

CIRC Alternatives Task Force



US RT 2 Taft Corners to Williston
Village Multimodal
Scoping Study, October 30, 2013



Develop alternatives for bike, pedestrian and transit improvements along U.S. Route 2 from Williston Village to Taft's Corner. The study area extended along US RT 2 from North Williston Road to VT Route 2A.

Examine the feasibility and approximate costs of developing bicycle, pedestrian and transit improvements in order to enhance the safety and mobility of travelers using these modes through and along this corridor.

- Incomplete sidewalks
- Insufficient road shoulder widths
- High vehicular speeds
- Abutting residential neighborhoods
- Unsafe conditions for bus stops
- Multimodal needs in this corridor are identified in Town Plan



Segment A: North Alternative



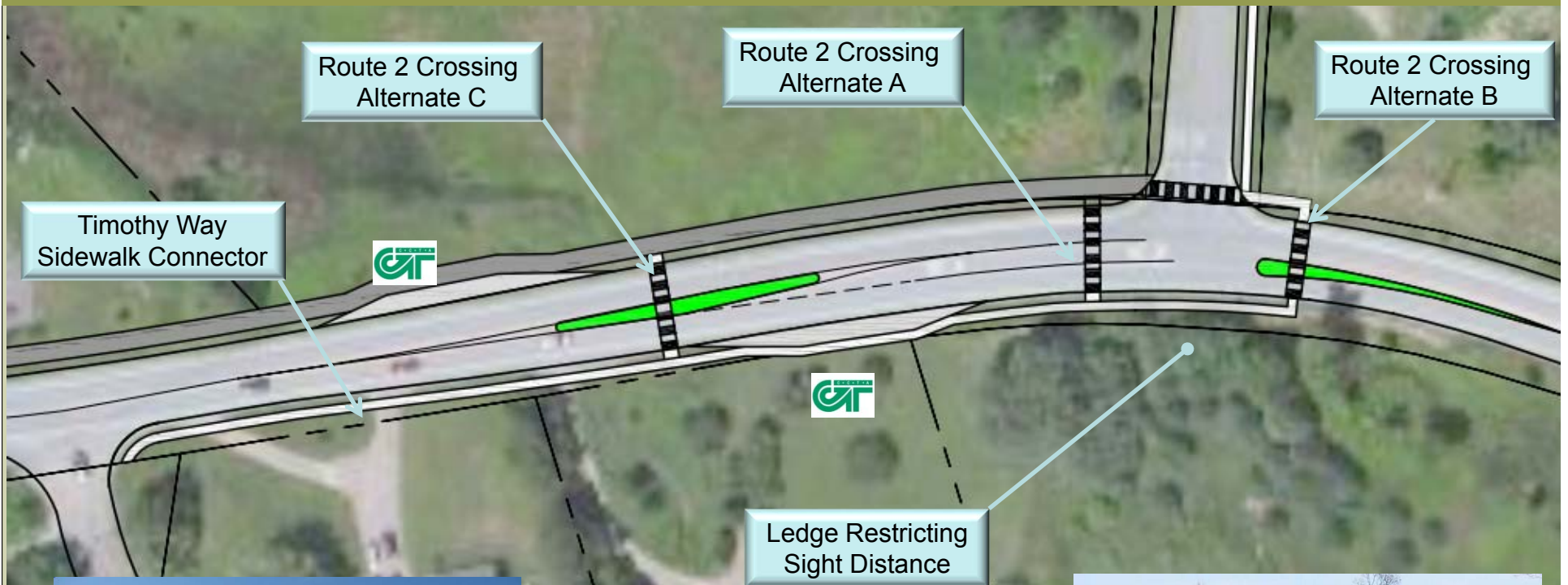
Segment B: North Alternative



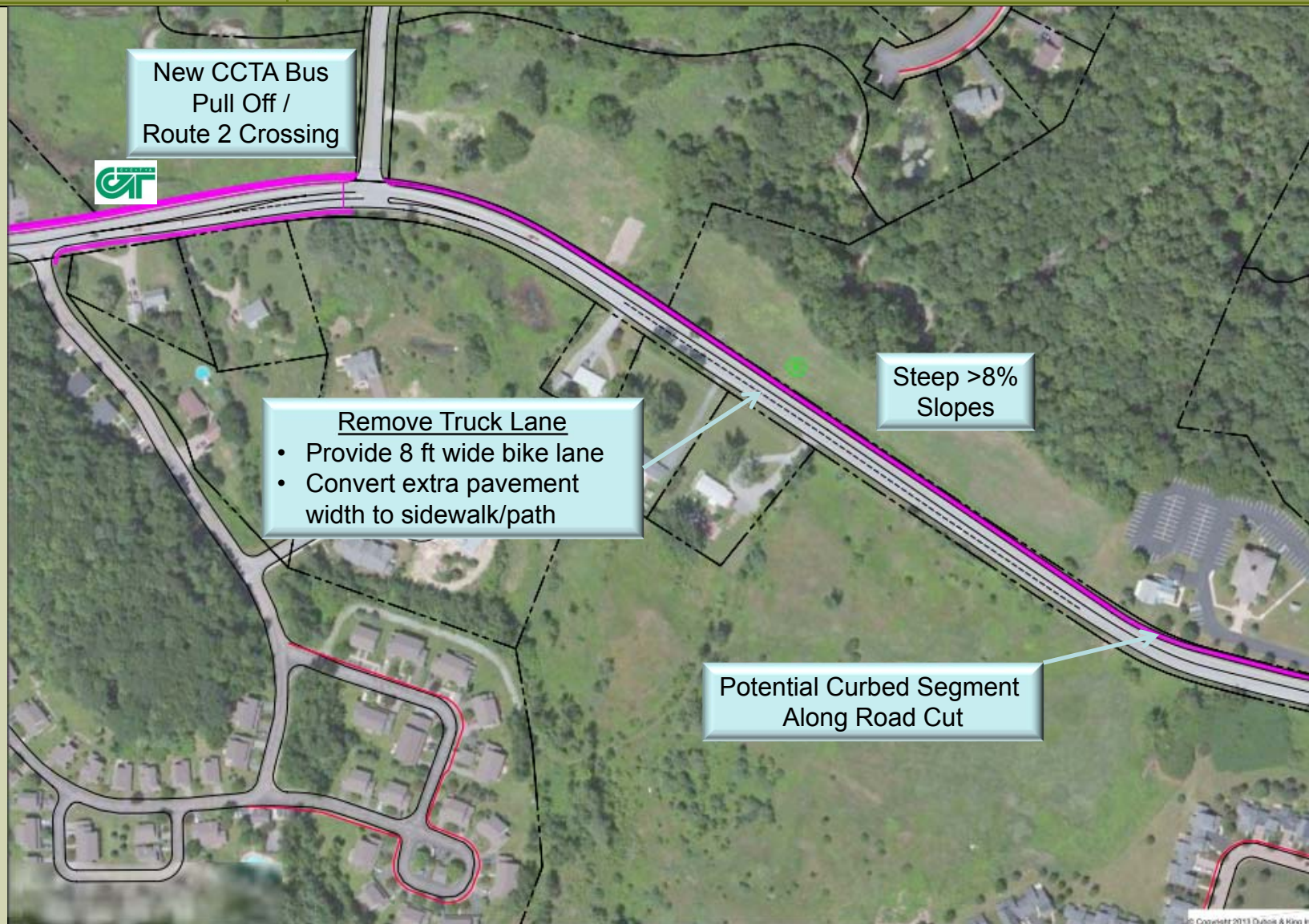
Segment B: North Alternative



Segment B: South Ridge Intersection



Segment B: North Alternative (Hill)



Segment C: Rehabilitation Alternative



Segment C: Rehabilitation Alternative



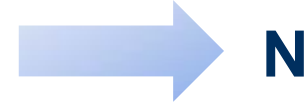


Probable Construction

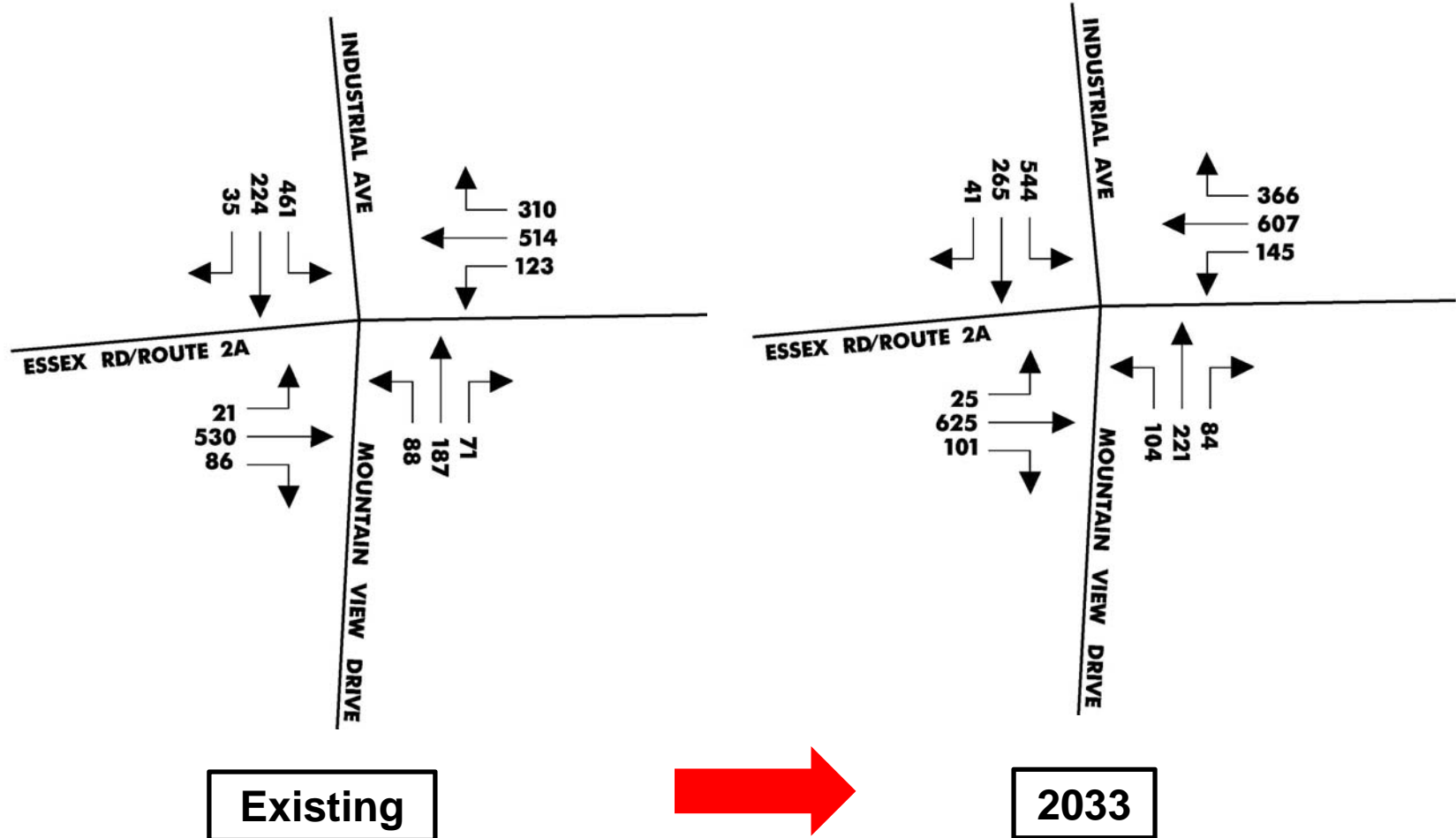


| U.S. Route 2 Segment | Description | Construction Cost | Design Cost | Inspection Cost | Total Probable Cost | Probable Cost Per Foot |
|----------------------|--|--------------------|------------------|------------------|---------------------|------------------------|
| | | | | | | |
| SEGMENT A –B (South) | SHARED PATH TO SOUTHRIDGE | \$1,001,000 | \$150,150 | \$100,100 | \$1,251,250 | \$251 |
| SEGMENT A-B (North) | SHARED PATH TO SOUTHRIDGE | \$1,120,000 | \$168,000 | \$112,000 | \$1,400,000 | \$238 |
| | RRFD Pedestrian Signal | + \$25,000 | | | | |
| | HAWK Pedestrian Signal | + \$175,000 | | | | |
| | | | | | | |
| SEGMENT B (HILL) | PCC SIDEWALK / WIDENED BIKE LANES | \$328,000 | \$49,200 | \$32,800 | \$410,000 | \$214 |
| SEGMENT B (HILL) | SHARED PATH | \$354,000 | \$53,100 | \$35,400 | \$442,500 | \$231 |
| | | | | | | |
| SEGMENT C | REMOVE & REHABILITATE EXISTING PCC SIDEWALKS | \$722,000 | \$108,300 | \$72,200 | \$902,500 | \$141 |
| | | | | | | |
| | RECOMMENDED ALTERNATIVE TOTAL | \$2,195,000 | \$340,500 | \$232,000 | \$2,767,500 | |

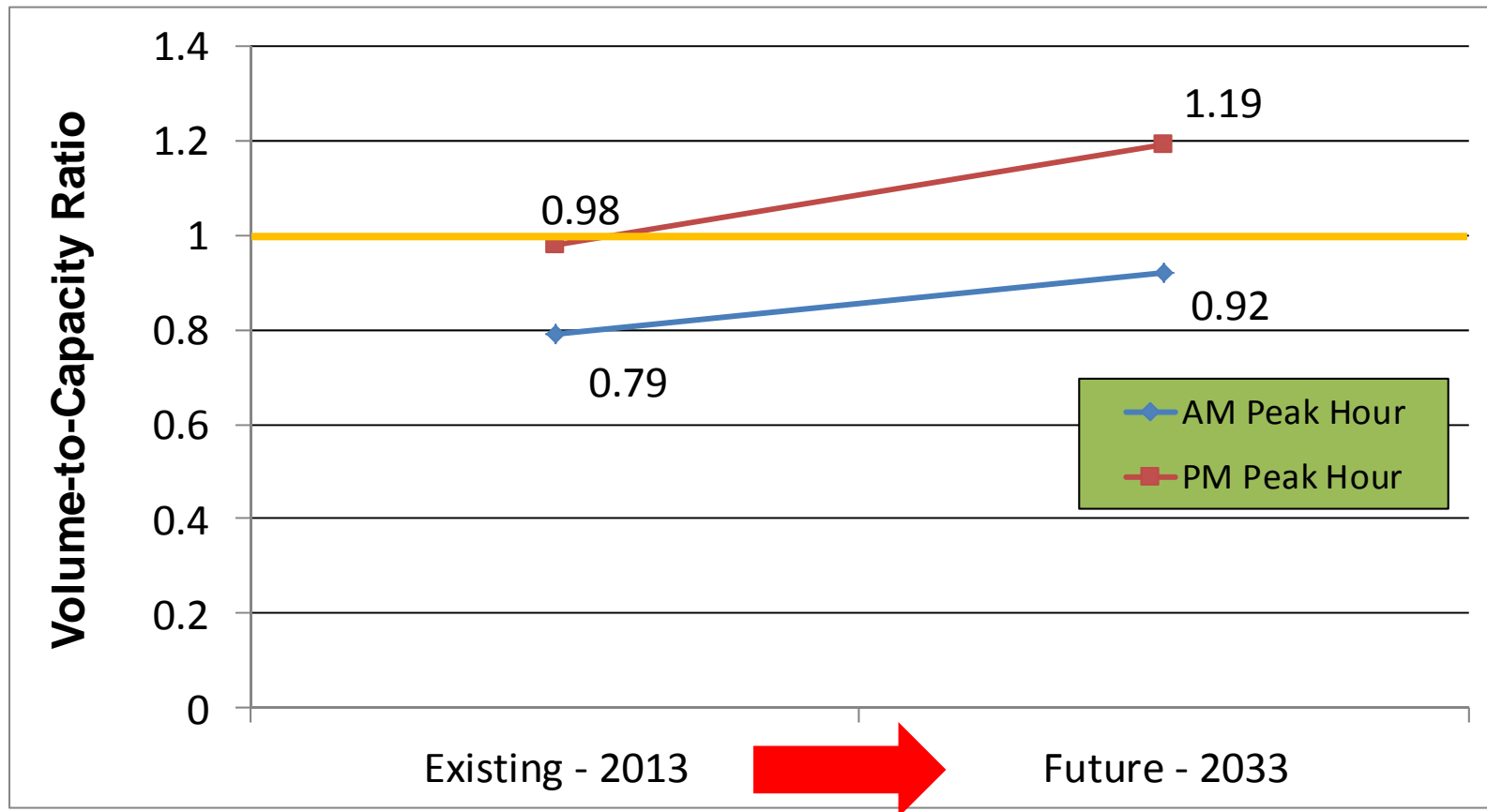
VT 2A Scoping Study - Industrial Avenue/ Mountain View Road to River Cove Road Williston, Vermont



Traffic Volume Projections



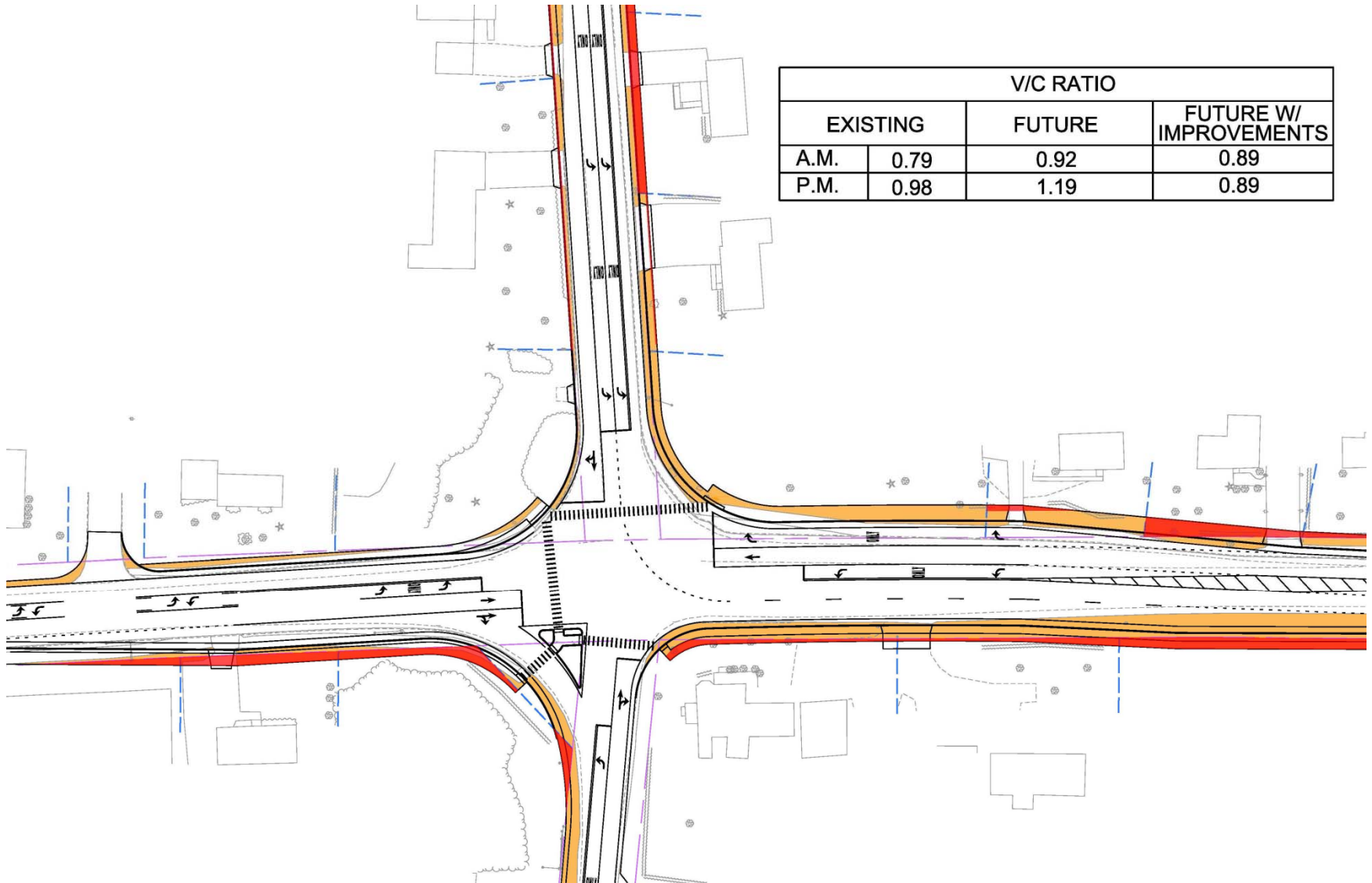
Traffic Operations Forecast



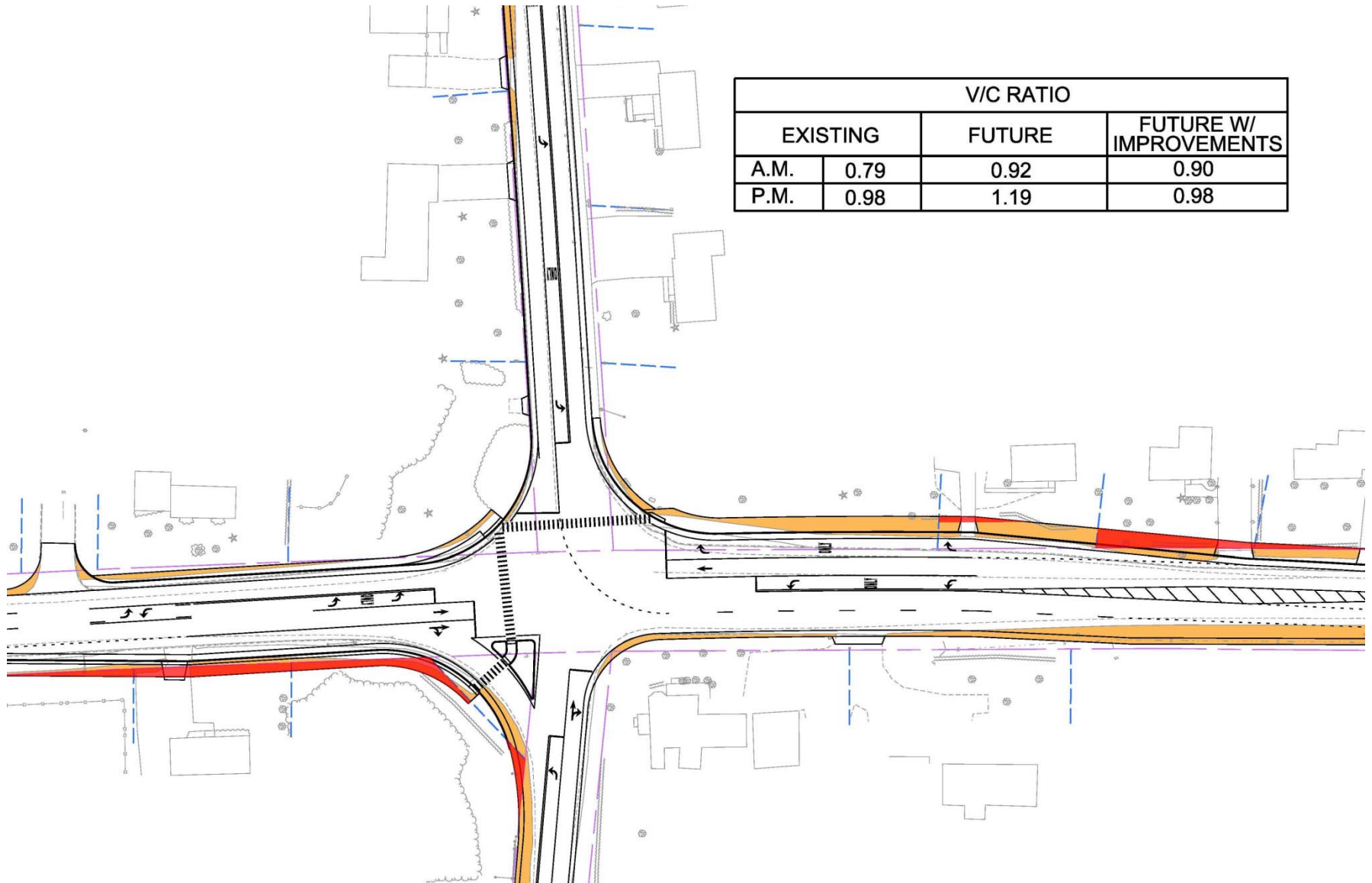
Existing Conditions



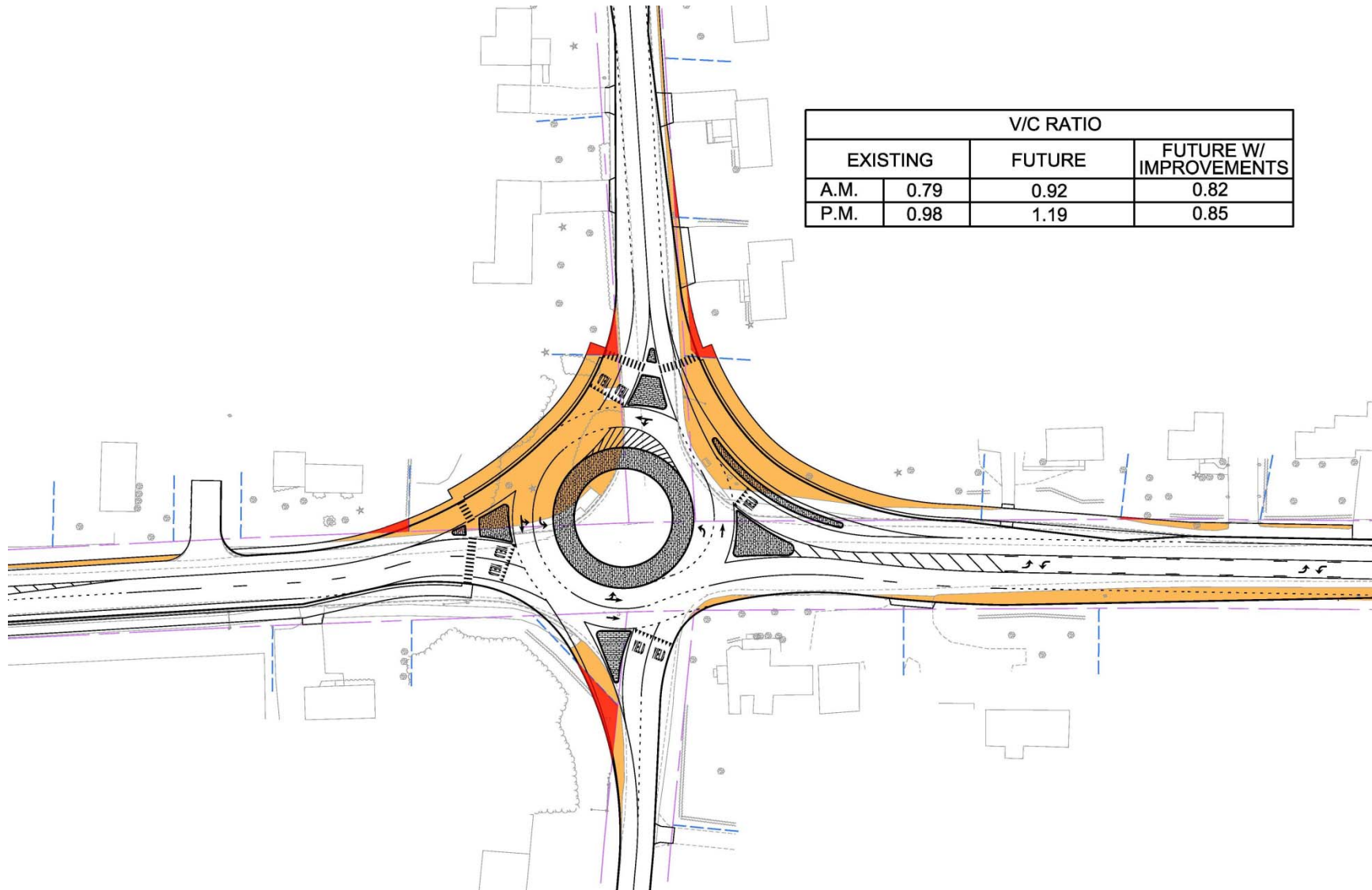
Option 3: All Lane Additions



Option 5: Some Lane Additions



Option 7: Dual Lane Roundabout



| V/C RATIO | | | |
|-----------|------|--------|---------------------------|
| EXISTING | | FUTURE | FUTURE W/ IMPROVEMENTS |
| A.M. | 0.79 | 0.92 | 0.82 |
| P.M. | 0.98 | 1.19 | 0.85 |

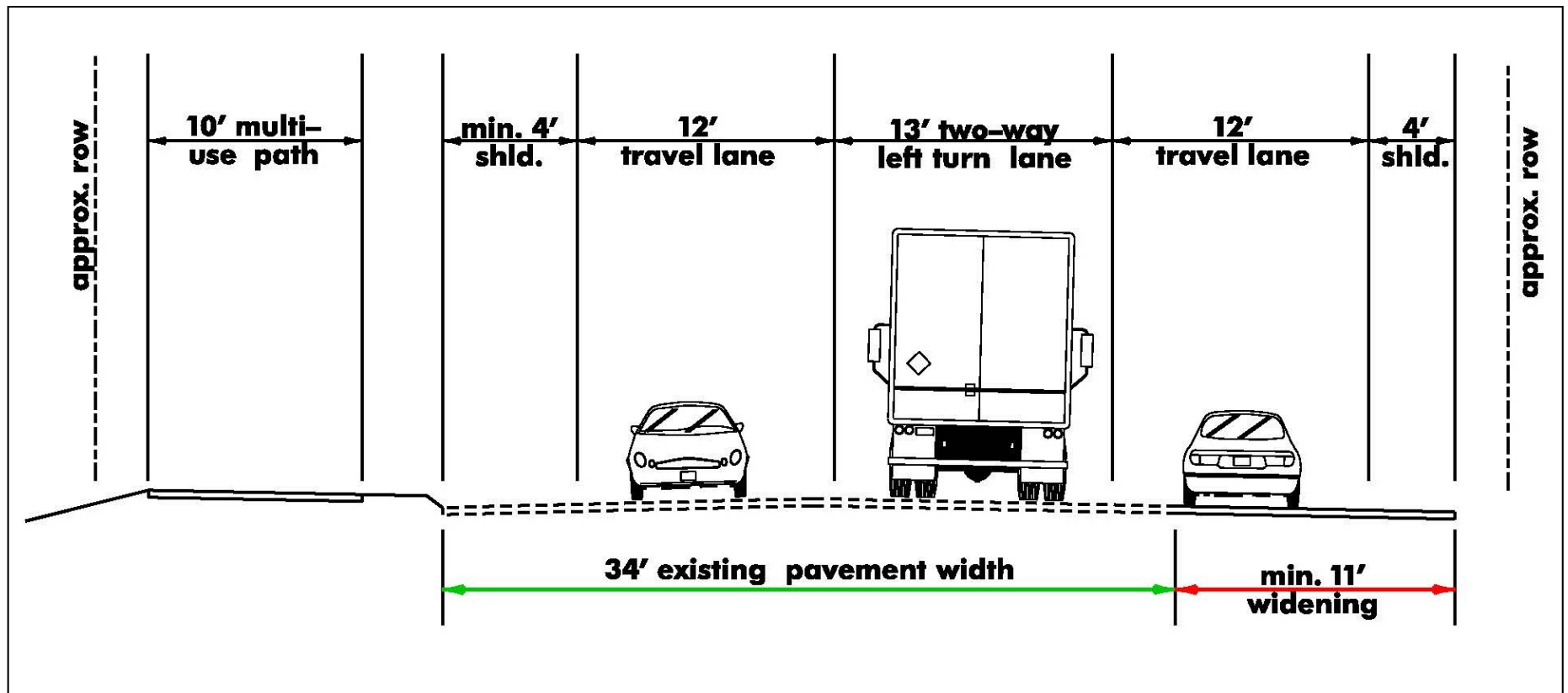
Comparison of Alternatives

| Benefit or Impact | All Lane Additions | Some Lane Additions | Roundabout |
|---------------------|--------------------|---------------------|---------------|
| Worst V/C Ratio | 0.89 | 0.98 | 0.85 |
| “Life Expectancy” | 31 Years | 22 Years | 35 Years |
| Added Pavement | 25,000 SF | 14,000 SF | 24,000 SF |
| ROW Takings-Area | 5,200 SF | 2,800 SF | 1,300 SF |
| ROW Takings-Parcels | 15 Parcels | 7 Parcels | 5 Parcels |
| Tree Loss | 3 Trees | 3 Trees | 5 Trees |
| Utility Poles Moved | 14 | 11 | 12 |
| Construction Cost | \$2.0 million | \$1.7 million | \$2.4 million |

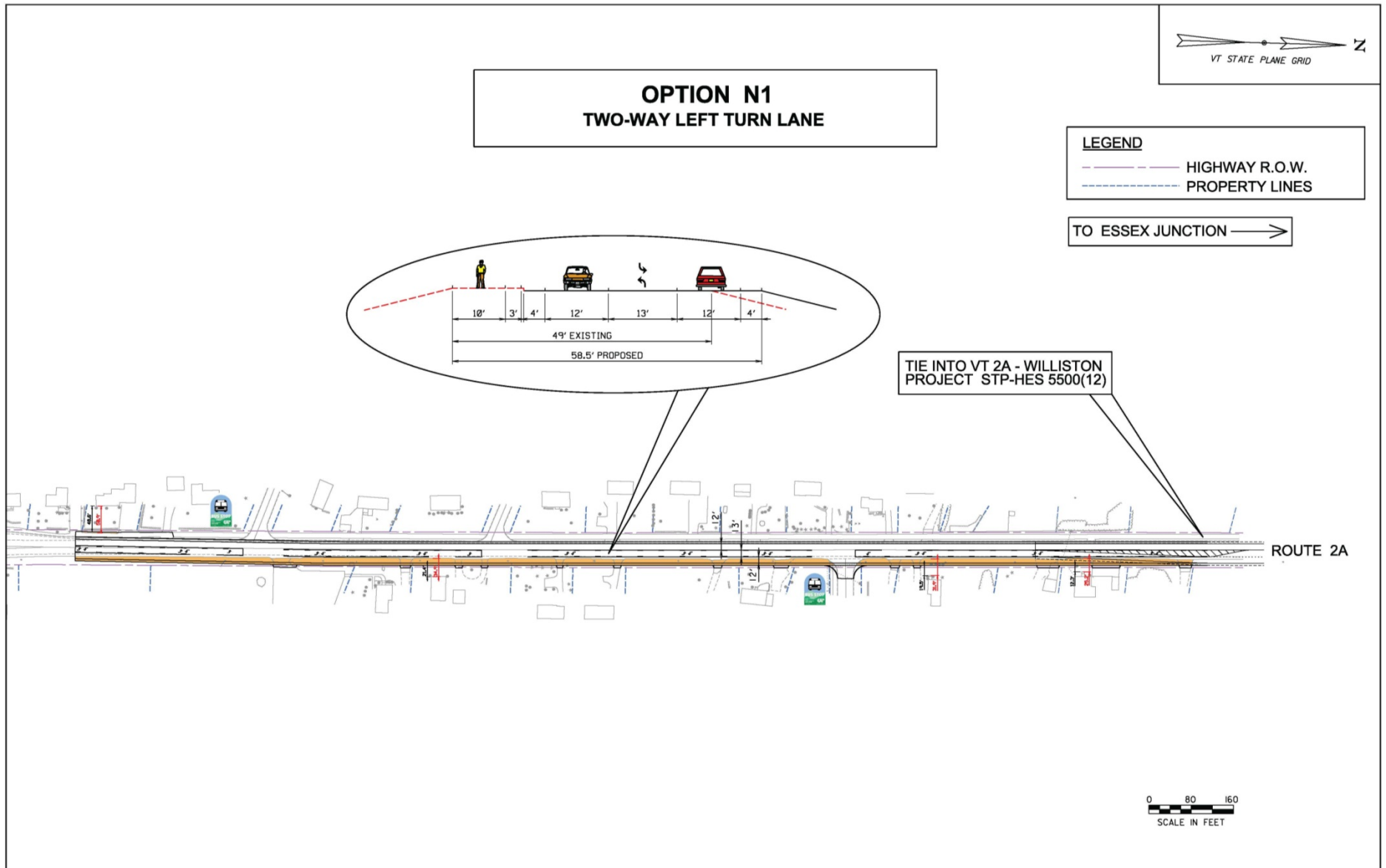
Proposed Improvements for VT 2A North of River Cove Road

(part of James Brown Drive signal project)

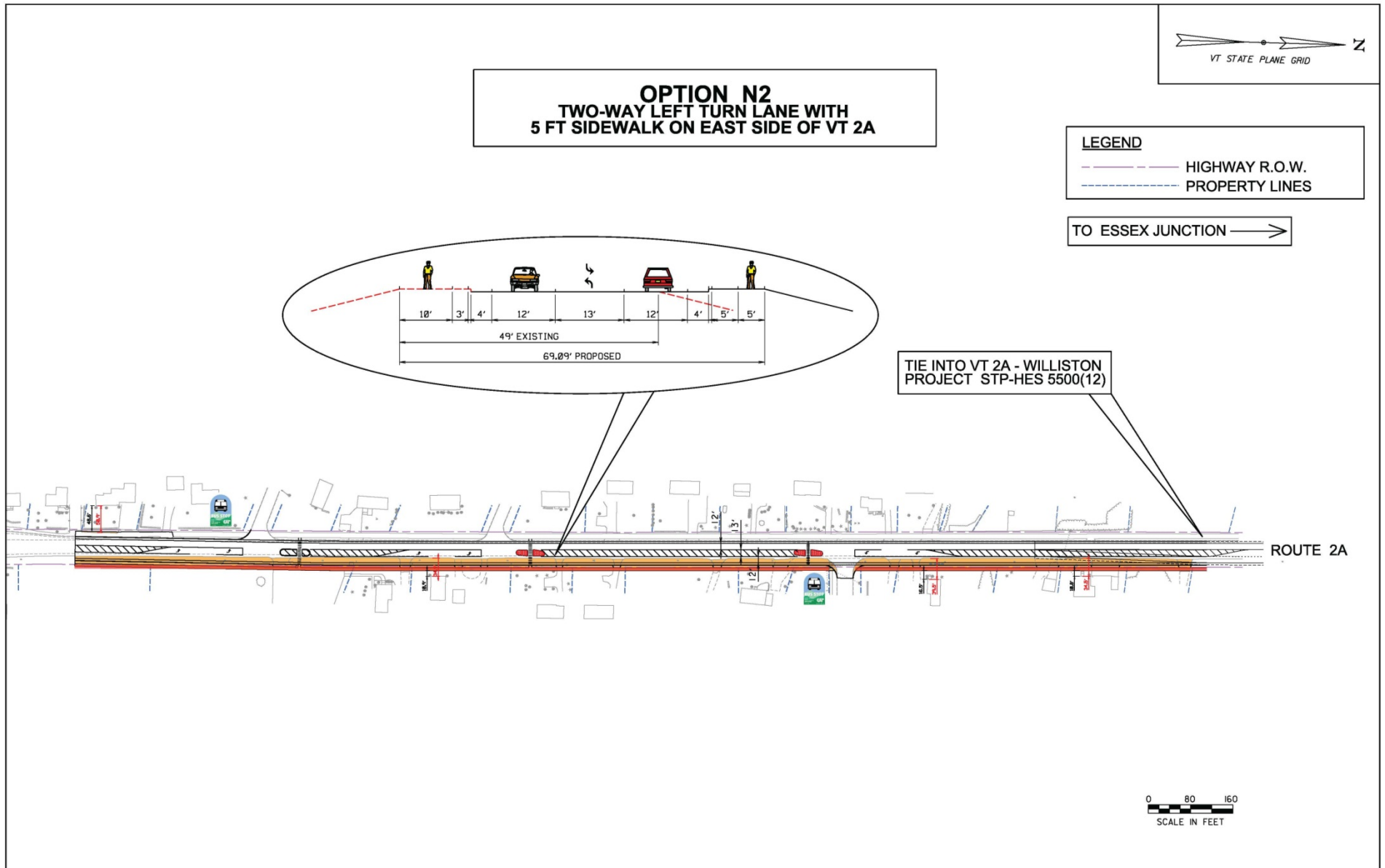
Looking North



Option N1: Three-Lane Section



Option N2: Add Sidewalk on East Side



Pedestrian Safety

- Pedestrian Actuated Rapid Flashing Beacons
- Crosswalks
- Pedestrian Refuge Island



Comparison of Alternatives

| Benefit or Impact | Existing | 3-Lane Cross Section | 3-Lane Cross Section + Sidewalk | Existing + Sidewalk |
|-----------------------|-----------|----------------------|---------------------------------|---------------------|
| Sidewalks | One Side | One Side | Two Sides | Two Sides |
| “Bike Lanes” | On Street | On Street | On Street | On Street |
| Refuge Islands | No | Yes | Yes | No |
| New Pavement | None | 27,000 SF | 50,000 SF | 19,000 SF |
| ROW Takings-Area | None | None | 15,000 SF | None |
| ROW Takings-Parcels | None | None | 17 Parcels | None |
| < 25 Feet of Driveway | None | None | 2 Parcels | None |
| Tree Loss | None | 6 Trees | 11 Trees | 5 Trees |
| Utility Poles | None | 14 | 14 | 14 |
| Construction Cost | None | \$0.9 million | \$1.2 million | \$0.4 million |

Summary of Alternatives

- Intersection:
 - All Lane Additions
 - Some Lane Additions
 - Roundabout
- VT 2A
 - Third Lane – Industrial/Mountain View to River Cove
 - East Side Sidewalk

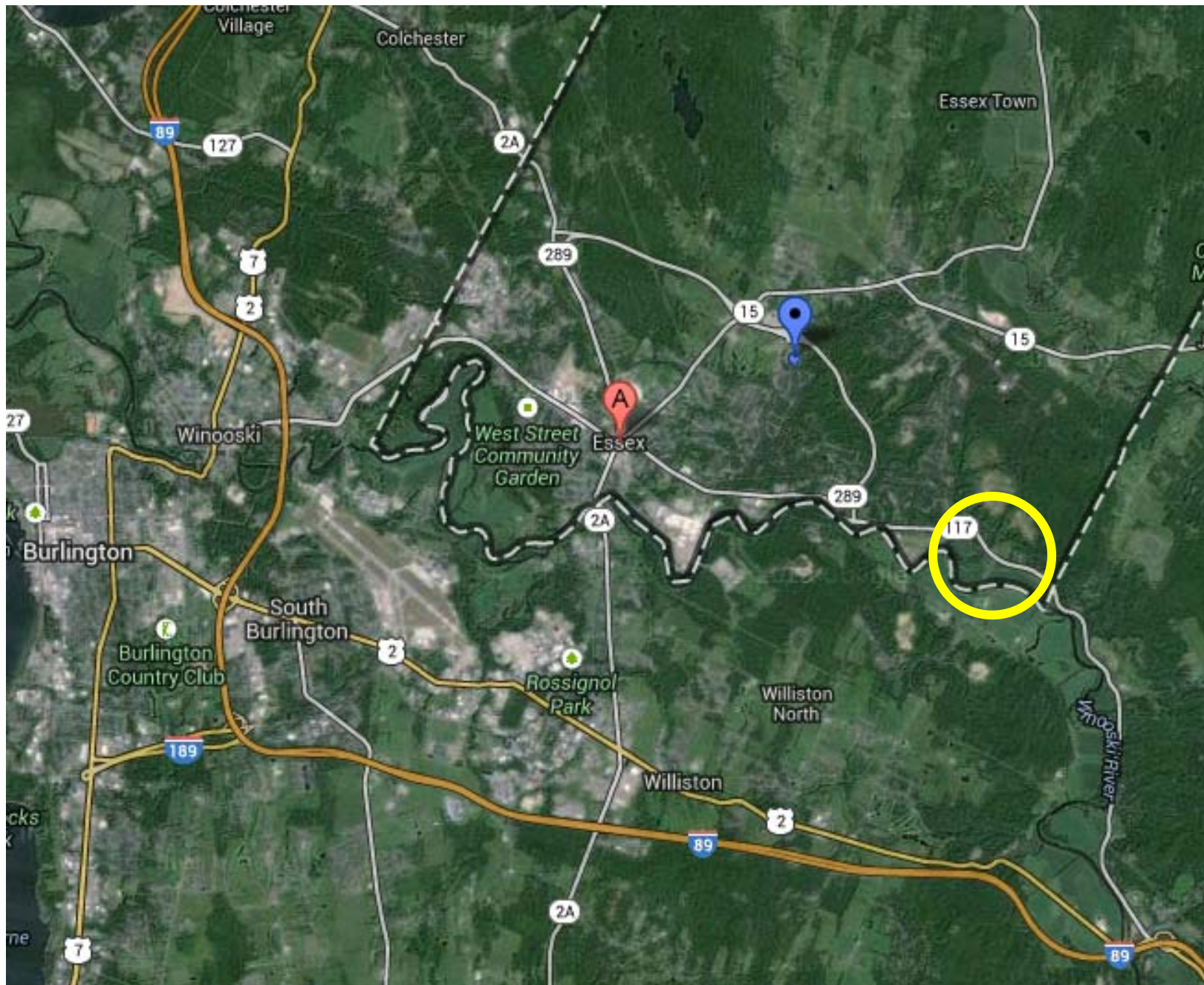


CHITTENDEN COUNTY RPC

Communities Planning Together

VT 117/North Williston Road Scoping Study

**CIRC Alternatives Meeting
10/30/2013**





Safety Issues

Roadway

- Drivers attempt to cross road during flood events and get stranded, requiring town forces to rescue
- Few crossings of the Winooski River are especially a problem during emergencies

Intersection

- Statewide High crash location
- Poor visibility of oncoming traffic
- Long intersection delays encourage risky maneuvers
- High speeds on Route 117

Operational Issues

Roadway

- Town forces must clean and repair road after flooding before re-opening
- Traffic congestion worsens at Five Corners during closures

Intersection

- Long queues and delays on North Williston Road during peak traffic hours

Study Goals

- Address intersection safety and congestion
- Improve flood resiliency
 - Reduce duration of road closures
 - Better notification of closures and improved gates
 - Easier and quicker clean up and reopening of road
- Avoid any negative impacts to local agriculture
- Avoid impacts to the floodplain or increases in flood elevation

May 2011



Hydraulic Screening Results

| Alternative | Elevation Increase | Reduction in Probability of Overtopping | Modeled floodplain impacts | Impacts to Agricultural Activities | Cost |
|-------------|------------------------|---|----------------------------|------------------------------------|----------|
| No Build | 0 feet | 0% | None | None | None |
| A1 | + 1.5 feet | 17% | Possible | Minimal | Moderate |
| A2 | + 1.5 feet w/ culverts | 17% | None | Moderate | High |
| B1 | + 3 feet | 30% | Possible | Minimal | Moderate |
| B2 | + 3 feet w/ culverts | 30% | Possible | Moderate | High |
| C | +11 feet | 46% | Prohibitive | High | High |
| D | +12 feet bridge | 49% | Possible | High | Extreme |

Concerns with Raising the Road

- **Erosion on opposite bank** of Winooski River has increased in past decade, possibly due to past increase in road elevation.
- Increased water velocity under bridge could contribute to **scour**.
- Culverts required to maintain flood elevation could become ineffective if **clogged with debris**.
- **Conclusion:** Raising road by any amount is **unlikely to garner permits**.

Reduce Duration and Disruption of Closures

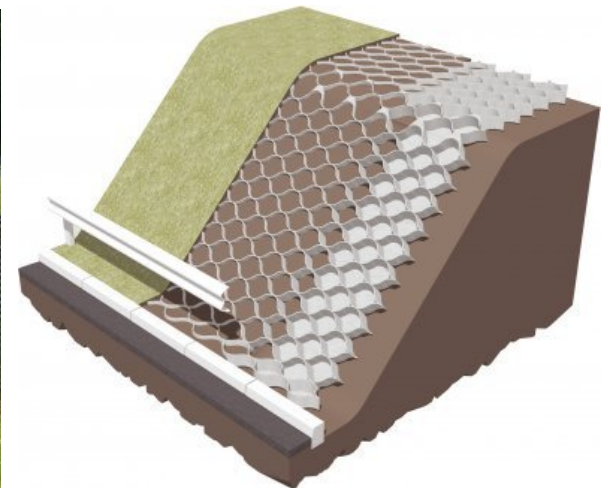
- Upgrade existing culvert to **6' box culvert**
- **Intelligent signs** to allow instant display of road closure alerts
- **Stream gauge** at bridge to allow more precision in need for closure
- **Durable gates** to prevent crossing during floods
- **Reconstruct road bank** at lowest elevation to prevent erosion and allow rapid re-opening
- **Cost: \$670,000**

Flood Detection & Warning



Erosion Mitigation

300 foot segment where erosion is frequent



VT 117/North Williston Road

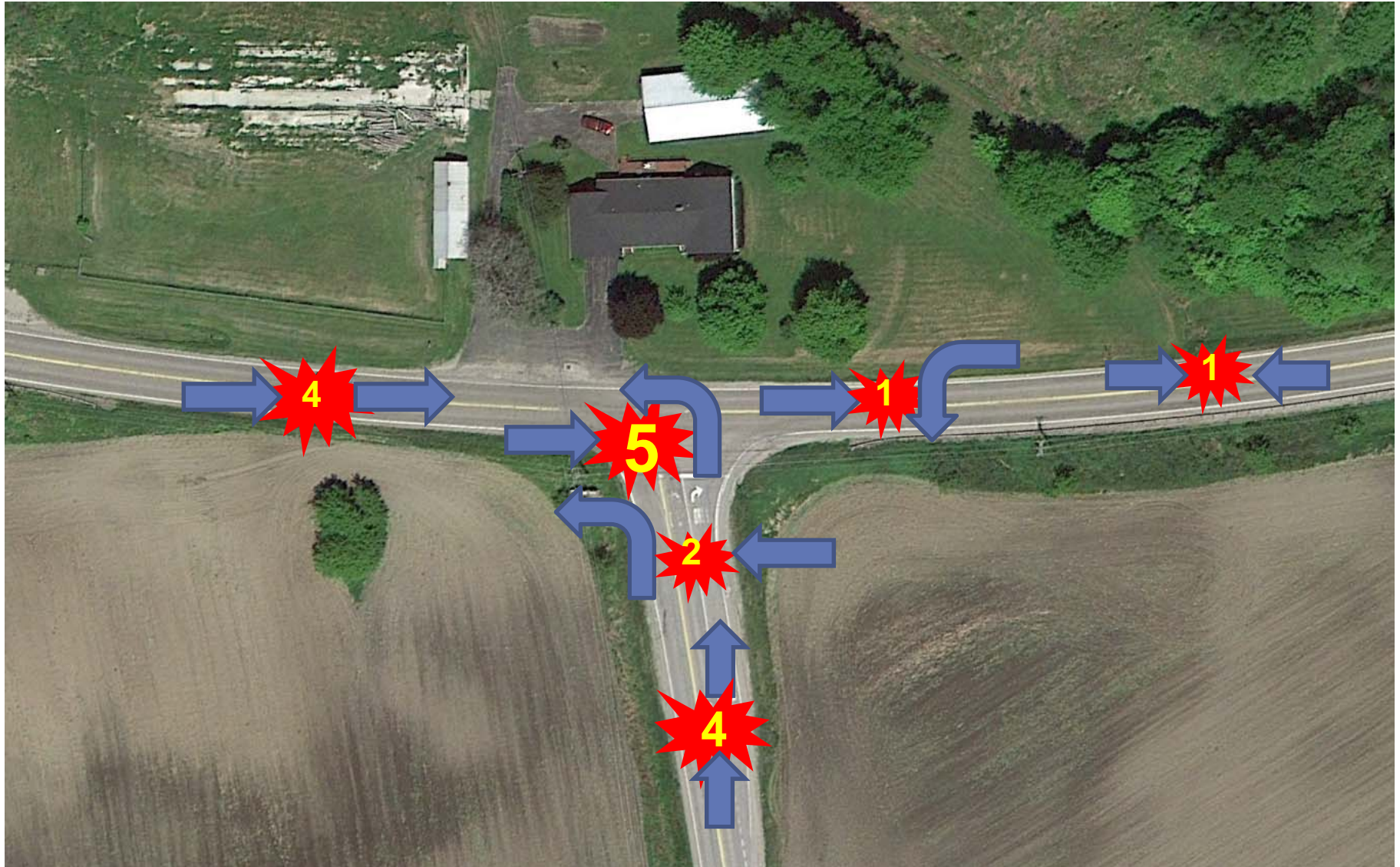


| Link | AADT |
|--------------------|-------|
| North Williston Rd | 5,500 |
| Route 117 West | 9,600 |
| Route 117 East | 5,500 |

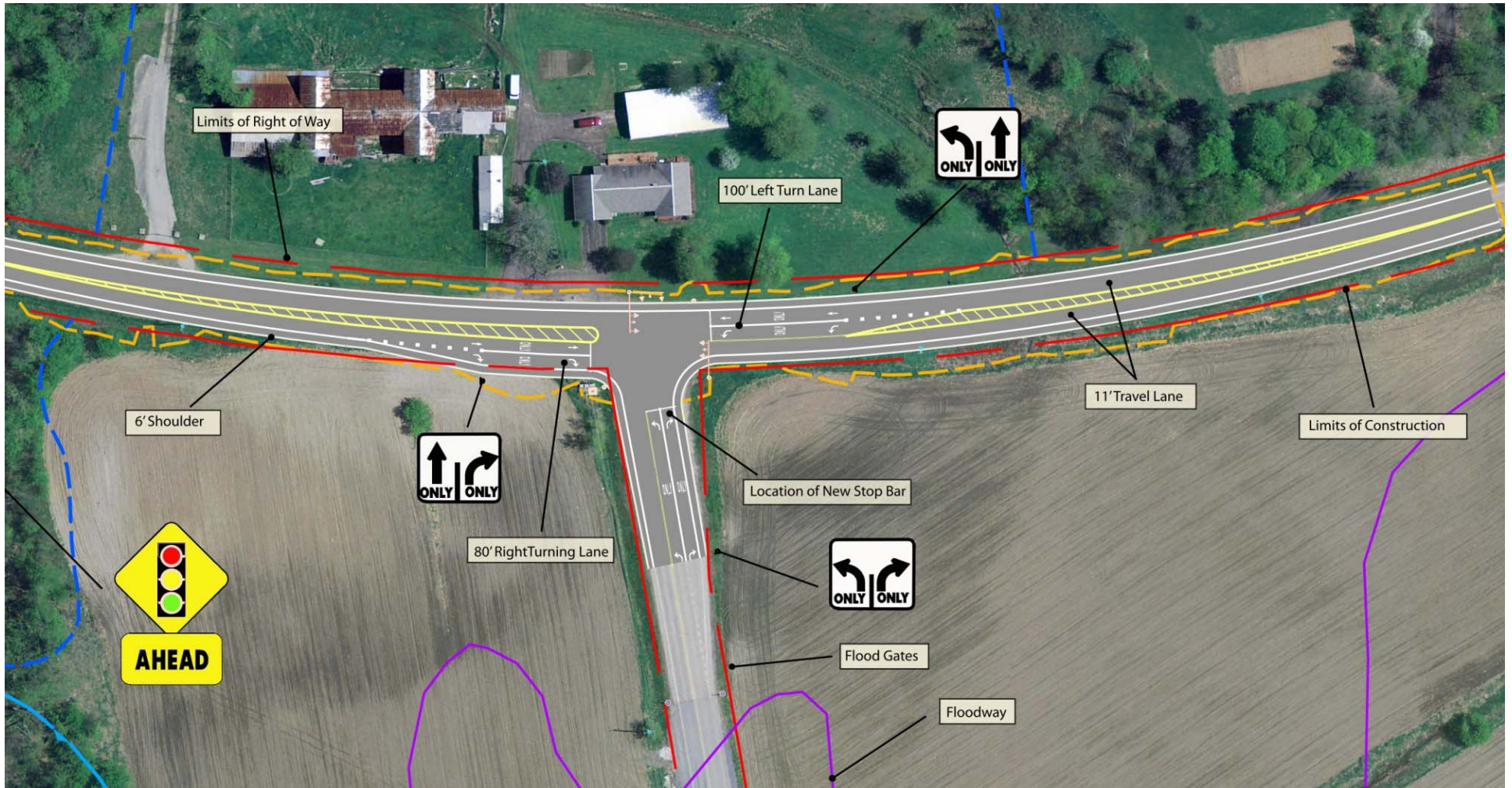
Existing Intersection Operation

| | 2012 AM Peak Hour | | | | 2012 PM Peak Hour | | | |
|-----------------|-------------------|-------|------------------------|------|-------------------|--------------|------------------------|-------------|
| | LOS | Delay | Q Length (95%, veh) | V/C | LOS | Delay | Q Length (95%, veh) | V/C |
| NB Left | D | 27.2 | 2.4 | 0.47 | F | 115.3 | 12.6 | 1.08 |
| NB Right | B | 10.1 | 0.2 | 0.06 | B | 12.4 | 1.0 | 0.26 |
| WB Left | A | 8.5 | 0.5 | 0.14 | A | 8.7 | 0.2 | 0.08 |

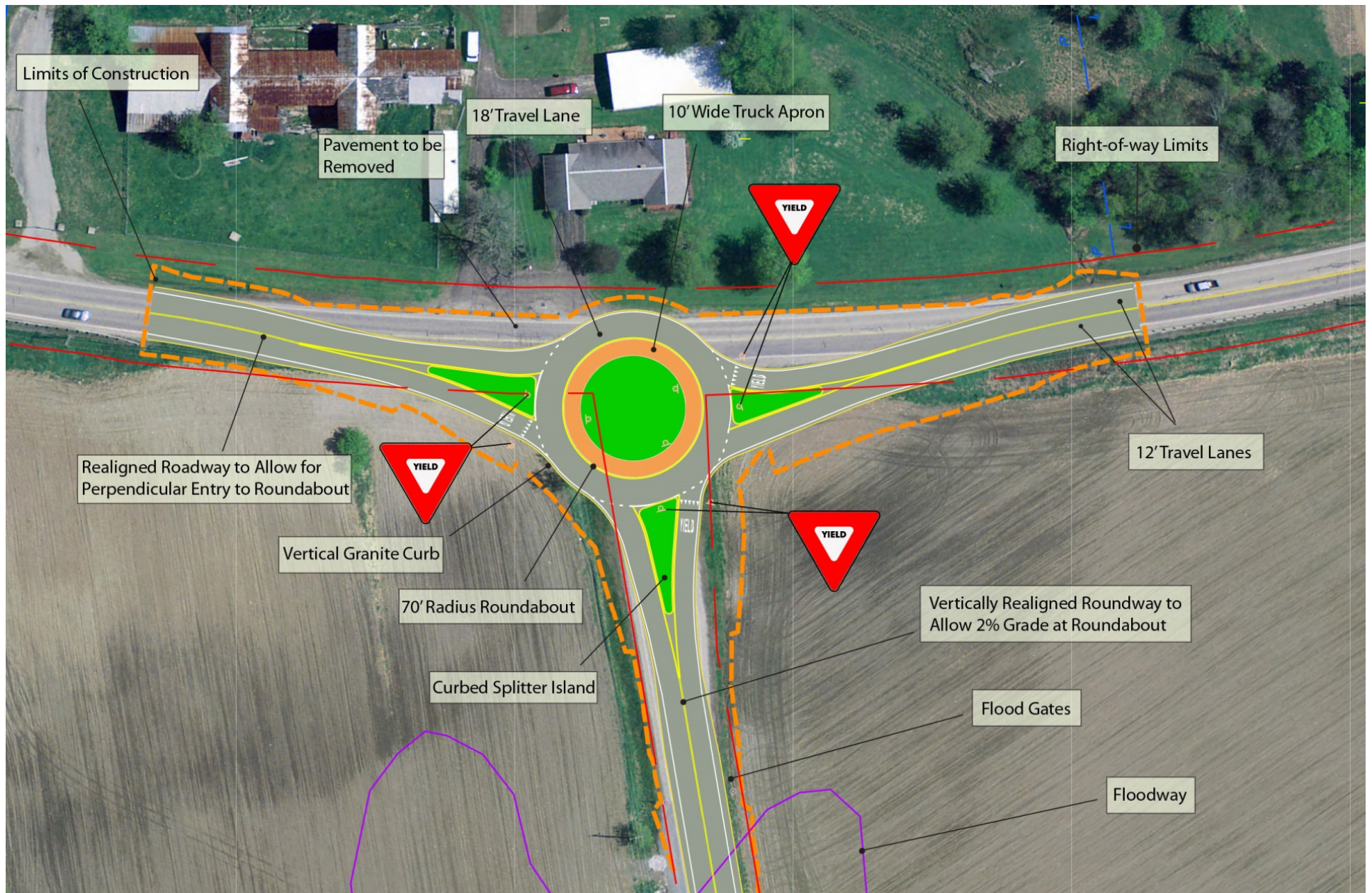
Crash Patterns (2008-2012)



(Un) & Signalized Improvements



Roundabout



Safety Comparison

| Context | Signal | Roundabout |
|-------------------|--------|------------|
| All areas | -13% | -40% |
| Roads over 40 mph | -5% | -78% |

- FHWA Crash Reduction Factors
- Cost per crash estimated at \$72,885 (\$290,000 per year)

2035 Intersection Operation

| Alternative | AM LOS | AM Delay | AM V/C | PM LOS | PM Delay | PM V/C |
|------------------------------------|-----------|-------------|-------------|-----------|--------------|-------------|
| Unsignalized (northbound lefts) | E | 49.4 | 0.82 | F | 394.8 | 1.79 |
| Signalized (overall) | A | 9.9 | 0.44 | B | 11.1 | 0.62 |
| Roundabout (overall) | A | 8.5 | 0.36 | A | 9.5 | 0.55 |

Alternatives Comparison

| Alternative | Cost | Impact to Ag Lands and Hydric Soils | Right of way |
|--------------|-------------|-------------------------------------|--------------|
| Unsignalized | \$690,000 | 0.08 acres | 0.27 acres |
| Signal | \$1,580,000 | 0.08 acres | 0.27 acres |
| Roundabout | \$1,860,000 | 0.21 acres | 0.35 acres |

- Utility relocation required for each alternative
- Additional archaeological investigation required for each alternative

Alternatives Performance

| Alternative | Safety - Crash Reduction | Congestion - LOS |
|----------------|--|--|
| X Unsignalized | <ul style="list-style-type: none"> Reduced crashes due to turning lanes | <ul style="list-style-type: none"> Minor improvement due to turning lanes LOS F - North Williston Rd at PM Peak hour |
| ✓ Signal | <ul style="list-style-type: none"> Reduced from signal control and turning lanes Possible increase of rear-end collisions and high speed broadside crashes | <ul style="list-style-type: none"> LOS A/B |
| ✓ Roundabout | <ul style="list-style-type: none"> Greatest crash and injury reduction due to design and low speed operations | <ul style="list-style-type: none"> LOS A |

Next Steps

- Essex Selectboard endorsement of alternative(s)
- Finalize Scoping Report
- <http://www.ccrpcvt.org/vt117>

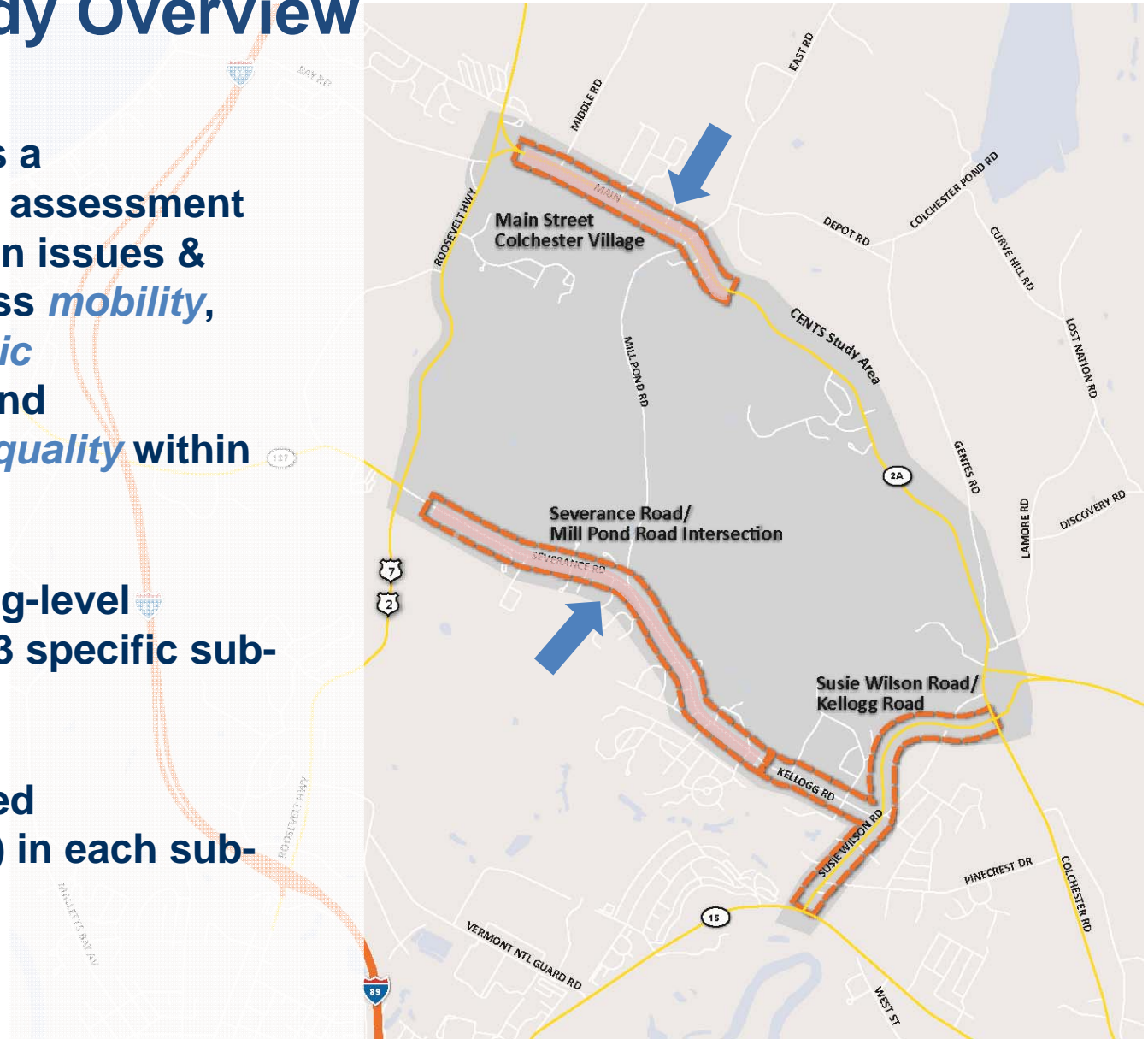
Colchester-Essex Network Transportation Study

Severance Road Corridor + Main Street Colchester Village



CENTS Study Overview

- CENTS Study is a comprehensive assessment of transportation issues & needs to address *mobility, safety, economic development, and environmental quality* within the study area
- Detailed scoping-level assessment in 3 specific sub-areas
- Identify preferred improvement(s) in each sub-area

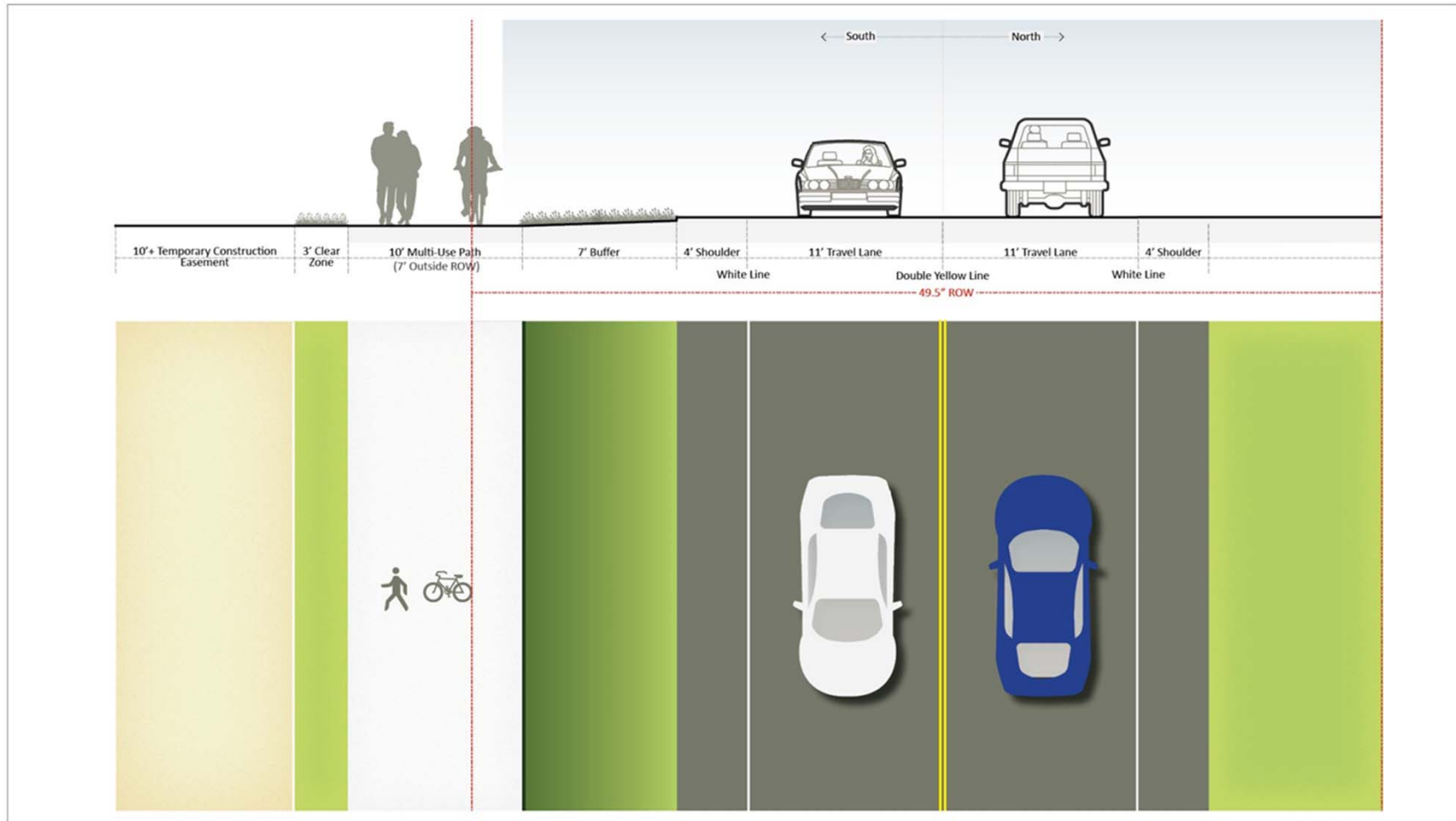


Severance Road: Review of Alternatives

- **Alternative 1: South-side Multi-use Path**
 - Mill Pond Road Intersection Improvements
 - Shoulder Widening
 - 10' multi-use path on south side of roadway with 7' green buffer
- **Alternative 2: North-side Multi-use Path**
 - Mill Pond Road Intersection Improvements
 - Shoulder Widening
 - 10' multi-use path on north side of roadway with 7' green buffer

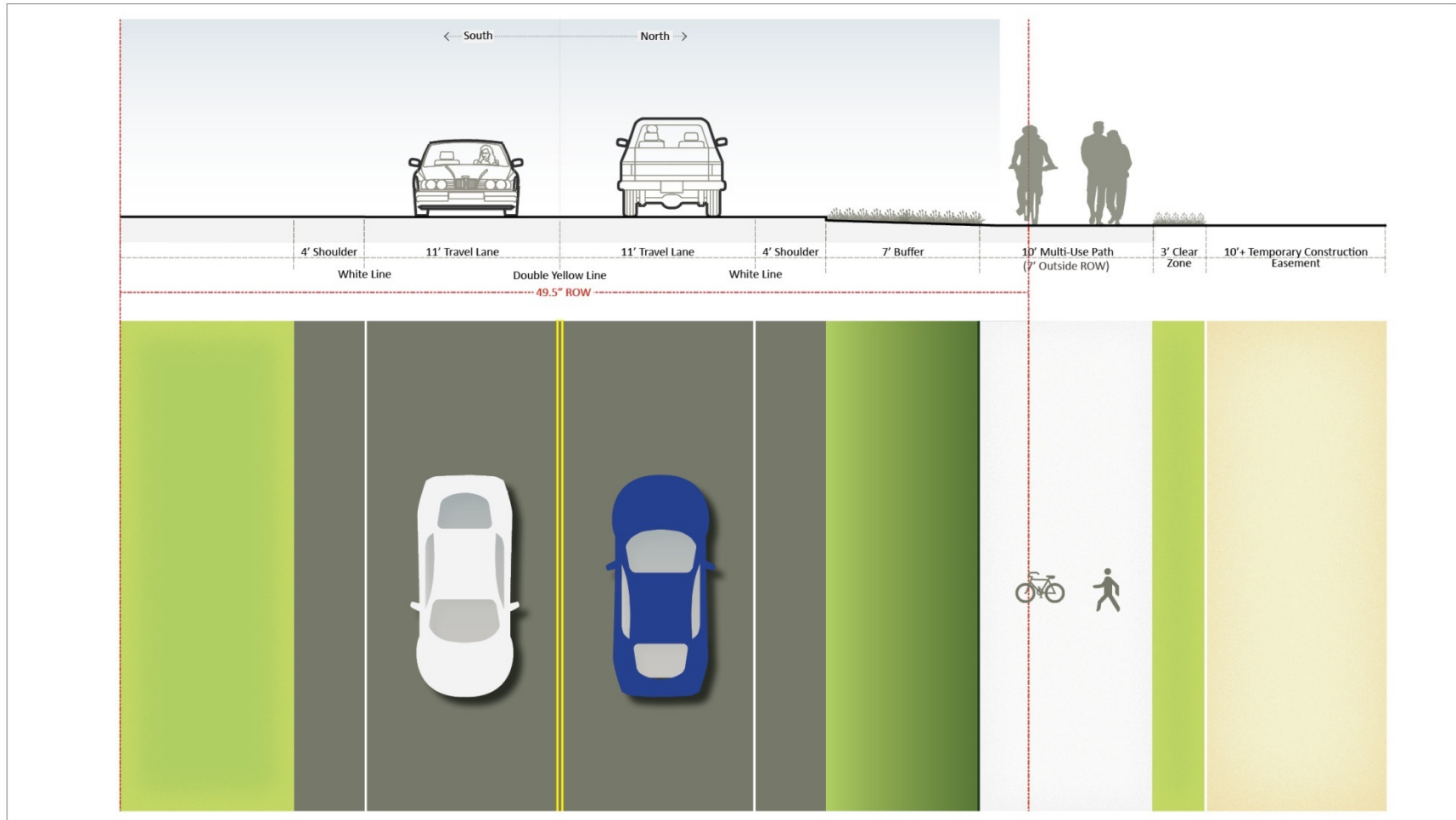


Severance Road Alt 1: Multi-use Path on South Side

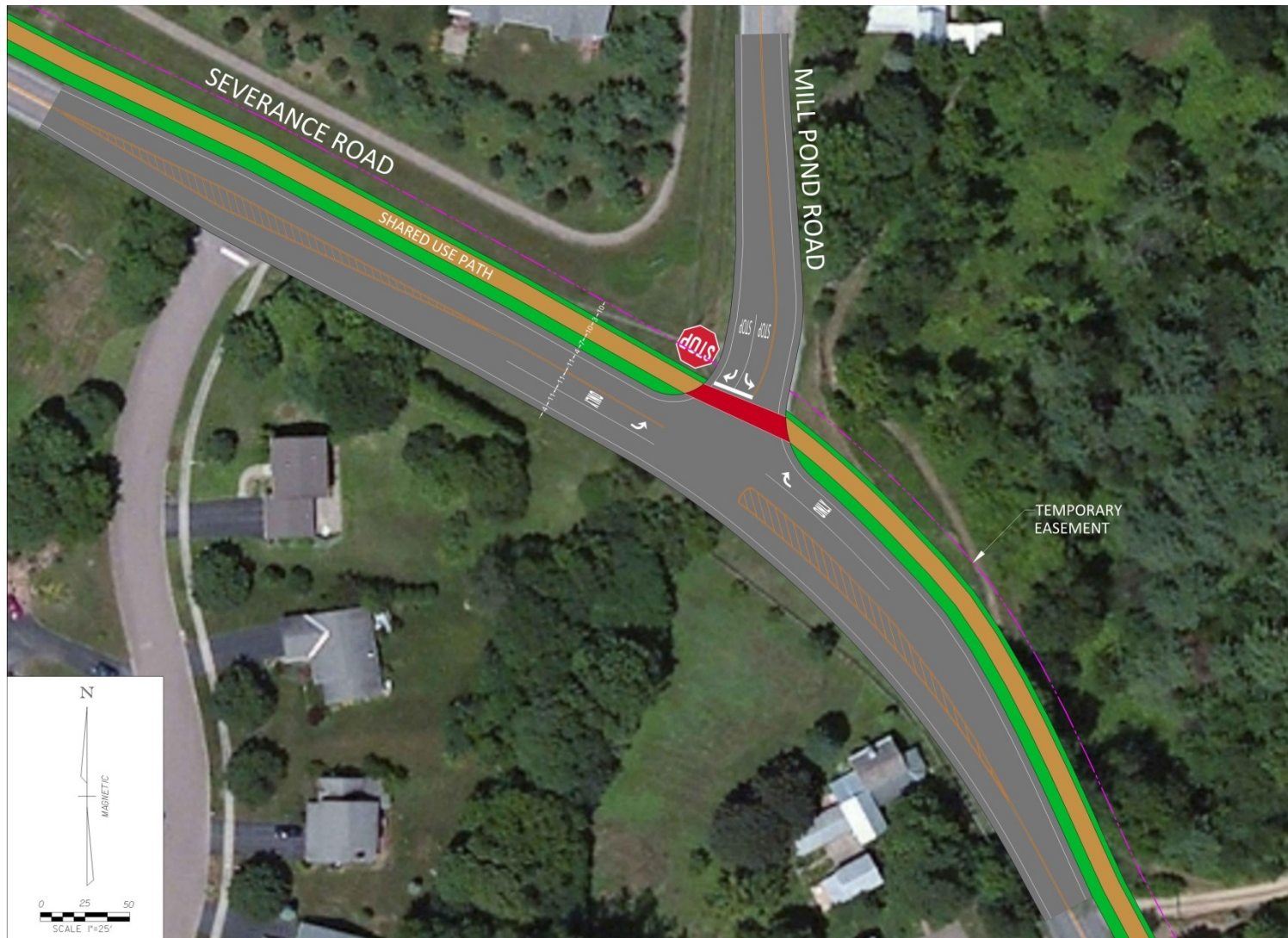




Severance Road Alt 2: Multi-use Path on North Side



Severance Road Alt 2: Multi-use Path on North Side



Alternative 1 (South-side Multi-use Path):

- **Class II Wetland west of Claussen's**
- **Steep slope east of Hidden Oaks Drive**

Alternative 2 (North-side Multi-use Path):

- **Steep slope near Mill Pond Road**
- **Steep slope near Wall Street**
- **Steep slope near Autumn Woods Lane**
- **Steep slopes near Hidden Oaks Drive and Essex Town Line**
- **Steep slopes near US 7**
- **Steep slope near Pheasant Woods**

Alternatives Assessment – Evaluation Matrix

| | No Build | | Alternative 1 South Side Path | Alternative 2 North Side Path |
|---------------------|---|-----------|--|--|
| COST | Preliminary Cost Estimate (final design, construction, inspection, contingency) | \$0 | Intersection Widening: \$272,250 Shared-Use Path + Shoulder Widening = \$1,829,125 Total = \$2.42M | Intersection Widening: \$272,250 Shared-Use Path + Shoulder Widening = \$1,795,000 Total = \$2.38M |
| PURPOSE & NEED | Bicycle and Pedestrian Safety | Worsen | Improve | Improve |
| | Intersection Deficiencies | Worsen | Improve | Improve |
| TOWN CONFORMANCE | Consistency with Town Plan and Community Vision | No Change | Yes | No |
| IMPACTS | Agricultural Lands | No | No | No |
| | Archaeological | No | No | No |
| | Historic Structures/Sites | No | No | No |
| | Floodplain | No | No | No |
| | Rare, Threatened & Endangered | No | Yes | Yes |
| | Right of Way | No | Permanent: Moderate Temporary: Moderate | Permanent: Moderate Temporary: High |
| | Relocate Utilities | No | 27 Poles | 20 Poles |
| | Public Lands | No | No | No |
| | Class II Wetlands | No | Potential Buffer Intrusion | No |
| | | | | |
| PERMITS | Act 250 | No | No | No |
| | 401 Water Quality | No | No | No |
| | 404 Corps of Engineers Permit | No | No | No |
| | Stream Alteration | No | No | No |
| | Conditional Use Determination | No | No | No |
| | Storm Water Discharge | No | Potential | Potential |
| | Shoreland Encroachment | No | No | No |
| | Endangered & Threatened Species | No | Yes | Yes |
| | VTrans ROW Permit | No | No | No |
| | State Historic Preservation | No | No | No |
| | Office Clearance | | | |
| | NEPA Category | No | Categorical Exclusion | Categorical Exclusion |

***Cost estimates do not include ROW acquisition or earthwork/retaining walls due to slopes**

Main Street Today in the Village



- Urban minor arterial road
- State route - VTrans Maintained
- 35 mph speed limit, 25 mph school zone
- 49.5' Right-of-Way
- 11' Travel lane width
- 1' to 2' shoulder width
- Overland drainage flow and absorption in grass area

Main St, Mill Pond Rd, and East Rd in 2030 (PM Peak)

| | 2030 | | |
|---|------|-----------------|--------------|
| | LOS | Delay (seconds) | Queue (feet) |
| 1. No Build, no detection | F | 100+ | Up to 140 ft |
| 2. Optimize signals + Detection, with dedicated left-turn pockets in both directions on VT 2A | E | 64 | Up to 37 ft |



Planning for the future: Adding turn lanes

Signal timing optimization



Permanent mast arms



Vehicle Detection



Pedestrian Signal and Detection



**Protected left-turn phase
for EB and WB
approaches on VT 2A**

Pro:

- **Vehicle safety**
- **Traffic flow**

Con:

Main Street Colchester Village: Review of Alternatives

- **Alternative 1: Walkable Neighborhood** (Operational Improvements)
- **Alternative 2: Main Street Character** (Operational and Village Character Improvements)
- **Alternative 3: Village Destination** (Operational, Character, and Traffic Calming Improvements)



Alternative 1 – Walkable Neighborhood



Alternative 2 – Main Street Character



Alternative 3 – Village Destination



Alternatives Assessment – Evaluation Matrix

| | No Build | | Alternative 1 Neighborhood Walkability | Alternative 2 Main Street Character | Alternative 3 Village Destination | |
|-------------------|--|-----------|---|--|--------------------------------------|-------------|
| COST | Preliminary Cost Estimate (final design, construction, inspection, contingency) | | \$0 | \$850,000 | \$2,990,000 | \$3,870,000 |
| PURPOSE & NEED | Traffic Conflicts | No Change | Improve | Improve | Improve | |
| | Walkability | No Change | Improve | Improve | Improve | |
| | Traffic and Noise | No Change | Improve | Improve | Improve | |
| | Village Character | No Change | Potential | Improve | Improve | |
| IMPACTS | Agricultural Lands | No | No | No | No | |
| | Archaeological | No | No | No | No | |
| | Historic Structures/Sites | No | No | No | No | |
| | Floodplain | No | No | No | No | |
| | Rare, Threatened & Endangered | No | No | No | No | |
| | Public Lands | No | No | No | No | |
| | Utilities | No | No | Yes | Yes | |
| | Wetlands | No | No | No | No | |
| PERMITS | Act 250 | No | No | No | No | |
| | 401 Water Quality | No | No | No | No | |
| | 404 Corps of Engineers Permit | No | No | No | No | |
| | Stream Alteration | No | No | No | No | |
| | Conditional Use Determination | No | No | No | No | |
| | Storm Water Discharge | No | No | Potential | Potential | |
| | Shoreland Encroachment | No | No | No | No | |
| | Endangered & Threatened Species | No | No | No | No | |
| | VTrans ROW Permit | No | Yes | Yes | Yes | |
| | State Historic Preservation Office Clearance | No | No | No | No | |
| | NEPA Category | No | Categorical Exclusion | Categorical Exclusion | Categorical Exclusion | |