Virginia Information Technologies Agency

Virginia Road Centerline Data Standard

Agenda

Review Data Standard discussion points
Next Steps

Draft Data Standard Charter

VGIN and Workgroup will:

- Create a formal data standard for the most common data elements
- Ensure data interoperability through common and accessible technology
- Ensure that the data needs of Next Generation 9-1-1 technology are met

Draft Data Standard Charter

VGIN and workgroup will:

- Ensure that the data needs of the Virginia Department of Transportation are met
- Identify educational opportunities for localities in the utilization of the road centerline data
- Address data sharing concerns and identify solutions

Draft Data Standard 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 Data Standard Table of Contents

3) **Road Centerline Data Quality**
   a) Attributes
   b) Geometry
   c) Road Centerline Topology
4) **Edge Matching Road Centerlines Across the Commonwealth**
   a) Snap To Points
5) **NG911 Compatibility**
6) **Metadata**

RCL Model

NVRRCL (Northern Virginia Regional Routable Centerline)

- PSAP grant to develop model, ETL, QC processes, and error reporting application for localities in the region and VGIN
- Used existing standards from FGDC, USPS, & NENA along with NOVA specific standards for CAD
- Developed snap points for edge matching

VGIN/VDOT Common Data Model

- Provides VGIN and publication data sets access to key roadway characteristics
- Allows flexibility for VDOT to contribute more attributes to VGIN RCL via ID values

RCL Model

Existing and Proposed Schema:

- ID Values
- Street Names
- Address Ranges
- VDOT Roadway Characteristics
- Routing & Symbology
- NENA NG911 Components

Proposed RCL Model Changes

Needs:

- Gradually move Virginia toward a relational database environment:
  - Carry Alternate and Alias Road names in separate table
  - Carry Alternate and secondary address ranges in separate table
- Fill in Gaps where NG911 data will be necessary (NENA)

Proposed RCL Model Changes

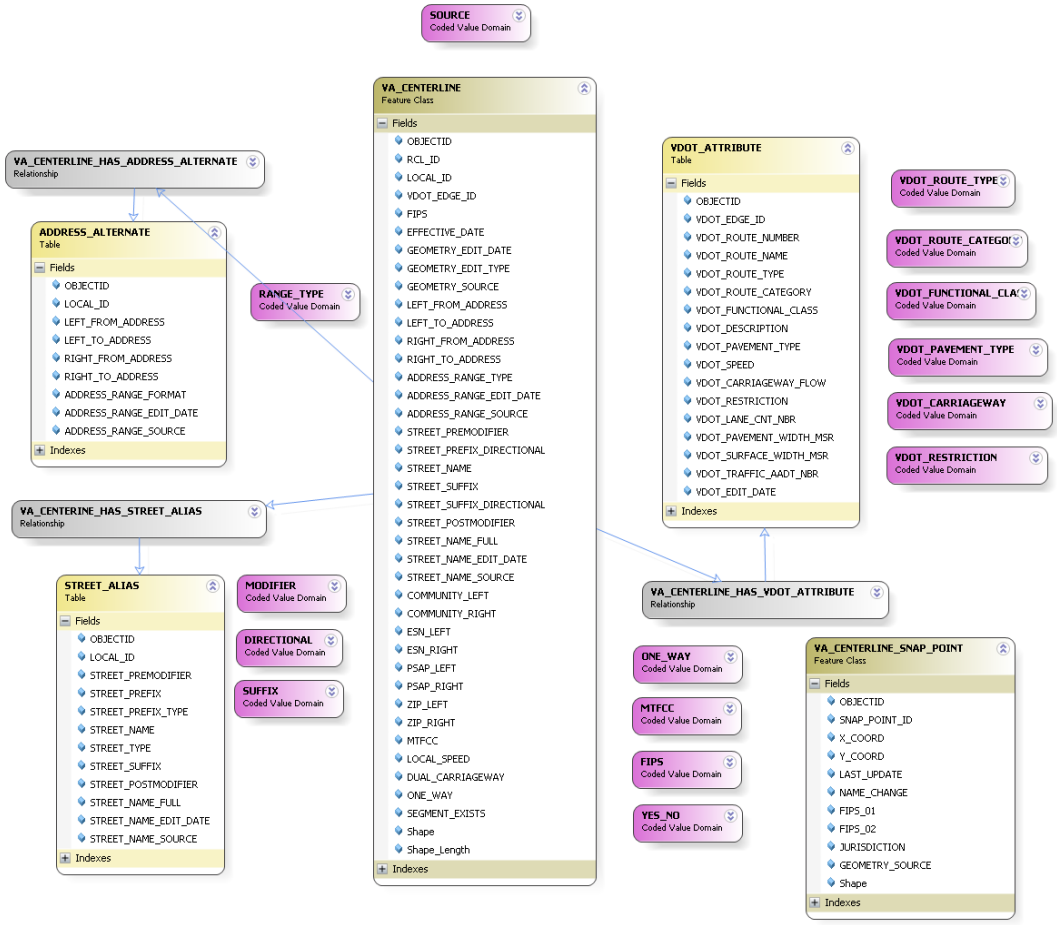
Column Additions:

- Community Left
- Community Right
- ESN Left
- ESN Right

Additional Resources

- Symbology fields
- Distinguishing routing

Proposed RCL Model



Attributes

Data Maintenance:

- Localities to maintain a unique and persistent numeric centerline ID value in their own database

Addressing Data Standards:

- Follow NENA addressing standards and best practices for data entry

Road Name Data Standards:

- Use existing USPS elements along with NENA for data entry

Attributes

- Implement GDB domain and LOV tables for QC and standardization
- Reduce data entry error and allow “cleaner” concatenations for MSAG/ALI synchronization
- Follow NENA guidelines for address entry
- Use USPS standards which are easily available

Attributes

Street Name attribute domain values which follow USPS for:

- Directional (Prefix & Suffix)
- Street Type (Ex, AVE, DR, ST, etc.)
- Modifiers (Prefix & Suffix)

Address Range attribute domain value for:

- Address Range Type

Roadway Characteristics – VDOT info as domain

Routing – One Way, **MTFCC**, Miscellaneous Y/N characters

Centerline Geometry

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)

Centerline Geometry

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

Centerline Geometry

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

Centerline Geometry

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)

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

Centerline Geometry

Existing & Planned

- Incorporate SEG_EXIST field locally and in state data model to:
  - Determine planned/paper vs. built and drivable by a Y or N character domain
  - Distinguish routing and planning for CAD & GIS
  - Be managed by localities and provided to VGIN
  - Represent ground condition

Closing

Final Comments? Questions?

Next Workgroup meeting:

- Tuesday, Sept 8 @ 2 pm
- Topic: Snap Points, Topology, Draft Document Review
  - Subsequent delivery of draft to workgroup for review