

# “IF IT AIN’T BROKE...”

## AND OTHER SAFETY LESSONS

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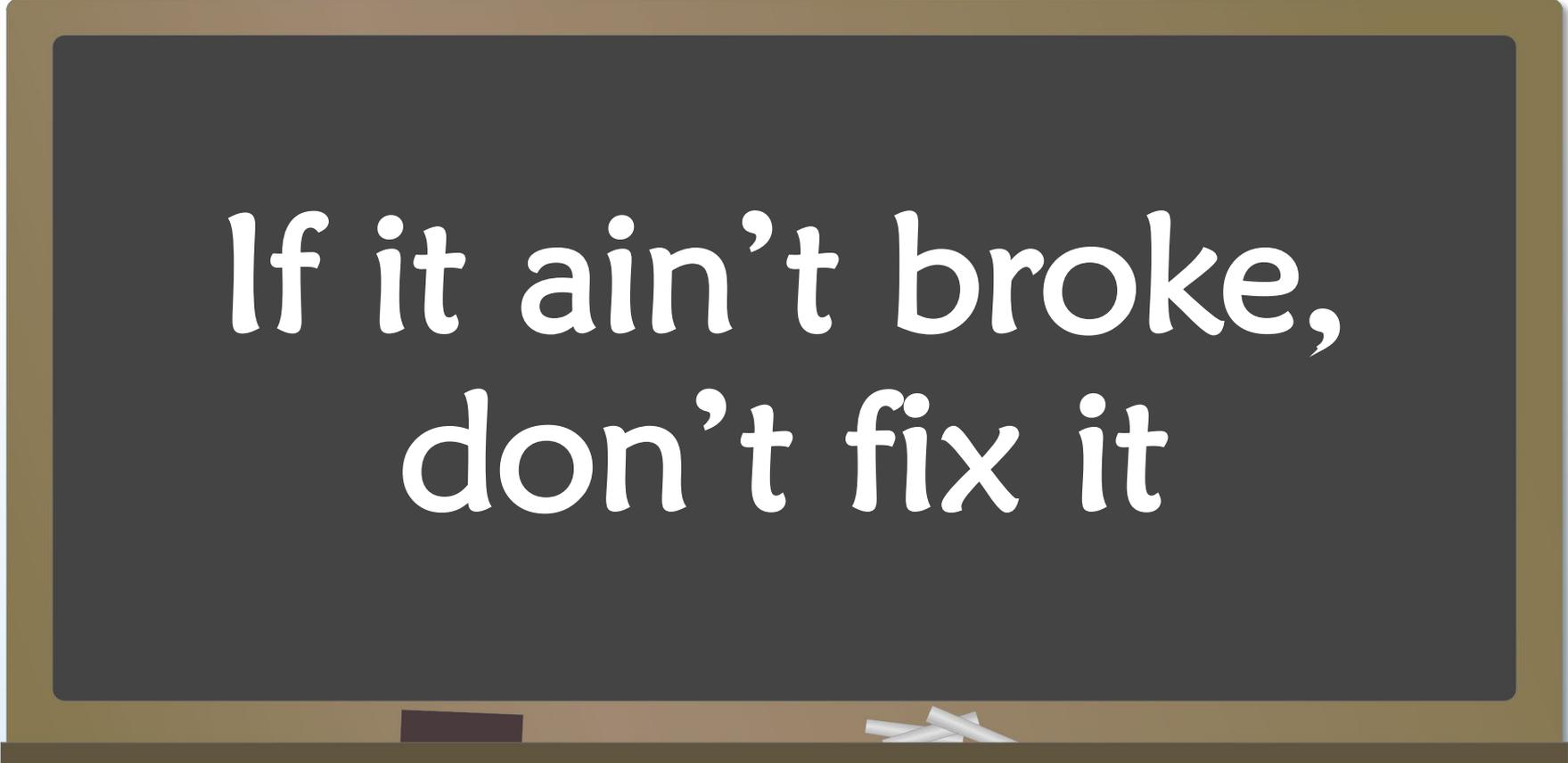
**BURGESS & NIPLE**  
Engineers ■ Architects ■ Planners

*Ideas in motion.*

# Safety Lessons

- If it ain't broke, don't fix it
- Rules are made to be broken
- Get your priorities straight

# Lesson 1



If it ain't broke,  
don't fix it

# Laybourne Road



# Laybourne Road

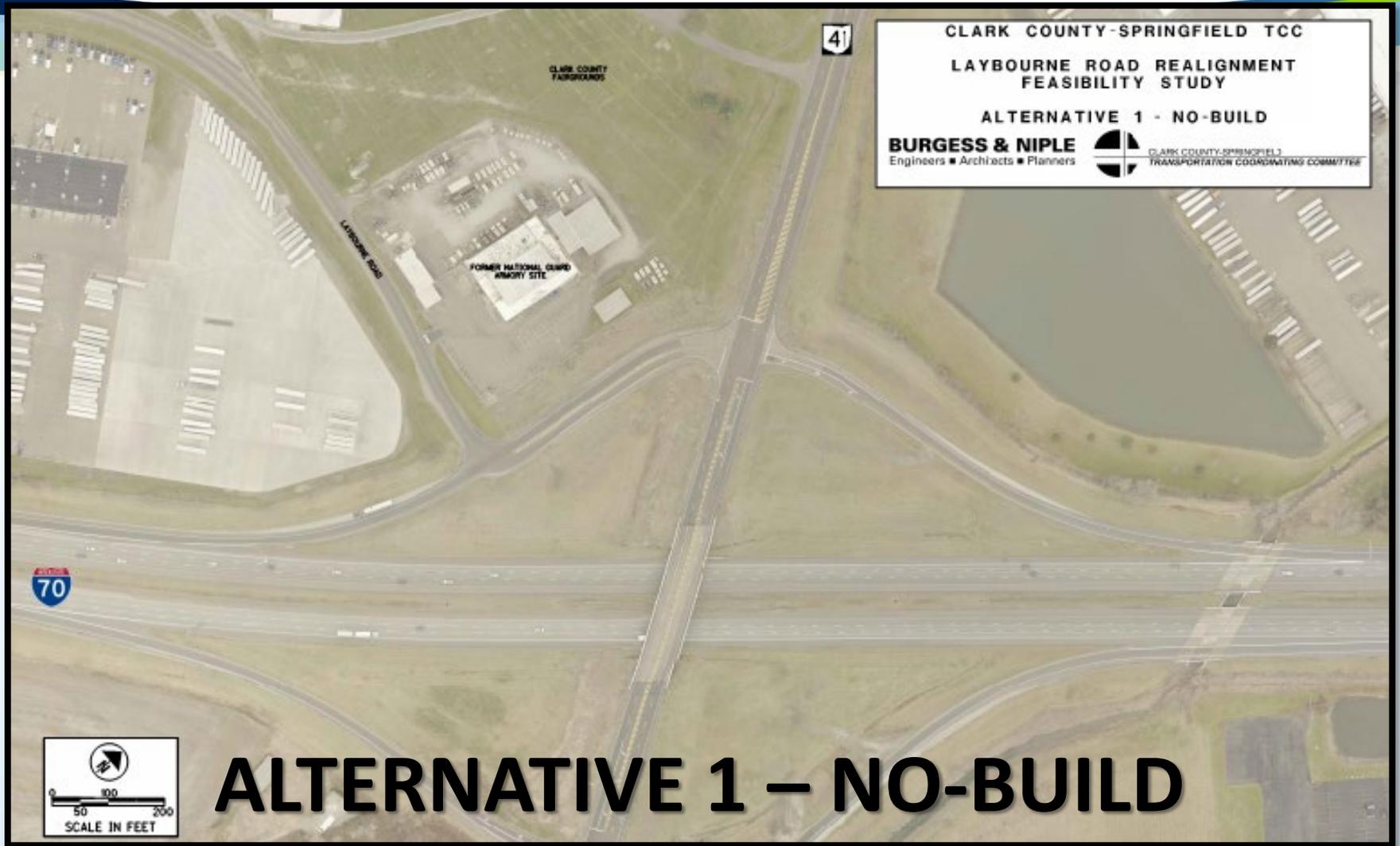


**BURGESS & NIPLE**

# Laybourne Road



# Laybourne Road

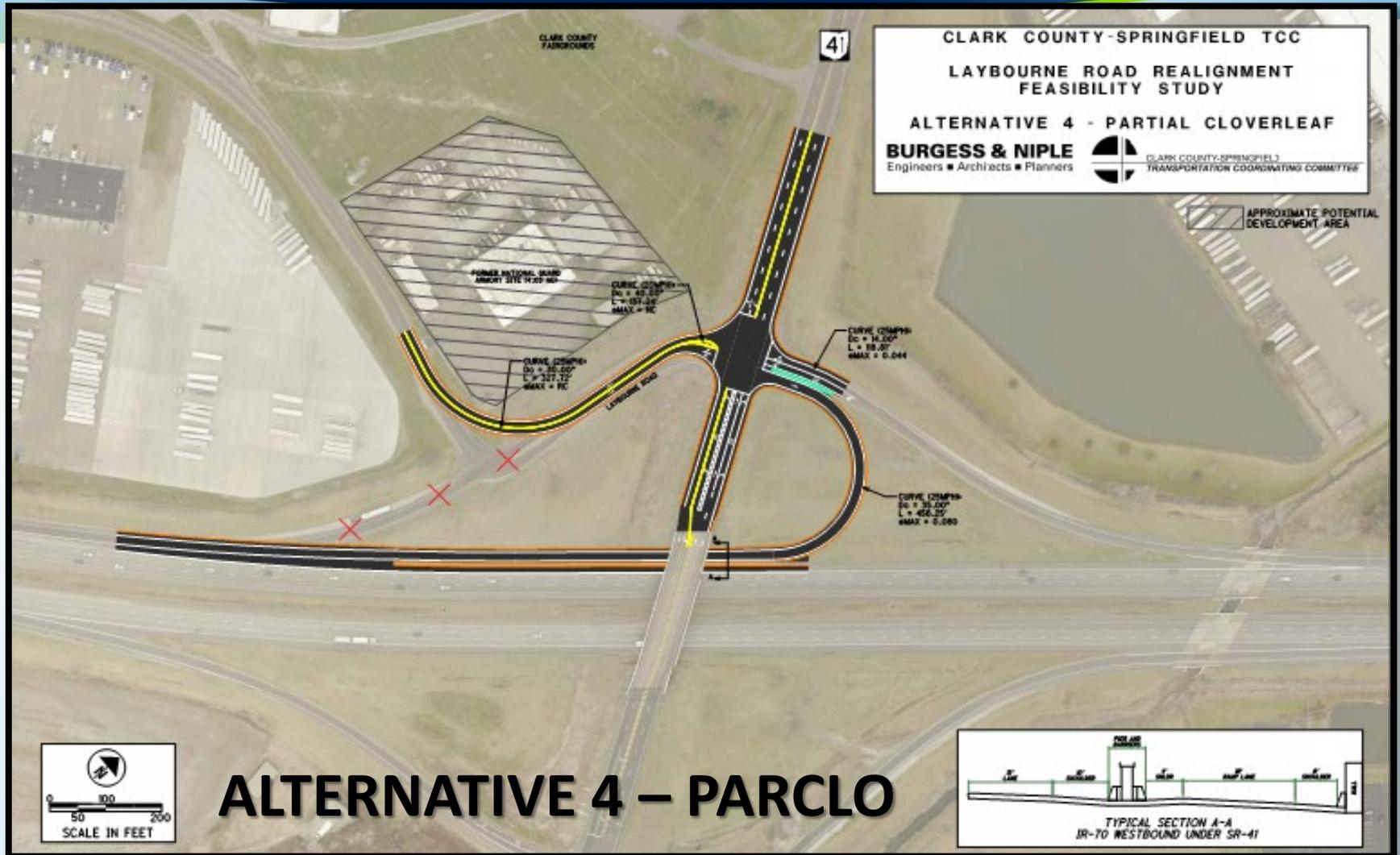


# Laybourne Road





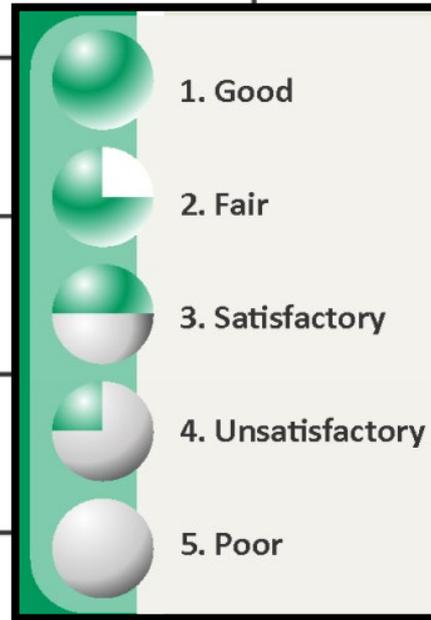
# Laybourne Road



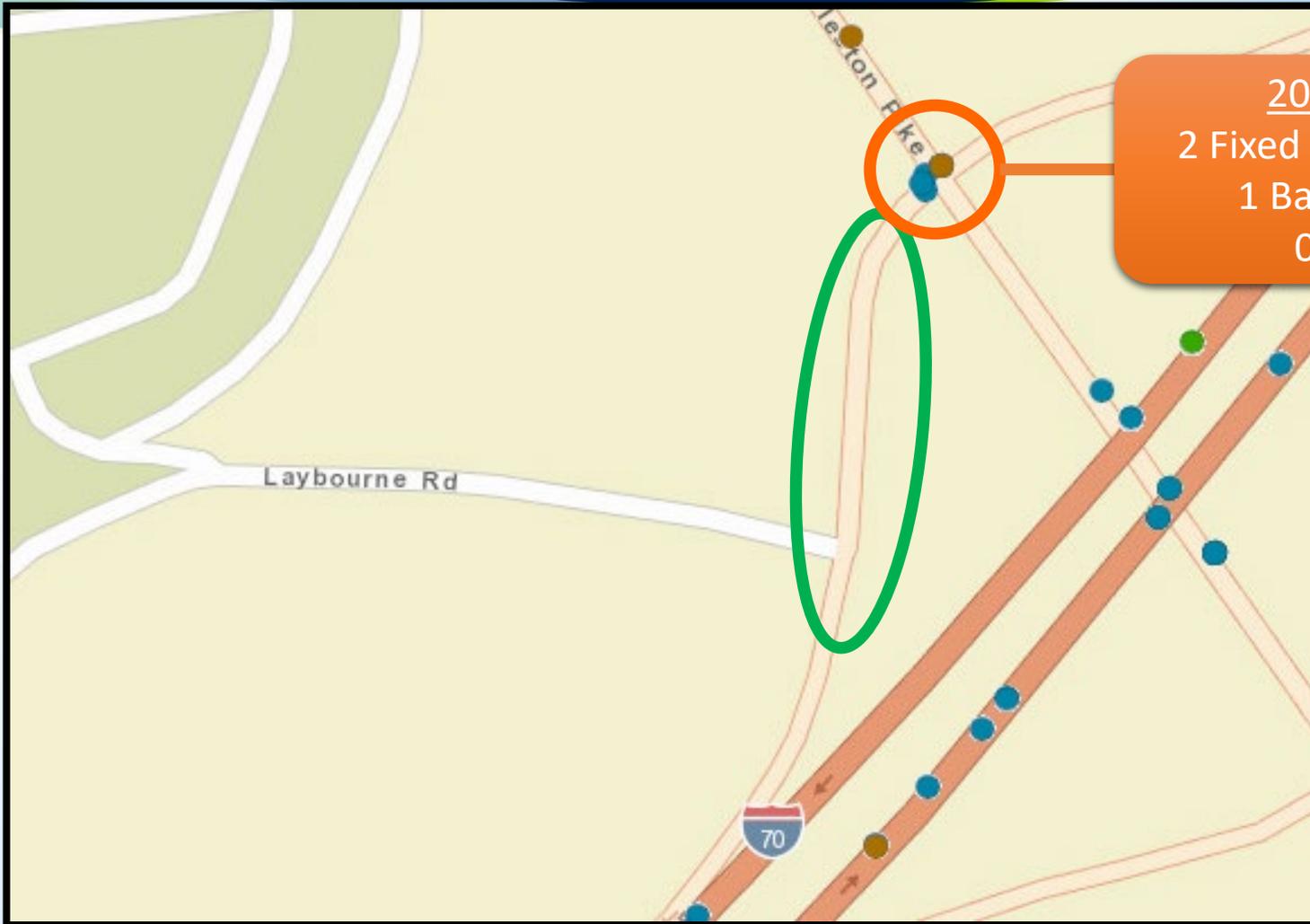
# Laybourne Road

## Alternatives Evaluation - Laybourne Road Relocation

Evaluation Criteria	Alternative 1 No-Build	Alternative 2 Tight Diamond	Alternative 3 Roundabout	Alternative 4 Partial Cloverleaf
Safety				
Traffic Operations				
Impacts				
Maintenance of Traffic /Constructability				
Design Geometrics				
Construction Cost (2019 \$\$)				



# Laybourne Road



2015 – 2017  
2 Fixed Object Crashes  
1 Backing Crash  
0 Injuries

# Laybourne Road

## Alternatives Evaluation - Laybourne Road Relocation

Evaluation Criteria	Alternative 1 No-Build	Alternative 2 Tight Diamond	Alternative 3 Roundabout	Alternative 4 Partial Cloverleaf
Safety				
Traffic Operations				
Impacts				
Maintenance of Traffic /Constructability				
Design Geometrics				
Construction Cost (2019 \$\$)	N/A	\$2.89M	\$3.10M	\$3.00M

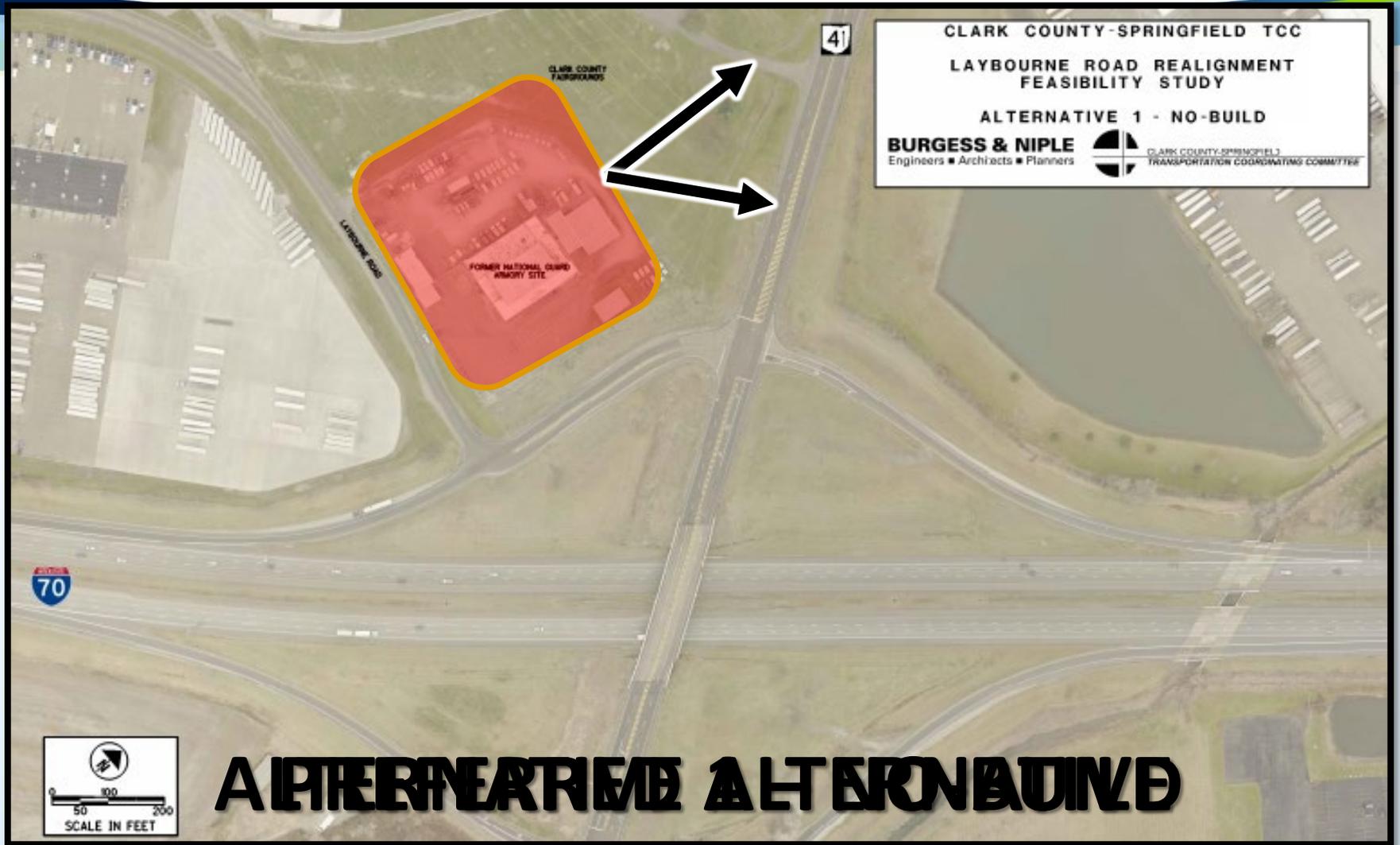
- 1. Good
- 2. Fair
- 3. Satisfactory
- 4. Unsatisfactory
- 5. Poor

# Laybourne Road

The

**Features of the existing design that are performing well may remain unchanged, while features that are performing poorly should be improved, where practical.**

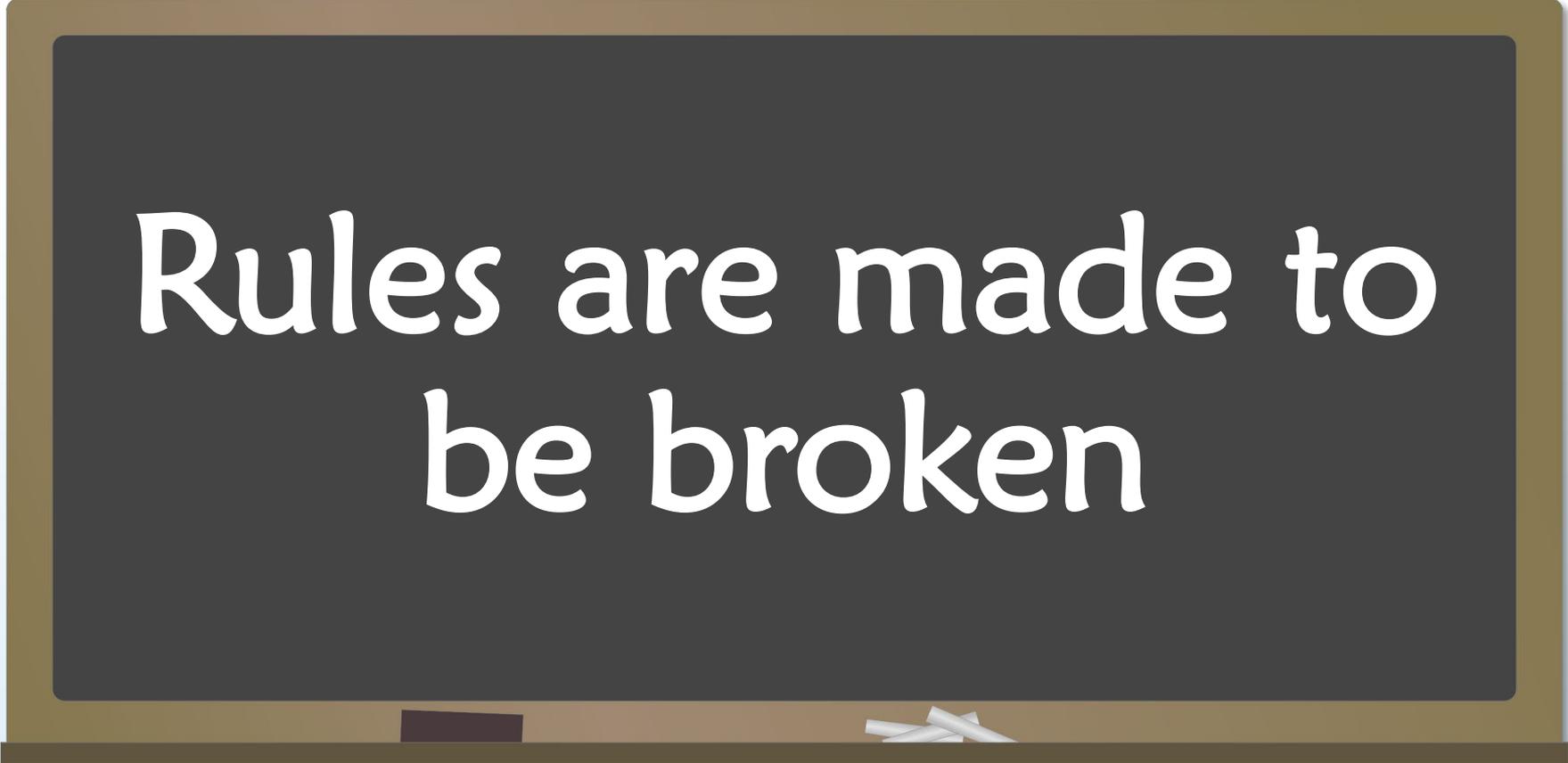
# Laybourne Road



# Lesson Summary

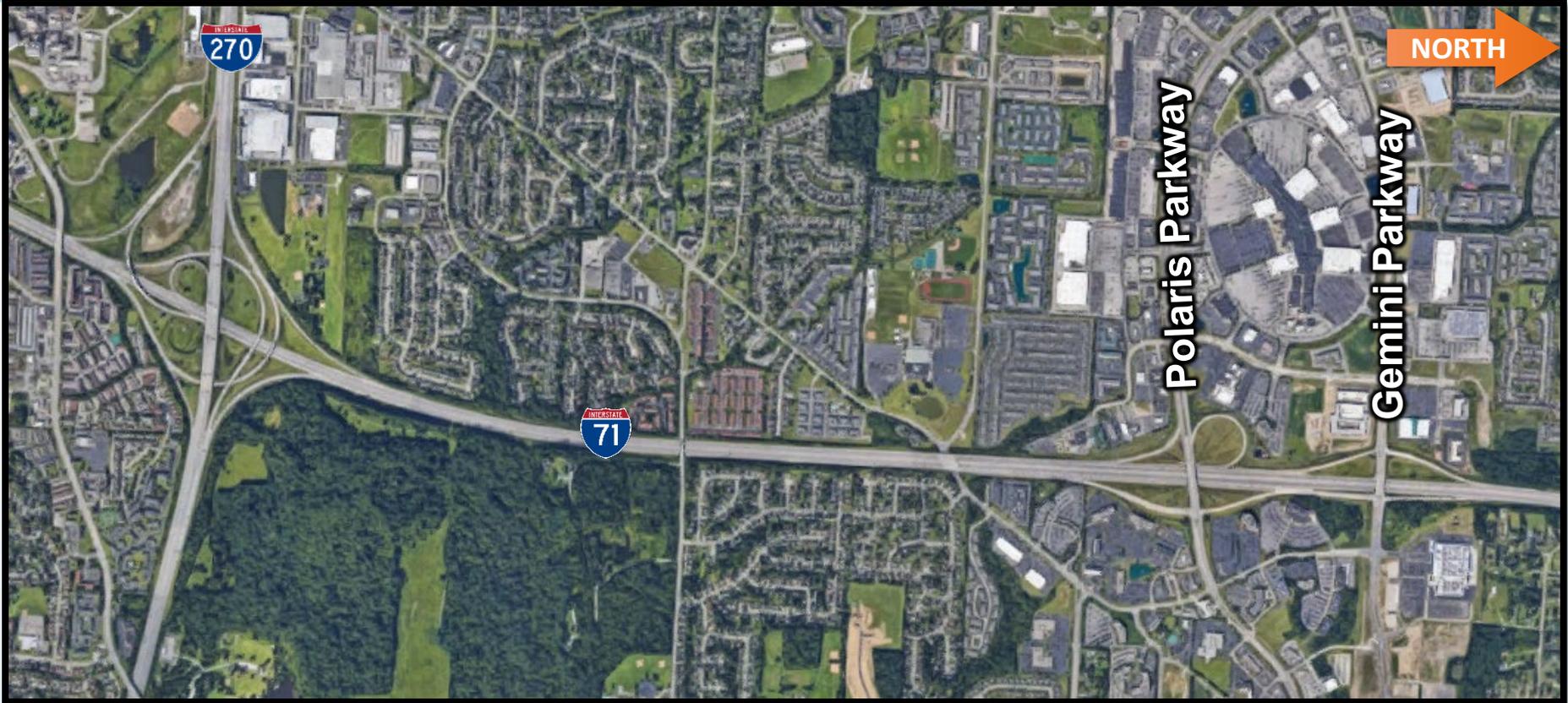
- Perception is not always reality
- Decisions (especially expensive ones) should be based on data

# Lesson 2



Rules are made to  
be broken

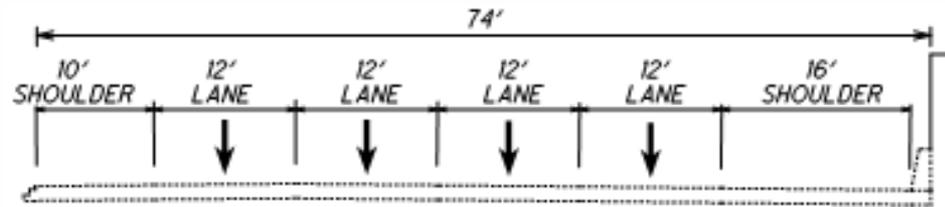
# Gemini Parkway



**BURGESS & NIPLE**

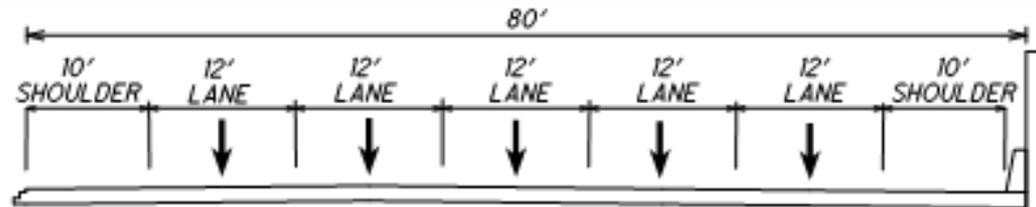
# Gemini Parkway

**EXISTING**



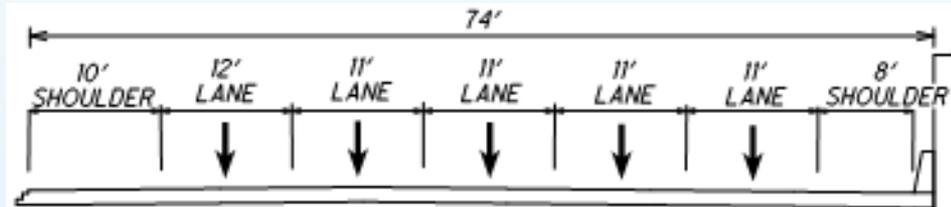
**74'**

**ALTERNATIVE 1**



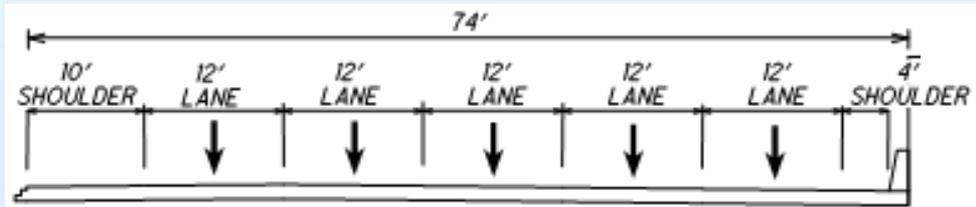
**80'**

**ALTERNATIVE 2**



**74'**

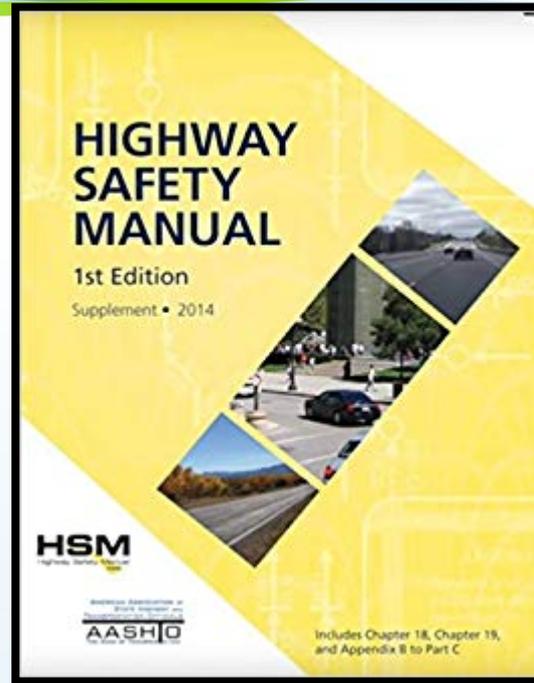
**ALTERNATIVE 3**



**74'**

**BURGESS & NIPLE**

# Gemini Parkway

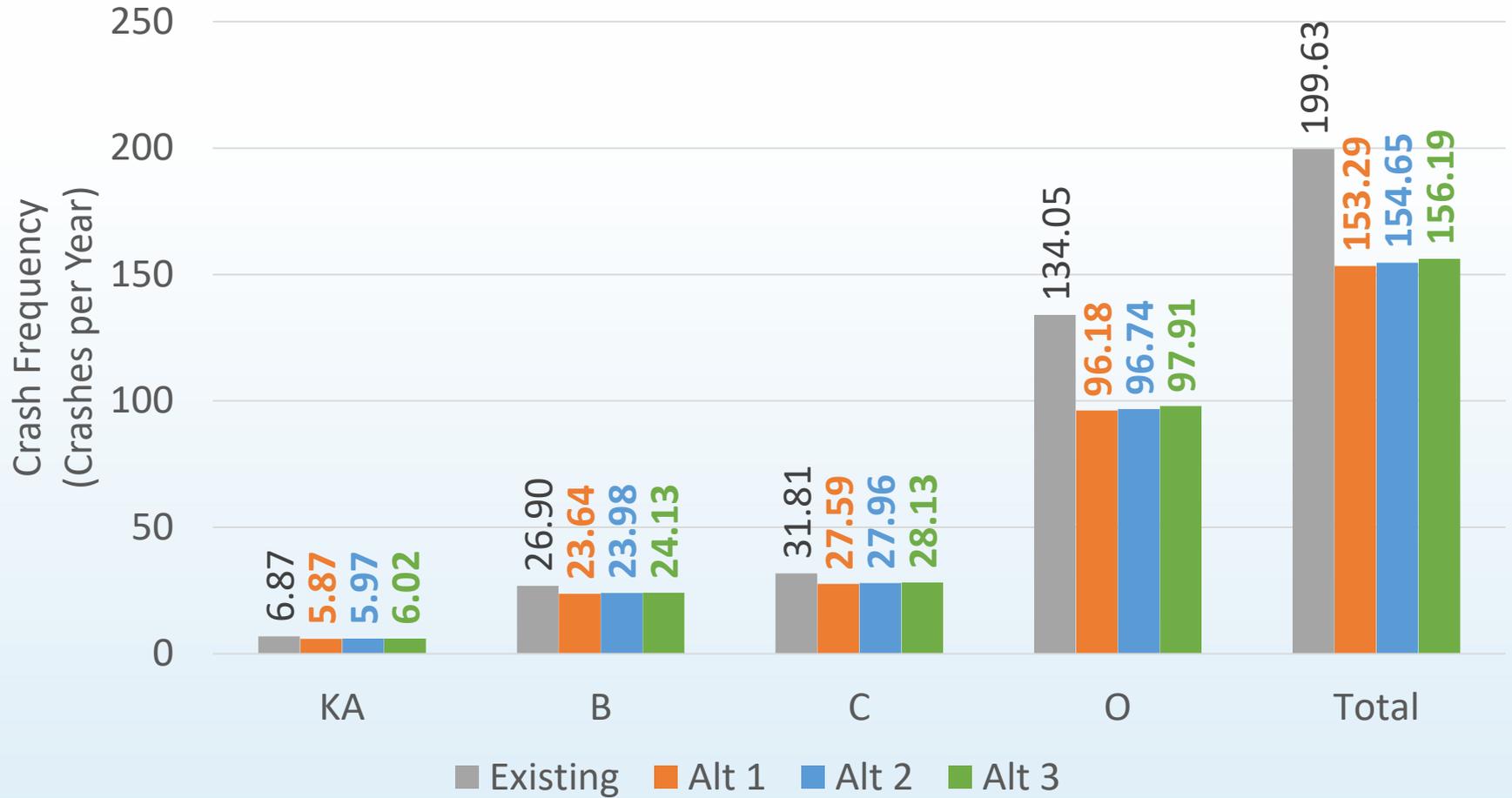


Class Average

Grade of Individual Student

**BURGESS & NIPLE**

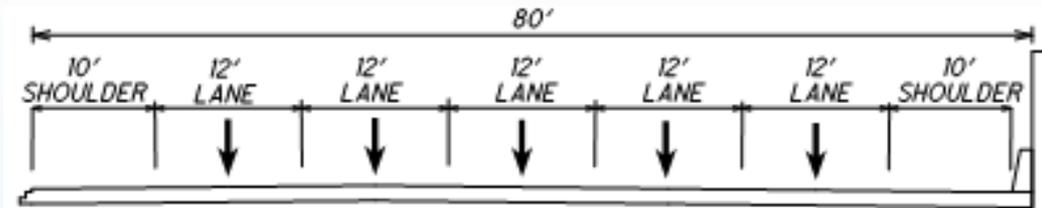
# Gemini Parkway



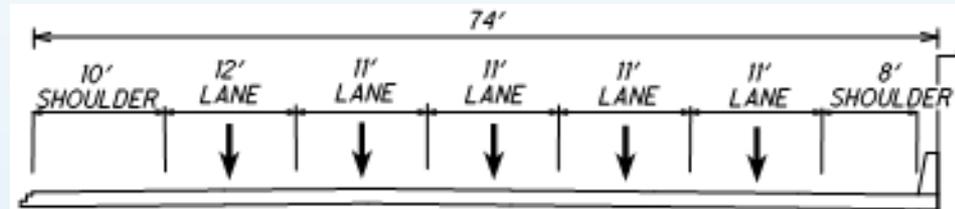
# Gemini Parkway

	Alternative 1	Alternative 2	Alternative 3
Fatal and Serious Injury	-1.00	-0.89	-0.85
Injury	-8.48	-7.67	-7.31
Total Crashes	-46.35	-44.98	-43.44
Construction Costs	\$7.44 M	\$5.48 M	\$5.48 M
Safety B/C	<b>2.07</b>	<b>2.61</b>	<b>2.49</b>

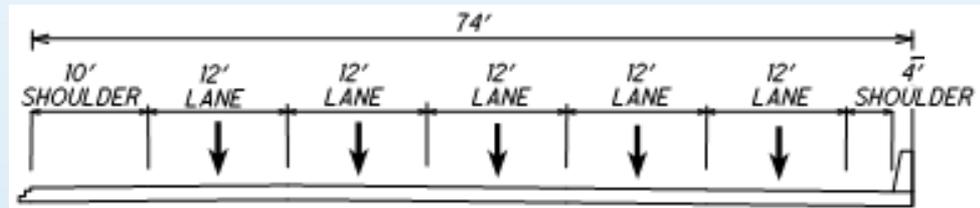
## ALTERNATIVE 1



## ALTERNATIVE 2

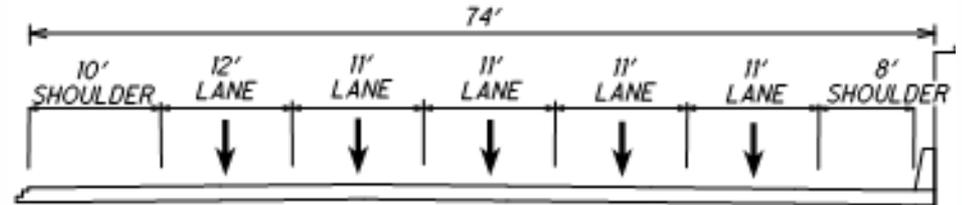


## ALTERNATIVE 3



# Gemini Parkway

## PREFERRED ALTERNATIVE 2



- Nearly \$2M in cost savings
- Design Exceptions for lane and inside shoulder widths

# Gemini Parkway

AASHTO

In the past, designers sought to assure **good traffic operational and safety performance** for the design of specific projects primarily **by meeting the dimensional design criteria** in this policy. This approach was appropriate in the past because the relationship between the design dimensions and future performance was poorly understood. Traditional applications of this policy took the approach that, if the geometric design of a project **met or exceeded specific design dimensional design criteria, it would likely to perform well**. In some cases, this may have led to **overdesign**, constructing projects that were **more costly** than they needed to be, or were **inappropriate** for the roadway context.

# Lesson Summary

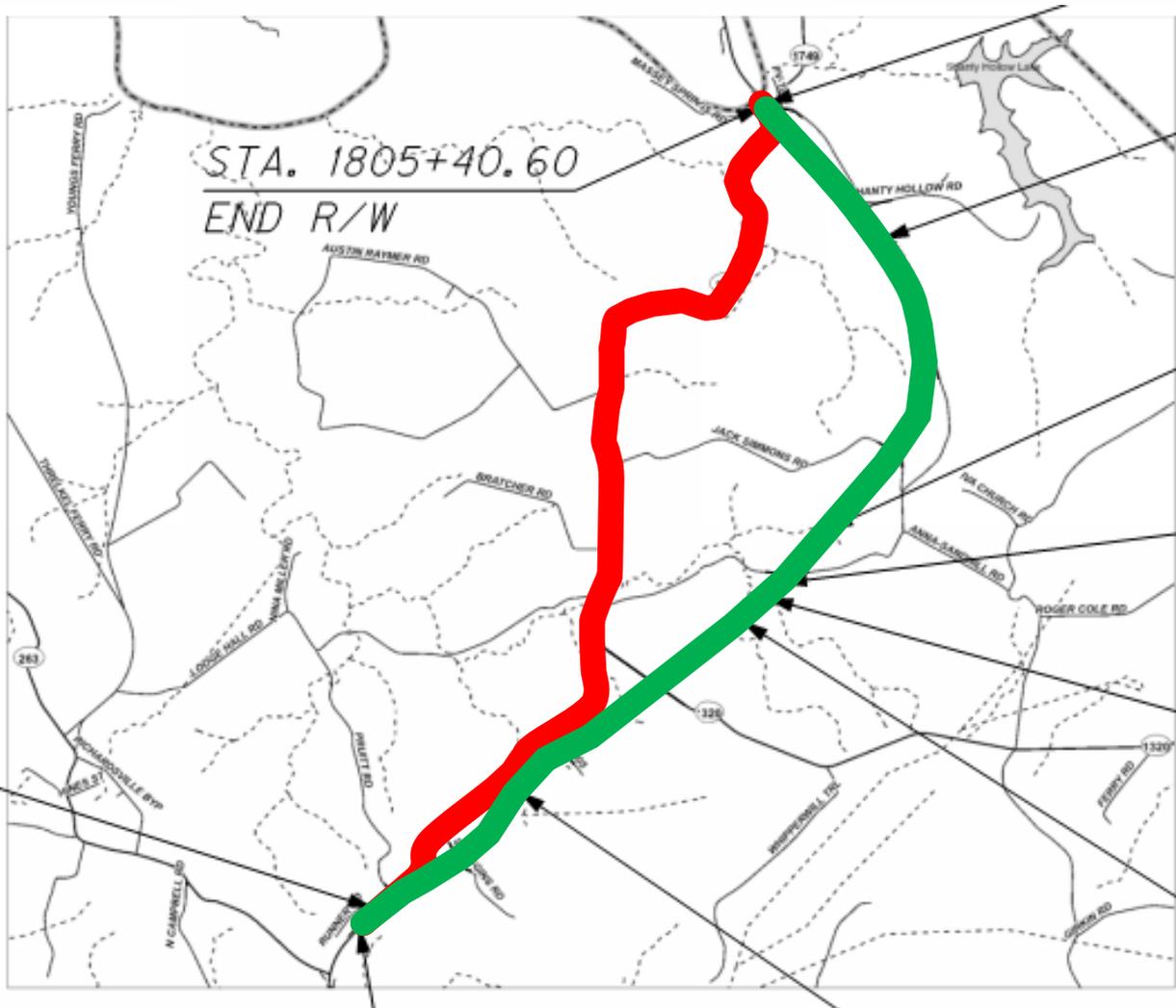
- “Safest” option doesn’t always “win”
- 12-foot lane widths aren’t required
- Just because it’s “in the manual” doesn’t mean it’s “safe”

# Lesson 3

A chalkboard with a dark grey surface and a brown frame. The text "Get your priorities straight" is written in white, bold, sans-serif font. At the bottom of the chalkboard, there are two pieces of white chalk and a small dark brown eraser.

Get your priorities  
straight

# KY 185 – Warren County, Kentucky

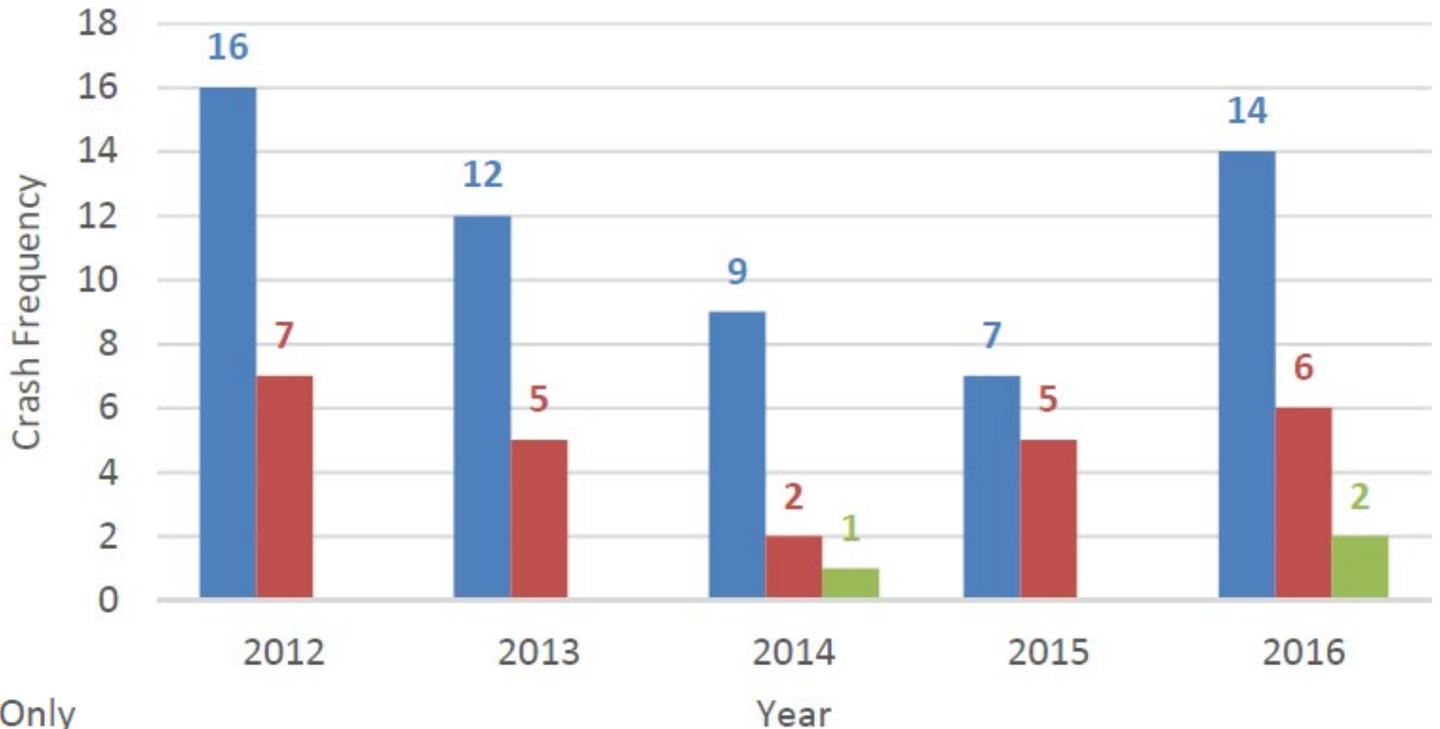


5.5 mile  
segment

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# KY 185 – Warren County, Kentucky

86 Crashes between January 1, 2012 to December 31, 2016

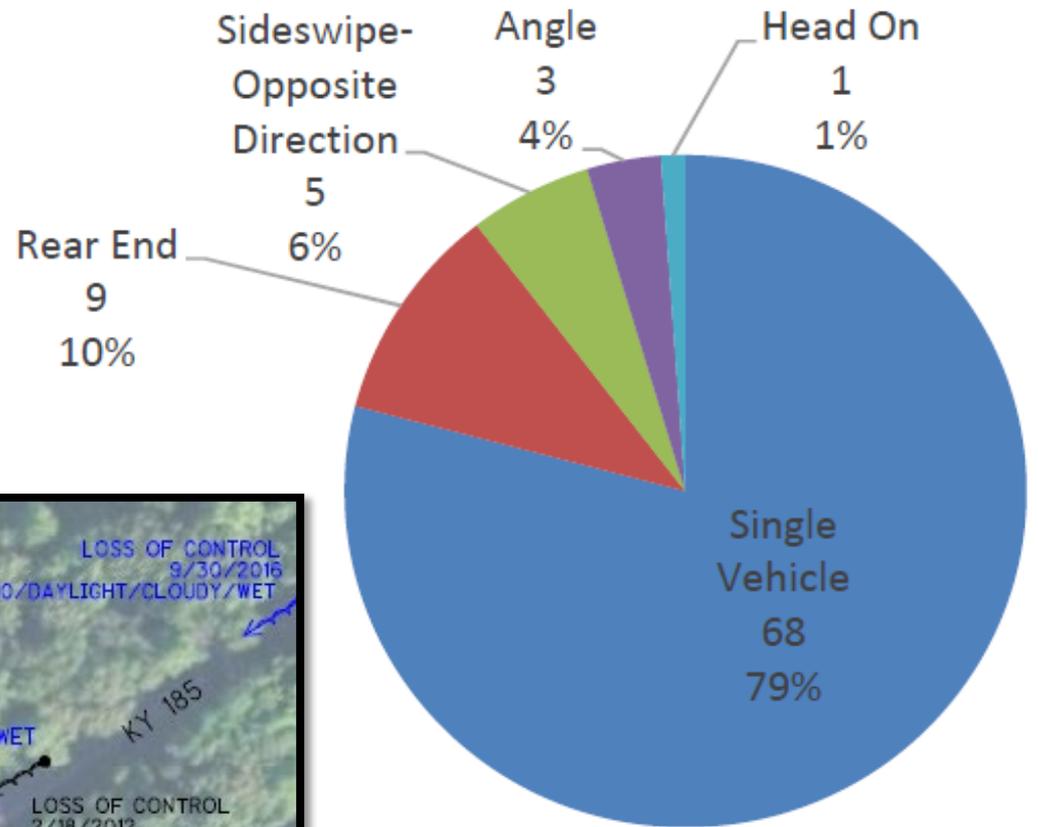


■ Property Damage Only

■ Injury

■ Fatal

# KY 185 – Warren County, Kentucky



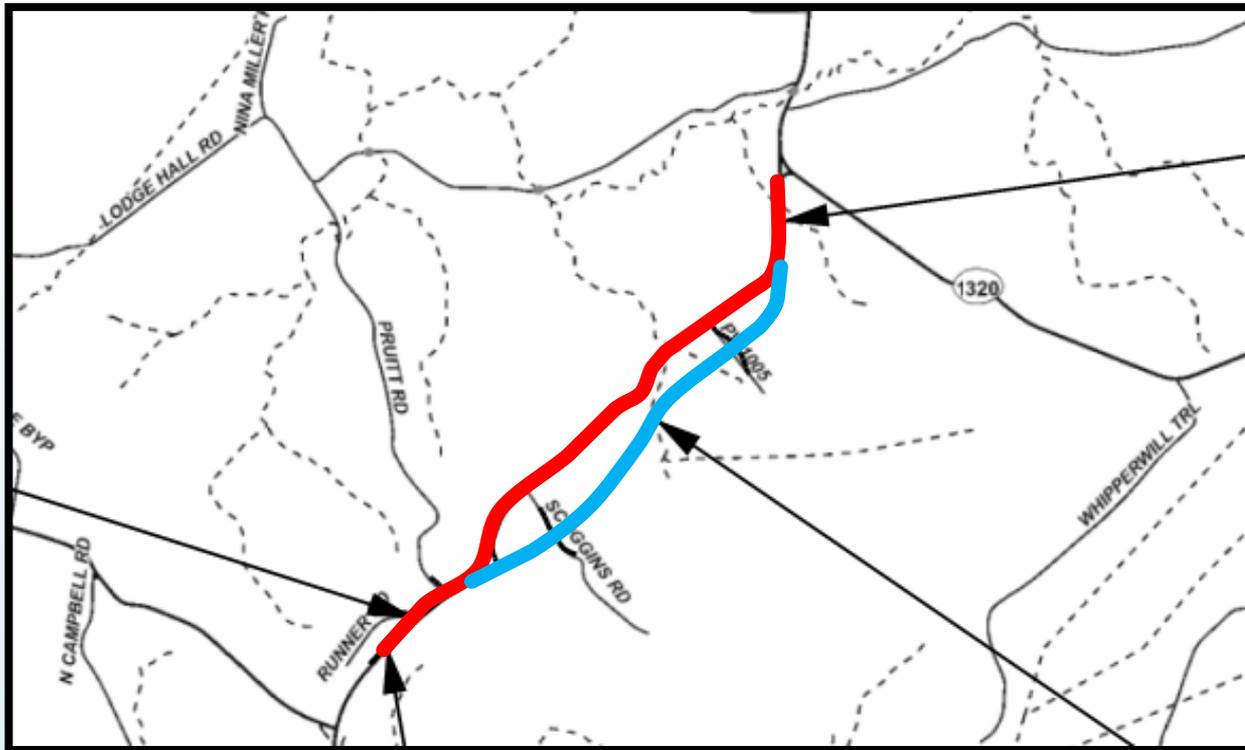
# KY 185 – Warren County, Kentucky

## HSM Analysis for Existing Conditions – 2018 through 2037

	Fatal and Injury Crashes	Property Damage Only Crashes	Total Crashes
N <sub>predicted</sub>	137.82	290.94	428.49
N <sub>expected</sub>			448.04
<b>PSI</b>			<b>19.59</b>
HS			037
	Crashes	Only Crashes	Total Crashes
Existing Alignment	137.82	290.94	428.49
Proposed Alignment	66.69	140.78	207.34
<b>Reduction in Crashes</b>	<b>71.13</b>	<b>150.16</b>	<b>221.15</b>

**\$23,290,000**

# KY 185 – Warren County, Kentucky

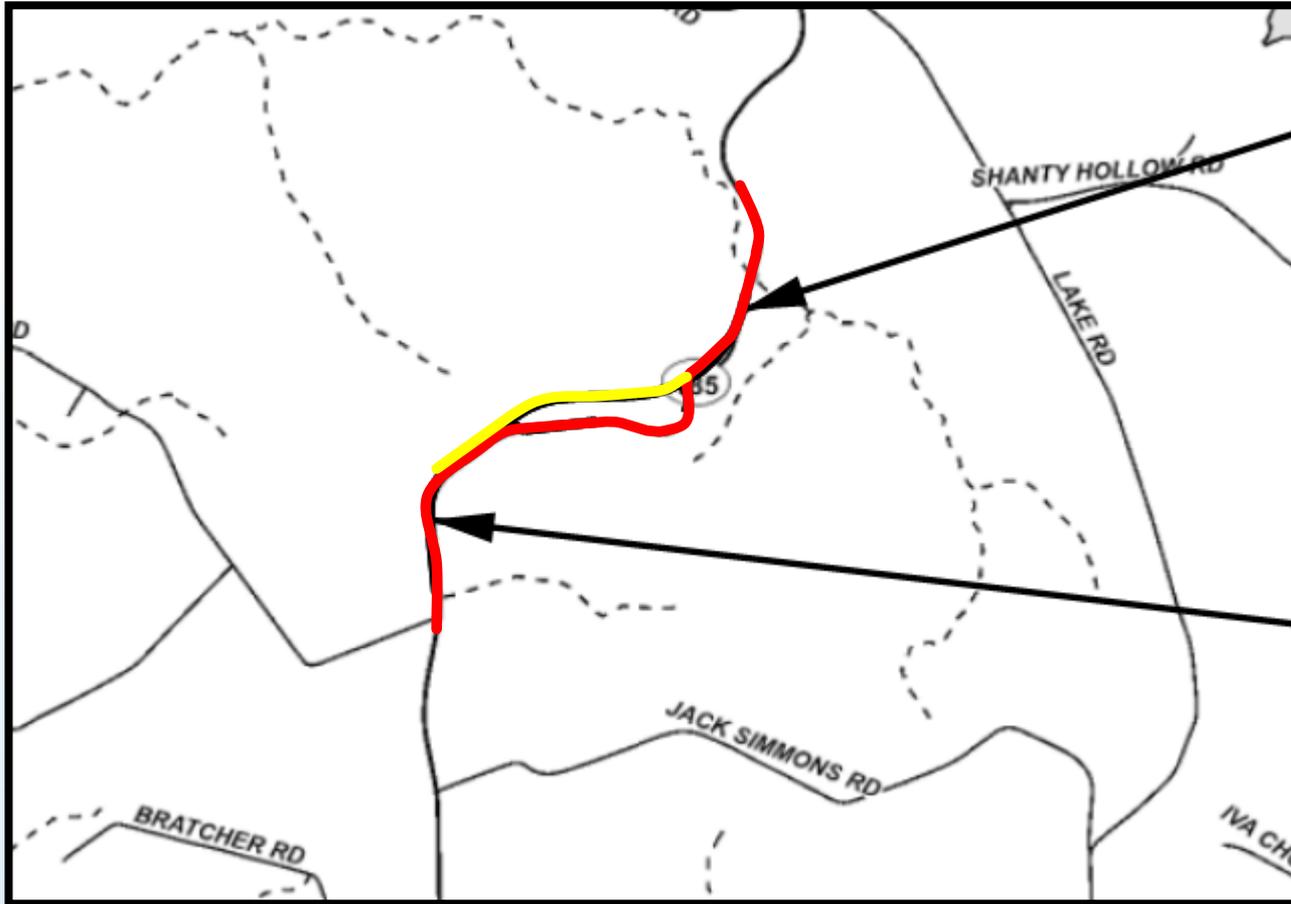


Spot  
Improvement 1

1.8 mile  
segment

**BURGESS & NIPLE**

# KY 185 – Warren County, Kentucky



Spot  
Improvement 5

0.9 mile  
segment

**BURGESS & NIPLE**

# KY 185 – Warren County, Kentucky

## HSM Analysis for Existing Conditions – 2018 through 2037

	Fatal and Injury Crashes	Property Damage Only Crashes	Total Crashes
<b>Spot Improvement 1</b>			
N <sub>predicted</sub>	51.24	108.18	159.32
N <sub>expected</sub>	54.77	113.75	168.40
<b>PSI</b>	<b>3.53</b>	<b>5.57</b>	<b>9.08</b>
<b>Spot Improvement 5</b>			
N <sub>predicted</sub>	29.35	61.96	91.25
N <sub>expected</sub>	49.51	62.21	111.62
<b>PSI</b>	<b>20.16</b>	<b>0.25</b>	<b>20.37</b>

# KY 185 – Warren County, Kentucky

## HSM Analysis Comparison– 2018 through 2037

	Fatal and Injury Crashes	Property Damage Only Crashes	Total Crashes
<b>Spot Improvement 1</b>			
Existing Segment	51.24	108.18	159.32
Proposed Alignment	22.88	48.31	71.14
<b>Reduction in Crashes</b>	<b>28.36</b>	<b>59.87</b>	<b>88.18</b>
<b>Spot Improvement 5</b>			
Existing Segment	29.35	61.96	91.25
Proposed Alignment	11.90	25.12	36.99
<b>Reduction in Crashes</b>	<b>17.45</b>	<b>36.84</b>	<b>54.26</b>

# KY 185 – Warren County, Kentucky

	Net Present Value of Safety Benefit	Net Present Value of Construction Costs	Benefit-to-Cost Ratio
Entire Corridor	\$25,128,000	\$23,290,000	1.08
Spot Improvement 1	\$10,019,000	\$8,530,000	1.17
Spot Improvement 5	\$6,165,000	\$4,805,000	1.28

**64% of the Benefit**

**57% of the Cost**

**COST SAVINGS  
APPROX. \$10M**

# Lesson Summary

- Don't wait!
- Use safety to help prioritize phased improvements or overall projects

# Safety Lessons

- If it ain't broke, don't fix it
- Rules are made to be broken
- Get your priorities straight



# Questions?

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*Ideas in motion.*