Conceptual Design Summary

Castleton Pedestrian Connector over CSX Rail
Village of Castleton, Rensselaer County, NY

January 2021

PREPARED FOR

The Village of Castleton

PREPARED BY

vhb

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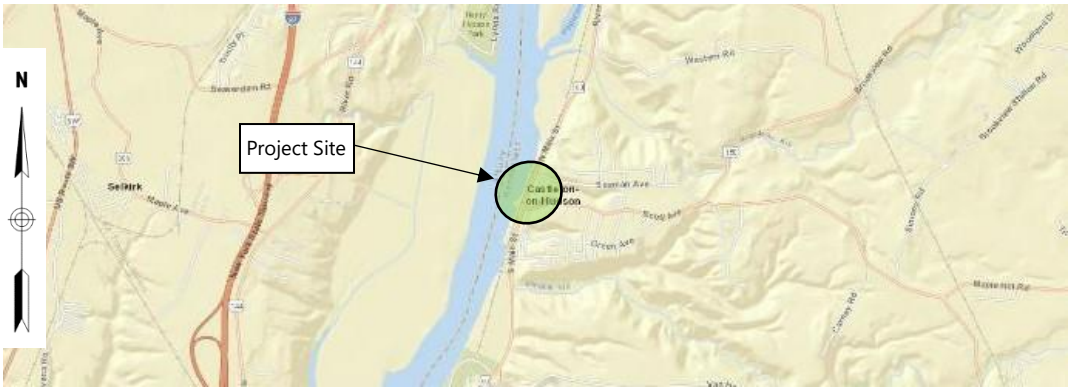
1 Introduction

1.1 Project Location



Project Locus Map

1.2 Purpose

An approximately ¾ acre public riverfront property previously accessible utilizing an at-grade crossing of high-speed CSX Railroad tracks has been closed. To restore access to the riverfront property NYSDOT has agreed to construct a pedestrian overpass above the railroad for the Village of Castleton-on-Hudson. With many pedestrian generators throughout the project vicinity, it is believed access to the waterfront would promote positive social, economic, and environmental effects. NYSDOT has provided the Village of Castleton with an overpass conceptual design consisting of stairs and an elevator shaft on either side of the overpass. The Village is requesting an assessment of alternative concepts that eliminate the need for an elevator to accommodate ADA requirements on the overpass as the Village has concerns regarding safety and maintenance costs of the proposed elevator. This conceptual design study serves to summarize potential options to create an alternative pedestrian connection over the CSX right-of-way (ROW) from NY Route 9J to the waterfront to improve pedestrian connectivity. This study also documents existing relevant design parameters in relation to two crossing alternatives to help compare and select a feasible alternative to the NYSDOT design.

When developing and selecting an alternative, there are several parameters to consider. First, are the critical parameters of safety and functionality of the structure. Second, there are preferred parameters that should be optimized to the extent practicable, including design life and future maintenance needs, the environmental

impacts, construction timelines, impacts to surrounding properties and traffic, and aesthetics. When there is more than one acceptable alternative that has a similar balance of preferred parameters, a third consideration is cost, including the up-front design and construction costs of the structure. For the purposes of this report, since the Village is not constructing the overpass, a construction cost estimate has not been performed.

2 Proposed Alternatives

2.1 Considerations Impacting Alternatives Selection

The existing project site located in Castleton is a combination of NYSDOT right-of-way (ROW), CSX ROW, and Village ROW. There is only one active railroad crossing in this area approximately 1,000 linear feet south. However, pedestrians cannot legally travel to the proposed bridge location without trespassing on CSX rail property due to limited horizontal distance from the tracks to the slope break and waterfront. Final ownership of any new structures will have to be determined as the design moves forward and coordinated will all involved entities.

The proposed crossing would span the CSX Rail, which is approximately 125 feet wide in this area. The required clearance over the tracks is assumed to be 23'-0" based off Amtrak design guidelines.

Impacts to rail traffic must be considered when constructing new structures within an active railroad ROW. It is anticipated that an overpass could be constructed with minimal impact to rail traffic and constructed during train operations, non-revenue hours, or with short duration closures.

The main constraints of the project are as follows:

- Working in and around the CSX Rail and active rail traffic, while minimizing any disruptions to rail service
- Accommodating roadway traffic on NY Route 9J and Scott Avenue during construction
- Structure aesthetics and walkway tie-in to the proposed redevelopment on the north approach
- Consideration to determine final ownership and maintenance responsibilities of any new structures or paths created as part of this project (CSX, Village of Castleton, NYSDOT, etc.)

2.2 Concept Alternatives

NYSDOT had previously provided the Village of Castleton with an overpass design consisting of stairs and an elevator on either side of the overpass. Two alternatives for crossing over the tracks are detailed below, one being the NYSDOT concept. It is assumed all alternatives will be designed to accommodate pedestrian bridge design

loading and will provide a minimum standard 75-year design life. The proposed pedestrian bridge is assumed to be located north of Scott Avenue.

2.2.1 Pedestrian Bridge Alternatives

The two alternatives being considered include a single-span bridge structure to span the tracks, along with similar approach ramp structures to reach the elevation required to pass over the ROW. A single span structure on new piers would span the CSX Rail, and result in reasonable spans for pedestrian structures. The NYSDOT crossing concept as well as a sketch of the second alternative can be found in Appendix 5.1. Characteristics of these two alternatives include both include a single span bridge supported on steel piers and concrete footings to span CSX Rail. The difference between the alternatives are the accesses from each side of the bridge.

- Alternative 1 – Elevator and stairwell access for the proposed overpass (NYSDOT design concept)
- Alternative 2 – Stairwell and elongated ramp access for the proposed overpass

Both alternatives consider the same superstructure types, while having slightly different approach structures. The first alternative considers a "stand alone" bridge with elevators on either end. The second alternative encompasses long, ADA compliant ramped approaches to the structure.

New pier towers could require deep foundations due to the height of the structure above the ground; however, with unknown bedrock depth and existing subsurface conditions, traditional spread footings or shallow foundations have been assumed for comparison between the alternatives.

Prefabricated steel through-truss bridges provide the smallest possible depth between the bridge deck and bottom of the structure, which is ideal in this situation due to the required clearance over the tracks. Most concrete beam alternatives would not be practical at this location, because of the span length needed at this location, the vertically constrained site, and weight of the beams.

Trusses are generally ideal for pedestrian applications at this span length, as they are very efficient structures with respect to strength-to-weight ratios. This can cut down significantly on material costs. As trusses are primarily shop fabricated, on site construction may be faster and could result in lower future maintenance costs. Use of either painted or galvanized steel is recommended for increased life span. (Both galvanized and painted have been used on some recent trail projects to achieve the protection of galvanizing, while retaining the aesthetics of a painted color.)

The alternatives will require extensive ramp tower structures, with concrete foundations, steel framing towers and concrete decks and stairs. To climb from ground level on either side of the ROW up over the tracks with the required clearance, the top of deck needs to be set approximately 25 feet above the existing ground. This will require approximately 300 linear feet of ramp at a 1 on 12 grade for the second alternative. Ramp width was assumed to be 5 feet wide with landings sized 5 feet by 5 feet to comply with ADA guidelines. By using a spiral system, the footprint of the ramp towers can be shortened significantly. Since the ramp lengths required are so long, staircase access would also be provided at each approach.

3 Project Impacts

3.1 Introduction

This section documents the assessment of social, economic and environmental effects of the project alternatives. Unless otherwise noted it is assumed that these impacts would be consistent for both alternatives being considered.

3.2 Project Coordination

3.2.1 NEPA Classification

It is assumed this project would be progressed as a Class II action (Categorical Exclusion) because it does not individually or cumulatively have a significant environmental impact and is excluded from the requirement to prepare an Environmental Impact Statement (EIS) or an Environmental Assessment (EA).

Per the Federal Highway Administration's regulations in 23 CFR 771.117, this project is anticipated to qualify as a Categorical Exclusion (CE). The project is primarily a bridge rehabilitation, reconstruction or replacement or the construction of grade separation to replace existing at-grade railroad crossings (23 CFR 771.117(c)(28)) and meets the conditions of 23 CFR 771.117(e), or Projects, as defined in 23 U.S.C. 101, that would take place entirely within the existing operational right-of-way (23 CFR 771.117(c)(22)). and does not significantly impact the environment.

3.2.2 SEQR Classification

In accordance with 17 NYCRR, Part 15, "Procedures for Implementation of State Environmental Quality Review Act" (SEQRA), it is anticipated that this project is a SEQRA Type II Action.

3.2.3 CSX & Amtrak Coordination

The existing railroad through the project vicinity is currently owned by CSX Rail. However, CSX only occasionally utilizes the rail for freight transportation, and leases

the use of the rail to Amtrak who uses it daily. Canadian Pacific Railway also owns rights to the use of the track for trackage, haulage, and commercial use.

Coordination with CSX and Amtrak will be required for either alternative. Fence protecting the existing ROW is anticipated to be required by the rail companies. The proposed structure shall remain within the Village and/or State ROW. Additionally, there may be permitting requirements by the stakeholders.

3.2.4 Flood Plains

Compliance with Executive Order (EO) 11988, 23 CFR 650, Subpart A and 6 NYCRR Part 502 will be required since the project is located within the 1% annual chance floodplain (100-year floodplain) of the Hudson River as indicated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Rensselaer County, New York, Panel 3606730001B dated November 15, 1984.

3.2.5 Additional Coordination with Agencies

It is anticipated that to complete the design and construction of the proposed overpass, NYSDOT or their representative would need to coordinate with the following agencies:

- New York State Department of Environmental Conservation (NYSDEC)
- United States Army Corp. of Engineers (USACE)
- Federal Highway Administration
- New York State Historic Preservation Officer (SHPO)
- US Fish and Wildlife Service
- New York Natural Heritage Program
- Municipalities – Village of Castleton, Rensselaer County
- Metropolitan Planning Organization - CDTC
- Utilities

A summary of potential impacts for each alternative considered as part of this assessment is identified in the table below. The increased footprint of Alternative 2 to accommodate the ramp system results in potential for wetlands permitting beyond what would be required for Alternative 1. As design of the preferred alternative is progressed, more precise limits of disturbance and design requirements will become apparent which may or may not identify additional impacts not identified at this stage.

Comparison of Alternatives		
Category	**Alternatives Evaluated**	
	NYSDOT Concept - Alternative 1	**Alternative 2**
Wetlands	None	0.10 acres Federal Wetland – Riverine Impacts, No State Wetland conflicts (Acreage is assumed.)
Cultural Resources (Section 106)	None	None
Section 4(f)	None	None
Endangered/ Threatened Species	May Affect, Not Likely to Adversely Affect the Northern Long Eared Bat and Monarch Butterfly	May Affect, Not Likely to Adversely Affect the Northern Long Eared Bat and Monarch Butterfly
Noise	None	None
Property/Relocations	None	None
Mobility (Pedestrian, bicycle, transit, etc.)	Enhanced pedestrian and bicycle facilities	Enhanced pedestrian and bicycle facilities
Environmental Justice	None	None
General Social Groups	Improved pedestrian and bicycle access to waterfront	Improved pedestrian and bicycle access to waterfront
Crash Costs	None	None
Economic Impacts	No change to vehicular access to businesses	No change to vehicular access to businesses
Temporary Detours	No Effect	No Effect
Reduction of Parking	Temporary loss of on street parking during construction	Temporary loss of on street parking during construction
Utilities	One+ Utility Relocation Anticipated	One+ Utility Relocation Anticipated

4 Evaluation of Proposed Alternatives

Based on our assessment of the above referenced designs and constraints, both alternatives appear to be feasible options for constructing a pedestrian overpass at the NY Route 9J site connecting over CSX Rail ROW to the waterfront. These alternatives provide accessible design for pedestrians to traverse the CSX ROW and access the Hudson River waterfront.

Alternative 1 allows for two identical structures, which provides redundancy of construction and materials, but requires future maintenance and presents a safety concern with two elevators. This alternative has the lower cost of the alternatives.

Alternative 2 requires a different ramp structure with significantly more construction materials; therefore, this alternative may have a higher construction cost than the NYSDOT concept; however, it presents less potential costs for maintenance in the future.

Construction costs for both options would be dependent on the materials selected to construct and design the bridge in more detail which would be determined in coordination with the structural engineer and an architect to develop a design for a decorative finish if desired. Additionally, structural footing requirements which would be identified during more detailed analysis of the existing soil conditions would impact construction costs.

For both alternatives there is potential for utility relocations to be required based on the final location and design of the bridge. Depending on the scope of utility relocations, these design elements would further add to the construction costs of the proposed overpass.

For both alternatives an assessment of potential impacts to the clear zone along NY Route 9J would need to be performed; however, based on the posted speed of 30 miles per hour and the existing clear zone restrictions immediately adjacent to the proposed bridge structure, this is not anticipated to cause any design concerns.

Below is a summary table of parameters to consider for each of these alternatives to help select a preferred concept.

Key Parameters for Consideration

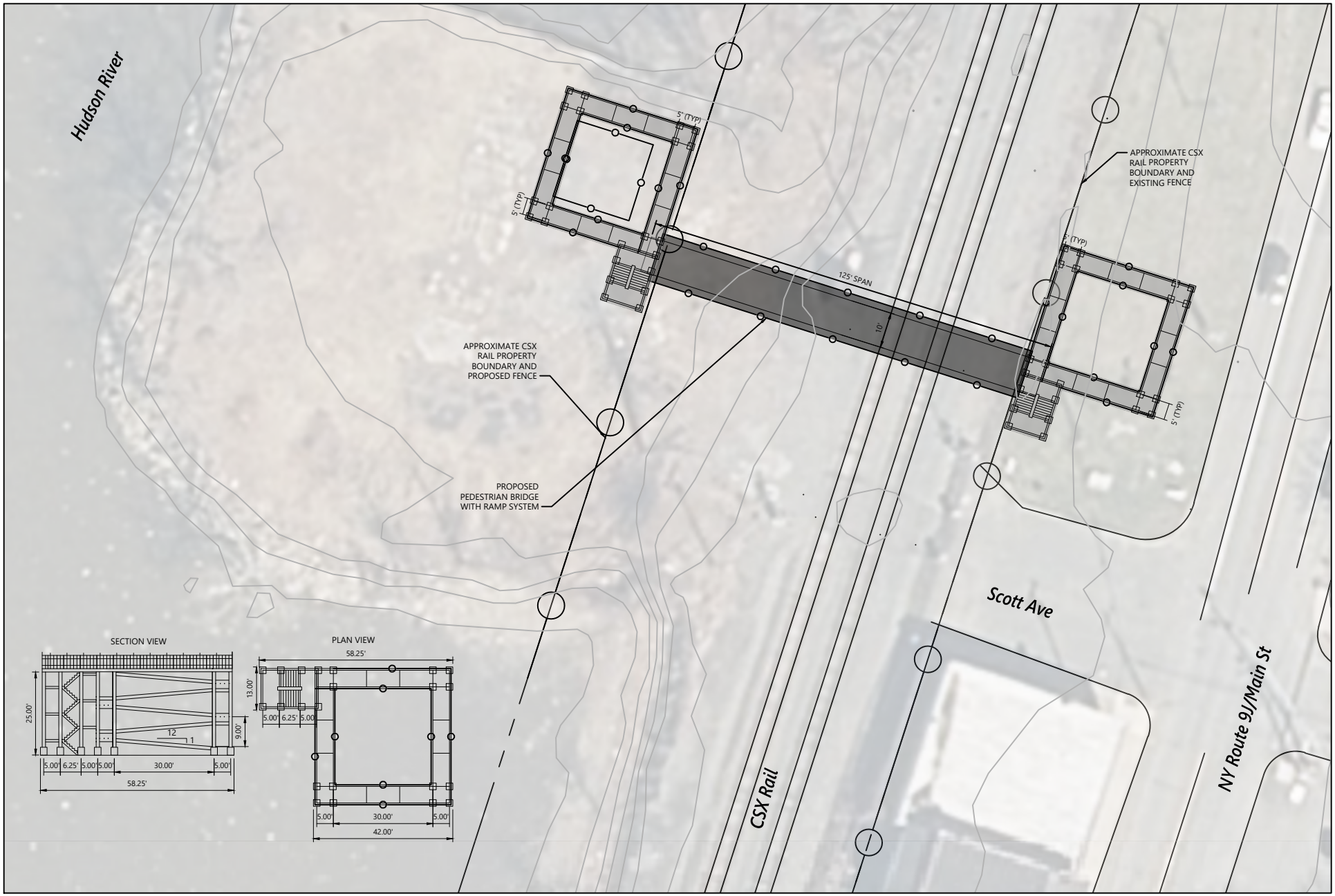
Parameter	Atl. 1 – Overhead w/ two elevators	Alt. 2 – Overhead w/ Elongated Ramps
Functionality	10′ wide path spanning over the CSX Rail	10′ wide path spanning over the CSX Rail
Design Life	75-year design life	75-year design life
Additional Project Risk Factors	Unknown subsurface conditions may require more extensive foundations to support such tall structures.	Unknown subsurface conditions may require more extensive foundations to support such tall structures.
Construction Considerations	Smaller impact to CSX Rail.	Longer estimated overall construction duration due to extensive approach structures.
Aesthetics	The overhead truss has wide variety of aesthetic looks that can be accommodated. The addition of larger approach structures may not be desirable along the NY Route 9J.	The overhead truss has wide variety of aesthetic looks that can be accommodated. The addition of larger approach structures may not be desirable along the NY Route 9J.

Based on our review of the two alternatives, either option appears to be viable in constructability. Alternative 1, due to the reduced footprint may incur less construction costs than Alternative 2. However, Alternative 2 likely has less future costs as it does not have the maintenance costs of an elevator.

5 Appendices

5.1 NYSDOT Concept

5.2 Ramp Alternative



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Conceptual Plan
Castleton Pedestrian Bridge

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