

# WELCOME TO THE US-81 & US-34 HIGHWAY STUDY VIRTUAL MEETING

Public Comment Period: June 23 – July 23, 2020

Project Website:

<https://dot.nebraska.gov/projects/future-projects/>

click on the "US-81 and US-34 Highway Study" link



# INTRODUCTION

The purpose of this Virtual Public Information Meeting is to:

- Introduce the public to NDOT's highway study
- Review preliminary analysis results
- Describe the types of improvements NDOT is considering
- Solicit input from the public via online comments



# Background

- US-81 is a major North-South corridor
- Construction of the bypass was completed in 2006.
- NDOT and City have previously implemented safety countermeasures



2000

Source: Google Earth



2016

# Purpose

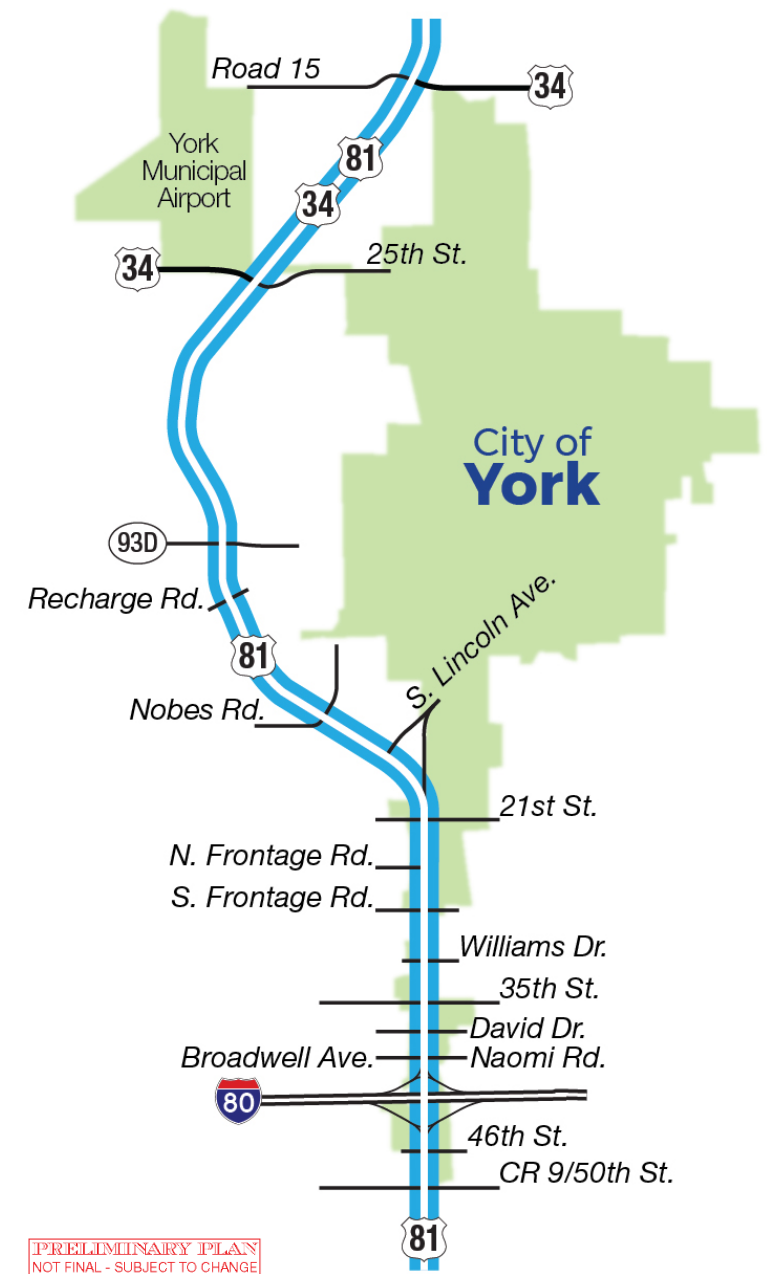
The purpose of the study is to evaluate potential improvements that:

- Preserve the transportation asset (US-81)
- Improve the reliability of the transportation system
- Enhance operations and safety along the corridor
- Perpetuate the mobility of the traveling public.



# Study Area

- 7.25 miles in length along US-81
- Starting just south of I-80 at CR-9/50th Street and extending north through the north junction of US-81 and US-34
- 17 study area intersections



# Scope of the Study

- Speed Study
- 2020 Existing Traffic Operations
- 2040 Future Traffic Operations
- Crash Study
- Public Involvement
- Conceptual Design of Alternatives (*Future Phase*)

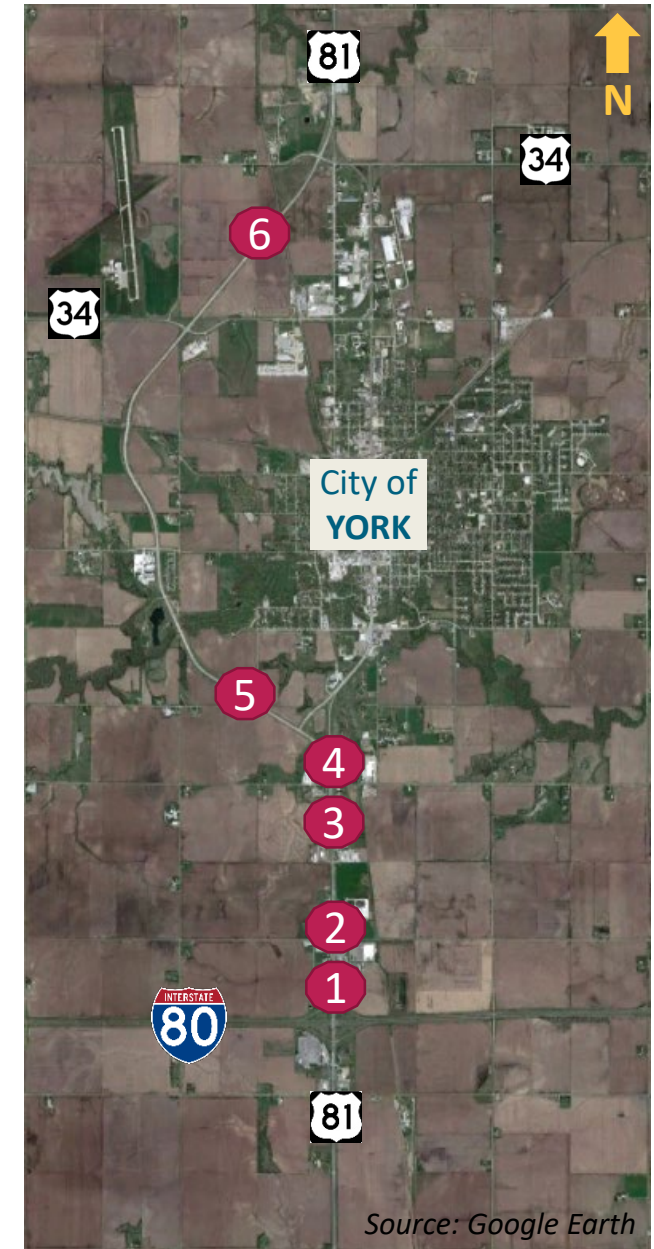


# Speed Study

## Results:

- 4 of 6 locations observed speeds above posted speed limit (yellow highlights)
- Speed differential between cars and trucks near David Drive (blue highlights)

Station	Posted Speed Limit (mph)	All Vehicles 85th Percentile Speeds	Speed Limit Differential	Cars Only 85th Percentile Speeds		Truck Only 85th Percentile Speed		Car-Truck Speed Differential			
				Both Directions		NB	SB	NB	SB	NB	SB
1	50	46.5	-3.5	-	47.7	-	37.5	-	10.2		
2	50	48.8	-1.2	49.2	-	46.6	-	2.6	-		
3	55	58.4	3.4	-	58.8	-	56.8	-	2.0		
4	55	59.0	4.0	59.1	-	58.3	-	0.9	-		
5	60	62.7	2.7	62.0	64.8	60.4	61.1	1.7	3.8		
6	60	64.6	4.6	66.5	64.0	64.8	61.9	1.7	2.1		



Source: Google Earth

# Operations Study

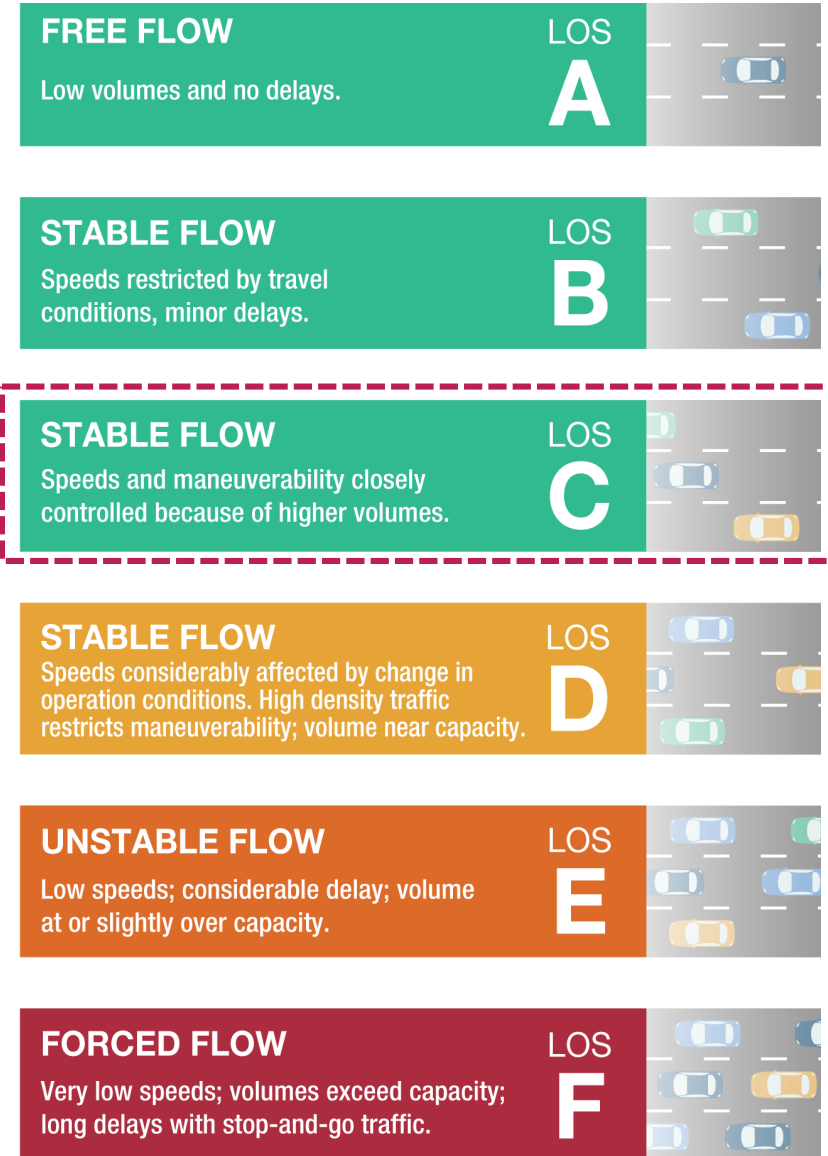
## Scope:

- Analysis years included:
  - 2020 Existing (from current traffic counts)
  - 2040 Future (from NDOT forecasts)
- Analysis periods included:
  - AM and PM Peak Hours
  - Midday Peak Hour
  - Design Hourly Volume (DHV)

## Goal:

- Level of Service (LOS) of C or better

## Levels of Service



Source: Utah DOT (<https://www.parleyseis.com>)











# Operations Study

## Results:

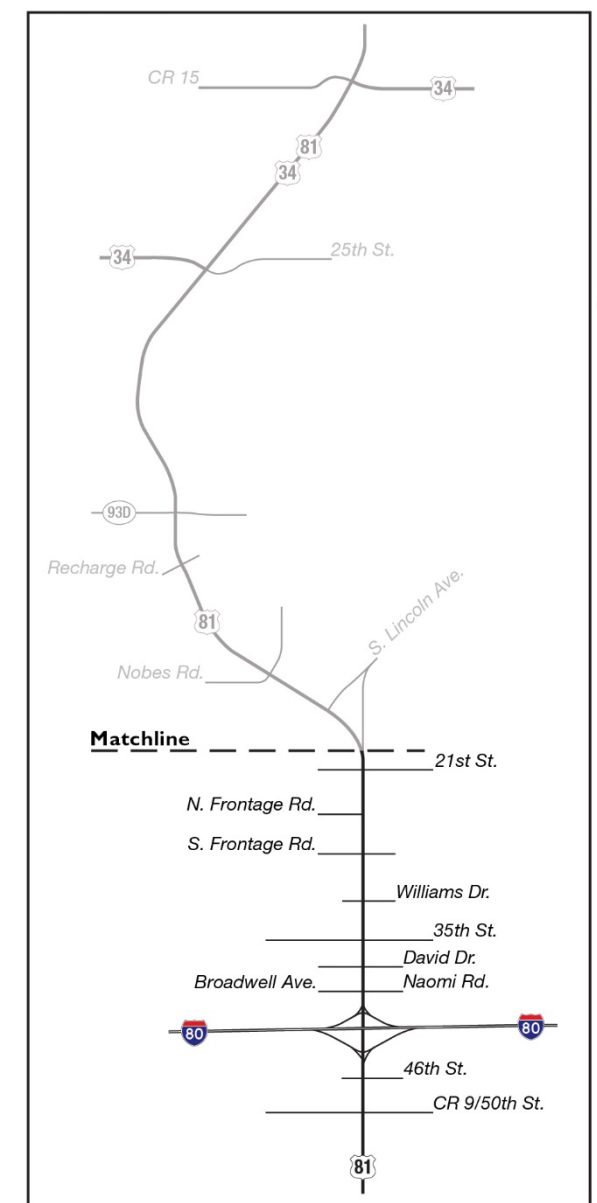
- 2020 Traffic Conditions – South Segment

### Acceptable LOS:

- US-81 & CR 9/ 50<sup>th</sup> St. 
- US-81 & 46<sup>th</sup> St. 
- US-81 & I-80 South Ramp 
- US-81 & I-80 North Ramp 
- US-81 & Broadwell/Naomi Rd. 
- US-81 & David Dr. 
- US-81 & 35<sup>th</sup> St. 
- US-81 & N. Frontage Rd. 

### Does Not Meet LOS C or Better Goal:

- US-81 & Williams Dr. 
- US-81 & S. Frontage Rd. 
- US-81 & 21<sup>st</sup> St. 











2020 Traffic Operations Figures  
Located on NDOT website

# Operations Study

## Results:

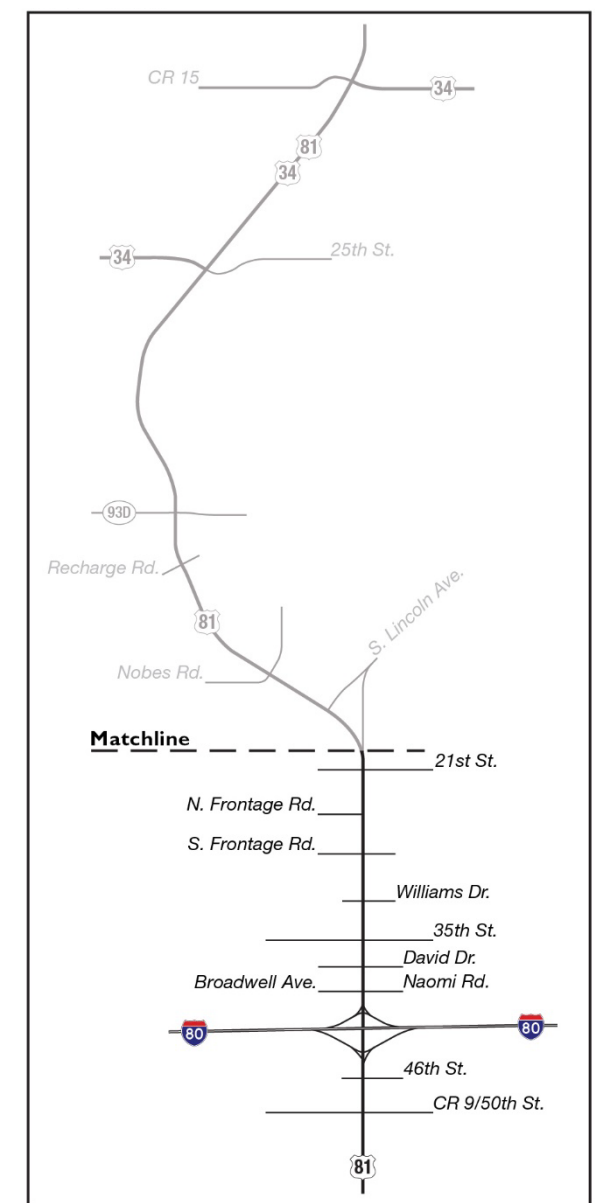
- 2040 Traffic Conditions – South Segment
  - No Roadway Improvements (No-Build)

### Acceptable LOS:

- US-81 & CR 9/ 50<sup>th</sup> St. 
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- US-81 & I-80 South Ramp 
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- US-81 & N. Frontage Rd. 

### Does Not Meet LOS C or Better Goal:

- US-81 & Williams Dr. 
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- US-81 & 21<sup>st</sup> St. 









2040 Traffic Operations Figures  
Located on NDOT website

# Operations Study

## Results:

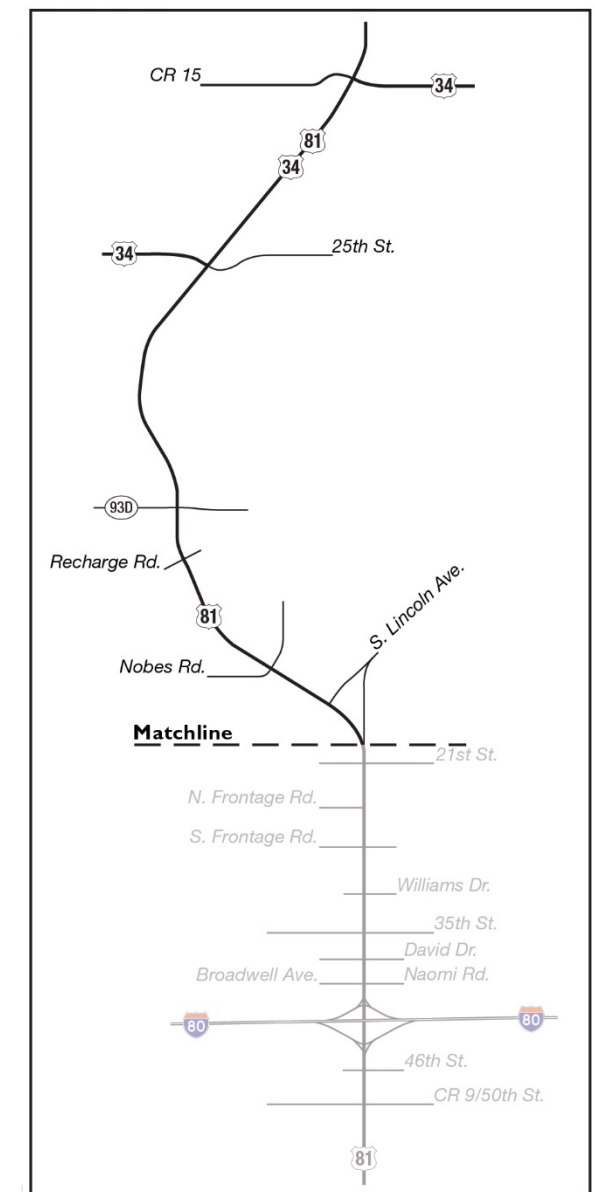
- 2020 Traffic Conditions – North Segment

### Acceptable LOS:

- US-81 & Lincoln Ave. 
- US-81 & Nobes Rd. 
- US-81 & Recharge Rd. 
- US-81 & Spur 93D 
- US-81 & US-34 S Junction 
- US-81 & US-34 N Junction 

### Does Not Meet LOS C or Better Goal:

- None






2020 Traffic Operations Figures  
Located on NDOT website

# Operations Study

## Results:

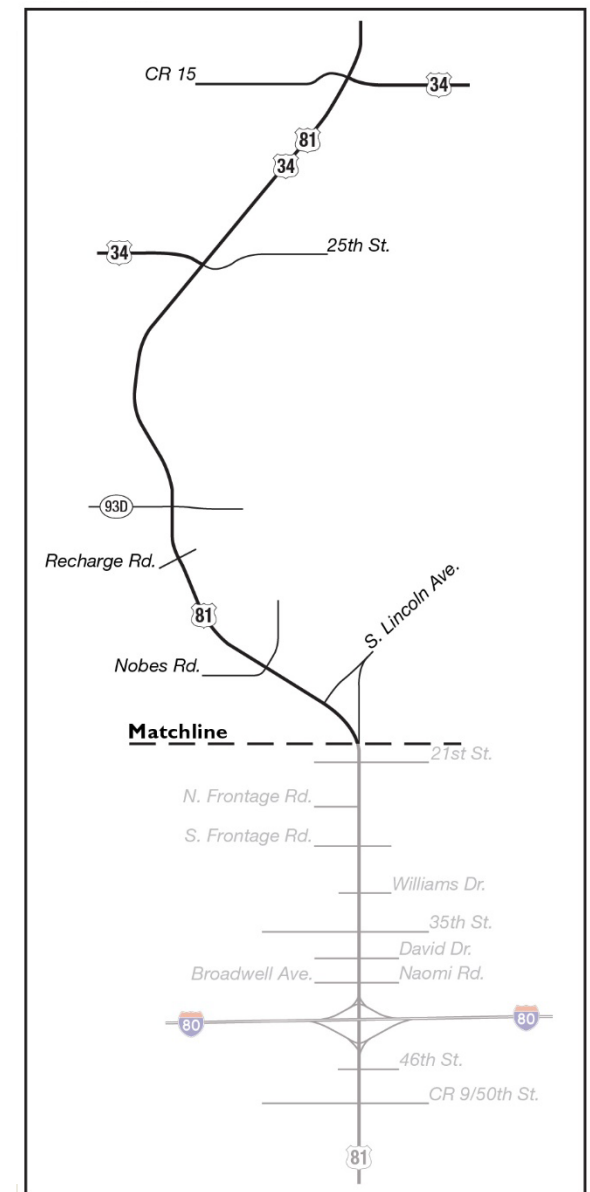
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### Acceptable LOS:

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### Does Not Meet LOS C or Better Goal:

- US-81 & Spur 93D 
- US-81 & US-34 S Junction 
- US-81 & US-34 N Junction 



2040 Traffic Operations Figures  
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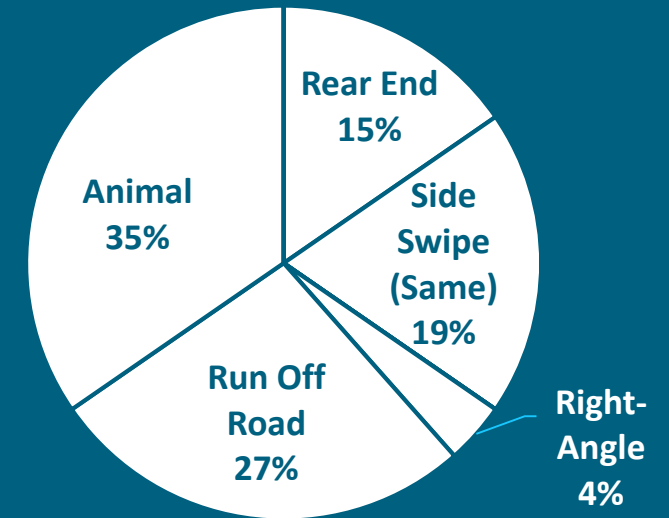
# Safety Study

## Scope:

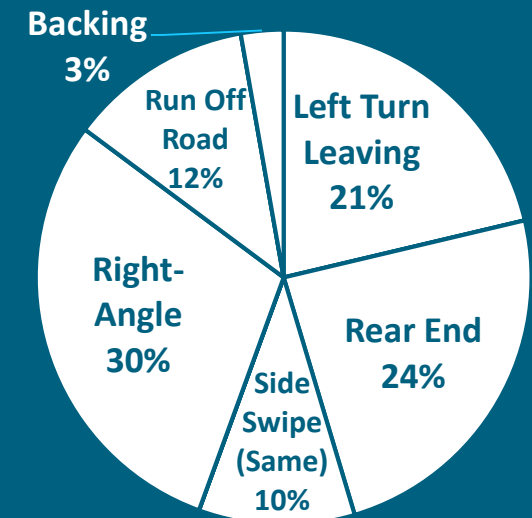
- 5-years of historic crash data (9-1-16 thru 8-31-19)
- Crash rates were calculated for each study intersection and roadway segment
- Crash rates were compared to statewide averages from similar facilities
- An outcome of the study will be recommendations for crash countermeasures

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## SEGMENT CRASH TYPE



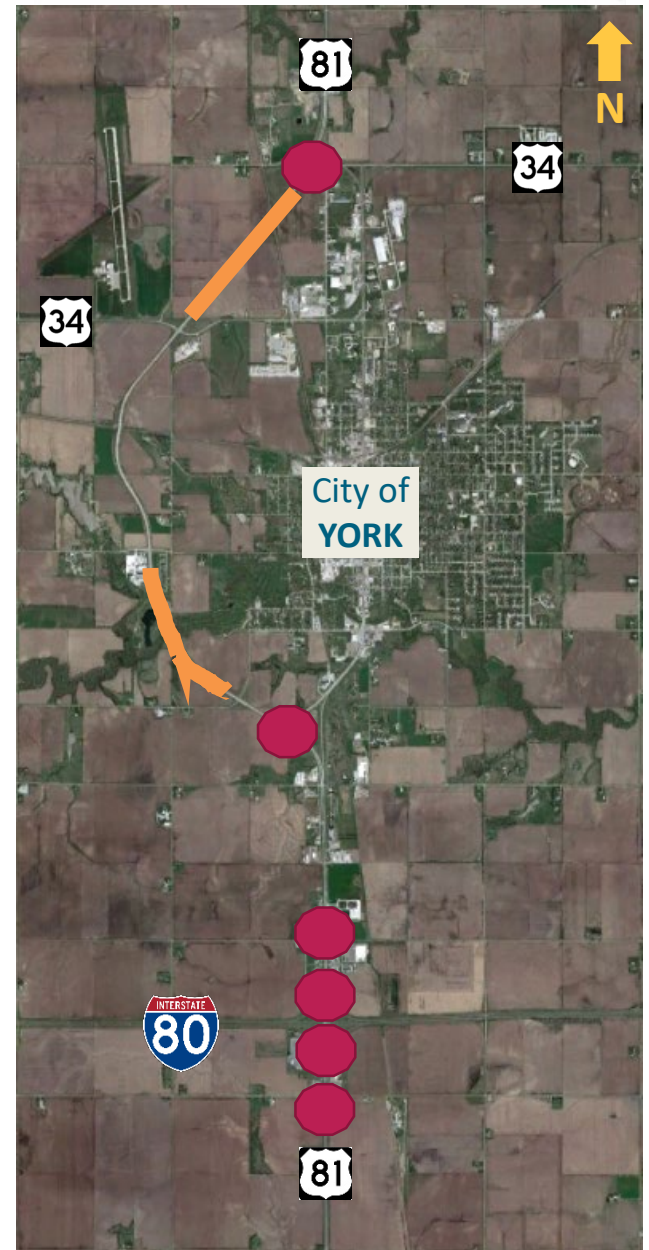
## INTERSECTION CRASH TYPE



# Safety Study

## Results:

- 6 intersections above statewide average crash rate (red circles):
  - CR-9/50<sup>th</sup> Street, I-80 S Terminal, I-80 N Terminal, David Drive, Lincoln Avenue, and US-34 N Junction
- 2 segments above statewide average crash rate (orange boxes):
  - Nobes Road to Spur 93D and US-34 S Junction to US-34 N Junction
  - Majority of crashes were animal related



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# Locations for Improvement

## Location Selection Criteria:

- Speed issues
- Operation concurs
- High crash location
- Public Input

## Countermeasures Considered:

- Alternative intersections
- Other low-cost improvements



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# Key Locations

## US-81 with I-80 Interchange :

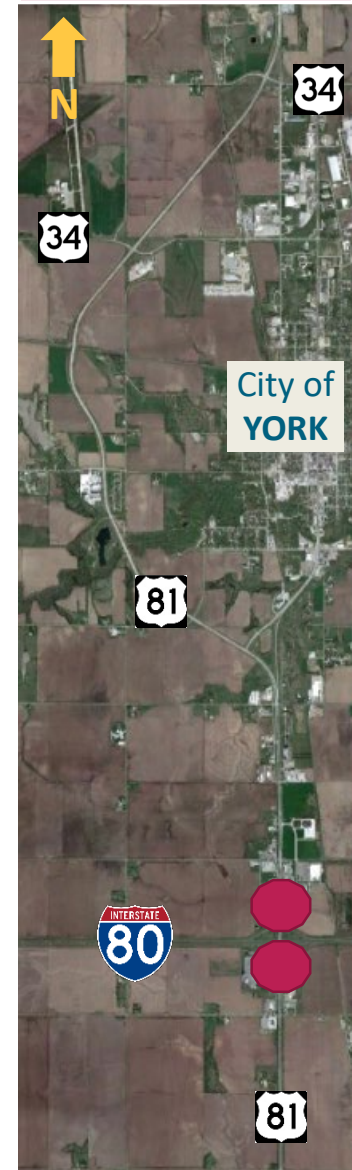
- Both signalized ramp terminals have crash rates above the statewide average
  - Pattern of left-turn leaving, right-angle, and rear-end type collisions
  - Crashes occurring are high severity
- Acceptable future traffic operations with current configuration

### Potential Countermeasure(s):

- Roundabouts at ramp terminals
- Diverging Diamond Interchange
- Additional travel lanes
- Other low-cost improvements



### Location Map:

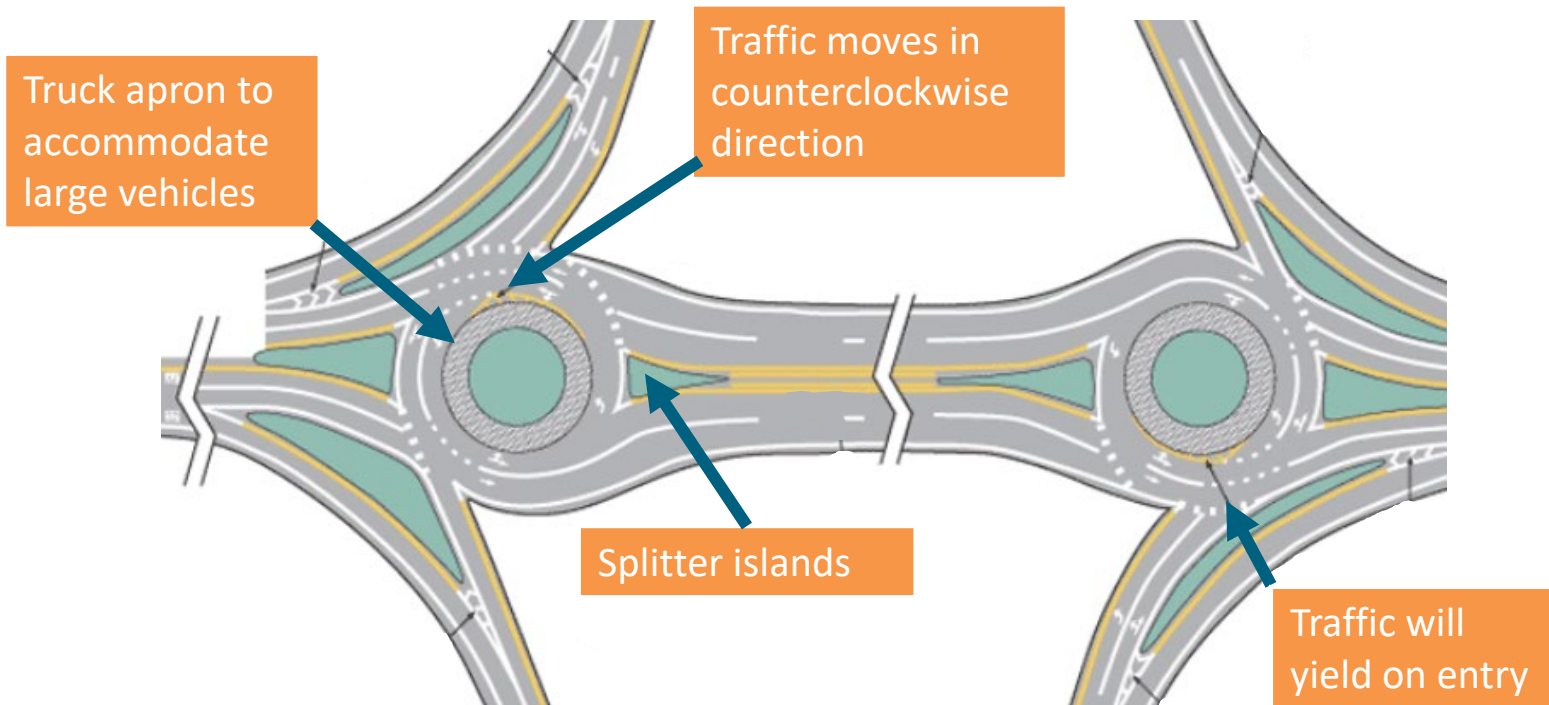




# Alternative Ramp Terminal Types

## Roundabouts at Ramp Terminals:

- Two roundabouts used in tandem



### Pros:

- Improved operations
- Improved safety
- Slower speeds
- Reduced conflicts
- Signalization not required

### Cons:

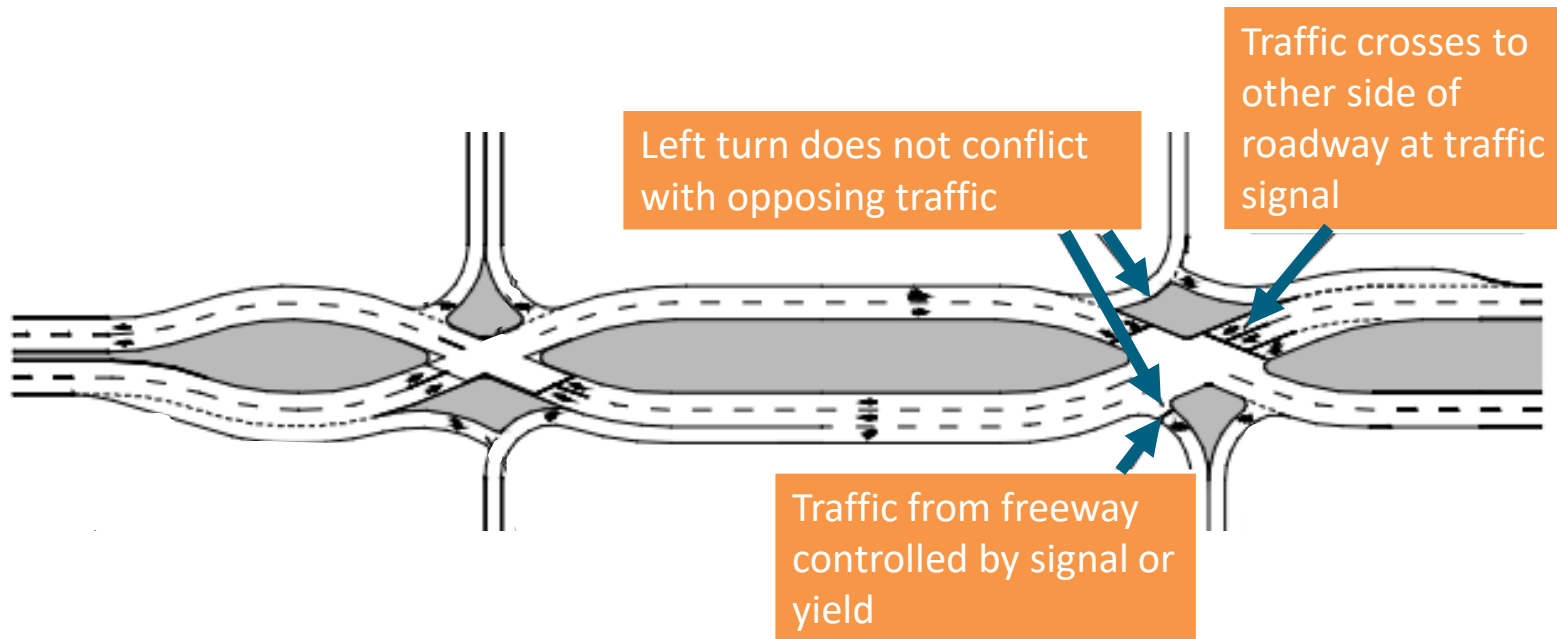
- Unfamiliar configuration
- Large footprint

Source: MUTCD

# Alternative Ramp Terminal Types

## Diverging Diamond Interchange (DDI):

- Also called a double crossover diamond (DCD)
- All left turns onto the interstate are unimpeded



### Pros:

- Increasing throughput
- Improved operations
- Improved safety
- Existing ramp terminals can be modified easily

### Cons:

- Unfamiliar interchange type
- Driver expectancy
- Large footprint

Source: FHWA DDI Brochure & Info Guide

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# Key Locations

## US-81 with CR-9/50<sup>th</sup> Street:

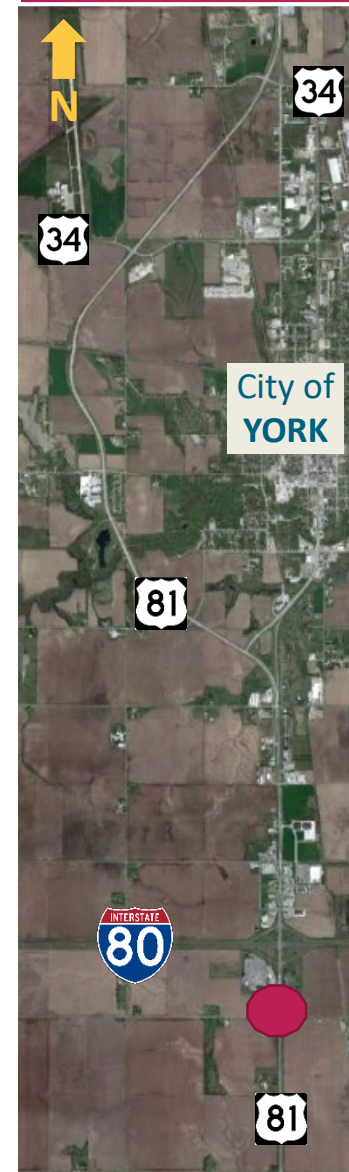
- Stop controlled intersection has crash rates above the statewide average
  - Pattern of right-angle type collisions
  - Crashes occurring are high severity
- Acceptable future traffic operations with current configuration

### Potential Countermeasure(s):

- Roundabout
- RCUT
- Access Restrictions
- Signalization
- Other low-cost improvements



### Location Map:



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# Key Locations

## US-81 with David Drive:

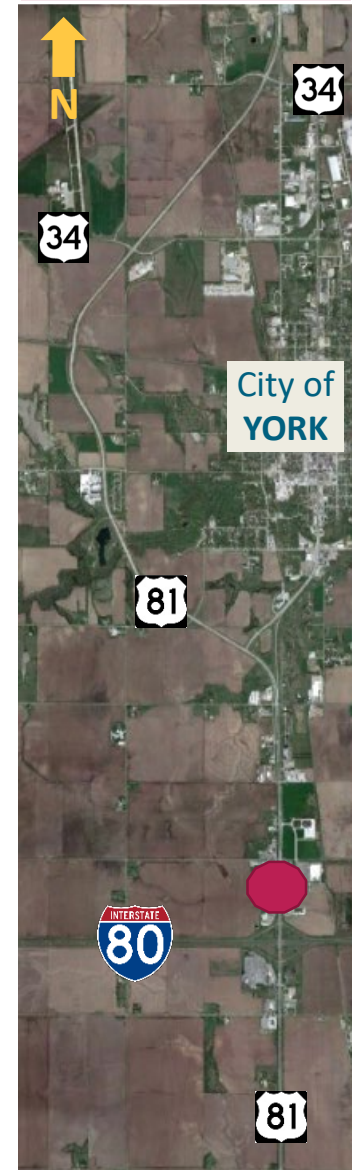
- Signalized intersection has crash rates above the statewide average
  - Pattern of right-angle and left-turn leaving type collisions
  - Crashes occurring are high severity
- Acceptable future traffic operations
- Speed differential between cars and semis

### Potential Countermeasure(s):

- Roundabout
- RCUT
- MUT
- Access Restrictions
- Upgraded Traffic Signals
- Other low-cost improvements



### Location Map:



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# Key Locations

## US-81 with Lincoln Avenue:

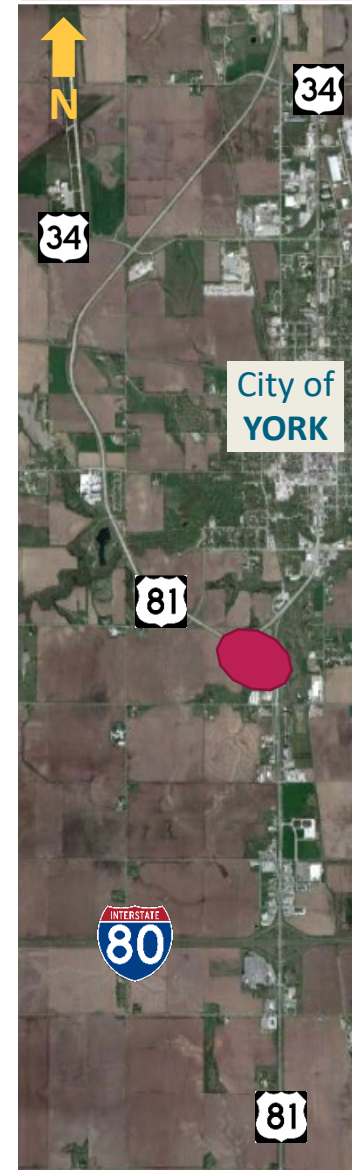
- Signalized intersection has crash rates above the statewide average
  - Pattern of right-angle and rear-end type collisions
  - Crashes occurring are high severity
- Northbound slip ramp provides unusual geometry after 21<sup>st</sup> Street intersection

### Potential Countermeasure(s):

- Roundabout
- RCUT
- Remove/Relocate slip ramp
- Other low-cost improvements



### Location Map:



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# Key Locations

## US-81 with US-34 Junctions:

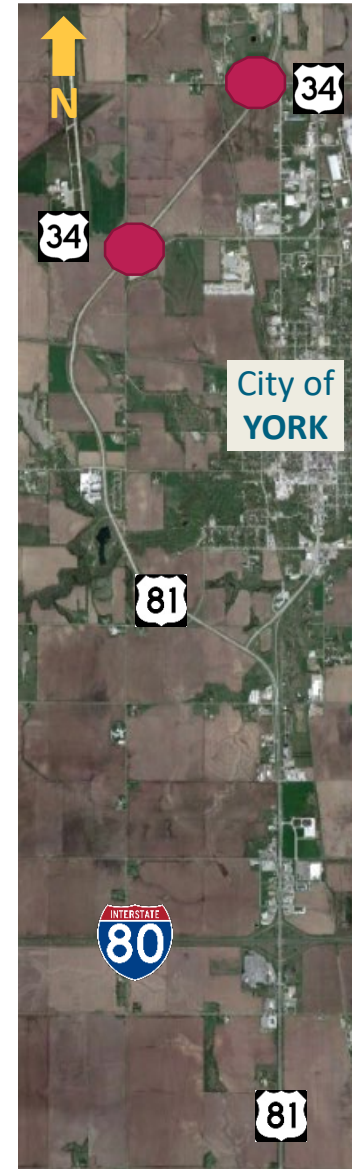
- North junction has crash rates above the statewide average
  - Pattern of right-angle and left-turn leaving type collisions
  - Crashes occurring are high severity
- Future traffic operations do not meet LOS C or better goal at both junctions

### Potential Countermeasure(s):

- Roundabout
- RCUT
- Additional turn-lanes
- Other low-cost improvements



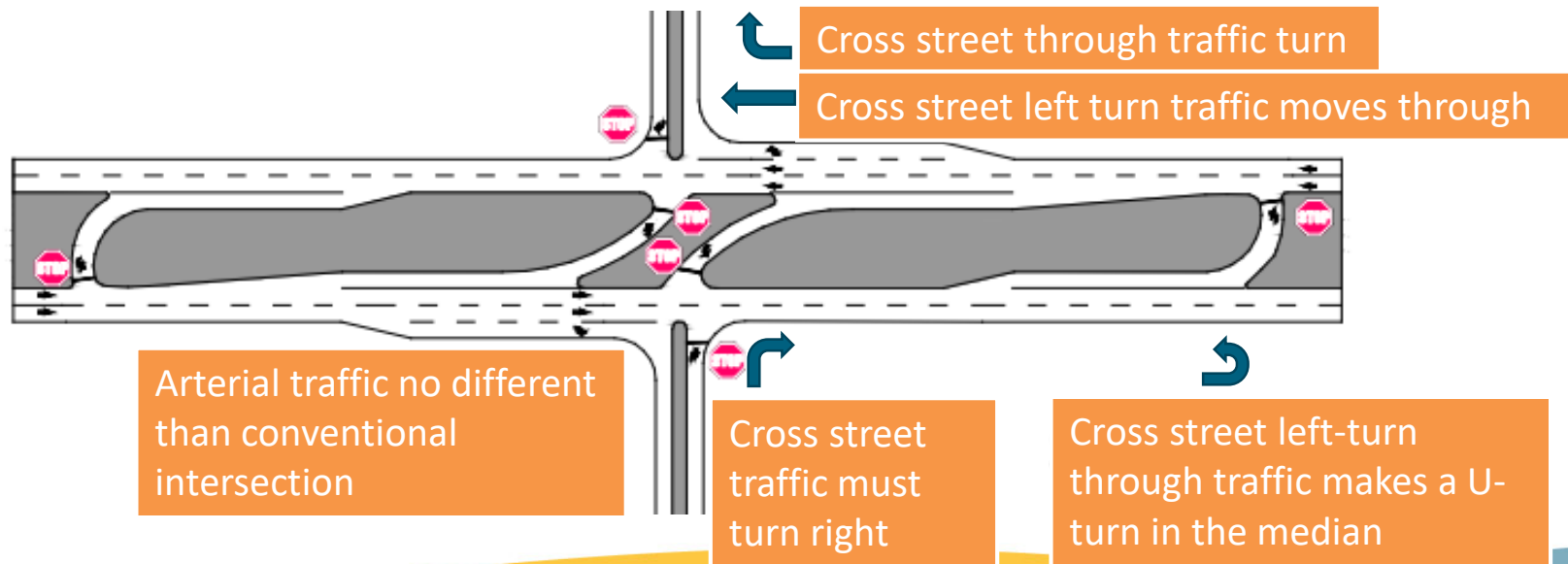
### Location Map:



# Alternative Intersection Types

## Restricted Crossing U-Turn (RCUT):

- Sometimes called J-Turn
- Benefits when implemented corridor wide
- Safer form of stop- or yield-control
- Alternative to signalization



### Pros:

- Reducing overall speeds
- Increasing throughput
- Improved operations
- Reduce number and severity of conflicts

### Cons:

- Longer distance to travel for minor road through and left-turn movements
- Wide medians required
- Restricts side street through and left-turn movements

Source: FHWA RCUT Brochure & Info Guide

# Alternative Intersection Types

## Median U-Turn (MUT):

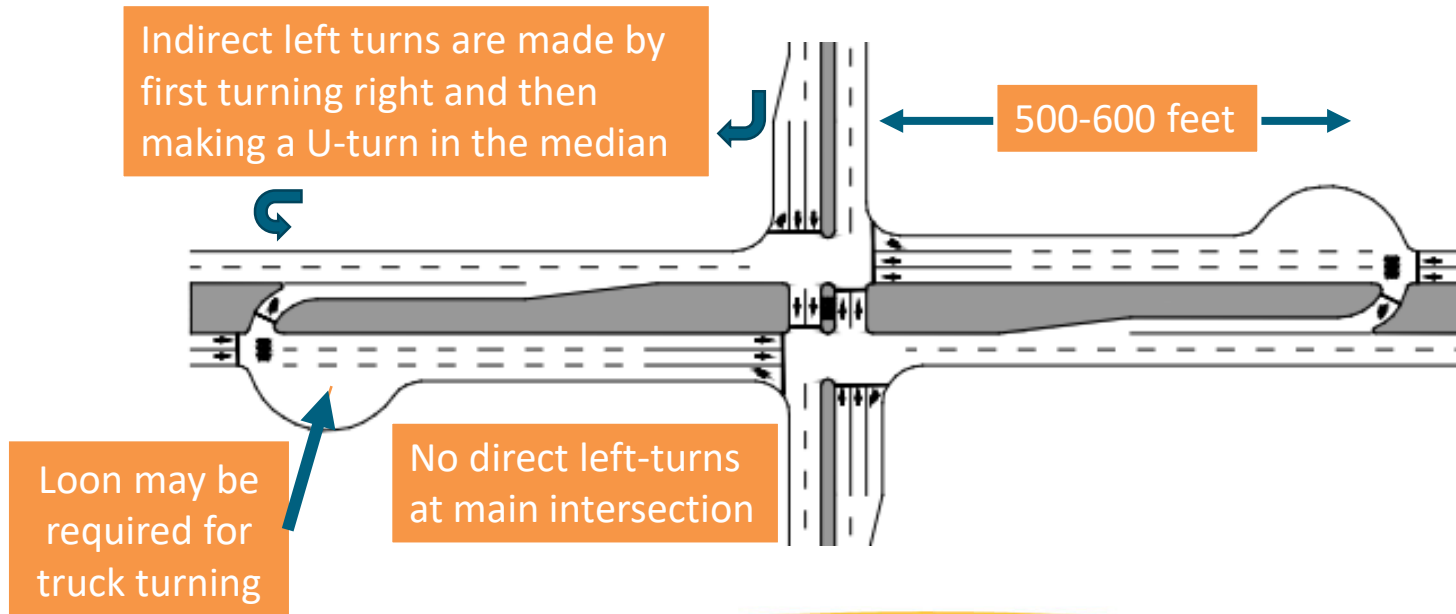
- Also called Indirect Left
- Benefits when implemented corridor wide
- Signalization is often required

### Pros:

- Reducing overall speeds
- Increasing throughput
- Improved travel times
- Reduce number of conflicts

### Cons:

- Larger distance to travel for all left-turn movements
- Wide medians required
- Restricts all left-turn movements



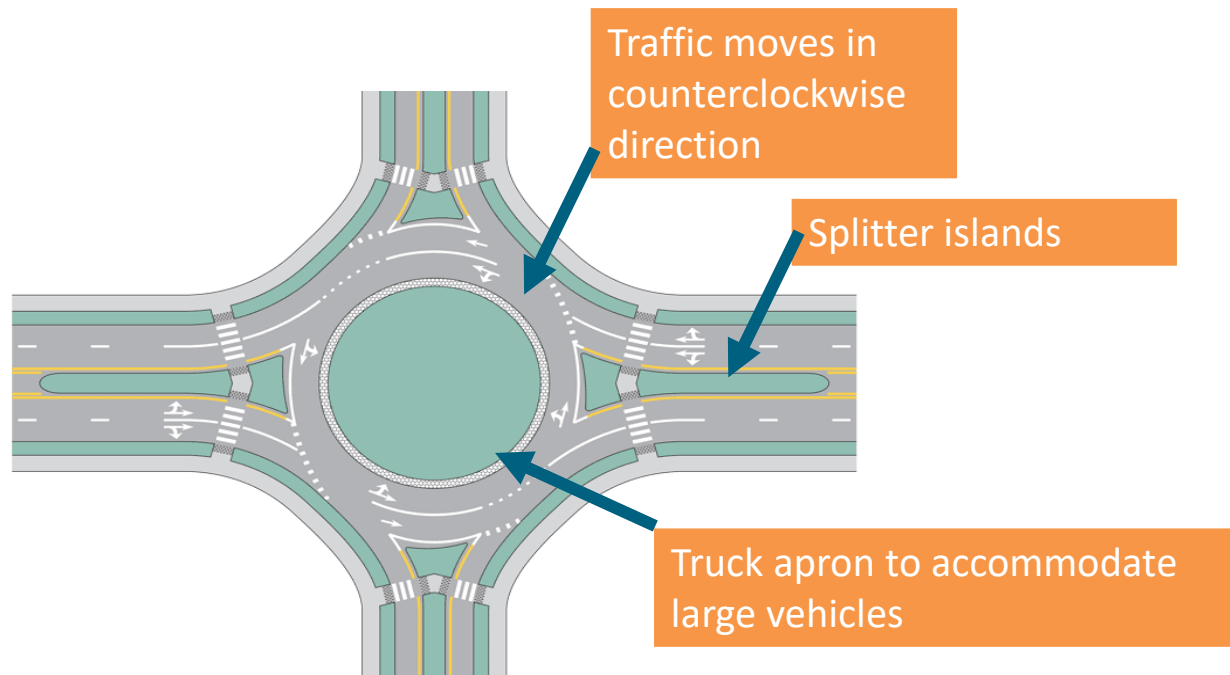
Source: FHWA MUT Brochure & Info Guide



# Alternative Intersection Types

## Roundabouts:

- Unsignalized circular intersection
- Yield on all approaches



### Pros:

- Traffic calming
- Less delay
- Lower number of conflicts
- Signalization not required
- Aesthetics

### Cons:

- Larger footprint
- Right-of-way impacts
- Significant cost to convert intersection

Source: MUTCD

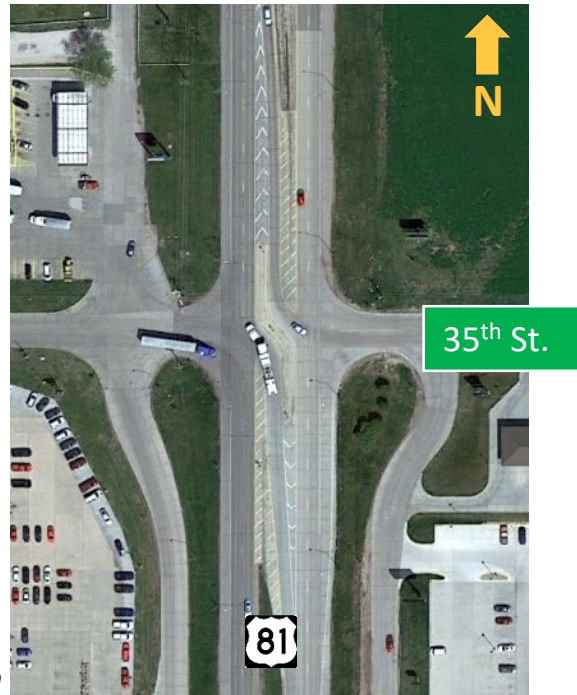
# Alternative Intersection Types

## Access Restrictions:

- Right-in/Right-out
  - Naomi Drive
- $\frac{3}{4}$  Access
  - 35<sup>th</sup> Street



Source: Google Earth



Source: FHWA Office of Safety Design

### Pros:

- Reducing speeds
- Improved throughput
- Lower number of conflicts
- Signalization not required

### Cons:

- Access to business limited
- Additional traffic on adjacent intersections

# Summary

- Comprehensive planning study of the US-81 corridor evaluating traffic speeds, operations, and safety performance
- Alternative intersections are being considered for this corridor
- Public input will help guide the future of the corridor

## The purpose of the study is to:

- Preserve the transportation asset (US-81)
- Improve the reliability of the transportation system
- Enhance operations and safety along the corridor
- Perpetuate the mobility of the traveling public



# Closing

**WE CARE**  
about what you think.

**WE LISTEN**  
to the needs of the community

**WE ACT**  
to improve relationships and performance

Study information, documents, and this presentation will be available by clicking on the “US-81 and US-34 Highway Study” link on the NDOT website:  
<https://dot.Nebraska.gov/projects/future-projects>

**If you have questions or comments, please contact:**

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