



Between 1997 - 2001, WSP (formerly Parsons Brinckerhoff) completed the Fort Washington Way (FWW) project in Cincinnati, Ohio for the City of Cincinnati and ODOT. As part of the FWW project, a Decking Over FWW Report was produced by WSP. At the time of the original project, piles for the foundations were installed as a future cost savings measure. Since 2001, the decks have been discussed with no action taking place. In November 2021, the Cincinnati USA Regional Chamber reached out to WSP for help in finally moving the project forward with a planning study due to our past involvement with the project. In support of this effort, WSP will be supported by KZF, a local architectural firm.

WSP will be focusing on the decking platform on down including tunnels safety with KZF focusing on what goes on top of the deck. Going forward, the opportunity will be to work with ODOT, the City of Cincinnati, and Hamilton County on this project. The next steps will be to develop a planning study to help with future grant applications to get the funding needed for the project.

Can ODOT get an updated copy of the cost estimates?

WSP completed the prior study for the Decking Over of FWW which is why the Chamber reached out to WSP per the recommendation of another consultant. WSP has had ongoing discussions with Jill Meyer (President & CEO) and Pete Metz (Director of the Connected Region, Transportation Policy & Coalition Manager Government Affairs) of the Chamber. WSP has provided the Chamber updated cost estimates of the prior study as requested. WSP has also had conversations with ODOT [Authority Having Jurisdiction (AHJ)]. In the coming weeks, WSP will be part of meetings representing the Chamber with key stakeholders and government agencies to present the project to them. The Chamber has already noted that WSP has the knowledge to help them make this project happen.

ODOT (Authority Having Jurisdiction (AHJ)) and the City of Cincinnati staff know of WSP's knowledge and expertise related to decking over projects and tunnel design. WSP has the right relationships and is positioned to build new relationships in partnering with the Chamber to win the design work once funding is secured. We have already engaged the tunneling / life safety group, advisory services, and our national bridges and structures group for support on this project.

No other design firm has the knowledge or history with the project. Between our past knowledge with the project and our national expertise with tunnel design and our recent experience with decking over projects, no other firm in the region has the knowledge that WSP has for this project. The following outlines the tasks of this project:

Task 1: Grant Application Support

WSP will provide grant application support coordination with the development of the feasibility study. There will be no formal deliverables for this task.

Task 2: Structural Engineering

WSP will advance plans of the work started in 2000 when piles and foundations were installed in anticipation of the original capping concept coming to fruition to apply for funding. Structural plans will incorporate original foundations and concepts and design new foundations needed at gaps, bringing the work in compliance with current codes. Since maintenance of traffic will be critical, and headroom is limited, making cast-in-place alternatives a challenge, a precast solution,

Adding foundations will not be practical for this project. Design of the cap should utilize the existing pile capacity.

The existing foundations and walls supporting the Caps were not designed to LRFD standards. It will be difficult, costly and impractical to update some elements to LRFD guidelines. Consider treating the superstructure as new (LRFD) only.



Note: Prestressed composite box beams would be an allowable structure type. However, hanging anything from the boxbeams is prohibited based on ODOT Standards.

Composite

Or shallow beam system

in line with the original adjacent prestressed box concept, will be provided. It is our understanding that other alternatives will not be needed. This will minimize traffic outages and permit construction in a manner best suited to this busy stretch of I-71. The following assumptions are enumerated to establish the requirements for this important project:

- 1) Cap and bridges will be updates to current codes using approximate methods provided by Precast/Prestressed Concrete Institute (PCI):

- a. AASHTO LRFD Bridge Design Specifications, Ninth Edition (AASHTO)
- b. State Of Ohio Bridge Design Manual, 2020 Edition
- c. State Of Ohio Construction and Material Specifications, 2023 Edition
- d. NFPA 502 Standard for Road Tunnels, Bridges, and Other Limited Access Highways, 2023 Edition.

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Basic concepts generally to follow 2000's plans with changes and additions noted below:

- a. Imperial units will be used in accordance with current practice (2000's contracts were in Standard International units).
 - i. Soft conversions will be made to provide reinforcement, precast shapes, pipe sleeves and other industry-standard items conducive to competitive future bidding under Buy American policies.
 - ii. Exact conversions will be made for global geometry and will be assumed to be provided by local surveyors for future stages of design.
 - b. Adjacent prestressed concrete boxes, post-tensioned together transversely in groups, will be the primary structural system for the deck. Fans, signs, lights etc. cannot be hung from boxbeams.
 - c. Bridges 12, 13 and 14 (Race Street, possibly Vine Street if it remains open under the updated plan, and Walnut Street) will be replaced lane-by-lane with similar adjacent precast boxes to provide a contiguous cap and comparable remaining service life for the full length of the facility.
 - d. Areas adjacent to those bridges previously left open will be capped, necessitating new foundations along the median and edges of I-71. These are assumed to be similar and in line with the existing foundations in the portion planned to be capped in the 2000s. WSP's approach will be to extend the details for the foundations in the capped portions across these previously open areas.
 - e. Bridge replacement and adjacent capping and foundation work is new to this project (not included in the original concept) and is assumed similar to the details used in the past for the alternative bridge concept provided under the original 2000 contract.
 - f. Standard approach slabs will be used for cross streets to accommodate settlement of approach fill. Approach slabs will not be needed where park is placed over the cap.
 - g. Adjacent precast box beams will be made assumed simply supported at piers and abutments for superimposed dead load and live load. If refinements of this assumption are needed, they will be addressed in future stages of this design. Composite slabs on boxbeams shall be designed as continuous
 - h. Adjacent precast boxes will be post-tensioned together transversely in groups and topped with a cast-in-place deck and waterproofing to allow drainage and mitigate the potential for leakage.
 - i. Jet fans will be used at entrance to each tube (bound) in the direction of traffic.
 - j. Each entrance to each tube will be upset to provide additional headroom for jet fans below deck and provide elevated platforms/stages to enhance the new park above deck.
 - k. Existing starter bars in medians from 2000's construction are assumed to be in adequate condition.
 - l. Median wall columns will need to be made continuous with intermittent fire doors incorporated in median walls to provide a 2-hour fire rating and emergency pass-through to safe space in the other bound in the event of a fire. Details will not be provided during this study.
 - m. Walls at abutments will also require fireproofing. Spray-on fireproofing will be assumed for this stage and refined in future stages of this design if appropriate.
 - n. Reinforced concrete slab and waterproofing will be used over the adjacent precast boxes for bridges and cap areas.
- 3) Loadings will be per AASHTO except those specific to this project:
 - a. 4' maximum height of soil assumed loading at 120 pcf unit weight
 - b. 15 pcf snow load

Please provide as-builts of what extra piling was installed and pile log information you have in your archive storage

Concerns with having fans over live traffic

Air flow modelling will be needed to confirm this configuration will work for the design fire load

Should "ceiling" structural units also have fireproofing?

Is fire proofing needed on ceiling?
Is tiling needed?

Use AASHTO LRFD for pedestrian per BDM 303.2. (probably 90 psf)

- c. ~~40 psf~~ combined live load and additional superimposed dead load
- 4) Cross streets remaining will be replaced, designed as simply supported bridges using ~~PCI design charts and tables.~~ ODOT Standards
- 5) City of Cincinnati will arrange for all Third-Party Agreements as the project progresses.
- 6) Steel sleeves will be assumed within precast boxes for existing utilities to cross I-71. Local Civil Engineers will provide sizes and locations for all utility crossings needed. **Utilities in boxbeams is prohibited. Follow BDM 310.4**
- 7) Inserts to be provided in typical details for hanging surface-mounted fixtures, conduits, SCADA, CCTV, and jet fans will be designed in future stages of the design. **Inserts in the bottom side of boxbeams is not allowed.**
- 8) Structural Drawings will follow Ohio DOT Standards and are assumed to be our deliverables (Approximately 10% complete) as follows:
 - a. General Plan & Elevation
 - b. Typical Sections (Deck and Bridges)
 - c. General Notes
 - d. Estimated Structural Quantities
 - e. Construction Phasing
 - f. New Foundations
 - g. Abutments (Typical, Deck and Bridges)
 - h. Piers (Typical, Deck and Bridges)
 - i. Superstructure (Typical Details for Deck)
 - j. Superstructure (Typical Details for Bridges)
- 9) Specifications will not be provided. Inflationary costs per ODOT's inflation calculator should also be included.
- 10) Engineer's Estimate will be updated and based upon ODOT's online Bid Data Item Search tool for major items and include budgetary contingency on estimated construction cost.
- 11) Construction phasing details will not be included as part of this scope.
- 12) Existing geotechnical data and similar foundation requirements will be assumed for this phase. Additional Geotechnical investigations, work, or coordination on previous work are not included in this scope.
- 13) No additional survey will be performed or incorporated into this design.

Existing borings are sufficient for design efforts at current level.

Task 3: Tunnel M&E / Life Safety Engineering

The specific requirements for the systems and elements necessary to meet the fire protection and life safety goals of the new tunnel will need to be founded on the minimum requirements established in NFPA 502 Standard for Road Tunnels, Bridges, and Other Limited Access Highways.

FHWA will need to be included. The contact at the Ohio Division will be provided by ODOT.

Recognizing that NFPA 502 defers to the AHJ for the enforcement of its provisions, WSP's approach toward the developing these requirements will be to conduct an initial meeting with ODOT facility management and operating staff, local and state emergency response agencies, district-wide emergency management agencies, and any other entity, agency or jurisdiction identified as having a key interest in the overall planning and implementation of the fire protection, life safety and emergency response planning for the proposed FWW deck over project. The purpose of this initial meeting will to establish a partnered approach with the key project participants, agencies, and stakeholders to establish the overall goals of the fire protection and life safety design for the tunnel and ensure that the design concept approach is in unison with the operational concepts envisioned for both emergency response and incident management planning.

Since certain elements of the fire protection and life safety systems have significant spatial requirements on a tunnels overall design, WSP will develop a system design concept to a level



necessary to allow development of the tunnel structure to proceed. Fire protection and life safety system elements having significant spatial impacts include:

1. Ventilation System
2. Fire Protection and Suppression Systems
3. Drainage System
4. Traffic Control and Monitoring
5. Tunnel lighting
6. Fire alarm and detection
7. Electrical power distribution
8. Emergency communications

SCADA system and housing of controls needs to be examined.

Controls for these system need to be enclosed and secure with access and substantial parking for emergency and maintenance vehicles

The TMC will monitor traffic operations; however, the SCADA system will need to include monitoring capabilities. There will need to be a tunnel operations and maintenance manual developed that will make final determinations on monitoring. It is not correct at this time that ODOT TMC will be monitoring the tunnel systems.

As part of this initial effort WSP will perform a one-dimensional fire modelling effort to get a preliminary estimate of the required capacity for the tunnels emergency ventilation system so that fan sizes and horsepower can be estimated. This information is critical to ensure that adequate space for the fans is provided within the structure. The following are WSP's preliminary key assumptions that will be made as related to the development of tunnel fire life safety and operating systems concept:

1. Tunnel design will comply with latest version of NFPA 502
2. Hazardous cargo (i.e., bulk fuel carriers) will not be allowed to operate through the new tunnel.
3. The tunnel design fire will assume a Heavy Goods Vehicle (HGV) w/peak HRR = 100MW (unsuppressed)
4. The new tunnel will be monitored 24/7 by ODOT traffic management operators.

Deliverables for this task will be incorporated into the Task 2 deliverables.

Task 4: Signage

WSP will coordinate with ODOT on changes needed related to signage along I-71 within the proposed Deck Cap and provide a high-level assessment of the requirements. There is currently interstate signage located on the existing bridge structures crossing I-71 (Race, Vine) that will need to be relocated. The following assumptions are:

1. Signage spacing and signage sizes within the limits of the Deck Cap will need to be evaluated and adjusted as needed to meet ODOT requirements.
2. Signage mounted to the existing bridges crossing FWW will have to be relocated.

Details need to be worked out early in preliminary design to ensure this is feasible.

Deliverables for this task include a preliminary layout of a potential signing plan.

Suggest one of the requirements of this task is an ODOT/City/County/WSP meeting to discuss signing prior to finalizing the concept. ODOT and KYTC will need to review the signing plan.

Task 5: Park and Street Level Features

To be completed by KZF, refer to sub-consultant scope.

Signage concepts should also identify other advanced warning signs (Hazardous Cargo notifications) in the region that will need update/added. Routes that may need to be included are I-71, I-75, I-471, and US 50

ODOT would like to have the opportunity to review once developed.



Task 6: Project Management

WSP will oversee the development of the FWW Decking Cap study. As part of this effort, general management, additional meetings and coordination efforts with the Chamber, City of Cincinnati, and Hamilton County will be required. All meetings are assumed to be virtual. The following meeting assumptions are:

1. Bi-Weekly Team Meetings (Up to 10, 30-minute meetings total)
2. Coordination Meetings (up to 5, 1-hour meetings total)
 - a. Meeting with ODOT to discuss what requirements they will require for meeting NFPA 502. This meeting will need to be initiated either by the City of Cincinnati or Hamilton County Engineer's office.
 - b. Meeting with the City of Cincinnati Department of Transportation to begin talks with them about the decking over.

Additional meetings may include the following:

- c. Meetings with City of Cincinnati and City Departments
- d. Meeting with Hamilton County
- e. Meetings with ODOT