

TABLE 1: Alignment Comparisons
Barre City and Barre Town
Multi Use Path Conceptual Alignment Study
 October 28, 2010

Project Description	Sections A&B						Segment C			High School					
	No Action	Alignment A-1	Alignment A-2	Alignment B-1	Alignment B-2	Alignment A-B	Alignment C-1	Alignment C-2	Alignment C-3	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Length	0	8,650 LF*	8,730 LF*	3,175 LF*	5,025 LF*	3,515 LF*	1,250 LF*	1,800 LF*	4,400 LF*	1,300 LF*	3,180 LF*	700 LF*	650 LF*	3,075 LF*	800 LF*
Length of New Sidewalk	0	0	2,500 LF*	1,250 LF*	975 LF*	1,575 LF*	625 LF*	950 LF*	21,950	0	1,750 LF*	0	0	3,075 LF*	0
Length of New Shared Use Path	0	8,650 LF*	6,125 LF*	1,925 LF*	3,050 LF*	1,825	0	850 LF*	2,000 LF*	1,300 LF*	1,030 LF*	550 LF*	650 LF*	0	800 LF*
Type & Length of On-Road Facilities	0	2,500 LF Bicycle Route	300 LF Wide shoulders 650 LF Bicycle lanes	975 LF Wide shoulders 1,750 LF Bicycle lanes	550 LF Wide shoulders 1,025 LF Bicycle lanes	Bicycle Lanes 1,250 LF	Wide Shoulders 950 LF*	1,950 Bicycle Lanes	None	1,750 LF Bicycle Route & 300 LF Bicycle Lanes	None	None	3,075 LF Bicycle Lanes	None	
Number of Crosswalks*	2	1	3	2	4	5	2	2	3	0	3	0	0	4	1
Length in ROW	0	0	2,500 LF*	1,250 LF*	2,725 LF*	1,575 LF*	1,250 LF*	950 LF*	2,000 LF*	0	3,180 LF*	0	50 LF*	3,075 LF*	800 LF*
Private property easements	0	15	13	3	3	8	0	7	2	9	7	1	1	0	0
Significant Physical Constraints	None	Several large and small sloped areas / Avoiding uninterested properties	Crossing Quarry Hill Road / Several steeply sloping areas	The steep slope east Wilson Road / The crossing on Bridge Street at the end of the existing City/Town path	Connection to Sterling Hill Road may require significant grading	The steep slope east Wilson Road / The crossing on Bridge Street at the end of the existing City/Town path	Tight, sloping curve on Prospect Street with bicyclists crossing and on road bicycle facilities	Narrowness of Branch Street makes adding facilities difficult / slope between Branch Street and the existing path	Narrowness of alignment adjacent to Prospect St. bridge	Very Steep Slopes	Narrowness of Mill Street / the slope and configuration of the Mill Street & Main Street intersection / limited space along Main Street/ the configuration of the Main St. and Ayers St. intersection	Crossing the Stevens Branch	Slope	The existing width of Websterville and Sterling Hill Roads	Space between the roadway and buildings is limited
Environmental/Cultural Constraints															
Flood Plain	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	Potential impact	No impact	No impact	No impact
Forest Impact	No impact	Impacts	No impact	Some impact	Some impact	Some impact	No impact	Impacts	Impacts	Impacts	No impact	No impact	Minor Impact	No impact	No impact
Approximate wetland disturbance	No impact	450 LF	No impact	No impact	No impact	No impact	No impact	No impact	300 LF	No impact	No impact	No impact	No impact	No impact	No impact (needs field verification)
Deer Yard Disturbance	No impact	No impact	No impact	No impact	Some impact	No impact	No impact	No impact	Minimal	No impact	No impact	No impact	No impact	No impact	No impact
Archaeological Resources	No effect	Potential effect	No effect	No effect	No effect	Potential effect	No effect	Potential effect	Potential effect	No effect	No effect	Potential effect	No effect	No effect	No effect
Historic Resources	No adverse effect	No adverse effect	No effect	Potential adverse effect (Sterling Hill Road and Bridge Street houses)	No effect	Potential adverse effect (Sterling Hill Road and Bridge Street houses)	No adverse impact	Potential adverse effect (Branch Street houses)	Potential adverse effect (Brooklyn Street houses)	No adverse effect	Potential adverse effect (Mill Street houses, S. Main Street Bridge, Ayers intersection)	No apparent adverse effect	No effect	No apparent adverse effect	Potential adverse effect (Bridge)
Hazardous Material	No impact	No known impact	No known impact	Potential impact - M & M Beveridge	No known impact	Potential impact - M & M Beveridge	Possible minor impact - Bonacorsi & Sons on the south side of Prospect Street	No known impact	No known impact	No known impact	Possible minor impact - Barre Cumberland Farms on the east side of S. Main Street	Possible impact - Transmission station	No known impact	No known impact	No known impact
Project Attributes															
Meets Purpose and Need Statement	No	Yes	Yes	Yes	Yes	Yes	Questionable	Most likely	Yes	Yes	Questionable	Yes	Yes	Yes	Yes
Number of Unsignalized Commercial/Institutional Driveways/Roadways Crossed by Sidepath	NA	0	5	0	0	0.00	0	0	0	0	4	1	0	0	1 (possibly 2)
Number of Unsignalized Residential Driveways Crossed by Sidepath	NA	0	3	0	0	0.00	0	0	0	0	0	0	0	0	3
Crossing of Route 14	Uses various signalized and unsignalized crossings	NA	NA	Uses intersection to be signalized in the near future	Uses existing signalized intersection with pedestrian signals	Uses intersection to be signalized in the near future	NA	NA	NA	NA	Uses intersection to be signalized in the near future	Uses intersection to be signalized in the near future	NA	NA	NA
Use of Existing City/Town Path	NA	NA	NA	Links with southern end of path	None	Links with southern end of path	Links with northern end of path	Links with middle of path	None	Links with middle of path	None	None	Links with middle of path	NA	NA
Number of Attractions	None	1	4	5	2	5	1	1	2	NA	2	1	NA	NA	NA
Need for Switchbacks	NA	No	No	Yes	No	No	No	No	No	No	No	No	No	No	No
Readily Serves all age groups and users	Experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Switchbacks may limit use by young and old pedestrian and bicyclists	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	May only serve experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	May be difficult for Children to use	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders
Interaction with roadway motor vehicle traffic	High	Minimal	High - must cross Quarry Hill Road - moderate on Cherywood and Golden Circle	Moderate - Sterling Hill and Bridge Street	Moderate - Parkside Terrace and Pouloit Street	Moderate - Sterling Hill and Bridge Street	High on Prospect Street	High on Branch Street	High on Brooklyn Street	None	High on Mill Street	None	None	High on Websterville Road and Sterling Hill Street and crossing Granville/Quarry Hill Road at intersection	Moderate
Utilities	No interaction	Portions in GMP transmission line ROW	Portions in GMP transmission line ROW	Possible interaction with water line on hillside east of Hannafords	Crosses transmission lines	Possible interaction with water line on hillside east of Hannafords	Adjacent overhead utilities may need to be relocated On Fairview Street	Overhead utilities adjacent to roadways may need to be modified.	Crosses transmission lines / requires relocation of electrical junction box east of Prospect St. bridge	No interaction	May require relocation of existing overhead utility poles	Requires use of transmission station property.	No interaction	May require relocation of existing overhead utility poles	Requires relocation of existing utility poles
Other Issues															
Other Issues	Does not provide adequate bicyclist or pedestrian connections	Will require the purchase-resale of at least one property / Steep slopes at Sterling Hill Road require grading bridge necessitates a new adjacent pedestrian-bicycle bridge	Industrial Park section may need to be on-road or realigned behind buildings / Use of sewer easement / Very steep slopes and limited locations for alignment approaching Sterling Hill Road	The switchbacks East of the park may remove most of the vegetation on the hillside / The unnamed drainage east of Sterling Hill Road will need to be crossed with a small bridge or culvert / sidewalks on the north side of Sterling Hill and Bridge Streets will remove small amounts of vegetation	Alignment through the woods needs to be planned to minimize impacts on property owners		The existing topography, curves, and traffic volumes make bicycle travel and crossings on Prospect Street difficult. There is insufficient room to create a sidepath that would keep bicyclists off the road	The connection at the north end to Brooklyn and Prospect Streets will need careful layout and signage.	Requires a new bridge over Stevens Branch south of Prospect St. Bridge	Steep slopes may require the construction of a wooden boardwalk extending out from the hillside	Configuring on road facilities and a sidewalk on Mill St. will be challenging / The sidepath along Main St needs extremely good signage and layout / the routing through the Main St. Ayers St. intersection is important	Requires new bridge across the Stevens Branch; will need to disturb setback areas.	The existing mowed path appears to meet ADA requirements, but will need to be wider	Sidewalk alignment has already been studied	Will require modifications to bridge widening plans.

Positive Considerations * Crosswalks include bicycle crossings to convert between on road facilities to off road facilities
 Negative Considerations

* Crosswalks include bicycle crossings to convert between on road facilities to off road facilities

Table 2: Cost Estimate (Part A)

	UNIT	QUANT.	UNIT PR.	COST
Town School Phase				
10' Wide Paved Path	LF	875	\$175	\$153,125
			Phase Total =	\$153,125
Project Engineering (15%)				\$22,969
Municipal Project Manager (5%)				\$7,656
Construction Engineering (10%)				\$15,313
Contingency (15%)				\$22,969
			Phase Subtotal	\$222,031
Purple Phase (Barre Town School to Silver Circle)				
4' Road Widening for Bike Lane along Town Roads	LF	1025	\$45	\$46,125
5' Wide Concrete Sidewalks along Town Roads	LF	1025	\$50	\$51,250
10' Wide Paved Path	LF	825	\$175	\$144,375
Graniteville Road Crossing (Signs and Markings)	EA	1	\$500	\$500
School Driveway Crossing (Markings only)	EA	1	\$100	\$100
			Phase Subtotal	\$242,350
Project Engineering (15%)				\$36,353
Municipal Project Manager (5%)				\$12,118
Construction Engineering (10%)				\$24,235
Contingency (15%)				\$36,353
			Phase Total	\$351,408
Blue Phase (Silver Circle to Sterling Hill Road)				
10' Wide Paved Path in Wooded Area	LF	3,375	\$175	\$590,625
10' Wide Paved Path in Wooded Area with Steep Slopes	LF	1,000	\$525	\$525,000
			Phase Subtotal	\$1,115,625
Project Engineering (15%)				\$167,344
Municipal Project Manager (5%)				\$55,781
Construction Engineering (10%)				\$111,563
Contingency (15%)				\$167,344
			Phase Total	\$1,617,656
Yellow Phase (Sterling Hill Road to End of Barre Town/City Path)				
5' Wide Concrete Sidewalks along Town Roads	LF	1750	\$50	\$87,500
4' Road Widening for Bike Lane along Town Roads	LF	525	\$45	\$23,625
VT Route 14 Road Crossing (Signs and Markings)	EA	1	\$500	\$500
Sterling Hill Road Crossing (Markings Only)	EA	1	\$100	\$100
			Phase Subtotal	\$111,725
Project Engineering (15%)				\$16,759
Municipal Project Manager (5%)				\$5,586
Construction Engineering (10%)				\$11,173
Contingency (15%)				\$16,759
			Phase Total	\$162,001
Tan Phase (Parkside Terrace to Mill Street)				
10' Wide Paved Path	LF	800	\$175	\$140,000
New Striping for Bike Lanes along City Streets	LF	435	\$5	\$2,175
			Phase Subtotal	\$142,175
Project Engineering (15%)				\$21,326
Municipal Project Manager (5%)				\$7,109
Construction Engineering (10%)				\$14,218
Contingency (15%)				\$21,326
			Phase Total	\$206,154
Grey Phase (Mill Street to Merchants Row)				
5' Wide Concrete Sidewalks along City Streets	LF	1,400	\$50	\$70,000
10' Wide Paved Path	LF	1,975	\$175	\$345,625
10' Wide Paved Path with Steep Slopes	LF	575	\$525	\$301,875
Side Path	LF	225	\$175	\$39,375
4' Widening for Bike Lanes on City Street	LF	1,400	\$45	\$63,000
Brooklyn Street Crossing	EA	2	\$500	\$1,000
Pedestrian Truss Bridge over Stream at South End	LF	65	\$1,600	\$104,000
Pedestrian Truss Bridge over River at North End	LF	65	\$1,600	\$104,000
			Phase Subtotal	\$1,028,875
Project Engineering (15%)				\$154,331
Municipal Project Manager (5%)				\$51,444
Construction Engineering (10%)				\$102,888
Contingency (15%)				\$154,331
			Phase Total	\$1,491,869
Total Preferred Path Alignment Construction Cost = \$2,793,875				
Total Preferred Path Alignment PE Cost = \$419,081				
Total Preferred Path Alignment MPM Cost = \$139,694				
Total Preferred Path Alignment CE Cost = \$279,388				
Total Preferred Path Alignment Contingency Cost = \$419,081				
OVERALL PROJECT TOTAL = \$4,051,119				
OVERALL CITY COST \$1,698,023				
OVERALL TOWN COST \$2,353,096				

Table 2: Cost Estimate (Part B)

	UNIT	QUANT.	UNIT PR.	COST
High School Phase				
10' Wide Paved Path	LF	100	\$175	\$17,500
10' Wide Stone Dust Path	LF	1,400	\$160	\$224,000
Side Path	LF	150	\$175	\$26,250
New Striping for Bike Lanes along City Streets	LF	225	\$5	\$1,125
Pedestrian Truss Bridge over River	LF	75	\$1,600	\$120,000
			Phase Total =	\$388,875
East Parkside Terrace Phase				
4' Widening for Bike Lanes on City Street	LF	475	\$45	\$21,375
5' Wide Concrete Sidewalks along City Streets	LF	475	\$50	\$23,750
			Phase Total =	\$45,125
Town School Phase				
10' Wide Paved Path	LF	875	\$175	\$153,125
			Phase Total =	\$153,125
Short Cut Phase				
10' Wide Paved Path in Field	LF	525	\$175	\$91,875
			Phase Total =	\$91,875
Green Phase (VT 14)				
New Striping for Bike Lanes along City Streets	LF	1,475	\$5	\$7,375
			Phase Total =	\$7,375
B1 Alternative (Switchbacks)				
10' Wide Paved Path with Gabion Walls	LF	2,000	\$525	\$1,050,000

TABLE 3: Phase Summary
Barre City and Barre Town
Multi Use Path Conceptual Alignment Study
 January 6, 2011

	Purple Phase	Blue Phase	Yellow Phase	Tan Phase	Grey Phase	High School Phase	Town School Phase	Shortcut Phase	Green Phase	East Parkside Terrace Phase
Project Description										
Length	3,515	4,375	1,835	1,235	4,240	1,500	900	525	1,475	1,660
Length of New Sidewalk	1,575	0	1,850	0	1,400	0	0	0	0	475
Length of New Shared Use Path	1,825	4,375	0	1,285	2,775	550 LF	900	525	0	0
Type & Length of On-Road Facilities	1025 LF Bicycle Lanes 550 LF Wide Shoulders	0	1225 LF Shared Roadway 525 LF Wide Shoulders	1,285 LF Bicycle Lanes	1,400 LF Wide Shoulders	300 LF Bicycle Lanes	0	0	1,475 LF of Wide Shoulders	475 LF of Wide Shoulders 1,115 LF Bicycle Lanes
Number of Crosswalks*	5	0	4	2	3	2	2	0	0	0
Length in ROW	1,650	0	1,835	1,285	1,625	700	0	50 LF	1,475	1,660
Private Property Easements	3	9	0	0	2	2	0	1	0	0
Significant Physical Constraints	Slopes on Websterville Road adjacent to the Cemeteries	Steep slopes west of Platinum Plain; grade changes between open fields south of Silver Circle; steep slopes near Sterling Hill Road	Houses close to Sterling Hill Road and Bridge Street	None	Steep slopes along Stevens Branch; un-named drainage gully east of Jail Branch confluence; electrical box on east side of Prospect Street Bridge	Crossing the Stevens Branch / Configuration of Main Street South - Ayers Street intersection	None	Slope	None	None
Environmental/Cultural Constraints										
Flood Plain	No impact	No impact	No impact	No impact	Northern section closest to Stevens Branch floodplain - needs to be examined in detail as plans are developed	Potential impact	No impact	No impact	No impact	No impact
Topography	No impact	Disurbance across steep slopes	No impact	Parkside Terrace existing slope is steep.	Disurbance across three sections of very steep slopes	No impact	No impact	No impact	No impact	No impact
Forest Impact	Impacts south of Websterville Road	Impacts in several locations	No impact	No impact	Impacts in several locations	No impact	No impact	No impact	No impact	No impact
Approximate Wetland Disturbance	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact
Deer Yard Disturbance	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact	No impact
Archeological Resources	Potential effect	Potential effect	No effect	No effect	Potential effect	No effect	No effect	No effect	No effect	No effect
Historic Resources	No adverse effect	No adverse effect	Potential adverse effect (Bridge Street house)	No adverse effect	Potential adverse effect (Brooklyn Street houses)	No apparent adverse effect	Potential adverse effect (Brooklyn Street houses)	No effect	No effect	No effect
Hazardous Material	No known impact	No known impact	No known impact	No known impact	No known impact	Possible impact - Transmission station	No known impact	No known impact	No known impact	No known impact
Project Attributes										
Meets Purpose and Need Statement	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Unsignalized Commercial/Institutional Driveways/Roadways Crossed by Sidepath	0	0	0	0	1	1	0	0	0	0
Number of Unsignalized Residential Driveways Crossed by Sidepath	0	0	0	0	0	0	0	0	0	0
Readily Serves All Age Groups and Users	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	Children, casual and experienced bicycle riders	May not serve small children	Children, casual and experienced bicycle riders
Interaction with Roadway Motor Vehicle Traffic	High along Websterville and Sterling Hill Roads and at Graniteville Road crossing	None	High on Sterling Hill Road and Bridge Street	Moderate on Parkside Terrace	Moderate - Brooklyn Street and crossing Prospect Street	Moderate at Main Street/Ayers Street intersection and Ayers Street	At school access drive and Websterville Road crossings	None	High on Rt. 14	On East Parkside and Parkside Terrace
Utilities	Crosses GMP transmission line; may require the relocation of two guying poles	Crossing GMP transmission line / crosses water main which may need to be reposition deeper near crossing	May require the relocation of several utility poles on Sterling Hill Road and one utility pole on Bridge Street	No interaction	Portions in or crossing GMP transmission line ROW / potential relocation of utility poles on Brooklyn Street / Requires relocation of electrical junction box east of Prospect St. bridge	Requires use of transmission station property.	No interaction	No interaction	No interaction	No interaction
Initial Estimate of Probably Construction Costs										
Other Issues										
Other Issues	Verify Archeological Resource Assessment conclusions for the portion between Sterling Hill Road and Silver Circle.	Further archeological work is needed prior to design work; may require purchase-resale of one property; add link to Silver Circle if developed before Purple Phase	Sterling Hill Road Sidewalk may need to be adjacent to pavement due to narrow ROS; New Bridge Street sidewalk appropriate for enhancement grant; existing wide shoulders on Main Street South could use more frequent maintenance; does not include work to be completed by existing VTrans Bridge replacement and Rt 14 intersection projects	Widen Parkside Terrace East 2 ft to accommodate wider paved shoulders for bicyclists; restripe Parkside Terrace to add paved shoulders at least 3 feet wide	Further Archeological work is needed prior to design work; determine limits of flood plain in the field to finalize alignment; use a bridge up to the south end of Brooklyn Street if floodplain precludes routing path along Stevens Branch; Requires new bridge over Stevens Branch south of Prospect Street bridge	Requires new bridge across the Stevens Branch; will need to disturb setback areas.	Alternate routing on north side of parking and east side of access drive avoids crossings, but crosses service drives	The existing mowed path appears to meet ADA requirements, but will need to be wider	The existing paved shoulders on Rt 14 need to be restriped and get more frequent maintenance	Will require some road widening to provide adequate paved shoulders

Positive Considerations
 Negative Considerations

* Crosswalks include bicycle crossings to convert between on road facilities to off road facilities

* Crosswalks include bicycle crossings to convert between on road facilities to off road facilities

