



FUSS & O'NEILL

March 31, 2015

Mill River Greenway Committee
c/o Gaby Immerman
Town of Williamsburg
141 Main St.
Haydenville, MA 01039-0447

RE: South Main Street Connector Traffic Review
Mill River Greenway
Fuss & O'Neill Reference No. 20141158.A10

Dear Gaby:

This letter report summarizes our review of South Main Street as it relates to providing a pedestrian and bike connection for the proposed Mill River Greenway in Haydenville.

PURPOSE OF STUDY

The purpose of our work was to provide the Committee with a review of how best to connect the end of the Northampton rail trail where it ends in the vicinity of the Williamsburg Town Line with the proposed Mill River Greenway in the vicinity of Walpole Street. This letter report provides the Town with an evaluation of some alternative improvements to South Main Street leading to a recommendation of the more feasible connection features.

EXISTING CONDITIONS ALONG SOUTH MAIN STREET

The following is a summary of the existing traffic conditions and physical roadway conditions observed and measured along South Main Street. The section we reviewed was the 2400 ft.. section between the Mill River bridge and the Walpole Street / Hillside Road intersection.

- South Main Street general pavement width = 23± feet (20 ft.. clear width at Mill River bridge)
- Posted Speed = 25 MPH
- Relatively low traffic volume conditions (less than 1,500 vehicles per day)
- South Main Street average daily (24 hour) traffic north of Fort Hill Road = 809 vehicles (weekday average, mid-January); peak traffic hour at 4-5 PM with 80 vehicles
- South Main Street average daily (24 hour) traffic south of Fort Hill Road = 672 vehicles (weekday average, mid-January); peak hour traffic at 4-5 PM with 68 vehicles

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- Fort Hill Road average daily (24 hour) traffic = 198 vehicles (weekday average, mid-January); peak traffic hour at 2-3 PM with 23 vehicles
- Sidewalk along portion of South Main Street on east side varies in type (cement concrete in newer portion at 5 ft.. wide, bituminous concrete at 4 ft.. wide in older section); bituminous concrete section in general poor condition
- Drainage system with catch basins and drop inlets in northern section; roadside drainage with no catch basins in southern section
- No significant history of accidents (per review of MDOT crash history years 2010 to 2012 there were 3 reported accidents)
- Sight distance limitations at Fort Hill Road intersection with South Main Street: roadside embankment on a curve on South Main Street restricts intersection sight distance viewing to/from south on Fort Hill Road eastbound approach at STOP sign
- Observed vehicle speeds in vicinity of Mill River bridge varied; limited number of observations indicated speeds between 20 and 37 MPH; road conditions included snow and ice along roadside shoulders at time of observations.

ALTERNATIVES CONSIDERED

The field review of existing conditions and information on issues and concerns from other residents and Town staff resulted in a summary of the major concerns to be considered in developing alternatives for better accommodating pedestrians and bikes along this section of South Main Street. *Exhibit 1* attached indicates the immediate concerns and issues along South Main Street.

Exhibit 2 is a summary of the concerns and corresponding recommendations that should be considered in the short term to improve conditions along South Main Street. An opinion of cost was developed based on a very conceptual level of improvements. This cost is estimated at around \$52,000 for some immediate improvements. This includes about \$37,000 for construction of improvements such as traffic signage, pavement markings, intersection improvements, and guardrail improvements. An additional \$15,000 was allotted for a drainage study around the Fort Hill Road intersection, and a study of the ground stability at the existing retaining wall opposite Fort Hill Road.

Figures 1 and 2 show the location of these recommended improvements.

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Table A-2 gives a breakdown of the opinion of construction cost for the immediate improvements recommended.

In addition to these immediate improvements along this South Main Street section, more specific long term improvements alternatives were identified relative to providing safer accommodation for bikes and pedestrians along South Main Street for this link in the proposed Mill River Greenway section. These came from suggestions by others (i.e., the alternating one-way traffic on the bridge) and from ideas based on our field review. There were four alternatives considered.

Ideally, the greenway would continue along the Mill River corridor as a separate trail with a width adequate to be shared with both bikes and pedestrians. This would require a minimum trail width of about 10 feet, on a separate right-of-way for this trail. Lacking separate, off-road property (s) for this trail between the Mill River bridge and Walpole Road, the challenge is to provide improvements along South Main St. to accommodate the trail users.

There is not sufficient street layout width to provide added bike lanes or a wide 10 foot multi-use pathway area along South Main Street. Bike lanes would require an additional eight to ten feet of pavement widening along the road, in order to provide the required minimum bike lane width of 4 feet (without curbing) or 5 feet (with curbing) on each side of the road. There would be too much impact to the tree line and private property along South Main to implement this.

Accordingly, the most feasible alternative appears to be to separate the bikers from the pedestrians along this section. For pedestrians this can be accomplished by utilizing the existing sidewalk, where available, and extending it by means of a new sidewalk to the Mill River. Bikers can use South Main Street as a bike route, and share it with existing traffic.

Alternative A – New Sidewalk on West Side

- Construct a pedestrian bridge (minimum 6 ft. wide) on the west side of the existing Mill River bridge to connect walkers to the rail trail , and get them over the river without walking on the existing narrow roadway bridge with traffic; this will require a pedestrian crosswalk on the south side of the bridge where the trail connector meets South Main Street
- Construct a sidewalk (5 ft.. minimum width) on the west side of South Main Street between the Mill River bridge and the north side of Fort Hill Road
- Provide a crosswalk in the vicinity of # 29 that connects with the existing sidewalk on the east side of South Main Street

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- Sign South Main as a Bike Route with other bike signage for bikers to use South Main Street
- See *Figure 01* for a typical cross-section of the road for this alternative
- See *Figure 1A and 2A* for the plan of this concept

Alternative B – New Sidewalk on East Side

- Construct a pedestrian bridge on the east side of the existing Mill River bridge that connects walkers to the rail trail.
- Construct a sidewalk along the east side of South Main Street between the Mill River bridge and the existing sidewalk in front of #29 South Main Street.
- Sign South Main as a Bike route with other bike signage for bikers to use South Main Street
- See *Figure 02* for a typical cross-section of the road for this alternative
- See *Figure 3B and 4B* for the plan of this concept

Alternative C

- Construction a multiuse (pedestrian / bike) bridge (minimum 10 ft. wide) on the east side of the existing Mill River bridge, that allows both pedestrians and bikers to connect to the trail without having to use the roadway section of the Mill River bridge.
- Construct a sidewalk on the east side of South Main St. , as in Alternative B (or provide a crosswalk on the north side of the bridge and construct a new sidewalk along the west side of South Main as in Alternative A)
- See *Figure 03* for a cross-section graphic

Alternative D

- Provide a pedestrian walking area (7 ft. wide clear maximum) on the east side of the roadway of the existing Mill River bridge, and sign the approaches to the bridge for one-lane alternating traffic.
- Construct trail walkway connections (ADA compliant) to each end of the bridge pedestrian walk area
- Construct a sidewalk along the east side of South Main St. as in Alternative B (or provide a cross-walk on the north side of the bridge and construct a new sidewalk along the west side as in Alternative A)
- See *Figure 04* for a cross-section graphic

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EVALUATION OF ALTERNATIVES

An assessment of the alternatives in providing a greenway user connection along South Main St. was conducted as they relate to certain evaluation criteria. The criteria considered were:

- a) safety of pedestrian, bike, and vehicular traffic;
- b) potential impact to private property;
- c) environmental and related resource permitting;
- d) construction cost (very preliminary, only at a conceptual stage level); and
- e) constructability and consistency with typical design criteria and standards.

Tables A, B, C, and D attached summarize the assessment of each alternative. They present the advantages and disadvantages of each.

An opinion of construction cost for each alternative was made based on a very conceptual design level. See *Tables A-3 and A-4*.

RECOMMENDED IMPROVEMENTS

Immediate Needs

Figures 1 and 2 show the recommended short term (more immediate) improvement recommendations for South Main Street. They include improvements to traffic signage, pavement markings such as new crosswalk markings, intersection alignment improvements, and guardrail improvements. The opinion of cost for the construction of these improvements is estimated at \$52,000, which includes an expenditure for additional studies of storm drainage and retaining wall stability.

Longer Term Improvements With Trail Connection

A combination of parts of Alternative A (new sidewalk on the west side of South Main Street) and Alternative C (a wide multiuse pedestrian/bike bridge on the east side of the Mill River bridge) appears to present the most beneficial solution to providing a safer and more cost-effective greenway path along South Main Street. Subject to more detailed design evaluation based on actual street layout location, field survey detail, and environmental permitting evaluation, such improvements would appear the most feasible.

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Here are the features of the improvements that we would recommend for further consideration and more detailed evaluation:

- Construction of a separate pedestrian / bike bridge on the east side of the existing Mill River bridge that connects directly with the rail trail to and from the south; pedestrian bridge would be minimum of 10 ft.. wide.
- On the north side of the Mill River bridge, the pedestrian bridge would connect to a new crosswalk that would provide a marked crossing of South Main Street, to take pedestrians to a new sidewalk along the west side of the road, as described in Alternative A.
- Bikes would use South Main Street as a bike route (traveling along the roadside) between the Mill River pedestrian/ bike bridge and points north.
- New sidewalk along the west side of South Main Street would be a minimum of 5 ft. (excluding a roadside curb), and extend from the north-west side of the Mill River bridge to the vicinity of across from #29 South Main, where it would connect via a new marked crosswalk with the existing sidewalk along the east side of South Main. (see *Figure 1A*).
- Improve the existing 5 ft. hot mix asphalt sidewalk between house #29 and Bridge Street.
- Improve the sidewalk and crosswalk at Bridge Street intersection to be ADA compliant and modify the island area, and add new traffic control signage and pedestrian warning signs and markings.
- Improve the existing 5 ft.. hot mix asphalt sidewalk between Bridge Street and the Walpole Road intersection (match to the existing 5 ft. concrete sidewalk in some areas) .
- Add new curve advisory signage, new Stop sign and new pavement markings at the South Main Street - Walpole Street intersection.
- Add other bike warning signs, speed limit signs, and curve advisory warning signs (See *Figures 1A, and 2A*).
- Modify the intersection geometry at the Fort Hill Road intersection so as to align at more of a 90 degree angle with South Main Street and improve the intersection sight distance.
- Evaluate further the need for roadside drainage improvements at the intersection of Fort Hill Road and South Main Street, and along the west edge of South Main Street between Fort Hill Road and the Mill River bridge; drainage improvements would need to be incorporated into the design of the new sidewalk.

See *Figure 01*, bottom half of the page for a typical cross section of South Main Street with a sidewalk along the west side of the road. *Figure 03* shows a graphic of the typical cross section of a pedestrian / bike bridge on the east side of the Mill River bridge.

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The opinion of cost for this alternative would be in the order of \$380,000, based on a very conceptual planning sketch of the improvements.

Sincerely,



Jon W. Dietrich, P.E.
Associate / Senior Transportation Engineer

Attachments: Exhibit 1 – Immediate Concerns Along Main Street
 Exhibit 2 – Recommendation To Address Immediate Concerns
 Table A-2 – Preliminary Construction Cost Estimate – Immediate Improvements
 Figure 01 – Pedestrian and Bike Alternative A – Cross Section
 Figure 02 – Pedestrian and Bike Alternative B – Cross Section
 Figure 03 – Pedestrian and Bike Alternative C – Cross Section
 Figure 04 – Pedestrian and Bike Alternative D – Cross Section
 Table A – Alternatives Assessment – Alternative A, Sidewalk on West Side
 Table B – Alternatives Assessment – Alternative B, Sidewalk on East Side
 Table C – Alternatives Assessment – Alternative C, Wide Pedestrian/Bike Bridge
 Table D – Alternatives Assessment – Alternative D, One Lane Bridge
 Table A-3 – Preliminary Opinion of Construction Cost – Concept A Improvements
 Table A-4 – Preliminary Opinion of Construction Cost – Concept B Improvements
 Table A-5 – Preliminary Opinion of Cost – Recommended For Consideration
 Figure 1 – Existing Issues and Recommended Immediate Improvements
 Figure 2 – Existing Issues and Recommended Immediate Improvements
 Figure 1A – Concept Alternative A – Sidewalk on West (South Section)
 Figure 2A – Concept Alternative A – Sidewalk on West (North Section)
 Figure 3B – Concept Alternative B – Sidewalk on East (South Section)
 Figure 4B – Concept Alternative B – Sidewalk on East (North Section)

Exhibit 1

Immediate Concerns/Issues Along South Main Street

The following are recommended improvement to South Main Street that should be considered for immediate consideration and implementation, based on a field review of existing conditions.

1. Install Narrow Bridge signs on approaches to the Mill River Bridge.
2. Replace existing guard rail on east side of South Main Street between the Mill River bridge and house No. 49.
3. Consider removing island on Fort Hill Road. Bring Fort Hill Road approach lanes in at more right angle and add new signage and pavement markings at this intersection.
4. Curve and advisory speed warning signs needed at Fort Hill Road intersection curve. Intersection sight distance viewing to/from the south is severely restricted by the stone wall.
5. Need to do further review/evaluation of storm drainage coming down Fort Hill Road and a) draining across South Main Street, and b) along the west side of South Main Street along the R. Wade frontage, where sand from roadside drainage has been deposited.
6. Need to do further review/evaluation of ground stability in shoulder area between edge of road and stone wall opposite Fort Hill Road.
7. Replace wooden plank fence along top of stone wall opposite Fort Hill Road intersection. It is not stable and has broken sections.
8. Need additional speed limit signs on South Main Street for southbound traffic and northbound traffic south of the Bridge Street intersection.
9. Need proper traffic control signage (e.g. STOP sign, Keep Right signs) and crosswalk markings and pedestrian signage at the Bridge Street/South Main Street intersection.
10. Need traffic control signage (i.e. STOP sign) at the Walpole Street approach to South Main Street.
11. Need bike warning signs on South Main Street to advise vehicular traffic of bikes along the roadway.

Exhibit 2

**RECOMMENDATIONS TO ADDRESS IMMEDIATE CONCERNS/ISSUES
ALONG SOUTH MAIN STREET, HAYDENVILLE**

January 28, 2015



Concern: Pavement narrows on bridge.

Recommendation: 1. Install Narrow Bridge signs on approaches to the Mill River Bridge.



Concern: Deteriorated guard rail posts and poor guard rail condition.

Recommendation: 2. Replace existing guard rail on east side of South Main Street between the Mill River bridge and house No. 31.



Concern: Poor intersection alignment with poor sight distance.

Recommendation: 3. Consider removing island on Fort Hill Road. Bring Fort Hill road approach lanes in at more right angle and add new signage and pavement markings at this intersection.



Concern: No advanced warning signage for side road intersection located on a curve.

Recommendation: 4. Curve and advisory speed warning signs needed at Fort Hill Road intersection curve. Intersection sight distance viewing to/from the south is severely restricted by the stone wall.



Concern: Roadway drainage issues involving Fort Hill Road and South Main intersection area.

Recommendation: 5. Need to do further review/evaluation of storm drainage coming down Fort Hill Road and a) draining across South Main Street, and b) along the west side of South Main Street along the R. Wade frontage, where sand from roadside drainage has been deposited.



Concern: Residents report unstable shoulder area conditions opposite Fort Hill Road intersection.

Recommendation: 6. Need to do further review/evaluation of ground stability in shoulder area between edge of road and stone wall opposite Fort Hill Road.



Concern: Poor fencing along top of retaining wall.

Recommendation: 7. Replace wooden plank fence along top of stone wall opposite Fort Hill Road intersection. It is not stable and has broken sections.



Concern: Lack of speed limit signs.

Recommendation: 8. Add additional speed limit signs on South Main Street for southbound traffic and northbound traffic south of the Bridge Street intersection.



Concern: Non-conforming crosswalk and sidewalks at Bridge Street intersection and lack of proper traffic control signage.

Recommendation: 9. Add proper traffic control signage (e.g. STOP sign, Keep Right signs) and crosswalk markings and pedestrian signage at the Bridge Street/South Main Street intersection.



Concern: Lack of traffic control signage and pavement markings at Walpole Street/South Main intersection

Recommendation: 10. Add traffic control signage (i.e. STOP sign) at the Walpole Street approach to South Main Street; add Curve warning sign on westbound approach to curve at bridge.

Concern: Remind vehicular traffic of bike use along the roadway.

Recommendation: 11. Add Bike warning signs on South Main, which will include the plaque “Share The Road” .

TABLE A-2
PRELIMINARY CONSTRUCTION COST ESTIMATE
PROPOSED IMMEDIATE IMPROVEMENTS ALONG SOUTH MAIN STREET
MILL RIVER GREENWAY - WILLIAMSBURG, MA

Location		Description of Proposed Improvements	Construction Cost Estimate
<i>A. Immediate Concerns</i>			
1	Mill River Bridge	Install Narrow Bridge Signs on both Approaches to bridge	\$1,100.00
2	S. Main Street - Between Mill River Bridge and House No. 31	Replace existing guardrail on east side of street Add Bridge Rail end treatments	\$7,000.00
3	Intersection of Fort Hill Road at S. Main Street	Remove Traffic Island and Re-align Fort Hill Road New signage (warning and regulatory) Add new pavement markings	\$9,000.00
4	S. Main Street - Horizontal Curve at Fort Hill Road	Add advanced curve warning signs	\$1,000.00
7	S. Main Street - North of Fort Hill Road	Install new wood safety fence on top of existing retaining wall.	\$4,000.00
8	S. Main Street - South of Bridge Street	Add Speed Limit Signs, Northbound and Southbound	\$1,000.00
9	S. Main Street at Bridge Street	Add Stop and Keep Right Signs Add and Revise Crosswalk markings Add Pedestrian Signs	\$2,500.00
10	Walpole Street at S. Main Street	Add Stop Sign on Walpole and revise pavement markings	\$1,500.00
11	Bike Warning Signs	Bike signs with bike symbol and "share the road" plaque	\$800.00

Notes:

Above prices include cost of all materials, labor, and work associated with construction required to complete activity in place by a general contractor.

This cost estimate shall not be used for construction

<i>Subtotal (Construction Items):</i>	\$27,900.00
10% Design & Engineering Contingency:	\$2,790.00
20% Construction Contingency:	\$5,580.00
<i>Subtotal:</i>	\$36,270.00
<i>Future Engineering Study of S. Main Street Stormwater Drainage Deficiencies</i>	\$10,000.00
<i>Future Engineering Study of S. Main Street Retaining wall stability (Across from Fort Hill)</i>	\$5,000.00
<i>*Total:</i>	\$51,270.00

Date: 1/29/2015

Estimated By: NJL

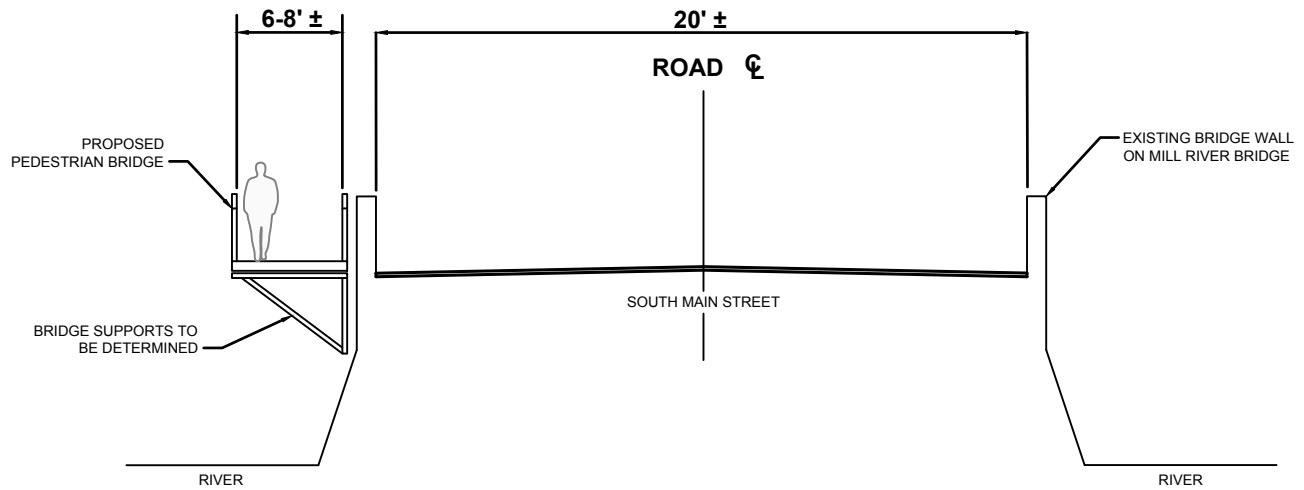
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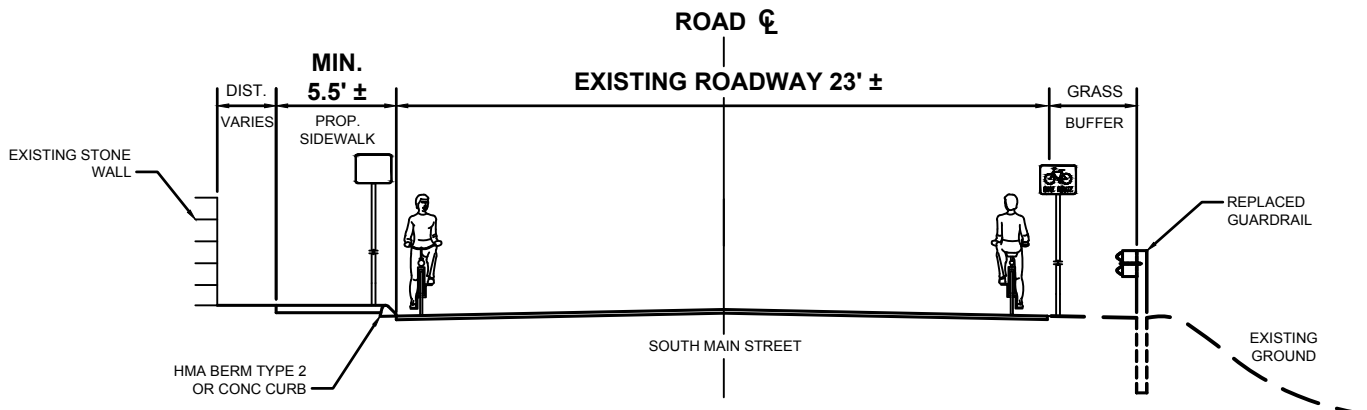
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ALTERNATIVE A
Cross Section Of Possible Pedestrian Bridge On West Side



ALTERNATIVE A
Cross Section Of South Main Street With New Sidewalk On West Side
(between Mill River Bridge and Fort Hill Road)



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MILL RIVER GREENWAY
PEDESTRIAN & BIKE ALTERNATIVE A
TYPICAL CROSS SECTION
SOUTH MAIN ST.

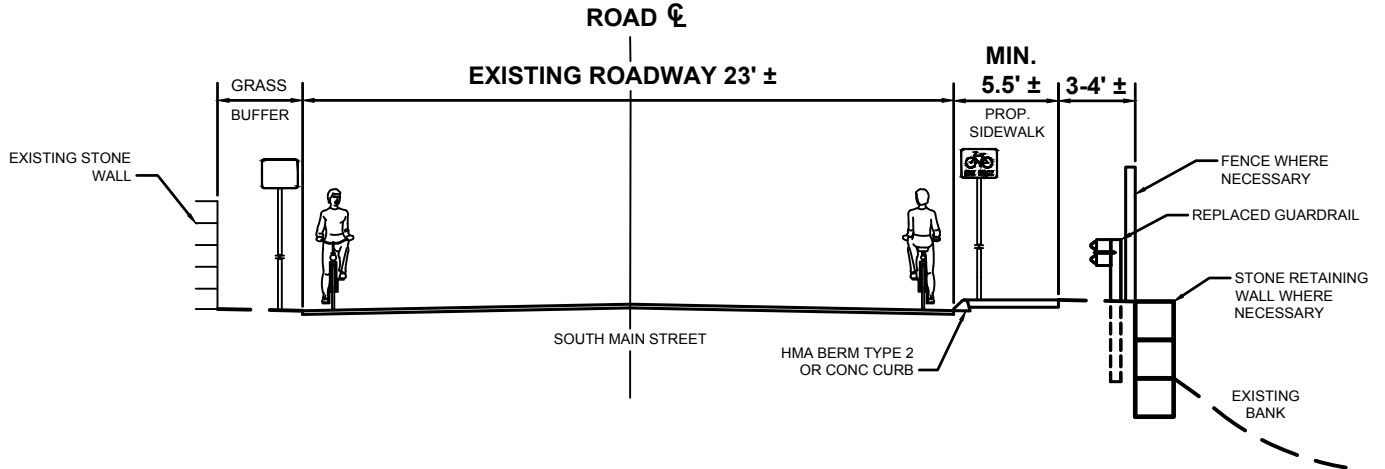
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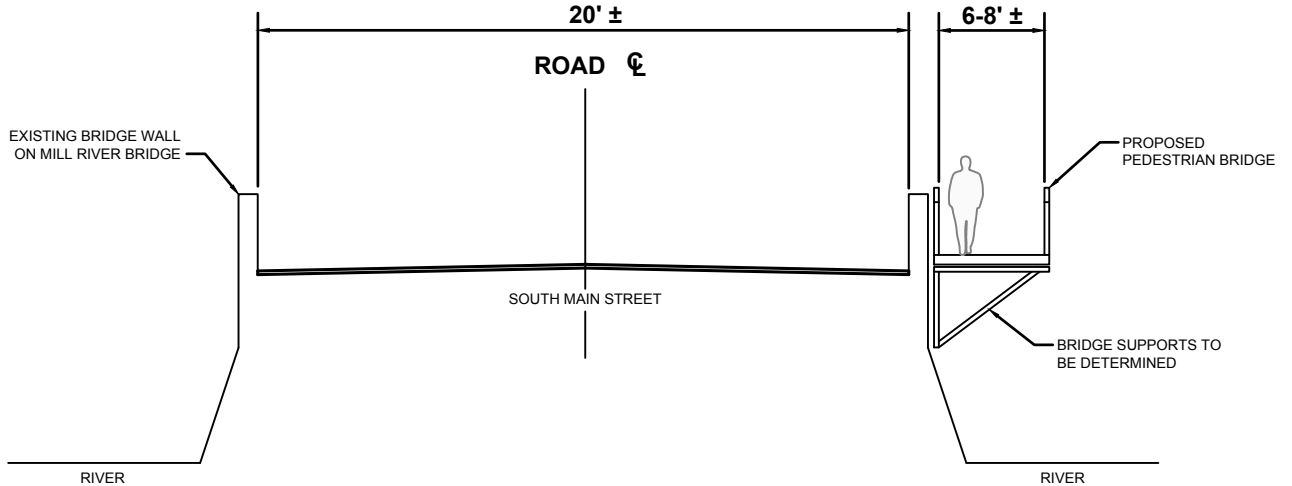
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ALTERNATIVE B
Cross Section Of South Main Street With New Sidewalk On East Side
(Mill River Bridge to meet existing sidewalk)



ALTERNATIVE B
Cross Section Of Possible Pedestrian Bridge On East Side



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 SOUTH MAIN ST.

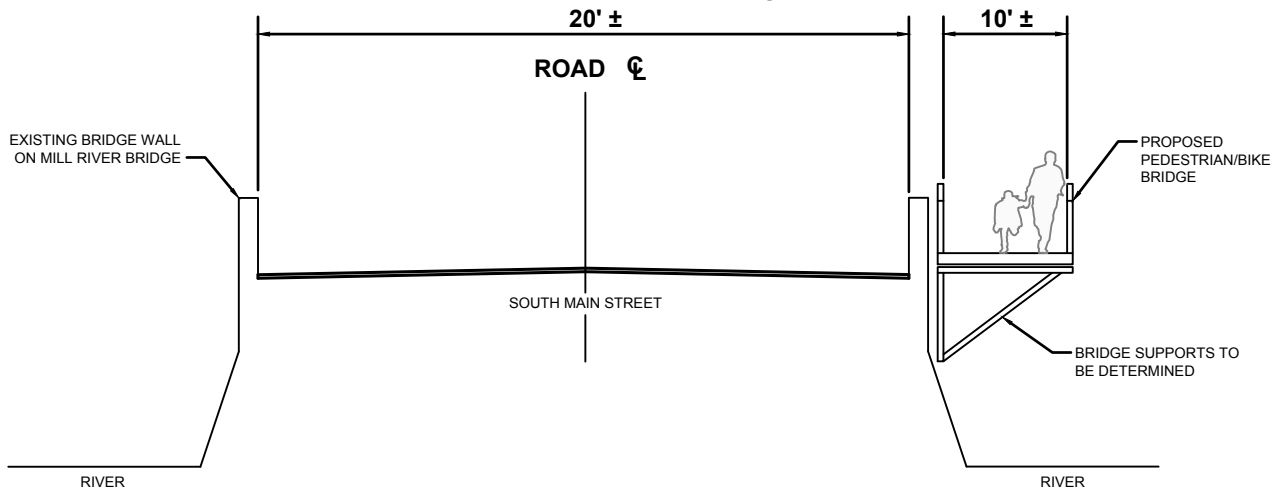
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ALTERNATIVE C
Cross Section Of Possible Pedestrian/Bike Bridge On East Side



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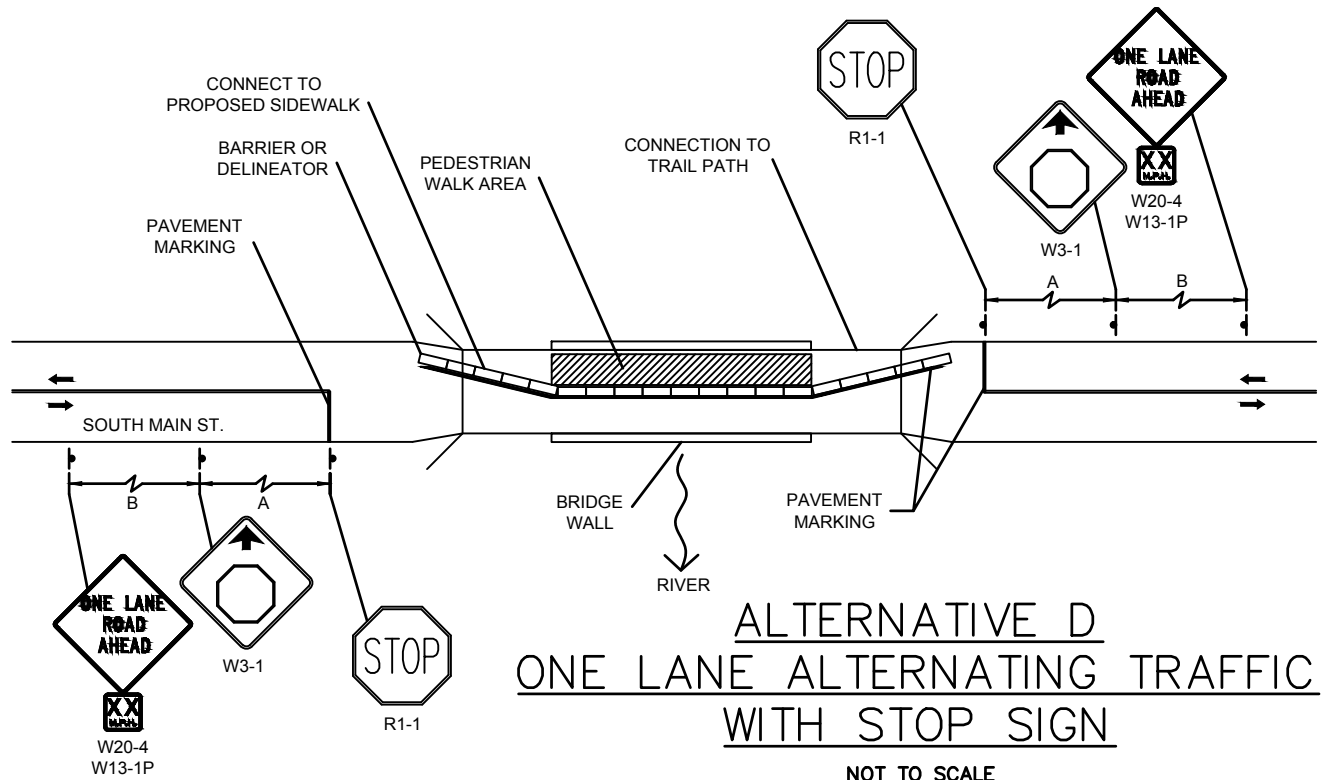
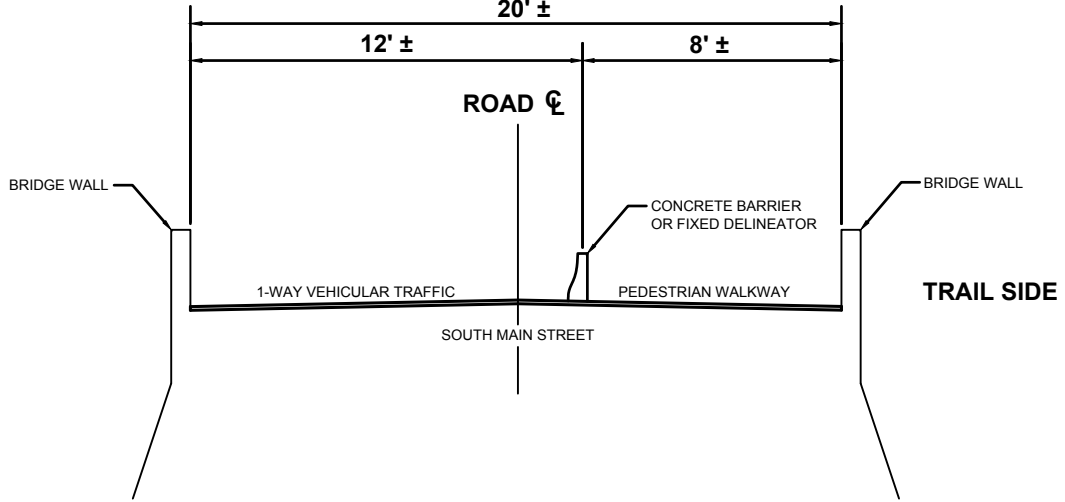
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ALTERNATIVE D
South Main Street - One Lane Bridge at Mill River
 20' ±



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Table A: Alternatives Assessment – South Main Street, Haydenville
Alternative A: Sidewalk on West Side

Evaluation Criteria	Advantages/Pluses	Disadvantages/Concerns
Safety (Pedestrian, Bike, Traffic)	<ul style="list-style-type: none"> a. New sidewalk will get pedestrians off the roadway and onto a safe pedestrian way. Separates pedestrians from vehicular traffic. b. Bike route signing will advise both motorists and bikers of assigned bike space. 	<ul style="list-style-type: none"> a. Will require a pedestrian crossing of South Main Street to connect proposed trail on east side with new sidewalk on west side of road. b. Will required a pedestrian crossing north of Fort Hill Road to connect with existing sidewalk on east side of South Main Street. c. Does not get bikes off the South Main Street roadway and onto a separate pathway.
Impact to Private Property	<ul style="list-style-type: none"> a. Uses existing roadside border between old stone wall and South Main Street. Little to no direct impact likely to private property, other than possible temporary construction easements (subject to confirmation of street layout and property lines.) 	<ul style="list-style-type: none"> a. Likely tight area for sidewalk north of Fort Hill Road. Requires further evaluation of town street layout location.
Permitting	<ul style="list-style-type: none"> a. Less impact for sidewalk construction with respect to work within the riverfront area compared to a sidewalk on the east side of South Main Street. b. No special retaining walls requiring permitting along river embankment, compared to sidewalk on east side. 	
Cost of Construction	<ul style="list-style-type: none"> a. No need for retaining walls and slope stabilization costs as compared with sidewalk construction on east side between Mill River and #31 South Main Street. 	<ul style="list-style-type: none"> a. Requires longer, more costly pedestrian bridge over Mill River. b. More construction cost required for 3 pedestrian crosswalks, compared to east side (more ADA requirements to meet, more drainage design to do relative to Fort Hill Road intersection.)
Constructability and Consistency With Design Criteria/Standards	<ul style="list-style-type: none"> a. New sidewalk relatively easy to construct, meeting minimum sidewalk width requirements. b. Access to construction area for sidewalk work easy with no major earth/side-slope retaining structures needed, or roadside trees impacted. c. Construction details and work schedule relatively simple compared to more involved construction work for sidewalk on the east side of South Main Street. 	<ul style="list-style-type: none"> a. Pedestrian bridge over Mill River would require longer section of bridge than that for east side (Alternative B.) b. More potential utility pole adjustments or relocation required, therefore, more utility company coordination required.

Table B: Alternatives Assessment – South Main Street, Haydenville
Alternative B: Sidewalk on East Side

Evaluation Criteria	Advantages/Pluses	Disadvantages/Concerns
Safety (Pedestrian, Bike, Traffic)	<ul style="list-style-type: none"> a. New sidewalk will get pedestrians off the roadway and onto a safe pedestrian way. Separates pedestrians from vehicular traffic. b. Bike route signing will advise both motorists and bikers of assigned bike space. c. Keeps pedestrians on same side of South Main Street as trail. No need for pedestrian crossings on South Main Street. 	<ul style="list-style-type: none"> a. Puts pedestrians on edge of fairly steep slope along Mill River embankment. b. Does not get bikes off the South Main Street roadway.
Impact to Private Property	<ul style="list-style-type: none"> a. New sidewalk enhances pedestrian accessibility/walkability for properties along east side of South Main Street. 	<ul style="list-style-type: none"> a. Would require construction easements along some private property frontage due to side slope stabilization needed for sidewalk and guard rail construction. b. New sidewalk would likely displace some residential planting and landscape area adjacent to the roadside at #31 South Main Street. (Although all sidewalk work appears to be possible within existing Town street layout; street layout and property lines need to be confirmed.) c. Homeowner at #31 South Main Street is not in favor of a sidewalk in front of property.
Permitting		<ul style="list-style-type: none"> a. More environmental impact and permitting involvement relative to slope stabilization/retaining wall construction necessary to accommodate a minimum 5 ft. sidewalk and guardrail improvements. b. Would require some tree removal along east roadside (need to get special Town review and approval for tree removal along a scenic roadway.)
Cost of Construction	<ul style="list-style-type: none"> a. Pedestrian bridge over Mill River would be shorter and less costly than Alternative A. 	<ul style="list-style-type: none"> a. Cost of special slope stabilization and retaining walls needed for sidewalk construction would be significant.
Constructability and Consistency With Design Criteria/Standards	<ul style="list-style-type: none"> a. Shorter, less costly pedestrian bridge on east side of existing concrete bridge. b. Little utility pole involvement. 	<ul style="list-style-type: none"> a. More complex construction plans, specifications required for east side sidewalk stabilization and roadside slope work. b. More difficult construction equipment access and impact on schedule.

Table C: Alternatives Assessment – South Main Street, Haydenville
Alternative C: Sidewalk on East Side, Wide (10 FT.) Pedestrian/Bike Bridge Over River

Evaluation Criteria	Advantages/Pluses	Disadvantages/Concerns
Safety (Pedestrian, Bike, Traffic)	a. Logical and safe off-road crossing for bicycles by crossing Mill River on same side of road as pathway to rail trail.	a. Would tend to make it easier for bikes to want to stay on the sidewalk after crossing the river bridge (sidewalk too narrow for bikes and pedestrians to share same space.)
Impact to Private Property		a. May require a larger construction easement on private property.
Permitting		a. More involvement in riverfront area.
Cost of Construction		a. Larger structure will result in higher construction cost.
Constructability and Consistency With Design Criteria/Standards		a. More involved construction plans and specifications due to larger bridge structure and support foundation.

Table D: Alternatives Assessment – South Main Street, Haydenville
Alternative D: One Lane Bridge With Pedestrian Walkway

Evaluation Criteria	Advantages/Pluses	Disadvantages/Concerns
Safety (Pedestrian, Bike, Traffic)	<ul style="list-style-type: none"> a. Will slow vehicular traffic through this Mill River section of South Main Street. b. Would provide a separation of pedestrians from vehicular traffic by means of channelization delineators or concrete barriers. 	<ul style="list-style-type: none"> a. Traffic likely to ignore STOP signs due to low volume roadway. b. Not a standard accepted method for traffic control on a bridge with adequate width for two-way traffic. One lane alternating traffic on a bridge that is normally adequate for two-way traffic only used for <u>temporary</u> traffic control. c. Can be confusing for drivers during nighttime (hours of darkness) unless operated with a traffic signal. d. Forces bikers onto a narrower roadway lane, shared with motor vehicles.
Impact to Private Property	<ul style="list-style-type: none"> a. Will slow traffic in immediate area of residence near bridge. 	<ul style="list-style-type: none"> a. Acceleration noise from some vehicles may be more obvious in immediate area of bridge.
Permitting		<ul style="list-style-type: none"> a. Traffic control signage (STOP control) and pavement markings will require approval from the Town.
Cost of Construction	<ul style="list-style-type: none"> a. Much less expensive than constructing a separate pedestrian bridge over the Mill River. 	
Constructability and Consistency With Design Criteria/Standards	<ul style="list-style-type: none"> a. Relatively simple to construct. 	<ul style="list-style-type: none"> a. Not consistent with traffic and pedestrian design standards for permanent operation over a roadway bridge.

TABLE A-3
PRELIMINARY OPINION OF CONSTRUCTION COST
PROPOSED CONCEPT A IMPROVEMENTS ALONG SOUTH MAIN STREET - SIDEWALK ON WEST SIDE
MILL RIVER GREENWAY - WILLIAMSBURG, MA

Location		Description of Proposed Improvements	Construction Cost Estimate
<i>B. Concept A Improvements</i>			
	S. Main Street - South of Mill River Bridge	New 6' wide HMA path connecting existing trail to S.Main Street New pedestrian crossing on S. Main St.- ADA compliant Wheelchair ramps Ped. Signs, Pavement markings, earthworks, gravel, fine grading	\$7,500.00
1	Mill River Crossing	New Pedestrian Bridge crossing the Mill River - 6' wide walkway Timber Pile Abutments, Stone Masonry Wingwalls, Timber Decking and Railings, Steel Truss Span	\$145,000.00
2	West side of S. Main Street - From Mill River to Fort Hill Rd	New 5' wide HMA sidewalk - Approx. 600 L.F. Gravel Borrow, Fine Grading, Excavation, Loam/Seed, Curbing As Needed	\$17,135.00
	S. Main Street - Between Mill River Bridge and House No. 31	Replace existing guardrail on east side of street - Approx 530 L.F. Add Bridge Rail end treatments	\$12,100.00
	Intersection of Fort Hill Road at S. Main Street	Re-Alignment of Fort Hill Rd with S. Main St. - remove island New pedestrian crossing on Fort Hill Rd.- ADA compliant Wheelchair ramps Potential Retaining wall for Wheelchair ramps and roadside slope cut Ped. & Stop Signs, Pavement markings, earthworks, gravel, fine grading, Asphalt,	\$34,000.00
	West side of S. Main Street - From Fort Hill Rd to 29 S. Main St.	New 5' wide HMA sidewalk - Approx. 200 L.F. Gravel , Fine Grading, Excavation, Loam/Seed, Curbing As Needed, one HMA Drvwy Apron	\$6,000.00
	29 S. Main Street	New pedestrian crossing on S. Main St.- ADA compliant Wheelchair ramps Gravel , Fine Grading, Excavation, Loam/Seed, Curbing As Needed, one Conc. Drvwy Apron Ped. Signs, Pavement Markings	\$5,000.00
	S. Main Street at Bridge Street	New Traffic island, curb, and signs Improve sidewalk and curb on south side of Bridge Street to make ADA compliant	\$6,500.00
3	Various Locations on S. Main Street	HMA sidewalk replacement for various segments along S. Main Street	\$11,000.00

Notes:

Above prices include cost of all materials, labor, and work associated with construction required to complete activity in place by a general contractor. Cost does NOT include permitting costs or possible storm drainage adjustments

<i>Subtotal (Construction Items):</i>	\$244,235.00
20% Design & Engineering :	\$48,847.00
20% Construction Contingency:	\$48,847.00
<i>*Total:</i>	\$341,929.00

This cost estimate shall not be used for construction

Date: 2/5/2015

Estimated By: NJL

Checked By: JWD



TABLE A-4
PRELIMINARY OPINION OF CONSTRUCTION COST
PROPOSED CONCEPT B IMPROVEMENTS ALONG SOUTH MAIN STREET - SIDEWALK ON EAST SIDE
MILL RIVER GREENWAY - WILLIAMSBURG, MA

Location		Description of Proposed Improvements	Construction Cost Estimate
<i>C. Concept B Improvements</i>			
1	S. Main Street - South of Mill River Bridge	New gravel path connecting existing trail to new Pedestrian bridge Ped. Signs, Pavement markings, earthworks, gravel, fine grading	\$3,500.00
2	Mill River Crossing	New Pedestrian Bridge crossing the Mill River - 6' wide walkway Timber Pile Abutments, Stone Masonry Wingwalls, Timber Decking and Railings, Steel Truss Span	\$115,000.00
	East side of S. Main Street - From Mill River to 29 S. Main Street	New 5' wide HMA sidewalk - Approx. 920 L.F. Grading of side slopes, clearing and grubbing, tree removal Replace existing stone retaining wall with gabion retaining wall and safety fence Gravel Borrow, Fine Grading, Excavation, Loam/Seed, Curbing As Needed, HMA drvwy Apron	\$66,805.00
	S. Main Street - Between Mill River Bridge and House No. 31	Replace existing guardrail on east side of street Add Bridge Rail end treatments	\$12,100.00
	Intersection of Fort Hill Road at S. Main Street	Re-Alignment of Fort Hill Rd with S. Main St. - remove island grading of roadside slope cut and minor roadside drainage improvements Stop Signs, Pavement markings, earthworks, gravel, fine grading, Asphalt,	\$11,500.00
	S. Main Street at Bridge Street	New Traffic island, curb, and signs Improve sidewalk and curb on south side of Bridge Street to make ADA compliant	\$6,500.00
3	Various Locations on S. Main Street	HMA sidewalk replacement for various segements along S. Main Street	\$11,000.00

Notes:

Above prices include cost of all materials, labor, and work associated with construction required to complete activity in place by a general contractor. Cost does NOT include permitting costs or possible storm drainage adjustments

Subtotal (Construction Items): \$226,405.00
20% Design & Engineering : \$45,281.00
20% Construction Contingency: \$45,281.00
**Total:* \$316,967.00

This cost estimate shall not be used for construction

Date: 2/5/2015

Estimated By: NJL

Checked By: JWD



FUSS & O'NEILL, INC.
78 Interstate Drive
West Springfield, MA 01089

TABLE A-5
PRELIMINARY OPINION OF CONSTRUCTION COST
RECOMMENDED IMPROVEMENTS FOR CONSIDERATION
MILL RIVER GREENWAY - WILLIAMSBURG, MA

Location		Description of Proposed Improvements	Construction Cost Estimate
	S. Main Street - South of Mill River Bridge	New gravel path connecting existing trail to new Pedestrian Bridge Ped. Signs, Pavement markings, earthworks, gravel, fine grading	\$3,500.00
	Mill River Crossing	New Pedestrian/ Bike Bridge crossing the Mill River - 10' wide Timber Pile Abutments, Stone Masonry Wingwalls, Timber Decking and Railings, Steel Truss Span	\$168,000.00
	Crosswalk at north side of Mill River Bridge	Crosswalk markings & traffic signs & ADA ramps Connecting Ped Bridge on east side to new sidewalk on west side	\$7,500.00
	West side of S. Main Street - From Mill River to Fort Hill Rd	New 5' wide HMA sidewalk - Approx. 600 L.F. Gravel Borrow, Fine Grading, Excavation, Loam/Seed, Curbing As Needed	\$17,135.00
	S. Main Street - Between Mill River Bridge and House No. 31	Replace existing guardrail on east side of street - Approx 530 L.F. Add Bridge Rail end treatments	\$12,100.00
	Intersection of Fort Hill Road at S. Main Street	Re-Alignment of Fort Hill Rd with S. Main St. - remove island New pedestrian crossing on Fort Hill Rd.- ADA compliant Wheelchair ramps Potential Retaining wall for Wheelchair ramps and roadside slope cut Ped. & Stop Signs, Pavement markings, earthworks, gravel, fine grading, Asphalt,	\$34,000.00
	West side of S. Main Street - From Fort Hill Rd to 29 S. Main St.	New 5' wide HMA sidewalk - Approx. 200 L.F. Gravel , Fine Grading, Excavation, Loam/Seed, Curbing As Needed, one HMA Drvwy Apron	\$6,000.00
	29 S. Main Street	New pedestrian crossing on S. Main St.- ADA compliant Wheelchair ramps Gravel , Fine Grading, Excavation, Loam/Seed, Curbing As Needed, one Conc. Drvwy Apron Ped. Signs, Pavement Markings	\$5,000.00
	S. Main Street at Bridge Street	New Traffic island, curb, and signs Improve sidewalk and curb on south side of Bridge Street to make ADA compliant	\$6,500.00
	Signage at Walpole Rd intersection	Add traffic warning & STOP sign & pavement markings at Walpole intersection with Bridge St. (Assume this work already completed under short term improvements)	—
	Various Locations on S. Main Street	HMA sidewalk replacement for various segments along S. Main Street	\$11,000.00

Notes:

This improvement is a combination of parts of Alternative A and Alternative C. Opinion of cost does not include environmental permitting or other permitting costs, or possible storm drainage adjustments.

Subtotal (Construction Items): \$270,735.00
20% Design & Engineering : \$54,147.00
20% Construction Contingency: \$54,147.00
**Total:* \$379,029.00
(Say \$380,000)

This cost estimate shall not be used for construction

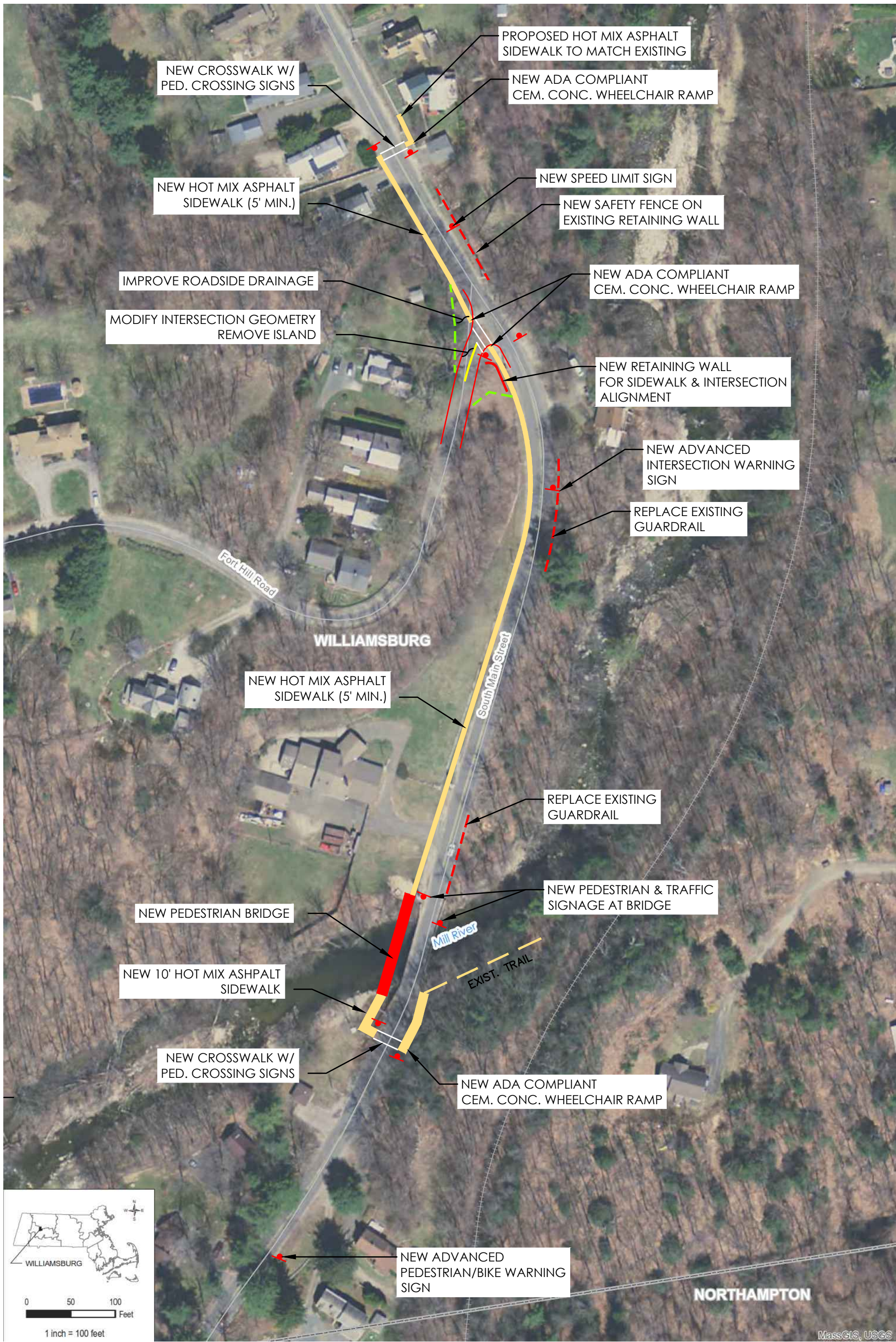
Date: 4/1/2015

Estimated By: NJL

Checked By: JWD









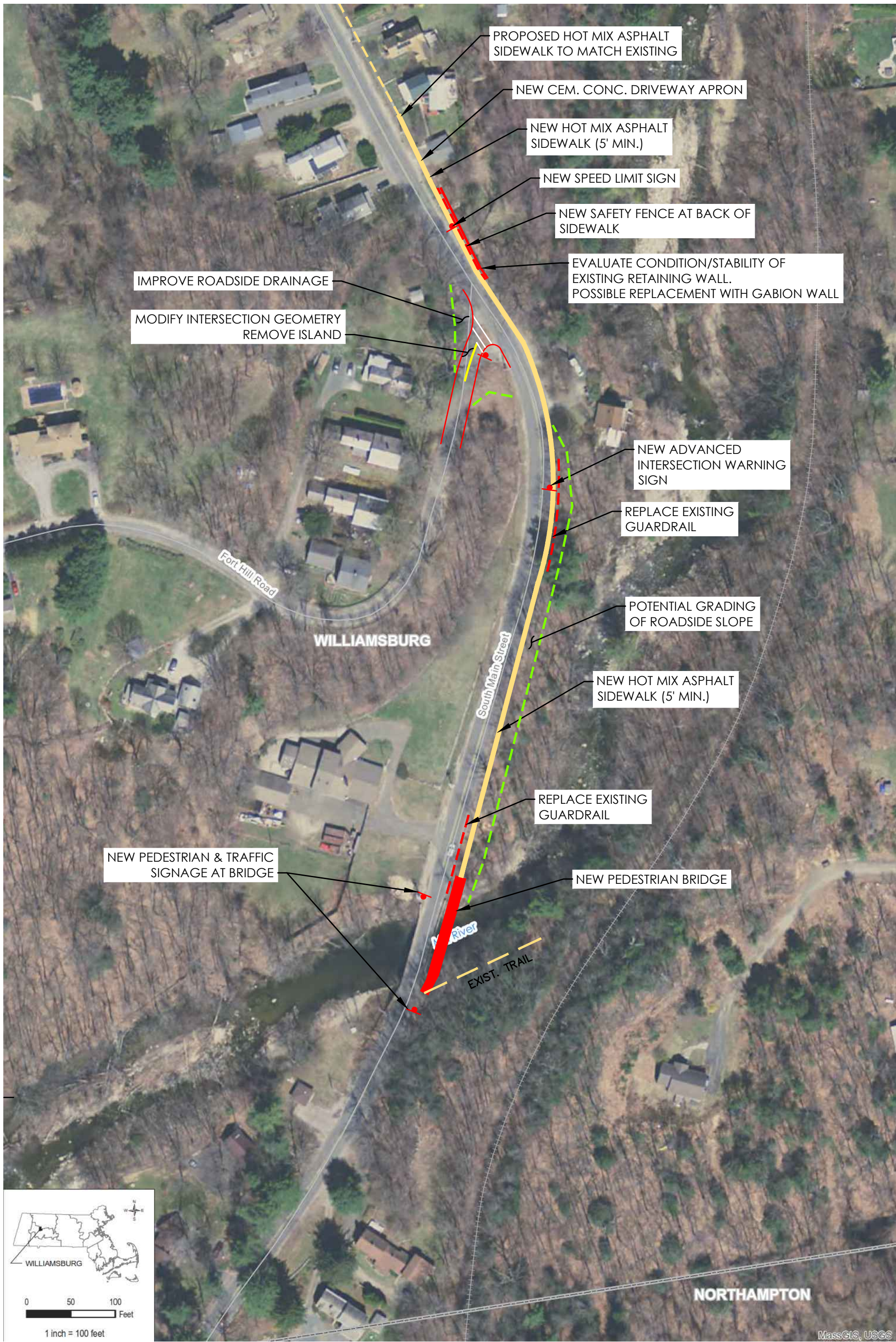


FIGURE 3B
Concept Alternative B - Sidewalk on east
MILL RIVER GREENWAY - WILLIAMSBURG, MA

PROJ.# 20141158.A10
DATE: 01-26-2015

