

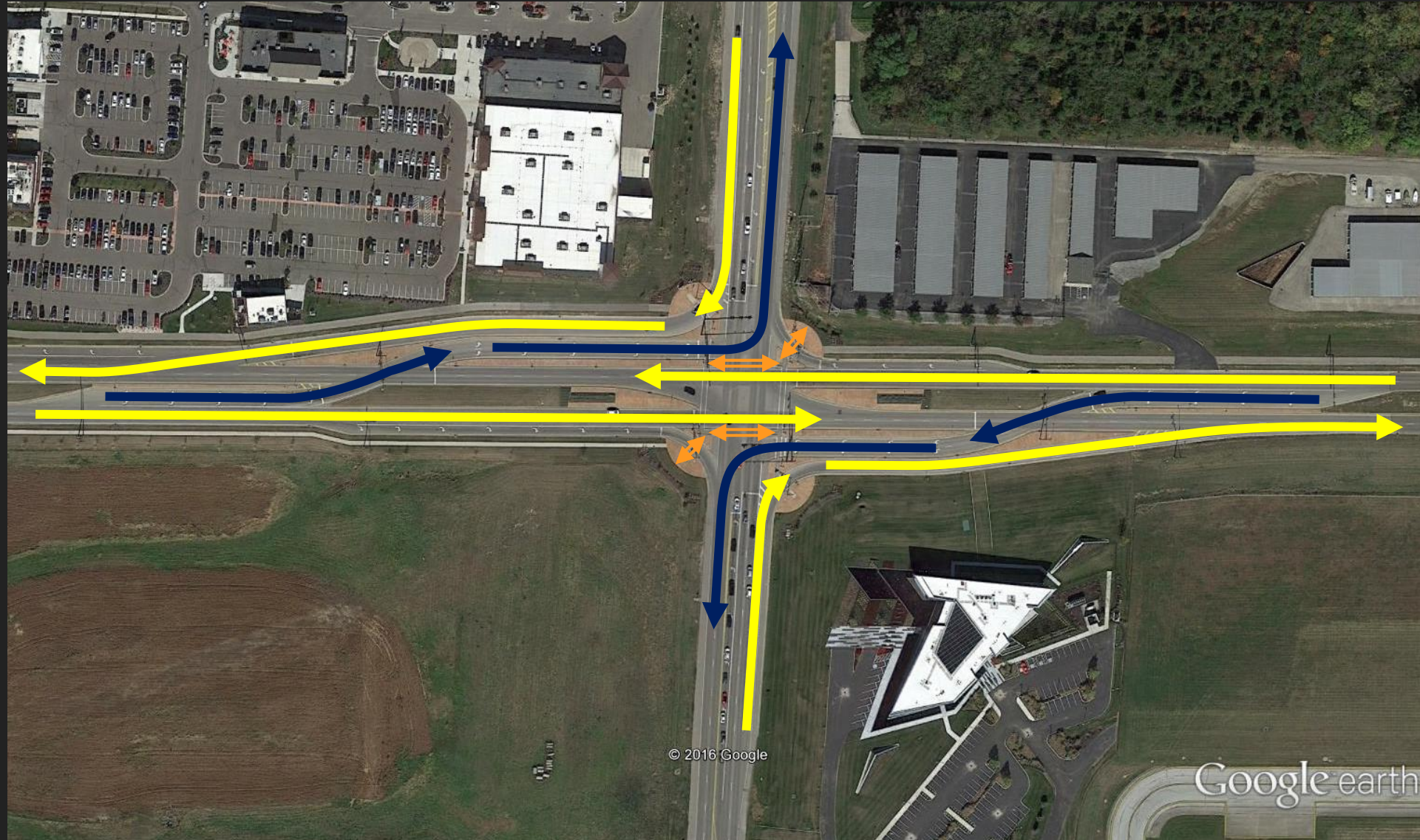


Tennessee Section ITE 2023 Annual Meeting

Continuous Flow Intersections: A Multimodal Alternative to Grade Separation

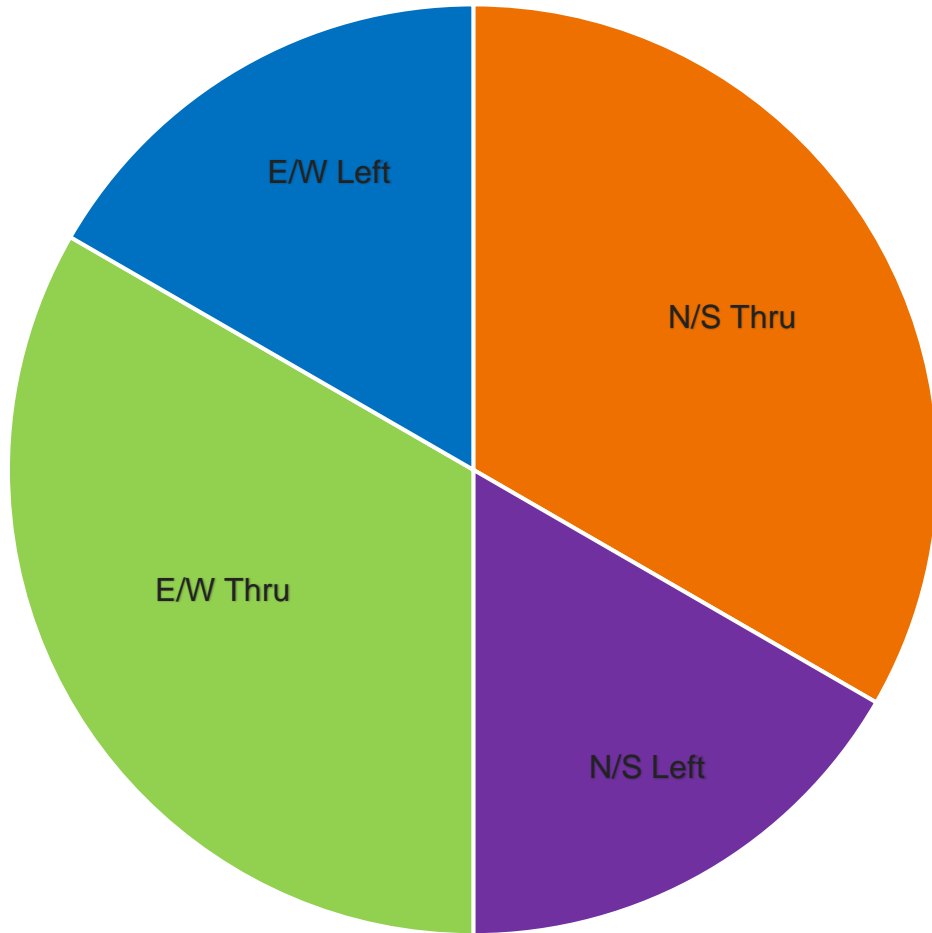


What is a Continuous Flow Intersection (CFI)?



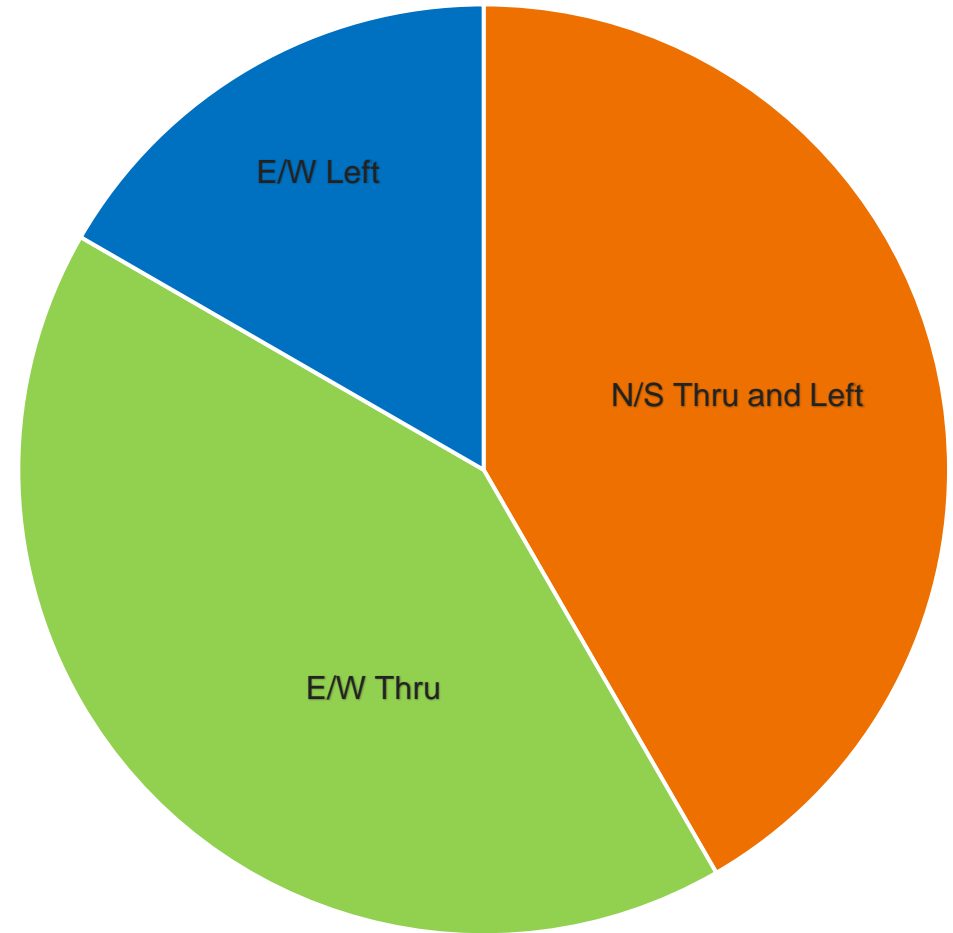
What's the benefit of a CFI?

Splits



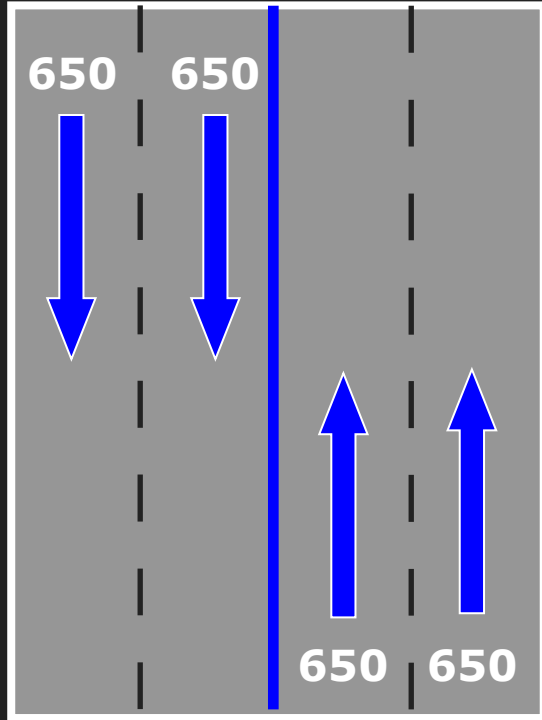
■ N/S Thru ■ N/S Left ■ E/W Thru ■ E/W Left

Splits



■ N/S Thru and Left ■ E/W Thru ■ E/W Left

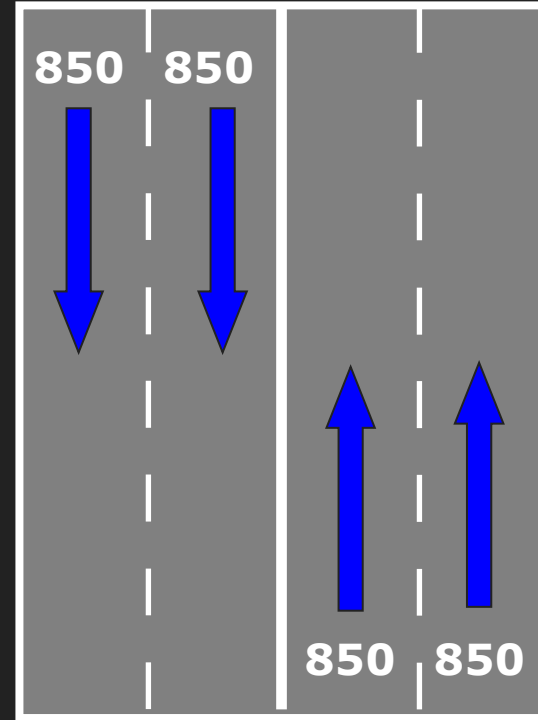
Volume Thresholds



Conventional 4-lane roadway

$$650 \text{ vphpl} \times 4 \text{ lanes} = 2600 \text{ vph}$$

C=150 P.M. Peak



CFI 4-lane roadway

$$850 \text{ vphpl} \times 4 \text{ lanes} = 3400 \text{ vph}$$

C=120 P.M. Peak

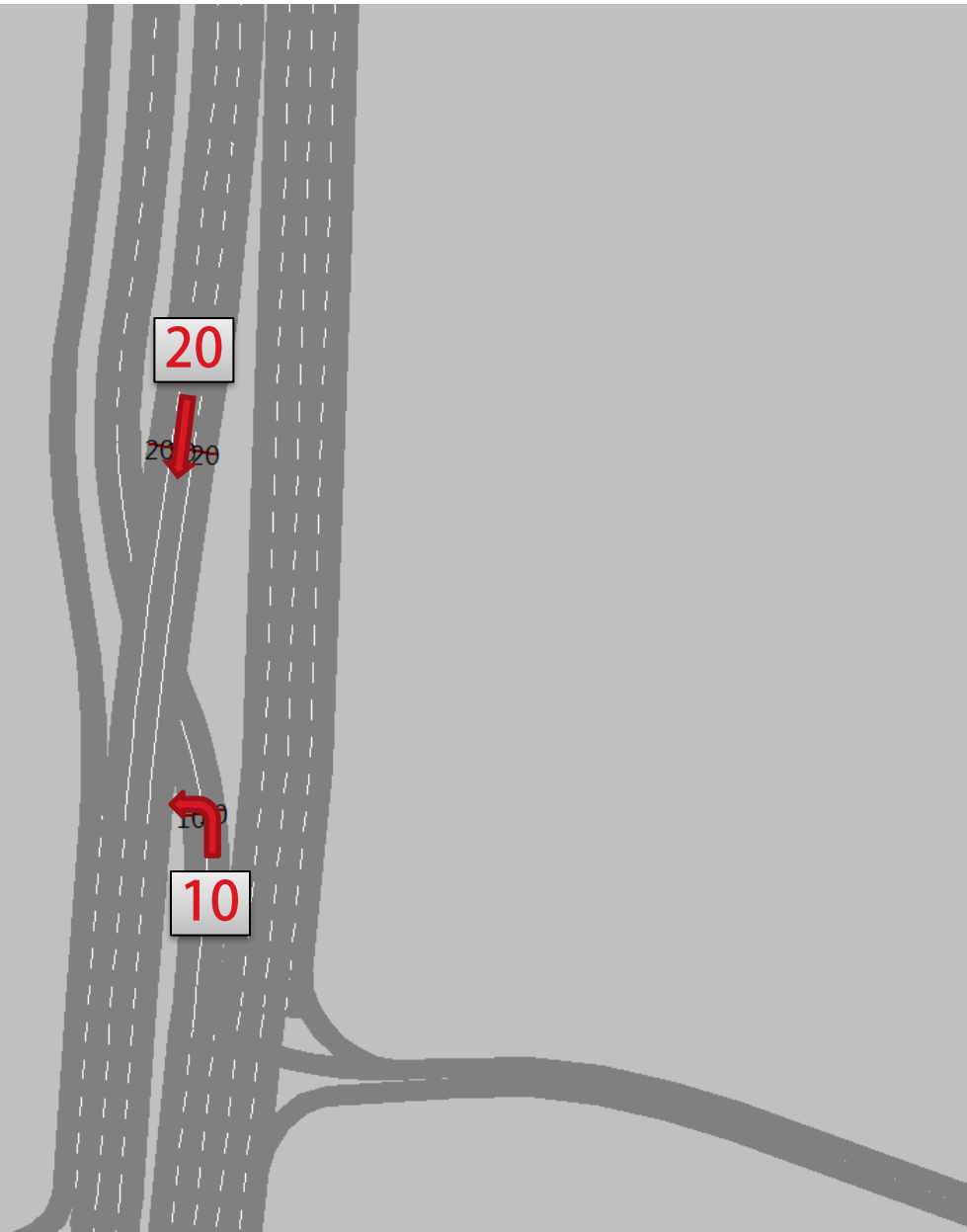
**30%
Capacity
Increase**

How Does a CFI Work?



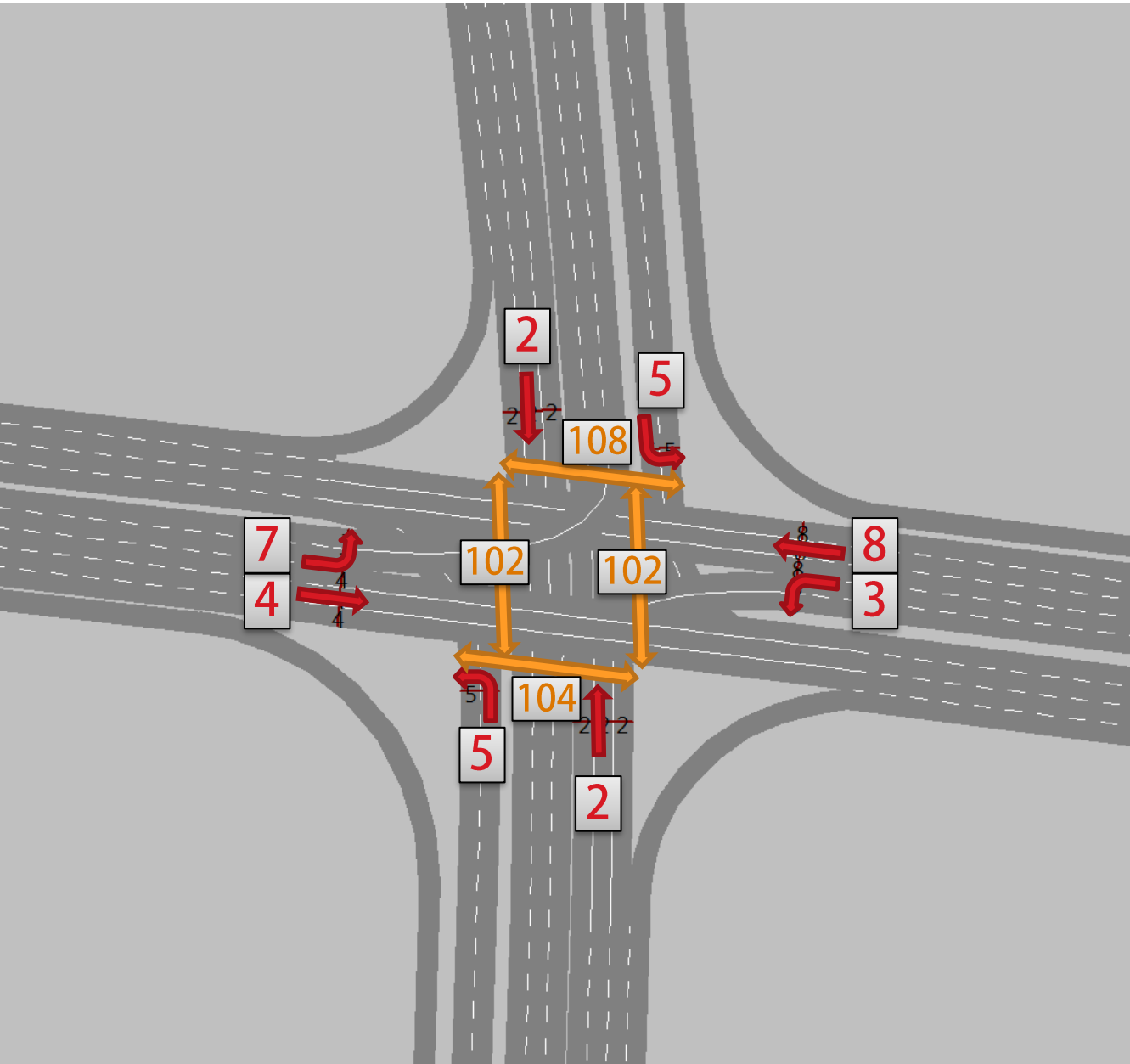
Crossover

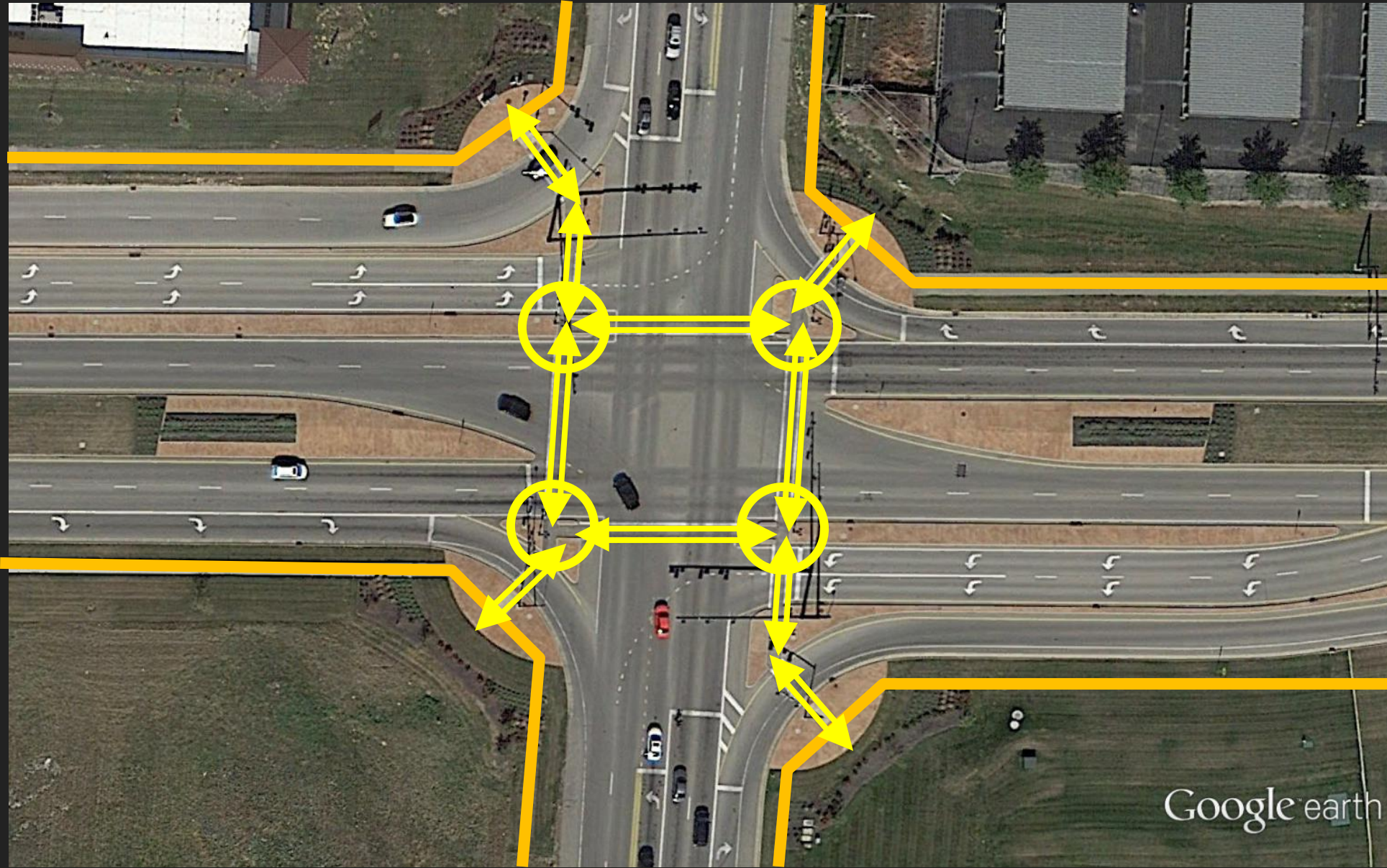
- 2-Phase, preferably running on controller at Primary Intersection
- Intuitive to Drivers (Turn Left to Go Left)
- Right Turn Typically Signalized



Primary Intersection

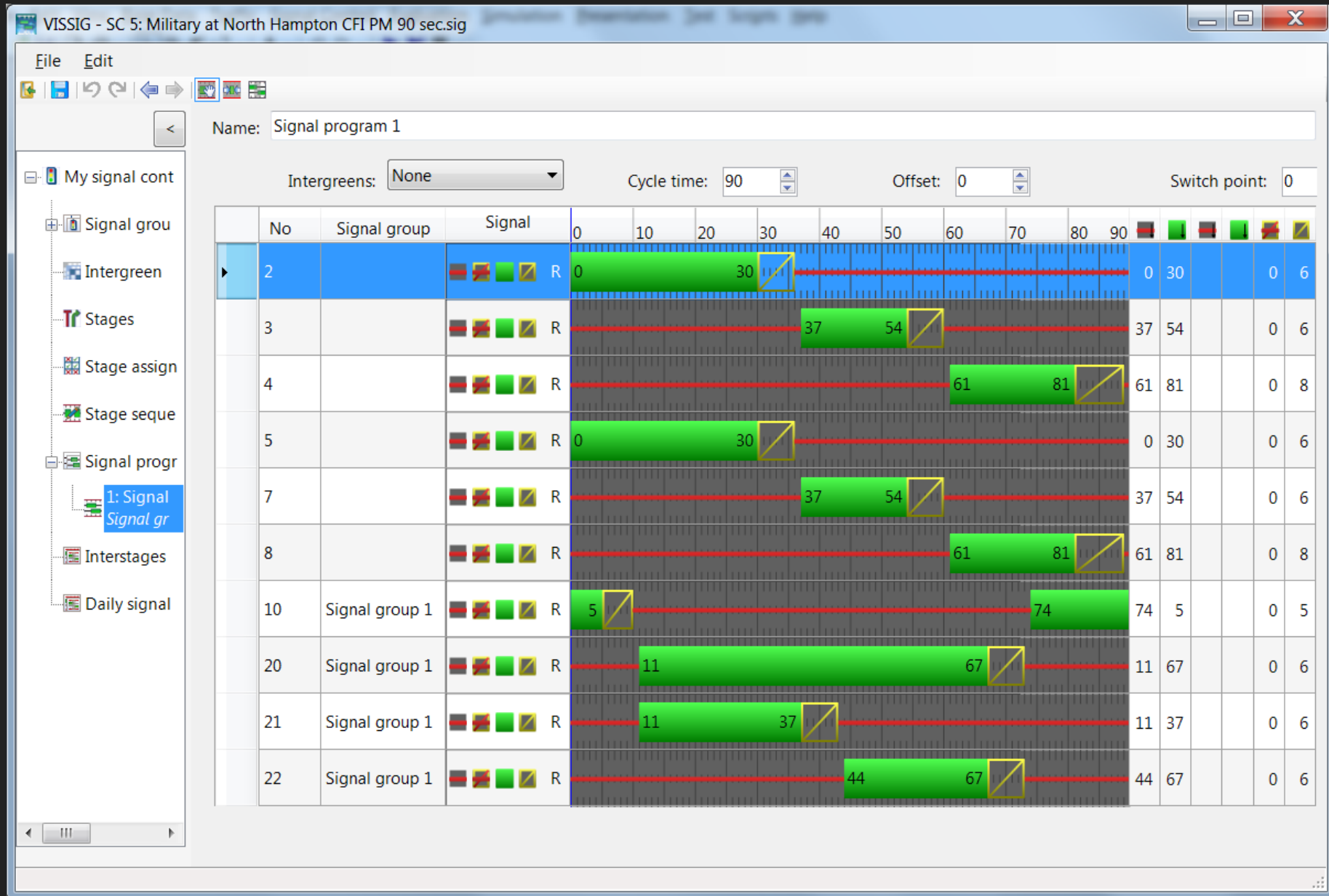
- 3-Phase
- Phases 2 and 5 Run Simultaneously
- N/S Right Turns Typically Signalized as Overlap with Phases 3 and 7
- E/W Right Turns SHOULD Occur Prior to Encountering CFI Left





Pedestrian Operations

Signal Timing



Grade Separation

High Capacity for Thru Movements

May Restrict Some Modes

ROW Impacts 4 Quadrants

\$10M-\$30M

CFI

Balanced Capacity for Thrus and Lefts

Facilitates All Modes

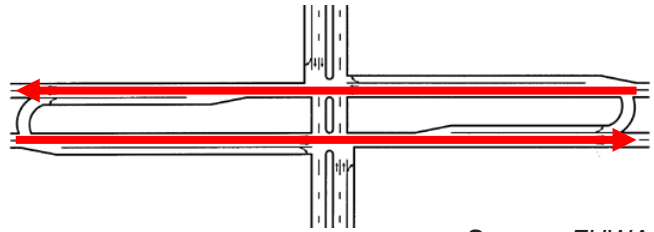
ROW Impacts 2 Quadrants

\$4M-\$7M



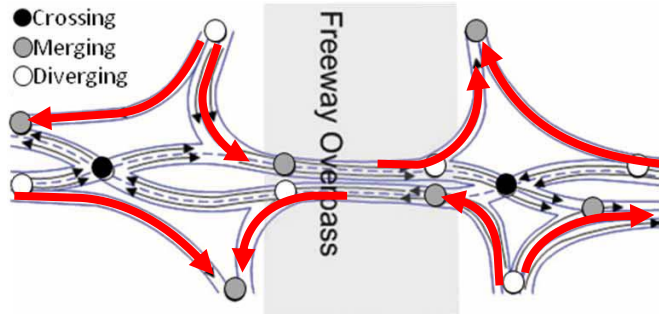
Selection Criteria

Median U-Turn



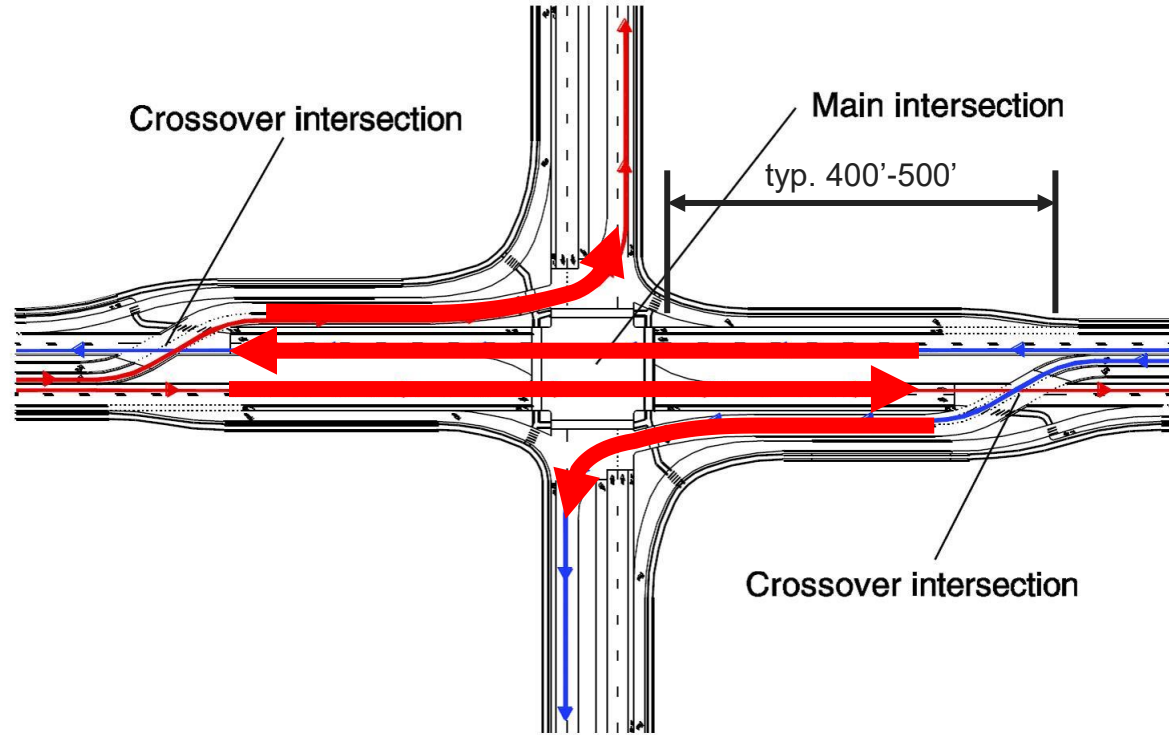
Source: FHWA

DDI or SPUI



Source: FHWA

CFI



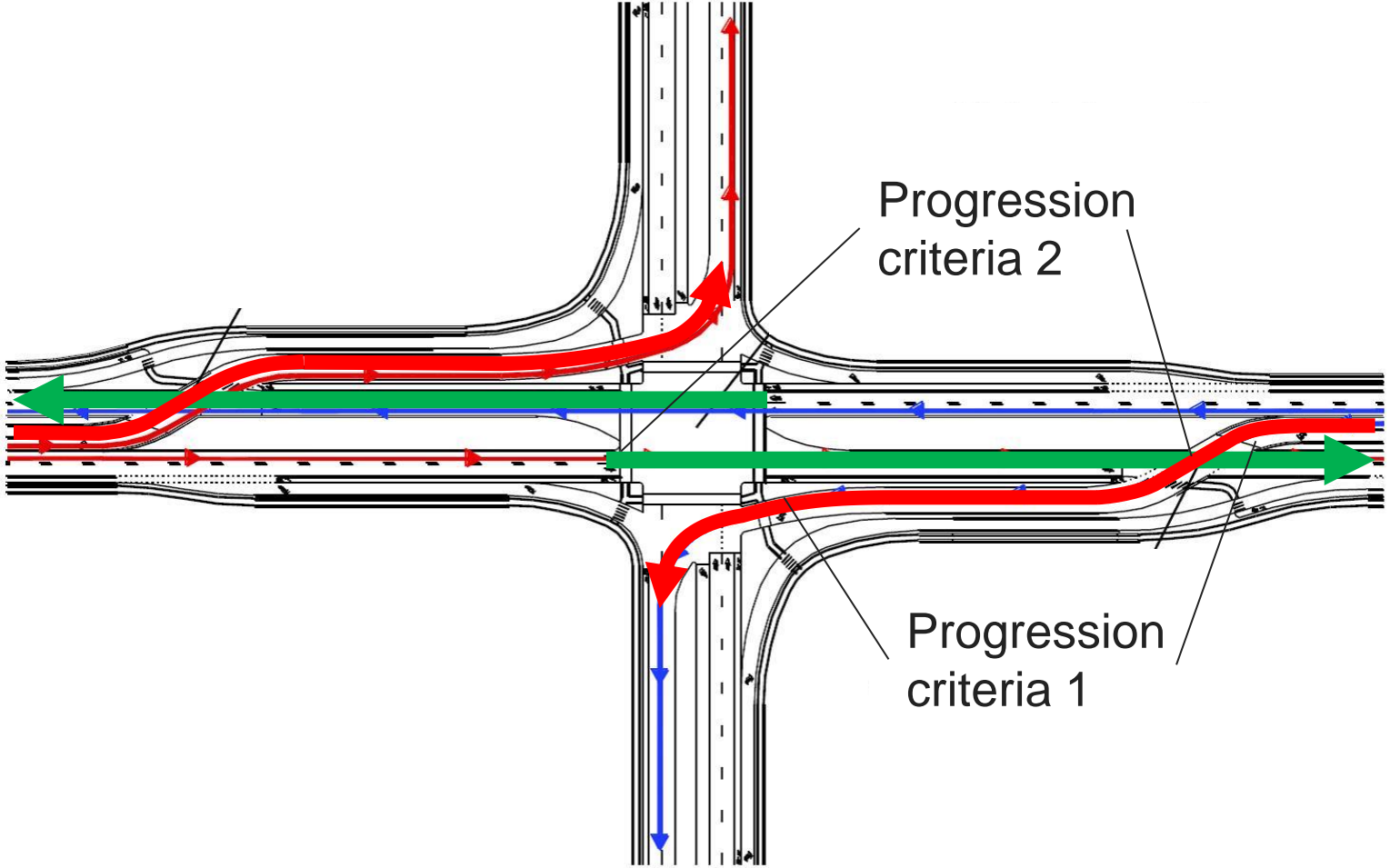
Source: FHWA



Design Considerations

- Single Traffic Signal Controller
- Can be Fully Actuated with Overlaps
- Robust UPS
- Geometry for Crossovers, Drainage, and Passing Stalled Vehicle
- Access to Adjacent Properties
- Staged Pedestrian Crossings and Multi-use Paths
- Distance of Crossover from Primary Intersection Important

Design Considerations

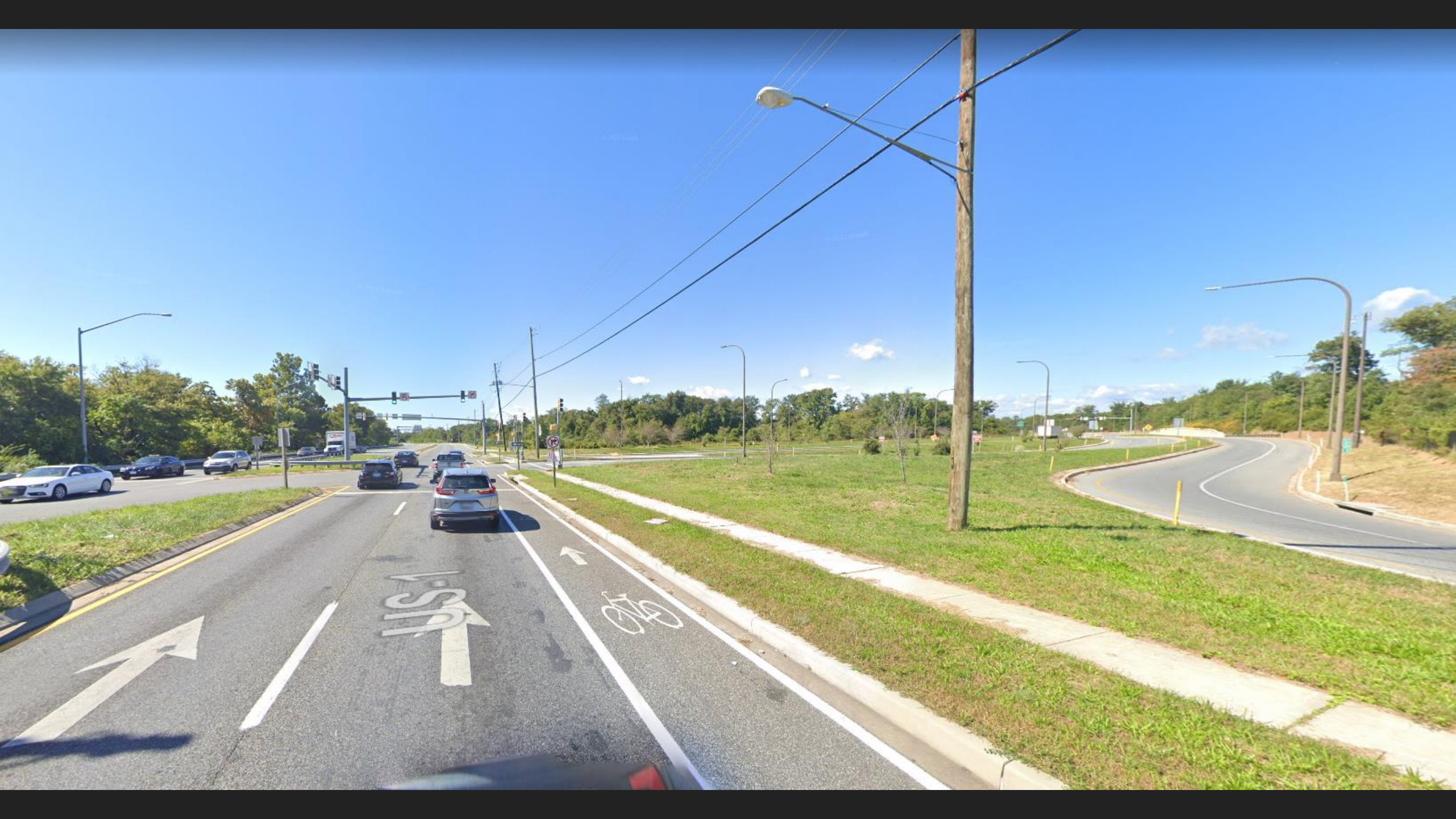


Source: FHWA



© 2016 Google

Google earth





Magnolia Rental & Sales

Dixie Dance

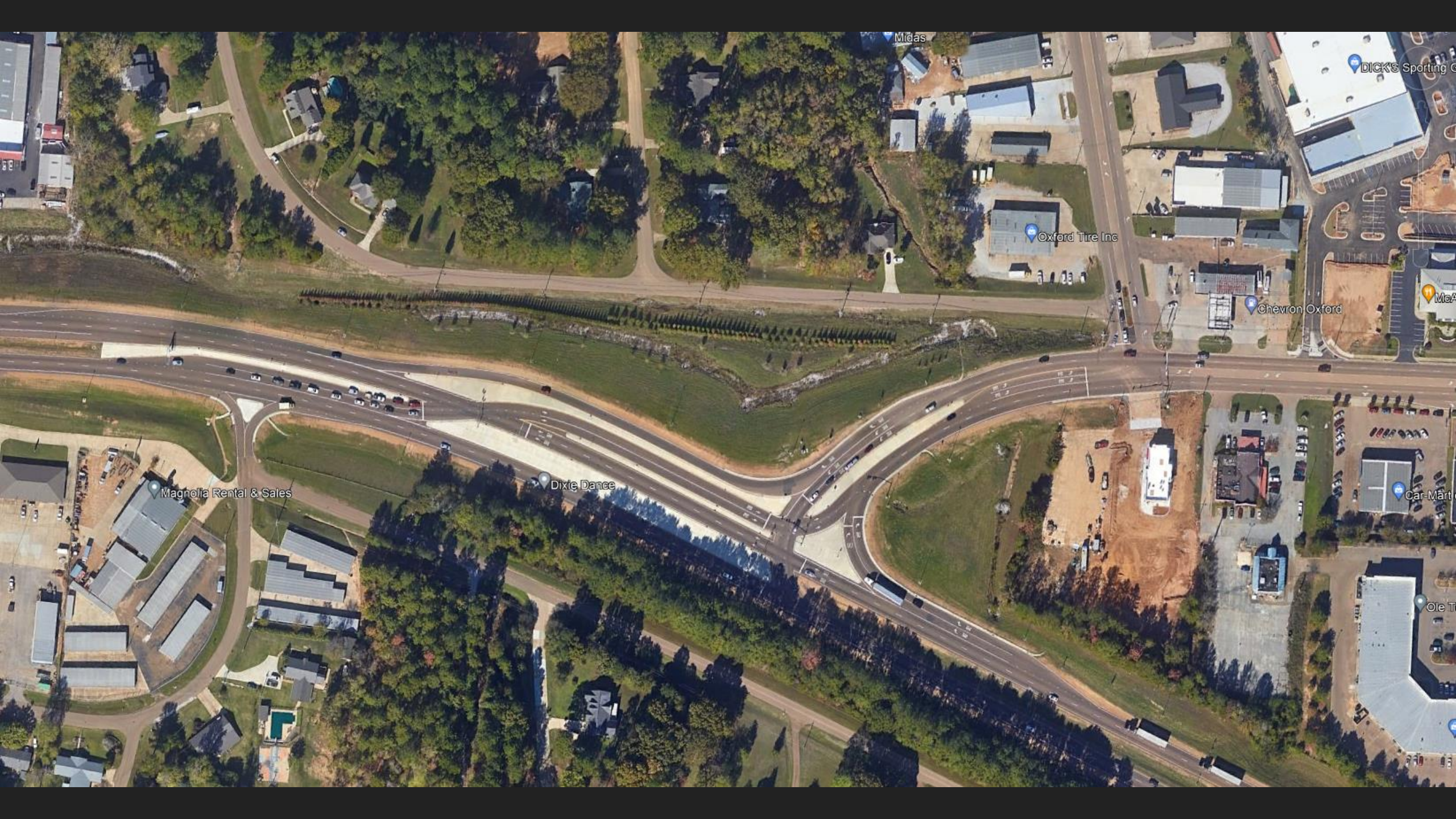
Oxford Tire Inc

Chevron Oxford

Car Mart

DICK'S Sporting Goods

Ole



Meas

DICK'S Sporting Goods

Oxford Tire Inc

Chevron Oxford

Magnolia Rental & Sales

Dixie Dance

Car-Mart

Ole T



193 ft

Image © 2012 DigitalGlobe

34°21'51.51" N 89°34'01.17" W elev 352 ft

Google earth









Juniper Grove Crafts

Tidewater Plumbing & Heating

Home2 Suites by Hilton Norfolk Airport

Bee Brilliant Childcare

Charis Support

Days Inn by Wyndham Norfolk Airport

DoubleTree by Hilton Hotel Norfolk Airport

Delta Hotels by Marriott Norfolk Airport

Residence Inn by Marriott Norfolk Airport



Charis Support Se

Juniper Grove Crafts

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Bee Brilliant Childcare

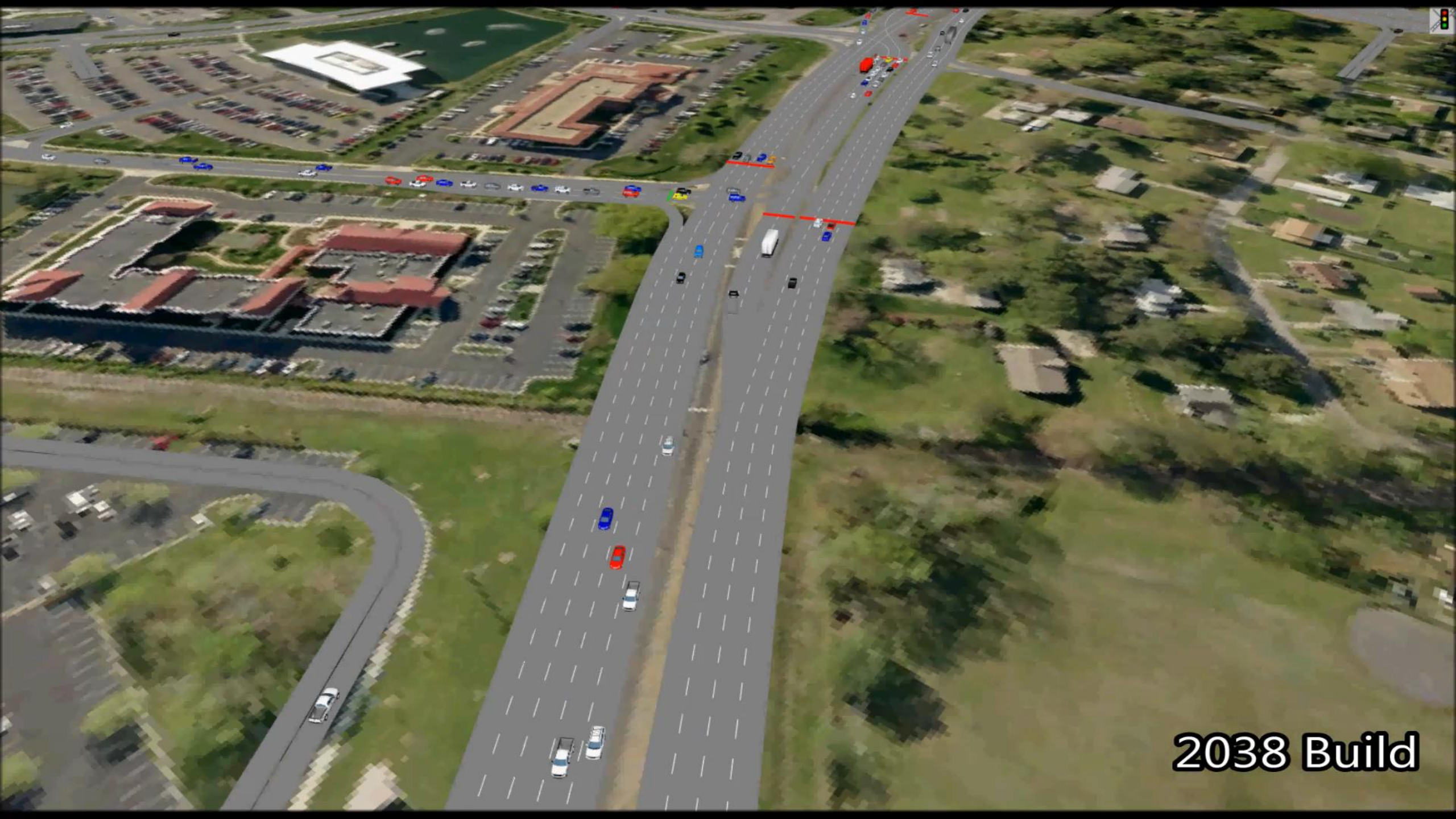
Home2 Suites by Hilton Norfolk Airport

Days Inn by Wyndham Norfolk Airport

DoubleTree by Hilton Hotel Norfolk Airport

Delta Hotels by Marriott Norfolk Airport

Residence Inn by Marriott Norfolk Airport



2038 Build



AAA Rent All

Robinson Brothers Ford

Robinson Brothers Ford

Quick Lane

XL Parts

Woodburners

Commercial Fleet Services

Jack in the Box

Alarm Center Security

Hertz Car Rental - Baton Rouge - Airline...

O'Reilly Auto Parts

Express Collision

AutoZone Auto

Clay Cut Bayou

Clay Cut Bayou

Clay Cut Bayou



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Case Study

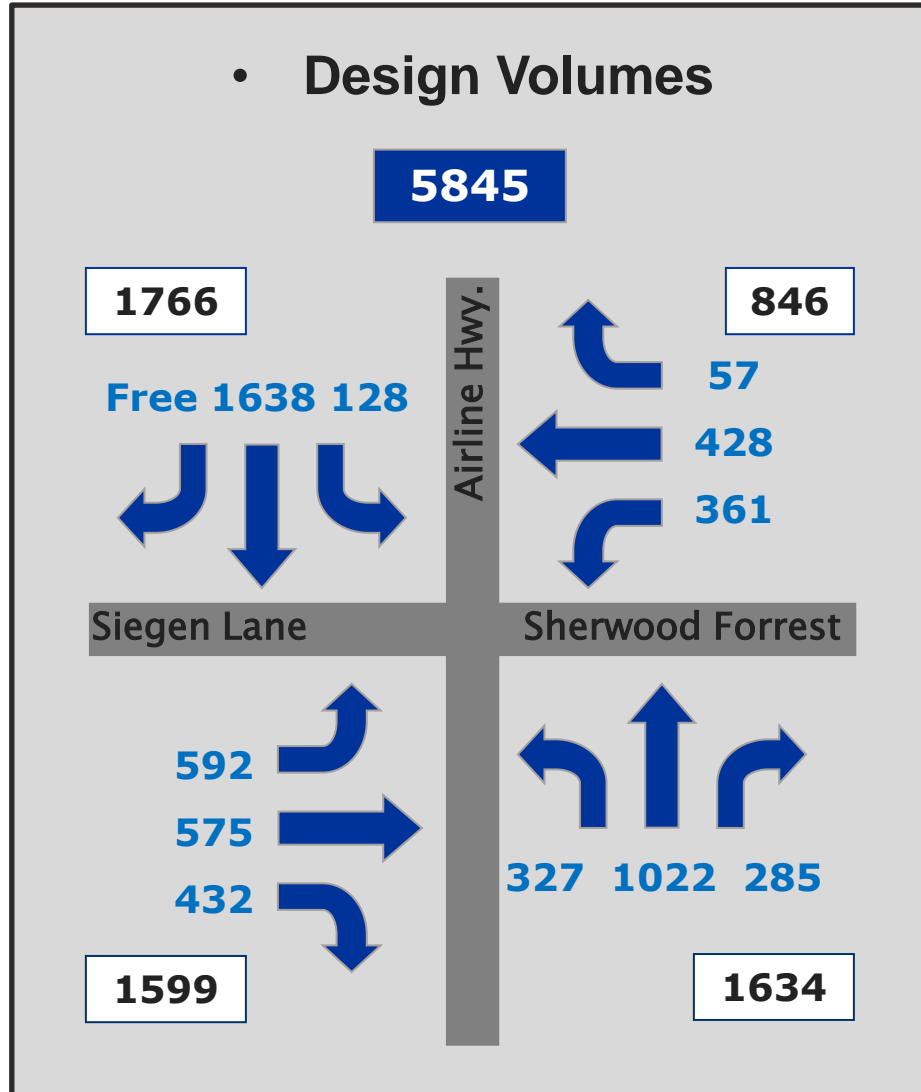
Airline Highway CFI

- 2002 - LADOTD and Stantec Began Discussing Possible CFI Applications
- Construction of the Airline/Siegen CFI Began in the Summer of 2005
- Opened on March 21, 2006
- Hurricane Katrina Caused Design Year Volumes to be Exceeded by Opening Day

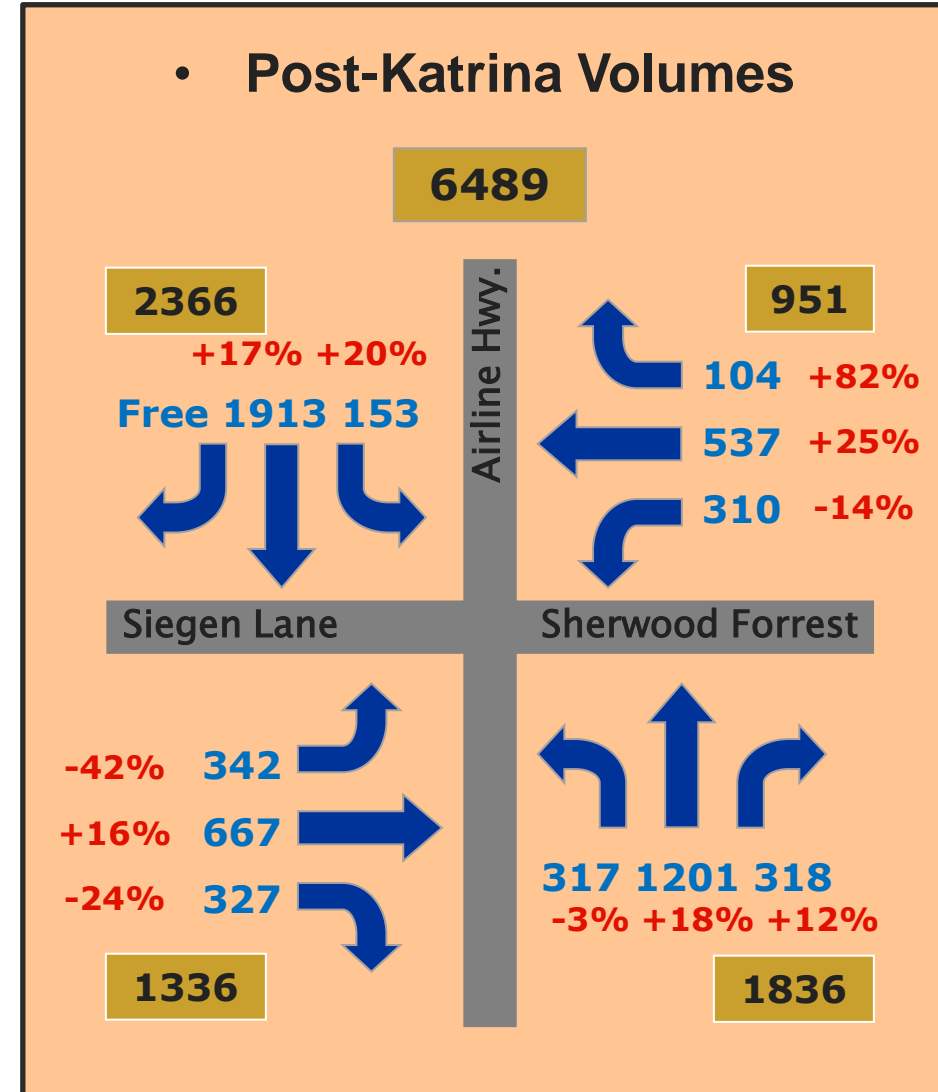
Case Study

Airline Highway CFI

• Design Volumes



• Post-Katrina Volumes



Airline Highway CFI

The Bad News

- Actual Volumes Much Higher Than Design Volumes
 - Katrina
 - “Avoiders” Returned to Intersection
- Unbalanced Increases Made Timing Adjustments Challenging

The Good News

- Operations Greatly Improved
 - Travel Times down 40%
 - Average Delay Less than ½ Previous
- Driving Public Satisfaction
- Safety

Case Study

Airline Highway CFI – 4 Months After Opening

TUESDAY
JULY 4, 2006

BATON ROUGE
2theadvocate.com
50 cents

THE ADVOCATE

THE INDEPENDENT VOICE OF SOUTH LOUISIANA



TODAY'S WEATHER
Short showers.
High: 87. Low: 72.
DETAILS: 8B



Easing intersection Drivers praise makeover of once-snarled area

BY WILL SENTELL
Capitol news bureau

What used to be one of the most jammed intersections in Baton Rouge is winning rave reviews after a Mexican makeover.

The site is the intersection of Airline Highway and Siegen Lane-South Sherwood Forest Boulevard.

Drivers turning off Airline are stopped about 350 feet from the intersection, directed to a left-turn bay and, once they get a green light, cross oncoming lanes using two new travel lanes.

The new design, which opened for traffic three months ago, is all but unheard of in the United States but is common in Mexico, which was the model for the switch.

"I love it. I wish they would put them all over town."

CECIL LABORDE,
operates a sports memorabilia shop
on Sherwood Forest Boulevard east of the intersection

The early reviews from drivers are overwhelmingly positive.

W.L. "Buck" Corbin Jr. turns left off Airline onto Siegen Lane around 7:30 a.m. on work days.

Before the change?

"Oh Jesus, you might sit there 15 or 20 min-

► Please see **INTERSECTION**, page 8A



Advocate staff photo by RICHARD ALAN HANNON

Traffic moves along Airline Highway at the Siegen Lane-South Sherwood Forest Boulevard interchange, revamped three months ago to improve traffic flow. The change is winning praise from drivers and nearby business owners.

INTERSECTION

Continued from page 1A

utes," Corbin said. "Now if I'm there five minutes it's unusual. I'm telling you, it really astounded me," he said.

Lacee Raybon, who makes the same turn between 8 a.m. and 9 a.m. on weekdays, echoed Corbin's view. "This is so moving now," Raybon said of northbound traffic on Airline. "It used to take me 10 or 15 minutes to get through."

Cecil Laborde, who operates a sports memorabilia shop on Sherwood Forest Boulevard just east of the intersection, can look out his

front window and see that west-bound traffic headed for Airline does not stack up like it used to. "I love it," Laborde said. "I wish they would put them all over town."

Metro Councilman Mike Walker, whose district includes part of the area, said one possibility is making a similar change at the intersection of Florida and Sherwood Forest boulevards.

Walker said that, since the new traffic pattern took effect March 21, comments from constituents in barber shops, drugstores and e-mails have been enthusiastic.

"The response has been overwhelmingly positive," he said. Walker said the cost of the project,

\$4.4 million, is modest compared with traffic improvements that often cost \$20 million or \$30 million.

Before the new plan took effect, motorists on Airline were directed to two left-turn lanes. Highway experts said that caused traffic backups for cars and trucks in the lanes traveling through the intersections. In addition, the accident rate was five times greater than the average at similar junctures.

The site of the new design serves motorists headed to and from Ascension Parish and New Orleans, the Sherwood Forest subdivision to the east and commercial establishments along Siegen to the west.

The intersection featured a rash of

traffic accidents initially.

From March 22 through April 3, there were seven accidents, compared with one during that same period the year before, according to Michael Bruce, principal engineer of ABMB Engineers, whose firm made about \$405,000 on the project.

But only seven more accidents occurred from April 3 through June 13, the same as the year before.

Bruce and others contend the new turn lanes will trim wait time at the intersection to around 30 seconds compared with four minutes before the switch.

However, results of a state study to test that hypothesis are at least three months away.

Rick Newton, who operates Jay's Bar-B-Q on South Sherwood Forest, said the new design has improved traffic flow through the intersection.

However, Newton emphatically says that the work should have included a right turn only lane for traffic on Sherwood Forest headed for Airline to avoid backups.

"From the customers that talk about it, that is their biggest complaint," Newton said.

Bruce said such a lane remains a possibility.

Business operators near the intersection generally praise the change, including some who were critical earlier.

Tammy Guilliams is secretary-treasurer for Service Glass Works, which sits on Airline just south of the intersection.

Guilliams said earlier this year that she was concerned the new traffic patterns would kill nearby businesses by making them hard to get to, especially for cars and trucks headed north on Airline.

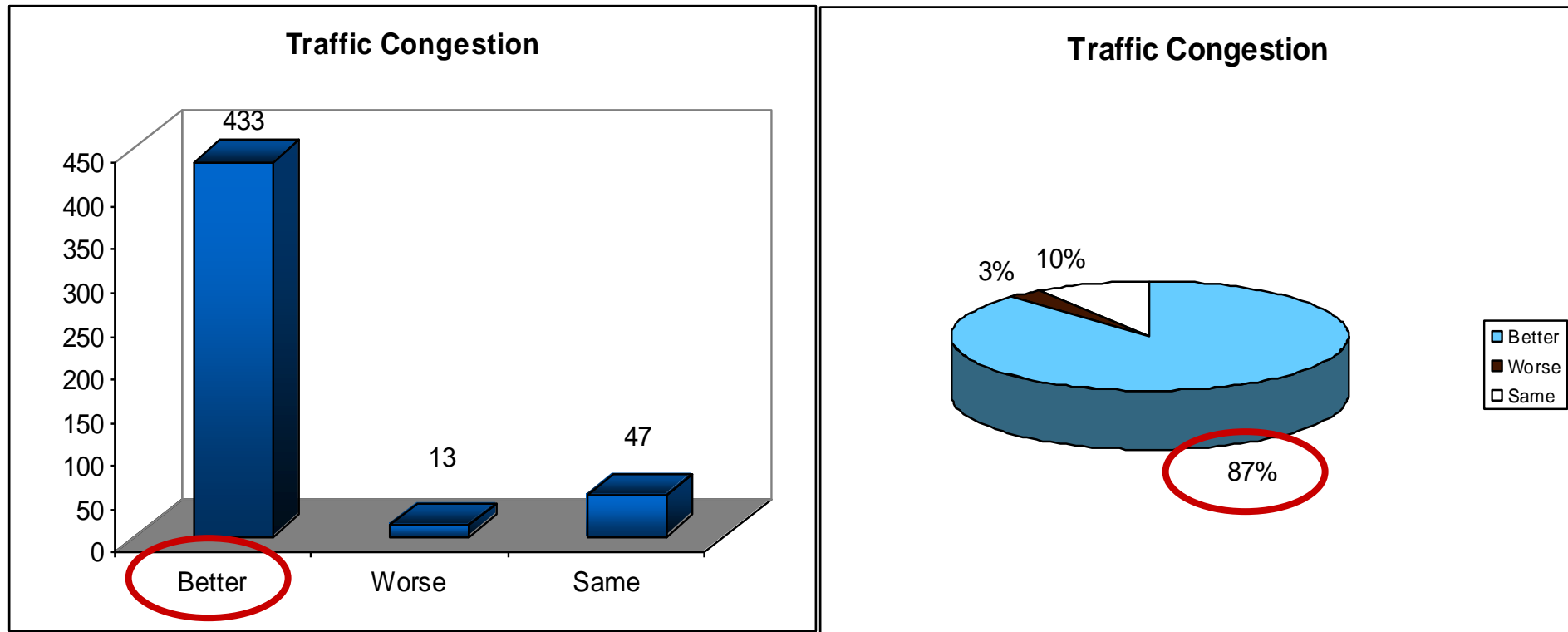
Now she says the addition of a service road in front of hers and other businesses has made it easier for customers to come and go, even if a few details still need attention.

"The intersection flow is doing very well," Guilliams said. "I can give them thumbs-up on that."

Case Study

Airline Highway CFI – Public Acceptance Survey

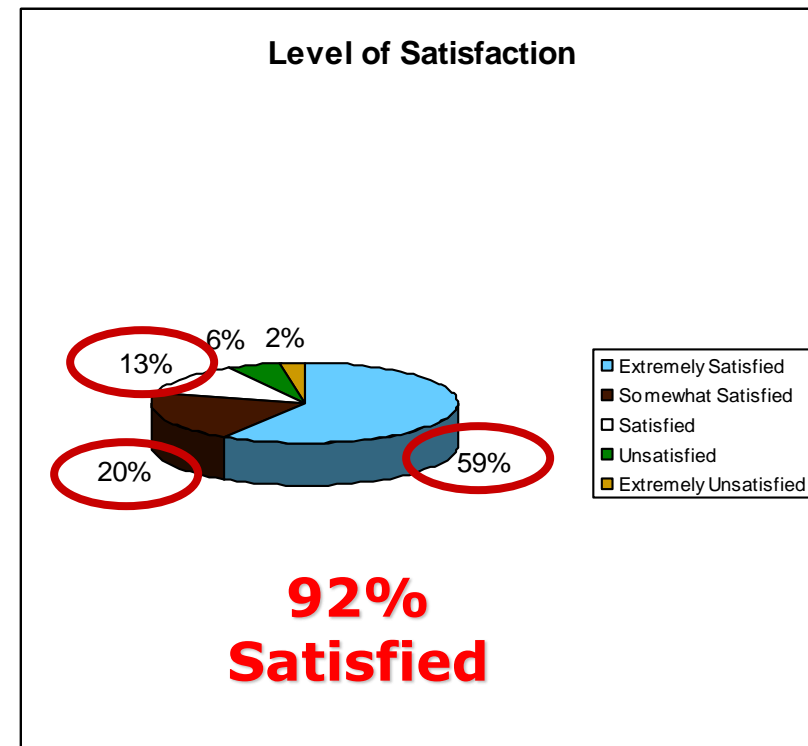
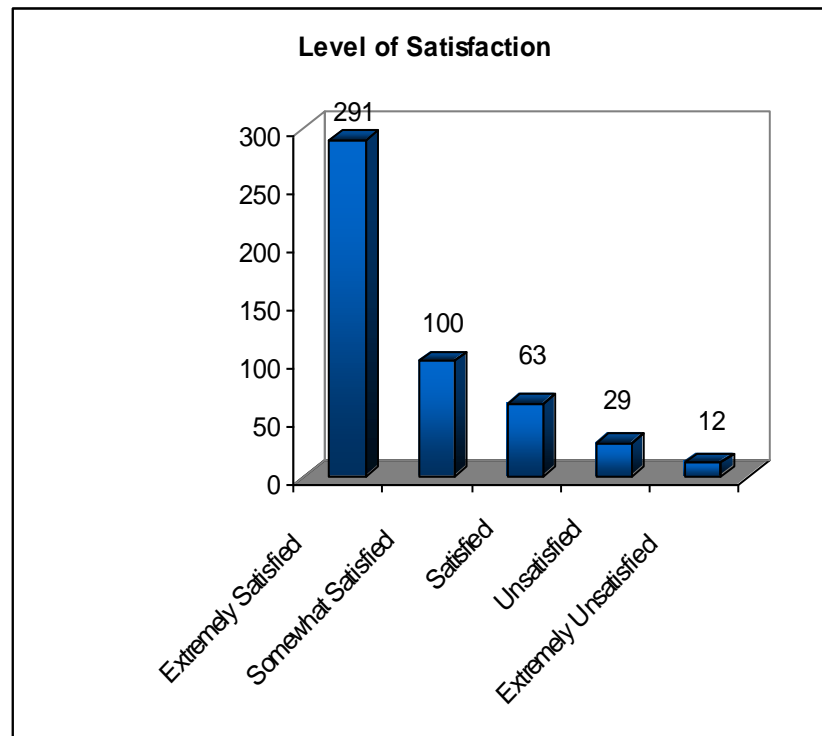
Question 3a: State below whether you think the improvements make TRAFFIC CONGESTION Better, Worse, or the Same...



Case Study

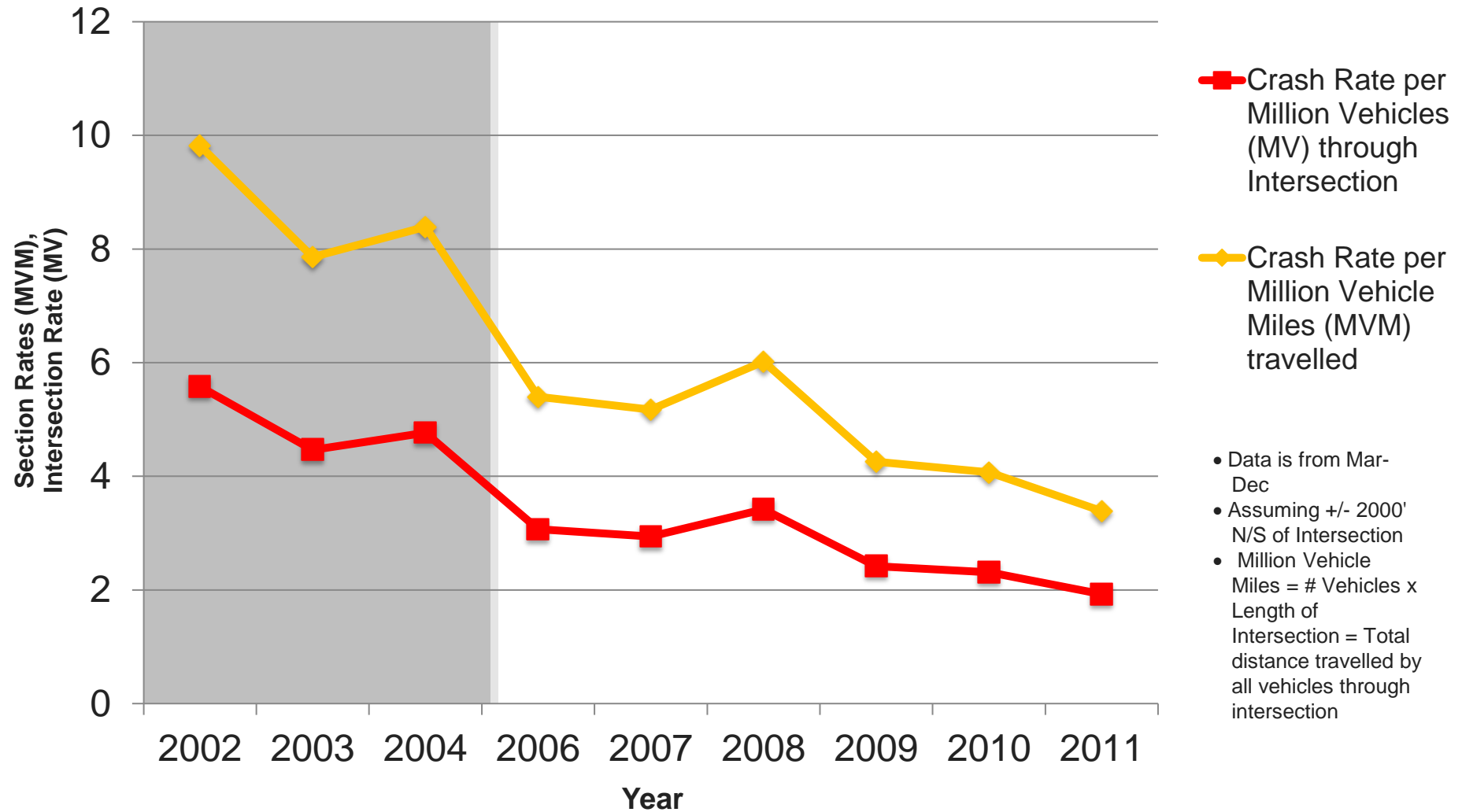
Airline Highway CFI – Public Acceptance Survey

Question 5. Please indicate your level of satisfaction with the current traffic conditions of the intersection.



Case Study

Airline Highway CFI





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A Multimodal Alternative to
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