BICYCLE & PEDESTRIAN PATHWAY SCOPING STUDY STP BIKE (53) SPRINGFIELD, VERMONT

October 7, 2014

Submitted to:

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Presented By:

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TABLE OF CONTENTS
BICYCLE AND PEDESTRIAN PATHWAY SCOPING STUDY
SPRINGIELD, VERMONT
October 7, 2014

LIST OF FIGURES
BICYCLE AND PEDESTRIAN PATHWAY SCOPING STUDY
SPRINGIELD, VERMONT
October 7, 2014

LIST OF TABLES
BICYCLE AND PEDESTRIAN PATHWAY SCOPING STUDY
SPRINGIELD, VERMONT
October 7, 2014

APPENDICES
BICYCLE AND PEDESTRIAN PATHWAY SCOPING STUDY
SPRINGIELD, VERMONT
October 7, 2014

SECTION 1
SUMMARY

The objective of this project is to create a safe route for pedestrians, bicyclists and other potential recreational users to travel from the Springfield downtown area to the North Springfield recreational facilities. The study includes an evaluation of the following options as possible corridors for reaching North Springfield:

1. Option 1 — Local roads in Springfield downtown and North Springfield with a cross country route along the Black River
2. Option 2 — Route 106 and Reservoir Road
3. Option 2b — Route 106 and Maple Street
4. Option 3 — Local roads for the entire route including the entire length of Fairgrounds Road

Characteristics for each of these alternatives routes were reviewed including right-of-way widths, roadway features, traffic data, historic/archaeological features, natural resources and other environmental impacts.

An Archeological Resource and Historical Preservation Assessment was completed which identified the portions of the route parallel to the Black River as “on or adjacent to locations with high potential for pre-contact and historic archeological deposits”. For the other portions of the study area the report notes that the majority of these corridors have been disturbed during grading and roadway construction therefore impacts are not expected, provided the route utilizes existing sidewalks and roadways. When the proposed route is further defined during final design, the potential for archaeological impacts should be reviewed again if the cross country route is the selected option. This review consists of conducting a Phase IB archaeological reconnaissance survey.

Three environmental issues were identified for the Option 1 route. No environmental issues were identified for the other routes. The environmental issues for Option 1 include:

1. Class II wetlands adjacent to the Recycling Center.
2. Black River floodway and 100 year flood plain.
3. Hazardous waste sites on Riverside Middle School property.

The alternative routes were reviewed at a Local Concerns meeting. As a result of the meeting, the following Purpose and Need Statement was developed.

> *The purpose of the project is to create a multi-use path from Riverside Middle School to the North Springfield Reservoir and Springweather Recreational Area located in North Springfield, Vermont.*
>
> *The need for the project is to facilitate the safe movement of bicycles and pedestrians between downtown Springfield and the Village of North Springfield, with connections to the Middle School and Springweather Recreational Area.*

All of the optional routes start at the intersection of Park Street and Main Street and terminate at the North Springfield Reservoir. Following a review of the roadway characteristics for the various routes, the alternatives that utilize existing roadway corridors (Options 2, 2b and 3) were eliminated due to the significant conflicts between vehicles and potential pathway users as described in Section 4. The original extent of the Option 1 route was modified to start at Riverside Middle School (RMS) rather than Park Street, since it would not be feasible to construct a pathway or bicycle lane on Park Street and Pearl Street without acquiring property and removing structures.

The recommended alternative to connect downtown Springfield to the North Springfield recreational facilities is a shared pathway from Riverside Middle School to the Town well field on Fairgrounds Road, with on road bicycle facilities to continue the route north to the reservoir area. The advantages of this route are the scenic aspects of a route along the Black River, the ability to construct a shared pathway and a cross-country route that avoids conflicts between pathway users and vehicular traffic.

Phase 1 of the project is a 6,000 lf (1.1 mile) shared pathway from Riverside Middle School north along the Black River to the Recycling Center. Phase 2 is another 6,000 lf segment from the Recycling Center to the north end of the Town well field on Fairgrounds Road. Bicyclists traveling between the pathway and the North Springfield Reservoir, a distance of about 5,700 ft, will utilize the existing roadway shoulder since the roadways from Fairgrounds Road to the reservoir area are not wide enough to accommodate a bike lane or shared pathway. Improvements to create a sidewalk network to the reservoir are not included in the recommended project.

Alternative materials of construction were considered for the pathway surface. The cost for a bituminous asphalt pavement surface is estimated at about $6/ft more than the cost for a crushed ledge surface. A paved surface is recommended due to the increased durability and the minimal increase in capital costs compared to crushed ledge. The construction cost in 2014 dollars for a paved pathway is estimated at $2,629,000.

The construction costs for sidewalk improvements between the north end of the pathway on Fairgrounds Road and the North Springfield Reservoir are estimated at $739,000 in 2014 dollars. This project consists of new sidewalks on Fairgrounds Roads, Elm Street, and Maple Street and replacement of the existing deteriorated sidewalks on Elm Street and Main Street. If the existing sidewalks are not replaced, the new sidewalk construction cost is estimated at $594,000 in 2014 dollars.

The total project cost for a shared pathway with a paved surface and from Fairgrounds Road to the North Springfield Reservoir is $4,089,000 based on construction in 2014. The total project cost for Phase 1 is $1,895,000 and the total project cost for Phase 2 is $2,194,000. Based on funding under the Bicycle and Pedestrian Program, the local share of the total project cost is $190,000 for the Phase 1 shared pathway project. However, other funding programs have different local match requirements. After the Town reviews and endorses this study, we recommend applying to the VTrans Bicycle and Pedestrian Program for design and construction funds to implement the pathway project.

SECTION 2
EXISTING FACILITIES

Existing Conditions

Study Area

The objective of this project is to create a pathway that provides improved bicycle and pedestrian facilities between the center of Springfield and the Village of North Springfield. The study area, as shown in Figure 2-1, includes the following alternative routes:

1. Option 1 Local roads and a cross country route along the Black River
2. Option 2 Route 106 and Reservoir Road
3. Option 2b Route 106 and Maple Street
4. Option 3 Local roads including Fairgrounds Road

Option 1, as initially delineated by the Springfield Trails and Greenways (STAG) and Town representatives, begins in Downtown Springfield at the intersection of Park Street and Main Street, and continues on Park Street to Pearl Street. At the termination of Pearl Street, the route crosses the Vermont Machine Tool parking lot and the Black River to the Springfield Plaza. After traversing the plaza, the route crosses Route 11 to the Riverside Middle School (RMS) grounds. From RMS, the route continues cross-country, parallel to the Black River, to the north end of Fairgrounds Road and through North Springfield village to the North Springfield Reservoir via Maple Street.

Options 2 and 2b are along the Route 106 corridor from Park Street to the North Springfield Reservoir, with two alternatives (Maple Street and Reservoir Road) to reach the recreational area.

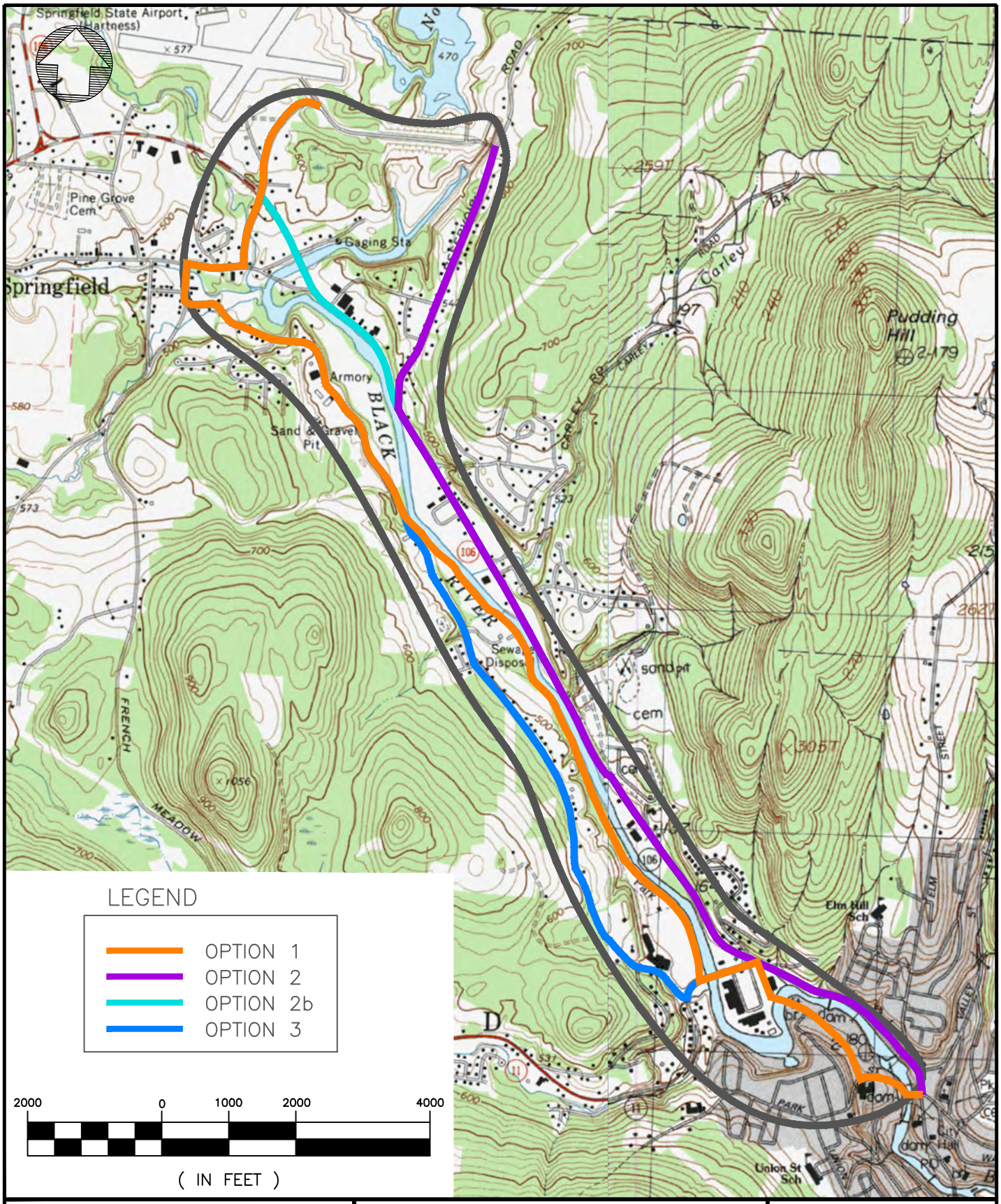
Option 3 is similar to Option 1, but follows Fairgrounds Road for its entire length rather than following a cross country route along the Black River.

Land Uses

Zoning Districts within the study area are shown in Figure 2-2 and include the following five zones:

- Central Business District (Zone CB)
- Medium Density Residential (Zone MDR)
- General Business (Zone GB)
- Land Reserve 10 acre (Zone LR-10)
- Residential Commercial

Riverside Middle School is located at the southern end of Fairgrounds Road and includes sports fields, tennis courts, a skateboard park, a playground, and the Town swimming pool. Other destinations within the pathway study area include the North Springfield Reservoir Springweather Recreational area and the North Springfield Bog west of Fairground Road.



FILE: P:\CADD Files\Springfield VT\Springfield Mixed Use Pathway\CAD BASE MAP.dwg Apr 03, 2014 - 11:48am

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FIGURE 2-1

STUDY AREA AND ROUTE OPTIONS ROUTES 1, 2, 2b, 3

SPRINGFIELD, VERMONT

PROJECT NO. 7130016
PROJECT MJR. NRJ
SCALE 1" = 2000'
DATE JAN. 2014
DRAWING NO. CAD BASE MAP.dwg

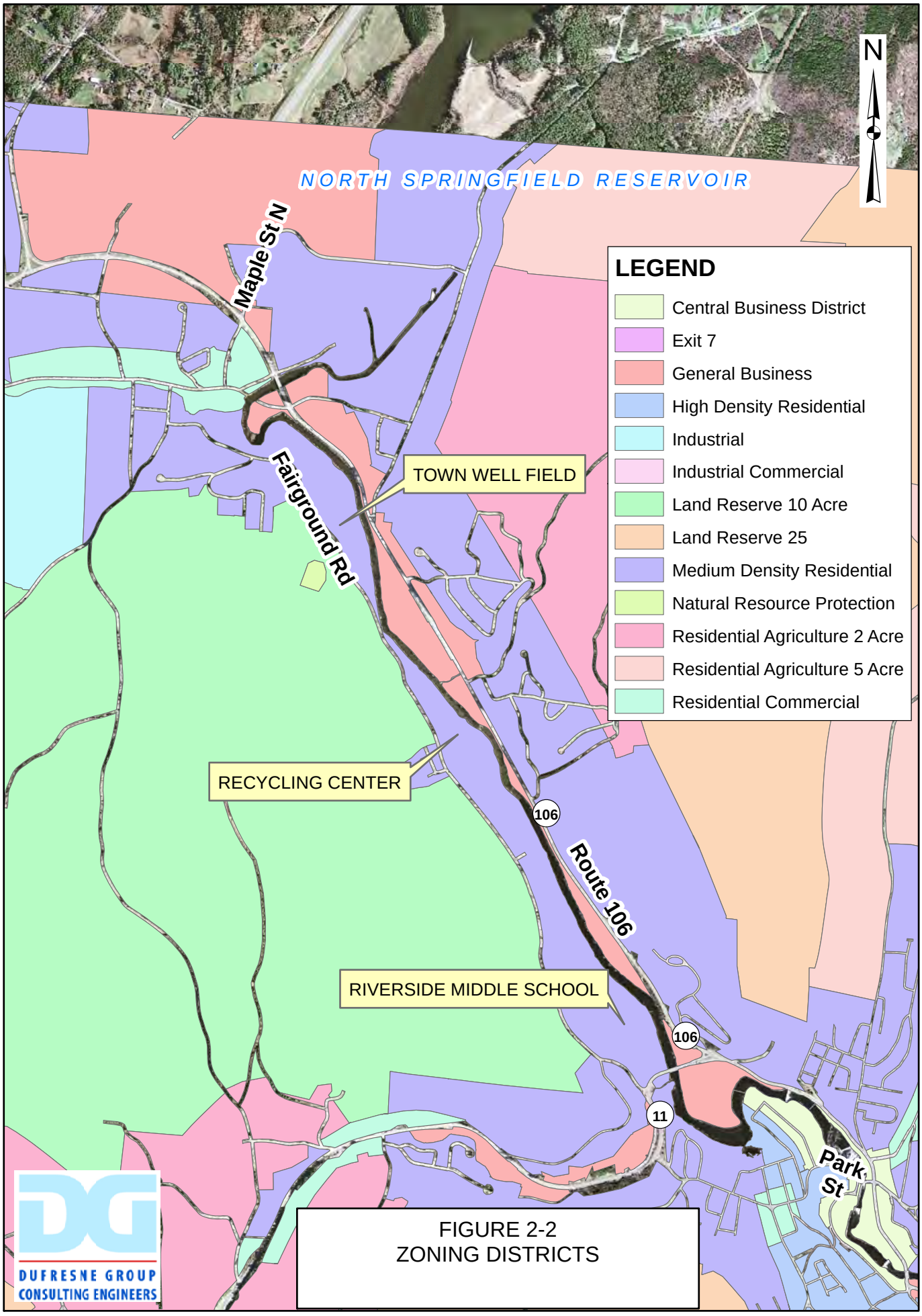


FIGURE 2-2
ZONING DISTRICTS

Transportation Facilities

The roads along each route have various roadway and right of way widths, pedestrian/bicycle facilities and speed limits as summarized in Table 2-1.

TABLE 2-1
EXISTING ROADWAY CHARACTERISTICS
FOR ALTERNATIVE PATH SEGMENTS
SPRINGFIELD, VERMONT
April 1, 2014

Option	Path Segment	Sidewalks[1]	Roadway[2]	Speed limit (mph)	ROW Width (ft)
1	Park Street: Main St. to Factory St.	Dual	2 lane	25	50
1	Park Street: Factory St. to Pearl St.	Single	2 lane	25	30
1	Pearl Street	Single	2 lane	25	30
1	Route 11/South Street	Dual	2-4 lane	25	50
1	Fairgrounds Road (bridge to Elm St.)	None	2 lane	35	50
1	Elm Street	Single (Central St. to Main St.)	2 lane	25	50
1	Main Street North Springfield	Single	2 lane	25	50
1	Maple Street	None	2 lane	25	50
2	Route 106: Park Street to Route 11	Dual	2 lane with marked bicycle lanes	35	Varies. Primarily 50 ft from the 100 River St. complex to Reservoir Road.
2	Route 106: Route 11 to Reservoir Road	Single, terminating 0.5 mile northwest of Rte 11/106 intersection.	2 lane with wide shoulders	40	50
2	Reservoir Road	None	2 lane	25	50
2b	Route 106: Reservoir Road to Maple Street	None except single sidewalk just east of Reservoir Road to Mill Street and dual from Mill Road to west side of bridge over Black River.	2 lane with wide shoulders	40	Varies, 90 ft typical.
3	Fairgrounds Road (Rte 11 to bridge)	None	2 lane	35	50

[1]Dual sidewalk refers to sidewalks on both sides of the road. Single refers to sidewalk on one side of the road.
[2]Roadway widths vary along the segment. Individual characteristics are reviewed within the text.

All of these roads are paved and, with the exception of Routes 11 and 106, the roadway widths average about 24 feet with minimal shoulders. The shared section of Route 11 and 106, from Park Street to the stop light near the Plaza, has marked bicycle lanes. Route 11 has a travelway width of about 40 feet from curb to curb with no marked shoulders. Route 106 has a travelway that is generally 24-26 feet with marked, wide shoulders. Although the shoulder width varies, many sections have 12-14 foot wide shoulders.

Route 106 is a heavily travelled State highway classified as Minor Arterial. According to Vermont Agency of Transportation (VTrans) data, the 2012 Annual Average Daily Traffic (AADT) was 9,700 for the section of Route 106 between Route 11 and Orchard Lane and 8,300 between Orchard Lane and Reservoir Road.

State highway Route 11 is classified as a Major Collector and the VTrans data shows a 2012 AADT of 8,700 between Fairgrounds Road and Route 106.

We obtained VTrans data for high crash locations, compiled for the 2006-2010 period. As shown in Figure 2-3, there are several high crash locations in the study area. These include:

- Route 106 between Brook Road and the 100 River Street complex
- Park Street and South Street
- Route 106/Route 11 intersection to the Fairgrounds Road/Route 11 intersection
- Carley Road/Route 106 to a point approximately 0.3 miles north on Route 106
- Intersection of Maple Street and Route 106

Natural and Cultural Resources

We compiled Geographic Information System (GIS) data available from the Agency of Natural Resources, VT Center for Geographic Information and Southern Windsor County Regional Planning Commission including:

- Utilities
- Surface water
- Rare, threatened and endangered species
- Fluvial erosion hazard areas
- Floodways
- Wetlands
- Ecological habitat
- Hazardous waste sites

The features of interest within the study area include:

1. Class II wetlands
2. 100 year flood plain and the floodway
3. Hazardous waste sites

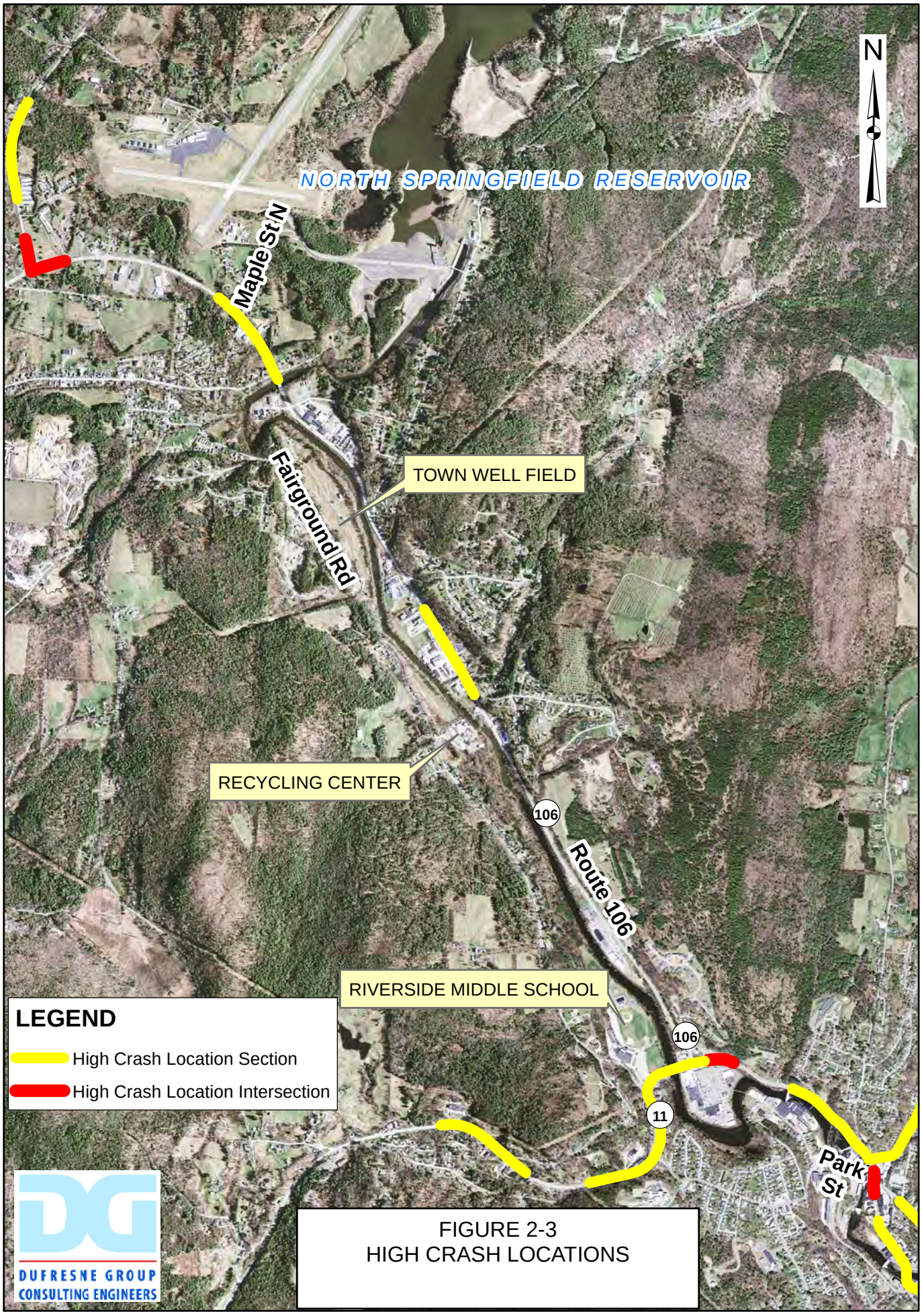


FIGURE 2-3
HIGH CRASH LOCATIONS

There is one Class II wetland along the route of Option 1, according to the Vermont Significant Wetlands Inventory mapping. This wetland is just south of the Springfield Recycling Center on Fairgrounds Road, as shown in Figure 2-4. If Option 1 is selected, a wetland delineation will be necessary during the project design phase and the proposed route will need to comply with the Vermont Wetland Rules.

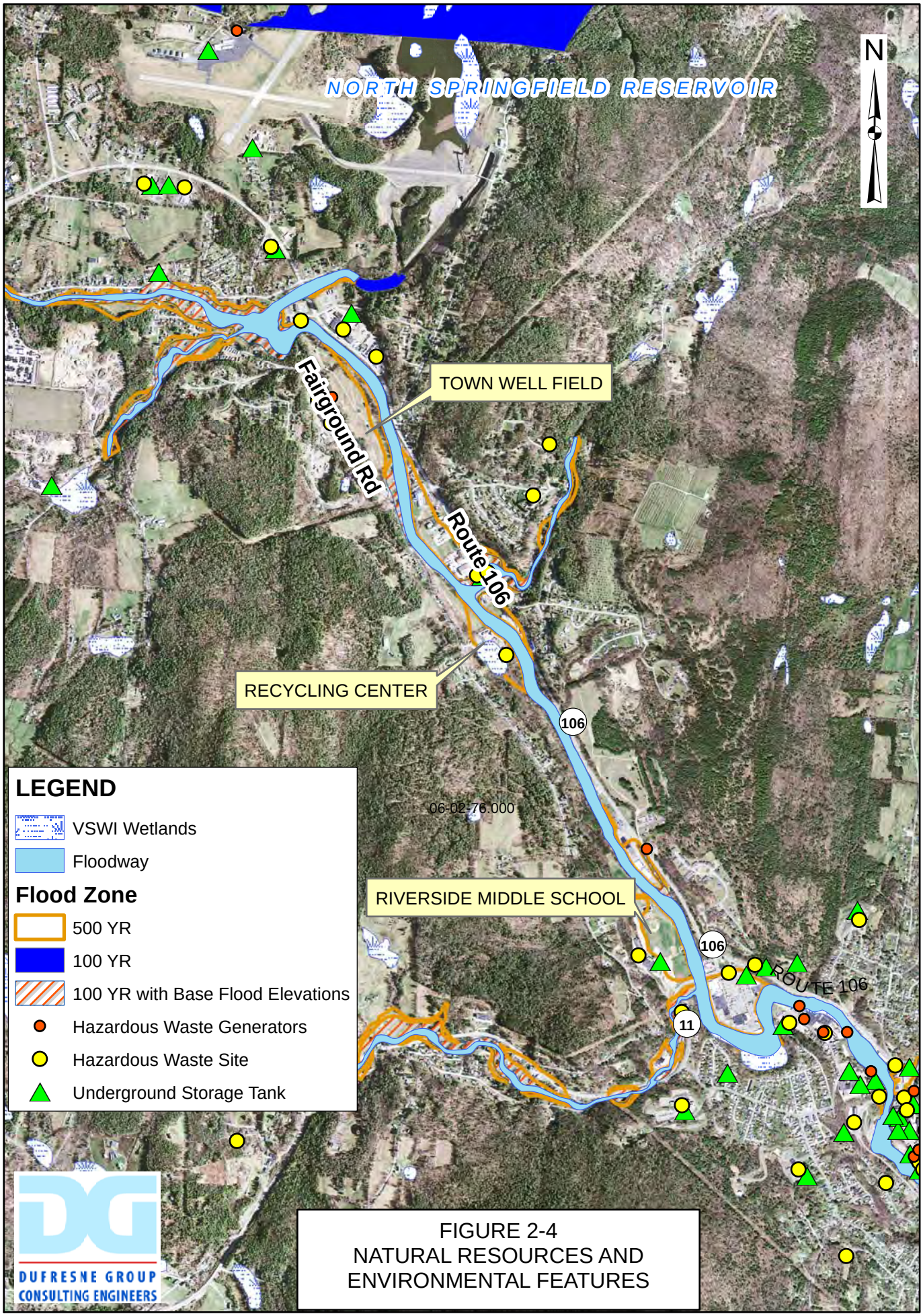
As shown in Figure 2-4, portions of the 100 year flood plain for the Black River and its tributaries are within the study area. Except for the portions in North Springfield, the Black River 100 year flood plain is not substantially wider than the river. There is one location at the south end of the Town well field where the 100 year flood plain expands to about 140 feet from the river bank. In North Springfield, both the 100 year flood plain and the floodway widen to the west of the river where two tributaries enter the river at a large bend.

Within the study area, there are several hazardous waste sites on properties adjacent to the proposed pathway routes, as shown in Figure 2-4. Most of the alternative routes are located within the public right-of-way and are not in conflict with the waste sites. However, the proposed pathway from Riverside Middle School along the Black River (Option 1) does cross two parcels with mapped hazardous waste sites. Both Riverside Middle School and the Recycling Center (which was formerly the site of a wastewater treatment facility) previously contained underground storage tanks (USTs) and groundwater contamination issues have occurred at both sites. The Recycling Center issues were investigated in 1999 and the site is rated as low priority. The Riverside Middle School site was evaluated in 2012 and the site is rated as medium priority.

The excavation depths for constructing pathways in these areas will be limited to approximately two feet and it is not expected that contamination will be encountered during construction. The permitting process during the final design phase will confirm if there are any hazardous waste concerns to be resolved.

An Archeological Resource and Historical Preservation Assessment was completed in November 2013 by Hartgen Archeological Associates, Inc. The report identified the Option 1 route as “on or adjacent to locations with high potential for pre-contact and historic archeological deposits”.

The report describes that the locations with archeological potential include alluvial and glaciofluvial landforms along the Black River and tributary streams, glaciofluvial delta deposits in North Springfield and a glacial till area approaching the river. The areas with alluvial soils include locations north and south of the Recycling Center, the Town well field parcel (which contains the Chapman I, Chapman II and Gilchrist wells), and the North Springfield village area. Although disturbed by various activities, there may also be locations on the Recycling Center property with alluvial soils. Level areas outside the existing disturbed sites are considered to have high archeological potential. Locations of intact glaciofluvial terraces between Riverside Middle School and the Recycling Center also have archeological potential.


NORTH SPRINGFIELD RESERVOIR
N
TOWN WELL FIELD
Fairground Rd
Route 106
RECYCLING CENTER
106
06-02-76.000
RIVERSIDE MIDDLE SCHOOL
106
ROUTE 106
11
LEGEND
VSWI Wetlands
Floodway
Flood Zone
500 YR
100 YR
100 YR with Base Flood Elevations
Hazardous Waste Generators
Hazardous Waste Site
Underground Storage Tank
DUFRESNE GROUP
CONSULTING ENGINEERS
FIGURE 2-4
NATURAL RESOURCES AND
ENVIRONMENTAL FEATURES
0 500 1,000 2,000
Feet

The report recommends placing the alignment of the pathway over previously disturbed areas wherever possible and avoiding a 19th century foundation located in the wooded river margin adjacent to Chapman 2 well fields.

As the proposed route is further defined during final design, the potential archaeological impacts should be reviewed again, which may include conducting a Phase IB archaeological reconnaissance survey.

For the northern portion of Option 1 in the North Springfield village area and Options 2, 2b and 3, the report notes that although there is the potential for archeologically sensitive areas, the majority of these corridors have been disturbed during grading and roadway construction. The report indicated the potential for historic preservation issues due to several structures in the Downtown Springfield and North Springfield village areas. However, provided the route utilizes existing sidewalks and roadways, impacts are not expected. The complete report is included in Appendix A.

Right-of-Way

The public road right-of-way widths are summarized in Table 2-1, presented previously. The routes are generally within the public right-of-way, with the exception of portions of Option 1. Option 1 was originally planned to cross the Vermont Machine Tool property and the Springfield Plaza property; however, this portion of the route was eliminated during the initial stages of this project. Instead of starting on Park Street, the southern section of Option 1 is planned to start on the Riverside Middle School grounds. The Option 1 route follows the Black River north across several private properties, which will require permanent easements from these property owners. The property boundaries for these parcels are shown in Figure 2-5.1 through 2.5.3, included in Appendix B.

Approximately 1.5 miles north of Riverside Middle School, the Black River is about 20 feet east of Fairgrounds Road and there is inadequate space to locate the pathway outside the road right-of-way. At this location, the pathway development may require a permanent easement from the property owner on the west side of Fairgrounds Road. Permanent easements will also be required from property owners north of the well field if the Option 1 pathway continues cross-country north of the Town owned well field parcel.

As shown in Table 2-2, the Option 1 route may affect fifteen properties.

TABLE 2-2 PARCELS AFFECTED BY MODIFIED OPTION 1 ROUTE SPRINGFIELD, VERMONT April 1, 2014	
Parcel #	Property Owner
22-01-08.000	Town of Springfield
06-02-36.000	Karl F. Rosengrant
06-02-35.000	Donald A. & Monica Pratt
06-02-32.000	Joseph C. Sampsell & Lynn M. Roberto
03-02-30.000	Karen E. Ruane, et.al.
06-02-29.000	Richard J. Donnegan, et.al.
06-02-28.000	Gordon J. & Karen L. Therrien
05-03-72.000	Koledo Family Revocable Trust
05-03-68.000	Town of Springfield
05-02-84.100	Karl H. & Barbara Riotte
05-02-84.000	Franklin & Nancy Curran
1B-03-56.000	Town of Springfield
1B-03-57.000	Shelly M. Leonard
1B-03-55.000	Linda A. Schaub
1B-03-55.100	Leroy P. Graham, et.al.

Utilities

Overhead and underground utilities in the project area include the following:

1. The municipal sewer collection system serves the majority of the study area, excluding the portion of Fairgrounds Road between Riverside Middle School and the Town well field.

2. The municipal water distribution system serves the majority of the study area. The Town groundwater sources are also in the study area.

3. Numerous overhead electrical lines exist throughout the project area.

4. Several storm drainage structures are located in the study area as well as approximately six bridges and an existing foot bridge across the Black River at the Springfield Plaza.

SECTION 3
PURPOSE AND NEED

General

Developing a Purpose and Need statement requires obtaining input from local citizens, meeting with Town staff representatives, and Springfield Trails and Greenways (STAG) representatives. This task also includes reviewing characteristics of the area and reviewing local/regional plans to identify the relationships of the planned improvements to these plans.

Local input was obtained by conducting a public meeting. In preparation for the meeting, several planning meetings were held with Town staff, STAG members, VTrans representatives and Jason Rasmussen, the Municipal Project Manager with Southern Windsor County Regional Planning Commission. The committee meetings identified the preferred alternative as a shared use path originating at Riverside Middle School and continuing north along the Black River to the North Springfield Village area then transitioning to on-road facilities. Existing sidewalks in North Springfield Village and new sidewalks on Fairgrounds Road, Elm Street, and Maple Street would be utilized by pedestrians traveling to the North Springfield Reservoir and the existing road shoulder would be utilized by cyclists. This alternative was reviewed at the Local Concerns meetings along with advantages and disadvantages of all the alternative routes.

Local Concerns and Alternatives Presentation Meeting

A Local Concerns Meeting was conducted on October 23, 2013 to discuss alternative pathways in the project area and obtain input from the public regarding the purpose and need for the project. A copy of the meeting minutes is included in Appendix C.

The alternative routes identified as Options 1, 2, 2a and 3 were reviewed and consensus from the attendees was that Option 1, with a cross country shared pathway parallel to the Black River, is the preferred alternative. Both Route 106 and a route along the length of Fairgrounds Roads were considered high risk due to traffic conflicts.

The attendees voiced strong support for the project and expected the pathway would receive heavy use.

Relationship to Town and Regional Plans

The Springfield Town Plan and the Southern Windsor County Regional Transportation Plan both contain goals, policies and recommendations in support of the proposed improvements.

The Springfield Plan contains language in the transportation, energy and economic development sections as follows:

Goals:

- Promote inclusion of alternative modes of transit of persons and goods in design, maintenance, and reconstruction of Town and State highways, and in land use abutting these highways.
- Continue to participate in regional transportation planning efforts through participation in the Transportation Advisory Committee of the Southern Windsor County Regional Planning Commission.
- Reduce transportation energy consumption.
- Encourage non-motorized vehicles and pedestrian traffic.

Objectives:

- Promote the potential for pedestrian and non-motorized traffic through the development of pedestrian walkways, the location of goods and services in close proximity to higher density residential areas, and the development of bikeways and greenways.
- The Town can encourage less driving through the development and/or maintenance of an interconnected system of sidewalks and walking/bicycle trails, linking residents to schools, stores, work and home.
- Work to improve the quality of life in Springfield by creating opportunities for young people; protecting natural, scenic and historic resources; and improving recreational opportunities.

The Southern Windsor County 2009 Regional Transportation Plan contains the following policies and recommendations in Volume 2, Chapter 5; Alternative Modes of Transportation:

Policies:

- Adopt the Regional Bicycling and Walking Plan as part of the Regional Transportation Plan.
- Promote transportation in village centers, downtowns, and growth centers which feature bicycle, pedestrian, and other forms of non-motorized forms transportation.

Recommendations:

- Work with interested towns to investigate the feasibility of developing bicycle and pedestrian facilities.
- Implement recommendations contained in the Regional Bicycling and Walking Plan.

Both the Town Plan and the Regional Transportation Plan support the recreational pathway project.

Purpose and Need Statement

The purpose of the project is to create a multi-use path from Riverside Middle School to the North Springfield Reservoir and Springweather Recreational Area located in North Springfield, Vermont.

The need for the project is to facilitate the safe movement of bicycles and pedestrians between downtown Springfield and the Village of North Springfield, with connections to the Middle School and Springweather Recreational Area.

SECTION 4
EVALUATION OF ALTERNATIVES

General

As discussed in Section 2, STAG and Town representatives (the Pathway Committee) identified four alternative routes for connecting Springfield downtown to North Springfield. The routes are shown in Figure 2-1, presented previously and described below:

1. Option 1 — Local roads and a cross country route along the Black River
2. Option 2 — Route 106 and Reservoir Road
3. Option 2b — Route 106 and Maple Street
4. Option 3 — Local roads including Fairgrounds Road

Design Considerations for Pathway Alternatives

The Vermont Pedestrian and Bicycle Facility Planning and Design Manual recommends a minimum path width of 8 feet and a preferred path width of 10 to 12 feet. There are additional requirements for setbacks or clearances. The design criterion are depicted in Figure 4-1 and summarized in Table 4-1 as follows:

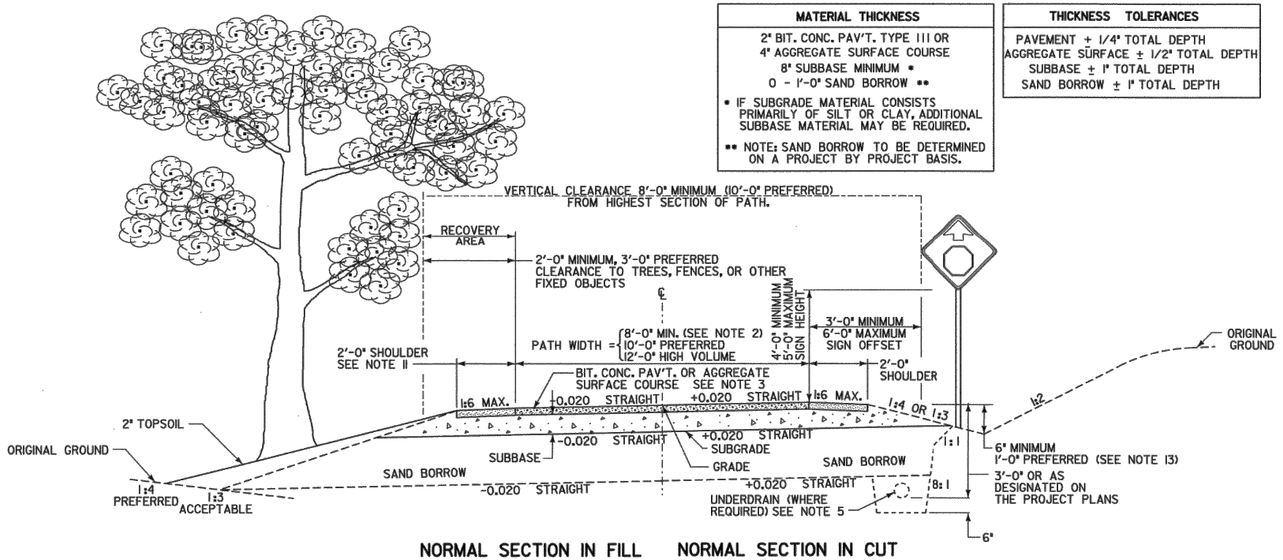
TABLE 4-1
PATH DESIGN CRITERION
SPRINGFIELD, VERMONT
April 1, 2014

Item	Path Type			
	Shared	Bicycle Lane	Pedestrian Walk	Shoulder
Path Width	8 ft min. 10 ft preferred	4-6 ft	5 ft	3 ft (bicycles)
Minimum horizontal clearance from objects	2 ft			
Minimum Shoulder	2 ft			
Recovery Area	3-5 ft			
Distance from signs	3 ft min. – 6 ft. max.			
Roadway/path separation (uncurbed sections)	5 ft buffer or a barrier		5 ft or a curb/barrier	

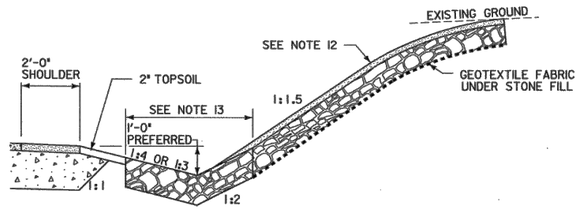
Notes:
1. Generally the minimum paved shoulder width to accommodate bicyclists is 3 feet. There are no specific design criteria or additional width requirements for unpaved roads. Roadway shoulder widths depend on road type, design speed and AADT as listed in the VT State Design Standards.
2. A recovery area is required where side slopes are 3H:1V or steeper.
3. The recovery area and lateral clearance for signs and objects includes the shoulder.
4. Pedestrian accommodations along the shoulders of roadways do not need to comply with the American Disability Act Accessibility Guidelines.

MATERIAL THICKNESS
2" BIT. CONC. PAV'T. TYPE III OR 4" AGGREGATE SURFACE COURSE
8" SUBBASE MINIMUM *
0 - 1'-0" SAND BORROW **
* IF SUBGRADE MATERIAL CONSISTS PRIMARILY OF SILT OR CLAY, ADDITIONAL SUBBASE MATERIAL MAY BE REQUIRED.
** NOTE: SAND BORROW TO BE DETERMINED ON A PROJECT BY PROJECT BASIS.

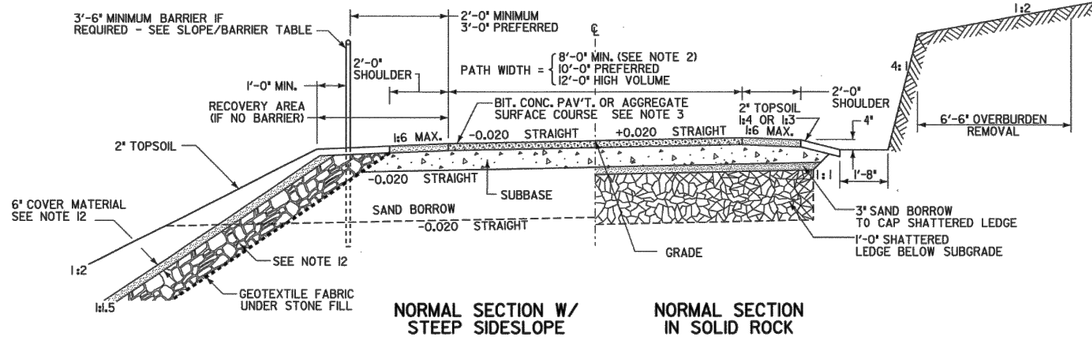
THICKNESS TOLERANCES
PAVEMENT ± 1/4" TOTAL DEPTH
AGGREGATE SURFACE ± 1/2" TOTAL DEPTH
SUBBASE ± 1" TOTAL DEPTH
SAND BORROW ± 1" TOTAL DEPTH



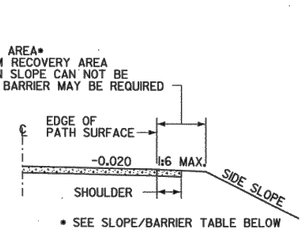
NORMAL SECTION IN FILL NORMAL SECTION IN CUT



NORMAL SECTION ON STEEP GRADE WITH 1:1.5 BACKSLOPE



NORMAL SECTION W/ STEEP SIDESLOPE NORMAL SECTION IN SOLID ROCK



* SEE SLOPE/BARRIER TABLE BELOW

SIDE SLOPE TREATMENT

SLOPE/BARRIER TABLE					
RECOVERY AREA WIDTH					BARRIER RECOMMENDATIONS*
UNPAVED SURFACE		SIDE SLOPE	PAVED SURFACE		
MIN.	PREFERRED		MIN.	PREFERRED	
0	2'-0"	1:4 OR FLATTER	0	3'-0"	GENERALLY NO BARRIER NECESSARY
2'-0"	3'-0"	1:3	3'-0"	4'-0"	IF VERTICAL DROP 5'-0" OR GREATER, CONSIDER USE OF BARRIER UNLESS PREFERRED RECOVERY AREA IS PROVIDED
3'-0"	5'-0"	1:2	4'-0"	5'-0"	IF VERTICAL DROP 4'-0" OR GREATER, CONSIDER USE OF BARRIER UNLESS PREFERRED RECOVERY AREA IS PROVIDED
5'-0"	>5'-0"	STEEPER THAN 1:2	5'-0"	>5'-0"	IF MINIMUM RECOVERY AREA NOT PROVIDED, BARRIER IS NECESSARY

* REFER TO VAOT PEDESTRIAN AND BICYCLE FACILITY PLANNING AND DESIGN MANUAL.

SPECIFICATION FOR AGGREGATE SURFACE COURSE	
SIEVE DESIGNATION	PERCENTAGE BY MASS PASSING SQUARE MESH SIEVES
3/8"	80 TO 100
NO. 4	60 TO 90
NO. 16	20 TO 40
NO. 30	14 TO 30
NO. 50	10 TO 25
NO. 100	8 TO 15
NO. 200	0 TO 8

GENERAL NOTES:

1.) ALL DESIGN SHALL BE IN ACCORDANCE WITH THE VAOT PEDESTRIAN AND BICYCLE FACILITY PLANNING AND DESIGN MANUAL.

2.) THE MINIMUM PATH WIDTH SHOULD ONLY BE USED WHEN THE CONDITIONS NOTED IN THE VAOT PEDESTRIAN AND BICYCLE FACILITY PLANNING AND DESIGN MANUAL ARE MET.

3.) WHEN AN AGGREGATE SURFACE COURSE IS USED THE SURFACE MUST BE FIRM, STABLE AND SLIP- RESISTANT. SEE VAOT STANDARD SPECIFICATIONS FOR CONSTRUCTION FOR AGGREGATE SURFACE COURSE.

4.) WHEN USING AGGREGATE SURFACE COURSE, PLACE GEOTEXTILE ROADBED SUBGRADE SEPARATOR FABRIC BETWEEN SUBBASE AND SURFACE. WHEN USING A PAVED SURFACE, ROADBED SUBGRADE SEPARATOR FABRIC SHALL BE PLACED BETWEEN SUBGRADE AND SUBBASE.

5.) THE USE OF UNDERDRAIN IS OPTIONAL. HOWEVER, ITS USE IS ENCOURAGED WHEN WET SUBGRADE CONDITIONS ARE ENCOUNTERED.

6.) WHEN SAND BORROW IS USED, ITS THICKNESS SHALL BE TRANSITIONED TO OR FROM FULL DEPTH AT THE RATE OF 1:25 ALONG THE LENGTH OF THE PATH TO PREVENT A BUMP FROM OCCURRING AT ITS TERMINUS.

7.) A CROWNED SECTION MAY BE USED FOR THE PATH SURFACE ON TANGENT SECTIONS. HOWEVER, ALL CURVED SECTIONS SHALL BE BANKED TOWARD THE INSIDE OF THE CURVE. A "BANKING DIAGRAM" SHOULD BE PROVIDED. THE SUBGRADE WILL NOT BE CROWNED.

8.) A PORTLAND CEMENT CONCRETE (PCC) SURFACE MAY BE USED WHEN SHOWN TO BE A COST EFFECTIVE ALTERNATIVE.

9.) ALL SHARED USE PATHS SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA). REFER TO THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) FOR SPECIFIC DETAILS.

10.) ANY TREE ROOTS ENCOUNTERED WITHIN THE EXCAVATION LIMITS SHALL BE SAWCUT AND REMOVED. PAYMENT WILL BE INCIDENTAL TO COMMON EXCAVATION.

11.) THE SHOULDER SHALL BE EITHER TOPSOIL AND GRASS OR AGGREGATE SHOULDERS.

12.) STONE FILL TYPE II IS REQUIRED ON ANY SLOPE STEEPER THAN 1:2. A 6" LAYER OF COVER MATERIAL OVER THE STONE IS ALSO REQUIRED.

A.) ANY SLOPES ADJACENT TO WETLANDS OR STREAMS SHALL USE GRUBBING MATERIAL AS A COVER FOR THE STONE FILL.

B.) STONE COVERED SLOPES IN DRY AREAS SHALL USE EXCAVATED EARTH OR EARTH BORROW AS A COVER MATERIAL. COVER MATERIAL SHALL BE SEEDED AND MULCHED.

13.) DITCHES WILL RECEIVE THE FOLLOWING TREATMENTS BASED ON THEIR SLOPE:

A.) 0-1% SEED AND MULCH
B.) 1-2.5% EROSION CONTROL MATTING AND SEED
C.) 2.5-10% TYPE I STONE FILL - 1'-0" DEPTH
D.) > 10% TYPE II STONE FILL - 2'-0" DEPTH

THIS SHEET IS NOT TO SCALE

OTHER STDS. REQ'D: A-80, E-195

REVISIONS AND CORRECTIONS

MAR. 31, 2004 - DATE OF ORIGINAL ISSUE

APPROVED

DIRECTOR OF PROGRAM DEVELOPMENT

LOCAL TRANSPORTATION FACILITIES PROGRAM MANAGER

FEDERAL HIGHWAY ADMINISTRATION

SHARED USE PATH TYPICAL

VERMONT AGENCY OF TRANSPORTATION

STANDARD A-78

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Project Mgr.	NRJ
Design	NRJ
Drawn	HHC
Checked by	NRJ
Date	FEB 2014
Scale	NO SCALE
Approved by	NRJ

PATHWAY STUDY

VAOT STANDARD DRAWING A-78

SPRINGFIELD, VERMONT

4-1

DWG. NO. FIG 4-1.dwg

SHEET 1 OF 1

FILE: P:\CADD Files\Springfield VT\Springfield Mixed Use Pathway\FIG 4-1.dwg Apr 03, 2014 - 11:53am

The path width requirements are important for determining what facilities can be accommodated within the existing public road rights-of-way. Right-of-way considerations and other advantages and disadvantages of the various pathway routes are reviewed individually for each of the options.

Option 1

Option 1 was originally planned to start on Park Street, continue via local roads and across private property to Riverside Middle School, then north to the North Springfield Reservoir. However, after considering the several challenges involved with developing a recreational path between Park Street and Route 11, described below, the Pathway Committee decided to eliminate the Park Street to Riverside Middle School segment from the Option 1 route.

Both Park Street and Pearl Street have 33 foot wide right-of-ways with a two lane local road and a sidewalk on the south side of the road. On Park Street, the pavement width varies from 22 feet to about 30 feet where the roadway is wider east of Pearl Street, in the vicinity of Park Street School and the VFW Club. The Pearl Street roadway width also varies, but averages 22 feet.

The existing ROW and roadway widths were compared to VTrans design criteria to determine the level of improvements necessary to accommodate a shared path or separate bicycle/pedestrian facilities.

Under VTrans road design criteria for a local road with an estimated AADT of 5,000, Park Street should have 11 foot wide lanes with 3 ft wide shoulders, for a total width of 28 feet. Based on the criteria summarized above, the minimum width for a shared pathway is 13 feet for an 8 feet wide path with 2 foot wide shoulders separated from the road by a 1 foot wide barrier. Therefore, for a shared pathway on Park Street, the total required roadway and pathway width is 41 foot minimum.

Although the exact AADT on Pearl Street is unknown, the design total width of travel lanes and shoulders, under current VTrans roadway design criteria is estimated at 26 feet for 10 foot lanes with 3 ft shoulders. For a shared pathway on Pearl Street, the total required surface width is 39 feet minimum.

Due to the existing buildings and retaining walls in close proximity to the road and the limited right-of-way, a shared pathway could not be constructed on Park Street or Pearl Street without obtaining permanent easements as well as demolishing existing structures.

The alternative to a shared pathway is separate bicycle and pedestrian facilities. However, although the existing sidewalk could be upgraded to achieve the required minimum 5 foot width for pedestrians, there is insufficient room for a 4 foot minimum width designated bicycle lane. The shoulders are also not adequate in all areas to accommodate bicycles on these streets. The minimum shoulder width for bicycles is 3 feet and a larger shoulder of 6 feet wide should be provided where grades exceed 5%, such as on the hill from the Park Street/Factory Street intersection to Park Street

School, just east of the Park Street/Pearl Street intersection. As noted above, there is a wide shoulder near the VFW Club but generally no shoulder is available on Park Street.

In summary, to meet the minimum criteria for travel lanes, shoulders for bicyclists and a sidewalk, a width of 33 feet is required on Park Street. This total width is based on 11 foot travel lanes, a 5 foot wide sidewalk and 3 foot minimum shoulders. On Pearl Street, the required width is 31 feet (with 10 foot travel lanes). These widths are beyond the existing roadway widths and at the limit of the existing right-of-way.

At the north end of Pearl Street, the proposed route departs from the public right-of-way and crosses the privately owned Vermont Machine Tool Company parking lot, the Black River and the privately owned Springfield Plaza to reach Route 11. This route would require securing permanent easements, constructing a shared pathway around the parking areas and upgrading the existing Black River pedestrian bridge (which terminates in stairs on the west end) for ADA compliance and bicycle use. At the intersection with Route 11, the primary challenge is developing a safe route within and across the heavily travelled Route 11, which is a high crash location.

Riverside Middle School, which has high recreation use primary due to the numerous ball fields used by grades K-12, is a significant origin and destination site and is a logical location for the start of Option 1. The school has existing parking facilities, therefore only minimal improvements will be necessary to create a trailhead. However, the main parking area is in very rough shape and if the alternative is selected, upgrading the parking lot should be considered as part of the project.

The proposed route for a shared pathway through the middle school property is shown in Figure 4-2. At the north end of the football field (Brown's Field) at the northern limits of school property, the pathway route enters private property and a forested area. The proposed pathway continues north through the woods for over 0.5 mile, parallel to the Black River, over seven private properties before reaching the Springfield Recycling Center. As shown in Figure 4-2, the parcels have frontage on both Fairgrounds Road and the river, with dwellings located near the roadway. The proposed pathway would be about 300 feet east of the dwellings and about 40 feet lower in elevation, with a significant woodlands buffer between the residences and the proposed pathway.

After traversing the recycling center parcel, the proposed pathway route continues parallel along the river for about 1,500 feet. At this point, the river and Fairgrounds Road are separated by only 20 feet and there is insufficient room to continue the pathway outside the road right-of-way. Modifications to Fairgrounds Road are necessary to continue the shared pathway through this section. After about another 900 feet, the planned route departs from Fairgrounds Road and enters the Town well field parcel. At the Town well field parcel the path is planned to follow the river banks, with fencing along the path to provide security for the Town's groundwater source of supply. From the well field, the path could continue through forested areas another 1,000-2,000 feet if easements are secured from private property owners. If easements are not obtained, the pathway would terminate at the end of the well field and pathway users would utilize the existing street network to continue north to the North Springfield

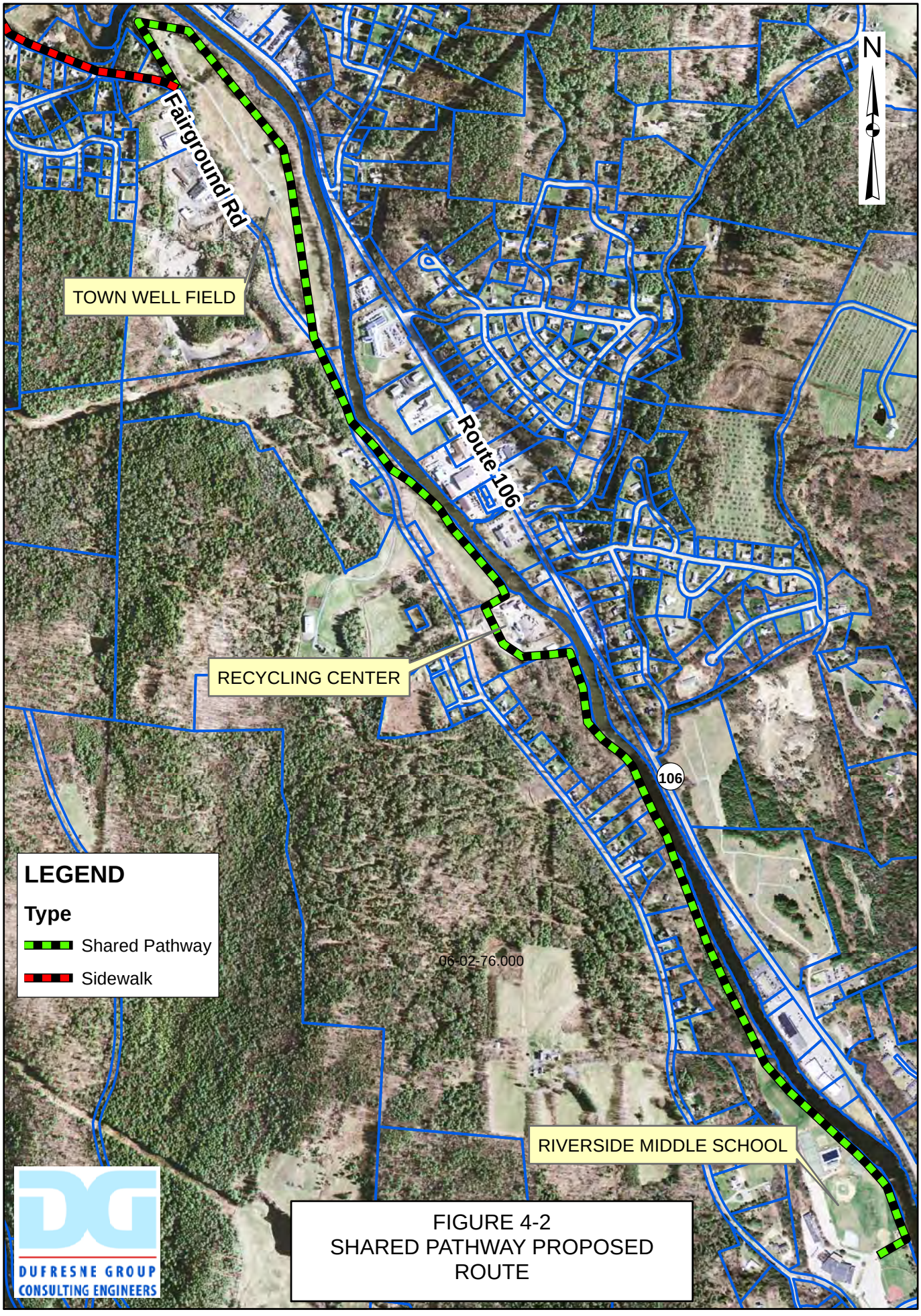


FIGURE 4-2
SHARED PATHWAY PROPOSED ROUTE

Reservoir. As portions of the parcels north of the well field are mapped flood plains, ending the shared pathway on the well field is more feasible than continuing the pathway north on private property.

As noted in Section 2, permitting will be required for the proposed pathway adjacent to the Class II wetland south of the Recycling Center. The State of Vermont Wetland Rule regulates activities in wetlands under Individual Permits and the Wetlands General Permit. The project should be designed to minimize the wetlands impacts, including maintaining the wetlands functions and values and minimizing vegetation removal, hydrology changes and earthmoving. The pathway is defined as a Linear Project under the DEC regulations, and would qualify for a General Permit if the project impacts less than 3,000 sf of Natural Areas with less than 150 sf of impacts in Surface Water Margins. Natural Areas include both the wetland and buffer areas. Surface Water Margins are the ten foot width measured from the top of the river bank.

If the path cannot meet the area thresholds, an Individual Permit may be possible, but the project must avoid adverse impacts to wetlands functions and values and must demonstrate an alternate route is not available.

We discussed the proposed project with Rebecca Chalmers, District Wetlands Ecologist, who described that a boardwalk would be required in any wet areas and a gravel path is preferred for the pathway crossing a buffer zone, rather than crushed ledge or a paved surface.

We believe that the wetlands can be avoided, and a boardwalk may not be required, but the pathway will likely cross the 50 foot wetlands buffer. A Wetlands Delineation should be conducted prior to developing final design plans for this alternative to determine the boundaries of the wetland and develop conceptual plans for avoiding the wetland and minimizing impacts. The conceptual plans will be developed as an initial step of the design phase.

Development within the floodway, which is the river and adjacent banks, is regulated by the Town of Springfield under the Flood Hazard Regulations and is prohibited unless a professional engineer certifies the project will not increase the flood levels during the base flood. A proposed pathway outside the floodway, but within the flood fringe (100 year flood plain), must be constructed to minimize flood damage as specified by the following development standards, from Section 4.19G of the Springfield Zoning Laws.

Development Standards

1. ***All Development*** *– All development within the SFHA shall be reasonably safe from flooding and:*
    a. *Designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure during the occurrence of base flood;*
    b. *Constructed with materials resistant to flood damage;*
    c. *Constructed by methods and practices that minimize flood damage; and*
    d. *Constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as*

to prevent water from entering or accumulating within the components during conditions of flooding.

The proposed route was reviewed with Bill Kearns, the local Zoning Administrator, who noted the project as proposed does not appear to be within the floodway.

As described in Section 2 of this report, there are two areas where the proposed path is adjacent to the 100 year flood plain: at the south end of the Town well field parcel and the north end of Fairgrounds Road where the shared pathway terminates. Constructing the pathway within the floodplain should be avoided to preserve the natural flood plain benefits and to eliminate the ongoing maintenance costs for rebuilding the pathway to address flooding and erosion damages. Mr. Kearns noted that paragraphs 1a, 1b and possibly 1c from Section 4.19G would apply to the improvements in the Special Flood Hazard Area (SFHA) or flooding fringe.

Once topographical survey is completed and the route is refined, the plans should be reviewed by the Zoning Administrator to confirm compliance with local regulations.

Options 2 and 2b

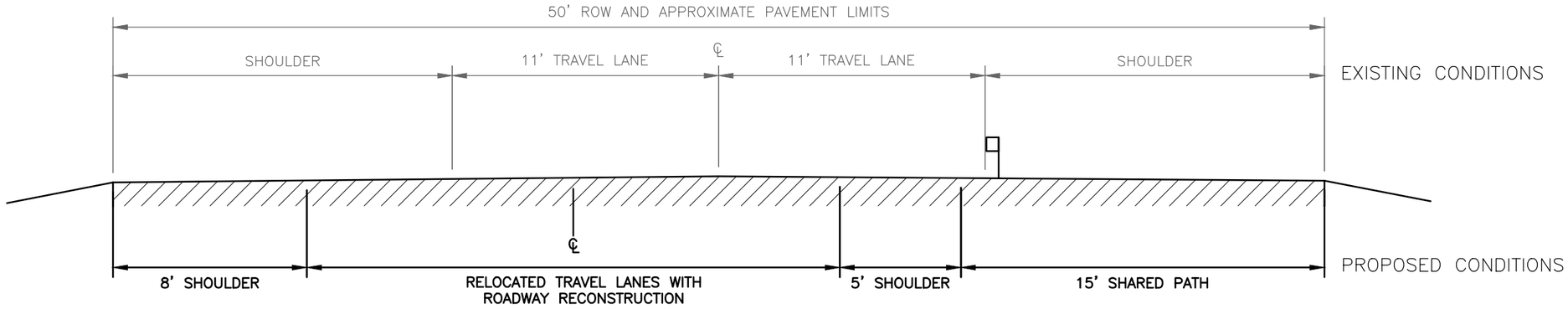
The Option 2 and Option 2b alternative connections, between Springfield and North Springfield, are along the Route 106 corridor for the majority of the distance. Option 2 follows Reservoir Road from Route 106 to the North Springfield Reservoir and Option 2b continues the Route 106 segment to Maple Street before turning east on Maple Street to the reservoir.

Although the Route 106 right-of-way (ROW) width varies in two areas, as noted in Section 2, the right-of-way is 50 feet wide within the majority of the study area. The entire 50 foot right-of-way width has been paved for the roadway travel lanes and shoulders, with sidewalks in limited sections.

The existing ROW and roadway widths were compared to VTrans design criteria to determine the level of improvements necessary to accommodate a shared path or separate bicycle/pedestrian facilities.

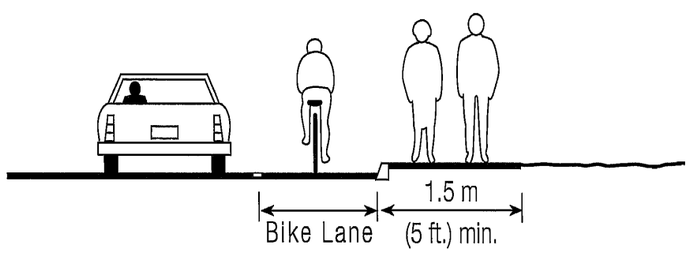
Under VTrans road design criteria, the required widths are 11 foot wide lanes and 5 foot wide shoulders, for a total width of 32 feet. It appears there is adequate room to locate a shared pathway within the right-of-way. However, the Route 106 roadway centerline would need to be shifted, with reconstruction of the road surface, for the construction of a shared pathway in the right-of-way, as shown in Figure 4-3. The centerline relocation would not be necessary if permanent easements were obtained from property owners along the pathway route to locate the pathway outside the right-of-way.

Instead of a shared pathway, on-road bicycle facilities could be provided in the road shoulder with a 5 foot sidewalk outside the bike lane, either separated by a vertical curb or by a greenstrip, as also shown in Figure 4-3.

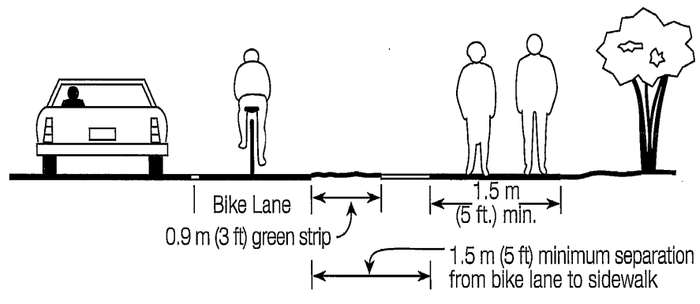


ROUTE 106 SHARED PATHWAY ALTERNATIVE

NOT TO SCALE



With Curb and/or Green Strip



Without Curb

ROUTE 106 BIKE LANE/SIDEWALK ALTERNATIVE

NOT TO SCALE

NOTE:

THIS SCHEMATIC IS ADAPTED FROM FIGURE 3-18 IN THE VTRANS PEDESTRIAN AND BICYCLE FACILITY PLANNING AND DESIGN MANUAL.

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Date	FEB 2014
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Approved by	NRJ

PATHWAY STUDY

ROUTE 106 ALTERNATIVE CROSS SECTIONS

SPRINGFIELD, VERMONT

4-3

DWG. NO. FIG 4-3.dwg

SHEET 1 OF 1

The significant constraint of Options 2 and 2b is the number of driveway crossings on both the east and west sides of Route 106 and the potential conflicts between vehicular and pedestrian/bicycle traffic. Route 106 and Route 11 are combined on the roadway section between Park Street and the intersection of Routes 106 and 11 adjacent to the Springfield Plaza. The majority of this heavily traveled segment is a high crash location and there are three road intersections and a few driveway crossings on the northeast side of the roadway. The southwest side of the road is characterized by a long uncontrolled curb cut that is several hundred feet long.

Between the Route 11/106 intersection and Reservoir Road there are two main areas of commercial development between the Black River and Route 106. At the commercial area closest to Route 11, there are currently five curb cuts. The second commercial development includes 10 curb cuts. Both of these commercial areas are on the south side of Route 106 and contain several high traffic generators, including restaurants, a laundry, gas station, hardware store, and medical offices. The development on the north side of the highway includes both residential and commercial properties also with a high number of curb cuts/driveway crossings. Another commercial area between Reservoir Road and Maple Street, which includes the Springfield Auto Mart car dealership and automobile repair shop, has 5 curb cuts.

Based on the numerous driveway crossings, existing high crash locations, high traffic volumes and conflicts between vehicular, bicycle and pedestrian traffic, the Option 2 and the Option 2b routes are not recommended.

Option 3

Option 3 is based on a path along Fairgrounds Road as an alternative to the cross-country route in Option 1. The existing ROW and roadway widths were compared to VTrans design criteria to determine the level of improvements necessary to accommodate a shared path or separate bicycle/pedestrian facilities. The Fairgrounds Road right-of-way is 50 feet wide and the existing roadway is about 26 feet wide.

Under VTrans road design criteria, the required widths are estimated to be 10 foot wide lanes and 3 foot wide shoulders, for a total width of 26 feet. With 12 feet of available space outside the road on each side, there is insufficient room for a 15 foot shared pathway without relocating the road from the center of the right-of- way or acquiring permanent easements for construction outside the right-of-way. Alternatively, separate bicycle and sidewalk facilities such as a 5 foot wide curbed sidewalk and a 4 foot to 6 foot wide bicycle lane could be constructed.

There are several residential properties on the east side of Fairgrounds Road. Bicycle lanes or sidewalks on this side of the road will cross driveways at 28 locations. Many of the lots are narrow, with 140 feet of footage. As a result, fourteen of the crossings will be in close proximity.

Compared to the cross-country route of Option 1, Option 3 is not preferred due to the driveway crossings and the potentially high conflicts between vehicular traffic, pedestrians and bicyclists.

No Build Alternative

The no build alternative must be considered for all projects funded by the Federal Highway Administrative Act to comply with the National Environmental Policy Act (NEPA). For the proposed pathway project, the no-build alternative is pedestrian use of the existing sidewalks, which are not continuous between Springfield and North Springfield, and utilization of roadway shoulders by bicyclists as well as pedestrians where sidewalks do not exist. In many sections of the study area, the shoulders are not adequate to provide safe use by both bicyclists and pedestrians.

The no-build alternative does not satisfy the Purpose and Need Statement and therefore it is not recommended.

Recommended Alternative

A revised version of the route originally identified as Option 1 is the recommended project to connect downtown Springfield to the North Springfield recreational facilities, as previously described on page 4-4. The advantages of this route are the scenic aspects of a route along the Black River, the ability to construct a shared pathway and a cross-country route that avoids conflicts between pathway users and vehicular traffic. The total length of the project is about 3.3 miles. Table 4-2 is a matrix of the impacts and permit requirements for all alternatives.

This alternative consists of about 12,000 feet (2.3 miles) of shared pathway from Riverside Middle School to the north end of the Town well field with trail heads at the Riverside Middle School and the Recycling Center. The pathway could extend from the well field property another 1,000-2,000 feet north on private property, if easements are secured and flood plain permit compliance is addressed. However, due to the uncertainty of these items, it is recommended that the project transition from a shared pathway to on-road facilities at this point and continue through the North Springfield village area to the reservoir.

New sidewalks on Fairgrounds Road, Elm Street and Maple Street would be required to provide for pedestrians as there are currently no sidewalks on Fairgrounds Road, Maple Street and a portion of Elm Street.

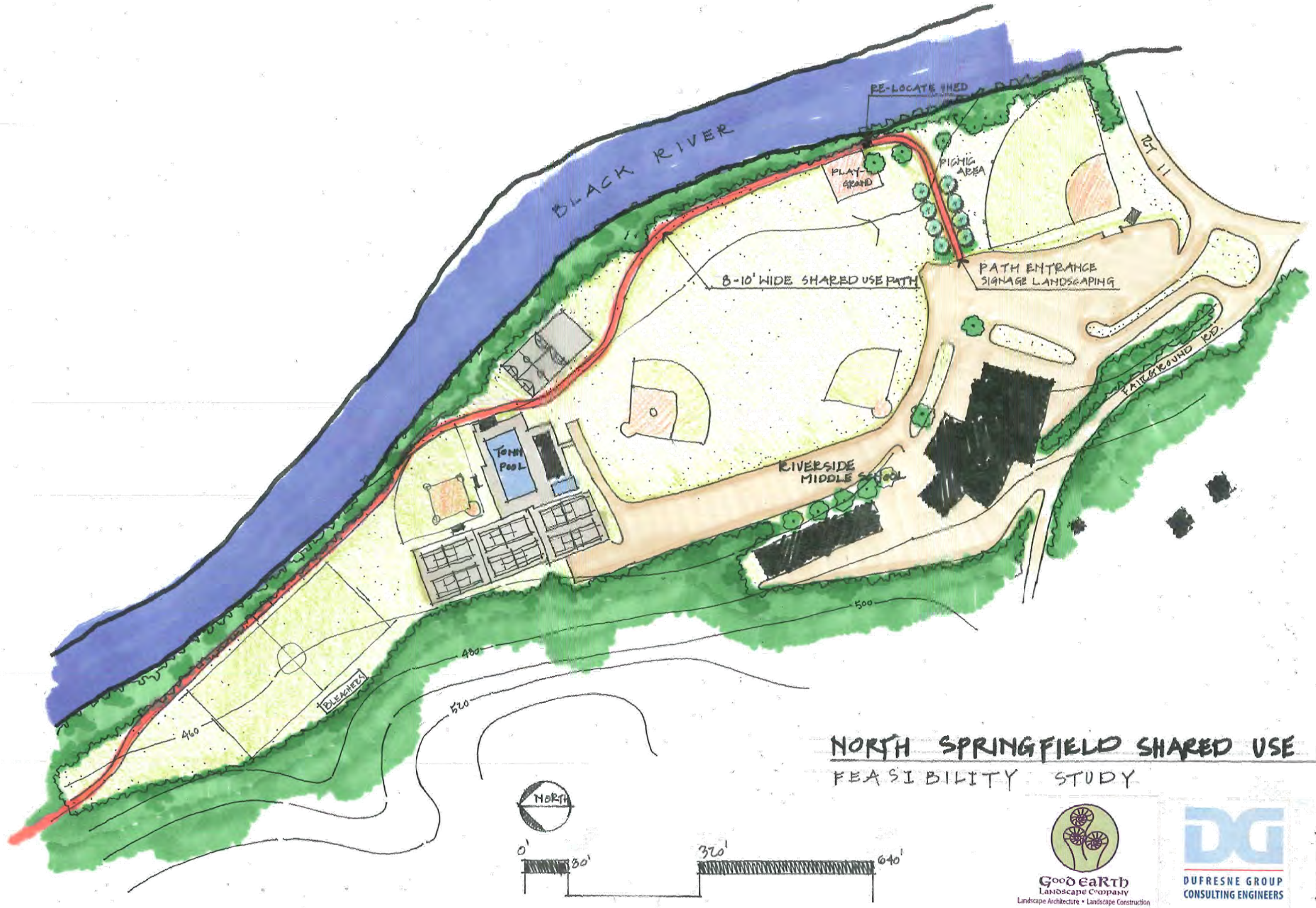
The conceptual pathway is shown by the schematic drawings in Figures 4-4 through 4-7. Photographs along the route are included as Figures 4-8 through 4-10. Figure 4-11 shows the entire route for Option 1.

The majority of the shared pathway will be separated from Fairgrounds Road and will cross forested areas and fields. Between Riverside Middle School and the Recycling Center, the pathway crosses an estimated eight intermittent streams, which will require the construction of culverts or small bridges.

The one location where the pathway intersects with Fairgrounds Road will require a guardrail to separate the pathway and road. In addition, Fairgrounds Road may need to be relocated to the west to provide adequate space for the pathway, with a retaining wall on the east side of the pathway, as shown in the sections on Figure 4-7.

TABLE 4-2
ALTERNATIVE MATRIX
SPRINGFIELD, VERMONT
October 7, 2014

		ALTERNATIVE				
	CATEGORY	Do Nothing	Route Option 1: Cross Country and Local Roads	Route Option 2: Route 106 and Reservoir Road	Route Option 2b: Route 106 and Maple Street	Route Option 3: Local Roads including Fairgrounds Road
Impacts to 23 CFR 771.117 C and other criteria	Archeological	None	No Adverse	None	None	None
	Historic	None	No Adverse	None	None	None
	Hazardous Materials	None	Minimal	None	None	None
	Floodplains	None	Minimal	None	None	None
	Fish & Wildlife	None	None	None	None	None
	Rare, Threatened & Endangered Species	None	None	None	None	None
	Public Lands Section 4(f	None	None	None	None	None
	LWCP Section 6(f)	None	None	None	None	None
	Wetlands	None	Buffer	None	None	None
	ROW Requirements	None	Permanent and Temporary	Temporary	Temporary	Temporary
	Traffic	None	No	Yes	Yes	Yes
Permits	Act 250	No	No	No	No	No
	401 Water Quality	No	No	No	No	No
	404 COE Permit	No	Yes	No	No	No
	Stream Alteration	No	Yes	No	No	No
	State Wetland Permit	No	Yes	No	No	No
	Storm Water Discharge	No	Yes	Yes	Yes	Yes
	Lakes and Ponds	No	No	No	No	No
	Threatened & Endangered Species	No	No	No	No	No
	SHPO	No	Yes	No	No	No
	Local Conditional Use for Development in a Floodway	No	Yes	No	No	No



NORTH SPRINGFIELD SHARED USE PATH
FEASIBILITY STUDY

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Project Mgr.	NRJ
Design	NRJ
Drawn	HHC
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Scale	AS SHOWN
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PATHWAY STUDY

CONCEPTUAL DRAWINGS
SHEET 1 OF 4

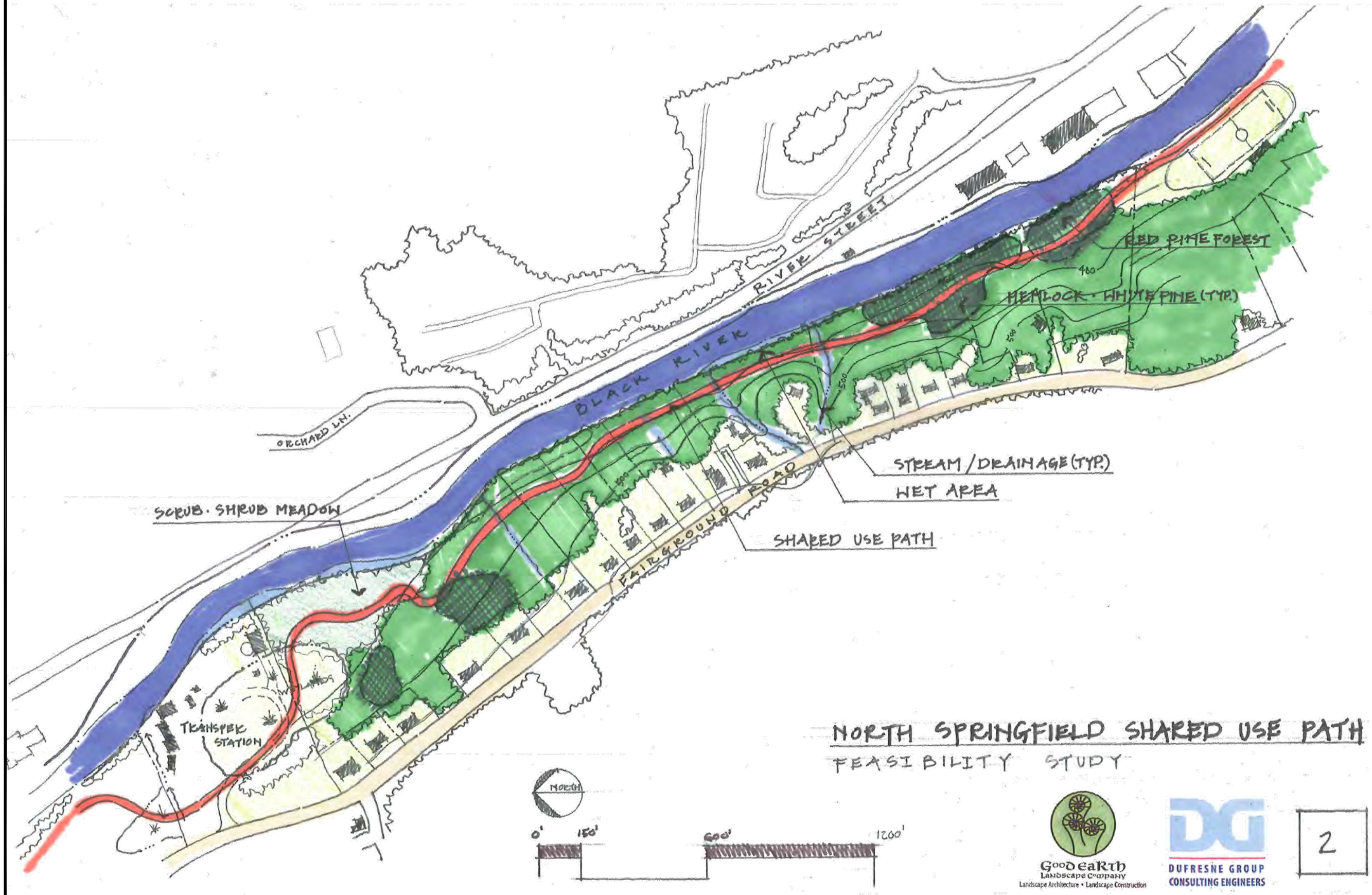
SPRINGFIELD, VERMONT

4-4

DWG. NO. FIG 4-4 to 4-10.dwg

SHEET 1 OF 4

FILE: P:\CADD Files\Springfield VT\Springfield Mixed Use Pathway\FIG 4-4 to 4-10.dwg Apr 01, 2014 - 9:30am



NORTH SPRINGFIELD SHARED USE PATH
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PATHWAY STUDY

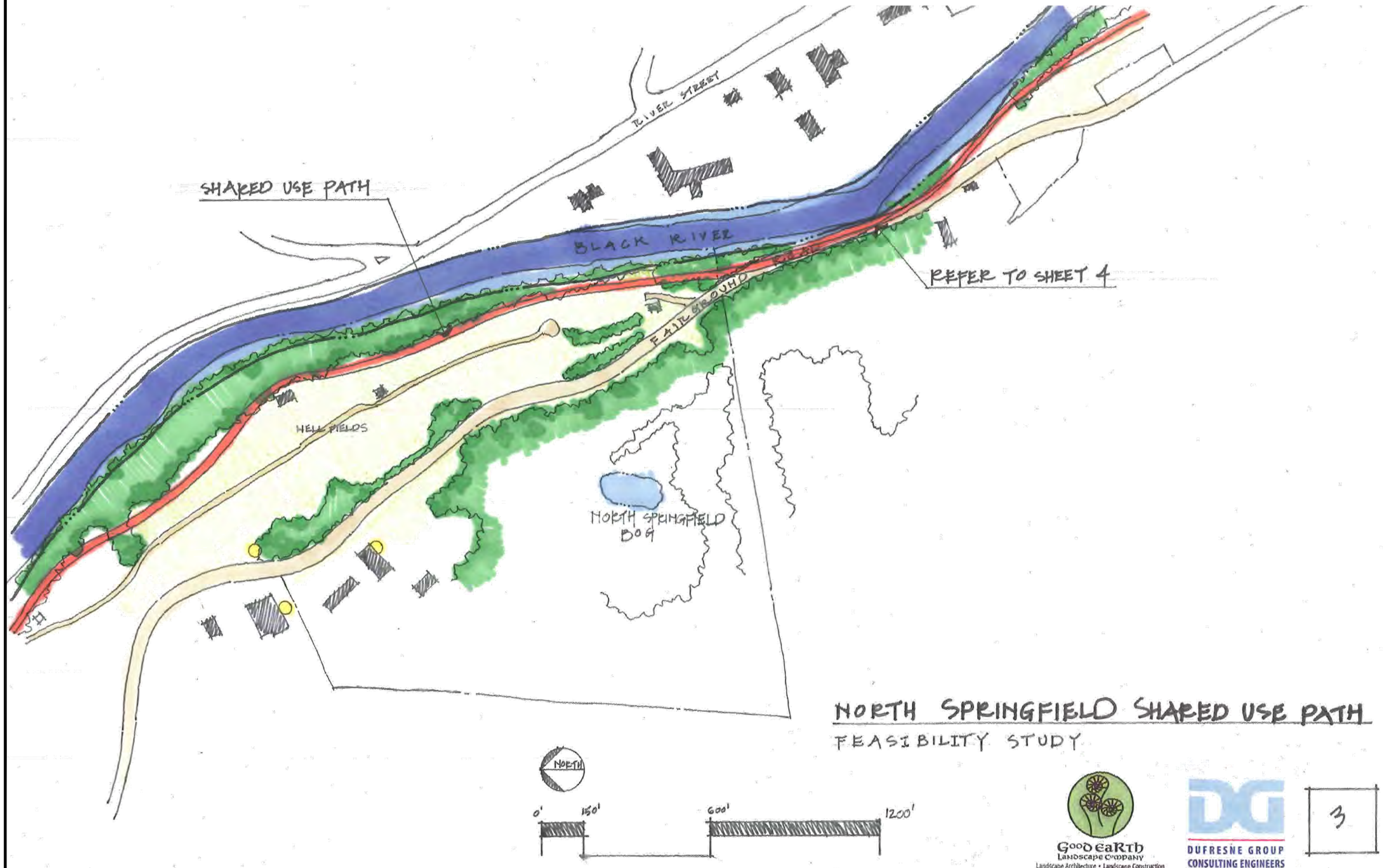
CONCETPUAL DRAWINGS
SHEET 2 OF 4

SPRINGFIELD, VERMONT

4-5

DWG. NO. FIG 4-4 to 4-10.dwg

SHEET 2 OF 4



NORTH SPRINGFIELD SHARED USE PATH

FEASIBILITY STUDY

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PATHWAY STUDY

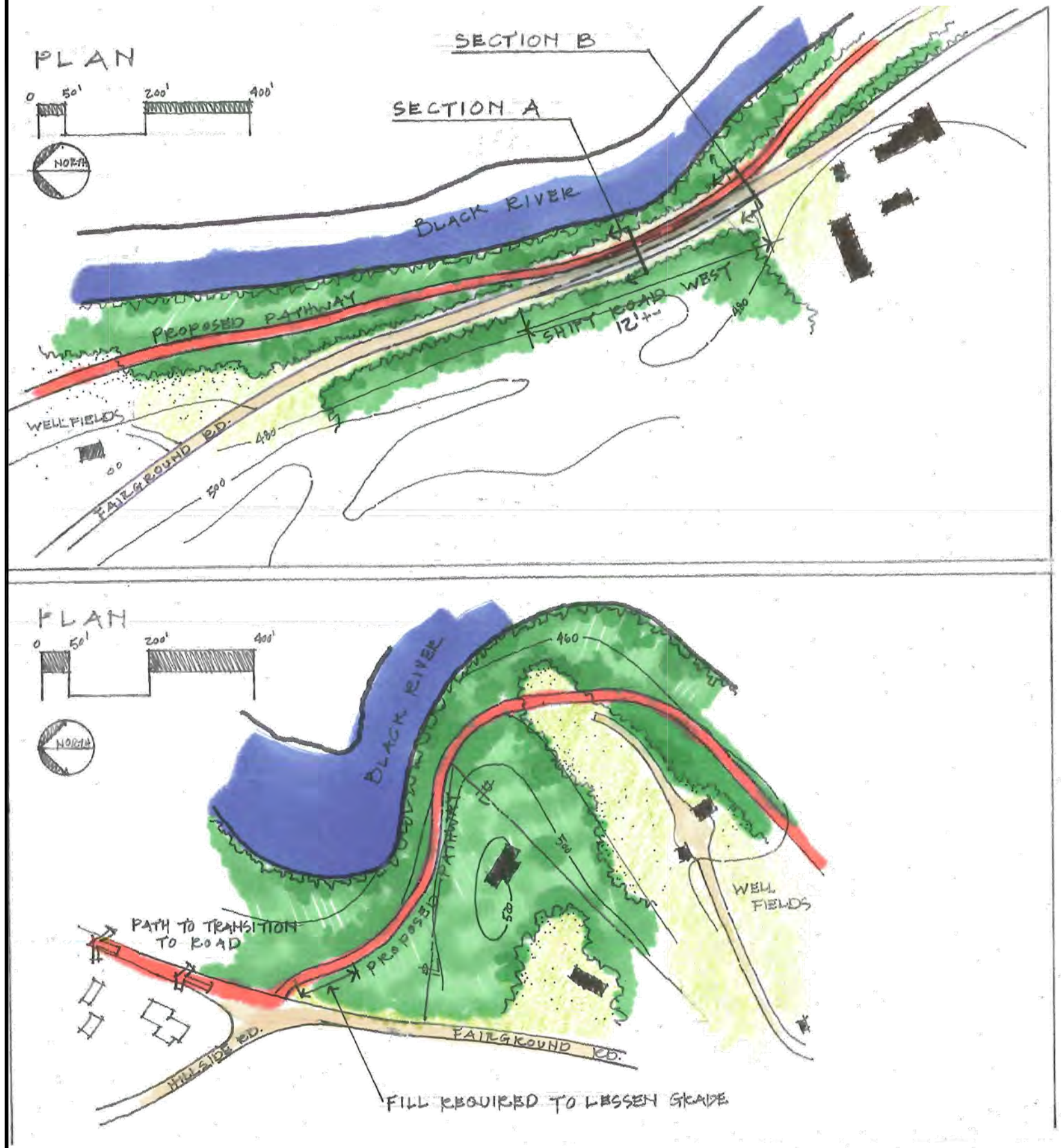
CONCEPTUAL DRAWINGS
SHEET 3 OF 4

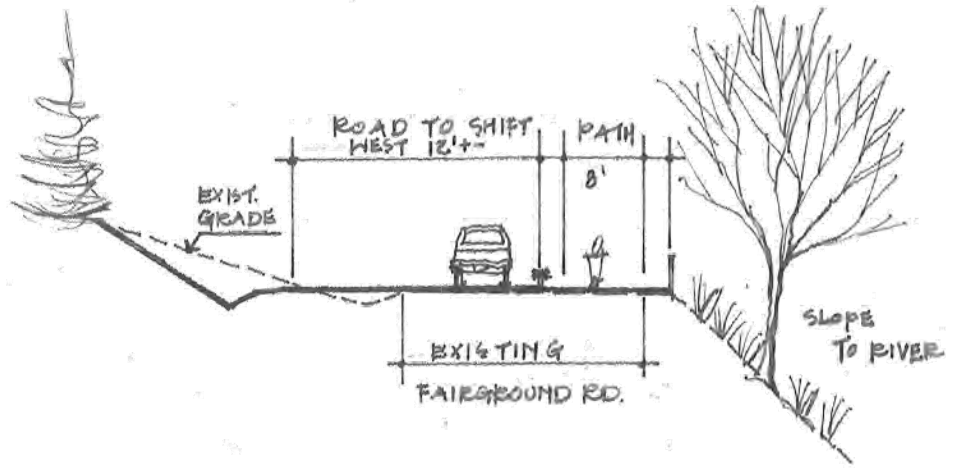
SPRINGFIELD, VERMONT

4-6

DWG. NO. FIG 4-4 to 4-10.dwg

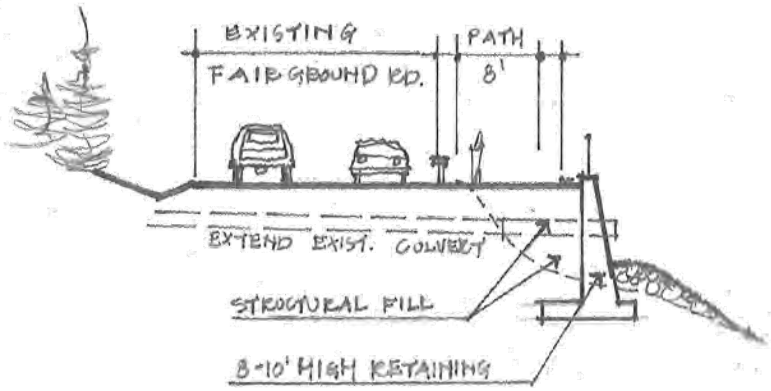
SHEET 3 OF 4





SECTION A

NTS



SECTION B

NTS

NORTH SPRINGFIELD SHARED USE PATH
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Project #	7130016
Project Mgr.	NRJ
Design	NRJ
Drawn	HHC
Checked by	NRJ
Date	MAR 2014
Scale	AS SHOWN
Approved by	NRJ

PATHWAY STUDY

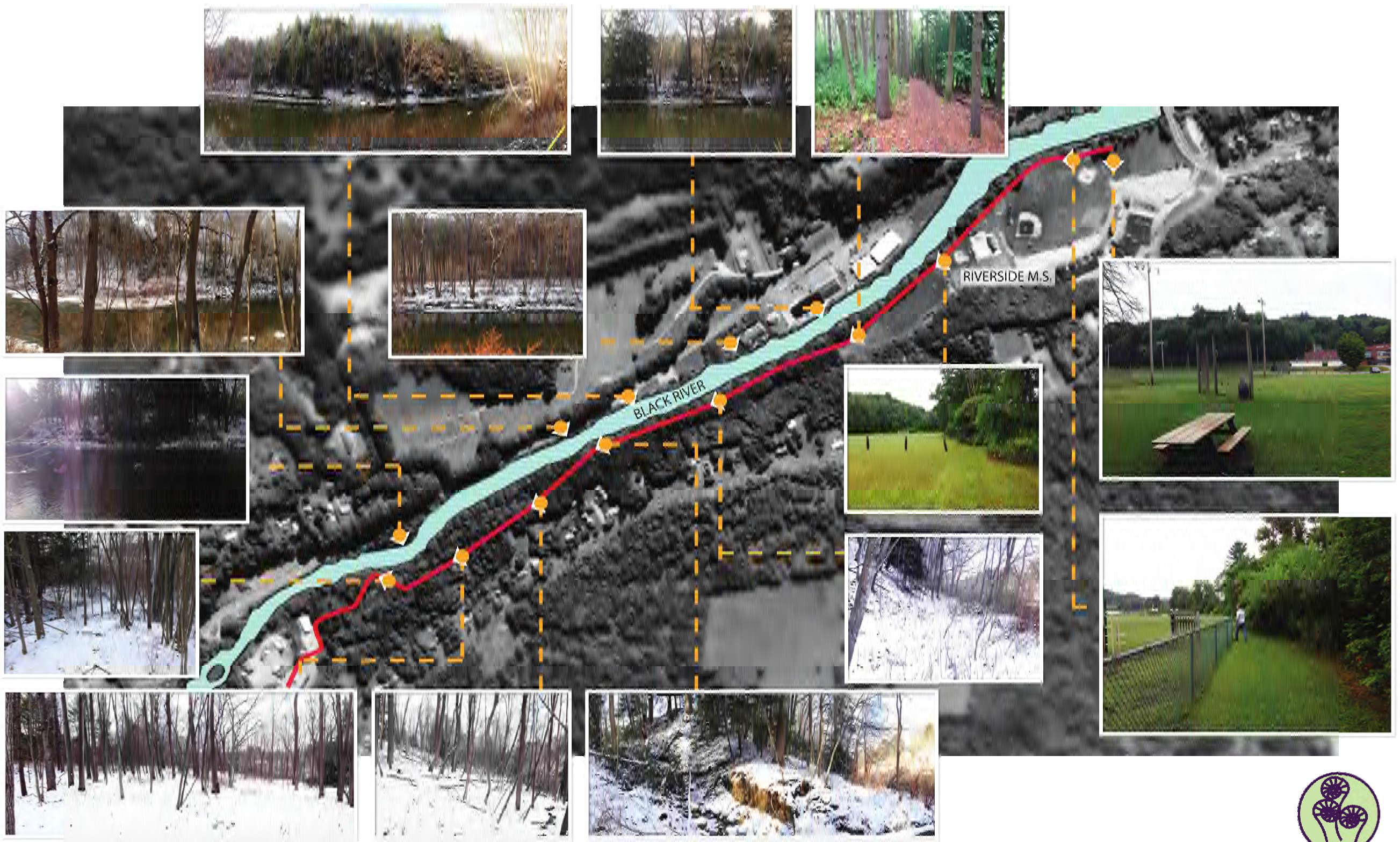
CONCEPTUAL DRAWINGS
SHEET 4 OF 4

SPRINGFIELD, VERMONT

4-7

DWG. NO. FIG 4-4 to 4-10.dwg

SHEET 4 OF 4



EXISTING CONDITION IMAGES

DUFRESNE GROUP
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PATHWAY STUDY

SHARED PATHWAY ROUTE PHOTOS 1 OF 3

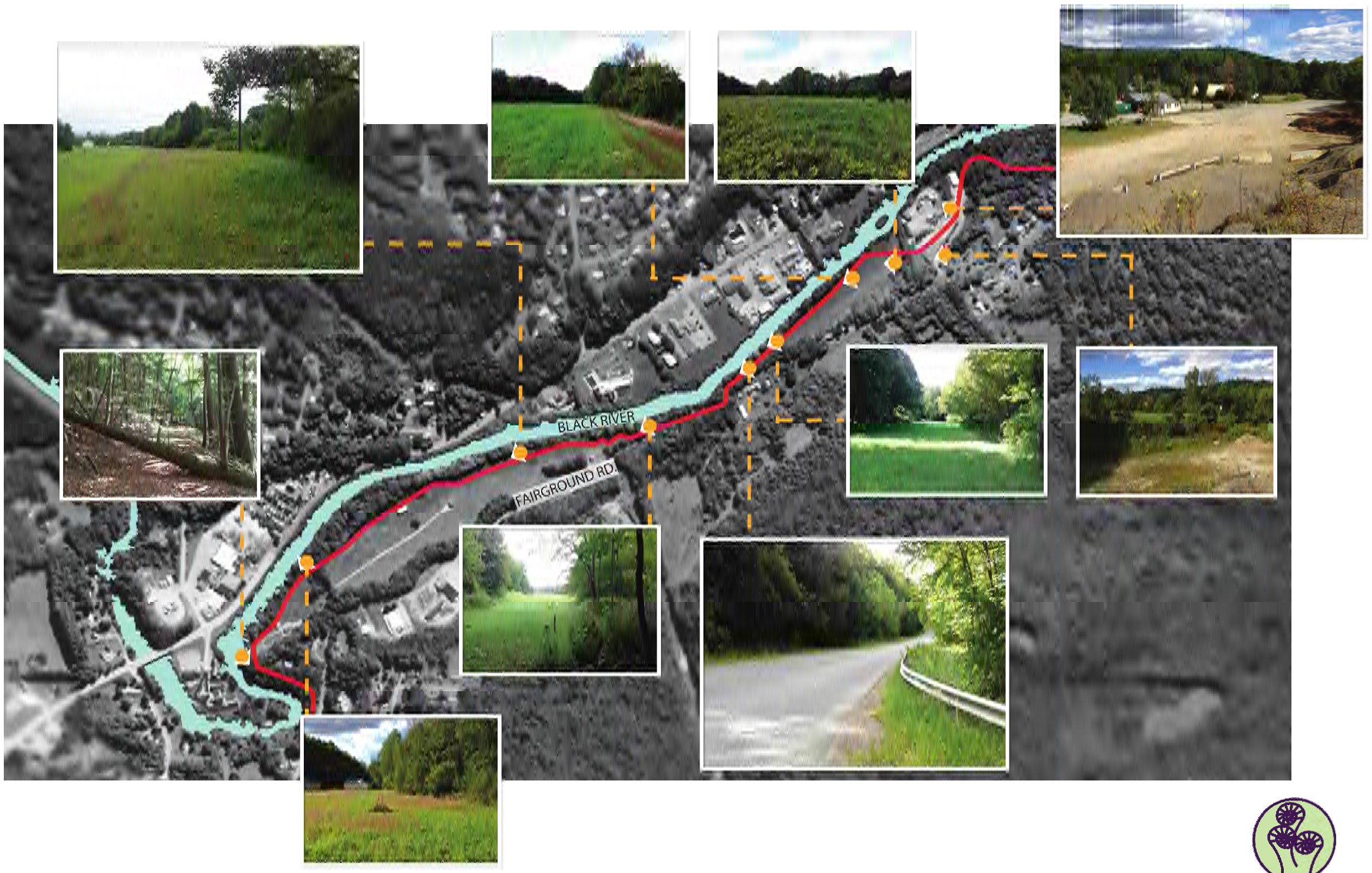
SPRINGFIELD, VERMONT

Good Earth Landscape Company
Landscape Architecture • Landscape Construction

4-8

DWG. NO. FIG 4-4 to 4-10.dwg

SHEET 1 OF 3



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PATHWAY STUDY

SHARED PATHWAY ROUTE
PHOTOS 2 OF 3

SPRINGFIELD, VERMONT

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4-9

DWG. NO. FIG 4-4 to 4-10.dwg

SHEET 2 OF 3

END OF PATH
NORTH SPRINGFIELD
DAM

MAPLE ST

VT RT 106

MAIN ST

ELM ST

RIVER ST

BLACK RIVER

FAIRGROUND RD

EXISTING CONDITION IMAGES

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PATHWAY STUDY

SHARED PATHWAY ROUTE
PHOTOS 3 OF 3

SPRINGFIELD, VERMONT

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4-10

DWG. NO. FIG 4-4 to 4-10.dwg

SHEET 3 OF 3

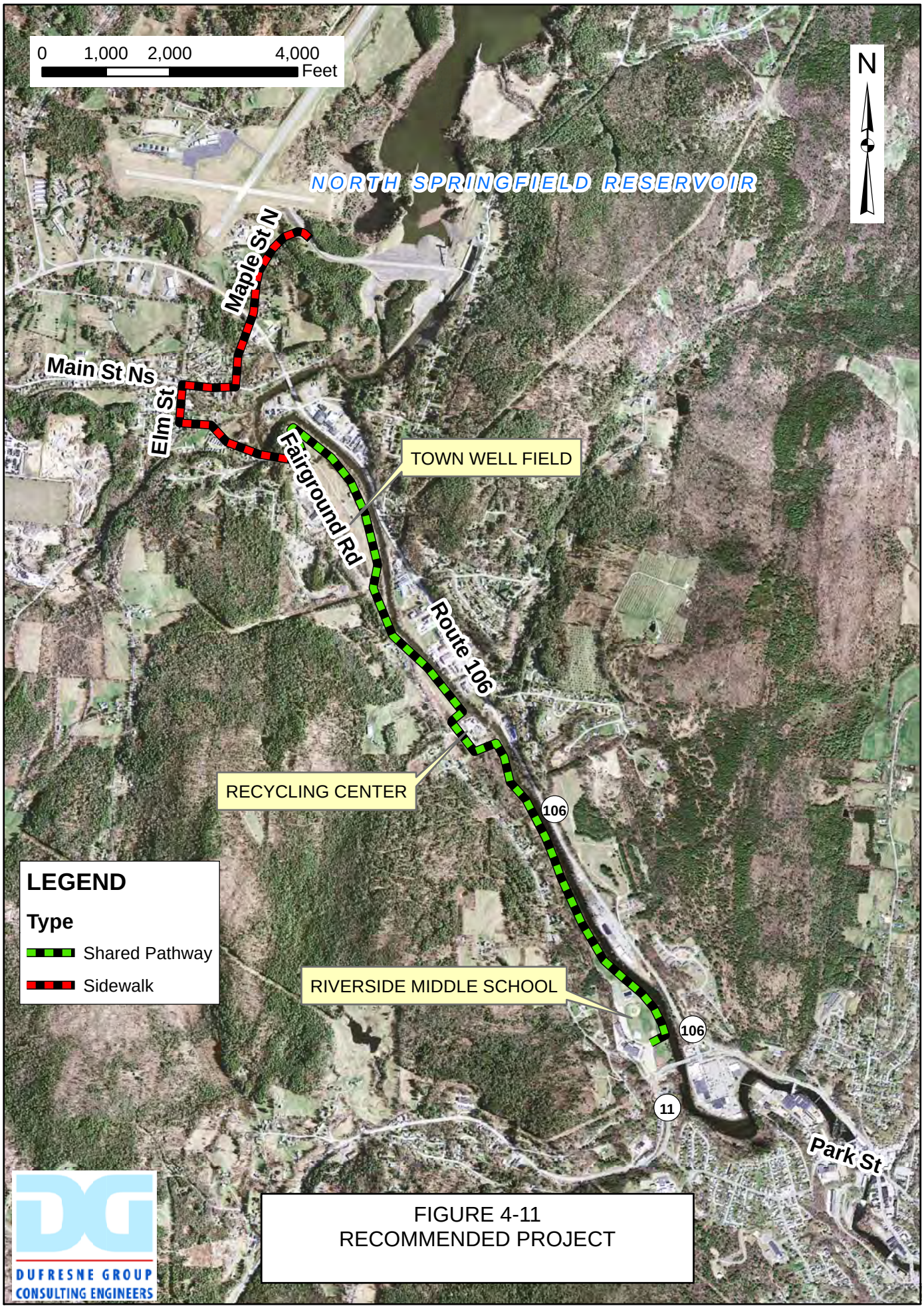

FIGURE 4-11
RECOMMENDED PROJECT

The sidewalk improvements project from the pathway to the reservoir area involves two stream crossings. The crossing on Fairgrounds Road is proposed with a pedestrian bridge and the crossing on Maple Street could be accomplished by extending the existing box culvert.

Construction Cost Estimate:

We have completed a preliminary construction cost estimate for the shared pathway, from Riverside Middle School to terminate at the north end of the Town well field. The cost estimate presented in Table 4-3 is for implementing the pathway projects in two phases with on-road bicycle facilities to the reservoir from Riverside Middle School to Fairgrounds Road.

As shown in Table 4-3, the cost for a paved surface is estimated to cost $6/ft more than the cost for a crushed ledge surface. The additional cost is not substantial compared to the total construction costs and a paved surface is recommended due to increased durability. The construction cost for a paved pathway is $2,629,000 in 2014 dollars.

Construction cost estimates were also prepared for two alternatives for sidewalk improvements from the shared pathway to the reservoir. The first alternative is to construct new sidewalk in sections where there are currently no sidewalks and to replace the existing deteriorated concrete sidewalks on Elm Street and Main Street. The second alternative is provided as possibly a phased approach to the sidewalk improvements, with construction of new sidewalk only in areas where there is no sidewalk currently (Fairgrounds Road, sections of Elm Street and Maple Street) and replacement of existing deteriorated sidewalk as a future project.

Table 4-4 presents the construction costs for sidewalk improvements between the north end of the pathway on Fairgrounds Road and the North Springfield Reservoir. If new sidewalks are installed on Fairgrounds Road, Elm Street and Maple Street and the existing sidewalks on Elm Street and Main Street are replaced, the construction cost is $739,000 in 2014 dollars. If the existing sidewalk is not replaced, the new sidewalk construction cost is $594,000 in 2014 dollars. After reviewing these alternatives, STAG indicated that on-road bicycle facilities using roadway shoulders is preferred to sidewalk improvements. Therefore the costs presented in Table 4-4 are not included in the recommended project. Improvements to complete a route to the North Springfield Reservoir are minimal, consisting of signage and other roadway markings for on-road bicycle facilities and a budget of $20,000 is recommended.

As shown in Table 4-5, the total project cost for the pathway from Riverside to the Recycling Center (Phase 1) is $1,845,000 based on a construction cost of $1,214,000 in 2014. The total project cost for Phase 2 is $2,194,000 based on a construction cost of $415,000 in 2014.

TABLE 4-3
PRELIMINARY CONSTRUCTION COST ESTIMATE FOR SHARED PATHWAY
SPRINGFIELD, VERMONT
October 7, 2014

DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT PRICE	TOTAL COST
6,000 ft Shared Path from RMS to Recycling Center (Phase 1)				
Cut and chip trees, heavy	3	ACRE	$15,000.00	$45,000
Earth stripping and stockpile	6,400	SY	$2.00	$12,800
Common Excavation	4,300	CY	$10.00	$43,000
Excavation for ditch lines	4,100	CY	$9.00	$36,900
Drainage Culverts 30" dia	4	EA	$1,700.00	$6,800
Drainage Culverts 12" dia	45	EA	$900.00	$40,500
6" underdrain	500	LF	$20.00	$10,000
Subbase gravel	5,500	CY	$40.00	$220,000
Rip rap for ditch lines	2,500	CY	$36.00	$90,000
Bituminous Asphalt Pavement	800	TON	$100.00	$80,000
Aggregate shoulders, in place	300	CY	$50.00	$15,000
Pedestrian bridges	4	EA	$45,000.00	$180,000
Trailhead sign and post	2	EA	$250.00	$500
Wooden boardwalk	1	LS	$50,000.00	$50,000
Landscaping	1	LS	$40,000.00	$40,000
Mobilization/demobilization	1	LS	$100,000.00	$100,000
			Total Phase 1	**$971,000**
6,000 ft Shared Path from Recycling Center to Fairgrounds Road (Phase 2)				
Earth stripping and stockpile	15,000	SY	$2.00	$30,000
Common Excavation	4,300	CY	$10.00	$43,000
Subbase gravel	5,500	CY	$40.00	$220,000
Bituminous Asphalt Pavement	800	TON	$100.00	$80,000
Aggregate shoulders, in place	300	CY	$50.00	$15,000
Trailhead sign and post	2	EA	$250.00	$500
6' high chain link fence	2,700	LF	$17.00	$45,900
Steel guardrail	620	LF	$30.00	$18,600
Retaining Wall, cast in place reinforced concrete, up to 10' h	600	LF	$490.00	$294,000
Fall protection barrier: Aluminum 2 rail pipe railing	600	LF	$70.00	$42,000
Road reconstruction	1	LS	$185,000.00	$185,000
Landscaping	1	LS	$40,000.00	$40,000
Uniform Traffic Officer	300	MHR	$60.00	$18,000
Mobilization/demobilization	1	LS	$100,000.00	$100,000
			Total Phase 2	**$1,132,000**
Phase 1 and Phase 2 Construction Cost				**$2,103,000**
Contingency 25%				$526,000
Total Construction Cost in 2014				**$2,629,000**

Notes:

1. Costs for the shared pathway are for a 12,000 lf, 10 ft wide shared-use pathway with 2 ft aggregate shoulders.

2. Construction costs are preliminary and are not based on detailed plans and specifications. Actual costs may vary substantially from these estimates. Contingencies are based on 25% of the construction cost at the preliminary planning stage.

3. The Engineering News Record Construction Cost Indices (CCI) was 9,681 when the cost estimate was completed in February 2014.

4. The alternative of a crushed ledge surface is expected to be lower than asphalt by about $6/ft.

TABLE 4-4
PRELIMINARY CONSTRUCTION COST ESTIMATE FOR ALTERNATIVE
SIDEWALK IMPROVEMENTS FAIRGROUNDS ROAD TO N. SPRINGFIELD RESERVOIR
SPRINGFIELD, VERMONT
October 7, 2014

Alternative 1: Construct 3,500 lf of new sidewalk and replace 2,200 lf of existing sidewalk				
DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT PRICE	TOTAL COST
Excavation of Surfaces	610	SY	$10	$6,100
Crushed Gravel subbase	750	CY	$40	$30,000
Asphalt shoulder	310	TON	$100	$31,000
Vertical Granite Curb	4,220	LF	$30	$126,600
Concrete Sidewalk (including excavation and subbase)	2,390	SY	$90	$215,100
Detectable Warning Plates	14	SF	$50	$700
Painted Crosswalks	1	LS	$250	$250
Trailhead Sign	2	EA	$75	$150
8'H Sign Post	2	EA	$25	$50
Pedestrian Sign	5	EA	$80	$400
12'H Sign Post	2	EA	$30	$60
Extend Existing Box Culvert	1	LS	$21,000	$21,000
Pedestrian Footbridge	1	LS	$90,000	$90,000
Uniform Traffic Officer	160	MHR	$60	$9,600
Misc. Work and Cleanup	1	LS	$60,000	$60,000
Subtotal Construction Cost				**$591,000**
Contingency 25%				$148,000
Total Construction Cost 2014				**$739,000**

Alternative 2: Construct 3,500 lf of new sidewalk, retain 1,200 lf of existing sidewalk				
DESCRIPTION	ESTIMATED QUANTITY	UNITS	UNIT PRICE	TOTAL COST
Crushed Gravel subbase	580	CY	$40	$23,200
Asphalt shoulder	220	TON	$100	$22,000
Vertical Granite Curb	3,500	LF	$30	$105,000
Concrete Sidewalk (including excavation and subbase)	1,750	SY	$90	$157,500
Detectable Warning Plates	12	SF	$50	$600
Painted Crosswalks	1	LS	$250	$250
Trailhead Sign	2	EA	$75	$150
8'H Sign Post	2	EA	$25	$50
Pedestrian Sign	5	EA	$80	$400
12'H Sign Post	2	EA	$30	$60
Extend Existing Box Culvert	1	LS	$21,000	$21,000
Pedestrian Footbridge	1	LS	$90,000	$90,000
Uniform Traffic Officer	160	MHRS	$60	$9,600
Misc. Work and Cleanup	1	LS	$45,000	$45,000
Subtotal Construction Cost				**$475,000**
Contingency 25%				$119,000
Total Construction Cost 2014				**$594,000**

Notes:

1. Construction costs are preliminary and are not based on detailed plans and specifications. Actual costs may vary substantially from these estimates. Contingencies are based on 25% of the construction cost at the preliminary planning stage.
2. The Engineering News Record Construction Cost Indices was 9,681 when the cost estimate was completed in February 2014.

TABLE 4-5
TOTAL PROJECT COST
SHARED PATHWAY AND SIDEWALK IMPROVEMENTS
SPRINGFIELD, VERMONT
OCTOBER 7, 2014

DESCRIPTION	TOTAL COST
Phase 1 Construction Cost in 2014 with 25% contingency	$1,214,000
Engineering:	
Preliminary Phase Engineering	$30,000
Design Phase Engineering	$244,000
Construction Phase Engineering	$244,000
Local Project Management	$123,000
Legal and Fiscal	$40,000
Total Construction Cost Pathway Phase 1	**$1,895,000**

DESCRIPTION	TOTAL COST
Phase 2 Construction Cost in 2014 with 25% contingency	$1,415,000
Signage and markings for on-road bicycle facilities	$20,000
Engineering:	
Design Phase Engineering	$290,000
Construction Phase Engineering	$287,000
Local Project Management	$142,000
Legal and Fiscal	$40,000
Total Construction Cost Sidewalk Phase 2	**$2,194,000**

Notes:

1. Construction costs are shown in Tables 4-2 and 4-3. The construction costs include 25% contingency. The pathway cost is for the paved surface alternative.
2. Construction costs are preliminary and are not based on detailed plans and specifications. Actual costs may vary substantially from these estimates.
3. The Engineering News Record Construction Cost Indices (CCI) was 9,681 when the cost estimate was completed in February 2014.
4. Contingencies are based on 25% of the construction cost at the preliminary planning stage.
5. Engineering costs are estimated based on the VTrans typical percentages.
6. Legal, Admin, and Fiscal costs are estimated at about 3% of the Construction Cost.

SECTION 5
FISCAL IMPLEMENTATION

Project Description

As presented in Section 4, the proposed project is a pathway to connect downtown Springfield to North Springfield and connecting to the school, Town pool and other destinations at the North Springfield Reservoir. A 2.3 mile shared pathway is proposed from Riverside Middle School north along the Black River to the north end of the Town well field on Fairgrounds Road.

On-road bicycle facilities are proposed to complete the route for to the reservoir area. Bicyclists traveling between the north end of the pathway and the reservoir will utilize the existing roadway shoulder as the roadways from Fairgrounds Road to the reservoir area are not wide enough to accommodate a bike lane or a shared pathway.

Total Project Cost Estimates

As shown in Table 5-1 the total project cost is estimated at $4,089,000 for the phased shared pathway based on construction cost estimates in 2014. The construction costs should be inflated by 3-4% per year to estimate construction costs in the future, with non-construction costs increased accordingly.

TABLE 5-1
SUMMARY OF ESTIMATED TOTAL PROJECT COSTS BY PHASE
SHARED PATHWAY PHASE IMPROVEMENTS
SPRINGFIELD, VERMONT
October 7, 2014

Pathway Segment	Total Project Cost
Phase 1: Riverside to Recycling Center	$1,895,000
Phase 2: Recycling Center to Fairgrounds	$2,194,000
Total Project Cost	$4,089,000

Notes:

1. Construction costs are shown in Table 4-3. Total project costs are shown in Table 4-5.
2. Engineering and Local Project Management costs are estimated based on the VTrans typical percentages of 20% of construction cost for the design phase, 20% of the construction cost for the construction phase and 10% of the construction cost for Local Project Management.
3. Legal, Admin, and Fiscal costs are estimated at about 3% of the Construction Cost.

Permit Summary

At this time, we anticipate the following permits may be required for the pathway project:

- Stormwater General Permit to Construct
- Stormwater General Discharge Permit
- Wetlands General Permit
- Local Conditional Use for Development in a Floodway
- NEPA Categorical Exclusion
- Stream Alteration Permit
- Section 404 Army Corps Permit

Shared Pathway Maintenance

The level of maintenance along the pathway will vary based on location. For the shared pathway, Town maintenance of the path will include routine upkeep such as snow clearing and any necessary repairs. During winter months, the Town may opt to not clear the route of snow as pathway users may prefer to snowshoe and cross country ski on this segment of the pathway.

Maintenance expenses such as asphalt repair and pathway clearing are estimated at a minimum of $1,000 per year based on the Town's existing budget for maintaining the Toonerville Trail, a shared pathway south of Springfield downtown.

Project Schedule

The proposed project schedule is based on several criteria including the following factors:

- The need for the improvements as defined by local officials.
- The cost of the project to property owners and local approval of the project.
- Securing permanent easements for the shared pathway.
- Funding requirements.
- Permitting requirements

Based on these factors we suggest a project schedule as shown in Table 5-2.

TABLE 5-2
PROJECT SCHEDULE
BICYCLE AND PEDESTRIAN PATHWAY
SPRINGFIELD, VERMONT
April 1, 2014

PROJECT TASK	DATE
Receive Study Approval	December 2014
Submit Funding Application for Final Design Funds	June 2015
Receive Approval of Funding Application	August 2015
Grant Agreement Executed	October 2015
Procurement for Design Services	January 2016
Complete Topographic Survey of Project Areas	May 2016
Final Design Plans and Specifications Advertised for Bid	April 2019

Notes:

1. The project schedule is based on several items beyond the control of the Town of Springfield including the availability of funding, securing easements, the time necessary to obtain permits, the time the regulatory and funding agencies need to review plans and specifications and the success or failure of local bond votes. The schedule may change based on the actual time needed to complete these tasks. Final design duration is based on typical LTF project schedules as provided by VTrans.

Funding Implications

The Town of Springfield does not have the funds to finance the pathway project locally and therefore must receive grants or take on long-term debt to finance the proposed project. The VTrans Bicycle and Pedestrian Program, administered by the VTrans Local Transportation Facilities (LTF), provided funding for this report and is the most likely funding source for design and construction.

The proposed path is an eligible project under the Bicycle and Pedestrian Program. The funding shares are 90% Federal/State and 10% local. However, if a project funded under this program does not proceed to construction, any funds provided for the preliminary and design phases are subject to being paid back by the municipality. Grant applications are accepted annually and are generally due by the last week of July.

The Transportation Alternatives Program, also administered by LTF, is an option for funding design. As the maximum Federal award under the Transportation Alternatives Program is limited to $300,000, this is not an option for funding the construction phase for the entire route. The Transportation Alternatives Program had an award range of $20,000 to $300,000 and the local match is 20%, with half of the match as cash expenditure.

Based on funding under the Bicycle and Pedestrian Program, the local share of the total project cost is $190,000 for the Phase 1 shared pathway project.