Updating Virginia’s Statewide Functional Classification System

Briefing to MPOs, PDCs, and Local Governments

October 15 & 19, 2012
Today’s Review

- Functional Class 101
- Shelton’s FC Game
- Research Phase
- New FHWA Guidelines
- Our Update Process
- Sample PDC – Northern Shenandoah Valley PDC
- Next Steps
What is Functional Classification

- Process by which streets and highways are grouped into classes, or systems, according to the part that any particular road or street plays in serving the flow of trips through a highway network.

- A roadway’s functional usage is based on Mobility & Accessibility
  - **Mobility** - is measured in respect to ability of traffic to pass through a defined area in a reasonable amount of time
  - **Accessibility** - is measured in terms of the road system’s capability to provide access to and between land use activities within a defined area
For each class, FHWA provides criteria. Examples include:
- Type of trips being served
  - Travel speeds
  - Trip distance
- Population center thresholds and/or traffic generators/destinations being served
- Expected volume
- Network characteristics
- Interval spacing
- Mileage extents

www.fhwa.dot.gov/planning/fctoc.htm
How does VDOT use Functional Classification

Used to determine:

✓ Federal-aid highway program **funding eligibility**
✓ Applicable **geometric design standards** of the VDOT Road and Bridge Design Manual
✓ **Maintenance payment** amounts that a locality will receive if the locality has responsibility for road maintenance
✓ **Access management features** (spacing-frequency and/or type of access such as interchanges, intersections, and roadside entrance, exit and/or driveway points)
✓ Highway Performance Monitoring System **federal reporting**
✓ **Secondary Street Acceptance Requirements**
• Map 21 requires FHWA to distribute funding to states in the following manner:
  – In FY 2013, the State receives the same apportionment as in FY 2012.
  – In FY 2014, the State receives the same apportionment as in FY 2012. However, the apportionment may be adjusted to ensure that the state receives at least 95% of its contributions to the Highway Account of the Highway Trust Fund.
Most recent update – 2005 Functional Classification for VA based off 2000 census

Updated Guidance for the Functional Classification of Highways – From FHWA on October 14, 2008

VDOT has historically updated functional classification following the decennial census. This is less of a priority as the new guidance reduces the emphasis of urbanized boundaries.
Shelton’s Functional Classification Game

The functional classification of many state roads is not what you would first guess!

The Game that puts the “FUN” in functional Class!
Pick the Urban Minor Arterial

A

Port Republic Road, Rockingham

Urban Minor Arterial

B

Port Republic Road, Rockingham

Rural Major Collector
Pick the Urban Collector

Garrisonville Rd, Stafford

Rt. 608, Spotsylvania

Urban Collector

Urban Collector
Pick the Rural Principal Arterial

Prince William Parkway

Rt. 60, Chesterfield

Urban Minor Arterial

Rural Principal Arterial
Research & Document Phase

- Best Practice Research
- Document Functional Classification Update Process
- Ad-Hoc Functional Classification Guidelines
Statewide Functional Classification Update:

Best Practices Research

Departments of Transportation Interviewed:

- Alaska
- Kentucky
- Maryland
- Minnesota
- New Jersey
- North Carolina
- Ohio
- Tennessee
- Texas
- Washington
- Washington D.C.
- West Virginia
- Wisconsin

Prepared by

Michael Baker Jr., Inc.

March 21, 2012
Best Practice Recommendations

Statewide Functional Classification Update

Best Practices Recommendations

- Recommendations for Adherence to New FHWA Guidelines
- Recommendations for Conducting a Statewide Update
- Recommendations for Maintaining the Functional Classification Network
- Recommendations for Ad Hoc Changes to the Functional Classification System

Prepared by:

Baker

Michael Baker, Jr. Inc.

March 21, 2012
Ad Hoc Changes Process
Ad Hoc Changes Request Form

FEDERAL FUNCTIONAL CLASSIFICATION REQUESTS

This form has been developed for use in all future requests for Federal Functional classification changes. One form should be completed and submitted for each requested classification change. Functional classification changes require coordination with the MPO, if applicable. Upon completion of the requested forms they should be submitted to the VDOT District Planner with a transmittal letter signed by the town council, city council, county board of supervisors or other responsible official.

1. COUNTY or CITY NAME | COUNTY or CITY NO (refer to Local Agency Guidelines)
2. LOCAL AGENCY CONTACT PERSON | TELEPHONE NO.
3. LOCAL NAME OF ROUTE | ROUTE NO (if State Route use SR No.)
4. TERMINAL ROUTE (Description and milepost of availability) FROM TO
5. TYPE OF ROUTE (Federal Aid Highway: Urban Area) | URBAN | RURAL
6. EXISTING FUNCTIONAL CLASSIFICATION | PROPOSED FEDERAL FUNCTIONAL CLASSIFICATION
   (Freeway/Expressway; Principal Arterial; Minor Arterial, Collector; Major Collector, Minor Collector, Local Access)
7. SPACING (Distance to closest parallel Federal Highway: classified route) Miles:
   Distance to closest parallel route with same classification: 
8. DOES REQUIRED FC CHANGE EXTEND INTO ANOTHER JURISDICTION? | YES | NO
   If yes = circumstance from the other affected agency is required.
9. EXISTING ROAD CHARACTERISTICS
   Roadway Width (incl. shoulders): Feet, Posted Speed Limit MPH, Number of Lanes
10. TRAFFIC (at significant volume change locations)
    Location Existing Traffic Location Existing Traffic
    Future Traffic (20 years) VPD Future Traffic (20 years) VPD

VDOT FORM 1 2012 OVER

11. Is the route on the National Highway System?
12. If applicable please list major traffic Generators (Incorporate that route serves out VPD):
   - SHOPPING CENTER: Total SQFT VPD
   - INDUSTRIAL: Employees VPD
   - GOV. INSTITUTION: Employees VPD
   - AIRPORTS: Annual Flights VPD
   - MILITARY INSTALLATION: Type VPD
   - SHIPPING POINTS: Annual Tons VPD
   - MAJOR TOURIST SITE: Annual Visitors VPD
   - COLLEGE OR UNIVERSITY: Enrollment VPD
   - OTHER: Type

13. A brief description why the proposed change is requested and justification for the change.
14. Additional remarks to more fully explain the situation.
15. Attach a vicinity map showing the proposed changes and existing Federal Functional Classifications.

Signature of Local Representative
Signature of VDOT District Planner

This section is for VDOT approval or denial and comments.
Comments:

Approval □ YES □ NO

Signature of VDOT TMPO Official
FHWA New Guidelines

- No longer requires a change at the location of the urbanized boundary (e.g., rural class can continue within urban boundary)
- Future Roads
- Urban Collectors replaced with Major and Minor Collectors
- New Mileage and VMT Thresholds
## New Mileage Thresholds

### Old Percentages

<table>
<thead>
<tr>
<th>Range (%)</th>
<th>Rural System</th>
<th>VMT</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Arterial</td>
<td>30 - 55</td>
<td>2 - 4</td>
<td></td>
</tr>
<tr>
<td>Principal Arterial Plus</td>
<td>45 - 55</td>
<td>6 - 12*</td>
<td></td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>40 - 65</td>
<td>5 - 10</td>
<td></td>
</tr>
<tr>
<td>Collector</td>
<td>20 - 35</td>
<td>20 - 25</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>5 - 20</td>
<td>65 - 75</td>
<td></td>
</tr>
</tbody>
</table>

*With most states falling in the 7-10 percent range.

### New Percentages

<table>
<thead>
<tr>
<th>Functional Classification Group</th>
<th>Percentage of Miles</th>
<th>Percentage of VMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Principal Arterial (for NHS apportionment)</td>
<td>4% max</td>
<td>30-55%</td>
</tr>
<tr>
<td>Urban Principal Arterial (for NHS apportionment)</td>
<td>10% max</td>
<td>40-65%</td>
</tr>
<tr>
<td>All arterials and Collectors (for STP and HSIP apportionment)</td>
<td>35% max</td>
<td>70-80%</td>
</tr>
</tbody>
</table>
Our Update Process

- Convert Existing FC into New FC Categories
- Identify New Roads from VGIN Database
- Calculate Composite Index
- Review FC Definitions/Criteria
- Make Recommendations
- Review VDOT CORE Network
- Review Other States FC Designations
- Calculate Network Mileage
- VDOT Review
- Coordinate with other States and FHWA
- Final Maps
# 1. Convert Existing FC into New FC Categories

<table>
<thead>
<tr>
<th>New FC</th>
<th>Old Urban FC</th>
<th>Old Rural FC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate</td>
<td>Urban Interstate</td>
<td>Rural Interstate</td>
</tr>
<tr>
<td>Other Freeways and Expressways</td>
<td>Urban Other Freeways and Expressways</td>
<td></td>
</tr>
<tr>
<td>Other Principal Arterial</td>
<td>Urban Other Principal Arterials</td>
<td>Rural Other Principal Arterials</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>Urban Minor Arterial</td>
<td>Rural Minor Arterial</td>
</tr>
<tr>
<td>Major Collector</td>
<td>Urban Collector</td>
<td>Rural Major Collector</td>
</tr>
<tr>
<td>Minor Collector</td>
<td>Urban Collector</td>
<td>Rural Minor Collector</td>
</tr>
<tr>
<td>Local</td>
<td>Urban Local</td>
<td>Rural Local</td>
</tr>
</tbody>
</table>
2. Identify New Roads from VGIN GIS Database
3a. Calculate Composite Index

Composite Index based on:
- Volume Percentile
- Speed Limit
- Primary Route or not
- Number of lanes
3b. Separating Composite Index into Percentile Ranges

Richmond Regional Planning District Commission

- Local (0 – 60%)
- Collector (60 – 80%)
- Arterial (80 – 100%)
Other Principal Arterials

**In Rural Areas**
- Serves corridor movements of substantial statewide or interstate travel
- Serves all urban areas of 50,000 and over population and a majority of those over 25,000
- Provide an integrated network without stub connections

**In Urban Areas**
- Serves the major centers of activity of a metropolitan area
- Highest traffic volume corridors
- Roads serving the longest trip desires
- Carry a high proportion of the total urban area travel on a minimum of mileage
- Carry significant amounts of intra-area travel
5. Review Other State’s FC Designations

FC across borders must match.
6. Review VDOT CORE Network

Most if not all routes should be classified.
7. Review City/County/MPO Plans

Provides initial input from local jurisdiction.
8. Make Recommendations
9. Calculate Network Mileage

### Table 1: 2008 Data from Traffic Engineering

<table>
<thead>
<tr>
<th>Category</th>
<th>VMT %</th>
<th>Total VMT</th>
<th>% Length</th>
<th>VMT</th>
<th>% Length</th>
<th>% Increase</th>
<th>% Increase</th>
<th>Potential New VMT</th>
<th>Total New VMT</th>
<th>Estimated VMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Principal Arterial - Interstate</td>
<td>24.44</td>
<td>964.44</td>
<td>11.1%</td>
<td>381.2</td>
<td>10.1%</td>
<td>1.3%</td>
<td>10.1%</td>
<td>56.44</td>
<td>3.5%</td>
<td>-</td>
</tr>
<tr>
<td>Rural Other Freeways and Expressways</td>
<td>12.54</td>
<td>264.12</td>
<td>20.6%</td>
<td>162.5</td>
<td>14.3%</td>
<td>1.2%</td>
<td>14.3%</td>
<td>16.56</td>
<td>1.6%</td>
<td>-</td>
</tr>
<tr>
<td>Rural Principal Arterial - Other</td>
<td>5.18</td>
<td>102.18</td>
<td>12.2%</td>
<td>54.1</td>
<td>6.8%</td>
<td>1.2%</td>
<td>6.8%</td>
<td>9.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Rural Minor Arterial</td>
<td>5.18</td>
<td>102.18</td>
<td>12.2%</td>
<td>54.1</td>
<td>6.8%</td>
<td>1.2%</td>
<td>6.8%</td>
<td>9.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Rural Major Collector</td>
<td>5.18</td>
<td>102.18</td>
<td>12.2%</td>
<td>54.1</td>
<td>6.8%</td>
<td>1.2%</td>
<td>6.8%</td>
<td>9.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
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<td>1.2%</td>
<td>6.8%</td>
<td>9.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Rural Local System</td>
<td>5.18</td>
<td>102.18</td>
<td>12.2%</td>
<td>54.1</td>
<td>6.8%</td>
<td>1.2%</td>
<td>6.8%</td>
<td>9.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Urban Principal Arterial - Interstate</td>
<td>15.18</td>
<td>346.18</td>
<td>20.6%</td>
<td>173.1</td>
<td>12.2%</td>
<td>1.2%</td>
<td>12.2%</td>
<td>17.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Urban Principal Arterial - Other</td>
<td>15.18</td>
<td>346.18</td>
<td>20.6%</td>
<td>173.1</td>
<td>12.2%</td>
<td>1.2%</td>
<td>12.2%</td>
<td>17.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Urban Major Collector</td>
<td>15.18</td>
<td>346.18</td>
<td>20.6%</td>
<td>173.1</td>
<td>12.2%</td>
<td>1.2%</td>
<td>12.2%</td>
<td>17.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Urban Minor Collector</td>
<td>15.18</td>
<td>346.18</td>
<td>20.6%</td>
<td>173.1</td>
<td>12.2%</td>
<td>1.2%</td>
<td>12.2%</td>
<td>17.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Urban Local System</td>
<td>15.18</td>
<td>346.18</td>
<td>20.6%</td>
<td>173.1</td>
<td>12.2%</td>
<td>1.2%</td>
<td>12.2%</td>
<td>17.18</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Total Rural System</td>
<td>20.58</td>
<td>457.02</td>
<td>16.6%</td>
<td>228.5</td>
<td>16.3%</td>
<td>1.2%</td>
<td>16.3%</td>
<td>22.85</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Total Urban System</td>
<td>20.58</td>
<td>457.02</td>
<td>16.6%</td>
<td>228.5</td>
<td>16.3%</td>
<td>1.2%</td>
<td>16.3%</td>
<td>22.85</td>
<td>1.1%</td>
<td>-</td>
</tr>
<tr>
<td>Nationwide Total</td>
<td>100.00</td>
<td>2200.00</td>
<td>100.00%</td>
<td>1100</td>
<td>100.00%</td>
<td>1.2%</td>
<td>100.00%</td>
<td>110.00</td>
<td>1.1%</td>
<td>-</td>
</tr>
</tbody>
</table>

### New FHWA Threshold Criteria

<table>
<thead>
<tr>
<th>Functional Classification Group</th>
<th>Percentage of VMT</th>
<th>Total VMT</th>
<th>% Length</th>
<th>Total VMT</th>
<th>% Length</th>
<th>% Increase</th>
<th>% Increase</th>
<th>Potential New VMT</th>
<th>Total New VMT</th>
<th>Estimated VMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Principal Arterial</td>
<td>30%</td>
<td>423.48</td>
<td>10.7%</td>
<td>243.7</td>
<td>6.2%</td>
<td>1.2%</td>
<td>6.2%</td>
<td>24.7</td>
<td>6.2%</td>
<td>-</td>
</tr>
<tr>
<td>Urban Principal Arterial</td>
<td>40%</td>
<td>414.48</td>
<td>11.5%</td>
<td>251.1</td>
<td>7.1%</td>
<td>1.2%</td>
<td>7.1%</td>
<td>25.1</td>
<td>7.1%</td>
<td>-</td>
</tr>
<tr>
<td>All Arterials and Collectors</td>
<td>50%</td>
<td>424.48</td>
<td>11.3%</td>
<td>252.6</td>
<td>6.9%</td>
<td>1.2%</td>
<td>6.9%</td>
<td>25.3</td>
<td>6.9%</td>
<td>-</td>
</tr>
</tbody>
</table>
10. VDOT/MPO/PDC Review

By Central Office, District Planners & District Staff & MPOs/PDCs
10. VDOT/MPO/PDC Review

http://gis3.rbf.com/vdot/
10. VDOT/MPO/PDC Review

http://gis3.rbf.com/vdot/
11. Coordinate with Other States and FHWA
12. Final Maps
Next Steps

- Review recommended changes with localities and MPO and finalize: Ongoing

- Finalize Functional Classification Update Process Documentation: Summer 2013

- Finalize Ad-Hoc Changes Guidelines Summer 2013

- Final Mapping and Website Updates: Summer 2013