

DURHAM COUNTY

I-40 and Miami Blvd.



Date: April 4, 2017	County: Durham
Interchange: I-40 and Miami Blvd.	
Location (exit ramp): EB Exit Ramp	

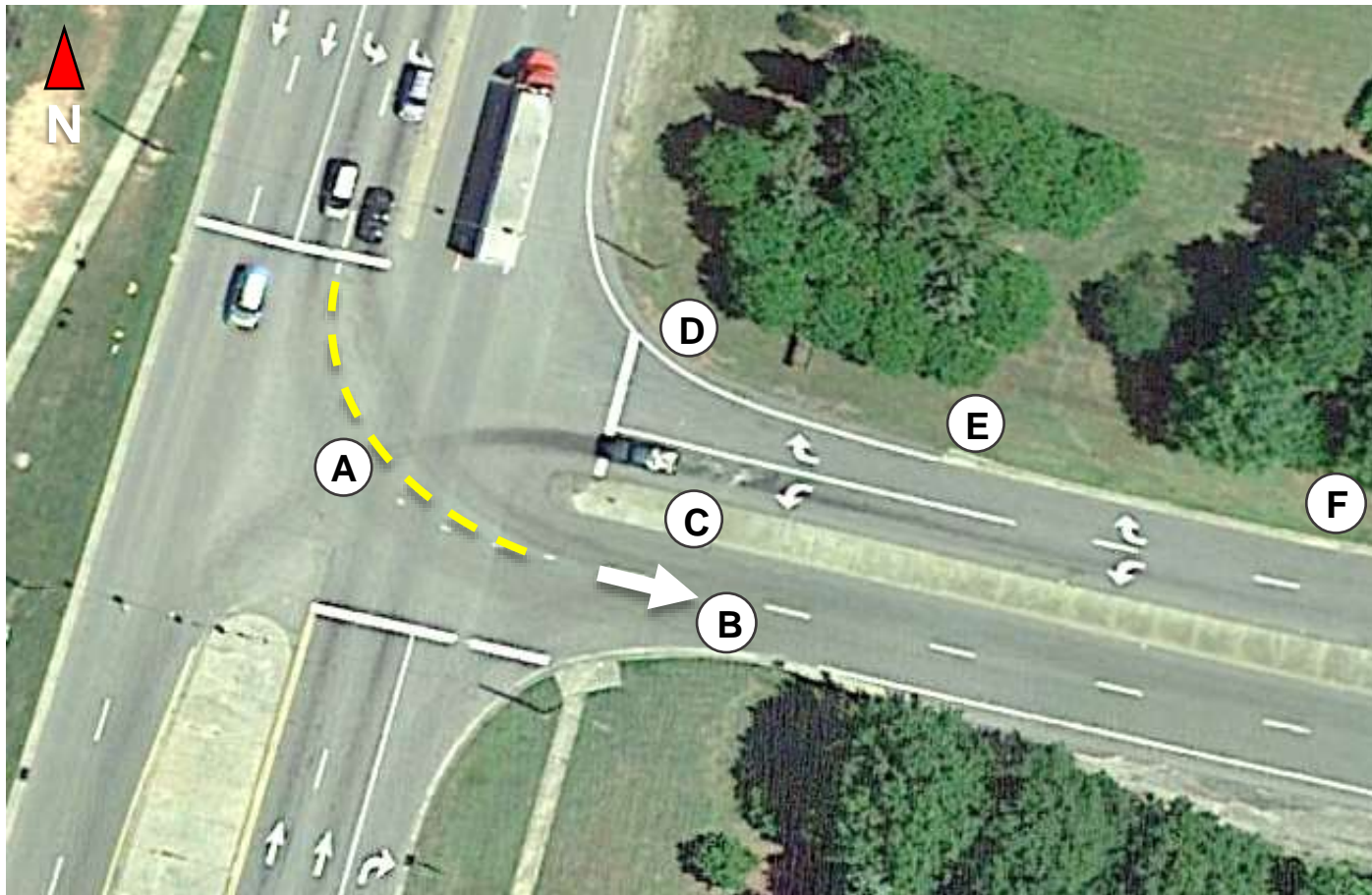
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		Add sign
Wrong way arrows	N		Add arrow
Do not enter sign	Y	Poor visibility at night	Move closer to intersection
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		Add signs
Dashed turning guide lines	N	Completely faded	Re-paint guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		
Splitter sign on median between	Y	Small and short sign	Increase height and size of sign
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-40 EB Exit Ramp at Miami Blvd.



- A. Add dotted lane line extension through intersection
- B. Add arrow indicating correct freeway entrance point
- C. Install larger island splitter sign
- D. Add Do Not Enter sign
- E. Add Wrong Way sign
- F. Add Wrong Way arrows

I-40 EB Exit Ramp approach from N



I-40 EB Exit Ramp



I-40 EB Exit Ramp approach from S



Date: April 4, 2017	County: Durham
Interchange: I-40 and Miami Blvd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		Add sign at splitter island
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

An aerial photograph of a road intersection. A large white semi-truck is positioned in the center of the intersection, angled towards the bottom right. A white arrow points to the truck's front, labeled with a circled 'C'. To the left of the truck, a dashed yellow line indicates a path or lane. A small white car is positioned near this dashed line, labeled with a circled 'B'. Further left, another small white car is visible, labeled with a circled 'A'. In the bottom right corner, a small white car is labeled with a circled 'D'. The road has multiple lanes with white dashed lines and arrows indicating traffic flow. A red arrow pointing upwards is labeled 'N' in the top left corner, indicating North. The surrounding area includes green grass and trees.

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I-40 WB Exit Ramp approach from N



I-40 WB Exit Ramp



I-40 WB Exit Ramp approach from S



I-85 and Duke St



Date: March 31 2017	County: Durham
Interchange: I-85 and Duke St.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	2 signs - Good	
Wrong way arrows	N		
Do not enter sign	Y	2 signs - Good	
One way	N		Add signs
No right turn	Y		
No left turn	Y		Recommend larger sign
Freeway entrance signs	N		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N	Painted median	Recommend raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Possibly from North side. Flared ramp.
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-85 NB Exit Ramp at Duke St.



- A. Install raised median
- B. Install larger overhead No Left Turn sign
- C. Add One-Way sign

I-85 NB Exit Ramp approach from S



I-85 NB Exit Ramp



I-85 NB Exit Ramp approach from N



I-85 and E. Club Blvd.



Date: April 4, 2017	County: Durham
Interchange: I-85 and E. Club Blvd.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add wrong way arrows
Do not enter sign	NA	Entry is allowed in WW direction	
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	NA		
Dashed turning guide lines	N		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

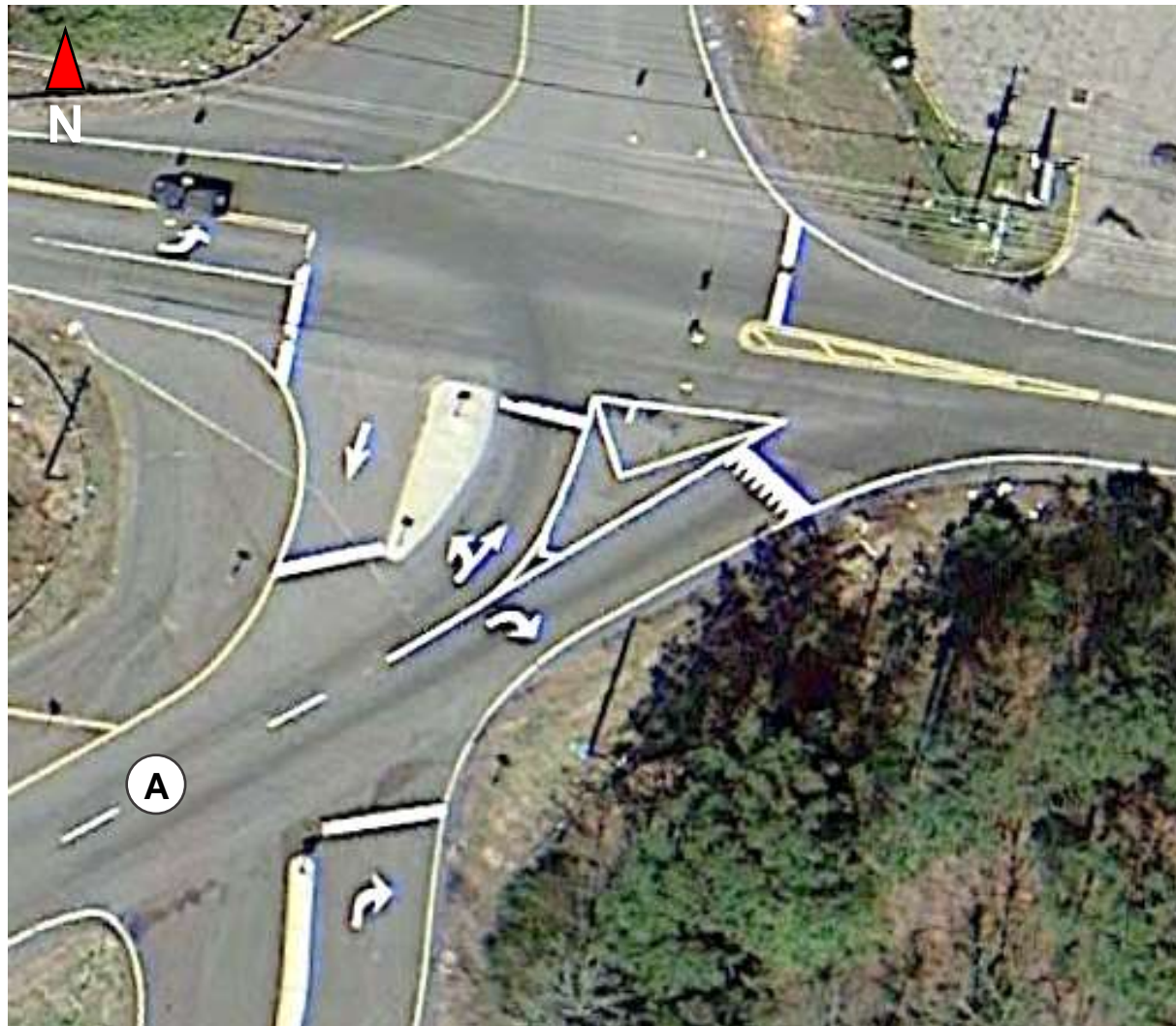
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted (for same direction) Raised (bi-directional movement)	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	Entry to private drive (?) is allowed, but encourages wrong-way movement down ramp
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	Y	Stop sign at wrong-way entry emphasizes that this movement is allowed

Other Notes:

This exit ramp terminal is strangely and potentially dangerously configured, in that it allows a movement onto the ramp that is counterflow to most of the ramp. This movement is apparently to provide access to the private driveway that accesses the ramp. This counterflow movement is accentuated by the placement of a pavement arrow which seemingly directs drivers to enter the exit ramp.

I-85 NB Exit Ramp at E. Club Blvd.



A. Add Wrong Way arrows

I-85 NB Exit Ramp approach from E



I-85 NB Exit Ramp



I-85 NB Exit Ramp approach from W



Date: April 4, 2017	County: Durham
Interchange: I-85 and E. Club Blvd.	
Location (exit ramp): SB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		
Wrong way arrows	N		Add wrong way arrows
Do not enter sign	Y		
One way	Y		
No right turn	N		
No left turn	N		
Freeway entrance signs	N		
Dashed turning guide lines	N		
Stop bar at end of exit ramp	Y	Poor – almost faded	Repaint
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Service road is adjacent to ramp	
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Wrong-way entry is allowed
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	Y	Service road entrance adjacent to exit ramp
Other distractors or confusing elements?	N	

Other Notes:

I-85 SB Exit Ramp at E. Club Blvd.



A. Add wrong-way arrow

B. Add arrow indicating correct entrance point to service road

I-85 SB Exit Ramp approach from E



I-85 SB Exit Ramp



I-85 SB Exit Ramp approach from W



US 70 and Cheek Rd.



Date: April 4, 2017	County: Durham
Interchange: US 70 and Cheek Rd.	
Location (exit ramp): EB Exit Ramp	

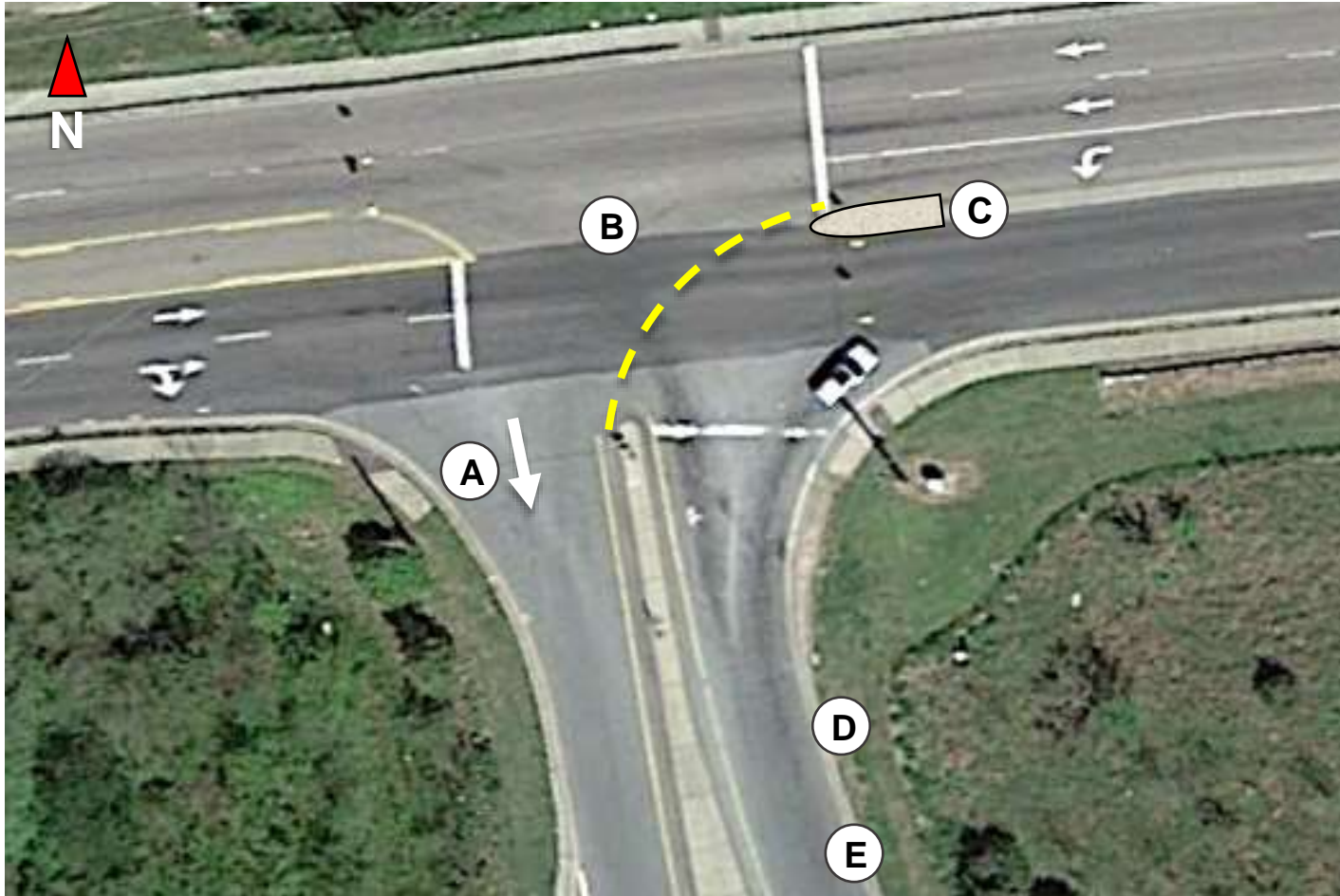
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		Add sign
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	Y		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		Extend raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Possibly
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 70 EB Exit Ramp at Cheek Rd.



- A. Add arrow indicating correct freeway entrance point
- B. Add dotted lane line extension through intersection
- C. Extend raised median
- D. Add Wrong Way sign
- E. Add Wrong Way arrow

US 70 EB Exit Ramp approach from E



US 70 EB Exit Ramp



US 70 EB Exit Ramp approach from W



Date: April 4, 2017	County: Durham
Interchange: US 70 and Cheek Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	Y		
No right turn	N		
No left turn	N		
Freeway entrance signs	NA		
Dashed turning guide lines	N		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N		Add median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Wrong way left turn is easy
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 70 WB Exit Ramp at Cheek Rd.



- A. Add No Left Turn sign at signal
- B. Add No Right Turn sign
- C. Add hashed or raised median
- D. Add Wrong Way arrows

US 70 WB Exit Ramp approach from E



US 70 WB Exit Ramp



US 70 WB Exit Ramp approach from W



US 70 and Holloway St.



Date: March 31, 2017	County: Durham
Interchange: US 70 and Holloway St.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		Move sign closer to corner
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y	Poor	Repaint stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Poor – no reflective strips, no yellow paint on curb. Blends in with road.	Improve visibility
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	Y	Several interstate signs and overpass sign nearby.
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 70 EB Exit Ramp at Holloway St.



- A. Add arrow indicating correct freeway entrance point
- B. Improve median visibility
- C. Add dotted lane line extension through intersection
- D. Move Do Not Enter sign closer to corner
- E. Add Wrong Way arrows

US 70 EB Exit Ramp approach from W



US 70 EB Exit Ramp



US 70 EB Exit Ramp approach from E



Date: March 31, 2017	County: Durham
Interchange: I-70 and Holloway	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		Move sign closer to corner
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Poor	Improve median visibility
Splitter sign on median between	N	Appears that a sign was present previously	Add sign
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N		

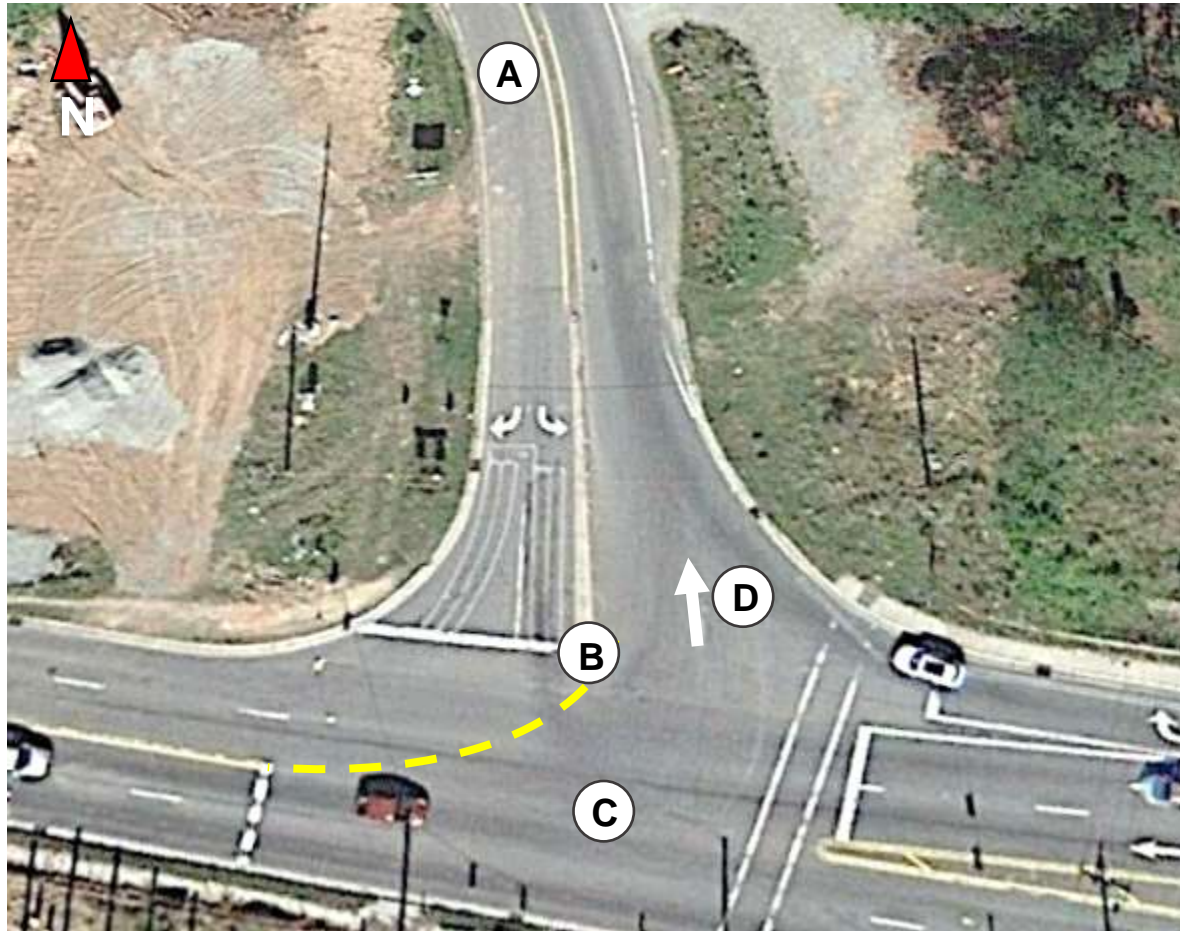
Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	Y	Several interstate signs and overpass sign nearby
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Sight line clutter – buildings, overpass, and signs converge, creating heavy visual stimuli

Improve visibility of the median on the exit/entrance ramp

US 70 WB Exit Ramp at Holloway St.



- A. Add wrong way arrows
- B. Improve median visibility, add splitter sign
- C. Add dotted lane line extension through intersection
- D. Add arrow indicating correct freeway entrance point

US 70 WB Exit Ramp approach from E



US 70 WB Exit Ramp



US 70 WB Exit Ramp approach from W



I-40 and Fayetteville Rd.

The research team recognizes that this single point interchange design creates many avenues for wrong way movements. The field visit and recommendations focused on the I-40 eastbound exit ramp, as that was the ramp potentially associated with a wrong way crash.



Date: April 4, 2017	County: Durham
Interchange: I-40 and Fayetteville Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		Add WW sign on exit ramp
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	N		
No right turn	N		
No left turn	N		
Freeway entrance signs	N		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

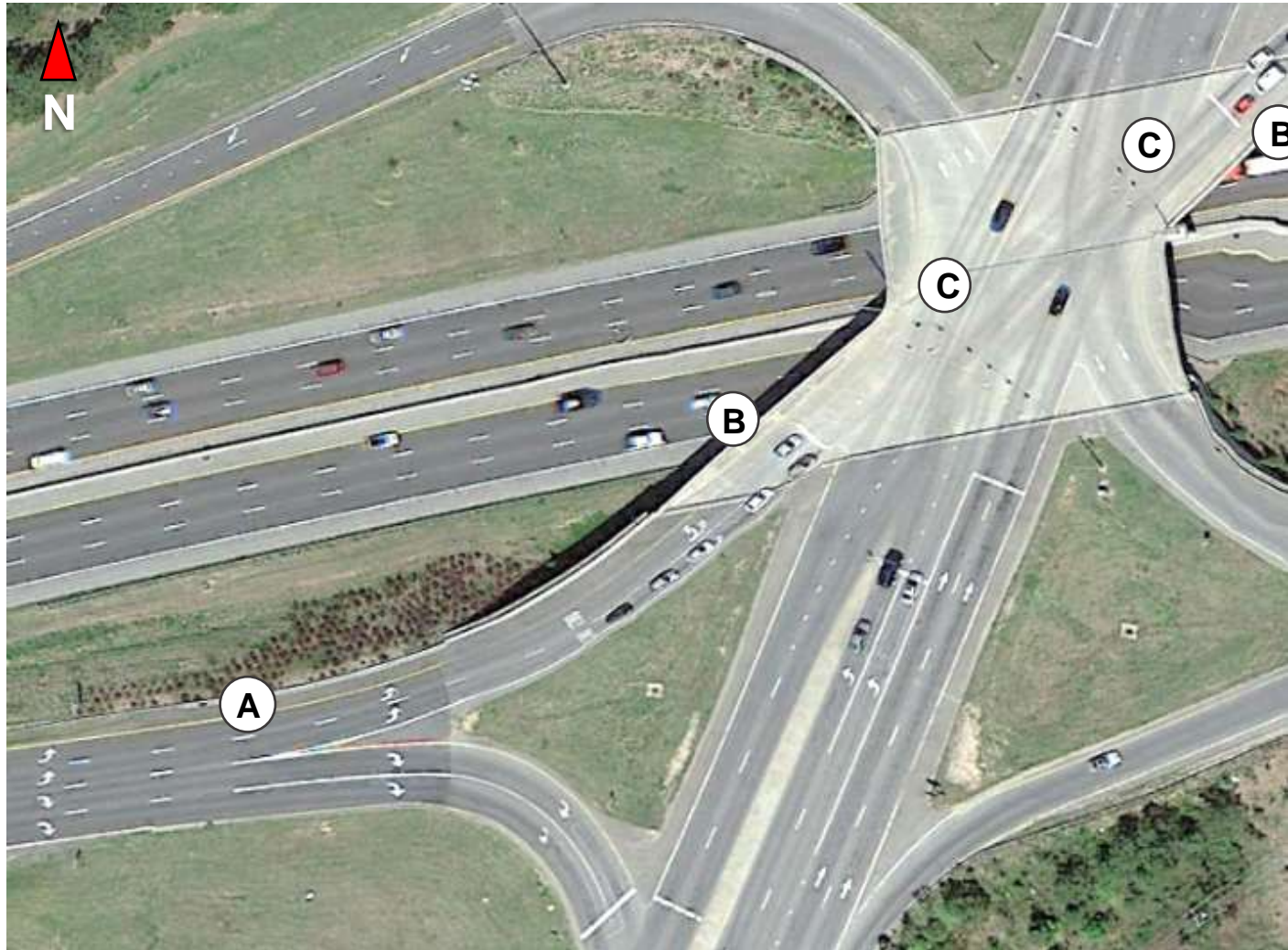
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	NA	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	Y	Wayfinding through interchange is difficult due to its size

Other Notes:

Some form of overhead 'Do Not Enter' sign may be appropriate above the directional lanes of the exit ramp. These could be similar to the static metal signs (i.e., circular with the words "Do Not Enter"), or could be configured as red X's, similar to the type of signs used on roads with changeable direction lanes.

I-40 EB Exit Ramp at Fayetteville Rd.



- A. Add Wrong Way arrows
- B. Add Wrong Way signs
- C. Add overhead signs to indicate 'No Entry'

I-40 EB Exit Ramp approach from N



I-40 EB Exit Ramp



FORSYTH COUNTY

I-40 Bus. and Cloverdale Ave.



Date: May 26, 2017	County: Forsythe
Interchange: I-40 Bus. and Cloverdale Ave.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		Improve visibility – add reflectors
Splitter sign on median between	Y		
Barrier between	N		

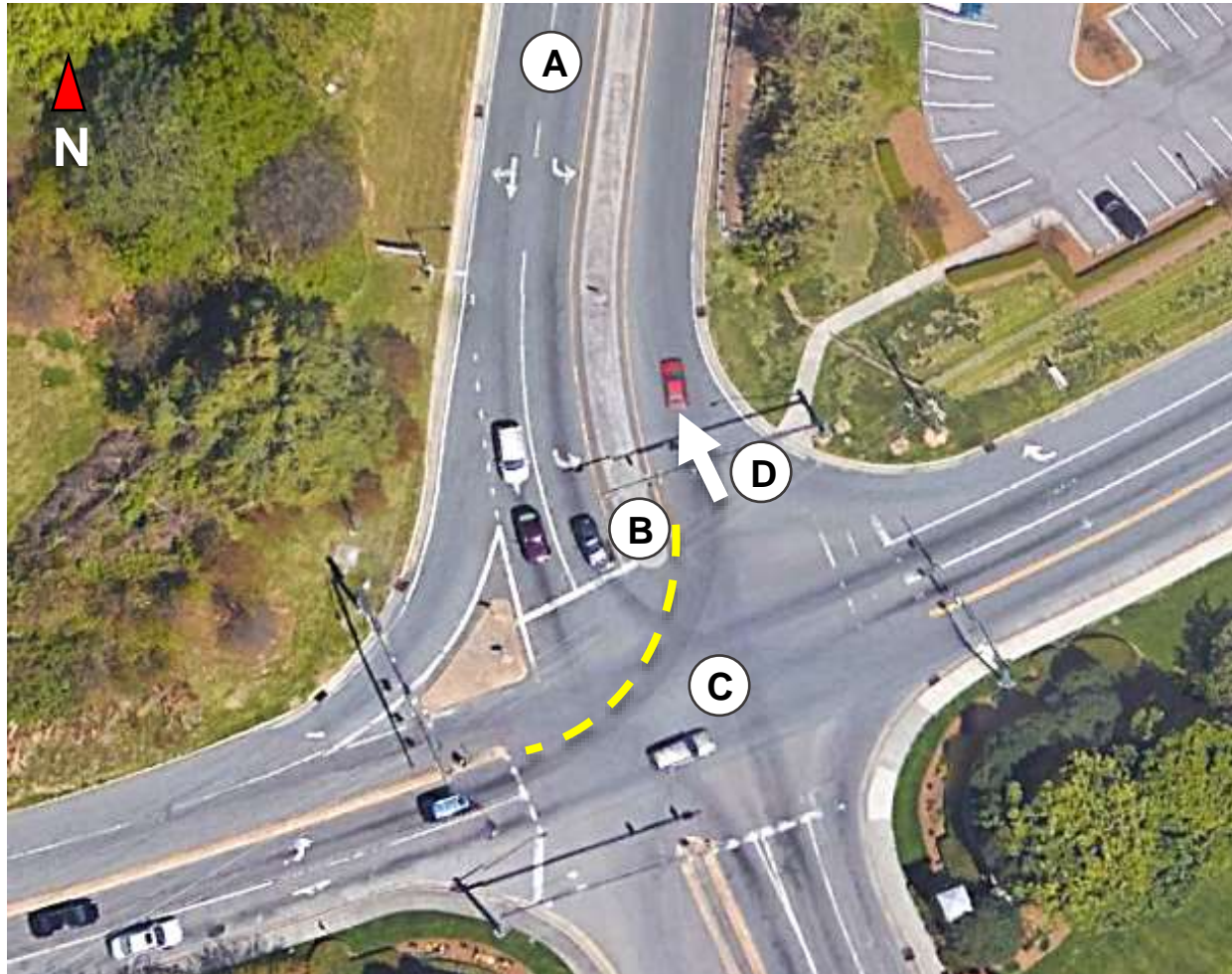
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type: Raised	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	Y	Hospital, multiple routes
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Median mitigates left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Low potential for right turn wrong-way movement. Left turn wrong-way movement has some potential.

I-40 Bus. EB Exit Ramp at Cloverdale Ave.



- A. Add Wrong Way arrows**
- B. Add reflectors and improve visibility of median**
- C. Add dotted lane line extension through intersection**
- D. Add arrow indicating correct freeway entrance point**

I-40 Bus. EB Exit Ramp approach from E



I-40 Bus. EB Exit Ramp



I-40 Bus. EB Exit Ramp from W



Date: May 26, 2017	County: Forsythe
Interchange: I-40 Bus. and Cloverdale Ave.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N	None visible	Add arrows
Do not enter sign	Y	Four signs	
One way	Y		
No right turn	N		
No left turn	N		
Freeway entrance signs	N		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	N	Totally worn away	Repaint
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Big	
Splitter sign on median between	N	Not needed	
Barrier between	N		

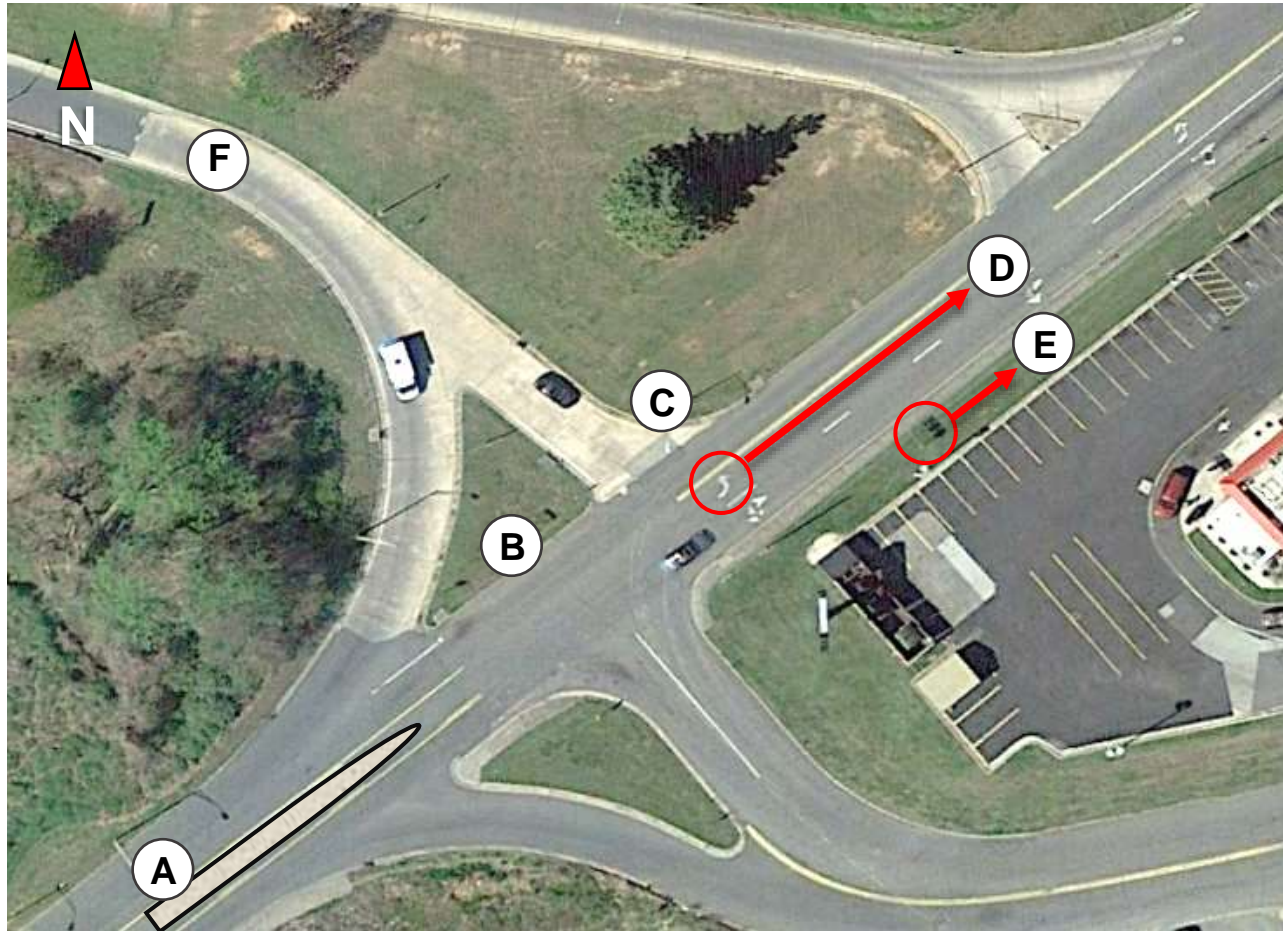
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised – good visibility in day	Improve night visibility
Raised median on crossroad	N		Difficult to recommend due to side street exit on opposite side of road

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	Y	See map notes – move route signs
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	Y	
Other distractors or confusing elements?	Y	Left-turn pavement arrows misleading (see map)

Other Notes:

When approaching Northbound on Cloverdale, a driver may not see that the entrance ramp is up ahead (i.e., they only see the exit ramp). Route sign placement does not help (i.e., too close to the exit ramp).

I-40 Bus. WB Exit Ramp at Cloverdale Ave.



- A. Add raised median to prevent wrong-way entry
- B. Add No Left Turn sign
- C. Tighten corner radius, repaint stop bar, add No Right Turn sign
- D. Remove turn arrow (misleading), move closer to entrance ramp
- E. Move route sign closer to entrance ramp (misleading)
- F. Add Wrong Way arrows

I-40 Bus. WB Exit Ramp approach from N



Google Earth street view

I-40 Bus. WB Exit Ramp



I-40 Bus. WB Exit Ramp approach from S



I-40/US 421 and NC 66



Date: May 27, 2017	County: Forsythe
Interchange: I-40/US 421 and NC 66	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add wrong way arrows
Do not enter sign	Y	Two signs	
One way	N		
No right turn	Y	One sign	
No left turn	Y	Two signs	
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted, flush	Install raised splitter island
Raised median on crossroad	Y	Painted, flush	Add raised short median

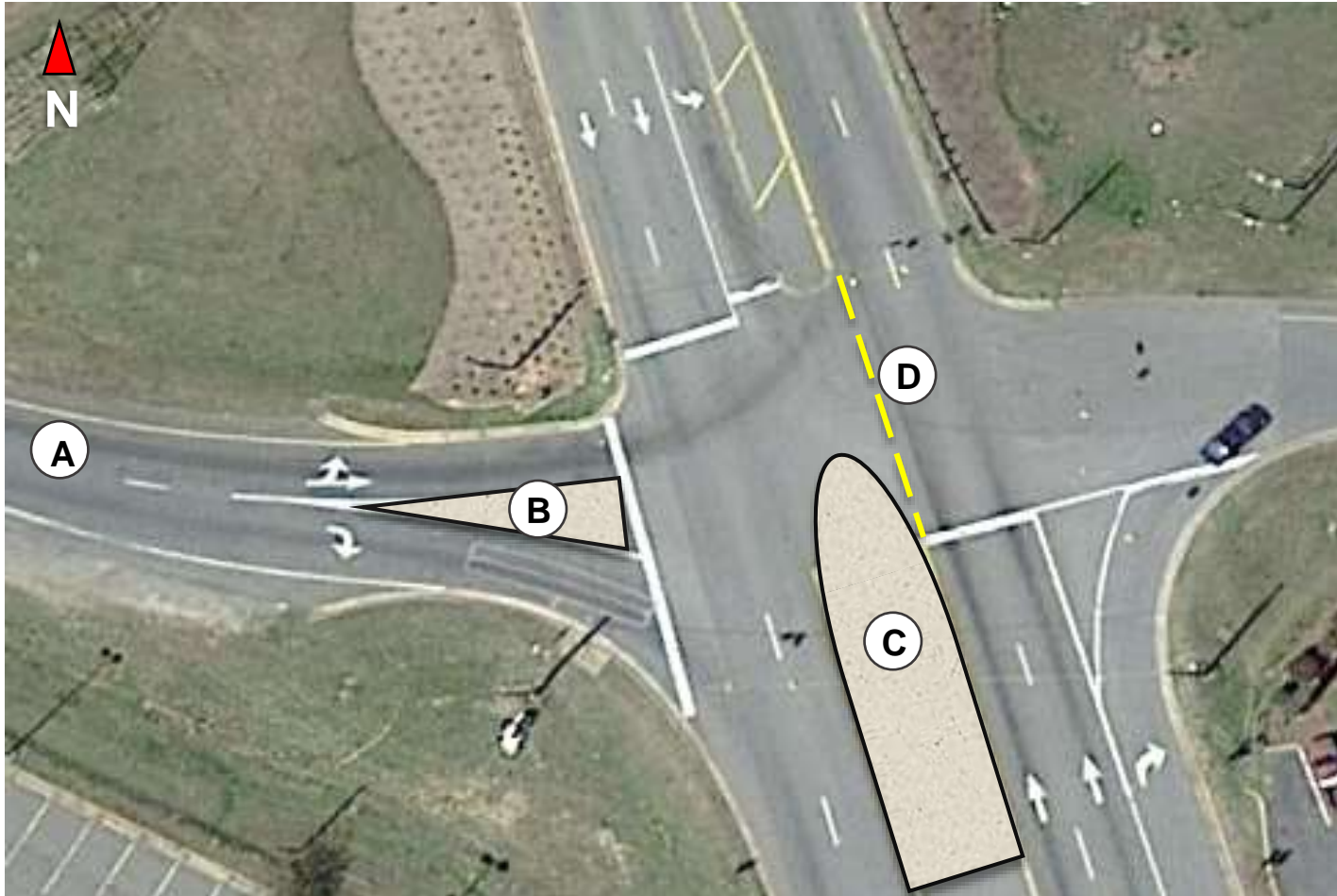
Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Add short raised median to reduce WW left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

The strongest recommendation at this site would be to incorporate a raised median on NC 66, extending out into the intersection to reduce the possibility of left turns into the exit ramp.

Installing dashed guide lines along the left lane of NC 66 through the intersection may help reduce wrong-way left turn movement.

I-40/US 421 EB Exit Ramp at NC 66



- A. Add Wrong Way arrows
- B. Add raised splitter island
- C. Add short raised median
- D. Add dashed guide lines

I-40/US 421 EB Exit Ramp approach from N



I-40/US 421 EB Exit Ramp



Google Earth street view

I-40/US 421 EB Exit Ramp approach from S



Date: May 27, 2017	County: Forsythe
Interchange: I-40/US 421 and NC 66	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		Move forward
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Decent visibility (has crosshatch)	
Splitter sign on median between	Y		
Barrier between	N		

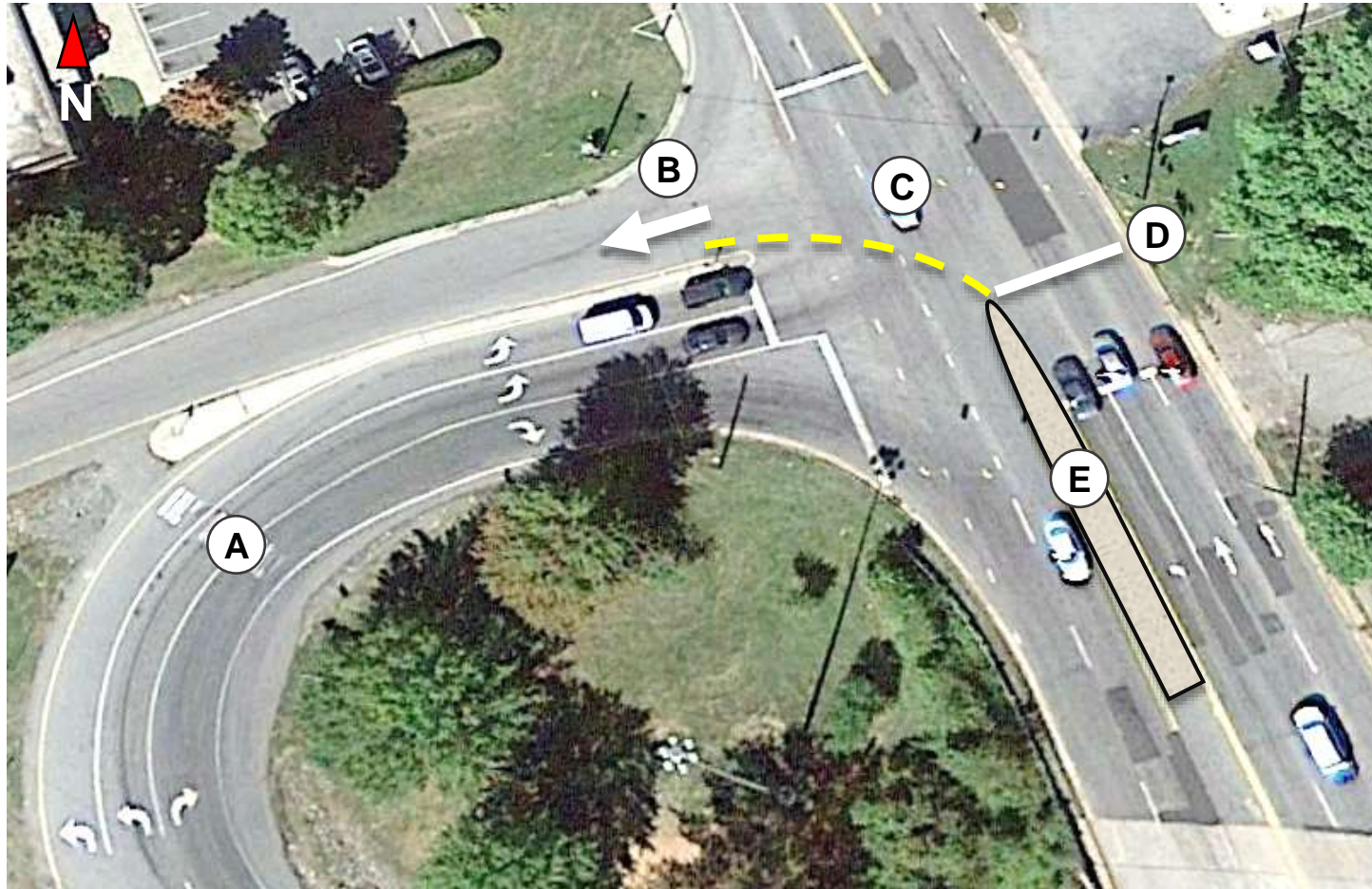
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y	Painted, flush	Add short raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	Many driveways
Other distractors or confusing elements?	Y	Dense access points

Other Notes:

See map for recommendations to move stopping location forward for NB 66 traffic.

I-40/US 421 WB Exit Ramp at NC 66



- A. Add Wrong Way arrows
- B. Add arrow indicating correct freeway entrance point
- C. Add dotted lane line extension through intersection
- D. Move stop bar forward
- E. Install raised median

I-40/US 421 WB Exit Ramp approach from S



I-40/US 421 WB Exit Ramp



I-40/US 421 WB Exit Ramp approach from N



US 421 and Lewisville Clemmons Rd.



Date: May 26, 2017	County: Forsythe
Interchange: US 421 and Lewisville Clemmons Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	UNK		Add arrows
Do not enter sign	Y	Two signs	
One way	Y	Two signs	
No right turn	Y	One sign	
No left turn	Y	One sign	
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	NA	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 421 EB Exit Ramp at Lewisville Clemmons Rd.



A. Add Wrong Way arrows

US 421 EB Exit Ramp approach from N



US 421 EB Exit Ramp



US 421 EB Exit Ramp approach from S



Date: May 26, 2017	County: Forsythe
Interchange: US 421 and Lewisville Clemmons Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	Y	One sign	
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		Extend raised median
Splitter sign on median between	N		
Barrier between	N		

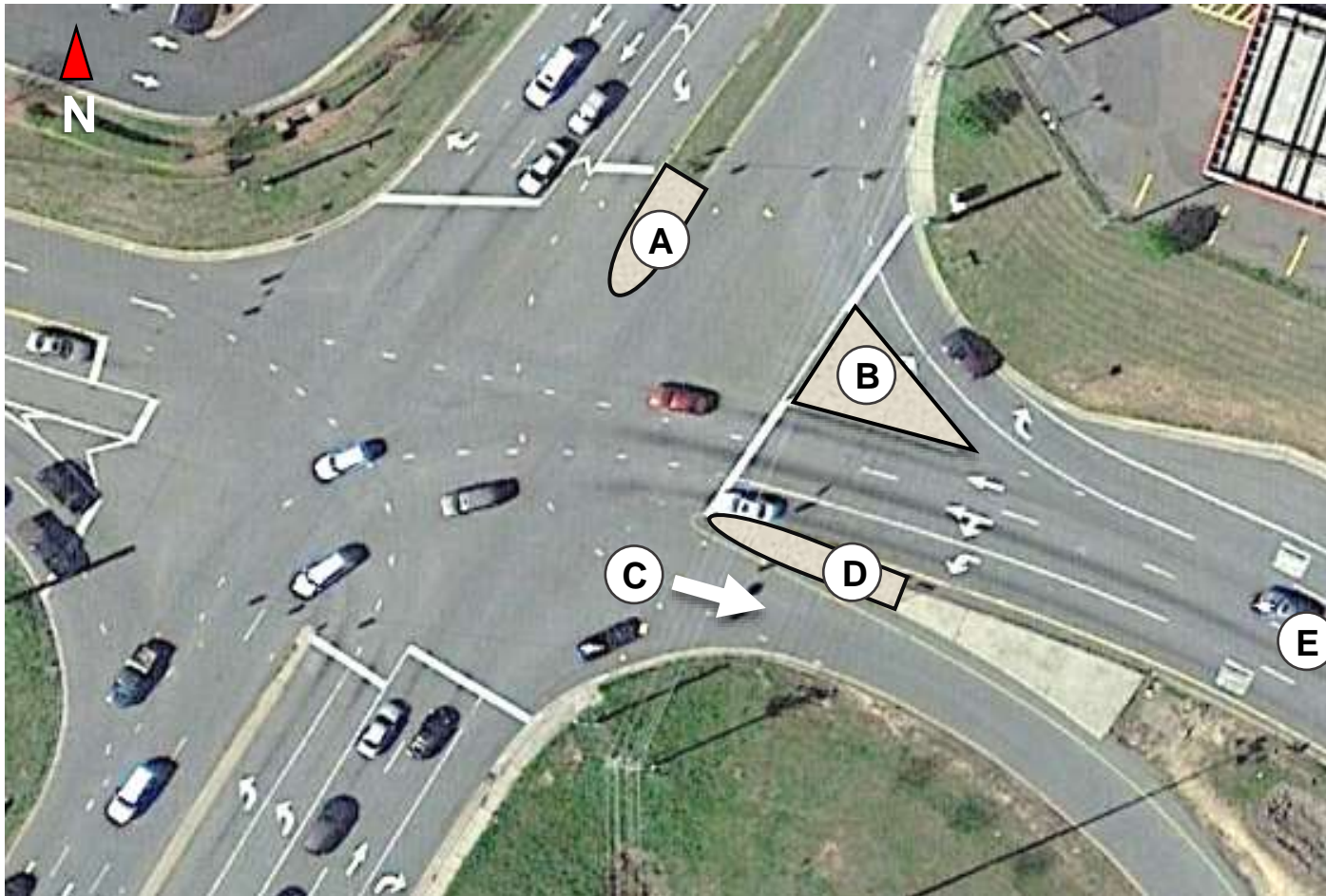
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted, flush	Convert to raised median to increase visibility
Raised median on crossroad	Y		Possibly extend median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Significant street lighting (4-bulb tall pole) present over entrance ramp area, so additional lighting probably will not help.

US 421 WB Exit Ramp at Lewisville Clemmons Rd.



- A. Extend median
- B. Convert paint splitter island to raised median
- C. Add arrow indicating correct freeway entrance point
- D. Extend raised median
- E. Add Wrong Way arrows

US 421 WB Exit Ramp approach from S



US 421 WB Exit Ramp



US 421 WB Exit Ramp approach from N



US 52 and Moore-RJR Rd.



Date: May 27, 2017	County: Forsythe
Interchange: US 52 and Moore-RJR Rd.	
Location (exit ramp): SB Exit Ramp	

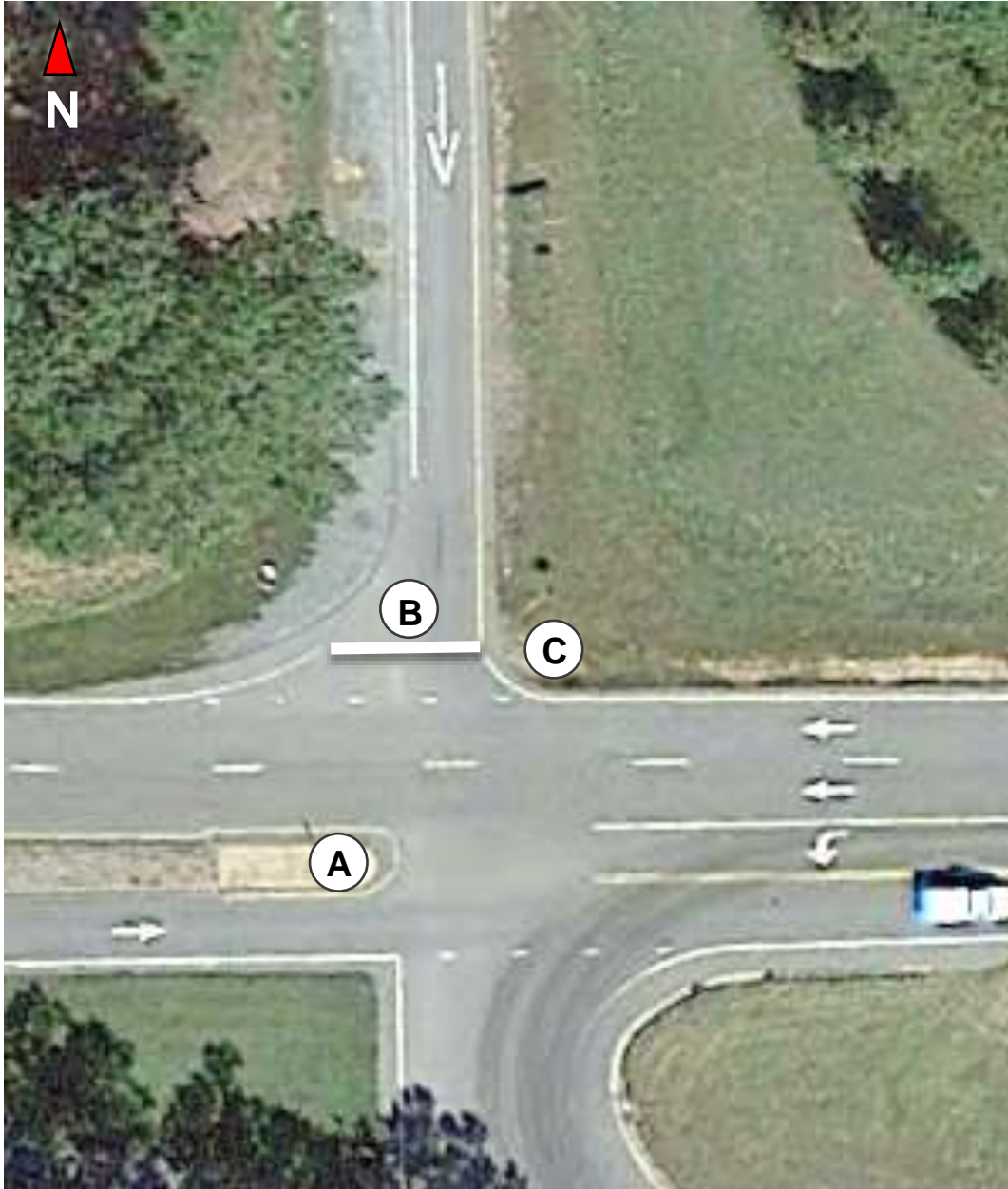
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	Y		
Do not enter sign	Y	Two signs	
One way	N		
No right turn	N		Add sign
No left turn	N		Add sign
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	N		Add stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes: This junction is very well designed to reduce wrong way movements. Crossroad median has good length and placement.

US 52 SB Exit Ramp at Moore-RJR Rd.



A. Add No Left Turn sign

B. Add stop bar

C. Add No Right Turn

US 52 SB Exit Ramp approach from E



US 52 SB Exit Ramp



US 52 SB Exit Ramp approach from W



Date: May 27, 2017	County: Forsythe
Interchange: US 52 and Moore-RJR Rd.	
Location (exit ramp): NB Exit Ramp	

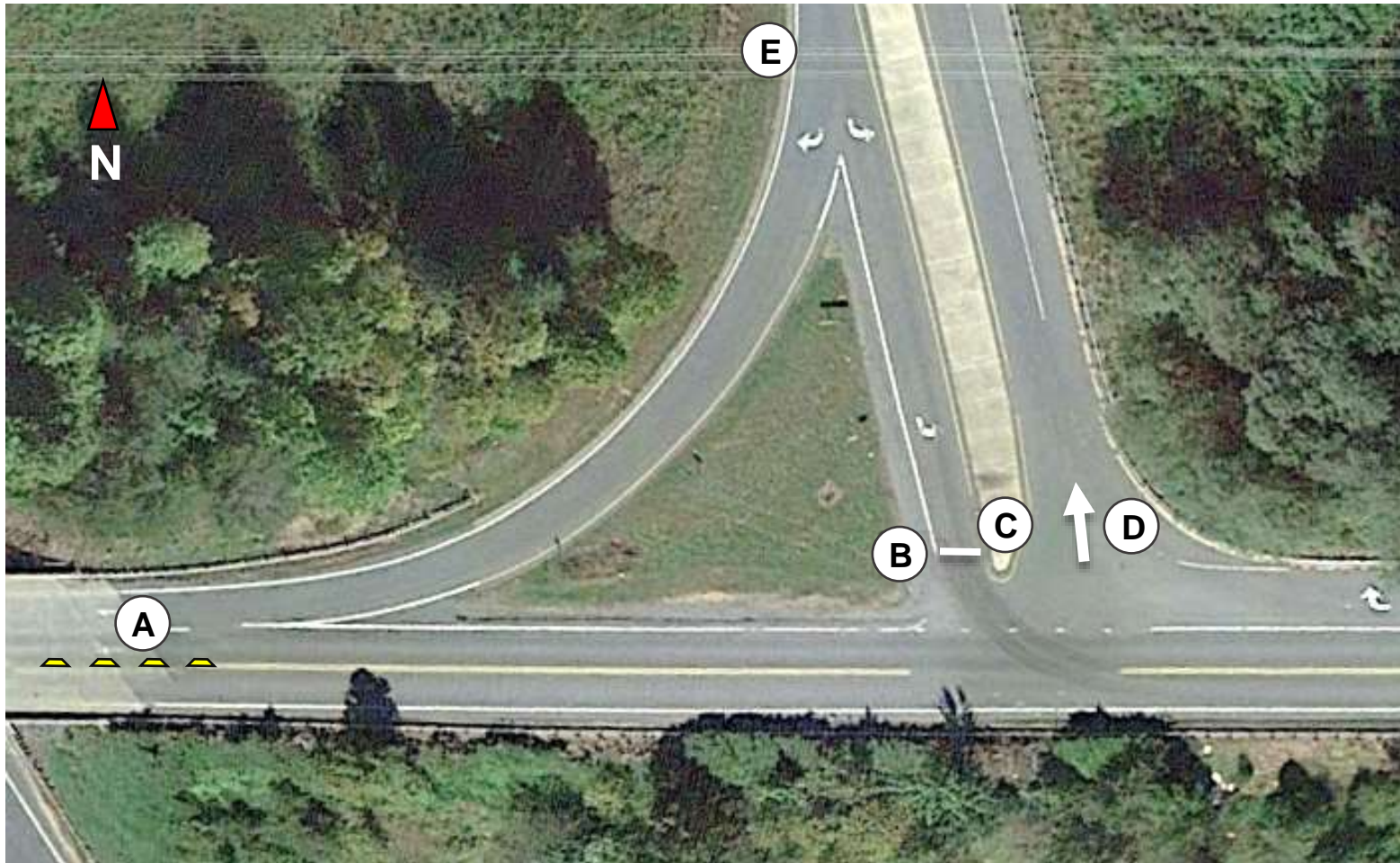
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Three signs	
Wrong way arrows	Y	One with raised pavement markers	
Do not enter sign	Y	Two signs	
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	NA	No exclusive left turn lane	
Stop bar at end of exit ramp	N		Add stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	N		Could improve visibility (reflectors, paint)
Splitter sign on median between	Y		
Barrier between	N		Could add yellow diamond to splitter sign

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Grass	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Add flexible median dividers to prevent WW entry
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 52 NB Exit Ramp at Moore-RJR Rd.



- A. Add flexible median dividers
- B. Add stop bar
- C. Add yellow diamond beneath splitter sign and improve visibility of median
- D. Add arrow indicating correct freeway entrance point
- E. Add Wrong Way arrows

US 52 NB Exit Ramp approach from E



Google Earth street view

US 52 NB Exit Ramp



US 52 NB Exit Ramp approach from W



GUILFORD COUNTY

I-40 and Gallimore Dairy Rd.



Date: May 30, 2017	County: Guilford
Interchange: I-40 and Gallimore Dairy Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y	Two signs	
No right turn	NA		
No left turn	NA		
Freeway entrance signs	NA		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		Repaint stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

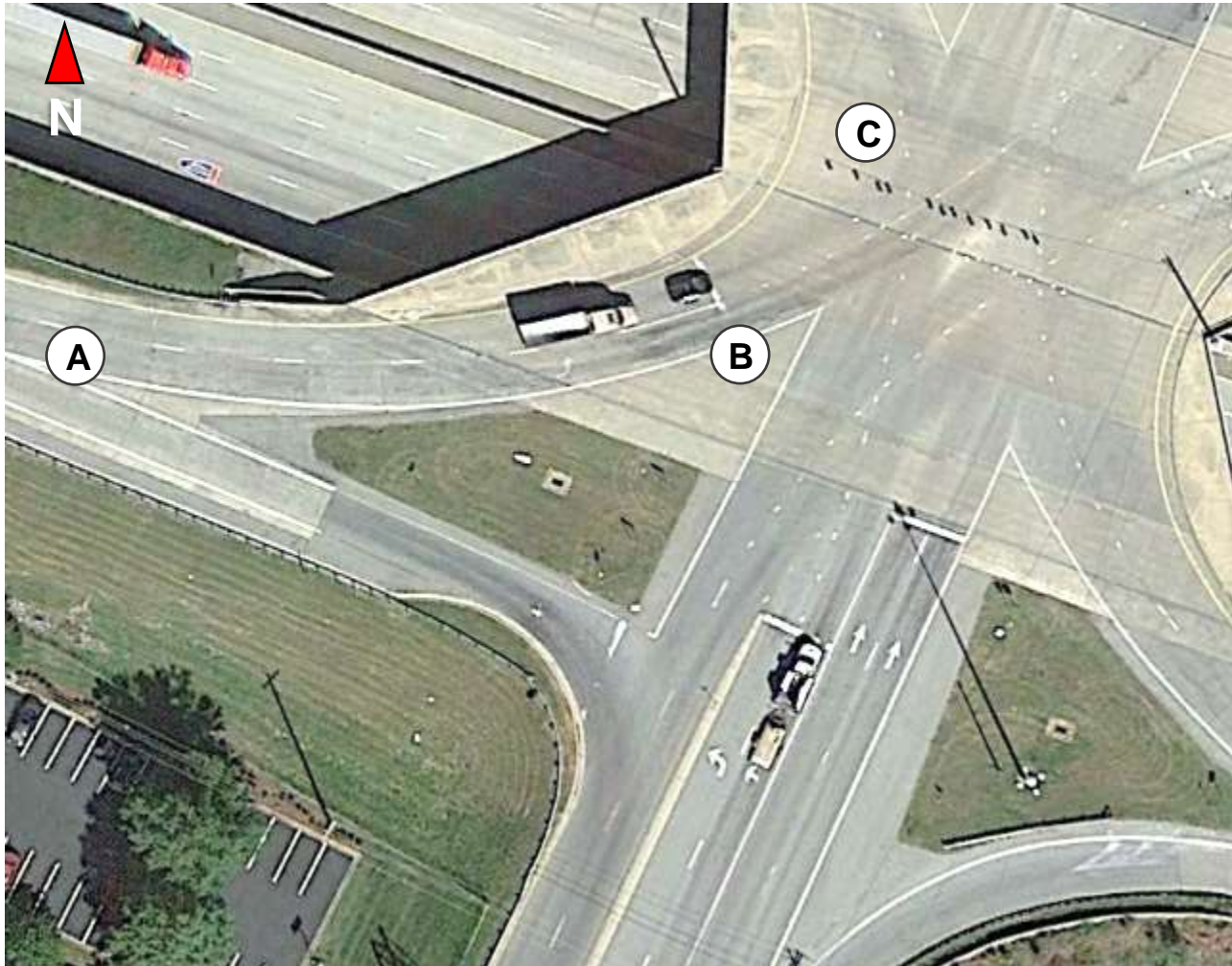
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Grass	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Very wide flare – easy to enter
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	Y	SPUI is inherently confusing

Other Notes:

Some form of overhead 'Do Not Enter' sign may be appropriate above the directional lanes of the exit ramp

I-40 EB Exit Ramp at Gallimore Dairy Rd.



A. Add Wrong Way arrows

B. Repaint stop bar

C. Consider overhead signs to indicate 'No Entry'

I-40 EB Exit Ramp approach from S



I-40 EB Exit Ramp at Gallimore Dairy Rd.



I-40 EB Exit Ramp approach from N



Google Earth street view

Date: May 30, 2017	County: Guilford
Interchange: I-40 and Gallimore Dairy Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	Y		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	NA		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	N		Repaint stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Grass	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Very wide flare – easy to enter
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	Y	SPUI is inherently confusing

Other Notes:

Some form of overhead 'Do Not Enter' sign may be appropriate above the directional lanes of the exit ramp

I-40 WB Exit Ramp at Gallimore Dairy Rd.



- A. Consider overhead signs to indicate 'No Entry'
- B. Repaint stop bar
- C. Add Wrong Way arrows

I-40 WB Exit Ramp approach from S



I-40 WB Exit Ramp



Google Earth street view

I-40 WB Exit Ramp from N



Google Earth street view

I-40 and Mt. Hope Church Rd.



Date: May 30, 2017	County: Guilford
Interchange: I-40 and Mt. Hope Church Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	Y		
No right turn	Y		
No left turn	Y		
Freeway entrance signs	Y		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y	Faded	Repaint stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised island	
Raised median on crossroad	N	Painted	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Could be tighter
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	Splitter island mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-40 EB Exit Ramp at Mt. Hope Church Rd.



- A. Add Wrong Way arrows**
- B. Repaint stop bar**

I-40 EB Exit Ramp approach from N



I-40 EB Exit Ramp



I-40 EB Exit Ramp approach from S



Date: May 30, 2017	County: Guilford
Interchange: I-40 and Mt. Hope Church Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	Y		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Sloped pavement and grass	
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	NA	Type:	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Easy right turn
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	Easy left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Bright yellow 'Turn Around' signs present on exit ramp

I-40 EB Exit Ramp at Mt. Hope Church Rd.



- A. Install median
- B. Repaint dotted lane line extension through intersection
- C. Add arrow indicating correct freeway entrance point
- D. Add Wrong Way arrows

I-40 WB Exit Ramp approach from E



I-40 WB Exit Ramp



I-40 WB Exit Ramp approach from W



Google Earth street view

I-40 and NC 68



Date: May 30, 2017	County: Guilford
Interchange: I-40 and NC 68	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	N	Entrance to I-40 is next to ramp	
No right turn	NA		
No left turn	NA		
Freeway entrance signs	Y		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		
Splitter sign on median between	N		
Barrier between	N		

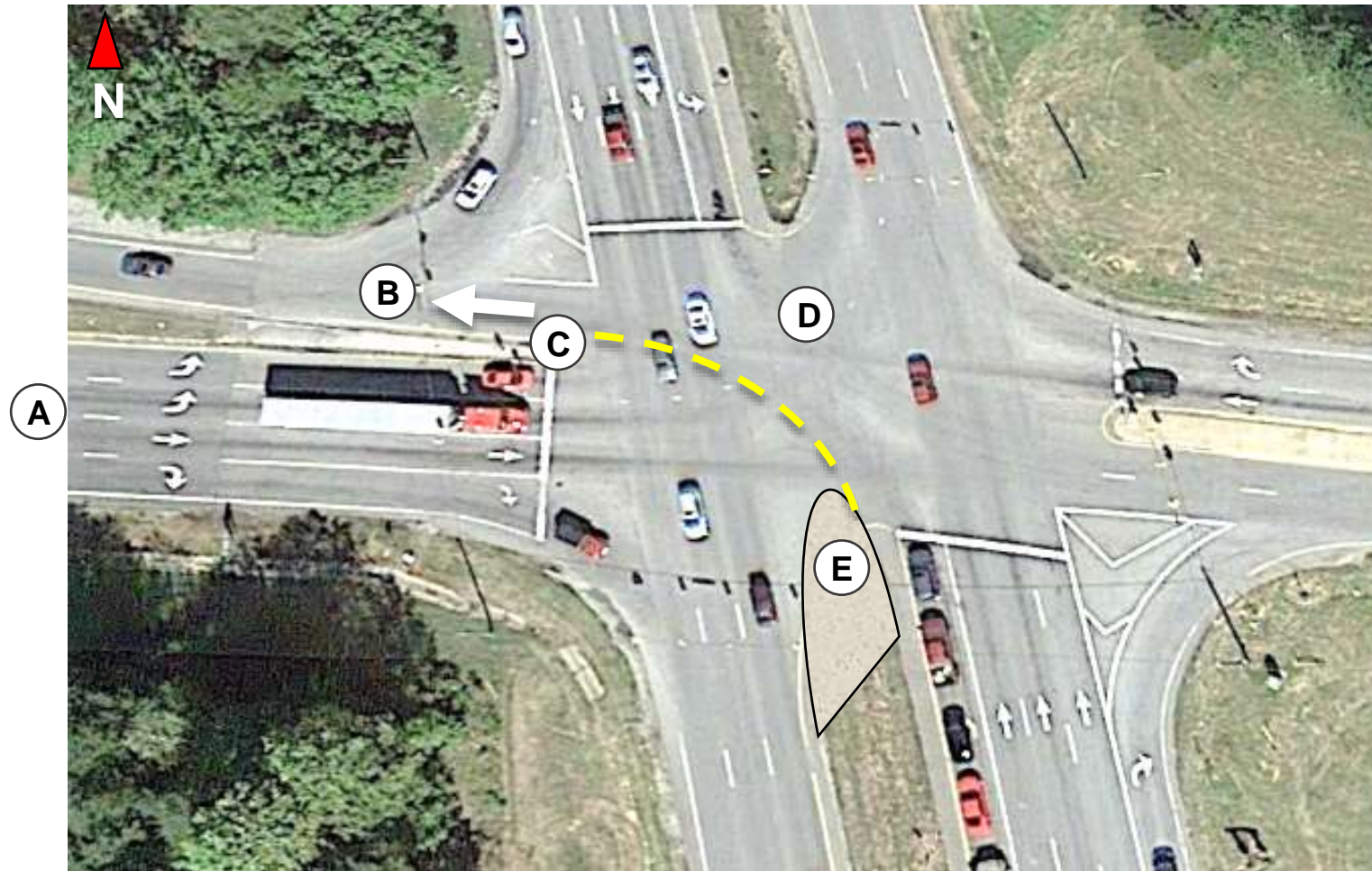
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	NA	Type:	
Raised median on crossroad	N	Wide grass	Install raised median at intersection and extend

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	Splitter island between I-40 entrance/exit ramps helps mitigate
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Add guide lines for L-turn onto I-40 EB entrance ramp, adjacent to I-40 exit ramp

I-40 EB Exit Ramp at NC 68



- A. Add Wrong Way arrows (not shown)
- B. Add arrow indicating correct freeway entrance point
- C. Add splitter sign on median
- D. Repaint dotted lane line extension through intersection
- E. Extend median / Install raised median

I-40 EB Exit Ramp approach from N



Google Earth street view

I-40 EB Exit Ramp



I-40 EB Exit Ramp approach from S



Date: May 30, 2017	County: Guilford
Interchange: I-40 and NC 68	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	N		Add One-Way sign
No right turn	Y	Two signs	
No left turn	Y		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	NA		Repaint stop bar

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics

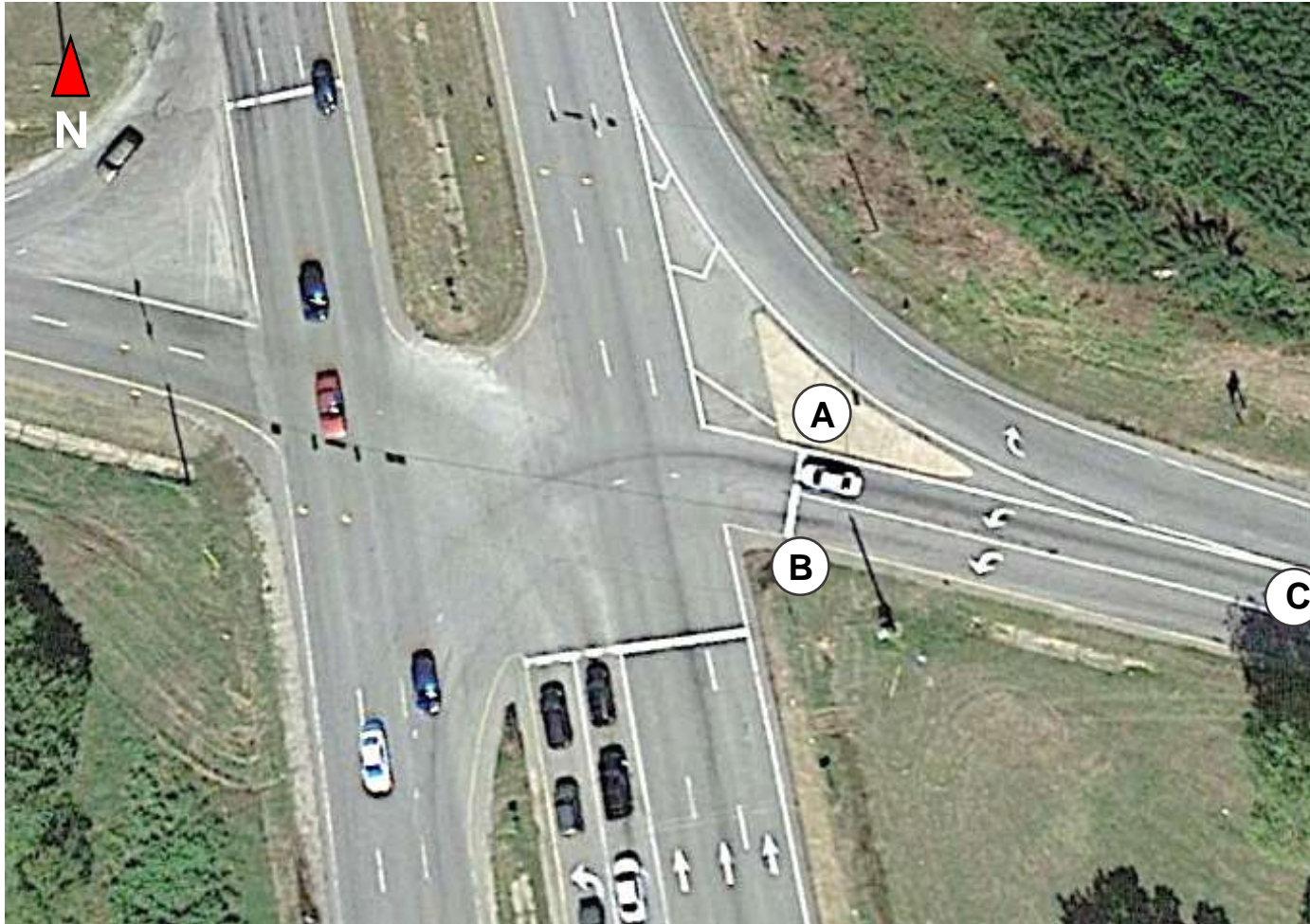
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised	
Raised median on crossroad	N	Grass	Install raised median at intersection and extend

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	Current median and splitter island mitigate
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Bright yellow 'Turn Around' signs present on exit ramp

I-40 WB Exit Ramp at NC 68



- A. Add One-Way sign
- B. Repaint stop bar
- C. Add Wrong Way arrows

I-40 WB Exit Ramp approach from S



I-40 WB Exit Ramp



I-40 WB Exit Ramp approach from N



I-40 and Rock Creek Dairy Rd.



Date: May 30, 2017	County: Guilford
Interchange: I-40 and Rock Creek Dairy Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		
Splitter sign on median between	Y		
Barrier between	N		

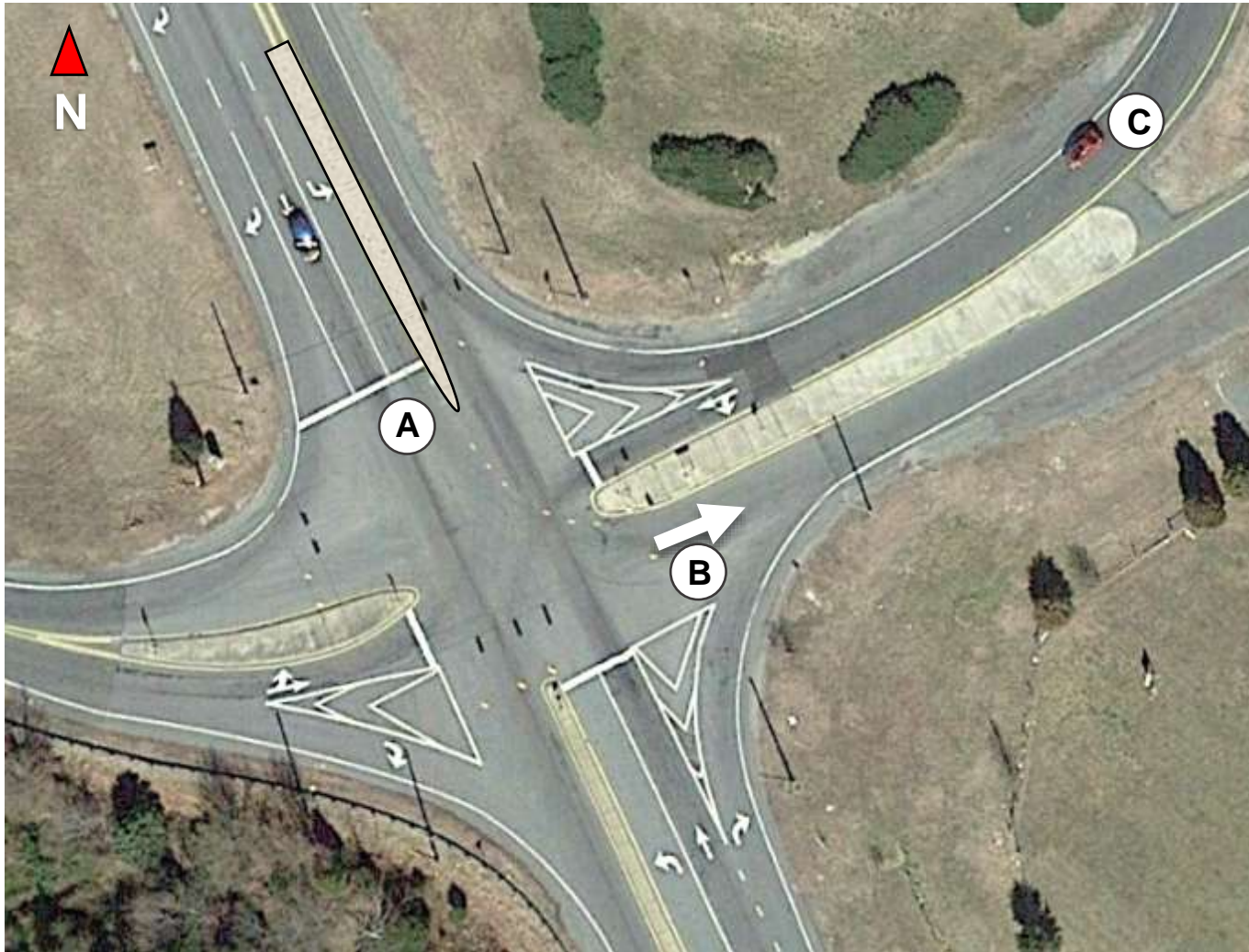
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted	
Raised median on crossroad	N	Painted	Install extended raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	Splitter island mitigates
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	L turn is very accessible
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Bright yellow 'Turn Around' signs located on map

I-40 and EB Exit Ramp and Rock Creek Dairy Rd.



A. Install raised median

B. Add arrow indicating correct freeway entrance point

C. Wrong Way arrows

I-40 EB Exit Ramp approach from N



I-40 EB Exit Ramp



I-40 EB Exit Ramp approach from S



Date: May 30, 2017	County: Guilford
Interchange: I-40 and Rock Creek Dairy Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	Y		
No right turn	Y		
No left turn	Y		
Freeway entrance signs	N		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted	
Raised median on crossroad	Y		Extend median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	Could be tighter
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	Crossroad median helps mitigate
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Bright yellow 'Turn Around' signs on ramp

I-40 WB Exit Ramp at Rock Creek Dairy Rd.



A. Extend raised median

B. Install Wrong Way arrow

I-40 WB Exit Ramp approach from S



I-40 WB Exit Ramp



I-40 WB Exit Ramp approach from N



Google Earth street view

US 29, Summit Ave., and Phillips Ave.



Date: May 30, 2017	County: Guilford
Interchange: US 29 and Summit Ave. and Phillips Ave.	
Location (exit ramp): SB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y		
Wrong way arrows	N		Add arrows to Summit Rd. South and/or U.S. 29 exit ramp
Do not enter sign	Y	2 present on far raised median	Add sign to central median
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	NA		
Dashed turning guide lines	N		Add guide lines for R turn on Summit
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	NA	Type:	
Raised median on crossroad	NA	Through traffic impeded by directional movement	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	R turn on the wrong-way street is very accessible
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	Not possible to turn left on road in question due to directional traffic pattern.
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	Y	Exit ramp lies <i>between</i> N Summit and S Summit
Other distractors or confusing elements?	Y	See above

Other Notes:

Through-movement from Phillips Avenue across Summit Avenue is not permitted and is somewhat mitigated by the cross road median.

The main issue is the right turn from Phillips Avenue onto Summit Avenue (heading North). Just beyond the access to the right turn on Summit is opposite directional travel from the US 29 Exit ramp, as well as opposite directional traffic on Summit Avenue heading South. We recommend several modifications. The last recommendation would be the most comprehensive and would eliminate the need for the other modifications.

- Extend the median between the U.S. 29 exit ramp and Summit Avenue N.
- Add a wrong-way arrow on U.S. 29 and/or Summit Avenue S.
- Add a right-turn arrow on Phillips to direct right-turns onto Summit Avenue N.
- Install some type of physical barrier between the right turn from Phillips onto Summit Avenue N. and the left turn from the U.S. 29 exit ramp onto Phillips.

US 29 SB Exit Ramp at Summit Ave. and Phillips Ave.



- A. Add guide lines and/or right turn arrow
- B. Extend raised median, add Do Not Enter sign
- C. Add wrong-way arrow(s)
- D. Add physical barrier (flexible bollards)

U.S. 29 SB Exit Ramp approach from E

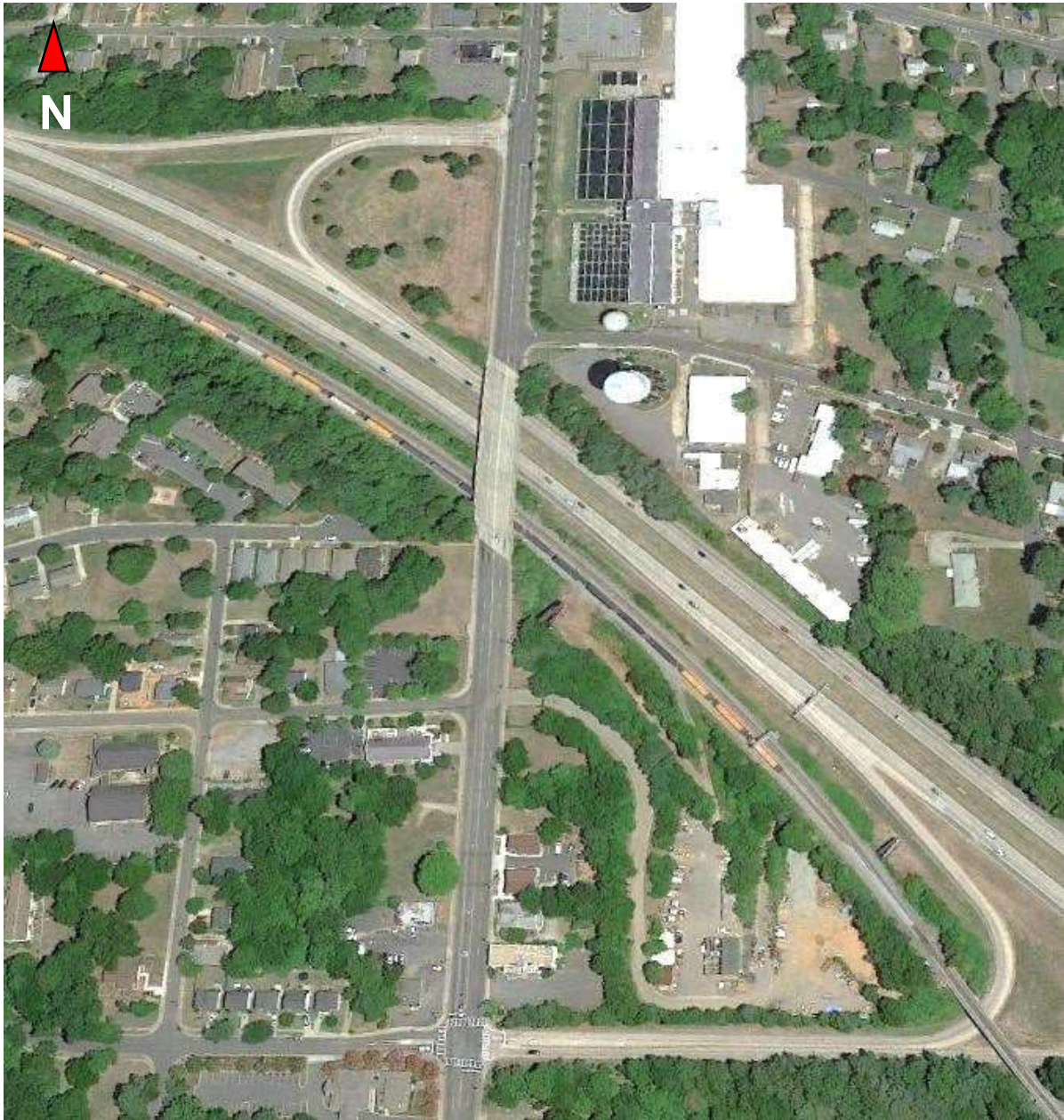


U.S. 29 SB Exit Ramp approach from E



MECKLENBURG COUNTY

Brookshire Freeway and Beatties Ford Rd.



Date: June 29, 2017	County: Mecklenburg
Interchange: Brookshire Freeway and Beatties Ford Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		Extend median
Splitter sign on median between	N		Add splitter sign
Barrier between	N		

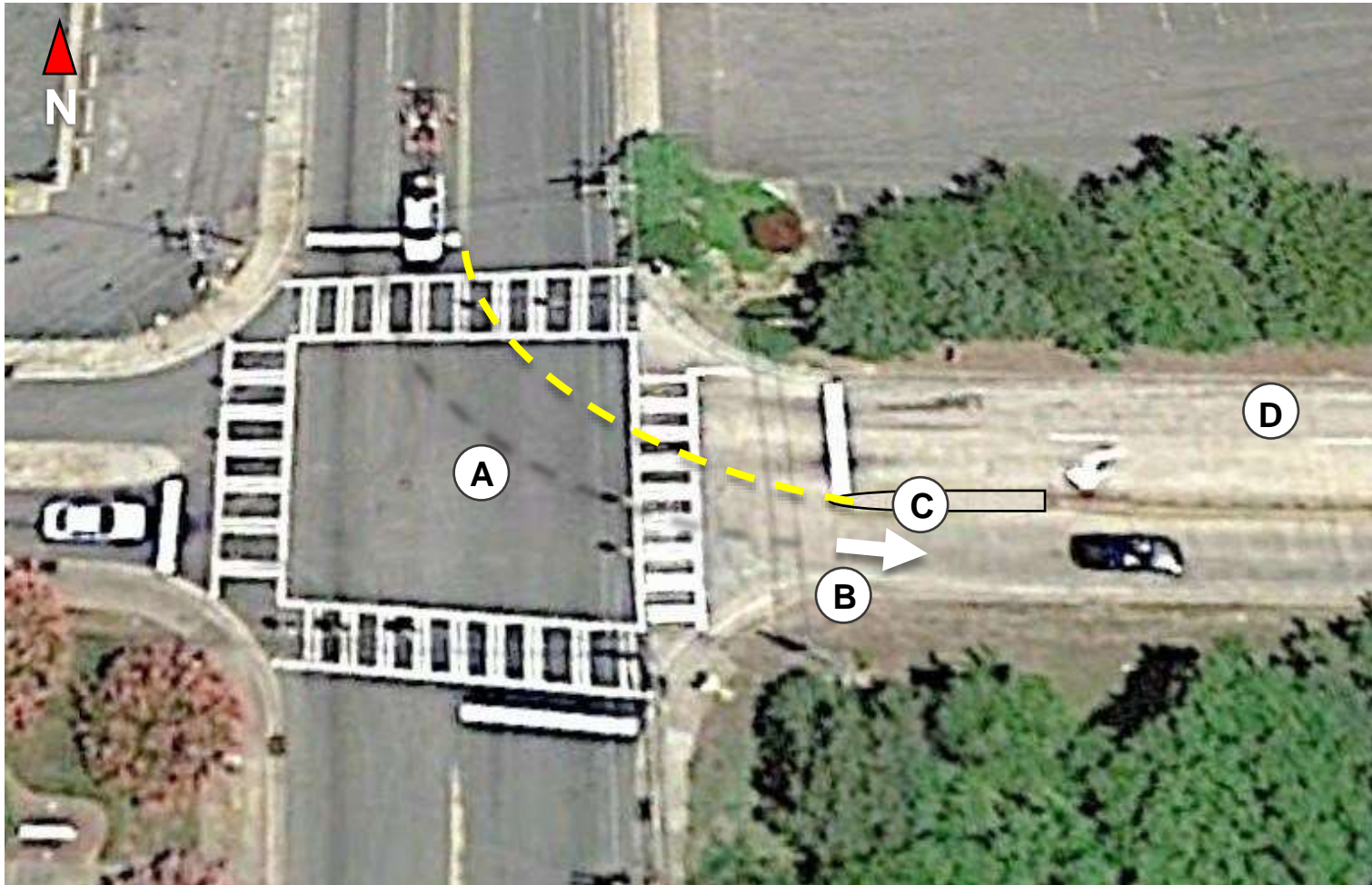
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Construction on sidewalk underway at time of visit. The ramp appears more like a typical street segment rather than a standard ramp.

Brookshire Freeway EB Exit Ramp at Beatties Ford Rd.



- A. Add dotted lane line extension through intersection
- B. Add arrow indicating correct freeway entrance point
- C. Extend raised median
- D. Add wrong way arrows

Brookshire Freeway EB Exit Ramp approach from S



Brookshire Freeway EB Exit Ramp



Brookshire Freeway EB Exit Ramp approach from N



Date: June 29, 2017	County: Mecklenburg
Interchange: Brookshire Freeway and Beatties Ford Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs at curve	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	N		Add sign
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		Repaint stop bar and turn arrows
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		Improve visibility
Splitter sign on median between	N		Add splitter sign
Barrier between	N		

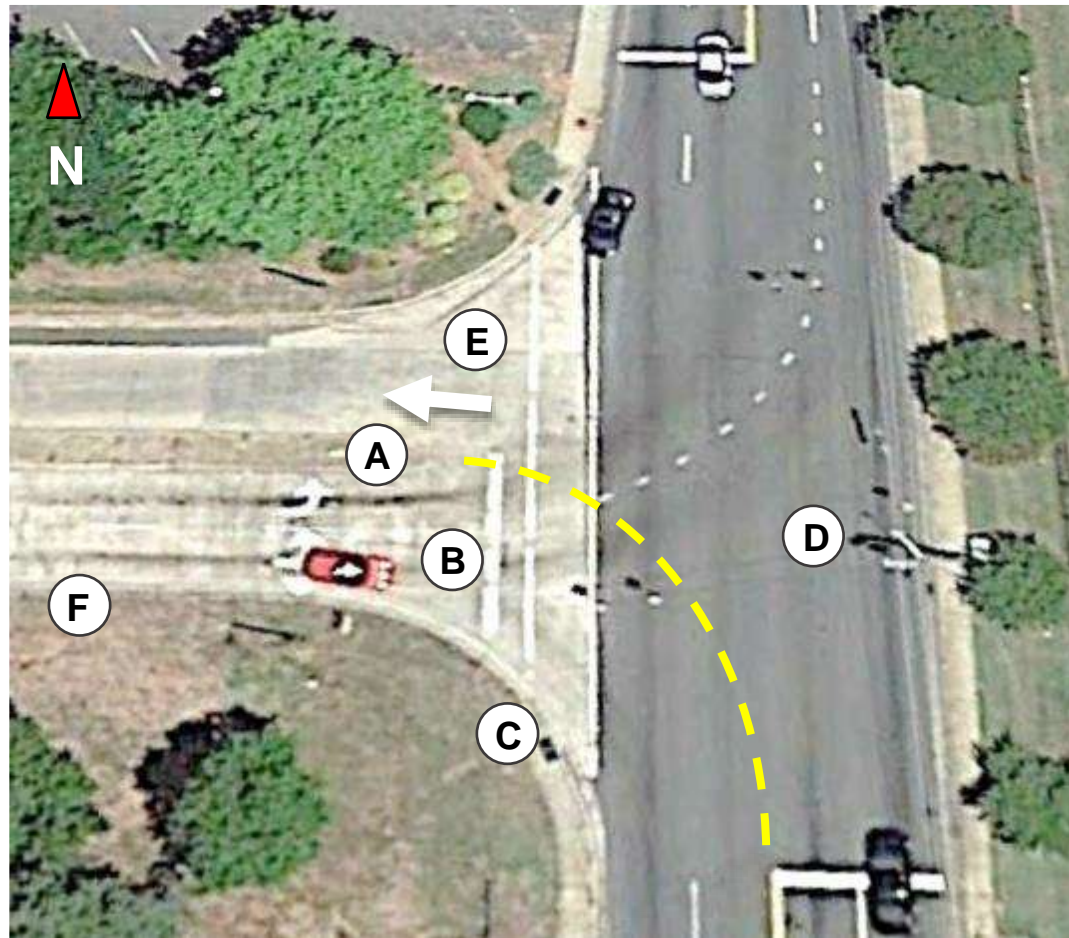
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	Y	
Other distractors or confusing elements?	N	

Other Notes:

No NC 16 Route signs present

Brookshire Freeway WB Exit Ramp at Beatties Ford Rd.



- A. Improve median visibility and add splitter sign
- B. Repair stop bar and turn arrows
- C. Add One-Way sign
- D. Add dotted lane line extension through intersection
- E. Add arrow indicating correct freeway entrance point
- F. Add wrong way arrows

Brookshire Freeway WB Exit Ramp approach from S



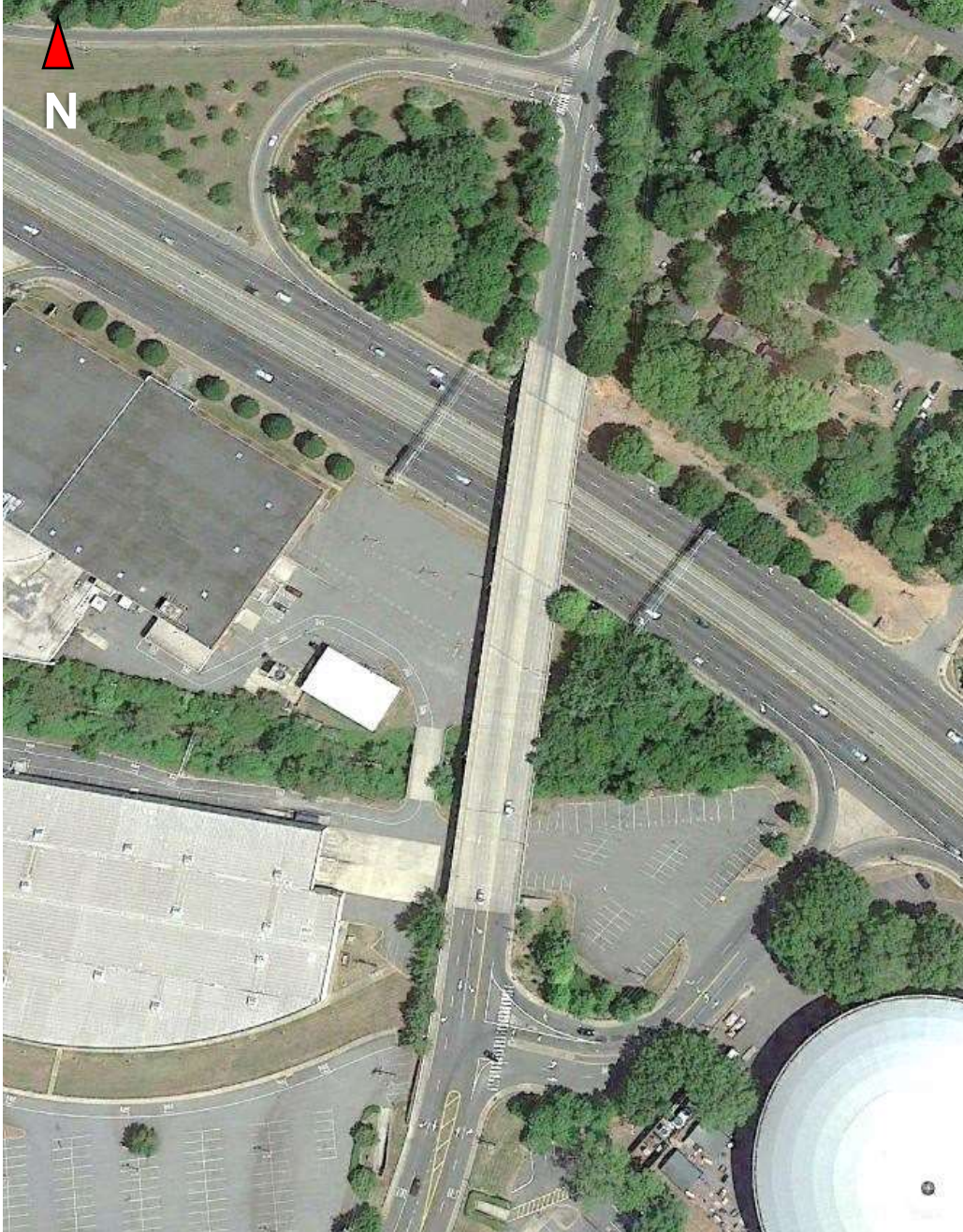
Brookshire Freeway WB Exit Ramp



Brookshire Freeway WB Exit Ramp approach from N



I-74 and Briar Creek Rd.



Date: June 29, 2017	County: Mecklenburg
Interchange: I-74 and Briar Creek Rd.	
Location (exit ramp): EB Exit Ramp	

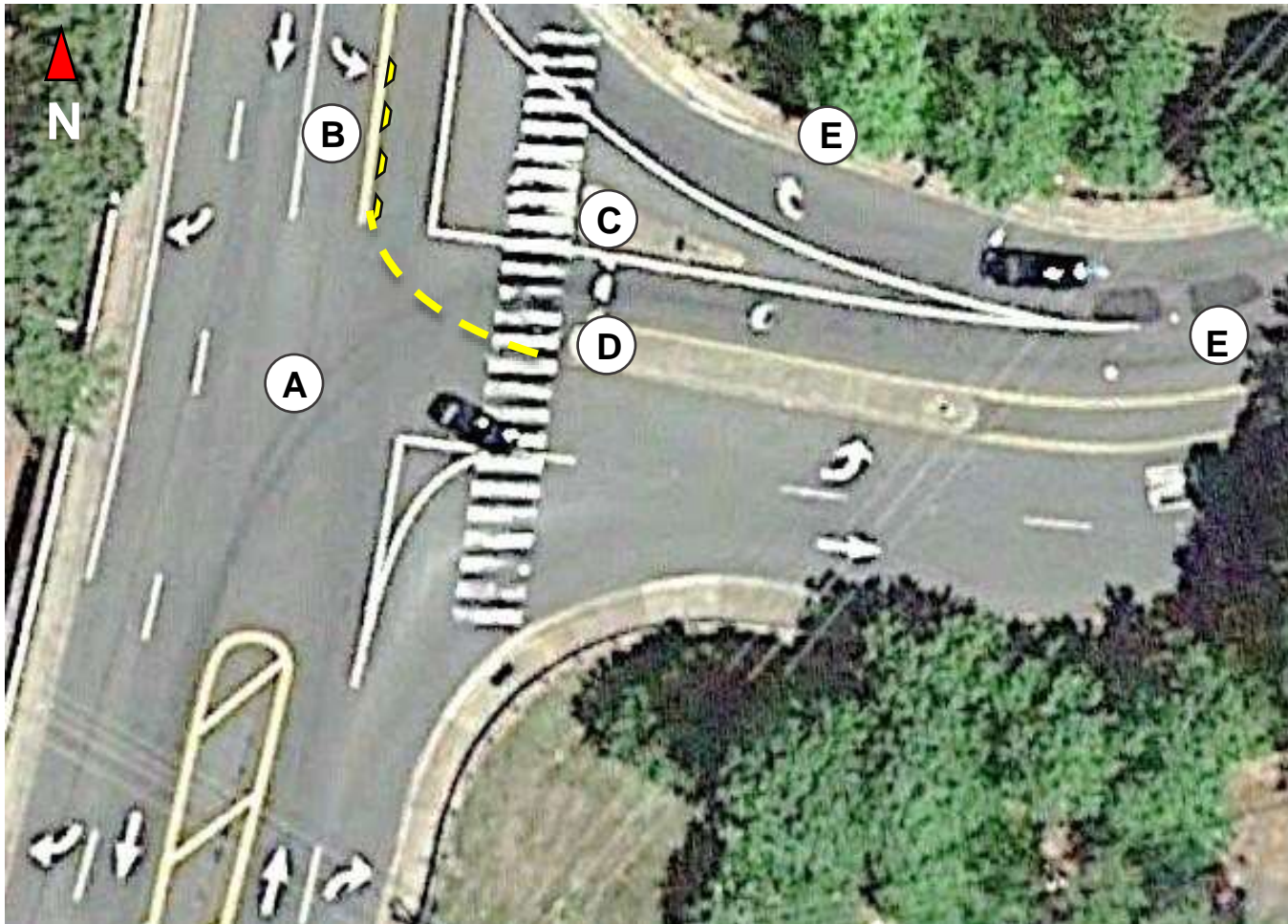
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		Add Wrong Way sign
Wrong way arrows	N		Add arrows, repaint turn arrows
Do not enter sign	Y	One sign	
One way	N		Add sign at splitter island
No right turn	NA		
No left turn	NA		
Freeway entrance signs	Y		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	N	Crosswalk at ramp	Repaint crosswalk
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Raised	
Splitter sign on median between	N	Sign was present in 2014	Replace splitter sign
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Paint and raised island	
Raised median on crossroad	N		Add median separator

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	Y	Ramp drops sharply from crossroad. Obscures visibility.
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-74 EB Exit Ramp at Briar Creek Rd.



- A. Add dotted lane line extension through intersection
- B. Add raised separator
- C. Add One-Way sign
- D. Add splitter sign, improve median visibility
- E. Add Wrong Way arrows

I-74 EB Exit Ramp approach from S



I-74 EB Exit Ramp



I-74 EB Exit Ramp approach from N



Date: June 29, 2017	County: Mecklenburg
Interchange: I-74 and Briar Creek Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows, repaint turn arrows
Do not enter sign	Y	Obscured by trees	Move closer to corner
One way	N		Add sign at corner
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y	Crosswalk is faded	Repaint

If entrance and exit ramps are directly adjacent to each other:

Median between	Y		Improve visibility
Splitter sign on median between	Y		
Barrier between	N		

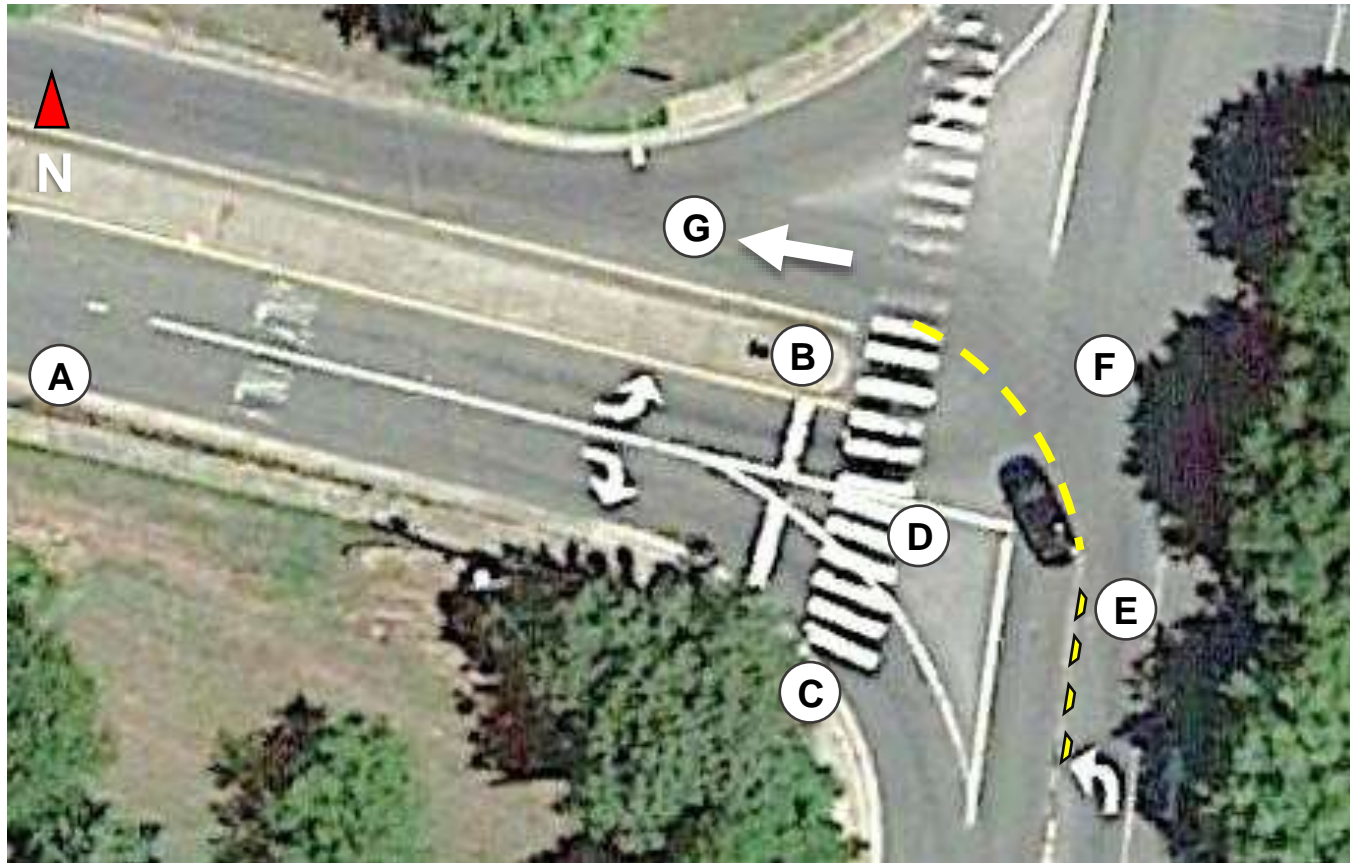
Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N	Rubber traffic separator	Extend separator

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	Rubber median separator mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-74 WB Exit Ramp at Briar Creek Rd.



- A. Add Wrong Way arrows
- B. Improve visibility of median
- C. Move Do Not Enter sign forward, add One Way sign
- D. Repaint crosswalk, pork chop island, and turn arrows
- E. Replace and extend separator
- F. Add dotted lane line extension through intersection
- G. Add arrow indicating correct freeway entry point

I-74 WB Exit Ramp approach from S



I-74 WB Exit Ramp



I-74 WB Exit Ramp approach from N



I-77 and I-73/Sam Furr Rd.



Date: June 29, 2017	County: Mecklenburg
Interchange: I-77 and I-73/Sam Furr Rd.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	Add sign to splitter island
One way	Y		
No right turn	Y	One sign at shoulder	Add sign to traffic light
No left turn	Y		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised	
Raised median on crossroad	Y	Raised	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Splitter island and crossroad median mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-77 NB Exit Ramp at I-73/Sam Furr Rd.



- A. Add Do Not Enter sign to splitter island**
- B. Add No Right Turn sign**
- C. Add Wrong Way arrows (not shown)**

I-77 NB Exit Ramp approach from W



I-77 NB Exit Ramp



Google Earth street view

I-77 NB Exit Ramp approach from E



Date: June 29, 2017	County: Mecklenburg
Interchange: I-77 and I-73/Sam Furr Rd.	
Location (exit ramp): SB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs, but not visible to approaching Westbound traffic	Adjust at least one sign angle
One way	Y		
No right turn	Y		
No left turn	Y	Sign askew	Adjust sign angle
Freeway entrance signs	NA	Freeway entrance is ~ 100 ft from exit ramp	
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-77 SB Exit Ramp at I-73/Sam Furr Rd.



- A. Adjust Do Not Enter Sign angle
- B. Remount No Left Turn Sign (askew)

I-77 NB Exit Ramp approach from E



Google Earth street view

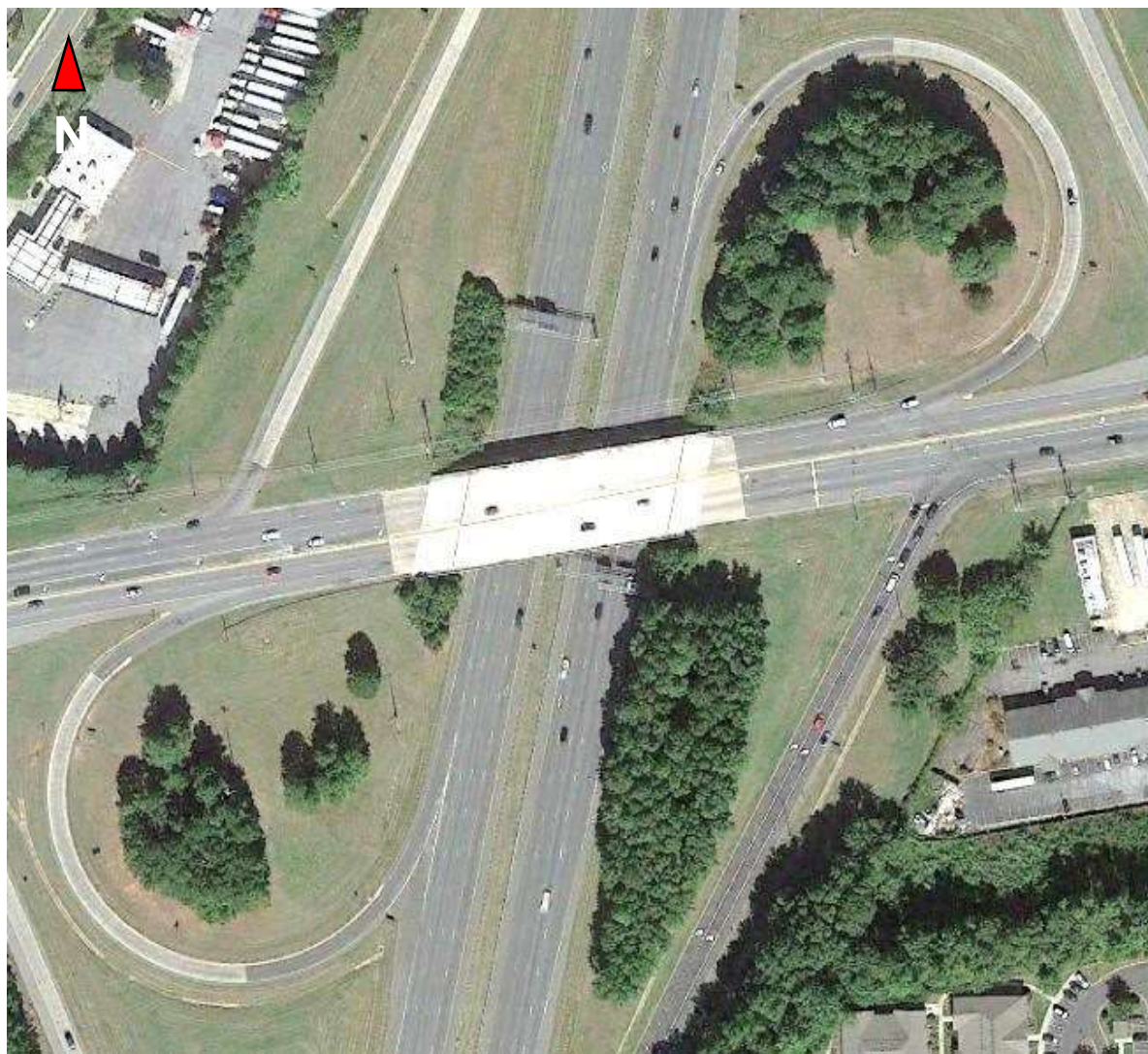
I-77 NB Exit Ramp



I-77 NB Exit Ramp approach from W



I-77 and Sunset Rd.



Date: June 29, 2017	County: Mecklenburg
Interchange: I-77 and Sunset Rd.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		
Do not enter sign	Y	Two signs	
One way	N		
No right turn	N		
No left turn	NA	Continuous median prevents left turn	
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	NA	Type: Right turn only from exit ramp	
Raised median on crossroad	Y	Continuous median mitigates left turns	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	Very angled
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	Crossroad median mitigates left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes: No recommendations

I-77 NB Exit Ramp at Sunset Rd.



Note: This ramp terminal intersection had a continuous raised median on the cross street and highly channelized ramp lanes. As such, the team had no recommendations for improvements.

I-77 NB Exit Ramp approach from W



I-77 NB Exit Ramp



I-77 NB Exit Ramp approach from E



Date: June 29, 2017	County: Mecklenburg
Interchange: I-77 and Sunset Rd.	
Location (exit ramp): SB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		
Do not enter sign	Y	Two signs	
One way	N		
No right turn	Y		
No left turn	NA	Continuous median prevents left turn	
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	N		

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	NA	Type: Right turn only from exit ramp	
Raised median on crossroad	Y	Continuous median mitigates left turns	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	Very angled
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	Crossroad median mitigates left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes: No recommendations

I-77 SB Exit Ramp at Sunset Rd.



Note: This ramp terminal intersection had a continuous raised median on the cross street and highly channelized ramp lanes. As such, the team had no recommendations for improvements.

I-77 SB Exit Ramp approach from E



I-77 SB Exit Ramp

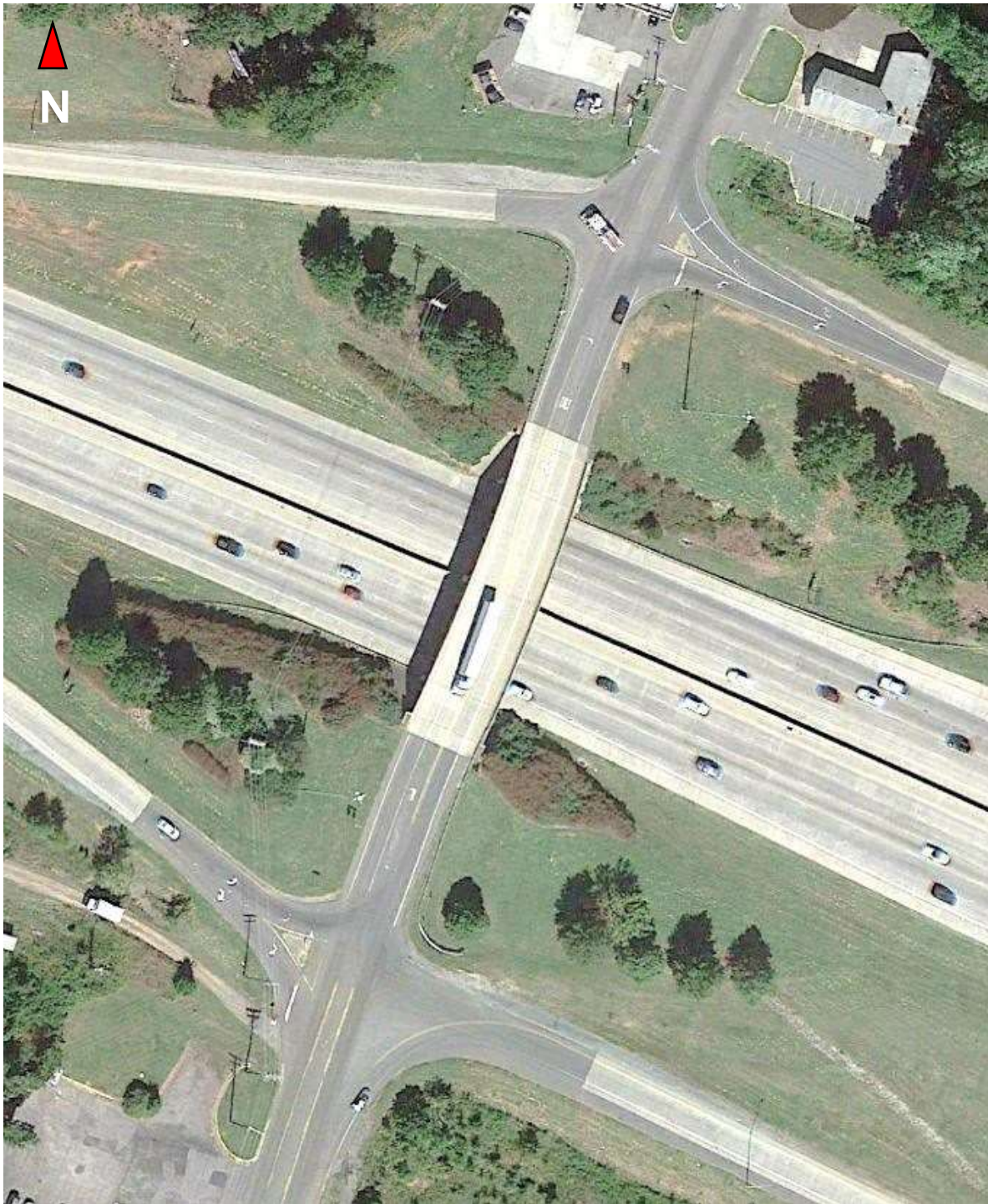


I-77 SB Exit Ramp approach from W



Google Earth street view

I-85 and Sam Wilson Rd.



Date: June 29, 2017	County: Mecklenburg
Interchange: I-85 and Sam Wilson Rd.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs w/ red reflective strip	
Wrong way arrows	N		Add arrows
Do not enter sign	N	Sign laying on the ground	Reinstall sign
One way	Y		
No right turn	N		
No left turn	N		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y	Faded	Repaint

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

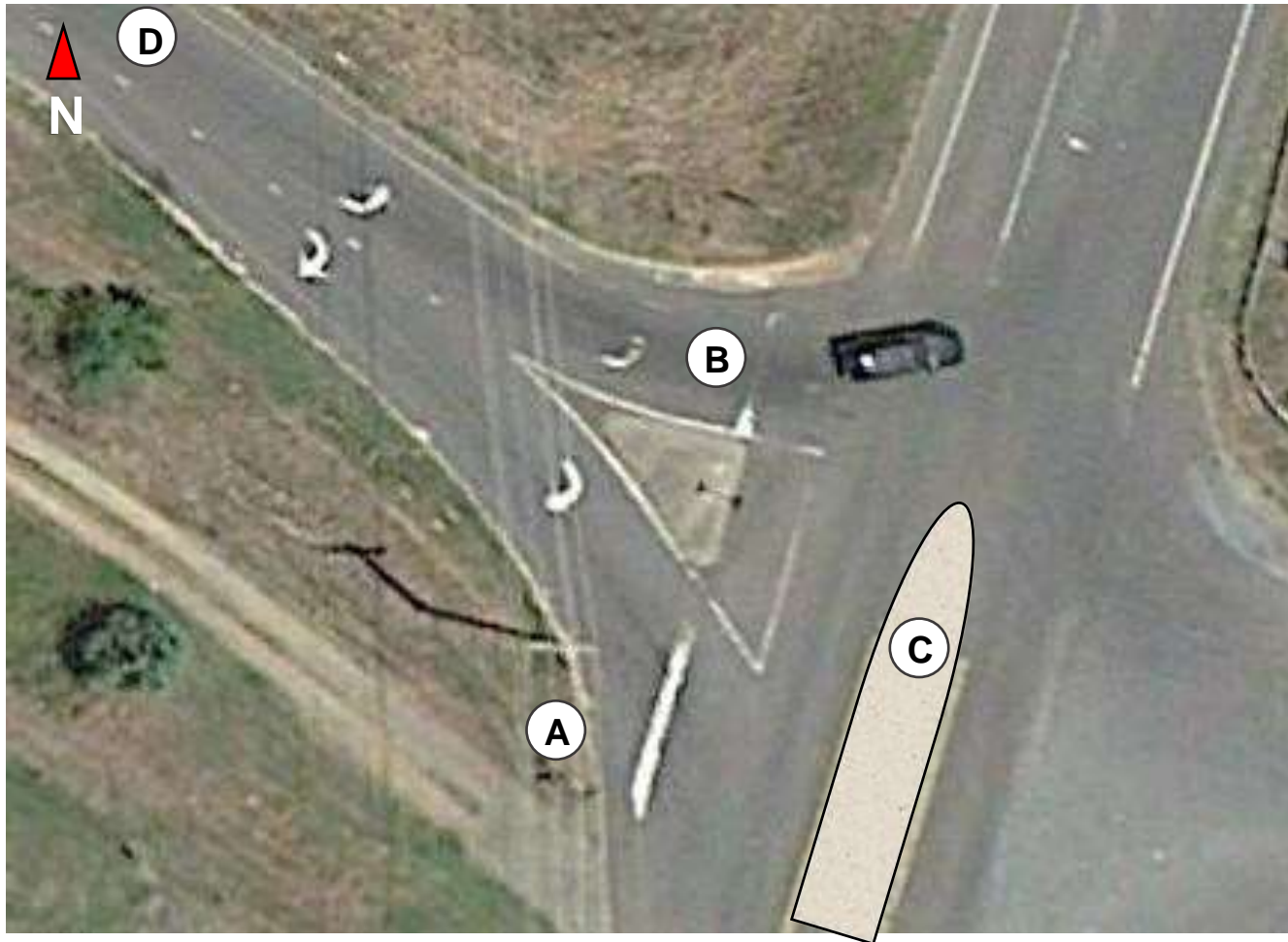
Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised	
Raised median on crossroad	N		Repaint or add raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	Y	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Possibly, no barrier or median to prevent left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-85 NB Exit Ramp at Sam Wilson Rd.



- A. Reinstall Do Not Enter sign
- B. Repaint stop bar
- C. Add raised median or repaint hash lines
- D. Add Wrong Way arrows

I-85 NB Exit Ramp approach from S



I-85 NB Exit Ramp



I-85 NB Exit Ramp approach from N



Date: June 29, 2017	County: Mecklenburg
Interchange: I-85 and Sam Wilson Rd.	
Location (exit ramp): SB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y		
No right turn	N		
No left turn	N		
Freeway entrance signs	N		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y	Faded	Repaint

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

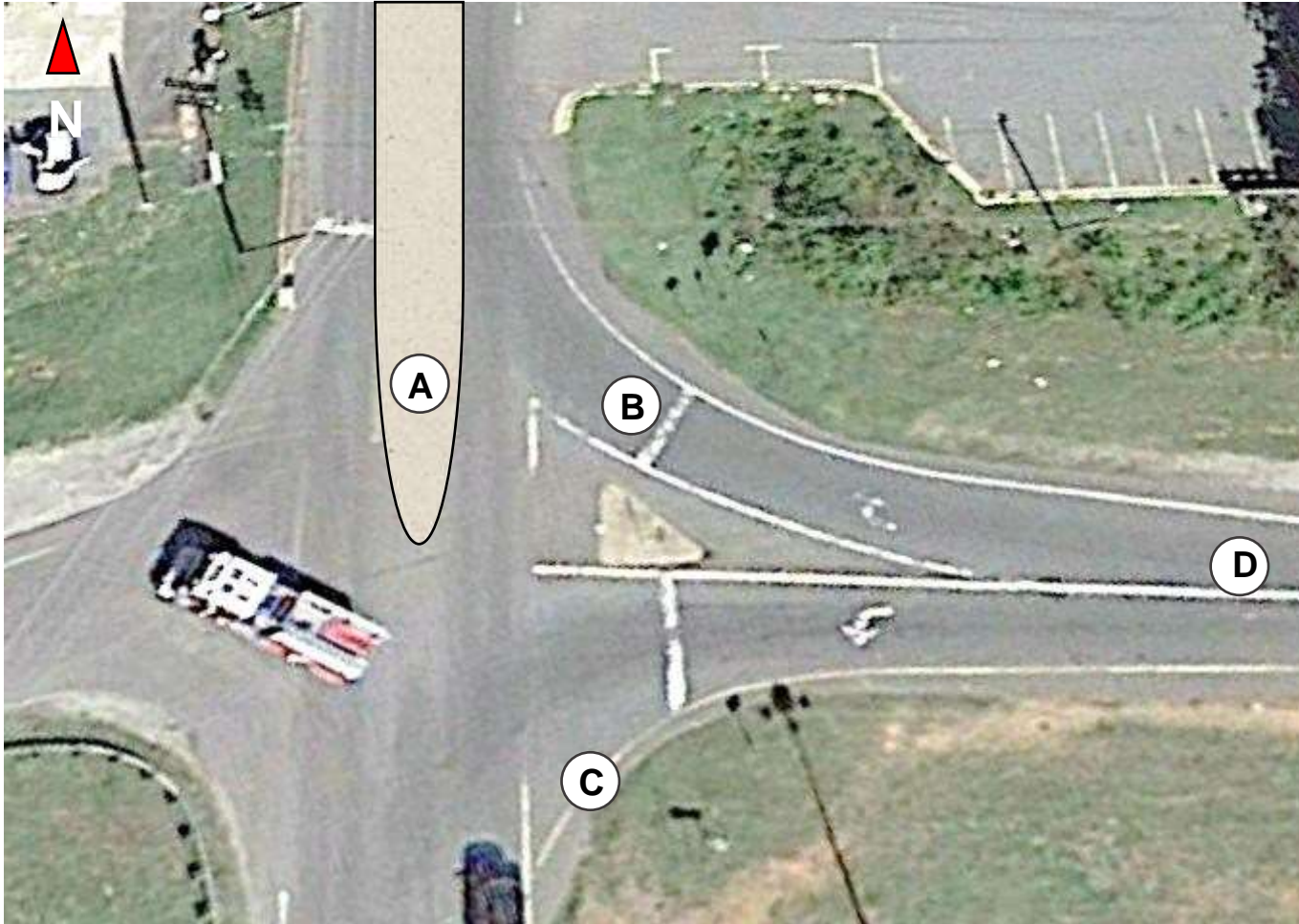
Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised	
Raised median on crossroad	N		Add raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	Y	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Very easy wrong-way right turn
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Possibly. No hard barrier preventing left turn.
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-85 SB Exit Ramp at Sam Wilson Rd.



- A. Add raised median or repaint hash lines
- B. Repaint stop bars
- C. Tighten corner radius
- D. Add Wrong Way arrows

I-85 SB Exit Ramp approach from S



I-85 SB Exit Ramp



I-85 SB Exit Ramp approach from N



I-485 and Idlewild Rd.



Date: June 29, 2017	County: Mecklenburg
Interchange: I-485 and Idlewild Rd.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Good – two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y		
No right turn	Y		
No left turn	Y		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		

If entrance and exit ramps are directly adjacent to each other:

Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

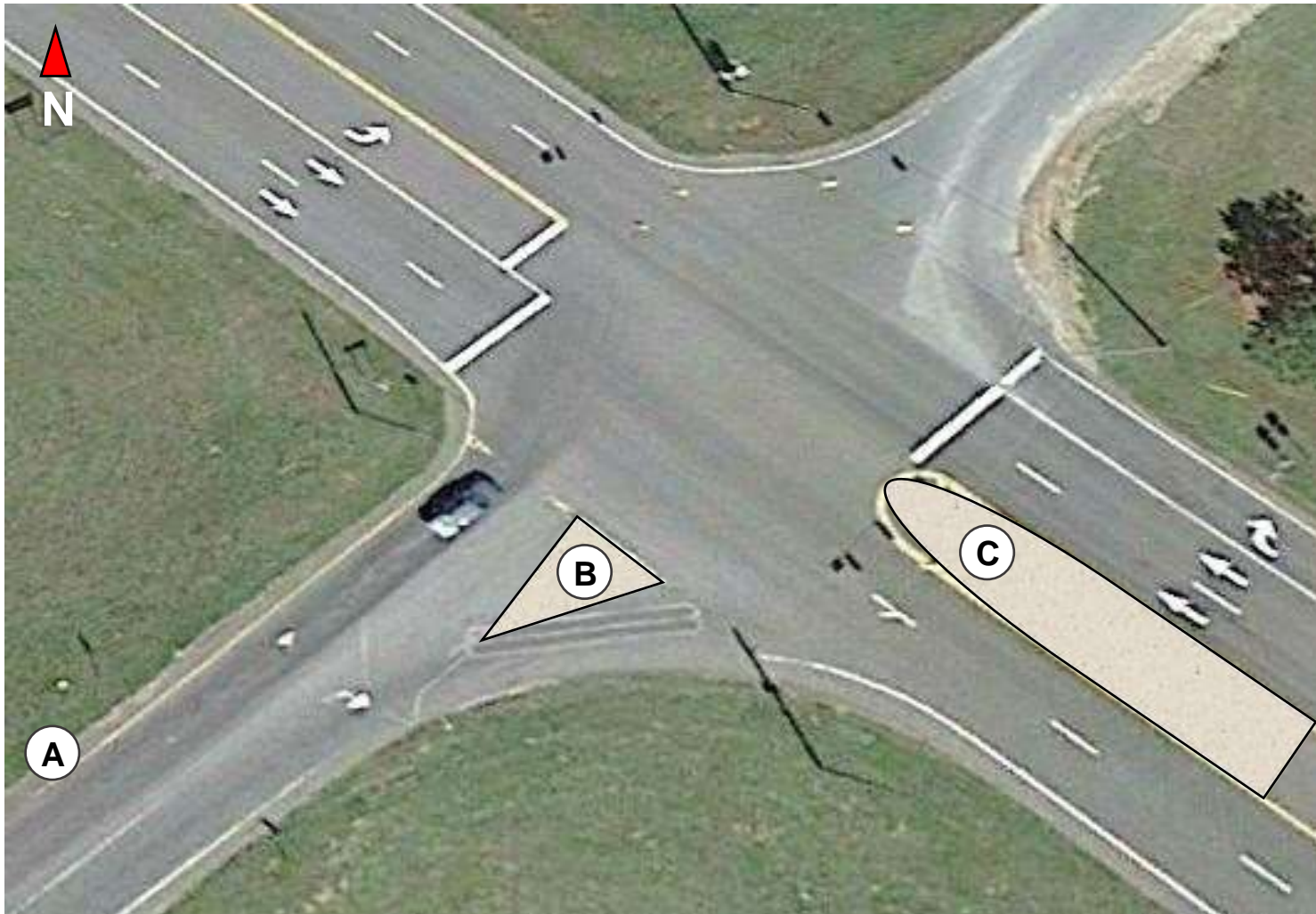
Geometrics

Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	Add raised splitter island
Raised median on crossroad	N		Add raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Possibly
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-485 NB Exit Ramp at Idlewild Rd.



- A. Add Wrong Way arrows
- B. Install splitter island
- C. Add raised median

I-485 NB Exit Ramp approach from W



I-485 NB Exit Ramp



I-485 NB Exit Ramp approach from E



Date: June 29, 2017	County: Mecklenburg
Interchange: I-485 and Idlewild Rd.	
Location (exit ramp): SB Exit Ramp	

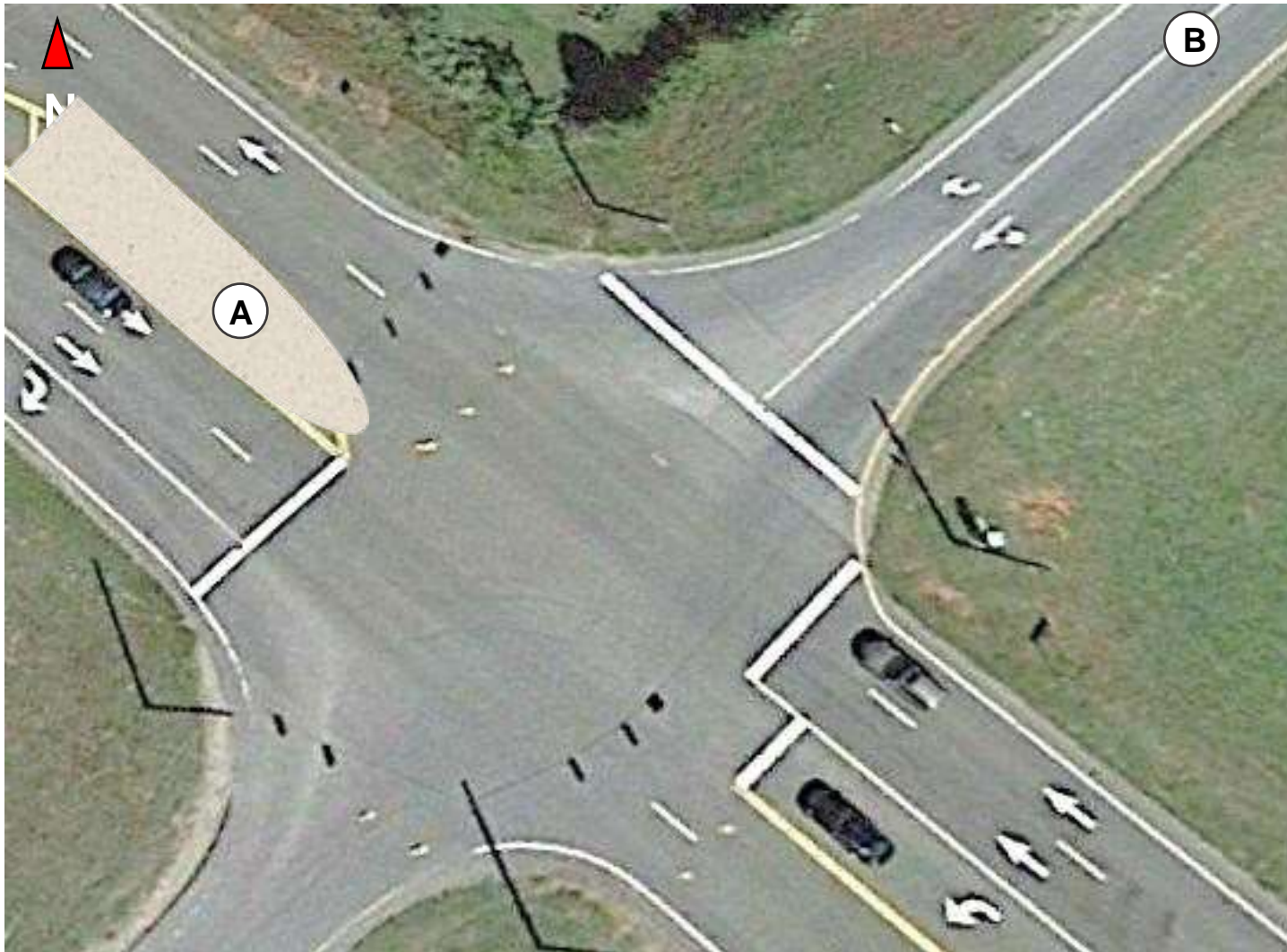
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs (w/ red reflective strips)	
One way	Y		
No right turn	Y		
No left turn	Y		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	Add splitter island
Raised median on crossroad	N		Add raised median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-485 SB Exit Ramp at Idlewild Rd.



- A. Install raised median**
- B. Add Wrong Way arrows**

I-485 SB Exit Ramp approach from E



I-485 SB Exit Ramp



I-485 SB Exit Ramp approach from W



WAKE COUNTY

I-40 and Airport Blvd.



Date: March 21, 2017	County: Wake
Interchange: I-40 and Airport Blvd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	Y	One sign	
No right turn	Y	One sign	
No left turn	Y	One sign	Add sign to cross road median
Freeway entrance signs	N		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

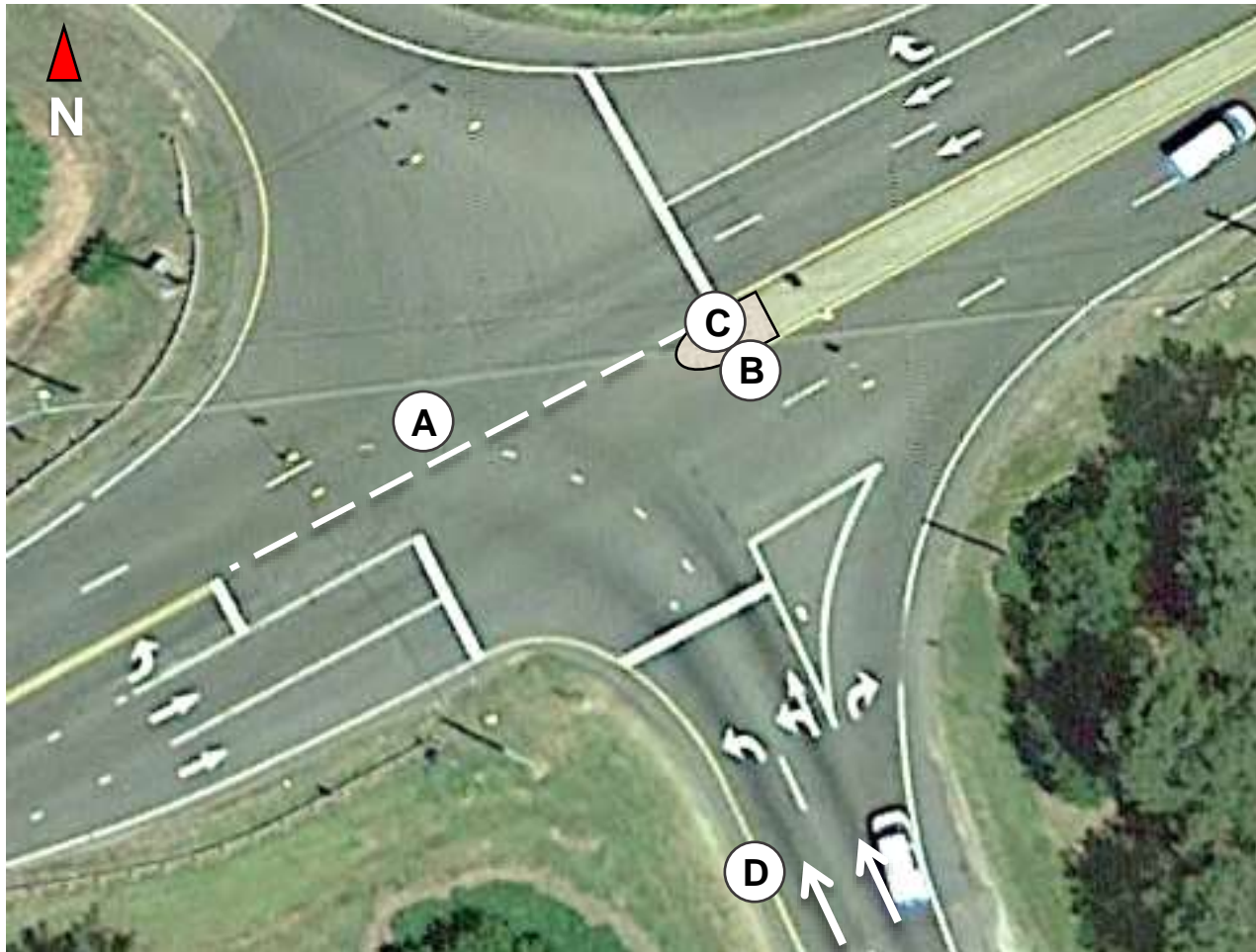
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Painted, flush	
Raised median on crossroad	Y		Extend median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Could be tighter
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Add straight dashed guide lines through intersection along left side of Southbound Airport Rd. to mitigate wrong way left turn.

I-40 WB Exit Ramp at Airport Blvd.



- A. Add dashed lines through intersection
- B. Extend raised median
- C. Add No Left Turn sign
- D. Add Wrong Way arrows

I-40 WB Exit Ramp approach from E



I-40 WB Exit Ramp



I-40 WB Exit Ramp approach from W



I-40 and Gorman St.



Date: May 15, 2017	County: Wake
Interchange: I-40 and Gorman St.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows
Do not enter sign	N		Add sign
One way	N		Add sign
No right turn	Y		
No left turn	Y		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

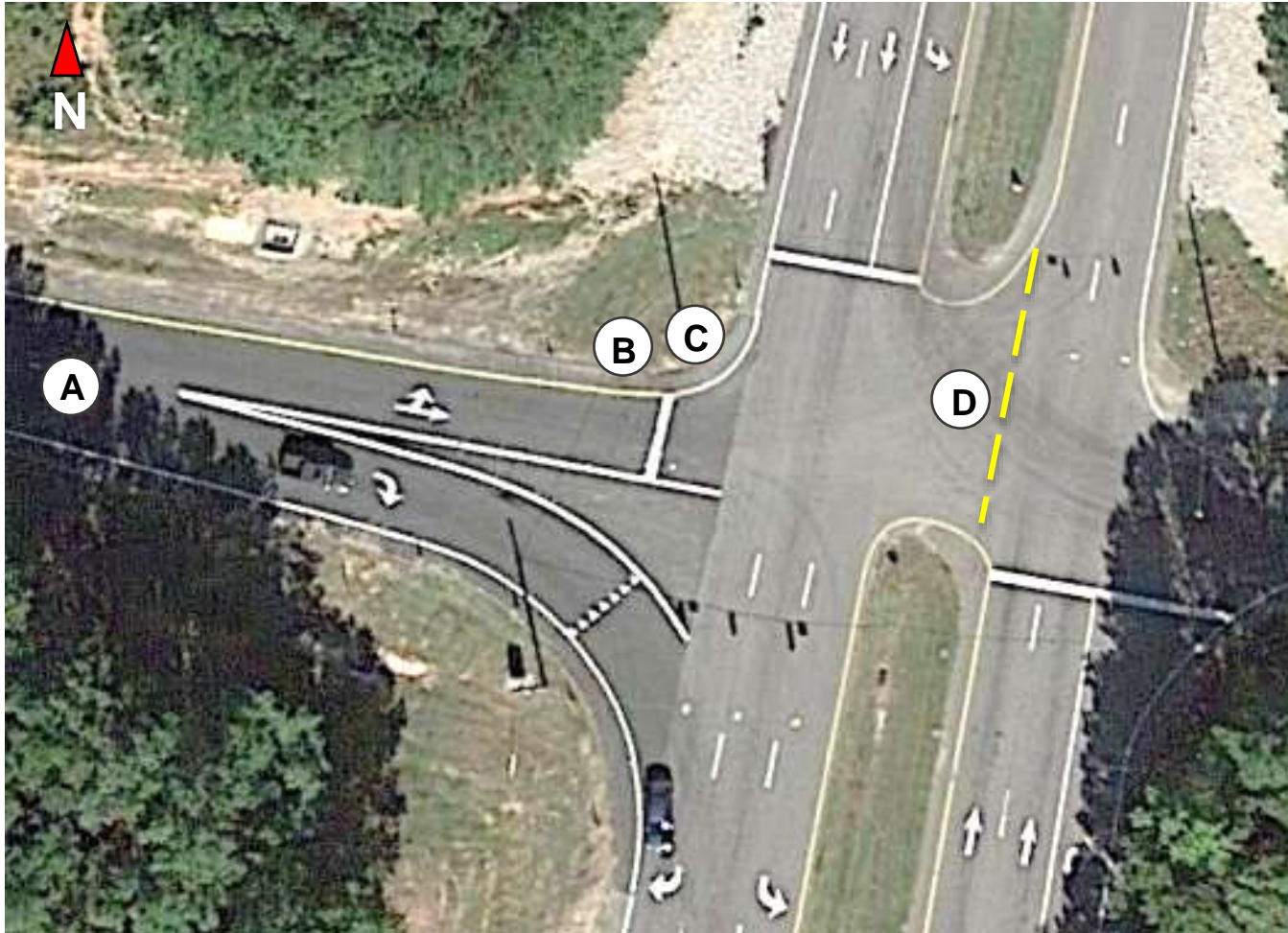
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y	Depressed grass	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Grassy median mitigates left turn
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Straight dashed lines along left side of Northbound lane at crossroad median break may help mitigate wrong way left turn.

I-40 EB Exit Ramp at Gorman St.



- A. Add Wrong Way arrows
- B. One-Way sign
- C. Add Do Not Enter sign
- D. Add straight dashed lines through intersection

I-40 EB Ramp approach from N



I-40 EB Ramp from Gorman St.



I-40 EB Ramp approach from S



Date: May 15, 2017	County: Wake
Interchange: I-40 and Gorman St.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows
Do not enter sign	N		Add sign
One way	Y		
No right turn	N		Add sign
No left turn	N		Add sign
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

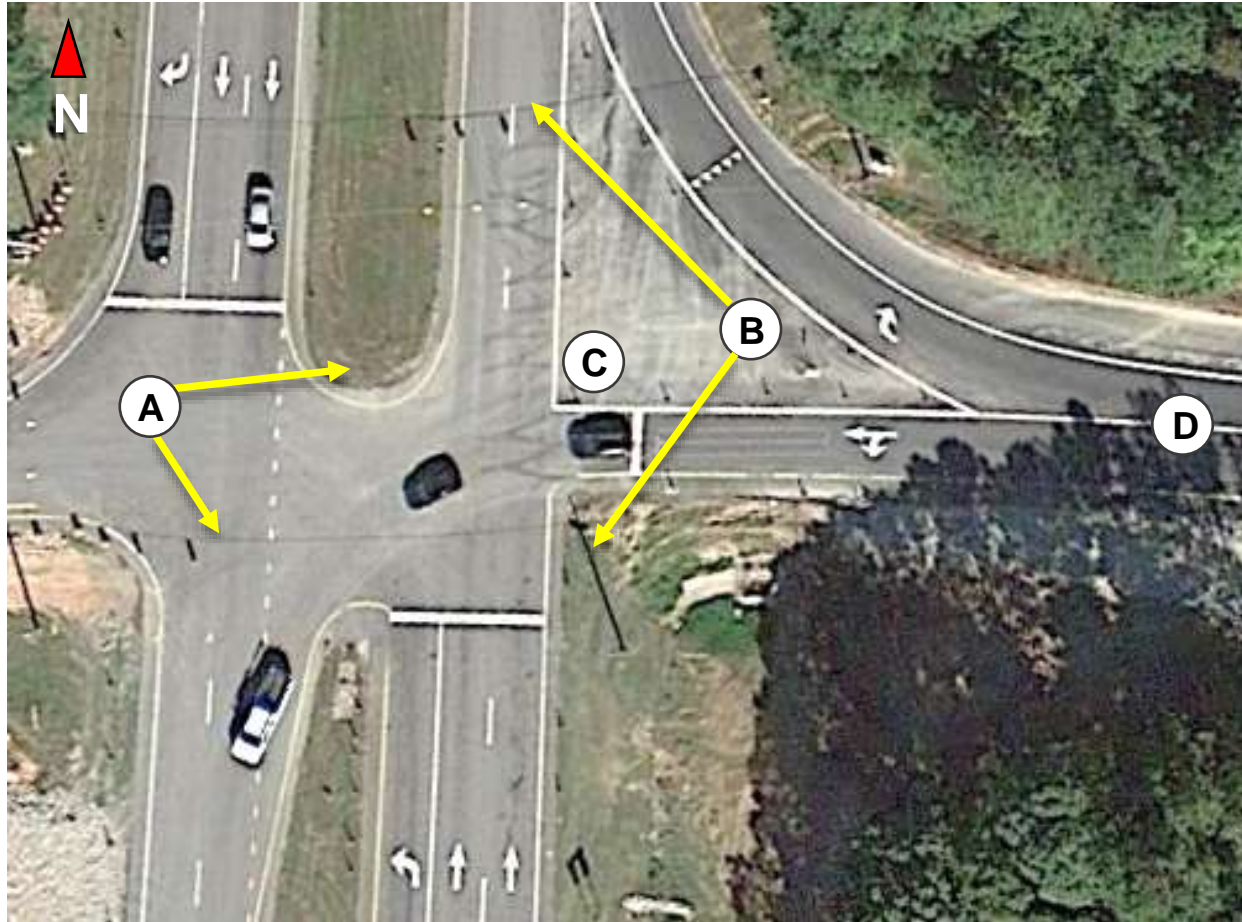
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	Y	Type: Raised (new 2017)	
Raised median on crossroad	N	Depressed grass	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	NA	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	Tight corner
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	Splitter island mitigates L-turn issues
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

Historic imagery shows that ramp was repaved in 2016 just behind splitter island.

I-40 WB Exit Ramp at Gorman St.



- A. Add No Left Turn signs (corner and overhead span wire)
- B. Add No Right Turn signs (corner and overhead span wire)
- C. Add Do Not Enter sign
- D. Add Wrong Way arrows

I-40 WB Ramp approach from N



Google Earth street view

I-40 WB Ramp from Gorman St.



I-40 WB Ramp approach from S



I-40 and Hammond Rd.

At the time of the field visit by the research team, this interchange had been reconstructed to a design that was very different from the previous configuration. This new configuration resulted from the significant reconstruction on I-40. As such, the team was unable to evaluate the interchange to compare the potential for wrong way movement to the circumstances of the crash with which it was associated. The team recommends that proposed final configuration of this interchange be evaluated for the potential for wrong way movements, based on the toolbox of strategies to prevent wrong way movements developed in this project.

I-40 and Rock Quarry Rd.

Due to recent construction, only the exit ramp from I-40 eastbound was evaluated in this field visit.



Date: April 17, 2017	County: Wake
Interchange: I-40 and Rock Quarry Rd.	
Location (exit ramp): EB Exit Ramp	

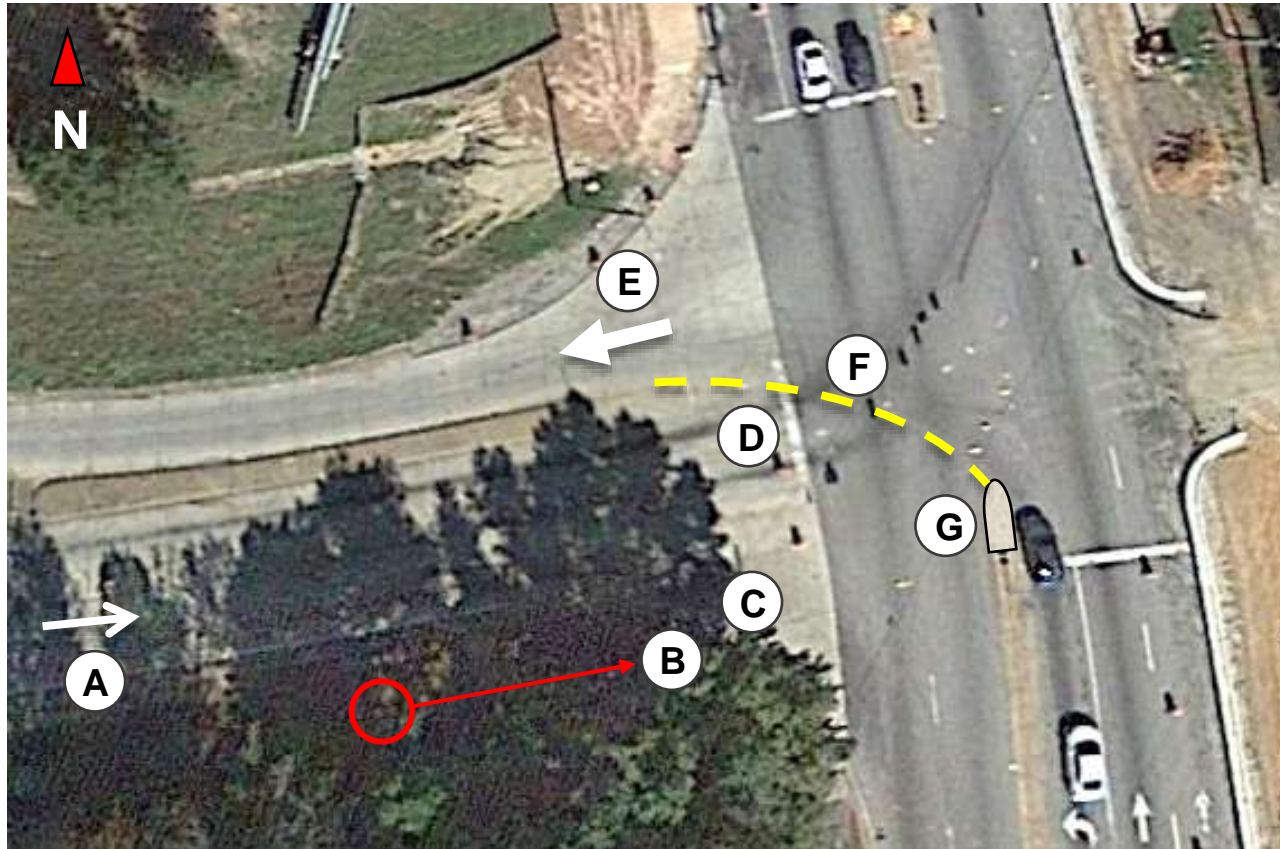
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Faded	Replace sign and relocate
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	N		Add sign
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y	Poor	Completely faded – repaint
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y		
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		Extend median

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	Y	Vertical curve. Entrance ramp curves down sharply away from cross street, difficult to see.
Nearby intersections (i.e., small roads, service roads)	Y	
Other distractors or confusing elements?	N	

Other Notes:

I-40 EB Exit Ramp at Rock Quarry Rd.



- A. Add wrong way arrows
- B. Replace Wrong Way sign and move to outside shoulder
- C. Add One-Way sign
- D. Repaint stop bar
- E. Add arrow indicating correct freeway entrance point
- F. Add dotted lane line extension through intersection
- G. Extend raised median

I-40 EB Ramp approach from N



I-40 EB Ramp

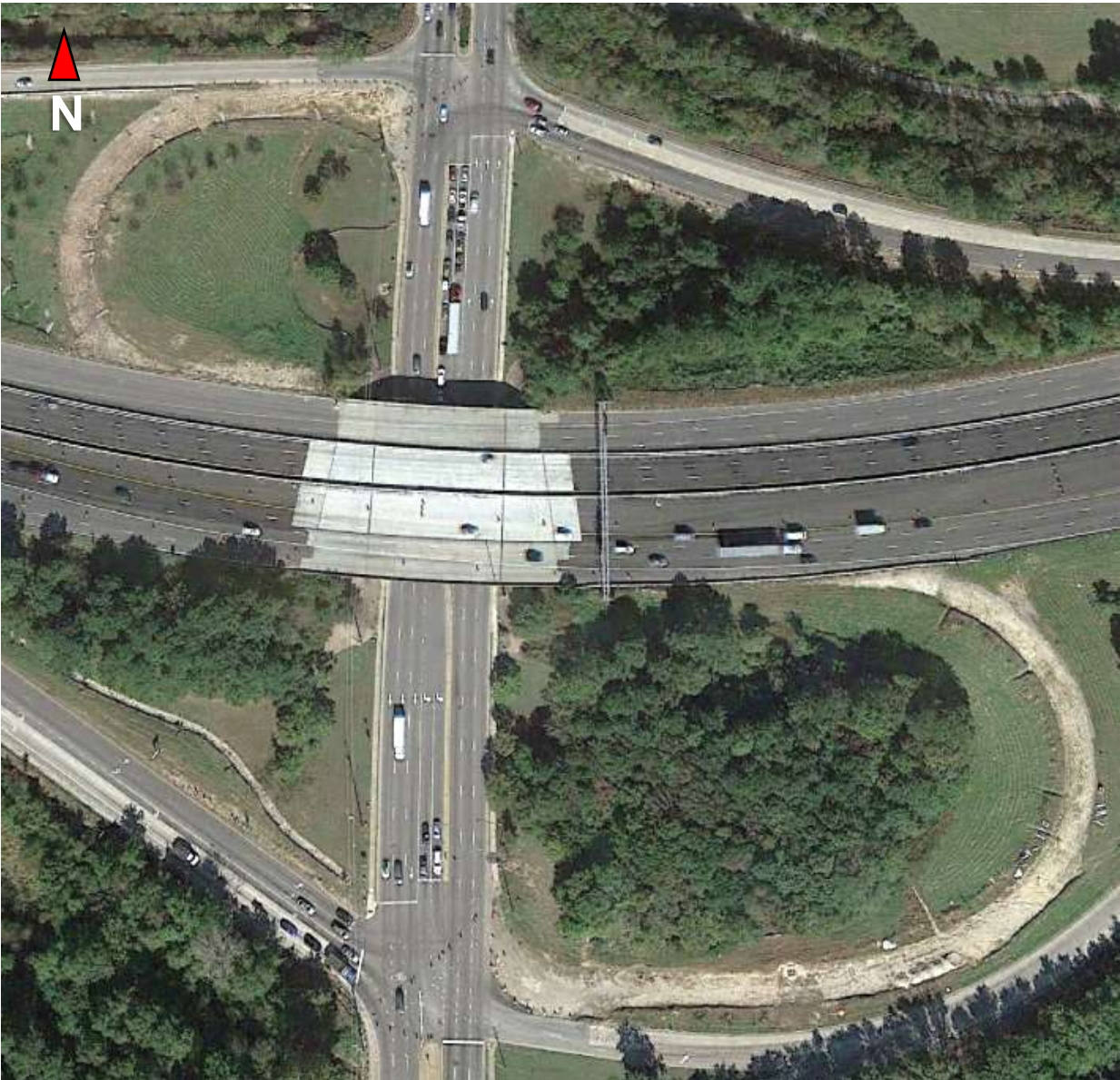


I-40 EB Ramp approach from S



I-40 and Saunders St.

Due to recent construction, only the exit ramp from I-40 eastbound was evaluated in this field visit.



Date: May 15, 2017	County: Wake
Interchange: I-40 and Saunders St.	
Location (exit ramp): EB Exit Ramp	

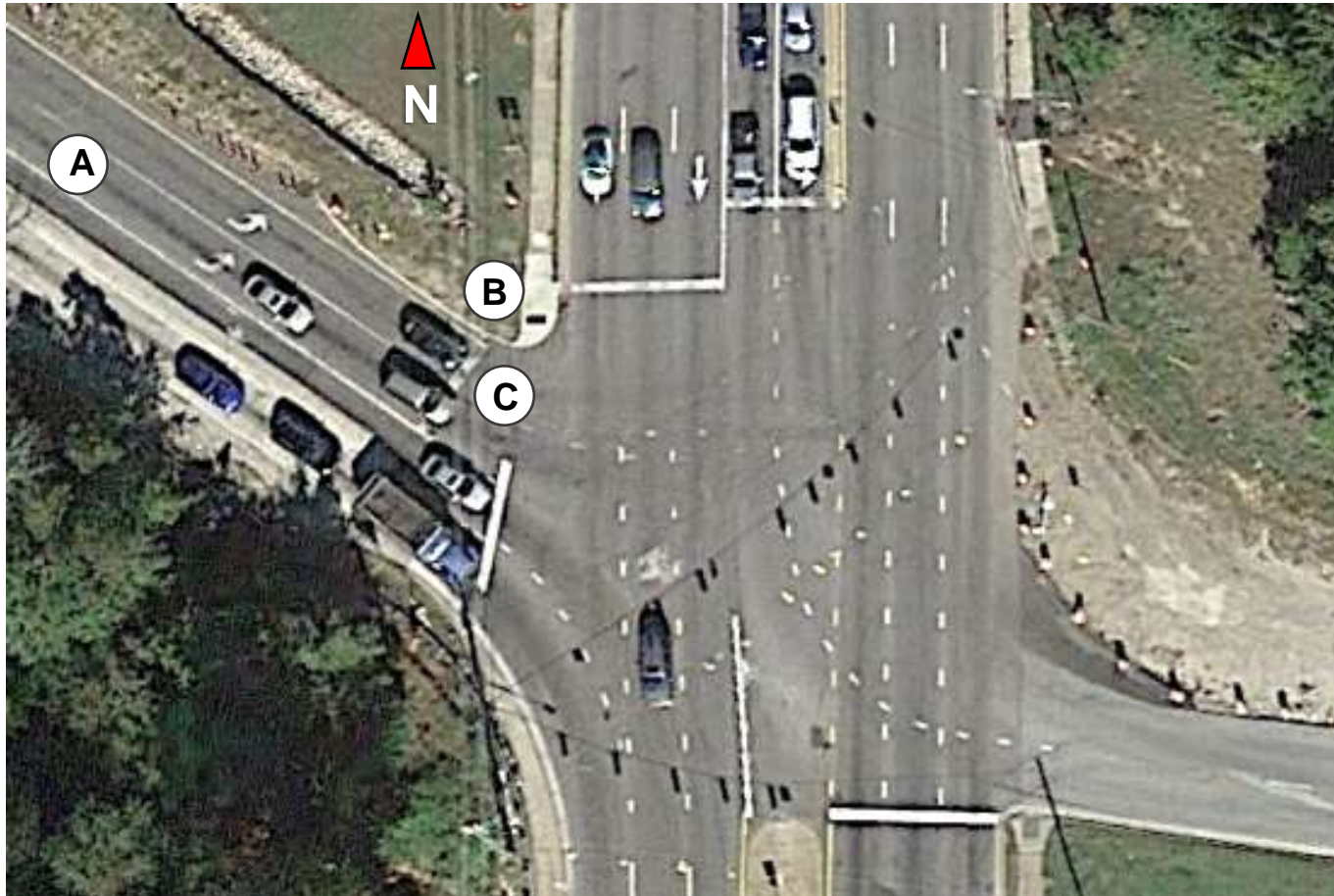
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	N		Add One-Way sign
No right turn	Y		
No left turn	Y		
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y	Not painted all the way across	Refresh stop bar
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y	Has been extended with flexible bollards	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	NA	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Mitigated by flexible median
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-40 EB Exit Ramp at Saunders St.



- A. Add Wrong-Way arrows
- B. One-Way sign
- C. Repaint stop bar

NOTES: Historic imagery shows R-turn lanes on EB Exit Ramp were added 2014-2015.

I-40 EB Ramp approach from N



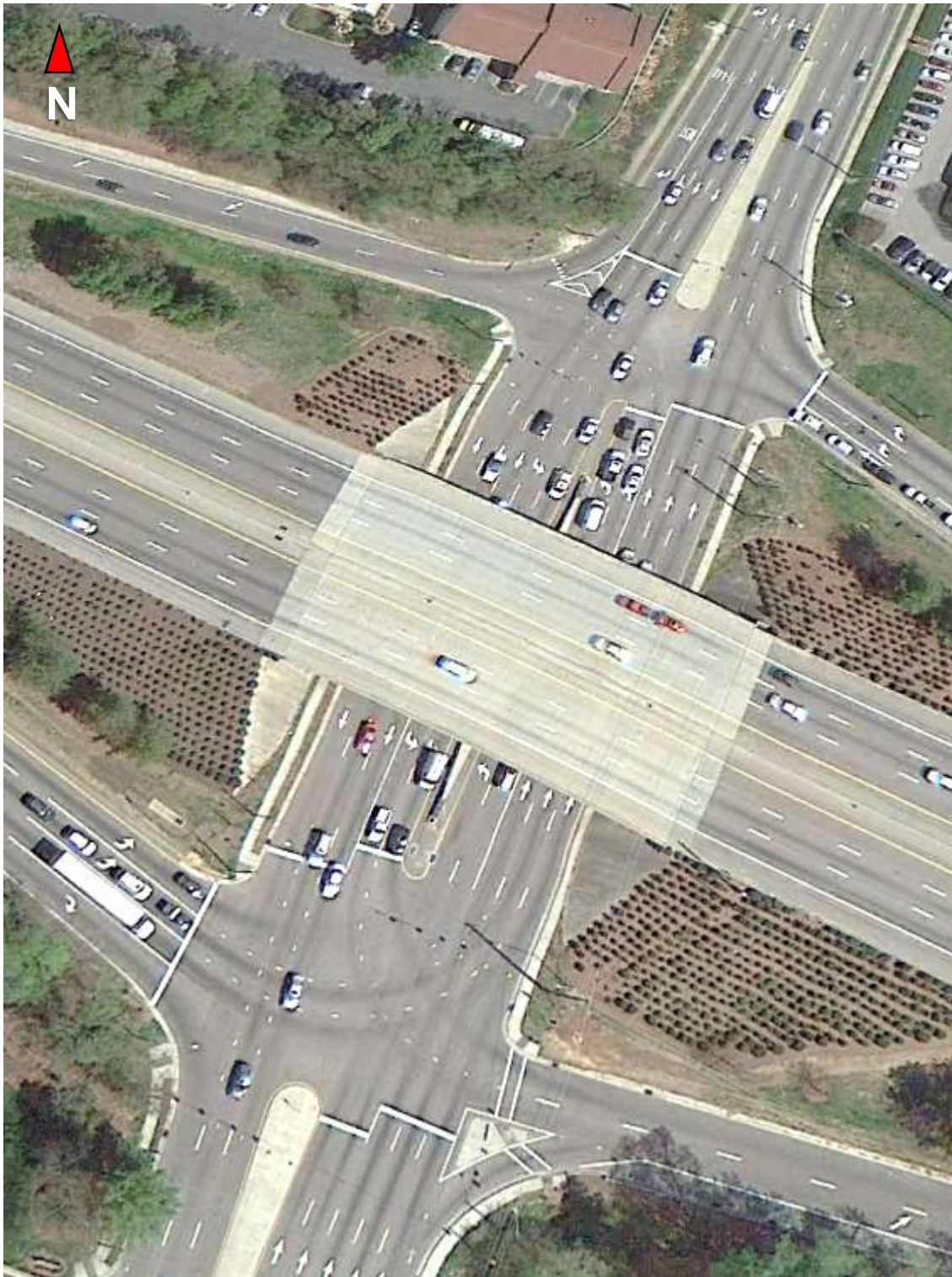
I-40 EB Ramp



I-40 EB Ramp approach from S



I-440 and Wake Forest Rd.



Date: April 17, 2017	County: Wake
Interchange: I-440 and Wake Forest Rd.	
Location (exit ramp): EB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	2 signs present	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	2 signs present	Check angle to improve visibility
One way	N		
No right turn	Y		
No left turn	Y		
Freeway entrance signs	N		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-440 EB Exit Ramp at Wake Forest Rd.



- A. Add Wrong Way arrows (not shown)**
- B. Check angle of Do Not Enter sign**

I-440 EB Ramp approach from N



Google Earth street view

I-440 EB Ramp



I-440 EB Ramp approach from S



Date: April 17, 2017	County: Wake
Interchange: I-440 and Wake Forest Rd.	
Location (exit ramp): WB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	1 sign present	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	1 sign present	
One way	N		
No right turn	N		Install No Right Turn sign
No left turn	Y		
Freeway entrance signs	N		
Dashed turning guide lines	Y		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	N	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-440 WB Exit Ramp at Wake Forest Rd.



A. Add No Right Turn sign on overhead span wire

B. Add Wrong Way arrows

I-440 WB Ramp approach from N



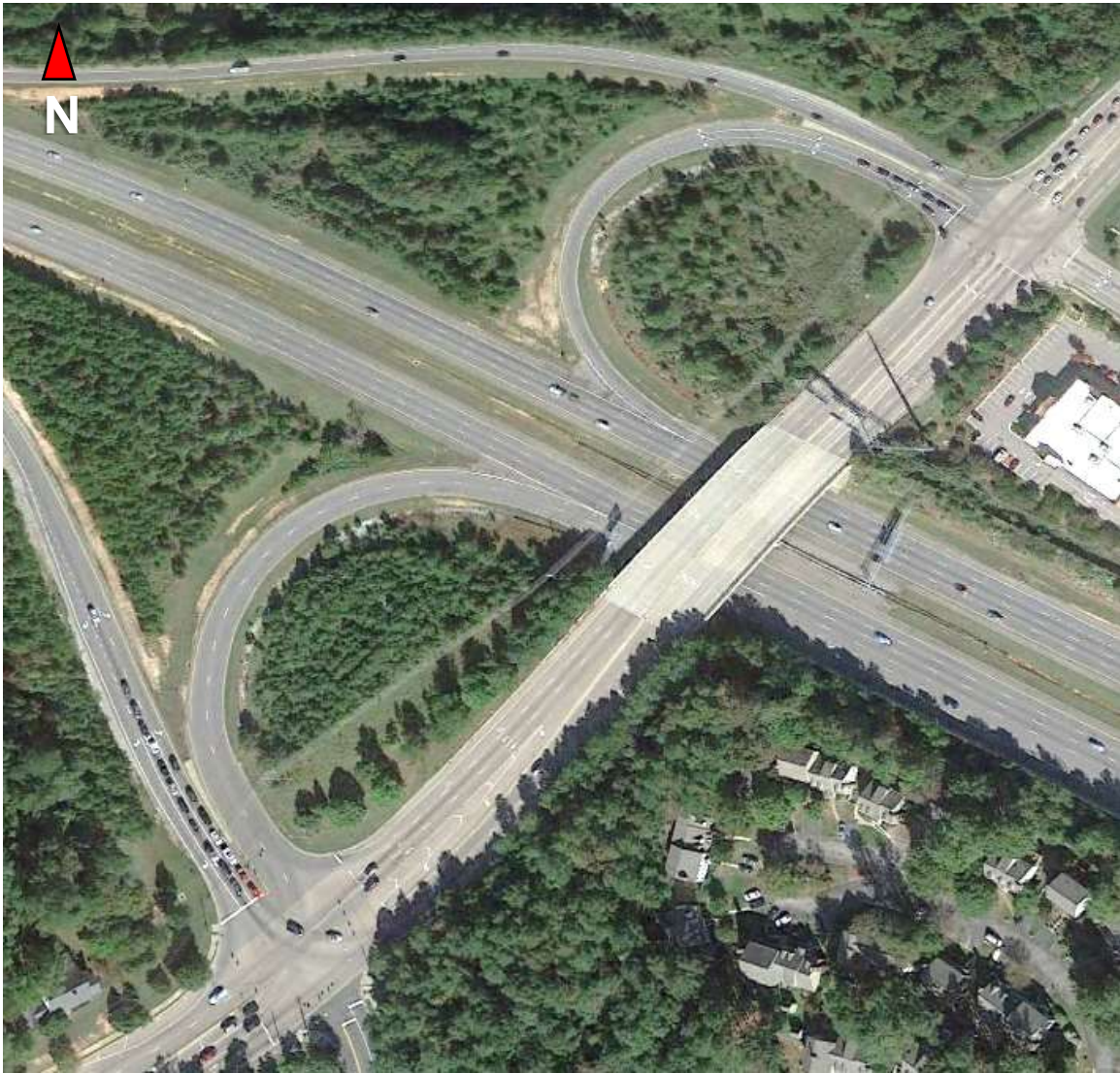
I-440 WB Ramp



I-440 WB Ramp approach from S



I-540 and Falls of Neuse Rd.



Date: April 17, 2017	County: Wake
Interchange: I-540 and Falls of Neuse Rd.	
Location (exit ramp): EB Exit Ramp	

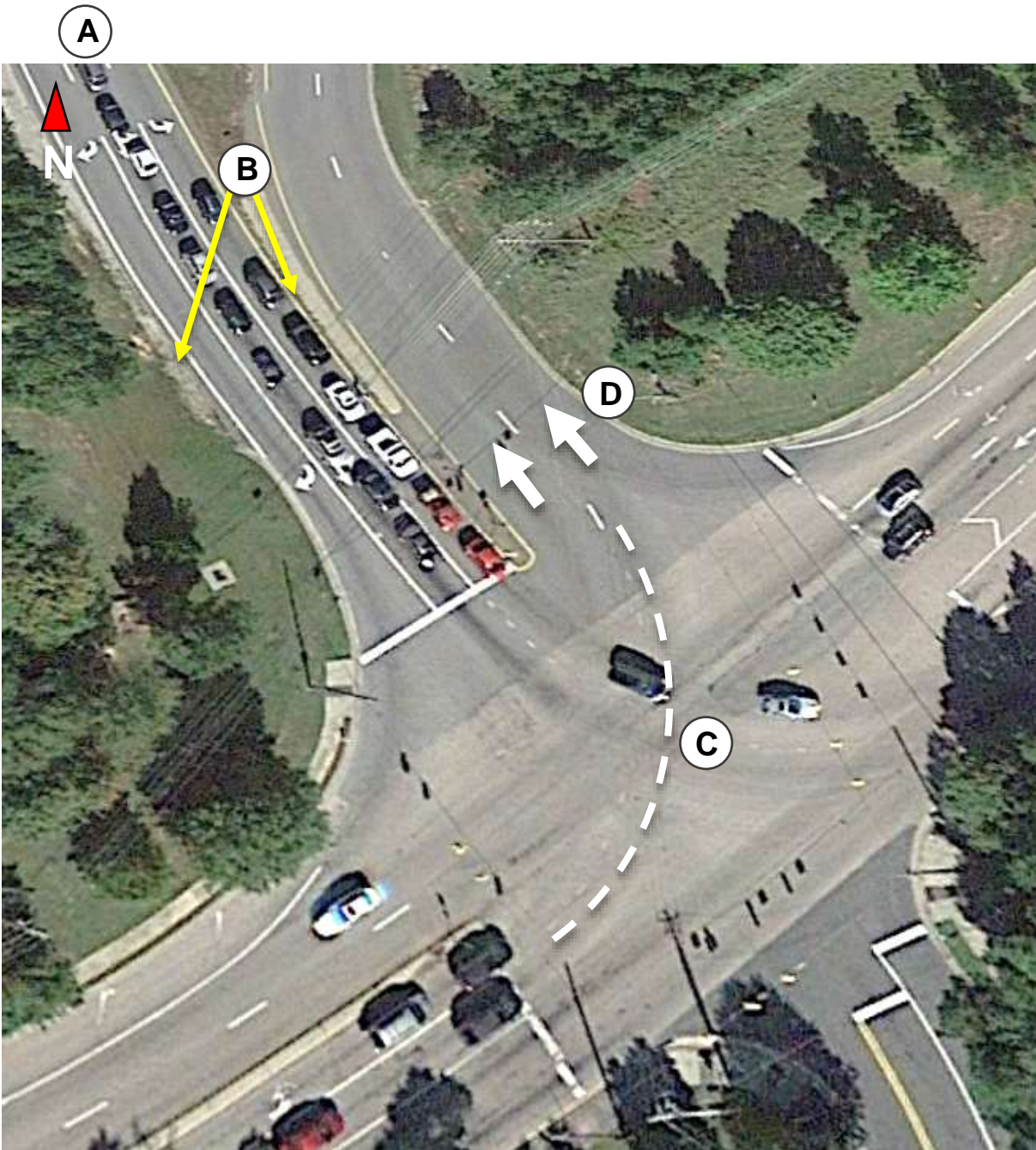
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	N		Add WW signs
Wrong way arrows	N		Add arrows
Do not enter sign	Y		
One way	Y		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	Y	Poor - faded	Renew dashed lines
Stop bar at end of exit ramp	Y	Good	
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Painted to flush	
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-540 EB Exit Ramp at Falls of Neuse Rd.



- A. Add Wrong-Way arrows (not shown)
- B. Add Wrong-Way signs
- C. Renew dotted lane line extension through intersection
- D. Add arrow indicating correct freeway entrance point

I-540 EB Ramp approach from N



I-540 EB Ramp



I-540 EB Ramp approach from S



Date: April 17, 2017	County: Wake
Interchange: I-540 and Falls of Neuse Rd.	
Location (exit ramp): WB Exit Ramp	

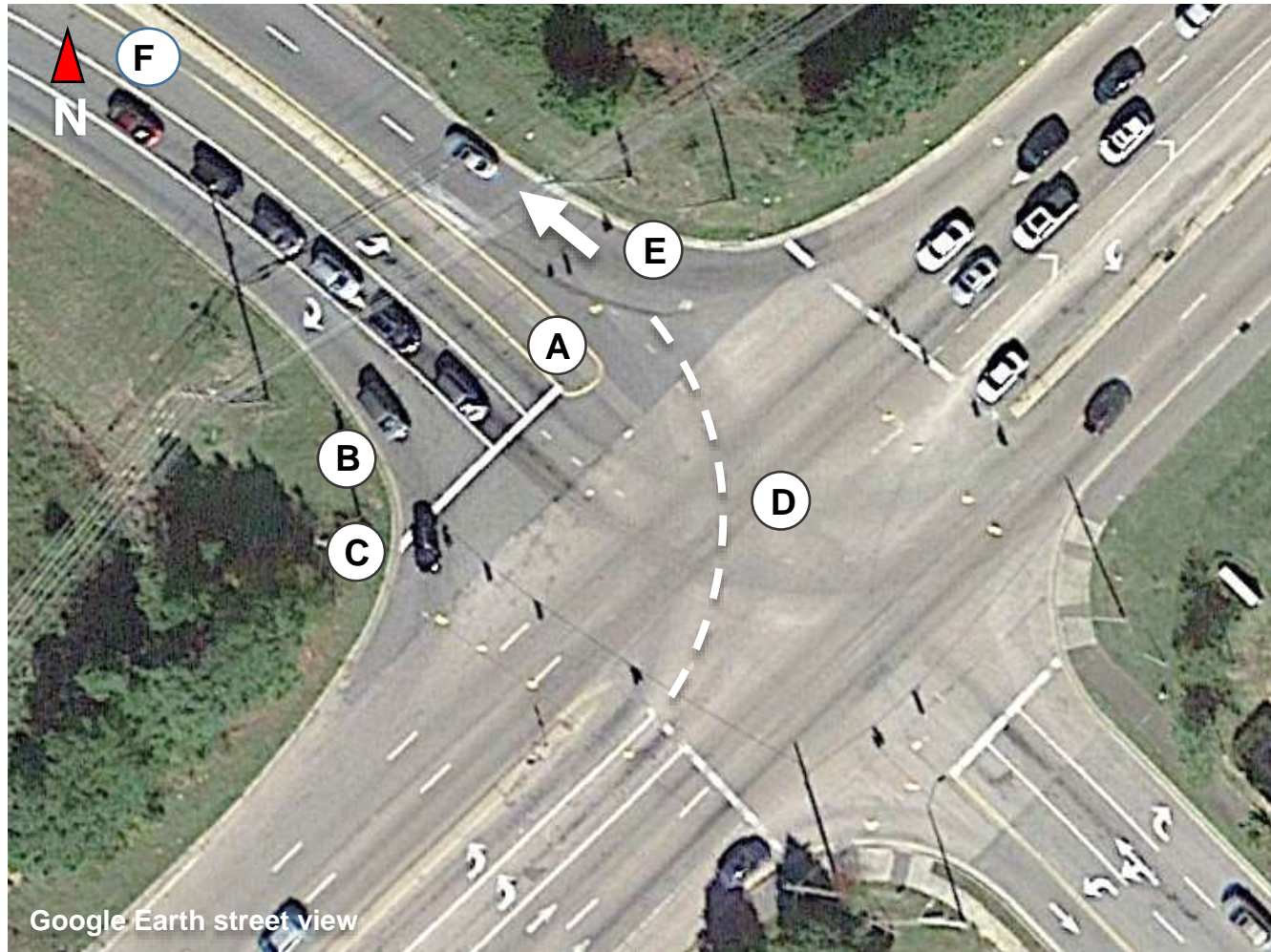
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	1 sign present halfway down ramp at curve	Bring sign closer to interchange
Wrong way arrows	N		Add arrows
Do not enter sign	N		Add Do Not Enter sign
One way	N		Add One-way sign
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	Y	Poor - faded	Renew dashed lines
Stop bar at end of exit ramp	Y	Good	
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Painted to flush	Extend raised median
Splitter sign on median between	N		Add splitter sign
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	Y	No lighting present
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

I-540 WB Exit Ramp at Falls of Neuse Rd.



- A. Extend raised median, increase visibility, add splitter sign
- B. Add Do Not Enter sign
- C. Consider One Way sign
- D. Add turning guide lines
- E. Add arrow indicating correct freeway entrance point
- F. Add Wrong Way arrows

I-540 WB Ramp approach from N



I-540 WB Ramp



I-540 WB Ramp approach from S



US 1 and NC 55 Rd.



Date: May 15, 2015	County: Wake
Interchange: US 1 and NC 55	
Location (exit ramp): NB Exit Ramp	

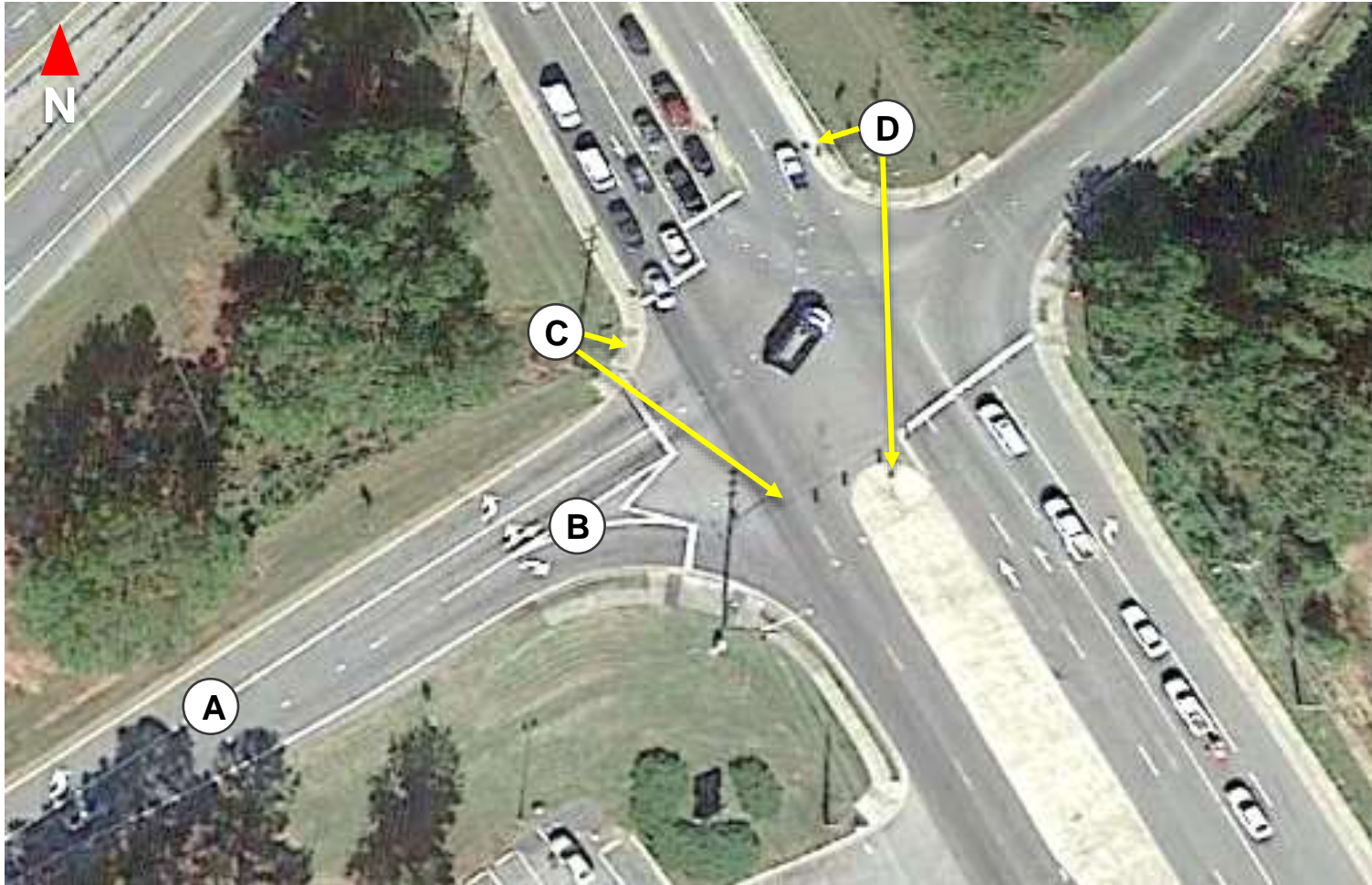
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y	Visible both directions	
No right turn	N		Add signs
No left turn	N		Add signs (at U-turn post)
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type: Flush paved area	Converted to raised median
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	NA	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	Y	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 1 NB Exit Ramp at NC 55



- A. Add Wrong Way arrows
- B. Convert flush splitter island to raised island
- C. Add No Right Turn signs (on corner and overhead span wire)
- D. Add No Left Turn Signs (on median and overhead span wire)

US 1 NB Ramp approach from N



US 1 NB Ramp



US 1 NB Ramp approach from S



Date: May 15, 2017	County: Wake
Interchange: US 1 and NC 55	
Location (exit ramp): SB Exit Ramp	

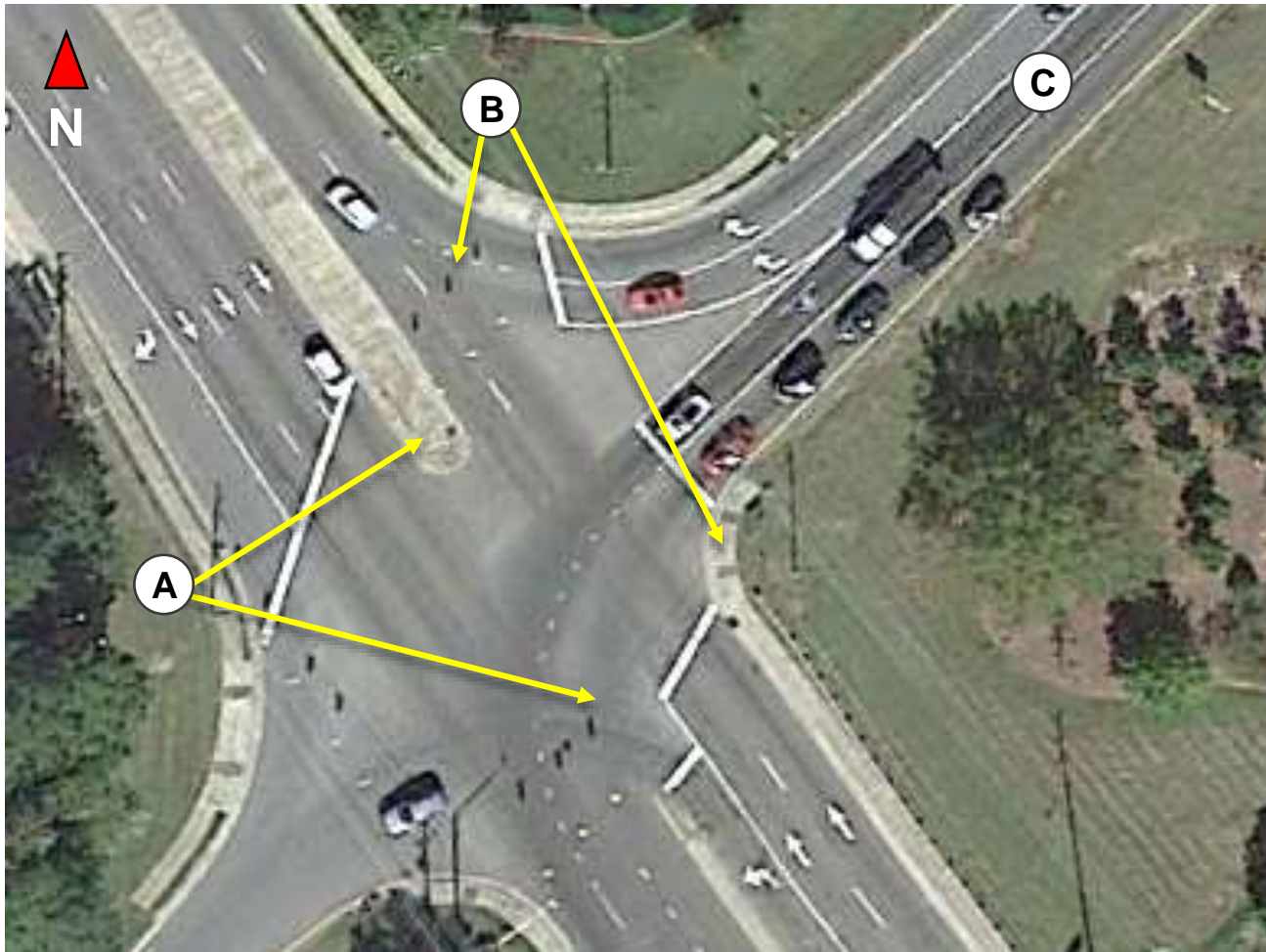
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	One sign	
One way	Y	Visible from both directions	
No right turn	N		Add signs
No left turn	N		Add signs
Freeway entrance signs	NA		
Dashed turning guide lines	NA		
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	NA		
Splitter sign on median between	NA		
Barrier between	NA		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	N	
Wide/flared exit ramp terminal contributing to left turn WW entry?	Y	Crossroad median mitigates
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 1 SB Exit Ramp at NC 55



- A. Add No Left Turn Signs (on median and overhead span wire)
- B. Add No Right Turn signs (on corner and overhead span wire)
- C. Add Wrong Way arrows

US 1 SB Ramp approach from N



US 1 SB Ramp



US 1 SB Ramp approach from S



US 1 and Ten Ten Rd.



Date: May 15, 2017	County: Wake
Interchange: US 1 and Ten Ten Rd.	
Location (exit ramp): NB Exit Ramp	

Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	Two signs	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	Y	One-way sign for S-bound only	Add sign facing N-bound direction
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Poor - grass	
Splitter sign on median between	Y		
Barrier between	N		

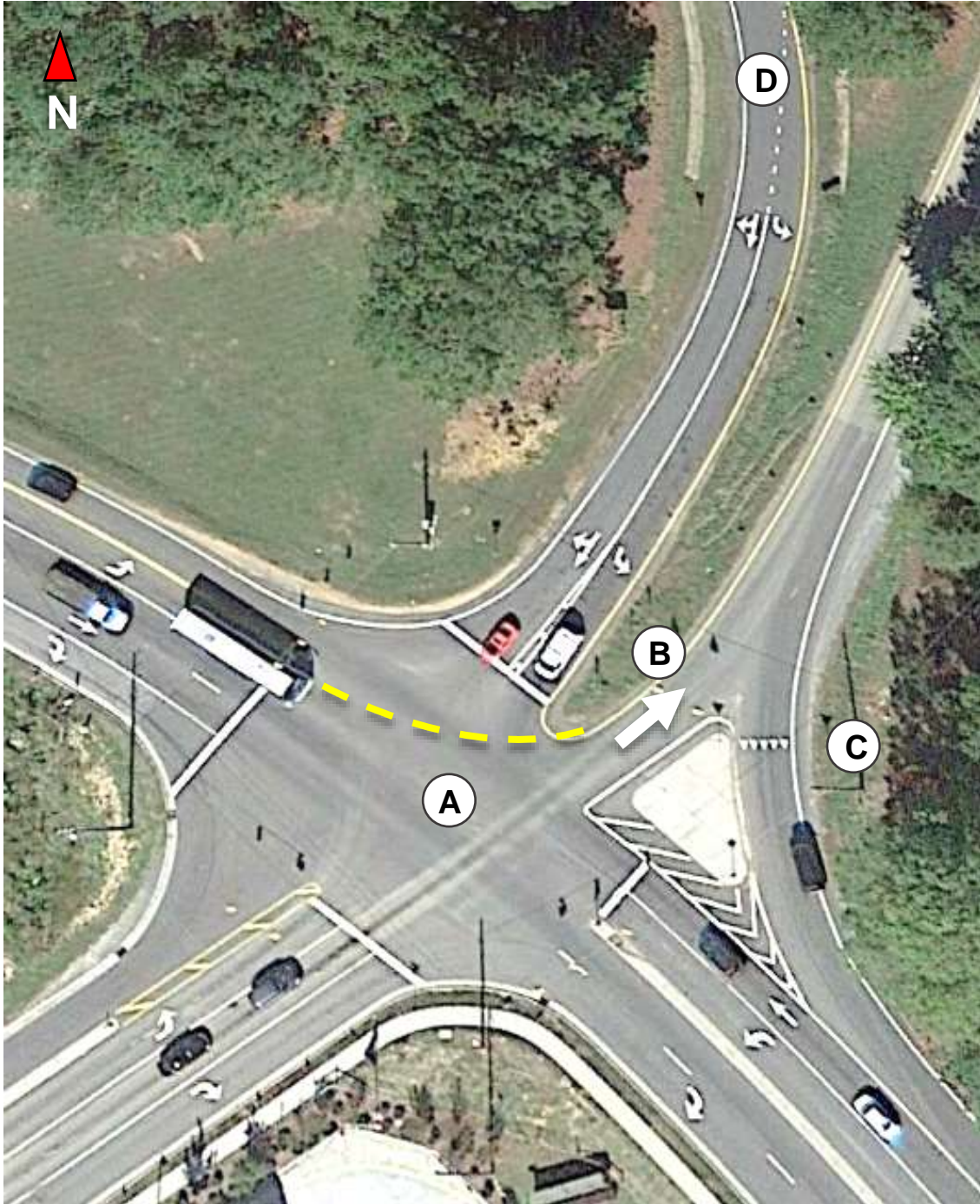
Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	Y	Only on S leg of Ten-Ten Rd	

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	Y	Add streetlight at entrance side of ramp to highlight the appropriate entrance point
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	Y	Entrance ramp slopes down and is difficult to see
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

There is a horizontal curve on Ten Ten Rd at the location of this ramp terminal, which increases the confusion and complication of the intersection, especially at night. The potential wrong-way right turn onto the ramp is well-signed, the wrong-way left turn is problematic. Adding a streetlight on the entrance side of the ramp would highlight the appropriate entrance point.

US 1 NB Exit Ramp at Ten Ten Rd.



- A. Add dotted lane line extension through intersection
- B. Add arrow indicating correct freeway entrance point
- C. Add streetlight to highlight appropriate entrance
- D. Add Wrong Way arrows

US 1 NB Ramp approach from E



US 1 NB Ramp



US 1 NB Ramp approach from W



Date: May 15, 2017	County: Wake
Interchange: US 1 and Ten Ten Rd.	
Location (exit ramp): SB Exit Ramp	

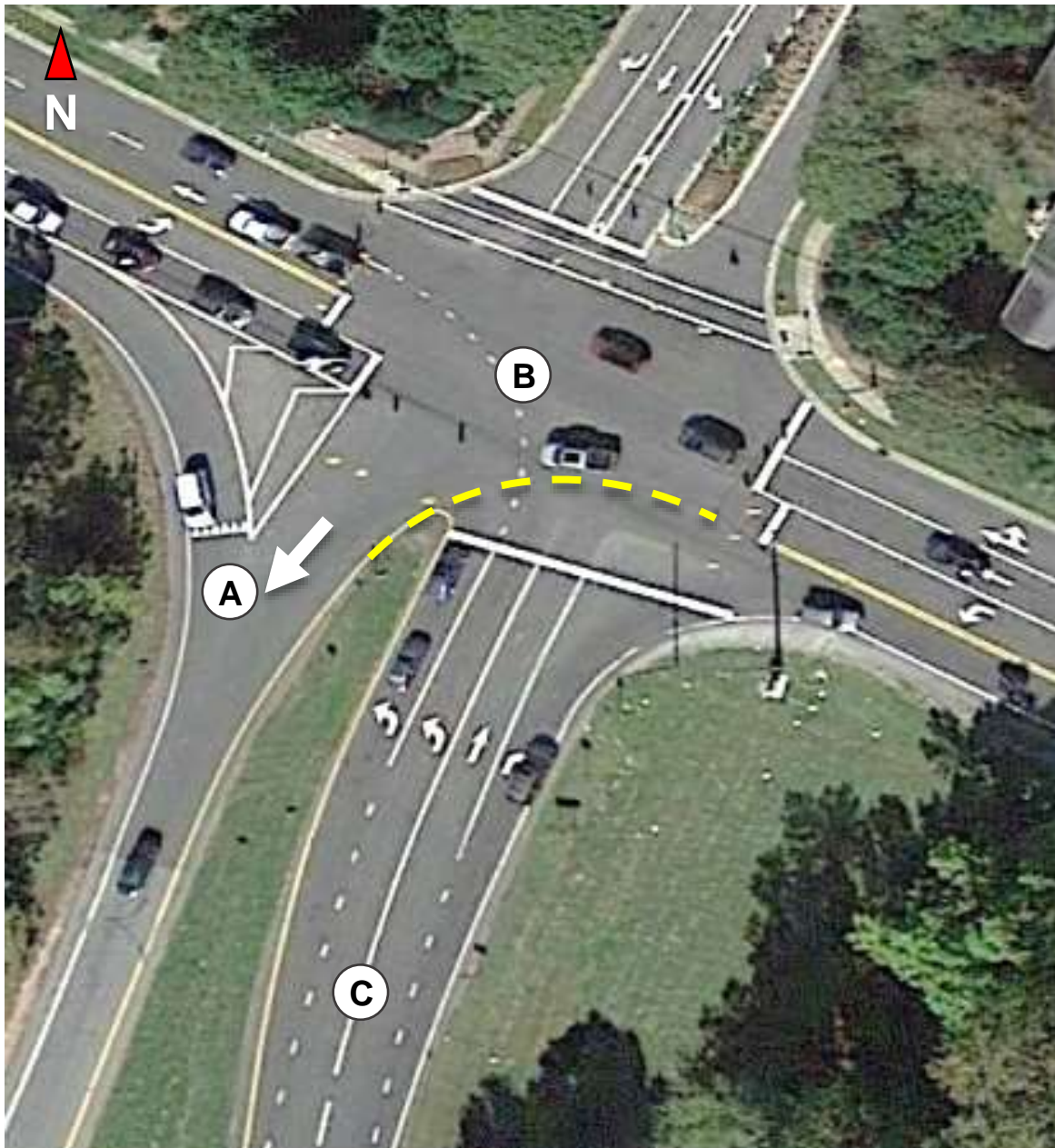
Feature	Presence	Visibility and Notes	Potential Modifications
Wrong way sign	Y	One sign	
Wrong way arrows	N		Add arrows
Do not enter sign	Y	Two signs	
One way	N		
No right turn	NA		
No left turn	NA		
Freeway entrance signs	N		
Dashed turning guide lines	N		Add guide lines
Stop bar at end of exit ramp	Y		
If entrance and exit ramps are directly adjacent to each other:			
Median between	Y	Poor – Depressed grass	
Splitter sign on median between	Y		
Barrier between	N		

Geometrics			
Feature	Presence	Visibility and Notes	Potential Modifications
Splitter island between directions of exit ramp?	N	Type:	
Raised median on crossroad	N		

Other Questions	Yes/No	Notes
Sign clutter creates potential confusion?	N	
Barrier obscuring view of entrance ramp?	N	
Lighting possibly contributing to WW entry?	N	
Corner radii at exit ramp tight enough to prevent right turn WW entry?	NA	
Wide/flared exit ramp terminal contributing to left turn WW entry?	NA	
Horizontal or vertical curvature obscures view of signs or entrance ramp?	N	
Nearby intersections (i.e., small roads, service roads)	N	
Other distractors or confusing elements?	N	

Other Notes:

US 1 SB Exit Ramp at Ten Ten Rd.



- A. Add dotted lane line extension through intersection**
- B. Add arrow indicating correct freeway entrance point**
- C. Add Wrong Way arrows**

Note: Second Left turn lane installed on SB Exit Ramp ~ 2015

US 1 SB Ramp approach from W



US 1 SB Ramp



US 1 SB Ramp approach from E

