North Williston Road Scoping Study

Town of Essex

DuBois & King inc.

Alternatives Review Meeting

September 4, 2013

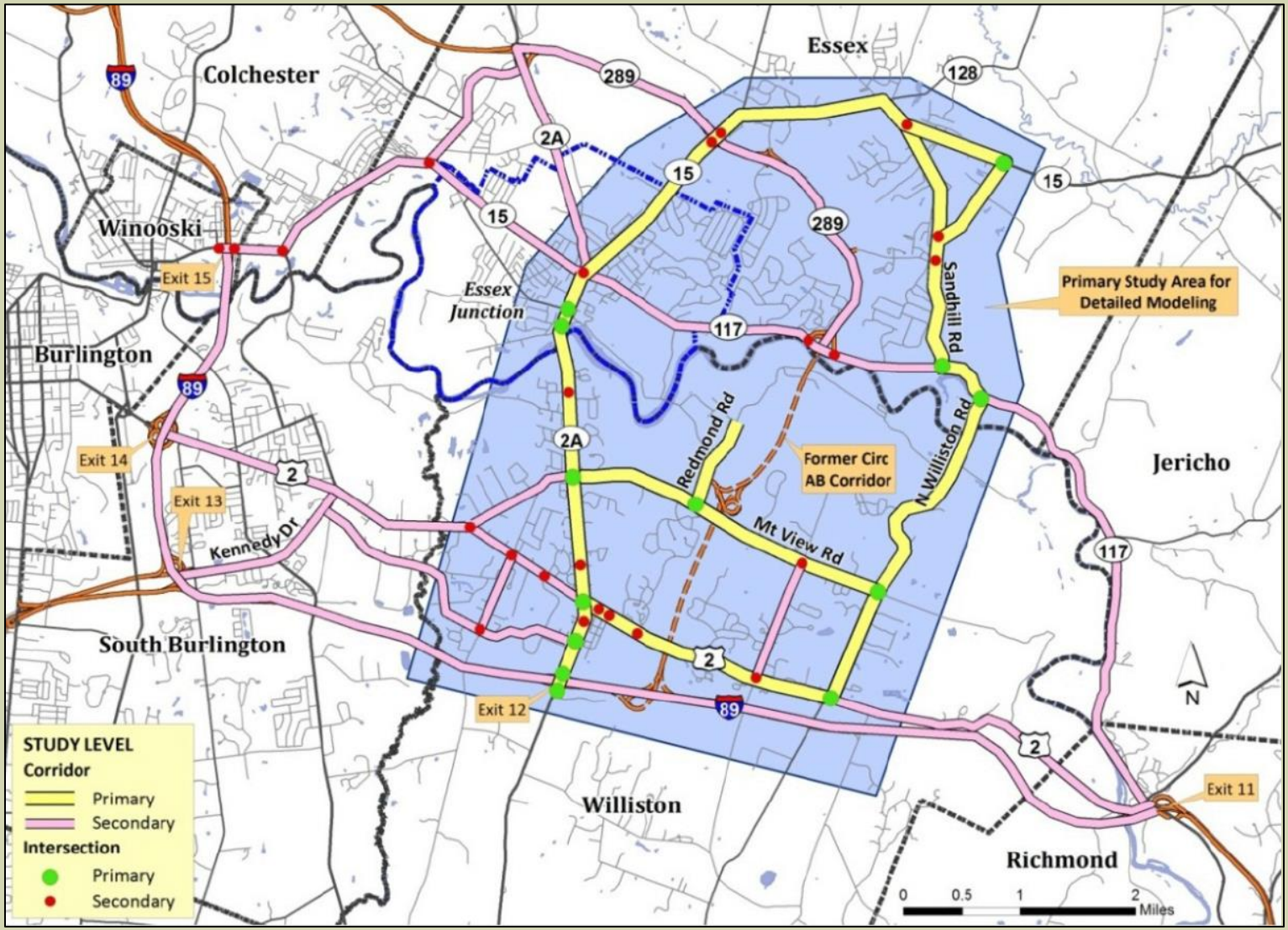
Town of Essex
Incorporated June 4, 1763
ESSEX VERMONT

TOWN OF WILLISTON VERMONT
1763

Agenda

- Project Issues and Needs
- Roadway Alternatives
- Intersection Alternatives
- Discussion

North Williston Road – WENTS Network




Residential and
Agricultural Buildings
Route 117/River Road
Agricultural Lands
Floodway Boundary
Winooski River
New England Central Railroad
North Williston Road

Local Concerns-Intersection

- **High speeds** on Route 117 make turns from North Williston Road very difficult.
- **Traffic backs up** North Williston Road, sometimes to the railroad tracks.
- **Visibility** from North Williston is often blocked by the adjacent car.
- Sometimes there are **stopped cars on Route 117** trying to turn left onto North Williston Road.
- If you are trying to turn left onto Route 117, it is **difficult to tell** if eastbound traffic is going to **turn right** onto North Williston **or go straight** through.
- Some **eastbound cars try to pass** a slower car turning right onto North Williston Rd.

Local Concerns-Road

- The **flood-related closures** are a great inconvenience.
- North Williston Road is **narrow and winding**, and not designed for the amount of traffic using the road.
- **Bicycle traffic** on North Williston Road is poorly accommodated by the **narrow shoulders**.
- Local farmers need to drive **wide agricultural equipment**, which is challenging with the narrow width of North Williston Road.
- The **railroad crossing** is deteriorated and rough, which is especially an issue for bicyclists.

Project Issues

	Safety	Operational
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	▪ Town forces must clean and repair road after flooding before re-opening ▪ Traffic congestion worsens at Five Corners during closures
Intersection	▪ High crash location, with frequent crashes due to poor visibility of oncoming traffic ▪ Long intersection delays encourage risky maneuvers ▪ High speeds on Route 117	• Long queues and delays on North Williston Road during peak traffic hours

Project Design Goals

- Address intersection safety and congestion
- Improve flood resiliency
  - Less frequent 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

ROADWAY

Roadway Flooding

- Occurs typically 2-3 times per year, during spring or winter ice jams.
- Towns of Williston and Essex close flood gates and put signs alerting drivers to closure.
- Cost to town of Essex to clean and repair road is about $3,000 per event on average.
- Safety concerns due to drivers attempting to pass through gates during flooding.

April 2011

May 2011

June 2011

August 29, 2011
Tropical Storm Irene

Alternative Descriptions

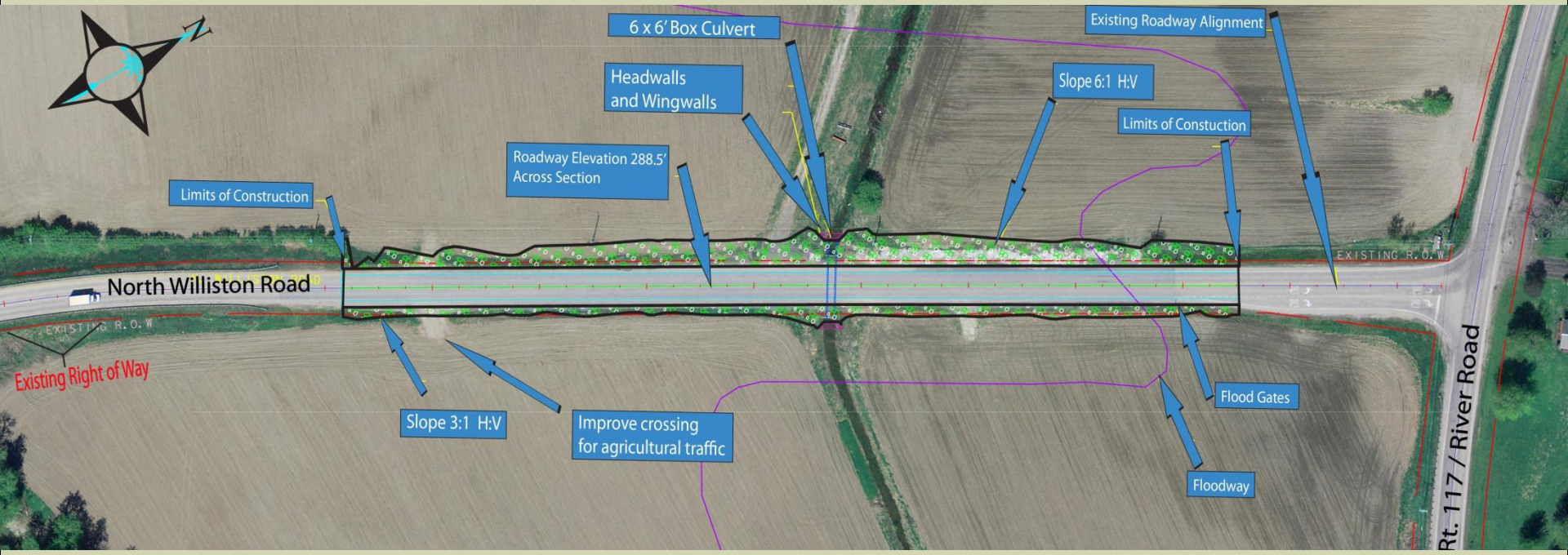
Alternative	Roadway Elevation	Structures
A1	Increased by 1.5’ to 287.0	Replace existing with 6 ft culvert
A2	Increased by 1.5’ to 287.0	Nine 20’ wide x 2’ high box culverts
B1	Increased by 3’ to 288.5	Replace existing with 6 ft culvert
B2	Increased by 3’ to 288.5	Nine 20’ wide x 3.5’ high box culverts
C	Increased by 11’ to 295.0 to clear 25 year flood	Replace existing with 6 ft culvert
D	Increased by 12’ to 296.0 to clear 100 year flood	New multi-span bridge

Alternative Costs

Alt	Road Elev.	Structures	Cost
A1	287.0	6 ft x 6 ft box	$550,000
A2	287.0	9 – 20 ft x 2 ft box	$2,000,000
B1	288.5	6 ft x 6 ft box	$790,000
B2	288.5	9 – 20 ft x 3.5 ft box	$2,600,000
C	295.0	6 ft x 6 ft box	$1,400,000
D	296.0	Bridge	> $10,000,000

Screening Results

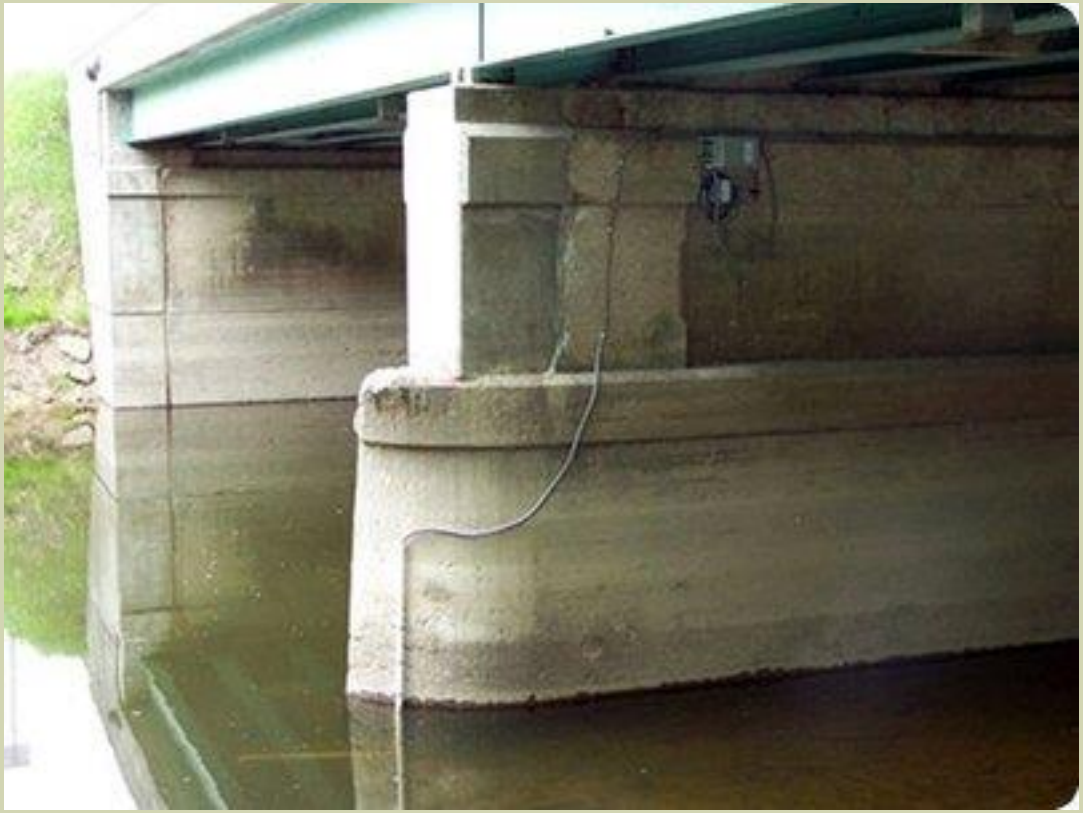
Alternative	Reduction in Probability of Overtopping	Modeled floodplain impacts	Impacts to Agricultural Activities	Cost
A1	17%	Possible	Minimal	Moderate
A2	17%	None	Moderate	High
B1	30%	Possible	Minimal	Moderate
B2	30%	Possible	Moderate	High
C	46%	Prohibitive	High	High
D	49%	Possible	High	Extreme


6 x 6' Box Culvert
Existing Roadway Alignment
Headwalls
and Wingwalls
Slope 6:1 H:V
Limits of Constuction
Roadway Elevation 288.5'
Across Section
Limits of Construction
North Williston Road
EXISTING R.O.W
EXISTING R.O.W
Existing Right of Way
Slope 3:1 H:V
Improve crossing
for agricultural traffic
Flood Gates
Floodway
Rt. 117 / River Road

Gate Options

Relocate gates to provide better protection, and easier operaton

Flood Detection and Warning



Improved Floodproofing Options

	Component	Cost
Warnings	Changeable Message Boards with Remote Access (5)	$28,000
	Flashing Beacon Road Closure Warning Signs (5)	$12,000
Gates	Heavy Duty Gate	$20,000
	Vertical Lift Gate	$40,000
Monitoring	USGS River Level Streamgage with Telemetry	$15,000
	ISCO Monitoring System	$9,000

Additional costs: $42,000 to $83,000

Screened Alternatives

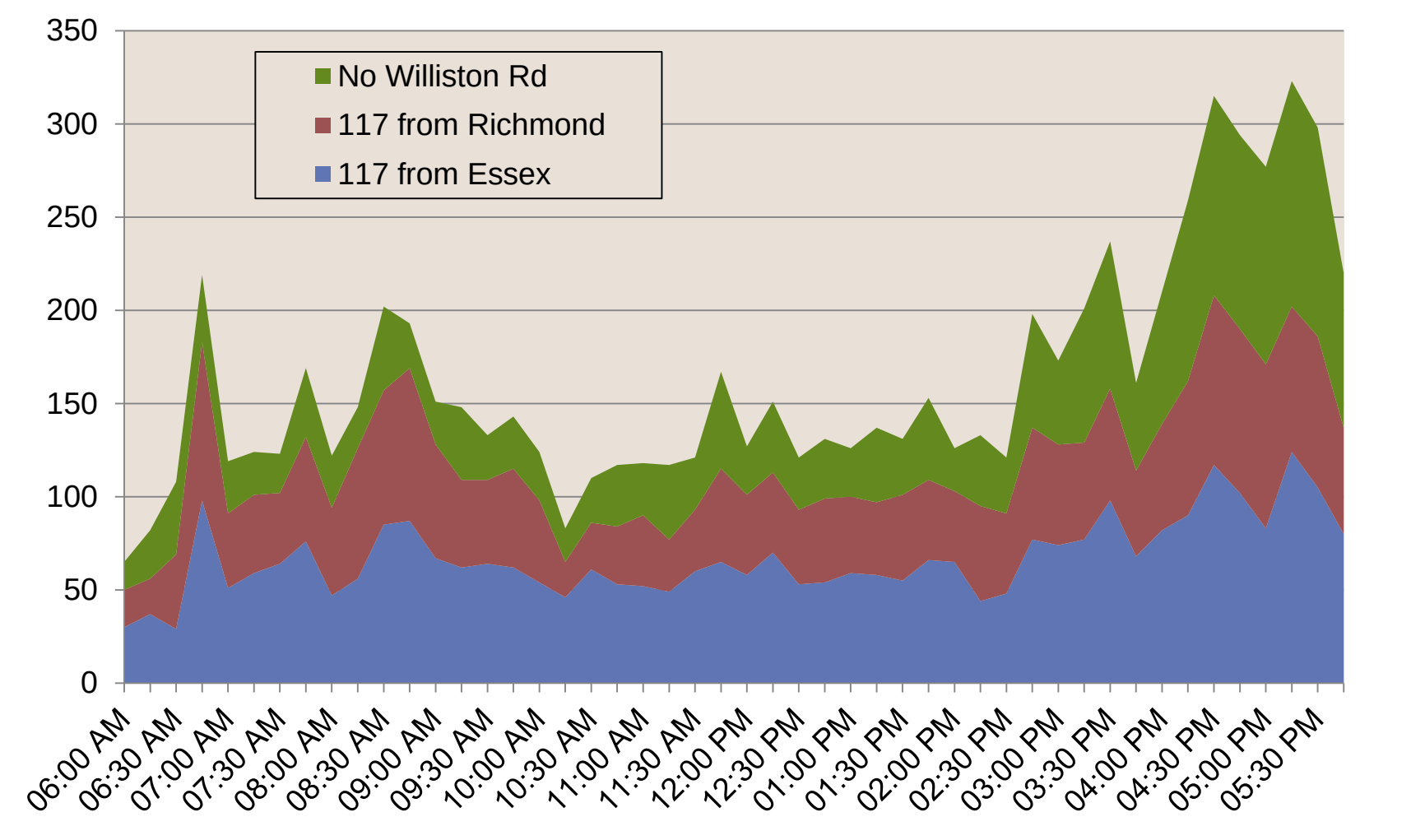
- **Alternative 0:** Maintain existing elevation; smooth slopes and armor road; provide improved signage and gates.
- **Alternative 1.5+:** Raise road elevation 1.5 or more feet, pending consultation with permitting agencies. Install larger culvert; smooth slopes and armor road, improved signage and gates.

INTERSECTION

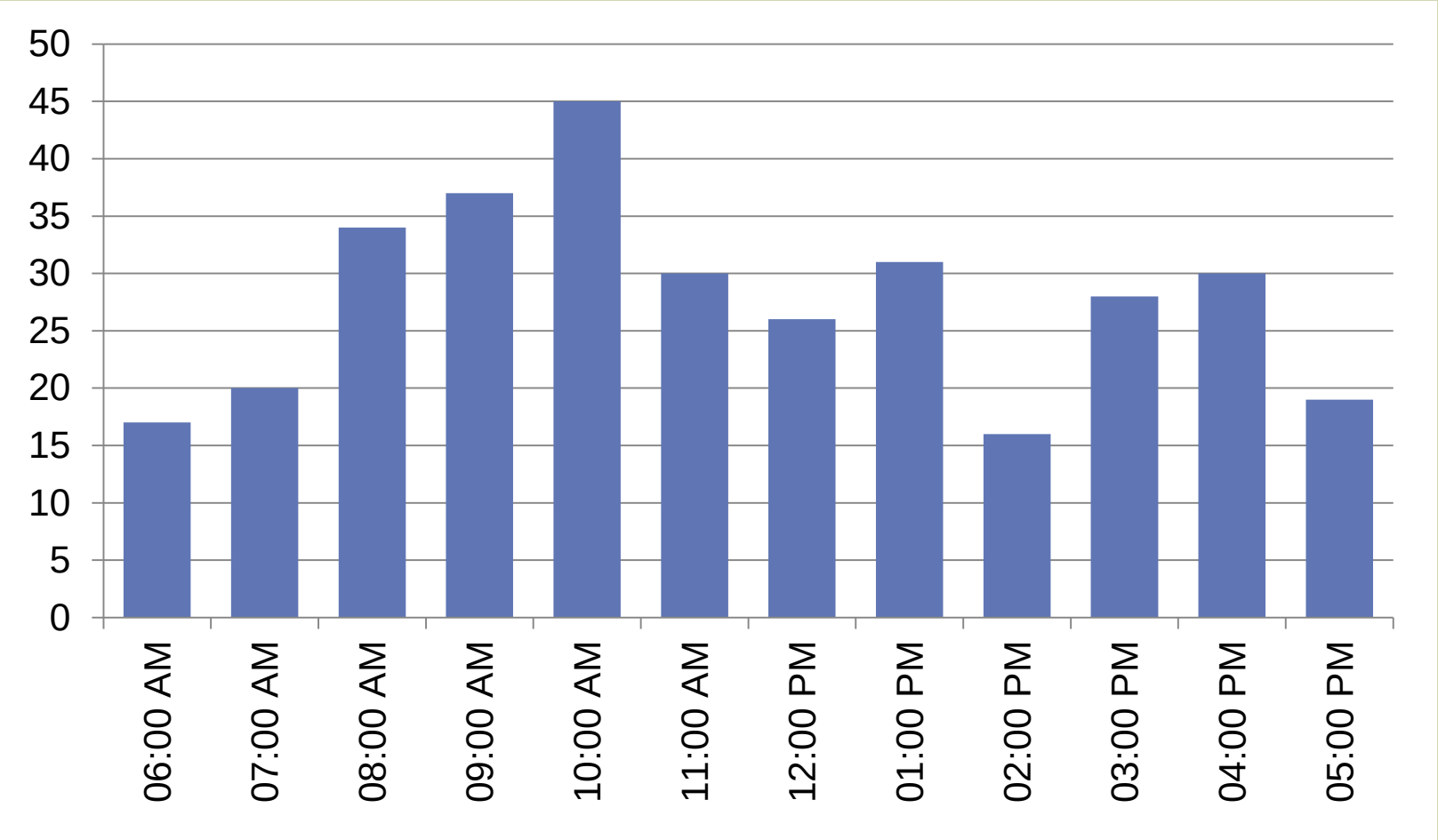
VT Route 117/North Williston Road

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

Hourly Traffic Patterns



Hourly Truck Traffic on North Williston

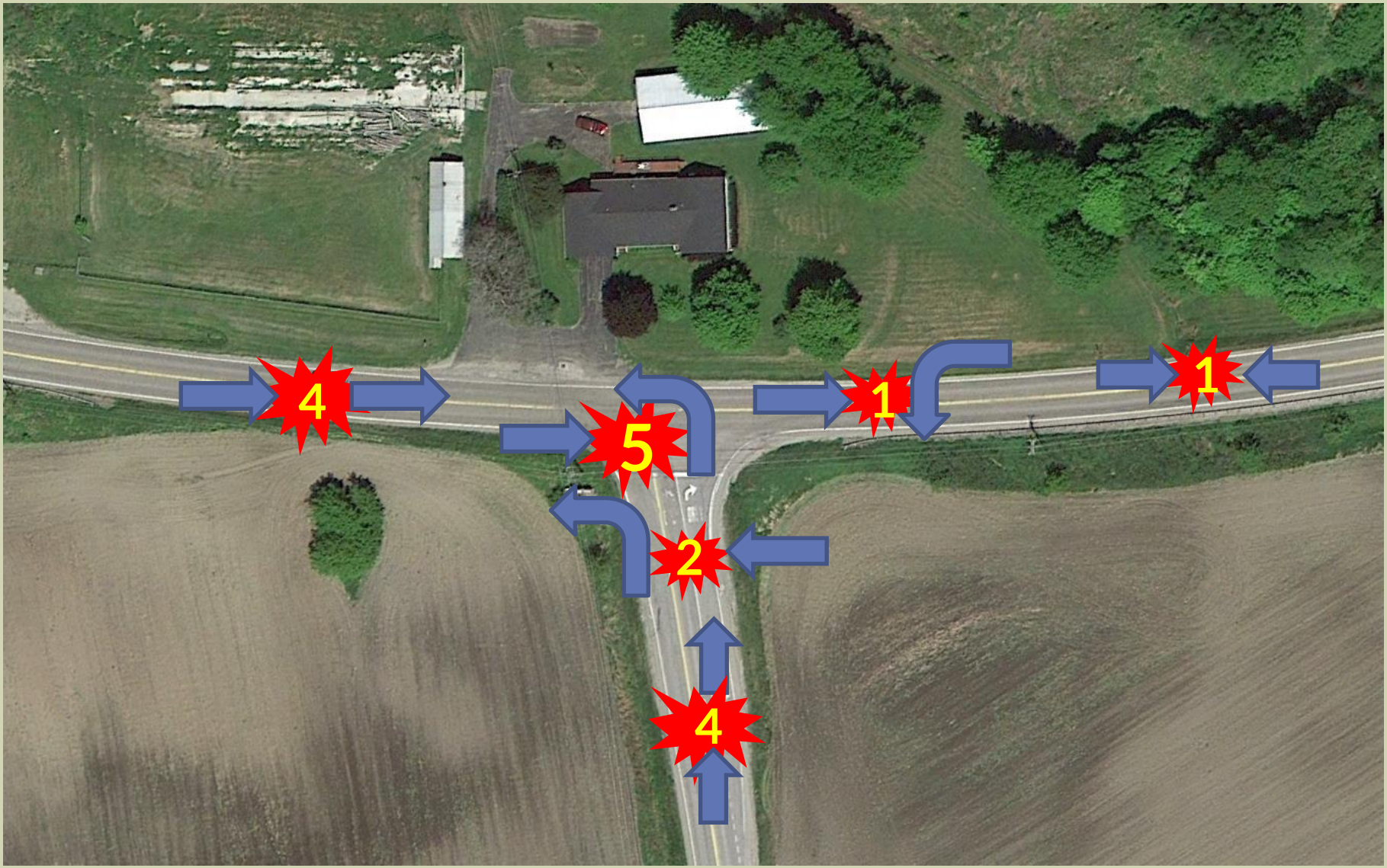


Vehicular Level of Service

	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


Agricultural Buildings
Sight Distance
to west = 430 ft
Residential
Sight Distance
to east = 500 ft
Route 117/River Road
Floodway
Agricultural Lands
Drainage Channel
Culvert
North Williston Road

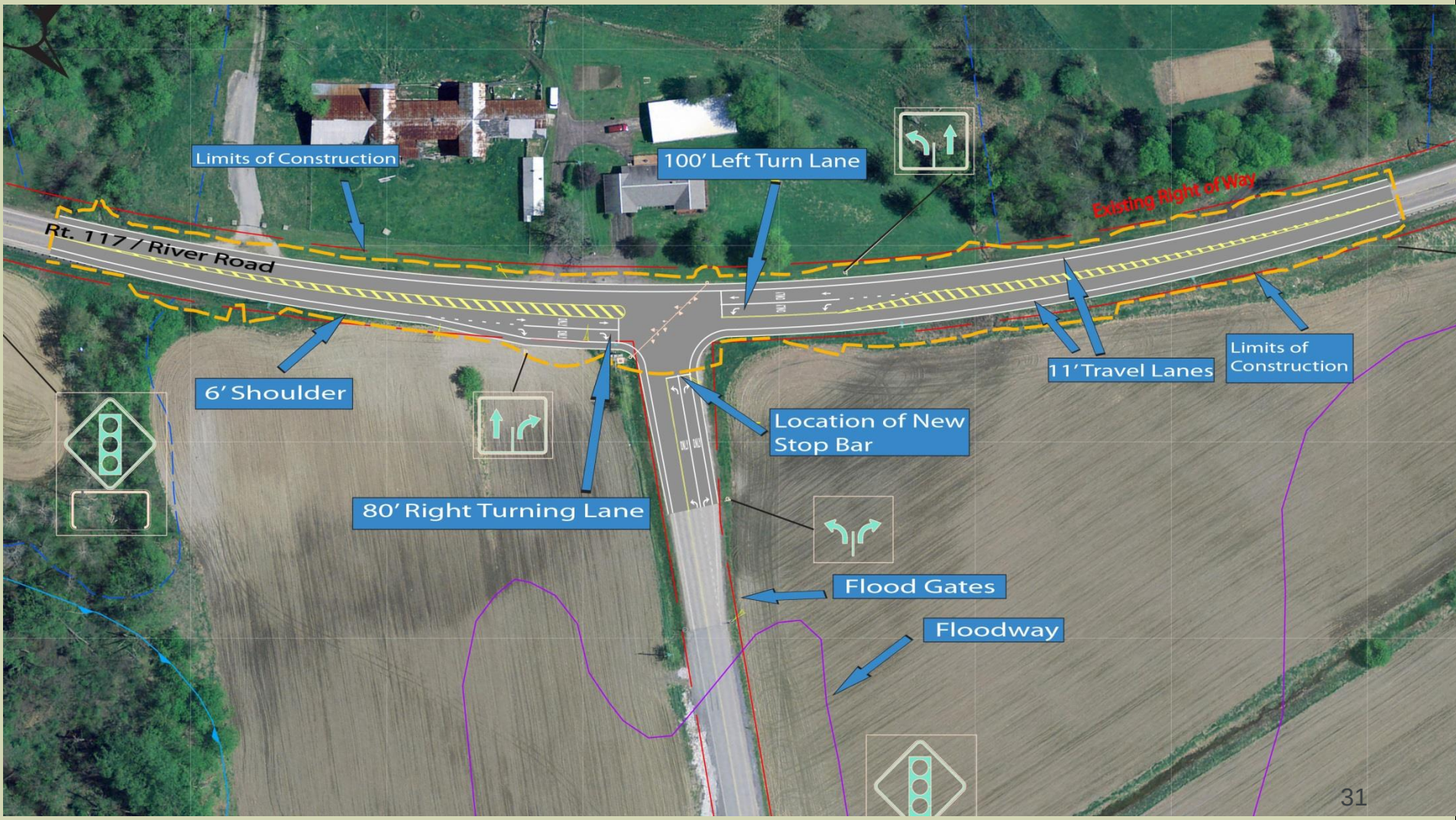
Crashes 2008 through 2012

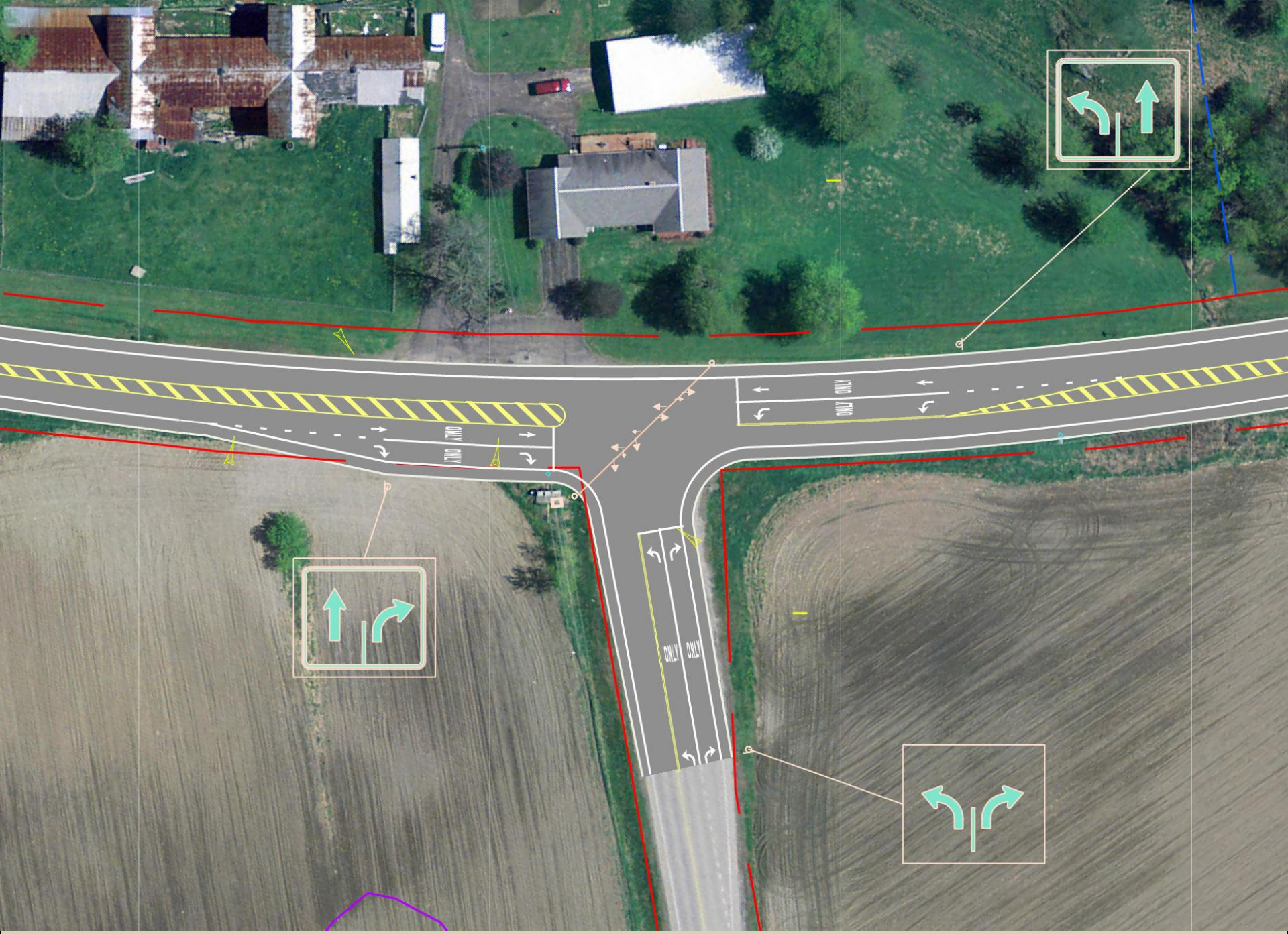


Alternatives

- Unsignalized Improvements
  - Provide westbound left- and eastbound right-turning lanes to improve safety by clarifying movements and improve level of service for northbound lefts.
- Signalization Improvements
  - Provide turning lanes to prevent blockage by waiting left turns, reduce eastbound rear-end collisions and avoid long eastbound queues
- Roundabout
  - Single lane, 140 feet in diameter

Unsignalized and Signalized Improvements

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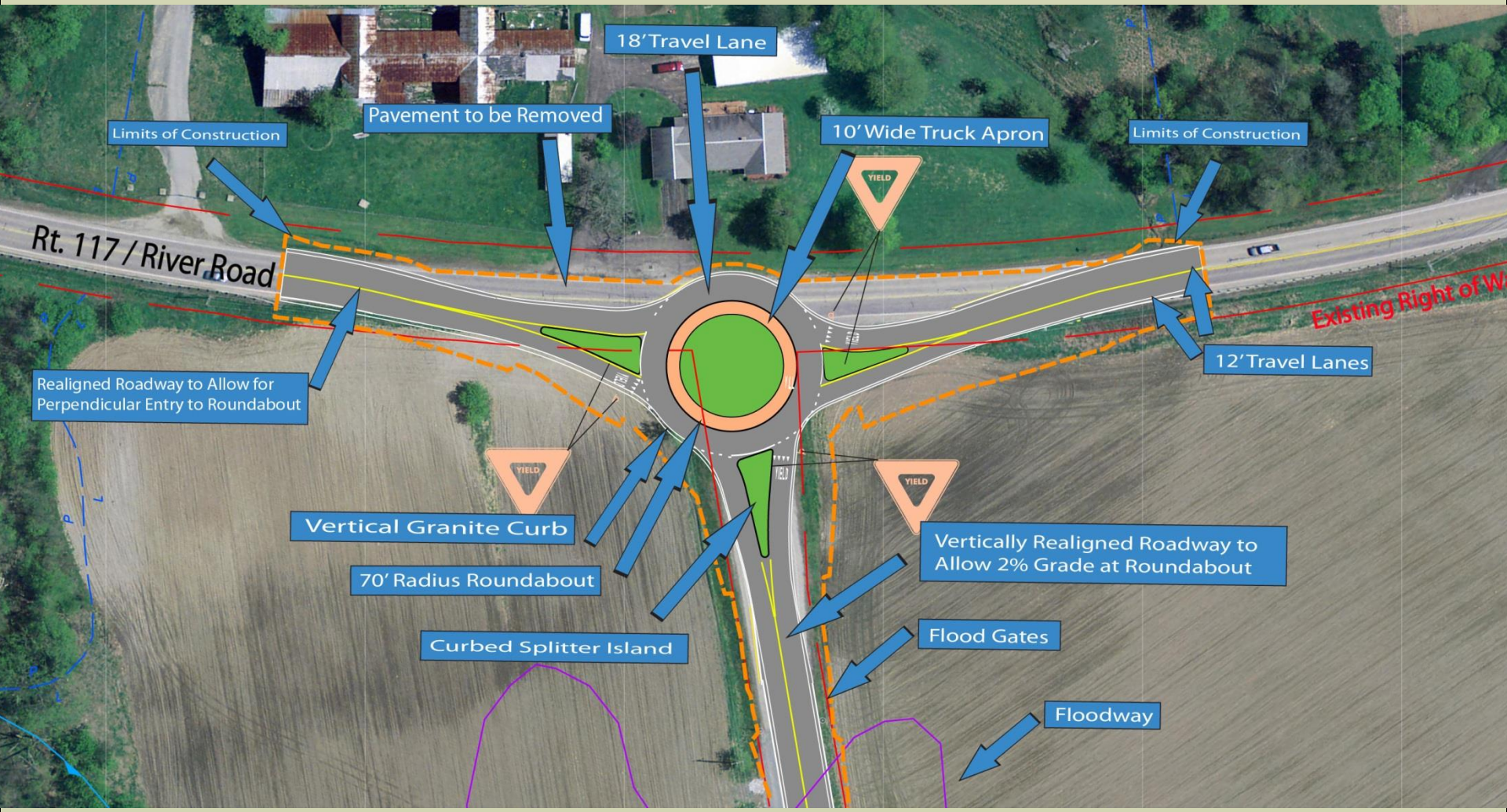
Roundabout


18' Travel Lane
Pavement to be Removed
10' Wide Truck Apron
Limits of Construction
Limits of Construction
Rt. 117 / River Road
Existing Right of W
12' Travel Lanes
Realigned Roadway to Allow for Perpendicular Entry to Roundabout
YIELD
YIELD
YIELD
Vertical Granite Curb
70' Radius Roundabout
Curbed Splitter Island
Vertically Realigned Roadway to Allow 2% Grade at Roundabout
Flood Gates
Floodway

2013 Level of Service

Alternative	AM LOS	AM Delay	AM V/C	PM LOS	PM Delay	PM V/C
No Build (northbound lefts)	D	27.2	0.47	F	115.3	1.08
Unsignalized (northbound lefts)	C	18.8	0.40	F	56.6	0.95
Signalized (overall)	A	9.2	0.32	A	9.6	0.53
Roundabout (overall)	A	8.2	0.26	A	9.5	0.55

2035 Level of Service

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

Alternative	Cost	Impact to Ag Lands and Hydric Soils	Right of way	Change in Volume
Unsignalized	$690,000	0.08 acres	0.27 acres	Negligible
Signal	$1,140,000	0.08 acres	0.27 acres	**Increase likely**
Roundabout	$1,100,000	**0.21 acres**	0.35 acres	**Increase likely**

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

Roundabout Considerations

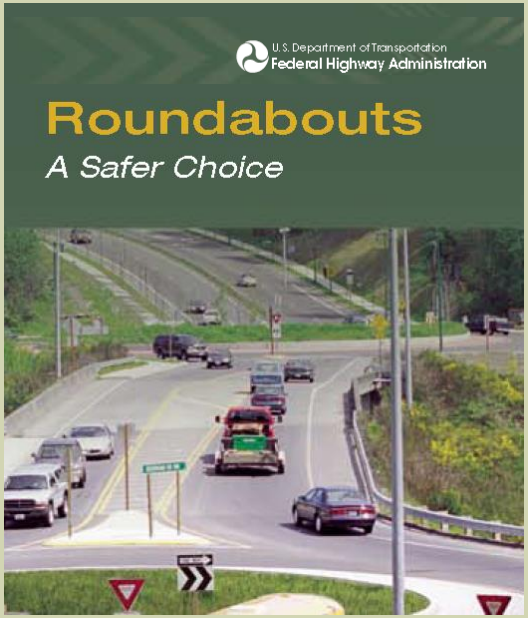
- ✓ Single lane roundabouts are the safest type of intersection, bar none.
- ✓ Speed reducing effect can improve quality of life, bicycle and pedestrian safety and environment.
- ✓ Island provides opportunity for beautification.

- X Snow removal will take more time and effort.
- X Require a larger area at the intersection

Safety: Signal vs. Roundabout

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

- Based on Crash Reduction Factors developed by the FHWA
- Roundabouts have much better record of reducing crashes at intersections, especially for rural higher speed roads.
- Cost of crashes at intersection estimated at $72,885 per crash, or $290,000 per year



NH DOT Roundabouts

NYSDOT Roundabouts

Alternatives Screening

Alternative	Safety - Crash Reduction	Congestion - LOS
Unsignalized	▪ Reduced crashes due to turning lanes	▪ Minor improvement due to turning lanes ▪ LOS F - North Williston Rd at PM Peak hour
✓ Signal	▪ Reduced from signal control and turning lanes ▪ Possible increase of rear-end collisions and high speed broadside crashes	▪ LOS A/B
✓ Roundabout	▪ Greatest crash and injury reduction due to design and low speed operations	▪ LOS A

Next Steps

- Review alternatives with Towns, CCRPC and State Agencies (VTrans, ANR) in September
- Present final alternatives at Selectboard Meetings
  - **October 7 – Williston**
  - **October 21 – Essex**
- Present recommended alternative at CCRPC Circ Alternatives meeting - October 30