but not the detector loops.

2.8 LIGHTING

Proposed SB ramp improvements are expected to trigger the need for light pole relocation along Easton Way. Based on preliminary design, three conventional light poles will be effected by the widening on the north side of Easton Way. It is assumed that these existing poles will be relocated to new foundations. If new poles are found to be necessary, standard poles may be used and the specific blue paint color used in the area will be specified by referencing a federal paint specification color. An existing light tower is missing adjacent to the planned widening. There is an existing foundation, but the pole is missing. The lighting estimate accounts for the replacement of this missing light tower.

2.9 MAINTENANCE OF TRAFFIC

For the SB ramp improvements, temporary pavement will be used to maintain all existing C-D lanes throughout construction. The Maintenance of Traffic scheme will not require the use of additional right of way.

2.10 ENVIRONMENTAL

EMH&T conducted a secondary source environmental review to identify any known environmental "red flag" issues in the study area. This investigation was undertaken with the knowledge that the project will require a full National Environmental Policy Act (NEPA) environmental review by ODOT. Based on the environmental resources assessed during this preliminary review, potential environmental obligations have been identified which may need to be addressed during the NEPA clearance phase of the project.

Appendix B provides further detail into key environmental issues that were identified. This section is intended to serve as a summary of the screening for potential environmental concerns only. Additional studies following ODOT procedures and protocols, agency coordination, and/or reviews will be necessary during the NEPA clearance phase of the project. Figure 14 below provides a summary of the environmental resources reviewed for the project.

Environmental Resource	Potential Impact
Streams and Wetlands	Possible
Floodplains	No
Section 4(f) Properties	No
Section 6(f) Properties	No
Cultural Resources	Possible
T&E Species	Possible
Hazardous Materials	Possible
Underserved Populations	Yes
Air Quality	Possible
Noise	Possible
Water Wells and Drinking Water Resources	No

Yes = Resource may be potentially affected and will likely require agency coordination;
No = Resource is not likely to be affected;
Possible = Further evaluation is required to determine applicability

Figure 14 - Summary of Environmental Resources

2.11 RIGHT OF WAY

The design intent for the Safety funded SB ramp improvements, is to construct all proposed work within the existing right of way, thus avoiding acquisitions. A major driver of the PBPD alternative was to avoid the need for right of way acquisitions, as is common with ramp clear initiatives. They are desired to be lower-cost with the ability to construct on an efficient timeline.

3.0 NB I-270 EXIT RAMP TO EASTON WAY

3.1 EXISTING CONDITIONS

Based on improvements completed in 2020, the NB exit ramp is now signed as an exit-only lane one mile prior to the exit. The single lane exit then develops a second lane as it approaches the signalized intersection at Easton Way, creating two left turn lanes.

3.2 ALTERNATIVES CONSIDERED

As stated in the introduction, rather than doing a stand-alone IOS for the SB ramp improvements, the Department requested that the NB exit ramp also be taken into consideration. The goal is to identify future needs and to verify that the added signal as part of the SB improvements will not

degrade the NB ramp. The intention of this section of the Feasibility Study is to provide a visual for the alternatives explored in the IOS for the NB ramp, identify some of the design challenges based on the existing infrastructure, and provide preliminary cost estimates for the Department's use in future planning efforts. Like the SB exit ramp, the NB exit ramp is currently a single-lane exit. Unlike the SB exit ramp and its minimal storage, the NB exit only lane currently is about a mile in length thanks to recent upgrades from the I-670/I-270 Smart Lane project. Although this helps with traffic queueing into through lanes, the single-lane exit is still over capacity. Therefore, two alternatives were explored to create a NB two-lane exit. With the current exit being only a single lane and rising quickly to meet the intersection, retaining walls are present on both sides of the ramp, starting about 400' beyond the gore. In order to maintain an existing 8' outside shoulder, approximately 900' of the existing retaining wall between the ramp and C-D lanes will need to be replaced. Considering the proximity of the C-D Road and the need to minimize impacts on the ramp for maintenance of traffic, we have assumed a soldier pile wall in this location for estimating purposes.

3.2.1 NB ALTERNATIVE 1 – OPTION LANE

The first alternative uses an option lane on the C-D Road, similar to what is proposed for the SB exit. This alternative creates a two lane exit by using an option lane design on the approach of the three lane C-D Road, as shown below in Figure 15 below and in **Appendix C**. Barrier grading will be needed along the widened pavement with adjustments to the existing drainage. Traffic models show that the decision lane operates acceptable in the Opening Year analysis, but the Design Year identifies queuing onto the through lanes due to the significant increase in volumes of the NB C-D road in the Design Year. The limits of improvements needed for this alternative are approximately 0.51 miles with an estimated cost of $6.4M in 2022 dollars.

Figure 15 - NB Alternative 1

3.2.2 NB ALTERNATIVE 2 – EXIT ONLY LANES

This alternative creates an additional exit only lane to form the two-lane exit. From Figure 505-2d in the L&D, 1,500' is required to develop a lane on a service interchange prior to an exit. This develops the lane adjacent to the diverge of the C-D and mainline I-270 as shown in Figure 16 and in **Appendix C**. Type D barrier with a paved gutter is proposed along the widening due to the proximity of the existing noise wall to the edge of pavement. The estimated cost of this alternative is $8.0M in 2022 dollars.

Figure 16 - NB Alternative 2

Due to the exit only lane developing at the C-D diverge, other options were considered to develop the lane *prior* to the C-D diverge point, Alternative 2A and Alternative 2B. Alternative 2A extends an existing lane the 1,500' prior to the diverge point. This extends the lane under the McCutcheon Road bridge, shown in Figure 17 below and in **Appendix C**. It should be noted that this opens an additional lane just north of where the 8th lane on I-270 is currently dropped. Should the length of exit lane be needed, perhaps extending the 8th lane and making it also an exit only lane, like the 7th lane, can be explored. For the purposes of this report, it is merely noted. The estimated cost of this alternative is $10.9M in 2022 dollars.

Figure 17 - NB Alternative 2A

The Alternative 2B avoids any widening under the McCutcheon Road bridge by shortening the length to 800' prior to the diverge point, as shown in Figure 18 below and in **Appendix C**. The estimated cost of this alternative is $9.1M in 2022 dollars.

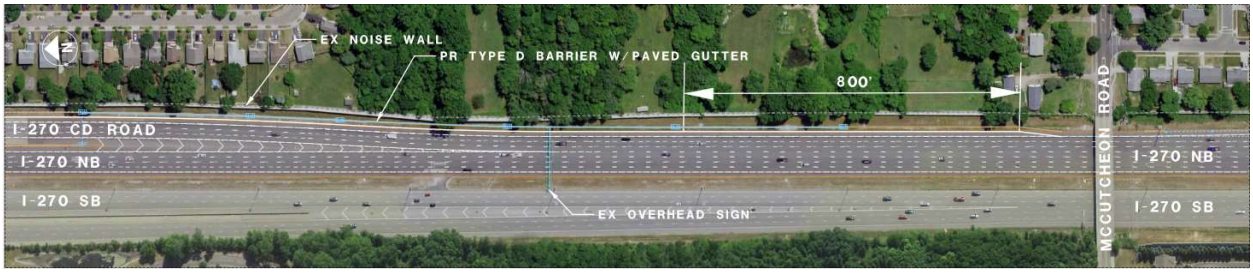


Figure 18 - NB Alternative 2B

4.0 COST ESTIMATE

Below is a summary of the costs for NB and SB ramp alternatives. The cost associated with the Easton Way improvements are included in the SB ramp costs. A detailed estimate has been summarized in **Appendix D** and it should be noted that a 40% contingency was used for all alternatives for this preliminary effort.

- SB Exit to Easton Way Safety Project
  - Alternative 1 (Conventional Geometry) = $9.5M
  - Alternative 2 (Conventional Geometry w/ 6' shift) = $7.5M
  - Alternative 3 (PBPD Design w/ no shift) = $5.0M
  - Alternative 4 (PBPD Design w/ 6' shift) = $6.6M
- NB Exit to Easton Way Ramp Alternatives
  - Alternative 1 (Option Lane) = $6.4 million
  - Alternative 2 (Exit Only Lanes) = $8.0 million
  - Alternative 2A (1500' before C-D diverge) = $10.9M
  - Alternative 2B (800' before C-D diverge) = $9.1M

5.0 CONCLUSION

The four alternatives presented in this study for the I-270 SB ramp to Easton Way all reduce traffic backups from extending onto C-D road from the Easton Way exit ramp, but come at varying costs. To limit impacts to existing infrastructure, the Department is supportive of a PBPD design that targets the specific needs of the project without sacrificing safety for the traveling public. As shown in the accompanying IOS, the added capacity at the ramp terminal and the storage provided at the signal eliminate queueing onto the mainline of the C-D road, which is the cause of the safety concern. There were 23 crashes in a three year period, 5 of which were injury, all due to excessive queueing along the ramp and onto the C-D road. Based on the analysis done of the two PBPD designs presented herein (Alternative 3 and Alternative 4), Alternative 3 is recommended for further development. The increased cost of Alternative 4, $1.7M, does not justify the slightly flatter diverging curve (0°-05') and 32' increase in gore length.

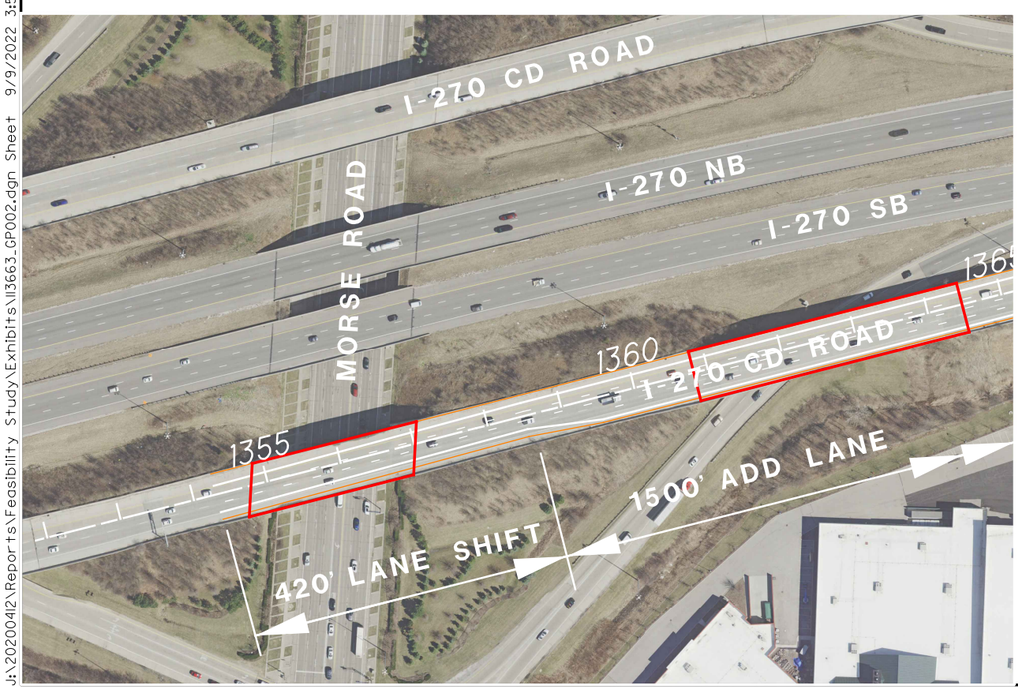
The NB ramp alternatives presented are merely to provide a starting point for further discussion with the Department.

APPENDIX A:

Southbound Design Alternative Exhibits

J:\2020041\2\Reports\Feasibility Study\Exhibits\113663_GP001.dgn Sheet Layout_002_2 Lane Exit with Option 9/9/2022 4:22:22 PM bmiller

FRA-270	270 SB OFF RAMP TO EASTON WAY ALTERNATIVE 1 - CONVENTIONAL GEOMETRY	CALCULATED CHECKED	0 50 100 200 HORIZONTAL SCALE IN FEET N



270 SB OFF RAMP TO EASTON WAY
ALTERNATIVE 2 - CONVENTIONAL WITH 6' SHIFT

FRA-270

J:\2020412\Reports\Feasibility Study\Exhibits\113663_GP002.dgn Sheet 9/9/2022 3:57:16 PM bmiller

270 SB OFF RAMP TO EASTON WAY
ALTERNATIVE 3 - PBPD WITH NO SHIFT

FRA-270

J:\2020412\Reports\Feasibility Study\Exhibits\U3663_GP003.dgn Sheet 9/9/2022 3:31:13 PM bmiller

HORIZONTAL SCALE IN FEET
0 50 100 200

CALCULATED
CHECKED

270 SB OFF RAMP TO EASTON WAY
ALTERNATIVE 4 - PBPD WITH 6' SHIFT

FRA-270

J:\2020041\2\Reports\Feasibility Study\Exhibits\113663_GP004.dgn Sheet-6' Shift 9/9/2022 11:51:18 AM bmiller

APPENDIX B:

Environmental Red Flag Summary

SUMMARY OF KEY ENVIRONMENTAL CONSIDERATIONS

Surface Waters and Wetlands

The project area is located within the Upper Scioto Watershed (HUC 05060001). According to the USGS 7.5' Topographic Map Series *Northeast Columbus, Ohio* quadrangle (USGS 1983), and USGS StreamStats website, one (1) mapped intermittent stream may be located within the north end of the project study area. A copy of the USGS Topographic Map is included as Exhibit 1 – USGS Topo. This stream is a direct Unnamed Tributary to Big Walnut Creek and has a drainage area of approximately 0.44 square miles at the point where it passes through the project area. Per the Ohio EPA 401 Water Quality Certification for Nationwide Permits (NWP) map, the stream is located within an area designated as possibly eligible for coverage under a NWP, though additional field screening procedures are required. Any impacts below the Ordinary High Water Mark (OHWM) of the stream will be subject to regulation by the U.S. Army Corps of Engineers (USACE) and by the Ohio EPA.

The National Wetland Inventory (NWI) Wetlands Mapper was reviewed for the project area. According to available NWI data, four (4) Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated (PUBGx) features and one (1) Riverine, Intermittent, Streambed, Seasonally Flooded stream (R4SBC) are located within or directly adjacent to the project area (see Exhibit 2 – MWI Map). Some features may no longer be present due to development in the area.

- A thorough ecological field investigation will be needed to confirm the existence of and determine the locations of these features, and to establish if the project would be considered ecologically exempt, or if a Level 1 Ecological Survey Report will need to be completed during the NEPA clearance phase of the project.

Floodplains

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) was conducted. The project area is shown on panels 39049C0191K and 39049C0192K, both dated June 17, 2008. The project area is located entirely within Zone X (unshaded), which is an area determined to be outside the 0.2% annual chance floodplain (see Exhibit 3 FEMA FIRM).

- No floodplain coordination is anticipated for this project. However, the FIRM panel numbers, flood zone (i.e. Zone X), and the FIRM map date will be included in the design plan for review and confirmation by the City of Columbus.

Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 is codified at Title 49, United States Code, Section 303 and applies only to the agencies of the U.S. Department of Transportation (USDOT), including the Federal Highway Administration (FHWA). Section 4(f) protects public parks, recreation areas, wildlife and waterfowl refuges, and historic sites included in or eligible for inclusion in the National Register of Historic Places (NRHP). Based on a review of aerial maps and the City of Columbus Recreation and Parks website, no public parks or recreational resources are located within or immediately adjacent to the project area. There are no known significant archaeological or historic sites in the area.

- No Section 4(f) resources are currently located within the project area.

Section 6(f)

Section 6(f) of the Land and Water Conservation Act applies to the conversion of recreational lands that have received Land and Water Conservation Fund (LWCF) money to non-recreational purposes. Approval must be sought from the U.S. Department of the Interior – National Park Service for the conversion of any such lands. The U.S. Department of Interior/National Park Service listings of LWCF grant properties for Franklin County was reviewed by EMH&T on December 10, 2021.

- No Section 6(f) properties are currently located in the project area.

Cultural Resources

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their actions on historic properties. This act applies to federally funded projects and projects that require a federal action (e.g. a waterway permit from the USACE). EMH&T staff archaeologists reviewed the State Historic Preservation Office's (SHPO) GIS website to determine if there were any known cultural resources in the vicinity of the project site. The information gathered indicates that the project area was studied extensively as part of the original roadway construction and several archaeological sites were identified within or immediately adjacent to the project area. A copy of the SHPO map showing the Cultural Resources identified in the project area is included as Exhibit 4 – SHPO Map.

- Should the project require additional right-of-way, additional evaluation of known archaeological sites will likely be required during the NEPA clearance phase of the project.

Threatened and Endangered Species

U.S. Fish and Wildlife Service

The Endangered Species Act of 1973 provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend. The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website was reviewed (December 2021) and the following species are listed for the project area:

- *Myotis sodalis* (Indiana bat) – Endangered
- *Myotis septentrionalis* (Northern long-eared bat) – Threatened
- *Noturus trautmani* (Scioto madtom) – Endangered

Additionally, the bald eagle (*Haliaeetus leucocephalus)* is also protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Potential suitable wooded habitat (SWH) for the federally endangered Indiana bat or the federally threatened northern long-eared bat was identified within the project study area. SWH areas were characterized as any tree covered area that is ½ acre (ac) or larger, containing any potential roosts (i.e., live trees and/or snags that have exfoliating bark, cracks, crevices, and/or cavities) greater than 13-ft tall and at least 5-inch (in) diameter at breast height (dbh), OR any patch of trees with these characteristics that is less than ½ acre in size but is within 1,000 feet of or connected by a travel corridor to a potential maternity roost tree, ½-acre or larger stand of SWH, or any patch of wooded riparian buffer.

- Based on a review of aerial maps, the trees growing along the existing right-of-way throughout the project area could be considered SWH. A more detailed review for potential bat habitat will be conducted as part of the future ecological investigation.

The Scioto madtom prefers stream riffles of moderate flow over a sandy gravel bottom. Water must be of high quality and free of suspended sediments.

- Based on the review of surface waters described previously, there are no streams within the project area large enough to support the Scioto madtom.

The bald eagle uses super canopy trees (trees that are taller than the surrounding trees) as nesting habitat. The ideal habitat for the bald eagle is a secluded site within two (2) miles of water so the bird has access to a source of fish.

- Based on a review of aerial maps, the project area does not contain suitable habitat for the bald eagle.

All native mussels are protected in the State of Ohio (Section 1533.324 of the Ohio Revised Code). In addition, ten federally listed species occur in the State and are protected by the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.). Per ODNR's Ohio Mussel Survey Protocol (OMSP) updated in 2020, as there are no streams present within the project area that have a drainage area greater than five square miles, no reconnaissance for freshwater mussels is required.

- Based on the review of surface waters described previously, there are no streams within the project area large enough to support mussel populations.

Ohio Department of Natural Resources

In correspondence dated December 14, 2021, the Ohio Department of Natural Resources (ODNR) Division of Wildlife (DOW) stated that they have a record for the state-threatened Paddlefish (*Polyodon spathula*) within a one-mile radius of the project area in Big Walnut Creek. They had no additional records for rare or endangered species or other significant features within the project area or within a one-mile radius of the project area. Correspondence received from ODNR is included.

- The project will not impact Big Walnut Creek, and there are no streams or lakes within the project area large enough to support the Paddlefish.

Hazardous Materials

A cursory review of ODOT's Ohio Regulated Properties Search website was completed to assist in identifying potential regulated materials concerns within the project area. No known regulated materials sources are located in or immediately adjacent to the project area. The ORPS summary report is included. Additionally, any properties located within the project area considered a "high risk" land use will also be considered. High risk land uses include gas stations, dry cleaners, automotive repair/service/oil change, body shops, electrical substations, railroad maintenance/sidings, junkyards/scrapyards, landfills, oil/chemical warehouses/storage, or any industrial/manufacturing use. Based on a review of Google Aerial imagery, the majority of the study area has either "exempt" or "low risk" land use categories.

- The project area will be further evaluated through the ODOT Regulated Materials Review (RMR) Screening process to be completed during the NEPA clearance phase of the project.

- Depending on need for additional permanent right-of-way or the extent of deep excavation (6 feet or greater in depth), additional RMR investigations may be necessary.

Air and Noise

The federal Clean Air Act (CAA) was enacted to reduce air pollution and establish clean air standards. If a project receives federal funding, conformity must be demonstrated with respect to carbon monoxide (CO), ozone (O3), particulate matter (PM 2.5/PM 10), and Mobile Source Air Toxics (MSATs). All of Ohio is now in attainment for CO. Therefore, the project is considered exempt from a project level conformity analysis for CO. Regarding ozone, the project is listed in the 2021-2024 STIP (*Reference ID 113663: 21-24 STIP*) and therefore ozone has been addressed. Franklin County is not located within a PM 2.5 nonattainment or maintenance area, thus, no further PM 2.5 analysis is required. Due to the possible presence of sensitive land uses within 500-feet of the project, and the project's potential to add capacity, an MSAT analysis may be required.

- A detailed review of the project-level mobile source air quality analysis requirements will be initiated prior to the NEPA clearance phase of the project.

Potential Noise Sensitive Areas (NSA) were identified through a review of existing aerial mapping. The ODOT *Flowchart for When a Noise Analysis is Needed* (ODOT, 11/23/2012) was consulted to determine whether a noise analysis would be potentially required for the project.

- As the proposed project is expected to add auxiliary traffic lanes, potential noise impacts will likely need to be assessed during the NEPA clearance phase of the project.

Underserved Populations

ODOT defines Underserved Populations (UPs) as People of Color, Low-Income, Older Adults, Individuals with Disabilities, and Individuals with Limited English Proficiency. U.S. Census Data was reviewed to identify whether or not UPs are present within the proposed project area.

- Based on the census data, UPs have been identified in the project area.

During field investigations, any signs of special accommodations/needs (such as wheel chair ramps, facilities that provide assistance to people with disabilities, signs that indicate there is a deaf child in the area, etc.) will be noted, along with any resources in the area that may service UPs, such as schools for the blind or deaf or assisted living facilities.

- Public involvement (PI) efforts will be tailored to ensure all UPs are given sufficient opportunity to participate in the PI process.

The presence of HUD or Section 8 housing within or immediately adjacent to the project area was reviewed using the HUD Resource Locator website.

- No public or low-income HUD-funded housing is located within or immediately adjacent to the project area.

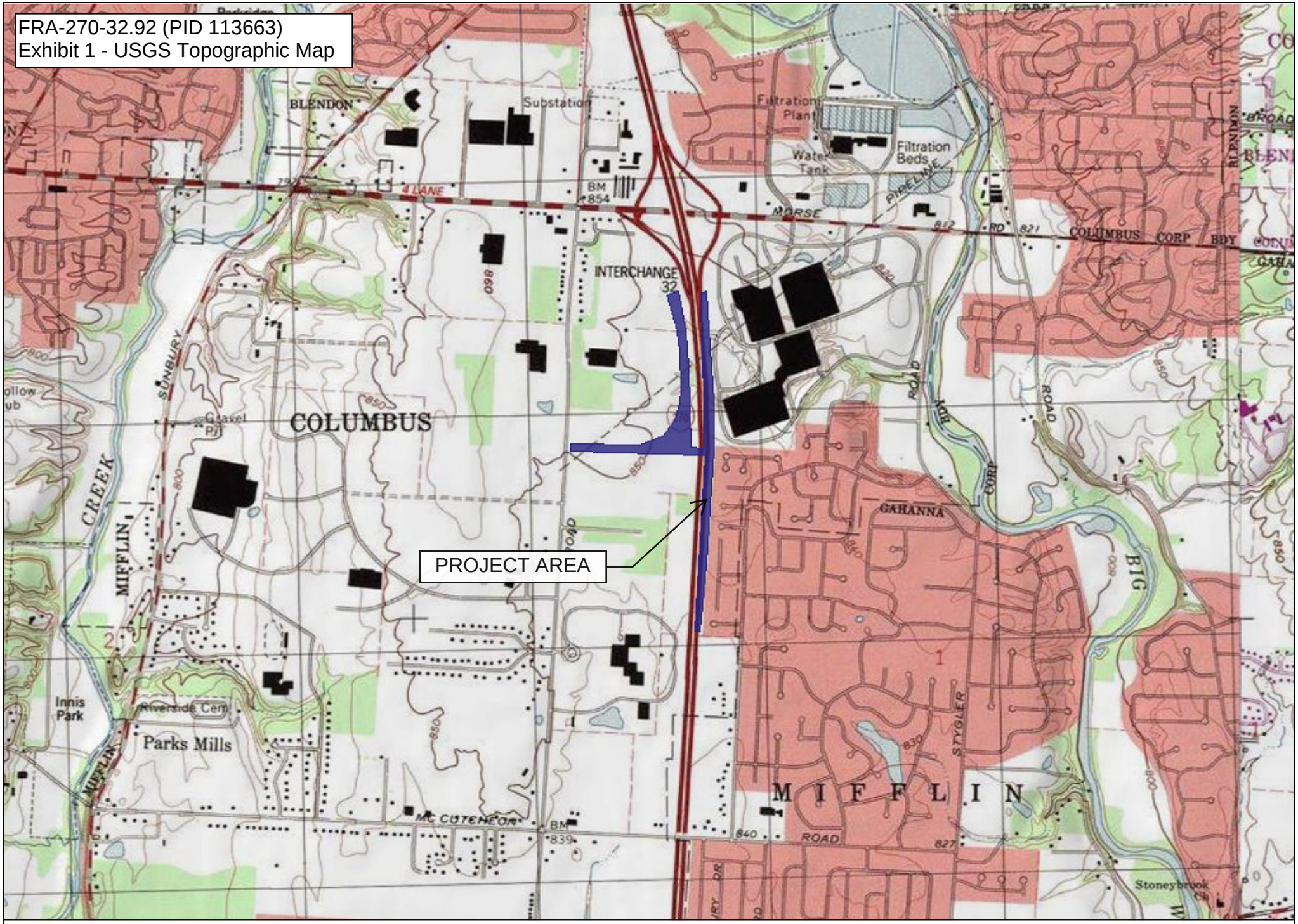
Water Wells and Drinking Water Resources

A cursory review of available drinking water resource mapping was completed to assess the project's potential to impact drinking water resources (i.e. residential wells, public water systems,

and drinking water source protection areas). Based on a review of ODNR's Ohio Water Wells online mapping system, one private water well (#41588) was identified adjacent to the Project Area (see Exhibit 5 – Water Wells Map). Further investigation indicates that this well is misrepresented on the map and is actually located at 3971 Hines Road, approximately 1,200-feet south of the southern limits of the project area. According to the Ohio EPA Drinking and Ground Waters online mapping system, the project area is not located within any drinking water source protection areas (see Exhibit 6 - Drinking Water Map). The Columbus Public Water System Inland Surface Water Emergency Management Zone boundary is located approximately 800-feet north of the northern project area limits.

- No drinking water resources were identified within or immediately adjacent to the project area.

FRA-270-32.92 (PID 113663)
Exhibit 1 - USGS Topographic Map



TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

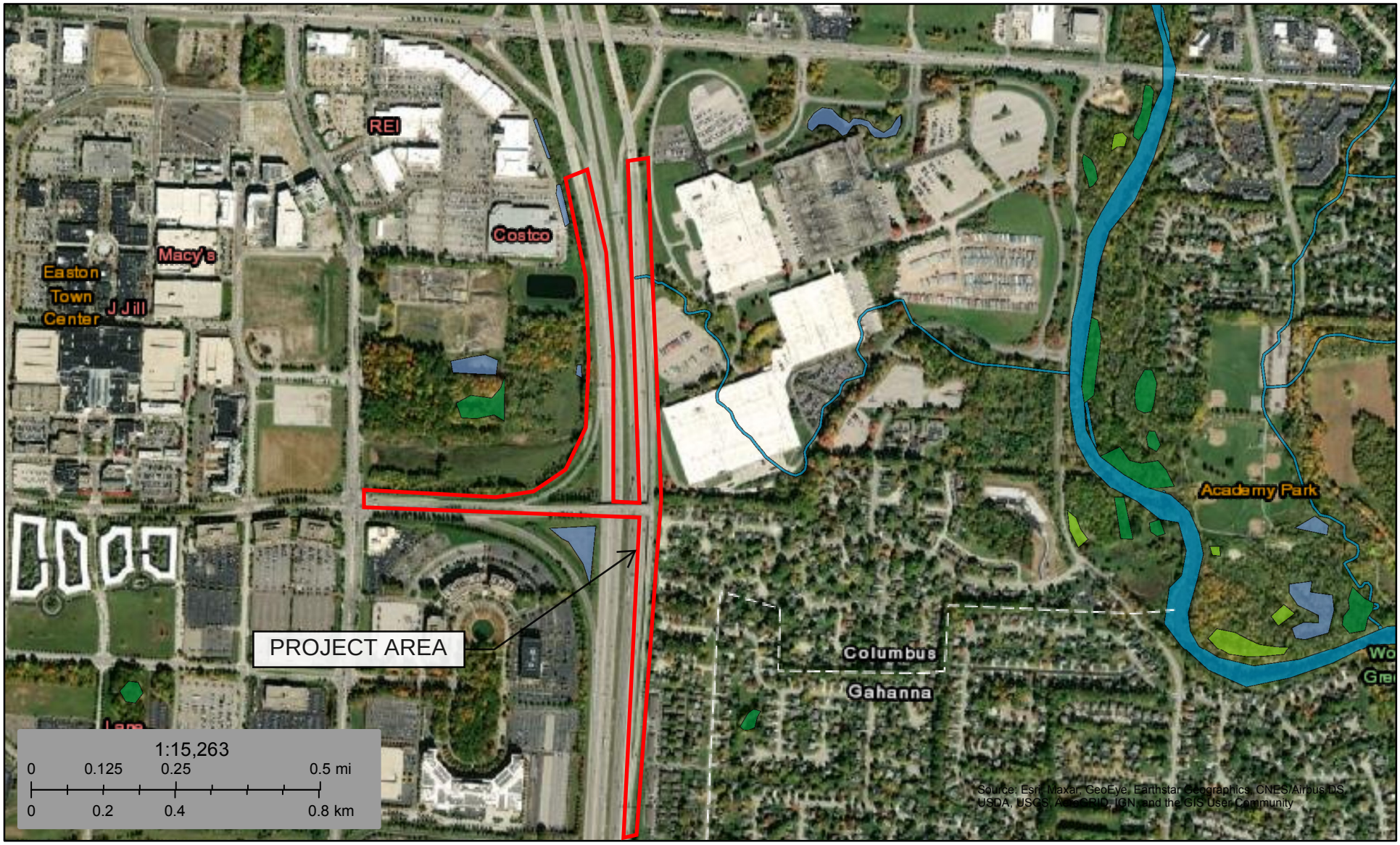
This file was generated by the Transportation Information Mapping System from the Ohio Department of Transportation (ODOT). ODOT does not make any warranty and does not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of the data provided herein. Any use of this information is at the recipients own risk.

Date: 12/7/2021

U.S. Fish and Wildlife Service
National Wetlands Inventory

FRA-270-32.92 (PID 113663) NWI Map

Exhibit 2



December 7, 2021

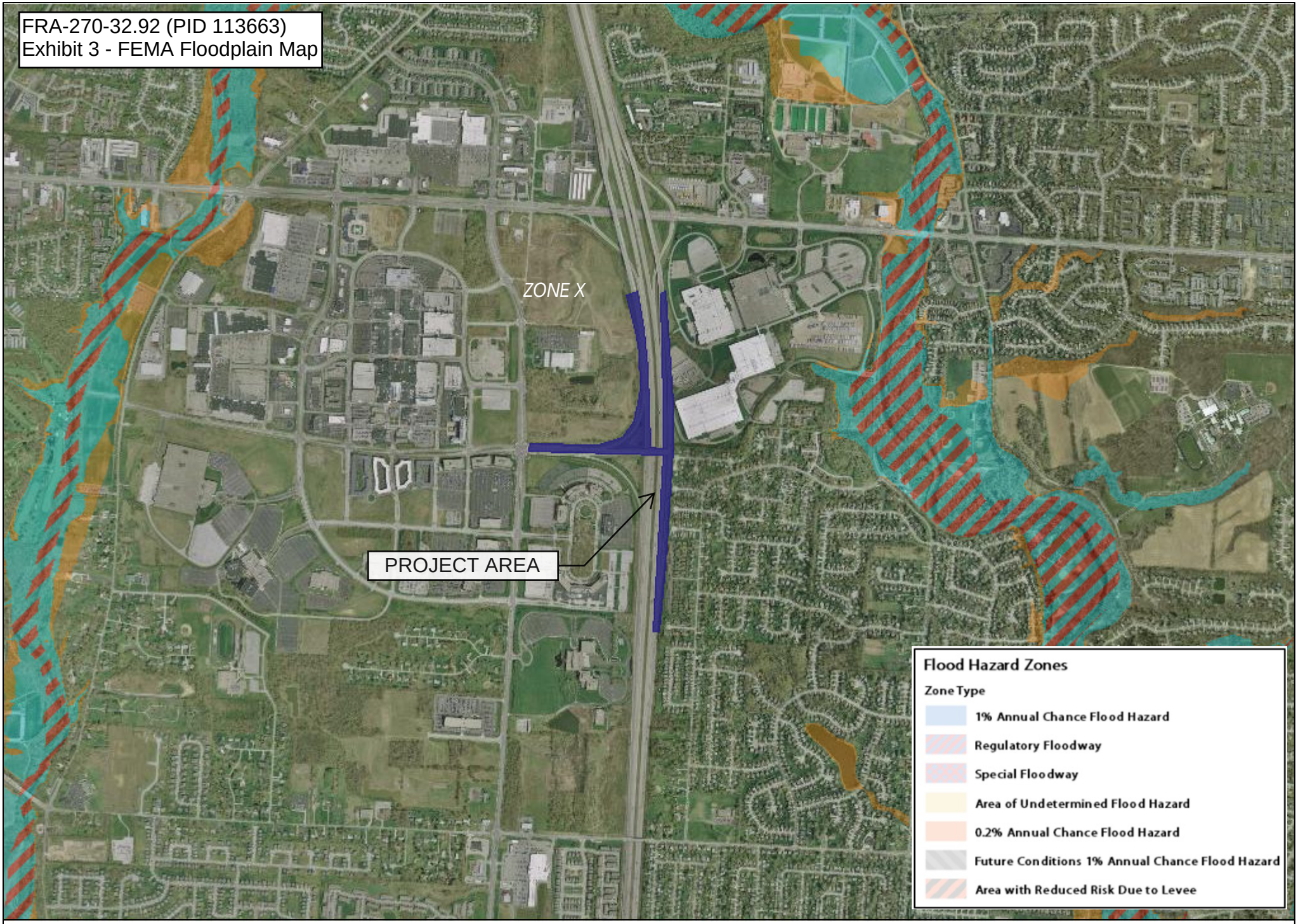
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

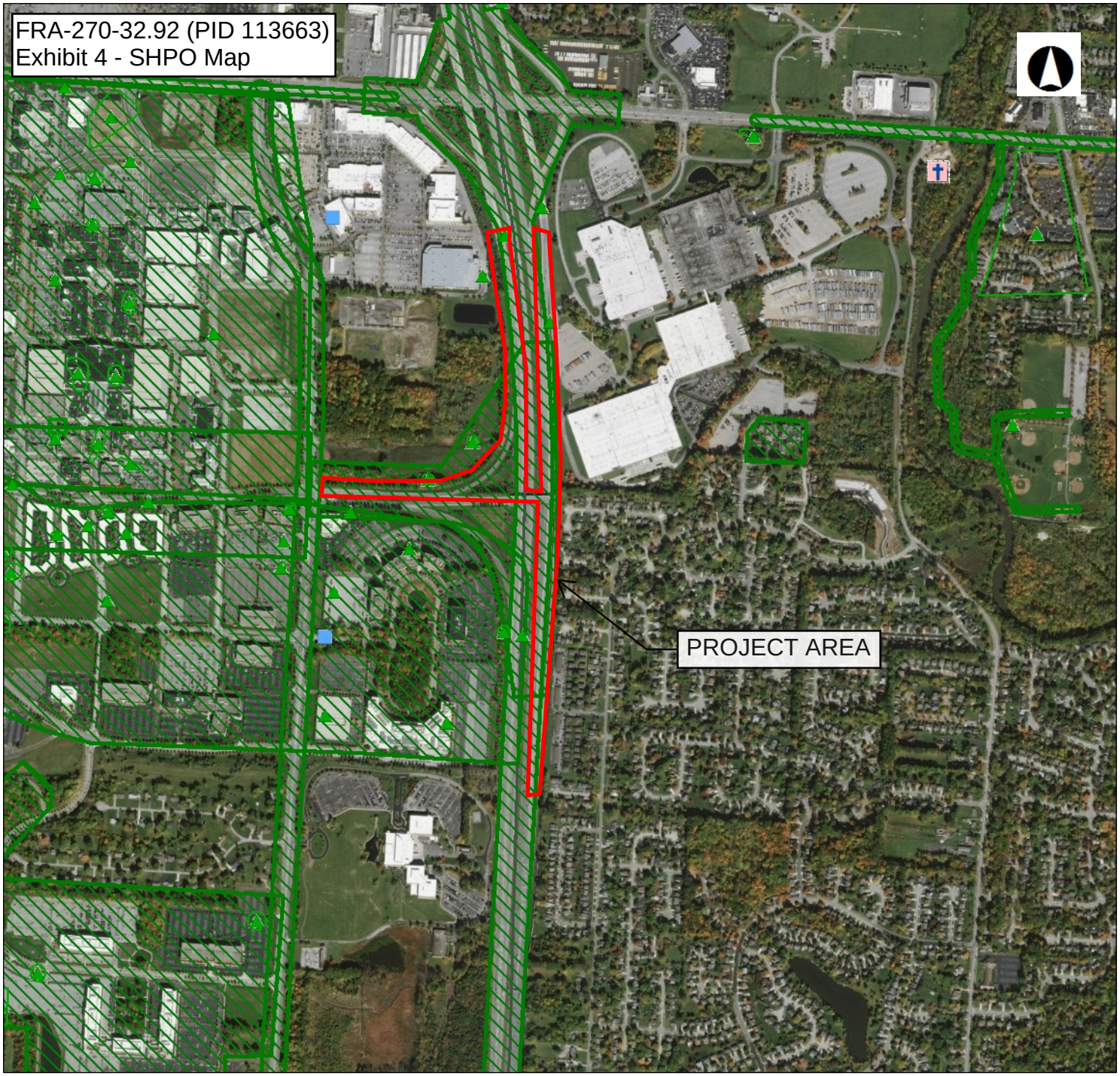
FRA-270-32.92 (PID 113663)
Exhibit 3 - FEMA Floodplain Map



TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

This file was generated by the Transportation Information Mapping System from the Ohio Department of Transportation (ODOT). ODOT does not make any warranty and does not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of the data provided herein. Any use of this information is at the recipients own risk.

Date: 12/7/2021



State Historic Preservation Office

Legend

NR Listings
- Listed
- National Historic Landmark
- Delisted

Determinations of Eligibility
- DOE
- Demolished

- Archaeological Sites
- Historic Structures
- Historic Bridges
- Historic Tax Credit Projects
- Local Designations

OGS Cemeteries
- Confident
- Not Confident

- Historic Markers
- Dams
- UTM Zone Split

0 0.24 0.48 Miles

1: 19,069

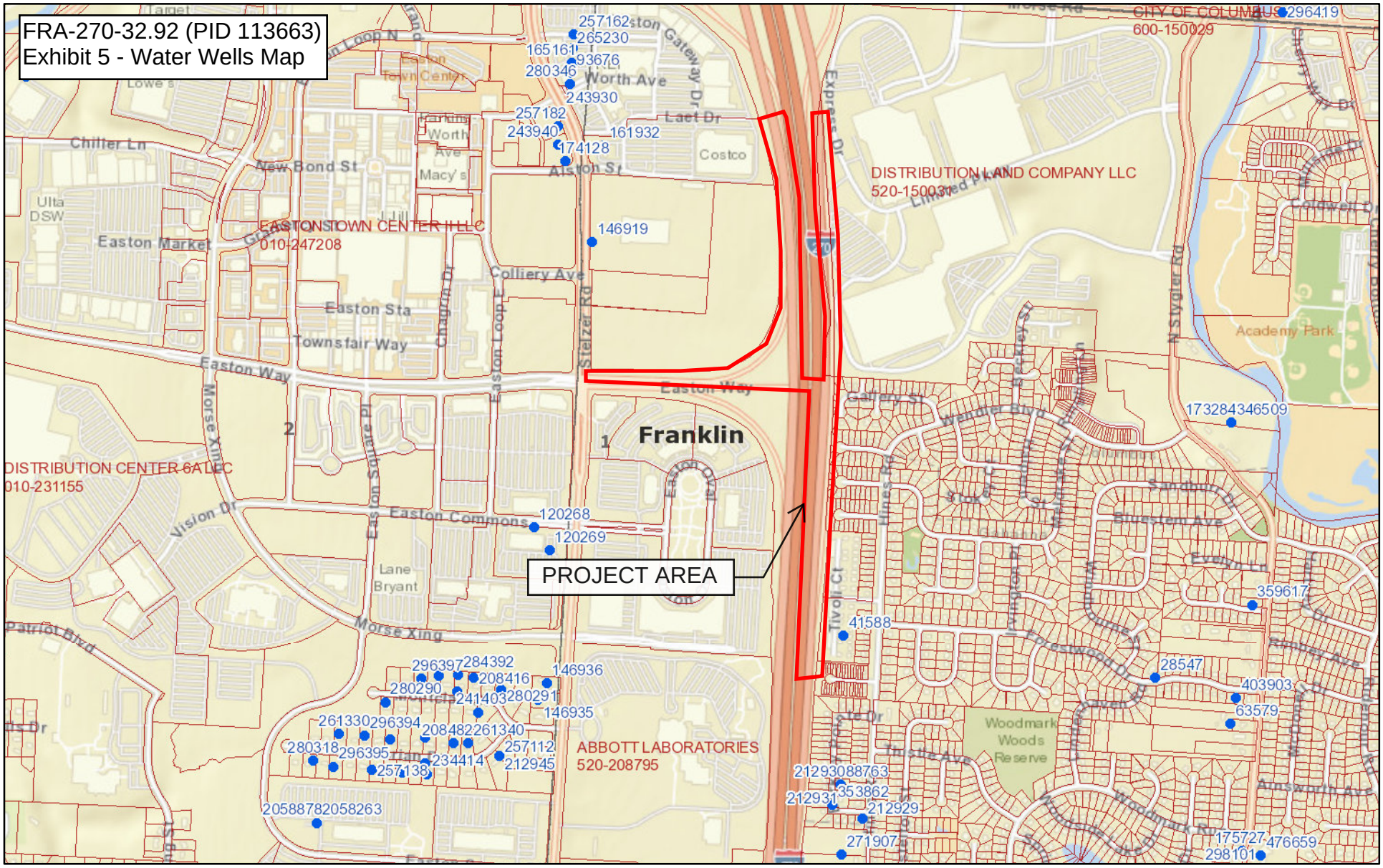
Copyright/Disclaimer

This map is a user generated static output from an Internet mapping site and is for generalThis map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Datum: [Datum]

Projection: WGS_1984_Web_Mercator_Auxiliary _Sphere

Ohio Water Wells



December 10, 2021

- Water Wells
- Statewide Parcels
- Counties
- Current Township
- Land Subdivision

1:18,056

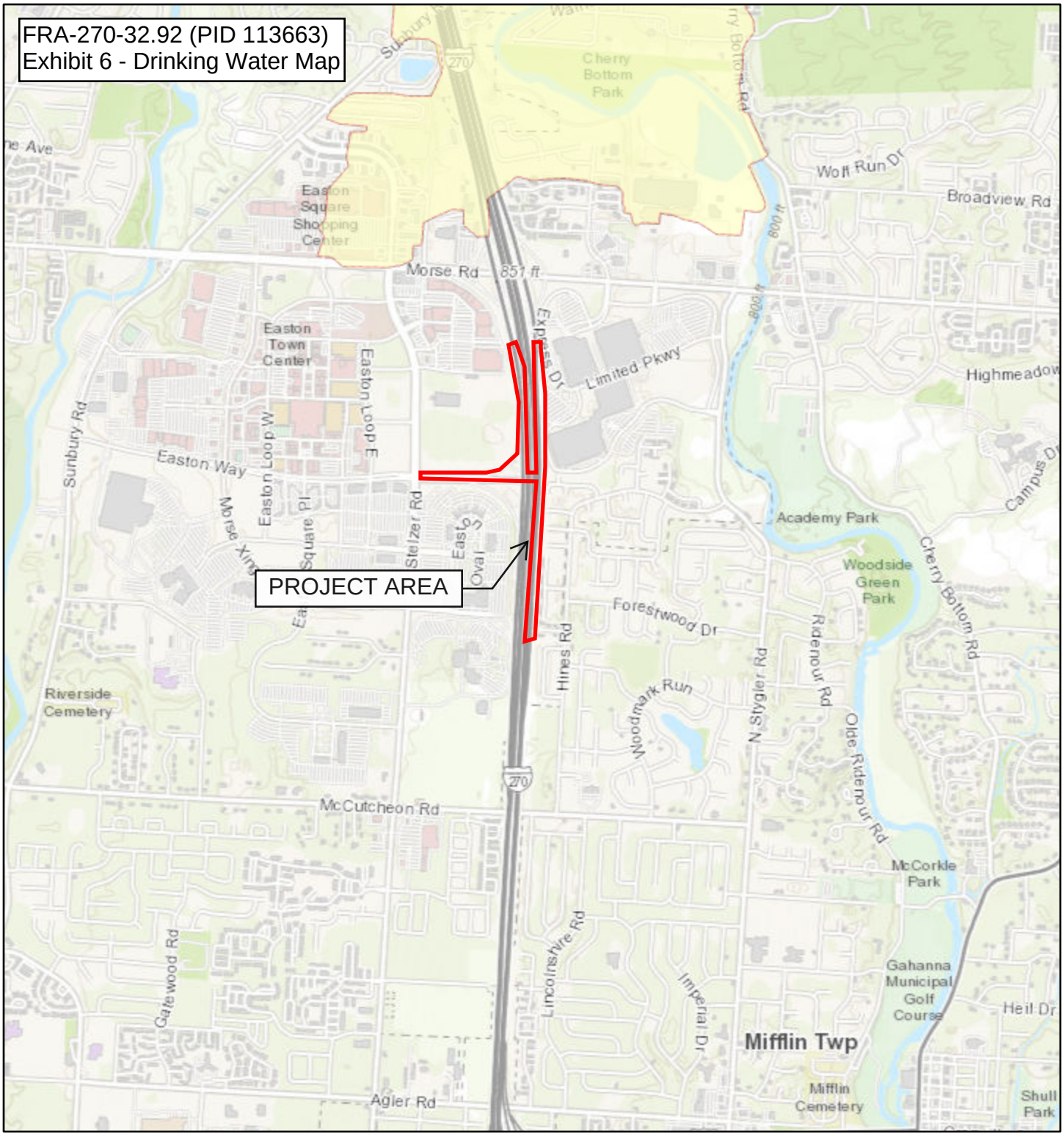
0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand),

Division Of Water Resources

Drinking Water Source Protection Areas



12/10/2021, 3:30:23 PM

1:36,112

0 0.23 0.45 0.9 mi

0 0.38 0.75 1.5 km

Inland (surface water)

- Emergency Management Zone
- Corridor Management Zone
- Source Water Area Watershed

Division of Drinking and Ground Waters, Ohio EPA, Franklin County Auditor, West Virginia GIS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

Ohio EPA
Division of Drinking and Ground Waters

Jeff Johnson, Chief
Division of Natural Areas & Preserves
2045 Morse Rd, Building A
Columbus, Ohio 43229

14 December 2021

Melissa Seeley
EMH&T
5500 New Albany Rd.
Columbus, OH 43054

Dear Ms. Seeley,

I have reviewed the Natural Heritage Database for the FRA-270-32.92 (PID 113663) project area, including a one-mile radius, in Columbus, Franklin County, Ohio. We have one record within the project area and/or the one mile radius. The location for the Paddlefish (*Polyodon spathula*), threatened, is shown in red on the attached map.

We are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state nature preserves, wildlife areas, parks or forests, national wildlife refuges, parks or forests, or other protected natural areas within a one mile radius of the project area.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. This letter only represents a review of rare species and natural features data within the Ohio Natural Heritage Database. It does not fulfill coordination under the National Environmental Policy Act (NEPA) or the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S. C. 661 et seq.) and does not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

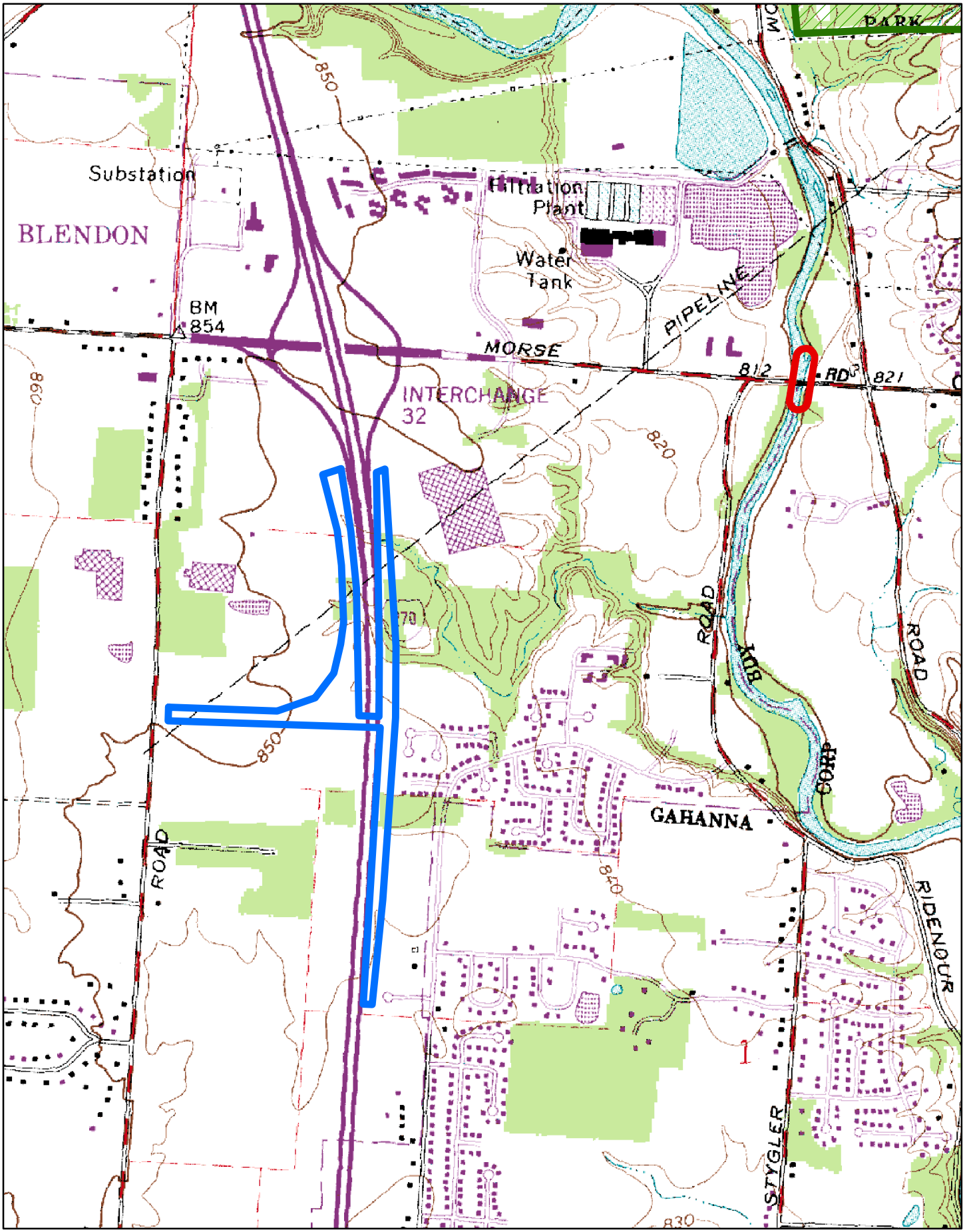
Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

Debbie Woischke

Debbie Woischke
Ohio Natural Heritage Program

FRA-270-32.92 (PID 113663)

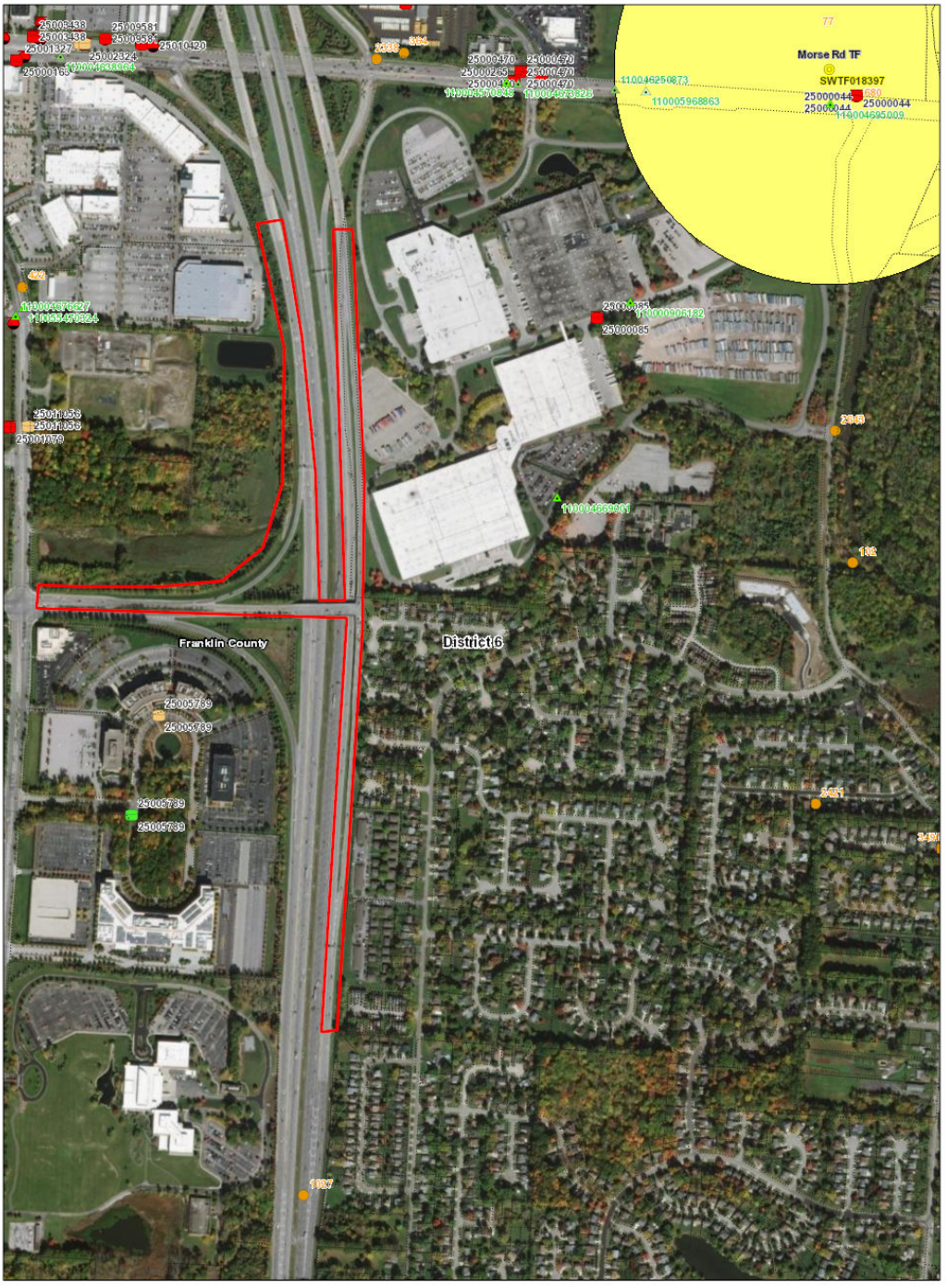


FRA-270-32.92 (PID 113663) ORPS Summary Report

Area of Interest (AOI) Information

Area : 30.4 acres

Dec 13 2021 10:53:11 Mountain Standard Time



StatewideParcels2020
Institutional Controls
Engineering Controls
TSD
RCRA (US EPA)
CESQG
LQG
SQG
TRANSFER FACILITY
TRANSPORTER
TSD
UNSPECIFIED UNIVERSE
OTHER HAZARDOUS WASTE ACTIVITIES
NPL - 1/2-mile Buffer
Non-NPL - 0.1-mile Buffer
SEMS (US EPA)
SUPERFUND (NON-NPL)
SUPERFUND NPL
Potential Areas of Concern
Ohio Voluntary Action Program Sites
Ohio Spills Database

1:9,028

0 0.07 0.15 0.3 mi

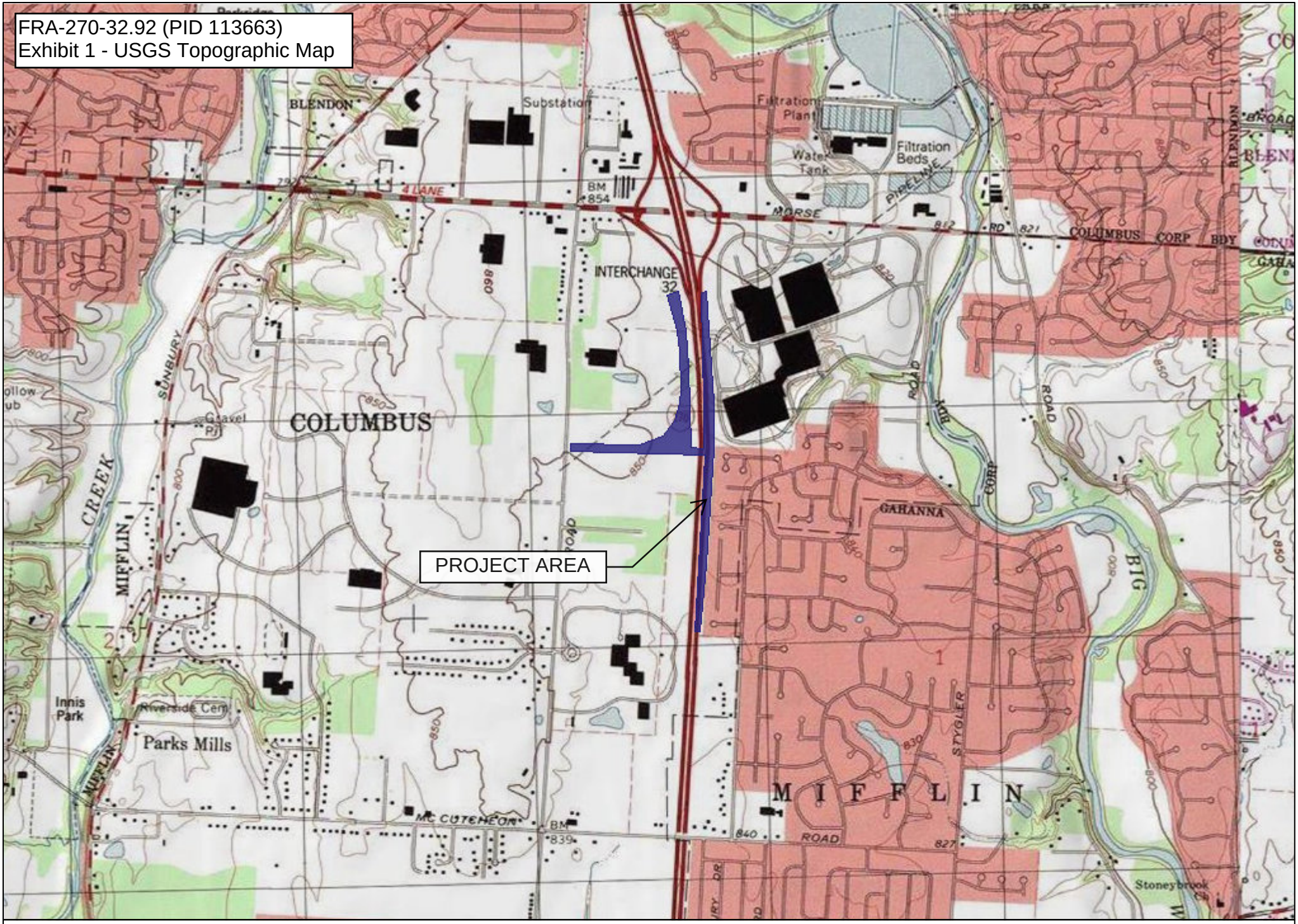
0 0.13 0.25 0.5 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Department of Natural Resources, Office of Information Technology.

Summary

Name	Count	Area(acres)	Length(ft)
SEMS - Non-NPL Sites w/buffer (US EPA)	0	0	N/A
SEMS - NPL Sites w/buffer (US EPA)	0	0	N/A
RCRA (US EPA)	0	N/A	N/A
RCRA - TSD Sites w/buffer (US EPA)	0	0	N/A
Federal Engineering Controls (US EPA)	0	N/A	N/A
Federal Institutional Controls (US EPA)	0	N/A	N/A
BUSTR - UST Locations (BUSTR/OGRIP)	0	N/A	N/A
BUSTR - LUST Locations (BUSTR/OGRIP)	0	N/A	N/A
Coal Gas Generators (OEPA-DERR)	0	N/A	N/A
DERR Database (OEPA-DERR)	0	N/A	N/A
Impoundment Sites (OEPA-DERR)	0	N/A	N/A
Landfills - Active Solid Waste Facilities w/buffer (OEPA-DMWM)	0	0	N/A
Landfills - Historic/Abandoned Facilities w/buffer (OEPA-DMWM/DERR)	0	0	N/A
Landfills - Solid Waste Facility Polygons (OEPA-DMWM)	0	0	N/A
Projects With Engineering Controls (OEPA-DERR)	0	N/A	N/A
Projects With Institutional Controls (OEPA-DERR)	0	N/A	N/A
Spills Database (OEPA)	0	N/A	N/A
VAP Sites (OEPA-DERR)	0	N/A	N/A
Potential Areas of Concern (ODOT-OES)	0	0	N/A

FRA-270-32.92 (PID 113663)
Exhibit 1 - USGS Topographic Map



TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

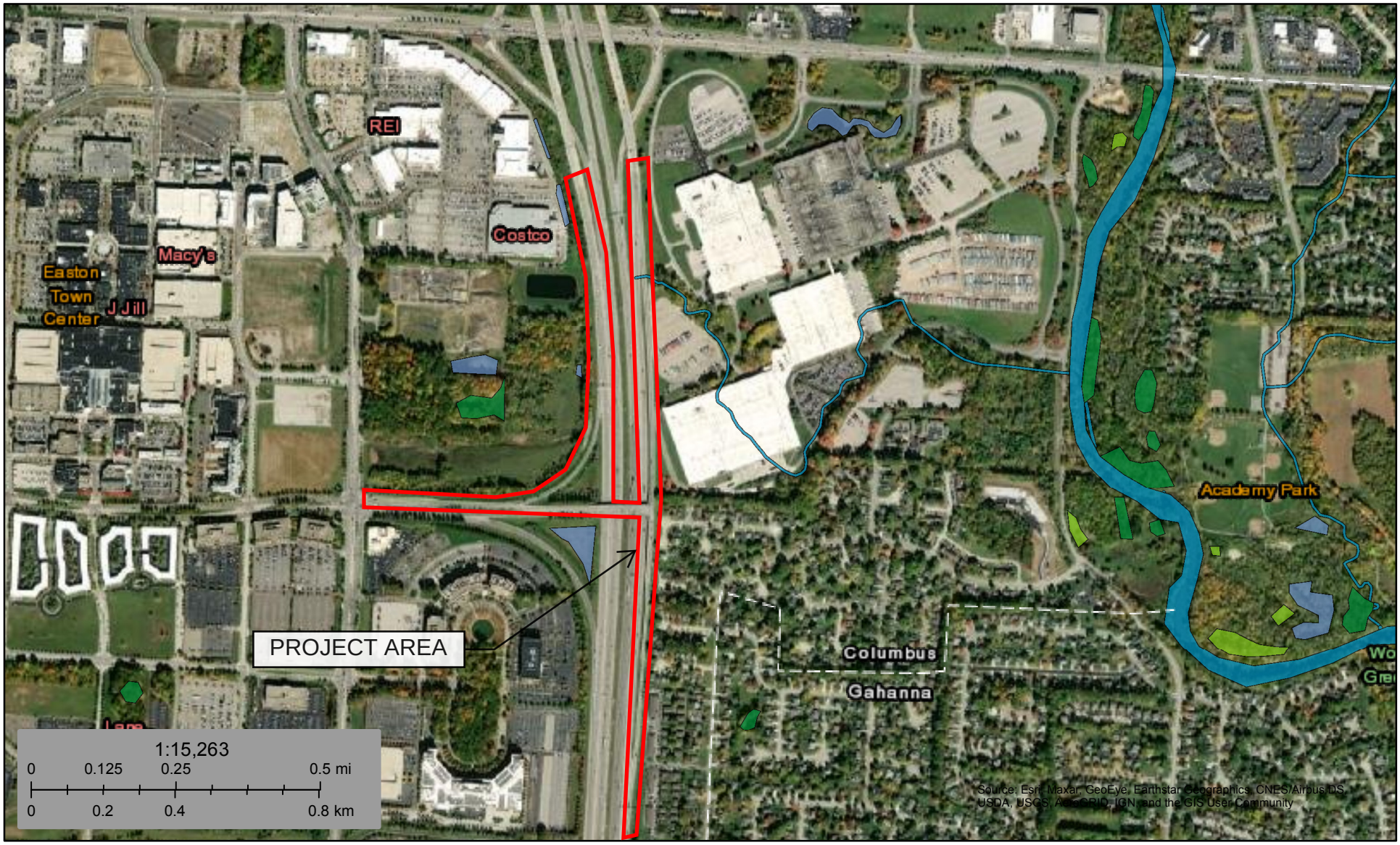
This file was generated by the Transportation Information Mapping System from the Ohio Department of Transportation (ODOT). ODOT does not make any warranty and does not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of the data provided herein. Any use of this information is at the recipients own risk.

Date: 12/7/2021

U.S. Fish and Wildlife Service
National Wetlands Inventory

FRA-270-32.92 (PID 113663) NWI Map

Exhibit 2



December 7, 2021

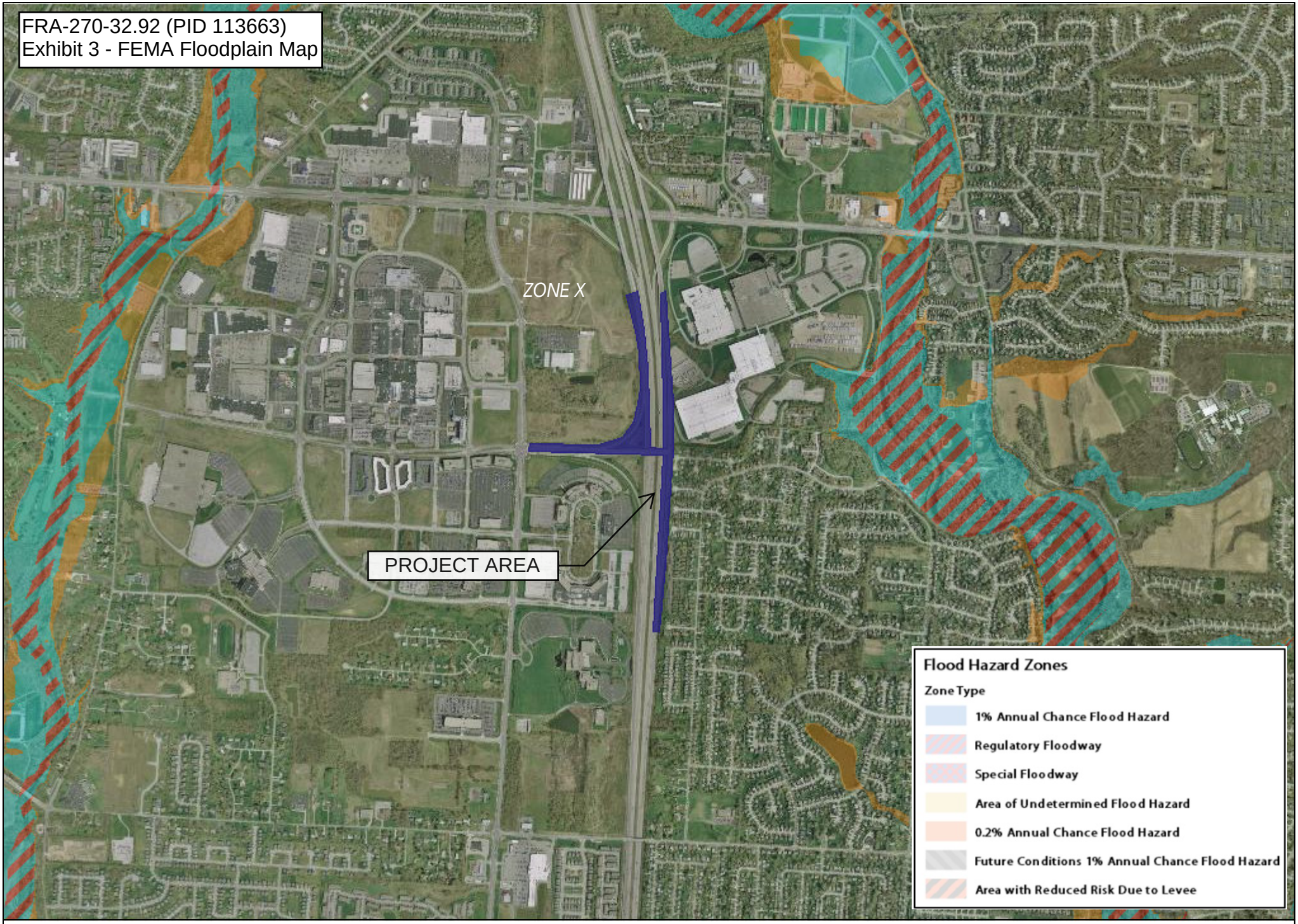
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

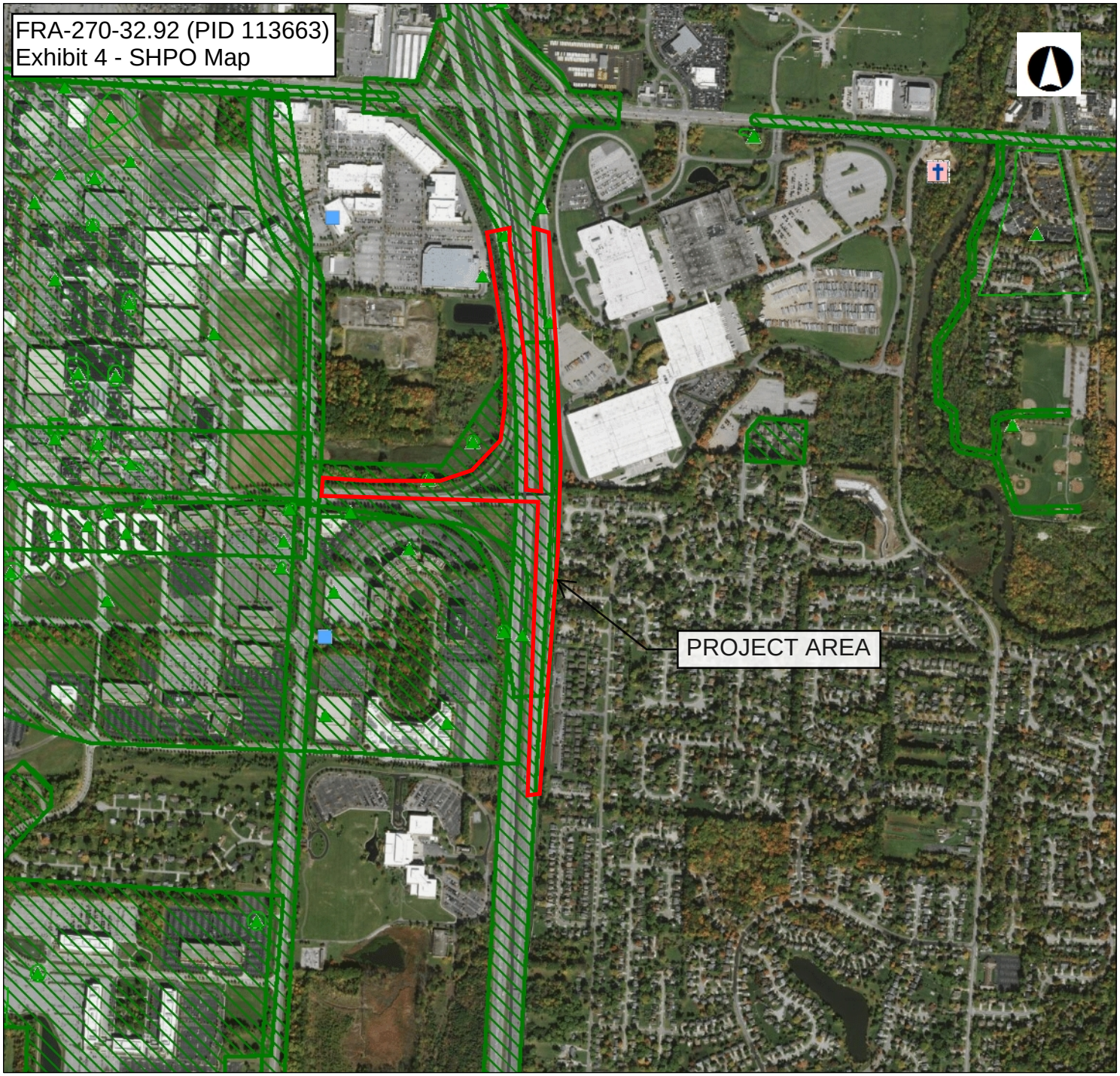
FRA-270-32.92 (PID 113663)
Exhibit 3 - FEMA Floodplain Map



TIMS TRANSPORTATION INFORMATION MAPPING SYSTEM

This file was generated by the Transportation Information Mapping System from the Ohio Department of Transportation (ODOT). ODOT does not make any warranty and does not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of the data provided herein. Any use of this information is at the recipients own risk.

Date: 12/7/2021



State Historic Preservation Office

Legend

NR Listings
- Listed
- National Historic Landmark
- Delisted

Determinations of Eligibility
- DOE
- Demolished

- Archaeological Sites
- Historic Structures
- Historic Bridges
- Historic Tax Credit Projects
- Local Designations

OGS Cemeteries
- Confident
- Not Confident

- Historic Markers
- Dams
- UTM Zone Split

0 0.24 0.48 Miles

1: 19,069

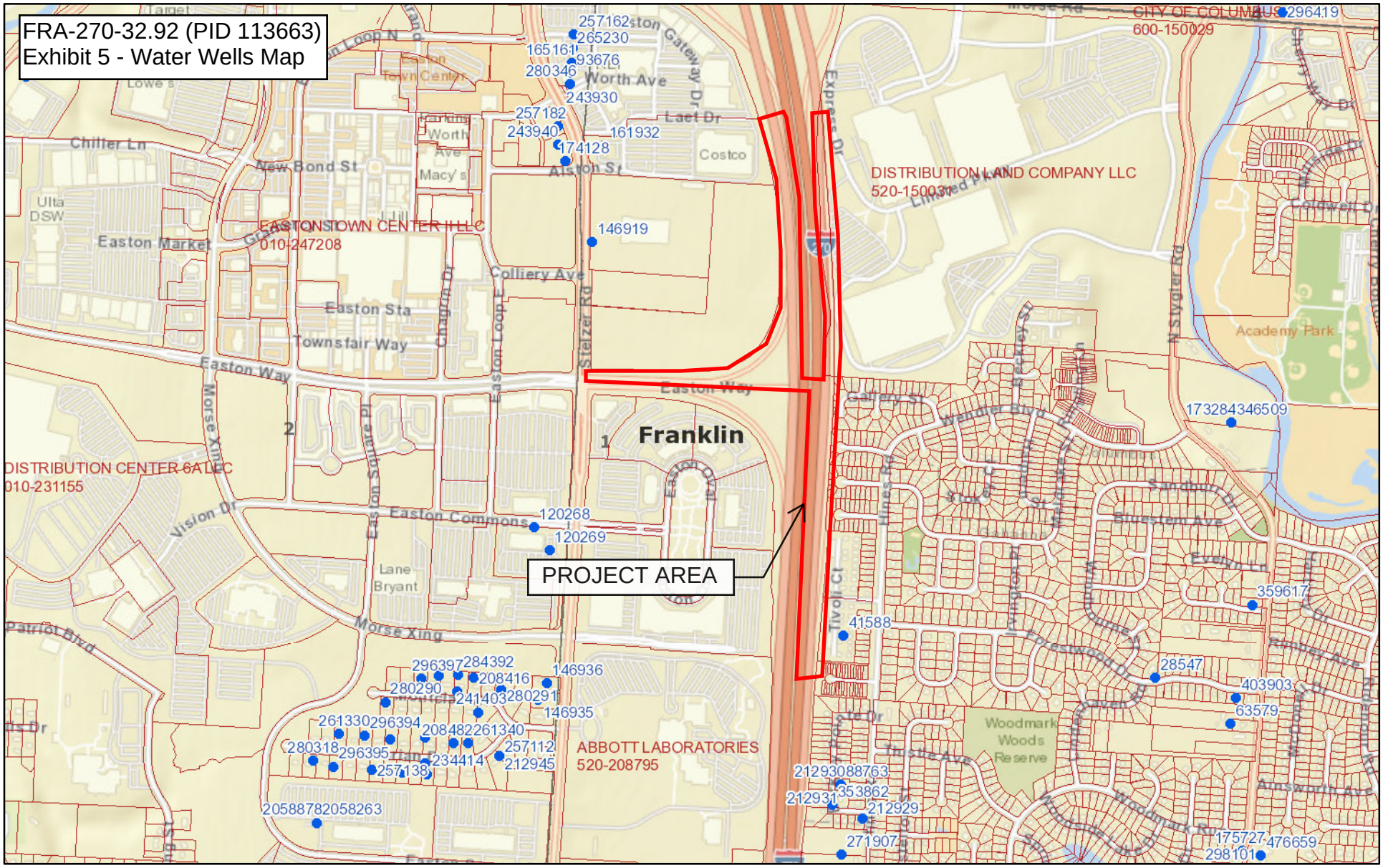
Copyright/Disclaimer

This map is a user generated static output from an Internet mapping site and is for generalThis map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Datum: [Datum]

Projection: WGS_1984_Web_Mercator_Auxiliary _Sphere

Ohio Water Wells



December 10, 2021

- Water Wells
- Statewide Parcels
- Counties
- Current Township
- Land Subdivision

1:18,056

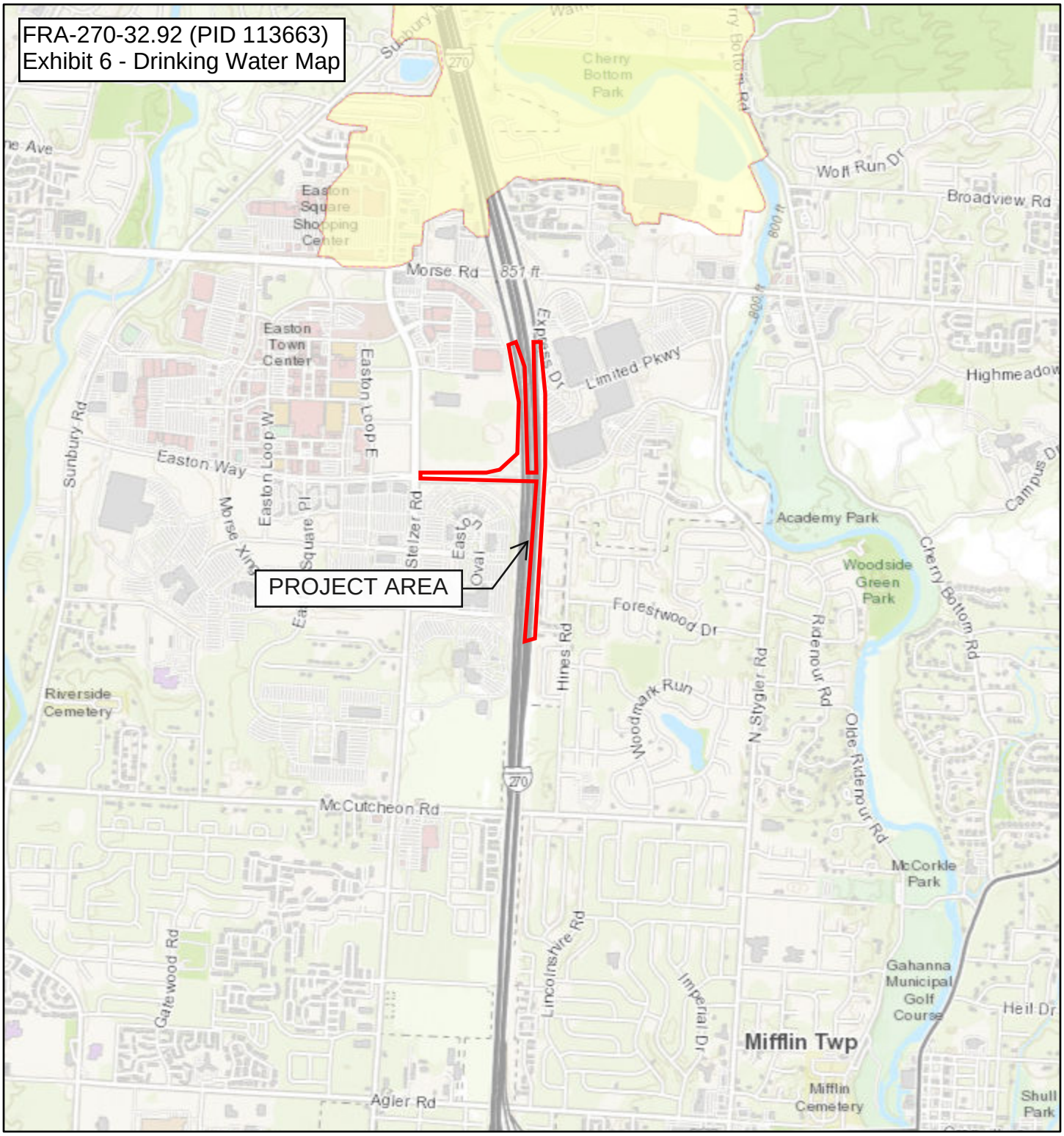
0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand),

Division Of Water Resources

Drinking Water Source Protection Areas



12/10/2021, 3:30:23 PM

1:36,112

0 0.23 0.45 0.9 mi

0 0.38 0.75 1.5 km

Inland (surface water)

- Emergency Management Zone
- Corridor Management Zone
- Source Water Area Watershed

Division of Drinking and Ground Waters, Ohio EPA, Franklin County Auditor, West Virginia GIS, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

Ohio EPA
Division of Drinking and Ground Waters

Jeff Johnson, Chief
Division of Natural Areas & Preserves
2045 Morse Rd, Building A
Columbus, Ohio 43229

14 December 2021

Melissa Seeley
EMH&T
5500 New Albany Rd.
Columbus, OH 43054

Dear Ms. Seeley,

I have reviewed the Natural Heritage Database for the FRA-270-32.92 (PID 113663) project area, including a one-mile radius, in Columbus, Franklin County, Ohio. We have one record within the project area and/or the one mile radius. The location for the Paddlefish (*Polyodon spathula*), threatened, is shown in red on the attached map.

We are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state nature preserves, wildlife areas, parks or forests, national wildlife refuges, parks or forests, or other protected natural areas within a one mile radius of the project area.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. This letter only represents a review of rare species and natural features data within the Ohio Natural Heritage Database. It does not fulfill coordination under the National Environmental Policy Act (NEPA) or the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S. C. 661 et seq.) and does not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

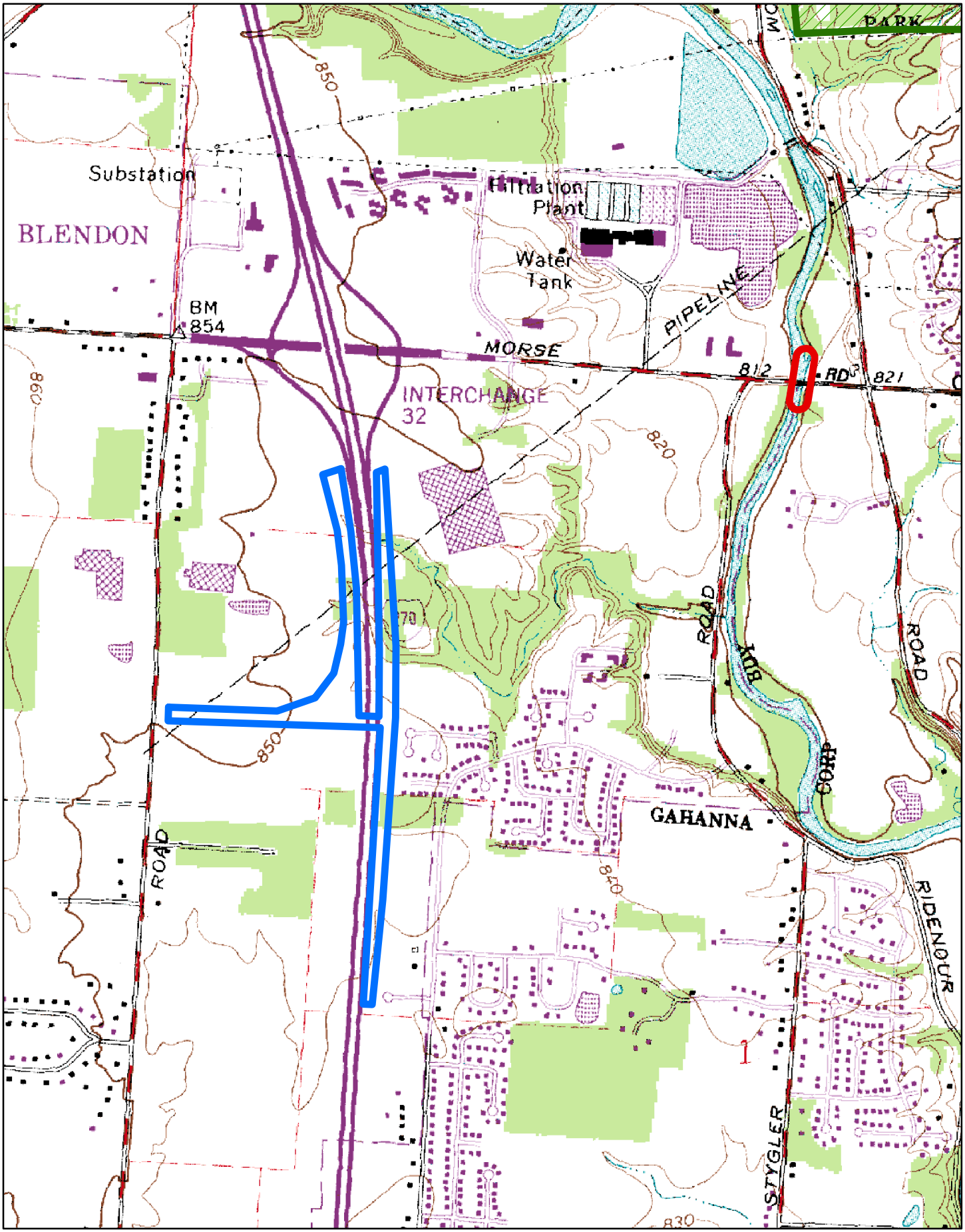
Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

Debbie Woischke

Debbie Woischke
Ohio Natural Heritage Program

FRA-270-32.92 (PID 113663)

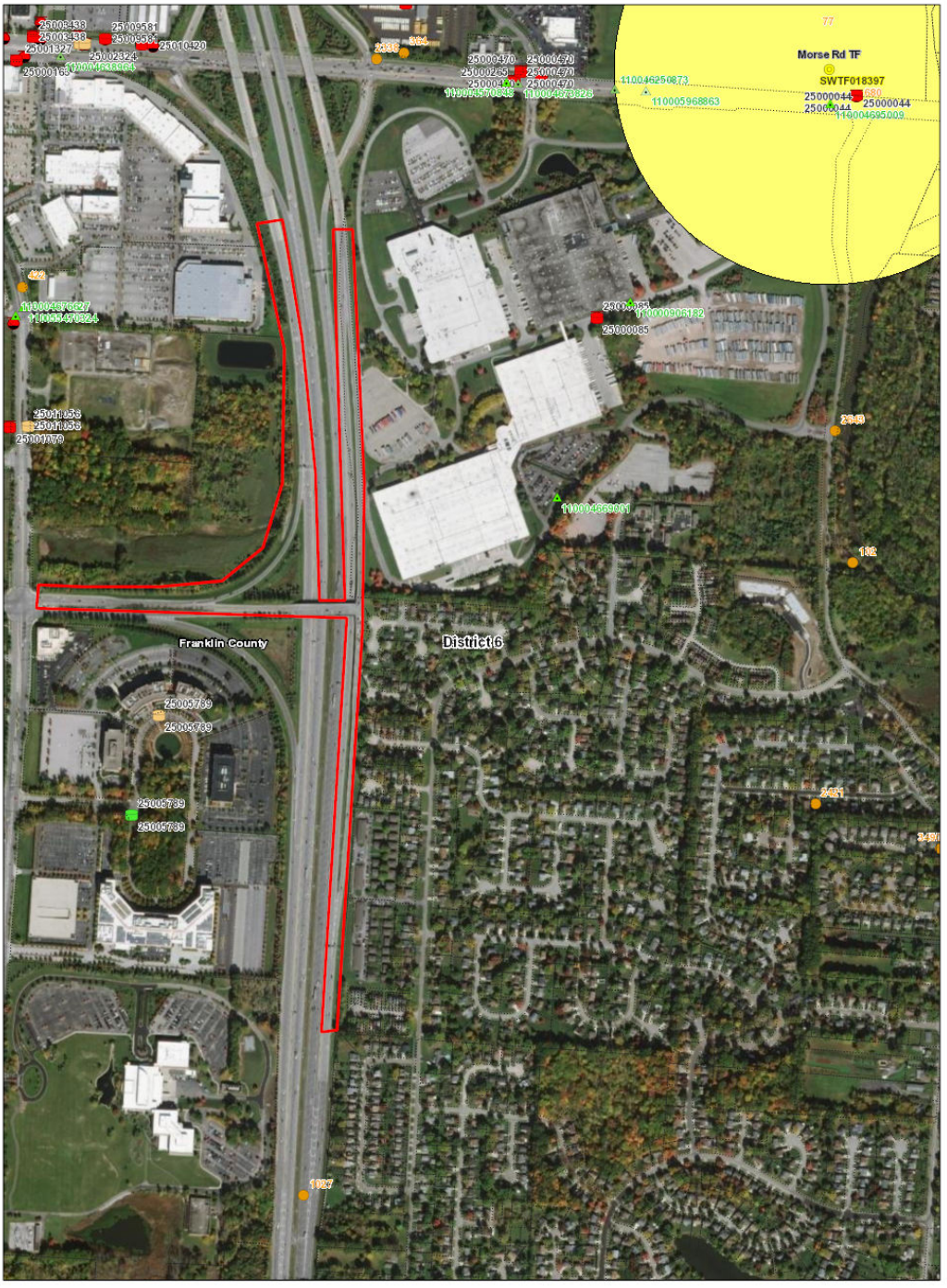


FRA-270-32.92 (PID 113663) ORPS Summary Report

Area of Interest (AOI) Information

Area : 30.4 acres

Dec 13 2021 10:53:11 Mountain Standard Time



StatewideParcels2020
Institutional Controls
Engineering Controls
TSD
RCRA (US EPA)
CESQG
LQG
SQG
TRANSFER FACILITY
TRANSPORTER
TSD
UNSPECIFIED UNIVERSE
OTHER HAZARDOUS WASTE ACTIVITIES
NPL - 1/2-mile Buffer
Non-NPL - 0.1-mile Buffer
SEMS (US EPA)
SUPERFUND (NON-NPL)
SUPERFUND NPL
Potential Areas of Concern
Ohio Voluntary Action Program Sites
Ohio Spills Database

1:9,028

0 0.07 0.15 0.3 mi

0 0.13 0.25 0.5 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Department of Natural Resources, Office of Information Technology.

Summary

Name	Count	Area(acres)	Length(ft)
SEMS - Non-NPL Sites w/buffer (US EPA)	0	0	N/A
SEMS - NPL Sites w/buffer (US EPA)	0	0	N/A
RCRA (US EPA)	0	N/A	N/A
RCRA - TSD Sites w/buffer (US EPA)	0	0	N/A
Federal Engineering Controls (US EPA)	0	N/A	N/A
Federal Institutional Controls (US EPA)	0	N/A	N/A
BUSTR - UST Locations (BUSTR/OGRIP)	0	N/A	N/A
BUSTR - LUST Locations (BUSTR/OGRIP)	0	N/A	N/A
Coal Gas Generators (OEPA-DERR)	0	N/A	N/A
DERR Database (OEPA-DERR)	0	N/A	N/A
Impoundment Sites (OEPA-DERR)	0	N/A	N/A
Landfills - Active Solid Waste Facilities w/buffer (OEPA-DMWM)	0	0	N/A
Landfills - Historic/Abandoned Facilities w/buffer (OEPA-DMWM/DERR)	0	0	N/A
Landfills - Solid Waste Facility Polygons (OEPA-DMWM)	0	0	N/A
Projects With Engineering Controls (OEPA-DERR)	0	N/A	N/A
Projects With Institutional Controls (OEPA-DERR)	0	N/A	N/A
Spills Database (OEPA)	0	N/A	N/A
VAP Sites (OEPA-DERR)	0	N/A	N/A
Potential Areas of Concern (ODOT-OES)	0	0	N/A

APPENDIX C:

Northbound Design Alternative Exhibits

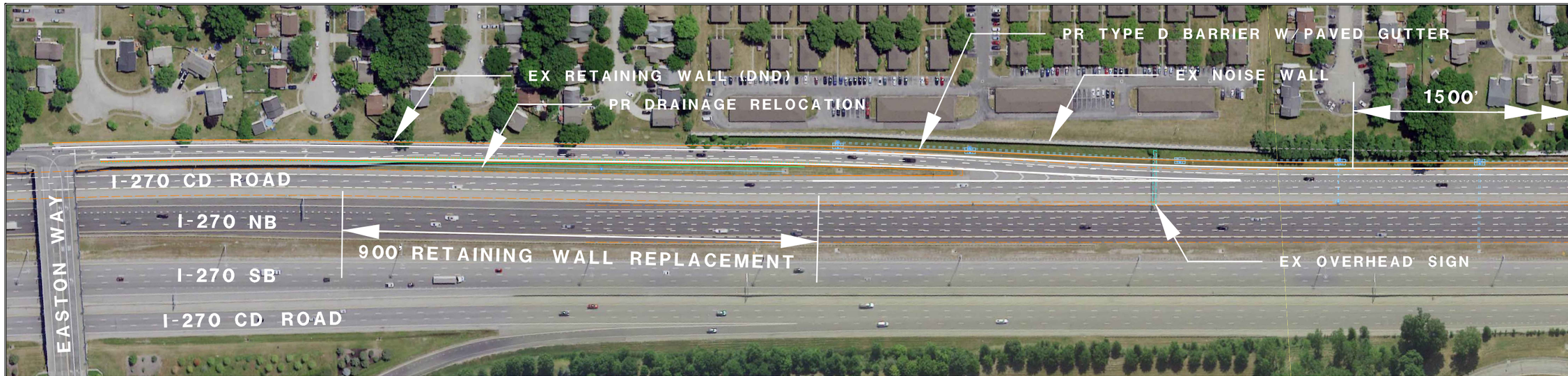
HORIZONTAL SCALE IN FEET
0 50 100 200

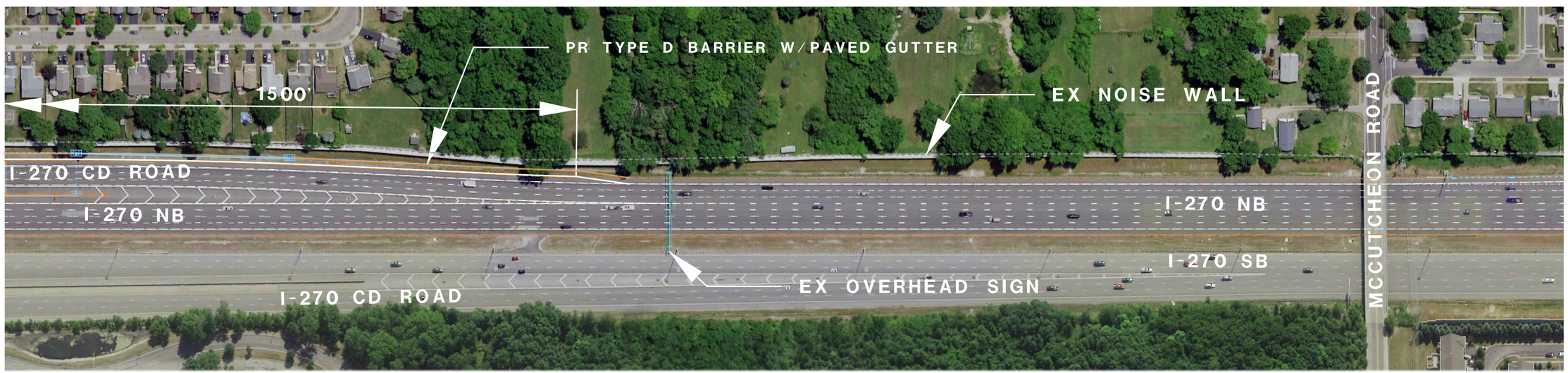
CALCULATED
CHECKED

270 NB OFF RAMP TO EASTON WAY
ALTERNATIVE 1 - OPTION LANE

FRA-270

J:\2020412\Reports\Feasibility Study\Exhibits\U3663_GP01.dgn Sheet 2/17/2022 5:55:18 PM bmiller





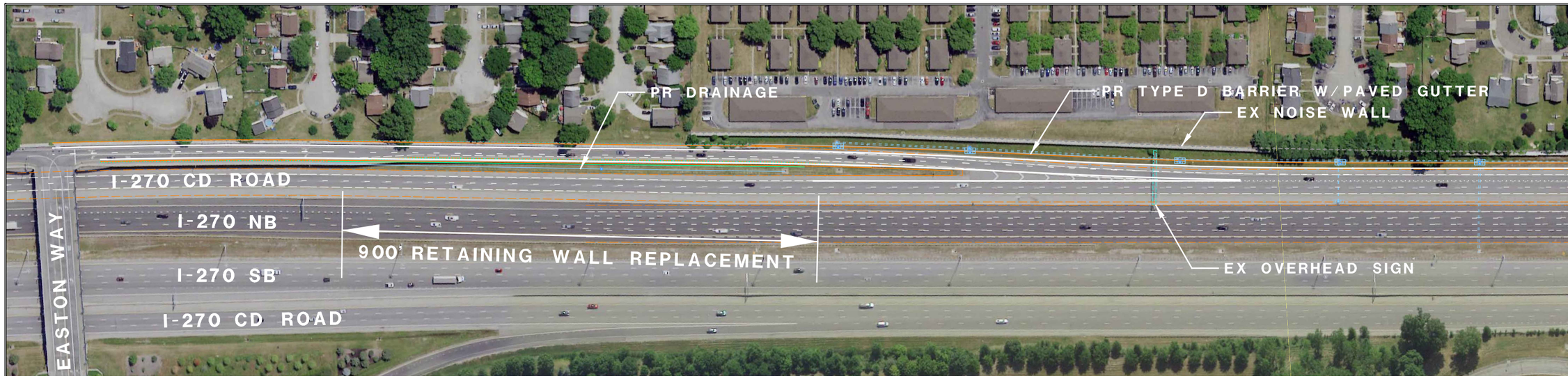
0 50 100 200
HORIZONTAL SCALE IN FEET

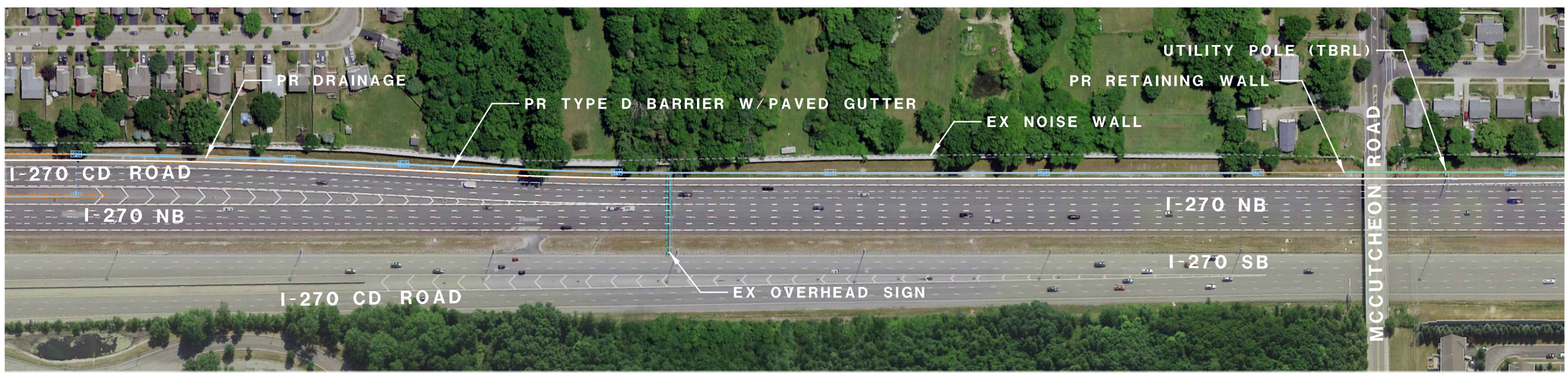
CALCULATED
CHECKED

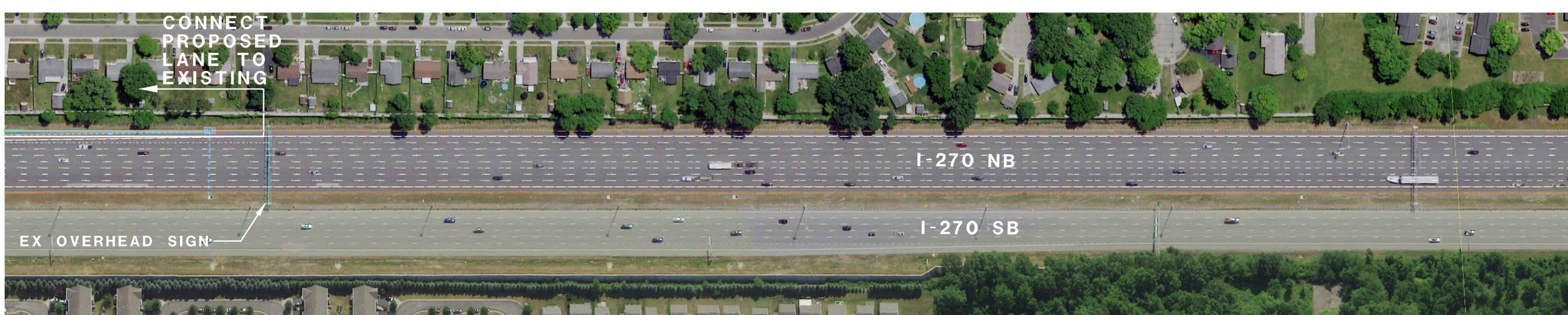
270 NB OFF RAMP TO EASTON WAY
ALTERNATIVE 2 - EXIT ONLY LANES

FRA-270

J:\2020412\Reports\Feasibility Study\Exhibits\113663_GP102.dgn Exhibit - ALT 2 2/17/2022 6:08:46 PM bmiller







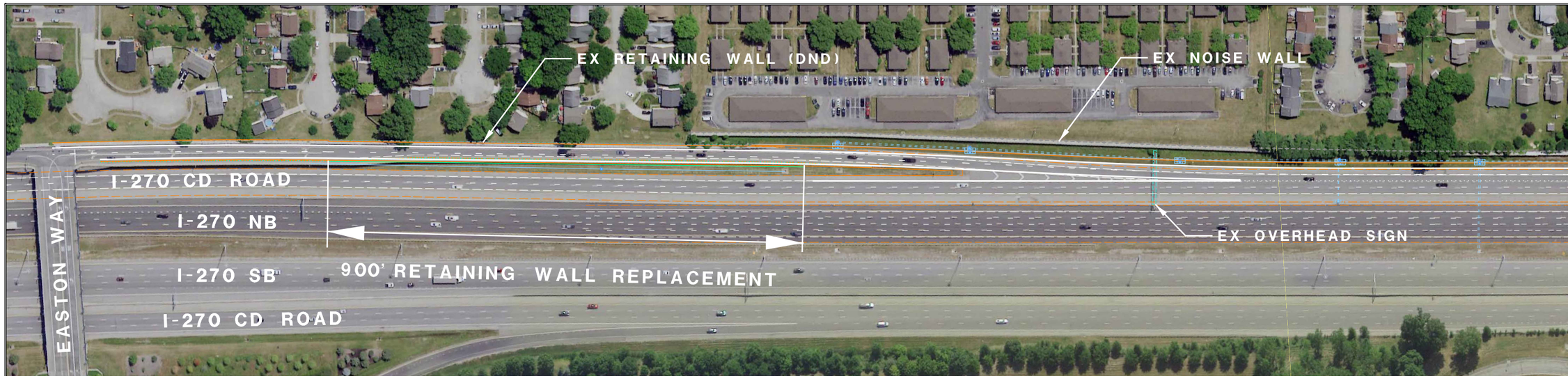
HORIZONTAL SCALE IN FEET
0 50 100 200

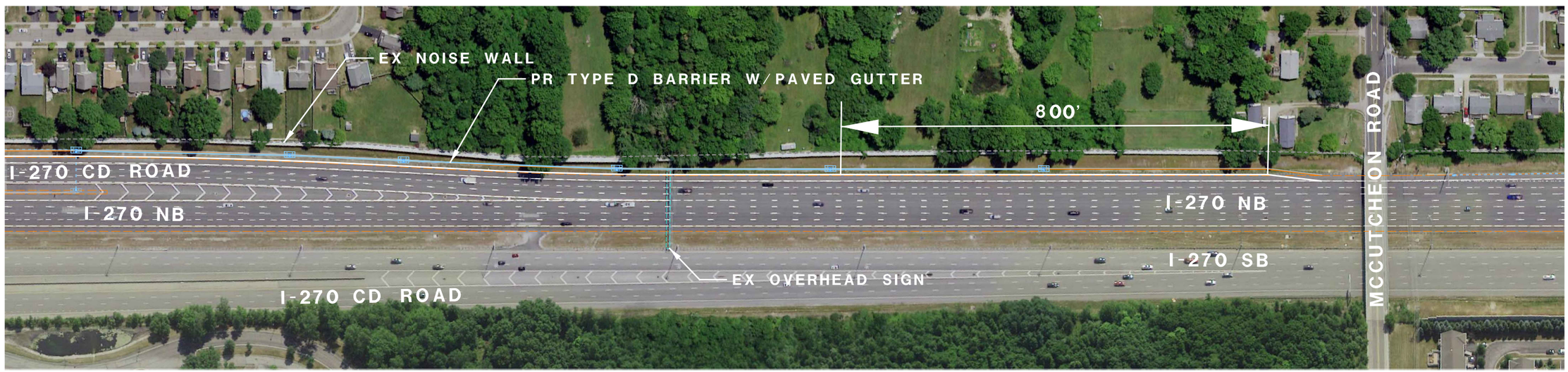
CALCULATED
CHECKED

270 NB OFF RAMP TO EASTON WAY
ALTERNATIVE 2A - EXIT ONLY LANES

FRA-270

J:\2020042\Reports\Feasibility Study\Exhibits\U3663_GPI02A.dgn Exhibit - ALT 2A 2/17/2022 6:21:54 PM bmiller





HORIZONTAL SCALE IN FEET
0 50 100 200

CALCULATED
CHECKED

270 NB OFF RAMP TO EASTON WAY
ALTERNATIVE 2B - EXIT ONLY LANES

FRA-270

J:\20200412\Reports\Feasibility Study\Exhibits\113663_GPI02B.dgn Exhibit - ALT 2B 2/17/2022 6:57:48 PM bmiller

APPENDIX D:

Cost Estimates

FRA-270-SB Exit Ramp
(Alternative 1 - Conventional Geometry)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	FRA-270-SB Exit Ramp
Roadway Subtotal	$ 662,000
Erosion Control Subtotal	$ 155,000
Drainage Subtotal	$ 195,000
Pavement Subtotal	$ 1,514,000
Lighting Subtotal	$ 125,000
Traffic Surveillance Subtotal	$ 10,000
Traffic Control Subtotal	$ 523,000
Structures Subtotal	$ 2,771,000
Noisewall Subtotal	$ -
Sanitary Sewer Subtotal	$ -
Water Works Subtotal	$ -
Landscaping/Aesthics Subtotal	$ 184,000
Maintenance of Traffic Subtotal	$ 178,000
Incidentals Subtotal	$ 429,000
Right-of-Way Subtotal	$ -
2022 Preliminary Opinion of Construction Cost Total	$6,746,000
Contingency (40%)	$2,699,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)	**$9,445,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.

Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-SB Exit Ramp
(Alternative 2 - Conventional Geometry With 6' Shift)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	**FRA-270-SB Exit Ramp**	
Roadway Subtotal	$	1,565,000
Erosion Control Subtotal	$	159,000
Drainage Subtotal	$	209,000
Pavement Subtotal	$	2,159,000
Lighting Subtotal	$	125,000
Traffic Surveillance Subtotal	$	10,000
Traffic Control Subtotal	$	178,000
Structures Subtotal	$	-
Traffic Signal Subtotal	$	345,000
Sanitary Sewer Subtotal	$	-
Water Works Subtotal	$	-
Landscaping/Aesthics Subtotal	$	148,000
Maintenance of Traffic Subtotal	$	178,000
Incidentals Subtotal	$	288,000
Right-of-Way Subtotal	$	-
2022 Preliminary Opinion of Construction Cost Total		$5,364,000
Contingency (40%)		$2,146,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)		**$7,510,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-SB Exit Ramp
(Alternative 3 - PBPD With No Shift)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	**FRA-270-SB Exit Ramp**
Roadway Subtotal	$ 619,000
Erosion Control Subtotal	$ 181,000
Drainage Subtotal	$ 209,000
Pavement Subtotal	$ 1,343,000
Lighting Subtotal	$ 125,000
Traffic Surveillance Subtotal	$ 10,000
Traffic Control Subtotal	$ 170,000
Structures Subtotal	$ -
Traffic Signal Subtotal	$ 345,000
Sanitary Sewer Subtotal	$ -
Water Works Subtotal	$ -
Landscaping/Aesthics Subtotal	$ 90,000
Maintenance of Traffic Subtotal	$ 214,000
Incidentals Subtotal	$ 228,000
Right-of-Way Subtotal	$ -
2022 Preliminary Opinion of Construction Cost Total	$3,534,000
Contingency (40%)	$1,414,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)	**$4,948,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-SB Exit Ramp
(Alternative 4 - PBPD With 6' Shift)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	FRA-270-SB Exit Ramp	
Roadway Subtotal	$	1,223,000
Erosion Control Subtotal	$	181,000
Drainage Subtotal	$	209,000
Pavement Subtotal	$	1,796,000
Lighting Subtotal	$	125,000
Traffic Surveillance Subtotal	$	10,000
Traffic Control Subtotal	$	170,000
Structures Subtotal	$	-
Traffic Signal Subtotal	$	345,000
Sanitary Sewer Subtotal	$	-
Water Works Subtotal	$	-
Landscaping/Aesthics Subtotal	$	130,000
Maintenance of Traffic Subtotal	$	214,000
Incidentals Subtotal	$	267,000
Right-of-Way Subtotal	$	-
2022 Preliminary Opinion of Construction Cost Total		$4,670,000
Contingency (40%)		$1,868,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)		**$6,538,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-NB Exit Ramp
(Alternative 1 - Option Lane)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	FRA-270-NB Exit Ramp	
Roadway Subtotal	$	310,000
Erosion Control Subtotal	$	89,000
Drainage Subtotal	$	180,000
Pavement Subtotal	$	283,000
Lighting Subtotal	$	-
Traffic Surveillance Subtotal	$	10,000
Traffic Control Subtotal	$	250,000
Structures Subtotal	$	3,000,000
Traffic Signal Subtotal	$	-
Sanitary Sewer Subtotal	$	-
Water Works Subtotal	$	-
Landscaping/Aesthics Subtotal	$	-
Maintenance of Traffic Subtotal	$	134,000
Incidentals Subtotal	$	265,000
Right-of-Way Subtotal	$	-
2022 Preliminary Opinion of Construction Cost Total		$4,521,000
Contingency (40%)		$1,809,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)		**$6,330,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-NB Exit Ramp
(Alternative 2 - Exit Only Lanes)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	FRA-270-NB Exit Ramp	
Roadway Subtotal	$	702,000
Erosion Control Subtotal	$	105,000
Drainage Subtotal	$	237,000
Pavement Subtotal	$	841,000
Lighting Subtotal	$	-
Traffic Surveillance Subtotal	$	10,000
Traffic Control Subtotal	$	250,000
Structures Subtotal	$	3,000,000
Traffic Signal Subtotal	$	-
Sanitary Sewer Subtotal	$	-
Water Works Subtotal	$	-
Landscaping/Aesthics Subtotal	$	-
Maintenance of Traffic Subtotal	$	134,000
Incidentals Subtotal	$	402,000
Right-of-Way Subtotal	$	-
2022 Preliminary Opinion of Construction Cost Total		$5,681,000
Contingency (40%)		$2,273,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)		**$7,954,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-NB Exit Ramp
(Alternative 2A - Exit Only 1500' Before CD Diverge)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	FRA-270-NB Exit Ramp
Roadway Subtotal	$ 1,202,000
Erosion Control Subtotal	$ 142,000
Drainage Subtotal	$ 474,000
Pavement Subtotal	$ 1,354,000
Lighting Subtotal	$ -
Traffic Surveillance Subtotal	$ 10,000
Traffic Control Subtotal	$ 250,000
Structures Subtotal	$ 3,750,000
Traffic Signal Subtotal	$ -
Sanitary Sewer Subtotal	$ -
Water Works Subtotal	$ -
Landscaping/Aesthics Subtotal	$ -
Maintenance of Traffic Subtotal	$ 134,000
Incidentals Subtotal	$ 472,000
Right-of-Way Subtotal	$ -
2022 Preliminary Opinion of Construction Cost Total	$7,788,000
Contingency (40%)	$3,116,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)	**$10,904,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.

FRA-270-NB Exit Ramp
(Alternative 2B - Exit Only 800' Before CD Diverge)

Easton Way, Columbus, Ohio

Preliminary Opinion of Construction Cost

February 2022

Summary of Project Costs	FRA-270-NB Exit Ramp	
Roadway Subtotal	$	1,001,000
Erosion Control Subtotal	$	129,000
Drainage Subtotal	$	378,000
Pavement Subtotal	$	1,128,000
Lighting Subtotal	$	-
Traffic Surveillance Subtotal	$	10,000
Traffic Control Subtotal	$	250,000
Structures Subtotal	$	3,000,000
Traffic Signal Subtotal	$	-
Sanitary Sewer Subtotal	$	-
Water Works Subtotal	$	-
Landscaping/Aesthics Subtotal	$	-
Maintenance of Traffic Subtotal	$	134,000
Incidentals Subtotal	$	426,000
Right-of-Way Subtotal	$	-
2022 Preliminary Opinion of Construction Cost Total		$6,456,000
Contingency (40%)		$2,583,000
2022 Preliminary Opinion of Construction Cost including Contingency (in 2022 dollars)		**$9,039,000**

Notes & Clarifications

Estimate does not include Reimbursement to Private Utilities, Design, and Construction Engineering.
Construction timeframe and phasing of projects can impact construction costs.

Pricing reflects probable construction costs obtainable in the project locality on the date of this opinion. Unit rates have been obtained from historical records and/or discussion with contractors. The unit rates reflect current bid costs in the area. This estimate is an opinion of fair market value for the construction of this project. It is not a prediction of low bid. Pricing assumes competitive bidding for every portion of the construction work for all subcontractors and general contractors. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.

Since EMH&T has no control over the cost of labor, material, equipment, or over the contractor's method of determining prices, or over the competitive bidding or market conditions at the time of bid, the cost opinon is based on industry practice, professional experience and qualifications, and represents EMH&T's best judgment as a consultant familiar with the construction industry. EMH&T does not guarantee that the proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by them.