

Lacy Road Reconstruction Project City of Fitchburg

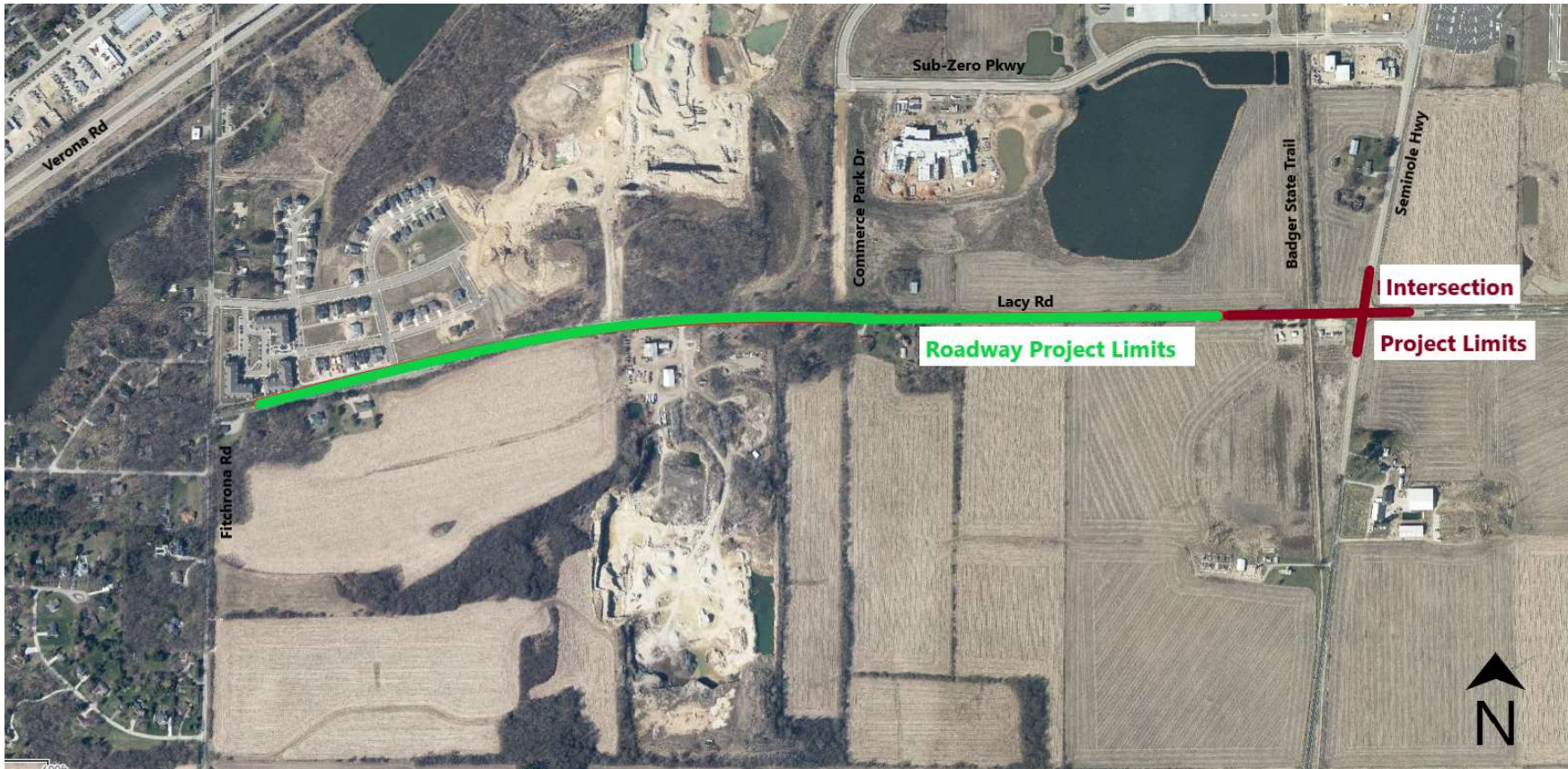
Public Information Meeting #2
August 31, 2021
5:30 PM



Agenda

- Background on Project
- Modified Design
- Questions and Answers
- Lacy & Seminole Intersection Control Options
- Questions and Answers

Location and Limits

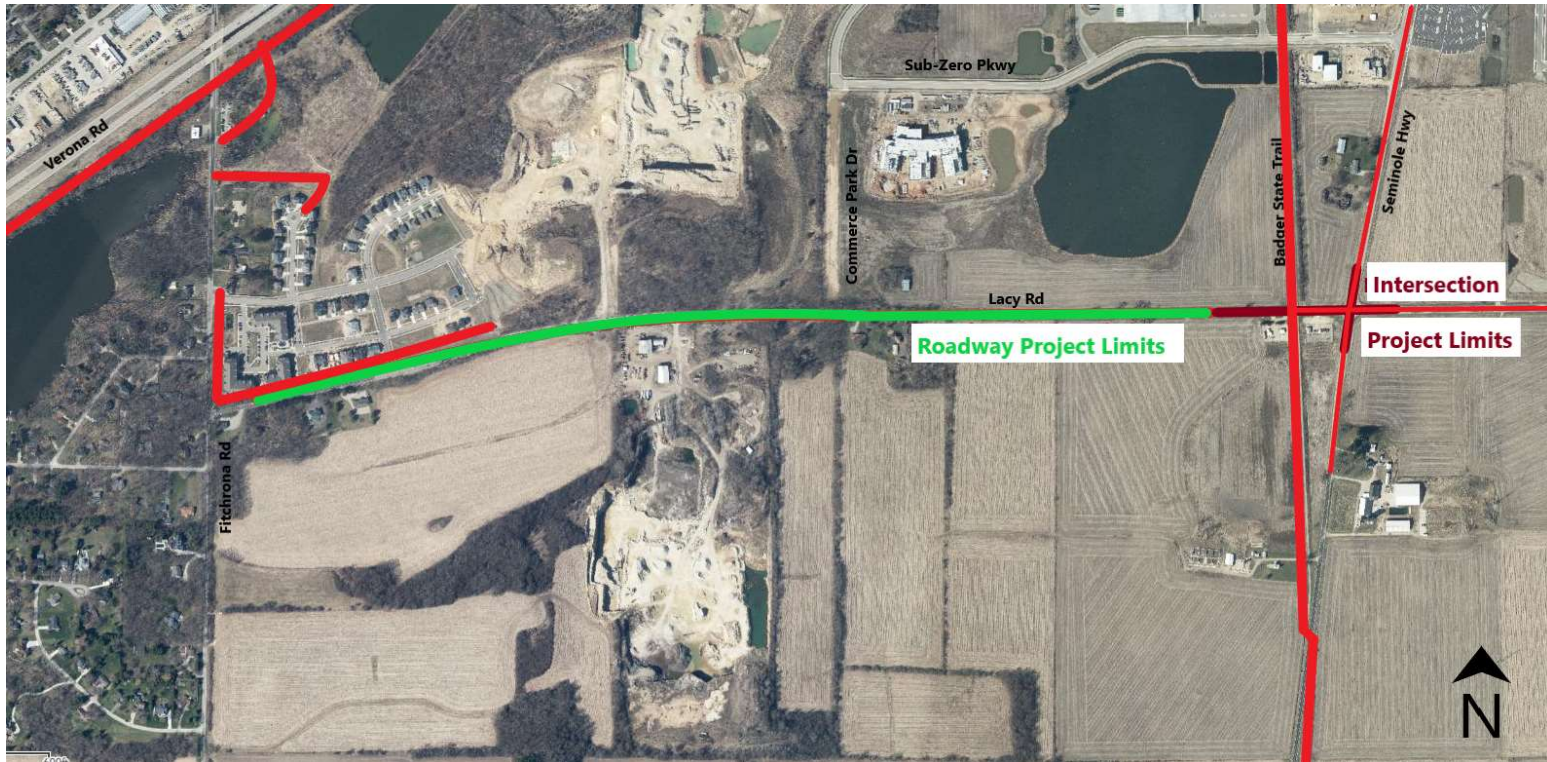


Need for Project

- Why Improve Lacy Road?
 - Address Existing and Long-Term Operational and Safety Needs
 - City Growth and Redevelopment along the Corridor
 - Discontinuous Pedestrian and Bicycle Accommodations

Need for Project

- Discontinuous Pedestrian and Bicycle Accommodations

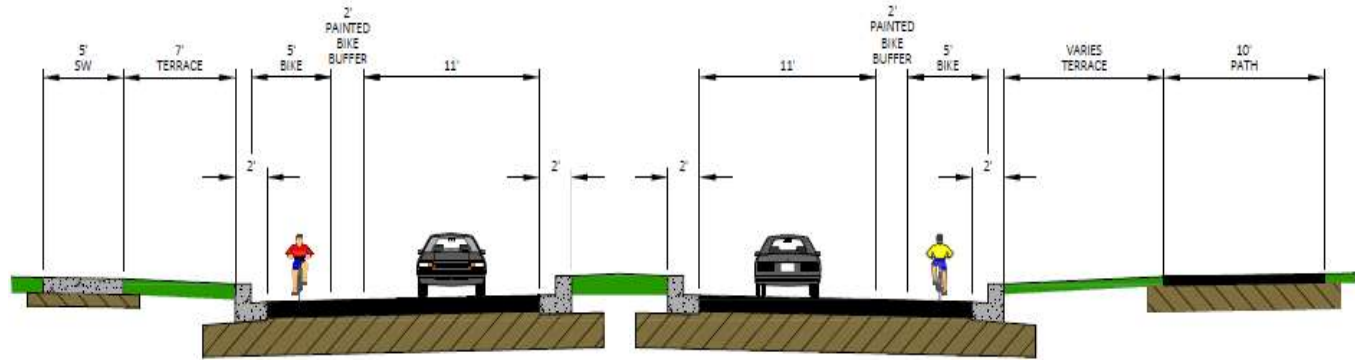


Project Outreach Responses

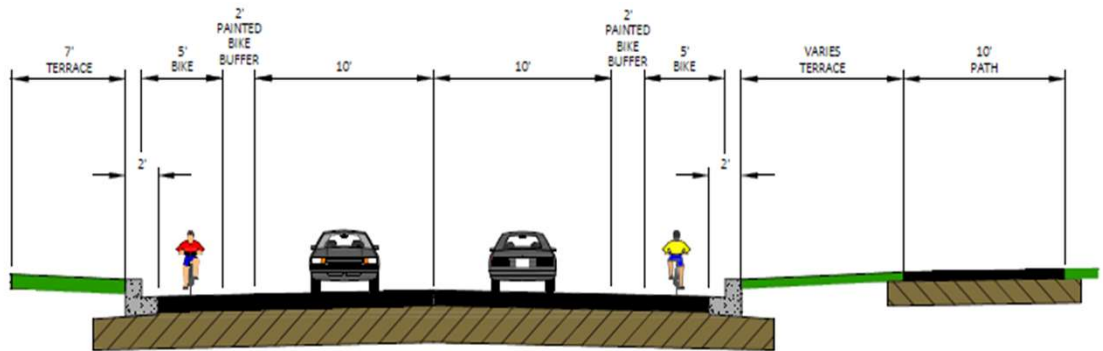
- Project team heard a lot of concern about the following:
 - Mature tree loss
 - Project cost
- Project team revised corridor to reflect smaller cross-section and reduced medians

Cross-section Comparison

February
Public Meeting



Approved
Resolution
R-61-21



Developed Priority Areas

- Tree preservation at Quarry - Commerce
 - Reduction in cross-section width
 - Horizontal Realignment (shift south)
- Quarry Ridge and south access alignment
- Tree preservation 900' west of Badger State Trail
- Relocating some existing trees to donor areas
- New street tree number, species, and clustering
- Permeable Pavement for SUP
- Raised versus surface level medians

Developed Priority Areas

- **Tree preservation at Quarry - Commerce**
 - **Reduction in cross-section width**
 - **Horizontal Realignment (shift south)**
- **Quarry Ridge and south access alignment**
 - Not able to align driveways at this time
 - Short-term design includes two way left turn lane
 - Long-term design adds left turn lanes at align access
 - Drops the roadway, increases north side cut, and increases tree loss
 - Could save 10 south side spruce trees adjacent to roadway

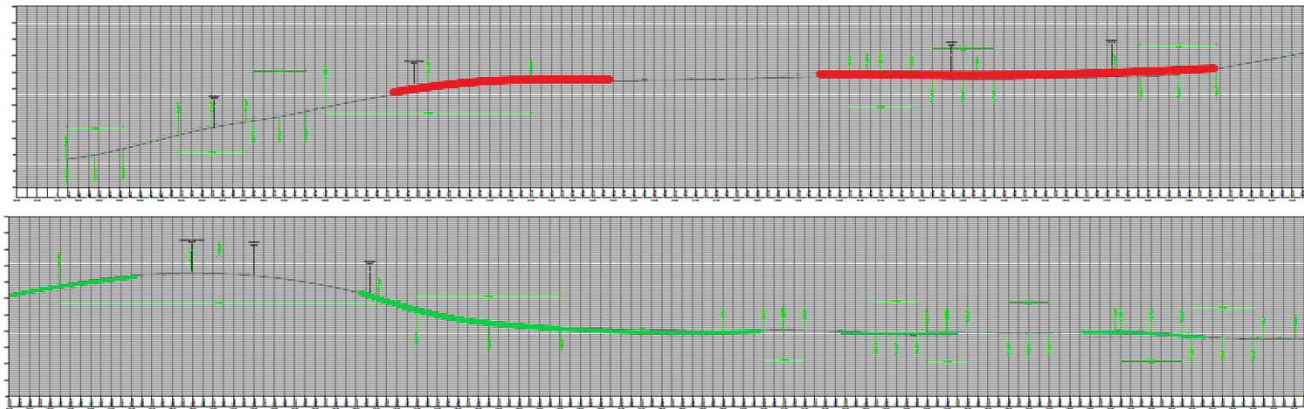
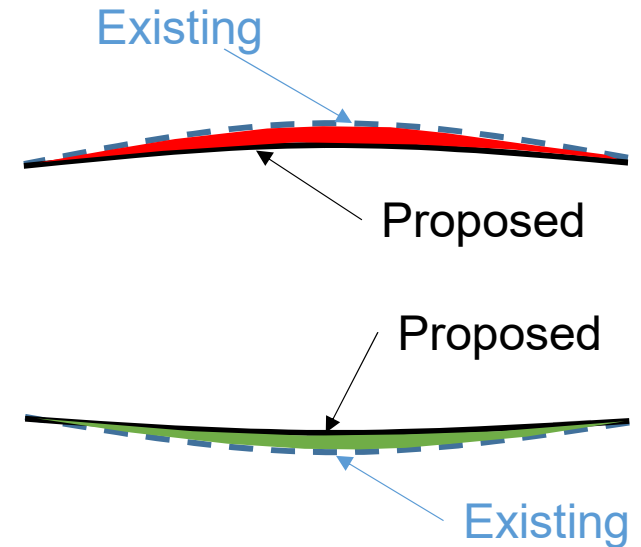
Developed Priority Areas

- **Tree preservation at Quarry - Commerce**
 - **Reduction in cross-section width**
 - **Horizontal Realignment (shift south)**
- **Quarry Ridge and south access alignment**



Earthwork Balancing

- Cut
 - Proposed grade is *lower* than existing
 - Removed soil
- Fill
 - Proposed grade is *higher* than existing
 - Added soil



Project is currently balanced

Retaining Wall

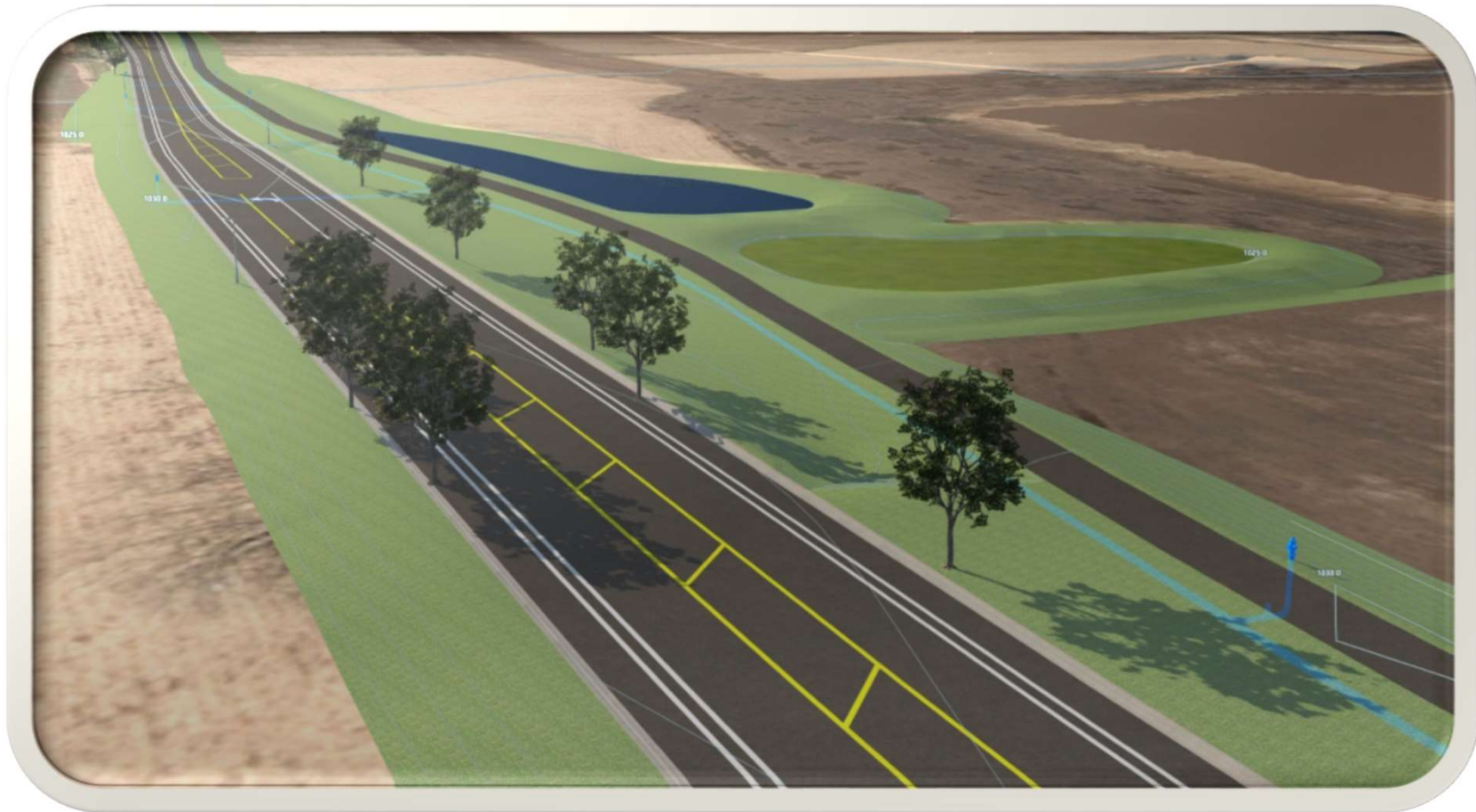
- Could save 20' to 75' of clearing
- Options used in Fish Hatchery Road Reconstruction Project
 - Modular Block Gravity Wall
 - [Generally used up to 8'](#)
 - \$100 per square foot
 - Soldier (Post and Panel) Pile Wall
 - [Generally used up to 28'](#)
 - Roughly \$85 per square foot
 - Cost to build 10' x 1,100' wall
 - Modular – \$1,100,000
 - Pile – \$880,000

Developed Priority Areas

- **Tree preservation 900' west of Badger State Trail**
 - South side trees damaged from overhead power lines
 - Focus on north side 4 bur oak and 1 black cherry
 - Plan to save majority and plant new trees to create small grove

Developed Priority Areas

- Tree preservation 900' west of Badger State Trail

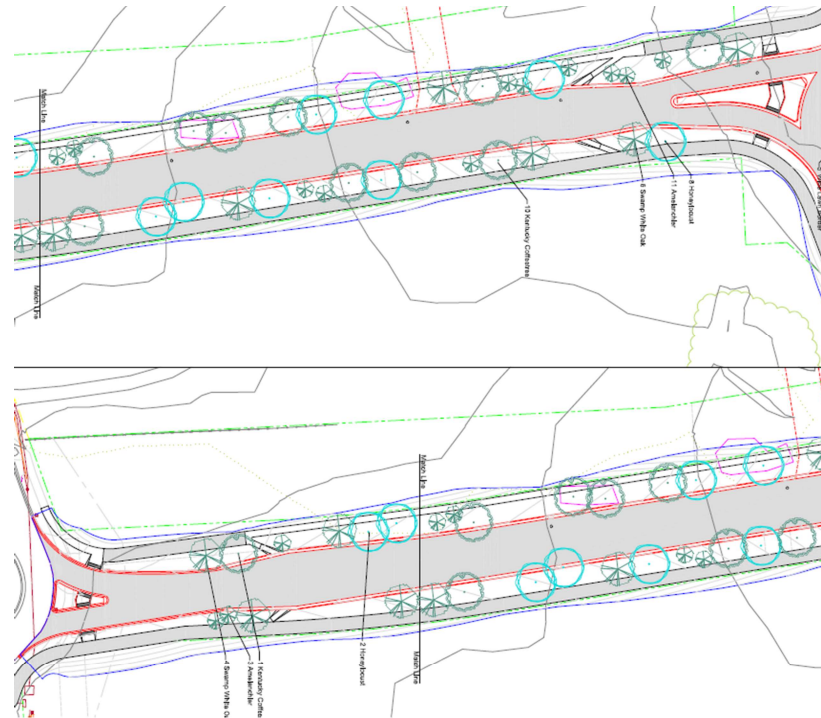


Developed Priority Areas

- **Relocating some existing trees to donor areas**
 - Not a viable option for preserving trees on corridor
 - Costly without good chance of survival
 - Issue of donee site disturbance during compressed schedule

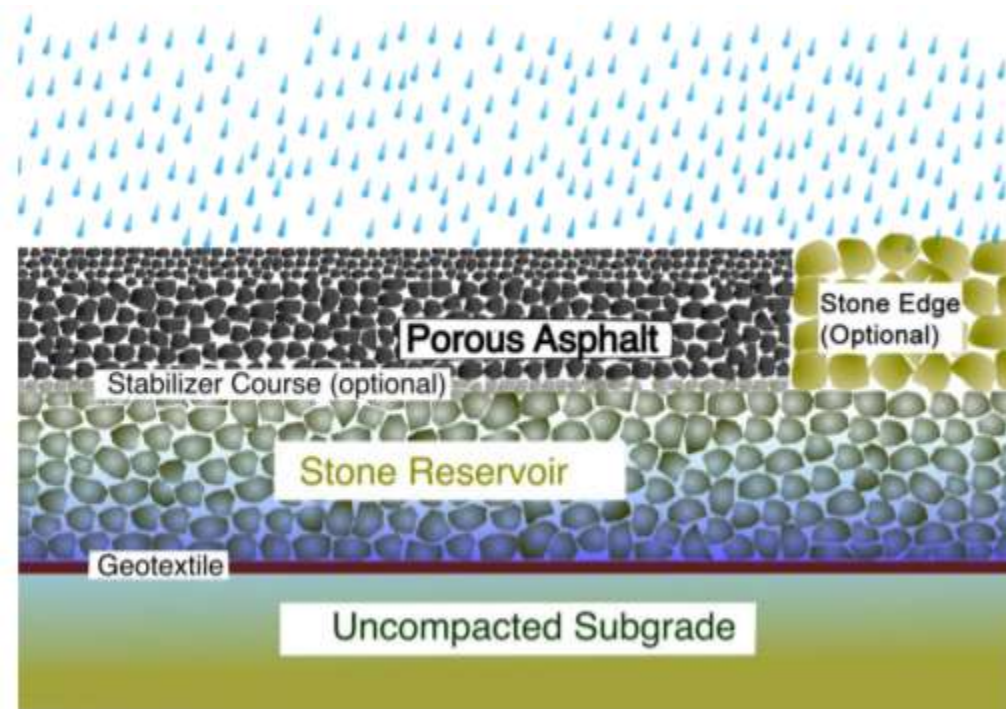
Developed Priority Areas

- **New street tree number, species, and clustering**
 - City ordinance requires street trees at 80' spacing
 - Project will double required number of street trees



Developed Priority Areas

- **Permeable Pavement for SUP**
 - Project plans to use permeable pavement in eastern portion of project



Source: <https://www.fhwa.dot.gov/pavement/asphalt/pubs/hif15009.pdf>

Permeable Pavement Benefits and Costs

Benefits

- Snow and ice melts faster, reduction in deicing salts (Lebens 2012)
- Cools stormwater temperature during summertime before discharge and mitigates heat island effects (Lebens 2012).
- Reduction in contamination in water runoff and sediment loading (Lebens 2012; Houle et al. 2013)
- Recharging of groundwater supplies (UNHSC 2012)
- Low impact development and cost effective technology for stormwater management, by reducing need for drainage structures and rights of way (Houle et al. 2013; UNHSC 2011; EPA 2014)
- Improves water and oxygen transfer to nearby plant roots (CTC & Associates 2012)

Disadvantages

- Pavement structure initial costs are often higher; however, this may be offset by cost reductions realized from stormwater infrastructure (Houle et al. 2013)
- Sloped pavements require extra design considerations such as underground berms and drainage pipes at low points
- Potential clogging with dirt and organic debris requiring specialized maintenance such as vacuuming or other cleaning mechanisms (UNHSC 2012)
- Some variation from standard construction practices

Source: <https://www.fhwa.dot.gov/pavement/asphalt/pubs/hif15009.pdf>

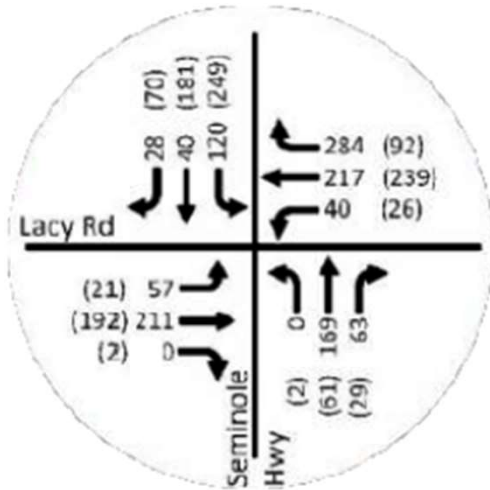
Developed Priority Areas

- **Raised versus surface level medians**
 - Project plans to use small raised medians only at Rock Ridge Rd

Q & A – Roadway project

- Additional Comments can be added through the online survey here:
<https://arcg.is/0fLHT0>

Lacy Road – Seminole Highway



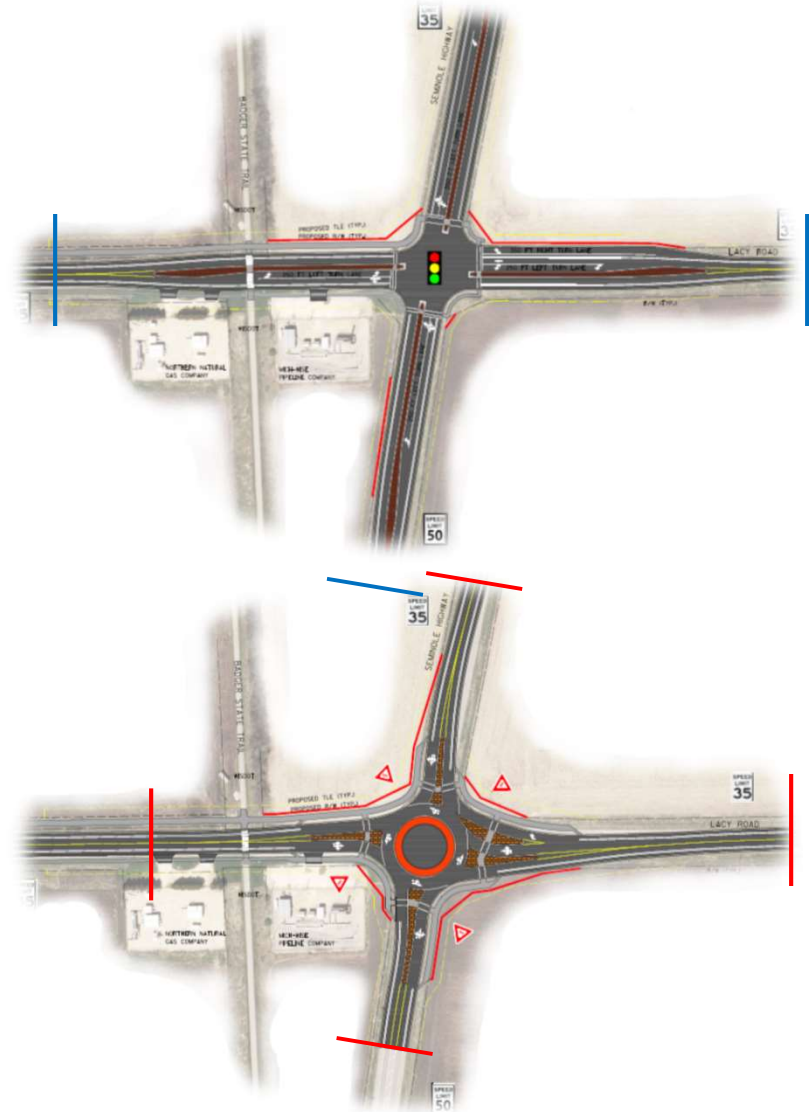
Vehicle Turning Movements
March 10 2020 - AM Peak (PM Peak)



Lacy Road – Seminole Highway

- Two New Alternatives:
 - **Traffic Signal**
 - Includes left turn lanes in all directions and right turn lane for westbound Lacy Rd
 - Estimated Cost:
 - Construction + ROW - \$2.76 M
 - Annual Maintenance - \$1,800
 - **Roundabout**
 - Includes right turn bypass lane for westbound Lacy Rd
 - Estimated Cost:
 - Construction + ROW - \$2.46 M

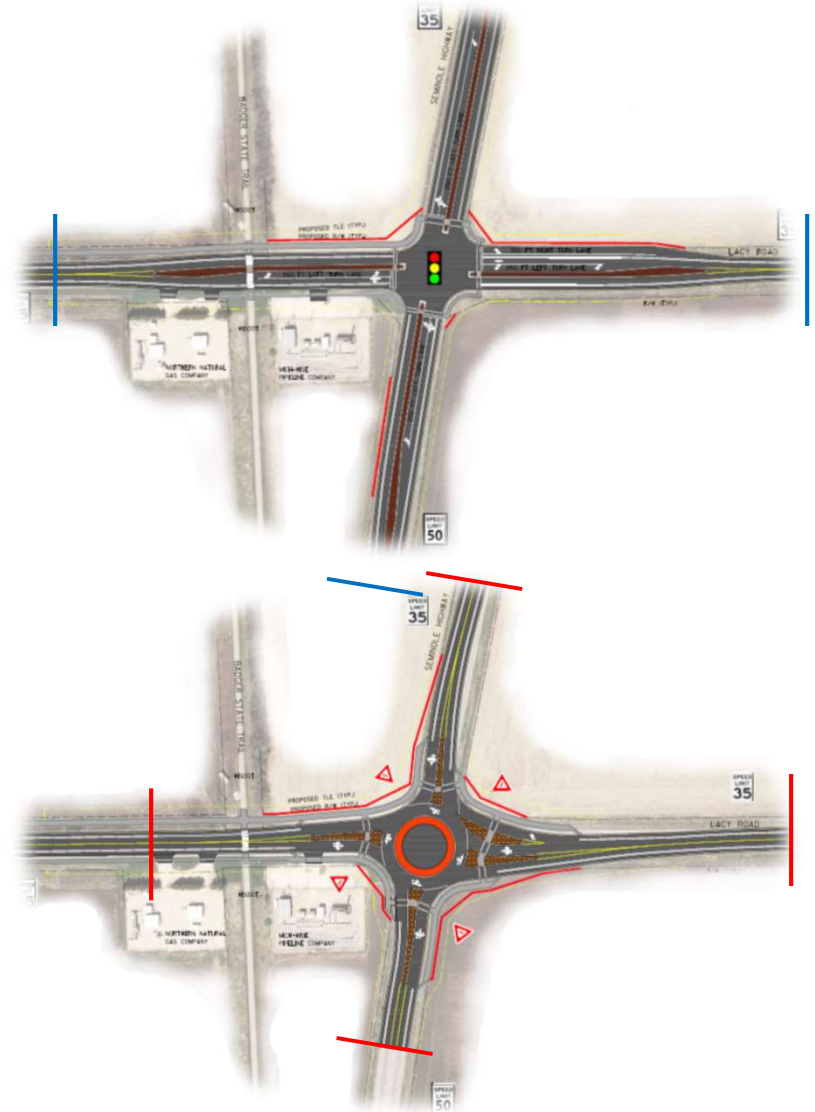
Note that functional area is different



Lacy Road – Seminole Highway

- Two New Alternatives:

Leg	Roundabout	Signal
North	535'	800'
East	645'	650'
South	365'	785'
West	475'	670'
Sum	2020'	2905'



Note that functional area is different

Lacy Road – Seminole Highway

Intersection Operational Comparison (**Existing Volume**)

Peak Period	Traffic Control	Measure of Effectiveness	Intersection Movement												Overall Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	Existing: AWSC	LOS	C			C			C			B			C
		Delay (s)	19			17			15			17			17
		V/C	0.57			0.52			0.51			0.50			--
		Queue (ft)	90			75			75			70			--
	Alternative 1: Traffic Signal	LOS	B	A	B	A	A	-	A	B	A	A	A		
		Delay (s)	11	9	10	9	9	-	9	11	7	9	9		
		V/C	0.14	0.43	0.09	0.45	0.43	0.00	0.45	0.28	0.14	--	--		
		Queue (ft)	<25	30	<25	30	25	<25	25	<25	<25	--	--		
	Alternative 2: Roundabout	LOS	A			A			A			A			A
		Delay (s)	6			6			7			6			6
		V/C	0.28			0.27			0.29			0.27			--
		Queue (ft)	30			30			30			25			--
PM Peak	Existing: AWSC	LOS	C			C			B			C			C
		Delay (s)	16			18			10			12			16
		V/C	0.46			0.56			0.17			0.20			--
		Queue (ft)	60			85			<25			25			--
	Alternative 1: Traffic Signal	LOS	B	A	B	B	B	B	A	A	A	A	A		
		Delay (s)	12	11	12	11	9	10	7	9	9	10	10		
		V/C	0.14	0.43	0.09	0.45	0.43	0.00	0.45	0.28	0.14	--	--		
		Queue (ft)	<25	40	<25	50	<25	<25	25	40	60	--	--		
	Alternative 2: Roundabout	LOS	A			A			A			A			A
		Delay (s)	7			5			4			5			8
		V/C	0.27			0.24			0.08			0.12			--
		Queue (ft)	30			25			<25			85			--

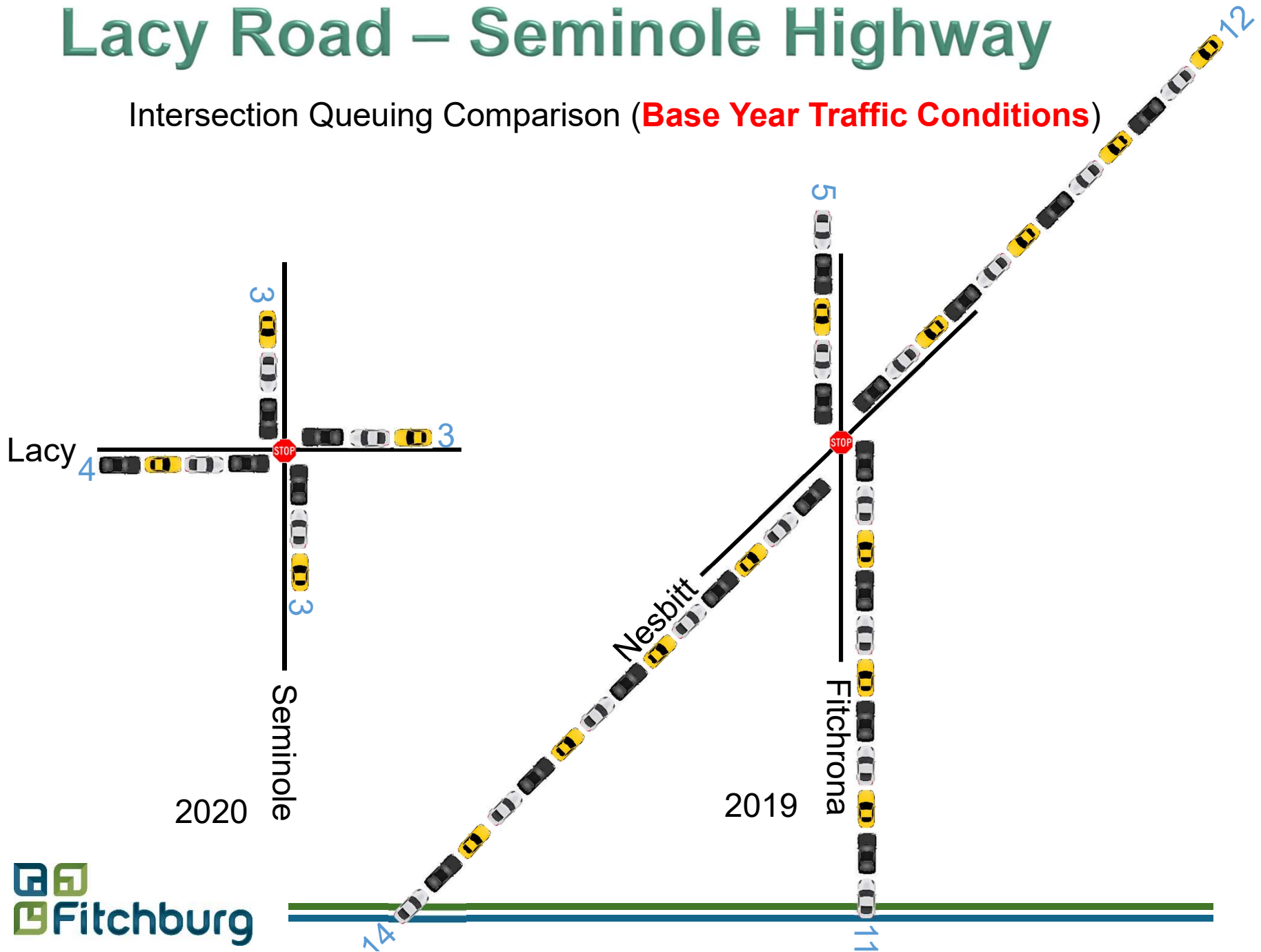
Lacy Road – Seminole Highway

Intersection Operational Comparison (2041 Volume)

Peak Period	Traffic Control	Measure of Effectiveness	Intersection Movement												Overall Intersection		
			Eastbound			Westbound			Northbound			Southbound					
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
AM Peak	Existing: AWSC	LOS	E			D			C			D			C	B	D
		Delay (s)	38			30			21			28			17	14	28
		V/C	0.81			0.74			0.63			0.69			0.35	0.23	--
		Queue (ft)	190			155			110			130			40	25	--
	Alternative 1: Traffic Signal	LOS	B	B	B	B	B	-	B	B	A	B	A	B	A	B	
		Delay (s)	13	10	12	10	12	-	10	14	9	14	9	11	9	11	
		V/C	0.23	0.46	0.11	0.47	0.62	0.00	0.50	0.33	0.17	0.33	0.17	--	0.33	0.17	
		Queue (ft)	<25	55	<25	55	70	<25	60	35	<25	35	<25	--	35	<25	
	Alternative 2: Roundabout	LOS	A			A			A			A			A		
		Delay (s)	8			8			7			9			7		
		V/C	0.36			0.35			0.33			0.36			0.26		
		Queue (ft)	45			40			40			45			25		
PM Peak	Existing: AWSC	LOS	C			D			B			B			C	D	C
		Delay (s)	24			31			11			15			23	25	24
		V/C	0.65			0.76			0.20			0.29			0.63	0.70	--
		Queue (ft)	115			160			<25			30			105	140	--
	Alternative 1: Traffic Signal	LOS	B	B	B	B	A	B	A	B	A	B	A	B	A	B	
		Delay (s)	14	11	13	12	10	11	7	11	9	11	9	11	9	11	
		V/C	0.09	0.50	0.09	0.61	0.23	0.00	0.18	0.45	0.52	0.45	0.52	--	0.45	0.52	
		Queue (ft)	<25	55	<25	70	<25	<25	<25	55	60	55	60	--	55	60	
	Alternative 2: Roundabout	LOS	A			A			A			A			B		
		Delay (s)	9			6			4			6			14		
		V/C	0.37			0.31			0.09			0.15			0.66		
		Queue (ft)	45			35			<25			<25			130		

Lacy Road – Seminole Highway

Intersection Queuing Comparison (**Base Year Traffic Conditions**)



Lacy Road – Seminole Highway

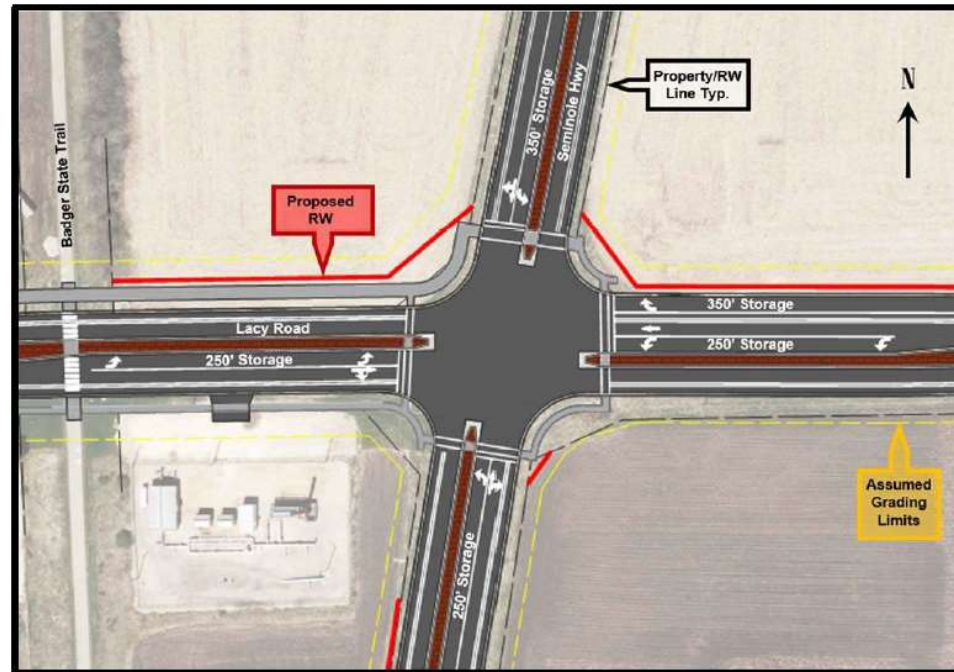
Intersection Operational Comparison (Sensitivity Analysis)

Traffic Control Alternatives	Peak Period	
	AM Peak	PM Peak
Existing: <i>All-Way Stop Control</i>	32%	39%
Alternative 1: <i>Traffic Signal</i>	102%	111%
Alternative 2: <i>Roundabout</i>	126%	63%

This table provides what amount of additional vehicle volume each alternate can handle before any movement has a Level of Service F

- i.e. higher percentages indicate more spare capacity

Lacy Road – Seminole Highway



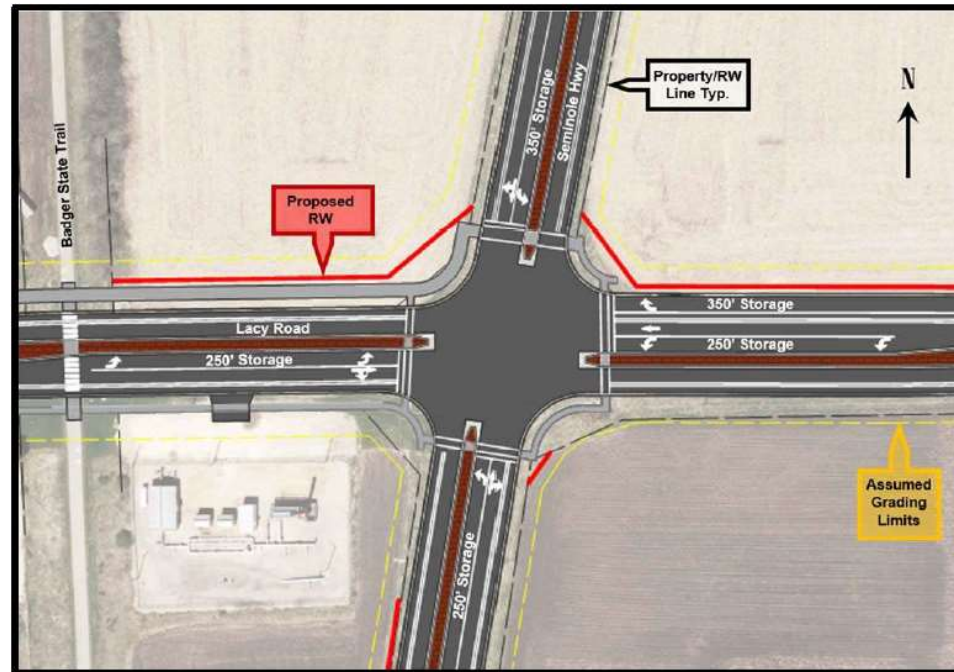
Pros:

- Lower Cost than signal
- Less out of direction travel for bike/pedestrians

Cons:

- Little spare capacity
- Some discomfort for bike/pedestrians depending on yielding compliance

Lacy Road – Seminole Highway



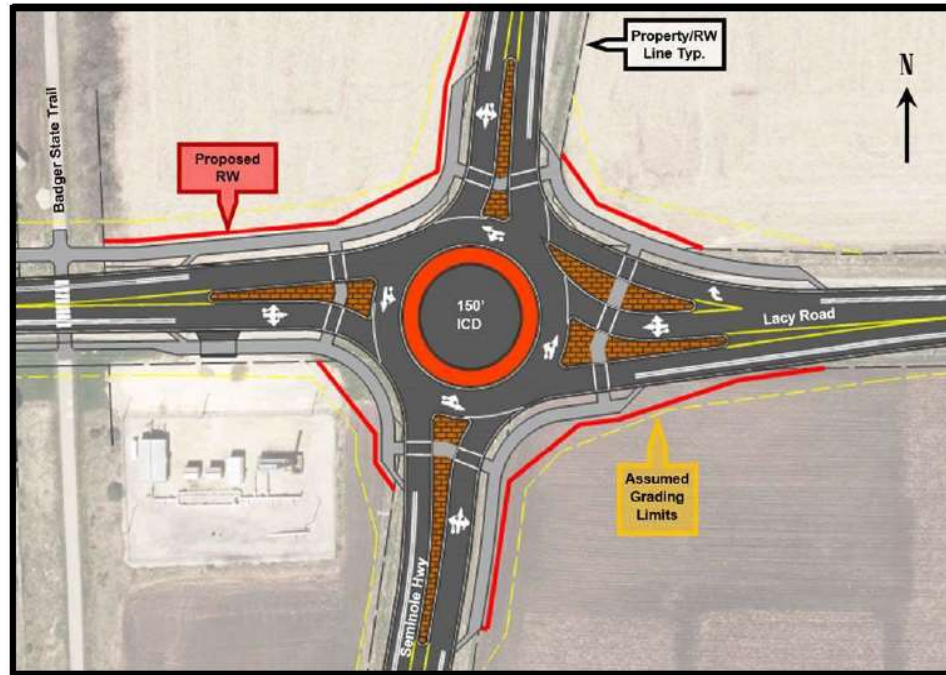
Pros:

- Higher spare capacity
- Less out of direction travel for bike/pedestrians

Cons:

- Higher cost
- Longer wait for bikes/pedestrians

Lacy Road – Seminole Highway



Pros:

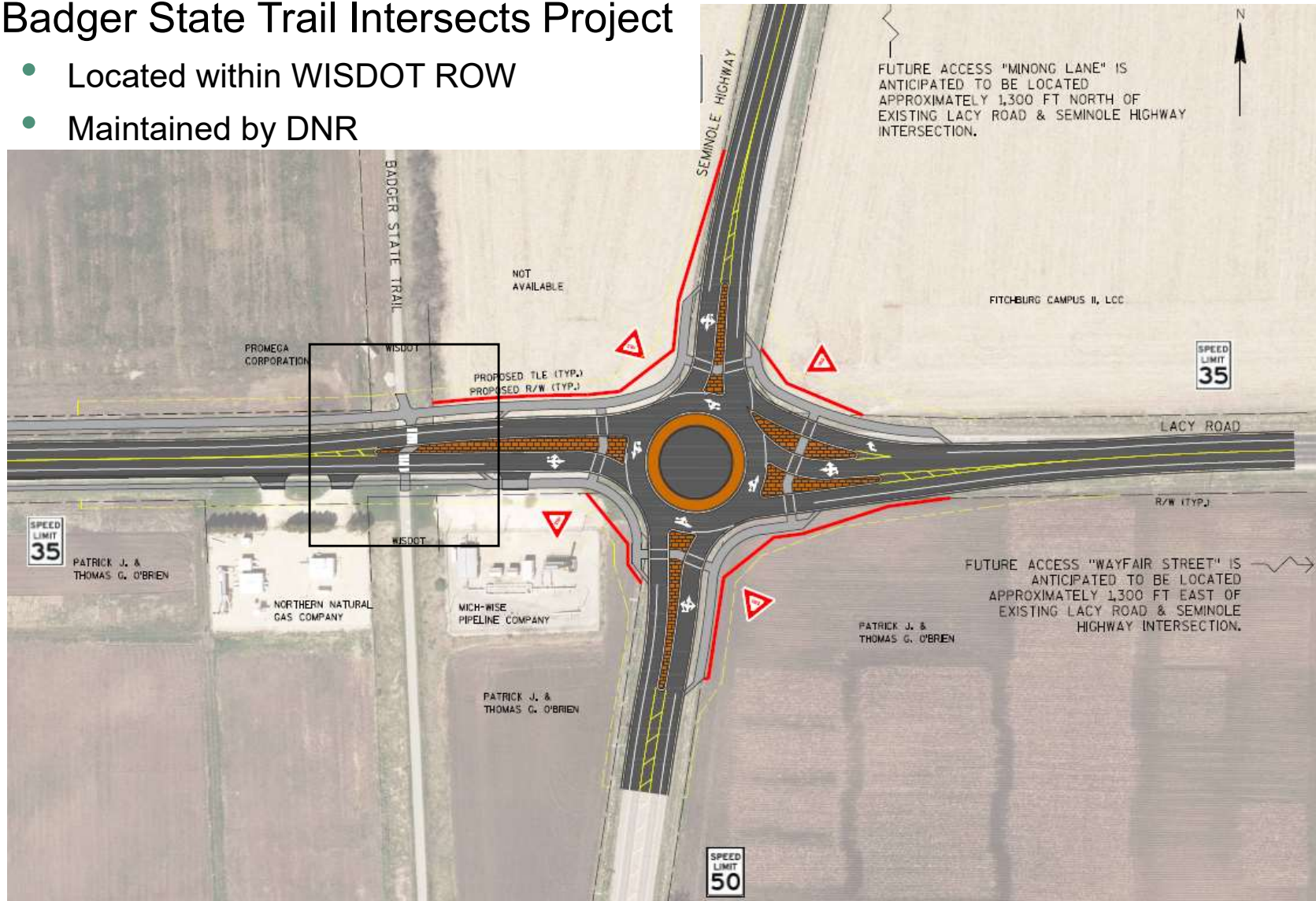
- Lower Cost than signal
- Bike/pedestrians cross one direction at a time
- Lower right angle collisions

Cons:

- Difficult crossing for pedestrians with vision impairments
- No emergency vehicle priority

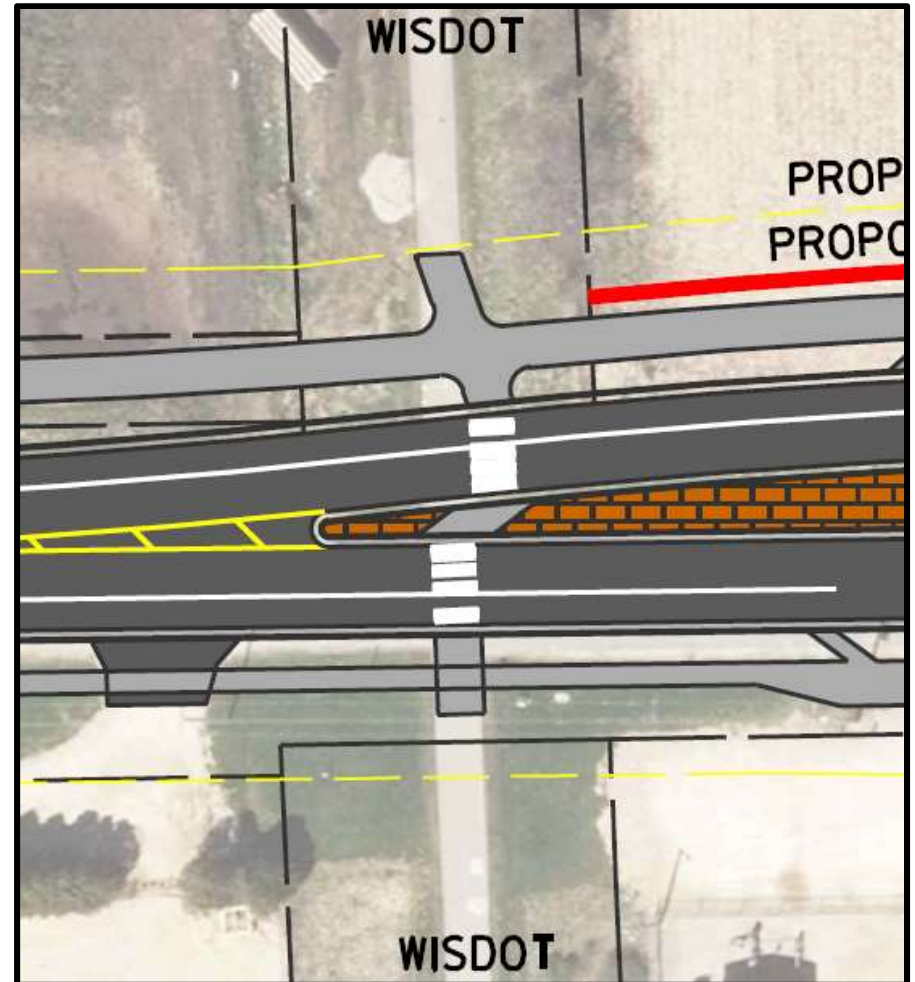
Trail Crossing

- Badger State Trail Intersects Project
 - Located within WISDOT ROW
 - Maintained by DNR



Trail Crossing

- Badger State Trail Intersects Project
 - Connecting Shared Use Paths
 - Designed to extend 1 mile to the west
 - Planned to extend to schools ½ mile to the east
 - Currently designed as a z-crossing
 - Two-stage crossing
 - Improves visibility of trail users and vehicles
 - May include Rectangular Rapid Flashing Beacon (RRFB)



Q & A – Lacy & Seminole project

- Additional Comments can be added through the online survey here:
<https://arcg.is/0fLHT0>