US ROUTE 1 RECONSTRUCTION PA ROUTE 41 TO SCHOOLHOUSE ROAD

SR 3033 (Newark Rd) Interchange

New Garden Township

PROJECT LOCATION AND OVERVIEW

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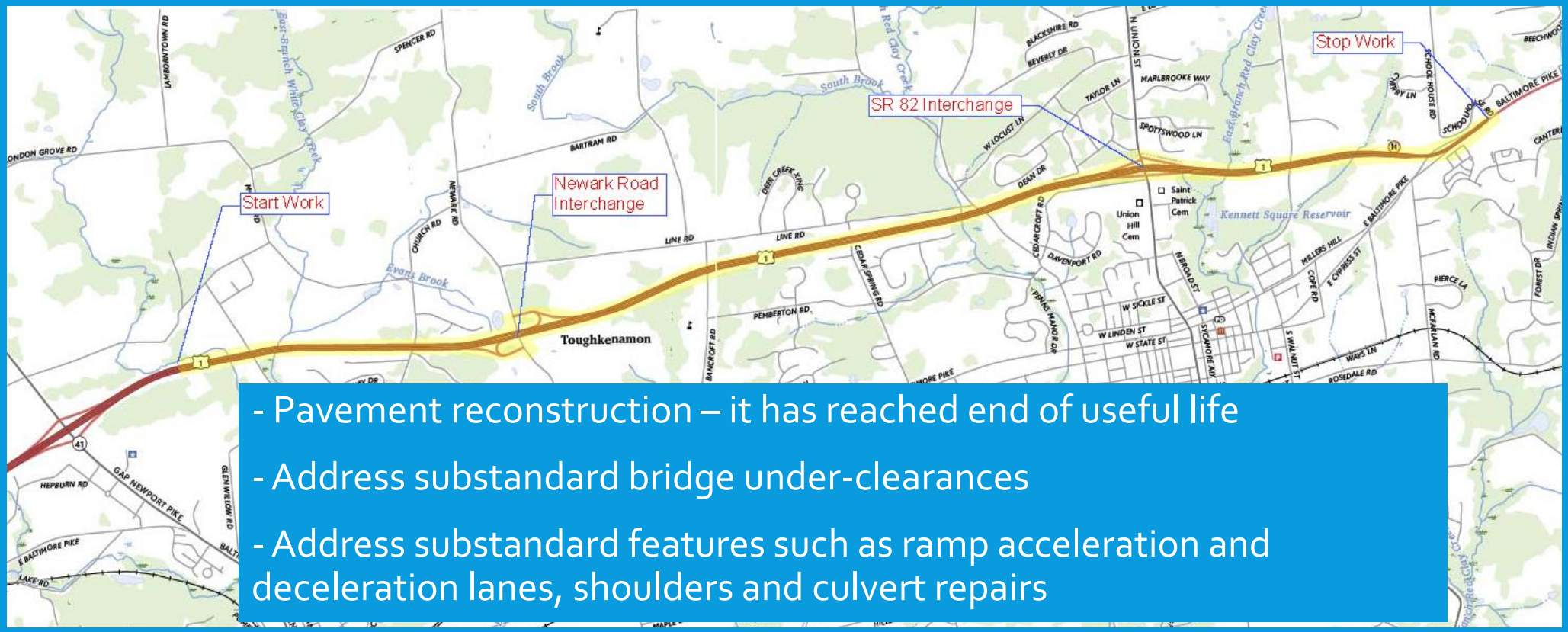

- Pavement reconstruction – it has reached end of useful life
- Address substandard bridge under-clearances
- Address substandard features such as ramp acceleration and deceleration lanes, shoulders and culvert repairs

ADJACENT PROJECTS IN DESIGN

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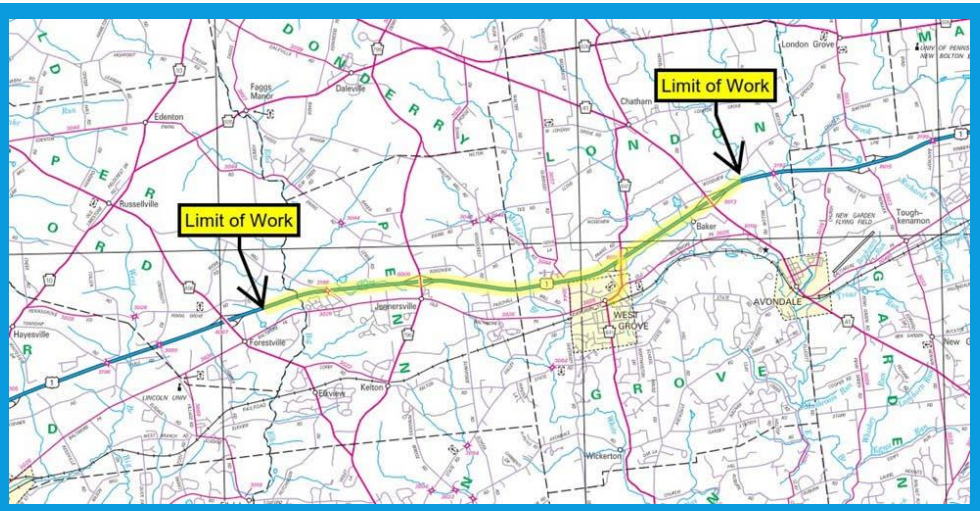
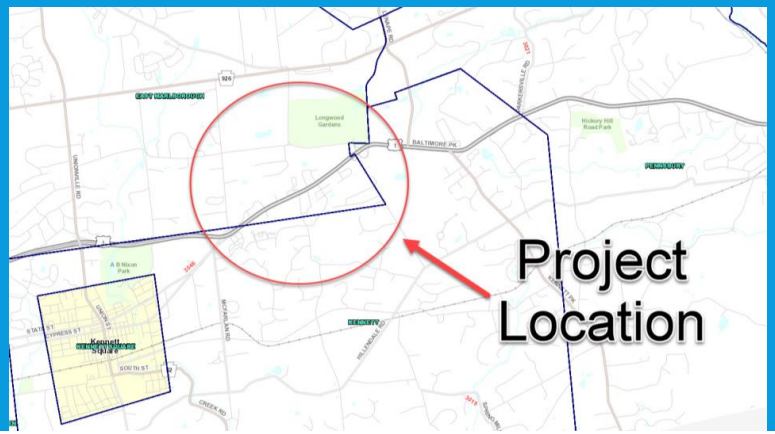
SR 1 Reconstruction Project:

- Sec 100 just N of Locust St Bridge to just N of SR 896
- Sec 200 meets SR 896 to just north of SR 41



SR 1 Widening Project:

- 3 through lanes each direction from Kennett/Oxford Bypass to SR 1 at Greenwood Road



EXISTING CONDITIONS

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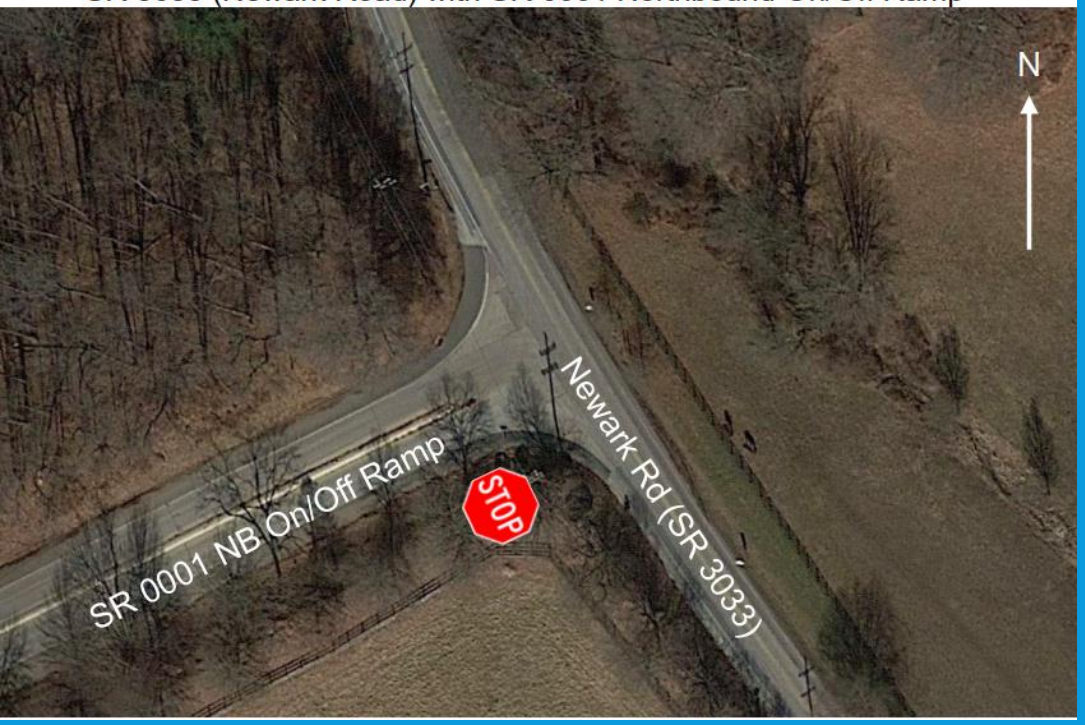
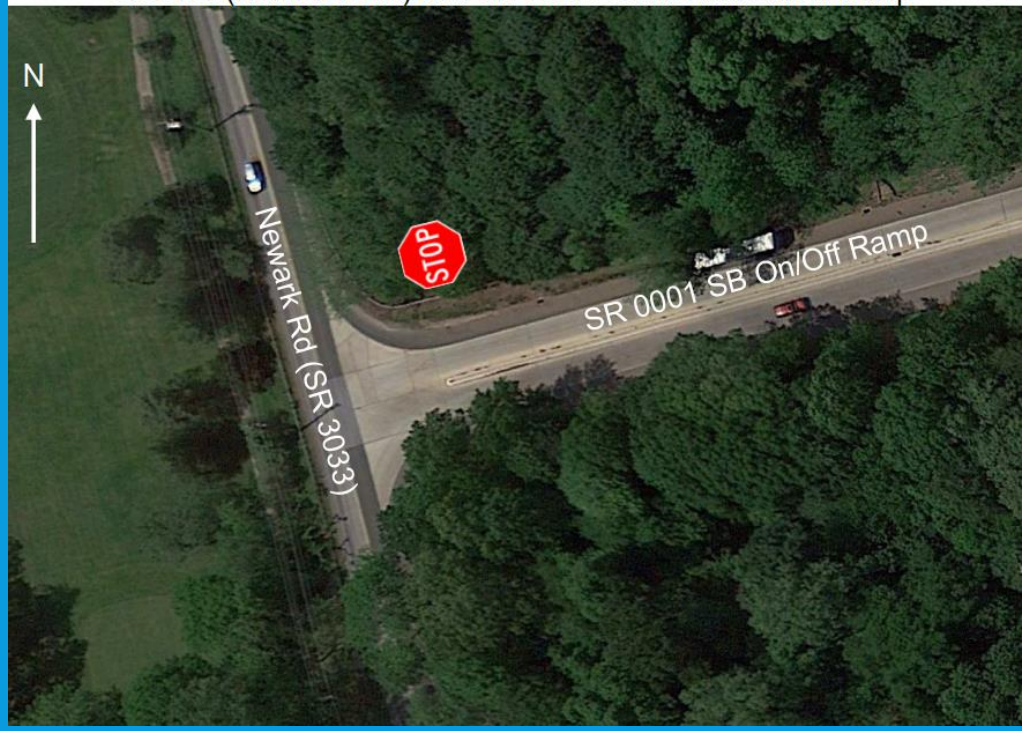
SR 3033 (Newark Road) with SR 0001 Northbound On/Off Ramp



SR 3033 (Newark Road) with SR 0001 Southbound On/Off Ramp



EXISTING CONDITIONS

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Crash Analysis 2017-2021

10 total crashes (3 with injuries)

40% angle
30% hit fixed object
20% head on
10% rear end

Location	Total Crashes	Hit Fixed Object	Head On	Angle	Pedestrian	Rear End	Sideswipe	Uknown / Deer	Non - collision
SR 1 SB Off-Ramp at SR 3033 (Newark Rd)	0	0	0	0	0	0	0	0	0
SR 1 SB On-Ramp at SR 3033 (Newark Rd)	1	1	0	0	0	0	0	0	0
SR 3033 (Newark Rd) Southbound Ramp Intersection	8	2	2	3	0	1	0	0	0
SR 1 NB Off-Ramp at SR 3033 (Newark Rd)	0	0	0	0	0	0	0	0	0
SR 1 NB On-Ramp at SR 3033 (Newark Rd)	0	0	0	0	0	0	0	0	0
SR 3033 (Newark Rd) Northbound Ramp Intersection	1	0	0	1	0	0	0	0	0
Total	10	3	2	4	0	1	0	0	0
Percentage		30%	20%	40%	0%	10%	0%	0%	0%

FUTURE CONDITIONS

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Included neighboring developments considered when developing future conditions

- Modern Mushroom Business Park development potentially completed by 2030, future site traffic overlaid on 2030 and 2050 volumes

TRAFFIC ANALYSIS

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Included a No-Build scenario in the Opening Year 2030 and Design Year 2050

Additionally, evaluated:

- Signal Warrant – 4-hr warrant met at northbound ramp intersection in 2050
- Turn Lane Warrant
  - left turn lanes from SR 3033 onto US 1 at both intersections under stop-control and signal control conditions
  - right turn lanes from SR 3033 onto US 1 at southbound ramp intersection under stop-control and signal control conditions

Alternatives Analysis included:

- Alternative 1: Signal Control with Auxiliary Lanes
- Alternative 2: Single-Lane Roundabout Control

Existing and No Build Delay and Level of Service Summary (AM)

AM Peak			2022 Existing							2030 No Build							2050 No Build						
ID	Intersection	Lane Group	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS
51	SR 3033 at SR 01 SB Ramps	WBLR	13.1	B	WB	13.1	B	3.1	A	21.7	C	WB	21.7	C	5.5	A	31.2	D	WB	31.2	D	7.5	A
		NBTR	0.0	A	NB	0.0	A			0.0	A	NB	0.0	A			0.0	A	NB	0.0	A		
		SBTL	3.0	A	SB	3.0	A			2.2	A	SB	2.2	A			2.4	A	SB	2.4	A		
52	SR 3033 at SR 01 NB Ramps	EBLR	22.2	C	EB	22.2	C	10.3	B	142.3	F	EB	142.3	F	56.1	F	317.5	F	EB	317.5	F	124.0	F
		NBTL	3.7	A	NB	3.7	A			3.9	A	NB	3.9	A			4.1	A	NB	4.1	A		
		SBTR	0.0	A	SB	0.0	A			0.0	A	SB	0.0	A			0.0	A	SB	0.0	A		

Existing and No Build Delay and Level of Service Summary (PM)

PM Peak			2022 Existing							2030 No Build							2050 No Build						
ID	Intersection	Lane Group	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS
51	SR 3033 at SR 01 SB Ramps	WBLR	19.1	C	WB	19.1	C	5.3	A	41.4	E	WB	41.4	E	8.4	A	112.1	F	WB	112.1	F	21.4	C
		NBTR	0.0	A	NB	0.0	A			0.0	A	NB	0.0	A			0.0	A	NB	0.0	A		
		SBTL	4.0	A	SB	4.0	A			4.5	A	SB	4.5	A			4.9	A	SB	4.9	A		
52	SR 3033 at SR 01 NB Ramps	EBLR	15.3	C	EB	15.3	C	4.7	A	44.0	E	EB	44.0	E	10.0	A	123.9	F	EB	123.9	F	26.3	D
		NBTL	2.1	A	NB	2.1	A			2.5	A	NB	2.5	A			2.6	A	NB	2.6	A		
		SBTR	0.0	A	SB	0.0	A			0.0	A	SB	0.0	A			0.0	A	SB	0.0	A		

Alternative 1 Signalized Delay and Level of Service Summary (AM)

AM Peak			2030 Signal							2050 Signal						
ID	Intersection	Lane Group	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS
51	SR 3033 at SR 01 SB Ramps	WBLR	24.5	C	WB	25.5	C	11.6	B	25.8	C	WB	25.8	C	12.6	B
		NBT	10.8	B	NB	10.3	B			12.3	B	NB	11.7	B		
		NBR	8.5	A						9.1	A					
		SBL	6.4	A	SB	5.2	A			7.0	A	SB	5.7	A		
		SBT	4.9	A						5.3	A					
52	SR 3033 at SR 01 NB Ramps	EBLR	40.4	D	EB	40.4	D	28.9	C	48.0	D	EB	48.0	D	35.7	D
		NBL	16.1	B	NB	13.3	B			20.9	C	NB	16.4	B		
		NBT	11.4	B						13.5	B					
		SBTR	29.1	C	SB	29.1	C			38.6	D	SB	38.6	D		

Alternative 1 Signalized Delay and Level of Service Summary (PM)

PM Peak			2030 Signal							2050 Signal						
ID	Intersection	Lane Group	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS
51	SR 3033 at SR 01 SB Ramps	WBLR	32.5	C	WB	32.5	C	12.6	B	32.6	C	WB	32.6	C	13.3	B
		NBT	10.1	B	NB	10.1	B			10.8	B	NB	10.7	B		
		NBR	10.1	B						10.7	B					
		SBL	6.2	A	SB	4.9	A			7.2	A	SB	5.7	A		
		SBT	4.1	A						4.9	A					
52	SR 3033 at SR 01 NB Ramps	EBLR	32.3	C	EB	32.3	C	14.1	B	35.5	D	EB	35.5	D	16.5	B
		NBL	7.9	A	NB	7.4	A			9.4	A	NB	8.8	A		
		NBT	7.2	A						8.6	A					
		SBTR	14.3	B	SB	14.3	B			17.3	B	SB	17.3	B		

Alternative 2 Roundabout Delay and Level of Service Summary (AM)

AM Peak			2030 Roundabout							2050 Roundabout						
ID	Intersection	Lane Group	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS
51	SR 3033 at SR 01 SB Ramps	WBLR	6.3	A	WB	6.3	A	6.3	A	7.2	A	WB	7.2	A	7.0	A
		NBTR	6.2	A	NB	6.2	A			7.0	A	NB	7.0	A		
		SBTL	6.3	A	SB	6.3	A			6.9	A	SB	6.9	A		
52	SR 3033 at SR 01 NB Ramps	EBLR	14.1	B	EB	14.1	B	9.9	A	18.7	C	EB	18.7	C	12.4	B
		NBTL	7.3	A	NB	7.3	A			8.5	A	NB	8.5	A		
		SBTR	7.3	A	SB	7.3	A			8.2	A	SB	8.2	A		

Alternative 2 Roundabout Delay and Level of Service Summary (PM)

PM Peak			2030 Roundabout							2050 Roundabout						
ID	Intersection	Lane Group	Delay	LOS	Appr	Delay	LOS	Delay	LOS	Delay	LOS	Appr	Delay	LOS	Delay	LOS
51	SR 3033 at SR 01 SB Ramps	WBLR	6.3	A	WB	6.3	A	8.0	A	7.2	A	WB	7.2	A	9.4	A
		NBTR	9.6	A	NB	9.6	A			11.4	B	NB	11.4	B		
		SBTL	5.9	A	SB	5.9	A			6.7	A	SB	6.7	A		
52	SR 3033 at SR 01 NB Ramps	EBLR	6.7	A	EB	6.7	A	8.5	A	7.7	A	EB	7.7	A	9.9	A
		NBTL	10.2	B	NB	10.2	B			12.0	B	NB	12.0	B		
		SBTR	6.5	A	SB	6.5	A			7.3	A	SB	7.3	A		

SAFETY ANALYSIS

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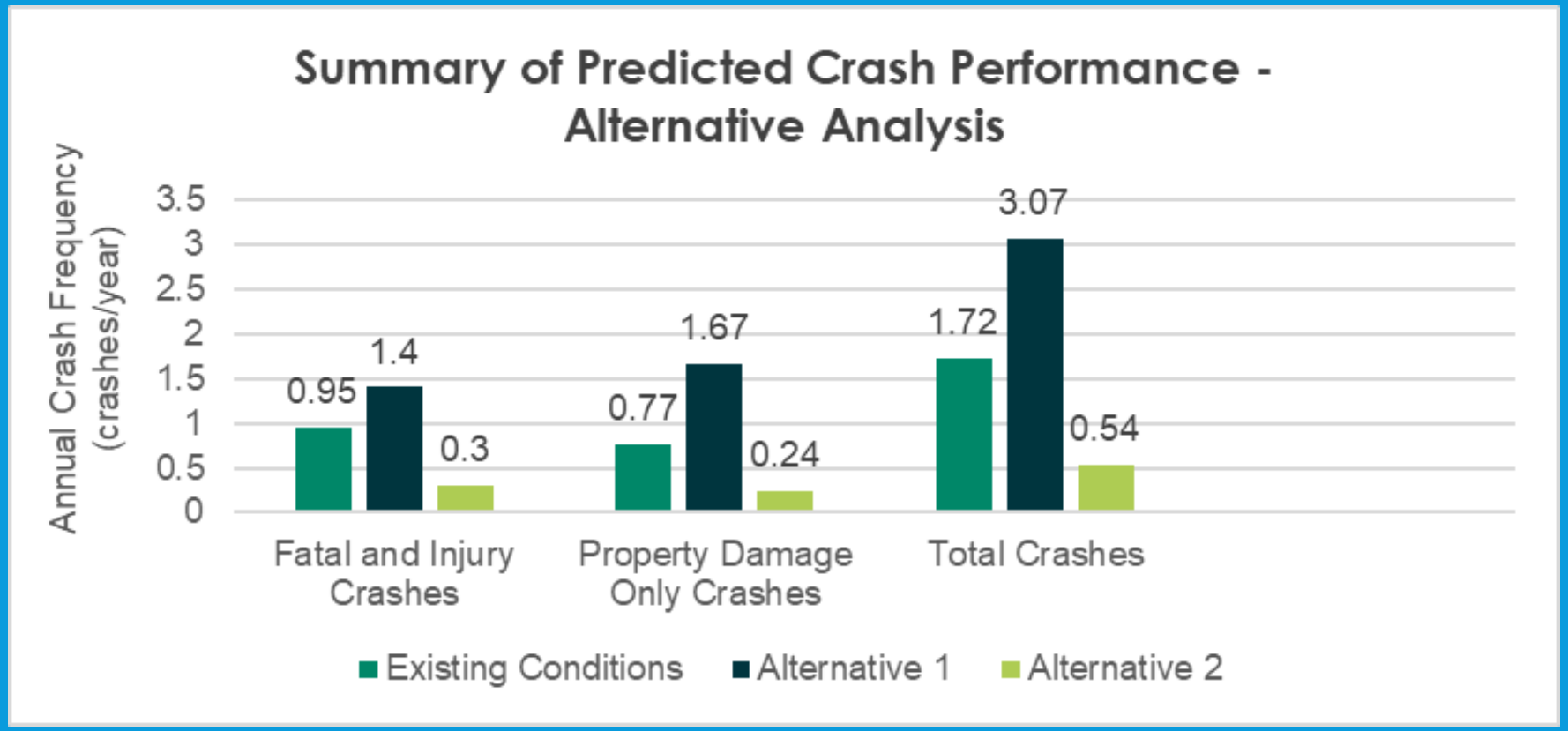


SIGNAL ALTERNATIVE

PROS

- No bridge replacement required
- Minimal environmental impacts

CONS

- Increase in fatal, injury & total crashes
- Higher per-year maintenance costs
- ROW impacts, but < 0.25 acre
- Higher delays than roundabout alternative (at most intersection LOS D)

ROUNDABOUT ALTERNATIVE

PROS

- No bridge replacement required
- Decrease in all crashes
- Provides traffic calming
- Lower delays than signal (at most intersection LOS B)

CONS

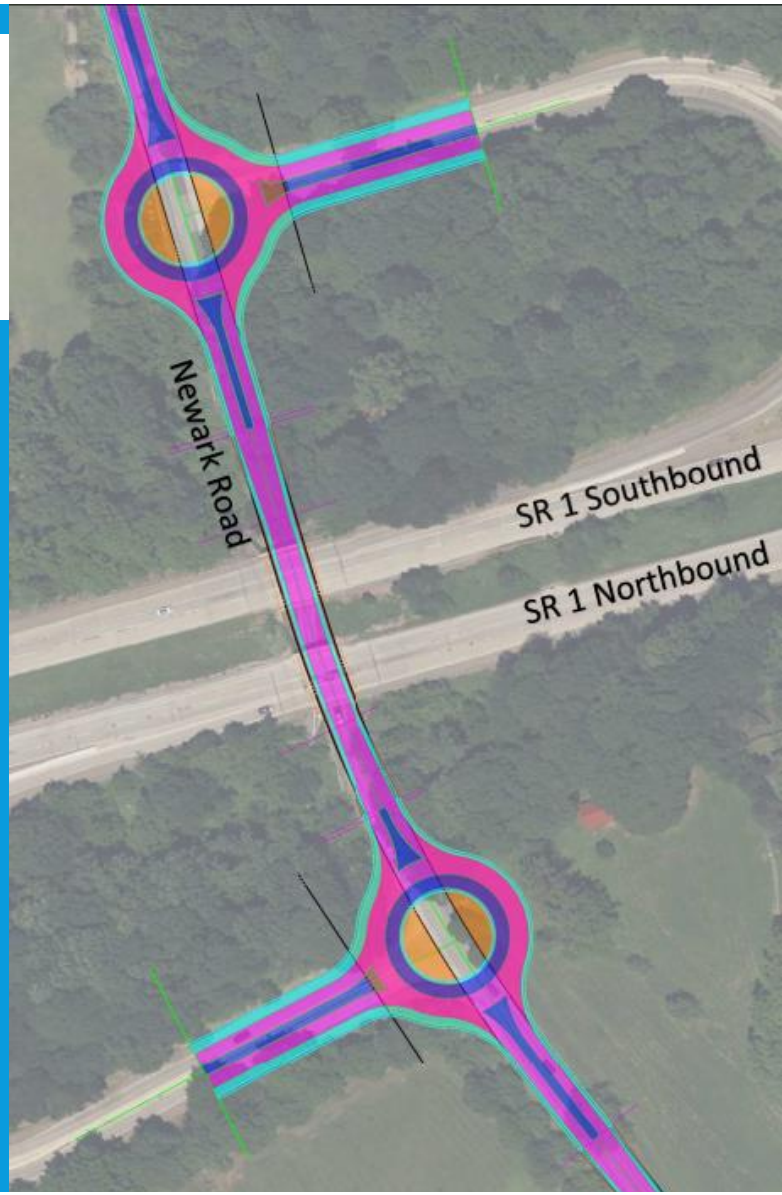
- Moderate environmental impacts
- ROW impacts, but < 1 acre

RECOMMENDATION

Roundabouts recommended due to:

- Predicted crash reductions (particularly angle crashes)

- Lowest delay anticipated as compared to no-build or signalization



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OPEN DISCUSSION