



# Virginia Road Centerline Data Standard

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# Agenda

## TOC Review Geometry Standards



# Draft Overview Table of Contents

- 1) Developing Road Centerlines**
  - a) Road Centerline Schema
  - b) Road Centerline Attributes
- 2) Road Centerline Field Standardization**
  - a) Addressing Standards For Road Centerline
  - b) Road Name Standards for Road Centerline
  - c) Roadway Characteristics from VDOT and Localities



## Draft Overview Table of Contents

- 3) Road Centerline Geometry Standardization
- 4) Edge Matching Road Centerlines Across the Commonwealth
- 5) Road Centerline Topology



# Centerline Geometry

NENA/FHWA/DOT/VGIN standards implemented for:

- Segmentation model standard
  - Carriageway Representation
  - Intersections
  - Elevated Crossings
  - Segment Directionality
    - Geometry
    - Addressing Dual Carriageways
    - Routing Dual Carriageways
- Define Centerline data availability
  - Existing vs. Proposed



# Carriageway Representation

**Virginia Road Centerline geometry will be represented as a single centerline where no physical barrier is present and dual centerline where physical barrier is present with opposing lanes of traffic**

“Dual Carriageways for a roadway typically involve a physically divided roadway that necessitates two or more lines to adequately model the road when it has become too complex to be represented by a single line.”

Source: FHWA

[http://www.fhwa.dot.gov/policyinformation/hpms/documents/arnold\\_reference\\_manual\\_2014.pdf](http://www.fhwa.dot.gov/policyinformation/hpms/documents/arnold_reference_manual_2014.pdf)



# Carriageway Representation

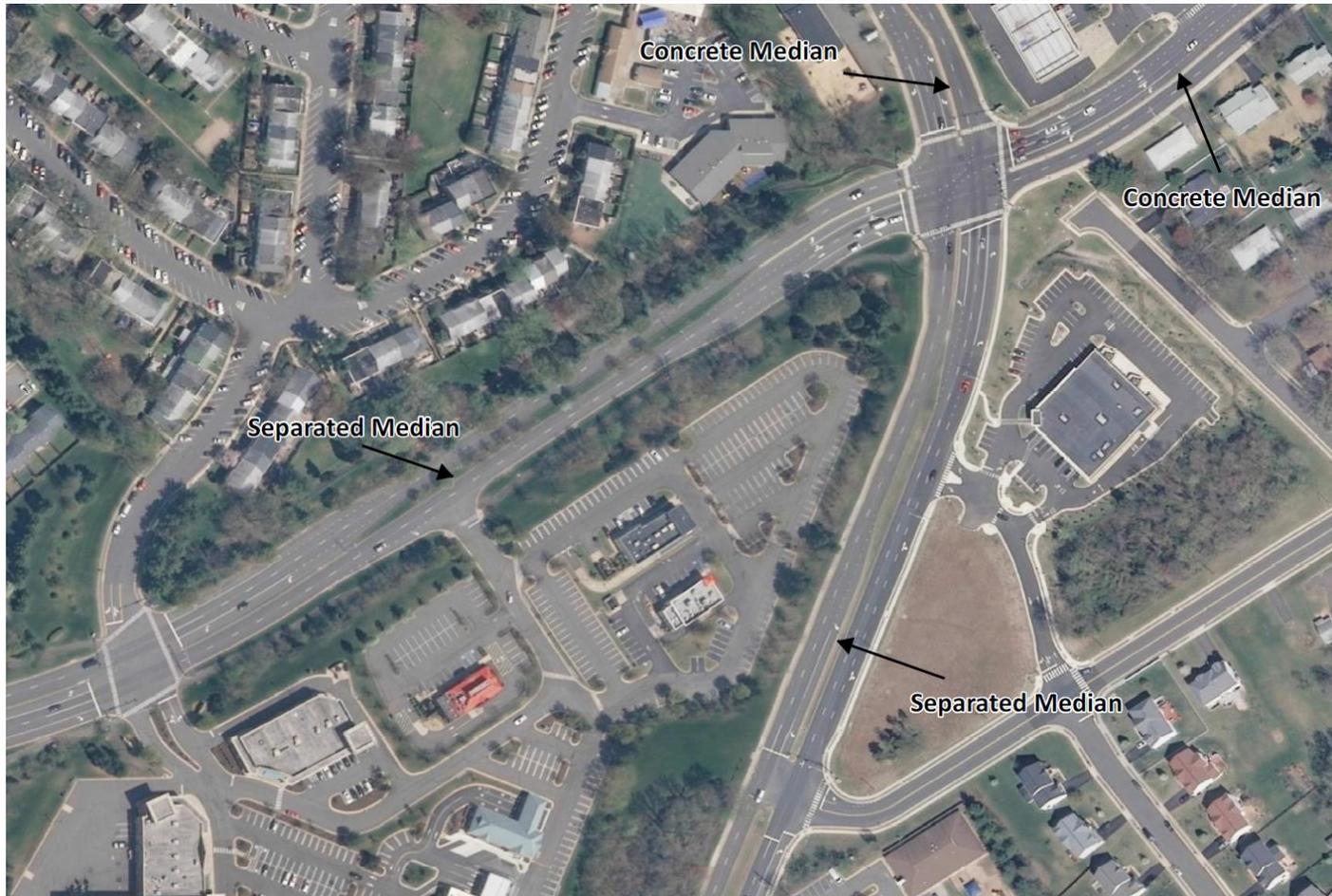
## VDOT and VGIN Recommendations:

- Whenever a road is a single width of unbroken pavement, with no barriers between the opposing traffic, it should be represented as a single centerline no matter how wide the road
- When opposing traffic on a road is separated by an obvious barrier, such as a raised median or jersey wall, it should be represented as dual centerlines
- When opposing traffic is separated by a grass median, it should be represented as dual centerlines
- For dual centerlines, digitize median segments as crossover values and code data accordingly

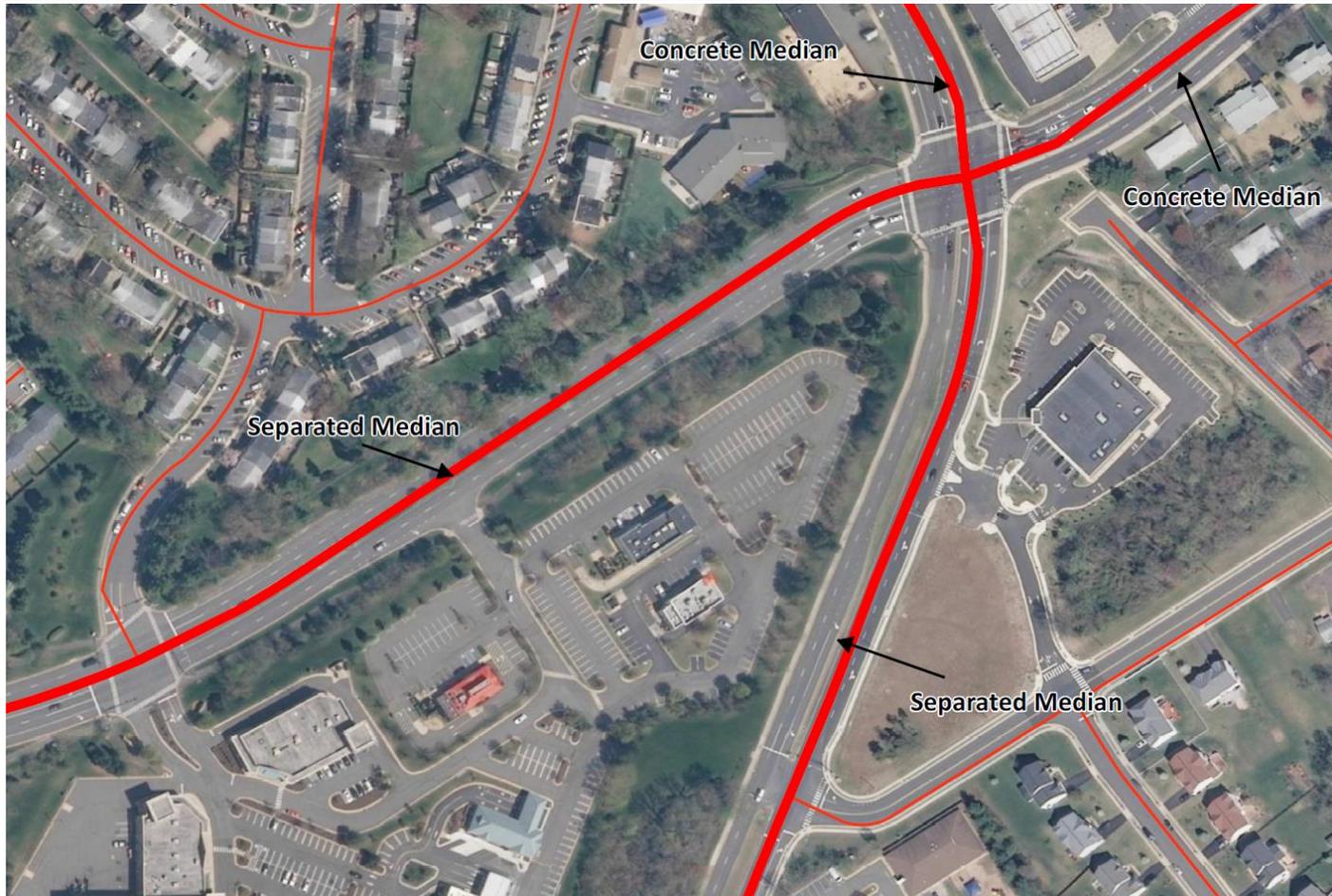
Source: VDOT Roadway Centerline Editing Style Guide

More Detail = Better Routing

# Carriageway Representation

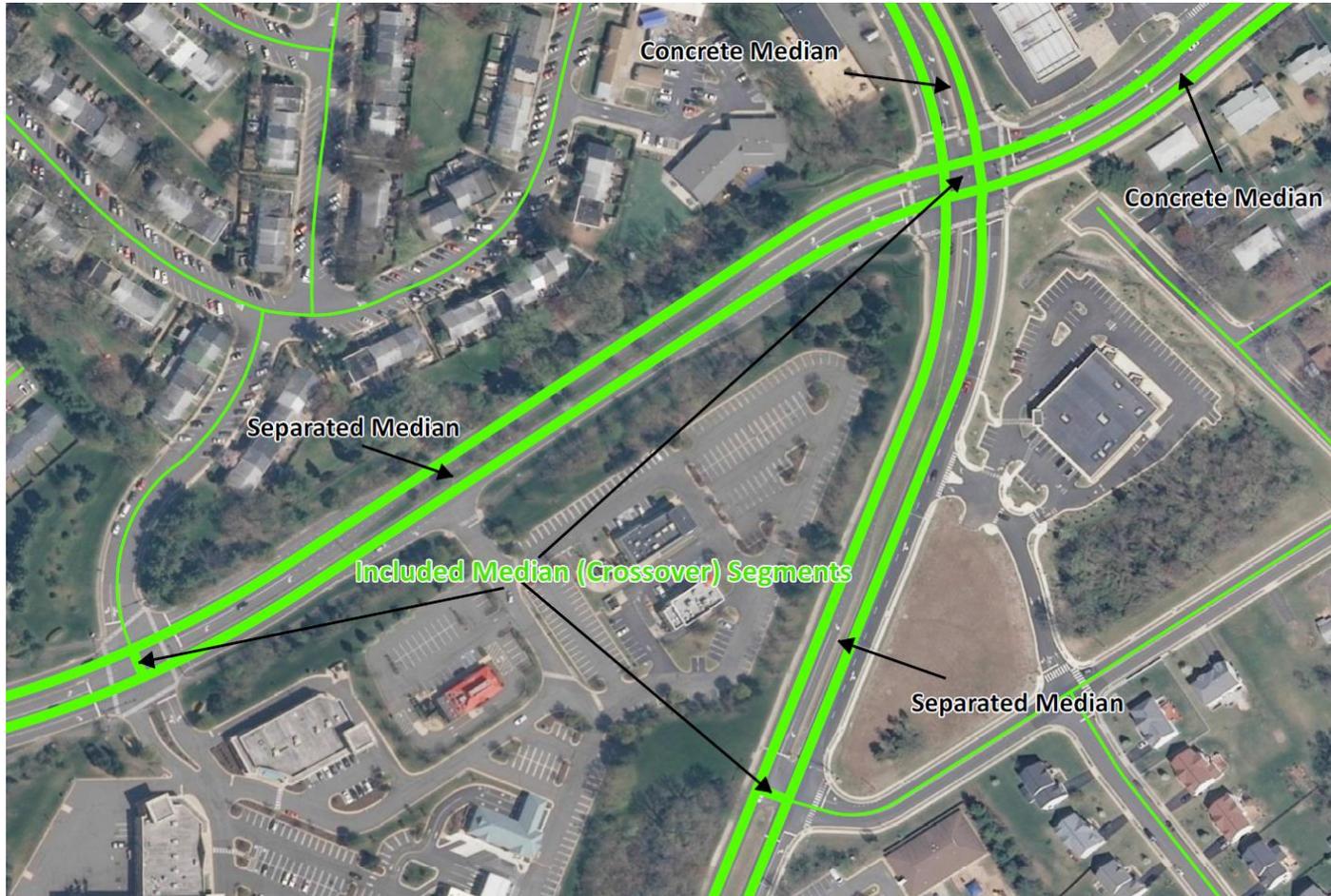


# Carriageway Representation



Not  
State  
Standardized

# Carriageway Representation



State  
Standardized



# Carriageway Representation

Additional Illustrations of Single and Dual Carriageway Standards for ramps

**Orange** lines represent centerline segments not classified as ramps

**Light green** lines represent centerline segments classified as a ramp





# Intersections

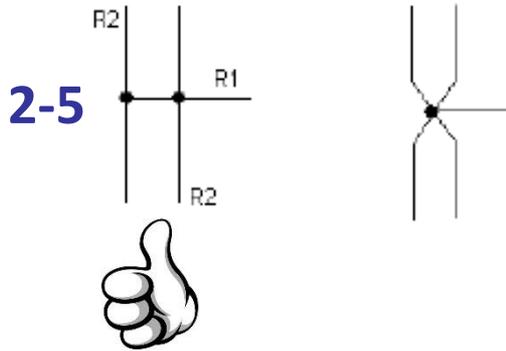
**Road intersections and interchanges should be modeled within the Centerline based on naming conventions and graphics by VGIN, VDOT, and FHWA**

- VGIN solicited the listservs and inquired which model best described more complex intersections
  - Quick Glimpse into workflows
  - Basic 1X intersections needed little or no explanation
  - Complex 2X intersections needed pattern
- Use interchange geometry recommendations and naming conventions from FHWA

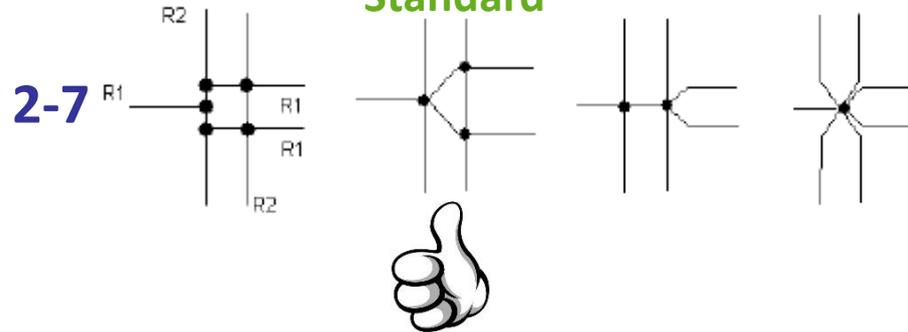
# Intersections

## Complex Intersection Results for Dual Carriageways

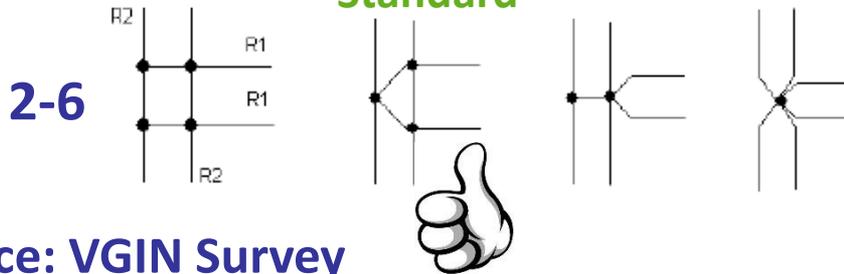
Standard



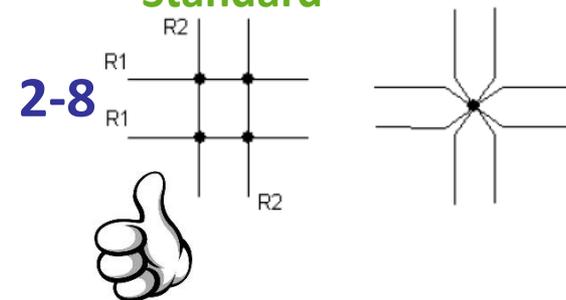
Standard



Standard



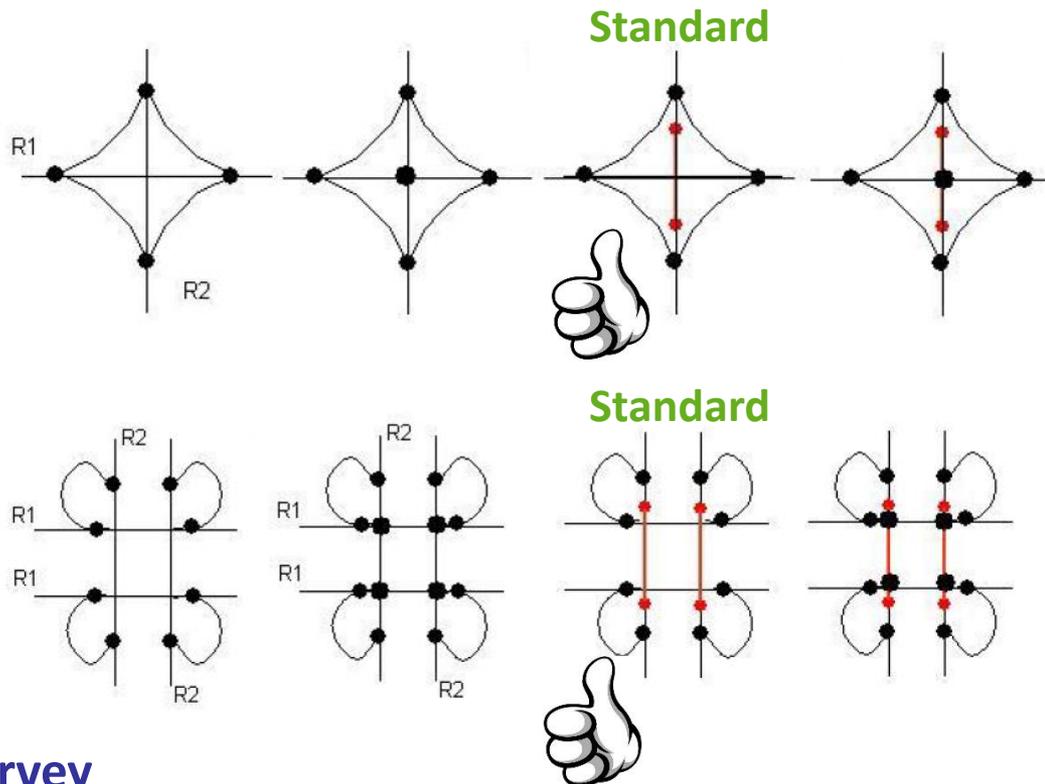
Standard



Source: VGIN Survey

# Intersections

## Interchange Results

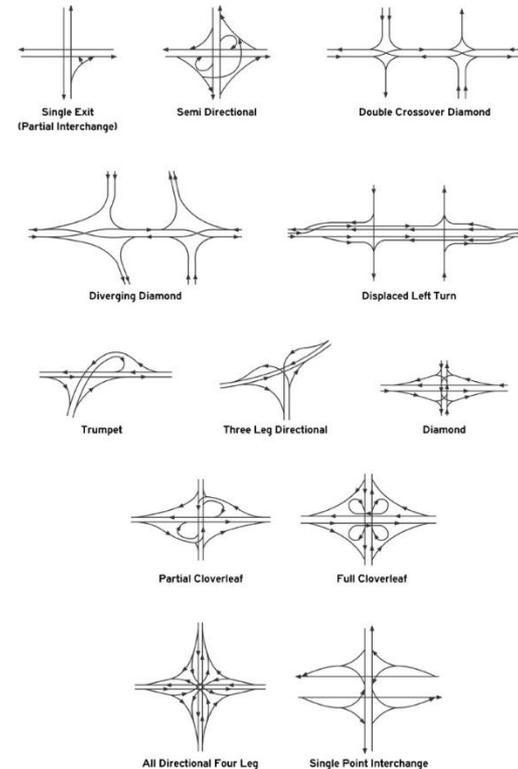
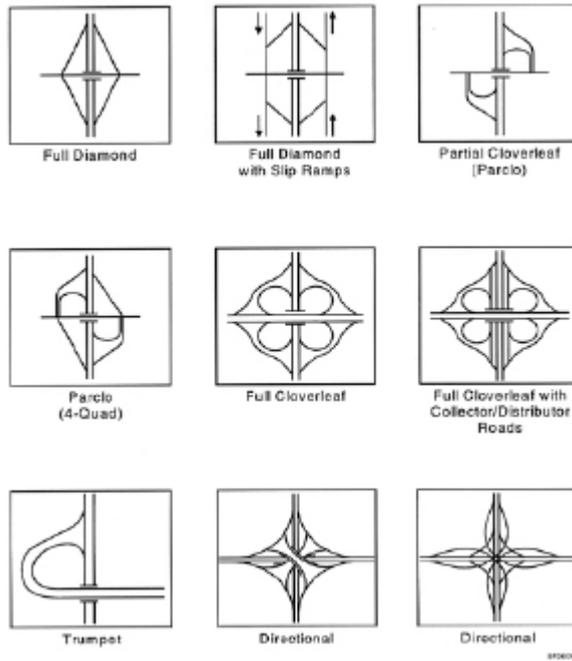


Source: VGIN Survey

# Intersections

[http://safety.fhwa.dot.gov/tools/data\\_tools/mirereport/182.cfm](http://safety.fhwa.dot.gov/tools/data_tools/mirereport/182.cfm)

<http://safety.fhwa.dot.gov/hsp/hrrr/manual/sec42.cfm>





## Elevated Crossings

**VA Road Centerline geometry will be split at grade level intersections and not split at grade separations (elevated crossings) within the physical road network.**

- Splitting at bridge decking to store bridges as overpass / underpass code for easy lookup

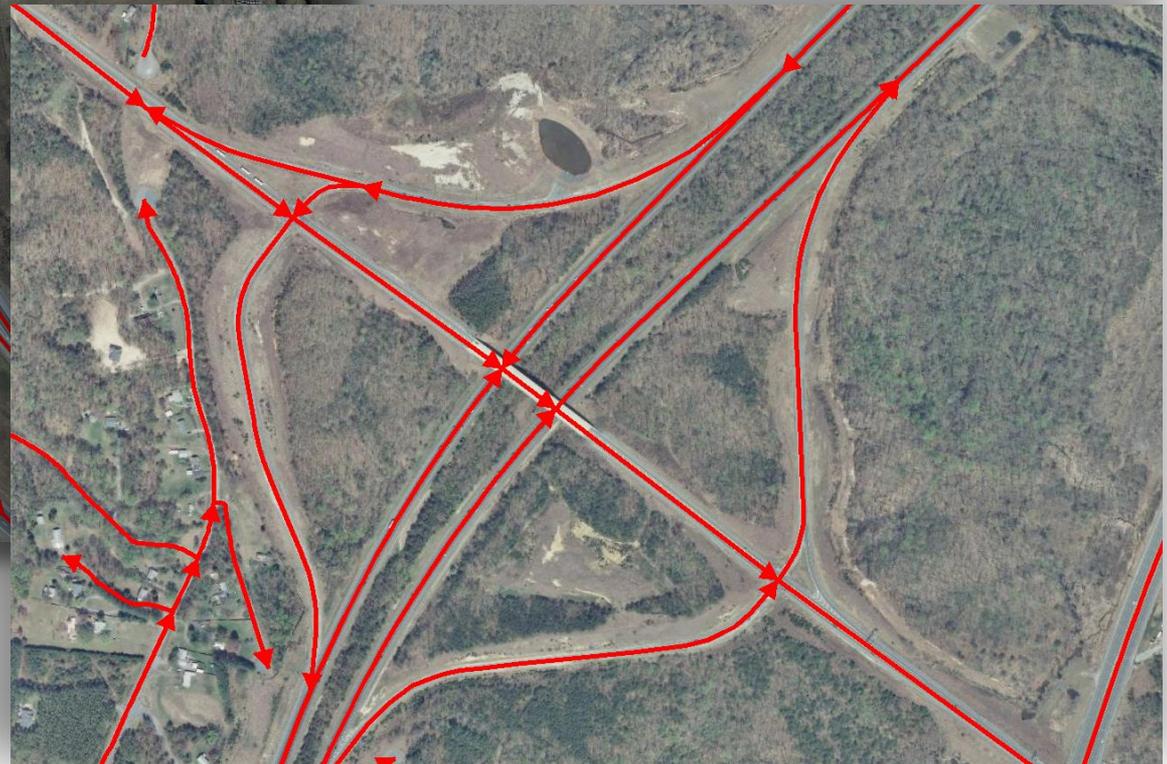
“For routing purposes and intersection lookup purposes, each intersection must be split. Centerline segments must be split (broken) at all true (grade-level) intersections.”

- Consider splitting at railroad tracks and streams for intersection searches.

Source: NENA

# Elevated Crossings

Not State Standardized



# Elevated Crossings

State Standardized





## Segment Directionality

**Virginia Road Centerline segment geometry directionality will be oriented in the direction of increasing address ranges**

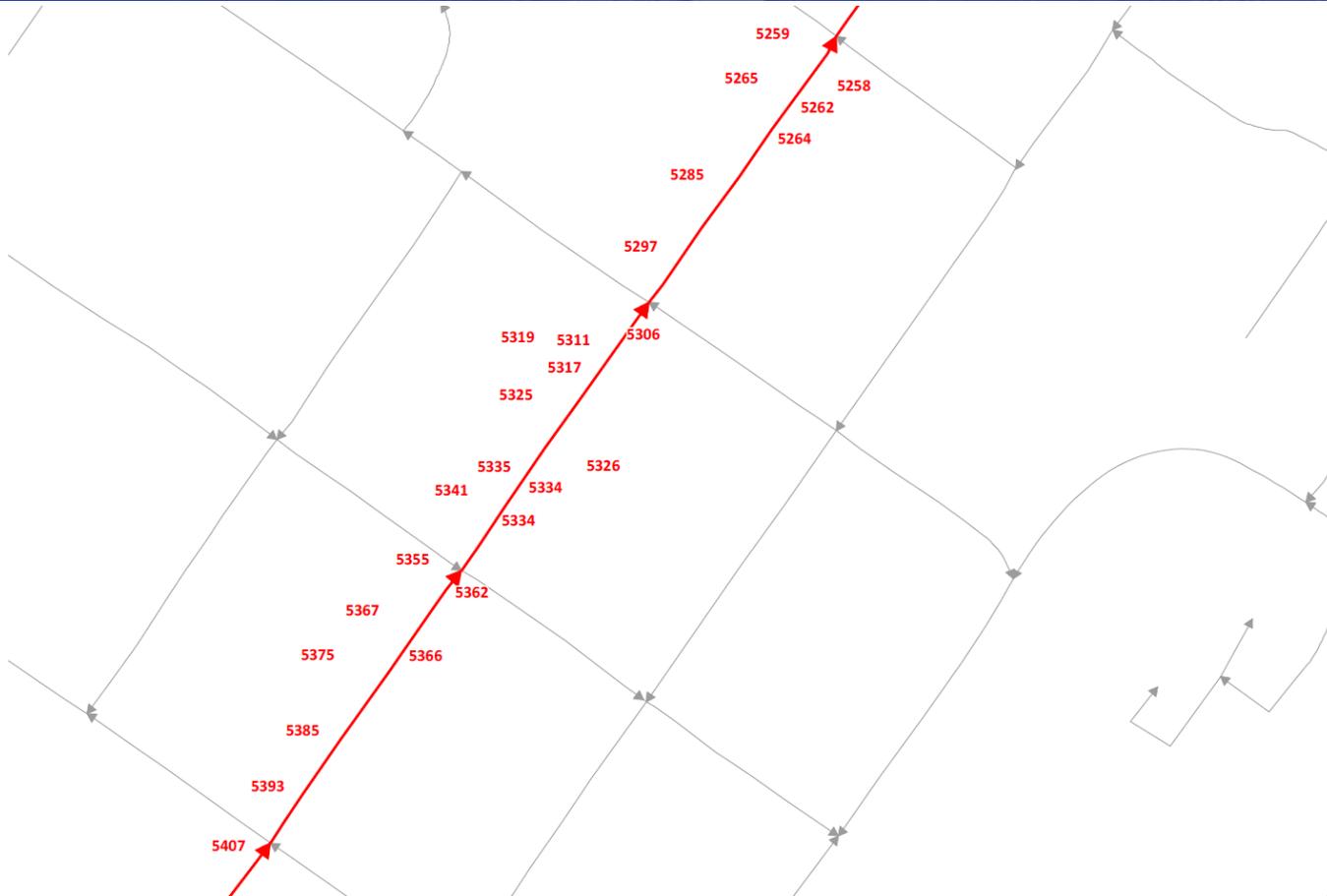
“The centerline segments should be drawn in the direction of increasing addresses, which is not necessarily the same as the direction of travel”

Source: NENA

[https://c.ymcdn.com/sites/www.nena.org/resource/collection/F2E0D66A-4824-418C-8670-3238D262B84A/NENA\\_71-501-v1\\_Synchronizing\\_GIS\\_Databases\\_with\\_MSAG\\_and\\_ALI.pdf](https://c.ymcdn.com/sites/www.nena.org/resource/collection/F2E0D66A-4824-418C-8670-3238D262B84A/NENA_71-501-v1_Synchronizing_GIS_Databases_with_MSAG_and_ALI.pdf)

- It is understood that some address point side inconsistencies will arise
- Interstates will maintain prime directionality on both dual carriageway lanes

# Segment Directionality

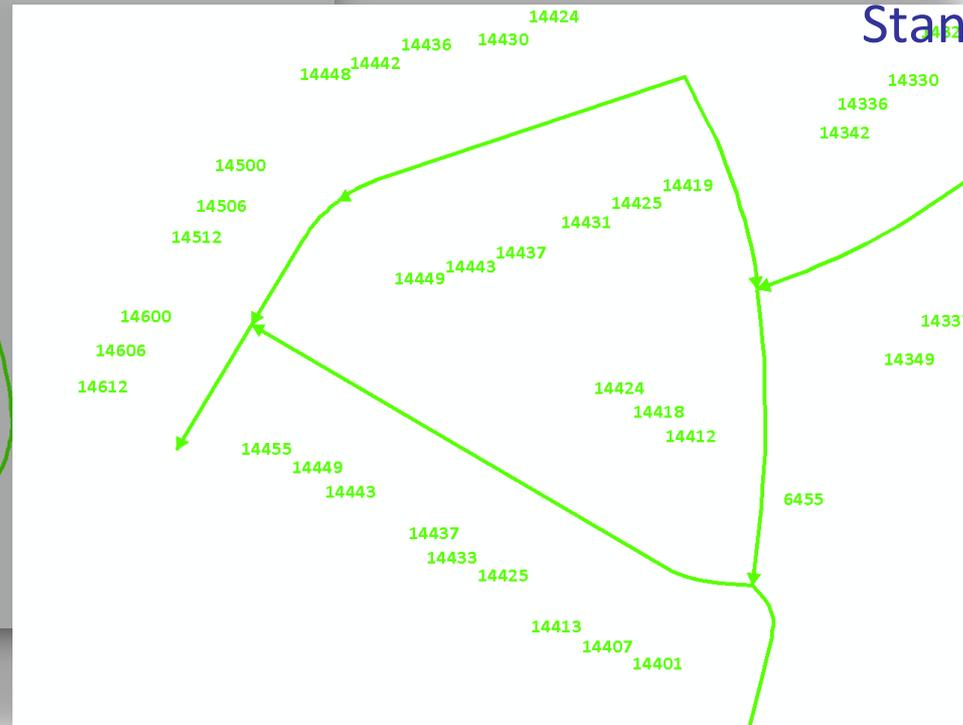
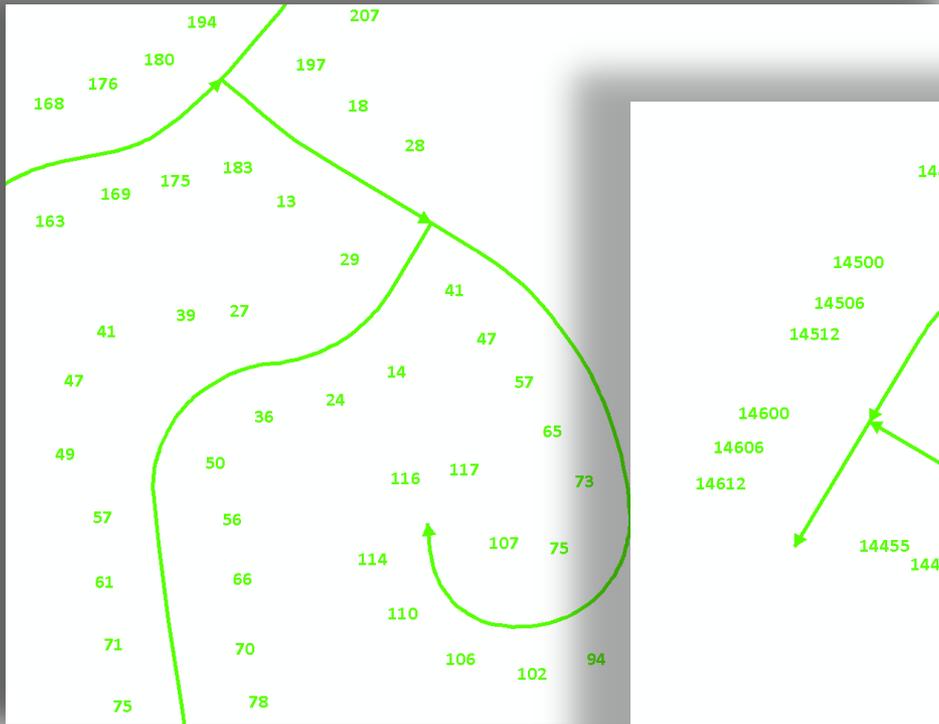


Single Carriageway:

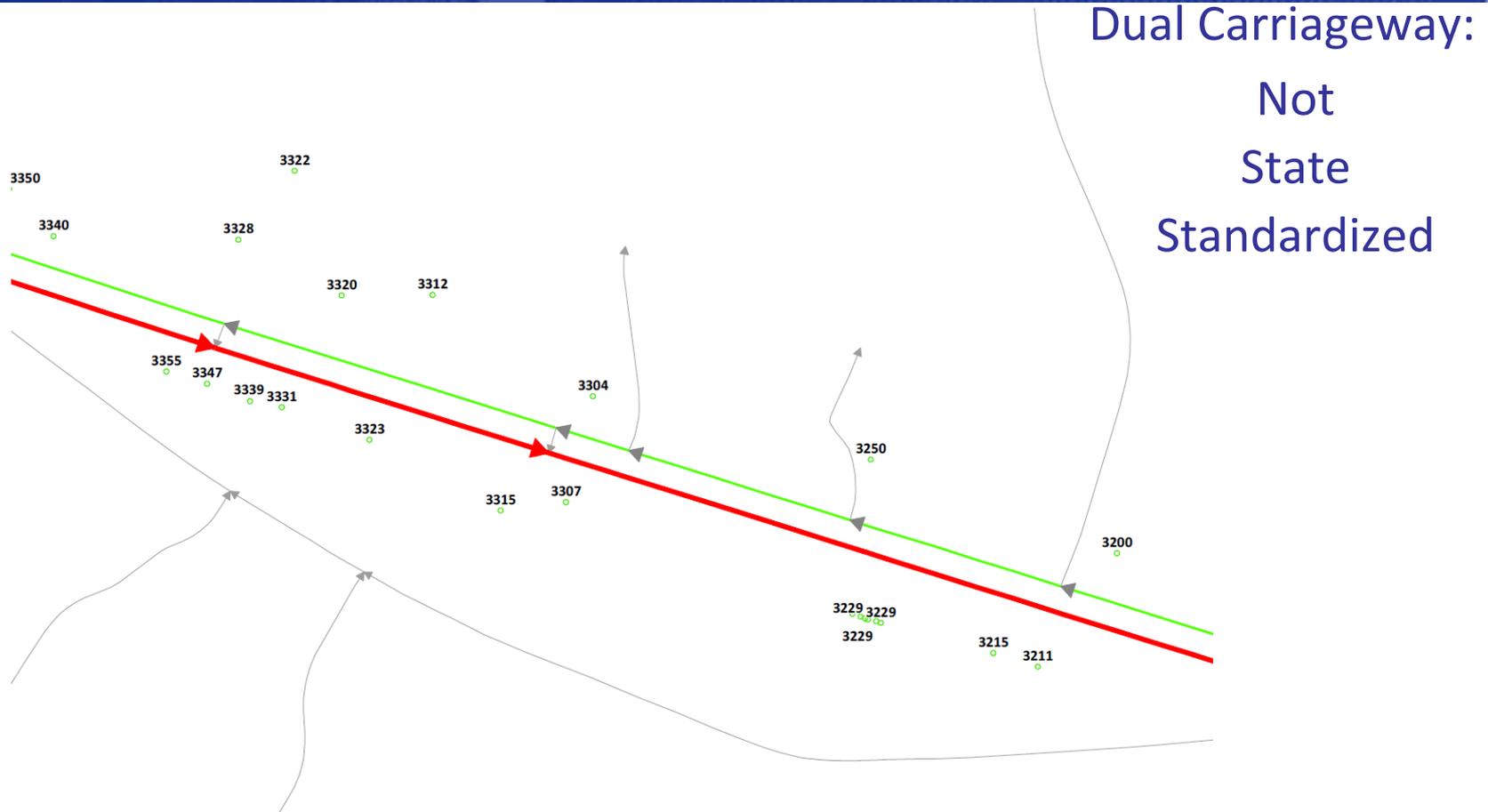
Not  
State  
Standardized

# Segment Directionality

Single Carriageway:  
State  
Standardized

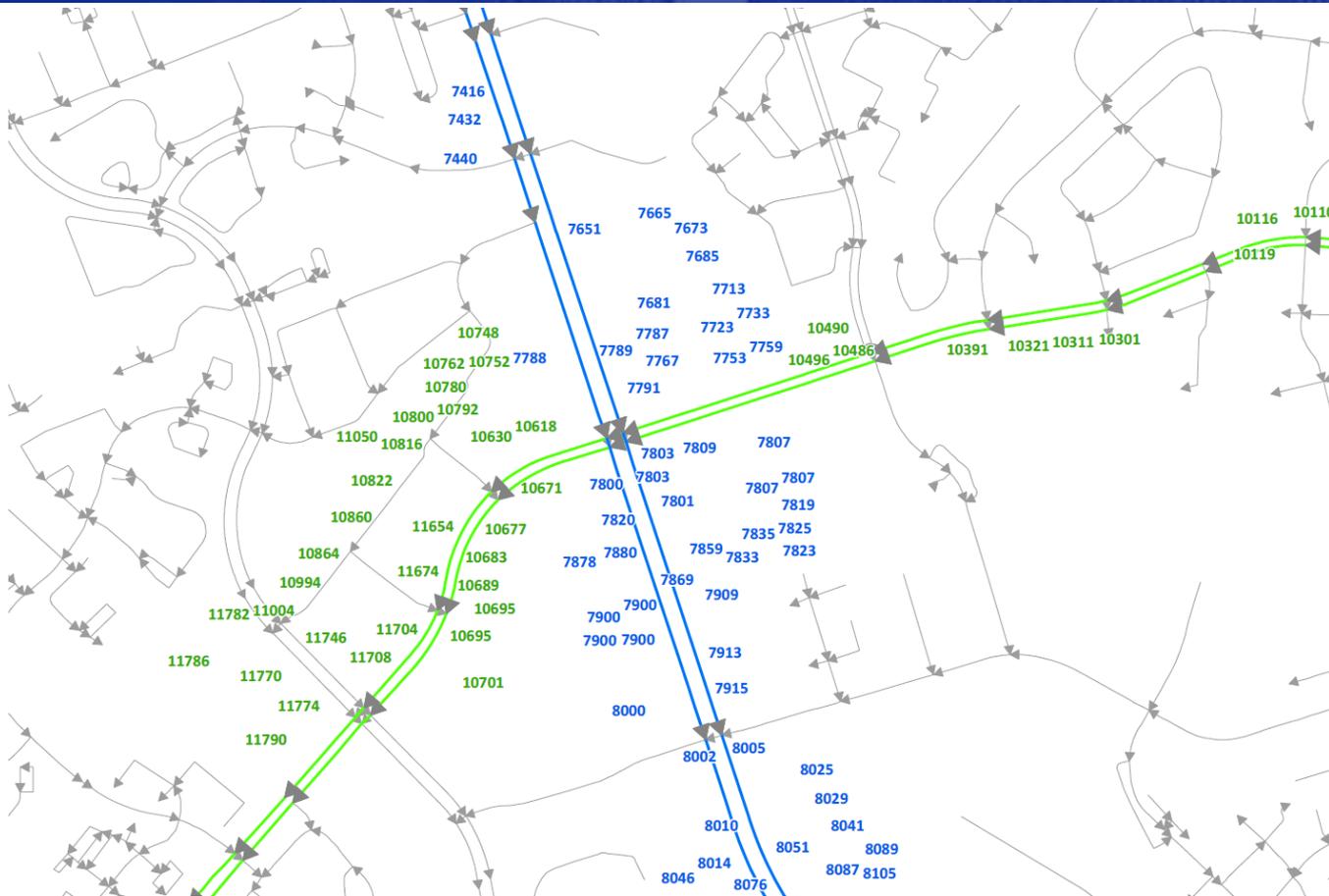


# Segment Directionality



# Segment Directionality

Dual Carriageway:  
State  
Standardized





## Segment Directionality

Populating routing data for dual carriageways

- Check arcs in a chain for street name and make sure directionality is the same on both street sides
- Populate Y/N attribute for dual carriageway information
- Populate One Way Attribute (FT or TF) for all dual carriageways

# Segment Directionality

- DUAL CARRIAGEWAY ARC DIRECTION  
→
- ALL OTHER CENTERLINES  
—
- ONE WAY = FT  
—|
- ONE WAY = TF  
—|





# Segment Directionality

## Addressing

- Single centerline: use NENA address input standards
- Dual carriageway:
  - Left from/To or Right From/To should be zeroed out for interior
  - Potential exceptions but almost always barriers have no addresses

## State Standard QC resource:

- Dual Carriageway= Y & One Way = FT, Left From Address and Left To Address should = 0
- Dual Carriageway = Y & One Way = TF, Right From Address and Right To Address should = 0
- Check all dual carriageways that remain which do not have the appropriate address side information and adjust routing attribute or rage

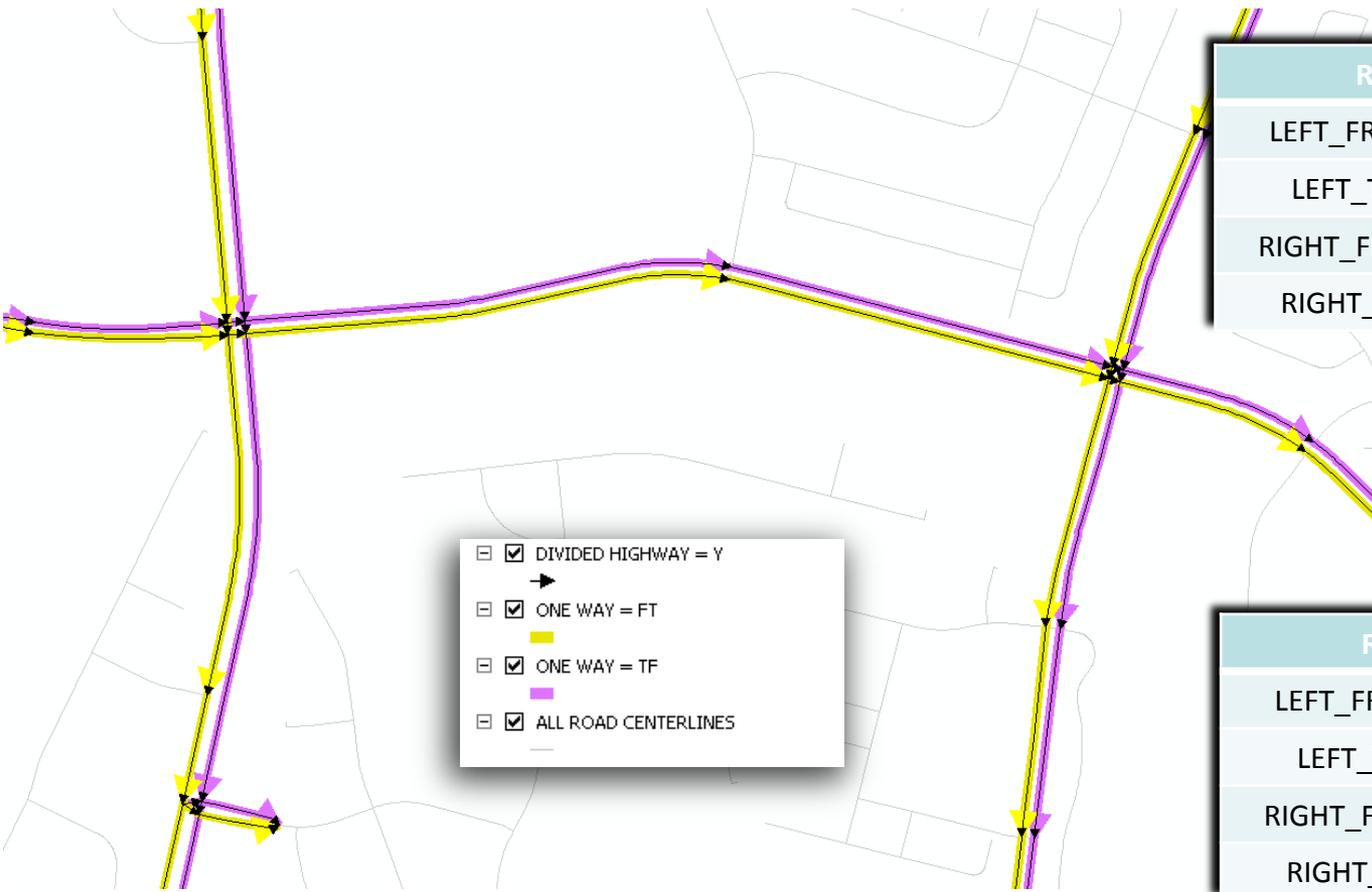
# Segment Directionality

## ONEWAY = FT

RCL Field	RCL Attribute
LEFT_FROM_ADDRESS	0
LEFT_TO_ADDRESS	0
RIGHT_FROM_ADDRESS	MISC
RIGHT_TO_ADDRESS	MISC

## ONEWAY = TF

RCL Field	RCL Attribute
LEFT_FROM_ADDRESS	MISC
LEFT_TO_ADDRESS	MISC
RIGHT_FROM_ADDRESS	0
RIGHT_TO_ADDRESS	0

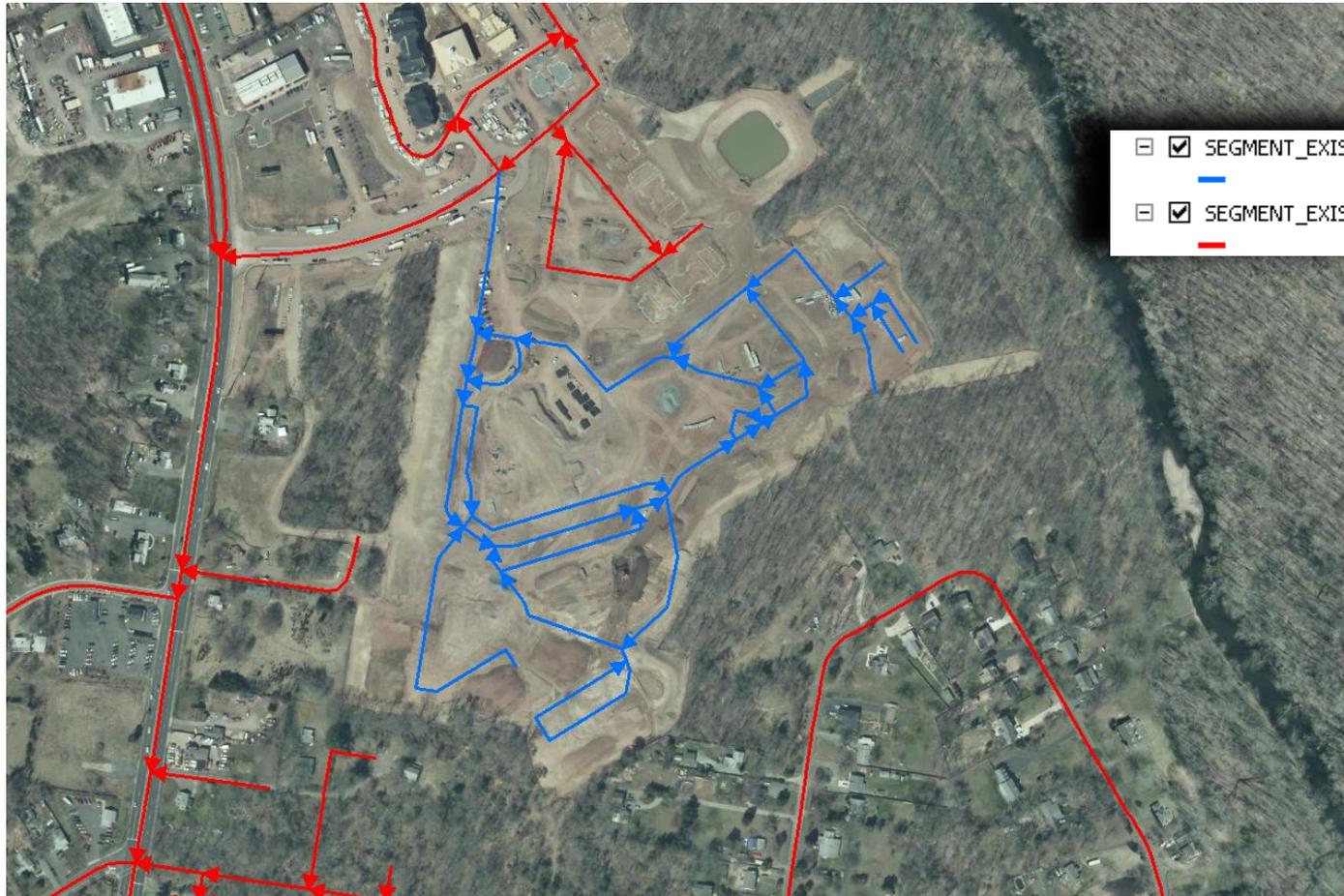




## Existing & Planned

- VGIN Inherited a field from NOVA RRCL project called SEG\_EXIST
- Determines planned/paper vs. built and drivable by a Y or N character domain
- Important distinction for local CAD routing and planning
- Field populated by VGIN where data is a new road addition and not present on most recent imagery
- Best to be managed by localities and provided to VGIN
- Digitize segments to Virginia statewide standards, segment and address roads in preparation for planned centerlines to prevent topology errors
- Code based on ground condition

# Existing & Planned



<input checked="" type="checkbox"/>	SEGMENT_EXISTS = N
<input checked="" type="checkbox"/>	SEGMENT_EXISTS = Y



## Conclusion

### Resources:

- will be included with draft document

### Final Comments? Questions?

### Next Workgroup meeting:

- Tuesday August, 11 @ 2 pm
- Metadata, NG911