MSK ENGINEERS

SUBMITTED TO
**WINDHAM COUNTY REGIONAL COMMISSION**

SUBMITTED BY
**MSK ENGINEERS**

SUBMISSION DATE
**JULY 2022**

SCOPING STUDY

# Jacksonville Municipal Center Access and Flood Resiliency

TOWN OF WHITINGHAM EST 1770

VERMONT AGENCY OF TRANSPORTATION

WINDHAM REGIONAL COMMISSION

Creighton Manning

Fitzgerald Environmental Associates LLC.

# CONTENTS

## 1.0 PROJECT OVERVIEW

The goal of this project is to complete a scoping study for previously identified river corridor flood resiliency projects that are on and adjacent to municipal land, and to increase flood resiliency for the Village of Jacksonville.

The East Branch of the North River passes through Jacksonville, Vermont, the central village in Whitingham. The village contains a mix of residences, business, and a municipal complex, including the town offices, library, and fire house. During major storm events, the river floods the village. The most serious flood in recent years occurred during Tropical Storm Irene in 2011 when flood levels, as estimated through USGS StreamStats from nearby USGS stream gauges, reached the 200-year level. Less catastrophic but severe flooding remains an ongoing problem in this area, causing both inundation and erosion.

The river in the village center has been historically straightened and channelized to facilitate development adjacent to the state highway, VT 100. In just over 300 linear feet, with VT 100 to the east and the municipal complex parking lot to the west, the river passes through a narrow bridge, a deteriorating squash culvert, and an armored channel. It is highly constricted, at less than 50% bankfull capacity throughout much of the reach, leading to rapid overtopping.

In August 2020, the Windham Regional Commission issued a request for proposals to advance a set of flood resiliency projects in Jacksonville. These proposed projects originate in the River Corridor Plan for the East Branch of the North River in Halifax and Whitingham, Vermont, completed in 2017 by Fitzgerald Environmental Associates (FEA) on behalf the Windham Regional Commission. FEA identified two reaches in Jacksonville as high-priority areas, owing to the “poor” condition of the river corridor in the village. This scoping study has addressed the feasibility of three proposed projects on a high priority reach adjacent to VT 100. In addition to FEA, we have also partnered with Creighton Manning (CM) for traffic analysis and the University of Vermont (UVM) for archaeological resource assessments.

# 2.0 EXISTING CONDITIONS

## 2.1 Project area

The area of focus in the proposed scoping study includes the Whitingham Municipal Center, which encompasses the public library, the Town Clerk's office, a dining hall with a full kitchen serving seniors and other community members, a space for public meetings and events, and the Whitingham fire house. The municipal complex includes a recreational area in the northwest with courts to play tennis and basketball.

The project is located on a parcel of land owned by the town that is approximately 6.2 acres. The developed portion of the site is relatively flat and slopes down to the southeast. A combination of dry laid stone walls and cast in place concrete walls are used to transition the site grades around the existing stream channel. The undeveloped portion of the parcel consists of forested land sloped steeply to the east.

## 2.2 Land uses

Jacksonville's history and development are tied to the East Branch of the North River. In the nineteenth century, the river powered mills that created decades of prosperity and growth, and the legacy of that era can be seen today in the village's historic structures, which include a traditional New England church and well-built houses with neighborly front porches set close to village roads.

Jacksonville remains a center of community and business activity within the Town of Whitingham. The immediate area consists of private residences, an auto body shop, a post office, a general store, and a wine bar.

The project area is located in the Village District as identified in the Town of Whitingham Zoning Regulations (the "Regulations") dated November 10, 2021 and the accompanying municipal Zoning Map. The proposed alternatives to mitigate potential flooding impacts to the Municipal Center and Fire Station will not conflict with the existing land uses in the project area and will continue to support the purpose of the Village District as defined in Section 4.1.4 of the Regulations:

> *"The purpose of the Village district is to provide areas for appropriate village uses, including residential and commercial uses, public buildings and public facilities, and associated services."*

## 2.3 Natural resources and cultural resources

Figure 1 was developed from Geographical Information System (GIS) data provided by the Vermont Agency of Natural Resources and Vermont Center for Geographic Information, which includes available data for:

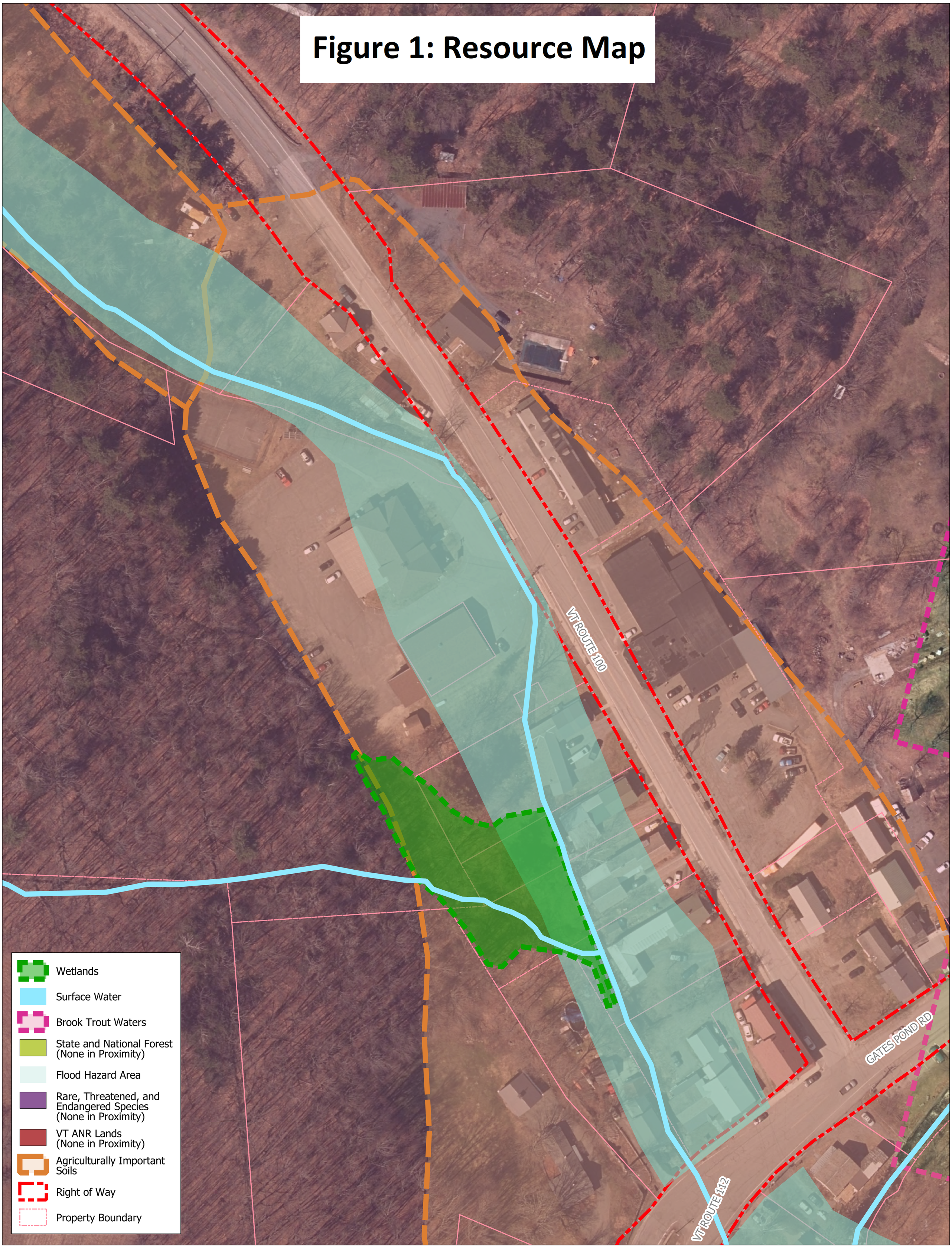
- Wetlands
- Brook Trout Waters
- Surface Water
- State and National Forest
- Flood Hazard Area
- Rare, Threatened, and Endangered Species
- VT Agency of Natural Resources Lands
- Land and Water Conservation Fund Lands (Section 6(f))
- Right of Way
- Agriculturally Important Soils

Other resources reviewed include:

- Utilities
- Archaeological Resources
- Standing Historic Structures
- Section 4(f) Properties
- Social Features / Demographic Data
- Potential Impact on Economic Growth and Development
- Conformance to Town and Regional Plans

This project is part of the Town and Regional Plan to increase flood resiliency for the region. Increased flood resilience will have a positive impact on economic growth and development as the region will not have to devote resources to damage repair. Residents will also benefit from a reduced flooding risk.

# Figure 1: Resource Map




RESOURCE MAP

Resources identified in the immediate project area include:

1) Wetlands: An approximately 0.5-acre forested floodplain wetland is located on the west side of the channel immediately downstream of the fire station. Under the existing site condition, the wetland receives sheetflow runoff from the steep forested slope to the west and receives overflow from the river during larger flood events. The proposed channel improvements will have no direct impacts on the wetland or associated buffers. Installation of a bankfull structure will improve conveyance during large flood events, likely increasing the volume of water accessing the floodplain wetland.

2) Flora/Fauna Including Brook Trout: The bottom of the existing culvert is rusted out. During baseflow conditions all water flows through the bottom of the culvert. The existing culvert condition is likely a barrier to brook trout movement, particularly during low flows. The undersized culvert may also reduce Brook Trout movement during elevated flows due to high velocity. Replacing the existing culvert with a bankfull structure, designed to maintain a naturalized bottom, will significantly improve Brook Trout passage during low flows and will reduce velocity during elevated flow conditions. During the design phase aquatic organism passage should be evaluated as part of the permitting effort.

3) Surface Water: The proposed channel improvements will have a beneficial effect on the quality or quantity of surface water through the project area.

4) Flood Hazards: The forested floodplain area described above represents the only accessible floodplain area between the project site and the confluence with Gates Pond Brook downstream of the VT 100/112 crossing. The proposed channel improvements do not directly affect floodplain accessibility or function, however the installation of a bankfull structure will increase channel capacity and conveyance during large storm events. Historically, large flood events exceeded the capacity of the existing culvert causing floodwater to spill over onto VT 100. The widened river will protect municipal assets like municipal center/firehouse.

5) Archaeological Resources: As part of the permit review process, a combined Archaeological Resource Assessment (ARA) and Historic Resource Review (HRR) was undertaken by the University of Vermont Consulting Archaeology Program (UVM CAP). The purpose of the review is to identify portions of a project's Area of Potential Effect (APE) that have the potential for containing Pre-Contact era Native American and/or historic era archaeological sites and to identify and assess any standing historic resources on or eligible for listing on the National and/or State Register of Historic Places that have the potential to be directly or indirectly affected by project work.

As a result of the ARA, the proposed project was determined to have relatively low base sensitivity for pre-Contact Native American sites and given the range of documented ground disturbance from repeated flood damage, stream management, and building, utility, sidewalk, and parking lot/driveway construction, this review recommends that the APE is unlikely to contain significant precontact Native American archaeological sites.

Based in the lack of early building construction in the APE, along with the various ground disturbances noted, it is also unlikely that subsurface testing would uncover any significant intact historic period archaeological resources. Therefore, this review concludes that the proposed project will have no effect on significant archaeological resources and no further archaeological investigation is recommend for pre-Contact Native American or historic resources within the currently proposed phase of the Jacksonville Municipal Center Access and Flood Resiliency Project (See Appendix 1 for the complete report).

## 2.4 Standing historic structures

Two standing structures within the currently proposed phase of the Jacksonville Municipal Center Access and Flood Resiliency Project are recommended as eligible for listing on the National Register of Historic Places.

1) 1926 Concrete Box Culvert Bridge

The HRR recommends that the 1926 concrete box culvert bridge located over the East Branch of the North River in front of the Municipal Center meets the eligibility requirements and significance outlined for concrete bridges in the National Register of Historic Places Multiple Property Documentation Form: Metal Truss, Masonry, and Concrete Bridges in Vermont, MPDF (USDI NPS 1990). The bridge is a functioning structure built before 1940, with its original core and design features intact, and it retains integrity of location and setting. It is historically significant under National Register Criterion A for its contribution to the broad patterns of transportation history, and architecturally significant under Criterion C for embodying the types, forms, and methods of engineering and constructions as associated with bridge building in Vermont. This review therefore recommends that the proposed removal of the bridge would result in an adverse effect on historic resources; this determination would be made during National Environmental Policy Act review. If the removal of the bridge cannot be avoided as part of project work, the completion of a VDHP Historic Resources Documentation Package (HRDP) is recommended prior to project work (See Appendix 1).

2) c. 1860 House, 2984 VT 100

This HRR identified that the c. 1860 house at 2984 VT 100 is eligible for inclusion on the National and State Register of Historic Places and could be part of a theoretical Jacksonville Village Historic District. Based on a preliminary review of Jacksonville's history, historic maps, a drive through of the village during the field visit of the project area, and online Google Earth street views, the proposed district would include properties along VT 100, VT 112, and Gates Pond Road (Appendix 1). The proposed boundaries are based on the development of the village from the first decades of the nineteenth century and into the early decades of the twentieth century, along with the integrity of the resources within the proposed boundaries.

Four buildings within the proposed district are currently listed on the State Register of Historic Places, including a church (1321-1) and Masonic Hall (1321-2) along VT 112, and a store (1321-3) and house (1321-4) on Route 100 (VDHP 1971a,b,c,d). Many of the buildings within the proposed district boundaries retain defining period historic characteristics, with contributing resources representing the Federal, Greek Revival, Queen Anne and Colonial Revival styles. This review therefore advises that the proposed removal of the house at 2984 Route 100 would result in an adverse effect on historic resources; this determination would be made during the National Environmental Policy Act review. If the removal of the house cannot be avoided as part of project work, the completion of a VDHP HRDP is recommended prior to project work. (See Appendix 1)

## 2.5 Right of way

The limits of the VT 100 right of way are based on information collected during a survey completed in May of 2021. The right of way has a a three rod width and is centered on the existing roadway.

## 2.6 Utilities

There are multiple utilities within the study area including:

- Municipal catch basins, storm sewer and sanitary sewer lines
- Utility poles with electric, telephone and cable wires

While depicted in Figure 2, the utilities within the subject area are as follows:

- The catch basins and associated storm sewer convey stormwater generated from VT 100 and the surrounding properties into the North River. As part of the final design the stormwater system will have to be designed.
- A sanitary sewer line and manhole serving the town office and fire station crosses the river before connecting into a larger line along VT 100. At this time there appears to be minimal impact to the sanitary sewer line but this should be verified as part of the final design.
- The utility poles within the study area are owned and maintained by the Jacksonville Electric Co. A utility pole as shown in alternative 2 (56-foot culvert) and alternative 3 (96-foot culvert) will have to be relocated. As part of the final design the telecom and electrical lines serving the town offices and fire station should be evaluated to see whether transitioning to underground services is feasible.

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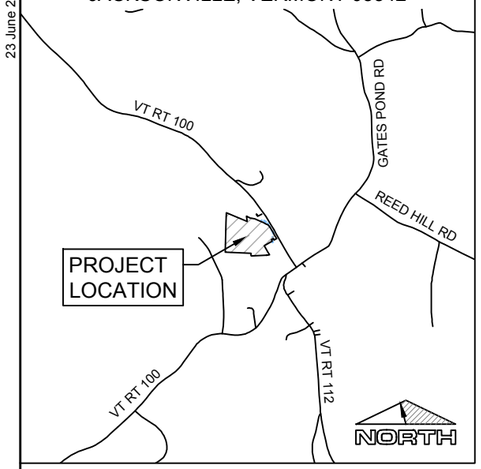
## VICINITY MAP

APPROXIMATE SCALE: 1:2000

JACKSONVILLE, VERMONT 05342




1. EXISTING CONDITIONS AND THE APPROX. PROPERTY LINE LOCATION ARE BASED ON RECORD INFORMATION OBTAINED FROM THE TOWN LAND RECORDS AND A FIELD SURVEY PERFORMED BY MSK ENGINEERS. A BOUNDARY SURVEY WAS NOT INCLUDED IN THE DEVELOPMENT OF THIS PLAN.

2. UNDERGROUND UTILITY LOCATIONS WHERE SHOWN ON THE PLAN ARE APPROXIMATE ONLY.

06-J010
KRIS A AND DEBORAH L SPRAGUE
2915 VT RTE 100
WHITINGHAM VT 05342

06-0416-02
BRIANNA HOPE HARRIS
58 ELWIN LANE
WHITINGHAM VT 05342

06-0416-01
ADAM AND JESSICA BUURSMA
45 GATES POND RD
WHITINGHAM VT 05342

06-J011
BETIMOR INC
C/O STEVE BETIT
2939 VT RTE 100
WHITINGHAM VT 05342

06-J012
BRIGGS REAL ESTATE LLC
2977 VT RTE 100
WHITINGHAM VT 05342

EXISTING BRIDGE TO BE REMOVED

EXISTING CULVERT TO BE REMOVED

VT ROUTE 100

CONCRETE WALKWAY

EAST BRANCH NORTH RIVER

APPROXIMATE PROPERTY LINE

UTILITY POLE TO BE RELOCATED IN COORDINATION WITH LOCAL SERVICE PROVIDER

RESIDENCE ORIGINALLY CONSIDERED FOR REMOVAL

06-J007
ROBIN W KINGSLEY
2984 VT RTE 100
WHITINGHAM VT 05342

TOWN OFFICE BUILDING

FIRE STATION

06-0425-01
TOWN OF WHITINGHAM
2964 VT RTE 100
WHITINGHAM VT 05342

FLOOD HAZARD AREA

NORTH

0 40 80 FEET

K:_DRAWING DATABASE\1243-001 WHITINGHAM FLOOD RESILIENCY\SHEETS\1243-001 EXISTING.DWG

MSK ENGINEERS

# Figure 2: Existing Conditions

PRELIMINARY
NOT FOR CONSTRUCTION

| NUMBER | DATE |
|---|---|
| 1243-001 | 05-02-2022 |
| DRAWN | CHECKED |
| MSK | AR |

SHEET NUMBER
C1

EXISTING CONDITIONS PLAN

# 3.0 PUBLIC INVOLVEMENT

## 3.1 Public concerns meeting

On August 25th 2021, MSK and FEA met with the Selectboard of Whitingham to clarify local concerns and to develop a purpose and needs statement. This meeting was open to the public and the minutes are included in Appendix 3.

## 3.2 Purpose and needs statement

Project Purpose: The project's purpose is to evaluate feasibility of three previously identified flood resiliency improvement projects from the River Corridor Plan (Appendix 4) for the East Branch of the North River in Halifax and Whitingham, Vermont, completed in 2017 by Fitzgerald Environmental Associates. The improvements to be evaluated are (NR-19) the removal of a concrete bridge in front of the municipal complex; (NR-18) Replacement of a culvert and widening and stabilizing the river channel in front of the municipal complex, and (NR-21) Removal of a house (address 2984 VT 100) located over the river channel downstream of the municipal complex. (Note that NR-21 was eliminated from scope due to the property owner declining.)

Project Needs: The project area has a history of flooding during large storm events risking the public's well-being, damaging private and public property, and blocking traffic on VT 100 and VT 112 within the Jacksonville downtown. The three identified structures above significantly contribute to the flood risk to the project area. Without flood resiliency improvements the project area will remain vulnerable to flooding, damage and roadway shut down.

## 3.3 Alternatives presentation

A presentation was held on February 9th, 2022, to obtain input from the public on these 3 alternatives:

1) Alternative 1 (No Build): Would not require construction and would not increase the areas flood resiliency.

2) Alternative 2 (56-foot Culvert): Removes the existing stone bridge and replace the existing culvert with new culvert 56' foot long by 16' foot wide. Due to the widening of the channel, parking would be reduced.

3) Alternative 3 (96-foot Culvert): Removes the existing stone bridge and replace the existing culvert with new culvert 96' foot long by 16' wide. This option would not reduce on-site parking.

Alternative 2 (the 56-foot culvert) was selected as the preferred alternative because it addresses the project needs while being the lowest-cost build option.

As part of the meeting, concerns were raised about river flow restrictions beyond the project scope, namely the culvert under the intersection of VT 112 & VT 100. There was a concern raised that this project would increase flows to this restricted section.

While beyond the project's scope, an initial analysis by FEA revealed a nominal (under 6 inches) increase in flood height at the VT 100 restriction if Alternative 2 were to be constructed.

## 3.4 Public information meeting

MSK recommends aligning this meeting date with the July selectboard meeting date.

# 4.0 EVALUATION OF ALTERNATIVES

Deviation from proposed project scope: Part of the project scope was to evaluate the (NR- 21) removal of a house located over the river channel downstream of the municipal complex. The feasibility of this improvement was subject to the purchase of the property by the town. Currently the current landowner has no interest in selling the property. MSK and FEA performed initial modeling of potential changes to the floodplain while leaving the building intact and found that they showed no improvement to flood resiliency due to downstream constraints that are out of the town's control. Because this option is not considered feasible at this time it was excluded from conceptual alternatives.

## Alternative 1: No Build

This alternative would be to leave the site as it is. This would not improve the downtown flood resiliency and leave the downtown at risk of flooding during storm events. Hydraulic modeling indicates that the undersized crossings at the municipal center, in particular the severely undersized bridge, cause floodwaters to overtop the road by 1-2 feet during an extreme flood event (i.e., 100-year flood). When the effect of sediment and debris buildup during a flood is considered at the bridge inlet, which has been commonplace in past floods, moderate floods such as the 25-year or 50-year floods are predicted to overtop the road and flow down VT 100. The no build alternative leaves the town's infrastructure and several other private residences and businesses along VT 100 at risk of repeat flood damage.

Figure 3: August 2011 flooding on VT 100 in Jacksonville during the Irene flood.

*Photo courtesy of G. Havreluk*

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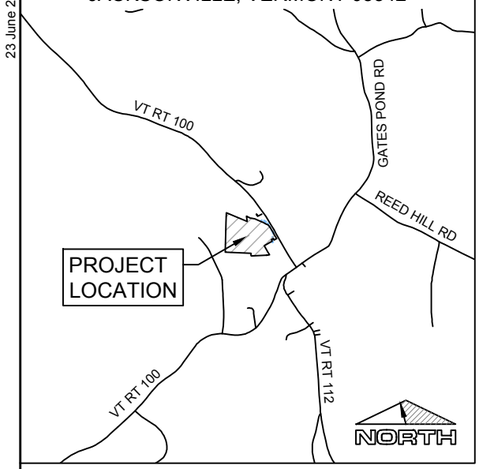
## VICINITY MAP

APPROXIMATE SCALE: 1:2000

JACKSONVILLE, VERMONT 05342

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EAST BRANCH NORTH RIVER

APPROXIMATE PROPERTY LINE

UTILITY POLE TO BE RELOCATED IN COORDINATION WITH LOCAL SERVICE PROVIDER

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TOWN OFFICE BUILDING

FIRE STATION

06-0425-01
TOWN OF WHITINGHAM
2964 VT RTE 100
WHITINGHAM VT 05342

FLOOD HAZARD AREA

NORTH

0 40 80 FEET

K:_DRAWING DATABASE\1243-001 WHITINGHAM FLOOD RESILIENCY\SHEETS\1243-001 EXISTING.DWG

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# Figure 4: Alternative 1 | No Build

PRELIMINARY
NOT FOR CONSTRUCTION

| NUMBER | DATE |
|---|---|
| 1243-001 | 05-02-2022 |
| DRAWN | CHECKED |
| MSK | AR |

| SHEET NUMBER |
|---|
| C1 |

EXISTING CONDITIONS / NO BUILD PLAN

## Alternative 2: 56’ Long by 16' Wide Culvert

This alternative would involve the demolition of the existing concrete bridge and replacement of the existing undersized culvert with a bankfull sized culvert and widening and stabilizing the river channel in front of the municipal complex. This would improve the downtown flood resiliency and reduce the risk of flooding during storm events. The available parking on site would be reduced in this scenario as the channel widening would require the reduction of several parking spaces along the river.

Hydraulic modeling indicates that the proposed bankfull sized structure would lower floodwaters substantially at the Municipal Center and significantly reduce the risk of flooding along VT 100. Specifically, floodwater elevations at the municipal center are predicted to be 3-4 feet lower during an extreme flood event (i.e., 100-year flood) in comparison to the existing condition. There would also be significant improvements during moderate floods (i.e., 25-year or 50-year floods) as there would be 3-4 feet of the total bridge height remaining to accommodate sediment and debris buildup at the inlet. In other words, the proposed culvert replacement would be resilient to most or all extreme flood conditions anticipated in this setting. In addition, the new crossing structure would have a naturalized bottom allowing for full aquatic organism passage.

It is important to note that the flood conveyance improvements associated with Alternatives 2 and 3 are limited to the municipal property in the vicinity of the fire station. This is because severe channel constrictions will remain downstream, including the undersized channel on municipal property and the building overhanging the river channel on the adjacent property to the south.

02 May 2022 13:11:37

PROPOSED CONCRETE WALKWAY WITH
DETECTABLE WARNING SURFACE (TYP.)

NEW CONCRETE CURB (TYPICAL)

REINFORCED CAST-IN-PLACE CONCRETE
WALL @ 42" ABOVE GRADE

REINFORCED CAST-IN-PLACE CONCRETE
WALL @ 42" ABOVE GRADE

40'

4'

4'

6'

16'

RELOCATE UTILITY POLE
(IN COORDINATION WITH LOCAL SERVICE PROVIDER)

REINFORCE BANK WITH
RIP-RAP (TYPICAL)

56' PROPOSED CONCRETE
BOX CULVERT

NEW UNDERGROUND
ELECTRICAL SERVICE

TOWN OFFICE BUILDING

FIRE STATION

NORTH

0 20 40 FEET

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BENNINGTON, VERMONT 05201
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# Figure 5: Alternative 2 | 56' Long by 16' Wide Culvert

PRELIMINARY
NOT FOR CONSTRUCTION

PROPOSED CONDITIONS PLAN
ALTERNATIVE 2

| NUMBER | DATE |
|---|---|
| 1243-001 | 01-11-2022 |
| DRAWN | CHECKED |
| JWS | AR |

SHEET NUMBER
C1.1

K:_DRAWING DATABASE\1243-001 WHITINGHAM FLOOD RESILIENCY\SHEETS\1243-001 PROPOSED _ALT1.DWG

## Alternative 3: 96’ Long by 16' Wide Culvert

This alternative would involve the demolition of the existing concrete bridge and the replacement of a culvert and widening and stabilizing the river channel in front of the municipal complex. This would improve the downtown flood resiliency and reduce the risk of flooding during storm events. The available parking on site would remain in this scenario as the culvert would extend further upstream allowing for parking to be reconfigured in front of the municipal complex.

Regarding flood resiliency, Alternative 3 would not result in significant improvements over Alternative 2. Hydraulic modeling indicates that the longer structure would only marginally increase floodwater conveyance during moderate and extreme flood conditions. Floodwater elevations at the Municipal Center are predicted to be less than 6” lower in Alternative 3 as compared to Alternative 2. This is because the gains in floodwater conveyance over the existing condition are a result of the increased hydraulic opening to 16 feet, which is the same in Alternatives 2 and 3.

It is important to note that the flood conveyance improvements associated with Alternatives 2 and 3 are limited to the municipal property in the vicinity of the fire station. This is because severe channel constrictions will remain downstream, including the undersized channel on municipal property and the building overhanging the river channel on the adjacent property to the south.

PROPOSED CONCRETE WALKWAY WITH DETECTABLE WARNING SURFACE (TYP.)

NEW CONCRETE CURB (TYPICAL)

REINFORCED CAST-IN-PLACE CONCRETE WALL @ 42" ABOVE GRADE

REINFORCED CAST-IN-PLACE CONCRETE WALL @ 42" ABOVE GRADE

40'

R10' TYP

4'

4'

1353

19'

16'

NEW PAVED PARKING AREA

1349

1352

1352

1344

RELOCATE UTILITY POLE (IN COORDINATION WITH LOCAL SERVICE PROVIDER)

REINFORCE BANK WITH RIP-RAP (TYPICAL)

9' TYP

36'

PLANTING BED

96' PROPOSED CONCRETE BOX CULVERT

NEW UNDERGROUND ELECTRICAL SERVICE

TOWN OFFICE BUILDING

FIRE STATION

NORTH

0 20 40 FEET



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# Figure 6: Alternative 3 | 96' Long by 16' Wide Culvert

PRELIMINARY
NOT FOR CONSTRUCTION

PROPOSED CONDITIONS PLAN
ALTERNATIVE 3

| NUMBER | DATE |
|---|---|
| 1243-001 | 12-23-2021 |
| DRAWN | CHECKED |
| JWS | AR |

| SHEET NUMBER |
|---|
| C1.2 |

# 5.0 PERMITTING REQUIREMENTS

## 5.1 Act 250 Land Use

There is no existing Act 250 permit series on the project site. A review of the online Act 250 Land Use Database did not yield any results for permits related to adjoining lots. The proposed alternatives are not subject to Act 250 jurisdiction.

## 5.2 Local Permitting

The project area is located in the Village District as identified in the Town of Whitingham Zoning Regulations (the "Regulations") dated November 10, 2021 and the accompanying municipal Zoning Map. The proposed alternatives do not necessitate a Zoning Permit under the requirements identified in Section 5.1.4 (Village Districts) of the Regulations.

The project area and the impacts of the proposed alternatives are located within the Town of Whitingham's Flood Hazard Area. Section 7.4 (b) of the Regulations states:

(b) *A permit is required, to the extent authorized by State law, for all proposed construction or other development, including the placement of manufactured homes, in areas of special flood hazard. Conditional use approval by the Zoning Board of Adjustment is required for:*

1. *New buildings,*
2. *Substantial improvement of existing buildings, and*
3. *Development in a floodway*

*prior to being permitted by the Zoning Administrator. All development and subdivisions shall be reviewed to assure that such proposals minimize potential flood damage, public facilities, and utilities such as sewer, gas, electrical, and water systems are constructed so as to minimize flood damage, and adequate drainage is provided to reduce exposure to flood hazards.*

"Development" is defined in relation to Article VII Flood Hazard Regulations under Section 7.14 as: *any man-made change to improved or unimproved real estate, including, but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operation or storage of equipment or materials.*

The proposed alternatives will qualify as development under this definition, and it has been determined by the Zoning Administrator that a permit is not required for development.

## 5.3 State and Federal Environmental Permitting

Any new crossing and manipulation to the bed and banks of the East Branch North River will require a VTDEC Stream Alterations Permit and authorization under the U.S. Army Corps of Engineers (USACE) Vermont General Permit. In both cases, because the proposed structure matches the bankfull channel dimensions and would provide a naturalized channel bed for aquatic organism passage, authorizations under VTDEC and USACE permits would be expected.

No wetland impacts are anticipated under either alternative. No clearing of trees greater than 3" is proposed under either alternative, therefore there would be no need to coordinate with USACE or other Federal agencies regarding endangered bat species. The proposed amount of disturbance and impervious areas fall below jurisdictional thresholds for construction and post- construction stormwater permits.

## 5.4 Stream Permitting

A Stream Alteration General Permit will be required for either alternative. As part of the final design, the Vermont Department of Environmental Conservation River Management Program will need to be contacted as part of the permitting process.

## 5.5 Vermont Agency of Transportation State Highway Access and Work Permit

As part of the proposed work a State Highway Access and Work Permit will need to be filed with the Vermont Agency of Transportation.

## Figure 7: EVALUATION MATRIX

| Category | | Alternatives | | |
|---|---|---|---|---|
| | | **Option 1** | **Option 2** | **Option 3** |
| | | No Build | Remove concrete bridge; restore stream bank; install 56' culvert | Remove concrete bridge; restore stream bank; install 96' culvert with parking |
| **Cost** | Site work | | Demo, Grading, Paving, and Minor plantings | Demo, Grading, Paving, Parking spaces and minor plantings |
| | Structure | | $ | $$ |
| | Detour | | 0 | 0 |
| | Traffic & Safety | | $ | $ |
| | Total | 0 | $ | $$ |
| **Engineering** | Facility performance | No Impact | sufficient | sufficient |
| | Hydraulic Performance | Insufficient | sufficient | sufficient |
| | Utilities | No Impact | limited impact | limited impact |
| **Impacts** | Ag. Lands | No Impact | No Impact | No Impact |
| | Archaeological | No Impact | No Impact | No Impact |
| | Historic | No Impact | Historic Resource Documentation | Historic Resource Documentation |
| | Hazardous Materials * | No Impact | No Impact | No Impact |
| | Flood Hazards | No Change | Reduction in flooding potential | Reduction in flooding potential |
| | Fish & Wildlife | No Change | Improved | Improved |
| | Rare, Threatened & Endangered Species | None | None | None |
| | Public Lands – Sect. 4(f) | No impact | No impact | No impact |
| | LWCP – Sect. 6(f) | No impact | No impact | No impact |
| | Noise | No Change | No Change | No Change |
| | Wetlands | No Change | No Change | No Change |
| **Local & Regional Issues** | Concerns | No Change | Reduction in flooding potential | Reduction in flooding potential |
| | Aesthetics | No Change | Minimal change | Minimal change |
| | Community Character | Unchanged | Affected | Affected |
| | Economic Impacts | Unchanged | Unchanged | Unchanged |
| | Conformance to Reg. Transportation Plan | No impact | No impact | No impact |
| | Satisfies Purpose & Need | No | Yes | Yes |
| **Permits** | ACT 250 | No | No | No |
| | 401 Water Quality | No | No | No |
| | 404 COE Permit | No | Potentially | Potentially |
| | Stream Alteration | No | Yes | Yes |
| | State Wetland Permit | No | No | No |
| | Storm Water Discharge | No | Yes | Yes |
| | Lakes & Ponds | No | No | No |
| | T & E Species | No | No | No |
| | SHPO | No | Potentially | Potentially |
| | State Highway Access and Work Permit | No | Yes | Yes |

* There have been no documented hazardous materials on site. The design and construction documents should include a contingency for hazardous material.

# 6.0 SELECTED ALTERNATIVE: DESIGN DECISIONS

The result of the alternatives presentation was that Alternative 2 was chosen as the preferred alternative. While described above, additional analysis was performed on the selected alternative and the following considerations should be assessed during the final design process:

## 6.1 Utility Pole Relocation

The utility poles within the study area are owned and maintained by the Jacksonville Electric Co. There is a utility pole is shown in Alternative 2 that will have to be relocated. The design engineer should coordinate with Jacksonville Electric Co to determine the best location and their pole installation requirements. The retaining wall and grading downstream of the culvert will have to be designed to account for this new pole location. As part of the final design, the telecom and electrical lines serving the town offices and fire station should be evaluated to see whether transitioning to underground services is feasible.

## 6.2 Drainage system modifications

The existing stormwater drainage system within VT 100 consists of catch basins, manholes and outfalls into the North River. While the general conveyance patterns are expected to remain the same, the final design should account for the necessary modifications to the outlets and catch basins within the project area. Several drainage manholes were paved over in the project area, prior to construction. These manholes should be uncovered, and the relevant system components inspected.

## 6.3 Sanitary sewer modifications

A sanitary sewer line and manhole serving the town office and fire station crosses the river before connecting into a larger line along VT 100. At this time there appears to be minimal impact to the sanitary sewer line but this should be verified as part of the final design.

## 6.4 Stream alteration permits

Alternative 2 expands the stream width to a minimum of 16 ft, removes the bridge, and replaces the existing culvert within the North River. This expansion, as well as replacement of the existing structure, will require a Stream Alteration General Permit with the Vermont Department of Environmental Conservation River Management Program, as well as a general permit with the US Army Corps of Engineers. The design engineer should coordinate with both departments during the design process.

## 6.5 Traffic Considerations

### 6.5.1 Sight Distance Analysis

Site Driveway Sight Distance Assessment: The available intersection sight distance from the Site Driveway intersection was measured from the perspective of a vehicle looking in both directions along VT 100 to determine if adequate sight lines are provided. The intersection sight distance looking straight ahead for vehicles traveling north on VT 100 turning left into the driveway was also measured.

The available intersection sight distance on a side street should provide drivers a sufficient view of the intersecting highway to allow vehicles to enter or exit the intersection without excessively slowing vehicles traveling at or near the operating speed on the intersecting mainline. Stopping sight distance was also measured at the Site Driveway. (Stopping sight distance is the length of the roadway ahead that is visible to the driver.) The available stopping sight distance on a roadway should be of sufficient length to enable a vehicle traveling at or near the operating speed to stop before reaching a stationary object in its path. The diagram below in Figure 8 illustrates these sight distance measurements.

Travel speed data collected by Creighton Manning near the project site shows that the 85$^{th}$ percentile travel speed on VT 100 is approximately 41 mph. The sight distances measured in the field were compared to the guidelines presented in *A Policy on Geometric Design of Highways and Streets, 2018* published by the American Association of State Highway Transportation Officials (AASHTO) and the Vermont Agency of Transportation (VTrans) Traffic Impact Study Guidelines for the 41-mph design speed. The results of the evaluation are summarized in Table 1.

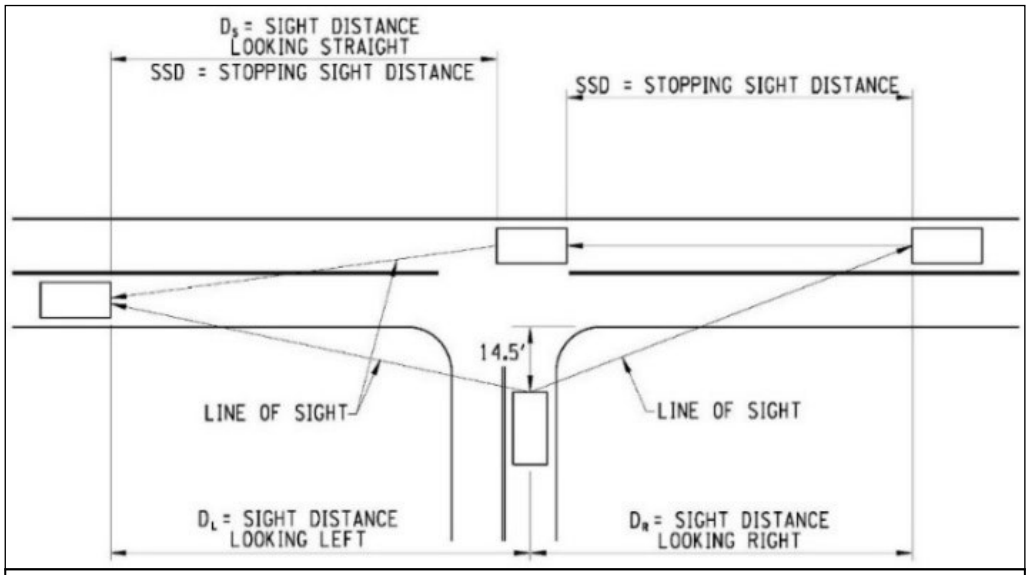


**Figure 8: Intersection and Stopping Sight Distance**

Table 1 – Summary of Sight Distance at Site Access Road Intersection (Feet)

| Intersection | | Intersection Sight Distance[1] | | | | Stopping Sight Distance[2] | |
|---|---|---|---|---|---|---|---|
| | | Right Turn from Site Driveway ($D_L$) | Left Turn from Site Driveway | | Left Turn from VT 100 ($D_S$) | $SSD_{NB}$ | $SSD_{SB}$ |
| | | | Looking Left ($D_L$) | Looking Right ($D_R$) | | | |
| Site Driveway Rt-100 | Available | 500 | 500 | 565 | 650 | 565 | 625 |
| | Recommended[3] | 395 | 455 | 455 | 335 | 285 | 320[4] |

[1] Intersection sight distance is measured at an eye height of 3.5-ft and object height of 3.5-ft.
[2] $SSD_{NB}$ = Stopping sight distance measured for a 2-foot object located in the path of vehicles traveling northbound and southbound on VT 100.
[3] Sight distance measurements are compared to AASHTO recommended distances for the 41-mph.
[4] The recommended stopping sight distance values reflect an approximate 6.0% grade on VT 100.

While the posted speed is 30-mph, the available intersection and stopping sight distances at the Site Access Road intersection on VT 100 meet the AASHTO guidelines for the observed 41-mph speed.

### 6.5.2 Work Zone Analysis

Creighton Manning was tasked with developing a work zone traffic control alternative on behalf of MSK Engineering for the Whitingham Culvert Replacement Project located along Vermont State VT 100. Due to the existing culvert in question being located beneath the driveway of the Whitingham Fire Department and Whitingham Town Offices, it was requested that during construction the driveway remain open and accessible at all times during construction. With this in mind, Creighton Manning developed the below described work zone traffic control alternative.

Work Zone Traffic Control Alternative:

As shown in Appendix 2, Creighton Manning developed an alternating two-way, one lane work zone traffic control plan in accordance with FHWA's Manual on Uniform Traffic Control Devices with temporary traffic signals for the Whitingham Culvert Replacement Project. The following was included in the proposed work zone traffic control plan:

- Five temporary traffic signals to maintain traffic movements along VT 100 and at the three commercial / residential driveways located within the work zone.
- Temporary crosswalks at the eastern and western ends of the work zone to detour pedestrians from the existing sidewalk on the south side of the road to the north side and back around the work zone.
- Channelizing devices and temporary positive barrier to protect workers within the work area and to prevent the traveling public from the entering unauthorized areas.
- Advanced warning signs, including pedestrian warning signs, and temporary pavement markings to warn the traveling public of the temporary traffic pattern.

Work Zone Traffic Control Impacts:

During construction, access to the surrounding businesses of Dean's Auto Body, Briggs Automotive, the US Post Office, Whitingham Fire Department, and Whitingham Town Offices will be maintained through the use of temporary traffic signals and channelizing devices to direct traffic in and out each establishment. The signal controlling the firehouse driveway will be equipped with emergency vehicle pre-emption devices. Using these features, it is anticipated that impacts to the operations of each establishment will be minimized. Furthermore, pedestrians in the area will be accommodated and directed around the construction area by the proposed temporary crosswalks, while bike traffic will be maintained in the travel lane. During special events, such as the Ride 200 on 100 event, the contractor will utilize flaggers to accommodate bicyclists and pedestrians through the work zone safely.

The alternating two-way, one lane operation is expected to have minimal to minor impacts to the overall transportation system during construction. The peak hour traffic counts are expected to be about 160 to 180 vehicles in the weekday peak hour (two-way) and 200 to 220 vehicles (two-way) in the peak hour on a weekend. The one-lane section is about 450 to 500 feet in length, which would require about 16 seconds of clearance time from the moment the last vehicle entered the one lane zone to the point of clearing the other end. If the signal cycle is divided into two phases, 30 seconds for northbound, 30 seconds for southbound, for a 60-second cycle, this would equate to about three to four cars passing through the work zone during each cycle. As such, this work zone proposal should not result in significant queues, and will continue to provide access to adjoining properties, most importantly, the firehouse.

Conclusion:

Utilizing FHWA's Manual on Uniform Traffic Control Devices, Creighton Manning developed an alternating two-way, one lane work zone traffic control plan utilizing temporary signals. This alternative meets the needs of the project by maintaining access to the Whitingham Fire Department, Town Offices, and surrounding businesses during construction, while also providing safe and efficient movement through the work zone for both pedestrians, cyclists and cycling events, and the motoring public. Furthermore, based on the insignificant queues anticipated it is expected that overall impacts to the transportation system during construction will be minimal.

## 7.0 COST ESTIMATE

| Town of Whitingham Culvert Replacement - Opinion of Probable Cost | | | | |
|---|---|---|---|---|
| | | | | |
| | UNITS | TOTAL | UNIT COST | TOTAL COST |
| General Conditions | | | | |
| Mobilization | LS | | | $ 32,709.20 |
| Traffic Controls | LS | 1 | $ 45,000.00 | $ 45,000.00 |
| Erosion and Sediment Control | LS | 1 | $ 5,000.00 | $ 5,000.00 |
| Earthwork | | | | |
| Trench Excavation of Rock | CY | 10 | $ 160.00 | $ 1,600.00 |
| Removal and Replacement of Unsuitable Material | CY | 25 | $ 35.00 | $ 875.00 |
| Rip Rap | CY | 10 | $ 100.00 | $ 1,000.00 |
| Asphalt Paving | | | | |
| Bituminous Concrete Pavement - Patching | TON | 150 | $ 230.00 | $ 34,428.36 |
| Utilities | | | | |
| Electrical Conduit | LF | 80 | $ 30.00 | $ 2,400.00 |
| Cast-in Place Concrete | | | | |
| Concrete Curbing | LF | 145 | $ 50.00 | $ 7,250.00 |
| Concrete Walkway | SY | 340 | $ 20.00 | $ 6,800.00 |
| Reinforced Concrete Wall | LF | 150 | $ 100.00 | $ 15,000.00 |
| Utilities | | | | |
| Utility Crossing | EACH | 1 | $ 800.00 | $ 800.00 |
| Lump Sum Items | | | | |
| Culvert Replacement | LS | 1 | $ 425,000.00 | $ 425,000.00 |

| | |
|---|---|
| WORK AND MATERIAL TOTAL | $545,153.36 |
| TOTAL WITH MOBILIZATION/DEMOBILIZATION | $577,862.56 |
| ENGINEERING DESIGN (15%) | $86,679.38 |
| CONTINGENCY (20% OF Construction) | $115,572.51 |
| CONTRACT TOTAL | $780,114.45 |

## 8.0 SCHEDULE

| MILESTONE | DATES (Summer 2022 - Summer 2024) |
|---|---|
| **Receive Approval of Scoping Study** | Summer 2022 |
| **Grant Application for Final Design** | Fall 2022 |
| **Procurement of Design Services** | Winter 2022 |
| **Design** | Winter 2022- Winter 2023 |
| 25% Plans and VTrans Review | Winter 2022 |
| 60% plans | Spring 2023 |
| Utility relocation submission | Spring 2023 |
| Permitting | Summer 2023 |
| Right-of-Way | Fall 2023 |
| Material / Product Selection | Fall 2023 |
| 85% plans and VTrans | Winter 2023 |

## 9.0 LIMITATIONS

- This report was prepared by MSK in partnership with Creighton Manning, UVM, and Fitzgerald Environmental Associates.
- Our recommendations are based on the project information provided to us at the time of this report and may require modification if there are any changes in the nature, design, or location of the proposed project.
- Our professional services for this project have been performed in accordance with generally accepted engineering practices. No warranty, expressed or implied, is made.

# APPENDIX 1

# HISTORIC RESOURCE REVIEW AND ARCHAEOLOGICAL RESOURCE ASSESSMENT

FOR THE WHITINGHAM STP MM20(3) FLOOD RESILIENCY PROJECT, WHITINGHAM, WINDHAM COUNTY, VERMONT


*View northwest along Church Street (VT Route 100) c. 1900, Jacksonville, Vermont*

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UVM Report No. 1377
October 13, 2021
Revised May 13, 2022

Submitted to:

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## PROJECT DESCRIPTION

This combined Historic Resource Review (HRR) and Archeological Resource Assessment (ARA) was prepared by the University of Vermont Consulting Archaeology Program (UVM CAP) for MSK Engineering & Design, consultants to the Town of Whitingham, to help satisfy requirements under the Section 106 permitting process for the proposed Whitingham STP MM20(3) Flood Resiliency Project, Whitingham, Windham County, Vermont (Figure 1). The Town of Whitingham is considering several undertakings to reduce the potential for flood damage within the Village of Jacksonville. The current phase of the proposed project has three potential components, all located along the west side of VT Route 100 (Figures 2 – 6):

1) the replacement of the 1926 concrete bridge known as the 'Welcome to Jacksonville Bridge,' located at the northern entrance to the Whitingham Municipal Center with a larger structure (NR-19);
2) the replacement of the undersized 8.5 ft squash CMP culvert under the southern entrance to the Whitingham Municipal Center with a 16 ft bridge, along with the general widening of the stream channel in front of the Fire Department building (NR-18); and \
3) the removal of the house at 2984 VT Route 100, which has structural elements extending over the East Branch of the North River (NR-21).

The objective of the HRR is to identify and document any historic resources on or eligible for listing on the National and/or State Register of Historic Places that have the potential to be directly or indirectly affected by project work, and if present, to recommend a determination of effect on the resources by the proposed project. The proposed project was reviewed according to standards set forth in 36 CFR Part 800, the regulations established by the Advisory Council on Historic Preservation to implement Section 106 of the National Historic Preservation Act, and its amendments. The Area of Potential Effect (APE) for standing historic resources was identified as all properties abutting the project limits along the river, and the overall streetscape.

The goals of the ARA are to identify any portions of the project's APE that may contain pre-Contact Native American and/or historic archaeological sites, to provide sufficient information to gauge their potential for archaeological significance, and to recommend if further archaeological work would be needed prior to project work. To assess the potential of the proposed project's APE for pre-Contact Native American sites, a review of the files maintained by the Vermont Division of Historic Preservation (VDHP) was undertaken to identify the location and nature of nearby previously reported sites in order to understand the archeological potential of the general area. Additionally, the criteria outlined in the VDHP's *Environmental Predictive Model for Locating PreContact Archaeological Sites* were used to establish the general sensitivity for Pre-Contact Native American sites within the proposed APE. The Area of Potential Effect for archaeological resources was identified as the project limits, which include the riverbanks and the house lot at 2984 VT Route 100.


Figure 1. Map showing the location of the Whitingham STP MM20(3) Flood Resiliency Project in Whitingham, Vermont.


Figure 2. Map showing components of the Whitingham STP MM20(3) Flood Resiliency Project, Whitingham, Vermont.

Figure 3. View northwest of the project area along VT Route 100; left to right, house at 2984 VT Route 100, fire department building, municipal building.

Figure 4. View southwest of the project area along VT Route 100; fire department building at left, municipal building at right, 1926 bridge at left foreground.

Figure 5. View northeast of the project area across VT Route 100 from in front of the fire department; East Branch North River at right corner.

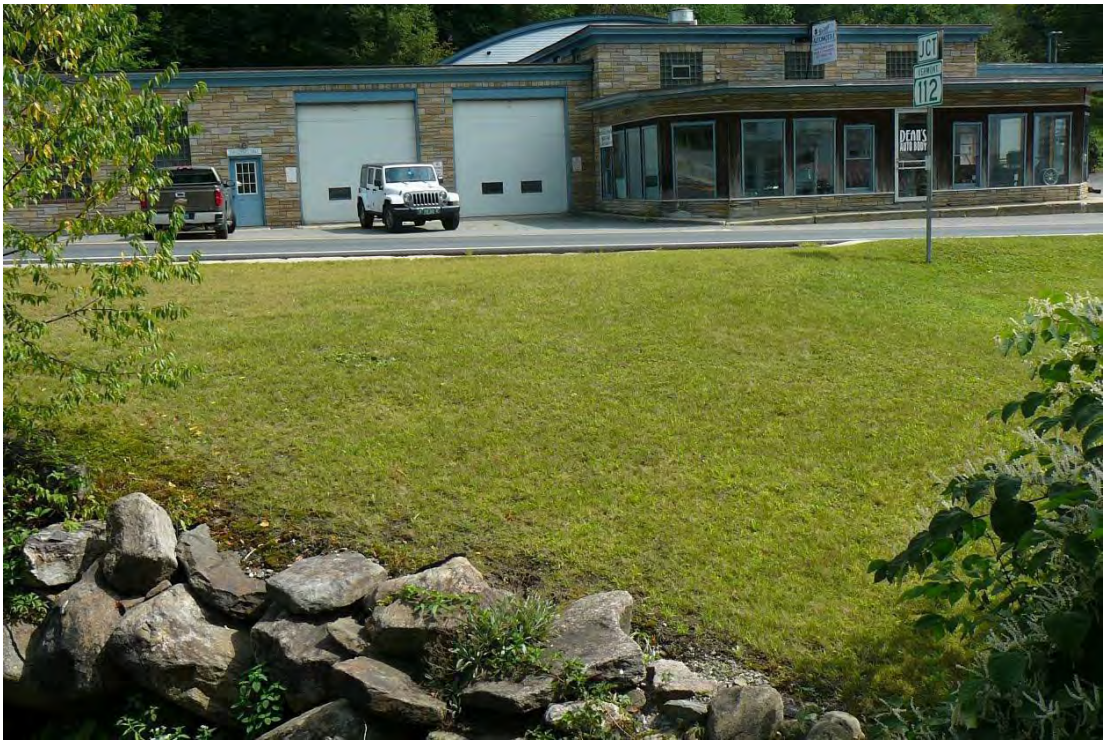


Figure 6. View east of the project area across VT Route 100 from in front of the fire department; stone-lined bank of East Branch North River in foreground.

A variety of records were used in the preparation of this report including historic maps, land records, newspapers, town histories, census records, aerial photographs, and vital records. Some on-line databases were accessed for historical information including newspapers.com; findagrave.com and Ancestry.com. Secondary sources were checked at the University of Vermont's Silver Special Collections, Billings Library Annex, Burlington, Vermont; at the Vermont Historical Society's Leahy Library in Barre, Vermont; and on-line at https://books.google.com/. Aerial photographs were accessed at the Vermont Center for Geographic Information's website (VCGI) at https://vcgi.vermont.gov/ and at the Vermont State Archives & Records Administration (VSARA), in Middlesex, Vermont. The files of the Vermont Division for Historic Preservation (VDHP) were accessed through the Vermont Agency of Commerce and Community Development's Online Resources Center (ORC) at www.https://orc.vermont.gov. Land records were researched at VSARA. Environmental data was obtained from the VCGI; the USDA's Natural Resources Conservation Service's Web Soil Survey website at www.http://websoilsurvey.nrcs.usda.gov; the Vermont Agency of Natural Resources website https://anrweb.vermont.gov/dec/_dec/WaterQualitySummary.aspx; and the ORC.

## ENVIRONMENTAL SETTING

The Town of Whitingham lies within the Green Mountain physiographic region of Vermont. The surface of the town is hilly and uneven with elevations ranging from about 1,240 to 2,235 ft above mean sea level. The hills are incised by numerous streams and the town is dotted by several ponds (Jillson 1886:15, 16; Thompson 1842, Pt. III:191; Vermont Bureau of Publicity 1914:161, 250). The largest watercourse is the Deerfield River. This river, which originates near the southeast corner of Sunderland and flows generally southeast about 75 miles to join the Connecticut River near Greenfield, Massachusetts, cuts through the western part of Whitingham where in passes through some "rich" meadows (Thompson 1842, Pt. III:191; Vermont Bureau of Publicity 1914:195; 250). The natural ponds and/or enhanced impoundments in the town include, but are not limited to: the approximately 191-acre Lake Sadawga, a natural waterbody with artificial control; Jacksonville Pond, an artificial impounded waterbody of about 17 acres;[1] Ryder Pond,[2] an impounded waterbody of about 14-acres; Laurel Lake (formerly Roberts Pond), a spring fed waterbody of about 17 acres; and Gates Pond, a natural waterbody of about 30 acres with artificial control (Brown 1886:13; Jillson 1886:16-17; Vermont Bureau of Publicity 1914:249-250 and the Vermont Agency of Natural Resources website https://anrweb.vermont.gov/dec/_dec/WaterQualitySummary.aspx). The upland glaciated soils, both till and outwash, found in Whitingham "varies from a clay loam to a sandy and gravelly
loam" with the till areas noted for numerous erratics (Jillson 1886:16-17; Vermont Bureau of Publicity 1914:161). Historically, the soil was considered "generally good" with some level tracts being "quite easily cultivated" and "the high lands" considered to be "well adapted to grazing" (Child 1884:303; Jillson 1886:15; Thompson 1842, Pt. III:191). The early historic period forest consisted of a "heavy growth" of beech, birch, maple, spruce, hemlock, balsam, and ash (Child 1884:303; Jillson 1886:18; Thompson 1842, Pt. III:191). Hemlock was particularly abundant, and many trees were of "immense size ranging from three to five feet in diameter" (Jillson 1886:15, 18).

[1] Jacksonville Pond Dam State ID #243.06.
[2] Ryder Pond Dam State ID #243.04. Also spelled: "Rider Pond."

The Village of Jacksonville, located in the eastern part of the town, lies within a "narrow gorge[3] between the abruptly rising hills on the east and the more gradual slopes from the center ridge on the west" (Brown 1886:127). Elevations near the village range from about 1,360 ft (in the valley) to 1,780 ft (on the nearby hills). The East Branch of North River, the most significant stream in the eastern part of Whitingham, flows through the village (Vermont Bureau of Publicity 1914:250). The East Branch of North River is an approximately 15.73 mi (25.31 km) long watercourse, which begins at Ryder Pond about 1.5 mi (2.4 km) upstream from the project area.[4] Within the project area, the East Branch of North River is shallow, running only about 14 in (35.6 cm) deep most of the time. In the village, the sides of this stream are extensively lined by dry-laid rubble stone walls (often referred to in the historic period deeds as the "bank wall"), sections of which were in place by at least the early 1850s (e.g., see WLR 14:167). Within the village, the East Branch of North River is joined by water flowing from the artificial impoundment of Jacksonville Pond[5] via Gates Pond Branch. About 0.29 mi (0.46 km) downstream from Jacksonville Pond this watercourse joins the East Branch of North River near the intersection of VT Route 100 and VT 112. The East Branch of North River eventually joins the West Branch of North River near the village of Lyonsville in the town of Colrain, Massachusetts; this river, in turn, joins the Deerfield River about 1.5 mi north of Shelburne Falls, Massachusetts (Jillson 1886:16).

The surficial geology of the Jacksonville valley consists primarily of glaciofluvial outwash deposits, heavy with cobbles (ranging "from small pebbles to considerable sized bowlders [sic]") and gravels, having a cap of finer post-glacial alluvium (Brown 1886:12). According to the NRCS, the expected soil within the proposed project area is 'Houghtonville fine sandy loam,' a very deep well drained soil. An undisturbed profile in this soil consists of a thin upper organically enriched layer (O) underlain by a thin black fine sandy loam (with about 10% rock content) (A); underlain by a thin brown fine sandy loam (E); underlain by a dark reddish brown fine sandy loam (Bhs); underlain by a dark yellowish brown cobbly fine sandy loam (with about 15% rock content) (Bs); underlain by a dark brown to dark yellowish brown cobbly fine sandy loam grading to a light olive brown cobbly fine sandy loam (with about 20% rock content) (C). This type of soil can be vulnerable to erosion.

Given the local topography, it is not surprising that the proposed project area has been impacted by numerous floods. For example, in 1878, in Jacksonville,

> "the water in North River was from 12 to 20 inches higher than the great freshet of '69. The damage to the highway leading from this village down North River through South Halifax and Coleraine [sic] to Shelburne Falls was very severe, carrying away ten large bridges and leaving only three large ones standing, while there were many severe washouts in the roadway. In this village, a portion of Porter's grist mill dam and
> bulkhead was demolished. Next south of this establishment is Stetson Bros' extensive saw mill and box factory. The store room of this firm, which was situated over the stream, was torn open, and about 3,000 butter boxes and grain measures swept away,

[3] The floor of this valley is only about 0.15 mi (300 m) across.

[4] Note: In some historical accounts of floods, it appears that the East Branch of the North River was considered to extend up what is today called Gates Pond Brook rather than the watercourse flowing from Ryder Pond.
[5] Jacksonville Pond is mainly fed by streams coming from Gates Pond and Laurel Lake.

passing through the store room the machinery and tools required to manufacture these boxes, together with stock and materials sufficient for 5,000 more boxes nearly ready for use, were entirely cleaned out. The tannery, owned by Hon. P. Starr of Brattleboro, was the next to severely suffer, the water from a small brook coming from another direction at this point, causing the vats to be filled with water, spoiling the liquors so that they are now being replaced by new ones-a loss of several hundred dollars. J. Brigg's barn came next in order and now presents a somewhat dilapidated condition. O.H. Pike's building occupied by him as a dwelling and carriage shop was so thoroughly used up that will probably not be repaired. Mr. Pike suffers severely in the loss of his valuable set of tools. The roadbed of Main Street at this point is completely torn out, having the appearance of the bed of a brook for many rods" (*Vermont Phoenix* December 20, 1878).

After another flood in 1893, it was reported that in Jacksonville, "much damage was done to highways and bridges, many roads being impassable. Quite a number of men and teams are now at work" (*Deerfield Valley Times* May 19, 1893). In 1927, it was reported that in Jacksonville,

> "the dam at the storage pond for Hager's mill at Gates's meadow was sawed off in the early part of the evening to allow the water to come more gradually as it was feared the dam would give way under the unusual pressure. This probably saved the village considerable damage. A few persons, mostly children and elderly people, were moved to higher parts of the village as a precaution. Cellars along North River were flooded, and winter supplies of vegetables suffered. The roads are being rapidly repaired. In some places chasms three feet deep had to be filled. Temporary bridges have been constructed so traffic is resumed in all directions from this village" (*Brattleboro Reformer* November 10, 1927).

After the flood of 1936 it was reported that, "in the center of the village [Jacksonville] traffic is detoured because of the deep water in the main street between Freeman Hager's and N.G. Stone's" (*Brattleboro Reformer* June 7, 1936). In this flood, "at Reed's hardware store the back work was washed [so] that water came into the cellar and damaged much stock . . . bridge at the schoolhouse did . . . the water so it was forced [into the] street. Coming on the street [illegible] down town hill, a great [illegible] of gravel and rocks was [illegible] onto the Common to a depth of several feet (*Brattleboro Reformer* March 27, 1936).

Possibly the most damaging flood in Jacksonville, however, was associated with the New England Hurricane of 1938.[6] During this flood, the streams, fed by "a deluge of rain," sent "two feet of rushing water . . . through the village" (*Springfield Reporter* September 29, 1938). It was reported that,

> "E.J. Roberts old grist mill, used for storage purposes was washed out and went down stream striking the store and residence of Clyde Reed, crumpling the foundation, the building going into the stream below. The back part of Leon Williams' house just below was torn from the rest of the house. Farther down stream an abandoned chair

[6] At one time, movies "of Flood Damage, Wilmington and Jacksonville" existed (*Deerfield Valley Times* July 21, 1939).

factory was washed out. Several families along the river had their cellars and lower floors flooded. Several bridges on the Jacksonville-Colrain Road were taken out and the road from Arthur Farrington's to the village was nothing but rocks but has now been repaired to open the road to Whitingham. The only road by which Jacksonville could be reached was over Shearer Hill" (*Bennington Evening Banner* September 29, 1938).

Furthermore, near Jacksonville it was reported that the, "brooks have torn across the roads at numerous places causing washouts of varying degrees. In some instances, the worst washouts have been filled in with logs, junk & etc." (*North Adams Transcript* September 24, 1938). After the flood, it was reported that, "the town is widening and deepening the course of the river" in places (*Brattleboro Reformer* December 15, 1938). More recent severe flooding has also occurred, including during Tropical Storm Irene (Figure 7).


Figure 7. View northwest up Vermont Route 100 from the intersection of VT 112, during Tropical Storm Irene in 2011, with the project area in the background (Fitzgerald Environmental Associates, photo courtesy of G. Havreluk, n.d.:2).

## HISTORIC BACKGROUND

### *General*

The Town of Whitingham was initially granted in 1766, but was only first settled in ca. 1770 by Bratlin and Silas Hamilton (Child 1884:303). By about 1840, there were two grist mills, nine sawmills, two fulling mills, five stores, one tavern, and one tannery" in the town as a whole (Thompson 1842, Pt. III:191). It appears that the earliest settlement in Jacksonville occurred by "about 1808" (Brown 1886:127). At that time, just "three families" were "living in this vicinity" near the grist mill owned by Col. Isaac Martin and operated by Patrick Peebles (Brown 1886:127-128). However, the waterpower sites available at Jacksonville soon attracted more people and industry. By the 1820s, Jacksonville had a sawmill, a carding mill, and a cloth dressing shop (Brown 1886:128). By ca. 1840, the village had seven dwellings (including a hotel) and had added a store and a thriving tannery (Brown 1886:130). Although there were "but few good sites for farming" near the village site, Jacksonville quickly became "the most populous and wealthy district in town" (Brown 1886:11, 127). By the mid-1880s, Jacksonville counted about 760 inhabitants, or "more than one fifth of the population" of Whitingham, and had, two churches, "an excellent school-house, with two school rooms," a hotel, "a large village hall for public purposes, lectures, concerts, exhibitions at agricultural fairs, town meetings, etc." two stores, a tannery, a grist mill, two sawmills, two butter box manufactories, a cider mill, a sash and door shop, a carriage shop, two blacksmith shops, "an establishment for manufacturing apple jelly," three shops for manufacturing butter boxes and tubs, a tin shop, and "about fifty dwellings" (Brown 1886:11, 127; Child 1884:304). By the early 20th century, the village had suffered some decline. However, in ca. 1914, Jacksonville still had two sawmills and a factory producing barrels and tubs (Vermont Bureau of Publicity 1914:161).

### *House*

Historic maps indicate that the house within the proposed project area at 2984 VT Route 100, was probably built after ca. 1856 (Figures 8 – 10) (Beers 1869; Chase 1856). On April 13, 1867, Parley Starr[7] sold the house to Carrie Clark, wife of Samuel A. Clark, of Halifax, Vermont (*Whitingham Land Records* [WLR]17:66). The lot was described as beginning on the west side of 'North Street'[8] on the north line of Lucy M. Newell's fence; then running west on Newell's property to the brook; then up the brook to a point 3 ft 1 in north of the north side of the dwelling house and shed located on the premises; then running east to the street; then running south on the

[7] Among the most prominent men in Jacksonville in the 1800s was Parley Starr (Brown 1886:129). Starr (1814-1889) was a native of the Milton/Colchester area who learned tanning in Guilford, Vermont, before moving to Jacksonville in ca. 1837 where he bought a small tannery formerly run by Daniel Dean "and did an extensive leather manufacturing business for 37 years accumulating a large property" (*Rutland Daily Herald* November 15, 1889; *Vermont Phoenix* December 24, 1869). In the 1860s, Starr's tannery processed 12,000 hides annually and employed about 15-20 men (*Vermont Phoenix* December 24, 1869; April 30, 1875). Starr moved to Brattleboro in 1873 and became the first president of the Peoples' National Bank (*Rutland Daily Herald* November 15, 1889). After Starr moved, he sold his tannery in Whitingham, "which has for some time past has been unused," to E.E. Putnam (*Vermont Phoenix* August 7, 1885). The tannery closed for good ca. 1879 and its boiler and chimney were taken

away by the Deerfield Shoe Company in 1888 (*Deerfield Valley Times* December 27, 1888; *Vermont Phoenix* September 19, 1879).

[8] This street appears to have been renamed School Street, *possibly* after the construction of the high school (now municipal office) in 1923.

street 83 ft to the beginning (WLR17:66). This transfer included the right to build a barn over the brook, with the far sill to rest on the "bank wall on the west side of brook" (WLR17:66). S.A. Clark "opened a boot and shoe store and shop" in 1867 in a building that had been built by Parley Starr "nearly opposite E.S. Roberts' clothing store" in Jacksonville (*Vermont Record* May 25, 1867*; Vermont Record and Farmer* March 25, 1868). S.A. Clark, however, soon moved to Clarksburg, Massachusetts (*Vermont Phoenix* January 7, 1870). On February 12, 1870, Samuel and Carrie Clark, sold their home in Jacksonville to Lurissa (Lynde / Lyndes) Putnam (1820-1907), wife of John Putnam (1812-1892), then of Guilford, but formerly of Halifax, Vermont,[9] for $700 (U.S. Census 1850, 1900; *Vermont Phoenix* April 22, 1892; *Vermont Vital Records* 1720-1908; WLR 17:323;). John Putnam was a farmer who retired to Jacksonville ca. 1874 (*Vermont Record and Farmer* November 13, 1874).

Sometime after John Putnam's death in 1892, the house was sold to Herbert L. Putnam (1873-1948), a son of Edward E. Putnam, a prominent mill owner[10] (*Vermont Vital Records* 1720-1908). On January 30, 1897, H.L. Putnam sold the property to Don G. Taylor (WLR 23:20). D.G. Taylor (1841-1908) was a native of Adam, New York, and a Civil War veteran (24th New York and 21st Wisconsin) (*Deerfield Valley Times* March 13, 1908). He was also a carpenter who had "a mechanical turn of mind" (*Deerfield Valley Times* March 13, 1908). Taylor and his first wife Anna Brown, daughter of Leonard Brown, moved to Whitingham prior to ca.
1870 (*Deerfield Valley Times* March 13, 1908; U.S. Census 1870, 1890, 1900). By 1880, Taylor operated a "thriving" door, sash, blinds, and windows moldings factory in Jacksonville and had a side line in the undertaking business (*Deerfield Valley Times* May 16, 1890, May 18, 1894; U.S. Census 1880). In 1894, fire destroyed Taylor's shop, machinery, and lumber along with the house in which he then lived (not in the proposed project area), two barns, and a shed[11] (*Deerfield Valley Times* May 18, 1894; *Vermont Phoenix* May 18, 1894). After the fire, Taylor appears to have become a full-time undertaker (*Deerfield Valley Times* March 27, 1908; U.S. Census 1900). On August 1, 1897, D.G. Taylor married Viora N. (Brown) Jillson (1849-1928), a daughter of Martin Brown and the widow of Rinaldo E. Jillson (1836-1875) (*Deerfield Valley Times* March 13, 1908; U.S. Census 1890; *Vermont Vital Records 1720-1908*). As noted above, Don Taylor bought the house within the proposed project area in January of 1897. Taylor subsequently added to the property and expanded its structures. For example, Taylor bought a small parcel from H.L. Putnam for $5 in 1897 (WLR 23:28). Also, in 1897, he bought a spring right for the property from Cranston Dix (WLR 23:40). In 1899, he purchased an additional water right from Albert C. Stetson (WLR 23:106) and acquired the right to extend his barn 12 ft onto the other side of brook from H.L. Putnam (WLR 23:105). In 1899, it was reported that, "D.G. Taylor is putting an addition on his barn so as to make more room for carriages, extending his barn floor across the stream" (Figures 11 and 12) (*Vermont Phoenix* May 5, 1899).

[9] This property was now described as being north of Mrs. L.M. Eastman's house, see the Beers map (see Figure 10).
[10] In 1867, Parley Starr sold a sawmill and a shop in Whitingham to Edward E. Putnam of Halifax, Vermont (*Vermont Record* December 7, 1867). Herbert L. Putnam married Ida M. Worden (1877-1943) in 1894 (*Vermont Vital Records* 1720-1908).
[11] This factory was rebuilt and became known as the North River Manufacturing Company (*Deerfield Valley Times*

November 2, 1894; *Vermont Phoenix* May 18, 1894). The 1894 fire also destroyed George G. Hamilton's "old store," then occupied by the grange, a photographer, and a goods storage area, which was located about eight feet away from Taylor's property (*Deerfield Valley Times* May 18, 1894; *Vermont Phoenix* May 18, 1894).

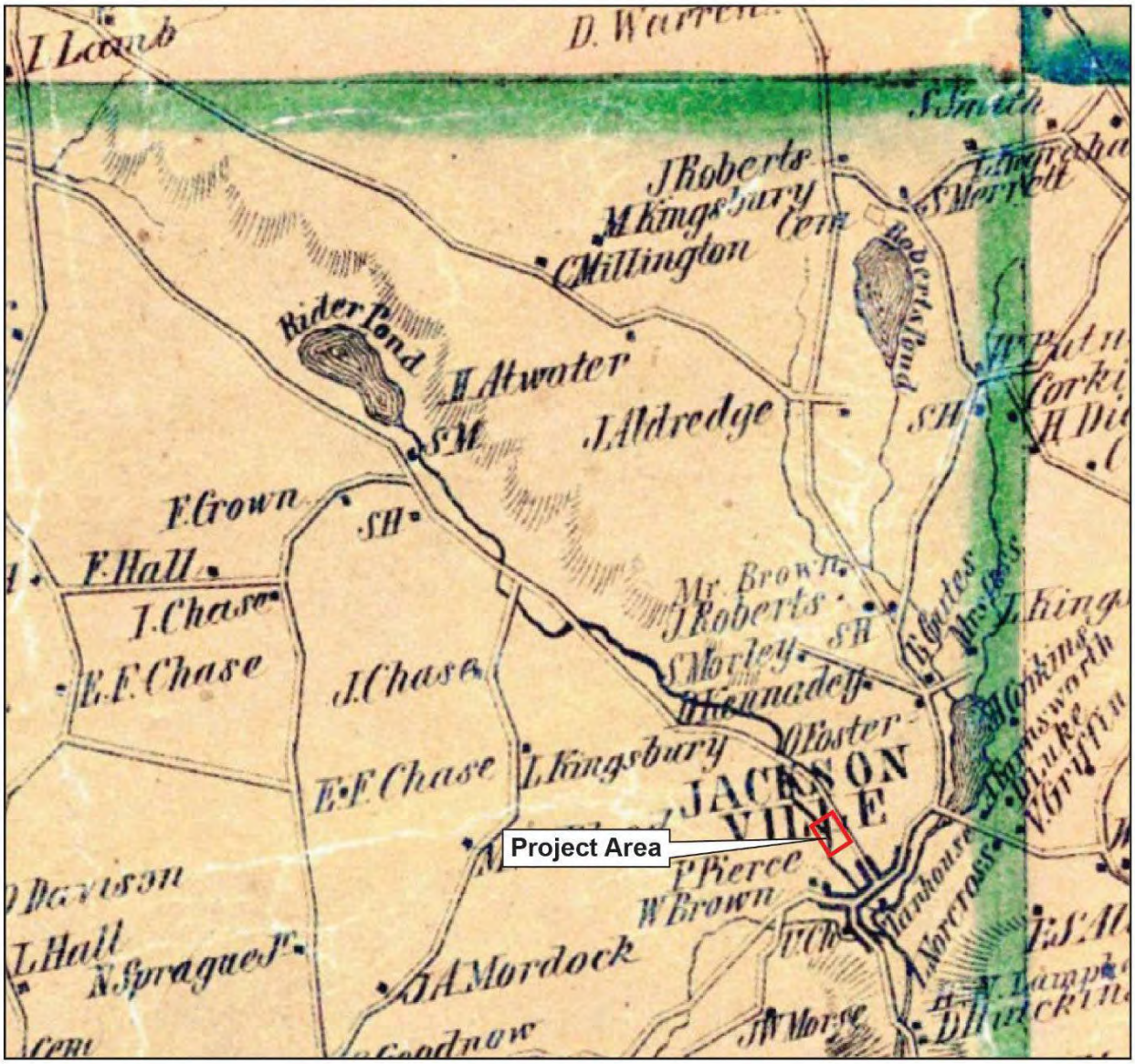


Figure 8. Detail of J. Chase's *McClellan's Map of Windham County, Vermont* (1856).

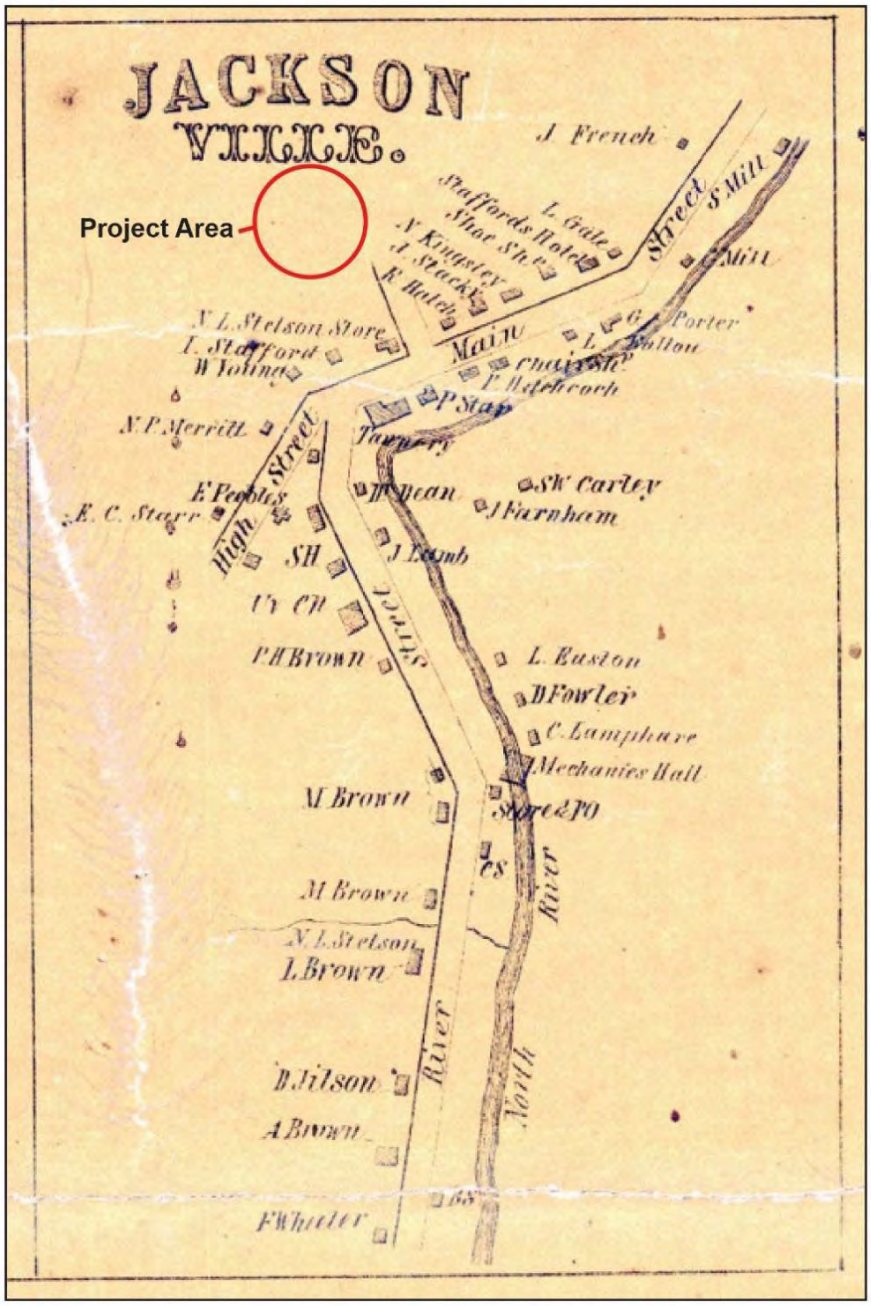


Figure 9. Detail of the inset showing "Jacksonville" from J. Chase's *McClellan's Map of Windham County, Vermont* (1856).

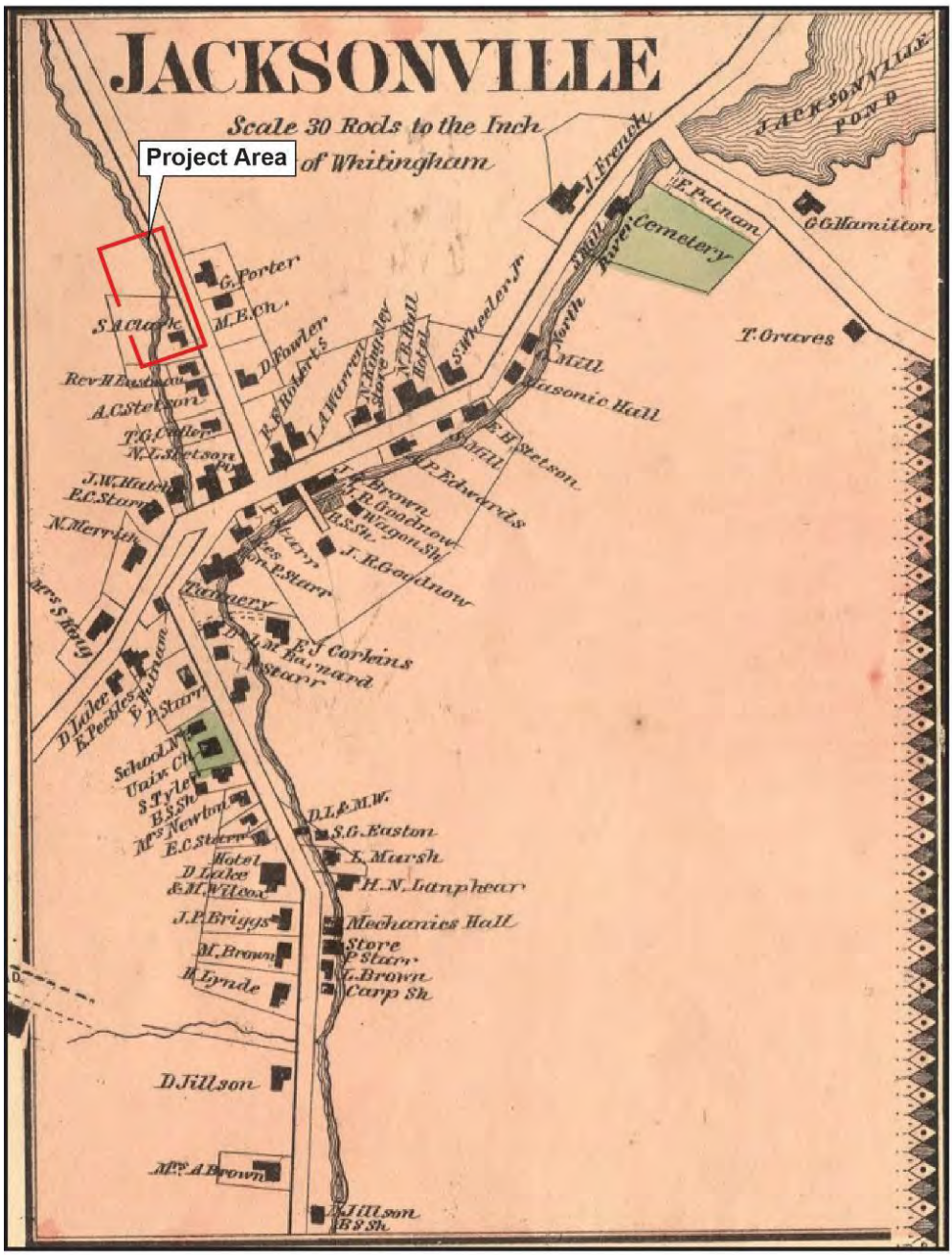


Figure 10. Detail of "Jacksonville" from F.W. Beers, A.D. Ellis, and G.G. Soule's *Atlas of Windham Co. Vermont* (1869).

Figure 11. Real photo postcard postmarked July of 1908 of the project area house at 2984 VT Route 100. The people in the image are believed to be Don G. and Viora Taylor.


Figure 12. View northwest along Church Street (VT Route 100) c. 1900, Jacksonville, Vermont; 2984 VT Route 100 is last house on left.

Don G. Taylor died early in 1908, at 65 years of age (*Deerfield Valley Times* March 13, 1908). At the time, he was a professional undertaker and the director of the Heath Telephone Company, a local service (*Deerfield Valley Times* March 13, 1908). The property passed to his widow, Viora, who willed it (ca. 1928) to her daughter, Elva E. (Jillson) Russell[12] (WLR 31:343; U.S. Census 1920; *Vermont Death Records 1909-2008*). On November 8, 1928, Elva Russell sold the house to Charles M. Fox (1867-1932) (*North Adams Transcript* February 22, 1932; WLR 31:343). On February 16, 1933, the estate of Charles Fox sold the house to the New England Telephone Company (WLR 31:438). It appears that the house was then occupied by Forrest and Lottie Willard. According to one account,

> "from 1929 until 1958, the exchange [for the New England Telephone & Telegraph Co.] was located in the front parlor of the home of Forrest and Lottie Willard, then two houses down from the school and across the street from E.J. Roberts & Son Garage and the public library building . . . The switchboard operators had a bird's eye view of School Street" (*Brattleboro Reformer* August 22, 1998).

On July 26, 1956, the New England Telephone Company sold the house to their long-term tenants, Forrest and Lottie Willard (WLR 43:433). On September 23, 1959, Lottie Willard's estate sold the property to Bryon Morse (WLR 46:291). In November of 1959, Bryon and Beatrice Morse sold the property to Carl and Edith Paige (WLR 46:322). On April 24, 1984, the property was transferred to Virginia, Carl, and Edith Paige, as joint owners (WLR 71:383). In 2002, Virginia (Paige) Coombs sold the property to Joseph Zenorini (WLR 114:89). In 2004, Joseph Zenorini sold it to Robin W. Kingsley (WLR 124:496).

*The Municipal Center & Firehouse*

The present 'Municipal Center' was formerly the Jacksonville High School (*Brattleboro Reformer* January 4, 1958; March 2, 1960; *North Adams Transcript* March 10, 1961). The first high school building on this site was built in 1923, but it burned down in December of 1926 (*Brattleboro Reformer* August 9, 1923; *Caledonian-Record* December 23, 1926). A small concrete bridge had been built over the East Branch of the North River in 1926, likely to access the school; it still stands today and is part of the proposed project work (see Figure 4). In 1927, the present building was built as a high school "on the site of the one which burned" (Figure 13) (*Vermont Phoenix* January 14, 1927; March 18, 1927; May 27, 1927). The existing building was enlarged (probably to the north) in 1931, to add "two well lighted and ventilated class rooms [sic] and a basement 24 by 48 feet which will be used as a gymnasium" (*North Adams Transcript* August 10, 1931).[13] In ca. 1960-1961, this building was converted to its present use for town offices and meeting spaces (*Brattleboro Reformer* April 3, 1961; *North Adams Transcript* March

[12] Elva Jillson (1870-1948) married Howard L. Russell (1861-1904), a native of Dover, Vermont, in 1889 and "spent her entire life in Jacksonville and Wilmington, where they lived on a farm now [1948] occupied by Lee Titus" (*North Adams Transcript* February 23, 1948; *Vermont Vital Records* 1720-1908). At the time of his death, Howard Russell

was the driver of the Jacksonville and Colrain stage (*North Adams Transcript* January 27, 1904).
[13] The contractor for this building was Chester Willey of Claremont, New Hampshire, and the estimated cost was $4,800 (*North Adams Transcript* July 16, 1931).

Figure 13. View southwest showing the flood damage in 1938 in front of the High School, now the Municipal Building, in Jacksonville (Bennington Museum, Bennington, Vermont. Gift of Marge Doyle, Cat No.#2004.301.7). Note that the "Welcome to Jacksonville Bridge," built in 1926, survived the flood, but the ground around it was scoured.

10, 1961). Early in 1961, it was reported that the "Municipal center, being established in the old high school building in Jacksonville, is nearing completion" (*Brattleboro Reformer* April 3, 1961; *North Adams Transcript* March 10, 1961).

The present firehouse located south of the Municipal Center was built ca. 1973 – 1974, along with the parking lot on the north and south sides of the Municipal Center (Figures 14 and 15) (*Brattleboro Reformer* March 6, 1974). At present, the 6.1-acre municipal property also includes a triangle of land immediately north of the house at 2984 VT Route 100, where another historic period structure once stood (see Figure 11) (*Brattleboro Reformer* August 22, 1998). This structure may have been built very close to or even partially over the brook. This structure was standing in 1962 (see Figure 14) and appears to have been extant in 1993, but likely no longer exited by 2003 (Google Earth).


Figure 14. Detail of an aerial photograph showing the project area 1942 (Aerial Photograph GS-AE 3-85; accessed on the Vermont Center for Geographic Information's website at https://vcgi.vermont.gov/).

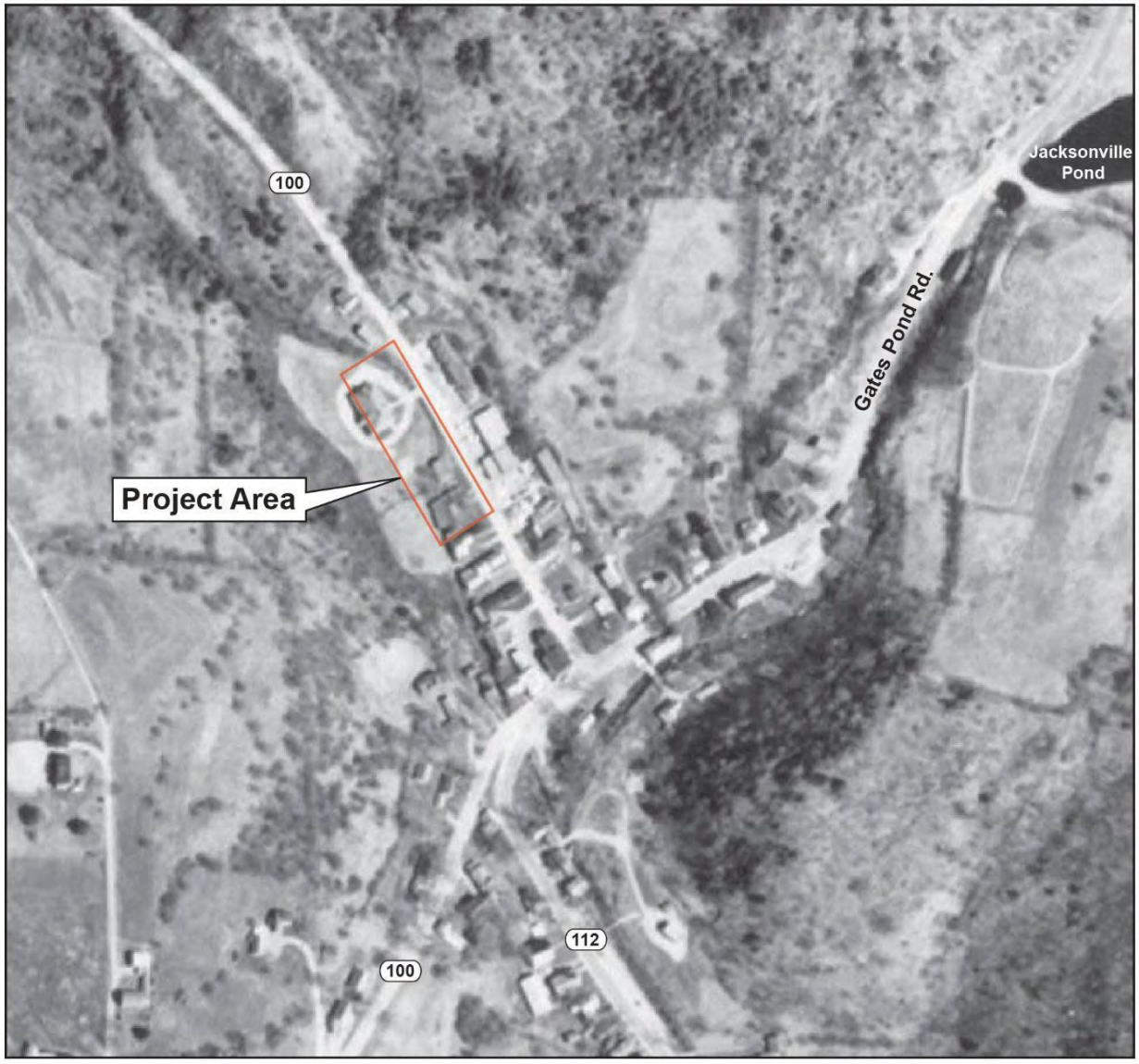


Figure 15. Detail of an aerial photograph showing the project area 1962 (Geotechnics & Resources Inc., 1962).

## PRE-CONTACT NATIVE AMERICAN ARCHAEOLOGICAL RESOURCES

The Vermont Division for Historic Preservation's Vermont Archaeological Inventory (VAI) indicates that there are no previously reported pre-Contact Native American sites within a 1.5 km (0.93 mi) radius of the proposed Whitingham STP MM20(3) Flood Resiliency Project (Figure 16). The closest site to the proposed project area is VT-WD-0369, the Harriman Reservoir Site, which is located on the eastern side of the Harriman Reservoir, southwest of the project area, and consists of a scatter of quartz debitage exposed by a tree throw. There are also two known pre-Contact Native American sites in the Deerfield River Valley, further southwest of the project area, VT-BE-0544 and VT-WD-147. VT-BE-0544, the 'Hemlock Row Site,' in Readsboro, was identified by the recovery of 186 artifacts including, quartzite, quartz and rhyolite lithic debitage, a mica schist abrader, and a quartz hammerstone. VT-WD-0147, the 'Sherman Prehistoric Locus 1 Site,' in Whitingham, was identified on the basis of two quartz flakes, one quartzite flake, and eight quartz 'shatters.'

An application of the Geographical Information System (GIS) based version of the Vermont Division for Historic Preservation's (VDHP) "Environmental Predictive Model for Locating Archaeological Sites" was utilized to predict archaeological sensitivity within the project area. With this model, archaeological sensitivity is depicted by the presence of one or more overlapping habitability factors, or environmental characteristics that may have attracted Native American occupation at some point in the past. The model indicates that the proposed project area may include up to three key sensitivity factors for pre-Contact Native American sites, specifically Drainage Proximity Presence; Stream-Stream Proximity Presence; and Level Terrain Presence (Figure 17).[14]

The VDHP's paper version of the predictive model is a checklist that scores an area's proximity to a select list of environmental features important to pre-Contact Native American communities. A score of 0 – 31 predicts the area is archaeologically non-sensitive, while a score of 32 or greater predicts the area is sensitive. The Whitingham STP MM20(3) Flood Resiliency Project area scores a -2, indicating that it is likely not sensitive (Appendix I).

[14] Wetland Proximity Presence was also indicated in the general area of Jacksonville by the computer model, but, on inspection, it is not directly applicable to the proposed project area.

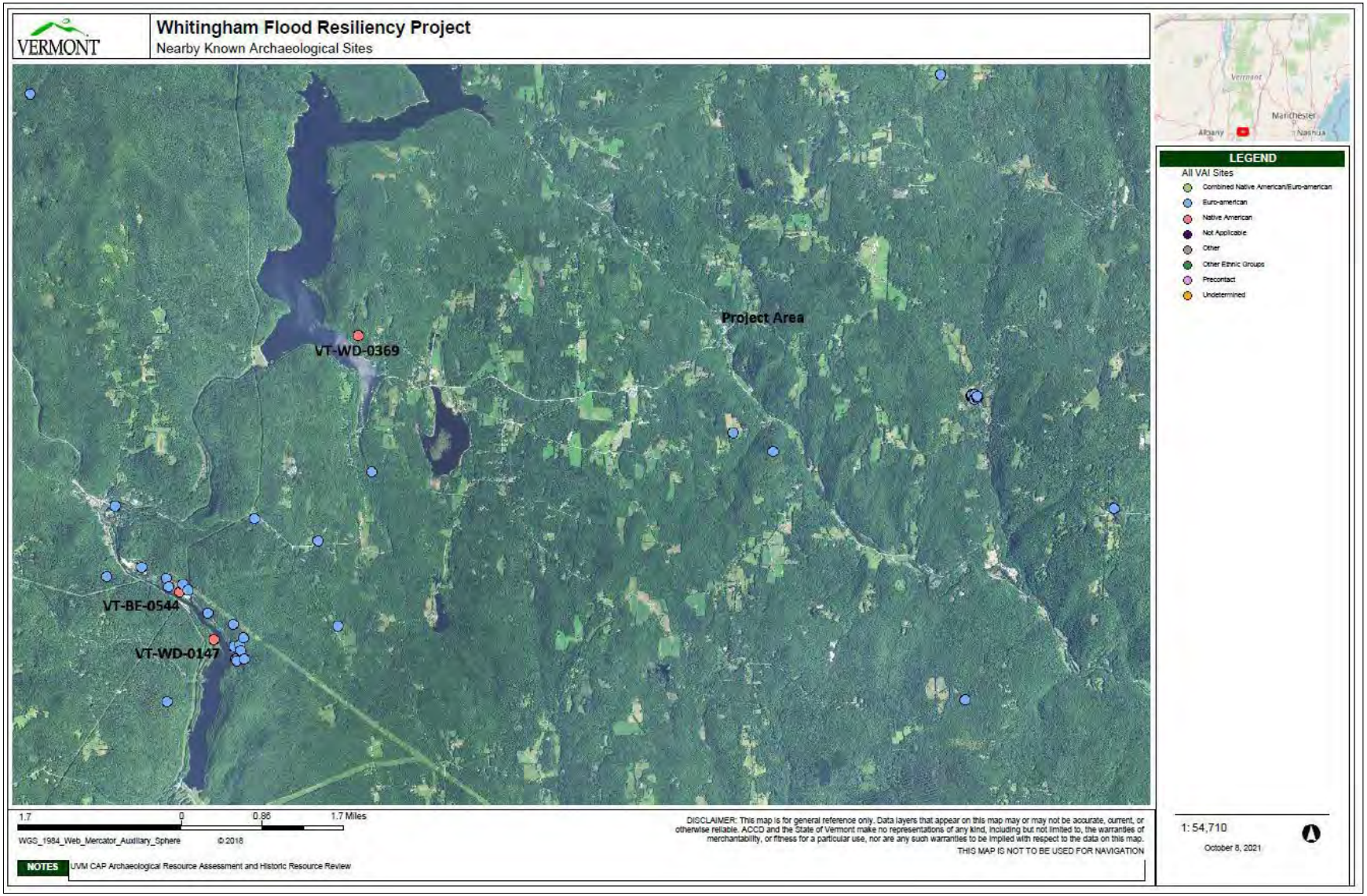


Figure 16. Map showing the location of known historic (blue) and pre-Contact era Native American (red) archaeological sites near the Whitingham STP MM20(3) Flood Resiliency Project.

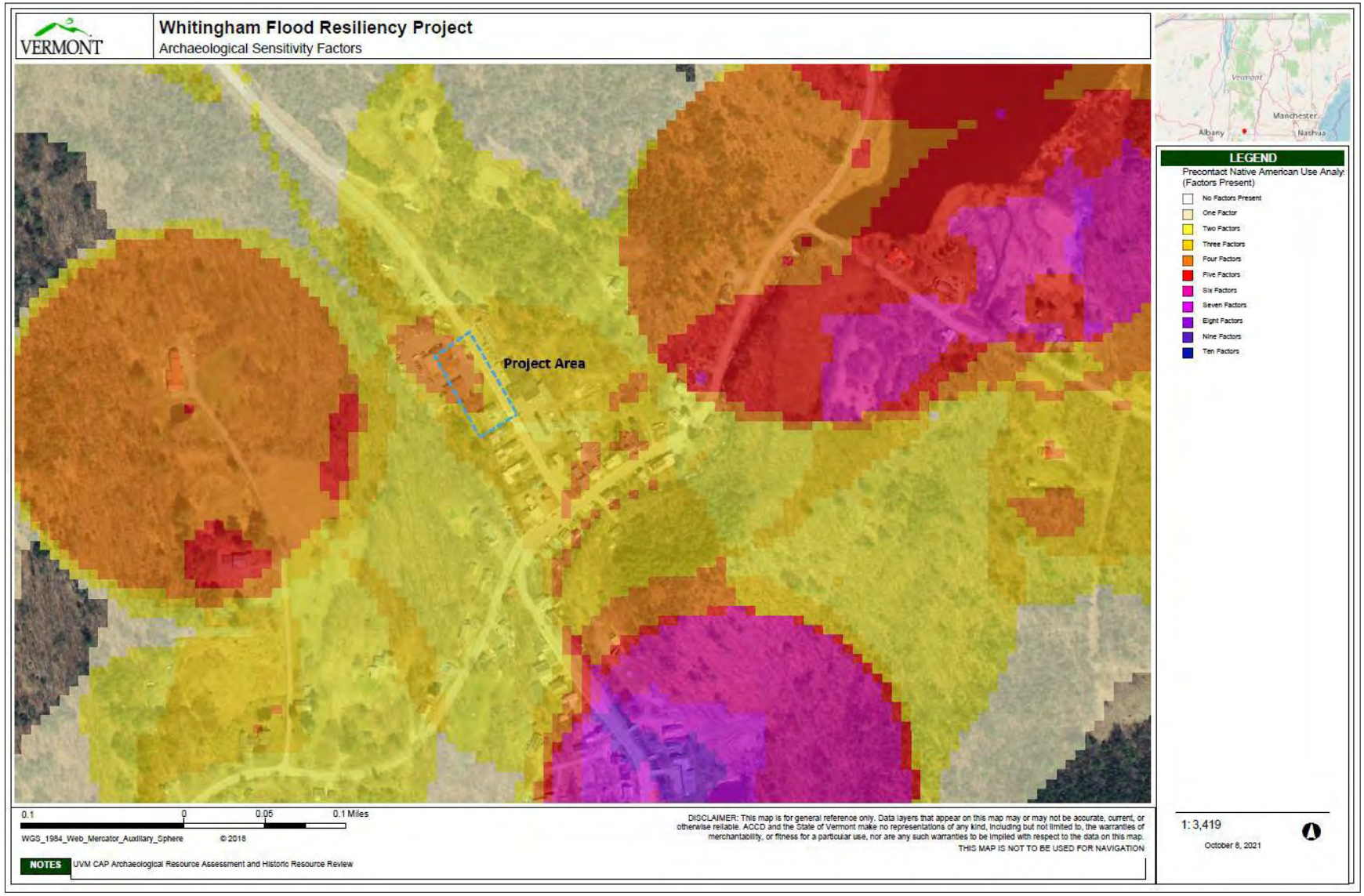


Figure 17. GIS based Archeological Sensitivity Map for the Whitingham STP MM20(3) Flood Resiliency Project, Whitingham, Vermont (VACCD ORC).

## HISTORIC EUROAMERICAN ARCHAEOLOGICAL RESOURCES

A review of the VAI indicates that no historic era Euroamerican sites have been designated within the project area (see Figure 16). The closest mapped historic site in the VAI is VT-WD-0356, unidentified mill remains, which are located approximately 1.77 km (1.0 miles) south of the project area on Holbrook Road. A second mill site, VT-WD-0155 lies approximately 710 m (0.44 miles) southwest of VT-WD-0356.

Historic maps indicate that no buildings were constructed within the project area until after 1856 (see Figures 8 – 10). The building that appears within the project area by 1869 is the existing house at 2984 VT Route 100 (see Figure 11). A structure that once existed immediately north of 2984 VT Route 100, is no longer extant (see Figure 11). As noted previously, this structure was standing in 1962 (see Figure 14) and appears to have been extant in 1993, but does not appear to exist by 2003 (Google Earth).

## FIELD INSPECTION

A field inspection of the project area was conducted by Catherine A. Quinn, Historic Preservation Specialist at the UVM CAP, on August 27, 2021. The general project area is primarily built upon with VT Route 100, a concrete sidewalk, the Municipal Center and surrounding paved parking areas, the concrete bridge, the metal culvert, and the house and its attached structures (Figures 18 – 23). Riverbanks within the project area are lined/reinforced with concrete and stone (Figures 24 and 25).

### *Archaeological Site Potential*

*Pre-Contact Native American*

Hand cores taken in the grassed areas in front of the firehouse and north of the house at 2984 VT Route 100, where widening of the stream channel is proposed, indicate extensive fill and disturbed contexts from flood damage, stream management, buildings (including a structure once located on the lot north of the house), utility and parking lot/driveway construction. The portion of the project area where bridge and culvert replacement are proposed are also extensively disturbed by the construction of the current structures, sidewalk, roads and driveways, and the lining/relining of the river banks with rock and concrete walls. The house lot appears to be built up with fill or moved sediment. The APE was therefore not identified as sensitive for significant pre-Contact Native American sites.

*Historic Euroamerican*

No buildings or other structures appear to have existed within the project area until c. 1860 when the house at 2984 VT Route 100 was constructed. Given the lack of early development of this area, along with the various ground disturbances noted above, it is unlikely

that subsurface testing would uncover any significant intact historic period archaeological resources within the proposed project's APE.

Figure 18. View northwest of the project area showing structures and paving in front of the Municipal Center.

Figure 19. View southwest of the project area showing fill, utility pole and paving in front of the Fire House.

Figure 20. View southwest of the project area showing area of fill to the north of house at 2984 VT Route 100.

Figure 21. Close-up view southwest of fill to the north of house at 2984 VT Route 100.

Figure 22. View southwest of the project area showing well location to the north of house at 2984 VT Route 100.

Figure 23. View west of the project area showing area of probable fill/land disturbance to the east of house at 2984 VT Route 100.

Figure 24. View northeast of riverbanks within the project area; fire station is to left and house at 2984 VT Route 100 is to right.

Figure 25. View southeast of concrete riverbank wall along VT Route 100 within the project area, between the concrete bridge and culver.

*Concrete Bridge*

Constructed in 1926, the structure that crosses the East Branch of North River in front of the Municipal Center, appears to be a box culvert type concrete bridge (Figures 26 – 31; see Figure 2). The bridge crosses the river in an east-west direction. It has solid rails with centered, recessed panels on both sides, topped by a capstone, that run between two pillars with capstones. All capstones have raised centers. The height of the rail, including the capstone, is 3 ft 1 in, while the total height of the pillars, including capstones, is 3 ft 3 in, with the pillars rising 2 in above the rail. Rails are 7 ft long and the pillars measure 2 ft 1 in, for a total length of 11 ft 2 in; total length with the capstones is 11 ft 5 in. Pillars are rectangular, with their north-south length measuring 1 ft 5 in. Railings, not including the capstones, are 9 in thick. The northeast pillar has a panel with "1926" engraved on its south side. Concrete used has a rough aggregate; it was not determined if the concrete is plain or reinforced. Board form marks are evident on the substructure and the pillars. The western pillars have 1 ½ in diameter holes through them, one under the capstone and one near the base; the purpose of the holes is unknown. There are recent concrete repairs / reinforcement to the substructure. Roadway width between the pillars measures 15 ft 6 in and the traveling surface consists of asphalt over concrete. Flower boxes with
"Welcome to Jacksonville" painted on their stream sides, are bolted to each rail.

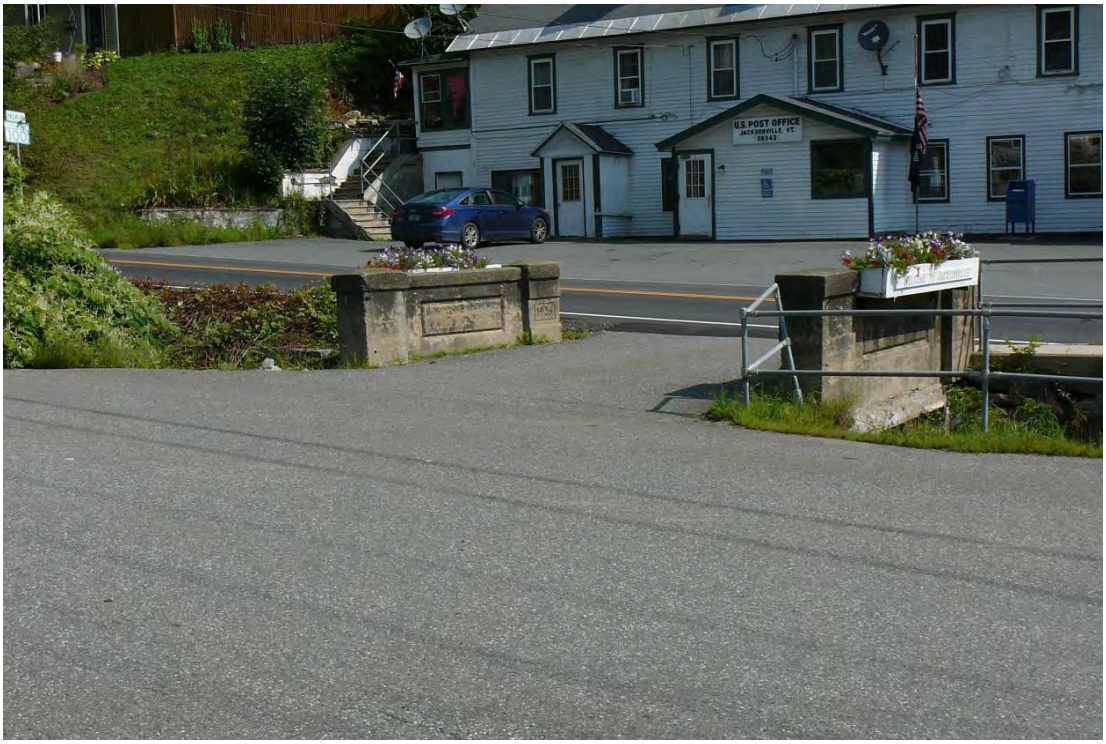


Figure 26. View northeast of concrete bridge.

Figure 27. View northeast of concrete bridge.

Figure 28. View northeast of upstream rail of concrete bridge.

Figure 29. View northeast of upstream rail of concrete bridge.


Figure 30. View northwest of downstream rail of concrete bridge.

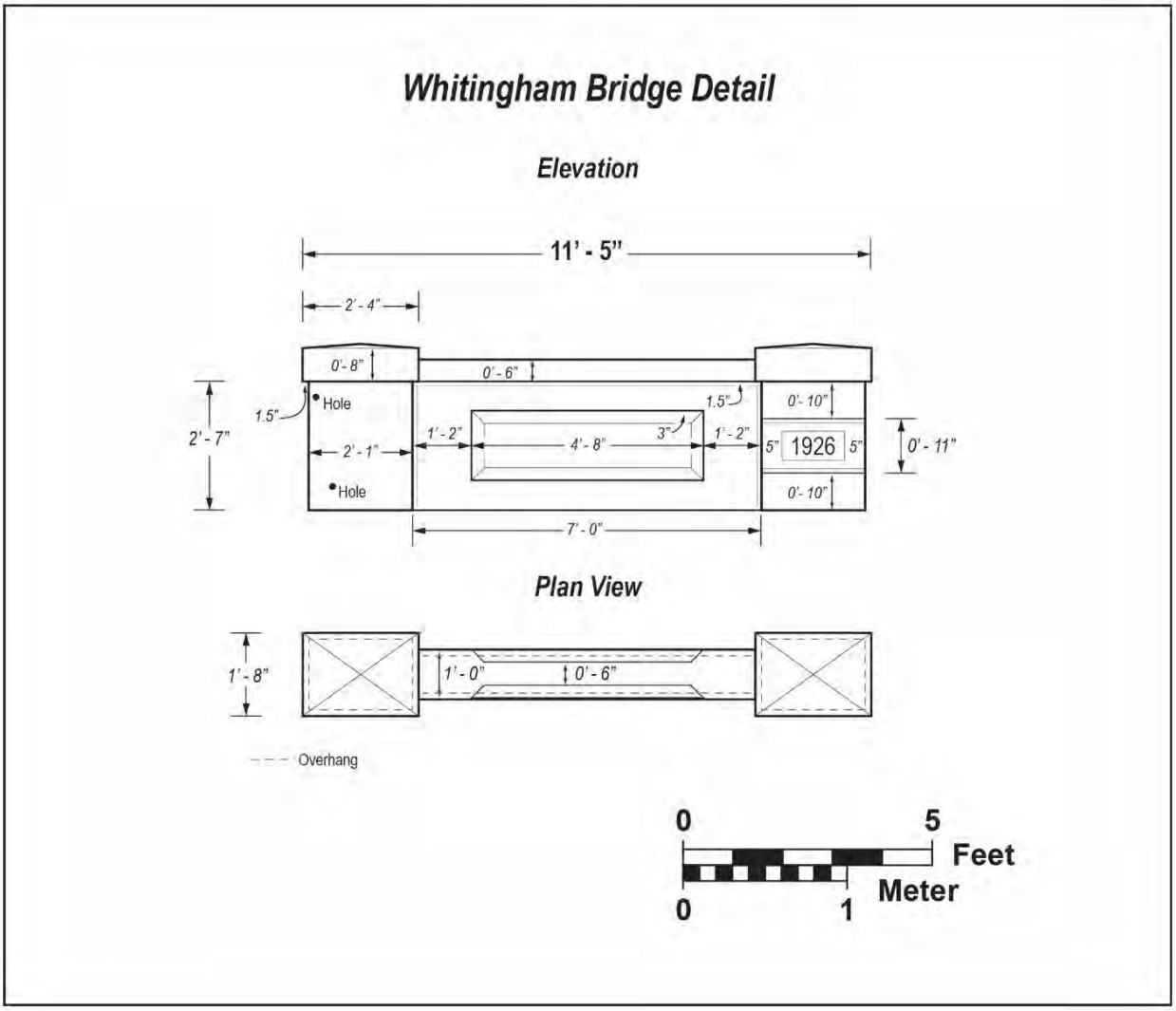


Figure 31. Rail detail of "Welcome to Jacksonville Bridge" built 1926.

*Corrugated Metal Pipe Culvert*

A structure under the southern entrance to the Municipal Center consists of an 8.5 ft wide squash Corrugated Metal Pipe (CMP) type culvert (Fitzgerald Environmental Associates 2017, Table 5.4) (Figures 32 and 33; see Figure 2). The CMP carries the East Branch of North River under the roadway, south of the concrete bridge. It is surrounded by rock and fill, and the road surface above it is paved.

Figure 32. View southeast of inlet/upstream end of culvert.

Figure 33. View northeast of outlet/downstream end of culvert.

*Municipal Center*

Constructed in 1927 as a high school and renovated to town offices in 1960 – 1961, the Municipal Center at 2948 VT Route 100 is a single story, rectangular building with steeply sloped hipped roof, concrete foundation, and rear wing addition (Figure 34). The primary entrance is on the east side of the building and a small porch with four columns covers the entry door. Concrete and wooden steps lead up to the porch. There are various other entrances around the building. Shed dormers are in place on the east, west and north roof slopes. It is clad in vinyl or aluminum siding and has asphalt shingle roofing. Windows on the building have been significantly altered since its use as a school (see Figure 13).

Figure 34. View northwest of the Municipal Center.

*Firehouse*

Constructed c. 1974, the firehouse at 2964 VT Route 100 is a rectangular, concrete building with an irregular sloped gable roof with asphalt shingles (Figure 35). The gable end faces VT Route 100. It has brick facing on its front (east) side, two overhead doors for firetrucks, and an entrance door. Windows are in place on the south and north sides of the building.

Figure 35. View southwest of the firehouse.

*House, 2984 VT Route 100*

Constructed c. 1860, 2984 VT Route 100 is a 1 ½ story gable front house with an attached single story wing on its west (rear) side, which then attaches to a perpendicular running barn (Figures 36 – 38). The building is situated on the west side of VT Route 100, on the east bank of the East Branch of the North River, with the ell and barn extending over the river and resting on the west bank. The structures rest on a concrete or concrete-faced foundation, with some portions of the foundation having a stone veneer. Roofs on the main block and barn are metal, while the ell has a slate roof. The house and easternmost portion of the ell, area clad in wide aluminum siding and the portion of the ell that extends over the river has clapboard siding. The barn has wood siding with vertical batten strips. An overhead garage door has been added to the east elevation of the barn, and it also has an entry door. Windows on the house are 1/1 double hung sash. The ell has awning and 1/1 windows. A small gable roof structure appears to provide entry to the basement on the north side of the house. The main entrance door at the southeast corner of the house is flanked by multi-pane sidelights. A small Queen Anne style porch with a turned post and spindle work board protect the entryway. The northern half of the porch area has been enclosed since the early 1900s (see Figure 11 and 12).

Figure 36. View northwest of the house at 2984 VT Route 100.

Figure 37. View southwest of the house at 2984 VT Route 100.


Figure 38. View northwest of the porch on the house at 2984 VT Route 100.

Figure 39. View southeast of the rear (west) side of the house at 2984 VT Route 100. (Fitzgerald Environmental Associates n.d.:9).

# CONCLUSIONS AND RECOMMENDATIONS

The Town of Whitingham, with assistance from MSK Engineering & Design, proposes the Whitingham STP MM20(3) Flood Resiliency Project, located in Whitingham, Windham County, Vermont, to reduce the potential for flood damage within the Village of Jacksonville. To assist with their Section 106 permit review process, a combined Archaeological Resources Assessment (ARA) and Historic Resource Review (HRR) was undertaken by the University of Vermont Consulting Archaeology Program (UVM CAP). The purpose of the review is to identify portions of a project's Area of Potential Effect (APE) that have the potential for containing pre-Contact era Native American and/or historic era archaeological sites and to identify and assess any standing historic resources on or eligible for listing on the National and/or State Register of Historic Places that have the potential to be directly or indirectly affected by project work.

## Archaeological Resources

As a result of the ARA, the proposed project area has a relatively low base sensitivity for pre-Contact Native American sites and given the range of documented ground disturbance from repeated flood damage, stream management, and building, utility, sidewalk, and parking lot/driveway construction, this review recommends that the APE is unlikely to contain significant pre-Contact Native American archaeological sites. Based on the lack of early building construction in the APE, along with the various ground disturbances noted, it is also unlikely that subsurface testing would uncover any significant intact historic period archaeological resources. Therefore, this review recommends that the proposed project will have No Effect on significant archaeological resources and no further archaeological investigation is recommend for pre-Contact Native American or historic resources within the currently proposed phase of the Whitingham STP MM20(3) Flood Resiliency Project APE.

## Standing Historic Structures

Two standing structures within the currently proposed phase of the Whitingham STP MM20(3) Flood Resiliency Project APE are recommended as eligible for listing on the National Register of Historic Places.

### *1926 Concrete Box Culvert Bridge*

This HRR recommends that the 1926 concrete box culvert bridge located over the East Branch of the North River in front of the Municipal Center meets the eligibility requirements and significance outlined for concrete bridges in the *National Register of Historic Places Multiple Property Documentation Form: Metal Truss, Masonry, and Concrete Bridges in Vermont*, (MPDF) (USDI NPS 1990). The bridge is a functioning structure built before 1940, with its original core and design features intact, and it retains integrity of location and setting. It is historically significant under National Register Criterion A for its contribution to the broad patterns of transportation history, and architecturally significant under Criterion C for embodying the types, forms, and methods of engineering and constructions as associated with bridge building in

Vermont. This review therefore recommends that the proposed removal of the bridge would result in an Adverse Effect on historic resources. If the removal of the bridge cannot be

avoided as part of project work, the completion of a VDHP Historic Resources Documentation Package (HRDP) is recommended prior to project work (Appendix II).

*c. 1860 House, 2984 VT Route 100*

This HRR also recommends that the c. 1860 house at 2984 VT Route 100 is eligible for inclusion on the National and State Register of Historic Places as part of a proposed Jacksonville Village Historic District. Based on a preliminary review of Jacksonville's history, historic maps, a drive through of the village during the field visit of the project area, and online Google Earth street views, the proposed district would include properties along VT Route 100, VT 112, and Gates Pond Road (Appendix III). The proposed boundaries are based on the development of the village from the first decades of the nineteenth century and into the early decades of the twentieth century, along with the integrity of the resources within the proposed boundaries. Four buildings within the proposed district are currently listed on the State Register of Historic Places, including a church (1321-1) and Masonic Hall (1321-2) along VT 112, and a store (1321-3) and house (1321-4) on VT Route 100 (VDHP 1971a,b,c,d). Many of the buildings within the proposed district boundaries retain defining period historic characteristics, with contributing resources representing the Federal, Greek Revival, Queen Anne and Colonial Revival styles. This review therefore recommends that the proposed removal of the house at 2984 VT Route 100 would result in an Adverse Effect on historic resources. If the removal of the house cannot be avoided as part of project work, the completion of a VDHP HRDP is recommended prior to project work (Appendix II).

The Vermont Division for Historic Preservation (VDHP)/Vermont State Historic Preservation Office (SHPO) will have the opportunity to review and comment on all archaeological and standing historic resource recommendations prior to project work.

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APPENDIX I: VDHP ENVIRONMENTAL PREDICTIVE MODEL FOR LOCATING PRE-CONTACT ARCHAEOLOGICAL SITES

**VERMONT DIVISION FOR HISTORIC PRESERVATION**

## Environmental Predictive Model for Locating Pre-contact Archaeological Sites

**Project Name** WhitinghamFlood Resiliency **County** Windham **Town** Whitingham
**DHP No.** **Map No.** **Staff Init.** **Date**

**Additional Information**

| Environmental Variable | Proximity | Value | Assigned Score |
|---|---|---|---|
| **A. RIVERS and STREAMS (EXISTING or RELICT):** | | | |
| 1) Distance to River or Permanent Stream (measured from top of bank) | 0- 90 m<br>90- 180 m | 12<br>6 | 12 |
| 2) Distance to Intermittent Stream | 0- 90 m<br>90-180 m | 8<br>4 | |
| 3) Confluence of River/River or River/Stream | 0-90 m<br>90 –180 m | 12<br>6 | 6 |
| 4) Confluence of Intermittent Streams | 0 – 90 m<br>90 – 180 m | 8<br>4 | |
| 5) Falls or Rapids | 0 – 90 m<br>90 – 180 m | 8<br>4 | |
| 6) Head of Draw | 0 – 90 m<br>90 – 180 m | 8<br>4 | |
| 7) Major Floodplain/Alluvial Terrace | | 32 | |
| 8) Knoll or swamp island | | 32 | |
| 9) Stable Riverine Island | | 32 | |
| **B. LAKES and PONDS (EXISTING or RELICT):** | | | |
| 10) Distance to Pond or Lake | 0- 90 m<br>90 -180 m | 12<br>6 | |
| 11) Confluence of River or Stream | 0-90 m<br>90 –180 m | 12<br>6 | |
| 12) Lake Cove/Peninsula/Head of Bay | | 12 | |
| **C. WETLANDS:** | | | |
| 13) Distance to Wetland (wetland > one acre in size) | 0- 90 m<br>90 -180 m | 12<br>6 | |
| 14) Knoll or swamp island | | 32 | |
| **D. VALLEY EDGE and GLACIAL LAND FORMS:** | | | |
| 15) High elevated landform such as Knoll Top/Ridge Crest/ Promontory | | 12 | |
| 16) Valley edge features such as Kame/Outwash Terrace** | | 12 | |

| | | | |
|---|---|---|---|
| 17) Marine/Lake Delta Complex** | | 12 | |
| 18) Champlain Sea or Glacial Lake Shore Line** | | 32 | |
| **E. OTHER ENVIRONMENTAL FACTORS:** | | | |
| 19) Caves /Rockshelters | | 32 | |
| 20) ☑ Natural Travel Corridor<br>☐ Sole or important access to another drainage<br>☐ Drainage divide | | 12 | 12 |
| 21) Existing or Relict Spring | 0 – 90 m<br>90 – 180 m | 8<br>4 | |
| 22) Potential or Apparent Prehistoric Quarry for stone procurement | 0 – 180 m | 32 | |
| 23) ) Special Environmental or Natural Area, such as Milton acquifer, mountain top, etc. (these may be historic or prehistoric sacred or traditional site locations and prehistoric site types as well) | | 32 | |
| **F. OTHER HIGH SENSITIVITY FACTORS:** | | | |
| 24) High Likelihood of Burials | | 32 | |
| 25) High Recorded Site Density | | 32 | |
| 26) High likelihood of containing significant site based on recorded or archival data or oral tradition | | 32 | |
| **G. NEGATIVE FACTORS:** | | | |
| 27) Excessive Slope (>15%) or Steep Erosional Slope (>20) | | - 32 | |
| 28) Previously disturbed land as evaluated by a qualified archeological professional or engineer based on coring, earlier as-built plans, or obvious surface evidence (such as a gravel pit) | | - 32 | -32 |
| **** refer to 1970 Surficial Geological Map of Vermont** | | | |
| | | **Total Score:** | -2 |
| **Other Comments :** | | | |
| **0- 31 = Archeologically Non- Sensitive**<br>**32+ = Archeologically Sensitive** | | | |

APPENDIX II: VDHP HISTORIC RESOURCE DOCUMENTATION PACKAGE

**Photographic Documentation Requirements for Historic Resources**

**What is a Historic Resource Documentation Package?**
Despite our best efforts, sometimes a historic resource cannot be saved. The following guidelines identify the process by which a historic resource should be documented prior to demolition or removal. Preparation of a Historic Resource Documentation Package (HRDP) is one method of collecting important information about a historic resource and serves as a final record after the resource itself is gone. The HRDP must fully convey, in both text and photographs, the significant features, context and history of the historic resource. All materials must be prepared and submitted digitally. Printed materials will not be accepted.

The federal Historic American Building Survey (HABS), Historic American Engineering Record (HAER), and Historic American Landscape Survey (HALS) programs offer excellent guidance on documenting historic buildings, structures and sites, respectively. There are instances, however, when the level of detail and cost required to meet HABS/HAER/HALS guidelines is not feasible. The Division for Historic Preservation (the "Division") has developed the HRDP requirements as a cost-effective alternative for projects in Vermont that may need documentation under local, state or federal regulations.

Each HRDP submitted to the Division must meet the guidelines described below. Incomplete packages will be returned for revision and re-submittal. The Division must be allowed up to thirty (30) days to review the HRDP, and demolition or removal cannot begin until the Division has formally accepted the HRDP. In order to avoid unnecessary delays, please include adequate time in your project planning to allow for the Division's review and approval of the HRDP.

Unless otherwise approved by the Division, the HRDP should be prepared by an architectural historian with substantial experience in photographing and researching historic resources. The history and significance of the resource should be studied prior to photographing the resource in order to fully understand its significance and unique features.

For additional guidance on photographic documentation standards, please see:

- National Register Bulletin #23: How to Improve the Quality of Photographs for National Register Nominations
- HABS/HAER/HALS Photography Guidelines
- National Register Photo Policy Factsheet (Updated 5/15/2013)

**Preparing a Historic Resource Documentation Package**
A HRDP contains three primary components, each of which is described in detail below:

- Written Documentation
- Location Maps, Site Plans and Architectural Plans (if available)
- Photographic Documentation

Written Documentation

- **Cover Page:** stating the project name, location, date, project sponsor, property owner and author
- **Project Summary:** one to three paragraphs describing the history of the project and the process by which demolition of the building was determined to be acceptable
- **Physical Description:** one to three paragraphs describing the physical features, design and construction of the resource
- **Statement of Significance:** one to three paragraphs describing the historic significance of the resource within a local, state and/or national context
- **Photograph Index:** a numbered index to the sketch map and photographs

Location Maps, Site Plans and Architectural Plans

- **Location Map**: A map with the location of the property clearly indicated
- **Sketch Plan**: a site plan of the property showing all structures and significant landscape features (keyed by number to photographs and the Photograph Index)
- **Architectural Plans**: Include floor plans, elevations or other documentation of the resource if these materials are available. These can be historic and/or contemporary documents.

Photographic Documentation

Types of Images:

- Present day views of the historic resource and surrounding area
- Digital scans of historic photographs, drawings, and/or paintings (if available).

**Coverage**

Photographs should be taken of the overall property and the exterior and interior (if historically important) of each resource on the property, including old and new outbuildings. The number of interior and detail views will depend on the significance of those aspects of the resource(s).

The following photographs should be taken to document the property:

**Setting**

- Views of the overall setting of the historic resource(s), e.g. fields and forest surrounding a farm complex, a streetscape of buildings in a village, etc.
- Views of the historic resource in its immediate surroundings, showing the relationship of the resource to neighboring resources
- Aerial views when available (an adjacent hill or tall building may provide an aerial vantage point, or a Google Earth view)
- Views of significant landscape features, e.g. tree-lined approaches, stone walls, formal gardens, etc.

**Exterior Views**

- Full views of each side of the historic resource
- Views of important details, e.g. cupolas, steeples, porches, doors, decorative brickwork etc.

**Interior Views**

- Overall views of important interior rooms, e.g. courtrooms, formal parlors, historic kitchens, etc.
- Views of important interior features, e.g. staircases, fireplaces, ceiling medallions, exposed structural framing, etc.
- Views of significant interior details, e.g. door hardware, light fixtures, industrial machinery, hand-grained trim, etc.
- Views of people using the building.

**Photographic Formats**

All photographs must be prepared in accordance with the following guidelines, which are based on the National Register Photo Policy Fact Sheet (Updated 5/15/2013).

Digital Camera

- Digital single lens reflex (DSLR) camera with a non-distorting lens
- Filters that reduce glare and sharpen contrast are encouraged
- Camera phones are not acceptable

Taking the Picture

- Set the camera for its highest image quality
- TIFF or RAW formats are best; JPEGs may be converted to TIFFs by a computer conversion process

Digital Image Requirement

- Save as .TIFF files in RGB color format
- Minimum pixel depth or dimension of 3000 x 2000
- Minimum 300 dpi
- Do not insert text into the images. Name each image file as follows:
  - ResourceName_001, _002, _003, etc.
  - The number of each image must correspond to the photo index and sketch map

**Submitting the HRDP**

- Save the Written Documentation as a PDF
- Save the location map(s), sketch maps(s), and architectural plans as a PDF
- Save each digital image as an individual .TIFF file. Do not insert images into a PDF or Word document.
- Burn all of the above materials onto a CD or DVD, and label the CD or DVD as "Historic Resource Documentation Package" with the name of the resource and project. Mail or deliver the CD or DVD to the Division at the following address:

  Vermont Division for Historic Preservation
  One National Life Drive
  Davis Building, Floor 6
  Montpelier, VT 05620

One complete Historic Resource Documentation Package should be provided to the Division. Upon review and approval, the Division will upload the materials to the Online Resource Center for public access.

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# APPENDIX III: PROPOSED JACKSONVILLE VILLAGE HISTORIC DISTRICT, MAP AND GOOGLE EARTH IMAGES


Map of the approximate boundaries of the proposed Jacksonville Village Historic District.

VT 112, view northwest

VT 112, view northwest


VT 112, view northeast

VT 112, view northwest

VT 112, view southwest

VT Route 100, view north


VT Route 100, view northeast

VT Route 100, view south

Gates Pond Road, view north

Gates Pond Road, view northeast

Gates Pond Road, view west

Gates Pond Road, view north

VT Route 100, view northwest

VT Route 100, view northwest


VT Route 100, view southeast

VT Route 100, view southwest

# APPENDIX 2:
## Work Zone Traffic Control Alternative