







# CHAPTER 5

## ALIGNMENT ANALYSIS

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The alignment analysis explores several different corridor and crossing alternatives for the future Patroon Creek Greenway and provides a standardized framework for comparing the different alternatives. Selection and evaluation of the alignment and crossing alternatives was informed by the needs and opportunities identified in the Existing Conditions report, several stakeholder conversations, input from the Project and Citizen Advisory Committees, and feedback from the public. This analysis will directly inform the identification of preferred alignment and crossing alternatives.

The topics covered in this section include:

- An overview of the four character areas identified in the study area
- Introduction of the alignment and crossing alternatives
- Description of the evaluation criteria for each alternative
- Presentation of the alignment and crossing alternatives from west to east
- Summary of cost estimate assumptions

# INTRODUCTION

The purpose of the Patroon Creek Greenway alignment analysis is to identify and evaluate several trail corridor and crossing alternatives using standardized criteria to assist with the identification of a preferred alternative. This section begins with an overview of the alignment alternatives, a description of each evaluative metric, and a summary of trail design considerations, required coordination with other agencies and entities (e.g., electric utilities, railroads), and cost estimate assumptions. Following this introduction, a detailed analysis of each alignment alternative is provided.

## Character Areas

Four different character areas were defined within the study area based on existing land use and land cover. These character areas provided the foundation for the identification of trail alignment alternatives and include the following:

- **Campus Character Area (CA):** This character area includes the areas adjacent to the SUNY Albany and Harriman State campuses. It is the western most character area and is bound to the west by the Albany Pine Bush Preserve's Six Mile Waterworks Park and to the east by Central Avenue. Within this character area, the trail alignment alternatives are located along Patroon Creek and generally follow the Albany County Water Purification District's Patroon Creek trunk sewer easement.
- **Commercial/Retail Character Area (CR):** This character area is defined by the presence of large-scale commercial destinations along Central Avenue. It is bound to the west by Central Avenue and to the east by Everett Road. Within this character area, the trail alignment alternatives are located along Patroon Creek, between I-90 and the railroad, and generally follow the Albany County Water Purification District's Patroon Creek trunk sewer easement.
- **Industrial Character Area (IN):** This character area is defined by the prevalence of industrial uses located to the north and south of I-90 along Exchange Street, Industrial Park Boulevard, and Commerce Avenue. This character area is bound to the west by Everett Road and to the east by Tivoli Park Preserve. Three different trail alignments are evaluated within this character area, one which circumvents the CSX railyard to the north through the Town of Colonie and two alignments that stay south of I-90 and the railyard and remain entirely in the City of Albany.
- **Neighborhood Character Area (NE):** This character area is defined by dense residential and mixed-uses in Albany's Arbor Hill, Ten Broeck, and Downtown neighborhoods. It is bound to the west by Tivoli Park Preserve and to the east by Corning Preserve and the Hudson River. Within this character area, three trail alignments are evaluated, one which utilizes neighborhood streets and two of which include a mix of on- and off-road trail facilities.

## Trail Alternatives

Eight different trail alignments are evaluated as part of this analysis and were identified based on the following criteria:

- Proximity to the Patroon Creek;
- Connectivity to adjacent neighborhoods and local destinations;
- Ability to connect Albany Pine Bush Preserve, Tivoli Preserve, and the Corning Preserve as directly as possible;
- Use of public property and public rights-of-way; and,
- Support from the Technical Advisory Committee, Citizen Advisory Committee, and general public.

Below is a brief description of each trail alignment, organized by character area and proceeding from west to east. Beginning on page 10, a detailed description of each trail alignment alternative is provided.

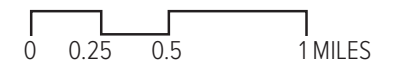
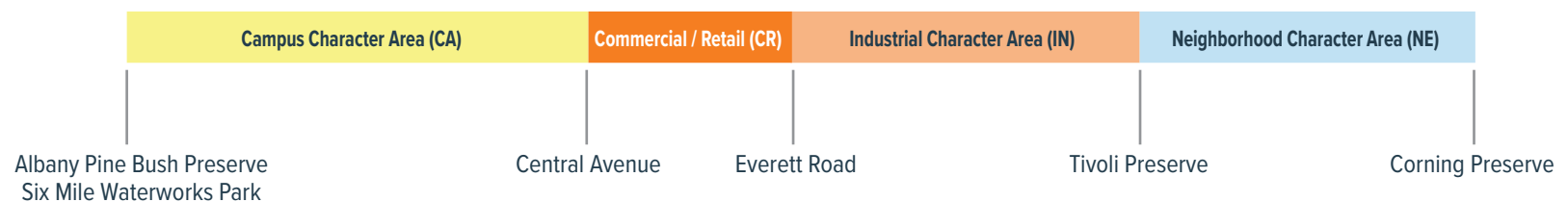
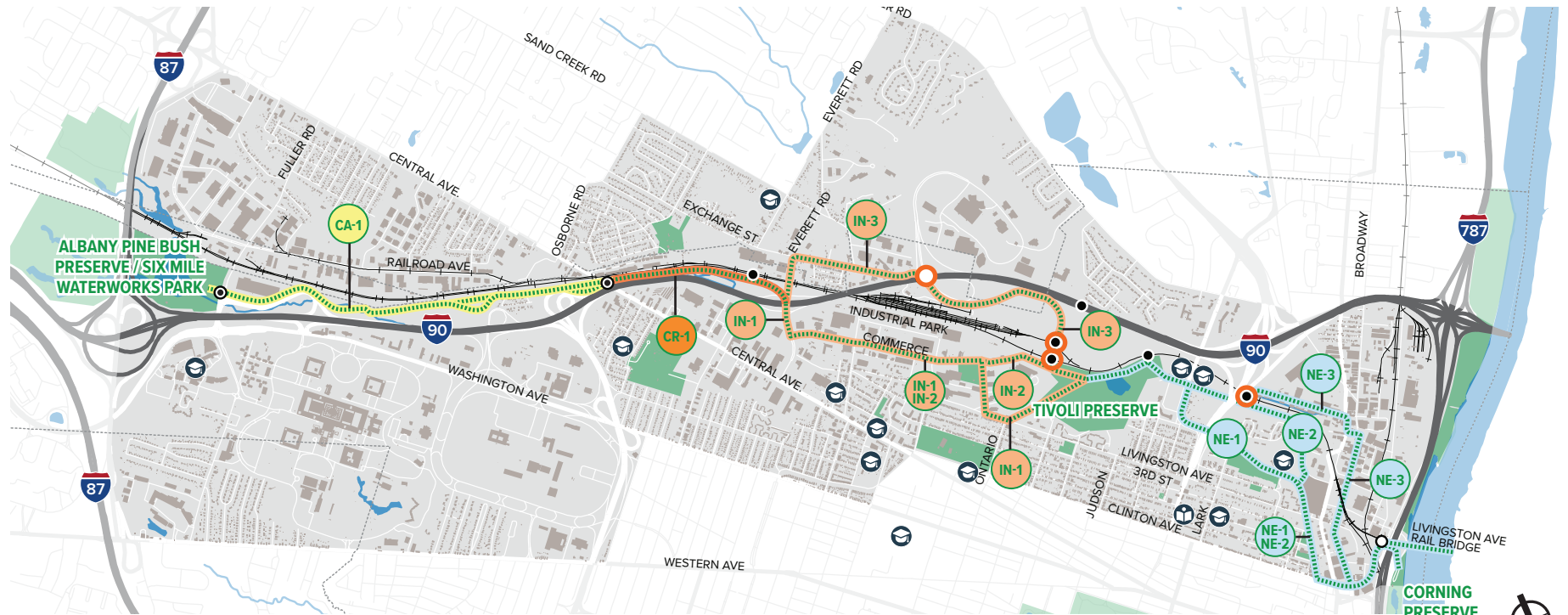
### CAMPUS (CA)

Within this character area, one primary trail corridor was identified, which uses the open space between the railroad and I-90, roughly following Patroon Creek. Along this corridor, two potential alignment options are evaluated:

- **CA-1a:** This option is the most direct route between Fuller Road and Central Avenue. The trail is off-road between Fuller Road and Yardboro Avenue and then transitions to a shared roadway with a sidewalk until reaching Central Avenue.

# ALIGNMENT ANALYSIS: CHARACTER AREAS AND TRAIL ALIGNMENT ALTERNATIVES

- Alignment Alternative CA-1
- Alignment Alternative CR-1
- Alignment Alternatives IN-1, IN-2, and IN-3
- Alignment Alternatives NE-1, NE-2, and NE-3
- Proposed bridge crossing
- Proposed at-grade crossing
- Existing tunnel
- Schools
- Libraries
- Structure is required with alignment alternative
- parks
- study area
- municipal boundaries



## INTRODUCTION (CONT.)

- **CA-1b:** This alignment option is similar to CA-1a, but where the terrain allows, it heads south to avoid the railroad and County sewer easement. The trail is off-road between Fuller Road and Yardboro Avenue and then transitions to a shared roadway with a sidewalk for approximately 1,300 feet. At a vacant lot, the trail heads south to utilize the space between the buildings on Yardboro Avenue and the I-90 access ramps. Along this stretch of off-road trail, a boardwalk is recommended to limit disturbance due to the proximity to Patroon Creek and wetland conditions.

### COMMERCIAL / RETAIL (CR)

Similar to the Campus character area, one primary trail corridor was identified in the Commercial/ Retail character area. The trail uses the open space between the railroad and I-90 and follows the northern shoreline of Patroon Creek from Central Avenue to Everett Road. Within this corridor, two potential options are evaluated:

- **CR-1a:** This alignment parallels Patroon Creek and follows the Albany County Water Purification District's Patroon Creek trunk sewer easement. A new ramp is proposed at the eastern end of this corridor to bring trail users up to Everett Road bridge.
- **CR-1b:** This alignment is identical to CR-1a, but also includes restoration of Patroon Creek and the surrounding wetland areas.

### INDUSTRIAL (IN)

Three different alignments are evaluated in this character area, all of which connect Everett Road bridge to Tivoli Preserve :

- **IN-1:** This alternative is comprised of separated on-road trail facilities until reaching Tivoli Preserve. The alignment crosses Everett Road bridge using a new, proposed separated shared-use path and continues south on Everett Road to Watervliet Avenue Ext. The trail then continues east on the south side of Watervliet Avenue Ext. and then Commerce Avenue until reaching Terminal Street. It then continues south along the west side of Terminal Street and then east on the north side of Livingston Avenue for approximately one block. The trail then enters the southwest corner of Tivoli Preserve and transitions to an off-road facility.
- **IN-2:** This alternative uses the same route as IN-1, but follows the north side of Watervliet Avenue Ext. / Commerce Avenue and at Terminal Street it continues east and transitions to an off-road facility, following Patroon Creek and traveling through the forested area on the north side of the Freihofer Bakery property to enter the northwest corner of Tivoli Preserve.
- **IN-3:** This alternative heads north on Everett Road to Exchange Street using a new proposed shared-use path on the west side of Everett Road. The trail continues east on Exchange Street using a proposed shared roadway with sidewalks and passes under I-90 through a new proposed underpass next to the existing Anderson Road tunnel. The trail then continues off-road between

the CSX railyard and I-90 to head east and then south. Two new pre-cast bridge structures are proposed to replace the existing abandoned rail trestles and enable trail users to cross over the rail line and enter the northwest corner of Tivoli Preserve.

### NEIGHBORHOOD (NE)

Three different alignments are evaluated in this character area, all of which connect Tivoli Preserve to the Albany Skyway and Corning Preserve. Each alignment exits the east side of Tivoli Preserve and includes a proposed shared-use path along the north side of N. Manning Boulevard to the intersection of Northern Boulevard. This new shared-use path would serve trail users and improve access to Tivoli Preserve for KIPP Tech Valley students.

- **NE-1:** This alternative is comprised entirely of on-road separated trail facilities. It heads south along Northern Boulevard and continues on Manning Boulevard, passing Arbor Hill Elementary School and the Ida Yarbrough Apartments. At Livingston Avenue, this trail alignment continues south along Ten Broeck Place and then heads east on the north side of Clinton Avenue to connect to the Albany Skyway.
- **NE-2:** At the intersection of N. Manning and Northern Boulevards, this alternative heads east past KIPP Tech Valley Elementary School as an off-road trail using City-owned property to pass under U.S. 9 and travel through the wooded areas behind the Capital Woods Apartments to connect



# Trail Design Considerations

*The Patroon Creek Greenway alignment alternatives utilize, cross, or are located in close proximity to property owned by the railroads, electric utilities, and county and local water utilities. This section provides an overview of important design criteria and considerations for the future Patroon Creek Greenway.*



## ELECTRIC UTILITIES National Grid

The following considerations were compiled based on a conversation with National Grid's right-of-way staff.

- National Grid has a standardized review procedure for municipalities requesting to use its right-of-way for recreational purposes. This review procedure focuses on the public's safety and any impacts to National Grid's infrastructure and assets.
- The use of National Grid's right-of-way in CA-1 and CR-1 would constitute a complex request, as these alignments are longitudinal occupations greater than 100-feet in length. National Grid would commence review of the trail proposal once the City of Albany (or other entity) entered into a commercial agreement to reimburse National Grid. Reimbursable charges may include costs associated with project management and review, construction supervision, and any costs associated with the modification or relocation of National Grid's facilities to accommodate the trail.



## WATER UTILITIES Trunk Sewer Easement

The following design and maintenance considerations were compiled based on a conversation with Albany County's Water Purification District staff.

- Alignment alternatives in CA-1, CR-1, and Tivoli Preserve utilize the County's trunk sewer easement, which is approximately 24-feet wide.
- County staff regularly (weekly) access the trunk sewer easement to maintain, repair, and inspect their infrastructure.
- A 10- to 12-foot wide lane within the County's trunk sewer easement should remain clear at all times to allow access to sewer infrastructure and minimize conflicts with future trail users.
- Any new plant material along the sewer easement should be low maintenance with minimal root structure (i.e., no new large trees) to minimize damage to sewer infrastructure.
- Trail segments within the sewer easement should be designed to accommodate heavy trucks and machinery to prevent damage to trail assets during the County's routine maintenance and inspections.



## RAILROADS CSX

The following considerations were compiled based on existing design requirements and input from Bergmann staff who regularly represent the railroads.

- Several alignment alternatives cross or are located adjacent to CSX railroad right-of-way (ROW), including CA-1, CR-1, IN-2, IN-3, and NE-3.
- It is likely CSX will object to the Greenway on their ROW.
- CSX opposes new at-grade crossings of their ROW. If a pedestrian bridge is constructed to cross the railroad, CSX requires a minimum vertical clearance of 23-feet, fencing on the bridge must be 8-feet high with a curved top or 10-feet high without a curved top, account for a future track 15-feet on center, span the railroad's entire ROW, and provide 25-feet of horizontal clearance on both sides.
- For trails within 50-feet of the railroad ROW, fencing must be provided and maintained. Fencing must be a minimum of 8-feet high with openings smaller than 2" x 2".
- Contractor's general liability insurance does not cover work within 50-feet of the railroad ROW; a special insurance policy is required.
- No drainage can be directed towards the railroad's ROW as a result of a project.
- Railroad coordination and protective services are required for any project on, over, or adjacent to the railroad. Railroad flagging/protective services is typically estimated as about \$1,500-\$2,000 per day.

## INTRODUCTION (CONT.)

to Lark Drive. At Lark Drive, the trail transitions to an on-road separated facility. It follows Lark Drive to Arbor Hill Elementary School where the trail merges and expands the school's perimeter walkway to the Arbor Drive / Manning Boulevard intersection. The trail then follows the NE-1 alignment to the Albany Skyway.

- **NE-3:** This alignment follows the NE-2 route from Tivoli Preserve. After crossing under U.S. 9, the trail heads north across a new proposed bridge over the railroad and connects to Tivoli Street. The trail proceeds along Tivoli Street as a shared roadway (and potentially a waterfront trail in the future), following the Patroon Creek to Broadway. At the intersection of Tivoli Street and Broadway, the trail continues south along Broadway to the Skyway.

### Crossing Alternatives

Several trail crossing alternatives were evaluated for Fuller Road, Central Avenue, and I-90 at Everett Road bridge. Every Patroon Creek Greenway alignment alternative crosses these roads, and therefore, improved crossing facilities at these junctures are critical to the success of the future Greenway. The crossing alternatives are summarized below and detailed descriptions are presented in the subsequent section and are introduced from west to east.

- **Fuller Road (2 alternatives):** An enhanced at-grade crossing and a new bicycle/pedestrian bridge are evaluated.
- **Central Avenue (3 alternatives):** A new signalized crossing at Yardboro Avenue and Central Avenue, a new crosswalk with a pedestrian refuge island and user-activated rectangular rapid flashing beacons

(RRFB), and a new bicycle/pedestrian bridge are evaluated.

- **Everett Road Bridge:** A new protected shared-use path is recommended as part of the future reconstruction of this bridge.

### Alignment Evaluation Criteria

The following data were collected and provide a standardized set of metrics to assist with the evaluation of each alternative.

- **Land ownership:** The types of property (public vs. private) and the property owners are documented for each alignment.
- **Connectivity:** The number of direct connections to CDPHP Cycle! bike share stations, existing or proposed bicycle/trail facilities, and existing parks are quantified for each alignment. A connectivity score was assigned to each alternative by dividing the number of connections by the total length of the trail alignment (i.e., connections per mile).
- **Equity:** The number of direct connections to schools and public transit stops and whether a trail alignment is entirely or partially contained in a Potential Environmental Justice Area (PEJA, as defined by NYS DEC)\* is documented for each alignment. An equity score was generated for each alternative using the following method: 3 points if an alignment is entirely contained within a PEJA; 2 points if an alignment is partially contained within a PEJA; 1 point if an alignment is immediately adjacent to a PEJA; and, 0.1 points for each bus stop or school to which the alignment connects.
- **Trail facility type(s):** Trail facility types are identified and illustrated for each alignment and serve as the basis for the cost estimates. To the extent possible, the most protected facility types are identified for each alignment.
- **Cost:** Planning level cost estimates are provided for each alignment alternative. These cost estimates include the features required to create a comfortable and accessible greenway for all that is separated from car traffic to the greatest extent possible. Additional placemaking features (e.g., lighting, public art, wayfinding signage) are not included, but will be considered once a preferred alignment(s) is selected. All cost estimates include materials and labor as well as soft costs (see page 88 for a summary of cost estimate assumptions).
- **Consistency:** This metric ranks each alignment alternative based on its ability to provide an off-road trail experience immersed in nature.
- **Implementation time frame:** The estimated amount of time (including design, permitting, and construction) necessary to implement an alignment is approximated for each alternative.
- **Public support:** An online public survey was created to gather feedback from the public regarding preferred trail alternatives in the Industrial (IN-1, IN-2, and IN-3) and Neighborhood (NE-1, NE-2, and NE-3) character areas. The results from this survey are presented in this section.
- **Challenges and required coordination:** The narrative describing each alignment alternative highlights engineering constraints (e.g., steep slopes) and required coordination and/or permits, all of which can increase the time and cost needed to implement an alternative.

*\*NYS DEC PEJAs were used to identify the most under-served populations in the study area, as they use more stringent socio-demographic thresholds and cover a smaller geographic area than the CDTC/federal environmental justice areas. Please see the Existing Conditions chapter to reference the CDTC/federal environmental justice areas.*



# Alignment Analysis Summary

	Ownership % publicly-owned	Connectivity connections/mile	Equity Score	Cost Estimate planning-level	Public Support	Timeframe	Required Structures	Challenges
CA-1	50%	2.4	1.7	CA-1a: <b>\$6M</b> CA-1b: <b>\$8.5M</b>	N/A	5-10 years	CA-1a: None CA-1b: Boardwalk	Adjacent to railroad ROW; uses Natl Grid and interstate ROW; limited access points
CR-1	55%	3.8	1.3	CR-1a: <b>\$4M</b> CR-1b: <b>\$10.5M</b>	N/A*	5-10 years	Bridge to Everett	Uses interstate, Natl Grid, and railroad ROW; steep topography; limited access points
IN-1	100%	5	3.3	<b>\$8M</b>	28%	5-10 years	None	Uses Albany Water Board property
IN-2	65%	4	3.2	<b>\$10</b>	39%	10+ years	Retaining walls	Adjacent to railroad ROW; steep topography; uses private property
IN-3	70%	1.9	2.1	<b>\$28.5M</b>	33%	10+ years	Tunnel; 2 bridges; retaining walls	Uses interstate and railroad ROW; steep topography
NE-1	100%	12.7	4.0	<b>\$8M</b>	37%	5-10 years	None	Removes one lane of on-street parking
NE-2	90%	10	4.1	<b>\$14M</b>	20%	5-10 years	Retaining walls	Steep topography; adjacent to railroad ROW
NE-3	95%	3.7	4.0	<b>\$25M</b>	43%	10+ years	Bridge over railroad	Crosses railroad ROW

\*85% of respondents identified native landscaping as a top amenity