

Halfway Brook to Hudson Pointe *Trail Connector Study*

Prepared for the Town of Queensbury
September 2018



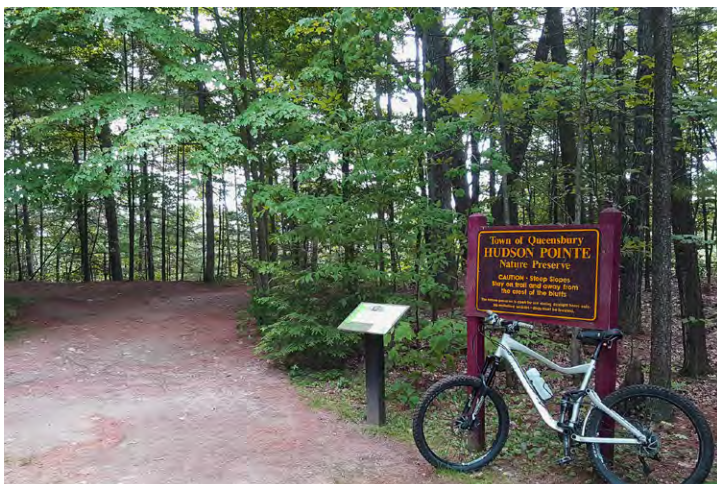


Over the past several years, the Town of Queensbury has worked steadily to improve conditions for cyclists and pedestrians. This has involved designating bike routes, constructing trails, and training local officials in the principles of Complete Streets. As part of this effort, the Town of Queensbury reached out to the Adirondack/Glens Falls Transportation Council (A/GFTC) for assistance in creating a conceptual plan for future trail connections in West Queensbury, from the southern terminus of the planned Halfway Brook trail to the Hudson Pointe preserve along the Hudson River. This north-south connection has long been noted as a priority in local and regional planning efforts.

The intent of this plan is to document existing conditions, compare potential alternative alignments for an on- or off-road connection, and document order-of-magnitude costs for a preferred concept. This has been completed with the assistance of Alta Planning + Design and Creighton Manning Engineering, as well as the guidance of a steering committee of stakeholders and the general public. This plan will provide the framework to allow the Town to pursue funding for implementation in a future phase of project development.

Please note that for the purposes of this plan, the term “trail” refers to the proposed bicycle/pedestrian connection as a whole, which may be made up of a variety of on- and off-road facilities. See page 2 for examples.

The first step in identifying a trail alignment is to understand the conditions and features that may affect the viability of a trail. To facilitate this, a GIS analysis was performed, in which several factors were mapped, including regional connections, existing bike/ped features, topography and environmental features, vacant and developed land, traffic volumes/speeds, and crash history.



Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and flows in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge, or parking lane. This type of treatment is often paired with traditional sidewalks to accommodate pedestrians. In some cases, the road shoulder can be designed and striped to act as a bike lane.



Photo: Bay Road, Queensbury NY



A **shared-use path** is a facility which may be used by bicyclists, pedestrians, and other non-motorized users. They are separated from the roadway by an open space or a physical barrier and designed to meet ADA standards. A **sidepath** is a specific type of shared use path facility that is physically separated from the road but located within the roadway right of way.

Photo: Fire Road, Glens Falls NY

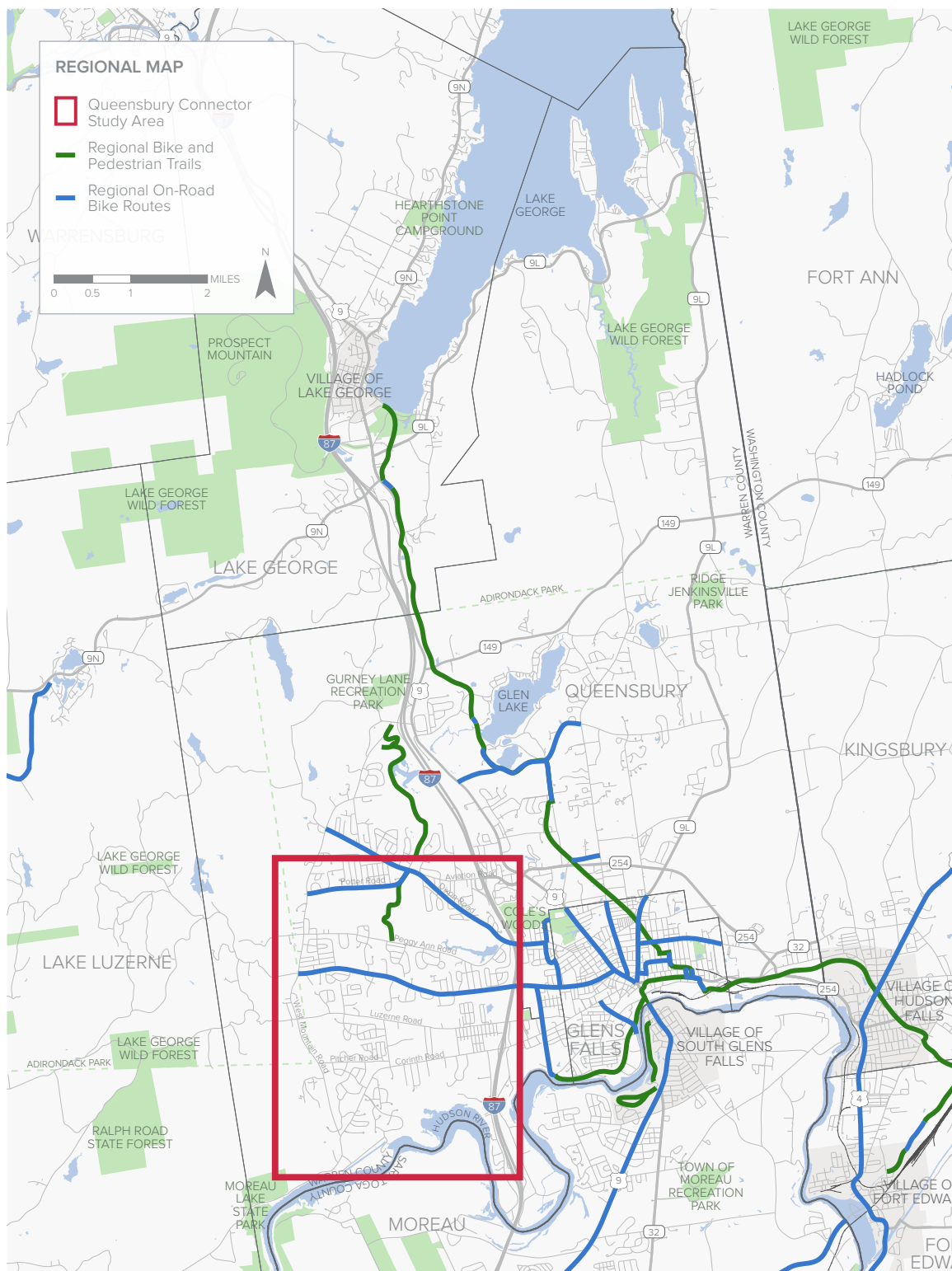
Bicycle boulevards are streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel equal priority as vehicles. Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle facility. Conversely, a **Yield Roadway** does not specifically discourage vehicle traffic, but rather promotes slow vehicular speeds via narrow travel lanes. These neighborhood streets are more conducive to bicycle travel, which, combined with bicycle route signage, can provide comfortable and safe on-road connections between off-road or other dedicated trail facilities.



Photo courtesy pedbikeimages.org/Adam Fukushima

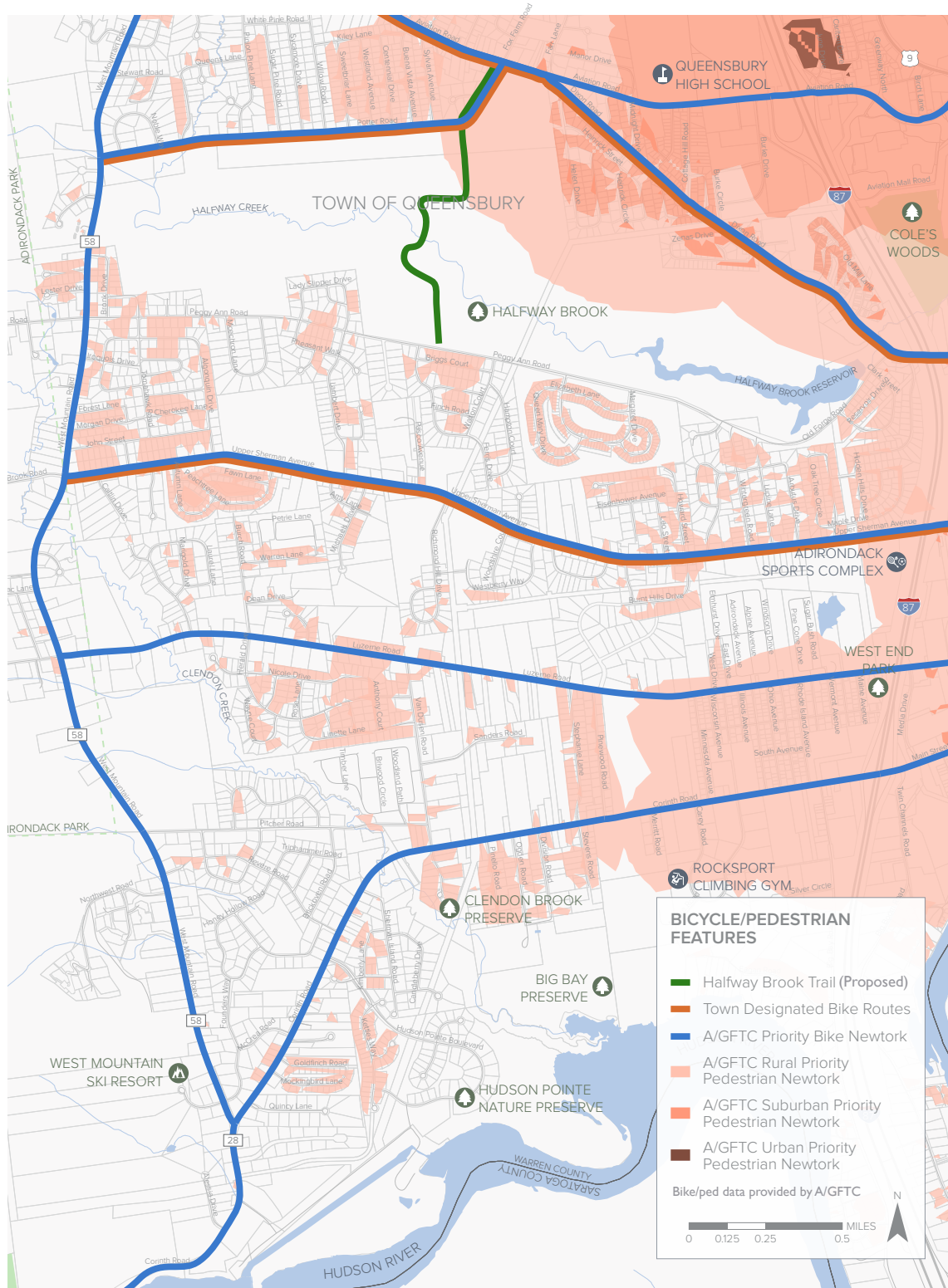
Regional Connections

The study area is located in the southwest portion of the Town of Queensbury, within Warren County, New York. The Regional Map shows the study area and the surrounding trails and bicycle routes throughout the region. As the map indicates, there is a lack of dedicated bicycle/pedestrian facilities within the study area. However, there are potential connections to the Rush Pond/Halfway Brook trail system in the north and the Feeder Canal Trail to the east, which in turn connects to the Warren County Bikeway, an important regional facility.



Bicycle & Pedestrian Features

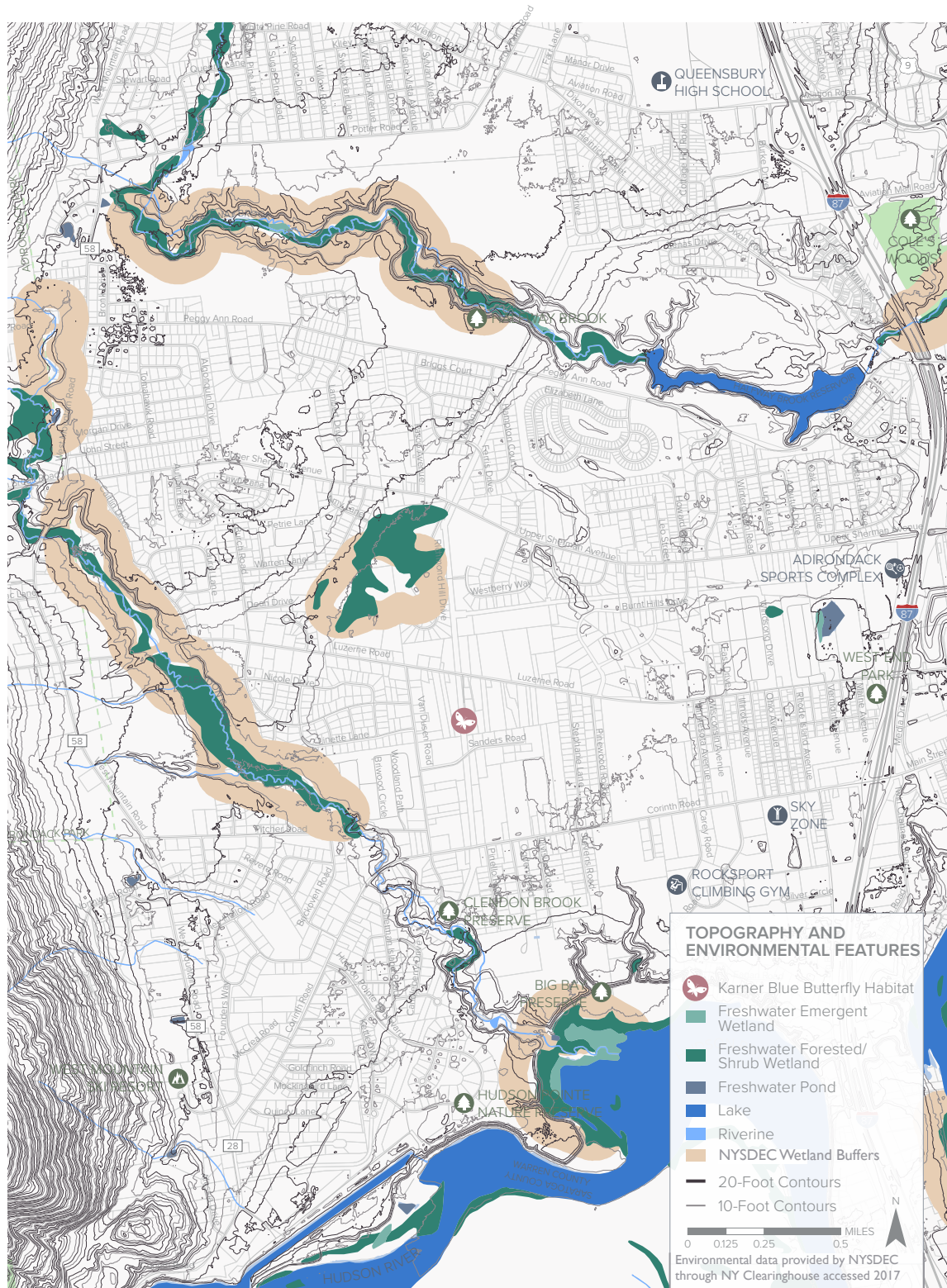
The existing trails and designated bike routes in the study area are documented in the map to the left. This includes the proposed Halfway Brook Trail (still under development), town designated bicycle routes, and the priority bicycle network and pedestrian areas identified by the [A/GFTC Regional Bicycle and Pedestrian Plan](#). Although the study area contains designated bicycle routes, these roadways do not have dedicated bicycle lanes; cyclists and pedestrians use the road shoulders (where available) or share space with vehicular traffic. In addition, the road network is not conducive to north-south travel; there is no easily-identifiable way to get from Peggy Ann road to Corinth Road without crossing private property or traveling miles to the east or west.



Topography & Environmental Features

Elevation and slope of the topography in the study area is an important consideration, as steep slopes can inhibit trail development. The elevation within the study area ranges from 284 feet to 502 feet, as shown in the map to the left. For the most part, the study area has flat-to-moderate slopes. However, the steep slopes south of Corinth Road where Clendon Brook meets the Hudson pose a challenge. There are existing trails in this vicinity, including a small bridge over the brook; however these facilities do not meet contemporary standards for access.

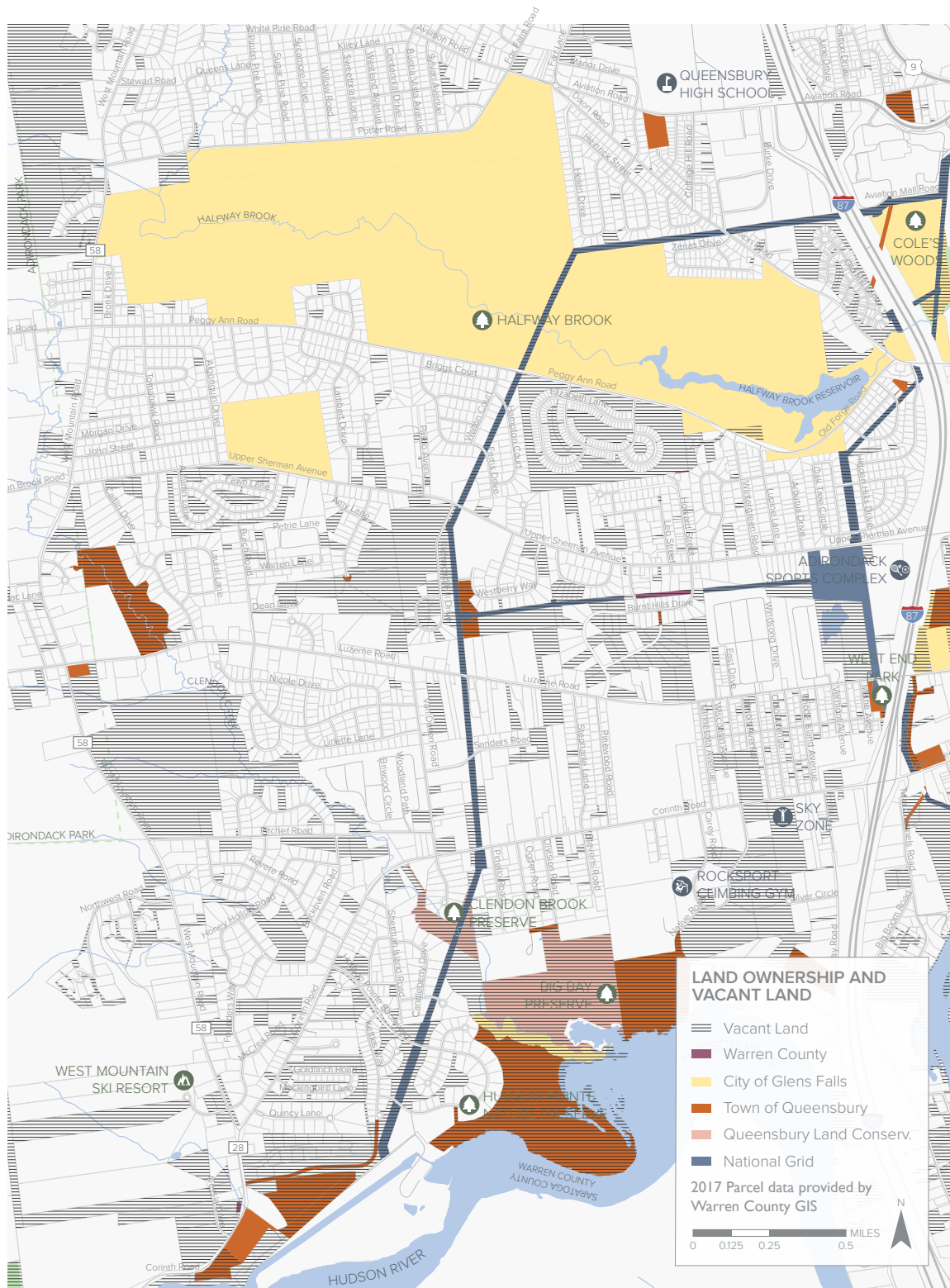
In terms of environmental features, there are limited amounts of wetland areas along Clendon Brook, as well as an isolated wetland between Michaels Drive and Richmond Hill Road. Neither of these wetlands areas are anticipated to directly impact any of the proposed trail alignments; however, as detailed design is undertaken, further analysis of wetlands should be undertaken if needed. In addition, previous environmental analyses have indicated the probable presence of Karner Blue Butterfly habitat in the study area. This should also be taken into account as part of the design process.



Vacant & Undeveloped Land

Property that is predominantly undeveloped (currently void of a commercial or residential building) can offer opportunity for integrating pedestrian and bicycle accommodations in site planning ahead of development. Some of these properties may already be in conservation and undeveloped in order to serve another purpose or remain in a natural state. There are also large parcels which are publicly owned. These lots, owned by the Town of Queensbury, the City of Glens Falls, and the Queensbury Land Conservancy, represent opportunities for off-road or expanded on-road facilities.

EXISTING CONDITIONS

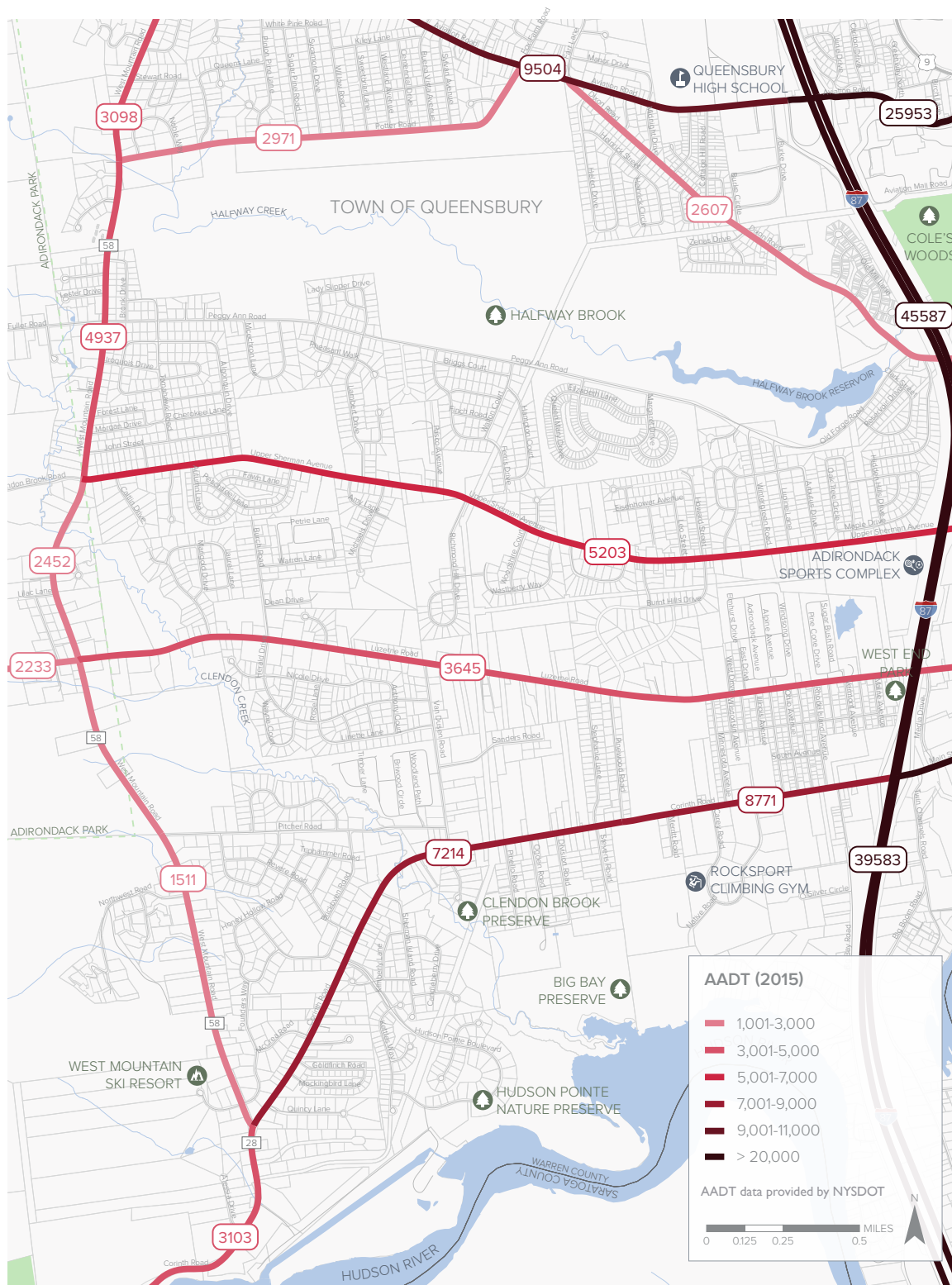


Traffic Volumes & Speed Limits

The average annual daily traffic (AADT) indicates the average traffic volumes on the roadway in a 24-hour period. It is important to consider the AADT of roadways when planning on-road bicycling and walking routes, as people tend to be more comfortable using on-road bicycling and walking facilities located on lower-volume roadways rather than higher volume roadways. This data is collected by the New York State Department of Transportation; the most recent AADT data available for this area was gathered in 2015. Map 6 shows the AADT for all recorded roadways within the study area.

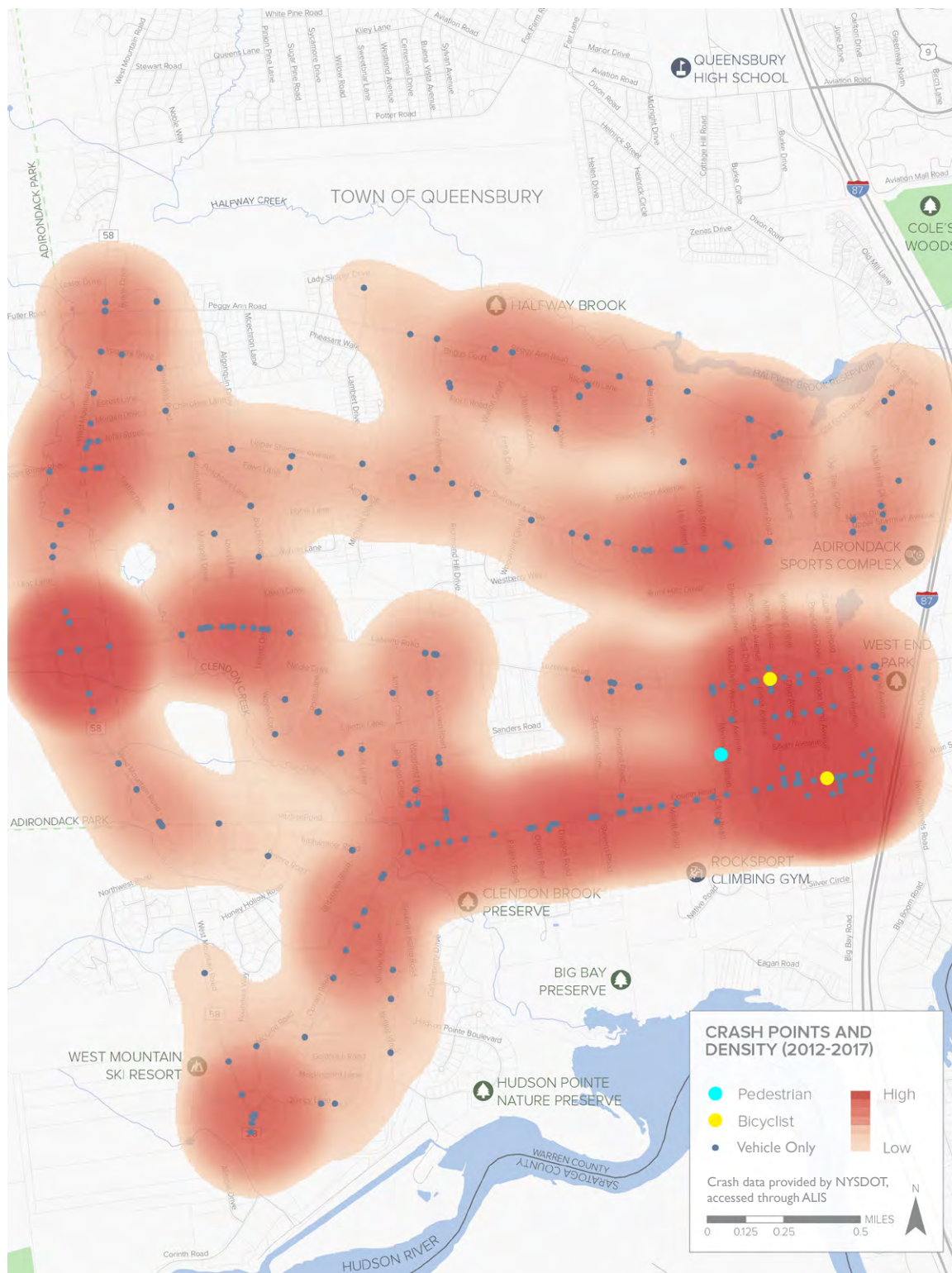
Corinth Road has the highest traffic volume within the study area, reaching over 8700 cars per day in certain sections. Upper Sherman also experiences traffic volumes of over 5000 cars per day, with about 3600 cars per day on Luzerne Road. Although current traffic counts are not available for Peggy Ann Road, A/GFTC staff estimates traffic volumes of between 3000-4000 cars per day, based on historic counts.

For the most part, the neighborhood streets and roadways have a speed limit of 30 mph. However, the major east-west roads (Peggy Ann, Upper Sherman, Luzerne, and Corinth) have speed limits of 40-45 mph. The higher speed limit can affect the comfort and safety of cyclists and pedestrians, and is a factor to consider when selecting a trail alignment.



Safety

Crash data was analyzed for the five years of crashes reported in the region from the beginning of April 2012 through the end of March 2017. This dataset includes multiple types of vehicle crashes. Especially important to this particular study are the crashes between vehicles and bicyclists and pedestrians. There are two crashes with bicyclists (noted by the yellow points on the map), one in July 2012 and one in June 2014, and each was located at an intersection. The 2012 crash occurred at the intersection of Corinth Road and Rhode Island Avenue and the 2014 crash was located at the intersection of Luzerne Road and Indiana Avenue. The pedestrian collision (noted by the blue point on the map) occurred in February 2017 on Minnesota Avenue. These isolated incidents do not indicate an easily identifiable pattern of bicycle or pedestrian crashes.



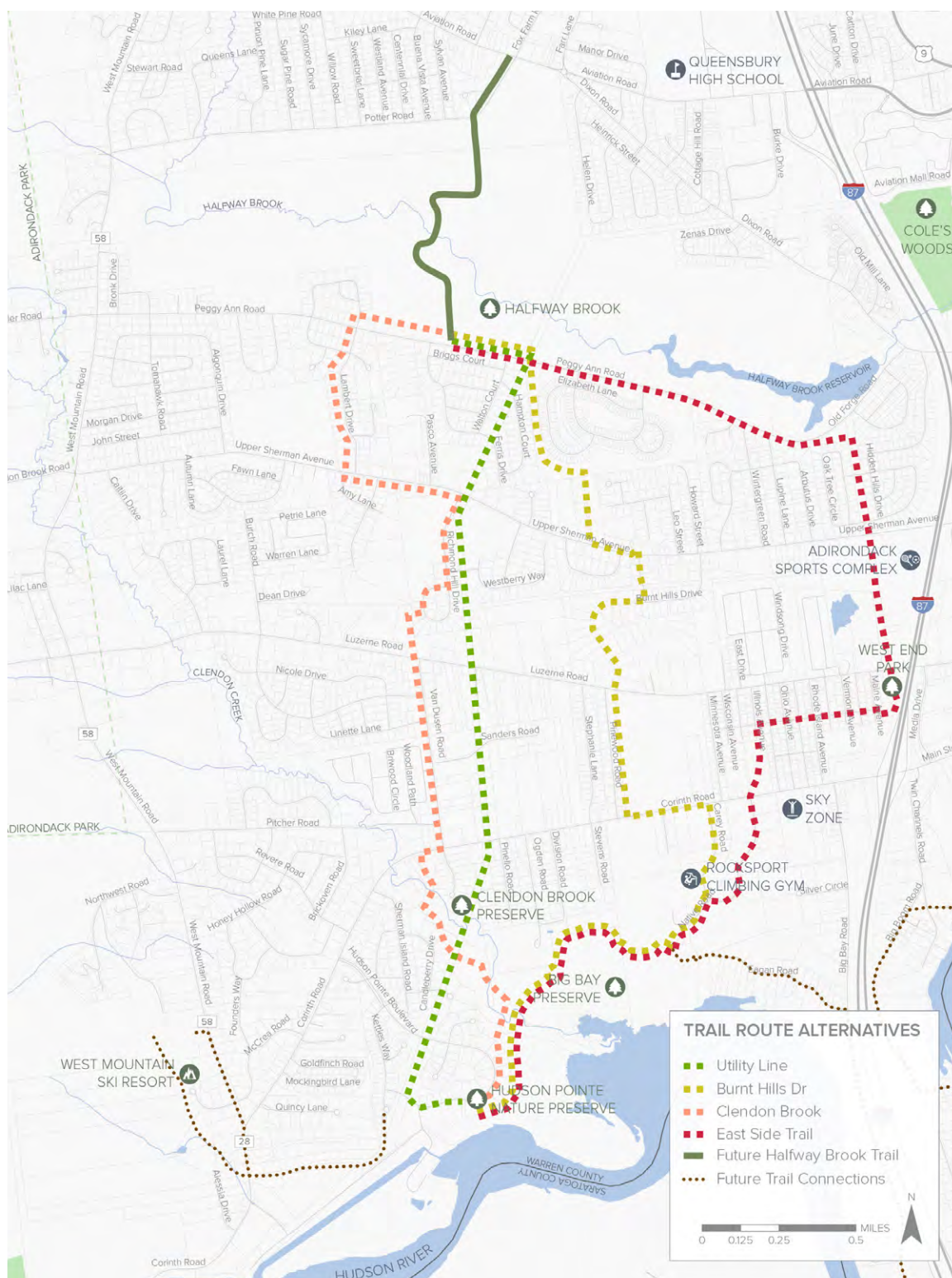
Overview of Alternatives

In attempting to identify the best possible location for a north-south connection, several ideas were put forth. The overall goal of creating a trail is to provide access, both to the trail itself, and to the destinations along the trail. Of the initial trail alignments, the concept of an on-road connection along the western edge of the project site, utilizing Peggy Ann and West Mountain roads, was rejected as not warranting further discussion. This concept was determined to not meet the goals of the project, in that it was too far removed from many of the neighborhoods in the study area to provide meaningful access, especially for pedestrians.

From the initial discussions, the four remaining alternatives were put forth, shown at left. These include:

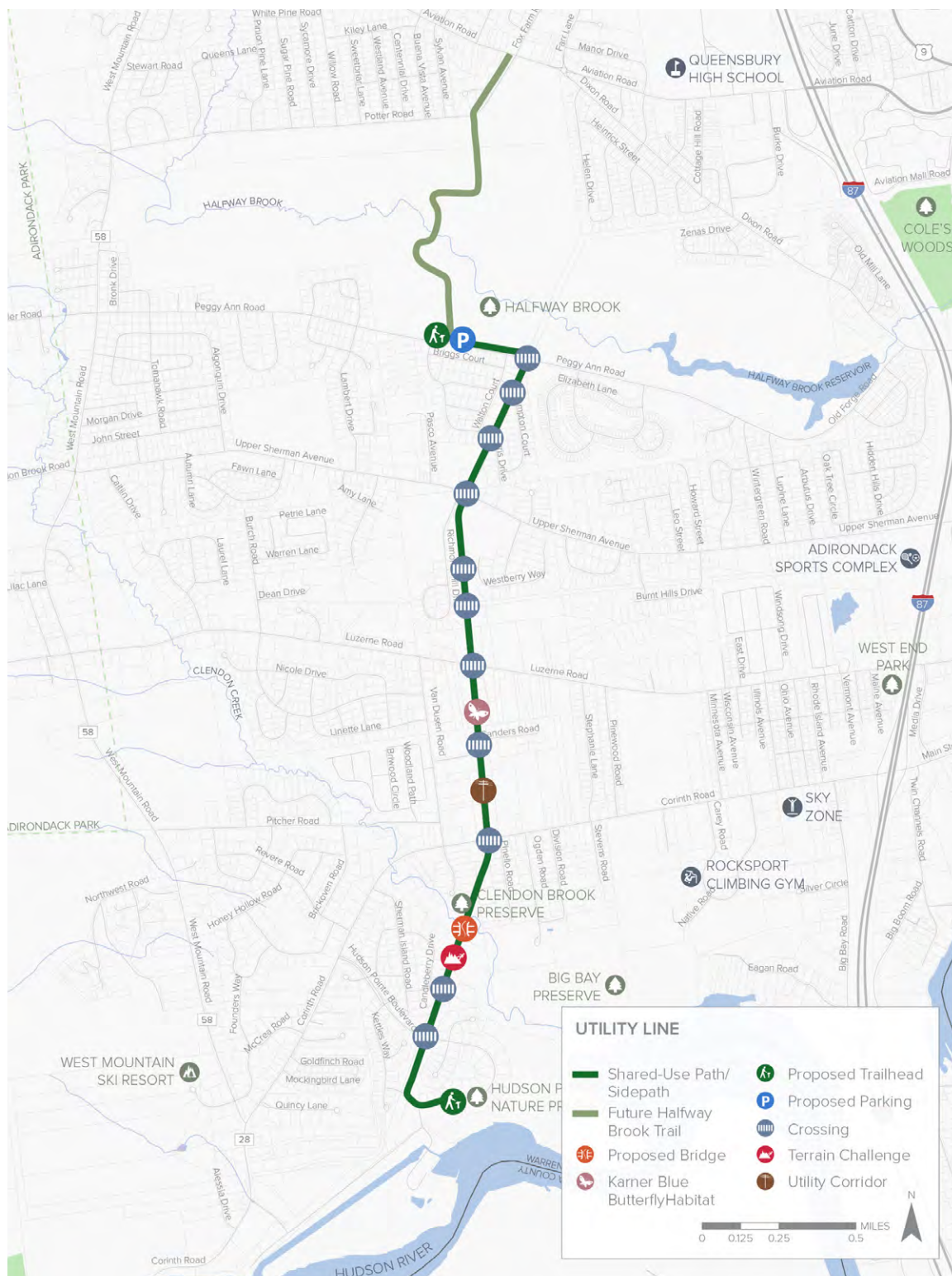
- » Utility Line Corridor (2.96 miles, off-road)
- » Clendon Brook (3.62 miles, on- and off-road)
- » East Side (4.71 miles, on- and off-road)
- » Burnt Hills (4.1 miles, on- and off-road)

Each option is described in greater detail on the following pages.



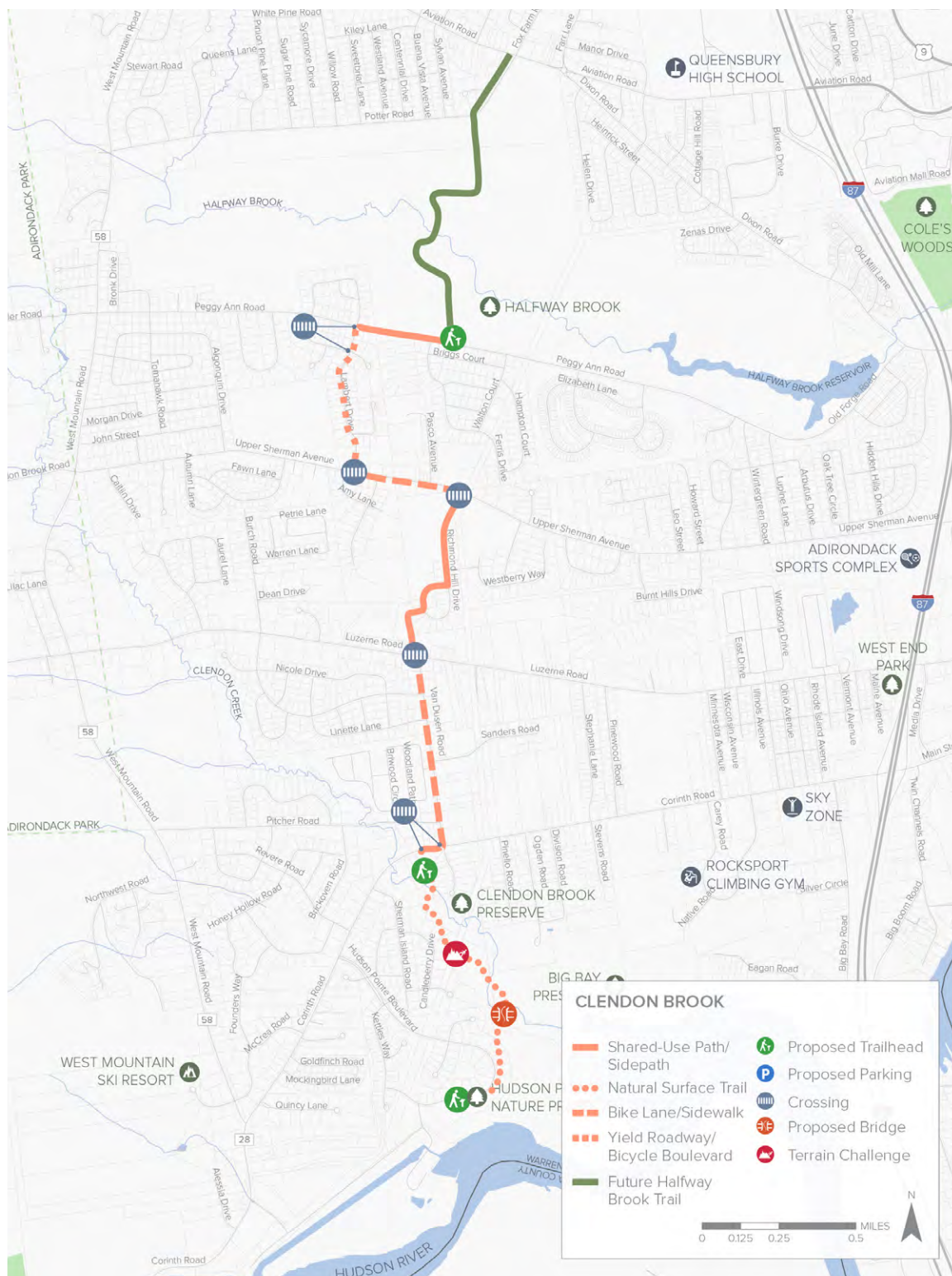
Option 1: Utility Line Corridor

The majority of this trail alternative is off-road. The northern terminus of this alignment is at the proposed Halfway Brook trailhead on Peggy Ann Road. From there, the trail would travel east along the north side of Peggy Ann for approximately ¼ mile as a shared use path, separated from the roadway. At the National Grid utility line, the trail would head south, following the utility corridor all the way to the Hudson Pointe Nature Preserve. There is a significant topographic challenge in crossing Clendon Brook within the utility line corridor. Alternately, the trail could break away from the utility corridor as it passes through the Clendon Brook Preserve, following a meandering path through the open space preserves as it crosses Clendon Brook at the existing bridge deck.



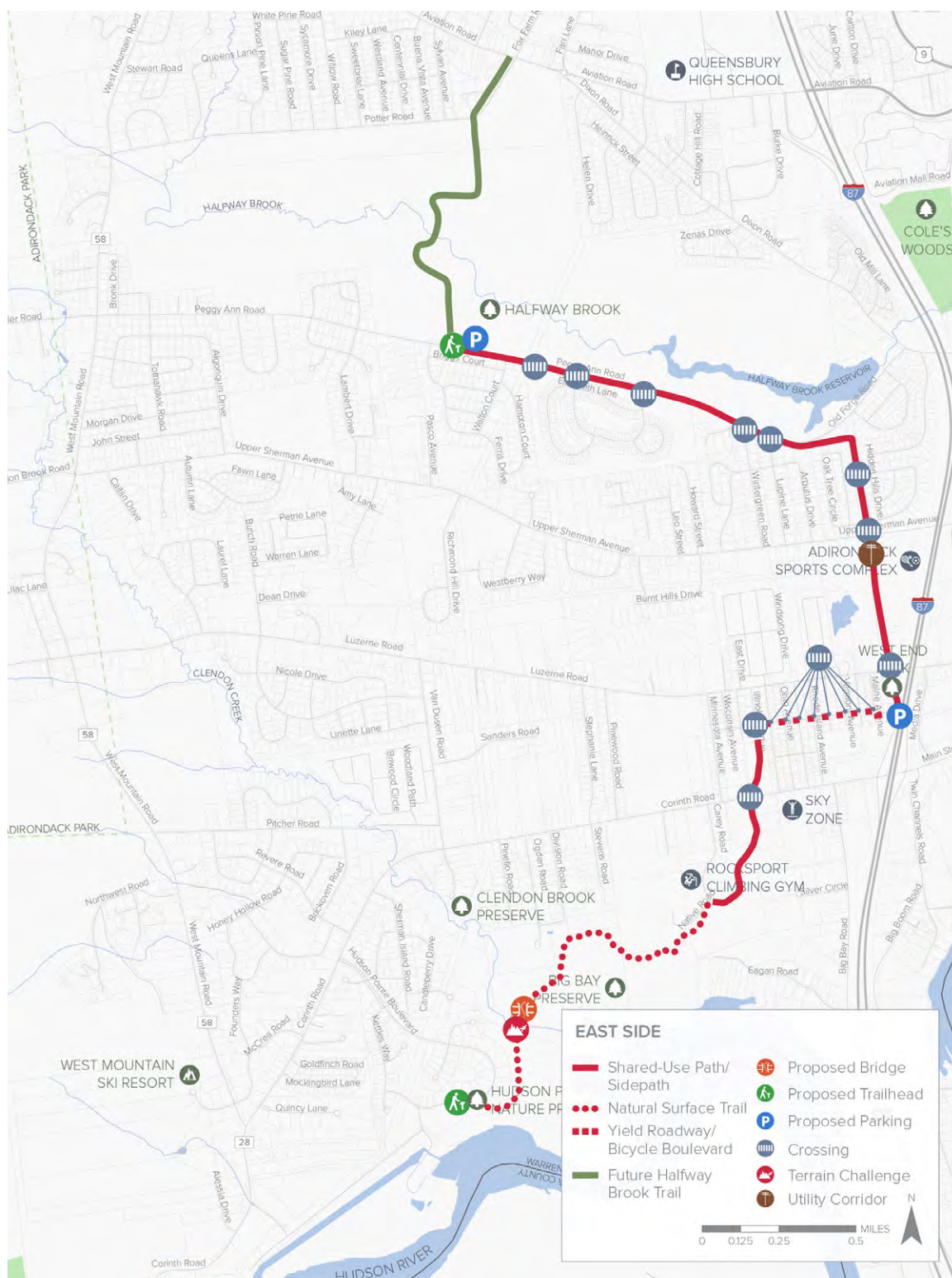
Option 2: Clendon Brook

This option includes a combination of on- and off-road facilities. From the Halfway Brook trailhead, this trail travels west along the north side of Peggy Ann for approximately 1/3 mile, turning south on Quail Run/Lambert Drive and transitioning to a bike boulevard. At Upper Sherman, the trail heads east, transitioning to bike lanes/shoulders and sidewalks. The trail then follows Richmond Hill Drive as a bike boulevard or a shared-use path. At the southern end of Richmond Hill, private easements would be required to make the connection to cross Luzerne Road. The trail then continues south along Van Dusen Road as bike lanes and sidewalks. Crossing Corinth Road, the trail jogs west as a shared use path for a few hundred feet, then utilizes existing and proposed trails in the Clendon Brook Preserve. The crossing and trail alignment at Corinth Road would require easement(s), enhanced crossing signage, and possible re-grading of the road shoulder to allow room for a trail. As with option 1, the crossing of Clendon Brook poses a topographic challenge; however, it may be possible to improve the existing bike/ped bridge to bring the facility up to contemporary standards for access.



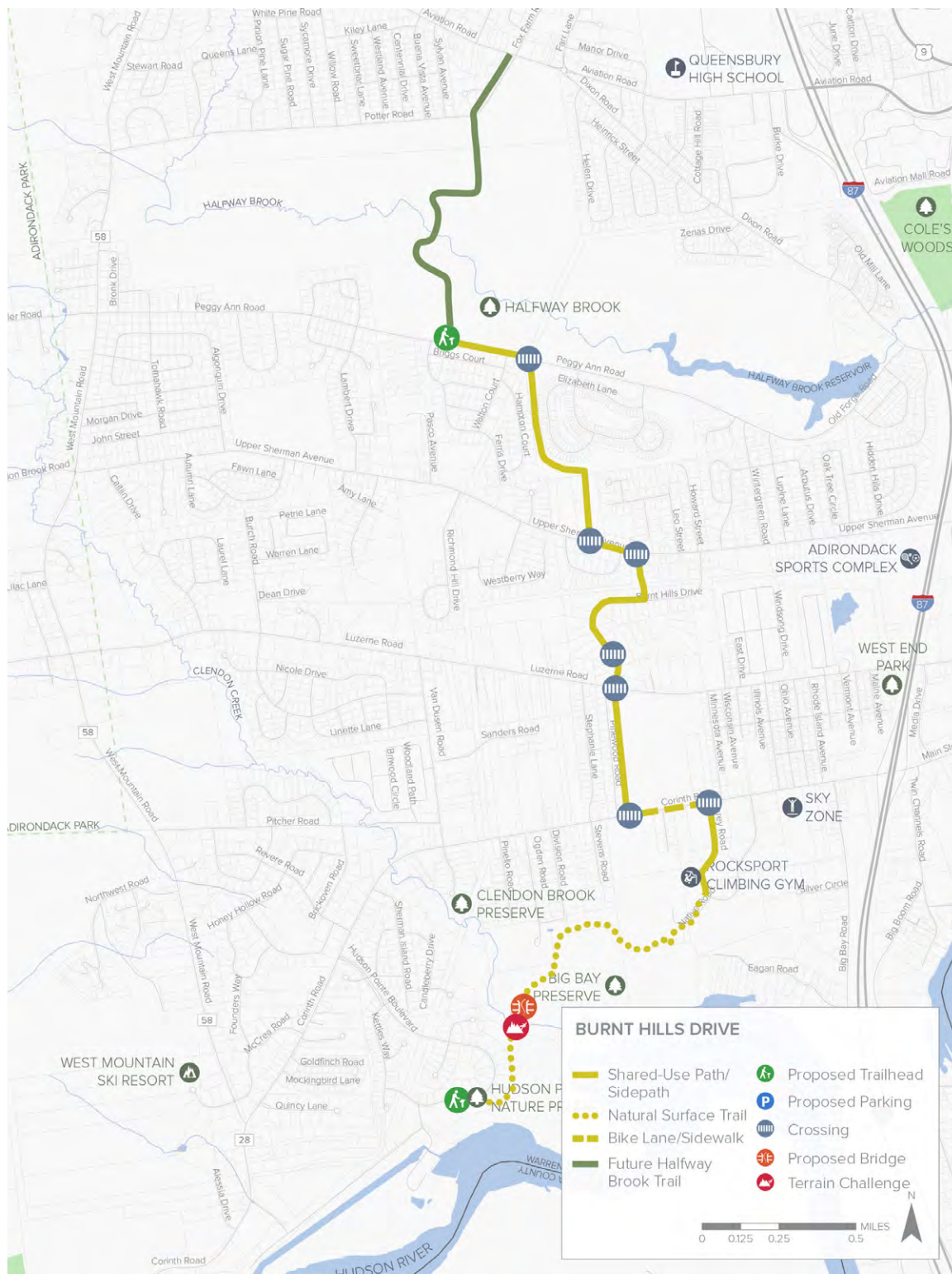
Option 3: East Side

From the Halfway Brook trailhead, this trail travels east as a shared use path along the north side of Peggy Ann for just under 1 mile before turning south along the National Grid utility corridor. The trail continues off-road, crossing Upper Sherman and Luzerne roads. The trail would then continue west along East and Central Avenues, turning south at Michigan Avenue. The on-road portions of the trail in this section would be bike boulevards or yield roadways. Utilizing Warren County property, the trail would transition to a shared use path, cross Corinth Road, then continue within the rights-of-way of Carey and Native roads as shared use paths. The trail would then cross into open spaces in the Big Bay preserve, following existing and proposed trails to Hudson Pointe. As with Option 2, the Clendon Brook crossing is anticipated to be accomplished by improving the existing bike/ped bridge, to bring the facility up to contemporary standards for access.



Option 4: Burnt Hills

From the Halfway Brook trailhead, this trail travels east along the north side of Peggy Ann for about half a mile before turning south and utilizing the trails and open space associated with the Queen Victoria's Grant development, which would likely require an easement and potentially approval of the Homeowner's Association. Another private easement would be required to make the connection to Upper Sherman road. The trail then travels east to Kylian's Way, following the roadway south to Burnt Hills Drive. The trail crosses Luzerne Road near Pinewood Road, which has limited sight distance and may require additional engineering consideration. Alternately, the trail could continue along the east side of the residences on Pinewood, which would require private easements. At Corinth Road, the trail jogs to the east, then turns south on Carey Road. As with Option 3, the trail continues within the rights-of-way of Carey and Native roads. The trail would then cross into open spaces in the Big Bay preserve, following existing and proposed trails to Hudson Pointe. As with Option 2 and 3, the Clendon Brook crossing is anticipated to be accomplished by improving the existing bike/ped bridge, to bring the facility up to contemporary standards for access.

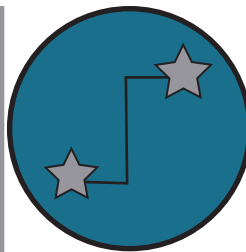


Evaluation Criteria

To enable the Town to make an informed choice between the conceptual alignments, a series of criteria were developed in collaboration with the Steering Committee. These represent the complexity concerning trail development and broadly include the consideration of topography, traffic volumes and conflicts, crossings, environmental impacts, cultural and economic resources, as well as site control and acquisition. Specifically, the Steering Committee sought to incorporate the following: ease of use, safety, exposure to motorized traffic (especially at higher speeds), cost, winter use, and environmental engineering issues such as stormwater and drainage. While not all of these are explicitly analyzed, they are integrated into the larger concepts detailed at left.

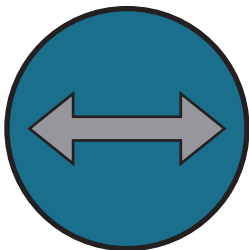
Connectivity

Evaluates the feasibility of each alternative to connect to existing facilities (e.g. sidewalks, bike lanes and trails) and destinations (e.g. parks and businesses). Measured by the number of existing facilities and destinations. A higher the ranking represents a stronger connection to existing facilities and destinations. Additionally, connections to [A/GFTC Priority Bike and Pedestrian Network](#) are considered.



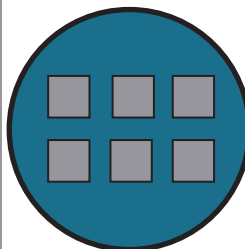
Directness

The alternatives were evaluated for directness of the trail alignment between the Hudson Pointe Preserve and the Halfway Brook Trail. Optimally, the trail will provide users a clear and consistent route or “ease of use” to avoid confusion, measured by entire distance and number of turns. The shorter the distance and fewer number of turns, the higher the directness ranking.



Consistency

Confusion can occur when multiple facility types are combined to cobble together a trail, leading trail users to switch between facilities and possibly conflict with other modes. Another means of representing ease of use, each alternative is evaluated for consistency based on the number of transitions as well as number of intersection crossings. The fewer the number of transitions and intersections, the higher the consistency ranking.



Implementation

This criterion evaluates how easily an alignment can be implemented. The implementation criteria includes constructability, which in this case primarily centers on site control, but also includes barriers to construction, such as topographic challenges, pinch points, and environmental issues. The more the alignment resides within the “public” right-of-way including the properties owned by local governments and land trusts, the easier it will be to implement.



Safety

Each alternative was evaluated for potential conflicts with other uses, especially exposure to motorized vehicles. Measured by both the degree the facility is separated from traffic and trail length located on roadways with higher traffic volumes and speeds. The greater the exposure of trail users to high speed, high volume roadways, the lower the safety score.



Evaluation Matrix

Option	Connectivity		Directness		Consistency		Implementation		Safety	
	RANK	NOTES	RANK	NOTES	RANK	NOTES	RANK	NOTES	RANK	NOTES
Utility Line	4	<ul style="list-style-type: none"> Only provides connections to destinations at the north and south ends of the alignment Central location connects to 4 neighborhoods 	1	<ul style="list-style-type: none"> 4 turns 2.96 miles 	1	<ul style="list-style-type: none"> 2 trail transitions 10 intersection crossings 	3	<ul style="list-style-type: none"> 1 easement¹ Significant topo. challenge at Clendon Brook crossing² 	1	<ul style="list-style-type: none"> No trail on roads with a speed over 30 mph No trail on roads with AADT over 5,000 No trail on roads with no physical separation 10 intersection crossings
Clendon Brook	3	<ul style="list-style-type: none"> Connects to destinations at the north and south ends of the alignment Some connection to town bike network and pedestrian priority areas Central location connects to 6 neighborhoods 	2	<ul style="list-style-type: none"> 9 turns 3.62 miles 	3	<ul style="list-style-type: none"> 7 trail transitions 13 intersection crossings 	4	<ul style="list-style-type: none"> 5 easements 2 moderate topo. challenges 	4	<ul style="list-style-type: none"> 20% of trail on roads with a speed over 30 mph 12 % of trail on roads with AADT over 5,000 14% of trail on roads with no physical separation 14 intersection crossings
East Side	1	<ul style="list-style-type: none"> Connects to many community destinations Strong connection to pedestrian priority network Eastern alignment connects to 7 neighborhoods 	4	<ul style="list-style-type: none"> 7 turns 4.71 miles 	4	<ul style="list-style-type: none"> 7 trail transitions 22 intersection crossings 	1	<ul style="list-style-type: none"> 1-2 easements³ 1 minor topo. challenge (improved Clendon Brook bridge at existing crossing) 	2	<ul style="list-style-type: none"> No trail on roads with a speed over 30 mph No trail on roads with AADT over 5,000 12% of trail on roads with no physical separation 22 intersection crossings⁴
Burnt Hills	2	<ul style="list-style-type: none"> Connects to destinations at the north and south ends of the alignment Some connection to town bike network and pedestrian priority areas Central location connects to 6 neighborhoods 	3	<ul style="list-style-type: none"> 9 turns 4.1 miles 	2	<ul style="list-style-type: none"> 7 trail transitions 7 intersection crossings 	2	<ul style="list-style-type: none"> 5 easements from 3 landowners, including Queen Victoria's Grant HOA 1 minor topo. challenge (improve Clendon Brook bridge) 	3	<ul style="list-style-type: none"> 11% of trail on roads with a speed over 30 mph 11% of trail on roads with AADT over 5,000 No trail on roads with no physical separation 7 intersection crossings

Notes:

¹ Although only one easement is required with National Grid, it is for the majority of the trail length. Failure to obtain this easement would render this alternative infeasible.

² It may be possible to mitigate this challenge by altering the alignment. See Engineering Considerations for more information.

³ A significant easement with National Grid would be required. Failure to obtain this easement would render this alternative infeasible.

⁴ The crash analysis indicated 13 accidents along Central Avenue from 2012-2016, 10 of which involved right-angle accidents. Although there were no serious injuries or fatalities, the high number of incidents indicates the need for further analysis if this roadway option is selected.

Preferred Alignment

Public Meeting Vote Tally

Trail Option	First Choice	Second Choice
Utility Line	14	4
East Side	6	4
Clendon Brook	4	10
Burnt Hills Drive	3	2

Preferred Alignment:
Combine Utility Line and East Side to form loop trail system

The decision to select one alignment is not merely a matter of assigning ratings and rankings to objective criteria. The evaluation matrix is an important tool to clarify consideration factors, but not all factors are of equal importance to the community. For example, it may be more important to provide access to neighborhoods and destinations than to select the alignment which is easiest to build. In addition, some of the factors influencing the criteria rankings can be mitigated through careful engineering and design.

Based on the criteria, the consensus of the Steering Committee was that the Utility Line alternative was the preferred alignment. There was also a preference expressed by Town representatives for the East Side alternative, due to the connections to destinations such as the West End Park, Rocksport Indoor Climbing Gym and Adirondack Sports Complex. In addition, this alternative offers strong potential for future connections to the Feeder Canal Trail.

Although the input of the Steering Committee is important, it is crucial to select an alternative supported by the community. An alternative may look suitable on paper, but may have hidden drawbacks that are not apparent through objective analysis. After all, bicycle and pedestrian facilities are meant to be used. By providing a thorough public outreach process, the Town can be more confident that the selected alternative will be enjoyed by the community.

A public meeting was held in December 2017. The meeting was well attended, with approximately 40-50 Queensbury residents and interested individuals. After a brief presentation on the project area and proposed alignments, attendees were asked to vote for their first and second choices for the trail. In addition, steering committee members and staff were present to answer questions. The vote tally is shown at left.

As can be seen from the results of the voting, the Utility Line alternative had the most support from attendees. In addition, there was strong support for the East Side alignment, as well as a moderate support for the Clendon Brook alternative as a “back-up”. The Burnt Hills option was the least popular.

There was clear consensus between public opinion and the Steering Committee. It is important to note that both the Utility Line and East Side options are dependent on securing access rights from National Grid, as discussed further in the Implementation section of this plan. In terms of selecting the preferred alignment, the Steering Committee opted to combine both the Utility Line and East Side alignments in a phased approach, also discussed in more detail in the Implementation section.

Implementation

There are many factors to consider before undertaking design and construction of the preferred trail. These include right-of-way acquisition, operation & maintenance, engineering considerations, cost, and phasing. Each of these is discussed in greater detail in this section of the plan. In addition, a list of potential funding sources and next steps has been included to further facilitate implementation.

Right-of-Way Acquisition

Before a trail can be designed and constructed, the Town of Queensbury must secure the rights to access the land. For the sections of trail that are located along a public roadway, this is likely to be straightforward, as the land is owned by either the Town itself or Warren County, which will likely grant access with proper permitting and maintenance agreements. Similarly, the sections of trail along the Hudson River are also located in publicly owned parcels. However, the majority of the off-road portions of the preferred alignment is located along National Grid utility corridors.

Each utility company has a different policy regarding providing access for trail construction along their property. There are considerations for liability and maintenance, as well as ensuring future access for equipment maintenance. Historically, National Grid has required a full set of design documents before granting an easement for trail construction. This approach allows the company to fully vet all aspects of the proposed trail ahead of time. However, this poses a difficulty for local municipalities, since transportation funding often bundles design and construction as one package. In addition, most grant sources require that an applicant demonstrate site control before funding will be given out. Given that trail design can cost tens of thousands of dollars, not many local agencies can afford to design a trail without receiving grant funding.

Recently, National Grid has struck an agreement with the Hudson Valley Greenway to provide access for the Empire State Trail. This long-term lease agreement was granted before detailed design was completed. As a condition of the agreement, National Grid will be involved in the design process. The agreement also calls for conditions relating to the trail specifications and other factors.

It is important to note that there is no guarantee that National Grid would be willing to enter into a similar agreement with the Town of Queensbury. It is recommended that the Town ensure that similar conditions can be met when reaching out to National Grid concerning access.



Operation & Maintenance

A crucial consideration regarding the development of this trail is which agency will be responsible for ongoing operations and maintenance. As this plan was undertaken on behalf of the Town of Queensbury, it would be reasonable to identify the municipality as a potential trail owner, especially as the Town already owns and maintains trails. However, there are other groups which could take on this responsibility as well. These include Warren County, which currently owns and maintains the Warren County Bikeway, or a not-for-profit group, such as the Feeder Canal Alliance. Another option is for the Town to create a formal partnership with another organization for aspects of the maintenance while retaining primary ownership of the trail. It is important to keep in mind that much of the trail is dependent on securing access to National Grid utility corridors, as noted previously. A Trail Maintenance Agreement is likely to be required for all parties involved in the operation of the trail, including third-party organizations.

Trail Maintenance Considerations & Cost

The ongoing maintenance of the trail will have an associated cost. It is difficult to predict the exact amount; however, according to the Maintenance Practices and Costs of Rail-Trails report issued in 2015 by the Rails-to-Trails Conservancy, trail maintenance can average about \$1,000/year/mile for non-asphalt surface trails, and about \$2,000/year/mile for asphalt surfaces.

The exact cost is likely to fluctuate from year to year. In addition, stone dust trails are likely to require less expensive, but more frequent, maintenance activities, as they are subject to more immediate effects of erosion and vegetative encroachment. Asphalt paths, conversely, may require significant resurfacing or repair every few years. In addition to trail surface, other factors which influence maintenance costs include:

- The availability of volunteer labor
- Mowing and vegetative clearing
- Litter clean-up
- Maintenance of signs and pavement markings

Some of these factors will depend on trail design, while others will be affected by weather and human behavior.



Phasing

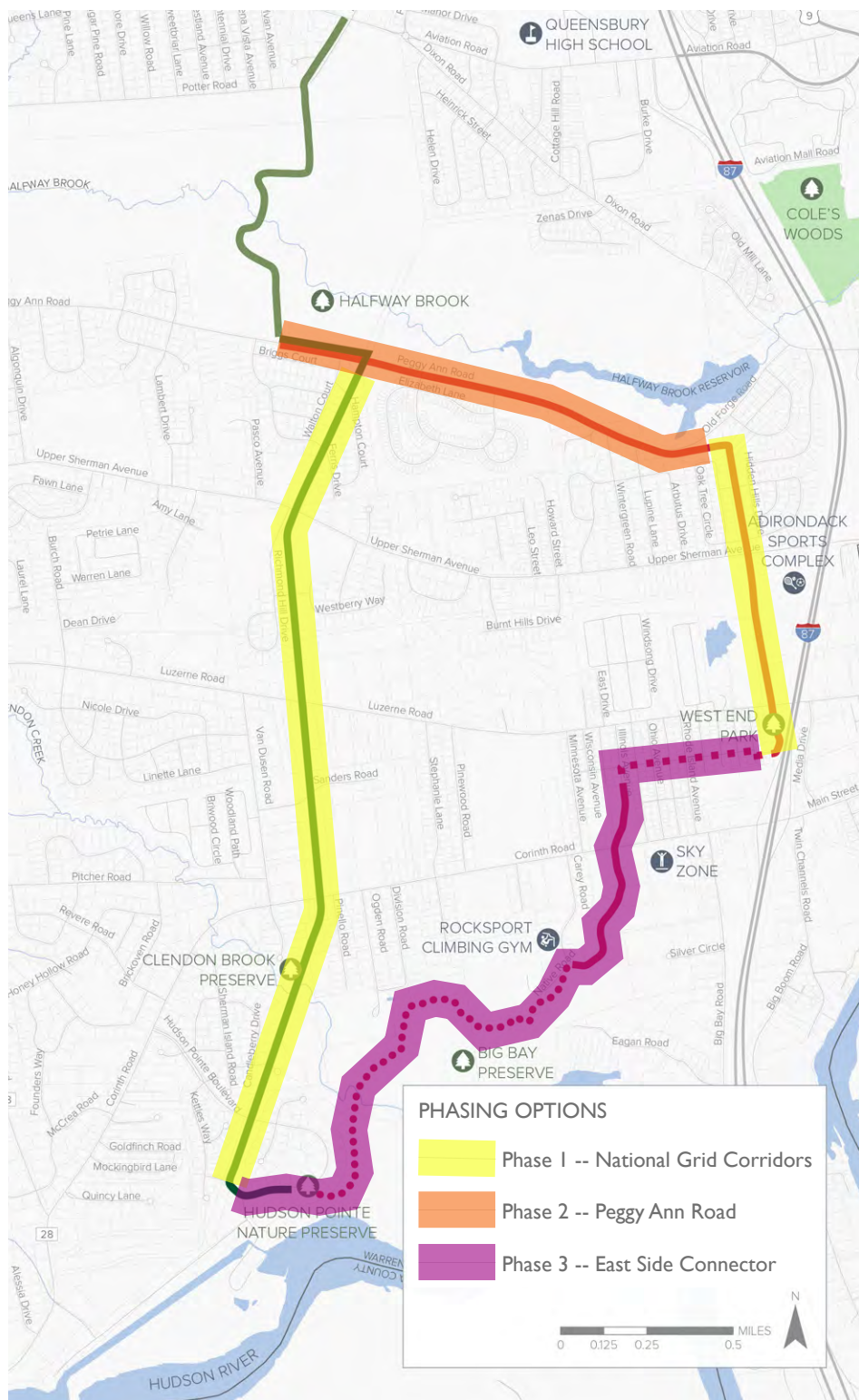
As stated in the previous section, the Town has expressed interest in pursuing a phased implementation approach, whereby the Utility Line and East Side alternatives could be combined. There are several ways the Town could phase the project; one option is detailed below.

Phase 1: Pursue ROW, design, and construction of the trail sections located along utility corridors. As both the Utility Line and East Side trails are dependent on National Grid owned parcels, it makes sense to bundle these sections into one phase. The longer, western section of trail effectively accomplishes much of the stated goal of the project, which is to connect the Halfway Brook Trail and Hudson Pointe Nature Preserve. Although it may seem counter-intuitive to construct an isolated section of trail in the eastern portion of the project area, this short length provides crucial connections between the Hidden Hills, Lupine/Arbutus, and State Avenue neighborhoods and the Adirondack Sports Complex and West End Park.

Phase 2: Pursue ROW, design, and construction of the Peggy Ann section. This section of trail is largely dependent on publicly-owned land. Although there are some topographic challenges in the eastern section of the trail, for the most part this shared path would be a straightforward construction project, as the area is largely undeveloped. Theoretically, if the Town of Queensbury and City of Glens Falls were to collaborate and construct portions of the trail using in-kind labor, this section could be used as a match in grant applications.

Phase 3: Pursue ROW, design, and construction of the southern loop connection. Much of this section of trail is located in the Hudson Pointe and Big Bay Preserve areas, which contain existing trails and are public lands. The on-road portions of the trail are anticipated to be located within the public ROW, however, a proper survey and detailed design are required. As with any on-road bicycle/pedestrian facility, the design phase may uncover hidden pitfalls (such as utility relocation or minor ROW requirements) that could slow the process.

The preferred trail alignment was reviewed by engineers at Creighton Manning as a way to highlight considerations for design and construction. This review was intended only to flag potential issues which may need further study during the design phase.



Engineering Considerations

Old Forge/Peggy Ann Roads: Steep grades on the north side of the road will require careful design to ensure accessibility.

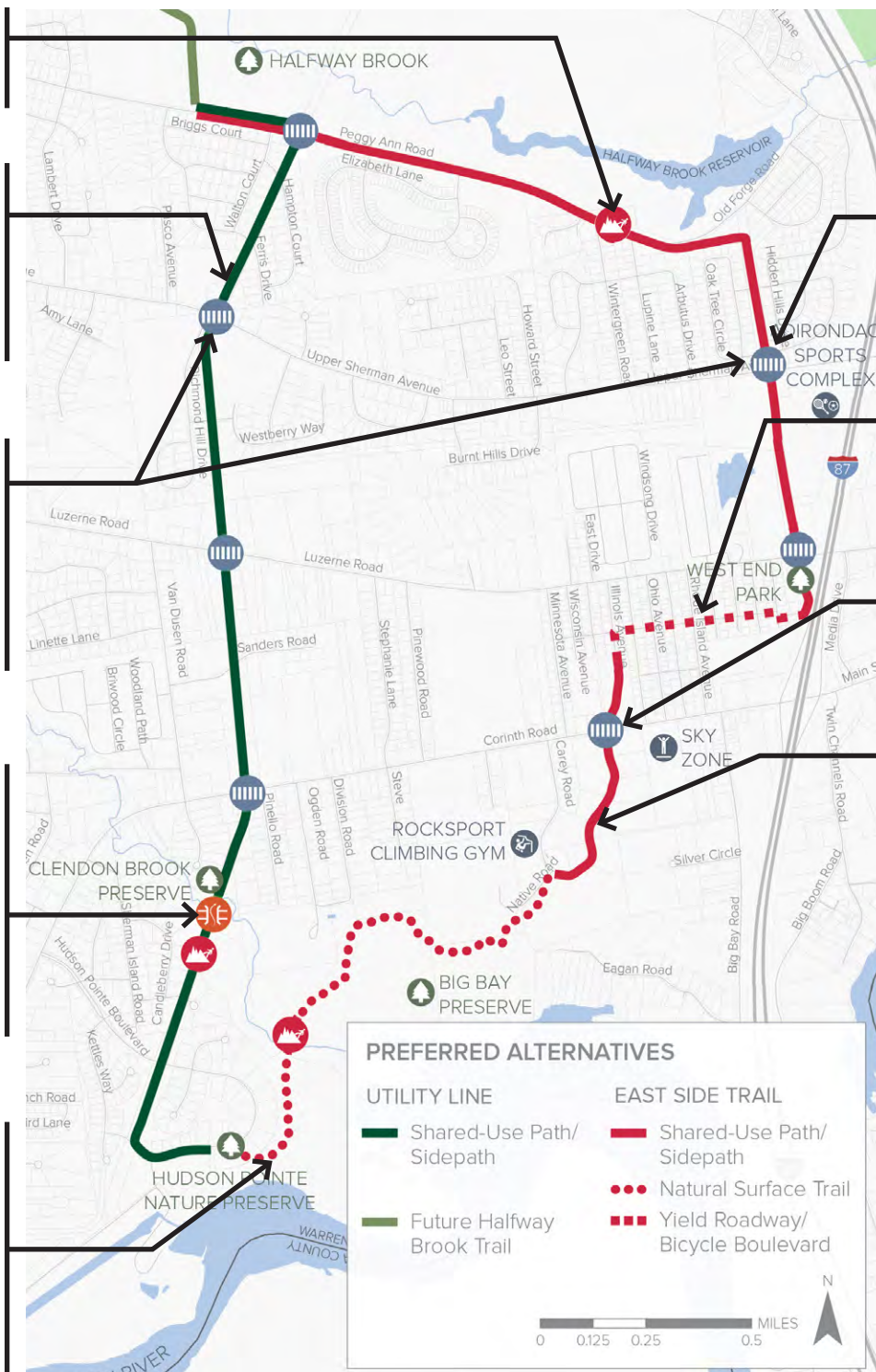
Off-Road Trail Surface, National Grid Corridors: Although stone dust may be the most economical option, soil conditions may warrant additional measures to ensure stability and durability. Steeper sections of trail may need to be paved or reinforced to prevent erosion.

Upper Sherman Avenue Crossing (East & West)

- High speed & truck volumes may warrant enhanced crossing
- Sight distance limited west of the crossing due to vegetation; additional clearing and roadside maintenance will be required

Clendon Brook Crossing: Alignment should avoid the steep slopes, perhaps along the southern ridge line. A boardwalk is a potential solution; the cost is contingent on the specifications and materials that are used for construction. Less expensive materials such as wood or composite can be used for decking, however increased long term maintenance costs will be required.

Off-Road Trail Surface, Hudson Pointe/Clendon Brook Preserves: Existing trails and footbridges may need modifications to meet accessibility standards for grade, width, and cross slope. Either a stone-dust or asphalt path surface could be implemented. The slopes on either side of Clendon Brook present a challenge to accessibility which will require careful design.



Luzerne Road Crossing (East): Vegetation clearing on north side of road is required to allow for adequate sight distance.

Central Ave: Further analysis of crash patterns is recommended before introducing additional bike/ped activity. If a sidewalk is constructed, the addition of curb will require a closed drainage system.

Corinth Road Crossing (East): Carey Road intersection has associated crash history; may require additional consideration during design phase

Native/Carey Roads: Fire hydrant relocations and driveway crossings are required if the sidepath is constructed on the west side of the roadway. The east side will have fewer utility impacts and driveway crossings, but will require more tree clearing and grading.

Note: Midblock Road Crossings

In general, trail and sidewalk crossings should be located near existing intersections when possible. Drivers may not expect to see trail crossings mid-block, making these locations less desirable. New mid-block crossings will require advance warning signs, crosswalks, and yield markings on the roadway. Flashing beacons could be considered at specific crossings, however widespread implementation should be avoided. Excessive deployment of enhanced crossing devices can desensitize motorists and reduce effectiveness.

Cost Estimates & Next Steps

For the purposes of this study, planning-level cost estimates were prepared by Creighton Manning, Engineering and are summarized at left. Full versions of the cost estimates are included in the Appendix. It is important to note that these estimates do not include acquisition of right-of-way, which may be necessary depending on final design. In addition, costs for design/engineering and construction inspection are given for order-of-magnitude estimation purposes only; actual costs may differ depending on project complexity.

It may also be possible to reduce overall costs by bundling design into fewer phases. Completing one overall design for all three phases also helps to improve the chances of securing grant funding. “Shovel ready” projects often score higher in grant rating, as the projects can be implemented faster and with greater chances of successful project delivery.

Once this plan is finalized by A/GFTC, the Town may choose to seek funding. There are a number of grant programs which provide funding for design, construction, or both. The list below includes several options, however, the Town is encouraged to seek non-traditional sources of funding, such as public-private partnerships or other groups, which may provide additional assistance. The grant programs listed below have historically allowed for trail or trail-related projects; future eligibility is not guaranteed.

- [Recreational Trails Program](#): 80/20 grant, \$25,000/\$200,000 project min./max.
- [Make the Connection Program](#): 80/20 grant, \$75,000 project min.
- [Transportation Alternatives Program](#): 80/20 grant, \$250,000/\$5M project min./max.
- [Waterfront Revitalization Program Implementation](#): 75/25 grant, \$2M project max.
- [Climate Smart Communities \(Mitigation Category\)](#): 50/50 grant, \$10,000/\$2M project min./max.
- [Green Innovation Grant Program \(Permeable Pavement\)](#): match varies, no project min.

Phase 1 -- National Grid Corridors		
Trail Section	Proposed Facilities	Cost
Utility Corridor, Hudson Pointe Blvd to Peggy Ann Road	New Stone Dust Trail, 10' Width; 20 Road Crossings; Clendon Brook bridge crossing	\$1,140,000
East Avenue Parking Lot to Lupine Lane (Utility Corridor)	New HMA Trail, 10' Width; 4 Road Crossings	\$631,000
Construction Subtotal		\$1,771,000
Contingency (~20%)		\$355,000
Design/Engineering (~10%)		\$178,000
Construction Inspection (~20%)		\$355,000
Phase 1 Total		\$2,659,000

Phase 2 -- Peggy Ann Sidepath		
Utility Corridor to Halfway Brook Southern Trailhead	New 10' Wide Asphalt Sidepath	\$133,000
Lupine Lane to Halfway Brook Trailhead	New 10' Wide Asphalt Sidepath, 6 crossings, hydrant relocation	\$464,000
Construction Subtotal		\$597,000
Contingency (~20%)		\$120,000
Design/Engineering (~10%)		\$61,000
Construction Inspection (~20%)		\$120,000
TOTAL, Phase 2		\$898,000

Phase 3 -- Central Ave to Hudson Pointe		
Hudson Pointe Blvd to Utility Corridor	Marked shared roadway, signs	\$3,000
Hudson Pointe Nature Preserve to East Ave Parking lot	Boardwalk/bridge, 10' asphalt sidepath, utility relocation, drainage, 12 road crossings, bicycle blvd and sidewalk	\$1,152,000
Construction Subtotal		1,155,000
Contingency (~20%)		\$231,600
Design/Engineering (~10%)		\$116,300
Construction Inspection (~20%)		\$231,600
TOTAL, Phase 3 (Rounded)		\$1,735,000
Total, All 3 Phases		\$5,292,000

Appendices: Detailed Cost Estimates & Technical Memos

MEMORANDUM

Date: July 30, 2018

To: William Sprengnether
From: Stephan Godlewski, PE
cc: Josh Wilsey, PE

Project: Halfway-Hudson Connector Trail
Re: East Side Trail Alternative Review

Purpose:

The purpose of this memorandum is to provide an engineering review of the East Side Trail alternative developed by the project steering committee. Specific criteria reviewed are safety, accessibility, implementation and cost.

Alternative Review:

Alternative 4 – East Side Trail (Magenta)

Accessibility: The existing trails within the Hudson Point and Clendon Brook Preserves may need modifications to meet accessibility standards. The slopes on either side of the Clendon Brook also present a challenge to accessibility. Existing footbridges within the preserves will need to be widened and brought up to current code. All proposed sidepaths and shared-use paths will meet accessibility standards for grade and cross slope. Either a stone-dust or asphalt path surface could be implemented. If existing roadway shoulders are used or widened (to provide on-road bicycle lanes or pedestrian paths) they may need to be modified to provide a maximum 2% cross slope.

Implementation: This alternative will generally utilize existing public trail systems within the preserves, which results in relatively easy implementation for that segment. A review of the routing beyond the preserve identified several locations where existing features and property lines will present challenges:

- Native Road/Carey Road - This segment of the route will require fire hydrant relocations and driveway crossings if the sidepath is constructed on the west side of the roadway. The east side will have less utility impacts, fewer driveway crossings, but will require more tree clearing and embankment to address the drop-off in grades.
- Central Ave –This section is being considered for a bicycle boulevard and sidewalk one side of the road. A key component that will require review is, the large number of stop-controlled intersections. There should be no right-of-way impacts, but the addition of curb will introduce the need for a revised closed drainage system.
- East Avenue Parking lot to Old Forge Road – This segment of the route will require an easement from National Grid as the proposed route will travel primarily through their utility corridor. The proposed section of the route through the West End Park should require little modifications to accommodate the proposed trail.
- Old Forge Road/Peggy Ann Road – Generally there are steeper grades on the north side of the road. The south side has several fire hydrants and light poles that may require relocation.

Safety: This criteria considers the type of trail facility (on-road or separated), existing traffic conditions and crossing conditions. The following segments/locations of this alternative will require careful consideration during detailed engineering:

MEMORANDUM

Halfway-Hudson Connector Trail Alternative Review

July 30, 2018

- Luzerne Road:
 - 85th percentile speed is approximately 50 mph and the posted limit is 40 mph
(Note: The 85th percentile speed is the speed that 85 percent of vehicles do not exceed.)
 - This crossing will require vegetation clearing on the north side of the road to provide sufficient sight lines for trail users.
- Upper Sherman Avenue:
 - 85th percentile speed for this roadway is approximately 59 mph and the posted limit is 45 mph
 - The roadway carries the highest percentage of truck traffic (10%) of the major roadways crossed by the alternative.
 - This crossing will require vegetation clearing on both sides of the road to provide sufficient sight lines for trail users.
- Corinth Road:
 - 85th percentile speed for this roadway is approximately 49 mph and the posted limit is 45 mph
 - This roadway contains the five motor vehicle crashes based on the information provided by AGFTC. None of these crashes involve pedestrians or bicyclists. A detailed review of the crash data was not completed as part of this study and should be completed as part of the detailed engineering.

Estimated Construction Cost: \$3.4M to \$3.8M

MEMORANDUM



ENGINEERS
PLANNERS
SURVEYORS

Date: March 12, 2018

To: William Sprengnether
From: Stephan Godlewski, PE
cc: Josh Wilsey, PE

Project: Halfway-Hudson Connector Trail
Re: Alternative Review

Purpose:

The purpose of this memorandum is to provide an engineering review of the trail alternatives developed by the project steering committee. Specific criteria reviewed are safety, accessibility and cost. The following alternatives are part of the Study:

1. Clendon Preserve – Center Trail Route (Pink)
2. Burnt Hills Drive – Center Trail Route (Yellow)
3. Utility Line Trail Route (Green)
4. East Side Trail (Magenta)

Based on public and steering committee input, alternatives 1 and 3 were identified as alternatives for further review. The review will consider the following criteria: Connectivity, Accessibility, Consistency, Implementation, Safety, and Cost Efficiency.

Alternative Review:

Alternative 1 - Clendon Preserve – Center Trail Route (Pink)

Accessibility: The existing trails within the Hudson Point and Clendon Brook Preserves may need modifications to meet accessibility standards. The slopes on either side of the Clendon Brook also present a challenge to accessibility. Existing foot bridges within the preserves will need to be widened and brought up current code. All proposed sidepaths and shared-use paths will meet accessibility standards for grade and cross slope. Either a stone-dust or asphalt path surface could be implemented. If existing roadway shoulders are used or widened (to provide on-road bicycle lanes or pedestrian paths) they may need to be modified to provide a maximum 2% cross slope.

Implementation: This alternative will generally utilize existing public trail systems within the preserves which results in relatively easy implementation for that segment. A review of the routing beyond the preserve identified several locations where existing features and property lines will present challenges:

- Corinth Road - The segment of the route located on the south side of the road will require excavation of the existing roadside berm, relocation of private fencing and landscaping, and potential right-of-way acquisition. (See site 1A on attached figure)
- Vandusen Road - A majority of the existing utility poles are on the east side of the road with a few additional on the west side. Shoulder widening and/or sidewalk construction may result in the relocation of these existing utility poles. The location of the sidewalks may be able to shift to avoid these utilities. The widening will also require clearing of trees to accommodate the widened roadway and sidewalk.
- Upper Sherman Avenue - Several utility poles may be in conflict on both sides of the roadway. The existing roadside grades appear relatively flat and will not require extensive excavation or embankment

MEMORANDUM

Halfway-Hudson Connector Trail Alternative Review

March 12, 2018

- Lambert Drive - Grades and underground utilities may be an issue on the west side of the roadway. If a bicycle boulevard or yield roadway is implemented the existing utilities and topography will not present a challenge.

Safety: This criteria considers the type of trail facility (on-road or separated), existing traffic conditions and crossing conditions. The following segments/locations of this alternative will require careful consideration during detailed engineering:

- Corinth Road:
 - This crossing has the highest vehicular traffic for the entire route. New crossings of roadways will need advance warning signs, crosswalks and yield markings on the roadway. Additional warning signs may be necessary based on site conditions such as limited sight distance. Flashing beacons could be considered at specific crossings however their widespread implementation should be avoided in an effort to maintain their effectiveness. Excessive deployment of enhanced crossing devices can have the unintended result of desensitizing motorists and reducing effectiveness.
 - Available traffic data indicates that the 85th percentile speed is approximately 50 mph which is higher than the posted speed limit of 45 mph. (*Note: The 85th percentile speed is the speed that 85 percent of vehicles do not exceed.*)
 - Sight distance west of the proposed crossing will need to be confirmed. The existing vegetation, roadside grading, vehicle speeds and roadway geometry (horizontal and vertical curvature) are all factors to be considered. The construction of a sidepath on the south side of this curve may result in improved sight lines at the crossing and for oncoming vehicles.
 - The proposed crossing is located at an intersection where motor vehicle crashes are clustered in the data provided by AGFTC. A detailed review of the crash data was not completed as part of this study and should be completed as part of the detailed engineering. Improvements to available sight distance for trail users may have the added benefit of reducing motor vehicle crashes at this location.
- Luzerne Road:
 - 85th percentile speed is approximately 50 mph and the posted limit is 40 mph
- Upper Sherman Avenue:
 - 85th percentile speed for this roadway is approximately 59 mph and the posted limit is 45 mph
 - The roadway carries the highest percentage of truck traffic (10%) of the major roadways crossed by the alternative.
 - Sight distance at the Richmond Hill/Upper Sherman intersection is limited west of the crossing due to vegetation. It appears that this can be addressed with additional clearing and roadside maintenance. (See site 1B on attached figure)

Estimated Construction Cost: \$3.5 to \$4M

MEMORANDUM

Halfway-Hudson Connector Trail Alternative Review

March 12, 2018

Alternative 3 - Utility Line Trail Route (Green)

Accessibility: With the majority of the route located within the utility corridor, this alternative will require a greater amount of work to meet accessibility standards than Alternative 1. The existing dirt trail/access road located under the transmission towers and wires will require regrading to meet accessibility standards for both running grade and cross slope. Either a stone-dust or asphalt path surface could be implemented along the corridor. The type of surface, trail width and minimum offsets from National Grid infrastructure will need to be coordinated with National Grid.

Implementation: The viability of this alternative is fully contingent on National Grid agreeing to the use of its right-of-way for the trail. A detailed evaluation of the existing soil conditions may result in additional measures to ensure the stability and durability of the trail within the right-of-way. Steeper sections of trail may need to be paved or reinforced to prevent erosion and ensure long term stability. Due to the existing topography, an alternative alignment across the Clendon Brook should be considered that avoids the steep slopes. The alignment could follow the southern ridge line and follow a route similar to the Clendon Brook Alternative. (See site 2A on attached figure)

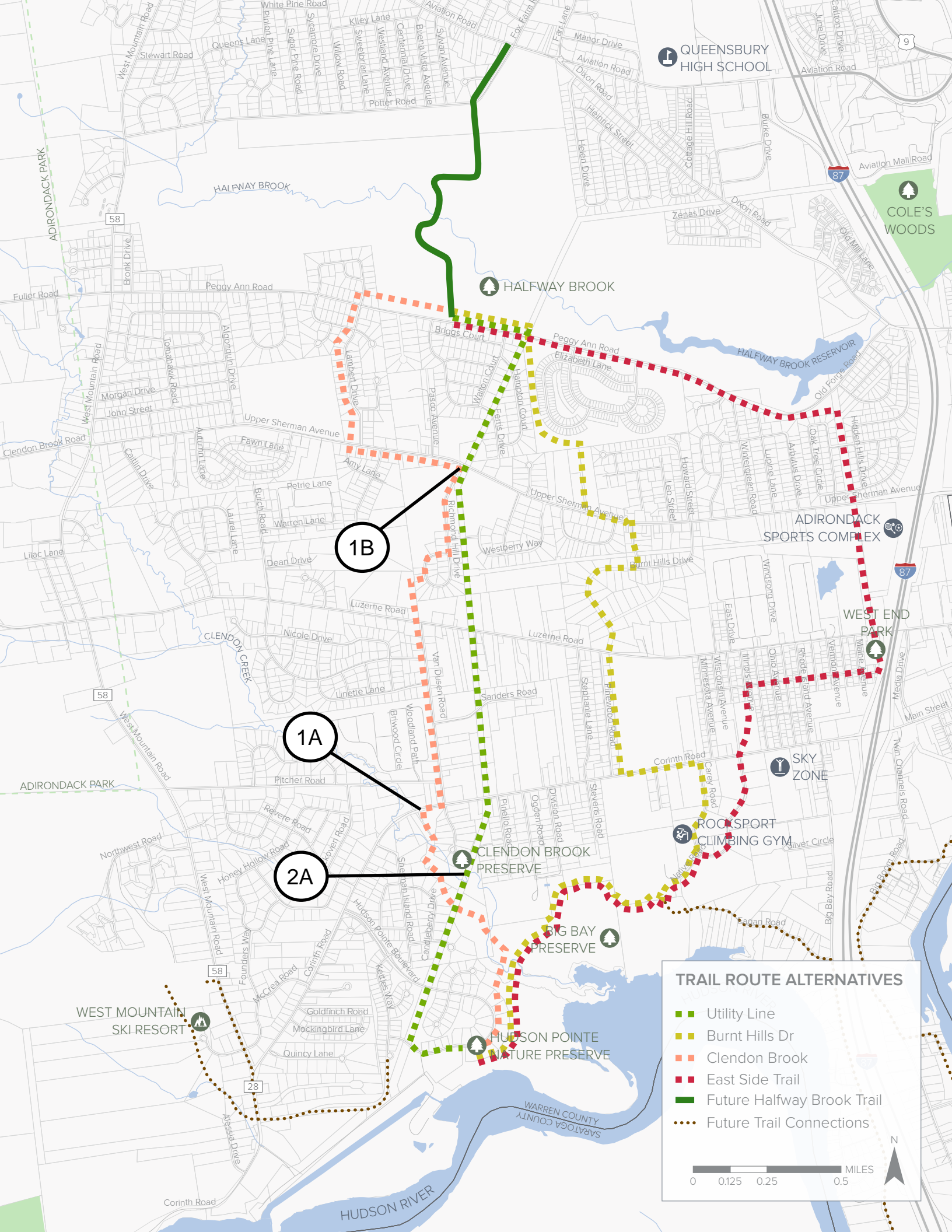
The following locations are existing features and property lines that may present challenges to implementation:

- Clendon Brook - A boardwalk is a potential solution for this location. The cost of the boardwalk is contingent on the specifications and materials that are used for construction. Less expensive materials such as wood or composite can be used for decking to lower the initial construction costs, however increased long term maintenance costs will be required. Alternative boardwalk products can be evaluated during detailed design to decrease the long term costs and maintenance of the crossing.
- Ferris Drive - Near the crossing of Upper Sherman Ave there are several properties that appear to be encroaching upon National Grids right-of-way. It is unclear if this is occurring via a formal easement. The trail may need to be rerouted for a short length to avoid the easement.

Safety: This alternative follows the utility corridor and thus avoids many of the lower volume streets and primarily crosses higher volume roads. This minimizes the interaction of the trail users with vehicular traffic. The following segments/locations of this alternative will require careful consideration during detailed engineering:

- Midblock Crossings - This alternative results in the greatest number of mid-block crossings located away from existing intersections. In general, it is better to locate trail and sidewalk crossings near existing intersections where motorists expect crossings. Mid-block crossings are less desirable and are not always an expected condition for drivers. The available sight distance at the crossings will need to be verified but it generally appears adequate due to vegetation clearing within the utility corridor. New crossings of roadways will need advance warning signs, crosswalks and yield markings on the roadway. Additional warning signs may be necessary based on site conditions. Flashing beacons could be considered at specific crossings however their widespread implementation should be avoided in an effort to maintain their effectiveness. Excessive deployment of enhanced crossing devices can have the unintended result of desensitizing motorists and reducing effectiveness.
- Upper Sherman Avenue:
 - 85th percentile speed for this roadway is approximately 59 mph and the posted limit is 45 mph
 - The roadway carries the highest percentage of truck traffic (10%) of the major roadways crossed by the alternative.

Estimated Construction Cost: \$1.5M to \$2M



1B

1A

2A

TRAIL ROUTE ALTERNATIVES

- Utility Line
- Burnt Hills Dr
- Clendon Brook
- East Side Trail
- Future Halfway Brook Trail
- Future Trail Connections

0 0.125 0.25 0.5 MILES

N



Calculated By: MDV
 Calculated Date: 9/10/18
 Checked By: JBW
 Checked Date: 9/11/2018

PHASE 1 - NATIONAL GRID CORRIDORS

UTILITY LINE TRAIL ALTERNATIVE

UTILITY CORRIDOR FROM HUDSON POINTE BOULEVARD TO PEGGY ANN ROAD

CONSTRUCTION	LENGTH	COST PER FOOT	TOTAL
COMPLEX 10' STONE DUST TRAIL	4700	\$ 100.00	\$ 470,000.00
CLENDON BROOK CROSSING	-	-	\$ 100,000.00
20 ROAD CROSSINGS	-	-	\$ 30,000.00
SIMPLE 10' STONE DUST TRAIL	8300	\$ 65.00	\$ 540,000.00
SUBTOTAL			\$ 1,140,000.00
CONTIGENCY (20%)			\$ 228,000.00
DESIGN ENGINEERING (10%)			\$ 114,000.00
CONSTRUCTION INSPECTION (20%)			\$ 228,000.00
TOTAL			\$ 1,710,000.00

EAST SIDE TRAIL

UTILITY CORRIDOR FROM EAST AVENUE PARKING LOT TO LUPINE LANE

CONSTRUCTION	LENGTH	COST PER FOOT	TOTAL
SIMPLE 10' HMA TRAIL	6250	\$ 100.00	\$ 625,000.00
4 ROAD CROSSINGS	-	-	\$ 6,000.00
SUBTOTAL			\$ 631,000.00
CONTIGENCY (20%)			\$ 127,000.00
DESIGN ENGINEERING (10%)			\$ 64,000.00
CONSTRUCTION INSPECTION (20%)			\$ 127,000.00
TOTAL			\$ 949,000.00

PHASE 1 TOTAL \$ 2,659,000.00



Calculated By: MDV
 Calculated Date: 9/10/18
 Checked By: JBW
 Checked Date: 9/11/2018

PHASE 2 - PEGGY ANN ROAD

UTILITY LINE TRAIL ALTERNATIVE

PEGGY ANN ROAD FROM UTILTIY CORRIDOR TO HALFWAY BROOK SOUTHERN TRAIL HEAD

CONSTRUCTION	LENGTH	COST PER FOOT	TOTAL
SIMPLE 10' HMA SIDEPAH	1400	\$ 95.00	\$ 133,000.00
SUBTOTAL			\$ 133,000.00
CONTIGENCY (20%)			\$ 27,000.00
DESIGN ENGINEERING (10%)			\$ 14,000.00
CONSTRUCTION INSPECTION (20%)			\$ 27,000.00
TOTAL			\$ 201,000.00

EAST SIDE TRAIL

LUPINE LANE TO HALFWAY BROOK SOUTHERN TRAIL HEAD

CONSTRUCTION	LENGTH	COST PER FOOT	TOTAL
SIMPLE 10' HMA SIDEPAH	4300	\$ 100.00	\$ 430,000.00
6 ROAD CROSSINGS	-	-	\$ 9,000.00
5 HYDRANT RELOCATIONS	-	-	\$ 25,000.00
SUBTOTAL			\$ 464,000.00
CONTIGENCY (20%)			\$ 93,000.00
DESIGN ENGINEERING (10%)			\$ 47,000.00
CONSTRUCTION INSPECTION (20%)			\$ 93,000.00
TOTAL			\$ 697,000.00

PHASE 2 TOTAL \$ 898,000.00



Calculated By: MDV
 Calculated Date: 9/10/18
 Checked By: JBW
 Checked Date: 9/11/2018

PHASE 3 - EAST SIDE CONNECTOR

UTILITY LINE TRAIL ALTERNATIVE

HUDSON POINTE BOULEVARD TO START OF UTILITY CORRIDOR

CONSTRUCTION	LENGTH	COST PER FOOT	TOTAL
MARKED SHARED ROADWAY	1050	\$ 1.50	\$ 2,000.00
SIGNS	-	-	\$ 1,000.00
SUBTOTAL			\$ 3,000.00
CONTIGENCY (20%)			\$ 600.00
DESIGN ENGINEERING (10%)			\$ 300.00
CONSTRUCTION INSPECTION (20%)			\$ 600.00
TOTAL			\$ 4,500.00

EAST SIDE TRAIL

HUDSON POINTE NATURE PRESERVE TO EAST AVENUE PARKING LOT

CONSTRUCTION	LENGTH	COST PER FOOT	TOTAL
EXISTING TRAIL TO REMAIN	6500	\$ -	\$ -
BOARDWALK / BRIDGE	-	-	\$ 100,000.00
WAYFINDING	-	-	\$ 10,000.00
SIMPLE 10' ASPHALT SIDEPATH	4175	\$ 95.00	\$ 397,000.00
1 UTILITY RELOCATION	-	-	\$ 10,000.00
BICYCLE BOULEVARD AND SIDEWALK	2700	\$ 179.50	\$ 485,000.00
DRAINAGE PIPE FOR 10 INTERSECTIONS	-	-	\$ 12,000.00
20 DRAINAGE STRUCTURES	-	-	\$ 120,000.00
12 ROADWAY CROSSINGS	-	-	\$ 18,000.00
SUBTOTAL			\$ 1,152,000.00
CONTIGENCY (20%)			\$ 231,000.00
DESIGN ENGINEERING (10%)			\$ 116,000.00
CONSTRUCTION INSPECTION (20%)			\$ 231,000.00
TOTAL			\$ 1,730,000.00

PHASE 3 TOTAL \$ 1,735,000.00