

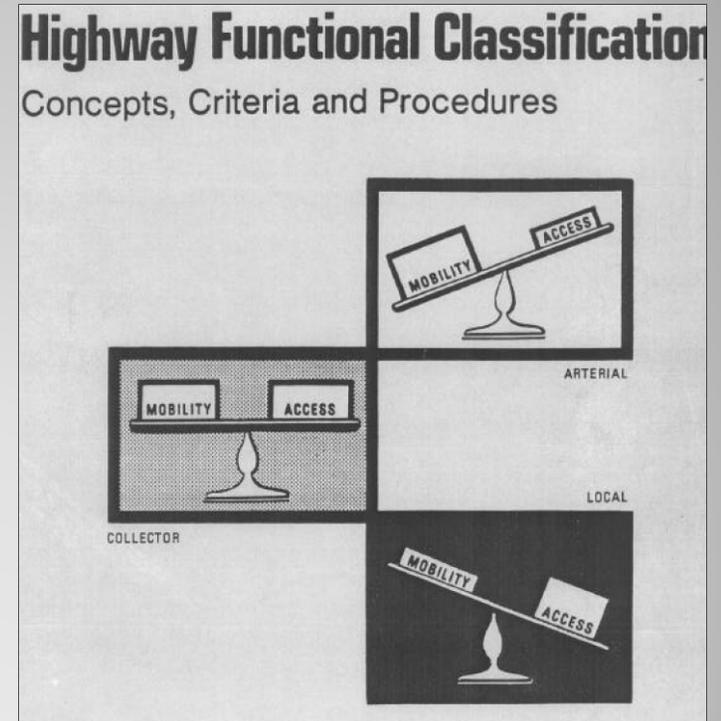
FHWA Functional Classification Guidance Update

Highway Information Seminar
October, 24, 2012
Joseph Hausman, Justin Clarke, FHWA



U.S. Department of Transportation
Federal Highway Administration

- Document is not a departure, it is a refresh
- Acknowledges advances in mapping technologies and analysis capabilities
- Introduces relationship of design and functional classification
- Geared towards everyday practitioners and professionals with casual interest



Overview



U.S. Department of Transportation
Federal Highway Administration

- Builds upon 1989 guidance and 2008 update
- Provides tangible “how to” – process and technical tasks
 - Clarifies what is mandatory and what is not
- Describes concepts and ideas behind functional classification
 - Describes influence of functional class and factors that have an influence on functional class

Document Overview



- How and where functional classification used
- Definition of functional classifications
 - Retained original terms
 - Minimized urban and rural distinctions
 - Introduced OFE/minor and major collectors for all areas
- Description of mobility and access
- Updated mileage and VMT distribution ranges

Contents

	Rural	Urban
1	Principal Arterial – Interstate	Principal Arterial - Interstate
2	Principal Arterial - Other Freeways & Expressways	Principal Arterial - Other Freeways & Expressways
3	Principal Arterial – Other	Principal Arterial – Other
4	Minor Arterial	Minor Arterial
5	Major Collector	Major Collector
6	Minor Collector	Minor Collector
7	Local	Local



- Federal Aid system is mature
- For States, level of coordination for decision-making is high and increasing
- Geospatial technologies and data acquisition capabilities have grown considerably
- Roadway design options have increased, to accommodate non-auto modes

What's Changed?



- Urban and rural demarcation defined by function not urban area boundary
- All functional classification exist in urban and rural categories
 - New Urban Minor Collector
- “Rule of Thumb” recommendations on VMT and mileage distributions
- Future roads – include only if in STIP
- Assign same FC to ramps as highest FC of connecting roadways



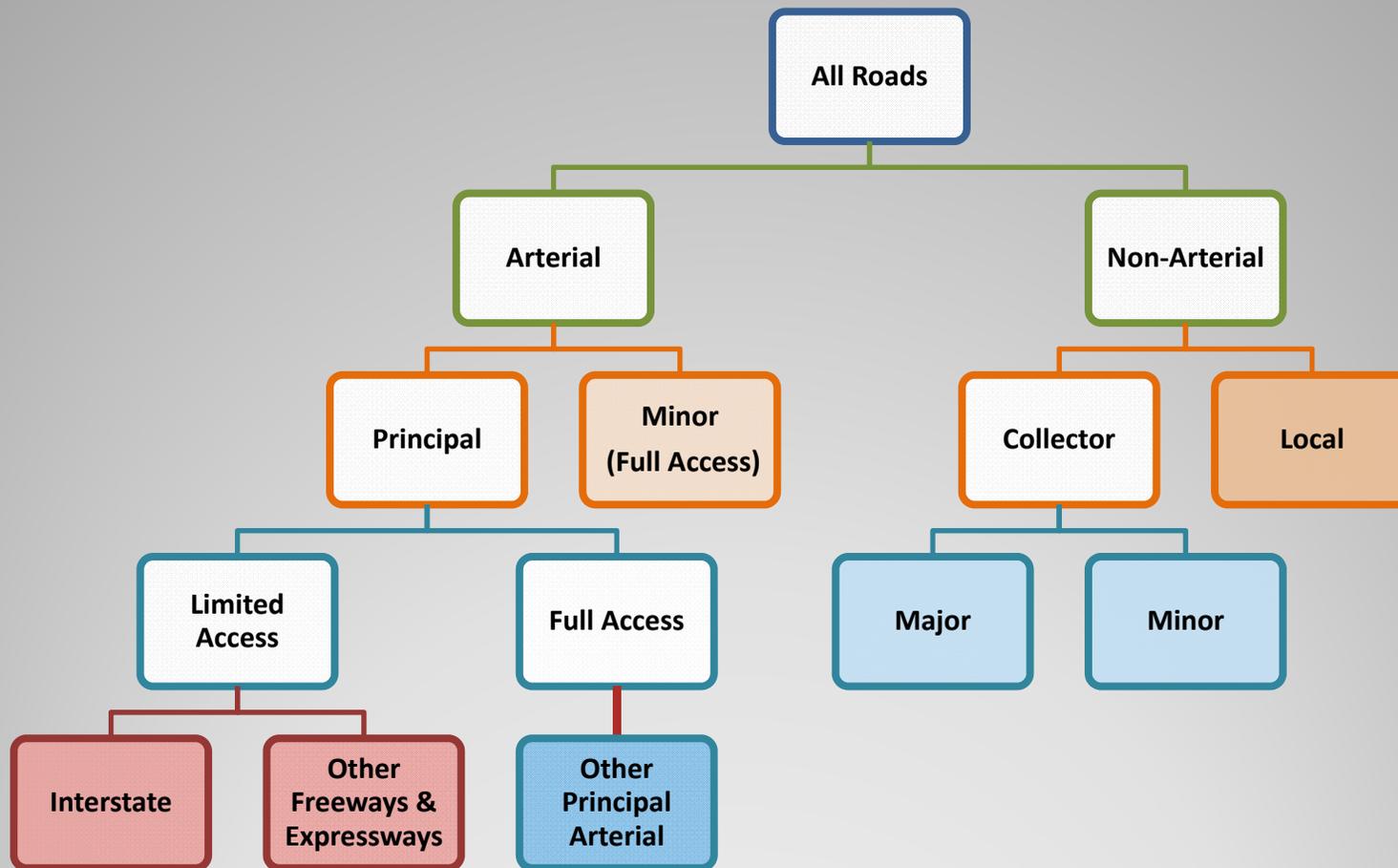
Other Principal Arterial in California



HOV lane on Interstate 95 in Woodbridge, VA

Guidance Highlights

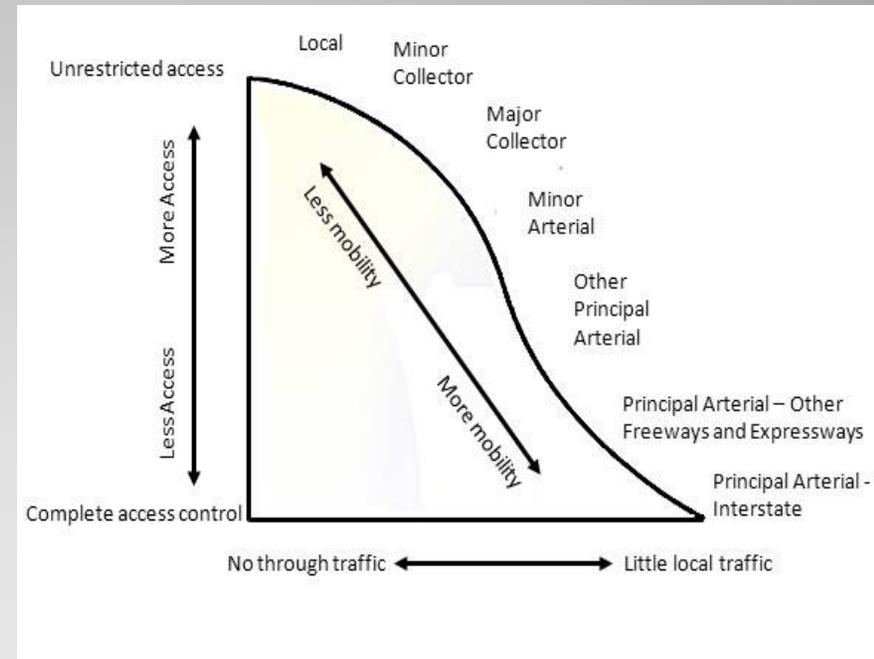




FC – Decision Tree



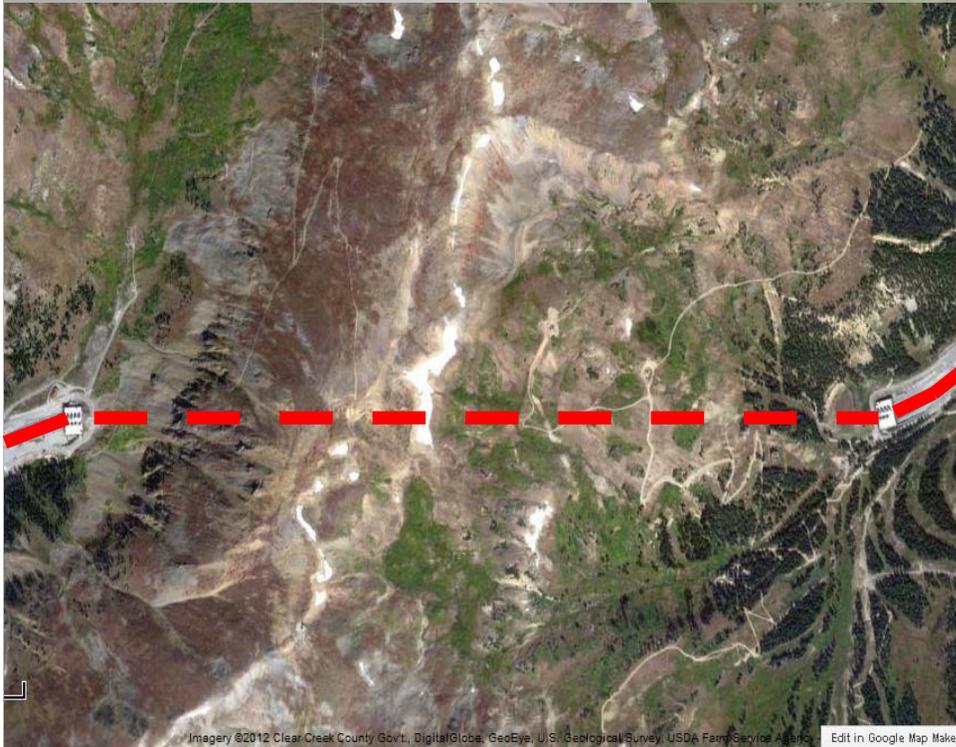
- Mobility: Few opportunities for entry and exit and low travel friction
- Accessibility function: Provides many opportunities for entry and exit; higher travel friction



FC Concepts



Eisenhower (and Johnson)
Tunnels along I-70, west of
Denver, CO



Inside the Eisenhower Tunnel

FC Concepts - Mobility



U.S. Department of Transportation
Federal Highway Administration

Eisenhower Court, North
Platte, NE



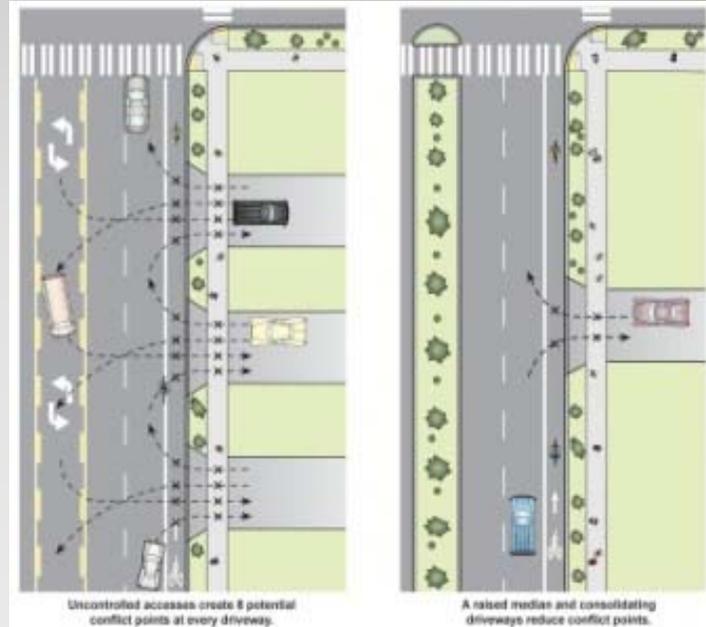
FC Concepts - Access



U.S. Department of Transportation
Federal Highway Administration

- Trip length: Longer trips – More Principal Arterial use. Shorter trips – more Local/Collector use.
- Access points: In theory, Surface Arterials provide the least access for-grade roads – Access Management tries to preserve function.
- Speed limit
- Route spacing
- Usage / traffic volume
- Number of lanes
- Connections to activity centers

FC influencers

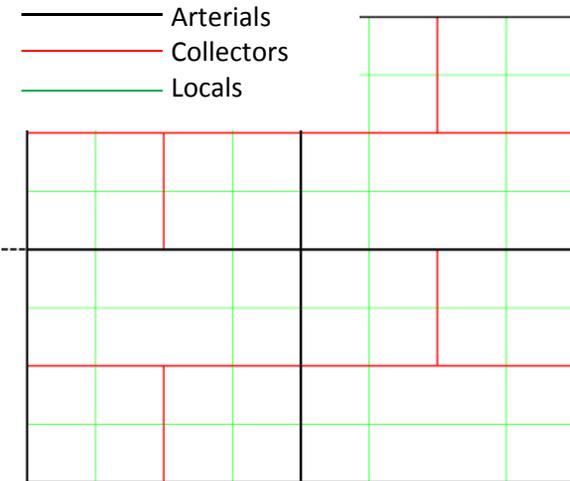


Intro Fig. Access Management - Caption: Benefit of Access Management

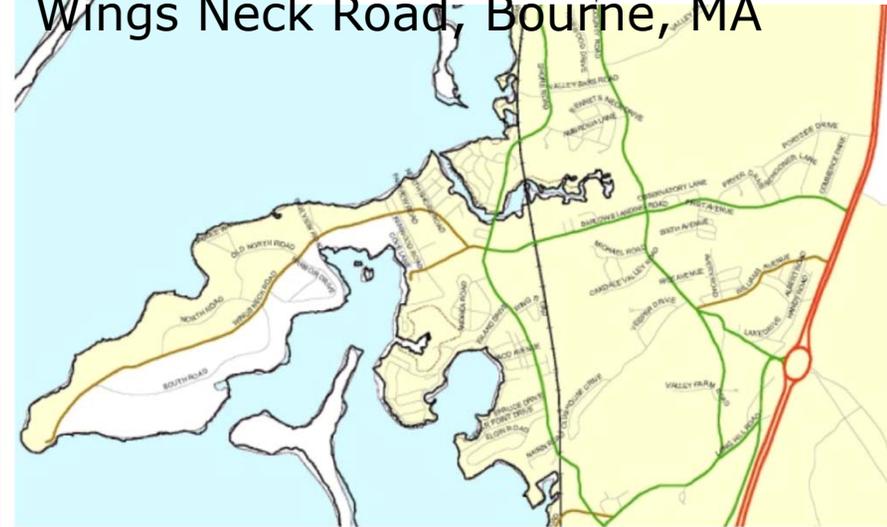


U.S. Department of Transportation
Federal Highway Administration

- A roadway of a higher classification should not terminate at a single roadway of a lower classification.
- Of course there are exceptions...



Wings Neck Road, Bourne, MA



FC Concepts: Continuity



Urban	Rural
<ul style="list-style-type: none"> • Serve major activity centers, highest traffic volume corridors and longest trip demands • Carry high proportion of total urban travel on minimum of mileage • Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area • Serve demand for intra-area travel between the central business district and outlying residential areas 	<ul style="list-style-type: none"> • Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel • Connect all or nearly all Urbanized Areas and a large majority of Urban Clusters with 25,000 and over population • Provide an integrated network of continuous routes without stub connections (dead ends)

Principal Arterials- Characteristics



Urban	Rural
<ul style="list-style-type: none"> • Interconnect and augment the higher-level Arterials • Serve trips of moderate length at a somewhat lower level of travel mobility than Principal Arterials • Distribute traffic to smaller geographic areas than those served by higher-level Arterials • Provide more land access than Principal Arterials without penetrating identifiable neighborhoods • Provide urban connections for Rural Collectors 	<ul style="list-style-type: none"> • Link cities and larger towns (and other major destinations such as resorts capable of attracting travel over long distances) and form an integrated network providing interstate and inter-county service • Be spaced at intervals, consistent with population density, so that all developed areas within the State are within a reasonable distance of an Arterial roadway • Provide service to corridors with trip lengths and travel density greater than those served by Rural Collectors and Local Roads and with relatively high travel speeds and minimum interference to through movement

Minor Arterials- Characteristics



Urban	Rural
<ul style="list-style-type: none"> • Serve both land access and traffic circulation in <u>higher</u> density residential, and commercial/industrial areas • Penetrate residential neighborhoods, often for <u>significant</u> distances • Distribute and channel trips between Local Roads and Arterials, usually over a distance of <u>greater than</u> three-quarters of a mile • Operating characteristics include higher speeds and more signalized intersections 	<ul style="list-style-type: none"> • Provide service to any county seat not on an Arterial route, to the larger towns not directly served by the higher systems and to other traffic generators of equivalent intra-county importance such as consolidated schools, shipping points, county parks and important mining and agricultural areas • Link these places with nearby larger towns and cities or with Arterial routes • Serve the most important intra-county travel corridors

Major Collectors- Characteristics

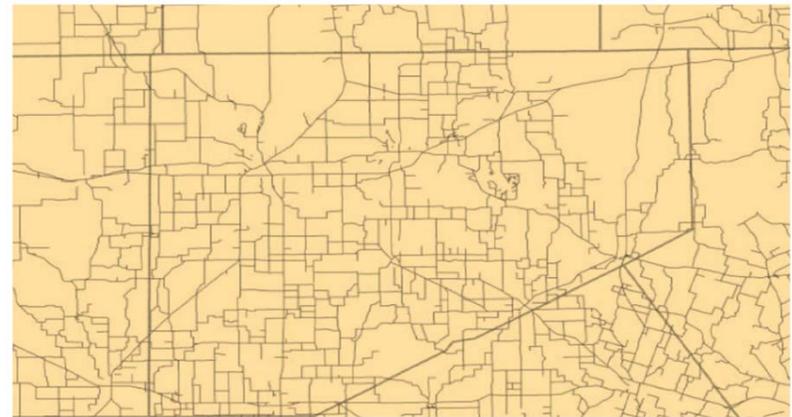


Urban	Rural
<ul style="list-style-type: none"> • Provide direct access to adjacent land • Provide access to higher systems • Carry no through traffic movement • Constitute the mileage not classified as part of the Arterial and Collector systems 	<ul style="list-style-type: none"> • Primarily, provide access to adjacent land • Provide service to travel over short distances as compared to higher classification categories • Constitute the mileage not classified as part of the Arterial and Collector systems

Minor Collectors- Characteristics



- Urban area networks more diverse
 - Greater variety in density, land use
 - Generally, stronger land use controls
- Rural area networks less diverse
 - Less variety in density, land use, less zoning control



FC – Typical Rural and Urban Distinctions



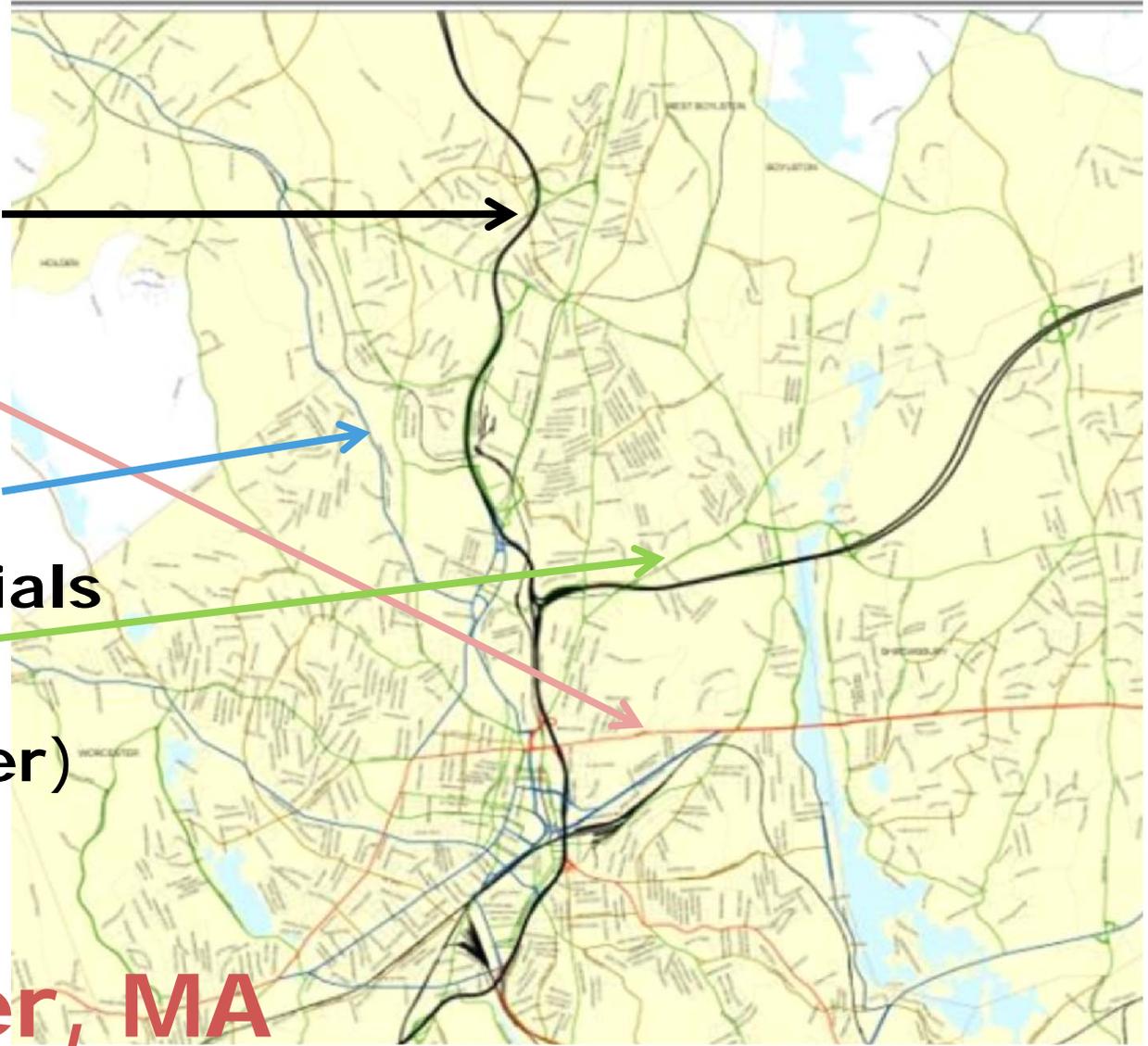
- Interstates (black)

- OFEs (red)

- OPAs (blue)

- Minor Arterials (green)

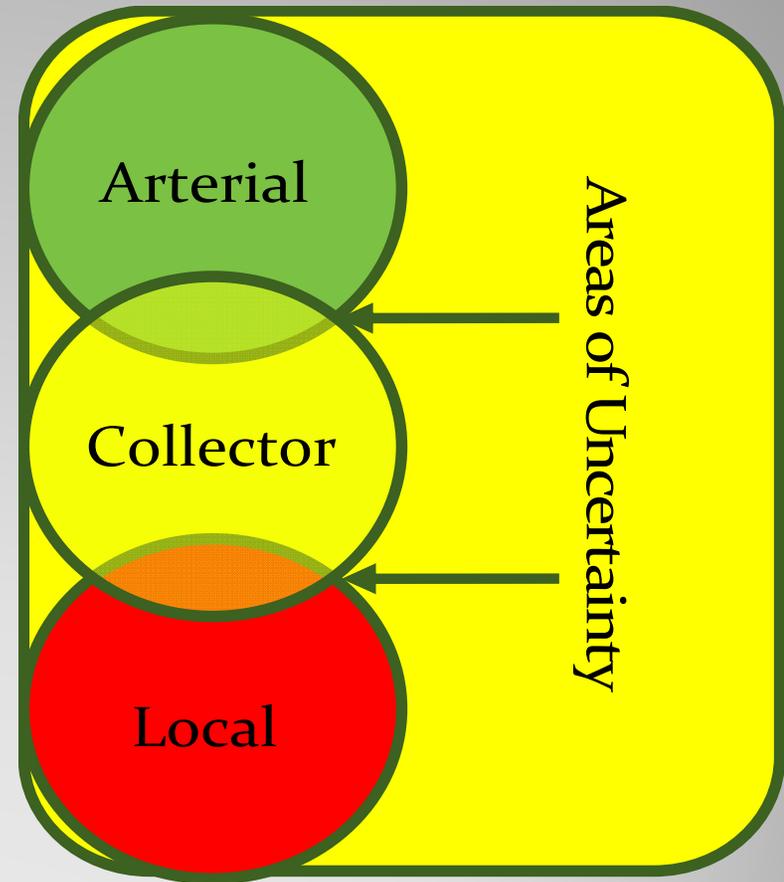
- Locals (other)



Worcester, MA



- Common sense should be guide
- Look at over all distribution and spacing when in doubt
- Be consistent with community standards



FC – Flexibility and Overlap



Typical Characteristics	Interstate	Other Freeways and Expressways	Other Principal Arterials	Minor Arterials
Lane Width	12 feet	11 - 12 feet	11 - 12 feet	10 feet - 12 feet
Inside Shoulder Width	4 feet - 12 feet	0 feet - 6 feet	0 feet	0 feet
Outside Shoulder Width	10 feet - 12 feet	8 feet - 12 feet	8 feet - 12 feet	4 feet - 8 feet
AADT (Rural)	12,000 - 34,000	4,000 - 18,500	2,000 - 8,500	1,500 - 6,000
AADT (Urban)	35,000 - 129,000	13,000 - 55,000	7,000 - 27,000	3,000 - 14,000
Divided/Undivided	Divided	Undivided/ Divided	Undivided/ Divided	Undivided
Access	Fully Controlled	Partially/Fully Controlled	Uncontrolled	Uncontrolled

FC – Typical Characteristics



Typical Characteristics	Interstate	Other Freeways and Expressways	Other Principal Arterials	Minor Arterials
Mileage Extent for Rural States	0% - 3%	1% - 14%	19% - 38%	3% - 5%
Mileage Extent for Urban States	1% - 2%	0% - 15%	15% - 35%	3% - 8%
Mileage Extent for All States	0% - 2%	0% - 14%	17% - 36%	3% - 7%
VMT Extent for Rural States	19% - 29%	2% - 19%	11% - 31%	11% - 18%
VMT Extent for Urban States	16% - 36%	1% - 19%	6% - 31%	11% - 19%
VMT Extent for All States	17% - 33%	2% - 18%	9% - 31%	11% - 18%

FC – Mileage/VMT Guidelines



U.S. Department of Transportation
Federal Highway Administration

Typical Characteristics	Interstate	Other Freeways and Expressways	Other Principal Arterials	Minor Arterials
Mileage Extent for Rural States	1% - 3%	6% - 19%	14% - 27%	8% - 13%
Mileage Extent for Urban States	1% - 2%	8% - 16%	17% - 26%	7% - 12%
Mileage Extent for All States	1% - 2%	17% - 18%	15% - 27%	8% - 12%
VMT Extent for Rural States	17% - 28%	9% - 28%	10% - 27%	17% - 26%
VMT Extent for Urban States	20% - 30%	12% - 28%	11% - 23%	15% - 22%
VMT Extent for All States	19% - 29%	10% - 28%	10% - 25%	15% - 25%

FC – Mileage/VMT Guidelines



U.S. Department of Transportation
Federal Highway Administration

Typical Characteristics	Major Collector	Minor Collector	Local
Lane Width	10 feet - 12 feet	10 - 11 feet	8 - 10 feet
Inside Shoulder Width	0 feet	0 feet	0 feet
Outside Shoulder Width	1 feet - 6 feet	1 feet - 4 feet	0 feet - 2 feet
AADT (Rural)	300 - 2,600	150 - 1,110	15 - 400
AADT (Urban)	1,100 - 6,300 ²		80 - 700
Divided/Undivided	Undivided	Undivided	Undivided
Access	Uncontrolled	Uncontrolled	Uncontrolled

FC – Mileage/VMT Guidelines



U.S. Department of Transportation
Federal Highway Administration

Mileage/VMT Extent (Percentage Ranges)	Major Collector	Minor Collector	Local
Rural System			
Mileage Extent for Rural States	11% - 18%	4% - 15%	61% - 74%
Mileage Extent for Urban States	9% - 16%	6% - 12%	63% - 74%
Mileage Extent for All States	10% - 17%	4% - 14%	62% - 74%
VMT Extent for Rural States	14% - 26%	2% - 8%	8% - 19%
VMT Extent for Urban States	12% - 22%	2% - 9%	7% - 21%
VMT Extent for All States	13% - 24%	1% - 9%	8% - 20%
Urban System			
Mileage Extent for Rural States	8% - 15%		65% - 73%
Mileage Extent for Urban States	8% - 14%		65% - 74%
Mileage Extent for All States	8% - 14%		65% - 74%
VMT Extent for Rural States	6% - 14%		10% - 21%
VMT Extent for Urban States	7% - 11%		8% - 19%
VMT Extent for All States	6% - 13%		9% - 20%

FC – Mileage/VMT Guidelines



U.S. Department of Transportation
Federal Highway Administration

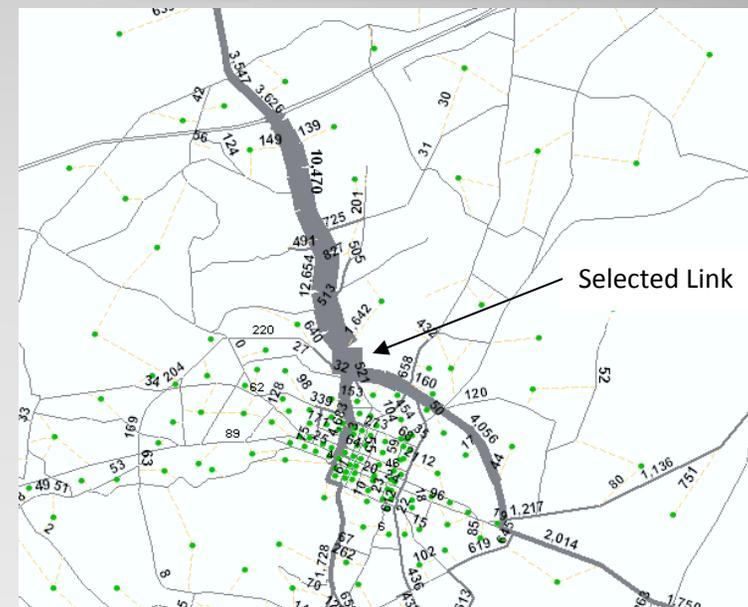
- New significant roadways that may warrant Arterial or Collector status
- Any Principal Arterial roadway reconstructed as a divided facility
- Construction of major development that has caused traffic patterns to change
- Significant growth that causes new access or mobility needs
- Arterial or Collector roadways been extended or to attract more through trip movements?
- Significant growth in daily traffic volumes?

FC Update Triggers



- Use of GIS

- Identify traffic generators/activity centers
- Rank / estimate traffic generated
- Connect with roadway system/validate FC
- Travel demand models (select link feature) can estimate the origin and destination of trips on a facility
- Results of GIS-based mapping and editing should synch up with enterprise data systems



FC – Validation/Review



- Create a multi-agency review team- stay in touch
- Build/share understanding of game plan
- Generate maps and share electronically – use GIS if at all possible
- Encourage/work towards timely delivery of FC revisions

FC Good Practice Steps/Schedule

Event	Month Following FHWA Adjusted Urban Area Boundary Approval
State DOT launches the formal Functional Classification update process after FHWA approves the State's adjusted urban area boundaries	Month 1
State DOT works with planning partners to review and propose changes to the functional classification of its roadways	Months 2-17
State DOT gathers and processes all proposed function classification changes and submit draft final data and/or maps to FHWA division office for review	Months 18-20
DOT incorporates updates into planning process and related databases, to ensure submittal of updated functional classification in upcoming June 15 th HPMS submittal	Months 22-24



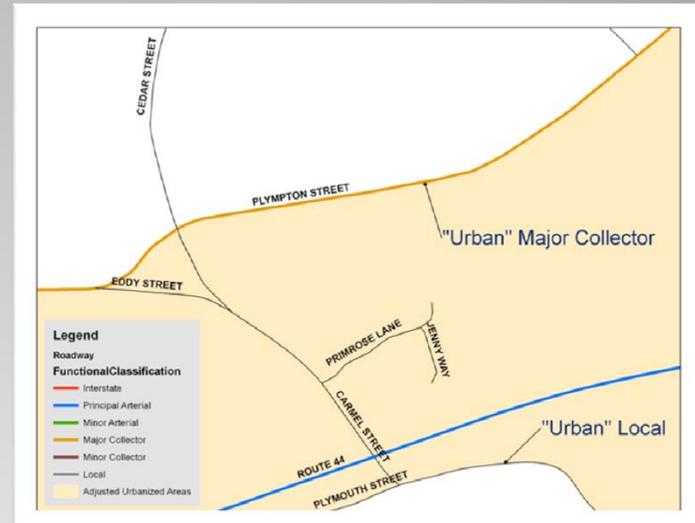


Urban Area Boundaries Urban/Rural Definition



U.S. Department of Transportation
Federal Highway Administration

- Urban and rural demarcation defined by function not urban area boundary
- Roads that define a boundary should be consistently urban or rural
- Area must encompass Census Bureau urban area, at a minimum
- Should be one contiguous area

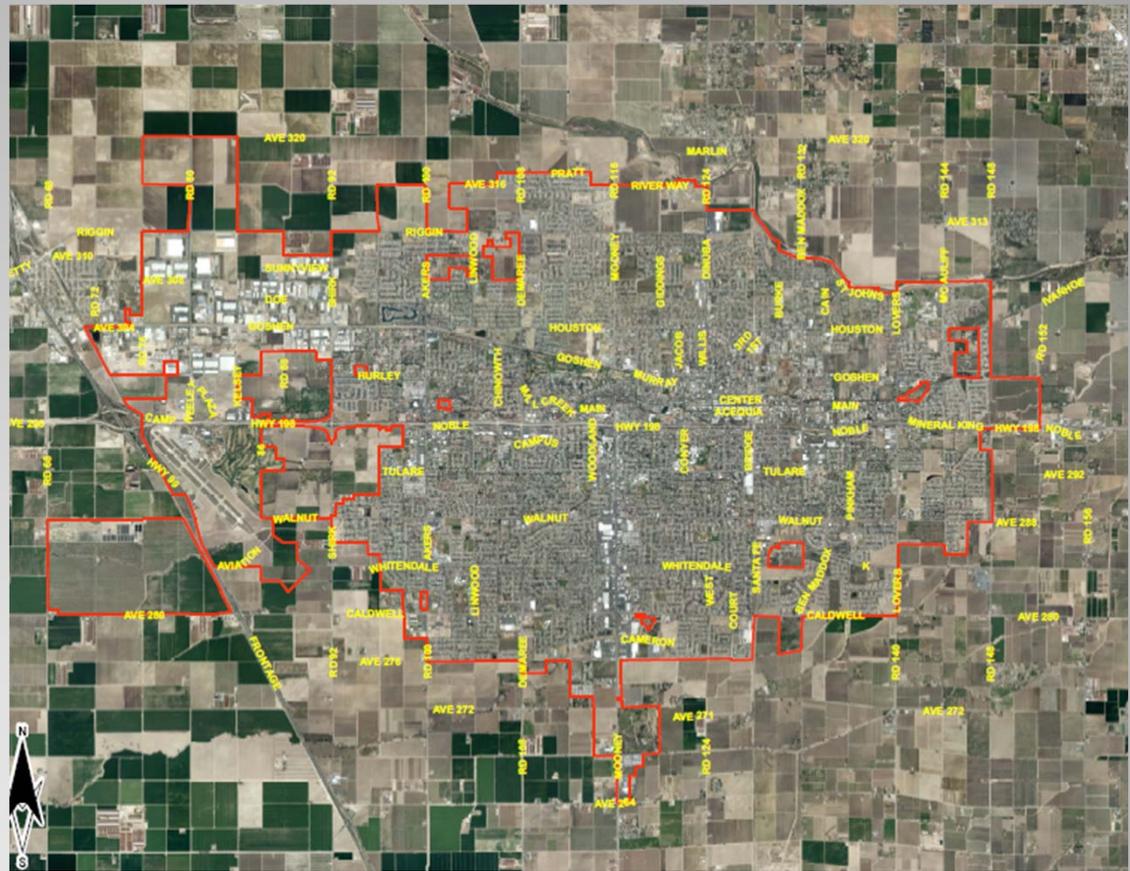


Example of Roadway Coinciding with Adjusted Urban Area

Urban Area Boundary



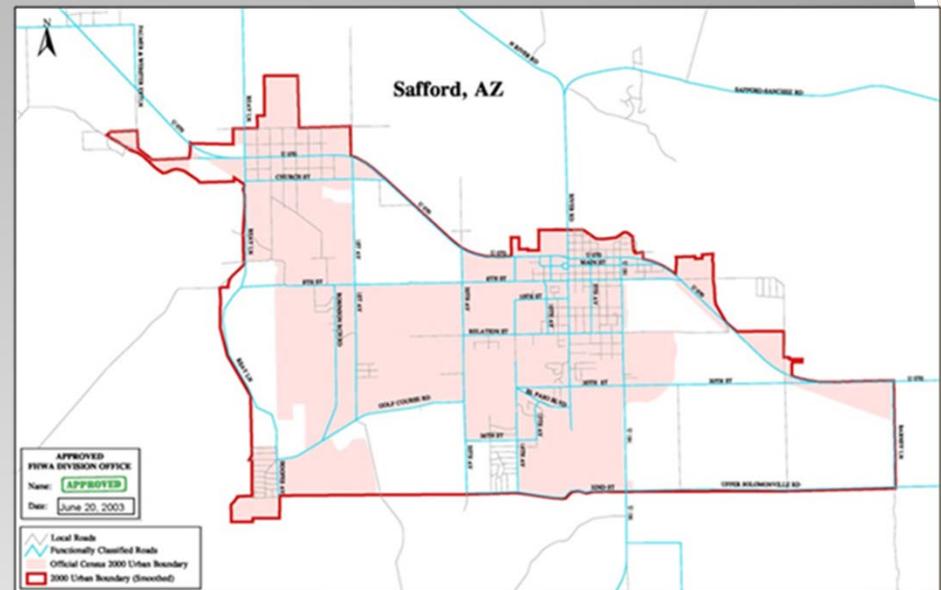
- Include entire municipality
- Include areas with urban characteristics
- Include large/significant generators, e.g., airports, industrial areas
- Should be one contiguous area



Urban Area Boundaries – Reasons to Expand



- Boundaries can consider transportation terminals, transit routes
- Boundary should follow municipal limits or physical features
- Boundary should be easy to discern
- Boundaries should be simple, without irregularities
- Boundaries should not split roadways or ramps



Example Boundary Adjusted to Align with Major East-West Roadway to the South

Urban Area Boundaries – Considerations



Census Bureau Area Definition	Population Range
Urban Area	2,500+
Urban clusters	2,500-49,999
Urbanized Area	50,000+



FHWA Area Definition	Population Range	Allowed Urban Area Boundary Adjustments
Urban Area	5,000+	Yes
Small Urban Area (From Clusters)	5,000-49,999	Yes
Urbanized Area	50,000+	Yes



Urban Area Boundaries

Urban/Rural Definition



- Recommended 12 month schedule following Census data release
- At a minimum – confirm Census boundaries are adequate, also...
 - Build/share understanding of game plan
 - Generate maps and share electronically – use GIS if at all possible
 - Encourage/work towards timely delivery of UAB revisions

Event	Months Following Decennial Census Data Release (CDR)
Census releases urban area boundaries and FHWA issues transmittal letter	Month 24
Begin adjusted urban area boundary update process	Month 24
DOT works with planning partners to define adjusted urban area boundaries	Month 27-Month 33
Provide draft final data and/or maps to FHWA Division Office for review	Month 34
DOT incorporates updates	Month 35
DOT submits adjusted urban area boundaries via annual HPMS submittal	Month 36

Urban Area Boundary Adjustment Good Practice Steps/Schedule



- Justin Clarke 202-366-9245
- Joseph Hausman 202-366-5047
- Comments/Questions

Contacts



U.S. Department of Transportation
Federal Highway Administration