

# Functional Classification Report

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November 2021

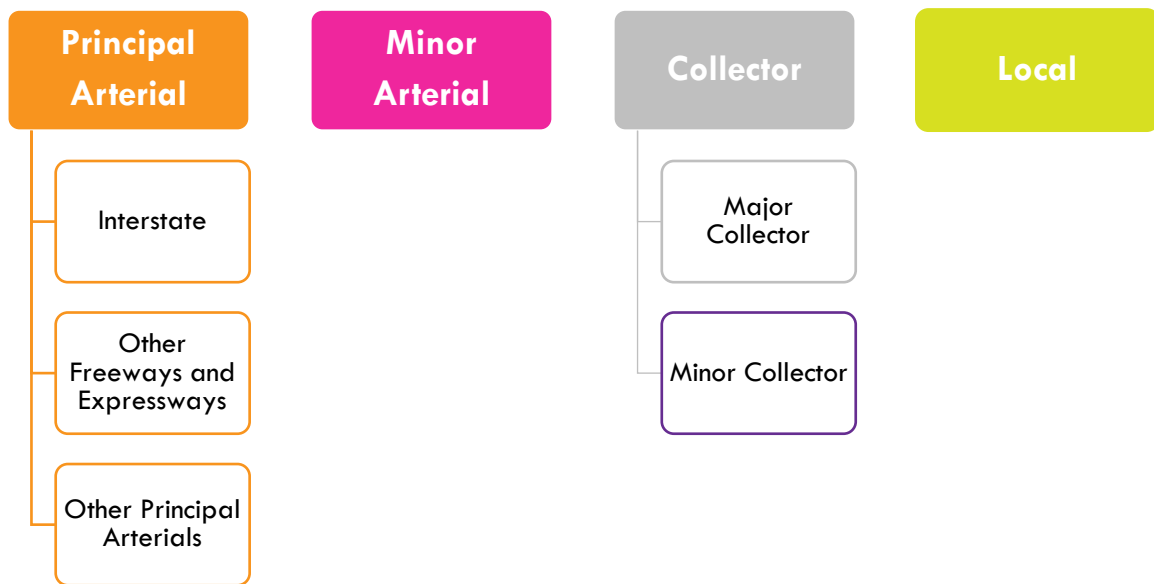


# Introduction

Functional classification is the system used to organize streets and highways according to how they move vehicles across our transportation network. This designation is based on criteria established by the Federal Highway Administration, such as roadway volume, speed limit, etc. Functional classification is used in transportation planning, roadway design, and is one of the factors in determining if a roadway project is eligible to receive federal funds.

As the Metropolitan Planning Organization for the Wichita Area, WAMPO is responsible for developing and maintaining the functional classification system of roadways within its planning boundaries in coordination with local cities, counties, and the Kansas Department of Transportation.

Functional classification consists of four categories, with two of those categories having sub-categories. The four main categories are Principal Arterial, Minor Arterial, Collector, and Local. The sub-categories are within Principal Arterial with Interstate, Freeways and Expressways, and Others, and Collector with Major and Minor Collectors.



## Concepts

There are two primary concepts for transportation functions of roadways, namely mobility and access. These primary concepts, alongside other factors, help determine the proper category that a particular roadway belongs to, such as trip length, speed limit, volume, and vehicle mix.

Roadway mobility is described as a roadway that provides few opportunities for entry and exit and therefore low travel friction from vehicle access/egress.

Roadway accessibility is described as a roadway that provides many opportunities for entry and exit, which creates potentially higher friction from vehicle access/egress.

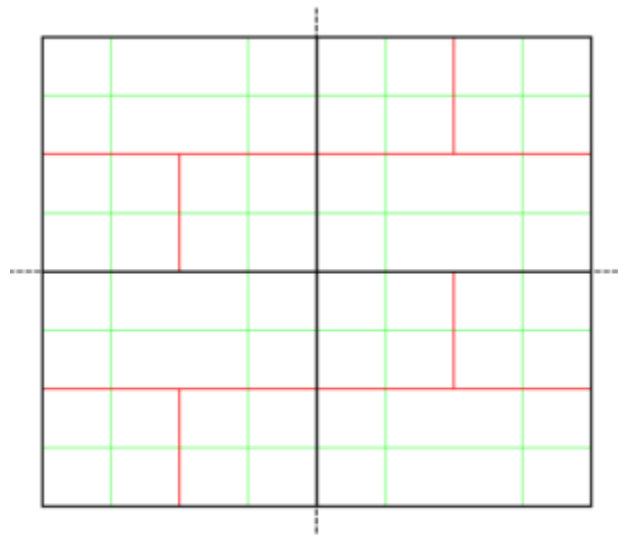


The two concepts can be most easily understood by using extreme examples. First, consider the Eisenhower Tunnel, which is one of the longest tunnels in the United States. The tunnel provides complete service to mobility, since there is no way for vehicles to enter or exit the tunnel. On the other hand, consider a residential street that has a multitude of entryways and exits for vehicles to be able to go home. These streets provide service to access as there are many vehicles entering and exiting. There are other travel characteristics that are taken into consideration as well, such as distance served, number of access points, speed limit, distance between routes, usage, significance, and number of travel lanes, as shown in the table below.

Functional Classification	Distance Served	Access Points	Speed Limit	Distance Between Routes	Usage (AADT and DVMT)	Significance	Number of Travel Lanes
<b>Arterial</b>	Longest	Few	Highest	Longest	Highest	Statewide	More
<b>Collector</b>	Medium	Medium	Medium	Medium	Medium	Medium	Medium
<b>Local</b>	Shortest	Many	Lowest	Shortest	Lowest	Local	Fewer

Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.

System continuity is also an important aspect of roadway systems, as the systems are an interconnecting network of facilities channeling traffic across the functional classifications. The basic principle of the functional classification network is continuity, and that a roadway with a higher classification should not connect to a single roadway with a lower classification. The example below shows how an example set of roads should be classified, such that the arterials only connect to other arterials and the collectors connect to other collectors or arterials (which have a higher classification).



Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.

- Arterials
- Collectors
- Locals



# Criteria and Definitions

## Principal Arterial

### Interstates

Interstates are a sub-classification of arterials and of the highest classification in the system. Interstates are the least subjective of all the functional classifications, as there is no ambiguity. Interstates are officially designated by the Secretary of Transportation and all routes that comprise the Dwight D. Eisenhower National System of Interstate and Defense Highways belong to the Interstate functional classification.

### Other Freeways and Expressways

Roadways in this classification are similar to those in the Interstate classification. These roads often have directional travel lanes that are separated by some type of physical barrier and have limited access/egress points. Similar to interstates, these roads are designed and constructed to maximize mobility over accessibility.

### Other Principal Arterials

Other Principal Arterials is the final sub-classification for Principal Arterials. These roadways serve major center of metropolitan areas, and provide a high degree of mobility, including through rural areas. Unlike the other Principal Arterials, abutting land uses can be served directly with these roadways. A detailed explanation on these roadways can also be found in the table below.

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

Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.

## Minor Arterials

Minor Arterials provide service for moderate length trips and serve geographical areas that are smaller than their higher Arterial counterparts along with offering connectivity to higher Arterial systems. In an urban context, these roadways interconnect higher Arterial systems and provide intra-community continuity and may carry local bus routes. In the rural setting, Minor Arterials are identified and spaced at intervals that are consistent with population density so all developed areas are within a reasonable distance to a higher Arterial. A detailed explanation can be found in the following table.



Urban	Rural
<ul style="list-style-type: none"> <li>• Interconnect and augment the higher-level Arterials</li> <li>• Serve trips of moderate length at a somewhat lower level of travel mobility than Principal Arterials</li> <li>• Distribute traffic to smaller geographic areas than those served by higher-level Arterials</li> <li>• Provide more land access than Principal Arterials without penetrating identifiable neighborhoods</li> <li>• Provide urban connections for Rural Collectors</li> </ul>	<ul style="list-style-type: none"> <li>• 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</li> <li>• 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</li> <li>• 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</li> </ul>

Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.

## Collectors

Collectors serve an important role in gathering traffic from Local Roads and funneling them to the Arterial network. Collectors are broken down into two sub classifications, Major and Minor. The distinction between the two is often subtle. Generally, Major Collectors have longer route lengths, spaced at greater intervals, have higher annual average traffic volumes, and have more travel lanes than their Minor counterparts. Overall, Major Collectors typically have a lower total mileage compared to Minor Collectors, while the total Collector mileage is typically a third of the Local roadway network.

### Major Collectors

Urban	Rural
<ul style="list-style-type: none"> <li>• Serve both land access and traffic circulation in <u>higher</u> density residential and commercial/industrial areas</li> <li>• Penetrate residential neighborhoods, often for <u>significant</u> distances</li> <li>• Distribute and channel trips between Local Roads and Arterials, usually over a distance of <u>greater than</u> ¾ of a mile</li> <li>• Operating characteristics include higher speeds and more signalized intersections</li> </ul>	<ul style="list-style-type: none"> <li>• 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</li> <li>• Link these places with nearby larger towns and cities or with Arterial routes</li> <li>• Serve the most important intra-county travel corridors</li> </ul>

Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.



## Minor Collectors

Urban	Rural
<ul style="list-style-type: none"> <li>• Serve both land access and traffic circulation in lower density residential and commercial/industrial areas</li> <li>• Penetrate residential neighborhoods, often only for a <u>short</u> distance</li> <li>• Distribute and channel trips between Local Roads and Arterials, usually over a distance of <u>less than</u> <math>\frac{3}{4}</math> of a mile</li> <li>• Operating characteristics include lower speeds and fewer signalized intersections</li> </ul>	<ul style="list-style-type: none"> <li>• Be spaced at intervals, consistent with population density, to collect traffic from Local Roads and bring all developed areas within reasonable distance of a Collector</li> <li>• Provide service to smaller communities not served by a higher class facility</li> <li>• Link locally important traffic generators with their rural hinterlands</li> </ul>

Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.

## Local

Local roads account for the largest amount of total mileage of all the classifications. These roads are not intended for long distance travel because of their provision of direct access to abutting land. They are often designed to discourage through traffic and generally do not contain local bus routes. Local Roads are often classified by default. An explanation on Local Roads can be found in the table below.

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

Source: Federal Highway Association. (2013). Highway Functional Classification Concepts, Criteria and Procedures.

## Final Considerations

Classification of roadways are sometimes straightforward, such as with Interstates and Local Roads, but can also be complicated. However, there is flexibility when deciding adjacent classifications. To assist in this process of classifications, there is a guideline from the FHWA that helps in determining functional classification of roadways based on several factors such as Average Annual Daily Traffic (AADT), Vehicle Miles Traveled (VMT), and more. These tables can be found on the following pages.



## VMT and Mileage Guidelines by Functional Classifications - Arterials

	Arterials			
	Interstate	Other Freeways & Expressway	Other Principal Arterial	Minor Arterial
<b>Typical Characteristics</b>				
<b>Land Width</b>	12 feet	11 - 12 feet	11 - 12 feet	10 feet - 12 feet
<b>Inside Shoulder Width</b>	4 feet - 12 feet	0 feet - 6 feet	0 feet	0 feet
<b>Outside Shoulder Width</b>	10 feet - 12 feet	8 feet - 12 feet	8 feet - 12 feet	4 feet - 8 feet
<b>AADT<sup>1</sup> (Rural)</b>	12,000 - 34,000	4,000 - 18,500 <sup>2</sup>	2,000 - 8,500 <sup>2</sup>	1,500 - 6,000
<b>AADT<sup>1</sup> (Urban)</b>	35,000 - 129,000	13,000 - 55,000 <sup>2</sup>	7,000 - 27,000 <sup>2</sup>	3,000 - 14,000
<b>Divided/Undivided</b>	Divided	Undivided/Divided	Undivided/Divided	Undivided
<b>Access</b>	Fully Controlled	Partially/Full Controlled	Partially/Uncontrolled	Uncontrolled
<b>Mileage/VMT Extent (Percentage Ranges)<sup>1</sup></b>				
<b>Rural System</b>				
<b>Mileage Extent for Rural States<sup>2</sup></b>	1% - 3%	0% - 2%	2% - 6%	2% - 6%
<b>Mileage Extent for Urban States</b>	1% - 2%	0% - 2%	2% - 5%	3% - 7%
<b>Mileage Extent for All States</b>	1% - 2%	0% - 2%	2% - 6%	3% - 7%
<b>VMT Extent for Rural States<sup>2</sup></b>	18% - 38%	0% - 7%	15% - 31%	9% - 20%
<b>VMT Extent for Urban States</b>	18% - 34%	0% - 8%	12% - 29%	12% - 19%
<b>VMT Extent for All States</b>	20% - 38%	0% - 8%	14% - 30%	11% - 20%
<b>Urban System</b>				
<b>Mileage Extent for Rural States<sup>2</sup></b>	1% - 3%	0% - 2%	4% - 9%	7% - 14%
<b>Mileage Extent for Urban States</b>	1% - 2%	0% - 2%	4% - 5%	7% - 12%
<b>Mileage Extent for All States</b>	1% - 3%	0% - 2%	4% - 5%	7% - 14%
<b>VMT Extent for Rural States<sup>2</sup></b>	17% - 31%	0% - 12%	16% - 33%	14% - 27%
<b>VMT Extent for Urban States</b>	17% - 30%	3% - 18%	17% - 29%	15% - 22%
<b>VMT Extent for All States</b>	17% - 31%	0% - 17%	16% - 31%	14% - 25%
<b>Qualitative Description (Urban)</b>	<ul style="list-style-type: none"> <li>• Serve major activity centers, highest traffic volume corridors, and longest trip demands</li> <li>• Carry high proportion of total urban travel on minimum of mileage</li> <li>• Interconnect and provide continuity for major rural corridors to accommodate trips entering and leaving urban area and movements through the urban area</li> <li>• Serve demand for intra-area travel between the central business district and outlying residential areas</li> </ul>		<ul style="list-style-type: none"> <li>• Interconnect with and augment the principal arterials</li> <li>• Serve trips of moderate length at a somewhat lower level of travel mobility than principal arterials</li> <li>• Distribute traffic to smaller geographic areas than those served by principal arterials</li> <li>• Provide more land access than principal arterials without penetrating identifiable neighborhoods</li> <li>• Provide urban connections for rural collectors</li> </ul>	
<b>Qualitative Description (Rural)</b>	<ul style="list-style-type: none"> <li>• Serve corridor movements having trip length and travel density characteristics indicative of substantial statewide or interstate travel</li> <li>• Serve all or nearly all urbanized areas and a large majority of urban clusters areas with 25,000 and over population</li> <li>• Provide an integrated network of continuous routes without stub connections (dead ends)</li> </ul>		<ul style="list-style-type: none"> <li>• 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</li> <li>• Spaced at intervals, consistent with population density, so that all developed areas within the State are within a reasonable distance of an arterial roadway</li> <li>• 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</li> </ul>	

1 - Ranges in this table are derived from 2011 HPMS data.

2 - For this table, Rural States are defined as those with a maximum of 75 percent of their population in urban centers.

## VMT and Mileage Guidelines by Functional Classifications – Collectors and Locals

	Collectors		Local
	Major Collector <sup>2</sup>	Minor Collector <sup>2</sup>	
<b>Typical Characteristics</b>			
Land Width	10 feet - 12 feet	10 - 11 feet	8 feet - 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 <sup>1</sup> (Rural)	300 - 2,600	150 - 1,110	15 - 400
AADT <sup>1</sup> (Urban)	1,100 - 6,300 <sup>2</sup>		80 - 700
Divided/Undivided	Undivided	Undivided	Undivided
Access	Uncontrolled	Uncontrolled	Uncontrolled
<b>Mileage/VMT Extent (Percentage Ranges)<sup>1</sup></b>			
<b>Rural System</b>			
Mileage Extent for Rural States <sup>3</sup>	8% - 19%	3% - 15%	62% - 74%
Mileage Extent for Urban States	10% - 17%	5% - 13%	66% - 74%
Mileage Extent for All States	9% - 19%	4% - 15%	64% - 75%
VMT Extent for Rural States <sup>3</sup>	10% - 23%	1% - 8%	8% - 23%
VMT Extent for Urban States	12% - 24%	3% - 10%	7% - 20%
VMT Extent for All States	12% - 23%	2% - 9%	8% - 23%
<b>Urban System</b>			
Mileage Extent for Rural States <sup>3</sup>	3% - 16%	3% - 16% <sup>2</sup>	62% - 74%
Mileage Extent for Urban States	7% - 13%	7% - 13% <sup>2</sup>	67% - 76%
Mileage Extent for All States	7% - 15%	7% - 15% <sup>2</sup>	63% - 75%
VMT Extent for Rural States <sup>3</sup>	2% - 13%	2% - 12% <sup>2</sup>	9% - 25%
VMT Extent for Urban States	7% - 13%	7% - 13% <sup>2</sup>	6% - 24%
VMT Extent for All States	5% - 13%	5% - 13% <sup>2</sup>	6% - 25%
<b>Qualitative Description (Urban)</b>	<ul style="list-style-type: none"> <li>• Serve both land access and traffic circulation in higher density residential, and commercial/industrial areas</li> <li>• Penetrate residential neighborhoods, often for significant distances</li> <li>• Distribute and channel trips between local streets and arterials, usually over a distance of greater than three-quarters of a mile</li> </ul>	<ul style="list-style-type: none"> <li>• Serve both land access and traffic circulation in lower density residential, and commercial/industrial areas</li> <li>• Penetrate residential neighborhoods, often only for a short distance</li> <li>• Distribute and channel trips between local streets and arterials, usually over a distance of less than three-quarters of a mile</li> </ul>	<ul style="list-style-type: none"> <li>• Provide direct access to adjacent land</li> <li>• Provide access to higher systems</li> <li>• Carry no through traffic movement</li> </ul>
<b>Qualitative Description (Rural)</b>	<ul style="list-style-type: none"> <li>• 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, important mining and agricultural areas</li> <li>• Link these places with nearby larger towns and cities or with arterial routes</li> <li>• Serve the most important intra-county travel corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Be spaced at intervals, consistent with population density, to collect traffic from local roads and bring all developed areas within reasonable distance of a minor collector</li> <li>• Provide service to smaller communities not served by a higher class facility</li> <li>• Link locally important traffic generators with their rural hinterlands</li> </ul>	<ul style="list-style-type: none"> <li>• Serve primarily to provide access to adjacent land</li> <li>• Provide service to travel over short distances as compared to higher classification categories</li> <li>• Constitute the mileage not classified as part of the arterial and collectors systems</li> </ul>

1- Ranges in this table are derived from 2011 HPMS data.

2- Information for Urban Major and Minor Collectors is approximate, based on a small number of States reporting.

3- For this table, Rural States are defined as those with a maximum of 75 percent of their population in urban centers.