

Intervale Road

Bicycle and Pedestrian Access Feasibility Study

November 2018

PREPARED FOR



Chittenden County Regional Planning Commission

110 W Canal Street
Suite #202
Winooski, VT 05404
802.846.4490

PREPARED BY



VHB

40 IDX Drive, Building 100
Suite 200
South Burlington, VT 05403
802.497.6100

WITH SUPPORT FROM



**BURLINGTON
PARKS
RECREATION
WATERFRONT
VERMONT**

**City of Burlington Public Works and Parks,
Recreation & Waterfront Departments**

645 Pine Street
Burlington, VT 05401



This study has been prepared for:

The Chittenden County Regional Planning Commission in partnership with the City of Burlington. The Steering Committee consisted of the following stakeholders:

Chittenden County Regional Planning Commission

Eleni Churchill

Peter Keating

Chris Dubin

City of Burlington Department of Public Works

Nicole Losch

Phillip Peterson

City of Burlington Parks, Recreation, and Waterfront

Dan Cahill

VHB

David Saladino, P.E., AICP

Michael Willard, LEED AP

Erica Quallen, E.I.T.

Intervale Center

Travis Marcotte

Chelsea Frisbee

Andy Jones

Gardener's Supply Company

Ellen Desjardin

Burlington Electric Company

Betsy Lesnikoski

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

Table of Contents

Project Overview..... 1

Project Background.....2

Intervale Center Vision2

Review of Previous Studies3

Existing Conditions.....4

Existing Roadway and Traffic Data.....5

Crash Data6

Cultural and Natural Resources6

Events at the Intervale6

Intervale Trail Network7

Winooski Valley Parks District.....7

Burlington Community Garden.....7

Joseph C. McNeil Generating Station.....7

Alternatives Analysis 8

Planning and Design Criteria9

Public Participation9

Asphalt Segment of Intervale Road.....10

Gravel Segment of Intervale Road.....13

Evaluation Matrix14

Preferred Alternative 16

Paved Section of Roadway.....17

Gravel Section of Roadway.....18

List of Appendices

- Appendix A** – Natural Resource & Trail Maps
- Appendix B** – Planning and Design Criteria
- Appendix C** – Alternative Design Plans
- Appendix D** – Conceptual Cost Estimate
- Appendix E** – Evaluation Matrix



1

Project Overview

The Chittenden County Regional Planning Commission (CCRPC), the City of Burlington, and project stakeholders worked collaboratively to identify a preferred approach for improving accessibility and safety for all modes along Intervale Road in Burlington, Vermont. The Intervale is a dense agricultural center for the City and is increasingly becoming a community and recreational hub for residents and visitors alike. This study assesses existing conditions, evaluates a set of alternatives, and determines a preferred design alternative for bicycle and pedestrian accessibility improvements along the full length of Intervale Road from Riverside Avenue to north of the Tommy Thompson Community Gardens.

Project Background

The Chittenden County Regional Planning Commission (CCRPC), the City of Burlington, and project stakeholders collaborated on a study to identify a preferred approach for improving accessibility and safety for pedestrians and cyclists along Intervale Road in Burlington, Vermont.

This study advances the recommendations from the Intervale Master Plan, which outlined walking and cycling options from Riverside Avenue into the Intervale. This study assesses existing conditions using updated topographic and boundary survey data, evaluates a set of alternatives, and identifies a preferred alternative for multimodal improvements along Intervale Road. See Figure 1 for the extents of the study area.

The study area runs along Intervale Road from Riverside Avenue north approximately 4,500 feet to the Pent Gate at the northerly limits of the City-maintained portion of Intervale Road.

Intervale Center Vision

The Intervale Center has nearly one million dollars-worth of planned improvements that are anticipated to be completed in the coming years. These improvements include historic preservation enhancements, agricultural facility upgrades, new parking and circulation improvements, and improved amenities for greater community access.

The Intervale has the potential to create a district of its own, complete with enhanced wayfinding, ornamental streetscaping, and a robust collection of community gardens, trails, and spaces for local events. A major part of this vision is to make it accessible for all users trying to access this area. Intervale Road currently does not have any facilities for bicycles or pedestrians which makes site access a challenge and potentially unsafe for cyclists and walkers.

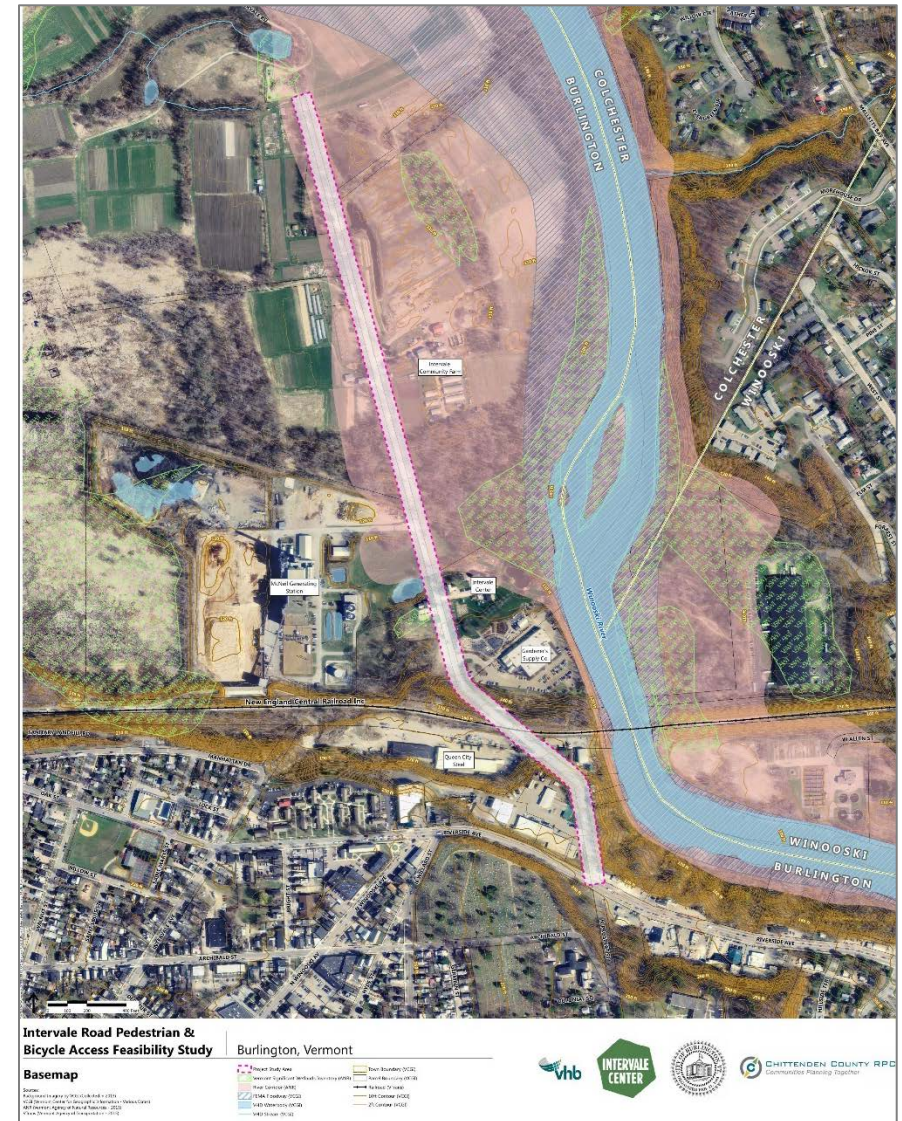


Figure 1: Project Area Base Map

Intervale Road is approximately 4,500 feet long and paved for roughly 1,500 feet from Riverside Ave to the McNeil Plant Driveway. It is city-owned and maintained, providing access to various private and public farms as well as city facilities.



Figure 2: Previous Planning Efforts

Various Chittenden County plans identify Intervale Road as a corridor which should be improved for active modes of transportation, especially cycling.

Review of Previous Studies

Intervale Road has been identified as a **Bicycle Street** in Burlington's 2011 Transportation Master Plan and Complete Street Guidance. The Bicycle Street classification means that the corridor should include five-foot minimum bike lanes and narrowed travel lanes. Under this category, travel lanes can be as narrow as ten-feet. Traffic calming measures are also encouraged on Bicycle Streets.

In addition, Intervale Road and/or the intersection of Intervale Road and North Prospect Street at Riverside Avenue has been identified as an area of interest in the following studies.

The **PlanBTV Walk Bike Master Plan**¹ suggests an advisory lane to improve bicyclist safety on Intervale Road. This treatment is usually used on low-volume roads and warns drivers to the likelihood of encountering a cyclist on the road.

The **2017 Winooski Transportation Master Plan**² proposed a new path along the Railroad Right-of-Way which would connect Clifford Street and River Street with Intervale Road via a pedestrian bridge adjacent to the rail bridge across the Winooski River.

Chittenden County Active Transportation Master Plan³ identifies Intervale Road as a connection to an existing facility which is part of the "Cycle the City" network. It is also noted that Intervale Road is ranked as a high feasibility corridor for implementation of bicycle and pedestrian improvements.

¹ PlanBTV Walk Bike Master Plan, DuBois & King, et. al. Burlington, VT. 17 March 2017

² 2017 Winooski Transportation Master Plan, VHB. Winooski, VT. March 2017.

³ Chittenden County Active Transportation Master Plan, CCRPC. Winooski, VT. 19 April 2017.

2 Existing Conditions

The first phase of this feasibility study is to gather information to provide a clear picture of the existing state of Intervale Road. The existing conditions assembled for this study include topographic, boundary mapping, and geometric information, traffic volumes, crash data, natural resources, and the surrounding characteristics of the area. A robust knowledge of the existing conditions helps to create more realistic and feasible alternatives which are evaluated as a later step in the project scoping process.



Existing Roadway and Traffic Data

Right of Way (ROW): 3 rods (49.5 feet) from Riverside Ave to south of Gardener's Supply Company Driveway

2 rods (33 feet) north of Gardener's Supply Company Driveway

Roadway Length:

- Asphalt – 1,500 feet
- Gravel – 3,000 feet

Roadway Geometry: Varies between 18 – 28' of pavement width with no striping

Speed Limit: 25 mph

Surrounding Characteristics:

- Utility poles on east side of road and switches to west side 300 feet north of railroad crossing
- Railroad crossing 950 feet north of Riverside Avenue

Pedestrian Facilities: None

Bicycle Facilities: None

Land Uses:

- Burlington Electric McNeil Generating Station
- Gardener's Supply Company Store and Headquarters
- Intervale Farm and Trailhead Access
- Burlington Community Gardens
- City of Burlington Water Division Soil Yard



Figure 3: Intervale Road (Looking North from Railroad Tracks)

Intervale Road has a posted speed limit of 25mph and no on-road striping for lane assignments.

Crash Data

Between 2012 and 2016, there were three reported crashes on Intervale Road. Two of these crashes resulted in property damage only. One crash resulted in an injury and none involved a cyclist or pedestrian. This area is not listed as a High Crash Location by VTrans for this time period⁴.

Cultural and Natural Resources

A desktop review of cultural and natural resources found the following natural resources in the project area:

- Significant wetlands are located along the Winooski River and in northern Intervale Community Farm fields;
- A closed wood ash landfill is located in the northwest corner of the McNeil Generator Station Property;
- Significant Natural Community of Silver Maple-Ostrich Fern Riverine Floodplain Forest.

A map of all natural resources in the area can be seen in Figure 4. A full-size map can be found in the appendix.

Events at the Intervale

Throughout the year, the Intervale Center hosts a variety of events such as Summervale, Wintervale, weddings, and agricultural events. In 2017, there were an average of over 800 people in attendance at each Summervale event. A traffic count done by VHB found that approximately 30% of Summervale attendees walked, 10% rode their bike, and the rest arrived by car.

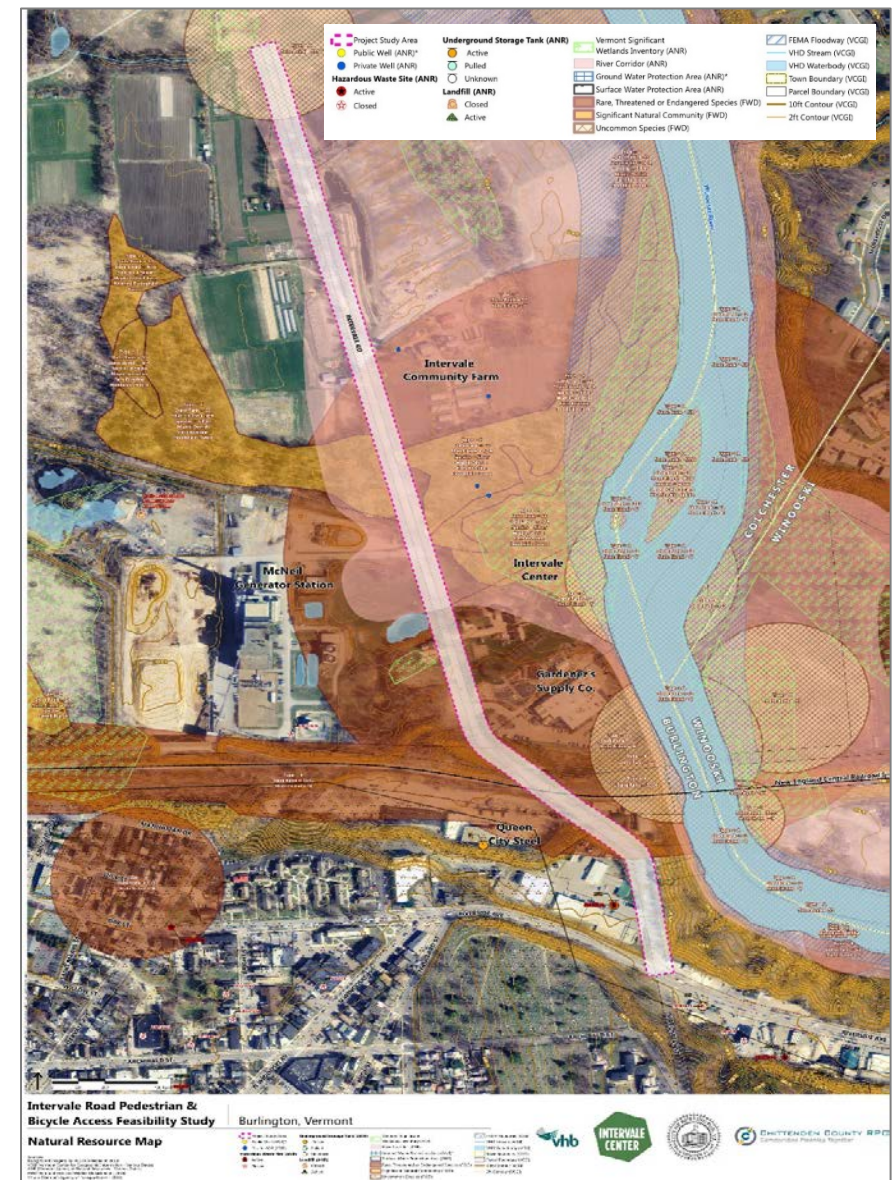


Figure 4: Natural Resource Map

⁴ High Crash Location Report: Sections and Intersections (2012-2016), Vermont Agency of Transportation, Office of Highway Safety Division, August 2017.

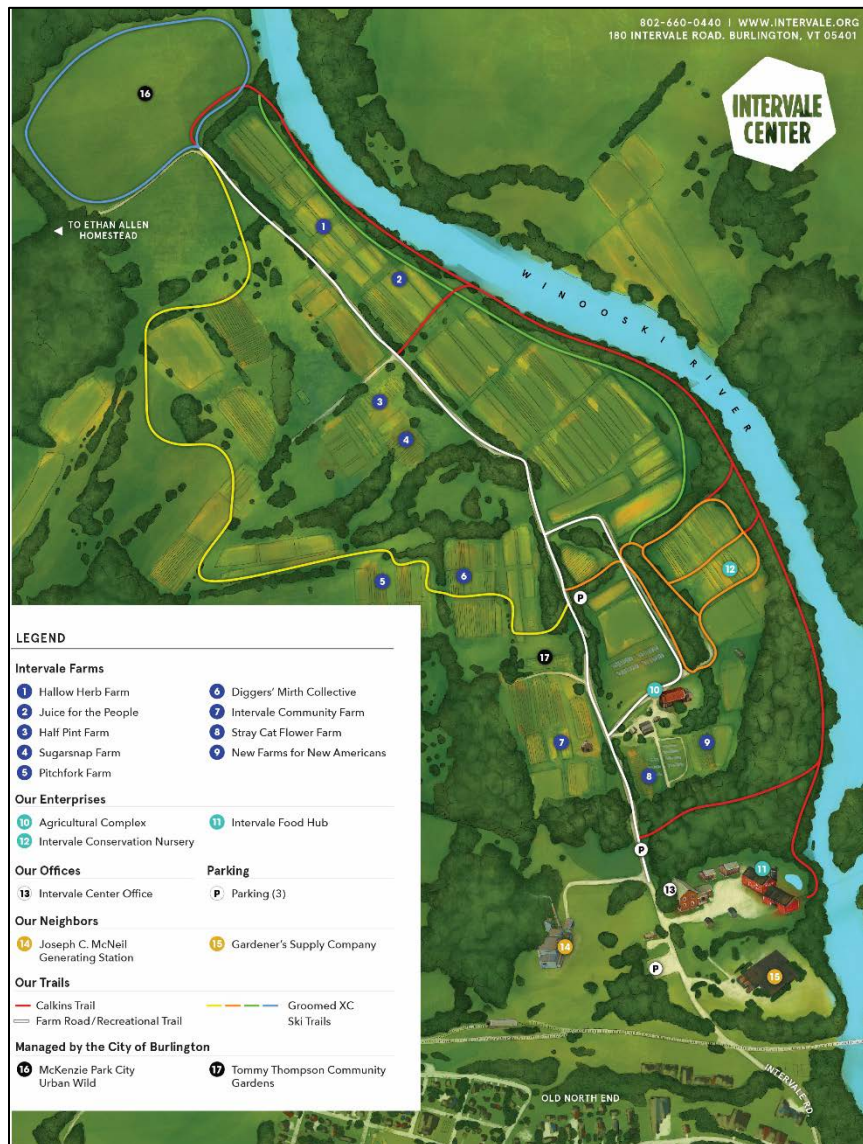


Figure 5: Intervale Trail Map

The Intervale Trail System meanders near the Winooski River with opportunities to connect through various farms. (Image courtesy of the Intervale Center)

Intervale Trail Network

The Intervale Center has an existing robust trail network which provides access to the Winooski River corridor and connects many of the farms within the Intervale. The Intervale bike path begins at the end of Intervale Road and continues to the Ethan Allen Homestead in the New North End of Burlington. A map of the current Intervale Trail Network can be seen to the left.

Alternatives for the gravel section of Intervale Road are intended to be able to interact easily with the existing trail network by providing access to the commonly used trailheads.

Winooski Valley Parks District

Salmon Hole Park and the Riverwalk Trail are located along the Winooski River southwest of the Winooski One Hydro Dam. The Riverwalk Trail is 0.8-mile trail connecting Salmon Hole Park on Riverside Avenue to a scenic viewing area near the southern end of Intervale Road.

Burlington Community Garden

The Tommy Thompson Community Garden began in 1975 and is named after Tommy Thompson, who started the Community Garden initiative in Burlington. This garden is home to 150 plots maintained by over 300 gardeners and is part of a vibrant network of 14 community gardens across Burlington.

Joseph C. McNeil Generating Station

The McNeil Generating Station is co-owned by Burlington Electric Department, Green Mountain Power, and Vermont Public Power Supply Authority. The generating station generates approximately 50 megawatts of electricity and operates mainly on wood chips which come from within 60 miles of the station.

3 Alternatives Analysis

The alternatives analysis process involves the development of design alternatives for both the paved segment and the gravel segment of Intervale Road. These designs were developed in concert with the Project Steering Committee and then evaluated through various means: public input, stakeholder comment, and a technical evaluation matrix. These methods of evaluation were then reviewed by the Steering Committee to arrive at a locally preferred alternative.



Planning and Design Criteria

At the onset of the alternatives development process, planning and design criteria were assembled from various sources. These criteria provided the basis for design to ensure that the alternatives presented in this study are feasible and correlate with the existing standards for the City of Burlington and State of Vermont. The criteria selected includes preferred lane width, sidewalk width, and stopping sight distance. The major sources used for this study are *A Policy on Geometric Design of Highways and Streets* and *The City of Burlington's Complete Streets Guidance*. A copy of the planning and design criteria table is shown in Table 1.

Public Participation

Public input was gathered at multiple points throughout the planning, design, and evaluation stages of this study. A Local Concerns Meeting was held on January 1, 2018 to gather initial thoughts on potential alternatives to be considered in this study. On June 18, 2018, a second public meeting was held to solicit feedback on the alternatives which were a result of public, advisory committee, and technical input. This meeting was held at the Intervale Center and provided an interactive opportunity for the public and Intervale stakeholders to see the alternatives, ask questions of the project team, and provide their thoughts on their preferred alternative. Copies of the public comments received at this meeting can be found in the Appendix.

Table 1: Planning and Design Criteria

	Intervale Road	Standard Reference
AADT (2003)	1,300	
Complete Street Classification	Bicycle Street	(2)
Posted Speed Limit	25 mph	
Stopping Sight Distance	155 feet	(1)
Lane Width		(2)
Minimum	10 feet	
Existing	14 feet unstriped	
Planting Strip		(2)
Minimum Width	5 feet	
Existing	None	
Sidewalks		(2)
Minimum Width	5 feet	
Existing	None	
Bike Lanes		(2)
Minimum Width	5 feet	
Existing	None	

- (1) *A Policy on Geometric Design of Highways and Streets, 6th Ed.* American Association of State Highways and Transportation Officials, Washington, DC. 2011.
- (2) *Burlington Complete Streets Guidance, Draft.* Burlington Department of Public Works, January 2013.

Asphalt Segment of Intervale Road

The asphalt segment of Intervale Road goes from Riverside Avenue at the southern end and continues north for approximately 1,500 feet to the McNeil Generator Station Driveway. Three alternatives were created for this section of roadway and are presented in the following sections.

Alternative 1

The first alternative analyzed along the paved section of Intervale Road involves the addition of striping to the existing roadway without any additional construction. No pedestrian accommodations are included as part of this alternative.

The striping includes center yellow lines, white edge lines, and shared lane markings for bicycles. The striping is intended to keep vehicles on the proper side of the roadway, particularly around the curves, and provide increased visibility for bicyclists along the roadway. In addition to striping, new signage is proposed to further increase bicyclist and pedestrian visibility. A cross section of this alternative is shown in Figure 6.

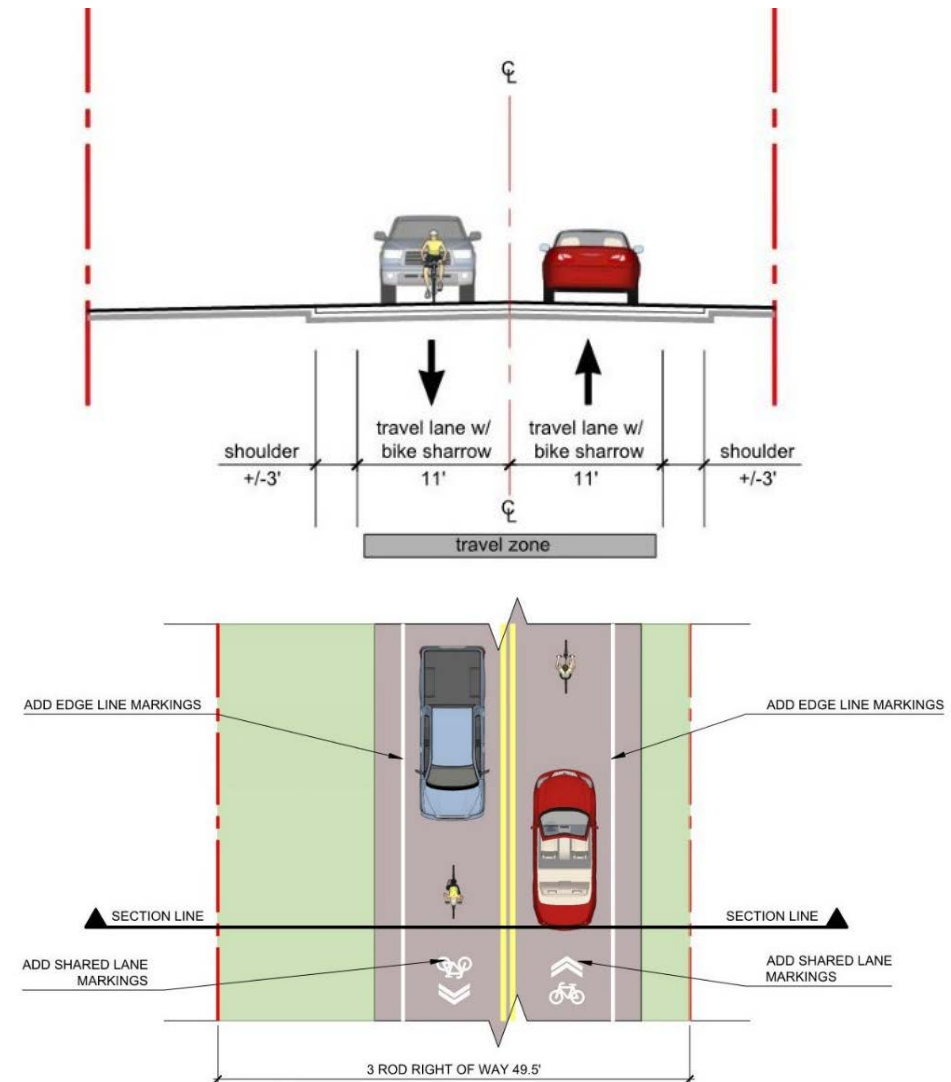


Figure 6: Alternative 1 (Asphalt Segment)

Alternative 2

The second paved segment alternative includes the widening of Intervale Road to the west to accommodate construction of a shared use path as shown in Figure 7. The proposed travel way is made up of a two-foot eastern shoulder, two 11-foot travel lanes with "sharrows", a three-foot striped buffer which may include physical barriers such as bollards, curb, or planters, and an at-grade eight-foot shared use path. At two points along the corridor, the shared use path cuts into a steep slope and requires new retaining walls in both of these areas. The western side of the road was selected for the shared use path as there is less earthwork required for construction and provides greater separation for vulnerable users from trucks travelling downhill at higher speeds.

The intent of this alternative is to increase visibility and provide separation for bicyclists and pedestrians along the corridor at a lower cost. Drivers should be more aware of cyclists who choose to use the road through the inclusion of the shared lane markings in the travel lanes and signs along the roadway. PlanBTV Walk Bike recommended advisory lanes along this corridor but this was not advanced after receiving feedback on the high volume of trucks along this corridor servicing the McNeil generating station.

For pedestrians and bicyclists who do not feel comfortable on the road, a separated facility is provided in the form of a shared use path on the western side of the roadway. As with Alternative 1, center line and edge line markings are recommended.

The current Right-of-Way along Intervale Road varies from 3-rod (49.5 feet) to 2-rod (33 feet) as the roadway travels north. When the ROW narrows to 33 feet, an expansion of the ROW would be required to accommodate the shared use path on the western side of the roadway. This expansion would occur on City owned property. These impacts are shown in the alternative plans provided in the Appendix.

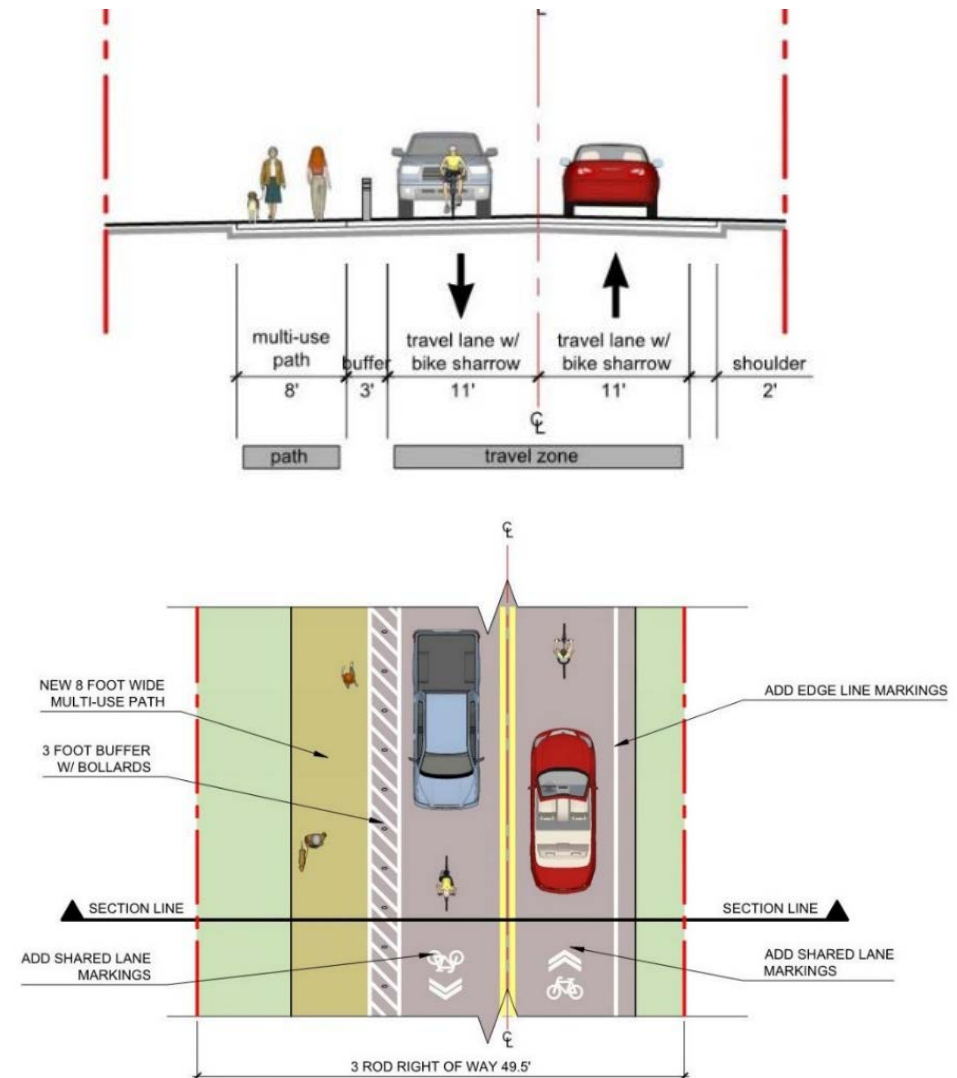


Figure 7: Alternative 2 (Asphalt Segment)

Alternative 3

The third paved alternative includes the most robust changes and improvements to the roadway. The changes associated with this alternative are the inclusion of a curb-separated ten-foot shared use path with three-foot vegetated buffer and the striping of two 11-foot travel lanes with shared use markings in both directions. This alternative requires the construction of closed drainage infrastructure to accommodate stormwater runoff. As with the second alternative, the shared use path cuts into a steep western slope at two points along the corridor and requires retaining walls in these locations. A cross-section of this alternative is shown to the right.

This alternative also focuses on the improved visibility and separation from vehicles for vulnerable users which was mentioned in the previous alternative. The intention of this alternative is that cyclists that are comfortable on the road will continue to use the road and drivers will be made more aware of their presence through the inclusion of shared use pavement markings and improved signage. All pedestrians and any cyclist not comfortable using the road would have a wider shared use space that could accommodate all of these modes. It is also recommended that pedestrian-scale, ornamental lights be included in the vegetated buffer to improve visibility of roadway users as well as improve aesthetics along the roadway.

The current Right-of-Way along Intervale Road varies from 3-rod (49.5 feet) to 2-rod (33 feet) north of the Gardener's Supply driveway. When the ROW narrows to 33 feet, an expansion of the ROW would be required to accommodate the shared use path on the western side of the roadway. Again, this expansion would occur on City owned property. These impacts are shown in the complete plans provided in the Appendix.

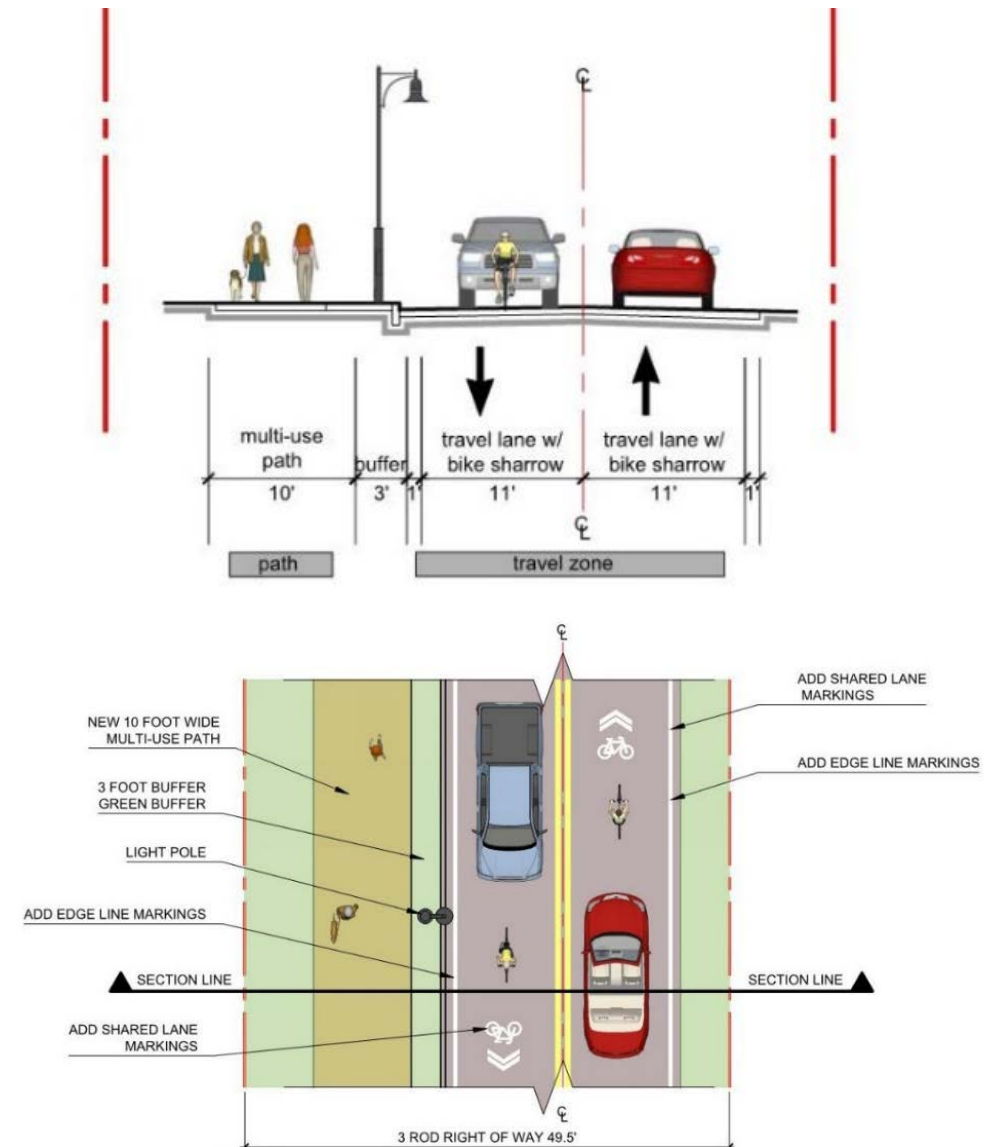


Figure 8: Alternative 3 (Asphalt Segment)

Gravel Segment of Intervale Road

The gravel segment of Intervale Road is approximately 3,000 feet in length and goes from the McNeil Generating Station driveway to the Pent Gate at the end of the City of Burlington's Right-of-Way. The two alternatives analyzed for this segment of roadway are summarized in the following sections.

Alternative 1

The first alternative proposed for the gravel section of Intervale Road involves maintaining the current road width and creating a natural barrier along the roadway between a five-foot pedestrian space and a narrow vehicle travel space. This barrier could be created using large planters, boulders, or bollards which would be spaced such that a vehicle could pull into this space to allow for passage of vehicles in the opposing direction. This configuration may present challenges for large farm equipment.

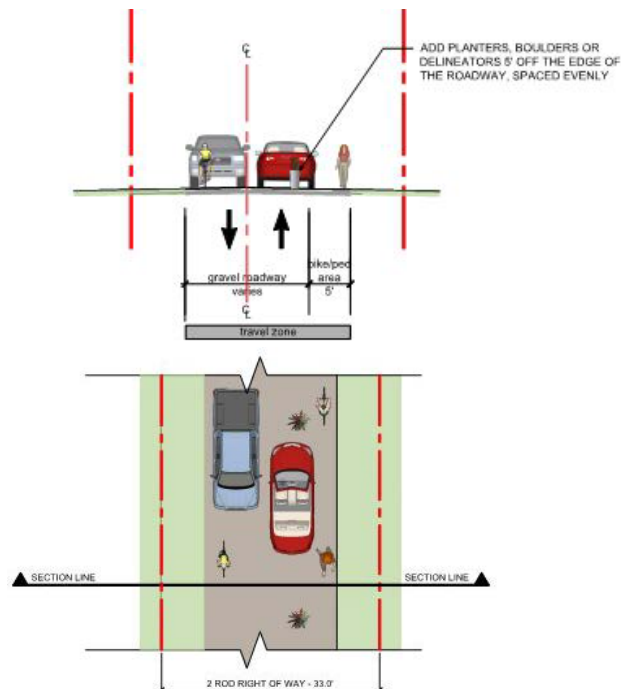


Figure 9: Alternative 1 (Gravel Segment)

Alternative 2

The second alternative along the gravel portion of the roadway proposes the construction of a five-foot separated stone dust path on the eastern side of the roadway. The western edge of the path would be offset five-feet from the edge of the gravel roadway with variations along the alignment to avoid any large legacy trees. The eastern side of the roadway was chosen for this design because most trailheads and parking areas are located on the eastern side of the road. As the current Right-of-Way is only 33-feet wide, the path would be almost entirely on Intervale Center property. This would either require a partnership between the City and the Intervale or the City to expand its ROW lines to include the path or the Intervale Center could construct the path entirely outside the ROW and be responsible for future maintenance.

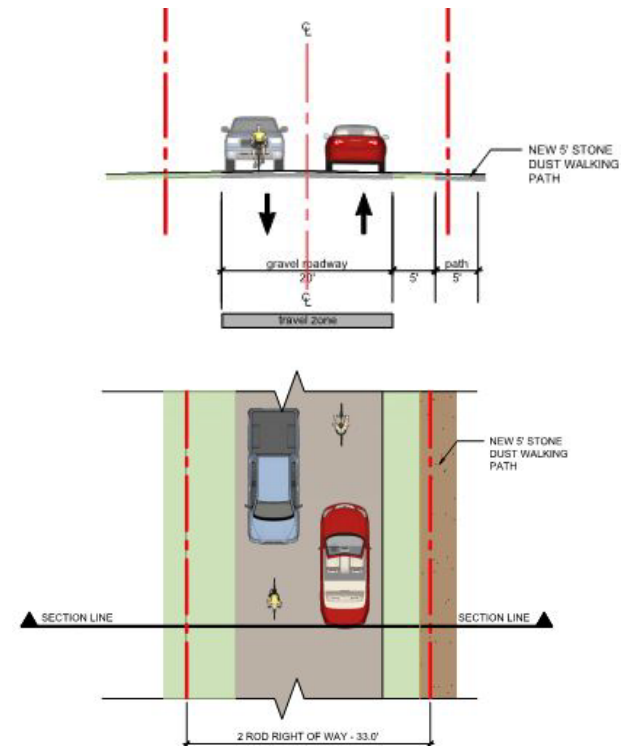


Figure 10: Alternative 2 (Gravel Segment)

Evaluation Matrix

The evaluation matrix shown in Figure 11 on the following page uses an objective approach to score each alternative based on expected costs, improvements to safety and access, environmental impacts, and permitting needs.

Costs

Costs for each alternative were calculated using pay item unit costs provided by VTrans or from previous projects and bid histories. The total estimated costs, including construction, engineering, permitting, and contingency for each alternative are as follows:

- Paved Alternative 1 - \$10,000
- Paved Alternative 2 - \$960,000
- Paved Alternative 3 - \$1,670,000
- Gravel Alternative 1 - \$9,000
- Gravel Alternative 2 - \$230,000

Engineering

This section of the matrix discusses changes in access, safety, and ROW impacts for each alternative. Bicycle and pedestrian access are improved in nearly every alternative to some extent for the paved segment of Intervale Road. The improvements range from pavement markings at the least to fully separated areas at the best. Bicycle access is not expected to change for the second gravel alternative as it is anticipated bicyclists will continue to use the roadway. As discussed in previous sections, there are expected ROW impacts for all alternatives, except for the first alternatives along both segments of roadway.

Impacts

The impact section of the of the Evaluation Matrix evaluates archeological, historical, hydrologic, and ecologic impacts based on the proposed construction. These impacts are estimated based on a desktop review of existing GIS data available in the area and field

investigations. There will likely be archeological impacts for all alternatives, except for the first paved and gravel alternatives as The Intervale is an area with known archeological resources. There are potential impacts to the floodplain, wetlands, and various fish and wildlife species with any construction in this area due to the proximity to the Winooski River.

Local Criteria

Aesthetics and Community Character were evaluated on a more subjective level for each alternative. The inclusion of pavement markings in Alternative 1 is not going to change the aesthetics of the area but all other alternatives will improve the character and aesthetics at some level. This was evaluated based on the creation of and access to community areas along Intervale Road. The third alternative for the paved section was assumed to highly improve both aesthetics and community character by creating a welcoming environment for all roadway users and improving aesthetics through ornamental lighting, plantings, and other features.

Figure 11: Evaluation Matrix

		Asphalt Segment (Riverside Avenue to McNeil Plant)			Gravel Segment (McNeil Plant to Pent Gate)		
		No Build	Alternative 1 Shared Lanes	Alternative 2 Shared Lanes + 8' Path	Alternative 3 Shared Lanes + 10' Path + Lighting	Alternative 1 Shared Road w/ Dividers	Alternative 2 5' Aggregate Path
Costs	Engineering, Permitting, Construction Inspection	\$0	\$2,000	\$150,000	\$410,000	\$0	\$40,000
	Roadway/Path Construction	\$0	\$8,000	\$810,000	\$1,260,000	\$9,000	\$190,000
	Total*	\$0	\$10,000	\$960,000	\$1,670,000	\$9,000	\$230,000
Engineering	Typical Section	No Change	11' Shared Use Lanes Striped Shoulders (1'-3')	11' Shared Use Lanes 3' Striped Buffer 8' Shared Use Path	11' Shared Use Lanes 3' Curbed, Landscaped Buffer 10' Shared Use Path	+/- 15' Unstriped Gravel Roadway 5' Separated Bike/Ped Area	+/- 20' Unstriped Gravel Roadway 5' Natural Pathway with 5' Separation from Roadway
	Bicycle Access	No Change	Shared Use Lane Markings	Shared Use Lane Markings 8' Shared Use Path	Shared Use Lane Markings 10' Shared Use Path	Separated Area	No Change
	Pedestrian Access	No Change	Delineated Shoulders	Shared Use Path	Curb Separated Shared Use Path	Separated Area	Separated Walkway
	Vehicle Safety	No Change	Narrowed Lanes	Narrowed Lanes	Narrowed Lanes	Narrowed Lanes	No Change
	ROW Impacts	None	None	Minor Shared Use Path encroaches on private property from Gardener's Supply Company driveway to Intervale Center Entrance	Minor Shared Use Path encroaches on private property from Gardener's Supply Company driveway to Intervale Center Entrance	None	Minor All impacts occurring on Intervale Center land which has shared interest in a partnership
Impacts	Agricultural Lands	None	None	None	None	None	Likely
	Archaeological	None	None	Likely	Likely	Likely	Likely
	Historic	None	None	None	None	None	None
	Hazardous Materials	None	None	None	None	None	None
	River Corridor	None	None	Potential	Potential	Potential	Potential
	Fish & Wildlife	None	None	None	None	None	None
	Rare, Threatened & Endangered Species	None	None	Potential	Potential	Potential	Potential
	Wetlands	None	None	Potential	Potential	Potential	Potential
	New Impervious Surfaces	None	Very Minor	Yes	Yes	None	Yes
	Stormwater Accommodations	No Change	No Change	No Change	Curb and Closed Drainage Added	None	None
Local	Aesthetics	No Change	No Change	Improved	Highly Improved	Improved	Improved
	Community Character	No Change	No Change	Improved	Highly Improved	Improved	Improved

* Total estimated cost includes 25% contingency. Does not include right-of-way costs.

4 Preferred Alternative

Based on the Evaluation Matrix and public input, the Steering Committee concluded that the preferred alternative is Alternative 3 along the asphalt segment and Alternative 2 along the gravel segment of Intervale Road. This chapter discusses the logistics of implementation and presents recommendations for future efforts related to this project.



Paved Section of Roadway

The preferred alternative selected for the paved section of Intervale Road is Alternative 3 which includes a curb separated ten-foot shared use path, a mostly reconstructed roadway with new pavement markings, two retaining walls, and ornamental features in the vegetated buffer.

Right-of-Way Impacts

As was previously described, the ROW narrows from 49.5-feet to 33-feet south of the Gardener's Supply Company driveway. At this point, the proposed shared use path encroaches onto property outside of the ROW. In this location, the property is owned by the City of Burlington and can be constructed on without any property acquisition. It is recommended that the official ROW lines be expanded to 49.5-feet for approximately 800-feet through this area for consistency. It can then return to 33-feet at the beginning of the gravel roadway.

Implementation Plan

This alternative has the most comprehensive improvements of all of the proposed alternatives and the components of this design could be implemented using a phased approach if the project could not be funded as a stand-alone project. Elements that could be constructed separately are described below with approximate costs. The costs shown here include design, permitting, construction, and a contingency. If the elements were to be constructed separately, the costs would be higher.

- Shared Use Path (with or without curb) and retaining walls - \$800,000 - \$1,000,000
- Curbed Vegetated Buffer (with or without lighting and amenities) - \$200,000 - \$700,000
- Roadway Reconstruction with Updated Pavement Markings - \$300,000

Total Cost

The total cost for the preferred alternative includes a ten-foot curbed shared use path, partial roadway reconstruction, two retaining walls, an upgraded railroad crossing, new crosswalks at the Intervale Center, and landscaping for the greenbelt. In addition to the material costs, there is also a 25% contingency, 15% mobilization and traffic control, 15% engineering and design, and 10% resident construction engineering incorporated into the total cost. The total costs for the preferred design is \$1,670,000. A detailed cost estimate is provided in the Appendix. As previously mentioned, this could be phased if the entire sum is not readily available. It is recommended that the City add the Intervale Road bicycle and pedestrian improvements to their list of projects and begin applying for funding for the design and construction of the proposed project.



Figure 12: CAD Sketch of the Preferred Alternative at New England Central Railroad Crossing

Gravel Section of Roadway

The preferred alternative selected for the gravel section of Intervale Road is Alternative 2 which includes a five-foot stone dust path on the eastern side of the roadway and a regrading of Intervale Road. The edge of the path is separated five-feet from the edge of the gravel roadway.

Right-of-Way Impacts

As was previously described, the ROW is 33-feet wide along the gravel section of Intervale Road. The proposed path is located entirely on Intervale Center property. In order to build the path as a public utility, the ROW would have to be widened or an easement would have to be acquired. If the path were to be constructed and maintained by the Intervale Center, they would be solely responsible for all capital, operating, and maintenance costs.

Implementation Plan

This alternative only contains one element, so it would be constructed at once, unless the length of the path was created in segments. Discussions with the Intervale Center indicated that there is a possibility of this being constructed in the near future if it were to be built as a volunteer effort. The Intervale often hosts volunteer days for local companies or farmers and this path could be constructed as labor and materials are available.

Total Cost

The total cost for the preferred alternative includes a five-foot stone dust path and tree trimming and thinning. In addition to the material costs, there is also a 25% contingency, 15% mobilization and traffic control, 15% engineering and design, and 10% resident construction engineering included in the total cost. The total costs for the preferred design is \$230,000. A detailed cost estimate is provided in the Appendix. As previously mentioned, this could be done using volunteers and would therefore dramatically reduce costs. Material costs are estimated at approximately \$150,000.

Path Ownership Implications

As mentioned, this path could be owned and maintained by either the City or the Intervale Center. If the City were to own and maintain the path, the design would have to follow standards set forth by the state, federal government, and the Americans with Disabilities Act. These standards require stricter conformance to preferred grades and material specifications to ensure universal accessibility.

If the Intervale Center were to own and maintain the path, these standards would not have to be complied with and it could be treated like other trails which already exist on the property.



Figure 13: CAD Sketch of the Preferred Alternative